City and County of Honolulu

Cluster/PD–H Guidebook

Department of Land Utilization
July 1993
City and County of Honolulu
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MAYOR’S MESSAGE

The Land Use Ordinance (Luo), in Article 6, provides for optional development methods which offer an alternative to standard residential subdivision development in residential and apartment zoning districts. This guidebook features two of these methods: Cluster Housing and Planned Development-Housing (PD-H).

The purpose of optional development methods is to allow residential and site design flexibility to encourage creative and better use of land in a manner permitted within the zoning district. Cluster Housing and PD-H can offer these advantages:

- A greater number of dwelling units or floor area density;
- Lower site development costs;
- Reduction in site grading;
- Relaxation of certain standards such as lot size, width, building spacing, road widths, building types;
- Land area for open space and recreation amenities; and
- Retention of natural site features, such as streams, landscaping and site topography.

Cluster Housing and PD-H projects require design review approval by the Department of Land Utilization, in consultation with other City and State agencies.

This booklet supplements the development standards in the LDU by explaining and illustrating the design guidelines followed in that review process.

FRANK F. FASI, Mayor
City and County of Honolulu
Projects should generally not be designed to the maximum permitted density. Cluster development ought to reflect the approximate residential density of the surrounding neighborhood or be comparable to the number of units that could be built if the site were developed as a conventional subdivision. If the area is eligible for Ohana Housing, this factor can be considered when comparing the density of the proposed cluster project with a conventional subdivision of the site. However, since ohana units are restricted as to floor area, the density comparison should take into account that an ohana unit may be one-half to one-fourth the size of a typical single-family dwelling in the neighborhood, depending on the underlying zoning district. In the case of PD-H projects, floor area should be reserved for future additions to the residential units. As a general guideline, at least 10 percent of the total permitted floor area should be reserved for future expansion.
INTRODUCTION

The Land Use Ordinance (LUO) permits Cluster Housing and Planned Development-Housing (PD-H) in Residential and Apartment Districts. Cluster development is also permitted in the Country District (LUO Section 5.30-1) and Agricultural District (LUO Section 5.20-1). In these latter two districts, the primary intent of Cluster development is to preserve natural features and promote efficient use of land best suited for agricultural activities. While many of the design principles discussed in this guidebook apply to Clusters in Country and Agricultural Districts, the focus of this guidebook is on the use of Cluster Housing and PD-H in Residential and Apartment Districts, where higher densities require greater attention to siting, building design and impact on existing neighborhoods.

The LUO establishes certain minimum development standards for all Cluster and PD-H projects, which vary according to zoning district. These standards are summarized in Appendix A, along with guidelines for project density.

Other standards or requirements result from the review of applications by the Department of Land Utilization and other public agencies to address health, safety, general welfare and compatibility with existing neighborhoods. The following are design guidelines to be used in planning a Cluster or PD-H project:

- Site planning
- Building design
- Road layout (ingress, egress widths, turnarounds)
- Pedestrian circulation
- Parking
- Sewers
- Refuse collection
- Drainage
- Landscaping
- Lighting
- Recreation facilities/open space
- Fences and walls
Cluster and PD-H development can be especially helpful for sites which have unusual features such as steep slopes, poor soil areas, rock outcroppings, major stands of trees which could be preserved, or natural streams. Such unique site features are constraints to conventional subdivision development, but can become assets in projects which incorporate these features in the design or site plan through Cluster or PD-H. In addition, design and site plan flexibility in a Cluster or PD-H project can achieve considerable savings in site development costs on a per-unit basis.

Reduced standards for unit spacing, lot size and width, and private roadways can permit "grouping" and clustering of units or lots to minimize grading in areas which may be difficult to develop, and preserve natural site features and amenities (see Figure 1).

**FIGURE 1**

**Subdivision**
- No common open space
- Concrete lined drainage channel
- Longer and wider street system

**Cluster or PD-H**
- Maximizes open space
- Preserves natural features and major landscaping
- Minimizes thru traffic
- Incorporates a passive drainage system through use of greenbelts
Alignment of the roadway should take the natural topography into account. A curvilinear roadway respecting natural contours not only minimizes grading but also creates design opportunities (see Figure 2). Development should be limited to the less steep portions of a site to avoid severe grading, and to provide useable private areas between dwellings. Slopes steeper than 40 percent should not be developed.

