



# Plumbing Plan Review Commercial Checklist

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This checklist is provided as a reference tool and it is not intended to be exhaustive of all possible plumbing requirements. It may also include more items than a specific set of plumbing plans may encompass.

Referenced Codes:

- 2021 Uniform Plumbing Code (UPC)
- 2021 International Energy Code Compliance (IECC)
- 20210603-057 City of Austin Ordinance
- City of Austin Administrative Policy (COA)
- Utilities Criteria Manual (UCM)

	Code Requirements	Code Section
<b>A. General</b>		
1.	Indicate scope of work on plans.	N/A
2.	Indicate the job address on each page of the plan.	N/A
3.	Plans shall bear the registration or license number and signature of engineer, an architect, or contractor, registered by the State of Texas in the appropriate discipline.	N/A
4.	Provide drawing abbreviation and symbol schedules.	N/A
<b>B. Administrative</b>		
5.	<b>Industrial Waste Requirements and Letter:</b> Provide a Trap Sizing Verification Letter from the City of Austin's Industrial Waste Division.	COA
6.	<b>Austin Water Utility Onsite Sewage Letter:</b> Obtain an approval letter from the Austin Water Utility Onsite Sewage Division stating the system is adequate to support the proposed or existing fixtures and/or additional proposed grease-producing fixtures.	COA
7.	<b>Swimming Pool:</b> If there is a plan to install a swimming pool, address the City of Austin Health Department's requirements for the outside shower and drinking fountain by providing the necessary plumbing components.	COA
8.	<b>Existing Water Meter Size:</b> Provide the existing water meter size and water service line size.	COA
9.	<b>Separate Meters:</b> Separate meters shall be used for all irrigation, swimming pools, common laundry areas, and all other common areas of each multi-family and commercial customer facilities.	AWUC 2.9.2 F 2 Water Systems
10.	<b>Grease Traps:</b> Grease traps installed in the exterior of a building must be illustrated on the utility site plan or have a site plan exemption specifically for the grease trap.	COA
11.	<b>SOVENT:</b> Projects designed with SOVENT systems are required to include an alternate method of compliance (AMC) document, a notarized deed restriction, compliance certificates for SOVENT fittings, and a list of at least three Engineers licensed in the State of Texas provided by the engineer of record.	UPC 301.3

	Code Requirements	Code Section
12.	<b>Water and Wastewater Holding Tank Letter:</b> Provide a letter of approval from Austin Water that approves the location of the proposed holding tank.	COA
13.	<b>Force Main and Lift Station Requirements:</b> Provide an approval letter from Austin Water Utility Pipeline Engineering that includes an approval of the proposed lift station hydraulics.	COA
<b>C. Backflow Protection</b>		
14.	Coordinate the fire suppression backflow protection requirements with the Austin Water Utility. Provide the project name and/or site permit number for installations on the exterior of the building. The required backflow protection, location, size and type must appear on the approved, red-stamped utility site plan or in the MEP documents.	UPC 603.5.14
15.	<p><b>Backflow Prevention:</b> Methods of backflow prevention are required to be illustrated by size, type and location in the plan set. An approved backflow prevention assembly shall protect connections to the potable water system, which can create a cross-connection.</p> <p>The degree of hazard, health or non-health will be the determining factor for the method of cross-connection control.</p> <p>When designing a domestic water system with backflow hazards located within the system, all hazards, high and low, shall be addressed by installing a Pressure Vacuum Breaker Backflow Prevention Assembly (PVB), Pressure Vacuum Breaker Spill-Resistant-Type Backflow Prevention Assembly (SVB), Reduced-Pressure Principle Backflow Prevention Assembly (RPZA), Atmospheric Vacuum Breaker (AVB), or a Double Check Valve Backflow Prevention Assembly (DCVA), depending on the type of hazard, the location, and the piping arrangement requirements for the proposed hazard.</p> <p>Provide a detail that will indicate the required method of backflow protection for each hazard.</p> <ul style="list-style-type: none"> <li>• Carbonators require an RPZA. Note: A Watts 9BD is not an acceptable method of cross-connection control for this hazard.</li> <li>• Ice makers require an RPZA.</li> <li>• Coffee, juice and tea machines require a DCVA.</li> <li>• Water softener equipment requires a DCVA.</li> <li>• HVAC equipment requires an RPZA, PVB or SVB.</li> <li>• Fire protection requires a Double Check Detector Assembly (DCDA) or DCVA, depending on piping arrangement.</li> <li>• Irrigation without chemicals requires a DCVA.</li> </ul> <p><u>Note:</u> The City of Austin requires a testable backflow preventer for most types of hazards and individual backflow preventers for each piece of equipment. However, low hazards (like hazards) may be grouped together and protected by one backflow preventer.</p> <p><u>Note:</u> High hazards require protection by using a dedicated high-hazard backflow preventer for each hazard.</p>	UPC 603.2; Table 603.2 Ordinance
<b>D. Drain, Waste, and Vent</b>		
16.	<b>Independent Systems (Sanitary Sewer):</b> The drainage system of each new building and of new work installed in any existing building shall be separate and independent from that of any other building and, when available, every building shall have an independent connection with a public or private sewer.	UPC 311.1

