City of Richmond

PLUMBING/GAS PLAN CHECKLIST

All plumbing and gas projects require plans except for single family or duplexes. Electronic plans shall be submitted. Where permitted by this handout a master plumber (or gas fitter for gas) may prepare the plans provided the plans are of the same quality and detail as normally provided by an engineer. This checklist is to be used by the design professional to ensure his/her plans will meet the minimum standards required.

General
Drawings and copies shall be neat and legible and all of the same size.

Drawings shall be at least 1/8” scale or larger. Standard architectural scales are required and all lettering shall be at least 1/8” in height. Each sheet shall be numbered.

Each plan shall have a complete title block. (see example below).

Site work requires plans
If there is any work on the exterior of the building or on the site, a site plan clearly showing the property lines is required. This plan must be sealed by a design professional

Show all the engineering details required in this checklist on the plans; providing this information in the specifications only is not sufficient.

A legend shall be provided for all symbols.

All spaces and rooms shall be labeled as to their use.

Indicate occupancy load, use group, (if a change of use so indicate) and building construction type on the plans.

Where typical plans are utilized, provide additional copies as necessary to have an individual plan for each individual unit on each floor.

New work shall be differentiated from that which exists.

Engineer shall seal, sign and date each sheet OR
Master tradesman shall sign and date each sheet, where permitted (see page 6). (master plumber for plumbing plans, master gas fitter for gas plans)

Title Block
Show title block on each plan.

Sample Title Block

<table>
<thead>
<tr>
<th>Project Name:</th>
<th>Project Address:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Designer’s Name:</td>
<td>Designer’s License No. or Master No.:</td>
</tr>
<tr>
<td>Telephone No:</td>
<td>Fax No:</td>
</tr>
<tr>
<td>Email:</td>
<td>Scale:</td>
</tr>
<tr>
<td>Title:</td>
<td>Sheet No:</td>
</tr>
</tbody>
</table>
Building Code Year: | Plumbing Code Year: | Construction Type: |
---|---|---|
Use Group | Change of Use? Yes  No | Occupancy Load: |
Is project in flood plain? | BFE per NGVD1929: | DFE: |
Is IEBC being used? | Level: | |

**Codes**
The design shall comply fully with the following codes. Specify on plans which edition the plans have been designed under.
Virginia Construction Code-2015
International Building Code IBC-2015
International Mechanical Code – 2015
International Plumbing Code – 2015
NFPA 70 (National Electric Code)-2014
ICC/ANSI A117.1 accessibility standards – 2009

**Public/Private Sewers and Water Services**
All water and sewer lines on private property are assumed to be privately owned and will fall under the plumbing code
If any portion of the above is intended to be publicly owned, you must show which portions will be publicly owned or in a utility easement with easement boundaries shown
A letter from the Department of Public Utilities must confirm which portions they will be taking as public water or sewer.

**Floor Plans / Fire Assemblies**
Label all fire rated assemblies, firewalls, fire separation walls as to their rating in hours on all plumbing and gas plans.
Provide UL listed fire-stopping detail as found in the latest edition of the UL Fire Resistance Directory for the type of through penetration used – see www.ul.com if help is needed.
If no rated assemblies are on the project put a note on the plans to that effect
If no rated assemblies will be penetrated state that on the plans
Make the indications of rated assemblies easy to pick out from the rest of the plans using darkened lines or hatched lines that show up well

**Flood Plain**
Show Design Flood Elevation on title sheet
Design Flood Elevation is the NGVD29 Base Flood Elevation plus 12 inches
Show floor elevations using the same datum as the flood elevations on each floor plan

**Revised Plans**
Revised plans are required to be the same size as original plans
Provide clouds around areas of change with numbered revision triangles
Provide revision triangles with number, description and date
Provide a complete list of all plumbing and gas drawings include all revisions and dates
Do not skip revisions, submit all revisions for review that affect the permit

**Plan Review Procedure**
Plans will be reviewed in the order they are received.
Plans that require additional information or that have code deficiencies will have a plan review comments sheet emailed if an email address is available or the comments will be faxed to the applicant and designer.
It is the applicant's responsibility to get the revised plans submitted within 30 days.
Failure to get revised plans back within 30 days will result in the permit being denied.
Approved plans and permit will be emailed to the applicant or a link to the approved plans will be provided.
Waste and Vent Riser Diagram - Isometric
Show all pipe sizes and label all connected loads (DFU counts), fixtures, drains, waste, vent lines
Show traps and all required cleanouts
Show any on site waste treatment (oil separator, grease interceptors, acid waste tanks, etc.)
State type of pipe to be used (PVC, cast iron etc.)
Show one entire riser so the reviewer can determine how all piping interconnects. Do not show several partial risers and expect the plan reviewer to figure out how they go together. Show the connection point of the new piping to the existing system.