FIGURE 2

Undesirable

- Ignores natural features
- Lacks visual interest
- Monotonous landscaping
- Loss of individual lot identity

Desirable

- Preserves or creates landscape features
- Variety of views/visual interest
- Landscaping provides privacy/interest
- Lots have a sense of individuality
When development does occur on slopes, buildings should be stepped to follow the existing topography, to minimize grading and to conceal foundations from the views of neighboring properties. Stepping or terracing buildings can also minimize site development and engineering costs, as well as lessen the visual impact of hillside development by making the project appear to be integrated with the natural environment (Figure 3).

**FIGURE 3**

Undesirable Buildings
- Visually higher buildings
- Flat building elevations

Desirable Buildings
- Visually lower and more interesting buildings
- Greater opportunities for architectural diversification

landscape to reduce height and bulk

step or grille
Yard setbacks and height stepbacks for the underlying zoning district apply to all buildings and uses around the project boundary where it abuts other properties and roadways. Figure 4 summarizes these requirements.

**FIGURE 4**

Multi-family dwellings in Residential Districts may require additional yard setbacks, depending on topography, landscaping, and zoning.

If a roadway abuts a neighboring property with less than the front yard setback, a wall or landscape buffer is required.

<table>
<thead>
<tr>
<th>Minimum Side and Rear Yards</th>
<th>Minimum Front Yard</th>
</tr>
</thead>
<tbody>
<tr>
<td>Agricultural: 10'</td>
<td>Agricultural: 15'</td>
</tr>
<tr>
<td>Country: 10'</td>
<td>Country: 15'</td>
</tr>
<tr>
<td>Residential: 5'</td>
<td>Residential: 10'</td>
</tr>
<tr>
<td>Apartment: 10' (5' for Single-Family and Two-Family dwellings)</td>
<td>Apartment: 10'</td>
</tr>
</tbody>
</table>
Although there are no specific regulations governing spacing between buildings (except building and housing codes), it is desirable to establish minimum guidelines to assure visual and acoustical privacy for each dwelling unit. These guidelines are similar to the requirements for conventional subdivisions. The distance between two 1-story units should be 10 feet; between 1-story and two-story units, 15 feet; and between two 2-story units or higher, 20 feet. However, the distance between structures may be reduced when exterior walls facing adjacent dwelling units do not have windows or other openings, depending upon the provision of adequate landscaping, topography and site plan configuration (see Figure 5).

**FIGURE 5**

It is difficult to establish a minimum standard for spacing between groupings of attached units, because factors such as building design, orientation, heights, openings, topography, and landscape buffering affect the need for visual interest and acoustic privacy of each unit. Figure 6, however, illustrates some minimum guidelines.

**FIGURE 6**

Side to Side, little or no openings

Front or Rear, facing each other

Front or Rear to Side, additional spacing may be required for multi-story structures
There is no required minimum for front yard setbacks within a project except along public roadways or roadways to be dedicated to the City. However, a minimum building setback of 10 ft. is desirable to allow adequate front yard landscaping. A distance of 16 ft. to 20 ft. from the front property line to carport or garage is recommended to accommodate guest parking on the driveways without blocking the sidewalks.

Variations in building setback and siting are important, especially where repetitious plans and models are to be used for economy. Building setbacks should be staggered a minimum of 2 ft. to 6 ft. to provide variation in building setbacks and interesting streetscape. Other techniques to vary streetscape design, as well as reduce construction costs, is to provide drivecourts and cul-de-sacs in lieu of flag lots, or shared driveways and turned carports (see Figure 7). Variation in roof shapes, exterior materials and colors and reversal of unit plans are also simple, inexpensive, and effective ways to create visual interest within the project.

Building designs should provide visual interest, privacy and be compatible with the architectural character of the existing neighborhood. Provision of lanais, overhangs, variety of building heights and building configurations, and roof slopes reflecting the slopes of the existing topography are encouraged. Architectural styles which highly contrast with abutting existing developments should be avoided.

