# PART 1 - GENERAL

* 1. **SUMMARY**
     1. This Section includes commercial, gas fired water heaters.

# SUBMITTALS

* + 1. Product Data: Include rated capacities, furnished specialties, and accessories for each type and size of water heater indicated.
    2. Shop Drawings: Detail water heater assemblies and indicate dimensions, required clearances, method of field assembly, components, and location and size of each field connection.
       1. Wiring Diagrams: Power, signal, and control wiring.
    3. Operation and maintenance data.
    4. Warranties.

# QUALITY ASSURANCE

* + 1. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, Article 100, by a testing agency acceptable to authorities having jurisdiction, and marked for intended use.
    2. ANSI Compliance: Water heaters shall comply with ANSI standards for gas water heaters and related products and bear AGA certification label.
    3. ASME Compliance: Water heater, hot-water storage tanks shall be fabricated and labeled according to ASME Boiler and Pressure Vessel Code: Section VIII, "Pressure Vessels," Division 1.
    4. ASHRAE Standards:
       1. ASHRAE 90.1, "Energy Efficient Design of New Buildings except Low-Rise Residential Buildings," for commercial water heaters.

# PART 2 - PRODUCTS

* 1. **MANUFACTURERS**
     1. In other Part 2 articles where subparagraph titles below introduce lists, the following requirements apply for product selection:
        1. Manufacturers: Subject to compliance with requirements, provide products by the manufacturers specified.

# STORAGE, GAS WATER HEATERS

* + 1. Description: Comply with ANSI Z21.10.1.
       1. Manufacturers:
  1. American Water Heater Co.
  2. Rheem Manufacturing Co.
  3. Smith, A. O. Water Products Co.
  4. State Industries.
     + 1. Storage Tank Construction: Steel with 150-psig working-pressure rating.
  5. Tappings: Factory fabricated of materials compatible with tank for piping connections, relief valve, drain, anode rod, and controls as required.
  6. Attach tappings to tank before testing and labeling. Include ASME B1.20.1, pipe thread.
  7. Interior Finish: Materials and thicknesses complying with NSF 61, barrier materials for potable-water tank linings. Extend finish into and through tank fittings and outlets.
  8. Insulation: Comply with ASHRAE 90.2. Surround entire storage tank except connections and controls.
  9. Jacket: Steel, with enameled finish.
     + 1. Burner: For use with atmospheric-vent water heaters for natural-gas fuel.

1. Temperature Control: Adjustable thermostat.
2. Automatic Ignition: ANSI Z21.20, automatic gas-ignition system and components.
3. Automatic Damper: ANSI Z21.66, gas-appliance, automatic-vent-damper device.
   * + 1. Anode Rod: Factory installed, magnesium.
       2. Dip Tube: Factory installed. Not required if cold-water inlet is near bottom of storage tank.
       3. Drain Valve: ASSE 1005, factory installed.
       4. Heat Trap: Factory-installed, integral piping arrangement or cold-type inlet and hot-type outlet fittings complying with ASHRAE 90.2.
       5. Draft Hood: Low-profile-type, draft diverter; complying with ANSI Z21.12.

# EXPANSION TANKS

* + 1. Description: Steel, pressure-rated tank constructed with welded joints and factory- installed, butyl-rubber diaphragm. Include air precharge to minimum system- operating pressure at tank.
       1. Manufacturers:
  1. Ben & Gossett.
  2. Amtrol, Inc.
  3. Zurn Industries, Inc.; Wilkins Div.
     + 1. Construction: 150-psig working-pressure rating.
       2. Tappings: Factory-fabricated steel, welded to tank before testing and labeling. Include ASME B1.20.1, pipe thread.
       3. Tank Interior Finish: Materials and thicknesses complying with NSF 61, barrier materials for potable-water tank linings. Extend finish into and through tank fittings and outlets.
       4. Tank Exterior Finish: Manufacturer's standard, unless finish is indicated.
       5. Air-Charging Valve: Factory charged.

