

40-YEAR RECERTIFICATION GUIDELINES

This document is presented to provide more stringent structural recertification guidelines to provide building ownership and its occupants a higher level of confidence in the structural integrity of their buildings.

A. Documents Needed from Building Ownership

- Original structural construction documents
- Original geotechnical report
- Building permit history
- Building repair documentation from previous engineers and contractors

B. Document Review

- Review the original construction documents to learn how the building was designed.
- Check that the design loads and structural criteria conform to the minimum standards of the building code in effect at the time the building was designed.
- Check that the organization of the structure is conceptually correct and that it is in accordance with accepted engineering practices.
- Review the load paths for gravity and lateral loads and verify that there are no deficiencies, discrepancies, or omissions.
- Perform a lateral analysis to confirm the adequacy of the lateral load system.
- Perform independent calculations for the following portions of systems, members, and details to verify their adequacy including 25% of the gravity and lateral load resisting elements.
- Review the geotechnical report and other pertinent reports and investigations that are relevant to the structural design to determine if the design properly incorporates the results and recommendations of the investigations.
- Review the permit history to determine what has occurred in the building since its original construction. This will provide useful information when reviewing the existing structure.
- Review previous construction and remediation contracts for similar reasons.

C. Foundations

- Look for evidence of settlement.
- If present, engage a geotechnical engineer to review foundation drawings and establish an investigation program.

D. Parking Garages

Typically, these are open-air structures subject to the elements that cause concrete deterioration. Frequent garage flooding is a warning sign for concrete deterioration. Visual observation is helpful, but not conclusive. Material testing will provide a much clearer picture for the quality of the concrete in place.

- Engineer to select an adequate number of columns and shear wall locations for a concrete core test. Corrosion is more likely at the base of the lowest columns and the concrete elements closest to the sea air (if located on the beach).
- Engage a testing lab. The lab will use Ground Penetrating Radar [GPS] to scan the concrete elements for reinforcing steel locations. Cores to be taken without damaging reinforcing steel.
- Test the concrete cores for strength, chloride content, and carbonation. Follow ACI standards.
- Select one core for petrographic testing to provide additional information on the concrete quality. Follow ICRI standards.
- Immediately re-grout core holes with high-strength non-shrink grout in accordance with ICRI standards.
- Use the GPR to confirm proper vertical spacing of column ties.
- Look for previous repairs and the quality thereof.

E. Back of House Areas

- Pool pump rooms can subject concrete to advanced deterioration due to the chlorinated water and sometimes chemical storage.
- Boiler rooms, if present, are high humidity areas that often contribute to concrete deterioration.
- Look for previous repairs and the quality thereof.

F. Pool Decks

- Pools typically use chlorine to disinfect pool water. Chlorine is very corrosive and deleterious to concrete.
- Inspect pool pump rooms.
- Check pool filtration piping and systems for leaks where accessible.
- Verify adequate pool deck sloping and drainage.
- Inspect the underside of the pool deck for evidence of concrete deterioration. If found, this could be an indication of failed pool deck waterproofing. Look for previous repairs and the quality thereof.
- Inspect areas below elevated planters for evidence of leaks and resultant concrete deterioration.
- Inspect expansion joints if present for present condition.
- Where deterioration is found, concrete testing should be conducted as per the parking garage criteria to determine the quality of the existing concrete elements.
- It may be necessary to remove pool deck finishes in areas of observed concrete deterioration to inspect the waterproofing system. It may be necessary to engage a waterproofing expert to determine the condition of the waterproofing system.
- If there is an elevated timber-framed pool deck, inspect the condition of timber members and especially the connections.

G. Balcony Slabs

- Inspect for evidence of concrete deterioration. If found, engineer to determine if concrete testing is warranted similar to the parking garage. If deterioration is typically found, then testing should be conducted to determine the quality of the balcony concrete.
- Observe the balcony surface. If protected by a membrane, check condition. If covered with tile, look for buckling, delamination, bulging, or grout deterioration. Check slab edge for grout and mortar bed leaching.
- Check for indications of water ponding and inadequate sloping.
- Look for previous repairs and the quality thereof.
- Inspect balcony and slab edges for evidence of post-tension cable or pocket damage or concrete spalling.
- Inspect balcony railings for evidence of deterioration. Pay special attention to the post bases and anchorage conditions including whether water can pond around the post base.

H. Roofs

- Check condition of roofing. Determine remaining life.
- Look for evidence of ponding, bubbling, cracking, seam separation, vegetation, previous repair failure and clear roof drains.
- Look for evidence of delamination or possible water intrusion below the roofing.
- Check the condition of flashing.
- If there is evidence of roofing distress, a roofing expert should be engaged to perform a thorough investigation.
- If possible, visually inspect the underside of the roof slab for spalling or signs of water intrusion.

I. Rooftop Equipment

- Inspect mechanical equipment dunnage for structural steel or concrete deterioration.
- Check to ensure that cooling tower water is not ponding on the roof.
- Check air handlers and exhaust fans for proper anchorage.

J. Glazing Systems

- While inspecting balconies, inspect the glazing systems. Check the general condition including the aluminum frames, protective coatings, and ease of operation.
- Check the condition of the sealant between the door frame and supporting structure.
- Where accessible on the podium or ground level, check the general condition including the aluminum frame and sealants.
- If there is evidence of glazing system distress, a facade expert should be engaged to perform a thorough investigation.
- Indicate whether the glazing is hurricane rated or not. If not, are hurricane shutters provided.
- Observe for indications of glazing distress.

K. Exterior Walls

Block and Stucco

- Observe for evidence of cracking, spalling, or other distress.
- Look for typical crack areas adjacent to vertical and horizontal concrete elements.

EIFS Systems

- Observe for evidence of cracking, delamination, deteriorated sealants, exposed mesh, exposed insulation, or deteriorated ferrous anchorage.

Metal Panel

- Observe for displacement of panels and any indication of ferrous anchorage deterioration.