Exterior colors can influence the character of a project. Warm, earth-tone colors can effectively blend a project into the neighborhood, while accent colors can produce individuality and variety. Bright colors in residential districts should be used selectively in order to avoid a gaudy, high-contrast appearance. Color schemes should be selected to harmonize with abutting developments or landscaping in the area. Color can be used to enhance a desired development character or special theme, such as blues for a marine-oriented development.
FIGURE 7

Drivecourts and Cul-de-sacs Instead of Flag Lots

- Extensive driveway curb cuts
- Extensive driveway paving
- Little landscaping along driveways
- No variety in unit types
- Less curb cuts
- Less driveway paving
- Landscaping opportunities
- Variety of unit types (more units)
- Cul-de-sac becomes street amenity

Variety in Driveways and Carport Entrances

- Similar unit design and types
- Similar site plan/lot configuration
- Extensive driveway curb cuts
- Little variety in building setbacks
- Variety of unit design and types
- Variety of site plan/lot configuration
- Share driveways, minimum curb cuts
- Variety in building setbacks
- Landscaping opportunities
Where possible, buildings should be located and designed to allow maximum natural ventilation and solar control. This can be achieved by building spacing, provision of architectural elements such as roof overhangs, lanais, placement of window and door openings, fencing, and landscaping which direct and encourage natural airflow.

ROAD DESIGN

Clusters and PD-H's may have either interior private roadways or dedicated public streets. Certain advantages accrue to each. Public streets need to be wider with full street improvements as required under Subdivision Rules and Regulations (curbs, gutters, sidewalks, street lights, etc.) and hence are more costly to construct. However, when dedicated to the City and County, the residents of the project would not have the responsibility for its maintenance. On the other hand, private roadways can be built to reduced construction standards. On sloping sites, a reduction in right-of-way width and possible elimination of curbs, gutters and sidewalks can mean significant savings in grading, retaining walls, and other on-site construction costs (see Figure 8).

FIGURE 8

*Must meet Fire Dept. approval
Private roadways must be clearly differentiated from public streets by dropped curb and driveway connection, and appropriate signage to clearly delineate the end of the public roadway. This informs motorists that they are entering a private area which may have less than subdivision standards for sight distances, street widths, signage and illumination. Public agencies have required the following minimum standards for private roadways based on safety and to provide essential public services. These requirements may be increased when, in the opinion of the Fire Chief, minimum clearances or widths are not adequate to provide access for fire fighting apparatus and equipment.

PAVEMENT WIDTH
The roadway must safely accommodate two-way traffic if it serves more than 3 units or is longer than 150 feet. Generally, 20 ft. of clear pavement width is preferred to allow fire truck access. However, an 18 ft. pavement may be considered acceptable if there is adequate clear width on each side to accommodate fire apparatus. Private roadways and access drives which do not serve more than two units may be 12 ft. in width.

ROAD GRADIENT
To accommodate public service vehicles, road grades may not exceed 19%.

VERTICAL CLEARANCE
Roads required for fire protection access shall have an unobstructed vertical clearance of not less than 13.5 feet.

BRIDGES
When a bridge is to be used as access for fire protection, it shall be constructed and maintained in accordance with the Building Code, using designed live loads to carry a 62,000 lb. gross vehicle weight for fire apparatus.
TURNING RADIUS AND TURNAROUNDS
All deadend roads in excess of 150 ft. in length must have adequate turnaround area for fire trucks and apparatus. The dimensions used for a 32 ft. right-of-way subdivision standard turnaround should be used as a guideline.

On private roads, areas normally used as access to private driveways may be used as required turnaround space, provided that the pavement area is adequately marked to prohibit parking, and provisions made in covenants and deed restrictions to assure that the area will not be blocked by vehicles or other uses (see Figure 9).

FIGURE 9

Private driveway turnaround, signage which states "No Parking At Any Time. Fire Dept. Turnaround" must be provided.
PAVEMENT SURFACE
All roads required for fire protection shall be designed and maintained to support fire apparatus and shall have an all-weather pavement surface, as defined in LUO Article 9.

CURBING
Private roadways may have straight or rolled curbs with gutters to follow subdivision standards, or curbs and gutters could be eliminated with drainage in the center of the pavement, surface swales, or a combination of all three.

