SECTION 5 - COMMERCIAL CONSTRUCTION – MECHANICAL, ELECTRICAL, PLUMBING AND ~~SOLAR~~ OTHER TECHNICAL CODES

5.1.0 GENERAL

Section five ~~reviews~~ consolidates ~~the various local amendments~~ technical code information related to commercial construction and includes the requirements per code, including the mechanical code, electrical code, plumbing code, and the ~~solar~~ other technical codes. ~~to the Uniform Mechanical, Plumbing, and Solar Energy Codes. Included in this section are mechanical and plumbing review check lists, gas test requirements, and requirements for solar energy systems licensing.~~

5.2 ELECTRICAL CODE

~~4.1.0~~5.2.1 GENERAL - This section contains information related to compliance with local amendments to the adopted National Electrical Code. Local amendments can be found on the City website. www.Austintexas.gov or in the City Code Section 25-12 . The Electrical Code applies to all residential and commercial construction within the City of Austin's jurisdiction, as well as electric service provided by the City of Austin's electric utility within the City's extraterritorial jurisdiction (ETJ). ~~Section Four describes the requirements for obtaining an electrical license, provides an electrical review checklist, explains the sign inspection process and addresses wiring over and under navigable water.~~

~~4.4.0~~5.2.2 ELECTRICAL REVIEW CHECK LIST

This rule is promulgated to administer and implement the Electrical Code. This rule does not apply to one- and two-family dwellings.

A. The following minimum requirements shall be included in the documents when submitted for electrical plan review:

1. All plans shall be sealed by a professional engineer.
2. Set of specifications.
3. Electrical service load analysis.
4. Emergency generator load analysis.
5. One (1) line diagram of main switchgear.
6. Panelboard and motor control center schedules or on line diagrams.
7. Electrical distribution riser.
8. Emergency distribution riser (may be included in item 7 above).
9. Fault current for all distribution devices indicated in items 7 and 8 with associated specified bracing.
10. Fire alarm riser with devices indicated.
11. Plans shall clearly indicate the location of all electrical distribution equipment.
12. Power, lighting and equipment layout.
13. Electrical notes on plans to substantiate items deleted.

Example: Item 3 deleted from plans because existing 150 ampere, 208/120 volt, three (3) phase electrical service supplying previous tenant is sufficient to carry new load. Item 7 deleted because existing service is to remain as it is currently installed.

Example: Items 3 and 7 deleted from plans because Panel 3H and Panel 3L are existing from completion of shell building and are sufficient to carry load of tenant remodel.

14. All documentation shall be submitted as an integral part of the plans. All additional and revised documentation shall be submitted as an integral part of the plans and submitted on the same size and type of material as the original plans. (No papers to be stapled, taped, glued, clipped, etc., to plans as documentation).

B. Exceptions:

1. For apartments and condominiums, three (3) stories or less in height, Items 1, 2, 4, 5, 6, 8, 9 or 10 shall not be required.
2. For one (1) and two (2) family dwellings converted to other uses, Items 1, 2, 4, 5, 6, 8, 9 or 10 shall not be required.
3. Commercial tenant finishouts and remodels, office and retail, where base building services and capacities are not exceeded (and noted as such on drawings), Items 1, 3, 4, 5, 6, 7, 8, 9, 10 or 11 will not be required. This does not include commercial tenants that are required to be metered separately, to be serviced by separate service points or common service point on premises and only Items 1, 4, 5, 6, 8, 9 or 10 will not be required.
4. Commercial tenant finishouts and remodels, office and retail, where the design complies with base building specifications, Item 2 shall not be required (and noted as such on drawings).

Electrical Code 25-12-111 Section 302
Processing Ordinance 25-1-82

~~4.2.0~~5.2.3 SIGN INSPECTION PROCESS - ELECTRICAL SIGNS

This rule is promulgated to administer and implement the provisions of the Sign Ordinance and the Electrical Code. No sign permit for an electrical sign shall receive a final inspection if the electrical permit has not passed final inspection. No sign may be served with electrical power until all required inspections have passed.