	<b>Code Requirements</b>	<b>Code Section</b>
17.	<b>Double Wye or Double Combination:</b> A double wye or double combination wye and 1/8 bend fitting installed in a horizontal position does not permit the branches to maintain the same slope as the barrel of the fitting. Section 708.0 requires that all horizontal drainage piping be run in practical alignment with a uniform slope of not less than 1/4 inch per foot toward the point of disposal.	UPC 708.1
18.	<b>Plumbing Layout Plan:</b> Provide a plumbing layout or floor plan to scale that will provide locations for the building drain system and its inlets and the water distribution system and its outlets.	UPC 104.3.1
19.	<b>Building Sewer:</b> The sanitary sewer of every building shall be separate and independent from any other building.	UPC 311.1
20.	<b>Fire Sprinkler Drain Discharge:</b> Provide a fire sprinkler discharge drain to meet the City of Austin fire sprinkler blow-down.	NFPA 24 10.10.2.1.4 UPC 804.1 & 812.1
21.	<b>Lift Station:</b> The proposed ejector pump shall meet the 2021 Uniform Plumbing Code, Section 710.3, Subsection 710.3.3.	UPC 710.3, 710.3(3) 710.4, 710.7 710.9
22.	<b>Combination Waste &amp; Vent System use for Grease Waste Systems:</b> Combination waste & vent systems are not an allowable method of piping for a grease producing area.	UPC 910.0 Appendix B
23.	<b>Drain, Waste and Vent Riser Diagram:</b> Provide a drain, waste and vent riser diagram.	UPC 701.1, 901.1
24.	<b>Suds Relief:</b> The drainage connections shall not be made into a drainage piping system within eight (8) feet of any vertical to horizontal change of direction of a stack containing suds-producing fixtures. Suds producing fixtures include bathtubs, laundries, washing machine standpipes, kitchen sinks and dishwashers.	UPC 711.0
25.	<b>Horizontal Venting Below the Flood Level Rim of the Fixture:</b> All venting of fixtures must be vertical until a point of 6 inches above the overflow rim of the fixture, at which point the vent can turn horizontal.	UPC 905.3
26.	<b>Combination Waste and Vent System:</b> Plumbing code requires a full size cleanout (same size cleanout as the building drain to which it is connected) in each vent of a combination waste and vent system.	UPC 910.6
27.	<b>Lift Station Venting Requirements:</b> Venting of a lift station shall be based on the venting requirement of Chapter 7, Section 710.10 UPC.	UPC 710.10 906.4 Table 703.2
28.	<b>Cleanouts Required:</b> Locations for cleanouts shall meet the referred code section.	UPC 707.4
29.	<b>Sewage Collection System Requirements:</b> Plumbing Plan Review will require utility plans that have slopes assigned to each portion of the sewer drainage system. This information is required as part of the review process to allow plan review to determine if the proposed private sewer distribution system meets requirements.	UPC Table 717.1
30.	<b>Sanitary Building Sewer and Sanitary Building Drain Location:</b> The sanitary sewer location as it enters the footprint of the building should be coordinated with the MEP and civil plans.	COA
31.	<b>Line Venting Violations:</b> The trap arm of every fixture shall connect to vertical vent piping, which connects to a horizontal building drain.	UPC 901.1 1002.2
32.	<b>Building Sewer and Building Drain:</b> Coordinate the building sewer location with the MEP and civil plans as it enters the footprint of the building.	COA

