Submitted design must consider all Architectural, structural, interior finishes and features shown on plans. System to be complete to include all required items for fully functioning Plumbing and water delivery systems.

See attached Owner Clarification document. (Attached)

Review Hilton Standards and guidelines for design section 2514.07 (Attached)

Review entire Section 2500 Hilton Standards and guidelines for Design as requirements for this design may be found throughout the document,

Permits must be obtained through City of Columbia Mo. Permit fees to be paid by this contractor.

All proposals to include taxes, delivery and other fees required to complete all work.

Careful attention is required for design of all ADA requirements for this project.

All required bath fixtures for Guest and public baths will be found listed on the Owners Scope and Clarification document.

Exposed traps and drains at vanities will require use of brass with chrome finish. Traps in ADA rooms will require scald protection.

Schedule 40 PVC allowed for DWV, except floor penetrations over public spaces and roof drains are to be in cast iron.

Provide and install main water service and meter installation (meter provided by City) to building with domestic tee for building fire/water service. Fees for service to be by owner.

Locations for all designed shafts to be coordinated with General contractor and the pre-cast slab manufacturer

Provide all required firestop and or fire sleeving for code compliant design.

Provide for all installations for kitchen Equipment as outlined by Kitchen supplier, plans attached with specification sheets.

Piping: Per equipment manufacturer and Hilton guidelines section 2514.07.

Valves: Ball type valves.
Water Heaters A.O. Smith High Efficiency and recovery. Fully redundant system to be designed. Specification sheets from phase 1 attached. Provide for Symmons mixing valve.

Water lines to be type L copper and fully insulated.

Roof drains for building to be routed to storm system located on the exterior of west elevation of building. See Civil design sheet CE-4.

Sanitary Drainage to be connected in alley near Southeast corner of building, see civil drawings for location.

All gas piping and individual regulators as required by equipment manufacturer.

Elevator Sump pit and pump required. Building sump pit to be located on North wall along interior foundation wall location TBD.

All required backflow prevention as determined by local codes.

Provide rough in for water softener.

See owner scope for number of exterior Hose Bibs.

Provide and install required grease traps in floor or in line for kitchen areas if required by code or City of Columbia Health Department.

A mock-up room will be built in building. Room to be selected by owner and is expected to become a finished unit.

Level and grout all shower base and tub units.

Provide and install eye wash stations as required.

Coordinate installation of other trades work that requires mechanical participation to complete. All gas piping, flue installation, CO detection, remote gas shut off or other items required for completed systems to be supplied and installed per code and Hilton standards.

System start up and commissioning to be included.

As built drawings to be provided at time of Commissioning.

All proposals to include description of warranty periods.
## Summary of Changes

Summary of Changes

### 2500 DESIGN, CONSTRUCTION & RENOVATION

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This Standards Manual (“Manual”) has been developed to provide the Owner (as defined below) of the Hotel with the required minimum standards, procedures, rules, regulations, policies, and techniques (the “Brand Standards”) of the DoubleTree by Hilton (“Brand”) full service brand system (the “System”). To achieve and maintain high standards of quality and service and associated goodwill for the System, it is essential that Owner strictly adhere to all elements of the System, including, without limitation, the Manual and the Owner’s Agreement. Notwithstanding anything in this Manual to the contrary, the policies contained in the Resources to this Manual are not required to be adopted by a franchised Hotel as long as the Hotel adopts a policy covering the subject matter in the attachment that meets all legal requirements.

All references in this Manual to “Owner” refer to the Owner operating under a License Agreement or Franchise Agreement (which may be the owner of the Hotel) or the owner under a Management Agreement, as applicable, with the Brand (the “Agreement”). All references in this Manual to the “Hotel” refer to the Hotel that has been provided with this Manual. At times this Manual imposes obligations on the Hotel that are essential to the System. Owner is responsible for ensuring the hotel’s compliance with those obligations. All references in this Manual to the “Brand” refer to Hilton Franchise Holding LLC or HLT Existing Franchise Holding LLC if the hotel is designated as a USA hotel. Otherwise, these references refer to Hilton Worldwide Franchising LP. All references to Hilton Worldwide refer to Hilton Worldwide, Inc.

These Brand Standards are subject to change, amendment, or supplement from time to time by the Brand. The Brand has the sole and absolute discretion to grant exceptions to these Brand Standards as it deems appropriate.

These Brand Standards are designed to protect the System and the trademarks and service marks associated with the System, and not to control the day-to-day operation of the Hotel. Owner at all times will remain responsible for the operation of the Hotel, and all activities occurring at the hotel. Owner must hire and train its own employees. The Brand is not responsible for and does not direct or control the conduct of any Hotel employee.

Owner must comply with and maintain the Brand Standards at a level equal to or greater than as set forth in this Manual. Violation of any of these Brand Standards by Owner shall constitute default of Owner’s Agreement and would allow the Brand to take all necessary action to protect the integrity of the System.

This Manual is the property of the Brand and is provided to Owner for use and reference during the term of its Agreement with the Brand. Additions and modifications to this Manual will be posted at a website of which the Brand will provide Owner notice, or will be sent to Owner, and Owner must comply with these additions and modifications to the same extent as if set forth in this Manual at this time. For the avoidance of any doubt, any such additions or modifications set forth at such a website are incorporated herein by reference.

Owner must maintain the confidentiality of the Manual. Upon termination of its Agreement, Owner must return this Manual and all other confidential material owned, created, or used by the Brand without retaining any photocopies.

At or about the time Owner executes the Agreement, the Brand will place Owner in a Region set forth below. The Region that Owner is placed in is within the sole and absolute discretion of the Brand and may be modified from time to time. Owner must comply with all Brand Standards applicable to that Region, which includes those Brand Standards that are not limited by Region.

For the avoidance of any doubt, if the applicability of a Brand Standard or a section of a Brand Standard is limited to a specific Region and the Owner has not been placed in that Region, then the Brand Standard or section, as the case may be, is not applicable to the Owner. Conversely, if the Owner has been placed in that Region, the Owner must comply with the Brand Standard or section.

For the avoidance of doubt, wherever it is stated in this Brand Standards Manual that certain requirements/specifications would apply where the Hotel has or decides/elects to have certain elements, whether the Hotel has or will have such elements is to be determined in the sole discretion of Hilton Worldwide.
The information contained in the portable document format (PDF) version of this manual represents the brand standards as of the effective date. Hilton Worldwide reserves the right, at our sole and absolute discretion, to change modify, add or remove portions of these standards at any time. These brand standards should be used for internal purposes only and may not be publicly distributed. This PDF contains confidential information and any unauthorized disclosure, copying or distribution of this material is strictly prohibited.
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<tr>
<td>2502.01.I.1</td>
<td>Floor: Porcelain tile, natural stone, wood - tongue and groove, carpet (broadloom), decorative hand-tufted area rug</td>
<td>Floor: Porcelain tile, natural stone, wood - tongue and groove, carpet (broadloom, high definition CYP 48 oz.), decorative hand-tufted area rug</td>
<td>Revision</td>
<td>Americas</td>
</tr>
<tr>
<td>2502.04.B</td>
<td>Registration workstations must be grouped together into units to allow circulation around each side of the unit. No more than two workstations are allowed within a single front desk unit.</td>
<td>Registration workstations must be grouped together into units to allow circulation around each side of the unit. More than two workstations grouped together must be submitted to Global Design for review and approval.</td>
<td>Revision</td>
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<td>Revision</td>
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<tr>
<td>2502.09.A</td>
<td>A separate, securable luggage storage room is required, located near the primary lobby entrance or behind the bellman's desk and directly accessible to the registration area. Hotels must have 0.75 ft²/0.07 m² per key or a minimum 200 ft²/18 m² of storage for luggage. Hotels with more than one registration area must allocate luggage storage at each area.</td>
<td>A separate, securable luggage storage room is required, located near the primary lobby entrance or behind the bellman's desk and directly accessible to the registration area. Hotels must have 0.75 ft²/0.07 m² per key or a minimum 200 ft²/18 m² of storage for luggage. Hotels with more than one registration area must allocate luggage storage at each area.</td>
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<td>Global</td>
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<tr>
<td>2502.09.H</td>
<td>The luggage room must be designed to accommodate a combination of hanging racks and storage shelving units (2'-0&quot;/600 mm deep x 4'-0&quot;/1.2 m wide x 6'-0&quot;/1.8 m high). Provide approximately 25 percent hanging racks and 75 percent shelving units. Each shelf must have a minimum weight allowance of 350 lbs/159 kgs.</td>
<td>The luggage room must be designed to accommodate a combination of hanging racks and storage shelving units (2'-0&quot;/600 mm deep x 4'-0&quot;/1.2 m wide x 6'-0&quot;/1.8 m high). Provide approximately 25 percent hanging racks and 75 percent shelving units. Each shelf must have a minimum weight allowance of 350 lbs/159 kgs.</td>
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<td>Americas</td>
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<tr>
<td>2503.00.H.3.b</td>
<td>Built-in liquid soap dispenser at each washbasin with reservoir below counter and spout that extends beyond the edge of the bowl. The dispenser must be automatic when touchless faucets are provided.</td>
<td>Built-in, automatic liquid soap dispenser at each washbasin with reservoir below counter and spout that extends beyond the edge of the bowl.</td>
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<td>Canada</td>
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<td>2504.01.Q.2</td>
<td>Wall: Epoxy paint, porcelain tile, natural stone, fire-resistant extruded PVCu seamless wall cladding</td>
<td>Wall: Epoxy paint, porcelain tile, natural stone, fiberboard reinforced plastic (FRP), fire-resistant extruded PVCu seamless wall cladding</td>
<td>Revision</td>
<td>Global</td>
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<tr>
<td>2504.01.Y.5</td>
<td>Exterior of millwork must be finished with veneers, tiles or plastic laminate as specified by designer/kitchen consultant.</td>
<td>When a Chef's Office is provided, provide a minimum of one wall mounted 50&quot; HDTV near the Chef's Office.</td>
<td>Addition</td>
<td>Americas</td>
</tr>
<tr>
<td>2504.08.N.2.c</td>
<td>Exterior of millwork must be finished with veneers, tiles or plastic laminate as specified by designer/kitchen consultant.</td>
<td>Exterior of millwork must be finished with veneers or tile as specified by designer/kitchen consultant.</td>
<td>Revision</td>
<td>Global</td>
</tr>
<tr>
<td>2508.01.G</td>
<td>The Fitness Center layout must include the following zones: • Entry Zone: Fitness centers over 600 ft²/56 m² must have a designated Entry Zone. The entry zone is to be clear of equipment and provide direct access to the towel station. • Provide a dedicated area with brand approved faux wood/faux marble flooring with a rubber underlayment. • Cardio Zone: Cardio units grouped together facing the same direction. • Provide a dedicated area with brand approved faux wood/faux marble flooring with a rubber underlayment. • Required framed mirror. • Strength Zone: Space for strength units. • Provide brand approved rubber flooring in strength training areas. • Required framed mirror. • Stretch Zone: Open floor space designated for stretching is required. The Stretch Zone must be outside of transition areas and have adequate space for stretching and utilization of core and balance equipment.</td>
<td>The Fitness Center layout must include the following zones: • Entry Zone: Fitness centers over 600 ft²/56 m² must have a designated Entry Zone. It is to be clear of equipment and provide direct access to the towel station. Provide a dedicated area with brand approved sports performance flooring. • Cardio Zone: Cardio units grouped together facing the same direction. Provide a dedicated area with brand approved sports performance flooring. Required framed mirror. • Strength Zone: Space for strength units. Provide brand approved rubber flooring in strength training areas. Required framed mirror. • Stretch Zone: Open floor space designated for stretching is required. The Stretch Zone must be outside of transition areas and have adequate space for stretching and utilization of core and balance equipment.</td>
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<tr>
<td>2508.01.Q.2</td>
<td>Five Feet to Fitness requires approximately 100 ft²/10 m² and will require the removal of the soft seating area of the guest room.</td>
<td>Five Feet to Fitness requires approximately 100 ft²/10 m² and may require the removal of the soft seating area of the guest room depending upon room size and design. All Five Feet to Fitness rooms must have a layout approved by Hilton Fitness and may not alter the floor plan in any way without prior approval from Hilton Fitness.</td>
<td>Revision</td>
<td>Global</td>
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<tr>
<td>2509.01.J.4.a</td>
<td>Floor: Natural stone</td>
<td>Floor: Natural stone, enhanced resilient tile (ERT), decorative hard surface or better. Wood or carpet finishes for elevator renovations must be submitted to Global Design for approval.</td>
<td>Revision</td>
<td>Canada</td>
</tr>
<tr>
<td>2509.01.J.4.b</td>
<td>Wall: Decorative panels and mirrors</td>
<td>Wall: Decorative panels and mirrors. Plastic laminate is not allowed.</td>
<td>Revision</td>
<td>Canada</td>
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<tr>
<td>2509.03.A.4.a</td>
<td>Floor: Carpet (broadloom)</td>
<td>Floor: Carpet (broadloom or high definition CYP 48 oz.), enhanced resilient tile (ERT)</td>
<td>Revision</td>
<td>Canada</td>
</tr>
<tr>
<td>2510.01.A.1</td>
<td>Doors must be solid core wood veneer suitable for painting or better. Metal clad entry doors are not allowed.</td>
<td>Doors must be solid core wood veneer suitable for painting or better. Metal clad entry doors are not allowed.</td>
<td>Revision</td>
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<td>2510.01.A.1</td>
<td>Doors must be solid core wood veneer suitable for painting or better. Metal clad entry doors are not allowed.</td>
<td>Doors must be solid core wood veneer suitable for painting or better. Metal clad entry doors are not allowed. High pressure laminate doors must be submitted for approval.</td>
<td>Revision</td>
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<tr>
<td>2510.01.C.3</td>
<td>Entry doors must have a multi-fin sound/smoke frame seal (Manufacturer must warranty against adhesion failure). If corridor pressurization is used to supply fresh air to the guest rooms drop down seals are not required.</td>
<td>Entry doors must have a multi-fin sound/smoke frame seal (Manufacturer must warranty against adhesion failure).</td>
<td>Revision</td>
<td>Global</td>
</tr>
<tr>
<td>2510.01.C.8</td>
<td>A drop down seal is required. If corridor pressurization is required to supply fresh air to the guestrooms, the drop down seal is not required but a door sweep is required.</td>
<td>All closets and built-in wardrobe cabinets for hanging clothes must have doors. Mirrored doors are only allowed if door is solid core. Bi-fold doors, bipass, drapes, or fabric type folding (accordion) doors are not allowed. Sliding “barn doors” will be only considered with prior approval and conditional that the doors do not block circulation when parked in the open position. Closet barn doors may not serve dual purpose as bathroom doors. Where closet doors conflict with guestroom entry door, provide a pair of smaller doors in lieu of one wider door, with self-closing hinges (not an overhead closure).</td>
<td>Addition</td>
<td>Global</td>
</tr>
<tr>
<td>2510.04.C</td>
<td>All closets and built-in wardrobe cabinets for hanging clothes must have doors. Mirrored doors are only allowed if door is solid core. Bi-fold doors, bipass, drapes, or fabric type folding (accordion) doors are not allowed. Sliding “barn doors” will be only considered with prior approval and conditional that the doors do not block circulation when parked in the open position. Closet barn doors may not serve dual purpose as bathroom doors.</td>
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<tr>
<td>2510.06.A.10.g</td>
<td>when parked in the open position. Closet barn doors may not serve dual purpose as bathroom doors.</td>
<td>not serve dual purpose as bathroom doors. Where closet doors conflict with guestroom entry door, provide a pair of smaller doors in lieu of one wider door, with self-closing hinges (not an overhead closure).</td>
<td>Revision</td>
<td>Global</td>
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<tr>
<td>2510.06.F.2</td>
<td>The center of the television in bedrooms must be positioned 13”/330 mm above the top of the bed. Bedrooms with platform beds or low beds must be reviewed for alternate locations.</td>
<td>The bottom edge of the television screens in bedrooms must be positioned 13”/330 mm above the top of the bed. Bedrooms with platform beds or low beds must be reviewed for alternate locations.</td>
<td>Revision</td>
<td>Canada</td>
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<tr>
<td>2510.06.F.2</td>
<td>The safe must be placed at a comfortable usage height for the guest and must be secured to a stationary object. On the closet shelf, in a drawer, on a pedestal in the closet and inside case goods are approved locations. When the safe is placed inside a casegood, the casegood must provide structural integrity to support a minimum weight of 55 lbs/24 kgs for the safe. Metal supports across the bottom of the drawer/shelf is required.</td>
<td>The safe must be concealed and placed at a comfortable usage height for the guest and must be secured to a stationary object. On the closet shelf, in a drawer, on a pedestal in the closet and inside case goods are approved locations. When the safe is placed inside a casegood, the casegood must provide structural integrity to support a minimum weight of 55 lbs/24 kgs for the safe. Metal supports across the bottom of the drawer/shelf is required.</td>
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<td>2510.07.C.1</td>
<td>Remote, wall-mounted, electronic digital thermostat specifically designed for guestroom applications must be provided.</td>
<td>Remote, wall-mounted, hard-wired, electronic digital thermostat specifically designed for guest suite applications must be provided. Studio suites and multi-room suites, served by a single HVAC unit, must have the thermostat located in the main sleeping area. Guest rooms served by multiple HVAC units must have a thermostat for each HVAC unit located in the space served by that unit. Battery powered thermostats are not acceptable.</td>
<td>Revision</td>
<td>Global</td>
</tr>
<tr>
<td>2512.01.G</td>
<td>Enclosures and swing doors are not required on water closets. If provided, swinging doors are required to swing out.</td>
<td>Enclosures and swing doors are not required on water closets. If provided, swinging doors are required to swing out.</td>
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<td>2512.01.G</td>
<td>Enclosures and swing doors are not required on water closets. If provided, swinging doors are required to swing out.</td>
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<tr>
<td>2512.04.H.7.a</td>
<td>Provide an adjustable flow rate showerhead with fine and coarse spray. Showerhead must incorporate flow rate restrictor providing a maximum flow of 2.5 GPM/9.5 LPM at minimum delivered water pressure of 30 PSI/2.1 bar. Showerheads/hand showers rated at or below 2.0 GPM/7.6 LPM must comply with minimum performance standards for low flow heads similar to USEPA Water Sense listings. Showerhead must be approved by Hilton.</td>
<td>Provide an adjustable flow rate showerhead with fine and coarse spray. Showerhead must incorporate flow rate restrictor providing a maximum flow of 2.5 GPM/9.5 LPM at minimum delivered water pressure of 30 PSI/2.1 bar. Showerheads/hand showers rated at or below 2.0 GPM/7.6 LPM must comply with minimum performance standards for low flow heads similar to USEPA Water Sense listings. Showerhead must be approved by Hilton. All guest bathrooms must have an adjustable flow rate showerhead. A handheld and/or rain head may be provided in addition to the showerhead, but not in place of the showerhead.</td>
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<td>2512.04.H.7.a</td>
<td>Provide an adjustable flow rate showerhead with fine and coarse spray. Showerhead must incorporate flow rate restrictor providing a maximum flow of 2.5 GPM/9.5 LPM at minimum delivered water pressure of 30 PSI/2.1 bar. Showerheads/hand showers rated at or below 2.0 GPM/7.6 LPM must comply with minimum performance standards for low flow heads similar to USEPA Water Sense listings. Showerhead must be approved by Hilton.</td>
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<tr>
<td>2513.01.A.8.a</td>
<td>7.6 LPM must comply with minimum performance standards for low flow heads similar to USEPA Water Sense listings. Showerhead must be approved by Hilton. All guest bathrooms must have an adjustable flow rate showerhead. A handheld and/or rain head may be provided in addition to the showerhead, but not in place of the showerhead.</td>
<td>At each desk/workstation there must be a minimum of four dedicated power outlets (socket outlets) and two power outlets (socket outlets). This must be located within 5’-0”/1.5 m of the workstation. All outlets must be ground. Each dedicated circuit may provide power for up to three workstations.</td>
<td>Revision</td>
<td>Global</td>
</tr>
<tr>
<td>2513.13.H.1</td>
<td>Not Applicable to this Brand</td>
<td>Furniture for at least one security officer</td>
<td>Revision</td>
<td>Global</td>
</tr>
<tr>
<td>2513.13.H.2</td>
<td>Not Applicable to this Brand</td>
<td>Keyed cabinet(s) securely mounted to the wall or floor</td>
<td>Revision</td>
<td>Global</td>
</tr>
<tr>
<td>2513.13.H.3</td>
<td>Not Applicable to this Brand</td>
<td>Storage cabinet for miscellaneous equipment</td>
<td>Revision</td>
<td>Global</td>
</tr>
<tr>
<td>2513.13.H.4</td>
<td>Not Applicable to this Brand</td>
<td>File cabinets</td>
<td>Revision</td>
<td>Global</td>
</tr>
<tr>
<td>2513.13.H.5</td>
<td>Not Applicable to this Brand</td>
<td>Emergency telephone extension and outside telephone (direct line not through the hotel PBX)</td>
<td>Revision</td>
<td>Global</td>
</tr>
<tr>
<td>2513.13.H.6</td>
<td>Not Applicable to this Brand</td>
<td>A locked storage cabinet or wire partitioned area for lost and found storage.</td>
<td>Revision</td>
<td>Global</td>
</tr>
<tr>
<td>2514.02.C.1</td>
<td>Tile must be decorative porcelain tile, minimum 3/8”/10.0 mm thick, with a rectified edge.</td>
<td>Tile must be ceramic tile, stone or porcelain tile, minimum 1/4”/6 mm thick. Porcelain tile must have a rectified edge or pressed edge. Tiles must be dimensionally accurate, flat and straight edged. Tile must conform to ISO 13006 2018-09 Types Bl, B1a, BIIa, BIIb, BIII and can be either calibrated pressed edge or rectified providing size tolerances of: ISO 10545-2 STRAIGHTNESS OF SIDES &lt;0.15% / RECTANGULARITY DEVIATION &lt;0.15% /</td>
<td>Revision</td>
<td>Global</td>
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<td>Standard No.</td>
<td>Old Summary</td>
<td>New Summary</td>
<td>Change Type</td>
<td>Applicable Locations</td>
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<tr>
<td>2514.02.C.3</td>
<td>Tile must not be installed over old tile in any areas of the property. Old tile must be completely removed before new tile is installed.</td>
<td>Tile must not be installed over old wall tile in any areas of the property. Old tile must be completely removed before new tile is installed. Thin tile (1/4&quot;/6mm thick) may be installed over existing tile in vertical wall applications only where critical room dimensions will not be impacted and must be approved by Hilton Design.</td>
<td>Revision</td>
<td>Global</td>
</tr>
<tr>
<td>2514.02.C.4</td>
<td>Glazed ceramic tile is only allowed in the Food Prep/Kitchen.</td>
<td>Content Deleted</td>
<td>Deletion</td>
<td>Global</td>
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<tr>
<td>2514.02.C.5</td>
<td></td>
<td>Must pass ASTM C373 for water absorption and ASTM C650 for chemical resistance or must comply with ISO 10545-3 Determination of Water Absorption and ISO 10545-13 Chemical Resistance Class A cleaning chemicals / Class B acid bases.</td>
<td>Addition</td>
<td>Global</td>
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<td>2514.02.C.6</td>
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<td>Must pass ASTM CTI 81-7D for stain resistance or must comply with ISO 10545-14 Stain Resistance Class 4 Minimum.</td>
<td>Addition</td>
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<td>2514.02.C.7</td>
<td></td>
<td>Porcelain tile must be through-body color material or a glazed porcelain that meets Mohs scratch hardness minimum rating of 4.0 for wall applications and C648 breaking strength for ceramic wall tile 120 - 230 lbs.</td>
<td>Addition</td>
<td>Global</td>
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<tr>
<td>2514.02.C.8</td>
<td></td>
<td>Tile must pass ISO 10545-11 Crazing Resistance.</td>
<td>Addition</td>
<td>Global</td>
</tr>
<tr>
<td>2514.03.G.2.c</td>
<td></td>
<td>Secondary Underlayment System - is required for properties with structural flooring systems of cast in place concrete slabs less than 7&quot; thick, hollow core plank construction, wood frame construction or any type of steel frame with concrete top coating in all areas above Guestrooms to meet the following minimum criteria:</td>
<td>Addition</td>
<td>Global</td>
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<td>Standard No.</td>
<td>Old Summary</td>
<td>New Summary</td>
<td>Change Type</td>
<td>Applicable Locations</td>
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<tr>
<td>2514.03.G.2.c.1</td>
<td></td>
<td>Must be a commercial grade, noise-reducing impact insulation underlayment system with minimum 20 year Commercial Warranty and meet the following criteria or as required by the local municipality: 1. Thickness: 2.0 mm maximum 2. Resistance to Heat: ASTM 1514 3. Smoke Density: ASTM E662 (&lt;450) 4. Radiant Flux: ASTM E648 (&gt; 0.45 watts/cm², NFPA Class 1) 5. Impact Insulation Class (IIC): ASTM E-492-04. Minimum rating of 60 db, achieved by combination of ERT with pre-attached Sound Underlayment noted in 2514.03.G in conjunction with the secondary underlayment and structural flooring system. Combinations of secondary underlayment with no compliant ERT will not be acceptable.</td>
<td></td>
<td>Addition</td>
</tr>
<tr>
<td>2514.03.H.2.f</td>
<td></td>
<td>High Definition CYP (computer yarn placement) 48: Public Areas, Guestrooms, Corridors* * Allowed only where noted under 'Finish Options' of a particular area of the hotel under sections 2502.00-2513.00.</td>
<td></td>
<td>Addition</td>
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<tr>
<td>2514.03.H.2.f.1</td>
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<td>Construction: Tufted</td>
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<td>Addition</td>
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<tr>
<td>2514.03.H.2.f.2</td>
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<td>Machine Gauge: Variable</td>
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<td>Addition</td>
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<td>2514.03.H.2.f.3</td>
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<td>Stitches per Inch: 11</td>
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<td>Addition</td>
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<tr>
<td>2514.03.H.2.f.4</td>
<td></td>
<td>Finished Pile Thickness: .360&quot; Tufted Loop Height: (0.218&quot; - 0.355&quot;) Tufted Cut Height: (0.375&quot;) +/- 0.025&quot;</td>
<td></td>
<td>Addition</td>
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<tr>
<td>2514.03.H.2.f.5</td>
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<td>Face Yarn: 100 percent Solution Dyed Type 6 Nylon Branded or equivalent Yarns</td>
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<td>Addition</td>
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<td>Standard No.</td>
<td>Old Summary</td>
<td>New Summary</td>
<td>Change Type</td>
<td>Applicable Locations</td>
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<tr>
<td>2514.03.H.2.f.6</td>
<td>Primary Backing: Woven polypropylene</td>
<td>Addition Americas</td>
<td>Addition</td>
<td>Americas</td>
</tr>
<tr>
<td>2514.03.H.2.f.7</td>
<td>Secondary Backing: Woven polypropylene or attached cushion.</td>
<td>Addition Americas</td>
<td>Addition</td>
<td>Americas</td>
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<td>2514.03.H.2.f.8</td>
<td>Face Weight: 48 oz./yd.²</td>
<td>Addition Americas</td>
<td>Addition</td>
<td>Americas</td>
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<td>2514.03.H.2.f.9</td>
<td>Density: 4,800</td>
<td>Addition Americas</td>
<td>Addition</td>
<td>Americas</td>
</tr>
<tr>
<td>2514.03.H.2.f.10</td>
<td>Weight Density: 230,400</td>
<td>Addition Americas</td>
<td>Addition</td>
<td>Americas</td>
</tr>
<tr>
<td>2514.03.H.9</td>
<td>Hand Tufted Rug Specifications</td>
<td>Area rug content must be 100% Virgin New Zealand Wool, 80/20 Axminster, or Nylon. Construction must be hand or machine tufted, cut, cut &amp; loop, or loop. (Refer to section 2514.03.H Carpet for carpet construction.) Rug edges must be serge or tape bound, or folded edge with back tape binding. Fringe and flat weave rugs must be submitted to Global Design for approval.</td>
<td>Revision</td>
<td>Canada</td>
</tr>
<tr>
<td>2514.03.H.9.a</td>
<td>4.5 Pound Hand Tufted Rug Specifications - Guestrooms and Suites</td>
<td>Area rug content must be 100% Virgin New Zealand Wool, 80/20 Axminster, or Nylon. Construction must be hand or machine tufted, cut, cut &amp; loop, or loop. (Refer to section 2514.03.H Carpet for carpet construction.) Rug edges must be serge or tape bound, or folded edge with back tape binding. Fringe and flat weave rugs must be submitted to Global Design for approval.</td>
<td>Revision</td>
<td>Canada</td>
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</tbody>
</table>

4.5 Pound Hand Tufted Rug Specifications - Guestrooms and Suites
- Quality: 4.5 pound
- Yarn Content: 100 percent NZ wool
- Yarn Count: 380 Tex, 1/80s Dewsbury
- Yarn Twist/10 cm: 130 twists
- Ply Twist/10 cm: 11.4 twists
- Total Weight: 3,920 gm/m²
- Gross Yarn Weight: 2,440 gm/m²
- Pile Height: 9-10 mm

Not Applicable to this Brand

Deletion Canada | United States
<table>
<thead>
<tr>
<th>Standard No.</th>
<th>Old Summary</th>
<th>New Summary</th>
<th>Change Type</th>
<th>Applicable Locations</th>
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<tr>
<td></td>
<td>No of rows/10 cm: 19-20&lt;br&gt;No of stitches/10 cm: 21&lt;br&gt;No of ends/insertion: 4&lt;br&gt;Primary backing: Basket Weave&lt;br&gt;60 percent cotton, 40 percent polyester&lt;br&gt;26 x 26 per inch&lt;br&gt;Width: 620 cm&lt;br&gt;Weight: 326 gm/m2&lt;br&gt;Secondary backing: Leno Weave&lt;br&gt;Warp: 100 percent cotton&lt;br&gt;Weft: 90 percent cotton, 10 percent polyester&lt;br&gt;12 x 6 per inch&lt;br&gt;Width: 300 cm&lt;br&gt;Weight: 61 gm/m2&lt;br&gt;Latex: Natural rubber latex based compound&lt;br&gt;A non-skid pad or backing is required.&lt;br&gt;Mothproofing: Mystox CMP</td>
<td>Not Applicable to this Brand</td>
<td>Deletion</td>
<td>Canada</td>
</tr>
<tr>
<td>2514.03.H.9.a</td>
<td>4.5 Pound Hand Tufted Rug Specifications - Guestrooms and Suites&lt;br&gt;Quality: 4.5 pound&lt;br&gt;Yarn Content: 100 percent NZ wool&lt;br&gt;Yarn Count: 380 Tex, 1/80s Dewsbury&lt;br&gt;Yarn Twist/10 cm: 130 twists&lt;br&gt;Ply Twist/10 cm: 11.4 twists&lt;br&gt;Total Weight: 3,920 gm/m²&lt;br&gt;Gross Yarn Weight: 2,440 gm/m²&lt;br&gt;Pile Height: 9-10 mm&lt;br&gt;No of rows/10 cm: 19-20&lt;br&gt;No of stitches/10 cm: 21&lt;br&gt;No of ends/insertion: 4&lt;br&gt;Primary backing: Basket Weave&lt;br&gt;60 percent cotton, 40 percent polyester&lt;br&gt;26 x 26 per inch&lt;br&gt;Width: 620 cm</td>
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<td>New Summary</td>
<td>Change Type</td>
<td>Applicable Locations</td>
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<td>Weight: 326 gm/m²</td>
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<td></td>
<td>Secondary backing: Leno Weave</td>
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<tr>
<td></td>
<td>Warp - 100 percent cotton</td>
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<tr>
<td></td>
<td>Weft - 90 percent cotton, 10 percent polyester</td>
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<td>12 x 6 per inch</td>
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<td>Width: 300 cm</td>
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<td>Weight: 61 gm/m²</td>
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<td>Latex: Natural rubber latex based compound</td>
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<td>A non-skid pad or backing is required.</td>
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<td>Mothproofing: Mystox CMP</td>
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<tr>
<td>2514.03.H.9.b</td>
<td>5.5 Pound Hand Tufted Rug Specifications - Guest Corridors</td>
<td>Not Applicable to this Brand</td>
<td>Deletion</td>
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</tr>
<tr>
<td></td>
<td>Quality: 5.5 pound</td>
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<td></td>
<td>Yarn Content: 100 percent NZ wool</td>
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<td></td>
<td>Yarn Count: 380 Tex, 1/80s Dewsbury</td>
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<td></td>
<td>Yarn Twist/10 cm: 130 twists</td>
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<td></td>
<td>Ply Twist/10 cm: 11.4 twists</td>
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<td></td>
<td>Total Weight: 4,460 gm/m²</td>
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<td></td>
<td>Gross Yarn Weight: 2,980 gm/m²</td>
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<td>Pile Height: 11-12 mm</td>
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<td></td>
<td>No of rows/10 cm: 20-21</td>
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<td>No of stitches/10 cm: 23</td>
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<td>No of ends/insertion: 4</td>
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<td>Primary backing: Basket Weave</td>
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<td></td>
<td>60 percent cotton, 40 percent polyester</td>
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<td>26 x 26 per inch</td>
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<td>Width: 620 cm</td>
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<td></td>
<td>Weight: 326 gm/m²</td>
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<td>Secondary backing: Leno Weave</td>
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<td>Warp - 100 percent cotton</td>
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<td>5.5 Pound Hand Tufted Rug Specifications - Guest Corridors</td>
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<td>Yarn Count: 380 Tex, 1/80s Dewsbury</td>
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<td>Yarn Twist/10 cm: 130 twists</td>
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<td>Ply Twist/10 cm: 11.4 twists</td>
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<td>6.5 Pound Hand Tufted Rug Specifications - Public Areas</td>
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<td>(Lobby, Meeting Facilities, F&amp;B Outlets)</td>
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<td>Yarn Twist/10 cm: 130 twists</td>
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<td>Ply Twist/10 cm: 11.4 twists</td>
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<td>26 x 26 per inch</td>
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<td>Width: 620 cm</td>
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<td>Change Type</td>
<td>Applicable Locations</td>
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|             | Weight: 326 gm/m2  
Secondary backing: Leno Weave  
Warp - 100 percent cotton  
Weft - 90 percent cotton, 10 percent polyester  
12 x 6 per inch  
Width: 300 cm  
Weight: 61 gm/m2  
Latex: Natural rubber latex based compound  
A non-skid pad or backing is required.  
Mothproofing: Mystox CMP                                                                                                                                  | Not Applicable to this Brand | Deletion    | Canada | United States |
| 2514.03.H.9.c | 6.5 Pound Hand Tufted Rug Specifications - Public Areas  
(Lobby, Meeting Facilities, F&B Outlets)  
Quality: 6.5 pound  
Yarn Content: 100 percent NZ wool  
Yarn Count: 380 Tex, 1/80s Dewsbury  
Yarn Twist/10 cm: 130 twists  
Ply Twist/10 cm: 11.4 twists  
Total Weight: 5,000 gm/m2  
Gross Yarn Weight: 3,525 gm/m2  
Pile Height: 13-14 mm  
No of rows/10 cm: 18-19  
No of stitches/10cm: 26-27  
No of ends/insertion: 4  
Primary backing : Basket Weave  
60 percent cotton, 40 percent polyester  
26 x 26 per inch  
Width: 620 cm  
Weight: 326 gm/m2  
Secondary backing: Leno Weave  
Warp - 100 percent cotton  
Weft - 90 percent cotton, 10 percent polyester  
12 x 6 per inch  
Width: 300 cm  
Weight: 61 gm/m2 | Not Applicable to this Brand | Deletion    | Canada | United States |
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<th>Standard No.</th>
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| 2514.04.C.1 | Latex: Natural rubber latex based compound  
A non-skid pad or backing is required.  
Mothproofing: Mystox CMP | Tile in public areas must be minimum 4'-0"/1.2 m x 4'-0"/1.2 m premium tegular (reveal) edge tiles. Alternate sizes must be approved by Hilton. | Revision    | Canada | United States       |
| 2514.04.C.1 | Tile in public areas must be 2'-0"/600 mm x 2'-0"/600 mm premium tegular (reveal) edge tiles. Alternate sizes must be approved by Hilton. | Tile in public areas must be minimum 4'-0"/1.2 m x 4'-0"/1.2 m premium tegular (reveal) edge tiles. Alternate sizes must be approved by Hilton. | Revision    | Canada | United States       |
| 2514.06.F.7.a.1 | Provide a minimum of two independent cooling circuits for units up through nominal 30 tons (105 kW) and at least four independent cooling circuits for larger units. | Provide a minimum of two independent cooling circuits for units up through nominal 30 tons (105 kW) and at least three independent cooling circuits for larger units. | Revision    | Global               |
| 2514.09.D.1 | Televisions must comply with the specifications listed below and those provided in Section 713.00.  
• Widescreen (16:9) HDTV screen  
• At least 1080P vertical resolution  
• Support MPEG4 decoding  
• Digital tuners and/or decryption capable of receiving HD Free to Guest TV content in the country in which the hotel is located (e.g., QAM/DVB-T/DVB-C/DVB-T2/MPEG-4/Pro:Idiom/Digital Rights Management).  
• C.E./U.L. (CCC in China) listed for commercial/hospitality use.  
• Televisions must not exceed seven years of age.  
• Power and cable outlets and cords must be concealed from view behind the television or using cable management.  
• Interactive Program Guide (IPG) is required in guestrooms. | Televisions must comply with the specifications listed below and those provided in Section 713.00.  
• Widescreen (16:9) HDTV screen  
• At least 1080P vertical resolution  
• Support MPEG4 decoding  
• Digital tuners and/or decryption capable of receiving HD Free to Guest TV content in the country in which the hotel is located (e.g., QAM/DVB-T/DVB-C/DVB-T2/MPEG-4/Pro:Idiom/Digital Rights Management).  
• C.E./U.L. (CCC in China) listed for commercial/hospitality use.  
• All new televisions must be equipped with an MPI/MTI port.  
• Televisions must not exceed seven years of age.  
• Power and cable outlets and cords must be concealed from view behind the television or using cable management.  
• Interactive Program Guide (IPG) is required in guestrooms. | Revision    | United States               |
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<td>2514.09.D.7</td>
<td>If a set-top box is required with the television, it must be hidden from view and space for it included in the design of the furniture supporting the television.</td>
<td>Not Applicable to this Brand</td>
<td>Deletion</td>
<td>United States</td>
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<td>2515.02.A.3.a</td>
<td>Upholstery and pillow fabrics: 30,000 DR Wyzenbeeck or equivalent.</td>
<td>Upholstery fabrics: 30,000 DR Wyzenbeeck or equivalent. Pillow fabrics: must meet or exceed 15,000 DR Wyzenbeek, 20,000 Martindale or equivalent.</td>
<td>Revision</td>
<td>Canada</td>
</tr>
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<td>2515.02.A.3.a</td>
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<td>Revision</td>
<td>Canada</td>
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<td>2516.02.C</td>
<td>Fire-resistive construction is required for the following areas:</td>
<td>Fire-resistive construction is required for the following areas:</td>
<td>Revision</td>
<td>Global</td>
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<td></td>
<td>See standard for chart</td>
<td>See standard for chart</td>
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# Design, Construction & Renovation

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Design, Construction & Renovation Overview

The following Design, Construction and Renovation Standards (the “DCR Standards”) represent the requirements established for design of a DoubleTree by Hilton hotel which is being newly built. The DCR Standards only apply to existing Hilton hotels in limited circumstances: being when that hotel undergoes a remodeling, refurbishment, renovation or there is an addition (an addition for which there is a relevant Brand Standard) as set out in more detail at point 2 below.

In these cases, the DCR Standards will apply to the particular project, i.e. those aspects which are being remodeled, refurbished or renovated. The DCR Standards will also apply to additions to an existing hotel. This is set out in further detail below.

If discrepancies are found between what the DCR Standards require, the Architecture & Construction (A&C) Department of Hilton will clarify. All owners are responsible for referencing the most current version of the DCR Standards at the relevant time when compliance with the DCR Standards is required. It is the owner's responsibility to ensure that this information is incorporated into the Construction Documents. Reduction of scope below these Standards will not be permitted.

Hilton, when giving approval for projects, may alter requirements contained herein in accordance with the project's local market, custom or practice.

The Design, Construction and Renovation Standards apply to the following situations:
1. The construction of a new-build Hilton hotel; or the conversion of an existing hotel from a non-Hilton brand to one of the Hilton Brands; or the conversion of an existing hotel from one Hilton brand to another Hilton Brand; or the adaptive reuse of a building not originally intended/occupied as a hotel.
2. Remodeling, refurbishing, renovating, and making additions to existing Hilton hotels. However, this is only to the extent that the existing Hilton hotel is undertaking a remodeling, refurbishment or renovation project which has, as part of that project, components for which there is a relevant DCR Standard. For example, if the hotel decides to refurbish the windows, then the DCR Standards in relation to windows will apply (unless the hotel applies for and obtains a waiver). However, the other DCR Standards would not be engaged or applicable at this stage.
3. Change of ownership or renewal of a license agreement.
4. In the limited circumstances mentioned in Section 100 to Section 1100 of the Brand Standards.

Codes

The owner is responsible for compliance with all applicable laws, codes and/or other governing building, zoning and design regulations. In the event applicable local codes and regulations exceed the requirements contained herein, the local codes and regulations must be construed as minimum requirements. All discrepancies found between the DCR Standards and applicable local codes must be brought to the attention of Hilton for resolution. Where designs deviate from applicable codes and regulations, approval or acceptance by the authority having jurisdiction must be documented and kept on file. Hilton is not responsible for review of documents for compliance with local codes. It is the responsibility of the owner to meet or exceed these local regulations.

The more stringent requirement between these Brand Standards and the applicable code(s) must be followed as a minimum standard.

Interior Design Review and Approval Process
Hotels which are being newly built or existing hotels within the Hilton portfolio that are undergoing remodeling, refurbishment or renovation or which have an addition (as set out above and for which the DCR Standards are therefore partially engaged in respect of the components of that project) must receive prior approval for their
In respect of those parts of a project for which the DCR Standards are engaged but for which Hilton confirms that the works undertaken do not need to comply with the relevant DCR Standards (such confirmation to be given, or not, in Hilton’s discretion), then a waiver letter or approval may be given by Hilton.

Submittals must be compiled by a licensed architectural firm and/or licensed interior design firm. Completed submittals must be sent to the Hilton GDS (Global Design Services) Director assigned to the particular hotel development. The Design Director will assist with all requirements of the process. Contact GDS for assistance, including a recommendation of design firms.

Project Review and Approval Process

Processes regarding the design, construction, pre opening and opening phases of a new or conversion hotel within the Hilton portfolio must be followed. These processes establish the framework around which reviews and approvals are conducted. The AD&C [Architecture Design & Construction] Project Review and Approval Process document outlines these processes including required submittals. The document may be obtained from https://designinformation.hilton.com.

2501.00 Exterior

Refer to Section 2514.00, Technical Criteria, for requirements applicable to this section.

2501.01 Utilities

2501.01.A Not Applicable to this Brand

2501.01.B Drains

Storm drains must be located away from the building. Drains must be located in parking areas rather than drives. Drains must be kept clear of pedestrian traffic routes. Grade parking lots and grade pedestrian pathway in cold climates to prevent icing of drive aisles and walkways.

2501.01.C Drainage

Roof and porte cochere drainage must be connected to the storm drainage system by concealed piping. Exposed rain drains are not acceptable adjacent to guest entrances and must be concealed.

2501.01.D Surface Drainage

Surface drainage across the sidewalks and landscaped areas adjacent to the building is not acceptable.

2501.01.E Storm Water Detention/Retention

Storm water detention/retention areas must be integrated with the landscape design, must be attractive whether dry or in service and must be designed so as not to provide a breeding area for insects or be a hazard to hotel guests. Consideration must be given to the capture of rainwater runoff for re-use with irrigation system where weather conditions allow.

2501.01.F Hose Bibbs

Provide hose bibbs or hydrants for porte cochere, parking area, sidewalk, patio and pool deck washdown.

2501.02 Landscaping
2501.02.A Registered Landscape Architect
A registered Landscape Architect must develop landscaping plans and maintenance program for all landscaping materials. Hilton reserves the right of final approval on all landscape plans.

2501.02.B Not Applicable to this Brand

2501.02.C Not Applicable to this Brand

2501.02.D Landscaping Percentage Requirements
A minimum of 10 percent of the total site area must be landscaped. Exceptions for urban locations are subject to review and approval by Hilton.

2501.02.E Primary Landscaped Areas
Primary landscaped areas must be generous in scale and concentration, and must be placed adjacent to the entrance drive, the primary hotel entrance, ballroom and other guest entrances, the restaurant, pool terrace and exterior garden areas that are used for public functions.

2501.02.F Secondary Landscaping
Landscaping must be provided at the entire building perimeter, throughout the parking areas and at the site perimeter.

2501.02.G Not Applicable to this Brand

2501.02.H Drought Resistant Plants/Turf
Native and succulent/drought resistant plants are recommended rather than those requiring significant watering. 100 percent recyclable, synthetic turf fiber infilled with sand/silica and installed with a backing system and aggregate base layer, to ensure proper drainage, may be considered with prior written approval by Hilton for location, application and product selection.

2501.02.I Parking Island Landscaping
Parking islands must be landscaped and irrigated.

2501.02.J Landscaping Screens
Provide landscape design elements to enhance the views from the guestrooms and screen undesirable views, such as parking lots, service areas and any ground mounted equipment. Clearances required by the equipment and/or local jurisdiction must be maintained.

2501.02.K Retaining Walls
Timber retaining walls are not acceptable.

2501.02.L Handrails or Guardrails
Provide guardrails at the top of all accessible retaining walls with a 42”/1.0 m or more drop. Railings must be a minimum of 42”/1.1 m in height and must have intermediate rails or ornamental pattern such that a 4”/102 mm diameter sphere is not able to pass through and that children cannot climb (i.e. horizontal rails). Refer to 2516.00 for Fire Protection and Life Safety Requirements.

2501.02.M Not Applicable to this Brand

2501.02.N Not Applicable to this Brand

2501.02.O Utility Equipment
Locate all utility equipment away from guest entrances and screen from guest view.

2501.02.P Underground Irrigation System
A manual irrigation system or an automated underground irrigation system must be provided to support the maintenance of the exterior landscaping. The use of grey or recycled water may be considered for irrigation purposes only.

2501.02.Q Earth Slopes
Earth slopes must not exceed 2:1 (vertical/horizontal). All slopes greater than 3:1 (vertical/horizontal) must be stabilized. Slope all landscape areas away from the building at not less than 1:25 (vertical/horizontal).

2501.02.R Landscape Drainage
Ensure proper drainage of landscaped areas by providing a permanent subsurface drainage system.

2500 - Design, Construction & Renovation Standards
Effective July 01, 2019
2501.03.L Smoking Area

Provide a convenient and weather protected smoking area at least 25'-0"/7.6 m away from main property entrances when properties are 100 percent non-smoking or when market conditions dictate. Area must include seating, trash can, and ash cans. All plans must be submitted and approved by Hilton.

2501.04 Building Exterior

2501.04.F Exterior Guest Area Protection

Provide protection from the elements at exterior guest entrances, dining and roof terraces, and swimming pool terraces.

2501.04.G Balconies

2501.04.G.1 Balconies (if provided) must be a minimum of 5'-0"/1.5 m deep.

2501.04.G.2 Balconies/patios must be designed to provide privacy and security for guestrooms. Views must be blocked to adjacent balconies/patios.

2501.04.G.3 Balcony floors must slope outwards or toward internal drains.

2501.04.G.4 Balcony railings must be a minimum of 42"/1.1 m in height and at least partly open, or transparent for views. Any opening in railings must not exceed 4"/100 mm and include a bottom rail a 2"/50 mm maximum above the floor. Railings must not be horizontal or climbable by children.

2501.04.I Roof Screening

Flats roofs, viewed from guestrooms, must be enhanced with colored patterns of gravel and/or plantings. All HVAC equipment must be screened from guest view. Must meet minimum performance criteria in section 2514.05.
2501.04.M Antennae
Hotel antennae and satellites are not allowed to extend higher than any parapet wall. Other antennae and satellite dishes that are not used for the operation of the property must be camouflaged to blend with the building design.

2501.04.N Window Washing
A practical method of exterior and interior window washing must be incorporated in hotel design and be approved by Hilton.

2501.04.O Awnings/Canopies
Fabric and canvas awnings are not allowed without prior approval from Hilton.

2501.05 Porte Cochere
2501.05.A Not Applicable to this Brand
2501.05.B Porte Cochere Width
The porte cochere must be designed to provide space for four parked cars, two deep and two across, with enough space remaining for motorists to drive under and exit the car without exposure to the elements. The size of the porte cochere may be required to be increased on larger hotels as directed by Hilton.

2501.05.C Clearance Height
Porte cochere clearance height must be a minimum of 13'-0"/4.0 m.

2501.05.D Covered Pedestrian Access
Covered pedestrian access to the porte cochere from the hotel entrance must be 10'-0"/3.00 m minimum width and clear of obstructions.

2501.05.E Porte Cochere Flooring
The area under the porte cochere must be a decorative non-slip surface paving such as brick, stone, tile pavers or color stamped concrete. Hand troweled, scored concrete, floated concrete or asphalt is not allowed. Decorative paving in driving areas must be sealed and cleanable.

2501.05.F Porte Cochere Columns
Porte cochere support columns and other features at the building entry that could be damaged by car doors, luggage carts, etc. must be finished with a high-quality durable finish to coordinate with main exterior building finishes.

2501.05.G Entrance Drive Paving
Entrance drive paving must be flush with the sidewalk at hotel entrance to facilitate the movement of luggage carts and for easy access into the hotel.

2501.05.H Taxicab Queuing
Provide a convenient area at the primary entrance for taxicab queuing and provide a taxi notification system at urban properties.

2501.05.I Not Applicable to this Brand
2501.05.J Porte Cochere Lighting
Provide decorative lighting at the porte cochere and any secondary entrance canopies.
2501.05.K Not Applicable to this Brand

2501.05.L Light Levels
Refer to Section 2514.08 for minimum light level requirements.

2501.05.M Heat Lamps
Heat lamps will be required in some locations, as directed by Hilton. When provided they must be built in heat lamps. Portable heat lamps are not allowed.

2501.05.N Porte Cochere Seating
Provide outdoor seating for guests adjacent to the primary entrance.

2501.05.O Valet Stand
When a valet stand is provided, it must be a permanent fixture. The valet stand must be finished with natural wood, tile, stone or approved decorative metal. The top surface material must comply with Section 2515.04.

2501.06 Parking

2501.06.A Parking Area Location
Parking areas must be conveniently located for building guests. Parking allocations must be distributed in accordance with the anticipated usage of each entrance (lobby, restaurant, function area, team member, etc.).

2501.06.A.1 Generally vehicular traffic and golf carts must be kept separate, cart pathways must be designed to accommodate pedestrians, guest and service carts. Parking allocations, charging stations and maintenance workshop must be distributed in accordance with the anticipated usage. Charging stations for service vehicles and golf carts must be screened from guest view. Must have multiple stations based on size of campus.

2501.06.B Coach Bus Parking
A coach bus drop off/pick up area located near the main entrance porte cochere is required.

Mexico: A coach bus drop off/pick up area or group entrance (when provided) must be located near the main entrance. A porte cochere is required.

2501.06.C Service Vehicles Access
Service vehicles must not pass through guest parking areas.

2501.06.D Parking Study Requirement
A parking and traffic analysis study is required. Must be completed by building architect and approved by the brand.

2501.06.E Light Levels
Refer to Section 2514.08 for minimum light level requirements.

2501.06.F Parking Lot

2501.06.F.1 The parking area must provide a minimum of one parking space for each guestroom. Hotels with inadequate parking must provide valet parking. Additional parking may be required based on market demand.
2501.06.F.2 Not Applicable to this Brand
2501.06.F.3 Provide wheelstops where car overhang has the potential of damaging light poles, landscaping or other objects.
2501.06.F.4 Parking and drive areas must be concrete or sealed asphalt.
2501.06.F.5 Concrete paving is required in all service areas, i.e., garbage dumpster, loading dock, service entrances.
2501.06.F.6 Provide 6”/152 mm concrete curb and gutter or sloped granite curbing at all edges of the parking lot and drives. Asphalt curbing at edges of the parking areas and drives is not allowed.
2501.06.F.7 Curbed landscaped islands must separate all parking from the primary entrance drive. Parking along the entrance drives is not allowed.
2501.06.F.8 Parking islands must be a minimum of 10'-0”/3.0 m wide and must be placed a minimum of every 120'-0”/36.0 m along the width of the parking lot with four rows of parking stalls and two drive lanes maximum between centerline of islands.
2501.06.F.9 Parking lot striping must be white, except where other colors are required for fire lanes and no parking zones.

2501.06.G Drives
2501.06.G.1 The primary entrance drive must provide two-way circulation through a lighted and landscaped corridor to guest parking and the primary hotel entrance.
2501.06.G.2 Two-way main entrance driveways must have a minimum width of 30'-0”/9.0 m and inside turning radius of 33'-0”/10.0 m.
2501.06.G.3 The drive lane minimum width must be 24'-0”/7.3 m between parking stalls.
2501.06.G.4 Speed bumps must be used in drives where there is a risk to pedestrians from excessive speeds by vehicles.
2501.06.G.5 Dead end drive lanes are not allowed.
2501.06.G.6 All paint on floor surfaces must be washable and antiskid.

2501.06.H Parking Stalls
2501.06.H.1 Parking stalls must be a minimum of 18'-0”/5 m long.
2501.06.H.2 Parking stalls must be a minimum of 9'-0”/2.75 m wide centerline to centerline. A maximum of 25 percent of the parking stalls may be compact stalls.

2501.06.I Parking Garage/ Covered Parking
2501.06.I.1 Convenient indoor parking may be required by Hilton, depending upon market and site restraints.
2501.06.I.2 Garage must be located within a short distance from the main hotel entrance.
2501.06.I.3 Finish Options - Parking Garage/ Covered Parking
2501.06.I.3.a Floor: Steel trowel finished concrete, hardened and epoxy sealed, paint optional. Floors exposed to external elements must be waterproofed.
2501.06.I.3.b Wall: Concrete or concrete block, paint optional; protective barriers must be installed at areas vulnerable to damage.
2501.06.I.3.c Ceiling: Concrete or painted concrete
2501.06.I.3.c.1 Parking garages must have a minimum clear ceiling height of 8’-0”/2.4 m.
2501.06.I.4 Light fixtures must be suitable for outdoor installation. Wrap-around type fluorescent fixtures are not permitted. Exposed lamp fixtures are not permitted. Fixtures must be located outside of drive lanes.

2501.06.I.5 Parking garages must be designed to provide positive drainage to prevent standing water.

2501.06.I.6 Provide ice control system on ramps that are exposed to the outdoor elements in cold climate zones.

2501.06.I.7 Parking garages or ramps designed with exterior decorative screens rather than permanent walls must be equipped with suitable protective guardrails for guest safety and protection.

2501.06.J Parking Control

2501.06.J.1 Parking control may be required by Hilton based upon regional and market conditions.

2501.06.J.2 Guests parking in the garage receive tickets from the entrance barrier on the way into the garage. Upon leaving, guests present their tickets at a Payment Station where payment is received and the ticket is processed to enable guests to leave the car park or garage.

2501.06.J.3 Entrance/exit barriers must provide control of access in and access out.

2501.06.J.4 Each entry lane must consist of entry station with graphical LED/LCD display, barcode ticket printer, proximity pass-card reader, integrated heating unit, voice intercom point with battery backup facility, barrier gate with folding rising arm, barrier arm knock off sensor, internal manual raise/lower switch and dual channel loop detector.

2501.06.J.5 Each exit lane must consist of exit station with graphical LED/LCD display, barcode ticket reader, proximity pass-card reader, collection tray for retained tickets, integrated heating unit, voice intercom point and battery backup facility, barrier gate with folding rising arm, barrier arm knock off sensor, internal manual raise/lower switch and dual channel loop detector.

2501.06.J.6 Payment Stations

2501.06.J.6.a Payment stations must be provided at the front desk, Concierge desk, an automatic pay station or at a manned parking control booth.

2501.06.J.6.b Automatic pay stations must be clearly visible with signage explaining tariffs and use.

2501.06.J.6.c Automatic pay stations must consist of LED/LCD display, coin acceptance, banknote acceptance, credit card acceptance, sufficient recycling coin tubes, lost ticket facility, barcode ticket reader, battery backup memory, receipt printer, intercom call point, two coin safes per machine and two note safes per machine.

2501.06.J.7 Parking Control Booths

2501.06.J.7.a Manned parking control booths are optional.

2501.06.J.7.b Booths must have heating, ventilation and refrigerant air conditioning.

2501.06.J.7.c Booths must have electrical and data connections for property management system and a telephone outlet.

2501.06.J.8 The ticket machine, barriers and automatic pay station must have an intercom to the front desk or Concierge desk.

2501.06.J.9 A central server for the car park system must be located within the Computer/Telecom Room.