Supply Risers - Isometric
Show all supply piping
Show type of pipe (copper, CPVC, PEX, etc.)
Show all full open valves and shutoff valves
Show sizes for all piping
Identify all connected devices and fixtures
Show all backflow prevention devices and type of backflow preventors
Show everything on one riser. Do not show several partial risers and expect our reviewer to figure out how they go together.
Show the connection point of the new piping to the existing system.
Show any required thermal expansion devices
Show water heater if new and where the drains for the T&P relief valve and drain pan discharge
Show incoming water supply pressure and sizing calculations for the piping

Floor Plans
Show fixture locations
Show piping layouts for waste, vent and water piping
Show locations of waste and vent stacks in the walls
Indicate any locations where non-metallic pipe will be installed in a plenum or return air ceiling
Make sure all spaces and rooms are labeled as to their use
Provide a plumbing fixture schedule that will describe each fixture

ADA Accessible Facilities
Show dimensions on all accessible rooms - dimensions for lavatories, tubs, showers, water closets and sinks. Show dimensions off walls, in front of water closets and between fixtures
Indicate which fixtures are accessible
Does the design comply with ICC/ANSI A117.1-2009 edition and Chapter 11 of the 2015 IBC?
Indicate mounting height for lavatories, water fountains, wall mounted water closets
Show locations and lengths of horizontal and vertical grab bars at water closets
Show the door swing of toilet compartments and restroom doors
Show required clear floor space at accessible fixtures

Site Plans-domestic water and sanitary sewer
Show outline of building
Show water service lines (pipe sizes and type of pipe and standards
Show locations of all thrust blocks
Show the size of the water meter
Show the depth of the water service pipe
Show sanitary sewer lines (pipe sizes, type of pipe and the pipe standards)
Show the locations of any cleanouts
Show the % of slope and drainage fixture unit calculations for each section of the sanitary sewer
Show any manhole locations and how the piping will connect to the manholes
Show any outside backflow prevention devices
Show any streets and alleys, property lines and any public utilities easements
Show the locations and sizes of any external grease interceptors or oil separators and the sizing calculations
**Site Work - domestic water**

Show all of the calculations used to size the water service and distribution piping. This should include the following:

- The pressure at the water main in street
- The pressure drop through water meter
- The pressure drop through backflow prevention devices
- The pressure drop due to static head
- The pressure drop due to pipe friction
- Provide the flow in gallons per minute
- Provide the water pressure at the entrance to the building
- Provide the difference in elevation between the service water and the highest point of the pipe in the building
- Provide distance from the street main to building and to the farthest fixture
- Provide total water supply fixture units from IPC Appendix E
- Provide sizes and types of pipes
- Provide the maximum pressure required at farthest fixture

**Elevator Pits**

Does the piping in the pit and elevator equipment room comply with the ANSI Elevator code?

- Does the piping from the elevator sump pump comply with the IPC?
- Does the pit contain a drain or sump pump with an indirect connection to the sanitary sewer?
- Does the piping discharge through an oil interceptor or is it equipped with an oil minder?