	<b>Code Requirements</b>	<b>Code Section</b>
33.	<b>Vent Convergence:</b> The vents from the inlet and outlet of the grease trap must run independently to the building and go from horizontal to vertical at least 6 inches above the overflow rim of the fixture before turning horizontal and connecting together.	UPC 905.3
34.	<b>Water Closet:</b> No water closet or urinal shall be installed on a combination waste and vent system. Those services should be tied in below/downstream of the CWV system.	UPC 910.7
35.	<b>Vent Size:</b> The minimum vent size for a six-unit trap and water closet is 2 inches.	UPC Table 703.2
36.	<b>Standpipe Receptors:</b> Plumbing fixtures or other receptors receiving the discharge of indirect waste pipes shall be approved for the use proposed, shall be of such shape and capacity as to prevent splashing or flooding, and shall be located where they are readily accessible for inspection and cleaning.	UPC 804.1
37.	<b>Vents:</b> Each combination waste and vent system shall be provided with a vent or vents adequate to ensure free circulation of air.	UPC 910.3
38.	<b>Gravity Drainage Requirement:</b> Where practicable, plumbing fixtures shall be drained to the public sewer or private sewage disposal system by gravity.	UPC 709.0
39.	<b>Walk-In Coolers:</b> Walk-in coolers and floor drains shall be permitted to be connected to a separate drainage line discharging into an outside receptor. The flood-level rim of the receptor shall be at least 6 inches (152 mm) lower than the lowest floor drain. Such floor drains shall be trapped and individually vented. Cleanouts shall be provided at 90-degree (1.57 rad) turns and shall be accessibly located. Such waste shall discharge through an air gap or air break into a trapped and vented receptor, but a full-size airgap is required where the indirect waste pipe is under vacuum.	UPC 801.3.2
40.	<b>Vertical Wet Venting:</b> Wet venting is limited to vertical drainage piping receiving the discharge from the trap arm of one- and two-fixture unit fixtures that also serves as a vent not exceeding four fixtures. Wet-vented fixtures shall be within the same story; fixtures with a continuous vent discharging into a wet vent also shall be within the same story as the wet-vented fixtures. No wet vent shall exceed 6 feet (1829 mm) in developed length.	UPC 908.1
41.	<b>Size:</b> The vertical piping between two consecutive inlet levels shall be considered a wet-vented section. Each wet-vented section shall be not less than one pipe size more than the required minimum waste pipe size of the upper fixture or shall be one pipe size more than the required minimum pipe size for the sum of the fixture units served by such wet-vented section, whichever is larger, but in no case less than 2 inches (50 mm).	UPC 908.1.1
42.	<b>Indirect Waste Connections:</b> Shall be provided for drains, overflows, or relief vents from the water supply system, and no piping or equipment carrying wastes or producing wastes or other discharges under pressure shall be connected directly to a part of the drainage system. The foregoing shall not apply to an approved sump pump or to an approved pressure-wasting plumbing fixture or device where the authority having jurisdiction has been satisfied that the drainage system is adequately sized to accommodate the anticipated discharge.	UPC 801.5
<b>E. Elevator</b>		
43.	<b>Acceptable Discharge Location:</b> In a new elevator shaft, an elevator sump pump must discharge to the storm system outside of the building, detention pond, or other location approved for each project by the authority having jurisdiction. A hydraulic elevator must be equipped with a hydraulic oil alarm, and secondary containment must be installed and approved for each project by the authority having jurisdiction.	Ordinance 20210603-057 322.1