ROADWAY CURVES AND ALIGNMENTS
Private roadways should, for safety reasons, meet as close as possible the standards contained in the City’s Traffic Standards Manual, as amended, and the policies set forth by the American Association of State Highway and Transportation Officials (AASHTO). Private signing and pavement markings should be installed as necessary for pedestrian and vehicular traffic safety using the Manual on Uniform Traffic Control Devices (MUTCD) as a guide.

PEDESTRIAN CIRCULATION
Subdivision road standards generally require a 4 ft. wide sidewalk on each side of the street. Private roadways may provide a 3 ft. to 4 ft. sidewalk on only one side of the road or eliminate sidewalks altogether depending upon the size of the project and if adequate grassed access is provided adjacent to a roadway.

Other walkways may be required to provide access to and from parking areas, recreation and laundry facilities or public streets or bus stops. Walkways shall be constructed of an all-weather surface such as asphalt, concrete, or grassblock.
On-site parking for Cluster and PD-H projects will vary depending on housing type, unit sizes, neighborhood characteristics, availability of on-street parking and lot configuration. Generally, for single-family or duplex projects, 2 spaces per unit are required, plus 1 guest stall per each 4 units (25%). If the Cluster or PD-H includes multi-family dwellings and the site is in a Residential District, multi-family dwellings must comply with the parking requirements specified for single family or duplex dwellings (LUO Section 6.50-2). Multi-family Cluster or PD-H projects in Apartment Districts must comply with parking requirements specified for multi-family dwellings (LUO Section 3.70-2).

Parking spaces may be covered or uncovered, and located within a reasonable distance from dwelling units. Parking spaces and driveways must be constructed of an all-weather surface. Landscaping under wheel overhangs of parking stalls is encouraged to minimize paved surfaces (see Figure 10).
Common parking areas may be provided when it is not possible or desirable to provide parking for residents and/or guests directly adjacent to each unit. Common parking areas should be located within a convenient walking distance from all the units it is intended to serve.

On sites with retaining walls along the roadsides, guest parking on the uphill side should be parallel to the road to minimize cuts into the hillside. On the downhill side, guest parking may be parallel, angled or 90 degrees to the road (see Figure 11).

**FIGURE 11**

![Diagram of parking spaces](image)

**Parallel Parking**

**Angled or 90°**

**SEWERS**

Private wastewater systems must be reviewed and approved by the State Department of Health. Connection to the City's sewer system must be reviewed and approved by the Department of Public Works. Design standards for sewerage facilities to be constructed by private developers and dedicated to the City are available from the Department of Public Works.

**REFUSE COLLECTION**

Roadways dedicated to the City would be designed with adequate width and turnaround area for City and County refuse pickup. Private roadways must also be designed with
adequate road widths and turnarounds for City refuse collection; if less than City standards, private refuse service must be provided.

To receive municipal refuse collection services, all private roads must meet the following conditions:

The roadway shall have an all-weather surface and serve at least three (3) residences.

The roadway shall have an unobstructed width of at least twelve (12) feet not including parking lanes.

Horizontal and vertical curbs, and turnaround shall meet subdivision standards.

Maximum roadway grade shall not exceed nineteen percent (19%) for curbside collection and twelve percent (12%) for dumpster collection.

Projects contemplating private pickup should consult with local companies to determine their criteria. Refuse areas should be conveniently located for users and refuse trucks but shielded from view with enclosures and/or landscaping.
DRAINAGE

Storm drainage systems within public rights-of-way must be designed to City and County Public Works standards. However, it may be cost effective to construct a private drainage system in conjunction with a private roadway which does not follow City subdivision standards. Features such as grass swales and alternate underground pipe materials could be used. While the cost of maintenance, in this instance, must be borne by the private homeowners, there are advantages to surface drainage and on-site ground percolation, versus the cost and appearance of concrete curbs and gutters. The more water that is allowed to percolate into the ground, the less piping will be required (see Figure 12).