2501.06.J.10 Parking Control Systems & Guest Room Key Cards

Parking control systems must be able to use both guest room key cards, and Digital Key (when activated at the hotel) for entry and exit. This would include having a dedicated key reader that can support both key cards and Digital Key at each gate.
2501.06.K Electric Vehicle (EV) Charging Stations
   2501.06.K.1 A minimum of two EV charging stations are encouraged where not required by law. When provided must have both universal and proprietary charging capabilities.
   2501.06.K.2 Stations must be protected or positioned to prevent damage from vehicles.
   2501.06.K.3 Power supplied to the stations must be provided underground.
   2501.06.K.4 Stations must provide Level 2 charging (240 volt AC input) minimum.
   2501.06.K.5 Features must include the following:
      2501.06.K.5.a Ability for drivers to access stations via contactless credit cards and/or any manufacturer’s subscription.
      2501.06.K.5.b 24/7 driver assistance including alternate charging station locations.
      2501.06.K.5.c Access control to eliminate energy theft and improve safety.
      2501.06.K.5.d Notifications to driver of charge status including completion or interruption of charge.
      2501.06.K.5.e Cord management system including long reach and storage.
   2501.06.K.6 Enclosure must be corrosion and weather resistant and comply with NEMA 3R.
   2501.06.K.7 Stations must be SAE J1772 compliant and meet all UL and NEC requirements.
   2501.06.K.8 Signage must be provided designating parking space(s) for the electric vehicle charging stations.
   2501.06.K.9 Stations must meet Hilton and any applicable local or federal accessibility requirements.

2501.07 Flag Poles
   2501.07.A Flag Poles
      Flag poles are optional.
      2501.07.A.1 If flag poles are provided, provide a minimum of three externally illuminated flag poles, aluminum or fiberglass, located at or near building entry. Flag poles in the United States must be one 35'-0”/10.5 m pole and two 25'-0”/7.5 m poles minimum. Building mounted flag poles must be approved by Hilton. Wood, steel, or plastic poles and brackets are not allowed. Flag poles must be spaced so that one flag must not wrap around the pole of another.

   2501.07.B Flag Pole Lighting
      If provided, flags must be illuminated. Lighting must be in ground mounted up lighting (flush with surface) aimed on the flags. Pole mounted fixtures 8'-0”/2.4 m above grade are allowed in climates susceptible to snow.

2501.08 Exterior Lighting/Electrical
   Refer to Section 2514.08, Electrical, for requirements applicable to this section.
   2501.08.A Lighting Designer Requirement
      A licensed professional lighting designer must design and coordinate all exterior lighting to be approved by Hilton. Refer to 2514.08.K for energy efficiency requirements.
2501.08.B Not Applicable to this Brand

2501.08.C Guest Entrance Lighting

All guest entrances must be well lit and readily identifiable.

2501.08.D Exterior Light Fixtures

All exterior light fixtures must be suitable for outdoor installation and must have coordinated color temperature and characteristics.

2501.08.E Cornice Uplighting

Provide building floodlighting to reinforce hotel identification and recognition. Floodlight major building masses, but do not light guestroom windows. Conceal luminaries within building elements and in landscaped areas.

2501.08.F Not Applicable to this Brand

2501.08.G Not Applicable to this Brand

2501.08.H Site Lighting Control

All site lighting must be controlled by zones and as a whole by photocell or timer based control and building automation system located in the back of house area.

2501.08.I Light Levels

Refer to Section 2514.08 for minimum light level requirements.

2501.08.J Parking Lighting

2501.08.J.1 Lighting (parking, landscaping, walkways and security) must cover the entire parking area.

2501.08.J.2 Parking lot and driveway lighting must be pole-mounted. Lighting must be high energy efficient and long life.

2501.08.J.3 Maximum pole height is 20'-0/6.0 m. Cut off shields or similar devices must be used to prevent glare and annoyance.

2501.08.K Landscape Lighting

Landscape Lighting

Refer to Section, Electrical, for requirements applicable to this section.

2501.08.K.1 Provide bollard or mushroom lighting for all walkways not illuminated by parking lot lighting.

2501.08.K.2 Landscape and walkway lighting must be rigidly connected to waterproof junction boxes and securely mounted to concrete bases.

2501.08.K.3 Landscape lighting must be provided for landscaped areas directly adjacent to the hotel and for outdoor activity areas.

2501.08.K.4 Landscape lighting must be indirect and decorative in nature.

2501.08.K.5 Locate all landscape lighting above grade in planting beds or mulch. Do not locate fixtures in areas of lawn or near walkways. All light fixtures must be located a minimum of 3'-0"/900 mm from the face of any adjacent curb.

2501.08.L Not Applicable to this Brand

2501.08.M Landscaped Area Outlets

Provide a weatherproof power outlet (socket outlet) in each primary landscaped area.
2502.00 Lobby Area

Refer to Section 2514.00, Technical Criteria, and Section 2515.00, Furnishings, Fixtures, and Equipment, for requirements applicable to this Section.

2502.01 Vestibule

2502.01.A Vestibule Depth/Door Requirements

A vestibule is required at the entrance to the lobby. Automatic doors must be provided via a revolving door or sliding doors. Bi-fold doors are not allowed.

2502.01.B Revolving Doors

Revolving doors must be a minimum 11'-0"/3.35 m diameter.

2502.01.C Automatic Sliding Doors

When automatic sliding doors are provided, vestibules must be a minimum of 12'-0"/3.7 m deep.

2502.01.D Automatic Revolving Doors

When automatic revolving doors are provided, single 36"/900 mm doors in a vestibule configuration must be provided directly adjacent to the revolving door. The vestibule must be a minimum 8'-0"/2.50 m deep where both doors are manually operated and swing in the same direction (outward). It must be a minimum 10'-0"/3.0 m deep where both doors are manually operated and swing 180 degrees.

2502.01.E Not Applicable to this Brand

2502.01.F Nighttime Security Requirements

Provide magnetic locks, intercom with buzzer, and card key access on primary and secondary entrance doors that will lock entrance doors during off hours. Provide remote release to securable primary entrance doors at front desk.

2502.01.G Not Applicable to this Brand

2502.01.H Not Applicable to this Brand

2502.01.I Finish Options - Vestibule

2502.01.I.1 Floor: Porcelain tile, natural stone, wood - tongue and groove, carpet (broadloom, high definition CYP 48 oz.), decorative hand-tufted area rug

2502.01.I.1.a Base (minimums): 6"/150 mm porcelain tile, natural stone, wood - stain grade

2502.01.I.1.b Provide an architectural walk-off mat or architectural grille where doors are present.

2502.01.I.2 Wall: Vinyl wallcovering, wood, paint, porcelain tile, natural stone, polished or textured plaster

2502.01.I.3 Ceiling: Paint on gypsum, acoustic ceiling tile (30 percent maximum)

2502.01.I.4 Vestibule finishes must match lobby finishes when doors are not present.

2502.01.I.5 When automatic suppression systems are required (see section 2516.00) concealed type sprinkler heads must be utilized.

2502.01.J Not Applicable to this Brand

2502.01.K Not Applicable to this Brand

2502.01.L Not Applicable to this Brand
**2502.01.M** Not Applicable to this Brand

**2502.01.N** Not Applicable to this Brand

**2502.01.O** Light Levels

Refer to Section [2514.08](#) for minimum light level requirements.

**2502.02** Lobby

**2502.02.A** Lobby Size Requirements

The lobby area is required to be a minimum of 1,500 ft²/139 m² or 6 ft²/0.56 m² per guestroom, whichever is greater, excluding registration area, Lobby Bar and corridors accessing the guest elevators/lifts. Lobby must have direct visual connection to Food & Beverage elements.

**2502.02.B** Not Applicable to this Brand

**2502.02.C** Not Applicable to this Brand

**2502.02.D** Not Applicable to this Brand

**2502.02.E** Not Applicable to this Brand

**2502.02.F** Not Applicable to this Brand

**2502.02.G** Not Applicable to this Brand

**2502.02.H** Not Applicable to this Brand

**2502.02.I** Not Applicable to this Brand

**2502.02.J** Finish Options - Lobby

2502.02.J.1 **Canada | Puerto Rico | United States:** Floor: Carpet (broadloom and high definition CYP 48 oz.), decorative hand-tufted area rug, porcelain tile, marble/granite, natural stone, wood - tongue and groove

Mexico: Floor: Carpet (broadloom), decorative hand-tufted area rug, porcelain tile, marble/granite, natural stone, wood, mosaic tile

2502.02.J.1.a Base (minimums): 6”/150 mm porcelain tile, wood, natural stone

2502.02.J.2 Wall: Vinyl wallcovering, paint, porcelain tile, natural stone, wood panels (special approval required), acrylic knockdown - orange peel texture (special approval required)

Mexico: Wall: Vinyl wallcovering, paint, porcelain tile, natural stone, wood panels (special approval required), acrylic knockdown - orange peel texture (special approval required), polished or textured plaster

2502.02.J.3 Ceiling: Paint on gypsum, acoustic ceiling tile (30 percent maximum), special finish/decorative ceiling

2502.02.J.3.a Lobby ceilings must be a minimum of 12’-0”/3.7 m high.

2502.02.J.3.b When automatic suppression systems are required (see section [2516.00](#)) concealed type sprinkler heads must be utilized.

**2502.02.K** Not Applicable to this Brand

**2502.02.L** Not Applicable to this Brand

**2502.02.M** Electrical
2502.02.M.1 Lighting must be switched from panels located within a team member area not accessible by guests.

2502.02.M.2 Not Applicable to this Brand

2502.02.M.3 Not Applicable to this Brand

2502.02.M.4 Not Applicable to this Brand

2502.02.M.5 Not Applicable to this Brand

2502.02.M.6 Not Applicable to this Brand

2502.02.M.7 Refer to Section 2514.08 for minimum light level requirements.

2502.02.N House Telephone Outlets

Provide a minimum of one outlet for house telephones in the lobby area. House telephones must be clearly identified. Wall mounted telephones are not allowed. Refer to Section 712.00 - Telephones functionality requirements.

2502.02.O TV Requirements

A television is required in the lobby area. Televisions must comply with the sizes and specifications provided in Sections 713.00 and 2514.09.

2502.02.P Furnishings, Fixtures and Equipment

2502.02.P.1 Not Applicable to this Brand

2502.02.P.2 Lobby seating must accommodate the size of the lobby footprint. Seating area must accommodate a power outlet and USB at a ratio of 4 seats per 1 outlet/USB.

2502.02.P.3 Not Applicable to this Brand

2502.02.P.4 Not Applicable to this Brand

2502.02.P.5 Not Applicable to this Brand

2502.02.P.6 Tables

2502.02.P.6.a Not Applicable to this Brand

2502.02.P.6.b Tables used in lobby area must be high quality, commercial grade. The top surface material must be compliant with Section 2515.04.

2502.02.P.6.c Commercial-grade bases must be provided for sturdy support of all tables.

2502.02.Q Lobby Connectivity Zone

Refer to Sections 2514.00, Technical Criteria, and 2515.00, Furnishings, Fixtures, and Equipment, for additional requirements applicable to this Section.

2502.02.Q.1 A Lobby Connectivity Zone can be installed in lieu of a Business Center. If a hotel wishes to design a custom solution instead of the connectivity station they must receive prior approval from Hilton.

2502.02.Q.2 A self service business center or a lobby connectivity zone is required.
2502.02.Q.3 The Lobby Connectivity Zone must be provided as an integral part of the social zone of the lobby.

2502.02.Q.4 The Connectivity Zone location, layout and FF&E selections must be reviewed and approved by Hilton.

2502.02.Q.5 Computer stations must be oriented so that as guests are viewing the screen they are not facing a wall and may view beyond the screen to the social space of the Lobby or out a window.

2502.02.Q.6 The computer stations are allowed to be on a communal table within the social space, a floating counter, in an alcove space, or within the general social area of the Lobby.

2502.02.Q.7 Furniture that supports the computer stations must meet the standards and requirements of all other public area furniture.

2502.02.Q.8 All seating that serves the computer stations must be comfortable, and appropriate in height to the furniture supporting the keyboard. For desk height installations, refer to Section 2510.06.A.24 for height and arm requirements. Ensure that the height of the desk work area is coordinated with the height of the adjustable chair.

2502.02.Q.9 Table-top heights must be 30" - 42"/760 mm – 1.06 m AFF and must be coordinated with the adjacent furniture heights within the Lobby. The top surface material must be compliant with Section 2515.04.

2502.02.Q.10 When the printer is located near the computer stations, it must be housed in a cabinet located below the height of the work surface, it must be easily identified and be located where the guest can retrieve prints without opening the top or side of the cabinet.

2502.02.Q.11 A station intended for only printing boarding passes may be located at the hotel entrance.

2502.02.Q.12 Provide electrical outlets for computer equipment and personal use devices. Outlets are allowed to be built into the casegoods or located on the floor.

2502.02.Q.13 Provide internet access for PC stations and laptop station.

2502.03 Not Applicable to this Brand

2502.04 Front Desk

2502.04.A Workstation Quantities

Provide a minimum of three registration workstations for hotels with 200 or fewer keys. An additional registration workstation will be required for each additional 100 keys above 200.

2502.04.B Workstation Layout

Registration workstations must be grouped together into units to allow circulation around each side of the unit. No more than two workstations are allowed within a single front desk unit.

**Canada | United States:** Registration workstations must be grouped together into units to allow circulation around each side of the unit. More than two workstations grouped together must be submitted to Global Design for review and approval.

2502.04.C Not Applicable to this Brand

2502.04.D Sit/Stand Front Desk
Stand up front desk units are required.

2502.04.E Front Desk Visibility
The front desk units must be directly visible and accessible from the primary entrance. The front desk units must have a clear view of the primary entrance, guest elevators/lifts and shuttle lifts.

2502.04.F Not Applicable to this Brand

2502.04.G Clear Circulation
Provide a minimum of 12'-0"/3.7 m clear circulation in front of the front desk. Allow for additional queuing space when dictated by market conditions such as convention center hotels.

2502.04.H Not Applicable to this Brand

2502.04.I Finish Options - Front Desk/Reception Desk

Finish Options - Front Desk
2502.04.I.1 Floor: Carpet (broadloom and high definition CYP 48 oz.), porcelain tile, natural stone, wood - tongue and groove
  2502.04.I.1.a Base (minimums): 6"/150 mm porcelain tile, natural stone, wood
  2502.04.I.1.b At freestanding desks/pods, the lobby flooring must continue through to the team member areas. Inset anti-static/anti-fatigue mats or carpets can be used behind the freestanding desks/pods.

2502.04.I.2 Wall: Vinyl wallcovering, porcelain tile, natural stone, paint (special approved required), acrylic knockdown - orange peel texture (special approval required), wood or special finish (special approval required)
  2502.04.I.2.a Not Applicable to this Brand
  2502.04.I.2.b Not Applicable to this Brand
  2502.04.I.2.c Not Applicable to this Brand
  2502.04.I.2.d Full height corner guards where susceptible to damage.

2502.04.I.3 Ceiling: Paint on gypsum, acoustic ceiling tile (30 percent maximum)
  2502.04.I.3.a Acoustic ceiling tile must be spineless, tight grid with smooth large acoustical panels or 4'-0 x 4'-0"/1.2 m x 1.2 m, 30 percent maximum.
  2502.04.I.3.b When automatic suppression systems are required (see section 2516.00) concealed type sprinkler heads must be utilized.

2502.04.J Front Desk Millwork
2502.04.J.1 The front desk unit’s exterior finish must be natural wood, porcelain tile, marble, granite or decorative metal. Wood, wood edged, or laminate writing surface is not allowed.
2502.04.J.2 The finished height of the front desk must not be more than 42"/1.07 m above the finished floor. Front desk must be built according to the design drawings and specifications found online at https://designinformation.hilton.com. The desk is designed to minimize the appearance of computer equipment. Credit card machines are not allowed to be permanently mounted to the front desk surface.
2502.04.J.3 Provide a minimum clear aisle space of 5'-0"/1.5 m behind the front desk.
2502.04.J.4 The front desk finishes must be as follows:
   2502.04.J.4.a The top surface material must be compliant with Section 2515.04.

2502.04.K Front Desk/Reception Desk Cabinetry
   The use of cabinetry behind the front desk unit and the placement of doors on the rear wall of the registration area are not allowed.

2502.04.L Not Applicable to this Brand

2502.04.M Electrical
   2502.04.M.1 Refer to Section 2514.08 for minimum light level requirements.
   2502.04.M.2 Not Applicable to this Brand
   2502.04.M.3 Each workstation must have the following as a minimum:
      2502.04.M.3.a Above the counter: a duplex power outlet (socket outlet), single telephone outlet and two data ports. Dedicated phone lines are required.
      2502.04.M.3.b Below the counter: two quad power outlets (socket outlets) and four data ports. All outlets must be dedicated and grounded.
   2502.04.M.4 The power outlets (socket outlets) below the desk must not be on the same dedicated grounded circuit as the outlets above the desk. Each dedicated circuit may provide power up to three workstations per circuit.

2502.04.N Furniture, Fixtures and Equipment
   2502.04.N.1 Not Applicable to this Brand
   2502.04.N.2 Not Applicable to this Brand
   2502.04.N.3 Artwork
      2502.04.N.3.a Provide art that is illuminated on the wall behind the registration area.
   2502.04.N.4 Not Applicable to this Brand
   2502.04.N.5 Provide a minimum of one single drawer built-in cookie warmer centrally located within the front desk area. Hotels in excess of 150 keys are required to install a two-drawer cookie warmer centrally located within the front desk area. The cookie warmer must be built into the front desk unit in a manner that allows the front desk agent to provide cookies without losing eye contact with the guest. Provide ventilation, and power supply to each warmer.
   2502.04.N.6 Security monitors and computer monitors with guest information must not be visible to guests.
   2502.04.N.7 Provide a panic button at the bottom of each workstation.
   2502.04.N.8 United States:
      (California Only) When required, seating must be provided for Front Desk team members. Seating must comply with the following:
         • Seating and upholstery must be manufacturer's commercial grade.
         • Stack chairs and folding banquet tables are not allowed.
         • Clearance from the seat to the front desk millwork must be no less than 8”/200 mm to allow for leg clearance from the seat to the bottom of the apron.
2502.06 Concierge

2502.06.A Concierge Facilities
Concierge facilities are permitted in a separate section of the front desk but in hotels with 400+ keys must be in a separate area apart from the front desk.

2502.06.B Desk Surface Requirement
Desk must have a minimum work surface area of 30”/760 mm x 60”/1.5 m with lockable drawers and slotted openings.

2502.06.C Desk Finish
The face of the desk must be natural wood, porcelain tile, marble, granite or decorative metal and complimentary to the design of the lobby and front desk area. The top surface material must comply with Section 2515.04. Wood, wood edged, or laminate writing surface is not allowed.

2502.06.D PMS Outlet
Provide power outlets (socket outlets) and data connections for the property management system.

2502.06.E Telephone Outlet
Provide a telephone outlet at concierge’s desk that is hidden from guest view.

2502.06.F Light Levels
Refer to Section 2514.08 for minimum light level requirements.

2502.06.G Ergonomic Chair
An ergonomic chair is required for the team member when a sit down concierge is provided. Guest chair must not be ergonomic.

2502.07 Bellman’s Desk

2502.07.A Bellman’s Desk
Hotels with 300+ keys require a bellman’s desk.

2502.07.B Bellman’s Desk Location
Bellman’s desk must be located in the lobby convenient to the entrance vestibule and adjacent to the luggage room.

2502.07.C Bellman’s Desk Size
Bellman’s desk must be a minimum of 4’-0”/1.2 m in length.

2502.07.D Bellman’s Desk Finish
The face of the bellman’s desk must be finished with natural wood, tile, stone or approved decorative material and complimentary to the design of the lobby and concierge area. The top surface material must comply with Section 2515.04.

2502.07.E Not Applicable to this Brand
2502.07.F Telephone Outlet
Provide a telephone outlet at bellman’s desk hidden from guest view.

2502.07.G Power Outlets
Provide power outlets (socket outlets) and data connections for the property management system.

2502.07.H Light Levels
Refer to Section 2514.08 for minimum light level requirements.

2502.08 Valet Desk
2502.08.A Valet Desk Location
If provided, valet desk must be adjacent to the primary entrance vestibule, convenient for guest access and shielded from the elements.

2502.08.B Transaction Window
Provide a glass transaction window when valet desk is located in a separate room to allow visual connection between valet attendant and guest.

2502.08.C Valet Desk Finish
The face of the valet desk must be finished with natural wood, tile, stone or approved decorative material. The top surface material must comply with Section 2515.04.

2502.08.D PMS Outlet
Provide four electrical and four data connections for point of sale and property management systems.

2502.08.E Not Applicable to this Brand

2502.08.F Key Storage Unit
Provide a securable key storage unit.

2502.08.G Light Levels
Refer to Section 2514.08 for minimum light level requirements.

2502.09 Luggage Room
2502.09.A Luggage Room Requirement
A separate, securable luggage storage room is required, located near the primary lobby entrance or behind the bellman’s desk and directly accessible to the registration area. Hotels must have 0.75 ft²/0.07 m² per key or a minimum 200 ft²/18 m² of storage for luggage. Hotels with more than one registration area must allocate luggage storage at each area.

2502.09.B Not Applicable to this Brand

2502.09.C Luggage Room Clearance
Locate the entrance to the luggage room so that clearance is provided to comfortably bypass the bellman’s desk with luggage carts.

2502.09.D Luggage Room Access
All luggage room entrances must be secured by either proximity reader or other electronic device. Refer to 2514.O.17

2502.09.E Luggage Cart Storage
Provide convenient space within the luggage room for storage of luggage carts when not in use.

2502.09.F Door Hardware
The luggage room door must be a minimum of 3'-6"/1.1 m wide and 6'-8"/2.04 m high with a door closer and a hold open feature.

2502.09.G Finish Options - Luggage Room
2502.09.G.1 Floor: Vinyl composite tile (when not visible from public areas)
   Mexico: Floor: Sealed concrete, vinyl composite tile (when not visible from public areas)
   2502.09.G.1.a Base (minimums): 6"/150 mm porcelain tile, 4"/100 mm through body synthetic, vinyl, natural stone
   2502.09.G.2 Wall: Paint
   2502.09.G.3 Ceiling: Paint on gypsum, acoustic ceiling tile

2502.09.H Racks & Shelving
The luggage room must be designed to accommodate a combination of hanging racks and storage shelving units (2'-0"/600 mm deep x 4'-0"/1.2 m wide x 6'-0"/1.8 m high). Provide approximately 25 percent hanging racks and 75 percent shelving units. Each shelf must have a minimum weight allowance of 350 lbs/159 kgs.

2502.09.I Not Applicable to this Brand

2502.09.J Not Applicable to this Brand

2502.09.K Light Levels
Refer to Section 2514.08 for minimum light level requirements.

2502.10 Safe Deposit Room
2502.10.A Safe Deposit Box Requirements
Safe deposit boxes must be provided when required by local code or when not provided in guestrooms. When provided, a minimum of one safe deposit box per every 50 rooms is required in the back of house area. Provide different size boxes.

2503.00 Public Restrooms
Refer to Section 2514.00, Technical Criteria, and Section 2515.00, Furnishings Fixtures and Equipment, for requirements applicable to this Section.

2503.00.A Restroom Quantities
There must be one restroom each for men and women in the lobby area. The restrooms must not open directly onto the lobby. The number of lavatories, stalls and urinals required are as dictated by code.

2503.00.B Not Applicable to this Brand

2503.00.C Entrance Doors
Restroom entrance doors must be a minimum of 3'-0"/915 mm wide x 8'-0"/2.4 m high, have self-closing, non-lockable hardware and push/pull plates. Vestibules are required. Direct line of sight into multi-occupant restroom toward the urinal or water closet is prohibited.

2503.00.D Janitor’s Closet
A janitor’s closet with storage shelf and service wash basin must be located within or adjacent to the restrooms.

2503.00.E Not Applicable to this Brand

2503.00.F Finish Options - Public Restrooms

2503.00.F.1 Floor: Porcelain tile, natural stone
   2503.00.F.1.a Base (minimums): 6"/150 mm porcelain tile, natural stone

2503.00.F.2 Wall: Vinyl wallcovering, porcelain tile, natural stone, wood or special finish (special approval required)
   2503.00.F.2.a A full height porcelain tile wall is required on all plumbing fixture walls.

2503.00.F.3 Ceiling: Paint on gypsum, acoustic ceiling tile (30 percent maximum)

2503.00.F.4 When automatic suppression systems are required (see section 2516.00) concealed type sprinkler heads must be utilized.

2503.00.G Stalls & Partitions

Stalls & Partitions

2503.00.G.1 Water Closet Partitions
Water closet partitions and urinal screens are required.

2503.00.G.2 Not Applicable to this Brand

2503.00.G.3 Not Applicable to this Brand

2503.00.G.4 Partition Installation & Finish
Partitions must be ceiling hung and must be solid polymer (high density polyethylene).

2503.00.G.5 Urinal Screen Installation
Urinal screens must be wall mounted with tamper proof fasteners.

2503.00.G.6 Partition & Door Material
Urinal screens and water closet partitions and doors cannot be metal or plastic laminate.

2503.00.G.7 Not Applicable to this Brand

2503.00.G.8 Partition Door Width
Water closet partition doors must be 2'-6"/760 mm wide minimum.

2503.00.H Accessories
Accessories

2503.00.H.1 Water Closet Stall Required Items
The following items are required within each water closet stall:

- 2503.00.H.1.a Double roll toilet tissue holder.
- 2503.00.H.1.b Coat hook mounted at 60”/1.5 m above the finished floor.
- 2503.00.H.1.c Sanitary napkin disposal trash bin (in women’s restroom).
- 2503.00.H.1.d Wall mounted recessed sanitary seat cover dispenser.

2503.00.H.2 Shared Space Required Items
The following items are required within the shared space:

- 2503.00.H.2.a A minimum of one motion-activated, paper towel dispenser that is recessed or semi-recessed. Electric hand dryers are allowed when used in conjunction with paper towel dispensers. **Mexico:** A minimum of one motion-activated paper towel dispenser (recessed or semi-recessed) or electric hand dryer is required.
- 2503.00.H.2.b Not Applicable to this Brand
- 2503.00.H.2.c Decorative wastebasket(s). Wall mounted recessed waste receptacles are not allowed.
- 2503.00.H.2.d Trash bin near the exit of the restroom.
- 2503.00.H.2.e Not Applicable to this Brand
- 2503.00.H.2.f Provide a recessed baby changing station that complies with ASTM F2285, BS EN 12221:2008 or country recognized safety equivalent in the unisex toilet. If there is not a unisex toilet, must be provided in both the men and women's restroom. Baby changing stations are required in lobby and pool area public restrooms.

2503.00.H.3 Washbasin Required Items
The following items are required at the washbasin:

- 2503.00.H.3.a Decorative, freestanding facial tissue dispensers, one per every two washbasins.
- 2503.00.H.3.b Built-in liquid soap dispenser at each washbasin with reservoir below counter and spout that extends beyond the edge of the bowl. The dispenser must be automatic when touchless faucets are provided. **Canada | United States:** Built-in, automatic liquid soap dispenser at each washbasin with reservoir below counter and spout that extends beyond the edge of the bowl.

2503.00.I Not Applicable to this Brand

2503.00.J Not Applicable to this Brand

2503.00.K Exhaust Ventilation

- 2503.00.K.1 Interlock Toilet Exhaust
For multi-stall restrooms, interlock toilet exhaust fan with an air handling system that provides makeup air for the exhaust air volume. Operate fans continuously.

2503.00.K.2 Negative Toilet Exhaust
Maintain the toilet room negative with respect to adjacent areas by exhausting ten percent more air flow than is supplied directly to the room.

2503.00.L Plumbing

2503.00.L.1 Not Applicable to this Brand
2503.00.L.2 Not Applicable to this Brand
2503.00.L.3 Exposed Plumbing
Exposed plumbing must be chrome-plated.
2503.00.L.4 Water Closet Material
Water closets must be vitreous china, wall mounted, low flow, with elongated bowls and a touchless flush valve.
2503.00.L.5 Not Applicable to this Brand
2503.00.L.6 Water Closet Seats
Water closet seats must match fixture color, be solid plastic, open front, self-sustaining and slow closing.
2503.00.L.7 Urinal Material
Urinals must be vitreous china with a touchless flush valve.
2503.00.L.8 Not Applicable to this Brand
2503.00.L.9 Faucets
Provide commercial grade touchless faucets at each wash basin. Faucets must be plated brass and manufactured by nationally known manufacturers. All fixtures must be low-flow type.

2503.00.M Vanity

2503.00.M.1 Not Applicable to this Brand
2503.00.M.2 Wash Basin Material
Wash basins must be vitreous china under-mount bowls with an overflow design as a minimum. Alternative designs are allowed but require approval.
2503.00.M.3 Top/Splash Material
Vanity top and splashes must be a solid surface or stone material compliant with Section 2515.04.
2503.00.M.4 Not Applicable to this Brand
2503.00.M.5 Concealed Piping
Vanity skirt or removable panel must conceal piping from guest view

2503.00.N Electrical

2503.00.N.1 Lights
Lights must be key switched or have occupancy sensors with a 30 minute delay before switching off. If sensors are used, a single entry light must remain on at all times in multi-stall restrooms.

2503.00.N.2 Not Applicable to this Brand
2503.00.N.3 Not Applicable to this Brand
2503.00.N.4 Light Levels
Refer to Section 2514.08 for minimum light level requirements.

2503.00.N.5 Power Outlets
Two GFCI/ELCB/RCCB (or equal) power outlets (socket outlets) are allowed. When provided they must be located on a sidewall of the wash basin.

2503.00.O Furnishings, Fixtures and Equipment

2503.00.O.1 Mirror
Mirrors are required over the wash basins. Mirror may be backlit and frameless.

2503.00.O.2 Line of Sight
Direct line of sight via mirror reflection into restrooms is prohibited.

2503.00.O.3 Full Length Mirror
Provide a decorative, full length mirror near the restroom entrance.

2503.00.O.4 Artwork
Framed artwork is required.

Mexico: Artwork is required in all bathrooms except those with full height, stone or tile walls.

2504.00 Food And Beverage
Refer to Section 2514.00, Technical Criteria, and Section 2515.00, Furnishings Fixtures and Equipment, for requirements applicable to this Section.

2504.01 Food Prep/ Kitchen

2504.01.A Professional Kitchen Consultant
All kitchens must be designed by a professional kitchen consultant and approved by Hilton.
2504.01.B Food Prep Area Location
The kitchen must be located to permit the least possible travel distance between food pick-up and the restaurant. If the banquet kitchen is located within the same zone, the combined area must be located as equidistant from banquet/meeting rooms and restaurant area as possible.

2504.01.C Receiving Area Access
Provide direct access from the receiving area to kitchen storage and preparation area.

2504.01.D Team Member Dining Access
Provide convenient access from the kitchen to the team member dining area.

2504.01.E Room Service Access
When room service is provided, provide room service in kitchen with convenient access to the pick-up area and beverage stations.

2504.01.F Assembly Area & Storage
Provide storage for room service carts adjacent to or under the work counter.

2504.01.G Room Service to Elevator Access
Provide convenient access from the room service area to the service elevators/lifts.

2504.01.H Lounge and Pantry Access
Provide secondary access from the kitchen to the lounge and pantries.

2504.01.I Kitchen Work Aisles
Kitchen work area aisles must be a minimum of 3'-6"/1.1 m wide. Aisles in the primary cooking/chef's area must be a minimum 3'-0"/900 mm wide. Provide additional clearance in front of ovens and large cooking equipment.

2504.01.J Direct Sight Lines
Direct sight lines are unacceptable between the kitchen and any guest area, except for display cooking areas.

2504.01.K Transition Zones
The transition zones between public and back of house areas must act as sound, light and visual filters between these areas. These transition zones must employ compatible and transitional lighting levels and colors, paint and finish materials and screening mechanisms to filter views and sounds from back of house areas.

2504.01.L Multi Level Facilities
If food and beverage and banquet facilities must be provided on more than one level of the hotel, provide convenient access from the kitchen by both service elevator(s)/lift(s) and a stair.

2504.01.M Cross Traffic
Avoid cross traffic between dishwashing and other kitchen functions.

2504.01.N Soiled Dishes/Storage Space
Provide space in the dishwashing area for the breakdown of soiled dishes and the storage of dish carts and dollies.
2504.01.O  Not Applicable to this Brand

2504.01.P  Doors
   2504.01.P.1  Not Applicable to this Brand
   2504.01.P.2  Kitchen receiving doors must have a lockset, kick plate and door closer with magnetic hold open feature.
   2504.01.P.3  Kitchen serving doors must be securable and have push/pull plates, kick plates and door closers.

2504.01.Q  Finish Options - Food Prep/ Kitchen
   2504.01.Q.1  Floor: Quarry tile (minimum 6”/150 mm x 6”/150 mm), porcelain tile (minimum 12”/300 mm x 12”/300 mm), epoxy-screed concrete floors, poured resinous flooring system. All floors must be non-slip or slip-resistant.
      2504.01.Q.1.a  Kitchen floors must be installed in a two-inch mortar bed. Extend kitchen floor finish into walk-in coolers.
      2504.01.Q.1.b  Where kitchens are located over other habitable spaces, provide a waterproof membrane and floating slab floor construction.
      2504.01.Q.1.c  Slope all floors to drain.
      2504.01.Q.1.d  All floor transitions must be flush to facilitate cart movement and avoid tripping hazards.
      2504.01.Q.1.e  Base (minimums): 4”/100 mm quarry tile, porcelain tile, through body synthetic. Tile base must be matching, sanitary and coved when possible.
   2504.01.Q.2  Wall: Epoxy paint, porcelain tile, natural stone, fiberboard reinforced plastic (FRP), fire-resistant extruded PVCu seamless wall cladding
      2504.01.Q.2.a  The walls must be a minimum fiberboard reinforced plastic (FRP), porcelain tile. Walls behind the cooking and dishwashing areas must be of masonry construction or full-height tile, stainless steel or fiberglass-reinforced panels. All joints must be sealed. All walls must meet code requirements and have a washable finish.
      2504.01.Q.2.b  Provide stainless steel or rubber corner guards and wall railings at columns and wall outside corners subject to damage from cart traffic.
   2504.01.Q.3  Ceiling: Washable ceiling tile, paint on gypsum
      2504.01.Q.3.a  Minimum clear ceiling height in all kitchen areas is 10’-0”/3.0 m.

2504.01.R  Countertop Materials
   Provide straight turn down edges and overhangs on fabricated counters and tables to permit a tight seal with adjacent equipment.

2504.01.S  Not Applicable to this Brand

2504.01.T  Required Accessories
   Provide waste receptacle, stainless steel towel dispenser and soap dispenser at hand wash basin in kitchen.

2504.01.U  Mechanical
   2504.01.U.1  Refrigerated Rooms
      2504.01.U.1.a  Locate all air-cooled refrigeration equipment remote from the equipment they serve where heat can be dissipated to the outdoors. Protect outdoor equipment with weather protection and screen from guest view.
      2504.01.U.1.b  Locate water-cooled refrigeration equipment with service access.
2504.01.U.1.c Provide temperature monitoring with building automation system.

2504.01.U.2 Air Conditioning

2504.01.U.2.a Provide air conditioning and ventilation to comply with the conditions listed in Section 2514.06, Environmental Conditions Matrix.

2504.01.U.2.b Design kitchen ventilation systems to comply with NFPA 96 (www.nfpa.org), including: interlock of supply and exhaust fans, grease exhaust duct systems, hood design, hood fire extinguishing systems, gas control valves, and manual shut off devices. See Section 2516.03.E Kitchen Hood and Duct Protection

2504.01.U.2.c Fabricate dishwasher exhaust ducts from aluminum, galvanized or stainless steel, sloped back to the capture hood.

2504.01.V Plumbing

2504.01.V.1 Grease Interceptors

2504.01.V.1.a Provide dual grease interceptors located outdoors in an area serviceable without disruption of normal activities, and out of guest view.

2504.01.V.1.b Use metallic piping for all underground piping upstream of the grease interceptor. Plastic piping is not acceptable.

2504.01.V.1.c Comply with local codes regarding size and location.

2504.01.V.1.d Connect water wash exhaust hoods drain line with air gap directly to grease waste and not through floor drain or basin.

2504.01.V.2 Floor Drains/Basins

2504.01.V.2.a Provide floor drains/basins with removable baskets or grates at all locations where indirect waste receptors are required.

2504.01.V.2.b Provide above the floor, porcelain enameled, cast iron basins that are suitable for food service installations.

2504.01.V.2.c Provide chrome-plated brass floor drains for all areas not requiring indirect waste receptors. All areas must be provided with drainage to centralized floor drains.

2504.01.V.3 Trough Drains

2504.01.V.3.a Provide where required by equipment locations.

2504.01.V.3.b Construct trough and grate of fiberglass or stainless steel.

2504.01.V.3.c Limit grate opening size to 1”/25 mm by 1”/25 mm.

2504.01.V.3.d Install trough drain along front of ice machines and extend 6”/150 mm on both sides of the machine opening.

2504.01.V.4 Provide hot and cold hose valves, hose with reel and floor drain in the prep area.

2504.01.V.5 Provide floor mounted mop basin with strainer and cold water hose valve in dishwashing area.

2504.01.V.6 Provide hot water supply to the dishwasher at a minimum of 140 °F/60 °C.

2504.01.V.7 Provide a hot water softening system when water supply hardness exceeds five grains. **Mexico:** Provide a hot water softening system when water supply hardness exceeds five grains. Separate soft water circulation system is required for kitchen area.

2504.01.V.8 Provide a plumbed emergency eye wash station that complies with ANSI/ISEA Z358.1-2009 (wwwansi.org) or country recognized safety equivalent with floor drain in the kitchen.
2504.01.V.9 Provide a water fill hose adjacent to or above four-burner ranges and hot tops.

2504.01.W Janitor's Closet

Provide a janitors closet in or adjacent to the kitchen. Janitor’s closet must have a mop wash basin, supply shelf and a mop and broom holder.

**Mexico:** Not Applicable to this Brand

2504.01.X Electrical

2504.01.X.1 Lighting

- **2504.01.X.1.a** Provide recessed LED, vapor-proof fixture with warm white lamps.
- **2504.01.X.1.b** Not Applicable to this Brand
- **2504.01.X.1.c** Not Applicable to this Brand
- **2504.01.X.1.d** Refer to Section 2514.08 for minimum light level requirements.

2504.01.X.2 Power

- **2504.01.X.2.a** Power outlets (socket outlets) must be provided to suit the installed equipment with an additional general purpose power outlets (socket outlets).
- **2504.01.X.2.b** Protect all power outlets (socket outlets) in kitchen with GFCI/ELCB/RCCB or equal circuits. Refer to Section 2514.08, Technical Criteria for requirements applicable to this section.
- **2504.01.X.2.c** Provide two power outlets (socket outlets) for the following locations:
  - **2504.01.X.2.c.1** Banquet food carts.
  - **2504.01.X.2.c.2** Clock located at 7’0”/2.1 m above the floor, and visible from cooking line and pickup area.
  - **2504.01.X.2.c.3** Point of sale equipment locations for room service, pick-up area, beverage stations and/or service stands require a minimum of four power outlets (socket outlets) and two data outlets.
  - **2504.01.X.2.c.4** Caller display unit in-room service.
  - **2504.01.X.2.c.5** General cleaning.
  - **2504.01.X.2.c.6** All kitchen equipment needing power.
- **2504.01.X.2.d** Provide stainless steel cover plates for all electrical devices in kitchen.

2504.01.Y Technology

- **2504.01.Y.1** Not Applicable to this Brand
- **2504.01.Y.2** Provide a telephone outlet for a wall mounted house telephone in the kitchen area.
- **2504.01.Y.3** Provide a telephone outlet for a minimum two-line telephone with calling number display in-room service.
- **2504.01.Y.4** Provide four telephone outlets and data ports at all cash register/point of sale terminals requiring credit card verification.
- **2504.01.Y.5** When a Chef's Office is provided, provide a minimum of one wall mounted 50” HDTV near the Chef's Office.

2504.01.Z Equipment
2504.01.Z.1 Provide for the following commercial grade equipment:

2504.01.Z.1.a Provide touchless hand washbasin in each food prep area or as required by code, complete with stainless steel back splash, soap and towel dispenser.

2504.01.Z.1.b Not Applicable to this Brand

2504.01.Z.1.c Not Applicable to this Brand

2504.01.Z.1.d Not Applicable to this Brand

2504.01.Z.1.e All convection ovens must have solid stainless steel doors (doors with glass panels are allowed).

2504.01.Z.1.f Not Applicable to this Brand

2504.01.Z.1.g Not Applicable to this Brand

2504.01.Z.1.h Provide both flaked and small cube water-cooled ice machines.

2504.01.Z.1.i Not Applicable to this Brand

2504.01.Z.1.j Not Applicable to this Brand

2504.01.Z.1.k Not Applicable to this Brand

2504.01.Z.1.l Provide isolating individual runs to service the soda dispensing system without shutting down entire system. Do not mount equipment on the floor. Provide exhaust for system if unit is mechanically refrigerated and has an air-cooled compressor.

2504.01.Z.1.m All equipment must have NSF, Underwriters Laboratories or CE labels or code-approved equivalent.

2504.01.Z.2 Not Applicable to this Brand

2504.01.Z.3 Kitchen hoods must be a minimum of 6'-6"/2.0 m above the finished floor.

2504.01.Z.4 Refer to 2516.03.E for kitchen hood and duct protection requirements.

2504.01.Z.5 Kitchen hoods must exhaust on average 350 ft² per minute/linear foot or 2,000 m² per hour/linear meter. The following must be taken into consideration in calculating specific exhaust requirements:

2504.01.Z.5.a Type, energy source and use of equipment below the hood.

2504.01.Z.5.b Position of equipment below the hood.

2504.01.Z.5.c Style and geometry of the hood.

2504.01.Z.5.d Introduction method for the kitchen make-up air.

2504.01.Z.6 Kitchen hoods must be tested for proper operation after installation of all pertinent equipment is complete.

2504.01.Z.7 Heavy duty cooking equipment must be on legs with wheels to allow utility service and fire protection disconnects.

2504.01.Z.8 Use grease extractor hoods except where the use of natural wood broilers requires water wash. Must not be connected with gas or electrical operated equipment. Hotels over 500 rooms require water wash hoods.

2504.01.Z.9 Provide flush/recessed handles and controls for all fabricated equipment.
2504.01.Z.10 Generate steam for kettles in electric steam boiler in compartment or convection steamer base. Do not use self-contained gas or electric kettles over ten gallons.

2504.01.Z.11 Tilting brazing pans must be gas heated.

2504.01.Z.12 Provide 18”/450 mm deep pick-up shelf with triple warming lamps at food pick-up areas.

2504.01.Z.13 Provide 3HP disposal in dishwashing area where code permits.

2504.02 Food And Beverage Storage

2504.02.A Food & Beverage Storage

Food and beverage storage must be laid out by a professional kitchen consultant and approved by Hilton.

2504.02.B Not Applicable to this Brand

2504.02.C Not Applicable to this Brand

2504.02.D Food Storage Areas

Food storage areas must be centrally located between the receiving area and the preparation area, but separate from the chef’s coolers and banquet prep area.

2504.02.E Beverage Dispensing Equipment Room

The beverage dispensing equipment room must be centrally located to the required dispensing points.

2504.02.F Food & Beverage Supplies Storage

Food and beverage supplies must be kept either on steel shelving in open racks, in boxes in the screened-in bulk storage area or in cold storage in the refrigerators or freezers.

2504.02.G Bulk Unprepared Food Storage

Bulk unprepared food, both dry and refrigerated, must be stored separately from issued and prepared food.

2504.02.H Finish Options - Food & Beverage Storage

Finish Options - Food & Beverage Storage

2504.02.H.1 Floor: Quarry tile (6”/150 mm x 6”/150 mm), epoxy-screed concrete floors within beer cooler/cellars laid to fall with central floor drain.

2504.02.H.1.a Base (minimum): 4”/100 mm quarry tile, through body synthetic

2504.02.H.2 Wall: Paint, FRP

2504.02.H.2.a Provide metal or rubber corner guards and wall railings at columns and wall outside corners.

2504.02.H.3 Ceiling: Washable ceiling tile, paint on gypsum

2504.02.H.3.a Storerooms must have a minimum clear ceiling height of 9’-0”/2.75 m.

2504.02.H.3.b The ceilings over refrigerated rooms must be insulated.

2504.02.I Liquor/Wine Storage
2504.02.I.1 Liquor and wine must be kept in a separate locked storeroom with a cool area for wine storage.
2504.02.I.2 The wine storage area must be professionally designed to store and maintain wine at its ideal temperature. The size of the facility is dependent upon the size of the beverage offering.
2504.02.I.3 The liquor and wine storage area must be located with convenient access to the restaurant and bar. Convenient access must also be available from the banquet service corridor, the lounge and the kitchen service bar. Liquor storage must be located adjacent to the primary service circulation and within reasonable proximity of the receiving area.
2504.02.I.4 Provide only one securable point of access to the liquor storage area.
2504.02.I.5 Entrance door must be fire rated, a minimum width of 4'-0"/1.2 m and include a lockset, kick plate and closer with hold open feature.
2504.02.I.6 Provide a removable core lock cylinder that is not on the building master keying system for the entrance door to the liquor storage area.
2504.02.I.7 Partitions surrounding the liquor storage area must extend and be secured to the underside of the structure above.
2504.02.I.8 Floor drains are required.
2504.02.I.9 Provide light fixtures with vapor proof diffusers. Refer to Section 2514.08 for minimum light level requirements.

2504.02.I.10 Liquor and wine must be kept in a separate locked storeroom with a cool area for wine storage.
2504.02.I.11 The wine storage area must be professionally designed to store and maintain wine at its ideal temperature. The size of the facility is dependent upon the size of the beverage offering.
2504.02.I.12 The liquor and wine storage area must be located with convenient access to the restaurant and bar. Convenient access must also be available from the banquet service corridor, the lounge and the kitchen service bar. Liquor storage must be located adjacent to the primary service circulation and within reasonable proximity of the receiving area.
2504.02.I.13 Provide only one securable point of access to the liquor storage area.
2504.02.I.14 Entrance door must be fire rated, a minimum width of 4'-0"/1.2 m and include a lockset, kick plate and closer with hold open feature.
2504.02.I.15 Provide a removable core lock cylinder that is not on the building master keying system for the entrance door to the liquor storage area.
2504.02.I.16 Partitions surrounding the liquor storage area must extend and be secured to the underside of the structure above.
2504.02.I.17 Floor drains are required.
2504.02.I.18 Provide light fixtures with vapor proof diffusers. Refer to Section 2514.08 for minimum light level requirements.

2504.02.J.1 A secure refrigerated storage facility, a cellar, must be provided when required by local market.
2504.02.J.2 The cellar area must be professionally designed to hold beer cases, ale kegs, post mix syrups, carbonators, associated dispensing lines, pumps, gas bottles, an area to restrain CO₂ gas cylinders, etc.
2504.02.J.3 The cellar must be located adjacent to service corridors and an external door (where possible) for delivery purposes. It must be conveniently located to the bar to minimize dispensing lines.
2504.02.J.4 Entrance door must be fire rated, a minimum width of 4'-0"/1.2 m and include a lockset, kick plate and closer with hold open feature.
2504.02.J.5 Area must include beverage storage rack units.
2504.02.J.6 Insulation must be provided at the walls and ceilings with a vapor barrier on the warm side.
2504.02.J.7 Provide air conditioning and ventilation compliant with the conditions listed in Section 2514.06 Environmental Conditions Matrix.
2504.02.J.8 Provide a low-level mop sink with hot and cold water.
2504.02.J.9 A floor drain must be provided.
2504.02.J.10 Provide light fixtures with vapor proof diffusers. Refer to Section 2514.08 for minimum light level requirements.

2504.02.K Walk-ins
2504.02.K.1 Locate the walk-in refrigerator within the storage area. Slab must be recessed to ensure refrigerator is flush with finished floor.

2504.02.K.2 Provide modular, prefabricated walk-in refrigerators and freezers with field-installed, 4"/10 cm, urethane sheet foam insulation, vapor-proof light fixtures, exterior thermostats and high temperature alarm system. **Mexico:** Provide modular, prefabricated walk-in refrigerators and freezers with field-installed, 4"/10 cm, urethane sheet foam insulation, vapor-proof light fixtures, exterior thermostats and high temperature alarm system. Condensate runs and other piping must be run on the exterior of the box.

2504.02.K.3 Walk-in boxes must be a minimum of 8'-3"/2.2 m high. Provide an integral bulkhead or a gypsum board bulkhead from the top of the box to the underside of the ceiling or structural deck above.

2504.02.K.4 Walk-in boxes must be specified without prefabricated floors. Recess and insulate building floor slab below. Isolate all refrigerator and freezer floor slabs from surrounding area. Raised floors in walk-ins and ramps must not protrude into the main circulation path.

2504.02.K.5 Provide floor recess for door heaters in walk-in boxes.

2504.02.K.6 Doors on walk-in boxes must have a minimum 12"/300 mm wide x 16"/400 mm high vision panel. Do not provide reach-in doors.

2504.02.K.7 Walk-in box entrance doors must be a minimum of 3'-6"/1.1 m wide and have lockset, kick plate, and closer with hold open feature.

2504.02.K.8 Provide escape hardware on inside of the walk-in box entrance door.

2504.02.K.9 Shelving in walk-in refrigerators must consist of approximately 1/3 full height shelving, 1/3 dunnage racks and 1/3 open area. Place full height shelving to rear of refrigerator.

2504.02.K.10 Size condensing units and evaporator coils for walk-in boxes to operate refrigerator at +35 °F/1.6 °C and freezer at -10 °F/-23 °C.

2504.02.K.11 Provide shielded vapor-proof ceiling lights in walk-in boxes. All conduit runs must be on the exterior of the box except the drop to the switch. Provide three way switches for boxes with two or more doors.

2504.02.L Electrical

2504.02.L.1 All large compressors must be remotely located from the equipment they service, either rack-mounted in an adjacent compressor room or clustered on the roof above in a weatherproof enclosure and screened from guest view.

2504.02.L.2 Provide a separate circuit for each compressor or each packaged compressor system that incorporates on-board distribution wiring.

2504.02.L.3 Provide a minimum of two power outlets (socket outlets) on each wall with spacing not to exceed 20'-0"/6.0 m on center and two convenience power outlets (socket outlets) at the entrance of each storage area.

2504.02.L.4 Provide a telephone outlet.

2504.02.L.5 Refer to Section 2514.08 for minimum light level requirements.

2504.03 Restaurant

2504.03.A Restaurant Requirements

A full-service three meal restaurant is required.

2504.03.B Restaurant Concepts
All restaurant concepts must be approved by Hilton.

2504.03.C Seating Requirements
The restaurant must have adequate seating based on market demand, number of rooms and food and beverage concepts but no less than 40 percent of the key count. Hotels with key counts in excess of 900 will require review for placement of additional outlets. Hilton reserves the right to adjust seating requirements dependent upon local market conditions.

2504.03.D Distinct Areas
When a full service restaurant is the only restaurant provided, consideration must be given to create distinct areas for general dining, breakfast and fine dining.

2504.03.E Not Applicable to this Brand

2504.03.F Not Applicable to this Brand

2504.03.G Server Stations/POS Stations
The restaurant must have concealed server stations, point of sale stations and kitchen access.

2504.03.H Restroom Proximity
Restrooms must be within close proximity of the restaurant and be separate from the hotel lobby public restrooms.

2504.03.I Not Applicable to this Brand

2504.03.J Coatroom
Provide a coatroom, where climate conditions dictate the use of coats.

2504.03.K Door Width
Restaurant doors must be a minimum of 3'-0"/915 mm wide x 8'-0"/2.4 m high.

2504.03.L Handrails
Handrails must be installed at all raised floor areas except where seating/planter act as barriers. Handrails must be installed at all steps along with appropriate step lighting.

2504.03.M Host/Hostess Station
The restaurant must have a designated host/hostess station located at the entrance. The face of the station should be designed to coordinate with the layout and decor of the restaurant. The inside of the station must be functionally designed to include space for menu storage, power and POS data cable management.

2504.03.N Natural Daylight
Provide natural daylight where possible while avoiding glare and excessive heat.

2504.03.O Finish Options - Restaurant
2504.03.O.1 **Canada | Puerto Rico | United States:** Floor: Carpet (broadloom and high definition CYP 48 oz.), wood - tongue and groove, porcelain tile, natural stone.

**Mexico:** Floor: Carpet (broadloom and high definition CYP 48 oz.), wood, natural stone, porcelain tile.

2504.03.O.1.a **Base (minimums):** 6"/150 mm wood, through body synthetic, 4"/100 mm porcelain tile, natural stone

2504.03.O.2 **Wall:** Vinyl wallcovering, paint, natural stone, porcelain tile, wood panels or special finish (special approval required)

2504.03.O.3 **Ceiling:** Paint on gypsum, acoustic ceiling tile (30 percent maximum)

**Mexico:** Ceiling: Open ceiling, paint on gypsum, acoustic ceiling tile (30 percent maximum)

2504.03.O.3.a Acoustic ceiling tile must be spineless, tight grid with smooth, large acoustical panels or 4'-0 x 4'-0'/1.2 m x 1.2 m acoustic ceiling tile, (30 percent maximum)

2504.03.O.3.b Minimum ceiling height is 10'-6"/3.2 m.

2504.03.O.3.c When automatic suppression systems are required (see section 2516.00) concealed type sprinkler heads must be utilized.

2504.03.P Not Applicable to this Brand

2504.03.Q Not Applicable to this Brand

2504.03.R **Top Surface Material**

Top surfaces of counters, buffets, bars and host/hostess stations must be a material that complies with Section 2515.04. If bar tops are wood, they must have a polyurethane finish.

2504.03.S **Electrical**

2504.03.S.1 Not Applicable to this Brand

2504.03.S.2 General lighting in the restaurant must be concealed, energy efficient light fixtures with electronic dimming controls by function zones. Dimmer controls must have a minimum four-scene preset setting. Locate the dimmer control panel near the host/hostess area. Dimmer panels must be concealed from guest view and linked with the building automation system if they are not located in a remote structure.

2504.03.S.3 Restaurant must have decorative lighting.

2504.03.S.4 Not Applicable to this Brand

2504.03.S.5 All steps must be illuminated for safety.

2504.03.S.6 Refer to Section 2514.08 for minimum light level requirements.

2504.03.S.7 Not Applicable to this Brand

2504.03.S.8 Power outlets (socket outlets) must be provided along the floor perimeter and around caseworks for guest convenience.

2504.03.S.9 Provide four power outlets (socket outlets) and four data/telephone outlets at each service station.

2504.03.S.10 Not Applicable to this Brand

2504.03.S.11 The host/hostess stand must have a telephone outlet, data port, and power outlets (socket outlets).

2504.03.T **Furnishings, Fixtures and Equipment**
2504.03.T.1 Seating must comply with the following:
   2504.03.T.1.a Seating must be manufacturer's commercial grade.
   2504.03.T.1.b Chair seats and backs must be upholstered with commercial grade fabric.
   2504.03.T.1.c Stack chairs and folding banquet tables or temporary tables are not permitted in the restaurant.

2504.03.T.2 Dining tables must comply with the following:
   2504.03.T.2.a Not Applicable to this Brand
   2504.03.T.2.b Not Applicable to this Brand
   2504.03.T.2.c Not Applicable to this Brand
   2504.03.T.2.d Dining tabletops must be a material that complies with Section 2515.04.
   2504.03.T.2.e Table base must be designed to support tabletops without tipping over easily when weight is applied to one side and must have leveling capabilities or use a flat-technology to avoid rocking and tipping. Table base must have gliders.

2504.03.T.3 Provide a counter that seats a minimum of 10.

2504.04 Bar
   2504.04.A Bar Definition & Location
      A bar is defined as a permanent, stand alone establishment, enclosed separately from public spaces such as the lobby. The bar includes the bar counter and associated seating (dining and lounge).
      **Mexico:** Not Applicable to this Brand
   2504.04.B Lobby Bar Definition & Location
      A lobby bar is defined as an open area bar positioned within the lobby area. The lobby bar transitions throughout the day as necessary – serves coffee in morning, drinks in evening. The lobby bar includes the bar counter and associated seating (dining and lounge).
      **Mexico:** Not Applicable to this Brand
   2504.04.C Not Applicable to this Brand
   2504.04.D Not Applicable to this Brand
   2504.04.E Bar Counter
      A bar counter is the millwork fixture and any associated back counters and equipment. Seating is not included.
      **Mexico:** Not Applicable to this Brand
   2504.04.F Non-Seating Bar
      Hotels are required to have either a bar or lobby bar as a minimum.
   2504.04.G Bar Location
      The bar must have access to the kitchen, where food service is anticipated. Provide direct exterior access for the general public where possible.
   2504.04.H Not Applicable to this Brand
2504.04.I Not Applicable to this Brand

2504.04.J Seating Quantity Requirements
Provide seating of 25 percent (30 percent if convention center facility) of key count at the lobby bar and bar combined. Hilton reserves the right to require more seating dependent upon local market conditions.

2504.04.K Cocktail Station
Provide one cocktail station for every 30 seats in the bar.

2504.04.L Bartender’s Station
Provide one bartender’s station for every 50 seats in the bar.

2504.04.M Doors
Entrance doors must be a minimum of 3’-0”/915 mm wide x 8’-0”/2.4 m high.

2504.04.N Hanging Glassware
Locate continuous hanging glassware away from guest seating area.

2504.04.O Coatroom
Provide a coatroom, where climatic conditions dictate the use of coats.

2504.04.P Raised Floor Handrails
Handrails must be installed at all raised floor areas except where seating/planters act as barriers.

2504.04.Q Step Handrails
Handrails must be installed at all steps along with appropriate step lighting.

