

Commercial Construction Plan Submittal Guide

General Requirements

1. A building permit application shall be completed in its entirety and shall accompany each submittal for review. This includes designating contractors' costs and the specific use of the property. Permit applications will need to be complete.
2. Submit two copies of all project drawings drawn to scale with sufficient detail to fully indicate the nature and scope of work to be performed.
3. All drawings shall be dated and signed by the designer. Professional seals, when required, shall appear on all sheets and be signed and dated by the designer.
4. Building Code Summary shall be reproduced on the drawings with all applicable sections completely filled out including the Energy Code and mechanical calculations/data.
5. If the work involves only a portion of a building, a key plan shall be provided showing the entire building with the area of new construction highlighted.
6. All drawings and specifications shall contain information on the properties of the building materials to be used where such properties are essential to show compliance with technical building codes.
7. Show location of concentrated loads and total loads.
8. All penetrations of fire-rated construction to be per manufacturer details. The details shall meet or exceed the rating of construction being penetrated and shall be provided to the inspector in the field. The penetration details shall be exactly as tested by and approved testing laboratory or agency and they shall include their system numbers. New penetrations of existing fire walls and assemblies shall be shown with appropriate designs.
9. Drawings shall be complete when submitted for plan review/permitting. Incomplete drawings will be returned without a review.

Architectural

1. Show architectural floor plans of each floor. Indicate and reproduce the approved tested hourly rating, number and location of all rated members and assemblies (i.e. walls, columns, beams, floor and ceiling, and ceiling and roof fire-rated design assemblies. Show all fire-rated walls (both existing and new) with their ratings if not shown elsewhere. Drawings submitted without required fire-rated walls shown will be rejected.
2. Show the square footage of each floor on the corresponding floor plans.
3. Identify the names and uses of each room.
4. Indicate the door schedule(s) that define(s) the applicable rated doors, frames, and hardware.
5. All glass schedules.
6. Show elevations with dimensions defining overall building height, floor-to-floor heights, or heights to ridge and eave as applicable to the type of building construction proposed.
7. Provide basement percentage below grade calculations.
8. Indicate roof slopes, drainage system and sized through wall scuppers, if applicable to the project.
9. Show fixed seating for assembly occupancy to allow determination of occupancy posting.
10. Show wall sections with proposed material sizes, construction, and fire-rated assemblies.
11. Show proposed plumbing fixtures and privacy screens.
12. If masonry construction is proposed, include the following information
 - a Type of brick ties and spacing of weep holes
 - b Control joints
 - c Placement of wall flashing and reinforcement
13. If appropriate for the proposed occupancy, show the extent of the hazardous locations and submit complete data on the type and the amount of materials stored, processed, manufactured, or used in the manufacturing of products in this facility. And, if such materials are corrosive, poisonous, or under pressure, in a liquid or gaseous state, radioactive, or other relevant properties.
14. Show the floor slab vapor barrier.
15. Show foundation water proofing if applicable.
16. For pre-engineered metal structures, provide supporting data and installation details along with proper engineered footing/foundation designs.
17. All penetrations of fire-rated construction to be per manufacturer details. The details shall meet or exceed the rating of construction being penetrated and shall be provided to the inspector in the field.
18. All fabric awnings or canopies shall be accompanied by a letter of certification of fire resistance from the manufacturer.
19. Provide on the drawings the calculations for the means of egress widths for the entire floor occupancy load and the existing capacity of all exits including all stairs, doors, corridors, and ramped exits.
20. Show attic ventilation louvers and vent sizes.
21. Provide the Special inspection requirements respective to the project and the supporting survey details.

Structural

1. Provide foundation plans showing the proposed slab elevations and types of foundation (i.e. mat foundation, caissons, spread footings, etc.).
2. Provide preliminary soil analysis data done by a Registered Engineering Testing Company, if required.
3. Indicate dimensions of foundations.
4. Show type, size and location of piling and pile caps for pile foundation.
5. Indicate grade beam sizes.
6. Indicate a footing schedule defining footing types and the required reinforcing.
7. Show the established footing depth below grade.
8. Indicate the thickness of the floor slab, size of reinforcing, slab elevations, and type and details of foundations.
9. Indicate location, size, and amount of reinforcing steel.
10. Show foundation corner reinforcing bars and minimum overlapping, as applicable.
11. Provide strength of concrete according to design and soil reports.
12. Show beams, joists, girders, rafters, and truss layouts and details of connections, structural steel gauge and gauge size, and connections.
13. Indicate the sizes and species of all members
14. Show all columns, girders, joists, purlins, beams, and base plates. Show all headers for wood construction.
15. Provide a complete lintel schedule.
16. Indicate the type of anchoring for steel bearing directly on masonry.
17. Indicate design dead and live, wind, snow, and seismic loads for floors, roofs, balconies, porches, breezeways, corridors, stairs, mezzanines, and platforms. Show concentrated loads (i.e. file rooms, machinery and forklift areas). Identify shear walls, bracing, strapping fastening, reinforcement, and any special anchoring required.
18. Indicate on roof framing plan where concentrated loads (mechanical equipment, cranes, etc.) may be placed.
19. Indicate on foundation and framing plans the location and lateral load resisting system (show walls, braced frames, moment connections, etc.).

