

Basis of Design

This section applies to the design and installation of roof framing and rooftop elevated platform framing.

Design Criteria

- Slope the structural roof system to accomplish the roof slopes shown on the drawings. This applies to plaza decks and walkways also.
- Design for a minimum Live Load of 25 PSF.
- Design and specify roofs that are engineered and constructed to achieve the following minimum degree of flatness when measured in accordance with ASTM E 1155: Overall $F_F = 25$, Localized $F_F = 20$.
- Design and specify roofs that are engineered and constructed to achieve the following minimum degree of levelness when measured in accordance with ASTM E 1155: Overall $F_L = 17$, Localized $F_L = 13$. Note that the use of F_L on roofs is limited to when the slab is still supported in its original as-cast position (still shored) and when the slab has no camber.
- The Localized F-Numbers indicated are the minimum quality acceptable in any one roof section. This allows the contractor sufficient margin for the normal variations that occur within a pour.
- In addition to the F-Numbers, specify the top of structure elevation at each column and wall to be within $\frac{1}{4}$ inch of the elevation shown on the drawings.
- Camber structural system as needed to assure positive flow of rainwater. Check for progressive deflection due to ponding.
- Design for International Building Code (IBC) Rain Loads due to rainwater that will accumulate if the primary drainage system for any portion of the roof is blocked.
- Design with additional dead load to allow for reroofing once.
- If the roof is to be designed as a future floor, detail tops of columns and walls above the roof level for ease of future vertical extensions and to minimize the disturbance to the existing roofing. Clearly indicate on the drawings the extent of future addition that is designed for.
- Be aware of possible increased roof loads due to “garden” or “vegetated” roofs that may be used for sustainability.
- Design for all present and future rooftop mechanical and electrical equipment. Be sure to use “operating” weights of heaviest possible equipment that may be selected. Design for weight of all curbs, housekeeping pads, and inertia pads. Coordinate pad thicknesses with acoustical consultant.
- Design rooftop elevated platforms for equipment to provide adequate access for maintenance personnel. This may include the design of catwalks and ladders at or above the main platform level.
- Design for bracing of fume hood exhausts and other items that project above the roof including towers, antennas etc. Arrange guy wires and supports in a manner to minimize aesthetic disturbance.
- Design for all window washing equipment support.

Design Evaluation

- Schematic Design Phase: Plan showing structural scheme.
- Design Development Phase: Roof framing plan and typical sections. Draft specifications
- Contract Document Phase: All information required for the installation of structural roofs and rooftop platforms. Final specifications.

Construction Submittals

- Product data for type of material utilized.

Related Sections

- Facilities Services Design Guide - Concrete
- Facilities Services Design Guide - Structural Steel
- Facilities Services Design Guide - Timber
- Facilities Services Design Guide - Roofing
- Facilities Services Design Guide - Thermal and Moisture Protection
- Facilities Services Design Guide - Fume Hood Exhaust Systems

Products, Material and Equipment

- See Related Sections.

Installation, Fabrication and Construction

- See Related Sections.

END OF DESIGN GUIDE SECTION