

DC 2.4 v08.08

Summary of Changes

To require design consultants to include permanent fall protection anchorages for all new and re-roof projects.

Architectural DESIGN CRITERIA

DC 2.4

- 2.4.1 Projecting Objects:** Ensure compliance with ADAAG for projecting objects along an accessible path. Reference Technical Guide TG B2020.01.
- 2.4.2 Protection of Metals:** Be aware of the severe corrosion problems we have experienced on weather exposed metals, on tall facilities such as athletic field light fixtures and frames, on metal buildings and on metal parts exposed to salt-laden moist air which are frequently exposed to salt spray in the atmosphere [e.g., such as at the Oahu North Shore; Kapaa, Kauai; Kahului Maui Community College; etc.].
- 2.4.2.1** Consider specifying special heavy-duty corrosion-resistant finishes (if available), corrosion-resistant materials (such as Type 316 stainless steel), or appropriate industrial quality corrosion-resistant maintenance coatings.
- 2.4.2.2** Additionally, design and detail light pole bases and the footing pedestals so that rainwater and moisture will not accumulate, on, in or under the pole base.
- 2.4.3 Masonry:**
- 2.4.3.1 Decorative Veneer Work:** Using lava or moss rock, stone, tile, etc. will not be allowed. Such materials, when used for an essential, functional and necessary purpose and where economical in cost and maintenance may be used upon the approval of the Public Works Administrator.
- 2.4.3.2 CMU Screen Block:** Materials that can be used as ladders for climbing shall be avoided from a safety standpoint. They shall not be located so as to provide access to a roof or to the upper floors. Particular attention must be given to the design of railings using CMU screen units that create hazards whereby children can easily climb over and fall.
- 2.4.3.3 Plaster:** Over CMU shall not be allowed unless approved by State Public Works Administrator. Do not use integral colored plaster. It fades and discolors in our wind and sun.
- 2.4.3.4 CMU Cap Units:** Shall not be allowed on partition walls less than six feet. Use poured in place concrete cap.
- 2.4.3.5 Solid Face CMU:** Because it is difficult, if not impossible, to waterproof split blocks, they are not to be used except where they are protected from the weather by a lanai or covered walk.
- 2.4.4 Stairs, Lanais, Railings and Ramps:**
- 2.4.4.1 Stairways:** Shall be designed to keep landings and steps reasonably free of rain and standing water. Provide adequate drainage scuppers at landings.

- a. Landings, ramps and steps shall have shall have integral non-slip surface, both exterior and interior. Specify grit or Carborundum for concrete surfaces.
- b. Handrail ends must return to the wall. Brackets shall be securely anchored with anchor bolts, not expansion bolts, and shall not protrude beyond the rail or have sharp corners or edges.

2.4.4.2 Lanais: Provide ½" drop between interior finish floor and lanai except in the following situations.

- a. In order to accommodate wheel chair access, do not provide a drop at the door. Instead, provide a ramp level or ¼" maximum height difference with the floor (all ground floor doors).
- b. In order to wheel equipment into kitchens and dining rooms, do not provide a drop at the door. Instead, provide a ramp level with the floor.
- c. Surfaces of lanai and landing shall slope away for drainage at 1-1/2% slope, 3/16" to a foot. Provide adequate drainage scuppers at lanais; spout to extend minimum 4" beyond face of building.
- d. Projection of a second floor lanai must be the same as, or further than, that of the first floor. Roof must project beyond the lanai floor sufficiently to afford rain protection, minimum 6".
- e. Lanais shall not provide ready access to the roof of a covered walk and vice versa.

2.4.4.3 Lanai Landing or Balcony Railings: Intermediate horizontal railings shall not be used as this will provide an easy step for children to climb on. Use vertical bars and space them according to code. All railings shall be smooth without protrusions, such as bracket protrusions. Stair railings shall have bottom rails such that no object can pass through exceeding code requirements. Where balcony railing abuts a column or wall, the railing shall be attached to the column or wall. If required, use an expansion connection.

2.4.5 Windows:

2.4.5.1 Window sill shall be above the height of fixed bookcases, lockers, shelves, etc.

2.4.5.2 Locate window operators so that they are easily accessible. Provide poles with hangers for high operators.

2.4.5.3 Do not use large glass panes because replacement is costly. Therefore, glass panes for doors or windows shall not be larger than eight square feet per panel, except as limited otherwise by the code. Any exception as to size must be approved by the State Public Works Administrator. Justification for deviation shall accompany request for deviation.