Plumbing

1. Show interceptors as applicable to the project and size by flow rate (i.e. grease, oil, lint, acid, sand).
2. Provide plumbing plan layouts for each floor. These shall show the water distribution DWV piping, details, notes, legends, and schedules necessary to define the system being installed.
3. Show the location of all major components required for a complete system.
4. Provide fixture and equipment schedule showing fixture number, detailed description, hot water, cold water, waste and vent connection sizes and other pertinent data.
5. Identify all fixtures on floor plans and in riser diagrams with the plumbing fixture schedule number.
6. Supply and waste/vent piping shall be shown on the floor plans. All pipe sizes shall be clearly shown. Include isometric drawings.
7. On buildings two stories and higher, provide isometric drawings and/or schematic riser diagrams for supply and waste/vent piping and identify them by number (R1, R2, etc.). Show where all riser base terminations connect to the building drain, along with all interconnecting piping on each floor plan. All pipe sizes shall be clearly defined.
8. Show the water, sanitary DWV piping and storm leaders/drains. Indicate sizes and materials for above/below grade.
9. Show slope of horizontal sanitary and storm drains that are 3" or greater in diameter, if different than 1/8" per foot.
10. Indicate roof drains and emergency, secondary, or overflow roof drains/scuppers with the areas they impact.
Example: Roof Drain- 6" RD (16880 SF) Emergency Roof
Drain- 6" ERD (8180 SF)
Parapet Wall Scupper- 8"x 5" WS (4000 SF) Emergency Scupper- 8" x
7" ES (4200 SF)
11. Show toilet room layouts at sufficient scale for dimensions and details to be ascertained.
12. Show drinking fountain locations.
13. All penetrations of fire-rated construction to be per manufacturer details. The details shall meet or exceed the rating of construction being penetrated and shall be provided to the inspector in the field.
14. Room names and numbers for each floor should be on a floor plan for each level.
15. Provide minimum facilities calculations on the plan sheet with the building information from the Code Summary Sheet.

Mechanical

1. Show code-required wall louvers, penetrations, and fans.
2. Indicate roof-mounted equipment locations
3. Show all mechanical equipment, piping, ductwork (above/below slab) on the mechanical floor and/or roof plan.
4. Provide mechanical plans for each floor and the roof. These shall show the ductwork layouts, schedules, notes, legends, piping schematics, and details necessary to define the system being installed.
5. Indicate air distribution devices showing cfm for supply, return, and exhaust devices.
6. Indicate the location of all equipment components required for a complete system.
7. Show the smoke ventilation of atriums and pressurization of high-rise stairwells as defined in NCSBC.
8. Show condensation drains, both primary and secondary, from the unit to the point of discharge.
9. Indicate toilet exhaust requirements.
10. Show mechanical room layouts at sufficient scale for dimensions and details to be ascertained.
11. Show the size of duct runs.
12. Indicate controls for fan shutdown: emergency manual and automatic smoke detection.
13. Show the location of all UL 555 certified fire dampers, ceiling radiation dampers, smoke dampers, and fire doors.
14. Show all fire-rated walls (both existing and new) with their ratings on the mechanical plans.
15. All penetrations of fire-rated construction to be per manufacturer details.
16. Room names and numbers for each floor should be on a floor plan for each level.
17. Provide outside air ventilation rate
18. Column line notations, if provided on the architectural/structural plans, shall be identified on the mechanical plans.
19. Provide gas piping layout on the floor plan for each floor. For multi-story buildings, all gas piping shall be shown per floor. Floor plans and risers, if multi-floor, should be provided. Include pipe sizes and material. Provide a schedule of connected equipment, total BTUH demand, total equivalent length, and most remote gas appliance.
20. Provide a heat loss / heat gains summary (Manual J)