**Gas Risers**

- Show all pipe sizes and types of pipe
- Show the type of gas (Natural or Propane)
- Show lengths of all pipe including vertical runs
- Show all loads in BTU's
- Show gas pressure (low, two or five pound) on customer's side of meter
- Show locations of shutoff valves and pressure regulators
- Show the type of pressure regulators to be used and the venting of the pressure regulators
- Show one entire riser; do not show typical risers for various parts of the building. All risers must be connected as they will be installed
- If connecting to an existing system, the entire system (pipe sizes, footages, and the total BTU load) must be shown
- For propane, show location of tanks and pipe sizes from tank to building, location of regulators
- For propane show layout including dimensions to windows, openings in the building, sources of combustion and property lines
- If there are rated assemblies being penetrated, show all rated assemblies on a floor plan and provide UL fire stopping details. If there are no rated assemblies state “NO Rated Assemblies in Building” on the plans
<table>
<thead>
<tr>
<th>Use Group</th>
<th>Description of Use of Building or Portion of Building</th>
<th>1 to 3 Stories - new building or work under $10,000</th>
<th>1. Over 3 stories - New building or 2. Remodeling over $10,000</th>
</tr>
</thead>
<tbody>
<tr>
<td>A1A</td>
<td>Theater with stage</td>
<td>2</td>
<td>Yes</td>
</tr>
<tr>
<td>A1B</td>
<td>Theater without a stage</td>
<td>2</td>
<td>Yes</td>
</tr>
<tr>
<td>A2A</td>
<td>Nightclub, dance hall</td>
<td>2</td>
<td>Yes</td>
</tr>
<tr>
<td>A2B</td>
<td>Restaurant</td>
<td>2</td>
<td>Yes</td>
</tr>
<tr>
<td>A3B</td>
<td>Museum or art gallery</td>
<td>2</td>
<td>Yes</td>
</tr>
<tr>
<td>A3C</td>
<td>Library, exhibit hall</td>
<td>2</td>
<td>Yes</td>
</tr>
<tr>
<td>A3D</td>
<td>Passenger terminal</td>
<td>2</td>
<td>Yes</td>
</tr>
<tr>
<td>A3F</td>
<td>Lecture hall</td>
<td>2</td>
<td>Yes</td>
</tr>
<tr>
<td>A3G</td>
<td>Restaurant Fast Food</td>
<td>2</td>
<td>Yes</td>
</tr>
<tr>
<td>A3H</td>
<td>Church</td>
<td>2</td>
<td>Yes</td>
</tr>
<tr>
<td>A4A</td>
<td>Recreation Center</td>
<td>2</td>
<td>Yes</td>
</tr>
<tr>
<td>B1</td>
<td>Auto Dealership</td>
<td>2</td>
<td>Yes</td>
</tr>
<tr>
<td>B2</td>
<td>Dentist/Doctor's Office</td>
<td>1</td>
<td>Yes</td>
</tr>
<tr>
<td>B3</td>
<td>Bank</td>
<td>2</td>
<td>Yes</td>
</tr>
<tr>
<td>B4</td>
<td>Car Wash</td>
<td>1</td>
<td>Yes</td>
</tr>
<tr>
<td>B5</td>
<td>Fire Station</td>
<td>2</td>
<td>Yes</td>
</tr>
<tr>
<td>B6</td>
<td>Funeral Home</td>
<td>1</td>
<td>Yes</td>
</tr>
<tr>
<td>B7</td>
<td>Laundry</td>
<td>1</td>
<td>Yes</td>
</tr>
<tr>
<td>B8</td>
<td>Medical Office</td>
<td>1</td>
<td>Yes</td>
</tr>
<tr>
<td>B9</td>
<td>Office</td>
<td>2</td>
<td>Yes</td>
</tr>
<tr>
<td>B10</td>
<td>Business-Other</td>
<td>2</td>
<td>Yes</td>
</tr>
<tr>
<td>E1</td>
<td>Education/School K to 12th grade</td>
<td>2</td>
<td>Yes</td>
</tr>
<tr>
<td>E2</td>
<td>Daycare over 2-1/2 Years</td>
<td>2</td>
<td>Yes</td>
</tr>
<tr>
<td>F1</td>
<td>Factory - moderate hazard</td>
<td>2</td>
<td>Yes</td>
</tr>
<tr>
<td>F2</td>
<td>Factory - low hazard</td>
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<tr>
<td>H1-H5</td>
<td>High hazard</td>
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<td>Yes</td>
</tr>
<tr>
<td>I1</td>
<td>Group home - 6 or more</td>
<td>2</td>
<td>Yes</td>
</tr>
<tr>
<td>I2A</td>
<td>Institutional - incapacitated</td>
<td>2</td>
<td>Yes</td>
</tr>
<tr>
<td>I2B</td>
<td>Institutional - Day nursery</td>
<td>2</td>
<td>Yes</td>
</tr>
<tr>
<td>M1</td>
<td>Retail Convenience Store</td>
<td>1</td>
<td>Yes</td>
</tr>
<tr>
<td>M2</td>
<td>Retail Department Store</td>
<td>1</td>
<td>Yes</td>
</tr>
<tr>
<td>M3</td>
<td>Retail Supermarket</td>
<td>1</td>
<td>Yes</td>
</tr>
<tr>
<td>M4</td>
<td>Retail Store</td>
<td>1</td>
<td>Yes</td>
</tr>
<tr>
<td>M5</td>
<td>Retail Auto Service Station</td>
<td>1</td>
<td>Yes</td>
</tr>
<tr>
<td>R1H</td>
<td>Hotel</td>
<td>1</td>
<td>Yes</td>
</tr>
<tr>
<td>R1M</td>
<td>Motel</td>
<td>1</td>
<td>Yes</td>
</tr>
<tr>
<td>R2A</td>
<td>Dormitories</td>
<td>1</td>
<td>Yes</td>
</tr>
<tr>
<td>R2B</td>
<td>Multifamily dwelling</td>
<td>1</td>
<td>Yes</td>
</tr>
<tr>
<td>R3</td>
<td>Single Family or Duplex over 3 stories</td>
<td>Plans not required</td>
<td>Plans not required</td>
</tr>
<tr>
<td>R5A, R5B</td>
<td>Single Family or Duplex Attached, under 4 stories</td>
<td>Plans not required</td>
<td>Plans not required</td>
</tr>
<tr>
<td>R5C, R5D</td>
<td>Single Family or Duplex Detached under 4 stories</td>
<td>Plans not required</td>
<td>Plans not required</td>
</tr>
<tr>
<td>S1</td>
<td>Storage Moderate Hazard</td>
<td>1</td>
<td>Yes</td>
</tr>
<tr>
<td>S2</td>
<td>Storage Low Hazard</td>
<td>1</td>
<td>Yes</td>
</tr>
</tbody>
</table>