Land Development Code Chapter 25-10
Electrical Code 25-12-111 Section 205(a) and 600

~~4.3.0~~5.2.4 WIRING OVER AND UNDER NAVIGABLE WATER

This rule is promulgated to administer and implement Section 555-8 of the Electrical Code. The following electric installation requirements shall apply on navigable waters in the corporate city limits:

A minimum of one (1) light station is required along each exterior side of the facility for each 50 feet in the dimension of structure which runs parallel to the shoreline and for each 30 feet which runs perpendicular to the shoreline. Only one (1) light station is required for a dock which is 50 feet or less, is of parallel length and is 30 feet or less from the shoreline.

If only one (1) light station is required, it must be on the end or side farthest from the shoreline.

If more than one (1) light station is required along the parallel dimension, they are to be on the side farthest from the shoreline and must be no closer together than 25 and no farther apart than 50 feet.

If more than one (1) light station is required along the side running perpendicular to the shoreline, they are to be no farther apart than 30 feet, with one (1) light station at the end farthest from the shoreline and one (1) light station located 30 feet or less from the shoreline.

Each light station shall have a two (2) bulb fixture with two (2) operable amber light bulbs and must use weatherproof lampholders and weatherproof junction boxes.

The lights are to be wired with a photoelectric cell which operates the lights automatically during the required periods.

All wiring on the structure shall be installed in accordance with the Electrical Code.

All lighting other than amber navigation lights shall be placed so as not to cast beams of light outward from the structure toward the lake.
Electrical Code 25-12-111 Section 555-8

~~4.5.0~~5.2.5 ELECTRICAL UTILITY SERVICE REQUEST
This rule is promulgated to administer and implement requirements for service by the City of Austin Electric Utility.
A. Basic
1. All electric plans will include the following:
Legal address of the lot as assigned by the Transportation and Public Services Department; volume and page of all recorded easements; recorded plat; contour map (if required by site plan approval process); tree survey (if required by site plan approval process).
2. Determination of aid to construction fee requirements
   a. Voltage
   b. Number of phases
   c. Wire size at service entrance
B. Residential and Tract Development
1. Reproducible preliminary or final subdivision plat, if a recorded plat is not available.
2. Utility plans to include: paving, drainage, water, wastewater, gas and oil pipeline.
3. Erosion and sedimentation control plans
C. Commercial and Industrial
1. Load analysis for individual structures
2. One (1) line electrical diagram
3. Switchgear approval drawings
4. On site utility plan and profiles
5. The date permanent service is required
All plans submitted shall include: the seal of the engineer responsible for the plans, the signature of said engineer, the date of the plan revision, the scale of the drawings and notation of the north direction.

~~4.6.0~~5.2.6 ELECTRICAL METERS ON EAVES
When there are practical difficulties involved in relocating, repairing, or rebuilding the electrical service for a structure served by the City of Austin Electric Utility, a licensed electrician may place an existing meter on the eave of the structure under the following circumstances:
A. A permit has been secured for electrical service work;
B. The permitted work requires that the meter be placed on the eave;
C. The electrician has paid all fees associated with placing the meter in its final location;
D. The meter is placed on the eave for a period not to exceed 45 days.
Any electrician who fails to comply with all of the requirements of this rule may be subject to the license suspension provisions of the Electrical Code.
Electrical Code 25-12-111 Section 202

~~4.7.0~~5.2.7 ENERGY CODE COMPLIANCE
This rule is promulgated to administer and implement provisions of the Building Code governing energy code compliance in the electric service area.
Any person requesting electrical service for a new residential or commercial building located in the City of Austin electric service area outside the corporate City limits shall provide evidence of

compliance with Appendix Chapter 53 of the Building Code through one of the following methods:
A. A report submitted by an engineer that the building complies with the requirements of Appendix Chapter 53 of the Building Code or;
B. A report submitted by an architect that the building complies with the requirements of Appendix Chapter 53 of the Building Code or;
C. A report submitted by a building inspector certified by the International Conference of Building Officials that the building complies with the requirements of Appendix Chapter 53 of the Building Code or;
D. A request for plan review and inspection submitted by a payment of minimum plan review and building permit fees for plan review and inspection services provided by the Watershed Protection and Development Review Department. All energy reviews and inspections shall comply with Appendix Chapter 53 of the Building Code.
Building Code 25-12-1 Appendix Chapter 53 Section 530(c)