Electrical

1. Provide panel schedules with circuit and feeder loading, overcurrent protection. And load summaries for all new and affected panels and services (loading has to be evaluated by highest phase). Include fault current data, short circuit ratings, and fault current protection coordination.
2. Show a single-line riser diagram showing all new and/or affected services, feeders, wire sizes and insulation types, and conduit sizes and types.
3. Indicate number of services and their physical locations; clearly indicate mains and characteristics.
4. Indicate the grounding electrode conductor size with new and/or affected services and transformers. Where necessary, provide details or notes on methods.
5. Show physical locations of all new and/or affected panels and switchgear (indicate front).
6. Indicate receptacle plans with circuitry.
7. Indicate lighting plans with circuitry.
8. Show electrical plans for each affected floor and roof.
9. Show wiring methods, conduit sizes and types, termination temperature requirements, conductor sizes, and insulation types.
10. Indicate the design and/or operation for any of the following applicable life/safety systems (i.e., emergency generators, smoke evacuation, shaft pressurization and relief, smoke detection, egress and emergency lighting, and fire alarms).
11. Indicate how special needs such as classified (hazardous), corrosive, and patient care are treated. Provide detailed plan of classified areas, the classifications and how complied with (i.e. hangers, waste treatment and collection, flammable dusts, gases, or liquids, spray booths, vehicle servicing and parking, etc.).
12. Indicate all HVAC nameplate data including MCA/MOCP. Indicate all major appliance and/or equipment nameplate data (i.e. voltage, phasing, HP, KVA, FLA, RLA, etc.).
13. Indicate all motor horsepower ratings if not supplied elsewhere.
14. Indicate the approved third-party testing agency (UL, FM, etc.), their test number and hourly ratings of all new and/or affected rated members and assemblies (i.e. columns, beams, floor/ceiling, and ceiling/roof fire-rated design assemblies). Show all new and/or affected fire-rated walls with their ratings if not shown elsewhere.
15. All penetrations of fire-rated construction to be per manufacturer details. The details shall meet or exceed the rating of construction being penetrated and shall be provided to the inspector in the field.
16. Provide all applicable NCSBC and Energy Code compliance data on the Building Code Summary sheet or on the electrical plans.
17. All submittals to include listing and labeling statement.

Fire Protection

1. Complete a sprinkler design data sheet and include in on the first plan of the sprinkler drawings.
2. Show floor plans for each floor with sprinkler piping layout, pipe sizes, pipe hanger details, piping materials, doors, walls, and room identities.
3. Show ceiling plans with sprinkler head layout, walls, soffits, openings, doors, dimensions, and room identities.
4. Verify system design by providing hydraulic calculations along with the following:
 - a Recent water flow test.
 - b 10 percent safety margin.
 - c Type of backflow preventer or reduced pressure zone showing equivalent foot loss.
 - d Fire pump summary.
5. Note the type of Sprinkler System used.
6. For residential occupancy, show sprinkler head location at breezeways if applicable.
7. Indicate the approved third-party testing agency (UL, FM, etc.), their test number and hourly ratings of all new and/or affected rated members and assemblies (i.e. columns, beams, floor/ceiling, and ceiling/roof fire-rated design assemblies). Show all new and/or affected fire-rated walls with their ratings if not shown elsewhere.
8. All penetrations of fire-rated construction to be per manufacturer details. The details shall meet or exceed the rating of construction being penetrated and shall be provided to the inspector in the field. The penetration details shall be exactly as tested by and approved testing laboratory or agency and they shall include their system numbers. New penetrations of existing fire walls and assemblies shall be shown with appropriate designs.
9. Provide a fire alarm riser showing connection to a UL approved central station. Show tamper switches on both OS and Y valves of backflow prevention device unless shown elsewhere.
10. Commodity and class height of any storage.
11. MSDS sheets on any hazardous materials.
12. Where special temperature-rated or high temperature sprinklers are required show sprinkler types pre area, office size, cut sheets with K-Factor, water requirements, spray pattern, coverage and other pertinent data.

Fire Protection-System Calculations

Hydraulically calculated and pipe schedule fire systems should be designed with a 10 percent safety margin for all new buildings and additions to existing buildings. Calculations for hydraulic systems shall include:

- a Flow and pressure at each flowing sprinkler head
- b Flow diagram for a grid system