2.4.5.4 Frames for doors and windows shall be caulked and trimmed. The exposing caulking to create a groove for appearance sake shall not be permitted. This creates an attractive nuisance for the public to dig the caulking out.

- 2.4.5.5** Windows exposed to playcourts shall be protected with some type of bars instead of light expanded metal. Window openings shall be provided for emergency use such as air conditioning and electrical outage.
- 2.4.5.6** Make provisions for window cleaning.
- 2.4.5.7** Projecting sash shall not interfere with door swings.
- 2.4.5.8** Provide ventilation for all storage rooms and custodian rooms.
- 2.4.5.9** Do not use vertical жалousies as the lever operator is difficult to operate and thus subject to breakage.
- 2.4.5.10** Large sections of жалousie windows shall have an operator for no more than every ten vanes.
- 2.4.5.11** жалousies shall be lever operated, not gear operated. For high windows over shelving or other obstructions, the operator shall be placed on the upper half of the window.
- 2.4.5.12** жалousie windows shall not be located next to door knob, within arm's length. Such windows shall be blanked out with a solid panel. More burglaries have occurred by simply removing the vanes and reaching in for the knob.
- 2.4.5.13** Insect screens shall be provided for dining room, kitchen, and food handling areas. Where security screens are also required, place security screens on the exterior and place insect screens on the interior.
- 2.4.5.14** жалousie windows shall not extend to floor level. Low louvers are easy to kick in and break, particularly at ground level.
- 2.4.5.15** If fixed vanes are used for clerestory openings, they shall be weatherproof type, together with bird screen.
- 2.4.5.16** Provide eyebrows (minimum 12", preferably 24") over жалousies to prevent rain from dripping down the face and blowing in.
- 2.4.5.17** Sills of observation-supervision windows, such as in a kitchen office shall be no more than 36" above the floor.
- 2.4.5.18** Interior wall shall not abut an exterior window except at the mullion. Otherwise, the window shall be blanked out with a window panel. A filler (as an extension of the wall) shall be provided between the end of the interior partition and the window panel or mullion.
- 2.4.5.19** Fixed louvers for transformer rooms, switch rooms, mechanical rooms, etc. shall be minimum 16 gauge galvanized sheet metal, waterproof type, together with bird screen.
- 2.4.5.20** Window draperies other than for blackout or sun shade purposes may be provided. Confirm with user's criteria.
- 2.4.5.21** Cross-ventilation in all buildings (except air-conditioning rooms) shall be carefully studied and provided for. On the other hand, excessive windows are to be avoided as they are not used and are also a maintenance problem.

2.4.5.22 Graylite or bronze glass is to be used with discretion as it is costly. Graylite does not cut out glare, especially direct morning sunlight and afternoon sunlight.

2.4.5.23 For an air-conditioned building, provide some windows that may be opened for ventilation should the A.C. system break down. The number, size and location of these windows would be a matter of judgment, perhaps a third of what is required by code if the building were not air-conditioned.

2.4.6 Doors and Hardware:

2.4.6.1 Door swing shall be checked so as not to swing into hanging electrical fixtures, operating windows, columns, etc.

2.4.6.2 Door and door frames of the heater room, electrical room and A.C. room shall be of galvanized metal construction. If louvers are used on doors, use minimum 16 gauge galvanized sheet metal with bird screen behind. Door to a paint spray room shall be fireproof type wire glass or tempered glass vision panel.

2.4.6.3 Gear-operated metal roll-up doors shall be hoisted by motor, not manually.

2.4.6.4 All outswinging doors on unsecured floor level shall have butts with non-removable pins.

2.4.6.5 All exterior double doors, especially those with panic hardware, shall have astragals secured against vandalism.

2.4.6.6 All exterior doors shall have locks of heavy duty type with six pin tumblers.

2.4.6.7 Locks and padlocks shall be keyed to the existing master key system.

2.4.6.8 For double doors of storage cabinets, the inactive leaf shall have slide bolts top and bottom.

2.4.6.9 Door catch for wall cabinets shall be located at the bottom of doors. Extend door one inch below the bottom shelf on which to install the door catch. Do not locate the door catch at the top of the door.