Gas riser is required for all commercial piping installations regardless of value.
Note 1 - Plans must be of same quality and detail as those prepared by an engineer but can be done by contractor's master plumber.
Note 2 - Sealed plans normally required but may be waived on a case by case basis - designer must be master plumber or gas fitter and he must demonstrate his knowledge of all codes involved and not just plumbing code.
BATHROOM ENLARGEMENT

SCALE: 1/4" = 1'-0"
System No. C-AJ-1013
(Formerly System No. 120)
F Rating - 1 Hr
T Rating - 4 Hr
L Rating At Ambient - Less Than 1 CFH/sq ft (See Item 4)
L Rating At 400F - Less Than 1 CFH/sq ft (See Item 4)

SECTION A-A

1. Floor or Wall Assembly-Min 5 in. thick reinforced normal weight (140-155pcf) concrete. Wall may also be constructed of any UL ClassIed Concrete Block. Max dia of opening is 6 in. See Concrete Block(CAT) category in the Fire Resistance Directory.

2. Through Penetrants-One metallic pipe, or conduit to be centered within the Firestop system. Pipe or conduit to be rigidly supported on both sides of floor or wall assembly. The following types and sizes of metallic pipe or conduit may be used:
   A. Steel Pipe-Non 4 in. dia or smaller Schedule 5 (or heavier) steel pipe. A non annular space of 3/4 in. is required within the Firestop system.
   B. Conduit-Non 4 in. dia or smaller steel electrical metallic tubing or steel conduit. A non annular space of 3/4 in. is required within the Firestop system.

3. Filling Material-Non Min 1 in. dia open cell polyurethane foam backed with friction-fitted into the opening as a permanent form. Filling material to be recessed from top surface of floor or from both surfaces of wall as required to accommodate the required thickness of fill material.

4. Fill, Void or Cavity Material-Silicon-Min 3/4 in. thickness of fill material applied within annulus, flush with top surface of floor or with both surfaces of wall.

MINNESOTA HEBING & MFG CD-FB-159
FB-2009+ OPIE: L Ratings apply only when FB-2009+ is used

<table>
<thead>
<tr>
<th>Project Name</th>
<th>DIAMOND PLATING</th>
</tr>
</thead>
<tbody>
<tr>
<td>Project Address</td>
<td>2312 Westwood Avenue</td>
</tr>
<tr>
<td>Master's Name</td>
<td>Robert Duce</td>
</tr>
<tr>
<td>Master's Card No.</td>
<td># 2710-012345</td>
</tr>
<tr>
<td>Company Address</td>
<td>Duce Plumbing Co. 800 East Broad St.</td>
</tr>
<tr>
<td>Pn</td>
<td>(804) 740-1234</td>
</tr>
<tr>
<td>Fax</td>
<td>(804) 740-4321</td>
</tr>
</tbody>
</table>
Accessible Single Occupant Toilet Room
(Based on ICC/ANSI A117.1-2003)

Typical Floor Plan

Grab bars shall be between 1 1/2" and 2" diameter.
The space between the grab bar and the wall shall be 1 1/2".

Water Closet Clear Floor Space, Min. 60" x 56"
Lavatory Clear Floor Space, Min. 30" x 48"
Wheelchair Turning Space, Min. 60" Dia.
Clearance at Door, Varies

Rear Wall Elevation

Lavatory Side Wall Elevation

Water Closet Side Wall Elevation

*Toilet Paper Dispenser - Must Be A Min. 15" And Max. 48" Above The Floor. Must Be At Least 1 1/2" Below or 12" Above The Grab Bar. The Outlet Of The Dispenser Shall Not Be Located Behind The Grab Bars.
Reference Documents for this Policy:

2015 International Building Code
2015 International Plumbing Code
2015 International Fuel Gas Code