FIGURE 12

If the site includes a natural streambed, the site plan should be designed to retain the natural stream and landscaping appearance as a project amenity. Concrete channelization is to be avoided whenever possible. Where stabilization of stream banks is required, rip-rap and natural stone revetments should be used. Maximization of the density of a project should not be used to justify concrete channelization or realignment of natural stream flow and configuration (see Figure 13).
**FIGURE 13**

**Undesirable Channelization of Streambed**

- Alters natural appearance of stream
- Alters natural topography
- Becomes non-accessible
- Ceases to be a natural amenity
- Removes existing vegetation
- Increases engineering costs

**Desirable Treatment of Streambed**

- Preserves natural appearance of stream
- Reduces grading by preserving natural topography
- Maintains stream accessibility
- Preserves stream as a visual amenity
- Preserves natural vegetation
- Reduces engineering costs
LANDSCAPING

Trees, bushes, shrubs, hedges, groundcover and other landscape materials can provide shade, ventilation control, visual enjoyment and variety, privacy, glare control and erosion protection. Designers of Cluster and PD-H projects should identify and retain all existing significant vegetation on the site. Flexibility in site planning, building placement and lot configurations can save large trees or other natural features, which would help mitigate the visual impact of the project on the existing neighborhood. Major trees that cannot be retained should be relocated to other parts of the site wherever possible.

When Cluster or PD-H projects have higher densities or different building types than that found in existing neighborhoods, landscaping along the perimeter of the project should be provided as a visual and acoustic buffer between abutting properties (see Figure 14).

**FIGURE 14**

Hedges and low-lying landscaping should be provided around the base of elevated structures to screen structural supports on sloped sites. Hedges should also be provided to screen parking areas and light intrusion from automobile lights from abutting properties and units within the project (see Figure 15).
Groundcover planting within the permitted overhang areas of parking stalls is encouraged. This would reduce the paved stall depth by as much as 3 ft. and increase areas for landscaping and surface drainage through ground percolation.

Street trees are required along both sides of all roadways. For developments where the lot width is narrow and prohibits the provision of street trees on dedicated or private roadways, one tree should be provided within the front yard of each lot. Canopy form trees may be selected from the approved tree list by the Department of Parks and Recreation. Consultation with the Department of Parks and Recreation is recommended prior to submittal of application documents.

All common project landscaping should have a permanent underground irrigation system. Smaller projects may use hose bib connections if they are adequate in number and spacing to effectively maintain the landscaping.
LIGHTING

Lighting should be provided for safety and convenience. Fixture design and luminaires should be recessed, screened or shielded to minimize glare and reflection to dwelling units and abutting properties. This is especially important when a higher density project is proposed adjacent to an established low-density neighborhood. Low intensity, incandescent or tungsten halogen type light fixtures are preferred. Fluorescent or high intensity light fixtures should be screened and not visible from public view.

Private roadways should be illuminated by relatively low, 12 to 14 ft. high street lights. Decorative and ornamental lights with wood or metal poles, in keeping with the residential design character of the project, are recommended. Bollard and low garden type lights, not to exceed 4 ft. in height, should be used to illuminate parking areas, common areas and pedestrian walkways (see Figure 16).

FIGURE 16
Generally, Cluster and PD-H projects should provide passive and/or active recreation areas and amenities for its residents.

Projects with more than 2 units within Residential and Apartment Districts must comply with Park Dedication Ordinance (Ordinance No. 4621). The method for compliance should be reviewed early in the design process with the Department of Parks and Recreation.

Projects anticipating young families should provide adequate tot lots and play areas. Level (or less than 5% slope) grassed areas with teetertotters, slides, swings and climbing equipment are desirable. Sandboxes are not recommended as they often become litter boxes for animals, pose potential health hazards, and are difficult to maintain. Tot lots and play areas for children should be secure and visually accessible to as many units as possible. If laundry or other common facilities are planned, play areas should be located near these facilities for closer parental surveillance. Passive areas could include picnic benches, barbecue pits, view gazebos, or other amenities. More active areas such as tennis courts and swimming pools should be centrally located, yet visually screened and buffered with landscaping from residences.

All common activity areas, such as tot lots, playcourts, swimming pools and barbecue facilities, should be set back a minimum of 25 feet from all adjoining property lines and dwelling units in the project (see Figure 17).
FENCES AND WALLS

Fences and walls can serve as effective sound and visual buffers and define common or private yard areas. Generally, chain link fencing is discouraged because of its appearance. Preferred materials are wood or CMU. Landscaping, offsets or painting in warm colors can add visual interest to flat CMU walls.