2.4.6.10 All drawers shall have metal drawer slide hardware in lieu of wood side guides.

2.4.6.11 All doors adjacent to corridors other than small office space shall have vision panel.

2.4.7 Toilet Rooms

2.4.7.1 Floor shall slope to drain, minimum 1/8" per foot and maximum 1/4" per foot. Material shall be impervious and easy to clean. Offset drains may have uneven floor slopes. Confirm slopes of each floor plan.

2.4.7.2 Provide keyless hose bibbs and floor drains in all gang toilets for hosing downs.

2.4.7.3 Mounting height of plumbing fixtures shall conform to ADAAG and User Agency requirements..

- 2.4.7.4** Mirrors shall be located so as to avoid reflected vision into toilets. Do not locate mirrors over lavatories in gang toilets. Do not use large size mirrors which are costly to replace when broken.
- 2.4.7.5** Provide toilet paper cabinet and paper towel cabinet. Provide type as directed by User Agency.
- 2.4.7.6** Floor drains shall not be located within toilet stalls. Locate near lavatories or urinals at least 12" away from the wall. Provide enough floor drains to facilitate cleaning. For a 2" drop slab and 1/8" per foot slope in floor surface, floor drains shall be located not more than 16' apart.
- 2.4.7.7** Pipe chases shall be 2'-0" clear width. Any less would be inadequate, any more would be a waste of space.
- 2.4.7.8** Acoustical tile shall not be used on toilet room ceilings.

2.4.8 Roofs, Roofing and Waterproofing

- 2.4.8.1** No structure shall have a dead level roof. Slope shall be accomplished by pitch of structure where practical or with tapered insulation. . Minimum slope for low slope roofs on all facilities shall be ½" per foot. For minimal effect on structural design, the use of lightweight, non-structural, cementitious fills on concrete deck coupled with a requirement for venting of roofing is permitted. Eave design shall be such as to prevent flow of water down face of wall causing staining; provide sufficient overhang.
- 2.4.8.2** All buildings with roof eave (or top of parapet) more than ten feet above grade shall have access to the roof by roof hatch and steel ladder located in a room, preferably the custodian's. Do not locate the ladder in a stairwell, lanai or any area accessible to the public. Provide roof hatch ladder extension in accordance with detail A/TG05510.
- 2.4.8.3** Downspout shall be galvanized pipe from grade to a minimum height of eight feet.
- 2.4.8.4** Horizontal width of edge flashings (gravel stop) should not exceed 4" (under the roofing felts).
- 2.4.8.5** The vertical face of edge flashings (gravel stop) shall be 1" below any horizontal joint in the fascia. This is to prevent any water from whipping upwards into joint.
- 2.4.8.6** Lower edge of edge flashings (gravel stop) shall be above outer edge of a gutter. In case of gutter overflow, water will not seep upwards behind gravel stop into the roofing.
- 2.4.8.7** Joints of gravel stops shall not be soldered, but lapped a minimum of 5", and set in a mastic compound. Expansion or contraction will split soldered joints. Provide additional fasteners to secure lapped joints.
- 2.4.8.8** Copper work shall not be acid stained.
- 2.4.8.9** Flashing reglets shall not be installed on the top of parapet walls nor on any horizontal surface. This is because, in practice, it is very difficult to install the flashing in the reglet in a watertight manner and creates a problem in pouring

concrete. This detail may work in theory and it may look good on paper, but the practical aspect of achieving a tight joint is difficult. We have had several job failures. Stating this in a positive manner, flashing reglets shall be installed only on the vertical side of a parapet wall, or building wall. This is the standard accepted method of installation of the reglet.