~~4.8.0~~5.2.8 UTILITY CONNECTION AND EROSION CONTROL
This rule is promulgated to administer and implement requirements linking installation of erosion and sedimentation controls outside the City Limits. When the connection of City utilities to a site outside the corporate City limits may not occur until the Watershed Protection and Development Review Department has certified compliance with erosion and sedimentation controls, the Watershed Protection and Development Review Department shall send notice of this requirement to the Utility Customer Service Office and the Building Official. No person shall authorize the temporary or permanent connection of electrical power to the subject location until the Watershed Protection and Development Review Department has issued written authorization to connect temporary or permanent electrical power.
Processing Ordinance 25-1-333

~~4.9.0~~5.2.9 ELECTRICAL WORK BY MECHANICAL CONTRACTORS
This rule is promulgated to administer and implement the requirements of the Electrical Code. It replaces an interpretation adopted on December 15, 1988.
All licensed air conditioning and refrigeration contractors, and mechanical contractors who demonstrate that equipment replaced and reconnected is of the same or lesser amperage may perform this work in Austin without securing an electrical license.
A. The new construction of environmental air conditioning/commercial refrigeration, process cooling or heating systems begins after the first connection on the line side of any listed appliance.
B. Air Conditioning and Refrigeration Contractors and mechanical contractors may replace and reconnect environmental air conditioning/commercial refrigeration, process cooling or heating systems or component parts of the same or lesser amperage. On replacement environmental air conditioning, commercial refrigeration, process cooling or heating systems where the electrical disconnect has not been installed and is required by the code, the Air Conditioning and Refrigeration Contractor may install a disconnect directly on the replacement system and reconnect the system.
C. Control wiring of 50 volts or less may be installed and serviced by a licensed Air Conditioning and Refrigeration Contractor.
D. Line voltage wiring is not within the scope of the air conditioning and refrigeration license or City-issued mechanical license.

E. All component parts may be serviced or replaced by an Air Conditioning and Refrigeration Contractor or City licensed mechanical contractor.
F. All electrical work shall be performed in accordance with Section 25-12-111 of the Austin City Code of 1981.
Section 25-12-111-301(b); 25-12-111-208; 25-12-111-205(a); 25-12-111 Article 100(c)(c)

5.3 ENERGY CODE
5.4 FIRE CODE
5.5 MECHANICAL CODE

~~5.3.0~~5.5.1 MECHANICAL REVIEW CHECK LIST
A. This rule is promulgated to administer and implement the Mechanical Code. This rule does not apply to one- and two-family dwellings.
B. Mechanical plans shall be submitted in duplicate and shall be drawn to scale. Plans shall be in print or ink of sufficient clarity to show that the proposed installation will conform to the provisions of all applicable codes, and rules. Whenever applicable, the plans shall show the following:
1. Site plan: locations of any mechanical equipment in relation to public utility easements and property lines.
2. Equipment schedule: listed capacity of air handlers and exhaust fans. Show openable windows.
3. Ventilation: demonstrate evidence of compliance through natural or mechanical ventilation.
4. Duct layout.
5. Detail of proposed fire dampers, with manufacturer's installation instructions.
6. Location and size of combustion air.
7. Condensate drains locations and sizes.
8. Locations of automatic shutoff devices or approved smoke control systems and detectors.
9. Show complete route of return air stream.
10. Details of air handler enclosures, access, all rated mechanical assemblies.
11. Gas equipment: flue details, rise and length, termination, location and the type of classification.
12. Kitchen hoods: details of all duct enclosures, equipment schedule and locations, fire suppression and the heating appliances under the hood.
13. Exits from mechanical and machinery rooms as well as boiler rooms.
14. Materials: ducts, duct insulation, drains, hangers or supports, with detail on flame spread and smoke density characteristics.
15. Location of roof access.
Mechanical Code 25-12-131 Section 302
Processing Ordinance 25-1-82