	Code Requirements	Code Section
44.	<p><b>Discharge Piping:</b> Piping must be at least one and one-half inch (1 1/2 inch) NPS. Piping must be independent and cannot connect to the storm or sub-soil piping within the building. Discharge piping must comply with Section 710.4 of the Plumbing Code. If an elevator sump pump is located below the 100-year floodplain, its piping must rise above the 100-year floodplain elevation before connecting to a gravity drainage system. Piping must be labeled as required in Section 601.2 of the Plumbing Code.</p>	<p>Ordinance 20210603-057 322.2</p>
45.	<p>Summarized to comply in the City of Austin as follows:</p> <p><b>Elevator Sump Pumps:</b></p> <ol style="list-style-type: none"> <li>1) Must be capable of discharging 50 gallons per minute per elevator car.</li> <li>2) Operation shall be automatic with no human intervention.</li> <li>3) Discharge piping shall remain separate from other building piping until connection with the required sample port.</li> <li>4) Discharge piping shall be labeled; also indicating car number if more than one elevator car.</li> <li>5) Discharge Piping shall rise to an elevation at or above the 100-year floodplain elevation before it can be run to a gravity drainage system.</li> <li>6) Discharge piping shall have a sample port at one of the following locations: <ol style="list-style-type: none"> <li>a) Outside the building on private property in an accessible location.</li> <li>b) For buildings with a zero lot line, a sample port located inside the building in an accessible location.</li> </ol> </li> <li>7) As approved by the authority having jurisdiction, acceptable sample ports are single-riser two-way cleanouts, open grate catch basins, or other approved fittings/receptors with ability to visually see the flow line and retrieve samples.</li> <li>8) If sump pump piping is connected to the sanitary sewer, an indirect waste (air gap) is required to prevent gases from building up in the elevator hoistway.</li> <li>9) Elevator sump pumps, where feasible, shall discharge to the stormwater system or other location as approved by the authority having jurisdiction.</li> <li>10) Hydraulic elevator sumps shall incorporate a secondary deeper sump (minimum 10 gallons liquid capacity) for the retention of oily wastes to capture and contain leaks, spills, etc. for later remediation.</li> </ol>	<p>Texas Dept. of Licensing and Regulations adopted elevator rules: ASME A17.1-2007/CSA B44-07</p>
<b>F. Energy</b>		
46.	<p><b>Residential Water Heating:</b> Residential buildings, as defined by the Energy Code, having existing or planned natural gas service or equivalent district gas service located in the adjacent right-of-way, shall not use electric resistance as the primary means for heating water. Residential buildings, as defined by the Energy Code and not having natural gas service or equivalent district gas service located within the adjacent right-of-way, may install electric resistance water heaters having a minimum efficiency of 93%, in conjunction with a preprogrammed water heater timer in lieu of gas fired water heating. The timer shall be preprogrammed to turn the water heater off between 3 p.m. and 7 p.m. from June 1 to September 30 and from midnight to 4 a.m. the rest of the year. The timer shall have a readily accessible override, as defined by the building official, capable of restoring power to the water heater for one hour when activated.</p>	<p>Ordinance No. 20210603-55 C404.10</p>
<b>G. Fire Systems</b>		
47.	<p><b>Fire Suppression Systems:</b> If any of the building's fire sprinkler system can freeze and chemicals are added to protect the piping, refer to the referenced code section.</p>	<p>UPC 603.5.14.2</p>