2504.04.R Back/Service Bar
Service Bar

2504.04.R.1 Not Applicable to this Brand

2504.04.R.2 Provide a separate designated service bar area that is concealed when not in use.

2504.04.R.3 Provide rolling counter shutters or lockable doors at pass-through windows of service bars. Shutter must be controlled from within the service bar.

2504.04.R.4 Provide locked storage cabinets that are in the public view that are designed to be aesthetically composed when in a closed condition and fully compatible with the rest of the restaurant public area finishes.

2504.04.S Finish Options - Bar/Lounge

2504.04.S.1 Canada | Puerto Rico | United States:
Floor: Porcelain tile, natural stone, wood - tongue and groove, carpet (broadloom and high definition CYP 48 oz.)

2504.04.S.1.a Base (minimums): 6”/150 mm wood - stain grade, 4”/100 mm porcelain tile, natural stone

2504.04.S.2 Wall: Paint, vinyl wallcovering, natural stone, porcelain tile, wood panels or special finish (special approval required)
2504.04.S.3 Ceiling: Paint on gypsum, acoustic ceiling tile (30 percent maximum)  
**Mexico:** Ceiling: Paint on gypsum, wood, acoustic ceiling tile (30 percent maximum), open ceiling

2504.04.S.4 When automatic suppression systems are required (see section 2516.00) concealed type sprinkler heads must be utilized.

2504.04.T Bussing/Server Stations  
Server stations, when provided, must be concealed.

2504.04.U Back Bar Millwork Requirements  
The bar must comply with the following:

- **2504.04.U.1** The bar counter must be a permanent fixture.
- **2504.04.U.2** The bar counter front finish must be wood, tile, stone or other approved material. Bar top must be a material that complies with Section 2515.04.
- **2504.04.U.3** Not Applicable to this Brand
- **2504.04.U.4** A 36”/900 mm hard surface apron is required around the base of the bar counter.

2504.04.V Not Applicable to this Brand

2504.04.W Mechanical/Plumbing  

- **2504.04.W.1** If smoking is allowed, provide smoke removal system for any recirculated air, or dedicated exhaust system to maintain indoor air quality.
- **2504.04.W.2** Provide a wash basin, soap and towel dispenser and trash receptacle in each work area, or as required by local code.
- **2504.04.W.3** Provide a covered floor drain behind each bar counter. Slope floor to drain.
- **2504.04.W.4** Provide at least one plumbed glass washing station.

2504.04.X Electrical  

- **2504.04.X.1** General lighting in the lobby bar must be recessed light fixtures supplemented with indirect and decorative lighting fixtures. Dimmer controls must have a preset four scene setting with a minimum of three zones. Locate the dimmer control panel at the main cocktail bar. Dimmer panels must be concealed from guest view.
- **2504.04.X.2** Not Applicable to this Brand
- **2504.04.X.3** Refer to Section 2514.08 for minimum light level requirements.
- **2504.04.X.4** Provide convenience outlets for guest use.
- **2504.04.X.5** Provide point of sale terminals at bartenders’ and/or servers’ pick-up stations.
- **2504.04.X.6** Provide two power outlets (socket outlets) above back splash at each cocktail station.
- **2504.04.X.7** Provide four power outlets (socket outlets) with dedicated power and conduit for each point of sale terminal and an additional two power outlets (socket outlets).
- **2504.04.X.8** Provide an outlet for one wall mounted house telephone, mounted below the bar counter and one at each service bar. Provide four data/telephone outlets at each point of sale terminal.

2504.04.Y Television Requirement
Provide a minimum of two wall mounted HDTVs at the bar counter area. Televisions must be incorporated into the bar millwork close to the ceiling. Televisions must comply with the sizes and specifications provided in Sections 713.00 and 2514.09.

2504.04.Z Furnishings, Fixtures and Equipment

2504.04.Z.1 Seating and upholstery must be commercial grade.
2504.04.Z.2 Not Applicable to this Brand
2504.04.Z.3 Tables must comply with the following:
2504.04.Z.3.a Not Applicable to this Brand
2504.04.Z.3.b Not Applicable to this Brand
2504.04.Z.3.c Not Applicable to this Brand
2504.04.Z.3.d Tabletops must be a material that complies with Section 2515.04. Table base must be designed to support tabletops without tipping over easily when weight is applied to one side and must have self leveling capabilities or use a flat-technology to avoid rocking and tipping.

2504.05 Not Applicable to this Brand

2504.06 Not Applicable to this Brand

2504.07 Cafe

2504.07.A Café Requirement

The café is optional. It is a quality, self service limited menu restaurant. The size of the café is market driven, but the total number of café seats must never be less than sixteen. Hilton must review and approve each plan based on local market demands/requirements.

2504.07.B Not Applicable to this Brand
2504.07.C Not Applicable to this Brand
2504.07.D Doors

Restaurant doors must be a minimum of 3'-0"/915 mm wide x 8'-0"/2.4 m high.

2504.07.E Concealed Bussing Stations

Provide concealed bussing stations and waitress stations.

2504.07.F Not Applicable to this Brand

2504.07.G Finish Options - Café

2504.07.G.1 Floor: Wood - tongue and groove, porcelain tile, natural stone, marble/granite
2504.07.G.1.a Base (minimums): 6"/150 mm wood - stain grade, porcelain tile, natural stone
2504.07.G.2 Wall: Vinyl wallcovering, paint, natural stone, porcelain tile, wood panels or special finish (special approval required)
2504.07.G.3 Ceiling: Paint on gypsum, acoustic ceiling tile (30 percent maximum)
2504.07.G.4 When automatic suppression systems are required (see section 2516.00) concealed type sprinkler heads must be utilized.

2504.07.H Top Surface Material
Top surfaces of counters and buffets must be a material that complies with Section 2515.04.

2504.07.I Adjustable Lighting Levels
Lighting must provide adjustable intensity levels.

2504.07.J General Lighting
General lighting must be recessed light fixtures with dimmer controls by function zones. Dimmer controls must have a preset four-scene setting with a minimum of three zones. Locate the dimmer control panel behind the counter concealed from guest view. Dimmer racks must be located within the Back of House areas, wall recessed units and without blocking operational traffic flow.

2504.07.K Light Levels
Refer to Section 2514.08 for minimum light level requirements.

2504.07.L Electrical/Data Connections
Provide four electrical and four data/telephone connections for point of sale system.

2504.07.M Convenience Outlets
Provide convenience outlets for guest use at fixed seating locations. Seating area must accommodate a power outlet (socket outlet) and USB outlet at a ratio of 4 seats per 1 outlet/USB.

2504.07.N Furniture, Fixtures and Equipment
2504.07.N.1 Seating must be manufacturer's commercial grade.
2504.07.N.2 Tabletops must be a material that complies with Section 2515.04.
2504.07.N.3 Table base must be designed to support tabletops without tipping over easily when weight is applied to one side and must have self leveling capabilities or use a flat-technology to avoid rocking and tipping.
2504.07.N.4 Stack chairs and folding banquet or temporary tables are not permitted.

2504.08 Buffet
2504.08.A Breakfast Buffet Requirement
A breakfast buffet is required for hotels having a single food and beverage outlet (three meal restaurant) and/or with limited banquet space (under 500 ft²/46 m²) and daily cover counts in excess of 75 cover per day on average. The breakfast buffet bar or counter must be located in the hotel's primary restaurant facility, with convenient access to the back of house kitchen or pantry. Sliding doors or partitions must be utilized and match the design and decor of the restaurant interior.

2504.08.B Design Approval
Detailed design approval is required.

2504.08.C Buffet Counter Sections
Buffet counters must ensure safe food handling and accommodate brand operating breakfast standards. Adequate space must be in place for the required food zones. Refer to Section 400 - Food and Beverage for requirements and specifications.

2504.08.D Sneeze Guards
All buffet counters must have sneeze guards, which comply with applicable regional laws and codes.

2504.08.E Breakfast Buffet Equipment
Breakfast buffet counters must include cold handling units/drop in frost tops, hot wells, hot holding units/induction buffet warmers, cook to order station for omelets and waffles or a carving station (optional), and toaster as determined by layout. Below counter areas of the breakfast bars or counters must include storage space for plates/bowls, bus boxes, wash basins, refuse receptacles, and refrigerated storage and drop in equipment as determined by layout. In all cases, final configuration must allow for ventilation and easy access for cleaning.

2504.08.F Not Applicable to this Brand

2504.08.G Built-in Millwork & Countertop
For hotels with a built-in unit, the breakfast buffet must have a custom millwork face and a solid surface counter at 34”/865 mm above the finished floor that compliments the interior design and restaurant finishes. The top surface material must comply with Section 2515.04.

2504.08.H Hand Wash Sink
A hand wash sink with hot and cold running water should be provided for a cooked to order station, in any new construction, if required by local code.

2504.08.I Access Panels
Access panels for service must match adjacent finishes.

2504.08.J Concealed Wiring/Plumbing
All wiring, plumbing and waste lines must be concealed within service chase inside the cabinet construction.

2504.08.K Finish Options - Buffet
2504.08.K.1 Floor: Carpet (broadloom and high definition CYP 48oz.), wood - tongue and groove, porcelain tile, natural stone
   2504.08.K.1.a Base (minimums): 6”/150 mm wood, porcelain tile, natural stone
   2504.08.K.1.b When carpet is utilized for the flooring in the buffet serving area a decorative hard surface must extend 24” – 36”/600 mm – 900 mm in front of the food service counter.

2504.08.K.2 Wall: Vinyl wallcovering, paint, hard surface, porcelain tile, wood panels or special finish (special approval required)

2504.08.K.3 Ceiling: Paint on gypsum, acoustic ceiling tile (30 percent maximum)

2504.08.K.4 When automatic suppression systems are required (see section 2516.00) concealed type sprinkler heads must be utilized.

2504.08.L Electrical
2504.08.L.1 Color/food enhancing lighting must be provided above the buffet food display and work areas. All lighting above the chilled displays must be dimmable LED and must have a dedicated on/off switch.

2504.08.L.2 Provide power outlets (socket outlets) for all kitchen equipment and convenience power outlets (socket outlets).
2504.08.L.3 All power outlets (socket outlets) must be provided with GFCI/ELCB/RCCB or equal protection.
2504.08.L.4 All electrical must be compliant with current IEE regulations or the requirement of the country of installation.
2504.08.L.5 The counters, where required by code, must be fitted with a mains distribution board or appropriately sized electrical panel with local isolation at the point of display.
2504.08.L.6 All display, both heated and chilled, must be fitted with local isolation switch and digital controller/display (heated and chilled) or simmer-stat (hot counters) on a control panel concealed within the counter behind a door on a touch latch to prevent tampering.
2504.08.L.7 Not Applicable to this Brand
2504.08.L.8 All lighting above the hotplates must be push fit quartz lamps, 300 or 500 watt type, with infinitely variable controllers. Heat lamps (unless decorative) must be height adjustable.
2504.08.L.9 Refer to Section 2514.08 for minimum light level requirements.

2504.08.M Furniture, Fixtures and Equipment
2504.08.M.1 Buffet unit or exhibition cooking counter must have all necessary equipment specified by kitchen consultant as approved by the Operator and Hilton.
2504.08.M.2 Refer to Section 400 – Food and Beverage for required display equipment.
2504.08.M.3 Induction chafing dishes must be counter top induction ready dishes. The induction/burners must be mounted in counter or under mounted below the chafer. The induction controllers must be mounted behind the valance panel within 3'-0"/1 m of the hob (or mounted below from the framework on a hinge down mechanism). Warmers/burners must be easily accessible for service and maintenance. Chafing dishes with open flame are allowed for exterior usage only.
2504.08.M.4 Chafers or other food cooking/warming units using liquid, gel or gas fuel and producing an open flame are not permitted. Induction warming or cooking unit systems must be used. Proper cold holding units for food displays must be used and must maintain temperatures consistent with local health regulations.
2504.08.M.5 The induction hobs must be mounted below the counter surface and suspended from the counter framework. Hobs must be easily accessible for service and maintenance.
2504.08.M.6 Regional health codes must be adhered to when designing, specifying, and installing buffet stations or equipment.
2504.08.M.7 All equipment must have NSF, Underwriters Laboratories, or CE labels or other local code equivalent.

2504.08.N Buffet Specifications
2504.08.N.1 Worktops
2504.08.N.1.a All worktops must be constructed using a Hilton approved solid surface material.
2504.08.N.1.b All worktop edges must have a 1-1/2"/40 mm square polished edge and be radiused to 1/10"/3 mm.
2504.08.N.1.c Worktops must extend a minimum of 1-1/2" / 40 mm past vertical millwork faces to prevent moisture damage to vertical surfaces.
2504.08.N.1.d Selected solid surfaces must be installed using the manufacturer’s recommended installation guidelines. Solid surfaces must be heat resistant to 212°F/100°C and cold resistant to 32°F/0°C to prevent damage and warping.
2504.08.N.1.e All up stands to the rear and ends (back and side splashes) must be fabricated in the identical material as the worktop 4”/100 mm high minimum.

2504.08.N.1.f All holes formed in the worktop to receive drop-in items must have polished edges and all cable ports must have black plastic cable management inserts or grommets.

2504.08.N.1.g The solid surface worktops must be constructed using minimal joints, bearing in mind that expansion joints are required to avoid the granite cracking along lines of least resistance, especially in close proximity to a heat source. Thermal strips must be installed as required.

2504.08.N.1.h The deck plates to the chilled displays must be in ½”/12 mm thick solid surface tiles to match the worktop, to reduce the weight of the deck plates when removed for service and cleaning.

2504.08.N.1.i The removable trivets to the chilled displays which form the upper base display level must be constructed using ¾”/20 mm thick granite or quartz bonded on to a steel plate with a 3/8”/10 mm stainless steel rod formed to make a skid. Trivets must be formed small enough to be removed easily and safely.

2504.08.N.1.j All worktops must be levelled and bedded down using food grade silicone sealant.

2504.08.N.2 Frame Work

2504.08.N.2.a All frame work must be constructed using ¾”/ 20 mm marine grade plywood and marine grade fir or equal blocking material.

2504.08.N.2.b 4”/100 mm millwork base required for installation of framework. Toe kick to set back a minimum of 2”/50 mm and must be clad in 18 gauge stainless steel or selected flooring material to cove up millwork base as specified by designer/kitchen consultant.

2504.08.N.2.c Exterior of millwork must be finished with veneers or tile as specified by designer/kitchen consultant.

2504.08.N.2.d Not Applicable to this Brand

2504.08.N.2.e Material transition strip must be Schluter or equal and inset metal corner protection must be Futura or equal and installed as per millwork design drawings.

2504.08.N.3 Linings

2504.08.N.3.a All cupboard lining must be finished in plastic laminate.

2504.08.N.3.b All cupboards linings fabricated in plastic laminate must be sealed with approved food grade silicone to prevent any ingress of liquid and moisture into the counter void below.

2504.08.N.3.c All shelves must be removable and supported on adjustable stainless steel pilasters. Shelves to be offset to allow a cleaning gap to the rear and both sides and for easy removal.

2504.08.N.3.d The rear cupboard panels must be removable where required to gain access to the void/service chase behind.

2504.08.N.4 Removable Access Panels

2504.08.N.4.a All removable access panels must be constructed using ¾”/20 mm marine grade plywood to receive a finish as specified by designer/kitchen consultant.

2504.08.N.4.b The rear of the panels must be secured with a Z Clip or French Cleat system for ease of removal for service and maintenance access.

2504.08.N.4.c All panel joints must be positioned according to the interior designer’s requirements or to allow safe removal of the counter panels.
2504.08.N.4.d Each joint must have a shadow gap either painted or stained to match the counter finish or as specified by the interior designer.
2504.08.N.4.e As an option the bottom edge of the valance panels can be clad in a stainless bar trim to avoid damage from floor cleaning equipment.
2504.08.N.4.f All doors to cupboards and control panels must be concealed and fitted with touch latches.

2504.08.N.5 Super Structure
2504.08.N.5.a All super structure must be constructed using 1-½”/38 mm diameter bright polished vertical posts with 1”/25 mm diameter horizontal posts.
2504.08.N.5.b Not Applicable to this Brand
2504.08.N.5.c The wall thickness to the support legs must be 1/10”/3 mm thick for rigidity supported on hollow spigots with room to pass electrical cabling through.

2504.08.N.6 Glass
2504.08.N.6.a All glass must be flat 3/8”/10 mm toughened (tempered) with polished edges.
2504.08.N.6.b Where required all exposed edges of glass must be protected with a bright polished stainless steel channel.
2504.08.N.6.c All glass must be fixed using “pig nose” or similar fixing with neoprene gaskets.

2504.08.N.7 Kick plinths
2504.08.N.7.a All kick plinths must be satin grained stainless steel bonded to water resistance MDF backing. Kick plinths must be sealed to the floor using food grade, clear, silicone sealer.

2504.08.N.8 Compressors
2504.08.N.8.a Refrigeration compressors other than remote must be completely concealed and soundproofed in a housing formed as a part of buffet unit or Frost top.
2504.08.N.8.b When in unit compressors are utilized, back of housing must be vented to provide air circulation to the compressor.
2504.08.N.8.c Remote Compressors
   2504.08.N.8.c.1 Remote compressors must be installed in a well ventilated and accessible area within 100’-0”/30 m of the chilled displays. Compressor location must be determined on site.
   2504.08.N.8.c.2 Remote refrigeration must be considered as to eliminate heat and noise from guest areas. The installation of the remote refrigeration plant must be carried out by a local refrigeration contractor to maintain a consistent level of service and maintenance.
   2504.08.N.8.c.3 As the compressors are remotely sited, a drain is required locally below the chilled display counter for the disposal of condensate waste.

2504.08.N.9 Displays
2504.08.N.9.a All chilled displays must operate at 37-41° F/3-5° C, core temperature, in an ambient of 73-77° F/23-25° C.
2504.08.N.9.b Chillers/frost tops must have 1-½”/40 mm drains to dispose of condensate waste to discharge into local drain, by general contractor.
2504.08.N.9.c All air grilles to displays must be in mirror polished stainless steel or epoxy paint finish as specified by designer and must be removable for cleaning and maintenance.
2504.08.N.9.d All hot warming/holding induction systems must operate at 60-200° F/16-90° C.
2504.08.N.9.e All cook to order induction systems must operate at 90-440° F/32-225° C.

2504.09 Specialty Restaurant
Refer to Section 2504.03 for requirements applicable to this Section.

2504.09.A Specialty Restaurant Requirement
A specialty restaurant may be required in addition to the full-service restaurant in specific market areas.

2504.09.B Not Applicable to this Brand

2504.09.C Size Requirement
The size of the specialty restaurant is market driven, but the total number of restaurant seats must never be less than 60.

2504.09.D Not Applicable to this Brand

2504.09.E Location
The location of the specialty restaurant must have direct exterior access for the general public.

2505.00 Executive Lounge

2505.00.A Requirement
Executive Lounges are optional, however, a minimum of one must be provided when the hotel distinguishes some guestrooms as “Executive”. Hilton reserves the right to adjust size and facility requirements dependent upon local market conditions.

2505.00.B Size Requirement
Executive Lounge must be a minimum of 1,075 ft²/100 m² and include a welcome/concierge desk, hot, cold and ambient food display area, a service pantry and restroom. If the Executive Lounge is a conversion of an existing space (i.e. guest rooms, meeting rooms, storage area, etc.), it will require approval from Hilton.

2505.00.C Bathroom
A minimum of one unisex bathroom with water closet and wash basin must be provided.

2505.00.D Not Applicable to this Brand

2505.00.E Service Pantry Visibility
The Executive Lounge service pantry must not be visible to guest view.

2505.00.F Kitchen Cabinets
The Executive Lounge service pantry must have kitchen cabinets (upper and base cabinets).

2505.00.G Entrance Doors
Executive Lounge entrance doors must be a minimum of 3'-0"/915 mm wide x 6'-8"/2.04 m high, glass or decorative solid core wood. Solid wood doors must have a sidelight window adjacent to the door. Refer to Section 2514.01, Technical Criteria for requirements applicable to this section.

2505.00.H Display Counter/Buffet
The Executive Lounge Food & Beverage display counter/buffet must be at minimum 16'-0"/4.9 m length x 30"/760 mm deep x 34"/865 mm high and conform to Section 2515.04. Below counter areas must include space for storage and refrigerated areas and must allow for ventilation and easy access for cleaning. The built in unit must have a custom millwork face. The following must be provided.

2505.00.H.1 Hot Food Holding

2505.00.H.1.a Minimum one induction warming unit not to exceed a total of three units.

2505.00.H.1.b Cooking induction credenza/station with exhaust (optional and in addition to minimum counter allocation).

2505.00.H.2 Cold Food Holding

2505.00.H.2.a Minimum 32"/810 mm frost top, blow over refrigeration with bright polished stainless steel air-grill, stainless steel in counter ice well or decorative counter top ice trough. If provided, the ice well/trough must have drain and drain tube run to floor sink.

2505.00.H.2.b Single door, glass front, under-counter refrigeration for yogurt and milk and/or “dairy cooler” must be located beneath cereal display counter.

2505.00.H.3 Beverage

2505.00.H.3.a Hot

2505.00.H.3.a.1 Commercial espresso-specialty coffee maker: requires dedicated 30 amp circuit and water.

2505.00.H.3.a.2 Automated hot water on demand for tea service (may cross-utilize espresso machine for hot water).

2505.00.H.3.b Cold

2505.00.H.3.b.1 Under counter, glass front or vertical wall display blow over refrigeration for bottled water, soda and other chilled beverage display.

2505.00.H.3.b.2 Under counter, glass front beer and wine refrigeration with locking mechanism and sliding panel to conceal during breakfast service. Panel may slide between under-counter dairy and beer cooler as cereal display converts to bottle liquor service in evening.

2505.00.H.3.b.3 Wine Display Cabinet (optional) - refrigerated dispensing unit.

2505.00.H.4 Ambient

2505.00.H.4.a Bread/Pastry display requires dedicated circuit for toaster.

2505.00.H.4.b Cereal display area, minimum of three cylinder dispensing units.

2505.00.H.4.c Juice display area, minimum of two juice cylinder dispensers with ice core.
2505.00.I Appearance
The lounge must have an upscale appearance, and differ from the color schemes and FF&E used in the guestrooms.

2505.00.J Finish Options - Executive Lounge

Finish Options - Executive Lounge
2505.00.J.1 Floor: Carpet (broadloom and high definition CYP 48 oz.), wood - tongue and groove, natural stone
   2505.00.J.1.a When carpet is utilized for the flooring in the lounge, a decorative hard surface must extend 24” – 36”/600 mm – 900 mm in front of the food service counter.
   2505.00.J.1.b Base (minimums): 6”/150 mm wood - stain grade, through body synthetic, 4”/100 mm porcelain tile, natural stone
2505.00.J.2 Wall: Vinyl wallcovering, hard surface
2505.00.J.3 Ceiling: Paint on gypsum, acoustic ceiling tile (30 percent maximum)
2505.00.J.4 When automatic suppression systems are required (see section 2516.00) concealed type sprinkler heads must be utilized.

2505.00.K Service Pantry Finishes

Executive Lounge Service Pantry Finishes
2505.00.K.1 Floor: Porcelain tile (12”/300 mm x 12” x 300 mm minimum)
   2505.00.K.1.a Provide a waterproof membrane and floating slab floor construction with slope toward drain/floor sink.
   2505.00.K.1.b Base (minimums): 4”/150 mm porcelain tile, natural stone, wood, through body synthetic
2505.00.K.2 Wall: Full height porcelain tile, full height stainless steel. Must meet code requirements and have washable finish.
2505.00.K.3 Ceiling: Paint on gypsum

2505.00.L General Lighting
General lighting in the lounge must be recessed light fixtures supplemented with indirect and decorative lighting fixtures with dimmer controls by function zones.

2505.00.M Light Levels
Refer to Section 2514.08 for minimum light level requirements.

2505.00.N Technology
Technology
2505.00.N.1 Telephone/Data/Power Outlets
   Provide six telephone/data outlets and six power outlets (socket outlets) at welcome/concierge desk.
2505.00.N.2 Service Pantry Telephone Outlet
   Provide a telephone outlet in the executive lounge service pantry.
2505.00.N.3 PMS Wiring
   Provide two Cat 6/FIOS pre-wire for property management systems.

2505.00.N.4 Wireless Internet
   Provide premium wireless internet access coverage.

2505.00.N.5 Wall Power Outlets
   Provide additional power outlets (socket outlets) in perimeter walls spaced at 5'-0"/1.5 m for laptop use.

2505.00.N.6 Work Station Telephone/Data/Power Outlets
   Provide four telephone/data outlets and four power outlets (socket outlets) at guest pc work stations.

2505.00.O Furniture, Fixtures and Equipment
   Furniture, Fixtures and Equipment

2505.00.O.1 Welcome/Concierge Desk
   Provide a welcome/concierge desk.

2505.00.O.2 Seating Materials
   Seating must be of commercial grade and upholstered with commercial grade fabric.

2505.00.O.3 Furnishing Requirements
   Furnishings must include a residential style soft-seating group for viewing television.

2505.00.O.4 Dining Seating Requirements
   Dining seating requirements must accommodate the capacity of executive levels without utilizing the soft-seating area. Provide a majority of deuce seating with 24"/600 mm x 30"/760 mm tables for versatility.

2505.00.O.5 Tabletop Surface Material
   Tabletop surface material must be compliant with Section 2515.04. Table bases must be designed to support tabletops without tipping over easily when weight is applied to one side.

2505.00.O.6 Console Requirement
   Provide a console for organizing and displaying magazines and newspapers.

2505.00.O.7 Television Requirement
   Provide a minimum of one television with swivel/slide capability to allow maximum viewing within the room. Televisions must comply with the sizes and specifications provided in Sections 713.00 and 2514.09.

2505.00.O.8 Artwork
   Artwork is required.

2505.00.O.9 Computers
Computers (two)

2505.00.O.10 Printer/Copier
   Copier with fax capabilities

2505.00.O.11 Not Applicable to this Brand
2505.00.O.12 Not Applicable to this Brand
2505.00.O.13 Not Applicable to this Brand
2505.00.O.14 Laptop Station
   One laptop station (Optional)

2505.00.O.15 Service Pantry Equipment
   Executive Lounge Service Pantry equipment must include:
   2505.00.O.15.a Commercial refrigerator capable of receiving roll-in racks
   2505.00.O.15.b Commercial ice machine
   2505.00.O.15.c Hand sink with paper towel dispensing unit
   2505.00.O.15.d Trash handling bay
   2505.00.O.15.e Under counter dishwasher
   2505.00.O.15.f Dish sink with drain board
   2505.00.O.15.g Commercial microwave oven
   2505.00.O.15.h Commercial pour-over coffee brewing system

2506.00 Commercial Facilities
   Refer to Section 2514.00, Technical Criteria, and Section 2515.00 Furnishings Fixtures and Equipment, for requirements applicable to this section.

2506.01 Sundries/Gift Shop
   2506.01.A Retail Space Requirement
      A sundries/gift shop must be provided.
   2506.01.B Size Requirement
      The three approved sundries/gift shop types follow:
      2506.01.B.1 A traditional gift shop (for high leisure destinations and large urban hotels) that is a minimum of 350 ft²/32 m². Shop must be securable and located adjacent to the lobby.
      2506.01.B.2 An upscale, self service gift shop that is a minimum of 100 ft²/10 m², located within close proximity of the front desk.
      2506.01.B.3 Combination gift shop and upscale coffee shop with prior approval.
   2506.01.C Storage Closet
Provide a storage closet equal to 10 percent of the shop floor area.

2506.01.D Cashiers Station
The cashier station must be located to provide visual control of the entire shop. The top surface material must be compliant with Section 2515.04.

2506.01.E Entrance Doors
The entry door must be a minimum of 3'-0"/915 mm w x 8'-0"/2.4 m high and have a full vision glass panel. Additional window sidelights are required for an open, secure feeling within the space.

2506.01.F Entry Door
An entry door is not required in an unmanned sundries/gift shop.

2506.01.G Finish Options - Sundries/Gift Shop
Finish Options - Sundries/ Gift Shop
2506.01.G.1 Floor: Porcelain tile, natural stone, wood - tongue and groove, carpet (Axminster, nylon broadloom, carpet tile and high definition CYP 48oz.)
   2506.01.G.1.a Base (minimums): 6"/150 mm porcelain tile, wood - stain grade, through body synthetic, 4"/100 mm natural stone
2506.01.G.2 Wall: Vinyl wallcovering, grooved plastic laminate display panel, paint (special approval required)
2506.01.G.3 Ceiling: Paint on gypsum, acoustic ceiling tile (30 percent maximum)
2506.01.G.4 When automatic suppression systems are required (see section 2516.00) concealed type sprinkler heads must be utilized.

2506.01.H Not Applicable to this Brand
2506.01.I Not Applicable to this Brand
2506.01.J Not Applicable to this Brand
2506.01.K Not Applicable to this Brand
2506.01.L Not Applicable to this Brand
2506.01.M Light Levels
   Refer to Section 2514.08 for minimum light level requirements.

2506.01.N Electrical/Data Connections
   Provide four electrical and four data connections for a point of sale system, and a telephone outlet if shop is manned.

2506.01.O Equipment
   2506.01.O.1 A minimum of one commercial reach-in refrigerator unit is required. Unit must be a minimum of 22 ft³/0.6 m³ and have full glass doors. Refrigerator must be easily cleanable on the exterior and interior, have adjustable shelving for product display, be water-cooled or remote condenser equipped and be NSF/CE and UL approved.
2506.01.O.2 Not Applicable to this Brand
2506.01.O.3 Not Applicable to this Brand
2506.01.O.4  Not Applicable to this Brand
2506.01.O.5  Not Applicable to this Brand
2506.01.O.6  Not Applicable to this Brand
2506.01.O.7  Vending machines are not allowed.

2506.02  Guest Laundry
2506.02.A  Guest Laundry Requirement
          A guest laundry is optional.
2506.02.B  Guest Laundry Location
          The guest laundry room must be enclosed and located convenient to guestrooms.
2506.02.C  Not Applicable to this Brand
2506.02.D  Entrance Doors
          The entry door must have a full vision panel.
2506.02.E  Finish Options - Guest Laundry
          2506.02.E.1  Floor: Porcelain tile, natural stone
                        2506.02.E.1.a  Base (minimums): 4"/100 mm porcelain tile, natural stone, through body synthetic
          2506.02.E.2  Wall: Paint
          2506.02.E.3  Ceiling: Paint on moisture resistant gypsum, acoustic ceiling tile (30 percent maximum)
          2506.02.E.4  No exposed structure, pipes, ducts, etc. are allowed.
          2506.02.E.5  When automatic suppression systems are required (see section 2516.00) concealed type sprinkler heads must be utilized.
2506.02.F  Countertop Requirement
          A built-in solid countertop must be provided. The top surface material must be compliant with Section 2515.04.
2506.02.G  Floor Drain
          Provide a floor drain with chrome plated brass cover with floor sloped to drain.
2506.02.H  Not Applicable to this Brand
2506.02.I  Concealed Connections
          Conceal all electrical and plumbing connections behind the connected equipment.
2506.02.J  Lighting Requirements
          Lights must be wired to remain on and have occupancy sensors with a 30 minute delay before switching off. A single entry light must remain on at all times.
2506.02.K  Light Levels
Refer to Section 2514.08 for minimum light level requirements.

2506.02.L House Telephone Outlets
Provide an outlet for a house telephone with automatic dialing to the front desk.

2506.02.M FF&E
Furnishings, Fixtures and Equipment
2506.02.M.1 A minimum of one each commercial washer and dryer must be provided. All lint traps/interceptors must be concealed and out of guest view.
2506.02.M.2 Provide a side chair or stool. Meeting room stack chairs are not allowed.
2506.02.M.3 Not Applicable to this Brand
2506.02.M.4 Provide a wall mounted, coin operated, laundry supplies dispenser.

2506.03 Vending Area
2506.03.A Vending Room Requirements
A minimum of one vending room must be located on every guestroom floor.

Mexico: A vending room may be required based on regional and market conditions. If ice delivery is provided, Grab & Go or mini-bar, vending room is not required.

2506.03.B Vending Room Location
Provide a vending area in close proximity to pool area.

2506.03.C Vending Equipment Location
Vending area must be enclosed to reduce noise.

2506.03.D Entrance Doors
Entry door must have a vision panel or sidelight.

2506.03.E Finish Options - Vending Area
2506.03.E.1 Floor: Porcelain tile (16"/400 mm x 16"/400 mm or 12"/300 mm x 18"/450 mm minimum), natural stone, quarry tile
2506.03.E.1.a Base (minimums): 4"/100 mm porcelain tile, natural stone, quarry tile, through body synthetic

2506.03.E.2 Wall: Vinyl wallcovering
2506.03.E.3 Ceiling: Paint on gypsum, acoustic ceiling tile
2506.03.E.4 No exposed structure, pipes, ducts, etc. are allowed.
2506.03.E.5 Not Applicable to this Brand
2506.03.E.6 When automatic suppression systems are required (see section 2516.00) concealed type sprinkler heads must be utilized.

2506.03.F Not Applicable to this Brand
2506.03.G Floor Drain
Provide a floor drain with chrome plated brass cover with floor sloped to drain.

2506.03.H Not Applicable to this Brand

2506.03.I Filtered Water Supply/Power Outlets
Provide a filtered cold water supply to the ice maker and power outlets (socket outlets) for all equipment.

2506.03.J Lighting Requirements
Lights must be wired to remain on and have occupancy sensors with a 30 minute delay before switching off.

2506.03.K Light Levels
Refer to Section 2514.08 for minimum light level requirements.

2506.03.L Vending Area Equipment
Each vending area must contain a minimum of one self service, water-cooled ice machine with a minimum production capacity of 175 lb/80 kg per 24-hours. Machine must be equipped with sanitary dispenser operated by push button, guestroom key or complimentary token. Open ice machines are not permitted.

  Mexico: Not Applicable to this Brand

2506.03.M Soft Drink Machine
A soft drink machine is optional.

2506.03.N Not Applicable to this Brand

2506.03.O Trash Container
Provide an enclosed, flame retardant trash container.

2507.00 Meeting Facilities
Refer to Section 2514.00, Technical Criteria, and Section 2515.00 Furnishings, Fixtures and Equipment for requirements applicable to this section.

2507.00.A Meeting Space Requirements
All hotels must have a minimum of 5,000 ft²/465 m² of meeting space that includes a ballroom and multi-purpose meeting rooms.

2507.00.B Function Space Size
Provide a minimum target function space of 35 ft²/3.3 m² per key and a maximum target function space of 70 ft²/6.5 m² per key. Target function space is the net internal meeting area excluding pre-function and storage areas.

2507.00.C Function Space Access
Access to all function spaces must be easily accessible from the hotel’s primary lobby or pre-function area.

2507.01 Ballroom
2507.01.A Ballroom Requirements
Ballrooms are required to be divisible into a minimum of three sections and free of columns.

2507.01.B Ballroom Length/Width
Ballrooms are not allowed to be more than twice as long as its narrowest dimension and free of columns.

2507.01.C Ballroom Entrance
Entrance by guests and visitors to the ballroom must be through the pre-function area via the guest elevators/lifts, guest corridors or a separate ballroom street entrance.

2507.01.D Staircase/Escalator
When the ballroom is not located on the ground floor of the hotel, a grand staircase and/or escalators and/or separate elevator(s)/lift(s) leading from the street entrance to the ballroom level must be provided.

2507.01.E Ballroom/Meeting Rooms Location
The ballroom and a majority of the meeting rooms must be on the same level. Ballroom and meeting rooms must be on the same level as the primary kitchen when possible.

2507.01.F Service Corridor Access
A vestibule is required at the service doors to avoid noise and light into the ballroom. The vestibule must be directly between the ballroom and kitchen or service hallway.

2507.01.G Ceiling Height
The minimum ceiling height for ballrooms of 5,000 ft²/465 m² and below must be 16'-0"/4.9 m at operable partitions, increasing to not less than 18'-0"/5.5 m within ceiling coffers. The minimum ceiling heights for ballrooms over 5,000 ft²/465 m² follow:

<table>
<thead>
<tr>
<th>Area</th>
<th>Finished Ceiling Height</th>
<th>Chandelier Clearance</th>
</tr>
</thead>
<tbody>
<tr>
<td>5,000 – 12,000 ft²/465 – 1,100 m²</td>
<td>20'-0&quot;/6.0 m</td>
<td>18'-0&quot;/5.5 m</td>
</tr>
<tr>
<td>12,000 – 28,000 ft²/1,100 – 2,600 m²</td>
<td>24'-0&quot;/7.3 m</td>
<td>22'-0&quot;/6.7 m</td>
</tr>
<tr>
<td>28,000 – 35,000 ft²/2,600 – 3,250 m²</td>
<td>26'-0&quot;/7.9 m</td>
<td>24'-0&quot;/7.3 m</td>
</tr>
<tr>
<td>35,000 – 45,000 ft²/3,250 – 4,180 m²</td>
<td>28'-0&quot;/8.5 m</td>
<td>26'-0&quot;/7.9 m</td>
</tr>
</tbody>
</table>

2507.01.H Structural Columns/Stacking Operable Partitions
Structural columns and stacking operable partitions must not protrude more than 1'-6"/450 mm into the ballroom or banquet room at any point.

2507.01.I Doors
2507.01.I.1 Ballroom entrance doors must be a pair of doors with no mullion; each leaf must be no less than 3'-0"/900 mm wide and 9'-0"/2.75 m high.
2507.01.I.2 All ballroom service doors must be no less than 3'-6"/1.10 m wide and 8'-0"/2.4 m high.
2507.01.I.3 Doors must have hardware to allow them to swing flat and be held open against the pre-function wall.
2507.01.I.4 Provide 12'-0"/3.65 m wide and 16'-0"/4.9 m high doors for vehicular and large exhibit access in larger ballrooms and/or specific markets.
2507.01.5 Entrance and service doors must have a tamper-proof, 180 degree, one-way viewer looking into the ballroom. Install viewer at centerline of door, 5'-0"/1.5 m above the finished floor.

2507.01.6 Ballroom entrance doors must have decorative hardware, perimeter sound stripping, concealed hydraulic closers with hold open capability and continuous hinges. Refer to Section 2516.05 Means of Egress for additional requirements applicable to this section.

2507.01.7 Service doors must have electronic locks, perimeter sound stripping, concealed hydraulic closers with hold open capability, continuous hinges and kick plates on the ballroom side of the door that must blend with decor.

2507.01.8 All hardware must have the same finish.

2507.01.9 Doors must be solid core wood. Painted hollow metal doors are not allowed except for doors opening directly to the exterior.

2507.01.10 Exterior doors must be metal clad, self-closing with door stops, checks and panic hardware, if legal egress. All doors must be able to be held open against an adjoining wall or open 180 degrees.

2507.01.J Operable Partitions

2507.01.J.1 Operable partitions must be standard steel construction with minimum 24 gauge steel faces and sound-retardant core assembled to a minimum 16 gauge reinforced steel frame and insulated to achieve acoustical performance specified.

2507.01.J.2 All operable partitions must be top-supported with drop-down floor seals. Provide a positive bulb-seal type mechanical closure (hinged closure not acceptable) with minimum 250 lbs/113 kgs pressure.

2507.01.J.3 Provide hard surfaced, flush walls with sufficient structural support where operable partitions terminate to ensure proper bedding of joint seal.

2507.01.J.4 Operable partitions must be stacked behind a concealed door in a closet when not in use. Closet doors must match the surrounding wall finish.

2507.01.J.5 Operable partitions must include single passage doors between the various rooms.

2507.01.J.6 Acoustical seal all wiring and piping penetrations above operable wall.

2507.01.J.7 Operable partitions are allowed to be covered with decorative acoustical fabric, wall covering or timber finishes. Discrete metal edging strips must be used to protect the finishes.

2507.01.K Rigging Points

2507.01.K.1 Rigging points (I bolts) must be provided in the ceiling for hanging temporary displays, lighting, etc.

2507.01.K.2 Rigging points must be provided every 20'-0"/6.0 m throughout the entire ceiling of the main ballroom.

2507.01.K.3 Points must allow a maximum load of 1,000 lbs/453 kgs as certified by a licensed engineer and the contractor.

2507.01.K.4 Points must have a tensile (breaking) strength of at least five times the working load. If the points are rated at 2,000 lbs/907 kgs, they must have a tensile strength of 10,000 lbs/4,536 kgs.

2507.01.K.5 Provide strut system throughout the ballroom and along walls for cable picks and banners/signs with a maximum 250 lbs/113 kgs weight limit for every 5'-0"/1.5 m.

2507.01.K.6 Not Applicable to this Brand

2507.01.K.7 All nuts and bolts used overhead must be rated and all wire rope clips and overhead hardware (eyebolts etc.) must be forged, unless approved by the rigging supervisor. Rigging hardware must meet ASME B30.26-2010, www.asme.org.
2507.01.K.8 A steel safety is required on each individual item suspended from the ceiling or any supporting structure or truss suspended from the ceiling including items suspended utilizing polyester round slings or other synthetic sling.

2507.01.K.9 Facility panels (power, data and voice connections) must be installed above the ceiling next to a group of rigging points.

2507.01.K.10 All rigging points and facility panels must be concealed when not in use. Concealment method must be approved by Hilton.

2507.01.K.11 Rigging and dynamic loading is not permitted from the air wall tracks.

2507.01.K.12 Bridling between rigging points is not permitted.

2507.01.K.13 Any articulating/dynamic (i.e. moving) show or performance elements require an arrester device and a 10:1 safety factor.

2507.01.L Finish Options - Ballroom

2507.01.L.1 Floor: Carpet (broadloom and high definition CYP 48oz.). Carpet tile is allowed in exhibit halls.

2507.01.L.1.a Base (minimum): 6”/150 mm wood - stain grade, stone

2507.01.L.2 Wall: Vinyl wallcovering, wood or special finish

2507.01.L.2.a A chair rail or wall finish and subsurface is required to withstand the wear and tear of chairs and table impact and abrasion without showing damage.

2507.01.L.3 Ceiling: Paint on gypsum, wood or special finish, coffered drywall ceiling

2507.01.L.3.a Acoustic ceiling tile inserts are only allowed in convention center properties with prior approval.

2507.01.L.3.b Ballrooms greater than 28,000 ft²/2,600 m² may be designed without a finished ceiling. Ballrooms without a finished ceiling must have the ceiling area and mechanical equipment in an organized appearance and be painted a dark color to mask the view.

2507.01.L.3.c In ballrooms where gypsum board ceilings are required, large (minimum 48” x 96”/1.2 m x 2.4 m) sound absorbing panels with tight butt joints may be provided in lieu of gypsum board if the panels appear to be gypsum board. The panels must not exceed 50 percent of the room.

2507.01.L.3.d Not Applicable to this Brand

2507.01.L.3.e When automatic suppression systems are required (see section 2516.00) concealed type sprinkler heads must be utilized.

2507.01.M Electrical

2507.01.M.1 Gang all controls at a control interface adjacent to the guest entrance to each subdivision.

2507.01.M.2 All visible devices must be located as inconspicuously as possible, must be finished to match the surrounding surface and must be coordinated with architectural finishes to insure that there is no obvious disruption in their placement or pattern.

2507.01.M.3 Provide four floor power outlets (socket outlets) per every 600 ft²/56 m².

2507.01.M.4 Provide ceiling mounted power outlets (socket outlets) with hinged covers for temporary lighting displays.

2507.01.M.5 Exit signs must be recessed and wall mounted whenever possible.

2507.01.M.6 Provide two power outlets (socket outlets) at no more than 20’-0”/6.0 m on center around perimeter walls. Maximum two outlets per circuit.

2507.01.M.7 Provide two single phase, 30 amp power outlets (socket outlets) in each ballroom subdivision.
2507.01.M.8 Provide one 60 amp, 3-phase power outlet (socket outlet) on a dedicated circuit for use in each ballroom.

2507.01.M.9 All electric cables and connections must be Underwriters Laboratories (www.ul.com) or local equivalent code rated for the amperage capacity required for safe operation and must conform to appropriate local codes. All materials must be non-flammable and must conform to the Fire Authorities’ regulations.

2507.01.M.10 Lighting for divisible ballrooms must be controlled by local dimmers and by remote dimmers allowing combined dimming control of subdivisions. A minimum of five lighting presets must be provided.

2507.01.M.11 Lighting must be designed under the following criteria:

2507.01.M.11.a Provide wall sconces and decorative light fixtures in all ballrooms. Bottom of wall sconce must not be less than 6’-4”/1.95 m above the finished floor. Chandelier size and hanging height must not interfere with projection and stage lighting.

2507.01.M.11.b Provide dimmable lighting to light head table locations in each division.

2507.01.M.11.c Dimmer system must be linked to building automation system.

2507.01.M.12 Refer to Section 2514.08 for minimum light level requirements.

2507.01.N Technology

2507.01.N.1 Provide one outlet for a house telephone per subdivision.

2507.01.N.2 Provide floor boxes for communications; quantity to be determined by size/division ability. Outlet locations must also be located on the perimeter walls every 20’-0”/6.0 m. Each outlet must be wired to accommodate the following and terminate in a six-way flush mount floor box:

- Two four-pair 24-gauge Category 6 Inside wire for voice (RJ11).
- Two four-pair 24-gauge Category 6 Inside wire for data (RJ45).
- One two-fiber multi-mode (62.5/125).

2507.01.N.3 Provide one MATV outlet in each ballroom subdivision.

2507.01.N.4 A qualified specialist must design and present full a/v package for approval (ballroom & pre-function).

2507.01.N.5 Audio System

2507.01.N.5.a Equip the ballroom with quality distributed sound reinforcement system suitable for speech reinforcement and background music. All speakers must be recessed ceiling type, inset wall mounted or of similar configuration. Spacing of loudspeakers must be approximately 1.0 times the distance from the ceiling to the floor. Amplification systems must be rated such that the number of loudspeakers connected to an amplifier constitutes no more than 60 percent of the rated output of that amplifier. Loudspeakers must be high impedance tapped at 70 or 100V, with power tapped at no less those 15 watts. Circuit the loudspeakers so that speakers above the stage position may be switched off to increase overall room gain before feedback. The use of 8 ohm speakers must be limited to areas where high SPL’s are needed.

2507.01.N.5.b The system must provide for multiple microphone and line level inputs from each room as well as providing for at least one line level return to each room for the purpose of in-room session recording. The DSP input configuration on the processing devices must provide for every room input to be actively connected without need for physical patching. DSP devices must be interconnected globally utilizing the CobraNet standard for transmitting audio and control signals via Ethernet connections. The system must also provide for the ability to virtually route audio signals anywhere on property which will allow for routing of multiple BGM sources to their corresponding outputs.
2507.01.N.6 Audiovisual

2507.01.N.6.a The ballroom audio visual system must cater for the following:

2507.01.N.6.a.1 Projection and large screen display of Internet access and laptop computer screens, digital visualizers, electronic overhead projectors, video conferencing, including all necessary auxiliary inputs, audio support for all of the above listed, lectern, microphones, radio microphones (4No neck and 4No hand held) and wired microphones including all necessary auxiliary inputs.

2507.01.N.6.a.2 Background music system;

2507.01.N.6.a.3 Image monitoring at the lectern location;

2507.01.N.6.a.4 Touch Panel Remote Control system integrating all of the above plus electric screens, projector hoist systems, house lighting system, voice evacuation and fire alarm system and electrically operated door closers, blinds or drapes.

2507.01.N.6.b The system must be designed to accommodate a number of subdivisions of the main ballroom space which may entail full provision of services described to each subdivision, the essence being that each subdivided space can stand alone or be combined. The projectors must retract into the ceiling void when not in use and the screens, if permanent, must also retract.

2507.01.N.6.c The ballroom must be fed by an integrated mixer/amplifier system having a minimum of 4 microphones per 3,229 ft²/300 m². Divisible rooms must have the means to connect all rooms or operate separately.

2507.01.N.6.d The sound system electronics racks are to be located in the back of the house. The rack must be positioned so that it can be serviced from the front and the rear without being moved. The ballroom sound system must be capable of producing 95dBA at 105 m above the floor. The frequency response must be +1– 5dBA from 100Hz to 1000Hz.

2507.01.O Furniture, Fixtures and Equipment

2507.01.O.1 Seating must be stack type chairs or better, with padded seats and backs upholstered with commercial fabric and flex back with stacking bars. Chair seat must be a minimum of 16”/400 mm wide x 22”/560 mm deep.

Mexico: Seating must be stack type chairs or better, with padded seats and backs upholstered with commercial fabric and optional flex back with stacking bars. Chair seat must be a minimum of 16”/400 mm wide x 22”/560 mm deep.

2507.01.O.2 When natural daylight is provided, full blackout screens or electronically operated blackout drapery must be provided.

2507.02 Meeting Rooms

2507.02.A Meeting Room Requirements

Meeting rooms are required.

2507.02.B Not Applicable to this Brand

2507.02.C Meeting Room Length/Width

Meeting rooms are not allowed to be more than twice as long as the narrowest dimension.

2507.02.D Not Applicable to this Brand

2507.02.E Coat Storage/Coatroom

All meeting rooms must have internal coat storage space or a central coatroom adjacent to the meeting spaces where climate conditions dictate.
2507.02.F Not Applicable to this Brand

2507.02.G Restroom Proximity
  Provide convenient access to public restrooms.

2507.02.H Kitchen Access
  Access must be provided from the kitchen or banquet pantry for food service to all meeting rooms. This access may, in part, be through the pre-
  function area or banquet related guest circulation.

2507.02.I Not Applicable to this Brand

2507.02.J Structural Columns/Stacking Operable Partitions
  Structural columns and stacking operable partitions must not protrude more than 1'-6"/450 mm into the meeting room at any point.

2507.02.K Strut System
  Provide strut system throughout the meeting rooms and along walls for cable picks and banners/signs with a maximum 250 lbs/113 kgs weight limit
  for every 5'-0"/1.5 m.

2507.02.L Not Applicable to this Brand

2507.02.M Credenza
  A credenza is required. Provide area adjacent to entry door for a credenza. Credenza must be a maximum of 34"/865 mm in height. Credenza may
  be built-in or be freestanding. The top surface material must be compliant with Section 2515.04.

  **Mexico:** A credenza is required. Provide area adjacent to entry door for a credenza. Credenza must be a maximum of 34"/865 mm in height, have a
  minimum 40 liter under-counter refrigerator with glass door. Credenza may be built-in or be freestanding. No folding or temporary tables can be used.
  The top surface material must be compliant with Section 2515.04.

2507.02.N Doors
  2507.02.N.1 Single doors must be a minimum of 3'-6"/1.0 m wide. Paired doors must be no less than 3'-0"/900 mm wide for each leaf. All doors must be
  8'-0"/2.1 m high minimum.
  2507.02.N.2 All entrance and service doors must have a tamper-proof, 180 degree, reverse, one-way viewer looking into the room.
  2507.02.N.3 Interior doors must be solid-core wood. Painted hollow metal doors are allowed only at exterior exits. Exterior doors must be solid; glass doors
  are not allowed on service or egress paths.
  2507.02.N.4 All meeting room service doors must be no less than 3'-6"/1.10 m wide x 8'-0"/2.40 m high.
  2507.02.N.5 Meeting room service doors must have electronic locks, perimeter sound stripping, concealed hydraulic closers with hold open capability,
  continuous hinges and kick plates on the meeting room side of the door that blend with décor.
  2507.02.N.6 Meeting room entrance doors must have electronic locks, decorative hardware, perimeter sound stripping, concealed hydraulic closers with hold
  open capability and continuous hinges.

2507.02.O Operable Partitions
  2507.02.O.1 Operable partitions must be stacked behind a concealed door in a closet when not in use. Closet doors must match the surrounding wall finish.
2507.02.O.2 All operable partitions must be top-supported with drop-down floor seals.
2507.02.O.3 Provide a positive bulb-seal type mechanical closure (hinged closure not acceptable) with minimum 250 lbs/113 kgs pressure. Provide sufficient structural support in abutting walls to compensate for this requirement.
2507.02.O.4 Provide hard surfaced, flush walls with sufficient structural support where operable partitions terminate to ensure proper bedding of joint seal.
2507.02.O.5 Operable partitions must be standard steel construction with minimum 24 gauge steel faces and sound-retardant core assembled to minimum 16 gauge reinforced steel frame, insulated to achieve acoustical performance specified.
2507.02.O.6 Operable partitions must include single passage doors between the various rooms. Door(s) must be 36"/900 mm and swing in both directions.
2507.02.O.7 Seal all wiring and piping penetrations above operable partitions.
2507.02.O.8 Operable partitions are allowed to be covered with decorative acoustical fabric, wall covering or timber finishes. Discrete metal edging strips must be used to protect the finishes.

2507.02.P Finish Options - Meeting Rooms
2507.02.P.1 Floor: Carpet (Axminster, broadloom and high definition CYP 48 oz.)
2507.02.P.1.a Base (minimum): 6"/150 mm wood - stain grade
2507.02.P.2 Wall: Vinyl wallcovering, wood panels or special finish, natural stone, tackable fabric wrapped panels (36"/900 mm minimum height)
2507.02.P.3 Ceiling: Paint on gypsum, acoustic ceiling tile (30 percent maximum), coffered drywall ceiling, decorative ceiling (special approval required)
2507.02.P.3.a In meeting rooms where gypsum board ceilings are required, large (minimum 48” x 96”/1.2 m x 2.4 m) sound absorbing panels with tight butt joints may be provided in lieu of gypsum board if the panels appear to be gypsum board. The panels must not exceed 50 percent of the room.
2507.02.P.3.b Minimum ceiling heights for meeting rooms are as follows:

<table>
<thead>
<tr>
<th>Area</th>
<th>Finished Ceiling Height</th>
</tr>
</thead>
<tbody>
<tr>
<td>Up to 500ft²/45 m²</td>
<td>9'-0&quot;/2.75 m</td>
</tr>
<tr>
<td>500–1,000ft²/45-90 m²</td>
<td>10'-0&quot;/3.0 m</td>
</tr>
<tr>
<td>1,000–3,000ft²/90-270 m²</td>
<td>12'-0&quot;/3.7 m</td>
</tr>
<tr>
<td>3,000–5,000ft²/270-450 m²</td>
<td>15'-0&quot;/4.6 m</td>
</tr>
</tbody>
</table>

2507.02.P.3.c When automatic suppression systems are required (see section 2516.00) concealed type sprinkler heads must be utilized.

2507.02.Q Not Applicable to this Brand
2507.02.R Electrical
2507.02.R.1 Lighting must be recessed with both direct and indirect LED lights, four-scene preset dimmer controlled with local bypass switching, direct lights and wall wash to provide lighting for perimeter of room.

2507.02.R.2 Lighting for divisible meeting rooms must be controlled by local dimmers and by remote dimmers allowing combined dimming control of subdivisions.

2507.02.R.3 Not Applicable to this Brand

2507.02.R.4 Refer to Section 2514.08 for minimum light level requirements.

2507.02.R.5 Not Applicable to this Brand

2507.02.R.6 Duplex power outlets (socket outlets), every 20'-0"/6.0 m on permanent walls, must be available for display purposes.

Mexico: Duplex power outlets (socket outlets), every 12'-0"/3.6 m on permanent walls, must be available for display purposes.

2507.02.R.7 Not Applicable to this Brand

2507.02.R.8 Provide four floor power outlets (socket outlets) per every 600 ft²/56 m². Floor boxes must be robust and resistant to loads up to 3000N. Floor boxes must be finished in the same finish as the meeting room floor.

2507.02.R.9 All visible devices must be located as inconspicuously as possible, finished to match the surrounding surface and coordinated with architectural finishes to insure that there is no obvious disruption in their placement or pattern.

2507.02.R.10 Provide two power outlets (socket outlets) at credenza.

2507.02.R.11 Exit signs must be recessed and wall mounted when possible.

2507.02.S Technology

Refer to Section 2507.08 Technology Infrastructure for audio visual requirements.

2507.02.S.1 Provide one outlet for a house telephone per subdivision.

2507.02.S.2 Not Applicable to this Brand

2507.02.S.3 Provide one outlet for a conference telephone in each meeting room.

2507.02.S.4 Outlet locations must be available in each subdivision every 45 ft²/4.8 m² on the floor and 20'-0"/6.0 m on the wall. Each outlet must be wired to accommodate the following and terminate in a six-way flush mount faceplate or floor box:

Two four-pair 24-gauge Category 6 Inside wire for voice (RJ11).

Two four-pair 24-gauge Category 6 Inside wire for data (RJ45).

2507.02.S.5 Each subdivision of a meeting room must be on a separate circuit to avoid overloading.

2507.02.S.6 Provide one MATV outlet in each meeting room subdivision.

2507.02.S.7 Audio visual

2507.02.S.7.a A control interface must be provided at the entry to each subdivision.

2507.02.S.7.b The following equipment must be provided:

2507.02.S.7.b.1 Projection screens (if permanent, must be motorized and ceiling recessed)
2507.02.S.7.b.2 Projector (if permanent, must be motorized and ceiling recessed)
2507.02.S.7.b.3 Conferencing telephone
2507.02.S.7.b.4 Not Applicable to this Brand
2507.02.S.7.b.5 Microphones

2507.02.S.7.c Projection screens must be capable of displaying the following video sources:
2507.02.S.7.c.1 2no. Laptop (integrated into table)
2507.02.S.7.c.2 Television Feed
2507.02.S.7.c.3 Auxiliary feed (for connecting DVD Player and other devices)
2507.02.S.7.c.4 HDMI input

2507.02.S.7.d Screens must be provided for projection purposes in all meeting rooms. The screen size for all rooms must be determined by dividing the distance from the screen to the furthest viewer by six for both horizontal and vertical dimensions.