- 2.4.8.10** Gutters shall slope a minimum of 1/16" per foot. Section detail shall indicate how this slope is to be achieved, either by false bottom or by sloping the gutter itself.
- 2.4.8.11** Where there is no hydrostatic pressure, all interior floor slabs on fill shall have a vapor retarder between the slab and fill. Where there is hydrostatic pressure, provide waterproof membrane.
- 2.4.8.12** Second floor toilet rooms shall have a waterproof membrane with edges turned up a minimum of six inches.
- 2.4.8.13** Where there is no hydrostatic pressure, all concrete block walls or concrete walls retaining earth shall be dampproofed with two coats hot mop asphalt to prevent penetration of water. Where there is hydrostatic pressure, provide waterproof membrane.
- 2.4.8.14** Do not encase roof gutters. This makes them difficult to repair and/or maintain and makes leaks difficult to locate.
- 2.4.8.15** Air-conditioned equipment shall be supported at least 18" above roof on steel legs set in pitch pocket. (Note: A.C. equipment shall not be installed on the roof, except where necessary on renovation projects.)
- 2.4.8.16** "Fancy-shaped" gravel stops shall be avoided due to high initial and replacement costs. Simple forms will be more leakproof.
- 2.4.8.17** For new construction and existing building re-roofs, provide permanent roof anchors for attachment of personal fall arrest and restraint equipment capable of withstanding loads and stresses within limits and under conditions specified in OSHA, HIOSH and other applicable safety codes.

2.4.9 Painting

- 2.4.9.1** Interior colors shall be checked for light reflectance; ceiling, minimum 80%; walls, 30%-50%; floors, 20%-30%. Confirm with user's criteria.
- 2.4.9.2** Kitchen and Toilets:
 - a.** Painted surfaces of walls and ceilings shall be of gloss enamel.
 - b.** Exposed wood trim shall be painted gloss enamel.
 - c.** Exposed wood casework and shelving shall be painted gloss enamel or polyurethane. Interior of casework and its shelving shall be stain polyurethane.
- 2.4.9.3** Walls and ceilings of the following spaces shall be unpainted; transformer or switchboard rooms, heater or mechanical rooms, and chiller rooms. However,

exterior windows, doors and trims and other metal subject to corrosion at these spaces shall be painted.

2.4.9.4 All shops and hazardous areas must be painted in accordance with the “Safety Manual for Industrial Arts Education” safety color code.

2.4.9.5 Pre-selection of Colors

- a. Due to difficulties encountered in matching colors on past projects with the furniture, the consultant will prepare color schemes and pre-select colors for all applicable items and specify these colors in the bid document with the provision that the State has the option to change the colors at no cost. Sample colors shall be submitted for approval by the Contracting Officer.
- b. Colors to be pre-selected shall include, interior and exterior paint, including trims, casework, etc.
- c. Pre-selection of the colors will be coordinated with the user of the facility, and may not be the exact shade that may be chosen later.

2.4.9.6 Avoid use of light colors within reach of children such as along corridors, railings, etc.

2.4.9.7 Exterior colors on addition to existing structures shall harmonize with the existing.

2.4.9.8 For high humidity areas, use mildew-resistant gloss paint.

2.4.10 Pre-selection of Finish Material Colors

2.4.10.1 Colors to be pre-selected include but are not limited to the following

- a. Resilient floor covering, base and carpet.
- b. Terrazzo, marble, hard tile, concrete stain and exposed aggregate finish.
- c. Laminated plastic.

2.4.11 Miscellaneous

2.4.11.1 Aluminum plates for room names, room numbers, building signs and “Fire Extinguisher Inside” signs shall be clearly spelled out as to the exact wording and the number required in the Room Finish Schedule. Individual letters, particularly for Building Signs (Public Library signs included) shall not be used as they are subject to vandalism. Specifications shall include direction requiring shop drawing approval before any plate is ordered or fabricated.

2.4.11.2 Fire extinguishers shall be located and clearly identified.

2.4.11.4 Fire extinguishers shall be mounted so that the top is no higher than 4' from the floor.

2.4.11.4 Room names and numbers: Every door in the building will be numbered as requested by the user. A list of designation will be supplied by the user.

2.4.11.6 Do not locate planting spaces indoors or under deep building overhangs.
Plants are hard to grow in shade.

2.4.11.7 Show location of critical electrical outlets on interior elevations, such as behind bookshelves, near sinks, behind carrels, etc.

2.4.12 Accessibility

2.4.12.1 Calculate spot elevations for all exterior accessible routes adjacent to buildings to assure compliance with ADAAG or ANSI as appropriate, and to assure adequate surface drainage. Indicate the spot elevations on a plan of sufficient scale to clearly define the design intent.

2.4.12.2 Where slopes or cross-slopes of a maximum 2% are allowed by ADAAG or ANSI, the design slopes should be **not less** than 1.5% to help prevent ponding water.