	<b>Code Requirements</b>	<b>Code Section</b>
48.	<b>Water protection:</b> Provide an approved method to prevent water from infiltrating into the hoistway enclosure from the operation of the automatic sprinkler system outside the enclosed fire service access elevator lobby.	IBC 3007.3
<b>H. Fixtures and Fittings</b>		
49.	Minimum plumbing restroom fixture count shall comply with referenced code for separate facilities required for the type of building occupancy and occupant load factors described.	Ordinance No. 20210603-057 422.0 Refers to Chapter 29 in IBC table 2902.1
50.	Plumbing fixtures shall be constructed of dense, durable, non-absorbent materials and shall have smooth, impervious surfaces, free from unnecessary concealed fouling surfaces. All fixtures shall comply, in quality and design, with nationally recognize applicable standards.	401.2 UPC, Table 1701.1
51.	<b>Hand Sink Locations:</b> A hand washing lavatory is required for each definitive area of food service and utensil washing (within 20 feet plain view of these areas.)	COA
52.	<b>Location of Valves and Heads:</b> Refer to the code section for specific information on location of valves and heads.	UPC 408.9
53.	<b>Family or Assisted-Use Toilet and Bathing Rooms:</b> In assembly or mercantile occupancies where an aggregate of six or more male and female water closets is required, an accessible or family-assisted-use toilet room shall be provided.	IBC 1110.2.1, UPC 422.1.1
54.	<b>Floor Drain Requirements:</b> Refer to the referenced code section for installation location of floor drains.	UPC 418.3
55.	<b>Domestic Water Fixture Analysis:</b> Provide a domestic water fixture analysis by using the required instructions located in Appendix A. Include the results in table format.	UPC APPENDIX A
56.	<b>Drainage Fixture Units Analysis:</b> Provide an analysis of the drainage fixture units for each multi-unit building. For the first analysis, use the 2021 UPC Table C 303.1(2), titled, "Drainage Fixture Unit Values (DFU) for Bathroom Groups." Table C 303.1(2) is only for sizing the sanitary sewer for the entire sewer system as the individual building sewers intersect throughout the property and eventually terminate into the City sewer utilities. For the second analysis, use the 2021 UPC Tables 702.1 & 703.2 for sizing all drain, waste and vent piping within the footprint of the building. Tables 702.1 & 703.2 are used for the sole purpose of sizing the plumbing drain, waste and vent piping within the footprint of the building. Provide the data on the pertinent MEP drawings for each multi-unit building at key intersection points within the footprint of the building.	UPC Table 702.1, 703.2, APPENDIX C C303.3
57.	<b>Drinking Fountain Required:</b> Occupancies shall have one drinking fountain per 100 occupants for public and employee use per table 422.1. B occupancies over 3,000 square feet are required to have one drinking fountain for every 100 occupants. The first required fountain for any occupancy is to be a high-low fountain, and any subsequent fountains can substitute up to 50% of required fountains for bottle filling stations or accessible break room sinks.	Ordinance 201200603-057 422.0 Refers to IBC Chapter 29 Table 2902.1
58.	<b>Service Sink Required:</b> Occupancies shall have one service sink per table.	Ordinance 201200603-057 422.0 Refers to IBC Chapter 29 Table 2902.1

	Code Requirements	Code Section
59.	<b>Accessible Route:</b> The route to the public toilet facilities shall not pass through kitchens, storage rooms or closets. Access to the required facilities shall be from within the building or from the exterior of the building. All routes shall comply with the accessibility requirements of the IBC. The public shall have access to the required toilet facilities at all times that the building is occupied.	UPC 422.4.1
60.	<b>Substitution:</b> Where restaurants provide drinking water in a container free of charge, drinking fountains shall not be required. In other occupancies where drinking fountains are required, <u>water dispensers</u> shall be permitted to be substituted for not more than 50 percent of the required number of drinking fountains.	UPC 415.2
<b>I. Gas</b>		
61.	<b>Elevated Gas Pressure Request:</b> Provide an Elevated Gas Pressure Request from Texas Gas Service. Send Elevated Gas Pressure Request inquiries to Texas Gas Service at <a href="mailto:slimgas-metroaustin@onegas.com">slimgas-metroaustin@onegas.com</a> . NOTE: Provide emailed confirmation letter from Texas Gas Service.	UPC 1215.6
62.	<b>Boiler Requirements:</b> Provide a diagram of the proposed boiler that includes gas vent size and penetration through roof, gallon capacity, and Btu Input. <u>Note:</u> If check valves or other devices that create a non-return barrier are used, the diagram must meet the requirements in the 2021 Uniform Plumbing Code Section 608.3, which includes the installation of an expansion tank or other approved device.	UPC 501.1
63.	<b>Natural Gas Riser Diagram:</b> Provide a gas riser diagram that includes the following information: <ul style="list-style-type: none"> <li>• Total Btu/h or Cubic Feet per Hour for the entire system downstream of the pertinent gas meter</li> <li>• The Btu/h or Cubic Feet per Hour for each appliance</li> <li>• Total developed length of piping, from the gas meter to the most remote outlet, along the centerline of the pipe and fittings and sizes for all sections of the piping system</li> <li>• Refer to the referenced table for low-pressure system.</li> </ul> <u>Note:</u> Provide a statement of the pressure of the proposed system. If the proposed system is a two-stage system five-pound-gas with a regulator reducing the system to inches of water column, the information listed above must be included for the medium-pressure system and for the low-pressure system.	UPC Table 1215.2 (1), UPC 104.3.1
<b>J. Storm Water</b>		
64.	<b>Storm Drainage Riser Diagram:</b> Provide a riser diagram for the storm drainage system that includes the following information: <ul style="list-style-type: none"> <li>• Square footage of area drained per drainage inlet</li> <li>• Desired horizontal slope of the storm drain piping (<math>\frac{1}{8}</math>, <math>\frac{1}{4}</math>, or <math>\frac{1}{2}</math> inch)</li> <li>• Termination point of primary and secondary drain if applicable.</li> </ul> <u>Note:</u> Storm drainage piping must terminate outside of the footprint of the building and to a point approved by the authority having jurisdiction. The roof drain termination point shall not terminate over a public way. <u>Note:</u> The size of the system will be based on five (5) inches/hour of rainfall per the 100-year 60-Minute Rainfall Rate.	UPC 104.3.1
65.	<b>Primary Roof Drainage:</b> Roof areas of a building shall be drained by roof drains or gutters.	UPC 1101.12.1
66.	<b>Secondary Drainage:</b> Secondary (emergency) roof drainage shall be provided by one of the methods specified in referenced code.	UPC 1101.12.2.1, 1101.12.2