2507.02.S.7.e The screen must be 16:9 or 16:10 format. Controls for screens must be located at the same level as lighting controls and must be marked.

2507.02.S.7.f When partitioned meeting rooms are opened to create one large room, the following options must be installed for the larger room:
2507.02.S.7.f.1 Large Front Projection System
2507.02.S.7.f.2 A 12'0"/3.6 m projection screen with a LED/LCD projector to provide a high quality integrated display solution.
2507.02.S.7.f.3 The projector must be capable of displaying the following video sources:
   2507.02.S.7.f.3.a 3no. Laptop inputs – 1no. per floor box in each meeting room
   2507.02.S.7.f.3.b Television Feed

2507.02.S.7.g Video sources must have an associated programmed audio output feed into the room audio system.

2507.02.T Furnishings, Fixtures and Equipment
2507.02.T.1 Seating must be stackable chairs (minimum of eight high) or better, with padded seats and backs upholstered with commercial fabric or better, flex back with stacking bars and leg bumpers. Stacking bars or ganging devices are optional.
   Mexico: Seating must be stackable chairs (minimum of eight high) or better, with padded seats and backs upholstered with commercial fabric or better, and leg bumpers. Stacking bars or ganging devices are optional.

2507.02.T.2 Permanent tabletops must be of a surface material that is compliant with Section 2515.04.
2507.02.T.3 Not Applicable to this Brand
2507.02.T.4 Provide wall-mounted artwork.
2507.02.T.5 Window Treatment
   Refer to 2515.03 for additional requirements
2507.02.T.5.a Provide decorative window treatment with blackout capability.
2507.03 Boardroom

2507.03.A Boardroom Requirements
A minimum of one flex-meeting space is required. A boardroom is optional. If a boardroom is provided it must adhere to the following standards.

2507.03.B Size Requirement
Boardrooms must be able to accommodate a minimum of 12 people.

2507.03.C Coat Closet
Each boardroom must have a coat closet with doors, where climate conditions dictate.

2507.03.D Not Applicable to this Brand

2507.03.F Doors
2507.03.F.1 Boardroom entrance doors must swing flat against the pre-function wall. All doors must be a minimum of 3'-0"/900 mm wide by 8'-0"/2.4 m high.
2507.03.F.2 All entrance and service doors must have installed a tamper-proof, 180 degree, one-way viewer looking into the function space.
2507.03.F.3 Doors must be solid core wood. Painted hollow metal doors are not allowed.
2507.03.F.4 Boardroom entrance and service doors must have an electronic lock, concealed door closers with hold open capability and full perimeter sound stripping.

2507.03.G Finish Options - Boardroom
2507.03.G.1 Floor: Carpet (Axminster, broadloom and high definition CYP 48 oz.)
2507.03.G.1.a Base (minimum): 6"/150 mm wood - stain grade
2507.03.G.2 Wall: Vinyl wallcovering, natural stone, wood or special finish, tackable fabric wrapped sound panels (36"/900 mm minimum height)
2507.03.G.3 Ceiling: Paint on gypsum, acoustic ceiling tile (30 percent maximum), decorative ceiling (special approval required)
2507.03.G.3.a In boardrooms where gypsum board ceilings are required, large (minimum 48" x 96"/1.2 m x 2.4 m) sound absorbing panels with tight butt joints may be provided in lieu of gypsum board if the panels appear to be gypsum board. The panels must not exceed 50 percent of the room.
2507.03.G.3.b Provide a minimum ceiling height of 10'-0"/3.0 m in boardrooms.
2507.03.G.3.c When automatic suppression systems are required (see section 2516.00) concealed type sprinkler heads must be utilized.

2507.03.I Electrical
2507.03.I.1 Lighting must be recessed, ceiling mounted, preset dimmer controlled and must have wall washers to provide lighting for perimeter of the room.
2507.03.I.2 Refer to Section 2514.08 for minimum light level requirements.
2507.03.I.3 Provide two power outlets (socket outlets) at no more than 12'-0"/3.7 m on center around perimeter walls.
2507.03.I.4 Provide floor power outlet (socket outlet) to accommodate requirement for power in conference table top.
2507.03.I.5 Provide two floor power outlets (socket outlets) per every 400 ft²/37 m².
2507.03.I.6 Provide two power outlets (socket outlets) at credenza.

2507.03.J Technology
2507.03.J.1 Provide a telephone outlet integrated into the boardroom table. Within the room outlets must be provided for speakerphone and fax.
2507.03.J.2 Provide one telephone outlet for house telephone. House telephone must dial directly to a permanently manned business center or office area.
2507.03.J.3 Each outlet at conference table must be wired to accommodate the following and terminate in a six-way flush mount faceplate.
   2507.03.J.3.a Two four-pair 24-gauge Category 6 Inside wire for voice (RJ11)
   2507.03.J.3.b Two four-pair 24-gauge Category 6 Inside wire for data (RJ45)

2507.03.J.4 Audio Visual (AV)
2507.03.J.4.a Boardrooms must be equipped with an AV conferencing system.
2507.03.J.4.b Provide a minimum of one wall mounted television with connectivity to MATV system and to boardroom table connection. Monitor size must be scaled proportionately to the room capacity/dimensions. Televisions must comply with the sizes and specifications provided in Sections 713.00 and 2514.09.

2507.03.K Furnishings, Fixtures and Equipment
2507.03.K.1 Provide a permanent conference table. Power outlets (socket outlets) and data outlets must be concealed and integrated into the table.
2507.03.K.2 Provide ergonomic chairs, fully upholstered with commercial grade fabric or leather, adjustable with armrests, swivel/tilt bases and casters. Chairs must include a stopgap mechanism on arms.
2507.03.K.3 Provide a 34"/865 mm maximum high credenza/sideboard that is built-in or freestanding. The top surface material must comply with Section 2515.04.
2507.03.K.4 Provide a refrigerator in the credenza.
2507.03.K.5 Not Applicable to this Brand
2507.03.K.6 Artwork must be provided.
2507.03.K.7 Window Treatment
   Refer to 2515.03 for additional requirements.
   2507.03.K.7.a Provide decorative window treatment with blackout capability.
   2507.03.K.8 A silent wall clock must be provided.

2507.04 Not Applicable to this Brand
2507.05 Pre-Function Area

2507.05.A Pre-function area must be approximately 35 percent of all meeting facilities.

2507.05.B Pre-function to Lobby Access
Provide direct access from the hotel lobby to the pre-function area.

2507.05.C Pre-Function Service Access
Provide service access from the banquet service corridor or the primary kitchen to the pre-function area.

2507.05.D Secondary Meeting Space Access
Provide direct access from boardrooms and secondary meeting space to the pre-function area.

2507.05.E Public Restroom Access
Provide direct access to public restrooms, telephones and coatroom.

2507.05.F Pre-function Public Entrance Connect
The pre-function area must adjoin and connect the primary public entrances to the meeting rooms and ballroom.

2507.05.G Exterior Access
Separate exterior access to the pre-function area is desirable but not required.

2507.05.H Size Requirement
The pre-function area results from the over sizing of guest circulation within the function spaces rather than the assignment of a specific and separate space for that purpose. It must be sized appropriately for the likely number of occupants.

2507.05.I Minimum Width
The minimum width of the pre-function area must be 25-30 percent of the depth of the largest adjacent function space.

2507.05.J Not Applicable to this Brand

2507.05.K Not Applicable to this Brand

2507.05.L Width at Ballrooms & Meeting Rooms
Pre-function area must not be less than 8'-0"/2.4 m wide at ballrooms and meeting rooms.

2507.05.M Not Applicable to this Brand

2507.05.N Exterior Windows
Provide exterior windows in pre-function area if possible.

2507.05.O Doors
Doors must be solid core wood and a minimum of 3'-0"/915 mm wide x 8'-0"/2.4 m high. Painted hollow metal doors are not allowed.

2507.05.P Finish Options - Pre-Function Area
2507.05.P.1 **Canada | Puerto Rico | United States:** Floor: Carpet (broadloom and high definition CYP 48 oz.), natural stone, porcelain tile, wood - tongue and groove

**Mexico:** Floor: Carpet (broadloom and high definition CYP 48 oz.), natural stone, wood - tongue and groove

2507.05.P.1.a Base (minimums): 6"/150 mm wood, porcelain tile, natural stone

2507.05.P.2 Wall: Vinyl wallcovering, paint, wood panels or special finish (special approval required), hard surface

2507.05.P.3 Ceiling: Paint on gypsum, coffered drywall ceiling, acoustic ceiling tile (30 percent maximum), decorative ceiling (special approval required)

2507.05.P.3.a In pre-function areas where gypsum board ceilings are required, large (minimum 48" x 96"/1.2 m x 2.4 m) sound absorbing panels with tight butt joints may be provided in lieu of gypsum board if the panels appear to be gypsum board. The panels must not exceed 50 percent of the room.

2507.05.P.3.b Minimum ceiling height in the pre-function area must be 10'-0"/3.0 m.

2507.05.P.3.c When automatic suppression systems are required (see section 2516.00) concealed type sprinkler heads must be utilized.

2507.05.Q Electrical

2507.05.Q.1 Provide two power outlets (socket outlets) at 50'-0"/15.0 m on center for cleaning.

2507.05.Q.2 Provide two power outlets (socket outlets), telephone outlet and Internet access connections at seating areas for laptop use. Outlets must be easily accessible for guest use and not hidden from view.

2507.05.Q.3 Provide six power outlets (socket outlets) at the entrance to each meeting room subdivision for beverage service set-up.

2507.05.Q.4 Lighting must be a combination of recessed fixtures and decorative lighting on four stage preset dimmer controls with local bypass switching.

2507.05.Q.5 Not Applicable to this Brand

2507.05.Q.6 Refer to Section 2514.08 for minimum light level requirements.

2507.05.R House Telephone Outlets

Provide outlets for house telephones adjacent to the public restrooms.

2507.05.S Entrance Telephone Outlets

Provide telephone outlets adjacent to each meeting room entrance.

2507.05.T Furniture Requirements

Provide soft seating areas off of pre-function area to serve as breakout spaces.

2507.05.U Artwork and Mirrors

Artwork is required.

2507.06 Meeting Support Areas

2507.06.A Business Center
2507.06.A.1 A self service business center or a lobby connectivity zone is required. A business center is required for hotels that have a combined meeting room space of 50,000 ft²/4,645 m². This is in addition to a lobby connectivity zone. Refer to Section 2502.02 for lobby connectivity zone requirements.

2507.06.A.2 Self service business center amenities may be provided in an open guest area with prior approval.

2507.06.A.3 The business center must be available for guest use 24-hours a day, year-round. The self service business center must be a minimum of 100 ft²/9.3 m² and must be conveniently located near the meeting facilities.

2507.06.A.4 Not Applicable to this Brand

2507.06.A.5 Not Applicable to this Brand

2507.06.A.6 When enclosed, the entry door to the business center must have a minimum half glass vision panel and be a minimum of 3'-0"/915 mm wide x 8'-0"/2.4 m high. Additional window sidelights must be provided adjacent to the door to provide an open and secure feeling to the area.

2507.06.A.7 Finish Options - Business Center
   2507.06.A.7.a Floor: Carpet (broadloom and high definition CYP 48 oz.)
   2507.06.A.7.a.1 Base (minimums): 6"/150 mm through body synthetic, porcelain tile, natural stone
   2507.06.A.7.b Wall: Vinyl wallcovering, wood panels or special finish (special approval required)
   2507.06.A.7.c Ceiling: Paint on gypsum, acoustic ceiling tile (30 percent maximum)
   2507.06.A.7.d When automatic suppression systems are required (see section 2516.00) concealed type sprinkler heads must be utilized.

2507.06.A.8 Provide a minimum of two flat screen PC workstations with a printer, one laptop station and low level privacy screens or tablets (where permitted). PC workstations must be a minimum of 30 ft²/2.78 m² each. Hotels with more than 250 rooms must add one workstation and related equipment for each additional 250 keys.

2507.06.A.9 When a manned business center is provided it must include a reception desk, a total of three PC workstations (minimum), work counter and a seating area.

2507.06.A.10 Wall and base cabinets must be furniture quality with all exposed surfaces made of wood. The top surface material must be compliant with Section 2515.04.

2507.06.A.11 Provide a securable closet or cabinet for supply storage.

2507.06.A.12 Not Applicable to this Brand

2507.06.A.13 Electrical
   2507.06.A.13.a Provide a minimum of four convenience power outlets (socket outlets) below counter for required equipment at each workstation and four convenience power outlets (socket outlets) above the counter for guest equipment.
   2507.06.A.13.b Power must be provided for the specified printer and fax machine.
   2507.06.A.13.c Provide a minimum of ten power outlets (socket outlets) at the reception area.
2507.06.A.13.d Not Applicable to this Brand

2507.06.A.13.e Lights in business center area must be on keyed switches or controlled at the circuit breaker so that they remain on at all times.

2507.06.A.13.f Refer to Section 2514.08 for minimum light level requirements.

2507.06.A.14 Technology

2507.06.A.14.a Provide a minimum of one outlet for a house telephone.

2507.06.A.14.b Provide data/telephone outlets at each PC and laptop workstation.

2507.06.A.14.c Provide a minimum of six data/telephone outlets at the reception area.

2507.06.A.15 Furniture, Fixtures and Equipment

2507.06.A.15.a Refer to Section 729.00 - Business Center for equipment and security requirements.

2507.06.A.15.b All task chairs must be ergonomically designed with casters, arms and fully upholstered seats and backs. The required number of chairs is equal to the number of required workstations, plus one for the laptop station.

2507.06.A.15.c A minimum of two pieces of artwork is required.

2507.06.B Meeting Storage

Meeting/Ballroom Storage

2507.06.B.1 Provide storage room area equal to 15 percent of ballroom/meeting room areas on the same floor level when possible. **Mexico:** Provide storage room area equal to 20 percent of ballroom/meeting room areas on the same floor level when possible.

2507.06.B.2 Meeting/ballroom storage must open directly to the service corridor.

2507.06.B.3 Direct access from the meeting/ballroom storage to the ballroom or meeting rooms is not desirable.

2507.06.B.4 If ballroom and meeting rooms are provided in more than one location in the hotel, a meeting/ballroom storage area must be apportioned to each area in accordance with the amount of function space provided in that area.

2507.06.B.5 Doors to the meeting/ballroom storage must be a pair of securable, 3'-0"/900 mm wide x 6'-8"/2.0 m high doors with automatic door closer, lockset, kick plate and hold open feature. Secondary access may be provided through a single 3'-6"/1.1 m door.

2507.06.B.6 Mechanical equipment, electrical panels, sound control panels or equipment racks and other audiovisual equipment must not be located within the meeting/ballroom storage.

2507.06.B.7 Finish Options - Meeting/ Ballroom Storage

2507.06.B.7.a Floor: Steel troweled concrete, hardened and sealed

2507.06.B.7.a.1 Base (minimum): 4"/100 mm vinyl

2507.06.B.7.b Wall: Paint
2507.06.B.7.b.1 Provide protection to meeting/ballroom storage walls with a 48"/1.2 m high laminated or fiber reinforced panel wainscot applied to gypsum board partitions.

2507.06.B.7.c Ceiling: Paint on gypsum, painted structure

2507.06.B.7.c.1 Provide a 10'-0"/3.0 m minimum ceiling height in the meeting/ballroom storage.

2507.06.B.8 Lighting fixtures must have a protective wire or plastic enclosure.

2507.06.B.9 Refer to Section 2514.08 for minimum light level requirements.

2507.06.B.10 Provide two power outlets (socket outlets) adjacent to entrance.

2507.06.C Meeting Registration Desk

2507.06.C.1 Meeting registration desk is optional. If provided, must be located in the pre-function area adjacent to the entrance and ballroom.

2507.06.C.2 Provide a method of concealing registration desk when not in use.

2507.06.C.3 Registration desk must consist of a 3'-0"/900 mm wide counter, 3'-0"/900 mm above the finished floor with securable storage cabinets and drawers under the counter.

2507.06.C.4 Finishes

2507.06.C.4.a The front of the meeting registration desk must be finished with natural wood, tile, stone or approved decorative material.

2507.06.C.4.b The top of the meeting registration desk must be a material compliant with Section 2515.04.

2507.06.C.4.c All cabinet surfaces must be plastic laminate or better.

2507.06.C.5 Not Applicable to this Brand

2507.06.C.6 Refer to Section 2514.08 for minimum light level requirements.

2507.06.C.7 Provide two power outlets (socket outlets), telephone and property management system outlets adjacent to counter at each end.

2507.06.D Coat Room

2507.06.D.1 A coat room is required adjacent to the pre-function area as well as adjacent to restaurant and bar where climate required.

2507.06.D.2 Coat room must consist of reception counter at 36"/900 mm above the finished floor that may be fully closed off when not in operation.

2507.06.D.3 The front of the coat room counter must be finished with natural wood, tile, marble or approved decorative material.

2507.06.D.4 The top surface of the coat room counter must be a material that is compliant with Section 2515.04.

2507.06.D.5 Provide an opening in counter for self service and a lift flap and gate (full counter) for attendant.

2507.06.D.6 Provide adjustable shelving under-countertop. All cabinet surfaces must be wood.

2507.06.D.7 Finish Options - Coat Room

2507.06.D.7.a Floor: Carpet (broadloom)

2507.06.D.7.a.1 Base (minimums): 4"/100 mm wood, natural stone, through body synthetic

2507.06.D.7.b Wall: Vinyl wallcovering
2507.06.D.7.c Ceiling: Acoustic ceiling tile, paint on gypsum

2507.06.D.8 Provide built-in coat racks inside an enclosed room accessed by a 3'-0"/900 mm wide door.

2507.06.E Public Restroom Requirements

- Provide a minimum of 1:75 pax based on occupancy load calculation public restrooms for the meeting facilities for areas where there are no code specifications. Ratio to be split 50-50% between male and female.

2507.07 Not Applicable to this Brand

2507.08 Technology Infrastructure

2507.08.A Audiovisual System

- The complete audiovisual system must be designed by a specialist/consultant qualified in the field and approved by Hilton.
- The audiovisual system must be comprised of a multi-zoned sound distribution system, visual display projectors and screens, associated cabling infrastructure and control interlinks with the immediate environment.
- Centrally locate head end equipment for AV, IT and MATV systems.
- Show power, AV/IT connectivity and connectivity for video production vehicles must be located on the exterior of the building.
- Provide an audio system with DSP signal flow and functional quality.
- Touch Screen user interface must be designed for ease of use for non-AV team members as well as hotel end users must be considered during Graphic User Interface (GUI) design and control software programming.
- Provide multiple satellite receivers for background music and other television channels with the ability to send these signals to individual meeting rooms via CAT6 tie lines.
- CAT6 tie line patch bay between all meeting rooms, pre-function space and outdoor function space to main AV head-end room.
- Touch panel controllers must be provided on walls in every room with the capability to control house lights, house sound and background music.
- Remote house light controllers must be provided.

2507.08.B Audio System

- The audio system(s) must be centralized, utilizing DSP audio processing devices that must be interconnected providing control over the entire property. The system must provide audio processing and control for all spaces which have sound reinforcement capabilities including but not limited to:
  - meeting rooms
  - boardrooms
  - ballrooms
  - pre-function spaces
  - restaurants
2507.08.B.1.f bars
2507.08.B.1.g executive lounge
2507.08.B.1.h fitness center/spa
2507.08.B.1.i indoor pools
2507.08.B.1.j business center
2507.08.B.1.k public spaces including but not limited to atrium, lobby and public restrooms
2507.08.B.1.l outdoor spaces including but not limited to porte cochere, pools and patios
2507.08.B.1.m all spaces that will have installed speakers for audio reinforcement.

2507.08.B.2 I/O locations must be placed so that the cabling does not cross guest passageways. Equipment racks must be located either in dedicated audiovisual equipment rooms or share the voice/data IDF locations. Due to the DSP systems being networked based, operation may be obtained from multiple locations with network access.

2507.08.B.3 The sound system must reproduce show sound, from transmitted or recorded material, voice enhancements through microphones, background music and facilities for the hard of hearing. Touch panel remote control systems integrated with electric screens and projection hoist systems must be provided.

2507.08.B.4 The system must be capable of producing a full range sound from 40 hertz to 18 kilohertz, averaging 95 dB SPL evenly across the listening area. Local control providing appropriate zoning of the sound level must be provided. System sensitivity must be specified as 90 decibels at/watt at 1 meter. Speakers must be wide angle, flush fitting, ceiling mounted, 10"/265 mm diameter with a metal grille finished to match the ceiling. These must be supplemented with provision for the connection of floor mounted speakers via the microphone/speaker outlet plates at regular intervals around the room.

2507.08.B.5 The system must include a hard disk replay system capable of receiving updates online via modem. The system must be complete with cabling buried in the building fabric to ceiling speakers, volume controllers and a floor buried induction loop system.

2507.08.C Control Interfaces

2507.08.C.1 Control interfaces must be provided in each zone to enable intuitive control of the source select and volume controls, without allowing users to adjust critical pre-set settings.

2507.08.C.2 A central master control interface at the system equipment racks must be provided allowing local zone settings to be overridden and zones to be combined in any configuration required.

2507.08.C.3 The user interface must consist of a customized keypad designed to provide the basic room operations such as system on/off, source select, volume up/down/mute and architectural lighting control. The keypad is allowed to be wall mounted with a tamper proof cover or mounted in a lectern to provide presenters with the necessary control.

2507.08.C.4 In larger more complex areas, there must be a technician panel based around an approximately 10"/250 mm wireless touch panel. The system must provide intuitive control of all aspects of the AV system. It must also provide a room mode page whereby the technician can set up any conference suite configuration through a bespoke graphical representation of the various conference suite configurations.
2507.08.D Dimming Systems
  2507.08.D.1 Each room must have a discretely located multi-channel dimming rack providing multiple channels per room.

2507.08.E Network Infrastructure for Internet Access
  2507.08.E.1 Four CAT6 drops to each wall, floor box and two drops on the ceiling locations run back to patch bays on the data network.
  2507.08.E.2 IDF patch bays cross connected with six CAT6 copper cables between IDF locations. Distances exceeding 330'-0"/100.0 m require fiber.
  2507.08.E.3 6 strand fiber from MDF location to each IDF location servicing meeting rooms.
  2507.08.E.4 Two CAT6 drops per location in corridor and pre-function areas run back to IDF.
  2507.08.E.5 MDF and IDF locations distributed in locations that will accommodate runs less than 330'-0"/100.0 m to any meeting room location.
  2507.08.E.6 MDF and IDF locations to include proper cooling.
  2507.08.E.7 MDF and IDF locations to include a minimum of a 20 amp service.
  2507.08.E.8 MDF and IDF locations to be sized based on quantity of Telco racks and equipment with clearance to walk entirely around rack.
  2507.08.E.9 PSAV office to have CAT6 connectivity to IDF location.

2508.00 Recreational Facilities

2508.01 Fitness Center
  2508.01.A Fitness Center Requirement
    All properties must have a fitness center designed by a professional fitness consultant.
    All fitness centers must complete a full and comprehensive renovation of the Fitness Center every six years including full FF&E, cardio and strength replacement. The fitness team must approve renovation plans.
  2508.01.B Not Applicable to this Brand
  2508.01.C Approval
    The Hilton fitness team must approve the floor plan, equipment and layout. Finishes must be approved by the Design team.
  2508.01.D Size Requirement
    The fitness center must comply with the minimum size requirements in accordance with the schedule set forth below:
    1. 0 – 150 keys = minimum 750 ft²/46 m²
    2. 151 – 300 keys = minimum 1000 ft²/56 m²
    3. 301 – 450 keys = minimum 1200 ft²/74 m²
    4. 451 – 1000 keys = minimum 1,500 ft²/93 m²
    In addition to the fitness center each hotel is required to have a minimum of three Five Feet to Fitness rooms. Refer to Section 2508.01.Q for details.
  2508.01.E Larger Hotel Requirements
    In larger hotels and certain markets the areas listed may be expanded, based upon Hilton requirements.
2508.01.F  Not Applicable to this Brand

2508.01.G  Required Zones

The Fitness Center layout must include the following zones:

• **Entry Zone:** Fitness centers over 600 ft²/56 m² must have a designated Entry Zone. It is to be clear of equipment and provide direct access to the towel station. Provide a dedicated area with brand approved sports performance flooring.
• **Cardio Zone:** Cardio units grouped together facing the same direction. Provide a dedicated area with brand approved sports performance flooring. Required framed mirror.
• **Strength Zone:** Space for strength units. Provide brand approved rubber flooring in strength training areas. Required framed mirror.
• **Stretch Zone:** Open floor space designated for stretching is required. The Stretch Zone must be outside of transition areas and have adequate space for stretching and utilization of core and balance equipment.
• **Functional Zone:** Space for functional equipment. Provide brand approved rubber flooring.

2508.01.H  Securable & Spa Adjacent

The fitness center must be securable and located adjacent to the spa (if applicable) and have convenient access to the pool area and restroom facilities.

2508.01.I  Not Applicable to this Brand

2508.01.J  Doors and Windows

2508.01.J.1  The fitness center door must have a pair of 3'-0"/900 mm wide x 8'-0"/2.4 m high frameless glass doors, large view panel doors or a solid door with side lights.

2508.01.J.2  Windows must be provided when possible.

2508.01.J.3  Semi-private window treatments must be present on guest facing corridors and exterior facing windows.

2508.01.K  Finish Options - Fitness Center

2508.01.K.1  The fitness center finishes must be reviewed and approved by the Hilton Design team.

2508.01.K.2  Floor:  Flooring must be submitted as part of the design review package and use the following spec: Rubber rolled good in the strength and functional zones at least 8 mm thick. Wood vinyl over rubber backing in cardio and entry zones at least 7 mm thick.

2508.01.K.2.a  Base: wood, through body synthetic

2508.01.K.2.b  **Mexico:** Vinyl flooring is allowed with prior approval from Hilton.

2508.01.K.3  Wall:  Paint

2508.01.K.3.a  Designer choice for color scheme must be approved by the Hilton Design team.

2508.01.K.4  Ceiling:  Paint on gypsum

2508.01.K.4.a  Not Applicable to this Brand

2508.01.K.4.b  Ceiling height must be 9'-0"/2.75 m or higher.
2508.01.K.4.c  When automatic suppression systems are required (see section 2516.00) concealed type sprinkler heads must be utilized.

2508.01.L  Not Applicable to this Brand

2508.01.M  Electrical

2508.01.M.1  Provide wall mounted uplighters and ceiling mounted recessed down lighters with feature accent lighting to highlight towel service station and wood framed mirrors.

2508.01.M.2  Lights for the fitness center must be on keyed switches or controlled at the circuit breaker so that they remain on at all times.

2508.01.M.3  Refer to Section 2514.08 for minimum light level requirements.

2508.01.M.4  A grounded power outlet (socket outlet), CAT6 cable and coaxial cable are required for each piece of cardio equipment. Label the grounded outlet. The power supply and cables must be home run to each piece of equipment. Refer to Section 502.00 - Fitness Center for equipment requirements.

2508.01.M.5  A cable management system is required to conceal the power and coaxial cable.

2508.01.M.6  Each treadmill must have a dedicated circuit with a NEMA power outlet (socket outlet). Where power supply is unstable, all fitness equipment that is electrically powered must have a minimum of 20 minutes UPS backup.

2508.01.M.7  Flush mounted floor outlets must be incorporated for any equipment that is not adjacent to a wall.

2508.01.M.8  Provide approximately 5db’s of signal strength for each personal viewing LED/LCD screen on equipment.

2508.01.N  House Telephone Outlets

2508.01.N  An emergency telephone is required. The emergency telephone must be mounted 48”/1.2 m maximum above the finished floor. The telephone must have a red casing. The telephone must allow direct calls to outside Emergency Responders and to a location that is manned 24-hours a day unless the local jurisdiction requires otherwise. The telephone must comply with Brand Standard 702.01.A – Emergency Services.

2508.01.O  Technology

2508.01.O.1  A minimum of one wall-mounted television is required. Televisions must comply with the sizes and specifications provided in Section 713.00.

2508.01.O.2  Each television requires a grounded power outlet (socket outlet), CAT6 cable and coaxial cable.

2508.01.P  Furniture, Fixtures and Equipment

2508.01.P.1  Refer to Section 502.00 - Fitness Center for a list of required equipment.

2508.01.P.2  Not Applicable to this Brand

2508.01.P.3  All fitness equipment clearances as specified in the Hilton floor plan layout and by the manufacturer at installation must be maintained in accordance with the plans provided at installation.

2508.01.P.4  Contact the Hilton Fitness Team for assistance with a floor plan layout identifying placement and quantities of equipment.
2508.01.P.5 Not Applicable to this Brand

2508.01.P.6 An Orion (or equivalent) towel cabinet is required. Refer to the Fitness Guide on https://designinformation.hilton.com for required specifications.

2508.01.P.7 Not Applicable to this Brand

2508.01.P.8 Mirrors

2508.01.P.8.a Framed mirrors must be present in the cardio, dumbbell, and stretch zones. Quantity is based on room dimensions and Hilton fitness dept. floor plan layout. Shatter proof mirror glass to be purchased locally. Specifications may be found in the Fitness Guide on https://designinformation.hilton.com.

2508.01.Q Five Feet to Fitness

Refer to https://fivefeettofitness.hilton.com for required buildout, equipment and FF&E.

2508.01.Q.1 Each hotel is required to implement a minimum of three "Five Feet to Fitness" rooms. Additional Five Feet to Fitness rooms are recommended for larger hotels. Contact Hilton Fitness for further recommendations. Prior to implementation, the hotel must obtain an approved layout from the Hilton Fitness Team.

2508.01.Q.2 Five Feet to Fitness requires approximately 100 ft²/10 m² and may require the removal of the soft seating area of the guest room depending upon room size and design. All Five Feet to Fitness rooms must have a layout approved by Hilton Fitness and may not alter the floor plan in any way without prior approval from Hilton Fitness.

2508.01.Q.3 Flooring: ECORE Terrain RX 7 mm thick.

2508.01.Q.4 Blackout shades are required.

2508.01.Q.5 Minimum ceiling heights:
- Streamline Bay – no minimum ceiling height
- Monkey Bar Bay – minimum 95”/2.4 m
- Deluxe Pull Up Bay – minimum 112”/2.8 m

2508.01.Q.6 Refer to Section 318.00 for equipment requirements.

2508.01.Q.7 Provide power outlets (socket outlets) and Cat 6 cabling behind the rig.

2508.01.Q.8 In addition to the guestroom HVAC requirements an ionization system must be mounted in the supply discharge of the air handling unit. The air quality system must be AtmosAir FC-100 or equal.

2508.02 Spa

2508.02.A Spa Requirement

A spa facility is optional. If provided it must meet all requirements in this section.

2508.02.B Urban and Resort Spa Requirements

Urban and Resort spa standards are outlined below:

2508.02.B.1 Urban Spa
2508.02.B.1.a Must be a minimum 4,000 ft²/372 m² (not including fitness center, pool and/or full service salon).
2508.02.B.1.b Provide a total of four treatment rooms including one double occupancy room.
2508.02.B.1.c A separate nail area is optional.
2508.02.B.1.d Not Applicable to this Brand
2508.02.B.1.e Provide relaxation lounge, one thermal experience (sauna, steam), and separate men’s and women’s locker room.

2508.02.B.2 Resort Spa
2508.02.B.2.a Must be a minimum 4,000 ft²/372 m² (not including fitness center, pool and/or full service salon).
2508.02.B.2.b Provide a total of four treatment rooms including one double occupancy room.
2508.02.B.2.c Separate nail area is optional.
2508.02.B.2.d Not Applicable to this Brand
2508.02.B.2.e Provide relaxation lounge, one thermal experience (sauna, steam), and separate men’s and women’s locker room.

2508.02.C Larger Spa Requirements
   If urban or resort spas exceeds minimum 4,000 ft², these requirements may change accordingly with approval of the Hilton spa team, i.e. - number of showers, wash basins and water closets, and point of sale systems.

2508.02.D Not Applicable to this Brand
2508.02.E Not Applicable to this Brand
2508.02.F Not Applicable to this Brand
2508.02.G Not Applicable to this Brand
2508.02.H Not Applicable to this Brand
2508.02.I Approval
   The spa must meet all minimum standards, be designed by an approved professional spa designer and approved by Hilton.

2508.02.J Fitness Center Access
   The spa facility must have direct or convenient access to the fitness center which will include separate men’s and women’s restrooms and locker facilities.

2508.02.K Door
   The spa entrance door must be a minimum of 3'-0"/915 mm wide x 8'-0"/2.4 m high and have a large view panel or side light.

2508.02.L Required Facilities
   The spa must have the following facilities:
   2508.02.L.1 Reception/Retail Area
2508.02.L.1.a Provide a seating area with a minimum of two seats located in/near the reception lobby. More seats may be required based on size of the spa/hotel.
2508.02.L.1.b The reception desk must not be higher than 42”/1.07 m on the customer side. Work surface for staff side must be 36”/915 mm.
2508.02.L.1.c Provide two point of sale stations at the primary reception desk with spa scheduling software that interfaces with the OnQ® property management system.
2508.02.L.1.d Provide two restricted telephone lines at reception desk, which do not allow inbound calls or reservations.
2508.02.L.1.e Four safe deposit boxes must be provided at the reception desk or other staffed desk, if not available in guest lockers.
2508.02.L.1.f The retail component must be adjacent to or near the primary spa entrance. Inventory and retail area must be lockable.
2508.02.L.1.g The retail desk must not be higher than 42”/1.07 m on the customer side. Work surface for staff must be 36”/900 mm. Chairs are not allowed behind desk.
2508.02.L.1.h The retail desk must accommodate space for gift-wrapping.
2508.02.L.1.i Provide product storage cabinets within the store equal to 10 percent of the total area of the store.
2508.02.L.1.j Provide a variety of furniture, fixtures and props to appropriately display merchandise.
2508.02.L.1.k Not Applicable to this Brand
2508.02.L.1.l Provide storage space and power outlets (socket outlets) for telephones, cash register, point of sale system, computers, fax, credit card, etc.
2508.02.L.2 Support Administration
2508.02.L.2.a Provide a reservation department separate from reception/registration desk (by front desk or with hotel central reservation department).
2508.02.L.2.b Provide a multi-purpose office located in/by reservation department.
2508.02.L.3 Locker Room
2508.02.L.3.a Provide 2.5 lockers per treatment room in the women’s locker room. Provide 2 lockers per treatment room in the men’s locker room. (Add an additional 20 half lockers in each locker facility if fitness center guests will be using the spa locker facility.)
2508.02.L.3.b Provide full length or half length lockers with a minimum of one shelf and keyless system.
2508.02.L.3.c Provide separate facilities for men and women.
2508.02.L.3.d Provide direct or easy access to fitness center and workout facilities.
2508.02.L.3.e Provide a private changing room in each locker room.
2508.02.L.3.f Not Applicable to this Brand
2508.02.L.3.g Provide for a seated dry grooming vanity area with a minimum of two hair dryers.
2508.02.L.3.h Provide cabinetry for clean and soiled linens.
2508.02.L.3.i Water Closets and Wash Basin Area
2508.02.L.3.i.1 Minimum of two water basins per locker room are required.
Showers

- Provide a minimum of two showers in the men’s and women’s locker rooms
- Showers design must include a private disrobing area at entry of shower and a seat or corner step in the shower area.

Thermal Therapy Area

- Provide a minimum of one thermal facility (i.e. – aromatic steam, sauna, hamman, etc.)

Waiting Area

- The co-ed spa waiting area must be accessed through locker room area.
- Co-ed or separate waiting areas to be selected based upon spa programming.
- Provide storage for towels.
- Number count for lockers, showers, wash basins and water closets will increase if the spa implements a fitness/spa membership program for locals.

Co-ed Relaxation Lounge (if space permits)

- Not Applicable to this Brand
- The lounge must have an array of comfortable seating types, including single chairs with ottomans or lounges, love seats or sofa seating with side tables and/or a coffee table.

Treatment Room

- All tiled floors must slope towards floor drains, to allow effective drainage.
- Each room must have cabinet storage for linen and supplies.
- Provide designated storage space in each room for major equipment, which is easily accessible to team members.
- Provide outdoor treatment areas if spa permits.
- Not Applicable to this Brand
- Not Applicable to this Brand
- Not Applicable to this Brand
- Accommodations must include three facials and two wet treatment rooms (vichy/showers).
- Provide thermostats in each treatment room to control the room’s temperature. The climate controls must be capable of producing 3-5 degrees of temperature change within five minutes.
- A hand wash basin is required in each treatment room/area.

Nail Room/Area

- Room/area dimension must be large enough to fit two manicure and two pedicure stations for urban spas plus space around the equipment for circulation. A prep area for the treatment room must be provided.
2508.02.L.8.b  Not Applicable to this Brand
2508.02.L.8.c  Room must have cabinet storage for linen and supplies.
2508.02.L.8.d  One prep room must be located near treatment area.

2508.02.L.9  Salon
2508.02.L.9.a  Salon consideration is based upon geographical location and customer mix of hotel. There may not be a need for a salon in certain markets.
2508.02.L.9.b  Salon must be separated from spa reception, lounges and other areas by a door.
2508.02.L.9.c  Salon reception desk must be equipped with power outlets (socket outlets) and data outlets for a telephone, computer, cash register and credit card machine. (This desk is not a part of the spa reception desk).
2508.02.L.9.d  Provide a seating area, up to two chairs per three styling stations.
2508.02.L.9.e  Styling stations must have product storage, electrical equipment storage, guest footrests and electrical supply. Power outlets (socket outlets) must be housed on the left hand side half way from the floor.
2508.02.L.9.f  Provide nail services consisting of two manicure stations and two pedicure stations (if not located in spa).
2508.02.L.9.g  In full service salons, a dispensary area must be provided for chemical preparation and storage.

2508.02.L.10  Team Member Break Room
2508.02.L.10.a  Provide a spa manager’s office with power outlets (socket outlets) and data outlets for a telephone, computer and printer linked to all spa/property systems.
2508.02.L.10.b  Provide a designated water closet, table and rest area (if space permits).
2508.02.L.10.c  Provide a team member locker facility (unless team members are able to use hotel locker facilities).
2508.02.L.10.d  Provide storage and shelving.

2508.02.L.11  Storage Rooms
2508.02.L.11.a  Provide a laundry and linen storage room. Storage room must have open shelves for clean linens and be large enough to house laundry carts/outlets for used linen. In some regions it is against health code regulations to store soiled linen and clean linen together. In this case, a separate room must to be designated for soiled linen carts.
2508.02.L.11.b  Not Applicable to this Brand
2508.02.L.11.c  Provide a minimum of one securable janitor’s storeroom.
2508.02.L.11.d  Provide one retail/product storage area.

2508.02.L.12  Pantry/Spa Prep Room
2508.02.L.12.a  Not Applicable to this Brand
2508.02.L.12.b  Provide a dishwasher and under-counter refrigerator.
2508.02.L.12.c  Provide wall and floor mounted cabinet storage with under-cabinet task lighting.
2508.02.L.12.d  Provide a deep hand wash basin.
2508.02.L.13 Finish Options - Spa
   2508.02.L.13.a Floor: Wood - tongue and groove, porcelain tile, natural stone, woven vinyl tile, marble/granite
       2508.02.L.13.a.1 Base (minimums): 6”/150 mm wood, porcelain tile, natural stone
       2508.02.L.13.a.2 Treatment room flooring must provide stress relief to therapists.
   2508.02.L.13.b Wall: Vinyl wallcovering, wood or special finish, epoxy paint, natural stone
   2508.02.L.13.c Ceiling: Paint on gypsum, wood or special finish
   2508.02.L.13.d When automatic suppression systems are required (see section 2516.00) concealed type sprinkler heads must be utilized.

2508.02.L.14 Mechanical/Plumbing
   2508.02.L.14.a Provide individual environmental controls in each treatment room.
   2508.02.L.14.b A floor wash basin must be included in each janitorial closet in locker room wet areas.
   2508.02.L.14.c Provide a climate controlled area for AV equipment storage in the mechanical room.

2508.02.L.15 Electrical
   2508.02.L.15.a Lights for the restrooms, lockers and waiting areas must be on keyed switches or controlled at the circuit breaker so that they remain on at all times during operation.
   2508.02.L.15.b Ceiling fixtures and air supply units are not allowed to be directly over massage tables.
   2508.02.L.15.c Provide indirect and dimmable lights in treatment rooms. Lighting is not allowed directly over massage tables.
   2508.02.L.15.d Provide wall sconces with up-lights that are individually controlled with dimmer switches in all spa areas. Fluorescent lighting must not be used in these areas.
   2508.02.L.15.e Refer to Section 2514.08 for minimum light level requirements.
   2508.02.L.15.f Provide a floor power outlet (socket outlet) in dry treatment rooms to power massage beds.
   2508.02.L.15.g Provide a GFCI/ELCB/RCCB or equal ground fault protected wall power outlet (socket outlet) in wet rooms to power hydro bed.

2508.02.L.16 Technology
   2508.02.L.16.a Not Applicable to this Brand
   2508.02.L.16.b Provide an outlet for a house telephone located near the seating area in lobby and in the locker room.
   2508.02.L.16.c Provide a sound system throughout the spa.
   2508.02.L.16.d Treatment rooms must have individual volume controls.
   2508.02.L.16.e Provide four data outlets for point of sale equipment.

2508.02.L.17 Furniture, Fixtures and Equipment
   2508.02.L.17.a Seating areas must have plush and oversized reclining or overstuffed chairs.
   2508.02.L.17.b Lounges and lobby area must have a console table or appropriate furniture piece to display reading material.
2508.03 Pool/Whirlpool

2508.03.A Not Applicable to this Brand

2508.03.B Pool Requirement
   All hotels must have a pool.

2508.03.C Not Applicable to this Brand

2508.03.D Whirlpool Requirement
   A whirlpool is optional unless a spa is provided. If a whirlpool is provided it must be reviewed and approved by the brand for design and functionality.

2508.03.E Dimensions
   2508.03.E.1 Indoor pools must have a minimum water surface of 600 ft²/55 m² with a length of not less than 30'-0"/9.0 m.
   2508.03.E.2 Outdoor pools must have a minimum water surface area of 800 ft²/74 m².
   2508.03.E.3 Not Applicable to this Brand
   2508.03.E.4 The minimum pool depth must be 3'-0"/900 mm except when a zero entry ramp is used; the maximum depth must be 5'-0"/1.5 m.
   2508.03.E.5 The whirlpool must be located near the pool and have a minimum 50 ft²/4.65 m² surface area.
   2508.03.E.6 Hilton reserves the right to increase the minimum pool size dependent upon key count and/or market demands.

2508.03.F Orientation
   The orientation of the outdoor pool must be such that it receives unobstructed sunlight from mid-morning to late afternoon.

2508.03.G Materials Allowed
   Pool finishes must be tile, plaster or stainless steel. Paint, PVC and vinyl liners are not allowed.

2508.03.H Gunite Construction
   Pool Shell
   2508.03.H.1 The pool shell must be constructed of concrete or stainless steel.
   2508.03.H.2 Pool shell finish over concrete must be tile or pool plaster with a 7 year life expectancy.
   2508.03.H.3 Pool shell finish over stainless steel must be tile, stainless steel with #320 finish or hot calandered, laminated stainless steel panels.

2508.03.J Pool Restrooms
   2508.03.J.1 Direct access is required to men's and women's restrooms. Outdoor pools must have easy access to restrooms.
   2508.03.J.2 Guest locker rooms shared between recreational facilities that are directly adjacent to the pool can serve as pool restrooms. Refer to Section 2508.04 for guest locker room requirements.

2508.03.K Not Applicable to this Brand

2508.03.L Doors and Windows
2508.03.L.1 Doors to indoor pools must be a minimum of 3'-0"/915 mm wide x 6'-8"/2.04 m high and have a full vision panel.

2508.03.L.2 Not Applicable to this Brand

2508.03.L.3 Not Applicable to this Brand

2508.03.L.4 Not Applicable to this Brand

2508.03.L.5 All pools must be securable after hours.

2508.03.L.6 When provided, entry gates to outdoor pools must be self-closing and self-latching. The entry handles and/or latch must be mounted at 48"/1.2 m above the finished floor (if allowed by local code) to prevent access by unaccompanied children.

2508.03.M Finish Options - Indoor Pool

2508.03.M.1 Floor: Porcelain tile, natural stone. The deck around the pool must be a decorative non-slip surface.

2508.03.M.1.a Base (minimums): 4"/100 mm porcelain tile, natural stone

2508.03.M.2 Wall: Epoxy paint, porcelain tile, natural stone, acrylic knockdown - orange peel texture

2508.03.M.3 Ceiling: Washable surface ceiling tile with non-corrosive grid

2508.03.M.3.a The finished ceiling must have a minimum height of 10'-0"/3.0 m.

2508.03.M.3.b Exposed painted structure, mechanical equipment and ductwork is not acceptable.

2508.03.M.3.c When automatic suppression systems are required (see section 2516.00) concealed type sprinkler heads must be utilized.

2508.03.M.4 High quality, non-corroding, non-ferrous finishes are to be provided throughout pool area.

2508.03.N Deck/Coping

2508.03.N.1 A clear, unobstructed space of 5'-0"/1.5 m wide around the pool perimeter and 3'-0"/900 mm wide around whirlpools must be provided. Infinity pools must have a clear, unobstructed space of 5'-0"/1.5 m wide around the three sides of the pool perimeter, the infinity edge must be protected by installing a safety glass barrier or by other design solutions.

2508.03.N.2 In addition to the unobstructed perimeter requirements, usable deck area at indoor pools must be a minimum of 12'-0"/3.7 m on each end for pool seating.

2508.03.N.2.a In addition to the unobstructed perimeter requirements, usable deck area around outdoor pools must be a minimum of 15'-0"/4.57 m on all sides for pool seating.

2508.03.N.3 The pool deck area must slope away from the pools to drains. Decks must not drain into landscaped areas.

2508.03.N.4 The coping must have a non-slip finish.

2508.03.N.5 Pool coping must be designed to allow maintenance or replacement without removal of the pool deck. Cascade edge copings must be reviewed and approved by Hilton.

2508.03.N.6 The pool deck must be easily cleanable. The floor surface finishes must be applied to provide a "low risk of slip" rating both under wet and dry conditions. The testing methods employed must be those that are specified by local laws or recognized as best practice guidance issued from the country. Refer to Section 2514.03.A. Where climate dictates, outdoor pool decks require a spray applied heat reflector coating.
2508.03.N.7 Not Applicable to this Brand

2508.03.N.8 Outdoor pool decks must have a Solar Reflectivity Index (SRI) of no less than 0.30.

2508.03.N.9 Joints where the pool or whirlpool coping meets the deck must be protected from the relative pressure of adjoining deck movement.

2508.03.N.10 Joints where the deck meets the pool or whirlpool must be watertight.

2508.03.N.11 Decks must be installed with relief joints for thermal movement and potential settling.

2508.03.N.12 Pools must be deck level gutter pools or infinity pools with the water level equal to the surrounding deck. Other designs will be considered with prior approval from Hilton.

2508.03.N.13 The pool deck must not be permeable. Large-scale deck paver systems may be used that allow water to drain through to an airspace that drains.

2508.03.O Stairs/Railing/Fencing

2508.03.O.1 Steps with uniform treads and risers and a handrail must be provided at the whirlpool and shallow end of the pool (unless zero entry ramp is provided). At least one ladder must be provided at the deep end.

2508.03.O.2 Provide fencing (minimum 48”/1.2 m high) around all outdoor pool areas. Chain link fencing is not allowed. Design must be approved by Hilton.

2508.03.P Pool Markers

2508.03.P.1 Recessed hard tile water depth markings in contrasting colors must be placed in the pool and whirlpool coping or in the deck immediately behind the coping and on the inside rim of the pool and whirlpool perimeter, above the water line at reasonable intervals and at every 12”/300 mm of depth change. Lettering must be at least 4”/102 mm high.

2508.03.P.2 Wherever islands, fountains and other structures are located within pools, depth markings must be posted thereon and must be visible from the opposite pool edge.

2508.03.P.3 Depth indicators must be in Imperial and metric units.

2508.03.P.4 Depth must be measured 24”/600 mm out from the edge of the coping. Actual pool depths must be measured and verified prior to marking the pool deck and sides. Variation from depth marker must be no more than ± 2”/50 mm.

2508.03.P.5 The pool and whirlpool must have the international no diving symbol and the words "NO DIVING" around the pool and whirlpool perimeter installed in the coping or immediately behind the coping. The text must be legibly displayed in contrasting characters in the English language. Text in the local language may also be added.

2508.03.P.6 Painted, stenciled and vinyl appliqué depth markings must not be used.

2508.03.Q Mechanical

2508.03.Q.1 Provide water vapor retarder within the pool enclosure walls to prevent moisture migration into the wall or ceiling cavities, adjacent spaces, and to minimize moisture condensation potential within the envelope.

2508.03.Q.2 The water temperature of all pools must be controlled.

2508.03.Q.3 Indoor pools must be maintained at a minimum of 83 °F/28.3 °C and exterior pools must be maintained at a minimum temperature of 80 °F/26.7 °C.
2508.03.Q.4 Outdoor pools must have temperature maintained between 80 °F/26.7 °C and 89 °F/31.7 °C. Locations where pool water temperatures will rise above 89 °F/31.7 °C must provide cooling systems to maintain pool water temperatures within the specified range.

2508.03.Q.5 The whirlpool must be operated between the temperatures of 99 °F/37.2 °C and 103 °F/39.4 °C. The water is never allowed to be in excess of 104 °F/40 °C.

2508.03.Q.6 Provide a complete packaged HVAC and dehumidification system to maintain the pool area temperature and relative humidity while minimizing pool water evaporation. Provide the features listed below:

- A packaged system specifically designed for pool area dehumidification, factory assembled and tested, with test report available on request.
- Materials suitable for the pool environment with air side surfaces coated for corrosion protection.
- An outdoor air connection that provides the outdoor air required in Section 2514.06.
- A microprocessor control system with solid state sensors and a remote-mounted solid state control panel with LED indicators and service diagnostics must be located in the pool room.
- Heating:
  - Gas duct heater: Provide a gas-fired duct heater with stainless steel heat exchanger, two-stage or modulating heating control, stainless steel burners, spark ignition and power vent.
  - Electric duct heater: Provide an electric resistance, two-stage or SCR controlled duct heater that complies with NFPA 70.
  - If fuel fired systems are used, they must be designed to comply with NFPA 54 (www.nfpa.org) and manufacturers recommended installations instructions. Refer to Section 2516.00 for additional requirements.

2508.03.Q.7 Install pool cooling systems with approved heat exchangers fed from the chilled water distribution system.

2508.03.Q.8 Provide water meters for pool makeup and filtration blow down systems.

2508.03.Q.9 Pool equipment rooms must not be located below guestrooms.

2508.03.Q.10 Pool equipment and chemicals must be located in a lockable, vented storage room away from guest view.

2508.03.R Plumbing

2508.03.R.1 Provide poolside showers for all pools.

2508.03.R.2 Not Applicable to this Brand

2508.03.R.3 Provide a hose bib for wash down. Hose bib must be frost-proof where climate conditions dictate.

2508.03.R.4 Provide plumbed eye wash station or country recognized safety equivalent within the pool equipment room that complies with ANSI/ISEA Z358.1-2009 (www.ansi.org).

2508.03.S Safety/Pool Systems

2508.03.S.1 Provide pool equipment room to house pool heaters, pumps and filtration equipment.

2508.03.S.2 Provide surge tanks for deck level gutter pools.

2508.03.S.3 Design pool filtration and recirculation system to recirculate the entire pool water volume every six hours.
2508.03.S.4 Provide water flow rate meters, pressure gages for pumping systems, and calibrated thermometers for spa and pool conditions.

2508.03.S.5 Provide an automatic water makeup system to include a back flow preventer.

2508.03.S.6 Provide automatic shutdown of pool circulation systems when heated supply water temperature exceeds 95 °F/70.5 °C for main pool and 110 °F/43.3 °C for spa to minimize risk of scalding.

2508.03.S.7 Size the whirlpool filtration system to operate at least two hours per day with full water turnover rate of not more than thirty minutes.

2508.03.S.8 All pools must be equipped with continuous monitoring/feed disinfecting equipment. The equipment must maintain a residual of not less than one part per million. Allowed disinfecting equipment includes:

- A saline-based generator system that is NSF 50 and UL standard 1081 (www.ul.com) tested and certified (or the equivalent) and sized per local guidelines.
- Not Applicable to this Brand
- Provide link to building automation system for remote monitoring and performance evaluation.

2508.03.T Electrical

- Not Applicable to this Brand

2508.03.T.2 Provide a labeled emergency equipment shut-off switch/button located adjacent to the whirlpool that will shut off all jet pumps/blower and re-circulating pumps.

2508.03.T.3 Lighting

- All electrical power circuits installed in and around the pool area must be equipped with GFCI/ELCB/RCCB or equal ground fault interrupters.
- Not Applicable to this Brand

- Provide a minimum of two UL (www.ul.com) listed wet niche submersible and underwater rated light fixtures for each pool and one fixture for each whirlpool. Lights must be changeable without draining the pool.

- Lights are not allowed to be located over the water surface.

- Lights at the indoor pool area must be on keyed switches or controlled in a location that is not accessible by guests so they remain on at all times.

- Refer to Section 2514.08 for minimum light level requirements.

- Power outlets (socket outlets) must be waterproof and must not be located on the floor.

- Provide a 20 minute time switch to control the whirlpool water jets.

2508.03.U House Telephone Outlets

- An emergency telephone is required. The emergency telephone must be mounted 48'/1.2 m maximum above the finished floor. The telephone must have a red casing. The telephone must allow direct calls to outside Emergency Responders and to a location that is manned 24-hours a day unless the local jurisdiction requires otherwise. The telephone must comply with Brand Standard 702.01.A – Emergency Services.

2508.03.V Furniture, Fixtures and Equipment
2508.03.V.1 Provide chaise lounges, tables and seating to accommodate a minimum of 20 people in the pool area. Minimum requirement increases with pool size and market demand. Indoor pools must provide more chairs and tables than chaises. Hilton must give final approval on number of seating.

2508.03.V.2 A minimum of three tables must be provided for interior pool decks.

2508.03.V.3 A minimum of three tables with umbrellas must be provided for exterior pool decks.

2508.03.V.4 Plastic straps and plastic pool furniture must not be used.

2508.03.V.5 Chaise lounge cushions are not required on Brand approved pool furniture (i.e., sling styles).

2508.03.V.6 Not Applicable to this Brand

2508.03.V.7 Not Applicable to this Brand

2508.03.V.8 Provide a lockable storage area hidden from guest view for outdoor pool furniture.

2508.03.W Safety Equipment

2508.03.W.1 Provide an anti-entrapment (hair, digit and suction) drain cover for all primary drains and suction inlets for all pools, whirlpools, water features and/or water fountains. Fountains with natural flow or drip and not mechanically powered are not included. All drain covers must be secured on drains at all times. Properties must retain a letter by the installer that states the cover was installed per the manufacturer’s instructions.

2508.03.W.2 A Safety Vacuum Release System (SVRS) or other approved automatic drain blockage relief system is required for all existing pools, whirlpools, water features and fountains that currently have a single main drain installed. All newly constructed pools, whirlpools, water features and fountains must be designed without the need for a SVRS.

2508.03.W.3 A professionally-fitted pool cover must be installed when the outdoor pool and/or whirlpool is closed for the season. The temporary use of pool covers is prohibited. When used, pool covers and their installation must meet local code regulations.
2508.04.E Entry Doors
Entry doors must be a minimum of 3'-0"/915 mm wide x 8'-0"/2.4 m high and have self-closing hardware, latch set and privacy button.

2508.04.F Finish Options - Locker Room/Restroom
2508.04.F.1 Floor: Porcelain tile, woven tile, carpet (nylon broadloom)
  2508.04.F.1.a Base (minimums): 4"/100 mm porcelain tile, carpet, through body synthetic
2508.04.F.2 Wall: Vinyl wallcovering, paint. Full height porcelain tile wall is required on all plumbing fixture walls.
2508.04.F.3 Ceiling: Paint on gypsum
  2508.04.F.3.a When automatic suppression systems are required (see section 2516.00) concealed type sprinkler heads must be utilized.

2508.04.G Changing Cubical
Provide at least one private changing cubical and one of universal access in the men’s and women’s locker rooms.

2508.04.H "Wet" Area Design
Locker rooms must be designed so that guests must not cross a “wet” area to gain access to the lockers. Wash basins, water closets and showers must be placed at the rear of each locker room or to one side of the lockers so that it is not necessary to cross any “wet” area to gain access to the lockers.

2508.04.I Shower Requirements
A minimum of one shower must be provided in each of the men’s and women’s facilities. Showers must provide for private disrobing area behind a locked door, a bench and coat hooks. The shower must have a seat or corner step and have amenity dispensers built into the shower area. Universal access showers must incorporate a level deck shower with grab rails, seat and pull cord alarm.

2508.04.J Vanity Top Materials
Vanity tops, apron and splashes must be of a material compliant with Section 2515.04. Vanities must have under mount vitreous china lavatories and suitable space for amenities.