~~5.7.0~~5.5.2 MECHANICAL PERMITS OUTSIDE THE CITY LIMITS
A. This rule is promulgated to administer and implement the cost containment resolution adopted by the City Council on July 14, 1988.
B. The City Council cost containment resolution of July 14, 1988 stipulated that the Department of Building Safety would provide mechanical inspection services after September 15, 1988 in the following circumstances:
1. The mechanical permit was purchased prior to September 15, 1988 AND/OR

2. The location is in the corporate city limits AND/OR
3. Full inspection is required under the terms of the Municipal Utility District contract including the following districts:

Maple Run MUD	Northern No. 1
Southwest Austin No. 1-4 (Circle C)	Davis Springs
South Austin MUD No. 1 (Village at Western Oaks)	Moore's Crossing
South Central Austin Growth Corridor (Southland Oaks)	Fern Bluff
Riverplace	Decker Creek 1-5
North Travis County No. 1	North Travis County 1-3

C. The Resource Management Department will require mechanical inspections and permits for rebates and loans on sites listed above. Electrical inspections will be required for any mechanical equipment replacement in the electric service area inside or outside the City limits where an electrical permit is required.
D. Mechanical installations outside the City limits will not be subject to permit or inspection unless one of the conditions listed above is applicable. This rule became effective September 15, 1988 and is posted for informational purposes only.

~~5.10~~5.5.3 MOBILE HOME MECHANICAL SYSTEMS

1) This rule is promulgated to administer and implement the Mechanical Code.
   i) When a mobile is placed on a lot or in a mobile home park in the city limits, heating/ventilation/and air conditioning equipment shall be installed in accordance with the Mechanical Code. A mechanical permit shall be secured by a registered air conditioning and refrigeration contractor before any mechanical work is performed.

5.6 PLUMBING CODE

~~5.4~~5.6.1 PLUMBING REVIEW REQUIREMENTS

Utility Site Plan Details (property lines must be noted, including any easements that may exist.)

A. Water Service Data.
1. Water service locations.
2. Water service size.
3. Water meter size and location.
4. Location of fire-line back flow prevention valves. (Isolate fire system from potable water.)
5. Landscape water supply with back flow prevention valves noted.
6. Location of back flow prevention valves for standpipes and fire sprinklers.

7. Materials.

B. Gas Service Data.
   1. Gas service size and location.
   2. Materials and size per UPC.

C. Sewer Service Data.
   1. Sewer line location, connection, size, grade of fall with clean outs per code.
   2. Sewer line load shall be calculated by fixture units.
   3. Location of existing and proposed sanitary sewer manholes and flow line elevations at manholes, with grade of fall.
   4. Storm sewer location, connection, size and grade of fall.

D. Plumbing Layout Diagram.
   1. Building and vent system
   2. Layout diagram on floor plan.
   3. Size of building drain and vents.
   4. Size of branch drains and vents.
   5. Location of grease trap, interceptor or chemical dilution tank.

E. Plumbing Water Riser Diagram.
   1. Plumbing Water Riser Diagram Shall Include:
      a. Water supply entry to building.
      b. Water supply size.
      c. Descriptive notes as to total fixture served (includes existing).
      d. Hose bibs shall have a note indicating back flow protection.
      e. Materials.
      f. Building supply to be sized according to Table 10-2 or Appendix.
   2. Necessary Documentation of Special Equipment, Materials and Installations.