Walls and fences along roadways and front yards should be set back a minimum of 24 inches, and the setback area planted with hedges or other landscaping to provide visual interest and improve the appearance of the streetscape relief. There should be a uniform design for all fencing provided within the project.
Preliminary consultation with Department of Land Utilization staff is encouraged to discuss development proposals and specific instructions for filing an application. The applicant should check with appropriate agencies on availability of utilities and public services as follows, prior to applying for Cluster or PD-H approval:

1. Board of Water Supply for availability of water;

2. Department of Transportation Services and Fire Department on adequacy of access roads and fire prevention service;

3. Department of Public Works on availability and adequacy of sewers, drainage and refuse collection;

4. Department of Parks and Recreation on method of compliance with Park Dedication, and acceptable street trees;

5. Department of Housing and Community Development on programs and assistance for any proposed low/moderate income housing; and

6. State Department of Health, if a private wastewater treatment system is proposed.

Additional information and the telephone numbers of agency staff to contact may be obtained from the Department of Land Utilization, Urban Design Branch (Phone 523-4252).
Appendix A

CLUSTER DEVELOPMENTS

The minimum land area and maximum number of dwelling units permitted under Cluster development varies by zoning district as follows:

<table>
<thead>
<tr>
<th>DISTRICT</th>
<th>MINIMUM LAND AREA</th>
<th>MAXIMUM # OF UNITS</th>
</tr>
</thead>
<tbody>
<tr>
<td>R-20</td>
<td>60,000 sq. ft.</td>
<td>Total project area/20,000</td>
</tr>
<tr>
<td>R-10</td>
<td>30,000 sq. ft.</td>
<td>Total project area/10,000</td>
</tr>
<tr>
<td>R-7.5</td>
<td>22,500 sq. ft.</td>
<td>Total project area/7,000</td>
</tr>
<tr>
<td>R-5</td>
<td>15,000 sq. ft.</td>
<td>Total project area/3,750</td>
</tr>
<tr>
<td>R-3.5</td>
<td>10,500 sq. ft.</td>
<td>Total project area/3,500</td>
</tr>
<tr>
<td>A-1 A-3</td>
<td>10,500 sq. ft.</td>
<td>Total project area/3,500</td>
</tr>
<tr>
<td>Country</td>
<td>3 acres</td>
<td>Total project area/1 acre</td>
</tr>
<tr>
<td>AG-1</td>
<td>15 acres</td>
<td>Total project area/5 acres</td>
</tr>
<tr>
<td>AG-2</td>
<td>6 acres</td>
<td>Total project area/2 acres</td>
</tr>
</tbody>
</table>

PLANNED DEVELOPMENT-HOUSING

The minimum land area and FAR for a PD-H project are as follows:

<table>
<thead>
<tr>
<th>DISTRICT</th>
<th>FAR</th>
<th>MINIMUM LAND AREA</th>
</tr>
</thead>
<tbody>
<tr>
<td>R-20</td>
<td>.13</td>
<td>4 acres</td>
</tr>
<tr>
<td>R-10</td>
<td>.24</td>
<td>2 acres</td>
</tr>
<tr>
<td>R-7.5</td>
<td>.26</td>
<td>1.5 acres</td>
</tr>
<tr>
<td>R-5</td>
<td>.35</td>
<td>1 acre</td>
</tr>
<tr>
<td>R-3.5</td>
<td>.40</td>
<td>1 acre</td>
</tr>
<tr>
<td>A-1</td>
<td>.79</td>
<td>.5 acre</td>
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<tr>
<td></td>
<td>1.00</td>
<td>If project size is greater than 1 acre</td>
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<tr>
<td>A-2</td>
<td>1.61</td>
<td>.5 acre</td>
</tr>
<tr>
<td></td>
<td>2.00</td>
<td>If project size is greater than 1 acre</td>
</tr>
<tr>
<td>A-3</td>
<td>2.60</td>
<td>.5 acre</td>
</tr>
<tr>
<td></td>
<td>3.00</td>
<td>If project size is greater than 1 acre</td>
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</table>