2508.04.K Plumbing
  2508.04.K.1 Provide one floor drain with chrome-plated brass cover at each water closet centered under a water closet partition.
  2508.04.K.2 Water closets must be wall mounted vitreous china units with automatic flush-valve operation.
  2508.04.K.3 Water closets must be elongated bowl type with a white solid plastic seat and self-sustaining stainless steel hinges.
  2508.04.K.4 Exposed plumbing must be chrome-plated.
  2508.04.K.5 All plumbing fixtures and faucets (except showers) must have touchless electronic operation.

2508.04.L Electrical
  2508.04.L.1 Provide two power outlets (socket outlets) with GFCI/ELCB/RCCB or equal ground fault protection at 3’–6”/1.07 m above the finished floor adjacent to vanity.
  2508.04.L.2 Refer to Section 2514.08 for minimum light level requirements.
2508.04.M House Telephone Outlets
An emergency telephone is required. The emergency telephone must be mounted 48”/1.2 m maximum above the finished floor. The telephone must have a red casing. The telephone must allow direct calls to outside Emergency Responders and to a location that is manned 24-hours a day unless the local jurisdiction requires otherwise. The telephone must comply with Brand Standard 702.01.A – Emergency Services.

2508.04.N Furniture, Fixtures and Equipment
2508.04.N.1 Not Applicable to this Brand
2508.04.N.2 Provide keyless system, double-tiered half-lockers, 12”/300 mm wide x 18”/450 mm deep x 36”/900 mm high, with enclosed bases, top and solid fronts with partial louvers. Lockers must be mounted on a tiled concrete plinth and securely anchored.
2508.04.N.3 Not Applicable to this Brand
2508.04.N.4 Provide locker benches.
2508.04.N.5 Provide one robe hanging rail approximately 5’-0”/1.5 m long with double robe hooks at 12”/300 mm on center in each locker room.
2508.04.N.6 Provide a wall mounted full length mirror in each locker room. Framed mirrors must be installed with tamper proof wall mounts.

2508.05 Sauna
2508.05.A Sauna Requirement
A sauna is optional but is required when a spa is provided. Refer to Section 2508.02 for sauna requirement within the spa facility.
2508.05.B Separate Men & Women Sauna
A sauna must be provided for men and women separately and accommodate a minimum of four people.
2508.05.C Unisex Requirement
The sauna may be a unisex facility for hotels with less than 300 keys.
2508.05.D Location
Sauna must be located in locker room area, if not located in the spa.
2508.05.E Door
The sauna door must be insulated, have a full glass panel with safety glass and narrow stile and open out. The door hardware must be non-locking or latching, with self-closing device.
2508.05.F Unit, Temperature & Humidity
The sauna must be a pre-engineered standard manufactured unit. Maximum sauna temperature must be 175 °F/79.4 °C with the relative humidity controlled in the range of 15 – 20 percent. Controls must not be accessible to the guest.
2508.05.G Timing Device
The sauna must have a hand-operated timing device to control the heating element. The timer must be mounted on the interior and exterior wall adjacent to the entrance.
2508.05.H Emergency Panic Button
An emergency panic button is required in the sauna room. The emergency button must be located 36”/900 mm maximum above the finished floor with an annunciation bell that rings to a location that is manned 24-hours a day.

2508.05.H.1 The emergency button must be located 36”/900 mm maximum above the finished floor with an annunciation bell that rings to a location that is manned 24-hours a day unless the local jurisdiction requires otherwise.

2508.05 Light
The sauna light must have a shatterproof safety cover and be continuously illuminated for security.

2508.05.J Light Levels
Refer to Section 2514.08 for minimum light level requirements.

2508.06 Steam Room
2508.06.A Steam Room Requirement
A steam room is optional but is required when a spa is provided. Refer to Section 2508.02 for steam room requirement within the spa facility.

2508.06.B Separate Men & Women Steam Room
A steam room must be provided for men and women separately and accommodate a minimum of four people.

2508.06.C Unisex Requirement
The steam room may be a unisex facility for hotels with less than 300 keys.

2508.06.D Location
Steam room must be located in locker room area, if not located in the spa.

2508.06.E Door
The steam room door must be insulated, have a full glass panel with safety glass and narrow stile and open out. The door hardware must be non-locking or latching, with self-closing device.

2508.06.F Unit, Temperature & Humidity
The steam room must be a pre-engineered standard manufactured unit. Maximum steam room temperature must be 120 °F/48.9 °C with relative humidity controlled in the range of 80 – 100 percent. Controls must not be accessible to the guest.

2508.06.G Timing Device
The steam room must have a hand-operated timing device to control the heating element. The timer must be mounted on the interior and exterior wall adjacent to the entrance.

2508.06.H Emergency Panic Button
An emergency panic button is required in the steam room. The emergency button must be located 36”/900 mm maximum above the finished floor with an annunciation bell that rings to a location that is manned 24-hours a day.

2508.06.H.1 The emergency button must be located 36”/900 mm maximum above the finished floor with an annunciation bell that rings to a location that is manned 24-hours a day unless the local jurisdiction requires otherwise.
2508.06.I Light
   The steam room light must have a shatterproof safety cover and be continuously illuminated for security.

2508.06.J Light Levels
   Refer to Section 2514.08 for minimum light level requirements.

2508.07 Not Applicable to this Brand

2508.08 Tennis Court
2508.08.A Tennis Court Requirement
   A tennis court is optional.

2508.08.B Design Criteria
   Tennis court must be designed by an approved tennis facility designer.

2508.08.C Enclosure Requirements
   Tennis courts must be completely enclosed with a 10'-0"/3.0 m chain link fence and securable gate. The fence must have attached windscreens.

2508.08.D Orientation
   Tennis courts must be oriented in a north-south direction.

2508.08.E Landscape Requirement
   Landscape buffer planting areas must be provided around the tennis court fencing.

2508.08.F Drinking Fountain
   An electric drinking fountain must be provided near the restrooms when restrooms are provided at tennis court.

2508.08.G Light
   Tennis courts must be lighted.

2508.08.H Not Applicable to this Brand

2508.08.I Light Levels
   Refer to Section 2514.08 for minimum light level requirements.

2508.08.J House Telephone Outlets
   Provide an outlet for a house telephone in a weatherproof box in close proximity.

2508.08.K Outdoor Bench
   An outdoor bench is required for spectator viewing

2509.00 Circulation
   Refer to Section 2514.00, Technical Criteria, and Section 2515.00, Furnishings, Fixtures and Equipment, for requirements applicable to this section.
2509.01 Elevators/Lifts

2509.01.A Horizontal/Vertical Transport Systems Design
All horizontal and vertical transportation systems must be designed by a professional lift consultant and be approved by Hilton.

2509.01.B Elevator/Lift Controls
Top of elevator/lift controls must be mounted no more than 48”/1.2 m above the finished floor.

2509.01.C Operating Panels
One operating panel in each cab is required. The design of the operating panels must clearly identify the major levels, i.e. lobby, ballroom, etc.

2509.01.D Door Open Button
Each elevator/lift control panel must be equipped with a “door open” button.

2509.01.E Card Reader Access
Guest elevators/lifts control panel must access to all guest floors. Each control panel inside the cab must have a card reader.

2509.01.F Ventilation Requirements
Elevator cabs that are not surrounded by conditioned space must be ventilated with a two-speed exhaust fan and concealed vents at the base and ceiling of the cabs.

2509.01.G Intercom Requirement
A recessed intercom connected to a constantly monitored location is required in all elevators/lifts.

2509.01.H Car Position Indicator
A car position indicator mounted above the operating panel mounted at a minimum height of 6’-0”/1.8 m above the finished floor must be visible to passengers.

2509.01.I Not Applicable to this Brand

2509.01.J Guest Elevator/Lifts

2509.01.J.1 All hotels must have a minimum of two guest elevators/lifts with a minimum 3,000 lb/1,350 kg capacity each. A traffic study must be provided to determine minimum elevator/lift requirements for ballrooms and meeting spaces.

2509.01.J.2 At least one elevator must be sized for a medical stretcher and must stop at all guestroom floors.

2509.01.J.3 Not Applicable to this Brand

2509.01.J.4 Finish Options - Guest Elevator/Lifts

2509.01.J.4.a Floor: Natural stone

2509.01.J.4.a.1 Base: Recessed, flush or surface mounted stone, wood - stain grade, metal or plastic laminate base
2509.01.J.4.b  Wall: Decorative panels and mirrors  
Canada | United States: Wall: Decorative panels and mirrors. Plastic laminate is not allowed.

2509.01.J.4.c  Ceiling: Decorative panels and mirrors. Eggcrate ceilings are not allowed.

2509.01.J.5  Not Applicable to this Brand

2509.01.J.6  Hydraulic passenger elevators/lifts are allowed and must have the following minimum cab speeds:

<table>
<thead>
<tr>
<th># Floors</th>
<th>Up</th>
<th>Down</th>
<th>Type</th>
</tr>
</thead>
<tbody>
<tr>
<td>2-3 Stories</td>
<td>150 FPM/0.64 m/s</td>
<td>165 FPM/0.84 m/s</td>
<td>Hydraulic</td>
</tr>
<tr>
<td>2-3 Stories</td>
<td>150 FPM/0.64 m/s</td>
<td>150 FPM/0.64 m/s</td>
<td>MRL gearless</td>
</tr>
<tr>
<td>4-5 Stories</td>
<td>150 FPM/0.64 m/s</td>
<td>150 FPM/0.64 m/s</td>
<td>MRL gearless</td>
</tr>
</tbody>
</table>

2509.01.J.7  Elevator/lift study must support an average wait time of 35 seconds with 15 percent handling capacity in a 5 minute period. Variables to be used for the study are 100 percent occupancy, 1.8 occupants per room. The elevator/lift study must include occupancy in all public areas of the hotel.

2509.01.J.8  Elevator/lift walls must have a handrail mounted 32"/810 mm above the finished floor on the back wall or have handrails on both side walls.

2509.01.J.9  Minimum width of the passenger elevator/lift door opening must be 3'-6"/1.1 m.

2509.01.J.10 Minimum height of door opening must be 7'-0"/2.1 m.

2509.01.J.11 Minimum clear inside cab height is 7'-6"/2.3 m.

2509.01.J.12 Not Applicable to this Brand

2509.01.J.13 Not Applicable to this Brand

2509.01.J.14 Not Applicable to this Brand

2509.01.J.15 Refer to Section 2514.08 for minimum light level requirements.

2509.01.K  Parking Garage Elevator/Lifts

2509.01.K.1 Parking garages must have a minimum of one elevator/lift separate from guestroom elevators. When only one elevator/lift is installed, stairs are required with front of house finish quality to allow access from the parking garage to the hotel lobby. An elevator/lift study must be submitted to support number of parking garage elevators/lifts.

2509.01.K.2 Where multi-level garages are provided, exit stairwells must meet the requirements in Section 2509.04.

2509.01.K.3 Parking garage elevators/lifts, when integral with the hotel, must terminate at the lobby level, within view of the front desk. Direct guest access from parking garage level to guestroom floors must be by card key/room key access.

2509.01.K.4 Not Applicable to this Brand

2509.01.K.5 Refer to Section 2514.08 for minimum light level requirements.

2509.01.L  Service Elevator/Lifts
All hotels must have a minimum of two banked service elevators/lifts with a 3,000 lb/1,350 kg capacity with a minimum clear inside height of 9'-6"/2.9 m. The desired proportion of the cab is greater depth than width. Additional service elevators/lifts must be added for each 250 guestrooms or fraction thereof. The evaluation must be approved by Hilton.

Not Applicable to this Brand

Service elevator/lift must have the following minimum cab speed:

<table>
<thead>
<tr>
<th># Floors</th>
<th>Speed</th>
<th>Type</th>
</tr>
</thead>
<tbody>
<tr>
<td>2-5 Stories</td>
<td>150 FPM/0.76 m/s</td>
<td>Hydraulic/MRL gearless</td>
</tr>
<tr>
<td>6-7 Stories</td>
<td>150 FPM/0.76 m/s</td>
<td>MRL gearless</td>
</tr>
<tr>
<td>8-14 Stories</td>
<td>530 FPM/1.78 m/s</td>
<td>Geared/MRL gearless</td>
</tr>
<tr>
<td>14-20 Stories</td>
<td>500 FPM/2.54 m/s</td>
<td>Gearless/MRL gearless</td>
</tr>
</tbody>
</table>

Minimum width of the elevator/lift door opening must be 52"/1.3 m, with a single side opening door.

Minimum width of the elevator/lift door opening must be 44"/1.1 m with two doors.

Service elevator/lift control buttons must be vandal-proof.

When a freight elevator/lift is provided, the minimum size is a 5,000 lb/2,500 kg capacity with a minimum clear inside height of 9'-6"/2.9 m.

Hotels with a ballroom/exhibit hall in excess of 15,000 ft²/1,400 m² must also provide an oversized vehicle elevator/lift with a 10,000 lb/4,500 kg capacity and a clear inside height of 9’-6”/2.9 m.

Service elevator/lift doors must be stainless steel – pressed pattern.

Finish Options - Service Elevator/Lifts

Floor: Vinyl composite tile, non-skid diamond mesh, porcelain tile (12”/300 mm x 12”/300 mm minimum; rectangular tiles are allowed), natural stone

Base (minimums): 4”/100 mm vinyl, stainless steel, natural stone, wood

Wall: Stainless steel - pressed pattern with wall bumpers at 14”/350 mm and 32”/800 mm above the finished floor

Ceiling: Baked enamel paint

Protected lighting is required.

Refer to Section 2514.08 for minimum light level requirements.
2509.02.A.1 Provide a minimum 8'-6"/2.6 m wide elevator/lift lobby when elevators/lifts are located only on one side of the lobby and a 10'-0"/3.0 m wide elevator/lift lobby when elevators/lifts are on both sides of the lobby.

2509.02.A.2 Not Applicable to this Brand

2509.02.A.3 Call buttons must be available for each elevator/lift bank and must be mounted with the centerline at 42"/1.0 m above finished floor.

2509.02.A.4 Not Applicable to this Brand

2509.02.A.5 An audible signal is required in each elevator/lift lobby indicating the arrival of an elevator/lift cab, along with a directional graphic indicating the current travel path of each cab.

2509.02.A.6 Elevator/lift hall lantern fixtures must be mounted with the centerline at least 6'-0"/1.80 m above finished floor.

2509.02.A.7 Finish Options – Guest Elevator Lobby
   2509.02.A.7.a Floor: Carpet (nylon broadloom and high definition CYP 48 oz.), porcelain tile, natural stone, wood - tongue and groove
      2509.02.A.7.a.1 Base (minimums): 6"/150 mm porcelain tile, wood - stain grade, natural stone, through body synthetic
   2509.02.A.7.b Wall: Vinyl wallcovering, wood panels or special finish (special approval required)
   2509.02.A.7.c Ceiling: Paint on gypsum, acoustic ceiling tile (30 percent maximum), decorative ceiling (special approval required)
   2509.02.A.7.d When automatic suppression systems are required (see section 2516.00) concealed type sprinkler heads must be utilized.

2509.02.A.8 Not Applicable to this Brand

2509.02.A.9 Furniture, Fixtures and Equipment
   2509.02.A.9.a Provide seating group and console table. Console must conceal telephone and lamp cords.
      Mexico: Not Applicable to this Brand
   2509.02.A.9.b Provide artwork or mirror above the console table.
      Mexico: Not Applicable to this Brand
   2509.02.A.9.c Provide a decorative trash urn at elevator/lift lobby.

2509.02.A.10 Refer to Section 2514.08 for minimum light level requirements.

2509.02.A.11 An outlet for a house telephone is required in the elevator lobbies.

2509.02.A.12 Parking Garage
   2509.02.A.12.a Parking garages must have finished elevator/lift lobbies if the elevator/lift delivers guests to a public space. The finishes must be equal to that of the hotel elevator/lift lobby finishes.
   2509.02.A.12.b Elevator/lift lobbies must have a minimum finished ceiling height of 8'-0"/2.4 m and have a minimum width of 8'-0"/2.4 m when elevators/lifts occur on one side only and 10'-0"/3.0 m when elevators/lifts occur on both sides of the lobby.
   2509.02.A.12.c Provide glazed openings and aluminum and glass doors at elevator lobbies to maintain a secure and open appearance.
   2509.02.A.12.d Elevator/lift lobbies must have heating, ventilation and refrigerant air-conditioning with a minimum of six air changes per hour.
   2509.02.A.12.e An outlet for house telephones must be provided at each elevator/lift landing within the parking garage.
2509.02.A.12.f Provide artwork and trash stands at entrance to elevators/lifts.

2509.03 Corridors
2509.03.A Guestroom Corridors
2509.03.A.1 Interior guestroom corridors must be a minimum finished dimension of 5'-0"/1.5 m clear width.
2509.03.A.2 Not Applicable to this Brand
2509.03.A.3 Guestroom corridors must have windows when possible.
2509.03.A.4 Finish Options - Guestroom Corridors
   2509.03.A.4.a Floor: Carpet (broadloom or high definition CYP 48 oz.)
   **Canada | United States**: Floor: Carpet (broadloom or high definition CYP 48 oz.), enhanced resilient tile (ERT)
   2509.03.A.4.a.1 Base (minimums): 4"/100 mm wood - stain grade, porcelain tile, natural stone, through body synthetic
   2509.03.A.4.a.2 Long, straight corridors must be visually broken up. The use of offsets, pilasters, carpet insets, breaks in the ceiling plane and cove lighting are required.
   2509.03.A.4.b Wall: Vinyl wallcovering
   **Mexico**: Wall: Vinyl wallcovering, stucco, acrylic knockdown, wood
   2509.03.A.4.c Ceiling: Paint on gypsum
   2509.03.A.4.c.1 Door drops must be grouped and coordinated in a rhythmic fashion. Door drops must be accentuated with special treatment of the lighting, walls, ceiling and floor areas.
   2509.03.A.4.c.2 Provide a minimum ceiling height in guest corridors of 8'-0"/2.4 m.
   2509.03.A.4.c.3 Not Applicable to this Brand
   2509.03.A.4.c.4 When automatic suppression systems are required (see section 2516.00) concealed type sprinkler heads must be utilized.
2509.03.A.5 Electrical
   2509.03.A.5.a Provide convenience power outlets (socket outlets) in corridors for housekeeping equipment with spacing not to exceed 50'-0"/15 m on center.
   2509.03.A.5.b Provide decorative light fixtures, wall sconces and ceiling fixtures in guestroom corridors.
   2509.03.A.5.c Eggcrate lighting diffusers are not allowed.
   2509.03.A.5.d Lighting must be switched at panel in electrical closet.
   2509.03.A.5.e Refer to Section 2514.08 for minimum light level requirements.
2509.03.A.6 Artwork must be located appropriately throughout guestroom corridors.
2509.03.A.7 Window Treatment
   Refer to 2515.03 for additional requirements
2509.03.A.7.a Decorative window treatment is required on guestroom corridor windows.

**Mexico:** Decorative window treatment is optional on guestroom corridor windows.

2509.03.B Service Corridor

2509.03.B.1 Service corridors must be a minimum of 6'-0"/1.8 m wide.

2509.03.B.2 Finish Options - Service Corridor

2509.03.B.2.a Floor: Vinyl composite tile, heavy duty anti-skid tile (12"/300 mm x 12"/300 mm minimum), natural stone, sealed concrete, luxury vinyl tile

2509.03.B.2.a.1 Base (minimums): 4"/100 mm vinyl, tile, natural stone

2509.03.B.2.b Wall: Epoxy paint with accent colors

2509.03.B.2.b.1 Provide wall protection with 4'-0"/1.2 m high wainscot fiberglass reinforced plastic panels with metal or rubber corner guards.

2509.03.B.2.c Ceiling: Acoustic ceiling tile, paint on gypsum, open ceiling

2509.03.B.3 Provide a minimum of two convenience power outlets (socket outlets) on each wall with spacing not to exceed 50'-0"/15 m on center.

2509.03.B.4 Refer to Section 2514.08 for minimum light level requirements.

2509.03.C Ballroom Service Corridors

2509.03.C.1 The ballroom service corridor must extend the length of the ballroom and connect to the kitchen or ballroom pantry and ballroom storage.

2509.03.C.2 Not Applicable to this Brand

2509.03.C.3 The clear width of ballroom service corridor must be 8'-0"/2.4 m. Additional width is required to accommodate service vestibules, the installation of ice machines, beverage stations and sound/dimmer rooms.

2509.03.C.4 Provide a minimum ceiling height of 10'-0"/3.0 m.

2509.03.C.5 Finish Options - Ballroom Service Corridors

2509.03.C.5.a Floor: Vinyl composite tile (12"/300 mm x 12"/300 mm minimum)

**Mexico:** Floor: Vinyl composite tile (12"/300 mm x 12"/300 mm minimum), sealed & polished concrete

2509.03.C.5.a.1 Base (minimum): 4"/100 mm vinyl

2509.03.C.5.b Wall: Paint

**Mexico:** Wall: Paint, acrylic knockdown, epoxy, tile in food service areas

2509.03.C.5.b.1 Provide wall protection with 4'-0"/1.2 m high wainscot fiberglass reinforced plastic panels with metal or rubber corner guards.

2509.03.C.5.c Ceiling: Acoustic ceiling tile, paint on gypsum

2509.03.C.6 Trough Drains

2509.03.C.6.a Provide trough drains where required by equipment.

2509.03.C.6.b Construct trough or grate of fiberglass or stainless steel.

2509.03.C.6.c Maximum grate size is 1"/25 mm by 1"/25 mm.
2509.03.C.6.d  Install trough drain along front of each ice machine and extend 6"/150 mm on both sides of machine opening. Trough drains must be recessed into the floor.

2509.03.C.7  Corridor lighting must be switched from control panels.

2509.03.C.8  Refer to Section 2514.08 for minimum light level requirements.

2509.03.C.9  Provide two power outlets (socket outlets) at 6'-0"/1.8 m on center the entire length of the corridor. Each set of power outlets (socket outlets) must be on a separate dedicated circuit.

2509.03.C.10 Provide one wall mounted outlet for a house telephone.

2509.03.C.11 Provide small cube and flaked water-cooled ice machines in ballroom service corridor. Machines are not allowed on a wall shared with the ballroom.

2509.04 Exit Stairs

Exit Stairs – Refer to Section 2516.05 Means of Egress for additional requirements applicable to this section.

2509.04.A  Stairwell Width

The widths of stairwells must not decrease in the direction of egress from the building.

2509.04.B  Stairwell Landing

Every stairwell landing must have a dimension, measured in the direction of travel, equal to the width of the stairwell or greater.

2509.04.C  Stairwell Treads and Risers

All stairwell treads and risers must be solid type for the entire width of the stair.

2509.04.D  Doors

All stairwell doors must include automatic door closures and be self latching.

2509.04.E  Finish Options - Exit Stairs

2509.04.E.1  Floor: Sealed concrete

2509.04.E.1.a  Treads at a minimum must be exposed, hand troweled concrete with sealer and non-skid nosings of contrasting color.

2509.04.E.1.b  Landings at a minimum must be exposed, hand troweled concrete with non-slip finish and hand sealed.

2509.04.E.2  Wall: Paint

Mexico: Wall: Epoxy paint

2509.04.E.3  Ceiling: Paint

2509.04.E.4  A class "A" flame spread rating is required for all finishes.

2509.04.F  Rising Mains

If stairwells contain dry and wet rising mains, all valves must be locked and fitted with tamper switches.

2509.04.G  Lights
Lights are not allowed to be manually operated and must remain on when the space is occupied.

2509.04.H Light Levels
Refer to Section 2514.08 for minimum light level requirements.

2509.05 Escalators
2509.05.A Escalator Requirement
Escalators must be provided when major ballroom and meeting rooms are located on a different level from the street/lobby level.

2509.05.B Width
Escalators must have a minimum width of 48”/1.2 m.

2509.05.C Incline
Thirty degrees is the maximum inclination of escalators.

2509.05.D Speed
Escalators must have a maximum speed of 90 FPM (0.5 m/sec).

2509.05.E Handling Capacity
The minimum handling capacity must be 4,500 persons per hour.

2509.05.F Glass Railing
Provide glass railing when freestanding.

2509.05.G Panic Button
Provide panic button for emergency shut off. Button must raise alarm at the 24 hour monitoring station.

2509.05.H Anti-entrapment Strips/Brushes
Provide anti-entrapment strips/brushes on the side of the moving steps.

2509.05.I Flat Steps Per Landing
Flat steps per landing must be a minimum of 2, above 19’-8”/6 m rise a minimum of 3 is required.

2509.05.J Step Width
Minimum step width must be 3’-3”/1000 mm.

2509.05.K Auxiliary Brake
Auxiliary brake is required.

2509.05.L Drive Machine
Drive machine must be inside upper landing. The gear must be helical type.

2509.05.M Step Chain Pin Pressure
Step chain pin pressure must not exceed 23 N/mm². Minimum diameter of step chain rollers must be 3”/75 mm with rubber or polyurethane tire/tyre.
2509.05.N Power Supply
Power supply must be provided at upper landing of escalator, front area.

2509.05.O Operating Panels
Operating panel must be located at each landing at the inner side of the balustrade, close to the handrail entry. It must include an emergency stop button and a starting key switch.

2509.05.P Starting Key Switch
Starting key switch must be provided in both landings near the newel ends.

2509.05.Q VVF Drive
VVVF (variable voltage variable frequency) drive is required.

2509.05.R Tread and End Lighting
Escalator tread lighting and end lighting must be provided.

2509.05.S Sprinkler Pipework
Include sprinkler pipework within escalator truss if required.

2510.00 Guestroom/Suites
Refer to Section 2514.00, Technical Criteria, and Section 2515.00 Furnishings, Fixtures and Equipment, for requirements applicable to this section.

2510.00.A Room Types and Layouts
Room Types and Layouts
2510.00.A.1 Not Applicable to this Brand

2510.00.A.2 King Room Types
The minimum king guestroom must be 13'-0"/3.96 m wide x 27'-0"/8.31 m long, 350 ft²/33 m² net area.

2510.00.A.3 Two Bedded Room Types
The minimum two bedded guestroom must be 13'-0"/3.96 m wide x 29'-0"/8.84 m long, 375 ft²/35 m² net area.
Mexico: The minimum two bedded guestroom must be 375 ft²/35 m² net area.

2510.00.A.4 Double Beds New Construction
Guestrooms with two double beds are not permitted in new construction. Two bedded room types must have two queen beds.

2510.00.B Connecting Rooms
2510.00.B.1 Connecting Room Percentage
A minimum of 15 percent of the total key count must be connecting (example: a 200 key hotel would have 15 rooms connecting to 15 other rooms for a total of 30 connecting rooms.).

2510.00.C Not Applicable to this Brand
2510.00.D Smoking Guestrooms

All smoking guestroom locations must be approved by Hilton. Refer to Section 719.00 - Smoking Policy for required number of smoking rooms.

2510.01 Doors

2510.01.A Entry Doors

2510.01.A.1 Doors must be solid core wood veneer suitable for painting or better. Metal clad entry doors are not allowed.

**Canada | United States:** Doors must be solid core wood veneer suitable for painting or better. Metal clad entry doors are not allowed. High pressure laminate doors must be submitted for approval.

2510.01.A.2 Doors must be a minimum of 3'-0"/900 mm wide x 6'-8"/2.1 m high.

2510.01.B Entry Door Frames

2510.01.B.1 Framed, non-masonry walls must be reinforced on the “strike” side of the jamb to prevent prying and flexing for security control.

2510.01.C Entry Door Hardware

2510.01.C.1 Provide electronic lockset from a Hilton approved manufacturer. Refer to Section 2514.00 Technical Criteria for detailed standards.

2510.01.C.2 Entry doors must have adjustable type, automatic, 2-stage hydraulic, low profile door closer. Hold-opens of any type are not allowed at guestroom doors.

2510.01.C.3 Entry doors must have a multi-fin sound/smoke frame seal (Manufacturer must warranty against adhesion failure).

2510.01.C.4 Provide a minimum of 180 degree with inside viewer cover that can not be damaged under normal use, installed 5'-0"/1.5 m above finished floor. Existing viewers requiring inside viewer covers must not require dis-assembly of the viewer to install the new viewer cover. Viewer finish must match the finish of the lockset.

2510.01.C.5 A safety (flip) latch is required for all entrance doors. Locate 4'-0"/1.2 m maximum above finished floor. Surface mounted safety chain locks and swing bar door guards are not allowed.

2510.01.C.6 Not Applicable to this Brand

2510.01.C.7 Provide a natural stone or quartz composite threshold at entrance and connecting doors. Thresholds must be the full width of the frame.

2510.01.C.8 A drop down seal is required. If corridor pressurization is required to supply fresh air to the guestrooms, the drop down seal is not required but a door sweep is required.

2510.01.C.9 All hardware finishes must match.

2510.01.C.10 Kick plates are not allowed.

2510.01.D Connecting Doors

2510.01.D.1 When guestrooms are connected, they must be separated by two doors.

2510.01.D.2 The door frame must be the full width of the wall thickness.

2510.01.D.3 Not Applicable to this Brand

2510.01.D.4 Each door must have a latch set with an operating lever on the room side only.
2510.01.D.5 Each door must have a thumb-turn deadbolt with 1”/25 mm throw on guestroom side. A blank plate must be installed on the opposite side of the door.

2510.01.D.6 A safety latch, same as on entry door, must be provided on each door.

2510.01.D.7 Sound stripping, same as on entry door, must be provided on the door frame of each door.

2510.01.D.8 Provide automatic drop down seal, same as on entry door, at each door for sound attenuation.

2510.01.D.9 A threshold matching the entry door must be provided. Threshold must be as wide as the door frame.

2510.01.D.10 All hardware finishes must match the entry door hardware finish.

2510.01.E Sliding Glass Doors

2510.01.E.1 Sliding glass doors (when provided) must have a non-keyed, auxiliary/additional locking device. Surface mounted safety door chains are not allowed.

2510.01.E.2 Sliding glass doors must be shatterproof or have tempered glass.

2510.01.E.3 The sliding panel must be mounted on the interior track to prevent any removal of the door from the exterior.

2510.01.F Not Applicable to this Brand

2510.01.G Interior Guest Room Doors

If provided, bedroom door locks must release by turning the inside lever and by closing the door; an emergency device must release this lock from outside of the room.

2510.02 Windows

2510.02.A Window Area

In new construction, each guestroom must have a window area equal or greater than 55% percent of the exterior wall. Adaptive re-use and conversion projects will be reviewed independently and must be approved by Hilton.

2510.02.B Operable Windows

Operable windows, if provided, must have a screen and a childproof locking device approved by Hilton and are not allowed to open more than 4”/102 mm unless required otherwise by code. Once opened, the window must remain in the open position without having to be propped open.

2510.02.C Not Applicable to this Brand

2510.02.D Window Sill Materials

Window sills must be a material compliant with Section 2515.04.

2510.03 Finish Options - Guestrooms/Suites

2510.03.A Floor: Carpet (broadloom and high definition CYP 48 oz.), porcelain tile, wood - tongue and groove, natural stone, enhanced resilient tile (ERT)

2510.03.A.1 Not Applicable to this Brand

2510.03.A.2 Base (minimums): 4”/100 mm porcelain tile, wood, through body synthetic
2510.03.B Wall: Vinyl wallcovering, wood or special finish (if approved by Hilton)

2510.03.C Ceiling: Paint on gypsum, paint on plaster or concrete - orange peel texture
   2510.03.C.1 Semi-gloss and gloss paint finishes must not be used.
   2510.03.C.2 Exposed concrete plank joints are not allowed. Concrete must be skim coated.
   2510.03.C.3 Guestroom ceiling height must be a minimum of 8'-0"/2.4 m.
      Mexico: Guestroom ceiling height must be a minimum of 8'-2"/2.49 m.
   2510.03.C.4 Dropped ceilings in guestroom entry must be a minimum height of 7'-6"/2.3 m.
      Mexico: Dropped ceilings in guestroom entry must be a minimum height of 7'-2"/2.23 m.

2510.03.C.5 When automatic suppression systems are required (see section 2516.00) concealed type sprinkler heads must be utilized.

2510.03.D Balcony Floor: Weather resistant porcelain tile or natural stone, composite decking, sealed concrete. Balcony floor must slope to drain.

2510.04 Closets
   2510.04.A Closet Size
      All guestrooms must have an enclosed clothes hanging space with a minimum of 3'-0"/900 mm in total width and 2'-0"/600 mm in total inside depth. Local markets may dictate larger capacity.
      Mexico: All guestrooms must have an enclosed clothes hanging space with a minimum of 3'-6"/1.1 m in total width and 1'-10"/550 mm in total inside depth. Local markets may dictate larger capacity.

2510.04.B Closet Shelf
      Provide a polished finish, chrome-plated coat rod and a continuous hardwood shelf 1'-6"/450 mm deep installed at 5'-10"/1.8 m above finished floor in closets. Install 1"/25 mm x 4"/100 mm wood shelf cleats on the three interior closet walls to provide support for the closet shelf. A pre-manufactured bracket with chrome rod and shelf is allowed but it must extend the full width of the closet.

2510.04.C Doors
      All closets and built-in wardrobe cabinets for hanging clothes must have doors. Mirrored doors are only allowed if door is solid core. Bi-fold doors, bi-pass, drapes, or fabric type folding (accordion) doors are not allowed. Sliding "barn doors" will be only considered with prior approval and conditional that the doors do not block circulation when parked in the open position. Closet barn doors may not serve dual purpose as bathroom doors.
      Canada | United States: All closets and built-in wardrobe cabinets for hanging clothes must have doors. Mirrored doors are only allowed if door is solid core. Bi-fold doors, bi-pass, drapes, or fabric type folding (accordion) doors are not allowed. Sliding "barn doors" will be only considered with prior approval and conditional that the doors do not block circulation when parked in the open position. Closet barn doors may not serve dual purpose as bathroom doors. Where closet doors conflict with guestroom entry door, provide a pair of smaller doors in lieu of one wider door, with self-closing hinges (not an overhead closure).

2510.04.D Wardrobes
      Freestanding wardrobes are not allowed.

2510.04.E Not Applicable to this Brand
2510.04.F  Down Light

**Mexico:** Closets are required to have an automatic on/off LED light strip.

2510.05  Bed

2510.05.A  Bed Frame/Base

2510.05.A.1  Not Applicable to this Brand

2510.05.A.2  A minimum 7.25"/184 mm high solid, recessed bed base must be provided to achieve a typical top of bed height of 26"/650 mm. Bed height is the measurement of the finished bed including base and mattress set (bedding not included). Provide a solid, recessed bed base in accessible rooms unless otherwise required by local jurisdiction.

2510.05.A.3  Bed frame/base must be wood or steel construction. Foundations with legs, pressboard and MDF bed bases are not allowed. Must have a finished, decorative appearance.

2510.05.A.4  Bed frame/base must be non-adjustable.

2510.05.A.5  Box covers of box springs must be fitted or tailored (not quilted).

2510.05.A.6  The use of bed legs are only allowed with prior approval.

2510.05.A.7  Wall beds or concealed pull-down wall beds are only allowed with prior approval.

2510.05.B  Platform Beds

2510.05.B.1  Platform beds will be considered with prior approval. They must comply with the following:

- The platform must be constructed by the case good manufacturer and any exposed wood, including legs, must have a furniture quality finish. Finish can be timber, leather or faux leather.

- The platform must have a minimum 6"/150 mm recessed toe kick for platform base and be high pressure plastic laminate.

- Top of mattress must be no less than 19"/480 mm above the floor.

- Box springs are not required for platform beds.

2510.05.C  Mattress Sets

2510.05.C.1  Not Applicable to this Brand

2510.05.C.2  Not Applicable to this Brand

2510.05.C.3  Not Applicable to this Brand
2510.05.C.4
Mattress sizes are:
53”/135 cm x 80”/200 cm Full XL
60”/150 cm x 80”/200 cm Queen
72”/180 cm x 80”/200 cm Hotel King
76”/200 cm x 80”/200 cm Eastern King
80”/200 cm x 80”/200 cm Presidential (Central America/Mexico/South America Only)

2510.05.C.5 Zip and link beds are not allowed.

2510.05.C.6 Canada | Mexico: All guestrooms must have one of the following mattress and stable base foundations:
Serta Suite Dreams II
Simmons Beautyrest Harmony
Puerto Rico | United States: All guestrooms must have one of the following mattress and stable base foundations:
Serta Suite Dreams NXT
Sealy Paradigm Suites

2510.05.C.7 Not Applicable to this Brand

2510.05.C.8 For existing hotels, any mattresses over ten years old must be replaced or sooner as condition warrants.

2510.05.D Bedding
2510.05.D.1 Refer to Section 305.00 - The Bed for all top of bed bedding.

2510.06 Furnishings, Fixtures and Equipment
Refer to Section 2515.00 for general FF&E requirements.

2510.06.A Furnishings
2510.06.A.1 Not Applicable to this Brand
2510.06.A.2 Not Applicable to this Brand
2510.06.A.3 There must be a minimum clearance of 18”/450 mm between any bed and the wall, and a minimum clearance of 30”/760 mm between the two beds. There must be a minimum clearance of 30”/760 mm from the end of the bed to an object or wall.
2510.06.A.4 Headboard
2510.06.A.4.a Headboards must be wider than the mattress and have a minimum overall height of 30"/760 mm or more above the bed. The bottom of the headboard must continue 2"/50 mm below the top of the boxspring with the edges extending down to the floor and open space behind mattress/below headboard must not be visible to guest. Wall panels exceeding these requirements must be approved by Hilton.

2510.06.A.4.b Headboards must be anchored securely to the wall with cleats.

2510.06.A.4.c Upholstered headboards must be hygienic, easily cleanable and easily removable.

2510.06.A.4.d Design must be coordinated with outlet locations to prevent conflict.

2510.06.A.4.e Rubber stops must be placed at all corners of headboard to prevent rattling and damage to wall finish.

2510.06.A.4.f The base of the wall hung headboard must be a minimum of 2"/50 mm below the top of the box spring.

2510.06.A.5 Bedside Surface

2510.06.A.5.a Guestrooms with a single bed must have a bedside surface on each side of the bed.

2510.06.A.5.a.1 Guestrooms with two beds must have at least one bedside surface adjacent to each bed. The surface may be shared but the size must accommodate both beds and all required appliances.

2510.06.A.5.b **Canada | Puerto Rico | United States**: Bedside surfaces without a base must include a back panel that extends to the floor.

2510.06.A.5.c The surface must support a minimum of 250 lbs/115 kg

2510.06.A.5.d The top must be the same height of the top of the mattress.

2510.06.A.5.e Bedside surface must be a minimum of 24"/600 mm wide x 18"/450 mm deep.

2510.06.A.5.f One bedroom suites are permitted to reduce the width to 15"/375 mm wide.

2510.06.A.5.g Top surface must be a material compliant with Section 2515.04.

2510.06.A.5.h Design must be coordinated with outlet locations to prevent conflict.

2510.06.A.5.i A minimum of 3"/75 mm must be provided between the bedside surface and the mattress for top of bed linens.

2510.06.A.6 Not Applicable to this Brand

2510.06.A.7 Drawer Storage

2510.06.A.7.a A minimum of 3 net ft³/0.08 net m³ of drawer or shelf storage must be provided for each guestroom.

2510.06.A.7.b Each bedroom and living area of a suite must each have a minimum of 3 ft³/0.08 m³ of drawer storage, measured inside the drawer.

2510.06.A.7.c A minimum of four drawers designated for clothing storage must be provided.

2510.06.A.7.d Not Applicable to this Brand

2510.06.A.7.e The top surface material must be compliant with Section 2515.04. All other surfaces (sides, drawer fronts, legs, end panels, etc.) must be solid wood or wood veneer.

2510.06.A.7.f Design must be coordinated with outlet locations to prevent conflict.

2510.06.A.8 Not Applicable to this Brand
2510.06.A.9  Not Applicable to this Brand

2510.06.A.10  Entertainment Area

- 2510.06.A.10.a  Refer to Section 2510.09 for television equipment requirements.
- 2510.06.A.10.b  Any casegoods below the television must be sized according to the television size. The television must never overhang the sides of the casegood unit. Sufficient clearance must be provided to allow the television to swivel without impeding traffic.
- 2510.06.A.10.c  Casegoods below the television must have a top surface material compliant with Section 2515.04. All other surfaces must comply with Section 2515.01.
- 2510.06.A.10.d  Casegoods supporting the weight of the television and/or television mount must be reinforced.
- 2510.06.A.10.e  The television must sit a minimum of 2½/50 mm above the casegood. Cables must not be visible to guests.
- 2510.06.A.10.f  The television must be positioned within view from the bed and work area in typical guestrooms. Televisions in sitting rooms or living areas must be easily viewed from the soft seating/lounge area. Other areas within the room(s) must be considered and accommodated when possible.
- 2510.06.A.10.g  The bottom edge of the television screens in bedrooms must be positioned 13½/330 mm above the top of the bed. Bedrooms with platform beds or low beds must be reviewed for alternate locations.
- 2510.06.A.10.h  Wall-mounted televisions are allowed on non-demising walls. If mounted on demising walls, it must be pre-approved and subject to sound transmission studies. Sufficient blocking must be provided to ensure that the television/mount is not easily pulled off of the wall.

2510.06.A.11  Not Applicable to this Brand

2510.06.A.12  Work Area

- 2510.06.A.12.a  All guestrooms must be equipped with a work surface. Work surface must be a minimum surface area of 10 ft²/1.0 m². Work surface height to be 28"-30"/71-76 cm.
  - Mexico: All guestrooms must be equipped with a work surface. Work surface must be a minimum surface area of 1,560 in²/1.0 m².
- 2510.06.A.12.b  Top surface must be a material compliant with Section 2515.04. All other surfaces (sides, drawer fronts, legs, end panels, etc.) must be solid wood or veneer. All sides must be finished.
- 2510.06.A.12.c  Not Applicable to this Brand
- 2510.06.A.12.d  Nesting desk unit may be used in lieu of freestanding desk. This unit is comprised of a fixed topped desk with a moveable-nesting table.

2510.06.A.13  Not Applicable to this Brand

2510.06.A.14  Breakfast/Side Tables

- 2510.06.A.14.a  Breakfast/side tables are required in all rooms with a lounge chair and must be located next to the lounge chair.
- 2510.06.A.14.b  The breakfast/side table must be 25"/635 mm - 30½/760 mm high with a minimum top surface of 450 in²/0.30 m².
- 2510.06.A.14.c  Top surface material must be compliant with Section 2514.04. All tops must be securely mounted to the base.
- 2510.06.A.14.d  Pedestals and bases must have heavy duty glides and may be wood or plated metal with finishes matching or complementing other case pieces in the guestroom.
2510.06.A.15  End Table
2510.06.A.15.a A minimum of one end table is required in all rooms with a sofa. End table must be located at one end of the sofa. Height of end table must be coordinated with arm height of sofa.
2510.06.A.15.b Tables must be 30"/760 mm high with a minimum top surface area of 380 in²/0.25 m².
2510.06.A.15.c Top surface must be compliant with Section 2515.04 other surfaces (sides, drawer fronts, legs, end panels, etc.) must be solid wood or veneer. If glass tops are used, they must be set into a frame with no solid bottom.

2510.06.A.16  Coffee Table
2510.06.A.16.a Coffee tables are required in all rooms with a sofa or chaise.
2510.06.A.16.a.1 Tables must be 18"/450 mm to 26"/650 mm high with a minimum top surface area of 600 in²/0.40 m².
2510.06.A.16.a.2 Coffee tables must be a single piece unit and easy to move when used with a sofa bed.
2510.06.A.16.a.3 Top surface must be compliant with Section 2515.04. All other surfaces (sides, drawer fronts, legs, end panels, etc.) must be solid wood or veneer.
2510.06.A.16.b Hinged leaves are not allowed.

2510.06.A.17  Sofa/Sofa Bed
2510.06.A.17.a Provide one sofa bed in all suite type accommodations.
2510.06.A.17.b Sofas and sofa beds must be fully upholstered with loose reversible seat and back cushions.
2510.06.A.17.c Sofas and sofa beds must have heavy duty, commercial construction grade fabric or leather upholstery. Vinyl upholstery is not allowed. Metal grommets must not be used with leather or vinyl upholstery cushion. The use of a breathable panel is required.

2510.06.A.18  Ottoman
2510.06.A.18.a Upholstered coffee tables (ottomans) are allowed.
2510.06.A.18.b Ottomans must have a minimum top surface area of 600 in²/0.40 m² and height of 17"-18"/43-45 cm, and no higher than seat.
2510.06.A.18.c Ottomans must have commercial construction grade leather or vinyl upholstery.
2510.06.A.18.d Ottoman must have casters or heavy duty nylon glides.

2510.06.A.19  Bench
2510.06.A.19.a A permanent luggage bench is required if a portable luggage bench is not provided.

2510.06.A.20  Lounge Chair
2510.06.A.20.a Provide one lounge chair with arms or chaise. Lounge chair must be fully upholstered.

2510.06.A.21  Not Applicable to this Brand
2510.06.A.22  Not Applicable to this Brand
2510.06.A.23  Dining Chairs
2510.06.A.23.a If provided, dining chairs must be upholstered open back chairs with tailored silhouette. Chair seat must be upholstered.
2510.06.A.23.b  Heavy duty nylon glides are required for all dining chairs used on flooring other than carpet.

2510.06.A.24  Work Area Chair

2510.06.A.24.a  Provide one chair at each work surface area with a fully upholstered seat and a seat back with a height ranging from 16"/400 mm - 24"/600 mm. If an ergonomic chair is used it must have a fully upholstered seat with adjustable seat height and a seat back with a height ranging from 16"/400 mm - 24"/600 mm.

2510.06.A.24.b  Not Applicable to this Brand

2510.06.A.24.c  Ensure that the height of the desk chair is coordinated with the height of the desk work area to avoid damage to the chair arms.

2510.06.A.25  Not Applicable to this Brand

2510.06.A.26  Chairs must have heavy duty, woven fabric. Metal grommets must not be used with leather or vinyl upholstery cushion. The use of a breathable panel is required.

2510.06.A.27  Not Applicable to this Brand

2510.06.A.28  Hospitality Area

2510.06.A.28.a  Mini Bar/Refrigerator

2510.06.A.28.a.1  A refrigerator is an under-counter cold storage unit available for guest use. A mini bar is a fully stocked, under-counter cold storage unit.

2510.06.A.28.a.2  An under-counter or drawer type refrigerator is optional. Refrigerator must be a minimum of 1.4 ft³/0.04 m³/ 40 liters.

2510.06.A.28.a.3  Equipment must be installed within a special cabinet, the television credenza or other casegood piece as approved by Hilton. The casegood unit must include the following:

2510.06.A.28.a.3.a  A counter, 30"/760 mm to 36"/900 mm high, with a minimum surface area of 720 in²/0.50 m².

2510.06.A.28.a.3.b  Top surface (and any back splashes where applicable) must be compliant with Section 2515.04. All other surfaces must comply with Section 2515.01.

2510.06.A.28.a.3.c  Cabinet doors to screen equipment. These must not be fixed to the equipment door.

2510.06.A.28.a.3.d  When located in the base cabinet, storage and shelving must be behind cabinet doors.

2510.06.A.28.a.3.e  Ventilation must be provided, as required by equipment manufacturers.

2510.06.A.28.a.3.f  Not Applicable to this Brand

2510.06.A.28.a.3.g  Not Applicable to this Brand

2510.06.A.28.a.3.h  Refrigerated drawers are allowed with prior approval.

2510.06.A.28.a.4  Provide power requirements for equipment behind casegood unit.

2510.06.A.28.b  Mini Bar Equipment (when provided)

2510.06.A.28.b.1  A mini bar central reporting unit is optional.

2510.06.A.28.b.2  Not Applicable to this Brand
The outer skin of the cabinet must be of a vapor proof material and any seams or perforations for pipes, wires and conduits must be sealed to prevent vapor penetration into the insulation.

The chiller must have a system for condensate collection and evaporation sufficient capacity to avoid damage to soft furnishings. Condensation must never form on any external part of the structure.

The refrigeration capacity of the chiller unit must maintain 41 °F/5 °C or lower average temperature within the mini bar and an ambient temperature of 77 °F/25 °C and 60 percent relative humidity.


The ammonia charge must not exceed 2.25-grams/liter of storage space and must comply with ASHRAE Standard 15-2007 (www.ashrae.org).

Energy consumption must be better than 1.2 Watts/liter of storage space.

Pipe work must be made of steel and meet or exceed DIN, EN or other standard suitable for ammonia at the prescribed temperatures and pressures.

The boiler tube must be a contiguous piece of material with no welds in the vicinity of the heater. The heater element must be of the wrap-around type and have a suitable heat transfer compound to avoid spot high temperatures. The boiler temperature during operation must be below 356 °F/180 °C. The design of the pipe system for the chiller must be laid out in such a way as to have no horizontal sections or silt traps, in order to prevent the occurrence of blockages.

The chiller unit must have installed within the aqueous ammonia solution an inhibitor to prevent attack of the boiler tube internal surfaces.

Steel pipe work must be protected with an anti-corrosion finish of sufficient quality to resist scuffs, knocks and abrasions – especially on any area of pipe work likely to be below the dew point of any surrounding air. The evaporator loop must be galvanized, chromeplated, painted with a resilient powder coat finish or encapsulated in a non-corrosive sheath. The cooler plate must be attached so that it does not pierce the anti corrosion coating yet can be easily cleaned.

Pressure testing must be carried out as detailed in BS EN 378-2.

Absorption chillers must be marked with an identification plate, which in addition to any statutory information for the country of use must include the following data.

- The manufacturers name
- The serial number
- The year of manufacture
- The design pressure or maximum working pressure
- The refrigerant type and quantity
- The strength test pressure and date of test
2510.06.A.28.b.14.g  Corrosion inhibitor type and quantity

2510.06.A.28.b.15  Chiller units must be fitted with a control system capable of controlling the temperature defrosting and switching off the system if necessary for safety reasons. It must be entirely independent in its operation of any network monitoring system in case of the event of a network failure or disconnection.

2510.06.A.29  Coffee/Tea Service

2510.06.A.29.a  Coffee/tea service is required within the guestroom. It is not allowed to be located in the bathroom.

2510.06.A.30  Patio/Balcony Furniture

a. Glass tabletops must not be used.

b. Vinyl/plastic straps, pvc and plastic furniture must not be used.

2510.06.B  Artwork

2510.06.B.1  Refer to Section 2515.05 for artwork requirements.

2510.06.B.2  All guestrooms must have artwork.

2510.06.C  Mirrors

Refer to Section 2515.06 for additional mirror requirements.

2510.06.C.1  All guestrooms must have a full length mirror with a minimum exposed glass measurement of at least 15”/375 mm wide and 60”/1.5 m high. Full length mirror must be located near the dressing area or closet. A mirror mounted on the back of bathroom or closet door is acceptable. If wall mounted, the mirror must be framed. There must be no visible clips or fasteners.

2510.06.D  Lighting Fixtures

2510.06.D.1  Not Applicable to this Brand

2510.06.D.2  All lamps used in the United States must be approved by Underwriter’s Laboratories with a label affixed to each lamp. UL Standard #153 (www.ul.com) must be used for lamps.

2510.06.D.3  All lamps must pass the Underwriters Laboratories tip test or CE certificate (declaration of conformity).

2510.06.D.4  Not Applicable to this Brand

2510.06.D.5  Not Applicable to this Brand

2510.06.D.6  Shades must be of sufficient size so that bulbs do not cause discoloration. Special consideration must be given in the selection of the lampshades to ensure the required light levels are not hindered.

2510.06.D.7  Not Applicable to this Brand
2510.06.D.8 Lamp weights must be cast iron; all rust must be removed and a sealant must be applied. A clear plastic bottom cover must be glued to the weight to ensure against rust damage.

2510.06.D.9 Lamps requiring three-way bulbs are not allowed.

2510.06.D.10 Provide one switch per lamp, located in the base.

2510.06.D.11 Not Applicable to this Brand

2510.06.D.12 Not Applicable to this Brand

2510.06.D.13 Not Applicable to this Brand

2510.06.D.14 Portable Fixtures

2510.06.D.14.a Cords must be a minimum 6'-0"/1.8 m in length from exit point of lamp to plug. Cord length on any lamp must not exceed 8'-0"/2.4 m.

2510.06.D.14.b All cords with grounded plugs must be black, brown, or bronze. Clear plugs are permitted only in non-grounded assemblies. All plugs must be molded.

2510.06.D.14.c Rocker base switches are required on all table lamps if no dimmer is used.

2510.06.D.14.d Not Applicable to this Brand

2510.06.D.14.e All portable fixtures must have felt protective padding secured to the bottom.

2510.06.D.15 Not Applicable to this Brand

2510.06.D.16 Work Surface Lamp

2510.06.D.16.a A task lamp is required.

2510.06.D.17 Bedside Lamps

2510.06.D.17.a A light source is required on or over each bedside surface.

2510.06.D.17.b Style of lamp base and extension must take into account the size of the bedside surface area combined with other equipment (telephone, clock radio, etc.)

2510.06.D.17.c Provide two bulbs, which can be switched separately and together, in lamp shared between two beds.

2510.06.D.17.d Bedside lamps are allowed to be attached to the wall or headboard.

2510.06.D.17.e Wall lamps must be hard wired except when cords of plug wired lamps are concealed in headboard or behind casegoods.

2510.06.D.17.f Not Applicable to this Brand

2510.06.D.17.g Clearance between surface top and bottom of lamp shade must be sufficient to provide light to the bed area.

2510.06.D.17.h Not Applicable to this Brand

2510.06.D.17.i Not Applicable to this Brand

2510.06.D.17.j Wall lights or pendant lights are acceptable bedside lamps.

   Mexico: Wall lights or anchored pendant lights are acceptable bedside lamps.

2510.06.D.17.k Bedside lamps must have a diffuser to prevent views to the bare bulb when lying in the bed or standing at the bedside.
2510.06.D.18  Floor Lamp
   2510.06.D.18.a  Not Applicable to this Brand
   2510.06.D.18.b  Floor lamps must have a diffuser at lower part of the shade to prevent guest viewing of bare lamp.
   2510.06.D.18.c  Not Applicable to this Brand
   2510.06.D.18.d  Provide rocker switches on floor lamps. Switches on floor lamps must not be a pull chain, foot or twist switch. Switches must be a maximum 48”/1.2 m AFF.

2510.06.E  Fireplaces
   2510.06.E.1  Not Applicable to this Brand
   2510.06.E.2  If fireplaces are provided, they must meet the following requirements:
      2510.06.E.2.a  Fireplaces must be metal, prefabricated, gas-fired, and UL and AGA approved. Controls must have one-hour timers, with automatic shut off.
      Fireplaces must be totally enclosed and inaccessible to guests.
      2510.06.E.2.b  Metal flues that extend above the roof line or direct vent are required. Ventless fireplaces are not permitted.

2510.06.F  In-Room Safes
   2510.06.F.1  All hotels must install battery powered in-room safes with an integrally designed manual override system.
   2510.06.F.2  The safe must be placed at a comfortable usage height for the guest and must be secured to a stationary object. On the closet shelf, in a drawer, on a pedestal in the closet and inside case goods are approved locations. When the safe is placed inside a casegood, the casegood must provide structural integrity to support a minimum weight of 55 lbs/24 kgs for the safe. Metal supports across the bottom of the drawer/shelf is required.
      Canada | United States: The safe must be concealed and placed at a comfortable usage height for the guest and must be secured to a stationary object. On the closet shelf, in a drawer, on a pedestal in the closet and inside case goods are approved locations. When the safe is placed inside a casegood, the casegood must provide structural integrity to support a minimum weight of 55 lbs/24 kgs for the safe. Metal supports across the bottom of the drawer/shelf is required.
   2510.06.F.3  Safes must be a minimum size to accommodate a 15”/380 mm laptop computer. Interior safe bottom must be flush with frame.
   2510.06.F.4  Safes are not allowed to have power outlets (socket outlets).

2510.06.G  Window Treatments
   Refer to Section 2515.03.A.7 for Guestroom Window Treatment.

2510.07  Mechanical
   2510.07.A  System Types
      2510.07.A.1  Select an appropriate air conditioning unit that is dedicated to individual guestrooms and provides on-demand heating and air conditioning that complies with the Indoor Environmental Requirements Matrix included in Section 2514.06.
      2510.07.A.2  Acoustical Requirements: Comply with Indoor Environmental Condition’s Matrix included in Section 2514.06.
2510.07.B Not Applicable to this Brand

2510.07.C Thermostat

   Guestroom Thermostat

2510.07.C.1 Remote, wall-mounted, hard-wired, electronic digital thermostat specifically designed for guest suite applications must be provided. Studio suites and multi-room suites, served by a single HVAC unit, must have the thermostat located in the main sleeping area. Guest rooms served by multiple HVAC units must have a thermostat for each HVAC unit located in the space served by that unit. Battery powered thermostats are not acceptable.

2510.07.C.2 Required features are as follows:

2510.07.C.2.a System on/off selection
2510.07.C.2.b Automatic or Manual heating/cooling selection
2510.07.C.2.c Backlit LED/LCD digital display with temperature numerals that are at least 0.5”/12.0 mm in height.
2510.07.C.2.d Fan mode button that allows guest to have either continuous fan, fan cycling on demand of heating/cooling, and manual speed selection.
2510.07.C.2.e Concealed temperature limits for heating and cooling.
2510.07.C.2.f If an in-room energy management solution based upon occupancy is installed, it must include a door switch or electronic lock interface to ensure that occupancy status is verified each time the entry door is opened. Once verified, the thermostat controls must remain in the occupied mode until the door or electronic lock is again activated. The system should ensure that occupancy status is obtained through an automated sensor. However, occupancy status is not allowed to be obtained through the key reader; key reader HVAC systems are not allowed.