F. Plumbing DWV Riser Diagram. Plumbing DWV Riser Diagram Shall Include:
   1. Finished floor levels (first, second, etc.)
   2. Size of waste lines and locations.
   3. Size of vents and point of connections.
   4. Total fixture unit load including existing fixtures.
   5. Note drains that require trap seal protection.
   6. Clean outs noted where required.
   7. Size and termination of vent.
   8. Materials.

G. Roof Drains.
   1. Locate roof drains with overflow drains or scuppers.
   2. Roof drains and overflow drains shall be run independently of each other to outside of building to an approved point of disposal.
   3. Roof storm drainage riser diagram, with piping sized and noted on plans per Appendix D of the Uniform Plumbing Code. Include total square footage of area drained (if applicable).

4. Type of materials to be used. (Cast iron, PVC, etc.)

H. Boilers (Water Heater Systems). When a boiler has been identified as required by state boiler law, the following is required.
   1. Piping detail to and from boiler.
   2. Detail of venting system.
   3. Access and combustion air to boiler.

I. Fixtures (Conservation). City of Austin Water Conservation Standards shall be met.

J. Water Meter Sizing Documentation (Alternative Method). The use of Appendix A of the Plumbing Code for sizing is recognized as an alternative method. Full documentation of the mathematical calculations required.

K. Newly Installed Combination ~~Water~~ Waste and Vent System. The necessary documentation for new combination waste and vent systems:

1. One-fourth (¼) inch scale isolated plumbing lay out diagram for the combination waste and vent system.
   a. All pipe sizes of the combination waste and vent system shall be labeled.
   b. When two (2) or more combination waste and vent systems are in the plan set, each system shall be documented independently by a plumbing lay out diagram.
2. One-fourth (¼) inch scale isolated plumbing riser isometric diagram of combination waste and vent systems.
   a. All pipe sizes of the combination waste and vent system shall be labeled.
   b. When two (2) or more combination waste and vent systems are in the same plan set, each system shall be documented independently by a plumbing layout diagram.
   c. A typical of main drain, branch with trap and tail pipe with reduction noted is required.
   d. Location of required vents: cleanouts of approved size.

L. Changes and Additions to Combination Waste and Vent Systems. Necessary documentation for changes or additions to an existing system.

1. One-fourth (¼) inch scale isolated plumbing lay out diagram of present system with projected changes or additions to the present system.
   a. All pipe sizes of present system and the changes or additions to the present system shall be labeled.
   b. When two (2) or more systems are presented in the plan set, each system shall be documented independently by a plumbing lay out diagram.
2. One-fourth (¼) inch scale isolated plumbing riser isometric diagram of the present system with projected changes or additions to the present system.
   a. All pipe sizes of the combination waste and vent system shall be labeled.
   b. When two (2) or more systems are presented in the plan set, each system shall be documented independently by a plumbing riser diagram.
3. A typical of main drain, branch with trap and tail pipe with reduction noted is required.

M. Tenant Finish Outs and Remodels. Restaurants, Pubs and Lounges

1. Water Service Data (New Water Service for tenant finish outs and remodel):
   a. Service location.
   b. Service size.
   c. Meter size and location.
   d. Existing fixtures on water system.
2. Drainage Service Data:
   a. Drainage line location, load connection, size, grade of fall.
   b. Drainage line load shall be calculated by fixture units (including existing installations).
   c. Building Drain (Layout Diagram):
      i. Layout diagram on floor plan.

ii. Building sewer sized.
iii. Building branch sewer sized.

d. Drainage System Vents (Layout Diagram):
i. Floor drain vents.
ii. Hub drain vents.
iii. Grease interceptor vents:
- Tank vent
- Down stream line vent from tank

3. Plumbing Water Riser Diagram:
a. Water service entry to building.
b. Water service size.
c. Descriptive notes as to fixtures served.
d. Hose bib shall have a note indicating back-flow protection.

4. Plumbing Sewer Riser Diagram:
a. Finished floor levels (first, second, etc.).
b. Drain line size and location.
c. Vent line size and location.
d. Special plumbing items (commode carriers, e.g.).
e. Floor drains that require trap primers.
f. Clean outs noted on urinals and sinks.
g. Roof line noted.