	<b>Code Requirements</b>	<b>Code Section</b>
67.	<b>Roof Scuppers or Open Side:</b> Secondary roof drainage shall be provided by an open-sided roof or scuppers where the roof perimeter construction extends above the roof in such a manner that water will be entrapped.	UPC 1101.12.2.1
68.	<b>Secondary Roof Drain:</b> Secondary roof drains shall be provided and located at least 2 inches (51 mm) above the roof surface. The maximum height of the roof drains shall be a height to prevent the depth of ponding water from exceeding the capacity for which the roof was designed, as determined by Section 1101.12.1. The secondary roof drains shall connect to a piping system in accordance with code.	UPC 1101.12.2.2.1, 1101.12.2.2
69.	<b>Rainwater Sumps:</b> Rain sumps in a public use occupancy are required to be duplex.	UPC 1101.14
70.	<b>Discharge:</b> Subsoil drains shall be piped to a storm drain, to an approved water course, to the front street curb or gutter, or to an alley. Alternately, the discharge from the subsoil drains shall be conveyed to the alley by a concrete gutter. Where a continuously flowing spring or groundwater is encountered, subsoil drains shall be piped to a storm drain or an approved water course.	UPC 1101.6.1
<b>K. Water</b>		
71.	<b>Domestic and Fire Main Services and Domestic Building Branches:</b> Coordinate the domestic water and fire line sizes and locations with the MEP and civil plans.	COA
72.	<b>Potable Water Riser Diagram:</b> Provide a potable water riser diagram.	UPC 104.3.1, COA
73.	<b>Total Water Supply Fixture Unit Count:</b> Provide a water fixture unit count. An MEP Engineer will provide a total water fixture unit count of existing tenant spaces that are supplied from the same water meter.	UPC 610.4
74.	<b>Hot Water Boiler/Domestic Water Heater Expansion Control:</b> A check valve is installed on the cold supply to the water heater in as much, the check valve has created a non-return barrier.	UPC 608.3
75.	<b>Pressure Loss:</b> No water filter, water softener, backflow prevention device, or similar device regulated by this code shall be installed in a potable water supply piping where the installation of such device produces an excessive pressure drop in such water supply piping.	UPC 610.2
76.	<b>Water Systems:</b> All fire lines shall have a gate valve on the line at the connection to the main line and a backflow preventer inside the property line, but accessible for inspection by City personnel. All unmetered fire lines shall have a flow-detection device approved by Austin Water. This flow detection service shall be located so no more than 100 gallons of <i>water</i> is contained between the device and the point where the fire line is connected to the City's main. Note: The distance exceeds the 100 gallon rule.	2.9.2 UCM