# WATER HEATER ACCESSORIES

* + 1. Combination Temperature and Pressure Relief Valves:
       1. Gas Water Heaters: ANSI Z21.22, combination temperature and pressure relief valve.
    2. Pressure Relief Valves:
       1. Gas Water Heaters: ANSI Z21.22 pressure relief valve for storage tanks of 200,000 Btu.
    3. Vacuum Relief Valves:
       1. Gas Water Heaters: ANSI Z21.22.
       2. Exception: Omit if water heater has integral vacuum-relieving device.
    4. Gas Shutoff Valves: ANSI Z21.15, manually operated. Furnish for installation in piping.
    5. Gas Pressure Regulators: ANSI Z21.18, appliance type, factory or field installed. Include pressure rating, capacity, and pressure differential required for water heater and gas supply.
    6. Automatic Valves: ANSI Z21.21, appliance, electrically operated, on-off automatic valve.
    7. Water Heater Stand and Drain Pan Units: High-density-polyethylene-plastic, 18- inch- high, enclosed-base stand complying with IAPMO PS 103 and IAS No. 2. Include integral or separate drain pan with raised edge and NPS 1 drain outlet with ASME B1.20.1, pipe thread.
    8. Water Heater Stands: Water heater manufacturer's factory-fabricated, steel stand for floor mounting and capable of supporting water heater and water. Include dimension that will support bottom of water heater a minimum of 18 inches above the floor.
    9. Drain Pans: Corrosion-resistant metal with raised edge. Include dimensions not less than base of water heater and include drain outlet not less than NPS 3/4.

# PART 3 EXECUTION

* 1. **INSTALLATION**
     1. Install commercial water heaters on concrete bases. Omit concrete bases for commercial water heaters if installation on stand, bracket, suspended platform, or direct on floor is indicated.
     2. Install water heaters, level and plumb, according to layout drawings, original design, and referenced standards. Maintain manufacturer's recommended clearances. Arrange units so controls and devices needing service are accessible.
     3. Anchor water heaters to structure.
     4. Install and connect gas water heaters according to NFPA 54.
        1. Install appliance, gas pressure regulators on gas-burner inlets of water heaters without pressure regulators.
        2. Install vent piping from gas-train pressure regulators and valves to outside of building where required. Terminate vent piping with brass-screened vent cap fitting. Do not combine vents except with approval of authorities having jurisdiction.
     5. Install temperature and pressure relief valves in top portion of storage tanks. Use relief valves with sensing elements that extend into tanks. Extend relief valve outlet with water piping in continuous downward pitch and discharge onto closest floor drain.
     6. Install water heater drain piping as indirect waste to spill into open drains or over floor drains. Install hose-end drain valves at low points in water piping for water heaters that do not have tank drains. Refer to Division 22 Section 22 11 19 "Plumbing Specialties" for drain valves.
     7. Install thermometers on water heater inlet and outlet piping. Refer to Division 22 Section 22 10 00 "Plumbing" for thermometers.
     8. Install pressure gages on water heater piping. Refer to Division 22 Section 22 10 00"Plumbing" for pressure gages.
     9. Arrange for insulation on equipment and piping not furnished with factory-applied insulation.

# CONNECTIONS

* + 1. Install piping adjacent to machine to allow service and maintenance.
    2. Connect hot- and cold-water piping with shutoff valves and unions. Connect hot- water-circulating piping with shutoff valve, check valve, and union.
    3. Connect gas piping to gas burner with drip leg, tee, shutoff valve, and union; minimum size same as inlet connection.
    4. Make connections with dielectric fittings where piping is made of dissimilar metal.
    5. Gas, Water Heater Vent Connections: Connect to vent system. Include draft hoods and diverters where required. Use vents same size as or larger than water heater outlets, but not smaller than indicated unless smaller vent size has been calculated according to NFPA 54.
    6. Electrical Connections: Power wiring and disconnect switches are specified in Division 26 Sections 26 05 00. Common Work Results For Electrical.

# FIELD QUALITY CONTROL

* + 1. Engage a factory-authorized service representative to perform startup service and to train Owner's maintenance personnel to adjust, operate, and maintain water heaters.
    2. In addition to manufacturer's written installation and startup checks, perform the following:
       1. Check for clear relief valve inlets, outlets, and drain piping.
       2. Test operation of safety controls, relief valves, and devices.
       3. Adjust operating controls.
       4. Adjust hot-water-outlet temperature settings. Do not set above 140 deg F unless piping system application requires higher temperature.

# DEMONSTRATION

* + 1. Engage a factory-authorized service representative to train Owner's maintenance personnel to adjust, operate, and maintain fuel-fired, domestic water heaters. Refer to Division 1 Section 01 77 00 “Contract Closeout.”

# END OF SECTION