~~5.5.0~~5.6.2 GAS TEST REQUIREMENTS

A. A natural gas pressure test shall be required as described in the Plumbing Code under the following circumstances:
1. Gas plumbing work has been performed; or
2. There is evidence of a gas leak; or
3. A building is declared substandard and gas service has been disconnected for more than 30 days; or
4. A building is declared dangerous; or
5. Any condition stipulated by the natural gas supplier.

B. The City shall not approve natural gas service to a building which has not complied with this rule.

~~5.6.0~~5.6.3 CROSS CONNECTION CONTROL

A. This rule is promulgated to administer and implement the Plumbing Code and Rules and Regulations for Public Water systems adopted by the Texas Department of Health in 1988. This rule supplements the Cross Connection Control rule adopted April 7, 1989.
1. Any person performing plumbing in the corporate city limits is required to test all new backflow prevention devices evident in the area of the building or on the site in which the plumbing work is performed. The test shall be performed by a certified tester approved by the Building Official.
2. All persons performing plumbing in a building or on a site served by the City of Austin Water and Wastewater Utility shall comply with the testing requirements listed in #A above.

3. All persons performing plumbing in a building or on a site served by a water district and/or municipal utility district which purchases water from the City of Austin Water and Wastewater Utility shall comply with the testing requirements listed in #A above.
4. No backflow prevention is required for fire hydrants located on private property that are tied only to the domestic water system and use only the domestic water system: (Based upon an opinion issued on July 8, 1988 by the International Association of Plumbing and Mechanical Officials).

B. This rule shall not be construed to relieve any person from compliance with provisions of the Plumbing Code or State law. This rule is effective June 1, 1989.

C. Diagrams 1 through 8 in Appendix I of this manual shall constitute examples of approved methods for cross connection control for irrigation systems.

D. Double check valves may be installed as a method of cross connection control when approved by the Texas Department of Health.

E. All newly installed backflow prevention devices shall be tested by a certified tester upon installation. All newly installed high hazard backflow preventors shall be tested on an annual basis and a copy of each test report shall be filed with the Building Official within ten days of the annual test of the high hazard backflow preventor.

~~5.7.0~~5.6.4 PROHIBITION OF LEAD IN PLUMBING

A. Any pipe, solder, or flux used after June 19, 1988, in the installation or repair of (i) any public water systems, or (ii) any plumbing in a residential or nonresidential facility providing water for human consumption which is connected to a public water system, shall be lead free. This subparagraph (a) (3) shall not apply to leaded joints necessary for the repair of cast iron pipes. For purposes of the subparagraph, the term "lead free," when used with respect to solders and flux refers to solders and flux containing not more than 0.2% lead, and when used with respect to pipes and pipe fittings, refer to pipes and pipe fittings containing not more than 8.0% lead.

B. Double check valves may be installed in accordance with Diagram No. 9, contained in Appendix I of this manual, if the device is listed by the manufacturer for underground installation.

~~5.8.0~~5.6.5 MOBILE HOME PLUMBING

A. This rule is promulgated to administer and implement the Plumbing Code.

B. When a mobile home is placed on a lot or in a mobile home park in the city limits or water/wastewater service area, all gas, water and drain/waste/vent connections are required to be tested in accordance with the Plumbing Code. A plumbing permit shall be secured by a registered master plumber before any plumbing work is performed.
Plumbing Code Section 1008, 1106, 1206(b), and Appendix E
This rule will be effective October 1, 1990.

~~5.9.0~~5.6.6 PLUMBING IN THE RIGHT OF WAY

A. This rule is promulgated to implement, license and permit requirements for plumbing in the right of way.

B. All plumbing installed in the right-of-way shall be inspected by the Watershed Protection and Development Review Department prior to connection. No backflow prevention device shall be installed in the right-of-way.

5.7 PROPERTY MAINTENANCE CODE
5.8 SOLAR CODE