2510.07.C.3 Locate thermostats remote from the air conditioning device. In typical guestrooms, locate it near the bathroom and entry wall in an area unaffected by supply air drafts. In suites where the sleeping area(s) is separate from the living room area and the entire suite is served by a single air conditioning unit, locate the thermostat in the master bedroom.

2510.07.C.4 Not Applicable to this Brand

2510.07.C.5 Install interlocks with exterior operable doors that de-energize the air conditioning when they are open and return to previous program mode once closed.

2510.07.C.6 Hilton must review and approve all selections.

2510.08 Electrical

2510.08.A Power Outlets

   Power outlets (socket outlets) must be placed to allow convenient connection of the individual light fixture. Power cords must be concealed from guest view.

2510.08.B Back-to-back Power Outlets

   Back-to-back power outlets (socket outlets) are not permitted between guestrooms. Outlets in walls between guestrooms must be offset a minimum of 6”/150 mm.
2510.08.C Not Applicable to this Brand

2510.08.D Fire Ratings

Maintain fire rating between guestrooms where devices are located.

2510.08.E Power Requirements

2510.08.E.1 Locations required:

2510.08.E.1.a Not Applicable to this Brand

2510.08.E.1.b Convenience power outlets (socket outlets) are required for the iron.

2510.08.E.1.c Four power outlets (socket outlets) must be provided at the work surface for guest convenience. Up to two are allowed to be USB ports. Outlets may be recessed in the wall or recessed in the work surface.

2510.08.E.1.d Power source for the work surface lamp must be located below the work surface for both hard wired and plugged lamps.

2510.08.E.1.e Not Applicable to this Brand

2510.08.E.1.f Near guestroom entry.

2510.08.E.1.g Not Applicable to this Brand

2510.08.E.1.h Non-switched, power outlets (socket outlets) must be provided at the bedside surface for guest convenience. There must be at least one traditional outlet and two USB outlets at each surface for single bedded rooms and two traditional outlets and two USB outlets where the surface is shared between two beds. Outlets may be provided in the base of light fixtures, recessed in the wall or recessed in the bedside surface. Outlets are not allowed in wall-hung light fixtures and must be for guest use only. Light fixtures with outlets in the base must be tall enough to allow chargers to fit squarely into the outlets.

*Mexico*: Non-switched, power outlets (socket outlets) must be provided at the bedside surface for guest convenience. There must be at least one traditional outlet and two USB outlets at each surface for single bedded rooms and two traditional outlets and two USB outlets where the surface is shared between two beds. Outlets may be recessed in the wall or recessed in the bedside surface. Outlets are not allowed in wall-hung light fixtures and must be for guest use only.

2510.08.E.2 Circuits

2510.08.E.2.a Provide a minimum of two independent power circuits for the general devices and light fixtures, and at least one GFCI/ELCB/RCCB or equal circuit for the bathroom. Circuit interruption in one guest suite should not affect an adjacent room.

2510.08.F Lighting

2510.08.F.1 All switches in the guestroom and guest bathroom must be rocker switches with screwless face plates.

2510.08.F.2 Provide an illuminated rocker switch with screw less face plate immediately adjacent to the entrance door to control one light fixture when entering the guestroom. This fixture may be a decorative ceiling mount, ceiling recessed or a decorative wall sconce.

2510.08.F.3 Not Applicable to this Brand

2510.08.F.4 Not Applicable to this Brand

2510.08.F.5 Not Applicable to this Brand
2510.08.F.6 All light fixtures must be UL listed (or regional equivalent) for the wattage that it will carry. They must use energy efficient, long life lamps.

2510.08.F.7 All illuminated rocker switches with screw less face plates must be LED.

2510.08.F.8 Any room within a suite that is accessible from two sides must have a light fixture that can be turned on and off at both entrances to the room at a lighted rocker wall switch with screw less face plate.

2510.09 Technology

2510.09.A Telephone

2510.09.A.1 Each guestroom must contain a minimum of one telephone outlet at the bedside surface or work surface. Suites must contain a minimum of two telephone outlets. Provide one at the bedside counter and one at the work surface in the living area.

2510.09.A.2 One additional telephone outlet is required in the living area of any suite if living area is separate from the sleeping area.

2510.09.A.3 Telephone outlets must be mounted at standard code heights out of guests’ view.

2510.09.B Internet Access

2510.09.B.1 Refer to Section 2514.09 for requirements within the guestroom.

2510.09.B.2 When wired, an Internet connection must be provided above the work surface. For required wireless access points, the jack must be located out-of-sight, preferably below a desk (or other open style furniture), inside a closet on the ceiling or high on the wall, or above a non-metallic access panel in the guestroom ceiling.

2510.09.C Television

2510.09.C.1 Televisions must comply with the specifications provided in Sections 713.00 and 2514.09.

2510.09.D Not Applicable to this Brand

2510.09.E Connected Room

United States: Connected Room Edge Controllers (Set Back Boxes) are required to be installed in all guest rooms no more than 12 months (one year) after the installation of UnoNet at the hotel.

2510.09.E.1 United States:

Television

Hotels must install CAT6 and coaxial cable, homerun to each television. Refer to 2518.00 for more wiring standards.

2510.09.E.1.a United States: Any built-in units housing the TV must hide the Edge Controller and provide easy access to the device. At least two inches of space should be available behind each TV for Edge Controller storage.

2510.09.E.1.b United States: Only head-end based Free-to-Guest solutions are permitted. Hotels may not use set-top boxes for new contracts or installations. For additional information on Free-to-Guest providers, please visit HiltonHDTV.com.

2510.09.E.2 United States:
Thermostat

All hotels procuring or replacing guestroom thermostats must only invest in Connected Room compatible thermostats in preparation for future standards. For a list of Connected Room compatible thermostat models, visit ConnectedRoom.Hilton.com

2510.09.E.3 United States:

Lighting

All hotels procuring or replacing hardwired guestroom light switches (with the exception of the bathroom) must only invest in Connected Room compatible lighting controls in preparation for future standards. For a list of Connected Room-compatible light switch models, visit ConnectedRoom.Hilton.com

2510.09.E.3.a United States: Connected Room-compatible light switches alone may not comply with your jurisdiction’s commercial energy codes. Please consult in_room_technology@hilton.com before purchasing Connected Room-compatible light switches to confirm energy code compliance.

2510.09.E.3.b United States: All guestroom light switches are required to have a neutral wire.

2510.09.E.3.c United States:

Power outlets serving the TV and Edge Controller must always be hot and never be controlled by a master switch.

2510.10 Kitchen/Wet Bar

2510.10.A Not Applicable to this Brand

2510.10.B Cabinets

2510.10.B.1 The bar must be 34”/865 mm - 36”/900 mm high with a utensil drawer.

2510.10.B.1.a The top surface and backsplashes must comply with Section 2515.04. All cabinets must be furniture grade wood.

2510.10.B.2 Not Applicable to this Brand

2510.10.B.3 Not Applicable to this Brand

2510.10.B.4 Undercabinet lighting must be provided at any upper cabinets.

2510.10.B.5 Not Applicable to this Brand

2510.10.B.6 Ventilation must be provided, as required by equipment manufacturers.

2510.10.C Plumbing

2510.10.C.1 A stainless steel undermount wash basin and goose neck faucet must be provided.
2510.10.D  Appliances
  2510.10.D.1  The following appliances are required for guestroom wet bars:
     2510.10.D.1.a  A built-in microwave behind cabinet doors.
     2510.10.D.1.b  A minimum 1.7 cubic feet/0.05 cubic meters under counter refrigerator behind cabinet door.
  2510.10.D.2  Appliances must be black or stainless.

2511.00  Not Applicable to this Brand

2512.00  Guest Bathroom
  Refer to Section 2514.00, Technical Criteria, and Section 2515.00 Furnishings, Fixtures and Equipment, for requirements applicable to this Section.
  2512.00.A  Bathroom Fixture Requirements
  In new construction, the layout of the guest bathroom must be such that the water closet is not on axis with the bathroom entry door, is not visible from the guestroom entry door upon entering the room, and is not adjacent to the wall separating the bathroom from the bedroom. The water closet is to be adjacent to the wall separating the bathroom from the corridor. The shower is to be adjacent to the wall separating the bathroom from the bedroom. Other configurations that meet the intent of these requirements may be considered on a case by case basis. The guest bathroom must have a minimum of three fixtures (not including a bidet). Inside finished area must be a minimum of 48 ft²/4.46 m². Bathrooms must include a vanity with one wash basin, shower or tub/shower combo and a water closet.
  2512.00.A.1  Shower Requirement
     King guestrooms require a shower in lieu of a combination bathtub/shower.
  2512.00.A.2  Shower Requirement
     60% of double rooms must have showers. Other mixes will be considered based on market conditions.
  2512.00.A.3  Bathroom Width
     In new construction, bathroom must be a minimum width of 5'-6"/1.6 m.

2512.00.B  Not Applicable to this Brand

2512.00.C  Not Applicable to this Brand

2512.01  Doors
  2512.01.A  Door Style
     Sliding bathroom doors, pocket or barn, are allowed. When barn doors are utilized, door trim must ensure no visible gaps through to the bathroom.
  2512.01.B  Door Width
     Clear width of door opening, when fully open, must be 32"/800 mm or greater and a minimum door height of 6'-8"/2.0 m.
  2512.01.C  Door Hardware Requirements
     All hardware must be commercial grade and have a finish to coordinate with surrounding bath accessories or entry door hardware.
2512.01.D  Not Applicable to this Brand

2512.01.E  Swinging Door Locking Hardware
Swinging doors must have a privacy lockset. Swinging door locks must release by turning the inside lever and by closing the door; an emergency
device must release this lock from the outside of the bathroom.

2512.01.F  Barn Door Locking Hardware
Locking hardware is not required on sliding barn doors.

2512.01.G  Direction of Swing Door
Canada | United States: Enclosures and swing doors are not required on water closets. If provided, swinging doors are required to swing out.

2512.02  Finish Options - Guest Bathroom
2512.02.A  Floor: Porcelain tile, natural stone
2512.02.A.1  Base (minimums): 3"/75 mm porcelain tile, natural stone. Height must be coordinated with the guestroom base when the two materials directly
intersect.
2512.02.A.2  The bathroom door threshold must be a single piece of natural stone or quartz composite. Threshold is not permitted if tile floor extends past
bathroom entry door.
Mexico: The bathroom door threshold must be a single piece of natural stone, quartz composite or a transition strip (Schluter or comparable).
Threshold is not permitted if tile floor extends past bathroom entry door.

2512.02.A.3  Not Applicable to this Brand
2512.02.A.4  Curb or trench drain must be provided at shower door to prevent water overflow.

2512.02.B  Wall: Vinyl wallcovering (non wet areas only), back painted/laminated toughened glass, tile, natural stone, paint (non wet areas only).
2512.02.B.1  Not Applicable to this Brand
2512.02.B.2  Not Applicable to this Brand
2512.02.B.3  Not Applicable to this Brand
2512.02.B.4  Not Applicable to this Brand
2512.02.B.5  Not Applicable to this Brand
2512.02.B.6  Moisture-resistant wallboard must be used on all plumbing walls.
2512.02.B.7  Tub/shower surrounds: Porcelain tile, full-panel natural marble with reinforced backing, natural stone with high-gloss finish
2512.02.B.7.a  Not Applicable to this Brand
2512.02.B.7.b  Surround panels must have a finished edge.
2512.02.B.7.c  The tub/shower surrounds must extend to the ceiling and coordinate with vanity color.

2512.02.C  Ceiling: Paint on gypsum
2512.02.C.1  Ceiling must be moisture resistant gypsum board with smooth finish.
2512.02.C.2 Ceilings must have minimum height of 7'-6"/2.3 m.
2512.02.C.3 When automatic suppression systems are required (see section 2516.00) concealed type sprinkler heads must be utilized.

2512.03 Mechanical
  2512.03.A Mechanical Exhaust
    The guest bathroom area must be mechanically exhausted to the exterior as described in Section 2514.06.
  2512.03.B Re-circulating Type Exhaust
    Re-circulating-type exhaust is not allowed.
  2512.03.C Noise Level
    2512.03.C.1 If individual exhaust fans are used, select for maximum inlet noise level of 2.0 sones per AMCA Standards at design air flow and static pressure.
    2512.03.C.2 If a central exhaust fan is used, design for noise levels within the guestrooms that comply with Section 2514.06.
  2512.03.D Exhaust Fan Wall Switch
    Provide separate wall switch for exhaust fan. An occupancy/motion sensor controlled exhaust fan is not allowed.
  2512.03.E Toilet Exhaust Termination
    Toilet exhaust must terminate to the exterior at the roof level.

2512.04 Fixtures/Plumbing
  2512.04.A Plumbing Fixture Requirements
    Provide white plumbing fixtures (shower pan, bathtub, water closet and wash basin) with chrome-plated exposed drain lines. Exposed drain finish must coordinate with metal finishes used throughout bathroom.
  2512.04.B Fixture Trim Finish Coordination
    Fixture trim finishes must coordinate in color.
  2512.04.C Overflows
    Bathtubs and wash basins must provide a gravity overflow outlet sized for full flow rate.
  2512.04.D Stoppers
    Provide metallic, mechanical lift type, lever activated stoppers from the overflow or twist and lift stoppers at bathtubs. Provide mechanical lift pop-up stoppers at vanity.
  2512.04.E Bathtubs
    2512.04.E.1 Not Applicable to this Brand
    2512.04.E.2 Not Applicable to this Brand
    2512.04.E.3 Provide minimum bathtub dimension of 60"/1.5 m long.
    2512.04.E.4 Acceptable bathtubs:
2512.04.E.4.a Cast iron bathtubs that meet the following minimum requirements:
  2512.04.E.4.a.1 An acid-and scratch-resistant enameled finish on a single one-piece, sand-cast base with integral apron.
  2512.04.E.4.a.3 Integral lumbar support/sloped back.

2512.04.E.4.b Porcelain-on-steel composite bathtubs that meet the following minimum requirements:
  2512.04.E.4.b.1 An acid-resistant enameled finish on a minimum .0598”/1.5 mm gauge thickness, one-piece, steel-formed bathtub with an integral apron and an acrylic-composite backing on the underside of the bathtub.
  2512.04.E.4.b.3 Straight tiling bead/flange.
  2512.04.E.4.b.4 Not Applicable to this Brand
  2512.04.E.4.b.5 Integral lumbar support/sloped back.

2512.04.E.4.c Porcelain-on-steel (POS) bathtubs that meet the following minimum requirements:
  2512.04.E.4.c.1 An acid-resistant enameled finish on a minimum .0598”/1.5 mm thickness (16-gauge), one-piece, steel-formed bathtub with an integral apron.
  2512.04.E.4.c.3 Straight tiling bead/flange.
  2512.04.E.4.c.4 Not Applicable to this Brand
  2512.04.E.4.c.5 Integral lumbar support/sloped back.

2512.04.E.4.d Not Applicable to this Brand

2512.04.E.4.e Acrylic quartz bathtubs that meet the following minimum requirements:
  2512.04.E.4.e.1 Through-colored with no layers and a minimum bottom thickness of .05”/12 mm without wood or other reinforcement.
  2512.04.E.4.e.2 Meet standards DIN 198 and EN 14516 for user safety and quality requirements.
  2512.04.E.4.e.3 An integral slip-resistant surface on the bottom of the well meeting BS 7976, pendulum test moderate slip potential.
  2512.04.E.4.e.4 Radius of outer product corners (rim) must not exceed 3/16”/5 mm for tiling flange.
  2512.04.E.4.e.5 Glued-on, high grade plastic feet for support.

2512.04.E.5 Unacceptable bathtubs: Fiberglass, gel-coated, acrylic, plastic, bathtub liners, applied bath mats or strips

2512.04.E.6 Hotels must not resurface or recoat existing bathtubs.
2512.04.F.3 The minimum shower receptor dimensions must be 60”/1.5 m x 30”/750 mm or 48”/1.2 m x 30”/750 mm. Shower receptors are required in new construction and where possible in renovations.

2512.04.F.4 Acceptable shower receptors:

2512.04.F.4.a Cast iron receptors that meet the following minimum requirements:

2512.04.F.4.a.1 An acid-and scratch-resistant enameled finish on a single one-piece, sand-cast base with integral apron.


2512.04.F.4.b Single-piece cast engineered stone receptors.

1. Product must be a non-porous through body color material (no gel-coats or other top coat finish allowed)
2. Must contain a minimum of 60% natural stone materials. Solid surface resin must be premium grade, NPG-isophthalic (ISO), UV inhibited acrylic based polyester resin.
3. Must meet the Slip-resistance requirements described in 2514.03.A.
4. Must feature a tile flange anywhere that wall meets the pan. Tile flange must be water tight and must not be thicker than 3/16”.
   Must be leveled and supported.
5. Final profile and finish color to be approved by Hilton.


2512.04.F.4.g Single-piece terrazzo receptors.

2512.04.F.4.h Tile floor finishes are acceptable for showers with prior approval from Hilton on size, color and installation technique. 1. Must meet the slip-resistance requirements described in 2514.03.A.

2512.04.F.5 Unacceptable shower receptors: Fiberglass, plastic, acrylic, gel-coated

2512.04.F.6 Pre-fabricated shower stalls are not allowed.

2512.04.F.7 Shower enclosure

2512.04.F.7.a Shower enclosures must be frameless clear glass with a frameless hinged door or a 3/8”/9.5 mm clear glass, frameless bypass shower door with the approval of Hilton. Locate glazing flush with outside face of shower receptor curb. Doors must be 74”/1.88 m high minimum. When barn doors are used, minimum door clearance below the door bar must be 74”/1.88 m.
2512.04.F.7.b Glass shower enclosures must be tempered or laminated safety glass. All hardware must withstand a wet environment. Sliding door must not be a continuous bottom track. Swinging door must not conflict with other doors.

Mexico: Glass shower enclosures must be tempered or laminated safety glass. All hardware must withstand a wet environment. Sliding door must not be a continuous bottom track. Swinging door must not conflict with other doors and must open in both directions or out only.

2512.04.F.7.c Shower door undercut must clear a floor mat when opened and swing out.

2512.04.F.8 Provide either a minimum 3"/75 mm diameter slot or floor drain.

2512.04.F.9 Modular Shower Surround Wall Systems with Full Sheet Pre-cut Surround Material

2512.04.F.9.a All modular shower surround wall systems with full sheet pre-cut surround material, caulk colors, manufacturer, design and shower mock up must be approved by Hilton Design.

2512.04.F.9.b Full sheets of decorative glass are permitted when pre-cut and supported by an engineered mechanical support structure.

2512.04.F.9.c Pre-cut glass sheets, to fit site conditions, must be a minimum of ½"/12 mm thick laminated heat strengthened glass with beveled and polished edges and connected with vinyl inter-layer.

2512.04.F.9.d Full sheets of glass must cover the left and right-hand side walls of the shower alcove extending from the shower enclosure to the back inside corners. The rear wall sheet material must be a single panel extending from corner to corner at the back of the shower alcove.

2512.04.F.9.e Sheet material for the designs must be selected by an architect or designer.

2512.04.F.9.f Caulk joints must be a bacteria resistant architectural grade 100% silicon and be no more than ¼"/6 mm wide.

2512.04.F.9.g The mechanical wall attachment system must be engineer designed providing a waterproof system and be designed to guide water to the drain for the shower alcove.

2512.04.F.9.h Modular shower system sheet material must have undergone and passed the following tests:

- Load cycle fatigue test: Method: A 300lbs load applied on shower bottom base as in clause 5.8.2 Load test shower thresholds and bottoms from CSA B45.5-11/IAPMO Z124-2011.

- Seal test: In accordance with the CSA B45.5-11/IAPMO Z124-2011, clause 5.18 Field-installed tiling-flange seal test.

- Area impact load test


- Corrosion test: Method: The drain grid, a piece of the aluminum panel frame and support were placed in a salt spray apparatus for 96 hours to the standard condition of the ASTM B117.

2512.04.F.9.i Glass must not be adhered to the wall substrate.
2512.04.F.9.j  Glass must be truly perpendicular to the adjacent glass panel, plumb and level, not impacted by rough openings that may not be truly perpendicular, plumb or level.

2512.04.F.9.k  The outside edge of glass panel must not receive a batten or return to the wall. The closure between glass and law panel must be a discrete reveal that accommodates nonparallel conditions. Provide a custom closure to seal the gap between the surround material and the alcove wall 2”/50 mm behind the surround material edge, leaving the material edge exposed and appearing to “float” over the alcove wall.

2512.04.F.9.i  The alcove wall treatment is to apply engineered stone trim strips as the finished material directly to the alcove wall behind the surround material.

2512.04.F.9.m  Lighting is required over the shower area. Options include the following and must be approved by Hilton: LED light panel lid, backlit grazer light, backlit waterfall pattern and halo up-light options.

2512.04.F.9.n  Accessories such as grab bars, foot rests, soap dishes and all plumbing fixtures provided by owner must be coordinated with the manufacture and shown in the shop drawings for approval.

2512.04.F.9.o  All properties utilizing this type of system must have at least one model shower mockup to ensure accurate measurements and discover unique field conditions. Mock up shower must be installed by Hilton Design approved manufacturer and/or certified installer.

2512.04.G   Water Closet

2512.04.G.1  Provide a 1.6 gallons per flush/6.06 liters per flush (maximum), tank type, vitreous china water closet with an elongated bowl.

Mexico: Provide a 1.6 gallons per flush/6.06 liters per flush (maximum), tank type or wall hung, vitreous china water closet with an elongated bowl.

2512.04.G.2  Water closets must have a commercial grade, closed-front, solid plastic seat with cover. Stainless steel hinges with slow-closing feature to minimize slamming of water closet seat must be provided. The water closet seat and lid must remain in an upright position without being held. The color of seat and lid must match the fixture.

Mexico: Water closets must have a commercial grade, closed or open front, solid plastic seat with cover. Stainless steel hinges with slow-closing feature to minimize slamming of water closet seat must be provided. The water closet seat and lid must remain in an upright position without being held. The color of seat and lid must match the fixture.

2512.04.G.3  Water supply must be mounted approximately 10”/254 mm above the floor to avoid conflict between the escutcheon plate and wall base.

2512.04.G.4  Mexico: If culturally relevant, water closet must be provided with hand shower if bidet is not installed.

2512.04.G.5  Not Applicable to this Brand

2512.04.G.6  In new construction, the space provided for the water closet must be 34”/860 mm wide.

2512.04.G.7  In new construction, toilet must not be visible from entering the guestroom.

2512.04.H   Bathtub and Shower Controls

2512.04.H.1  Bathtub/Shower Applications: Valve must be anti-scald, pressure and/or thermostatic automatically compensating mixing valve type. Construction must include integral stops, high temperature limit adjustment and replaceable cartridges. Brass/Bronze construction required for the main body and internal piston. Lever operation of the valve is required for manual valves. Unless integral diverter is provided as part of the mixing valve, a lift knob for shower diversion must be located on top of the bath spout.
2512.04.H.1.a Minimum requirements:
2512.04.H.1.a.1 Compliance to ASME A112.18.1/CSA B125.1 and ASSE 1016.

2512.04.H.2 Single Showerhead and combination showerhead/hand shower applications: Valve must be anti-scald, pressure and/or thermostatic automatically compensating mixing valve type. Construction must include integral stops, high temperature limit adjustment and replaceable cartridges. Brass/Bronze construction is required for the main body and internal pistons. Lever operation of the valve is required for manual valves. If applicable, lever or push button diverter actuation may be used. Diverter must be integral to the control valve or located within 1'-8"/0.5 m from the control valve.

2512.04.H.2.a Minimum requirements:
2512.04.H.2.a.1 Compliance to ASME A112.18.1/CSA B125.1 and ASSE 1016.

2512.04.H.3 Multi-outlet shower system applications: Valve must be anti-scald, pressure and/or thermostatic automatically compensating mixing valve type. Construction must include integral stops, high temperature limit adjustment and replaceable cartridges. Brass/Bronze construction is required for the main body and internal pistons. Lever operation of the valve is required for manual valves. Transfer or diverter valves are acceptable however; diverter/transfer valve must be integral to the control valve or located within 1'-8"/0.5 m from the control valve.

2512.04.H.3.a Minimum requirements:
2512.04.H.3.a.1 Compliance to ASME A112.18.1/CSA B125.1 and ASSE 1016.

2512.04.H.4 Valve trim: All finished exposed trim (including exposed valves) must meet minimum code requirements for corrosion in compliance to ASME A112.18.1/CSA B125.1. Trim must include identifiable control setting by symbols, letters or graphics/colors to indicate “off”, “cold” and “hot” operation for the control valve.

Mexico: Valve trim: All finished exposed trim (including exposed valves) must meet minimum code requirements for corrosion in compliance to ASME A112.18.1/CSA B125.1. Trim must include identifiable control setting by symbols, letters and graphics/colors to indicate “off”, “cold” and “hot” operation for the control valve.

2512.04.H.5 All valves and trim must be approved by Hilton.

2512.04.H.6 Not Applicable to this Brand

2512.04.H.7 Showerheads

2512.04.H.7.a Provide an adjustable flow rate showerhead with fine and coarse spray. Showerhead must incorporate flow rate restrictor providing a maximum flow of 2.5 GPM/9.5 LPM at minimum delivered water pressure of 30 PSI/2.1 bar. Showerheads/hand showers rated at or below 2.0 GPM/7.6 LPM must comply with minimum performance standards for low flow heads similar to USEPA Water Sense listings. Showerhead must be approved by Hilton.

Canada | United States: Provide an adjustable flow rate showerhead with fine and coarse spray. Showerhead must incorporate flow rate restrictor providing a maximum flow of 2.5 GPM/9.5 LPM at minimum delivered water pressure of 30 PSI/2.1 bar. Showerheads/hand showers rated at or below 2.0 GPM/7.6 LPM must comply with minimum performance standards for low flow heads similar to USEPA Water Sense listings. Showerhead must be approved by Hilton. All guest bathrooms must have an adjustable flow rate showerhead. A handheld and/or rain head may be provided in addition to the showerhead, but not in place of the showerhead.

Mexico: Provide an single flow showerhead. Showerhead must incorporate flow rate restrictor providing a maximum flow of 2.5 GPM/9.5 LPM at minimum delivered water pressure of 30 PSI/2.1 bar.
LPM at minimum delivered water pressure of 30 PSI/2.1 bar. Showerheads/hand showers rated at or below 2.0 GPM/7.6 LPM must comply with minimum performance standards for low flow heads similar to USEPA Water Sense listings. Showerhead must be approved by Hilton.

2512.04.H.7.b All showerheads/hand showers must be code listed indicating compliance to a formal standard and the markings should appear on the device. The code listing should include minimum corrosion standards.

2512.04.H.7.c Rough-in for the showerhead must be 6’-10”/2.08 m to 7’-0”/2.1m above the finished floor. Exception: showerheads on an adjustable bar/rail, in which case the bottom of the showerhead must reach at least 6’-6”/2.0 m.

2512.04.I Vanity Faucets

2512.04.I.1 Provide commercial grade faucets with dual lever handles with quarter turn feature and 8”/200 mm centers, or single-lever handles. Fixtures must be plated or solid brass with replaceable cartridges, as manufactured by nationally known manufacturers. Lever handles must not have exposed screws. Lever-activated/lift rod/pop-up waste stoppers are required.

2512.04.I.2 Each hot and cold water supply must have an individual shut off valve.

2512.04.I.3 All properties must have a minimum 1.2 gpm/4.5 lpm aerator.

2512.04.J Wash Basin

2512.04.J.1 Wash basin must be an undermount/bottom-set vitreous china bowl. Freestanding top-set, vessel-type wash basins are permitted with prior approval. All other type bowls must be submitted to Hilton for approval. Integral wash basins are only allowed for use with engineered stone vanity tops.

2512.05 Electrical

2512.05.A Rocker Switch

Provide an illuminated rocker switch immediately adjacent to entrance of bathroom. If LED, light must be white.

2512.05.B Not Applicable to this Brand

2512.05.C Power Outlets

Two GFCI/ELCB/RCCB or equal power outlets (socket outlets) must be located at one end of the bathroom vanity for convenient use of personal care appliances (unless prohibited by local law). Power outlets (socket outlets) must not interfere with mirror. Locate outlet so that hanging towels do not obstruct use of the outlet.

2512.06 Lighting

2512.06.A Light Level Requirements

Comply with requirements included in Section 2514.08.

2512.06.B Not Applicable to this Brand

2512.06.C Not Applicable to this Brand

2512.06.D Wall Sconces
Bathroom lighting must be wall sconces mounted on both sides of the mirror and a vapor resistant fixture ceiling-mounted over the bathtub/shower area. A vapor resistant fixture is required in the water closet if water closet is enclosed and separate from rest of bathroom. Light fixture(s) mounted above the vanity mirror or incorporated in the vanity mirror fittings are permitted with prior approval.

2512.07 Technology

2512.08 Vanities

2512.08.A Wash Basin/Vanity Top Height
Vanity tops must be 34”/860 mm high.

2512.08.B Base
2512.08.B.1 Vanities must be wall-mounted and extend wall to wall, or be supported by legs and held free of the sidewalls. Legs, when used, must have a non-corrosive metal cap at the bottom of the legs. Bowed top and apron are allowed.
2512.08.B.2 Not Applicable to this Brand
2512.08.B.3 The vanity base, if of wood construction, must have a catalyzed waterproof finish and have a decorative/casegood appearance. Refer to Section 2515.01 for more information on the construction of the vanity base.
2512.08.B.4 Not Applicable to this Brand
2512.08.B.5 Provide a drawer or cubby for hair dryer storage in the guest bathroom.

2512.08.C Tops
2512.08.C.1 Single bowl vanity tops must be a minimum of 60”/1.5 m in length. Dual bowl vanity tops must be a minimum of 72”/1.8 m in length. Bowed vanities must be a minimum of 20”/500 mm deep on the sides and enlarge to 24”/600 mm deep at the bowl. Straight vanities must be a minimum of 22”/560 mm deep.
Mexico: Single bowl vanity tops must be a minimum of 60”/1.5 m in length. Dual bowl vanity tops must be a minimum of 72”/1.8 m in length. Bowed vanities must be a minimum of 20”/500 mm deep on the sides and enlarge to 24”/600 mm deep at the bowl. Straight vanities must be a minimum of 22”/560 mm deep. Based on design bowl is not required to be centered on the vanity top.
2512.08.C.2 Vanity tops, sides (when wall-to-wall vanities are provided) and backsplash must be a minimum of 3/4”/20 mm thick granite, engineered stone, glass (semi-frosted underneath) or approved alternative and be stain resistant. All tops must have a 4”/100 mm backsplash.
2512.08.C.3 Substrates for vanity tops must be a ¾”/1.9 cm thick with a nine ply moisture resistant wood ply-core with MR glue line, Medex (waterproof MDF) or a ¾”/1.9 cm marine grade plywood.

2512.09 Bathroom Accessories

2512.09.A Bathroom Accessory Materials
All bathroom accessories must be non-corrosive and must match the plumbing fixture trim finish and style.

2512.09.B Internal Wood Blocking
Internal wood blocking secured to studs is required for all wall mounted accessory items.
2512.09.C Required Accessories

All guest bathrooms must contain the following accessories:

2512.09.C.1 Toilet Paper Holder

- 2512.09.C.1.a A single-roll, wall-mounted toilet paper holder, non-restrictor type must be provided.

2512.09.C.2 A curved shower rod is required for all rooms that have shower/bathtub compartments. Rod must be oval or round tube and must not rotate within the mounting bracket. Rod must be mounted 6'-8"/2.04 m above the finished floor to the center line of the rod, vertically centered on back side of bathtub edge, and permanently secured. Anchors are required to securely fasten to wall.

**Mexico:** A curved shower rod is required for all rooms that have shower/bathtub compartments. Rod must be oval or round tube and must not rotate within the mounting bracket. Rod must be mounted 6'-8"/2.04 m above the finished floor to the center line of the rod, vertically centered on back side of bathtub edge, and permanently secured. Rod must be 32"/81.2 cm at its widest point and cannot impede entry door when open 45 degrees at widest point. Anchors are required to securely fasten to wall. Shower curtains must not be used on walk-in showers unless required for wheelchair accessibility.

2512.09.C.3 Grab Bar

- 2512.09.C.3.a A grab bar with a minimum 12"/300 mm long gripping surface (portion of the bar that is 1.5"/38 mm from the wall) is required at all bathtubs, whirlpools and shower enclosures. The grab bar must be mounted vertically with its gripping surface spanning 38"/965 mm – 46"/1.17 m above the finish floor.

For Tubs and Whirlpools, the grab bar must be mounted 6"/150 mm to 12"/300 mm from the outermost edge of the tub, at the main tub entry/exit point.

For Showers, the grab bar may be located on any wall, at least 6"/150 mm from any corner or shower edge. Placement must be coordinated with swinging shower doors.

Grab bars must be decorative and coordinate with the surrounding fixtures and accessories. A grab bar is not required at freestanding tubs.

- 2512.09.C.3.b All grab bars must be securely anchored and capable of withstanding 250 lbs/120 kgs of pull. The gap between the wall and the grippable area must not exceed 1.5"/38 mm. Cement adhesive is not acceptable. Grab bars must have flange covers to conceal the mounting screws. Towel bars must not serve as a grab bar.

2512.09.C.4 Soap Dishes

- 2512.09.C.4.a Soap dishes must not have grab handles and must not be plastic. For shower-only units and bathtub/shower combos, a soap dish must be placed in the corner on the showerhead wall, 48"/1.20 m above the finished floor.
2512.09.C.4.b Open metal basket soap dishes are allowed and must meet the following criteria:
  2512.09.C.4.b.1 Must be manufactured with corrosion resistant brass or stainless steel.
  2512.09.C.4.b.2 Wire spacing must be no greater than 1/2"/12 mm.
  2512.09.C.4.b.3 Must be surface mounted with concealed fasteners – mounting connection must be easy to clean and maintain.
  2512.09.C.4.b.4 Overall minimum width must be no less than 6"/150 mm.
  2512.09.C.4.b.5 Finish must match other bath accessories.
  2512.09.C.4.b.6 The following finishes are acceptable: satin nickel, polished chrome or polished stainless steel.
  2512.09.C.4.b.7 Corner mount installations are required - other mounting is acceptable in oversize shower configurations only.

2512.09.C.5 Towel Storage
  2512.09.C.5.a Towel storage must be incorporated into the vanity area to accommodate the Brand terry program. Towels must not be stored over the water closet or in bathtub/shower area.

2512.09.C.6 Towel Bar
  2512.09.C.6.a 18"/450 mm towel bar or 6"/150 mm towel ring must be installed immediately adjacent to vanity. Towel bar/ring is not allowed over the water closet. The towel bar may be mounted on the face of the vanity. If the towel bar is mounted below the sink it must be recessed back enough to prevent direct contact with guest.

2512.09.C.7 Minimum of one towel hook or bar must be mounted in close proximity of the shower. A horizontal shower door handle on the outside of the shower may serve as the towel bar.

2512.09.C.8 Robe Hook
  2512.09.C.8.a Two single or one double robe hook must be provided. Mount at 6'-0"/1.8 m above the finished floor.

2512.09.C.9 Not Applicable to this Brand
2512.09.C.10 Recessed facial tissue dispensers are not permitted.
2512.09.C.11 Not Applicable to this Brand
2512.09.C.12 A freestanding, double sided, 1x - 3x magnification, LED lighted make-up mirror or a wall mounted, double arm, single sided, 3x magnification, LED lighted make-up mirror is required.

2512.10 Furniture, Fixtures and Equipment
  Refer to Section 2515.00 for typical FF&E requirements.

2512.10.A Artwork
  2512.10.A.1 Artwork is required in all bathrooms except those with full height, stone/tile walls.

2512.10.B Mirror
2512.10.B.1 A decorative mirror must be provided over the vanity. Mirror may have integral lighting and be frameless. There must be no visible clips or fasteners. Must be installed with tamper-proof wall mounts.

2512.10.B.2 Not Applicable to this Brand

2512.10.B.3 Integral lit and backlit mirrors must have the entire mirror UL approved and labeled, not just the components.

2513.00 Back-of-House

Refer to Section 2514.00, Technical Criteria, Section 2515.00, Furnishings, Fixtures and Equipment, and https://lobby.hilton.com/sites/heartofhouse for requirements applicable to this section.

2513.01 Office

2513.01.A All Offices

2513.01.A.1 Not Applicable to this Brand

2513.01.A.2 Provide a tamper-proof, 180-degree, one-way sidelight or viewer at the main office door entry. Install viewer at centerline of door, 5'-0"/1.5 m above the finished floor.

2513.01.A.3 Provide locksets with push-button lock or electronic card reader on all offices. Push-button lock must release with a key, by turning the inside lever and/or by closing the door.

2513.01.A.4 Not Applicable to this Brand

2513.01.A.5 Finish Options - Offices

2513.01.A.5.a Floor: Carpet (broadloom and carpet tile)

2513.01.A.5.a.1 Base (minimums): 4"/100 mm vinyl, through body synthetic, carpet, wood. Wood base is required in general office reception area.

2513.01.A.5.b Wall: Vinyl wallcovering, paint, Heart of House graphic

2513.01.A.5.c Ceiling: Acoustical ceiling tile, pops of color, architectural lighting per Heart of House Design Guide

2513.01.A.5.c.1 Offices must have a minimum ceiling height of 8'-6"/2.6 m.

2513.01.A.6 All built-in counters, shelves and cabinets must have a minimum plastic laminate finish. The top surface material must comply with Section 2515.04.

2513.01.A.7 Mechanical

2513.01.A.7.a Provide a thermostat for the office area. Separate controls are required for the general manager’s office.

2513.01.A.8 Electrical

2513.01.A.8.a At each desk/workstation there must be a minimum of four dedicated power outlets (socket outlets), two can be USB outlets. This must be located within 3'-0"/915 mm of the workstation. All outlets must be ground. Each dedicated circuit may provide power for up to three workstations.

2513.01.A.8.b Provide a minimum of two convenience power outlets (socket outlets) on each wall or desk location with spacing not to exceed 20'-0"/6.0 m on center.
2513.01.A.8.c Not Applicable to this Brand
2513.01.A.8.d Not Applicable to this Brand
2513.01.A.8.e Provide a power outlet (socket outlet) on a dedicated circuit for the copier, four power outlets (socket outlets) at each coffee station (two above and two below the counter), two power outlets (socket outlets) at 4'-0"/1.2 m above the finished floor above the mail sorting counter.
2513.01.A.8.f All office lighting must be locally switched.
2513.01.A.8.g Refer to Section 2514.08 for minimum light level requirements.
2513.01.A.8.h Provide decorative lighting in all back of house office areas.
2513.01.A.9 Provide two telephone/data outlets at each desk/workstation and one wall-mounted telephone outlet in the mailroom (when provided).
2513.01.A.10 Each workstation must be wired as required by Section 2518.00.
2513.01.A.11 Provide commercial grade, coordinating furniture in all offices and personal storage with seating in open offices.

2513.01.B  Front Office
2513.01.B.1 The front office area must be located adjacent to the front desk and must include the following areas/offices:
   2513.01.B.1.a Front office manager’s office
   2513.01.B.1.b Night auditor’s office
   2513.01.B.1.c Cashier’s office
   2513.01.B.1.d Count room
   2513.01.B.1.e Team Member safety deposit area, adjacent to count room
   2513.01.B.1.f Safety deposit box and viewing room
   2513.01.B.1.g Note: Larger hotels may require cashier’s office, count room and computer room in the accounting offices.
2513.01.B.2 Provide a minimum of 50 ft²/4.64 m² for the count room. The room must be adjacent to the cashier’s office.
2513.01.B.3 The count room must include:
   2513.01.B.3.a Self-closing entry door with tempered vision glass or side light for visual security.
   2513.01.B.3.b Counting shelf 2'-0"/600 mm x 6'-0"/1.8 m for counting receipts.
   2513.01.B.3.c Not Applicable to this Brand
   2513.01.B.3.d The connecting wall or door of the cashier’s office must have a shelf with secured transaction window and an after-hours, secured drop safe. The drop safe must have two locking mechanisms.
2513.01.B.4 Provide a glazed partition at the front office manager’s office to facilitate visual supervision of the front office area, if a separate front office manager’s office is provided.
2513.01.B.5 The primary telephone PBX must be located in an enclosed room adjacent to registration area and away from guest view.

2513.01.C  Executive Offices
2513.01.C.1 Not Applicable to this Brand
2513.01.C.2 A reception area is required whether the executive offices are consolidated or separated.
2513.01.C.3 Provide a minimum 10'-0"/3.0 m x 12'-0"/3.7 m reception area.
2513.01.C.4 The general manager, the assistant general manager, the director of sales, the director of food and beverage, the director of finance and the director of human resources must have private offices. These offices and any conference space must be enclosed by permanent partitions.
2513.01.C.5 Provide an additional telephone outlet in the general manager’s office.

2513.01.D Sales and Catering Offices
2513.01.D.1 The sales and catering offices must be consolidated with all other administrative offices with a separate entrance to the reception area from the lobby or a guest corridor.
2513.01.D.2 A minimum 10'-0"/3.0 m x 10'-0"/3.0 m reception area must be provided at the entrance to the office suite under the administrative assistant’s direct observation.
2513.01.D.3 Not Applicable to this Brand
2513.01.D.4 Provide a minimum 80 ft²/7.5 m² storage/work room with 2'-0"/600 mm deep x 4'-0"/1.2 m wide x 6'-0"/1.8 m high, enameled, metal storage shelving along one wall.
2513.01.D.5 Provide one wall-mounted telephone outlet in the storage/work room and one additional telephone outlet in waiting area.

2513.01.E Accounting Offices
2513.01.E.1 The accounting office must, whenever possible, be consolidated with all other administrative offices.
2513.01.E.2 Provide an area for active accounting files based on one file drawer for every 25 guestrooms.
2513.01.E.3 Not Applicable to this Brand
2513.01.E.4 Each workstation must have eight power outlets (socket outlets) below the countertop and two power outlets (socket outlets) above. All outlets must be dedicated and ground. One dedicated telephone outlet, one data port and USB outlets must be provided above the counter with two data ports below.

2513.01.F Human Resources
2513.01.F.1 The Human Resources offices must be located at the team member entrance with visual supervision by providing a window, borrowed light or glazed door. Team members must have immediate access to the Human Resources office without crossing receiving area traffic.
2513.01.F.2 The Human Resources offices must have an open office area for the Human Resources clerk, if applicable, and an enclosed office for the director of human resources.
2513.01.F.3 Provide space within the HR clerk's office for at least two applicants to fill out application forms. Provide additional waiting space in the general vicinity of the Human Resources office for four to six applicants.
2513.01.F.4 Provide a flex room/training room adjacent to the HR clerk’s office with a minimum of 325 ft²/30.0 m² or 1.6 ft²/457 mm²/0.15 m² per key, whichever is greater. Provide flexible or multi-purpose furniture that allows the space to be used for a variety of functions.
2513.01.F.5 Provide dimmable, architectural lighting in the training room.
2513.01.F.6 Provide a computerized time clock at the team member entrance area adjacent to the Human Resources office. Provide data connection and a power outlet (socket outlet) installed at 48”/1.2 m above the finished floor for time clock.

2513.01.F.7 Provide a fixed television in the training room. Televisions must comply with the sizes and specifications provided in Sections 713.00 and 2514.09.

2513.01.F.8 Provide a wall mounted/integral dry erase board or chalk wall.

2513.02 Housekeeping Zones

2513.02.A Laundry/Valet

2513.02.A.1 Provide an onsite laundry (or outsourced laundry services when approved by Hilton). The following standards are applicable to the onsite laundry.

2513.02.A.2 The laundry must be designed and specified by a professional Laundry Consultant and approved by Hilton.

2513.02.A.3 The laundry must be installed on grade and not adjacent, above or below the ballroom, meeting rooms, public restrooms, restaurant, or any other public space.

2513.02.A.4 The laundry must be contiguous with the housekeeping area and both areas must be located in close proximity to the service elevators/lifts.

2513.02.A.5 Provide a cart parking area for at least one cart per 75 guestrooms.

2513.02.A.6 Dryers must be enclosed in a gypsum board enclosure. Provide at least 2'-0”/600 mm of service access in the rear. Verify all service access requirements. The door to this enclosure must open out.

2513.02.A.7 Provide a minimum 538 ft²/50 m² linen room adjacent to the loading/unloading bay when laundry is outsourced.

2513.02.A.8 Approximately 20 percent of the laundry must be allocated to soiled linen receiving and sorting. The sorting area must be immediately adjacent to the washing area.

2513.02.A.9 Provide exterior access to the laundry to permit delivery and future replacement of equipment without major dismantling or demolition.

2513.02.A.10 The laundry must contain the termination of the linen chute.

2513.02.A.11 Doors

2513.02.A.11.a Primary laundry entrance door must be double doors, each 3'-0”/900 mm x 6'-8”/2.0 m minimum, with locksets, kick plates and door closers with a hold open feature.

2513.02.A.12 Finish Options - Laundry/Valet

2513.02.A.12.a Floor: Vinyl composition tile (allowed in dry areas, but not under large stationary equipment); concrete - steel troweled, triple epoxy sealed or better

2513.02.A.12.a.1 Base (minimums): 4”/100 mm through body synthetic, quarry tile, porcelain tile, natural stone

2513.02.A.12.b Wall: Epoxy paint, moisture-resistant gypsum board (painted), masonry (painted)

2513.02.A.12.b.1 Walls must have FRP or PVCu seamless wall-cladding wainscot.

2513.02.A.12.b.2 Provide metal or rubber corner guards and wall railings at columns and wall outside corners.

2513.02.A.12.c Ceiling: Washable ceiling system with non-corrosive aluminum grid, paint on gypsum.
2513.02.A.12.c.1 All exposed pipes, ductwork, etc. must be painted.

2513.02.A.13 Mechanical
2513.02.A.13.a Provide an independent central HVAC system for the laundry.
2513.02.A.13.b Provide separate temperature control for the laundry and housekeeping area.

2513.02.A.13.c Dryer Makeup Air and Exhaust System:
2513.02.A.13.c.1 Provide source for outdoor treated makeup air as required by the dryer manufacturer’s recommendations.
2513.02.A.13.c.2 Provide combustion air source for gas dryers that comply with NFPA 54 and 90A requirements (www.NFPA.org).
2513.02.A.13.c.3 In cold climates, protect equipment and piping from freeze potential.
2513.02.A.13.c.4 Fabricate and install exhaust ductwork to minimize dust or lint entrapment and provide cleanout openings at least 20'-0"/6.0 m.
2513.02.A.13.c.5 Laundry equipment supplier must provide a wet or dry exhaust vent filter to collect and control lint accumulation.
2513.02.A.13.c.6 Provide weather-stripped, motorized dampers interlocked to the dryer circuit.

2513.02.A.13.d Ironer and Ironer Exhaust Air System:
2513.02.A.13.d.1 Provide ironer equipped with built-in or field fabricated and installed heat collection hood to capture heat from the ironer.
2513.02.A.13.d.2 Provide independent exhaust duct system connected to the capture hood and sloped away from the ironer.
2513.02.A.13.d.3 Provide in-line filter assembly to capture lint prior to exhaust termination.

2513.02.A.13.e Plumbing
2513.02.A.13.e.1 Not Applicable to this Brand
2513.02.A.13.e.2 Provide trough drain when required for washers/extractors that are sized to accommodate 4 gallons/15.0 liters per pound of washer capacity or as per manufacturer’s requirements. Minimize size required is 14"/350 mm wide and 18"/450 mm deep with bottom sloped to at least two drains that are protected by easy-to-clean lint traps.
2513.02.A.13.e.3 Provide water temperatures to washing equipment at 165 °F/74 °C or as recommended by the equipment supplier and chemical system provider.
2513.02.A.13.e.4 Provide floor drains in front of every other washer.
2513.02.A.13.e.5 Provide individual shut off valves for each laundry equipment item, for each type of service.
2513.02.A.13.e.6 Provide compressed air system when required for the laundry equipment, sized for no more than 30 percent run time. Select system pressure and flow requirements based upon laundry equipment needs.
2513.02.A.13.e.7 Provide all welded fittings for thermal fluid systems, and thermally insulated with cellular glass that complies with ASTM C552-07 (www.astm.org).
2513.02.A.13.e.8 Provide a two-compartment linen soaking wash basin with soap and towel dispensers in the sorting area.
2513.02.A.13.e.9 Provide one floor drain at the center of the dryer area. Provide a floor drain under the exhaust duct connection for large chest-type ironers not exhausted from above the roll.
2513.02.A.13.e.10 Provide water softening for laundry if domestic water supply exceeds five grains of hardness.

2513.02.A.13.e.11 Where team members handle substances that could injure their eyes or get onto their bodies, provide a plumbed or gravity fed eyewash station and/or safety shower with floor drain that complies with ANSI/ISEA Z358.1 (www.ansei.org). It must be on an unobstructed path and accessible within 10 seconds of the hazard. Bottled saline or flushing liquids are considered a secondary eyewash and should not be used in place of an ANSI compliant unit.

2513.02.A.13.e.12 Provide a hand washbasin that complies with ANSI/ISEA Z358.1-2009 (www.ansi.org) complete with floor drain.

2513.02.A.14 Electrical

2513.02.A.14.a Provide power as required for washers/extractors, dryers and ironers.

2513.02.A.14.b Refer to Section 2514.08 for minimum light level requirements.

2513.02.A.14.c Not Applicable to this Brand

2513.02.A.14.d Provide a minimum of two power outlets (socket outlets) on each wall with spacing not to exceed 20'-0”/6.0 m on center in laundry.

2513.02.A.14.e Provide two GFCI/ELCB/RCCB or equal ground fault protected power outlets (socket outlets) behind each washer for service and detergent dispenser.

2513.02.A.14.f Provide two GFCI/ELCB/RCCB or equal ground fault protected power outlets (socket outlets) behind dryers for service.

2513.02.A.14.g Provide two GFCI/ELCB/RCCB or equal ground fault protected power outlets (socket outlets) on wall or column near ironer for service.

2513.02.A.15 Not Applicable to this Brand

2513.02.A.16 Equipment

2513.02.A.16.a The laundry area structure must be designed to accommodate full operating weight of the equipment plus dynamic action. Provide floating suspension, isolation-mounted washers/extractors at all above grade installations.

2513.02.A.16.b Provide required washer capacity with a combination of smaller machines rather than one or two larger machines.

2513.02.A.16.c Provide at least one small washer with 50-75 lb/23-25 kg capacity in each hotel. Washers must contain integral control systems and automated detergent dispenser.

2513.02.A.16.d Size dryers to process 40 percent or greater of the wash load. Provide incremental dryer capacity in lieu of one large unit. Provide at least one medium or light duty dryer to handle small loads.

2513.02.A.16.e Provide a small commercial grade washer and dryer in hotels without full service laundries.

2513.02.A.17 Locate the folding area between the dryers and the housekeeping area. Provide one to two 2'-6”/760 mm x 6’-0”/1.8 m x 3’-0”/900 mm high tables for folding depending upon the size of the hotel.

2513.02.A.18 Provide a 2’-0”/600 mm deep x 4’-0”/1.2 m wide x 6’-0”/1.8 m high painted/powder coated or stainless wire shelving unit along one wall of the chemical storage room.
2513.02.B.1 Linen chutes are required and must be designed in strict compliance with local codes. Linen chutes are not required when a hotel is 2 stories and under or has less than 100 guestrooms.

2513.02.B.2 A linen chute or chute enclosure must be accessed from the linen storage or the service elevator/lifts lobby on all guest floors. Direct access from a guest corridor or any other public area is not allowed. Refer to 2514.06 for Mechanical requirements.

2513.02.B.3 The linen chute must be 24”/600 mm diameter with an 18”/450 mm square access door on each guestroom floor.

2513.02.B.4 Linen chutes must run vertically. Offsets are not allowed. The linen chute must terminate in the sorting area of the laundry.

2513.02.B.5 Linen chute must terminate into a separate linen sorting room to ensure fire separation or per local code.

2513.02.B.6 Linen chute discharge doors must be top-hinged with fusible link release, fire/smoke seals and when closed must be at least 6’-0”/1.8 m above the finished floor.

2513.02.C Housekeeping

2513.02.C.1 The housekeeping area must be directly adjacent to the service elevators/lifts and conveniently accessible from the team member locker rooms.

2513.02.C.2 Locate the entrance to housekeeping and the housekeeping uniform issue counter so that the housekeeping team members queued at the uniform issue counter will not interfere with traffic in the service corridor or with those entering the laundry.

2513.02.C.3 The housekeeping area consists of an issue counter, the director of housekeeping’s office (additional offices may be required based upon guestroom count), a glass washing area, work area, bulk linen storage, uniform storage and bulk supplies storage.

2513.02.C.4 Provide a 10’-0”/3.0 m x 12’-0”/3.7 m director of housekeeping’s office. Locate office so that it has an unobstructed view of the housekeeping area and laundry through a sound-insulated window. An assistant director and housekeeper’s office, when provided, must meet the same requirements.

2513.02.C.5 The housekeeping issue counter must be a plastic laminate counter 3’-6”/1.1 m high x 3’-0”/900 mm deep x 6’-0”/1.8 m wide with one adjustable shelf beneath and be placed directly inside the entrance to the housekeeping/laundry area. The top surface material must comply with Section 2515.04.

2513.02.C.6 Not Applicable to this Brand

2513.02.C.7 The uniform issue room area will vary with size and type of hotel. Provide a minimum of 100 ft²/9.0 m² area for uniform issue. 10 ft/3.0 m of rack space is required for each 100 uniforms. A conveyor system is required at larger hotels.

2513.02.C.8 Provide bulk supply storage for the following:

- Cleaning compounds
- Guestroom amenities
- Paper goods
- Mops, brooms, spare vacuums, etc.
- Cribs, rollaway beds, etc.
- Drapery, bedspreads, blankets, etc.
- Machinery - floor scrubbers, wide area vacuums, etc.

2513.02.C.9 Doors

2513.02.C.9.a Housekeeping entrance doors must be two 3'-0"/920 mm x 6'-8"/2.04 m minimum doors with electronic lock, door closer with hold open feature, and have push/pull-plates and kick plates.

2513.02.C.9.b Provide a fire resistant roll-up door over issue counter.

2513.02.C.9.c Provide a door with two leaves, one above the other, to issue uniforms where housekeeping counter must not be conveniently used.

2513.02.C.10 Finish Options - Housekeeping

2513.02.C.10.a Floor: Vinyl composite tile, heavy duty anti-skid tile, natural stone

2513.02.C.10.a.1 Base (minimums): 4"/100 mm vinyl, porcelain tile, natural stone

2513.02.C.10.b Provide metal or rubber corner guards and wall railings at columns and wall outside corners.

2513.02.C.10.c Ceiling: Acoustic ceiling tile, paint on gypsum

2513.02.C.10.c.1 Provide a minimum ceiling height of 8'-0"/2.4 m in housekeeping area.

2513.02.C.11 Finish Options - Housekeeping Office

2513.02.C.11.a Floor: Carpet (broadloom and carpet tile)

2513.02.C.11.a.1 Base (minimum): 4"/100 mm vinyl

2513.02.C.11.b Wall: Paint

2513.02.C.11.b.1 Provide metal or rubber corner guards and wall railings at columns and wall outside corners.

2513.02.C.11.c Ceiling: Acoustic ceiling tile, paint on gypsum

2513.02.C.12 Mechanical/Plumbing

2513.02.C.12.a Provide a portable, two-compartment mop wash basin and storage for heavy cleaning equipment and chemicals somewhere within the laundry/housekeeping area and in convenient proximity to the service corridor.

2513.02.C.12.b Where team members handle substances that could injure their eyes or get onto their bodies, provide a plumbed eye-wash station and/or safety shower that complies with ANSI/ISEA Z358.1-2009 (www.ansi.org) with floor drain. It must be on an unobstructed path and accessible within 10 seconds of the hazard.
2513.02.C.13 Electrical
2513.02.C.13.a Provide a telephone outlet in the housekeeper's office and a telephone outlet for a wall-mounted phone at the issue counter.
2513.02.C.13.b Provide a property management system terminal and report printer at the housekeeper's desk.
2513.02.C.13.c The housekeeping office lighting must be locally switched.
2513.02.C.13.d Refer to Section 2514.08 for minimum light level requirements.
2513.02.C.13.e Provide two power outlets (socket outlets) above issue counter.
2513.02.C.13.f Provide a minimum of two power outlets (socket outlets) on each wall with spacing not to exceed 20'-0"/6.0 m on center in housekeeping area and office.

2513.02.C.14 Not Applicable to this Brand
2513.02.C.15 Not Applicable to this Brand
2513.02.C.16 Provide a fire-rated safety cabinet to store flammable liquids/spray cans.

2513.02.C.17 Shelving must be painted/powder coated/stainless wire shelving units. Each unit of shelving must be 4'-0"/1.2 m wide x 24"/600 mm deep x 6'-0"/1.8 m high and have four shelves, 18"/450 mm apart with the bottom shelf located off the floor. Shelving units must be furnished for the following:
2513.02.C.17.a Linen storage (not including reserve storage): Provide 6'-0"/1.8 m of shelving units for every 50 guestrooms.
2513.02.C.17.b Supply shelving: Provide 4'-0"/1.2 m of shelving per 100 guestrooms to be provided for compounds, facial tissue, toilet tissue, etc.
2513.02.C.17.c Miscellaneous shelving: Provide 8'-0"/2.4 m of shelving per 100 guestrooms to accommodate blankets, spreads, bed pads, pillows, etc.

2513.03 Engineering
2513.03.A Size Requirement
The engineering area must be a minimum of 500 ft²/46.45 m² or 2 ft²/0.185 m² per guestroom, whichever is greater.

2513.03.B Location
The engineering area must be directly adjacent to the primary mechanical equipment room and be readily accessible to the service corridor and service elevators/lifts.

2513.03.C Engineering Area Requirements
The engineering area must consist of an engineering office, locked storage, paint storage and open shop area.

2513.03.D Chief Engineer's Office
Provide a 10'-0"/3.0 m x 12'-0"/3.7 m engineer's office. Locate office so that it has an unobstructed view of the shop area through a glass vision panel.

2513.03.E Not Applicable to this Brand

2513.03.F Paint Storage Room
Paint storage room must be constructed in accordance with applicable code requirements for the storage of hazardous materials.
2513.03.G Workbench/Desk

Provide a workbench the entire length of one wall of engineering area. Workbench must have a hardwood work surface 30”/760 mm deep and 36”/900 mm above the finished floor. Provide a combination of securable cabinets and open storage shelves below workbench.

2513.03.H Door

2513.03.H.1 Entrance doors must be two 3’-0”/900 mm x 6’-8”/2.04 m minimum doors.

2513.03.H.2 Doors must have a lockset and door closer with a hold open feature.

2513.03.I Finish Options - Engineering

2513.03.I.1 Floor: Concrete - steel troweled and sealed

2513.03.I.1.a Base (minimum): 4”/100 mm vinyl

2513.03.I.2 Wall: Paint

2513.03.I.3 Ceiling: Paint on gypsum

2513.03.J Service Water Basin

A service wash basin must be must provided in the engineering area.

2513.03.K Workbench Convenience Power Outlets

Above the workbench, provide a minimum of six convenience power outlets (socket outlets) at 48”/1.2 m above the finished floor.

2513.03.L MATV Outlets

Provide three MATV outlets at 48”/1.2 m above the finished floor above the workbench and one in the engineer’s office.

2513.03.M Power Tool Power Outlets

Above the workbench, provide a minimum of two power outlets (socket outlets) sized for power tools.

2513.03.N Stationary Power Tool Power Outlets

When a full workshop is provided, provide a minimum of two power outlets (socket outlets) on separate circuits sized for stationary power tools.

2513.03.O Wall Convenience Power Outlets

Provide a minimum of two convenience power outlets (socket outlets) on each wall with spacing not to exceed 20’-0”/6.0 m on center.

2513.03.P PMS Connection

Provide a property management system connection at the engineer’s desk.

2513.03.Q Entrance Telephone Outlet

Provide an outlet for a wall-mounted telephone near the entrance to the engineering area.

2513.03.R Desk Telephone Outlet

Provide a telephone outlet at the engineer’s desk.

2513.03.S Light Levels
Refer to Section 2514.08 for minimum light level requirements.

2513.04 Team Member Facilities

2513.04.A Dining/Break Room

2513.04.A.1 Provide a team member dining/break room with a minimum of 375 ft²/34.8 m², 1.5 ft²/140 mm² per guestroom, or 10.76 ft²/1.0 m² per team member, whichever is greater.

2513.04.A.2 Locate the dining/break room adjacent to team member lockers and on an exterior wall to provide windows if possible.

2513.04.A.3 The team member dining/break room must be conveniently accessible from the kitchen to facilitate food service.

2513.04.A.4 Not Applicable to this Brand

2513.04.A.5 Food must be prepared in the kitchen. The serving line must be placed along one wall of the team member dining/break room with queuing space to avoid obstructing the service corridor. The serving line must consist of tray and utensil pick-up, hot and cold food display with tray slide and beverage service counter.

2513.04.A.6 Provide a collection area for soiled dishes and garbage.

2513.04.A.7 Provide 3'-0"/900 mm minimum aisle width in seating areas.

2513.04.A.8 Entrance doors must be 3'-0"/900 mm x 6'-8"/2.04 m minimum with self-closing hardware, lockset and a glass vision panel.

2513.04.A.9 Finish Options - Dining/Break Room

2513.04.A.9.a Floor: Luxury vinyl tile

2513.04.A.9.a.1 Base (minimums): 4"/100 mm wood, porcelain tile, through body synthetic

2513.04.A.9.b Wall: Paint, regionalized feature wall graphic

2513.04.A.9.b.1 A tile wall with accent paint is required at the buffet line wall.

2513.04.A.9.c Ceiling: Acoustic ceiling tile, paint on gypsum

2513.04.A.9.c.1 Exposed or painted structure ceilings are not allowed.

2513.04.A.10 Furnishings, Fixtures and Equipment

2513.04.A.10.a Provide counter and cabinets to house microwave, coffee maker, full-size refrigerator, a stainless-steel wash basin and filtered water. The top surface material must comply with Section 2515.04.

2513.04.A.10.b Provide commercial/contract quality furniture built for food and beverage environments to include a communal table with integral power, high seating and low seating. Quantity of each is dependent upon the size of the room and market demand. Excess guestroom, restaurant or banquet furniture is not permitted.

2513.04.A.10.c Provide a microwave, coffee maker, full-size refrigerator and full-size two-compartment stainless-steel wash basin.

2513.04.A.10.d Provide a minimum of one wall-mounted HDTV. TV size is dependent upon size of room. The television must be easily viewable from all locations. If the television is not easily viewable from all locations, hotel must install one or more additional televisions of the same size. See Sections 713.00 and 2514.09.
2513.04.A.10.e Provide a beverage station. Vending machines and open door markets are optional.
2513.04.A.10.f Provide regionalized feature wall graphic, plants and table decor.
2513.04.A.10.g Not Applicable to this Brand
2513.04.A.10.h A bottle filler is required.

2513.04.A.11 Refer to Section 2514.08 for minimum light level requirements.
2513.04.A.12 Not Applicable to this Brand
2513.04.A.13 Provide a minimum of one outlet for a house telephone.
2513.04.A.14 Provide a wall-mounted clock at 7'-0"/2.1 m above the finished floor.

2513.04.B Locker Room
2513.04.B.1 Provide separate men's and women's team member locker rooms equal to 5 ft²/0.46 m² per guestroom or 10 ft²/1.0 m² per team member, whichever is greater.
2513.04.B.2 Provide a restroom in each locker facility with the number of fixtures required by local code, but no less than two showers, two lavatories and two water closets (or one water closet and one urinal).
2513.04.B.3 Team member locker rooms must be located as near as possible to the team member entrance and uniform issue counter.
2513.04.B.4 Team member locker rooms must be designed so that it is not necessary to pass through the restroom area to reach the lockers.
2513.04.B.5 Provide vestibule entrances to block sight lines into the locker rooms.

2513.04.B.11 Finish Options - Team Member Locker Room
2513.04.B.11.a Floor: Luxury vinyl tile or porcelain tile
   2513.04.B.11.a.1 Base (minimum): 4"/100 mm vinyl
2513.04.B.11.b Wall: Paint
2513.04.B.11.c Ceiling: Acoustic ceiling tile, paint
   2513.04.B.11.c.1 A finished ceiling is required. Exposed or painted structure ceilings are not allowed.

2513.04.B.12 Finish Options - Team Member Restroom
2513.04.B.12.a Floor: Tile, natural stone
   2513.04.B.12.a.1 Base (minimums): 4"/100 mm porcelain tile
2513.04.B.12.b Wall: Paint. Full height porcelain tile wall is required on all plumbing fixture walls and an accent wall tile or accent wall with similar finish.
2513.04.B.12.c Ceiling: Paint, upgraded acoustic ceiling tile

2513.04.B.13 Mechanical/Plumbing
2513.04.B.13.a Water closets must be wall-mounted, vitreous china and flush valve-type with elongated bowls.
2513.04.B.13.b Water closet seats must be white, solid plastic and be self-sustaining.
2513.04.B.13.c Not Applicable to this Brand
2513.04.B.13.d Not Applicable to this Brand
2513.04.B.13.e Exposed plumbing must be chrome-plated.
2513.04.B.13.f An electric drinking fountain or bottle fill must be provided near the restrooms.
2513.04.B.13.g Provide a chrome-plated brass floor drain in restrooms. Slope floor to drain.

2513.04.B.14 Refer to Section 2514.08 for minimum light level requirements.

2513.04.B.15 Provide a GFCI/ELCB/RCCB or equal ground fault protected power outlets (socket outlets) at each wash basin.

2513.04.B.16 Furnishings, Fixtures and Equipment
2513.04.B.16.a Provide a mirror above each wash basin.
2513.04.B.16.b A full length mirror must be provided near the entrance of each locker room.
2513.04.B.16.c Vanity tops, apron and splashes must be of a material compliant with Section 2515.04. Plastic laminate is not allowed. Vanities must have under mount vitreous china lavatories and suitable space for amenities.

2513.04.B.17 Restroom accessories are required as follows:
2513.04.B.17.a Dual toilet paper holder.
2513.04.B.17.b Sanitary napkin/tampon dispensing machine in women's restroom.
2513.04.B.17.c Sanitary napkin/tampon waste receptacle in each stall in women's restroom.
2513.04.B.17.d Wall-mounted waste receptacle or waste basket.
2513.04.B.17.e Wall mounted paper towel dispenser.
2513.04.B.17.f Wall-mounted liquid soap dispenser at each wash basin.
2513.04.B.17.g A coat hook is required on the side wall or the back of each door, mounted 60"/1.5 m above the finished floor.
2513.04.B.17.h Wall-mounted sanitary seat cover dispenser.
2513.04.B.17.i Hand dryer

2513.04.B.18 A janitor's closet with storage shelf and wash basin must be located adjacent to the restrooms.
2513.04.B.19 Provide one locker per full-time team member.

2513.04.B.20 As a minimum, lockers must be a twin 7 ½'/190 mm wide and 60'/1.5 m high locker with two 12'/300 mm x 15'/375 mm extra compartments on top. In colder climates, larger lockers are required. Lockers must be factory-painted baked enamel or approved alternate and be placed on a 4'/100 mm concrete pad. Each locker must have a number plate, padlock attachment or keyless lockable system with override mechanism, a visual front and a sloped top. Each locker must be ventilated with vermin proof screens. Utilize Z-shaped lockers to maximize storage. Provide shoe storage below lockers to avoid wet items dripping on team member belongings from above.

2513.04.B.21 Provide 9'/225 mm x 4'-0'/1.2 m benches between banks of lockers and secure them to the floor.

2513.04.C Team Member Nursing Room

2513.04.C.1 A private room/office is required; it is not allowed to be located within the restroom.

2513.04.C.2 Provide a sink, side table with under-counter refrigerator, lounge chair, full-length mirror and two convenience power outlets (socket outlets).

2513.04.D Knowledge and Relaxation Room

2513.04.D.1 Not Applicable to this Brand

2513.04.D.2 Not Applicable to this Brand

2513.04.D.3 The room must be a separate room and conveniently accessible from the team member dining room. In places where this is not feasible, the room may be a partitioned section of the team member dining/break room.

2513.04.D.4 A finished ceiling is required. Exposed or painted structure ceilings are not allowed.

2513.04.D.5 Not Applicable to this Brand

2513.04.D.6 Furnishings, Fixtures and Equipment

2513.04.D.6.a Seating must be provided.

2513.04.D.6.b TV size is dependent upon size of room. The television must be easily viewable from all locations. If the television is not easily viewable from all locations, hotel must install one or more additional televisions of the same size. See Sections 713.00 and 2514.09.

2513.04.D.6.c Minimum of three computer workstations with access to the Internet and Intranet with printer and task chairs must be provided. Four required for resort locations.

2513.04.D.7 Not Applicable to this Brand

2513.04.D.8 Not Applicable to this Brand

2513.04.D.9 A regionalized feature wall is required

2513.04.D.10 Provide a wall mounted/integral dry erase board or chalk wall.

2513.04.E Not Applicable to this Brand

2513.04.F Not Applicable to this Brand

2513.04.G Not Applicable to this Brand

2513.04.H Not Applicable to this Brand
2513.04.I Team Member Restrooms
   2513.04.I.1 Refer to Section 2514.00 for Technical Criteria requirements.

2513.04.J Employee Smoking Area
   When possible, provide a team member smoking area that is covered and invisible to guests view with seating, an ash urn, trash can and heater in cold climates.

2513.05 Storage
   2513.05.A General Storage Requirements
      Total storage within the building must be a minimum of 1,000 ft²/92.9 m² or 5 ft²/.465 m² per guestroom, whichever is greater.
   2513.05.B Not Applicable to this Brand
   2513.05.C Secured Lost & Found Storage
      Provide a secured storage area for lost and found.
   2513.05.D Door
      Entry door must be 3'-0"/900 mm x 6'-8"/2.04 m minimum.
   2513.05.E Finish Options - Storage
      2513.05.E.1 Floor: Vinyl composite tile, concrete - steel troweled and sealed
         2513.05.E.1.a Base (minimum): 4"/100 mm vinyl
      2513.05.E.2 Wall: Paint
      2513.05.E.3 Ceiling: Paint on gypsum, acoustic ceiling tile, painted structure
   2513.05.F Wall Convenience Power Outlets
      Provide a minimum of two convenience power outlets (socket outlets) on each wall with spacing not to exceed 20'-0"/6.0 m on center.
   2513.05.G Light Fixture Exclusions
      Incandescent light fixtures are not allowed.
   2513.05.H Light Levels
      Refer to Section 2514.08 for minimum light level requirements.
   2513.05.I Not Applicable to this Brand
   2513.05.J Linen Storage
      2513.05.J.1 A linen storage must be provided on each floor. Floors with more than 40 guestrooms may require a second remote linen storage room.
      2513.05.J.2 The size of the linen storage is determined by the number of room attendants working out of it. In general, each room attendant will make up 15 - 16 guestrooms per day.
      2513.05.J.3 The bulk linen storage area must be securable and located in close proximity to the laundry function.
2513.05.J.4  Provide a separate securable linen storage adjacent to the laundry for storage of new/unbroken linen.

2513.05.J.5  The linen storage must be separate, but adjacent to and directly accessible from the service elevator/lift lobby on each floor without passing through any guest circulation.

2513.05.J.6  Additional storage programmed for guestroom floors must be integral with or adjacent to the linen storage, or it must be remotely located, provided that it is reasonably accessible from the service elevators/lifts. This storage area is for rollaway beds, cribs and additional guestroom supplies.

2513.05.J.7  Each linen storage must contain the following elements:
   2513.05.J.7.a  Cart storage: Provide space for one cart per room attendant, 58”/1.5 m long x 21”/550 mm wide x 44”/1.1 m high. It may be assumed that the linen storage will not be occupied when carts are stored in it.
   2513.05.J.7.b  Linen storage: Provide one 4’-0”/1.2 m section per room attendant of 24”/600 mm deep x 72”/1.8 m high non-oxidizing metal shelving for linen storage.
   2513.05.J.7.c  Housekeeping appliances storage: Provide one 5 ft²/.5 m² of floor area per room attendant for storage of housekeeping appliances.
   2513.05.J.7.d  Consumables storage: Provide one 4’-0”/1.2 m section of 24”/600 mm deep x 72”/1.8 m high non-oxidizing metal shelving for storage of consumables.

2513.05.J.8  Linen storage and guestroom service areas must not have exterior windows; if provided, they must have the same window covering treatment as adjacent spaces.

2513.05.J.9  Provide a 3’-6”/1.1 m x 6’-8”/2.04 m minimum door for access to linen storage from the service elevator/lift lobby.

2513.05.J.10 Any electrical risers or equipment located within the linen storage is required to be enclosed in a serviceable closet or have a securable panel cover.

2513.05.J.11 Provide an outlet for a house telephone adjacent to entrance.

2513.06 Electrical Rooms
   2513.06.A  Door & Hardware
      Entry door must be 3’-0”/900 mm x 6’-8”/2.04 m minimum with lockset and door closer.
   2513.06.B  Finish Options - Electrical Rooms
      2513.06.B.1  Floor: Concrete - steel troweled and sealed, porcelain tile
         2513.06.B.1.a  Base (minimums): 4”/100 mm vinyl, quarry tile, porcelain tile
      2513.06.B.2  Wall: Paint
      2513.06.B.3  Ceiling: Paint on gypsum, painted structure
   2513.06.C  Electrical Panel Boxes & Circuits
      All electrical panel boxes and circuits must be labeled.
   2513.06.D  Locked Electrical Panel Boxes & Circuits
Unless prohibited by local authorities, all electrical panels and circuits accessible to the public must be kept locked. Electrical panel boxes must be located in separate panel rooms when possible.

2513.06.E Light Levels
Refer to Section 2514.08 for minimum light level requirements.

2513.06.F Electric Shock Treatment Notices
Electric shock treatment notices must be prominently displayed on all switch boards, panel boards, industrial control panels, and motor control centers that are likely to require examination, adjustment, servicing, or maintenance while energized, to warn qualified persons of potential electric arc flash hazards. The marking must be located so as to be clearly visible to qualified persons before examination, adjustment, servicing, or maintenance of the equipment. Notice must also be displayed on the entry door.

2513.07 Mechanical Rooms
2513.07.A Door Width
Entrance doors must be two 3'-6"/1.0 m x 6'-8"/2.0 m minimum with lockset and door closer with hold open feature.

2513.07.B Finish Options - Mechanical Rooms
2513.07.B.1 Floor: Concrete - steel troweled and sealed, porcelain tile
2513.07.B.1.a Base (minimums): 4"/100 mm vinyl, quarry tile, porcelain tile
2513.07.B.2 Wall: Paint
2513.07.B.3 Ceiling: Paint on gypsum, painted structure

2513.07.C Not Applicable to this Brand

2513.07.D Not Applicable to this Brand

2513.07.E Floor Drain
2513.07.E.1 Provide at least one brass floor drain or as necessary for equipment drains and overflows, arranged to minimize potential tripping hazards.

2513.07.F Recessed Floor Slab
Recess floor slab, minimum ¾"/19 mm, for water containment.

2513.07.G Wall Convenience Power Outlets
Provide a minimum of two convenience power outlets (socket outlets) on each wall with spacing not to exceed 20'-0"/6.0 m on center.

2513.07.H Not Applicable to this Brand

2513.07.I Light Levels
Refer to Section 2514.08 for minimum light level requirements.

2513.08 Computer/Telecom Room
2513.08.A Computer Room Equipment Requirements
Computer room must contain the main PBX, Internet, IPTV equipment and the hotel management system equipment.

2513.08.B Size Requirement
Provide a minimum 170 ft²/16 m² MDF room for hotels with less than 300 guestrooms. Hotels with more than 300 keys must increase the size to a minimum 270 ft²/25 m². Note - Building layout or use of IDF Rooms may affect the MDF size requirement for larger properties.

2513.08.C Central Location
The room must be centrally located within the hotel. It may be located remote from the front desk but must only be accessible from back-of-house areas.

2513.08.D Thoroughfare Not Allowed
The room must not serve as a thoroughfare to any other room.

2513.08.E Heat/Electromagnetic/Fire/Flood Location Risk
The room must not be located adjacent to any area where there are potential risks for physical damage from excessive heat, electromagnetic fields, fire or flood.

2513.08.F Telecom Equipment Adjacency
For maximum efficiency, the computer equipment room must be within 100'-0"/30 m of the telecom equipment.

2513.08.G Weight Support
Floor must be capable of supporting up to 670 lb/ft² / 1000 kg/m².

2513.08.H Watertight Ceiling
Floor immediately above the room must be watertight and any openings in the ceiling, walls or floor must be sealed.

2513.08.I Structural Columns/Pillars
There must be no structural columns, pillars or other protrusions within the room that prevent full access to walls for mounting of equipment.

2513.08.J Windows
Windows are not allowed.

2513.08.K Earthquake/Disaster Regulations
The room must meet local earthquake or disaster regulations.

2513.08.L Finish Options - Computer/Telecom Room
2513.08.L.1 Floor - Electrostatic discharge (ESD) material - tile, paint, carpet or VCT
2513.08.L.1.a Base (minimum): 4"/100 mm vinyl
2513.08.L.2 Wall: Paint (walls must be painted white)
2513.08.L.3 Ceiling: Painted structure. Suspended ceilings are not allowed. Computer/telecom room must have a minimum ceiling height of 8'-6"/2.6 m.

2513.08.M Workbench
A workbench must be provided. The workbench must not serve as a permanent office area but must have a clear workspace for a PC or server.

2513.08.N Mechanical / Plumbing
2513.08.N.1 An air conditioning / cooling system must be installed to service the computer room which complies with Section 2514.00 Environmental Control Requirements.

2513.08.N.2 Provide a complete computer room type air conditioning system and loaded such that all terminal units within the computer room are not suspended over IT/Telecom equipment, including any wet piping, appurtenances or condensate drainage. Preferred location of the equipment is outside the room with ducted air supply to/from the units. Air conditioning to be sized to provide adequate cooling for the design equipment density in the rack system plus 33 percent for future loads, and all other internal room loads. Equipment must be able to reject internal heat loads regardless of outdoor temperature.

2513.08.N.3 Provide malfunction alarms for high temperature, low temperature and low relative humidity with remote annunciation to the security office (if applicable) and engineering office.

2513.08.N.4 Wet systems are not allowed to pass through the room.

2513.08.O Light Switch Location

Light switch for the room must be immediately adjacent to the entry door.

2513.08.P Light Levels

Refer to Section 2514.08 for minimum light level requirements.

2513.08.Q Power Outlets

A minimum of sixteen dedicated power outlets (socket outlets) must be provided adjacent to the property management system rack. All outlets must be grounded.

2513.08.R Dado-trunk

The area above the workbench must be fitted with a dual compartment dado-trunk (power and data) running parallel to the floor at a height somewhere between 3'-0"/1.0 m to 5'-0"/1.5 m. Outlets must be presented in pairs with no fewer than ten power and ten data.

2513.08.S Cabling

Cabling must run over equipment racks in approved cable trays. Refer to Section 2518.00.

2513.08.T PMS Equipment & Computer/Telecom Location

Property Management System equipment at workstations must be within 300'-0"/90 m of the computer/telecom Room.

2513.08.U Serial Cable Interface of Systems

Interface of systems (telephone /MATV /point of sale) with serial cable must be within 100'-0"/30 m of the Property Management System equipment in the computer/telecom room. Larger distances will require fiber optics in lieu of Cat6 Cable.

2513.08.V Equipment Racks

Equipment racks must be 42U (31"/800 mm x 39"/1000 mm) with suitable cable management. Racks are allowed to be open or enclosed models. Enclosed models must be lockable. Specific cabinets with different dimensions may be required by certain vendors.
2513.08.W PBX/HSIA Systems Racks
PBX and HSIA systems must be installed in proprietary racks or on standard data racks. They are not allowed to be freestanding.

2513.08.X Maneuvering Space
Sufficient maneuvering space must be provided in front and back of the equipment racks for access.

2513.08.Y Uninterrupted Power Supply
Uninterrupted power supply (UPS) is required for the computer systems.
2513.08.Y.1 The system must provide no less than one hour autonomy for the computer systems attached.
2513.08.Y.2 Where no generator exists, the UPS must provide not less than 4 hours autonomy.
2513.08.Y.3 All UPS circuits must be protected by a rated circuit breaker and clearly labeled at both ends.
2513.08.Y.4 The UPS may be located within the Computer Room or partitioned off separately.
2513.08.Y.5 UPS batteries must be maintained at a constant temperature of 20 °C/68 °F or less.
2513.08.Y.6 The UPS must have an external bypass switch and an external audible alarm to indicate faults.
2513.08.Y.7 The UPS must provide adequate surge protection to connected systems.

2513.09 Trash Collection Area
2513.09.A Trash Chute Requirements
Trash chutes are not allowed.

2513.09.B Not Applicable to this Brand

2513.09.C Trash Compactor/Container
2513.09.C.1 Provide a minimum 20 yd³/15 m³ compactor/container subject to the local trash removing standards and capabilities.
2513.09.C.2 Locate the compactor at the end of the dock nearest to the kitchen.
2513.09.C.3 Compactor must be self-contained, key-operated with a positive pressure switch, and have a failsafe lid arrangement with wash-down capabilities.
2513.09.C.4 Not Applicable to this Brand
2513.09.C.5 The charging point of the trash compactor must be accessible directly from the receiving dock.
2513.09.C.6 Verify the horizontal and vertical clearances for the removal of the trash compactor/container with unit supplier. Minimum vertical clearance of 18'-0"/5.5 m to 20'-0"/6.0 m is required.
2513.09.C.7 Not Applicable to this Brand
2513.09.C.8 Provide a 3'-6"/1.1 m x 6'-8"/2.04 m minimum door to the compactor/container area from trash rooms.
2513.09.C.9 Provide guardrails at dock adjacent to the compactor/container.
2513.09.C.10 Finish Options - Trash Compactor/Container
2513.09.C.10.a  Floor: Concrete - steel troweled and sealed or better
2513.09.C.10.b  Wall: Epoxy paint - painted to resist absorption of fats, grease and oils
2513.09.C.10.c  Ceiling: Epoxy painted structure

2513.09.C.11  Install the compactor on a concrete slab and pitch toward a separate sanitary drain.
2513.09.C.12  Locate a self-priming sanitary drain beneath the compactor/container. Position the drain near one end of the compactor/container area so that it is accessible when the compactor/container is in place.
2513.09.C.13  Provide power for the compactor/container as required for the specific unit selected.
2513.09.C.14  A dead-man switch must control the operation of the compactor/container.
2513.09.C.15  Provide a hose bibb for wash down.

2513.09.D  Refrigerated Trash Room
2513.09.D.1  A refrigerated trash room is required at properties where temperature, location or frequency of trash pickup will cause an odor problem and/or as required by local code.
2513.09.D.2  Not Applicable to this Brand
2513.09.D.3  Provide a 3'-6"/1.0 m wide x 6'-8"/2.0 m high minimum door with automatic closer, kickplate and lockset.
2513.09.D.4  Finish Options - Refrigerated Trash Room
   2513.09.D.4.a  Floor: Concrete - steel troweled and sealed, porcelain tile
      2513.09.D.4.a.1  Base (minimums): 4"/100 mm quarry tile, porcelain tile
   2513.09.D.4.b  Wall: Epoxy paint - painted to resist absorption of fats, grease and oils
   2513.09.D.4.c  Ceiling: Epoxy paint on gypsum, epoxy painted structure

2513.09.D.5  Wash-down capabilities must be provided with floor drainage.
2513.09.D.6  Refer to Section 2514.08 for minimum light level requirements.

2513.09.E  Recyclable Storage Room
2513.09.E.1  A recyclable storage room must be provided in close proximity to the loading dock/receiving area.
2513.09.E.2  Provide a 3'-6"/1.07 m wide x 6'-8"/2.04 m high minimum door with automatic closer, kickplate and lockset.
2513.09.E.3  Finish Options - Recyclable Storage Room
   2513.09.E.3.a  Floor: Concrete - steel troweled and sealed or better
      2513.09.E.3.a.1  Base (minimum): 4"/100 mm quarry tile
   2513.09.E.3.b  Wall: Epoxy paint
   2513.09.E.3.c  Ceiling: Epoxy paint on gypsum, epoxy painted structure

2513.09.E.4  Wash-down capability must be provided with floor drainage.
2513.09.E.5 Provide power outlets (socket outlets) as required for fixtures and equipment.
2513.09.E.6 Provide a baler, crusher, etc. as necessary to properly package recyclables for removal and dumping.
2513.09.E.7 Refer to Section 2514.08 for minimum light level requirements.

2513.09.F Can Wash
2513.09.F.1 Provide the can wash area on the same level as the receiving dock, adjacent to the compactor/container.
2513.09.F.2 The can wash area must be conveniently accessible from the kitchen.
2513.09.F.3 Partitions surrounding the can wash area must be of concrete masonry construction.
2513.09.F.4 Provide a 6”/150 mm high poured concrete curb at the entrance to the can wash area.
2513.09.F.5 Can wash areas provided within other spaces must be surrounded on three sides by concrete block partition walls or water-resistant materials.
2513.09.F.6 Provide a 3’-6”/1.1 m wide x 6’-8”/2.04 m high minimum door with automatic closer and kick plate on interior can wash rooms.
2513.09.F.7 Finish Options - Can Wash
   2513.09.F.7.a Floor: Exposed concrete - steel troweled and sealed
      2513.09.F.7.a.1 Base (minimum): 4”/100 mm quarry tile
   2513.09.F.7.b Wall: Epoxy paint
   2513.09.F.7.c Ceiling: Epoxy paint on gypsum, epoxy painted structure
2513.09.F.8 Provide hot and cold hose bibs, a hose rack and 50’-0”/15.0 m of hose.
2513.09.F.9 Provide a floor drain within the enclosed end of the area.
2513.09.F.10 Provide a minimum hot water temperature of 140 °F/60 °C.
2513.09.F.11 Provide one GFCI/ELCB/RCCB or equal vapor proof power outlet (socket outlet) at 48”/1.2 m above the finished floor.

2513.10 Receiving Area
2513.10.A Designated Receiving Area
   Designated receiving area must be provided for food, laundry, housekeeping and maintenance supplies.
2513.10.B Covered Dock Bays
   Receiving area must have a minimum of three covered dock bays. Two bays are to be used for service vehicles and the third for the trash compactor/container.
2513.10.C Dock Leveler
   Provide a dock leveler on the two bays used for service vehicles.
2513.10.D Service Entrance
   Provide a convenient and separate covered service entrance for receiving, garbage removal, team members, general maintenance, group luggage handling and package delivery.
2513.10.E Receiving Office Requirement
Provide 120 ft²/11.00 m² minimum receiving office located directly adjacent to the receiving/loading dock.

2513.10.F Ramp
Provide a ramp leading to the upper dock area.

2513.10.G Not Applicable to this Brand

2513.10.H Not Applicable to this Brand

2513.10.I Receiving Area Location
Receiving area must be located for easy access for trucks and to minimize circulation conflict with guests.

2513.10.J Screening
Receiving areas must be screened from guest view. Dense landscaping, earth berm, decorative fencing or other features must be used for screen.

2513.10.K Doors
2513.10.K.1 Provide a pair of 3/-0"/920 mm wide x 6'-8"/2.04 m high doors, as a minimum, from the receiving area into the property.
2513.10.K.2 Entry doors must be securable with door closers, hold open feature and kick plates.

2513.10.L Finish Options - Receiving Area
2513.10.L.1 Floor: Concrete - steel troweled and sealed
2513.10.L.1.a Base (minimum): 4"/100 mm quarry tile
2513.10.L.1.c Wall: Epoxy paint
2513.10.L.1.d Ceiling: Epoxy paint on gypsum, epoxy painted structure

2513.10.M Scales
Provide scales at receiving area.

2513.10.N FF&E
Provide a desk, chairs and file cabinet for receiving office.

2513.10.O Trench Drain
Provide a trench drain at the deep end of the receiving area to prevent liquid run-off.

2513.10.P Hose Bib
Provide a frost-proof hose bib adjacent to receiving area for area wash-down.

2513.10.Q Electrical
2513.10.Q.1 Provide insect fan above receiving area entrance to building.
2513.10.Q.2 Provide a waterproof, GFCI/ELCB/RCCB or equal convenience power outlet (socket outlet) at receiving area.
2513.10.Q.3 Receiving area must be well illuminated. Light fixtures must be moisture-resistant and protected from breakage.
2513.10.Q.4 Refer to Section 2514.08 for minimum light level requirements.
2513.10.Q.5 Provide telephone outlet, convenience power outlets (socket outlets) and data port for receiving office.
2513.10.Q.6 Provide an intercom/doorbell system.
2513.10.Q.7 Provide a property management system connection and printer in receiving area.

2513.11 Not Applicable to this Brand

2513.12 Not Applicable to this Brand

2513.13 Security Dispatch Office
   2513.13.A Security Dispatch Office Requirement
       A security dispatch office must be provided adjacent to the receiving/loading dock and team member entrance so that both areas are continuously monitored.
   2513.13.B Size Requirement
       Provide a minimum of 120 ft²/11.14 m² for the security dispatch office.
   2513.13.C Timekeeper Function
       In some instances, this office will perform the timekeeper function, thus additional equipment and storage space may be required.
   2513.13.D Vision Panels
       Provide glass vision panels to allow for visibility of receiving/loading dock and team member entrance.
   2513.13.E Door
       The entry door must be a minimum 3’-0”/915 mm wide and 6’-8”/2.04 m high, have a glass vision panel and be self-closing and self-locking.
   2513.13.F Not Applicable to this Brand
       2513.13.G.1 Floor: Vinyl composite tile
           2513.13.G.1.a Base (minimum): 4”/100 mm vinyl
       2513.13.G.2 Wall: Paint
       2513.13.G.3 Ceiling: Acoustic ceiling tile, paint on gypsum
   2513.13.H FF&E
       Provide the following FF&E in the security office:
   2513.13.I Equipment
       Provide the following equipment in the security office (or in the back of house area when a security office is not provided):
       Alarm indicator panels (both fire life/safety and other internal alarms)
       CCTV monitors
CCTV recorder
Two-way radio base station and portable radio charging units

2513.13.J Light Levels
Refer to Section 2514.08 for minimum light level requirements.

2513.13.K Wall Convenience Power Outlets
Provide a minimum of two power outlets (socket outlets) on each wall.

2514.00 Technical Criteria

2514.01 Doors and Windows

2514.01.A Public Area Door Height & Width
All public area doors must be a minimum of 8'-0"/2.4 m in height and be a minimum of 3'-0"/915 mm in width.

2514.01.B Entry/Bath/BOH Door Height & Width
Guestroom entry, guest bathroom and back-of-house doors (leaf) must be a minimum of 6'-8"/2.0 m in height and be a minimum of 3'-0"/900 mm in width.

2514.01.C Exterior Doors to Public Areas
When used, aluminum entrance doors must be a narrow stile design.

2514.01.D Exterior Door Weather Strippping
Exterior doors must have weather-stripping with the appropriate type of threshold.

2514.01.E Out-swinging Exterior Metal Doors
Out-swinging exterior metal doors must have closed tops.

2514.01.F Interior/Exterior Metal Door Requirements
When metal doors are used on the interior, they must be a minimum 18 gauge (.0478 inch/1.214 mm) cold-rolled steel with a minimum 16 gauge (.0598 inch/1.519 mm) 'A-60' galvanized.

2514.01.F.1 All service area hardware to be satin stainless steel or satin chrome, as determined by the Designer. Public and guestroom area finishes must be approved by Hilton.

2514.01.G Door Frame Requirements
When metal frames are used, they must be welded. Snap on trim and knock down frames are not allowed.

2514.01.H Door View Panels
Provide view panels in doors of rooms including fitness center, guest laundry, business center, vending (if applicable), swimming pool, etc. unless side lights are provided.

2514.01.I Doorstops
Provide wall-mounted doorstops for all doors. Floor-mounted door stops are not allowed.

**Mexico:** Provide doorstops for all doors.

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2514.01.J **Kick Plates**

All back of house doors subject to heavy traffic must have stainless steel kick plates. Kick plates are not allowed on public or guestroom area doors.

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2514.01.K **Hinged Doors**

Hinged doors must have lever hardware. For instances when panic hardware is required instead of lever hardware, refer to 2516.05.C.5.

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2514.01.L **Hinges**

All doors must have a minimum of three commercial-grade hinges.

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2514.01.M **Doors & Door Hardware Style & Finish**

All doors and hardware for doors to electrical and telephone closets, stairwells and other non-public spaces on guestroom floors must match, to the extent possible, the style and finish of the guestroom entry doors.

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2514.01.N **Lock Cylinders**

Lock cylinders must be master-keyed for use during construction only. Construction master key must be a type that is easily made inoperative when locks are installed.

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2514.01.O **Electronic Locks**

Electronic locksets are required in the following locations (deadbolt must be removed with the exception of the guestroom entry):

- 2514.01.O.1 Not Applicable to this Brand
- 2514.01.O.2 Each guestroom entry
- 2514.01.O.3 Business Center guest entrance (if unmanned)
- 2514.01.O.4 Fitness Center
- 2514.01.O.5 Indoor swimming pool entry and secondary entries (exception: entry from secure outdoor patio)
- 2514.01.O.6 Guest Laundry
- 2514.01.O.7 Meeting Rooms/Ballrooms/Boardrooms
- 2514.01.O.8 Not Applicable to this Brand
- 2514.01.O.9 Computer/Telecom Room
- 2514.01.O.10 Linen Room
- 2514.01.O.11 Not Applicable to this Brand
- 2514.01.O.12 Executive Lounge
- 2514.01.O.13 Liquor Room/Storage
- 2514.01.O.14 Not Applicable to this Brand
Electronic Lock Vendors

Electronic lockets must be procured from approved vendors and have the following minimum features:

- A mechanical override (hard key) is not allowed.
- An encoded card key/FOB must be used for operation.
- An audit/interrogation feature must be provided.
- The deadbolt must be engaged by a turn piece on the inside of the guestroom.
- The deadbolt and latch bolt must both retract when the inside lever is turned.
- Corridor side lever must remain in horizontal position when not in operation, and inside guestroom lever must remain in perpendicular position when not in use.
- RFID/Radio frequency identification (contact-less) locks are required. Locks must also be Hilton BLE enabled (BLE chip installed) for integration with the Hilton ‘Straight to Room’ program.

Electronic Card Reader Location Requirements

Electronic card readers with electronic lock interfaces must be used in the following locations, where a nighttime security-fixed post is not possible at the door:

- Primary entry to the lobby.
- Each secondary guest entrance to the guest corridors at lobby level.

Restricted Area Locking Devices

Restricted areas of the hotel must have an access-control system incorporated into door-locking devices. Approved devices are card access systems, digital keypad systems or remotely-controlled electronic door latches. Areas that must be provided access-control devices include, but are not limited to:

- Entrance to front office areas
- Back office areas that are accessible from guest corridors
- Team member entrance, if not monitored
- Ballroom/Meeting Rooms Service Corridor
- Telephone operator's room
- General cashier's office
- Count room(s)
2514.01.R.9 Safety deposit box rooms
2514.01.R.10 Paymaster's office
2514.01.R.11 Security Dispatch office
2514.01.R.12 Exterior entrance doors
2514.01.R.13 Rooftops
2514.01.R.14 Luggage storage room(s)

2514.01.S Not Applicable to this Brand

2514.01.T Acoustic, Smoke Seals, Neoprene Silencers
   All doors opening onto the guest corridor within the guestroom tower, including service elevator/lift lobby, linen rooms, vending and exit must have
   seals in accordance to 2510.01.C.3.

2514.01.U Rooftop Exit Locking Requirements
   All rooftop exits must be equipped with a panic bar or other releasing device, latching hardware and an alarm that is monitored in the security
   dispatch office or PBX. These doors must have a sign on the inside face indicating the door is alarmed and to be used in emergency situations only,
   if accessible to the public.

2514.01.V Internal Windowsill Finishes
   Internal windowsills must be granite, quartz, natural stone or approved composite solid surface material. Wood, drywall, plastic laminate and metal
   are not allowed.

2514.01.W Window Material Requirements
   Windows must be standard aluminum with dual glazing and a finish compatible with other window trim. Extruded polymer (uPVC) windows are an
   acceptable alternative when they have galvanized steel reinforcement (minimum 0.08"/2 mm thick) and minimum 0.106"/2.7 mm thick primary frame
   and sash extrusions (exterior), are commercial rated, and have a 10 year warranty against fading. All window frame colors must coordinate.

2514.01.X Exterior Window Insulation
   Exterior windows must be insulated. Frames must be thermally broken in areas where ASHRAE design temperature is below 32 °F/0 °C or above
   82.4 °F/28 °C.

2514.01.Y Safety Bar Requirement
   Glass panels, windows, glass doors, sidelights, etc. that extend to the floor in all areas must be shatterproof, be tempered glass, or be equipped with
   a safety bar mounted at 3'-0"/900 mm above the finished floor.

2514.01.Z Window Air Infiltration
   Windows must comply with a maximum air infiltration rate of 0.3 ft³ per square foot per minute or 5.5m³ per sqm per hour (7.1 kg/sqm per hour) at
   DP of 30Pa, and with no water leakage at 6.5 psf (300Pa) differential, a U-value of 0.4 and with an allowable wind load of 105 lbs per ft²/47 kg per
   m²/470 Pa.

2514.01.AA Architectural Films
Architectural films must meet the following requirements:

1. Class A ASTM E84 Fire Rating
2. Have pressure-sensitive adhesive (PSA) backing and this backing must have air release channels
3. Must be minimum 8 mil thickness Must be low VOC
4. Must feature 5,000 cycle or greater Taber Abrasion resistance
5. Must be able to conform and adhere to three-dimensional surfaces
6. Must be disposable in regular trash (non-hazardous)
7. Must be removable (may require use of heat)
8. Architectural films may be recovered with replacement architectural films not more than once.

2514.01.AB Public Area Operable Windows

Public area operable windows located above the ground floor are not allowed to open more than 4”/100 mm unless required otherwise by code. Once opened, the window must remain in the open position without having to be propped open.

2514.02 Walls

2514.02.A Vinyl Wall covering

2514.02.A.1 All vinyl wall covering must meet the following requirements:

2514.02.A.1.a Class A ASTM E84-12c tunnel test (www.astm.org).
2514.02.A.1.b Not Applicable to this Brand
2514.02.A.1.c All wall covering adhesives must be strippable and must contain mildew inhibitors.
2514.02.A.1.d 20 oz. per linear yard/ 460 g per square meter, Type II or heavier must be used in corridors and public areas.
2514.02.A.1.e 20 oz. per linear yard/ 400 g per square meter, Type II or heavier must be used in guestrooms.
2514.02.A.1.f Not Applicable to this Brand
2514.02.A.1.g 54”/1.3 m
2514.02.A.1.h Fabric backing is required. Non-woven wallcoverings of paper backed vinyl can be used within niches and protected areas with Hilton approval.
2514.02.A.1.i All wall coverings must contain an antimicrobial substance in the manufacturing process to safeguard against micro-organisms such as bacteria, fungi and actinomycetes.

2514.02.A.1.j When microvented wallcovering is used it is required to meet ASTM E96-02, Method B. Minimum 21 ounce rated at 10 perms and approximately 25,000 holes per square foot is required. A sample is required for review and approval from Hilton prior to ordering.

2514.02.A.2 Hotel must not install wall vinyl over existing wall vinyl in any areas of the hotel. Old wall vinyl must be completely removed before new wall vinyl is installed.

2514.02.B Acrylic Knock-Down

2514.02.B.1 Acrylic knock-down is only permitted in guestrooms with prior approval.

2514.02.B.2 In areas with high humidity levels, 100 percent acrylic knock-down may be considered. Prior approval is required.

2514.02.B.3 Proposed products must have the following information forwarded to Hilton for approval:

2514.02.B.3.a Two samples (8”/200 mm x 8”/200 mm minimum) showing the specific color and texture of the knock-down finish must be submitted. If the product is approved, one sample must be retained and one must be returned and must be kept on file at the jobsite for reference.

2514.02.B.3.b All submitted products must meet the following minimum performance characteristics and supportive documentation must be provided to verify conformance.

2514.02.B.3.b.1 Perm rating of greater than 16 for the system, including basecoat, primers, texture coats, etc.

2514.02.B.3.b.2 Scrub resistance of a minimum of 2500 scrubs before failure ASTM D2486-06 (www.astm.org).

2514.02.B.3.b.3 Minimum dry film thickness of 10 mils or greater.

2514.02.B.3.b.4 VOC levels of 1.0 lbs. per gallon/120 grams per liter or less ASTM-D3960-05 (www.astm.org).

2514.02.B.3.b.5 Minimum of a five year product performance warranty and a five year warranty against mold and mildew growth. (The product must have been in commercial use for a time period that meets or exceeds the factory-stated warranty period.)

2514.02.B.3.b.6 A product listing a “sealer” as part of the system is not permitted.

2514.02.B.3.c All submittals must be accompanied by Independent Laboratory Test Results to support manufacturer claims. Submitted Independent Lab Test Results must be on the testing lab letterhead. Test results on the manufacturer’s letterhead will not be accepted.

2514.02.B.3.d Substitutions must all be submitted for review with sufficient time allowed for evaluation.

2514.02.B.3.e No product is to be considered approved until Hilton provides written approval during plan submittals and the installation approval until installed and reviewed and approved on site.

2514.02.B.4 Wall finish using drywall mud or non-acrylic finishes with paint is not permitted in all instances.

2514.02.C Wall Tile

2514.02.C.1 Tile must be ceramic tile, stone or porcelain tile, minimum 1/4”/6 mm thick. Porcelain tile must have a rectified edge or pressed edge. Tiles must be dimensionally accurate, flat and straight edged. Tile must conform to ISO 13006 2018-09 Types Bl, Bla, Bllla, Bllb, BlIII and can be either...
calibrated pressed edge or rectified providing size tolerances of: ISO 10545-2 STRAIGHTNESS OF SIDES <0.15% / RECTANGULARITY DEVIATION <0.15% / CURVATURE SURFACE FLATNESS DEVIATION <0.15%.

2514.02.C.2 Tile grout must be non-shrink-type epoxy or latex Portland cement to minimize staining and the minimum grout joint must comply with ISO and ANSI guidelines. Non shrink epoxy must meet ANSI A118.3 minimum. 3/16” /5 mm is the maximum width allowed. Tile grout must be ISO 13888 Type CG2 minimum polymer modified cement and be anti-microbial, water resistant, anti-mold and color fast-efflorescence free.

2514.02.C.3 Tile must not be installed over old wall tile in any areas of the property. Old tile must be completely removed before new tile is installed. Thin tile (1/4”/6mm thick) may be installed over existing tile in vertical wall applications only where critical room dimensions will not be impacted and must be approved by Hilton Design.

2514.02.C.4 Not Applicable to this Brand

2514.02.C.5 Must pass ASTM C373 for water absorption and ASTM C650 for chemical resistance or must comply with ISO 10545 -3 Determination of Water Absorption and ISO 10545-13 Chemical Resistance Class A cleaning chemicals / Class B acid bases.

2514.02.C.6 Must pass ASTM CTI 81-7D for stain resistance or must comply with ISO 10545-14 Stain Resistance Class 4 Minimum.

2514.02.C.7 Porcelain tile must be through-body color material or a glazed porcelain that meets Mohs scratch hardness minimum rating of 4.0 for wall applications and C648 breaking strength for ceramic wall tile 120 - 230 lbs.

2514.02.C.8 Tile must pass ISO 10545-11 Crazing Resistance.

2514.02.D Stone

2514.02.D.1 All stone must be sealed.

2514.02.E Paint

2514.02.E.1 All paints must be low VOC (less than 50 VOC grams per liter) and low odor.

2514.02.E.2 Paint in high humidity areas must be satin or semi-gloss finish with a mildew-resistant formulation.

2514.02.E.3 Paint used in high contact areas must be satin or eggshell finish that is durable, washable and stain resistant.

2514.02.E.4 Not Applicable to this Brand

2514.02.E.5 Paint must be equal to Scuffmaster’s (www.scuffmaster.com) Scrubtough system, which is a water-base polyurethane acrylic coating for interior walls fortified with cross linked polyurethane plastic and Microban antimicrobial protection with a scrub resistance (ASTM D2486) of 2,800 cycles.

2514.02.F Not Applicable to this Brand

2514.02.G Corner Guards

2514.02.G.1 Not Applicable to this Brand

2514.02.G.2 Not Applicable to this Brand

2514.02.G.3 Provide full height corner guards at outside corners in all high traffic public and guestroom areas. Corner guards must be a resilient vinyl to coordinate with the wall color and must be adhesive mount. The flanges must be a maximum width of 1”/25 mm.
2514.03 Floors

2514.03.A Slip Resistance Requirements

2514.03.A.1 Tile must have a static coefficient of friction SCOF (ASTM-C1028-07e1; www.astm.org) of 0.6 wet or better or Dynamic Coefficient of Friction DCOF (ASTM-A137.1) of .42 or better and a breaking strength (ASTM-C648-04, 2009; www.astm.org) of not less than 250 lbs or ISO equivalent.

2514.03.A.2 Kitchen floor tile must pass the Robert's wheel abrasion test or ISO equivalent for hotels/projects outside the US, and have a slip-resistance coefficient of at least 0.6 when wet, or regional statutory standard.

2514.03.B Tile

* Allowed only where noted under 'Finish Options' of a particular area of the hotel under sections 2502.00-2513.00.

2514.03.B.1 Tile must be decorative non-slip or unpolished porcelain or natural stone tile, minimum 5/16”/8 mm thick with a rectified edge.

2514.03.B.2 Public area floor tile must be 18”/450 mm wide minimum. Rectangular-shaped or plank-shaped tiles are permitted. Small tile mosaics are permitted for accents when the design is approved by Hilton.

2514.03.B.3 Stone or porcelain floor tile must be a minimum size of 16” x 16”/400 mm x 400 mm or 12” x 18”/300 mm x 450 mm. Rectangular shaped tiles are permitted.

2514.03.B.4 Guestroom tile must be 16” x 16”/400 mm x 400 mm or 12” x 18”/300 mm x 450 mm minimum. Rectangular shaped tiles are permitted.

2514.03.B.5 Not Applicable to this Brand

2514.03.B.6 Not Applicable to this Brand

2514.03.B.7 Not Applicable to this Brand

2514.03.B.8 Not Applicable to this Brand

2514.03.B.9 Tile must not be installed over old floor tile in any areas of the hotel. Old tile must be completely removed before new tile is installed. Thin tile (1/8” thick) may be installed over existing tile in vertical wall applications only where critical room dimensions will not be impacted.

2514.03.B.10 Glazed ceramic tile is not allowed.

2514.03.B.11 Wall base must have a factory finish edge or approved alternate.

2514.03.B.12 Porcelain tile must be through-body color material or a glazed porcelain that meets Mohs scratch hardness minimum rating of 7.0.

2514.03.B.13 Must pass ASTM C373 for water absorption, frost and chemical resistant.

2514.03.B.14 Must pass ASTM CTI 81-7D for stain resistance.

2514.03.C Wood Flooring

* Allowed only where noted under 'Finish Options' of a particular area of the hotel under sections 2502.00-2513.00.

2514.03.C.1 Acrylic Impregnated Engineered Wood Flooring

2514.03.C.1.a Must be at least five-ply construction.
2514.03.C.1.b Plank width must be no less than 3”/75 mm.
2514.03.C.1.c A minimum five year commercial warranty is required.

2514.03.C.2 Hardwood Flooring
2514.03.C.2.a Hardwood flooring must be solid wood or engineered planks with a top ply of hardwood that can be refinished.
2514.03.C.2.b All visible surfaces must be free from splits, insect attacks, sapwood, shakes, irregular edges, large or unsound knots, spongy or brittle heart, stains and any other defects.
2514.03.C.2.c A minimum five year commercial warranty is required.
2514.03.C.2.d Pre-finished planks are allowed.
2514.03.C.2.e Minimum thickness of solid timber finish in guestrooms is ½”/12 mm.
2514.03.C.2.f Minimum thickness of solid timber finish in public areas is ¾”/19 mm.
2514.03.C.2.g Multi-plank format or composite planks, e.g., printed surfaces or veneered finishes onto softwood or MDF backing structure, are not allowed.
2514.03.C.2.h Cork or approved metal expansion gaps/strips must be provided at maximum 16’-0” o.c./5 m centers to all timber floors in both directions.
2514.03.C.2.i Finished floor must be perfectly level, smooth and free of any visible defects, ripples, splits or gaps on completion.
2514.03.C.2.j Provide a sub-base in compliance with the flooring system, manufacturers, or specialty consultant’s recommendations. Wood must be laid on approved substrate.
2514.03.C.2.k Supporting slab must be sufficiently dry to accept the timber finish with a relative humidity of less than 75 percent when tested with a hygrometer.

2514.03.D Natural stone
* Allowed only where noted under ‘Finish Options’ of a particular area of the hotel under sections 2502.00-2513.00.
2514.03.D.1 Natural stone must have a static coefficient of friction SCOF (ASTM-C1028-07e1; www.astm.org) of 0.6 wet or better or Dynamic Coefficient of Friction DCOF (ASTM-A137.1) of .42 or better.
2514.03.D.2 Any natural porous materials must be sealed after installation with a penetrating non-glossy sealer.
2514.03.D.3 Natural stone must be rectilinear, gauged with a micro-bevel.

2514.03.E Grout
2514.03.E.1 Natural stone grout must be non-shrink-type epoxy or latex portland cement to minimize staining and the minimum grout joint should comply with ISO or ANSI guidelines. 3/16” /5 mm is the maximum width allowed.
2514.03.E.2 Cementitious grout must be sealed after installation.

2514.03.F Concrete
* Allowed only where noted under ‘Finish Options’ of a particular area of the hotel under sections 2502.00-2513.00.
2514.03.F.1 Concrete must be helicoptered, polished and sealed.
2514.03.F.2 Concrete strength must be a minimum of 4,000 PSI/27,850 kPa.
2514.03.F.3 Seal as recommended by manufacturer and sealer must be applied in three coats.
2514.03.F.4 Substrate must be dust free, free of cracks, level and sound concrete subfloor.
2514.03.F.5 Verify with manufacturer the appropriateness of substrate.
2514.03.F.6 Coefficient of friction must comply with all state and local codes for both wet and dry application.

2514.03.G Enhanced Resilient Tile (ERT) Flooring

Enhanced Resilient Tile (ERT) Flooring - (ERT) is approved as follows:
LVT is not acceptable.

2514.03.G.1
Vinyl Sheet Flooring*

* Allowed only where noted under ‘Finish Options’ of a particular area of the hotel under sections 2502.00-2513.00.

2514.03.G.1.a Must be a commercial grade, slip resilient, sheet vinyl safety flooring with minimum 10 year warranty.
2514.03.G.1.b Thickness: 1/16”/2.0 mm minimum

2514.03.G.2 Enhanced Resilient Tile (ERT) Flooring

*Allowed for use in guestrooms only.

2514.03.G.2.a All ERT flooring must be DOP/DEHP free. Must be a commercial grade, rigid solid core, registered embossed finish to match the pattern of the tile flooring system. The product must be 4 sided tongue and groove type system that locks the planks together to form a tight durable joint. When installed in areas above guestrooms a pre-attached noise-reducing impact insulation underlayment (cork or IXPE foam backing) will be required. Not allowed in wet areas. ERT products must come with minimum 20 year Commercial Wear Warranty, design selections must be approved by Hilton Global Design Services and meet the following minimum criteria:
1. Slip Resistance: See 2514.03 Floors A. Slip Resistance
2. Overall Thickness: Gauge 5mm minimum
3. Wear layer: 0.5 mm (20 mil) minimum
4. Static Load: ASTM F970 – Passes, modified at 1000 psi
5. Resistance to Heat: ASTM 1514
6. Smoke Density: ASTM E662 (<450)
7. Resistance to Light: ASTM F 1515
8. Resistance to Chemical: ASTM F925
9. Radiant Flux: ASTM E648 (> 0.45 watts/cm2, NFPA Class 1)
10. Standard Classification: ASTM F 1700, Class 3
11. Impact Insulation Class (IIC): ASTM E-492-04. Minimum rating of 57 db, achieved by combination of ERT with pre-attached Sound Underlayment and cast in place concrete floor equal to or greater than 7”/178 mm thick.
12. For pre-approved solutions contact Hilton Global Design Services
2514.03.G.2.b  Not Applicable to this Brand

2514.03.G.2.c  Secondary Underlayment System - is required for properties with structural flooring systems of cast in place concrete slabs less than 7” thick, hollow core plank construction, wood frame construction or any type of steel frame with concrete top coating in all areas above Guestrooms to meet the following minimum criteria:

2514.03.G.2.c.1  Must be a commercial grade, noise-reducing impact insulation underlayment system with minimum 20 year Commercial Warranty and meet the following criteria or as required by the local municipality:

1. Thickness: 2.0 mm maximum
2. Resistance to Heat: ASTM 1514
3. Smoke Density: ASTM E662 (<450)
4. Radiant Flux: ASTM E648 (> 0.45 watts/cm2, NFPA Class 1)
5. Impact Insulation Class (IIC): ASTM E-492-04. Minimum rating of 60 db, achieved by combination of ERT with pre-attached Sound Underlayment noted in 2514.03.G in conjunction with the secondary underlayment and structural flooring system. Combinations of secondary underlayment with no compliant ERT will not be acceptable.

2514.03.H  Carpet

2514.03.H.1  Carpet must meet the following criteria:

2514.03.H.1.a  Radiant panel: ASTM E-648-10 Class 1 (installed carpet only)

Area rugs must meet DOF FF 1-70.

2514.03.H.1.b  Smoke density: ASTM E-662-09
2514.03.H.1.c  Lightfastness: AATCC 16-E
2514.03.H.1.d  Color fastness to water: AATCC 107
2514.03.H.1.e  Color fastness to rubbing: AATCC 165
2514.03.H.1.f  Wear resistance: ASTM D5252
2514.03.H.1.g  Appearance retention: ASTM D5252
2514.03.H.1.h  Tuft anchorage: ASTM D1335
2514.03.H.1.i  Flammability

2514.03.H.1.i.1  Not Applicable to this Brand
2514.03.H.1.i.2  Radiant Panel Test: ASTM E-648

2514.03.H.1.j  Not Applicable to this Brand
2514.03.H.1.k  Not Applicable to this Brand
2514.03.H.1 Not Applicable to this Brand
2514.03.H.1.m Static electricity/Stroll test: AATCC 134 < 3.5 KV
2514.03.H.1.n All carpet must pass TARR (Texture Appearance Retention Rating) of 2.5 – 3.0 or higher (Hexapod Test).
2514.03.H.1.o All nylon carpet must be stain treated with foam and heat set method.
2514.03.H.1.p International test certificates are required.

2514.03.H.2 Carpet must comply with the following minimum specifications:

**BROADLOOM CUT PILE: Guestrooms and Public Areas ***

* Allowed only where noted under 'Finish Options' of a particular area of the hotel under sections 2502.00-2513.00.

2514.03.H.2.a Construction: Tufted
2514.03.H.2.a.1 Machine Gauge: 1/10 Guestrooms and Public Areas
2514.03.H.2.a.2 Stitches per Inch: 10 – Guestrooms; 11.3 to 12 – Public Areas
2514.03.H.2.a.3 Finished Pile Height: .218” (7/32”) or greater for 32 oz. and .250” (1/4”) or greater for 36 oz.
2514.03.H.2.a.4 Face Yarn: 100 percent Solution Dyed Type 6 Nylon Branded or equivalent
2514.03.H.2.a.5 Primary Backing: Woven polypropylene
2514.03.H.2.a.6 Secondary Backing: Woven polypropylene or attached cushion.
2514.03.H.2.a.7 Face Weight: 36 oz./yd.² for Public Areas; 32 oz./yd.² for Guestrooms

**BROADLOOM CUT AND LOOP/TIP-SHEAR LOOP: Guestrooms and Public Areas ***

* Allowed only where noted under 'Finish Options' of a particular area of the hotel under sections 2502.00-2513.00.

2514.03.H.2.b Construction: Tufted
2514.03.H.2.c.1 Machine Gauge: 1/10
2514.03.H.2.c.2 Stitches per Inch: 10 - Guestrooms, 10 - Public Areas
2514.03.H.2.c.3 Finished Pile Height: High 7/32; Low 3/16
2514.03.H.2.c.4 Face Yarn: 100 percent Solution Dyed Type 6 Nylon Branded or equivalent Yarns +/- five percent variance on face weight allowed
2514.03.H.2.c.6 Primary Backing: Woven polypropylene
2514.03.H.2.c.7 Secondary Backing: Woven polypropylene/Attached cushion in public areas only.
2514.03.H.2.c.8 Face Weight: 36 oz./yd.² for Public Areas, 32 oz./yd.² for Guestrooms

2514.03.H.2.d Not Applicable to this Brand
2514.03.H.2.e

MULTI LEVEL LOOP TIP: Guestrooms *

* Allowed only where noted under ‘Finish Options’ of a particular area of the hotel under sections 2502.00-2513.00.

2514.03.H.2.e.1 Construction: Loop
2514.03.H.2.e.2 Machine Gauge: 1/8 / 31.5/10cm
2514.03.H.2.e.3 Stitches per Inch: 10
2514.03.H.2.e.4 Tufted Pile Height: max 3/16, min 1/8
2514.03.H.2.e.5 Face Yarn: 100 percent Solution Dyed Type 6 Nylon Branded or equivalent Yarns
2514.03.H.2.e.6 Primary Backing: Woven polypropylene
2514.03.H.2.e.7 Secondary Backing: Woven polypropylene or attached cushion.
2514.03.H.2.e.8 Face Weight: 32 oz./yd.²
2514.03.H.2.e.9 Not Applicable to this Brand
2514.03.H.2.e.10 Not approved for use in heavy traffic areas, guestrooms only

2514.03.H.2.f High Definition CYP (computer yarn placement) 48: Public Areas, Guestrooms, Corridors*

* Allowed only where noted under ‘Finish Options’ of a particular area of the hotel under sections 2502.00-2513.00.

2514.03.H.2.f.1 Construction: Tufted
2514.03.H.2.f.2 Machine Gauge: Variable
2514.03.H.2.f.3 Stitches per Inch: 11
2514.03.H.2.f.4 Finished Pile Thickness: .360"

Tufted Loop Height: (0.218" - 0.355")

Tufted Cut Height: (0.375") +/- 0.025"

2514.03.H.2.f.5 Face Yarn: 100 percent Solution Dyed Type 6 Nylon Branded or equivalent Yarns
2514.03.H.2.f.6 Primary Backing: Woven polypropylene
2514.03.H.2.f.7 Secondary Backing: Woven polypropylene or attached cushion.
2514.03.H.2.f.8 Face Weight: 48 oz./yd.²
2514.03.H.2.f.9 Density: 4,800
2514.03.H.2.f.10 Weight Density: 230,400

2514.03.H.2.g

BROADLOOM CYP (computer yarn placement): Public Areas *

* Allowed only where noted under 'Finish Options' of a particular area of the hotel under sections 2502.00-2513.00.

2514.03.H.2.g.1 Construction: Tufted
2514.03.H.2.g.2 Machine Gauge: 1/11
2514.03.H.2.g.3 Stitches per Inch: 10 - Public Areas
2514.03.H.2.g.4 Finished Pile Height: 7/32
2514.03.H.2.g.5 Face Yarn: 100 percent Solution Dyed Type 6 Nylon Branded or equivalent Yarns
2514.03.H.2.g.6 Primary Backing: Woven polypropylene
2514.03.H.2.g.7 Secondary Backing: Woven polypropylene or attached cushion.
2514.03.H.2.g.8 Face Weight: 42 oz./yd.²

2514.03.H.2.h

CARPET TILE – Exhibit Areas Only *

* Allowed only where noted under 'Finish Options' of a particular area of the hotel under sections 2502.00-2513.00.

2514.03.H.2.h.1 Use of carpet tile must be pre-approved by Hilton.
2514.03.H.2.h.2 Not Applicable to this Brand
2514.03.H.2.h.3 Machine Gauge: 1/10” minimum, 5/64” minimum
2514.03.H.2.h.4 Stitches per Inch: 7 minimum
2514.03.H.2.h.5 Finished Pile Height: 0.123 minimum
2514.03.H.2.h.6 Not Applicable to this Brand
2514.03.H.2.h.7 Face yarn: 100% solution-dyed nylon or equivalent
2514.03.H.2.h.8 Primary Backing: Non-woven
2514.03.H.2.h.9 Secondary Backing: Option 1: Polyurethane Cushion. Option 2: Fiberglass reinforced thermoplastic composite with polyethylene underlayment cushion, 5.3 lbs./2.4 kg density, 2 mm thickness. Installation method is glueless.

2514.03.H.2.h.10 Tufted Yarn Weight: 14 oz./yd.² to 40 oz./yd.²

2514.03.H.2.h.11 Not Applicable to this Brand

2514.03.H.2.h.12 Pile Density: 4,919 oz. per cubic yard minimum (face weight x 36 divided by thickness)

2514.03.H.2.i Not Applicable to this Brand

2514.03.H.2.j AXMINSTER – Guestrooms *

* Allowed only where noted under ‘Finish Options’ of a particular area of the hotel under sections 2502.00-2513.00.

2514.03.H.2.j.1 Fiber: wool/nylon blend (80/20) or 100 percent nylon (Type 6.6 or 100 percent Solution Dyed BCF Nylon 6). Wool must be woolen spun yarn. Semi-worsted is not permitted. 70 percent British specialty wool blended preferred.

2514.03.H.2.j.2 Yarn Count: 2/47’s or 3/42 (2/52 for nylon construction)

2514.03.H.2.j.3 Tuft Density: 56 per square inch (49 for nylon)

2514.03.H.2.j.4 Dye Method: Premetalized dyes required

2514.03.H.2.j.5 Pitch: 7

2514.03.H.2.j.6 Finished Pile Height: .250 to .281

2514.03.H.2.j.7 Rows per Inch: 8 (80/20), 7 (nylon construction), adjust to meet industry standards with 3/42 yarn count

2514.03.H.2.j.8 Total pile weight: 32 – 35 oz./yd.² (80/20), 25 – 28 oz./yd² (nylon)

2514.03.H.2.j.9 Total weight: 60 – 65 oz./yd.² (80/20), 55 – 58 oz./yd.² (nylon), 50 oz./yd.² (3/42 yarn count)

2514.03.H.2.j.10 Backing: synthetic, jute (jute backing allowable only in stretch guestroom applications)

2514.03.H.2.k AXMINSTER – Corridors *

* Allowed only where noted under ‘Finish Options’ of a particular area of the hotel under sections 2502.00-2513.00.

2514.03.H.2.k.1 Fiber: wool/nylon blend (80/20) or 100 percent nylon (Type 6.6 or 100 percent Solution Dyed BCF Nylon 6). Wool must be woolen spun yarn. Semi-worsted is not permitted. 70 percent British specialty wool blended preferred.

2514.03.H.2.k.2 Yarn Count: 2/47’s or 3/42 (2/52 for nylon construction)

2514.03.H.2.k.3 Tuft Density: 56 per square inch

2514.03.H.2.k.4 Dye method: pre-metalized dyes required
2514.03.H.2.k.5  Pitch: 7
2514.03.H.2.k.6  Finished Pile Height: .250 to .281
2514.03.H.2.k.7  Rows per Inch: 8, 80/20 and nylon (9 preferred for heavy traffic corridors, see specification information for meeting room and pre-function areas for technical specifications), adjust to meet industry standards with 3/42 yarn count
2514.03.H.2.k.8  Total pile weight: 32-35 oz./yd.² (80/20), 29-32 oz./yd.² (nylon)
2514.03.H.2.k.9  Total weight: 60 – 63 oz./yd.² (80/20), 57 - 60 oz./yd.² (nylon), 50 oz./yd.² (3/42 yarn count)
2514.03.H.2.k.10 Backing: synthetic

2514.03.H.2.l  AXMINSTER – Meeting Rooms, Pre-function Areas and Restaurants *

* Allowed only where noted under ‘Finish Options’ of a particular area of the hotel under sections 2502.00-2513.00.

2514.03.H.2.l.1  Fiber: wool/nylon blend (80/20) or 100 percent nylon (Type 6.6 or 100 percent Solution Dyed BCF Nylon 6). Wool must be woolen spun yarn. Semi-worsted is not permitted. 70 percent British specialty wool blended preferred.
2514.03.H.2.l.2  Yarn Count: 2/47’s or 3/42 (2/52 for nylon construction)
2514.03.H.2.l.3  Tuft Density: 63 per square inch
2514.03.H.2.l.4  Dye method: pre-metalized dyes required
2514.03.H.2.l.5  Pitch: 7
2514.03.H.2.l.6  Pile height: .250 to .281
2514.03.H.2.l.7  Rows per Inch: 9, adjust to meet industry standards with 3/42 yarn count
2514.03.H.2.l.8  Total pile weight: 36 - 40 oz./yd.² (80/20), 32 - 35 oz./yd.² (nylon)
2514.03.H.2.l.9  Total weight: 63 - 66 oz./yd.² (80/20), 59 - 62 oz./yd.² (nylon), 50 oz./yd.² (3/42 yarn count)

2514.03.H.2.m  AXMINSTER – Lobbies and Ballrooms *

* Allowed only where noted under ‘Finish Options’ of a particular area of the hotel under sections 2502.00-2513.00.

2514.03.H.2.m.1  Fiber: wool/nylon blend (80/20) or 100 percent nylon in pre-approved applications (Type 6.6 or 100 percent Solution Dyed BCF Nylon 6). Wool must be woolen spun yarn. Semi-worsted is not permitted. 70 percent British specialty wool blended preferred.
2514.03.H.2.m.2  Yarn Count: 2/47’s or 3/42 (2/52 for nylon construction)
2514.03.H.2.m.3  Tuft Density: 70 per square inch
2514.03.H.2.m.4  Dye method: pre-metalized dyes required
2514.03.H.2.m.5 Pitch: 7
2514.03.H.2.m.6 Finished pile height: .250 to .281
2514.03.H.2.m.7 Rows per Inch: 10, adjust to meet industry standards with 3/42 yarn count
2514.03.H.2.m.8 Total Pile Weight: 40 - 44 oz./yd.² (80/20), 36 - 40 oz./yd.² (nylon)
2514.03.H.2.m.9 Total weight: 68 - 72 oz./yd.² (80/20), 64 - 68 oz./yd.² (nylon), 50 oz./yd.² (3/42 yarn count)
2514.03.H.2.m.10 Backing: synthetic

2514.03.H.3 Tufted Broadloom Carpet
2514.03.H.3.a Not Applicable to this Brand
2514.03.H.3.b All nylon carpet must be stain treated with foam/spray and heat set method.
2514.03.H.3.c Not Applicable to this Brand
2514.03.H.3.d All carpet must be warrantied for wear at 10 percent fiber loss over 10 years.
2514.03.H.3.e Tufted carpet must have a primary and secondary backing (synthetic/polypropylene).

2514.03.H.4 Not Applicable to this Brand

2514.03.H.5 Carpet Pad (Underlay)
2514.03.H.5.a

Guestrooms and Suites:
Synthetic fiber pad must be minimum 32 oz. weight, 8.0 lb./ft³ density and 5/16" / 7.9 mm thickness. 100 percent SBR rubber cushion must be a textured flat construction with minimum 64 oz. weight and 21 lb./ft³ density. Froth polyurethane cushion must be minimum 1/4" / 6 mm thickness and 10 lb./ft³ density.

Public Areas:
100 percent SBR rubber must be a flat construction with minimum 1/4" / 6 mm thickness and 22 lb./ft³ density. Froth polyurethane cushion must be minimum 1/5" / 5 mm thickness and 12 lb./ft³ density.

Polyurethane (post-consumer synthetic fiber) double stick cushion must be minimum 3/8" thickness, 40 oz. wt. and 8.9 lbs. density. When installing double stick goods, a premium multi-purpose adhesive must be used. A premium seam sealer must be used on all seams. A premium edge sealer must be used on all edges that abut a hard surface.

2514.03.H.5.b Attached cushion must be frothed polyurethane with minimum 3/32" / 2.38 mm thickness and 18 lbs./ft³ density. All attached cushion must be factory applied. When installing goods with attached cushion, a premium multi-purpose adhesive must be used. A premium seam sealer must be used on all seams. A premium edge sealer must be used on all edges that abut a hard surface.
Attached Pad Synthetic Fiber (PET) 50% post-consumer recycle content, must not contain plasticizers, Minimum .165” and 8 lbs./ft³ density. All attached cushion must be factory applied. When installing goods with attached cushion, a premium multi-purpose adhesive must be used. A premium seam sealer must be used on all seams. A premium edge sealer must be used on all edges that abut a hard surface.

2514.03.H.5.c  All carpet pad must be Class II for guestrooms and suites and Class III for public areas, with a manufacturer’s level of contract/commercial grade.

2514.03.H.5.d  Carpet padding must be replaced at the same time as the carpet.

2514.03.H.6  Broadloom Installation
2514.03.H.6.a  All carpet installed over padding must be power stretched except in double glue-down installations.
2514.03.H.6.b  Direct glue down installation is allowed in office areas only. Jute backing is not allowed.
2514.03.H.6.c  Not Applicable to this Brand
2514.03.H.6.d  Maximum of one seam allowed in each guestroom.
2514.03.H.6.e  Not Applicable to this Brand
2514.03.H.6.f  Meeting space, public space and corridor carpet must be glued down as high traffic and equipment may adversely affect normal wear. Must be installed according to manufacturer’s instructions.

2514.03.H.7  Carpet Tile Installation
2514.03.H.7.a  Comply with manufacturer’s instructions and recommendations. Use manufacturer’s recommended adhesives.

2514.03.H.8  Printed carpet is not allowed.

2514.03.H.9  Hand Tufted Rug Specifications

**Canada | United States:** Area rug content must be 100% Virgin New Zealand Wool, 80/20 Axminster, or Nylon. Construction must be hand or machine tufted, cut, cut & loop, or loop. (Refer to section 2514.03.H Carpet for carpet construction.) Rug edges must be serge or tape bound, or folded edge with back tape binding. Fringe and flat weave rugs must be submitted to Global Design for approval.

2514.03.H.9.a  4.5 Pound Hand Tufted Rug Specifications - Guestrooms and Suites

- **Quality:** 4.5 pound
- **Yarn Content:** 100 percent NZ wool
- **Yarn Count:** 380 Tex, 1/80s Dewsbury
- **Yarn Twist/10 cm:** 130 twists
- **Ply Twist/10 cm:** 11.4 twists
Total Weight: 3,920 gm/m²

Gross Yarn Weight: 2,440 gm/m²

Pile Height: 9-10 mm

No of rows/10 cm: 19-20

No of stitches/10 cm: 21

No of ends/insertion: 4

Primary backing: Basket Weave

60 percent cotton, 40 percent polyester

26 x 26 per inch

Width: 620 cm

Weight: 326 gm/m²

Secondary backing: Leno Weave

Warp - 100 percent cotton

Weft - 90 percent cotton, 10 percent polyester

12 x 6 per inch

Width: 300 cm

Weight: 61 gm/m²

Latex: Natural rubber latex based compound
A non-skid pad or backing is required.

Mothproofing: Mystox CMP

Canada | United States: Not Applicable to this Brand

5.5 Pound Hand Tufted Rug Specifications - Guest Corridors

Quality: 5.5 pound
Yarn Content: 100 percent NZ wool
Yarn Count: 380 Tex, 1/80s Dewsbury
Yarn Twist/10 cm: 130 twists
Ply Twist/10 cm: 11.4 twists
Total Weight: 4,460 gm/m²
Gross Yarn Weight: 2,980 gm/m²
Pile Height: 11-12 mm
No of rows/10 cm: 20-21
No of stitches/10 cm: 23
No of ends/insertion: 4
Primary backing: Basket Weave
  60 percent cotton, 40 percent polyester
  26 x 26 per inch
  Width: 620 cm
  Weight: 326 gm/m²
Secondary backing: Leno Weave
  Warp - 100 percent cotton
  Weft - 90 percent cotton, 10 percent polyester
  12 x 6 per inch
  Width: 300 cm
  Weight: 61 gm/m²
Latex: Natural rubber latex based compound
A non-skid pad or backing is required.
Mothproofing: Mystox CMP

6.5 Pound Hand Tufted Rug Specifications - Public Areas (Lobby, Meeting Facilities, F&B Outlets)

Quality: 6.5 pound
Yarn Content: 100 percent NZ wool
Yarn Count: 380 Tex, 1/80s Dewsbury
Yarn Twist/10 cm: 130 twists
Ply Twist/10 cm: 11.4 twists
Total Weight: 5,000 gm/m²
Gross Yarn Weight: 3,525 gm/m²
Pile Height: 13-14 mm
No of rows/10 cm: 18-19
No of stitches/10 cm: 26-27
No of ends/insertion: 4
Primary backing: Basket Weave
  60 percent cotton, 40 percent polyester
  26 x 26 per inch
  Width: 620 cm
  Weight: 326 gm/m²
Secondary backing: Leno Weave
  Warp - 100 percent cotton
  Weft - 90 percent cotton, 10 percent polyester
  12 x 6 per inch
  Width: 300 cm
  Weight: 61 gm/m²
Latex: Natural rubber latex based compound
A non-skid pad or backing is required.
Mothproofing: Mystox CMP

Canada | United States: Not Applicable to this Brand

2514.04 Ceilings
  2514.04.A Height
    In no case may any ceiling be less than 7'-6"/2.3 m. Local codes may require higher ceilings than noted.
  2514.04.B Paint
    2514.04.B.1 Painted ceilings in public areas must have a smooth or light sand finish.
    2514.04.B.2 Guestroom ceilings must have a smooth painted finish.
    2514.04.B.3 Guestroom bathroom ceilings must have a latex enamel, semi-gloss paint.
    2514.04.B.4 Not Applicable to this Brand
2514.04.B.5 All paints must be low VOC (less than 50 VOC grams per liter) and low odor.
2514.04.B.6 Paint in high humidity areas such as guestroom bathrooms must be washable and have a mildew resistant finish.

2514.04.C Acoustic Ceiling Tile (ACT)
2514.04.C.1 Tile in public areas must be 2'-0"/600 mm x 2'-0"/600 mm premium tegular (reveal) edge tiles. Alternate sizes must be approved by Hilton.

**Canada | United States:** Tile in public areas must be minimum 4'-0"/1.2 m x 4'-0"/1.2 m premium tegular (reveal) edge tiles. Alternate sizes must be approved by Hilton.

2514.04.C.2 12"/300 mm x 12"/300 mm and 24"/600 mm x 48"/1.2 m tiles are not allowed in any public spaces.
2514.04.C.3 Maximum of 30 percent of the ceiling area is permitted to be ACT in public areas.
2514.04.C.4 Concealed spine acoustical tile ceilings are not allowed in public areas.
2514.04.C.5 Not Applicable to this Brand
2514.04.C.6 Not Applicable to this Brand
2514.04.C.7 All exposed ceiling grid systems must be narrow spline, 9/16"/15 mm maximum width, and must match the color of the ceiling tile.
2514.04.C.8 Grid systems in indoor pools must include a painted aluminum grid and vinyl coated, moisture-resistant tiles. All hanger wires must be stainless steel.
2514.04.C.9 Mineral fiber tiles are not allowed in humid environments.
2514.04.C.10 Acoustic ceiling tile is not allowed in guestroom corridors.
2514.04.C.11 Acoustic ceiling tile is not allowed in guestrooms.
2514.04.C.12 Kitchen ceilings must be 2'-0"/600 mm x 4'-0"/1.2 m washable plastic or fiberglass tile ceiling with aluminum suspension system.

2514.04.D Acoustical Panels
2514.04.D.1 Acoustical panels in ballrooms must be a minimum 48" x 96"/1.2 m x 2.4 m with tight butt joints.
2514.04.D.2 Maximum of 50 percent of the ceiling area is permitted to be acoustical panels in ballrooms.
2514.04.D.3 Acoustical panels in restaurants and front desk area must be a minimum 48" x 48"/1.2 m x 1.2 m with spineless, tight grid.
2514.04.D.4 Maximum of 30 percent of the ceiling area is permitted to be acoustical panels in restaurants and front desk areas.

2514.05 Acoustical Performance
2514.05.A Acoustical Performance Minimum Criteria

The following minimum criteria must be used for the acoustical performance of the building design. Acoustic performance must be measured using ISO 140, ISO 717 and ISO 3382, http://www.iso.org. An acoustical consultant is recommended.

<table>
<thead>
<tr>
<th>Acoustical Performance Minimum Criteria</th>
</tr>
</thead>
<tbody>
<tr>
<td>STC = Sound Transmission Coefficient / IIC = Impact Insulation Class</td>
</tr>
<tr>
<td>Function / Meeting Rooms</td>
</tr>
<tr>
<td>Section</td>
</tr>
<tr>
<td>----------------------------------------------</td>
</tr>
<tr>
<td>Function or meeting rooms</td>
</tr>
<tr>
<td>Meeting room – operable partitions</td>
</tr>
<tr>
<td>Meeting room – baffles above ceiling / partitions</td>
</tr>
<tr>
<td>Boardroom</td>
</tr>
<tr>
<td>Service room adjacent to meeting room</td>
</tr>
<tr>
<td>Guestroom</td>
</tr>
<tr>
<td>Guestroom to exterior</td>
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<tr>
<td>Guestroom to Guestroom</td>
</tr>
<tr>
<td>Guestroom to swimming pool or fitness center</td>
</tr>
<tr>
<td>Guestroom from public space</td>
</tr>
<tr>
<td>Guestroom to back of house</td>
</tr>
<tr>
<td>Guestroom floor / ceiling</td>
</tr>
<tr>
<td>Guestroom to elevator lobby</td>
</tr>
<tr>
<td>Back of House</td>
</tr>
<tr>
<td>Corridor to mechanical, laundry, service rooms</td>
</tr>
<tr>
<td>Floor Impact</td>
</tr>
<tr>
<td>Guestroom to Guestroom</td>
</tr>
<tr>
<td>Guestroom sleeping area to mechanical room</td>
</tr>
</tbody>
</table>

2514.05.B Acoustical Treatment/Isolation
Acoustical treatment/isolation must be provided in ceiling assemblies of the restaurant and bar in properties where guestrooms or function space are located directly above.

2514.05.C Acoustically Treated Ceiling Assemblies
Ceiling assemblies must be acoustically treated to limit sound transference where the pool is located directly below guest suites.

2514.05.D Pool Equipment Noise & Aesthetics
Locate pool equipment to minimize noise to adjacent guest areas.
2514.05.F External Noise Intrusion

2514.05.F.1 External building fabric, including any ventilators, must be designed and built to ensure that the following internal noise levels are not exceeded due to any regularly occurring external noise source.

2514.05.F.2 Measurements of noise within the hotel must be taken during the noisiest two hour period of the day, as identified in the noise survey.

<table>
<thead>
<tr>
<th>Room</th>
<th>External Intrusion Noise Level</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Guestroom</strong></td>
<td></td>
</tr>
<tr>
<td>Daytime (07:00 – 23:00):</td>
<td>35dB $L_{Aeq,16h}$</td>
</tr>
<tr>
<td>Night-time (23:00 – 07:00):</td>
<td>30dB $L_{Aeq,8h}$ / 40dB $L_{Amax(fast)}$ *</td>
</tr>
<tr>
<td><strong>Meeting/function rooms</strong></td>
<td>32dB $L_{Aeq,5min}$</td>
</tr>
<tr>
<td><strong>Bar/restaurant/breakout</strong></td>
<td>38dB $L_{Aeq,5min}$</td>
</tr>
<tr>
<td><strong>Executive lounge</strong></td>
<td>35dB $L_{Aeq,5min}$</td>
</tr>
<tr>
<td><strong>Lobby/reception/guest corridors</strong></td>
<td>42dB $L_{Aeq,5min}$</td>
</tr>
<tr>
<td><strong>Toilets/Team member changing</strong></td>
<td>40dB $L_{Aeq,5min}$</td>
</tr>
<tr>
<td><strong>Fitness center</strong></td>
<td>40dB $L_{Aeq,5min}$</td>
</tr>
<tr>
<td><strong>Spa</strong></td>
<td>38dB $L_{Aeq,5min}$</td>
</tr>
<tr>
<td><strong>Offices</strong></td>
<td>38dB $L_{Aeq,5min}$</td>
</tr>
</tbody>
</table>

* For hotels on or close to major international airports, maximum noise levels due to aircraft may be relaxed to 50dB $L_{Amax(fast)}$ subject to permission from Hilton.

2514.06 Mechanical

2514.06.A HVAC System Types

2514.06.A.1 HVAC System requires mechanically controlling indoor air quality (temperature, humidity, purity and circulation) to obtain comfort levels in the desired areas of building in a cost effective manner. Refer to the Environmental Conditions Matrix below:
<table>
<thead>
<tr>
<th>Location</th>
<th>Summer</th>
<th>Winter</th>
<th>Type</th>
<th>Fresh Air Supply</th>
<th>Exhaust Rate</th>
<th>Acoustical Rating</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Tdb F(°C)</td>
<td>R H% Max</td>
<td>Tdb F(°C)</td>
<td>R H% Min</td>
<td>Pos/Neg/Neut</td>
<td>Inches w.g. (Pa)</td>
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<tr>
<td>Vestibule</td>
<td>73 (23)</td>
<td>55</td>
<td>72 (22)</td>
<td>30</td>
<td>Pos</td>
<td>0.02 (5)</td>
</tr>
<tr>
<td>Atrium</td>
<td>73 (23)</td>
<td>55</td>
<td>72 (22)</td>
<td>30</td>
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<tr>
<td>Lobby</td>
<td>73 (23)</td>
<td>55</td>
<td>72 (22)</td>
<td>30</td>
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<tr>
<td>Front Desk</td>
<td>73 (23)</td>
<td>55</td>
<td>72 (22)</td>
<td>30</td>
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<tr>
<td>Concierge</td>
<td>73 (23)</td>
<td>55</td>
<td>72 (22)</td>
<td>30</td>
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<tr>
<td>Luggage Room</td>
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<td>55</td>
<td>72 (22)</td>
<td>--</td>
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<td>--</td>
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<tr>
<td>Bellman’s Desk</td>
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<td>72 (22)</td>
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<td>Neut</td>
<td>--</td>
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<tr>
<td>Valet Desk</td>
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<tr>
<td>Public Restrooms</td>
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<td>72 (22)</td>
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<td>Complimentary Area</td>
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<td>Bar</td>
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<td>72 (22)</td>
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<td>55</td>
<td>72 (22)</td>
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<tr>
<td>Café</td>
<td>73 (23)</td>
<td>55</td>
<td>72 (22)</td>
<td>30</td>
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<tr>
<td>Food Prep/Kitchen</td>
<td>80 (27)</td>
<td>60</td>
<td>68 (20)</td>
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<tr>
<td>Food and Beverage Stor age</td>
<td>78 (26)</td>
<td>60</td>
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<td>--</td>
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<tr>
<td>Location</td>
<td>Summer</td>
<td>Winter</td>
<td>Type</td>
<td>Differentia l</td>
<td>Fresh Air Supply</td>
<td>Exhaust Rate</td>
</tr>
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<td>------------------------</td>
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<tr>
<td></td>
<td>Tdb F(C)</td>
<td>R H% Max</td>
<td>Tdb F(C)</td>
<td>R H% Min</td>
<td>Pos/Neg/Neutral</td>
<td>Inches w.g. (Pa)</td>
</tr>
<tr>
<td>Sundries/Gift Shop</td>
<td>73 (23)</td>
<td>55</td>
<td>72 (22)</td>
<td>--</td>
<td>Neut</td>
<td>--</td>
</tr>
<tr>
<td>Vending Area</td>
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<td>60</td>
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<td>55</td>
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<tr>
<td>Guest Laundry</td>
<td>78 (26)</td>
<td>60</td>
<td>68 (20)</td>
<td>--</td>
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<td>0.02 (5)</td>
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<tr>
<td>Ballrooms</td>
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<td>72 (22)</td>
<td>30</td>
<td>Neut</td>
<td>--</td>
</tr>
<tr>
<td>Meeting Rooms</td>
<td>73 (23)</td>
<td>55</td>
<td>72 (22)</td>
<td>30</td>
<td>Neut</td>
<td>--</td>
</tr>
<tr>
<td>Boardrooms</td>
<td>73 (23)</td>
<td>55</td>
<td>72 (22)</td>
<td>30</td>
<td>Neut</td>
<td>--</td>
</tr>
<tr>
<td>Pre-function Areas</td>
<td>73 (23)</td>
<td>55</td>
<td>72 (22)</td>
<td>30</td>
<td>Pos</td>
<td>0.02 (5)</td>
</tr>
<tr>
<td>Business Center</td>
<td>73 (23)</td>
<td>55</td>
<td>72 (22)</td>
<td>30</td>
<td>Neut</td>
<td>--</td>
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<tr>
<td>Meeting Registration Desk</td>
<td>73 (23)</td>
<td>55</td>
<td>72 (22)</td>
<td>30</td>
<td>Neut</td>
<td>--</td>
</tr>
<tr>
<td>Coat Room</td>
<td>73 (23)</td>
<td>55</td>
<td>72 (22)</td>
<td>30</td>
<td>Neg</td>
<td>0.02 (5)</td>
</tr>
<tr>
<td>Meeting/Ballroom Storage</td>
<td>78 (26)</td>
<td>60</td>
<td>68 (20)</td>
<td>--</td>
<td>Neg</td>
<td>0.02 (5)</td>
</tr>
<tr>
<td>Satellite Pantry</td>
<td>73 (23)</td>
<td>55</td>
<td>72 (22)</td>
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<td>0.02 (5)</td>
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<tr>
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<tr>
<td>Guest Locker Room/Toilets</td>
<td>78 (26)</td>
<td>60</td>
<td>68 (20)</td>
<td>--</td>
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<td>0.02 (5)</td>
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<tr>
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<td>72 (22)</td>
<td>55</td>
<td>69 (20)</td>
<td>--</td>
<td>Neut</td>
<td>--</td>
</tr>
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</tr>
<tr>
<td></td>
<td>Summer</td>
<td>Winter</td>
<td>Type</td>
<td>Differential</td>
<td>Fresh Air Supply</td>
<td>Exhaust Rate</td>
</tr>
<tr>
<td>Tdb (°F)</td>
<td>R H% Max</td>
<td>Tdb (°F)</td>
<td>R H% Min</td>
<td>Pos/Neg/Neut</td>
<td>Inches w.g. (Pa)</td>
<td>CF/M-S F</td>
</tr>
<tr>
<td>Spa[^4]</td>
<td>--</td>
<td>--</td>
<td>--</td>
<td>Neut</td>
<td>--</td>
<td>--</td>
</tr>
<tr>
<td>Elevator</td>
<td>70</td>
<td>55</td>
<td>70</td>
<td>Neut</td>
<td>--</td>
<td>--</td>
</tr>
<tr>
<td>Guestroom Corridor</td>
<td>73 (23)</td>
<td>55</td>
<td>72 (22)</td>
<td>30</td>
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<td>0.02 (5)</td>
</tr>
<tr>
<td>Executive Guestroom Corridor</td>
<td>73 (23)</td>
<td>55</td>
<td>72 (22)</td>
<td>30</td>
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</tr>
<tr>
<td>Ballroom Service Corridor</td>
<td>78 (26)</td>
<td>60</td>
<td>68 (20)</td>
<td>--</td>
<td>Neg</td>
<td>0.02 (5)</td>
</tr>
<tr>
<td>Exit Stairs</td>
<td>N/C N/C</td>
<td>N/C</td>
<td>--</td>
<td>Neut</td>
<td>--</td>
<td>--</td>
</tr>
<tr>
<td>Guestrooms/Suites</td>
<td>73 (23)</td>
<td>55</td>
<td>72 (22)</td>
<td>30</td>
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<td>Guest Bathroom/Dressing Area</td>
<td>73 (23)</td>
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<td>0.02 (5)</td>
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<td>72 (22)</td>
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</tr>
<tr>
<td>Front Offices</td>
<td>73 (23)</td>
<td>55</td>
<td>72 (22)</td>
<td>30</td>
<td>Neut</td>
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</tr>
<tr>
<td>Executive Offices</td>
<td>73 (23)</td>
<td>55</td>
<td>72 (22)</td>
<td>30</td>
<td>Neut</td>
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<td>Sales and Catering Offices</td>
<td>73 (23)</td>
<td>55</td>
<td>72 (22)</td>
<td>30</td>
<td>Neut</td>
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<td>Accounting Offices</td>
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<td>55</td>
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<td>30</td>
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</tr>
<tr>
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<td>73 (23)</td>
<td>55</td>
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<td>30</td>
<td>Neut</td>
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<tr>
<td>Office</td>
<td>73 (23)</td>
<td>55</td>
<td>72 (22)</td>
<td>30</td>
<td>Neut</td>
<td>--</td>
</tr>
<tr>
<td>Employee Dining/Break Room</td>
<td>73 (23)</td>
<td>55</td>
<td>72 (22)</td>
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<td>0.02 (5)</td>
</tr>
<tr>
<td>Location</td>
<td>Internal Conditions</td>
<td>Pressure Relationships</td>
<td>Ventilation Air Quantity</td>
<td>Acoustical Rating</td>
<td></td>
<td></td>
</tr>
<tr>
<td>----------------------------------------</td>
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<tr>
<td></td>
<td>Summer</td>
<td>Winter</td>
<td>Type</td>
<td>Differential</td>
<td>Fresh Air Supply</td>
<td>Exhaust Rate</td>
</tr>
<tr>
<td></td>
<td>Tdb F(C)</td>
<td>R H% Max</td>
<td>Tdb F(C)</td>
<td>R H% Min</td>
<td>Pos/Neg/Neutr</td>
<td>Inches w.g. (Pa)</td>
</tr>
<tr>
<td>Employee Locker Room/Toilets</td>
<td>78 (26)</td>
<td>60</td>
<td>68 (20)</td>
<td>--</td>
<td>Neg</td>
<td>0.02 (5)</td>
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<td>On-site and Off-site Housing</td>
<td>73 (23)</td>
<td>55</td>
<td>72 (22)</td>
<td>--</td>
<td>Neutr</td>
<td>--</td>
</tr>
<tr>
<td>Service Pantry</td>
<td>73 (23)</td>
<td>55</td>
<td>72 (22)</td>
<td>--</td>
<td>Neg</td>
<td>0.02 (5)</td>
</tr>
<tr>
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<td>0.02 (5)</td>
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<tr>
<td>Engineering/Maintenance Shop</td>
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<tr>
<td>Storage Rooms</td>
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<td>0.02 (5)</td>
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<tr>
<td>Receiving Area</td>
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<td>--</td>
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<td>0.02 (5)</td>
</tr>
<tr>
<td>Receiving Office</td>
<td>73 (23)</td>
<td>55</td>
<td>72 (22)</td>
<td>--</td>
<td>Pos</td>
<td>--</td>
</tr>
<tr>
<td>Security Dispatch Office</td>
<td>73 (23)</td>
<td>55</td>
<td>72 (22)</td>
<td>--</td>
<td>Neutr</td>
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</tr>
<tr>
<td>Service Corridor</td>
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<td>60</td>
<td>68 (20)</td>
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<td>0.02 (5)</td>
</tr>
<tr>
<td>Mechanical Rooms</td>
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<td>N/C</td>
<td>N/C</td>
<td>--</td>
<td>Neutr</td>
<td>--</td>
</tr>
<tr>
<td>Electrical Rooms</td>
<td>N/C</td>
<td>N/C</td>
<td>N/C</td>
<td>--</td>
<td>Neut</td>
<td>--</td>
</tr>
<tr>
<td>Telecom Closets</td>
<td>80 (27)</td>
<td>55</td>
<td>68 (20)</td>
<td>--</td>
<td>Neut</td>
<td>--</td>
</tr>
<tr>
<td>Computer/Telecom Room</td>
<td>72 (22)</td>
<td>50</td>
<td>72 (22)</td>
<td>30</td>
<td>Neut</td>
<td>--</td>
</tr>
<tr>
<td>Trash Compactor/Container</td>
<td>N/C</td>
<td>N/C</td>
<td>N/C</td>
<td>--</td>
<td>Neg</td>
<td>0.02 (5)</td>
</tr>
<tr>
<td>Refrigerated Trash Room</td>
<td>50 (10)</td>
<td>60</td>
<td>50 (10)</td>
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<td>Neg</td>
<td>0.02 (5)</td>
</tr>
<tr>
<td>Location</td>
<td>Internal Conditions</td>
<td>Pressure Relationships</td>
<td>Ventilation Air Quantity</td>
<td>Acoustical Rating</td>
<td></td>
<td></td>
</tr>
<tr>
<td>-----------------------</td>
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<td>--------------------------</td>
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<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Summer</td>
<td>Winter</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Tdb (F(C))</td>
<td>R H% Max</td>
<td>Tdb (F(C))</td>
<td>R H% Min</td>
<td>Pos/Neg/Neut</td>
<td>Inches w.g. (Pa)</td>
<td>CF/M-SF (L/S-SM)</td>
</tr>
<tr>
<td>Recycle Storage Room</td>
<td>N/C</td>
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<td>--</td>
<td>Neg</td>
<td>0.02 (5)</td>
<td>--</td>
</tr>
<tr>
<td>Can Wash</td>
<td>N/C</td>
<td>N/C</td>
<td>--</td>
<td>Neg</td>
<td>0.02 (5)</td>
<td>--</td>
</tr>
</tbody>
</table>

1) Internal environmental conditions are +/- 2 F (1 C), and +/- 5% RH.

2) Pressure relationships identified are with respect to adjacent areas. For buildings located in warm, humid climates, overall building pressure must be positive with respect to outdoors to at least 5 pascals. For cold climates, overall building pressure must be neutral with respect to outdoors with adequate consideration for vapor transmission through the envelope to prevent moisture damage. For mixed climates (warm humid summer and cold winters), overall building pressures must be slightly positive in summer season and neutral in winter season, with respect to outdoors.

3) Ventilation rates are based upon the latest ASHRAE Standard 62.1 using default occupancy values, and have other indoor air quality requirements that are included in the standard. Actual occupancy rates can be used if known.

4) Spa interior conditions must comply with the Spa management design criteria.

5) Exhaust rates shown are for each fixture.

6) Where exhaust rates are not indicated, but negative relationships are desired, adjust exhaust air quantity for the pressure differential shown.

7) Provide combustion air for all fuel fired appliances that complies with the requirements of their listing, all local codes and ordinances.

8) Fresh air must be pre-conditioned before being distributed.

9) Ventilation rates are based upon the latest ASHRAE Standard 62.1 using default occupancy values, and have other indoor air quality requirements that are included in the standard. Actual occupancy rates can be used if known.
   a. The barrier must preclude ETS from transferring to non-ETS areas. Pressure relationships must be maintained so that the ETS areas are maintained at least -2.5 pascals (-0.01-inches water gage) with respect to the non-ETS areas.
   b. Signage must be included to warn guests when they are entering ETS areas. Signage must have notation that includes: “This Area May Contain Environmental Tobacco Smoke”.
   c. For guest rooms, selection of finishes may be altered to minimize absorption of smoking odors and ease of maintenance. Alternative gas phase filtration may be included as part of the guest room air conditioning.
   d. Submit all ETS area design information for review and approval by Hilton.

Abbreviations: Pos = Positive, Neut = Neutral, Neg = Negative, N/C = Not Conditioned, Tdb = Dry Bulb Temperature, Twb = Wet Bulb Temperature, RH = Relative Humidity, F = degrees F, C = degrees C, CF/M-SF = Cubic Feet per Minute per square foot, L/S-SM = Liters per second per square meter, Pa = Pascals, Inches w. g. = Inches water gage, NR = Noise Rating = Leq = equivalent continuous sound level in dBA, MERV = Minimum Efficiency Reporting Value per ASHRAE Standard 52.2.
2514.06.A.2 The system type and design capacity must be determined based on the standards required by Hilton Architecture and Construction, ASHRAE, national and local codes whichever is more stringent.

2514.06.A.3 Provide complete calculations and written confirmation that the design of the variable refrigerant system (VRF) complies with the latest ANSI/ASHRAE standard 15, Safety Standards for Refrigeration Systems, and ANSI/ASHRAE standard 34, Designation and Safety Classification of Refrigerants (www.ansi.org, www.ashrae.org).

2514.06.A.4 Do not use systems that require summer/winter changeover of heating/cooling capacity.

2514.06.A.5 Do not use through-wall type units (PTAC/VTAC).

2514.06.A.6 Design all HVAC systems to comply with the latest ASHRAE Standard 90.1 (www.ashrae.org) or an equivalent standard. Submit written compliance forms to Hilton for review.

2514.06.A.7 Refrigeration System Safety:
   2514.06.A.7.a Design all refrigeration systems and machinery rooms to comply with ASHRAE Standards 15 and 34, EN-378 or equivalent local codes and standards.
   2514.06.A.7.b For variable refrigerant flow systems that use R-410a in guestrooms the room volume calculations must include the following requirements:
      2514.06.A.7.b.1 Room volume must be reduced from the entire floor-to-ceiling measurement, and calculated base upon the floor-to bed-height or 3'0"/900 mm, whichever is higher.
      2514.06.A.7.b.2 Room volume must exclude the toilet room.
      2514.06.A.7.b.3 Room volume must exclude the volume of any fixed or portable case work.
      2514.06.A.7.b.4 Disregard any exhaust air flow out of the toilet room and any supply air into the guestroom from other ventilation systems.
      2514.06.A.7.b.5 Not Applicable to this Brand
      2514.06.A.7.b.6 Refrigerant piping must not be routed in egress corridors where accidental discharge may occur.
      2514.06.A.7.b.7 When the above requirements are unobtainable, an alarming device must be provided within each guestroom for detection of a refrigerant leak. In no case must the audible alarm be less than 75 dBA at the pillow level in all guestrooms, with intervening doors closed during the alarm.
   2514.06.A.7.c Submit written documentation that indicates compliance with the safety codes for review by Hilton.

2514.06.A.8 Do not use ceiling cassette units or high wall-mount units in guest rooms or public spaces. Equipment must be completely concealed.

2514.06.B HVAC System General Requirements

2514.06.B.1 Air Handling Equipment and Devices:
   2514.06.B.1.a Not Applicable to this Brand
2514.06.B.1.b Install all HVAC equipment with adequate space for circulation and access for maintenance. Do not install air-handling units, fan coil units, and mechanical equipment requiring regular maintenance above gypsum board or inaccessible ceilings. Service access of non-guest area equipment must not be from guest areas.

2514.06.B.1.c Protect all air handling devices having internal insulation with foil facings or double-wall construction.

2514.06.B.1.d Fabricate cooling coil condensate drain pans from non-corrosive materials.

2514.06.B.1.e Controls
   2514.06.B.1.e.1 Provide electric silent two-position or modulating motorized valve actuators that are replaceable without valve removal.
   2514.06.B.1.e.2 Provide silent type relays in guestroom devices.

2514.06.B.1.f Filtration
   2514.06.B.1.f.1 Unless more stringent local codes require it, provide minimum single-stage MERV 8 filtration (or equivalent) for recirculating equipment. Provide minimum MERV 12 filtration (or equivalent) for air handling equipment used to condition and supply ventilation air.
   2514.06.B.1.f.2 Provide fully synthetic media that does not allow microbial growth when wetted.

2514.06.B.2 Use only rigid metallic ductwork for supply air, outdoor air and exhaust systems. Flex ductwork is allowed for a maximum distance of 8'-0”/2.4 m between rigid duct and diffuser/grille.

2514.06.B.3 Use duct liner only where required for acoustic needs using closed-cell elastomeric material that complies with ASTM C1534-07-E1 (www.astm.org).

2514.06.B.4 Provide non-adjustable temperature sensors located to effectively control the temperature in all conditioned areas. Thermostats in fitness center, individual meeting rooms and boardrooms must be adjustable by guests.

2514.06.B.5 Not Applicable to this Brand

2514.06.B.6 Screen all rooftop and ground mounted equipment from street views. Locate equipment to avoid increased noise levels in adjacent guestrooms.

2514.06.B.7 Provide a complete fully automated monitoring and dosing water treatment system for open loop systems, and chemical feed capacity for closed loop systems.

2514.06.B.8 Design all gas or oil fired equipment rooms to comply with the latest NFPA 54, NFPA 58, NFPA 31, or equivalent local codes and standards.

2514.06.B.9 HVAC Piping
   2514.06.B.9.a Avoid exposed piping in all areas but mechanical spaces.
   2514.06.B.9.b Conceal all piping, except in mechanical spaces, to complement adjacent finishes.
   2514.06.B.9.c Insulate all chilled water and condensate drain piping using closed-cell insulation products that comply with the latest ASTM C534 or ASTM C522-03 (www.astm.org). Select insulation thickness per the latest ASHRAE Handbook of Fundamentals, Chapter 23 (www.ashrae.org).
   2514.06.B.9.d Do not use polyvinyl chloride (PVC) and chlorinated polyvinyl chloride (CPVC) piping systems.
   2514.06.B.9.e Provide full port ball valves and butterfly valves for isolation and shut off service. Gate valves are not allowed.
   2514.06.B.9.f Install unions and isolation valves on supply and return connections at each air-handling device.
2514.06.B.9.g Provide riser isolation and drain valves to minimize disruption of guestroom services during failures.
2514.06.B.9.h Provide a means for balancing and maintaining water flows at each device and distribution loop.
2514.06.B.9.i Provide a means for air elimination and removal from the system and at each terminal device.

2514.06.C Building Automation System

   Building Automation System (BAS):
   2514.06.C.1 General: Provide direct digital control and monitoring of all guest and back of house area HVAC systems, using an open protocol type BAS.
   2514.06.C.1.a The BAS must be capable of interface with HVAC system control panels, lighting control panels, energy use panels, electrical power supplies, property management systems, and fire and life safety systems.
   2514.06.C.1.b Provide backup power to the BAS to remain available during loss of utility power supply.
   2514.06.C.2 Provide third-party (independent of the Architecture and Construction team) commissioning agent for all guest area and back of house HVAC systems that comply with ASHRAE Guideline 1.1-2007 (www.ashrae.org).

2514.06.D Water Chillers and Chilled Water Distribution

   2514.06.D.1 Provide Underwriters Laboratories (or recognized equivalent)-listed chiller that complies with the latest pressure vessel design and construction standards for both refrigerant and waterside heat exchangers.
   2514.06.D.2 Rate per the latest ARI Standard (or recognized equivalent) and provide minimum of two chillers, with system sized to allow at least 75 percent of design capacity with one chiller not operable.
   2514.06.D.3 Not Applicable to this Brand
   2514.06.D.4 Acceptable Refrigerants are R-134a, R-407, R-410, and R-123. Comply with Montreal Protocol for phase-out compliance of refrigerants.
   2514.06.D.5 Select unit efficiencies that comply with national and local energy code requirements or the latest ASHRAE Standard 90.1 (www.ashrae.com) pending review by Hilton for exceptions.
   2514.06.D.7 Cooling Towers
      2514.06.D.7.a Select cooling towers based upon 0.4 percent wet bulb/mean coincident dry bulb (WB/MCDB) ASHRAE climate conditions.
      2514.06.D.7.b Galvanized steel construction is not allowed in coastal environments.
      2514.06.D.7.c Select tower locations to avoid noise or transmitted vibration that affects the guestrooms or guest areas.
      2514.06.D.7.d Locate cooling towers where re-entrainment of tower plume will not affect other air handling systems.
   2514.06.D.8 Specification of chillers shall be solely based upon performance criteria. Do not specify chillers by type of technology.

2514.06.E Ventilation Air

   2514.06.E.1 General
      2514.06.E.1.a Design ventilation air systems to comply with the latest ASHRAE Standard 62.1, Ventilation for Acceptable Indoor Air Quality (www.ashrae.org) and local codes.
2514.06.E.1.b Distribute conditioned ventilation air directly into each guestroom. Operable windows are not allowed as the primary means of guestroom ventilation.

2514.06.E.1.c Not Applicable to this Brand

2514.06.E.1.d Package terminal air conditioned units (PTAC) and fan coils are not acceptable for providing ventilation air.

2514.06.E.1.e Dedicated ventilation air equipment must be specifically designed to allow the ventilation air to be supplied at room neutral conditions.

2514.06.E.1.f Not Applicable to this Brand

2514.06.E.1.g Provide building air balance calculations to Hilton for review and approval.

2514.06.E.2 Dedicated Ventilation Air Equipment Selection

2514.06.E.2.a Select ventilation air units to offset any continuous bathroom exhaust air quantity, any other exhaust air from the corridors, plus air flow to maintain pressure relationships identified in the Environmental Conditions matrix. If prevailing winds will affect building pressurization, this must be taken into account in determining building air balance calculations and air quantity for pressurization.

2514.06.E.2.b Design Criteria

2514.06.E.2.b.1 Summer

2514.06.E.2.b.1.a Outdoor Conditions: Select ventilation air entering air temperature (EAT) for cooling based on ASHRAE 0.4 percent summer design Dehumidification [dew point/mean coincident dry bulb (DP/MCDB)] and Humidity Ratio (HR) (www.ashrae.org).

2514.06.E.2.b.1.b Discharge Air Conditions: Select the cooling coil to produce 55 °F DB/12.8 °C DB leaving air temperature and reheat to approximately 68 °F DB/20 °C if for corridor distribution or 70 °F DB/21 °C DB if supplied directly into guestroom.

2514.06.E.2.b.2 Winter

2514.06.E.2.b.2.a Select EAT for heating based on ASHRAE Annual Extreme Daily Mean Dry Bulb (MDB) Minimum winter design temperature (not Heating DB at 99.6 or 99 percent) (www.ashrae.org).

2514.06.F Dedicated Ventilation Air Units

2514.06.F.1 Provide ETL or Underwriters Laboratories (www.ul.com) listed equipment, or similar recognized agency that complies with local code requirements. Rate per ARI Standards or equivalent refrigeration standards agency.

2514.06.F.2 Provide preheat, cooling, dehumidification, humidification and reheat sections.

2514.06.F.2.a Humidification Requirement: Provide ventilation air units in ASHRAE (www.ashrae.org) Climate Zones 7 and 8 with humidification capability to comply with the Environmental Conditions Matrix included in the beginning of this Section.

2514.06.F.3 Wall construction must be double-wall insulated type.

2514.06.F.4 Condensate drain pans must be insulated, stainless steel and corrosion-resistant construction.

2514.06.F.5 Provide spacer for temperature sensor between cooling and reheat coils or means of coil temperature measurement via suction pressure sensing device.

2514.06.F.6 Provide special filter support structure to prevent moisture laden filter collapse.
2514.06.F.7 Direct-Expansion (DX) Ventilation Air Units
2514.06.F.7.a Refrigeration
2514.06.F.7.a.1 Provide a minimum of two independent cooling circuits for units up through nominal 30 tons (105 kW) and at least three independent cooling circuits for larger units.
2514.06.F.7.a.2 Provide cooling coil refrigeration circuiting with an intertwined arrangement. Face or horizontal split coil arrangement is not acceptable.
2514.06.F.7.a.3 Provide digital scroll lead compressor or include hot-gas re-injection (by-pass) on the lead refrigerant circuit.
2514.06.F.7.a.4 Provide hot-gas reheat coil, complete with modulating refrigerant valve, downstream of cooling coil, with spacer for temperature sensor between cooling and reheat coil. Do not use systems utilizing sub-cooler reheat circuits. Fuel gas or electric reheat is not allowed.
2514.06.F.7.a.5 Provide dehumidification refrigeration circuit if the outdoor ambient design humidity ratio is more than 100 grains/lb./14.3 g/kg or in those areas with annual rainy seasons. Do not use systems utilizing sub-cooler reheat circuits.
2514.06.F.7.a.6 Provide make-up air units in ASHRAE (www.ashrae.org) defined cold climates with humidification capability to comply with the Environmental Requirements included in the beginning of this section.

2514.06.F.7.b Gas Heating
2514.06.F.7.b.1 Provide a stainless steel heat exchanger.
2514.06.F.7.b.2 Provide minimum four-stage or modulating (minimum 3:1 turndown) control for heating.
2514.06.F.7.c Electric Heating: Provide with minimum four-stage control or SCR (saturated core reactor) modulating controls.
2514.06.F.7.d Use factory-mounted controls that provide continuous heating, cooling, and dehumidification of outside air using discharge air temperature control scheme, with space temperature reset control capability.

2514.06.F.8 Access panels must be hinged and use latches that do not require the use of tools to open.

2514.07 Plumbing
2514.07.A Plumbing Piping
2514.07.A.1 Domestic water storage, drainage systems, hot and cold piping material selections and system design must comply with national and local code requirements. For those locations without code requirements, contact Hilton for acceptable minimum code requirements.
2514.07.A.2 Mexico: Provide a fully automated domestic water monitoring, filtration and dosing system for potable water storage tanks. Treatment system must be capable to condition, filter and supply water to WHO or EPA standards.
2514.07.A.3 Do not use polyvinyl chloride (PVC) or polybutylene materials for potable water.

2514.07.B Valve Requirements
2514.07.B.1 Install unions and isolation valves on domestic water supply and return connections at each riser or horizontal distribution header.
2514.07.B.2 Provide isolation or stop valves at each plumbing fixture.
2514.07.B.3 Provide full port ball valves or butterfly valves for isolation or shut-off service.

2514.07.C Floor Cleanouts
   Locate floor cleanouts outside of normal foot traffic in all public and back-of-house areas.

2514.07.D Backflow Prevention Devices
   Install suitable backflow prevention devices on all potable water systems.

2514.07.E Grease, Oil & Sand Traps
   Locate grease, oil or sand traps in the back-of-house or service areas where the devices must be serviced without disrupting normal operations and out of site of normal guest activities.

2514.07.F Domestic Hot Water Generating System
   2514.07.F.1 Provide hot water production during all normal operating flow regimes.
   2514.07.F.2 Select system types, storage and heaters that will provide stable water temperature during all flow conditions, and recirculation system for on-demand hot water in guestrooms.
   2514.07.F.3 Select system equipment that provides for 100 percent design heating capacity with one heater out of service.
   2514.07.F.4 For systems that use separate heaters and storage to meet demand, provide at least two storage tanks for maintenance.
   2514.07.F.5 Design all domestic hot water systems to comply with ASHRAE Standard 90.1-2007 (www.ashrae.com) or an equivalent standard. Submit written compliance forms to Hilton for review.
   2514.07.F.6 Commission the hot water generating system, using a third-party (independent of the design and construction team) and comply with ASHRAE Guideline 1.1-2007 (www.ashrae.org).
   2514.07.F.7 Hot water is to be stored at no less than 140° F/60° C and delivered to guest accessible outlets at no less than 113° F/45° C.

2514.07.G Not Applicable to this Brand

2514.07.H Commercial Grade Plumbing Fixtures
   Provide commercial grade quality plumbing fixtures for all public and back-of-house areas.

2514.08 Electrical
   2514.08.A NFPA 70 Adherence
      Comply with applicable edition of NFPA 70 (www.nfpa.org) and all national or local codes.
   2514.08.B Light Fixture Safety Listing Requirements
      All lighting fixtures must have a safety listing as provided by a nationally recognized testing laboratory, e.g. CE, ETL, ISI, UL, VDE. Any other safety listings on any light fixture (plug-in or hardwired) will need to have undergone the equivalent ASTM testing that would have been required to achieve a UL listing, approval by the local authority having jurisdiction, and that the property insurance will not be in jeopardy by use of this labeling.
   2514.08.C Power Supply
2514.08.C.1 In locations where replacement transformers are not available within 24 hours, provide redundant primary transformers that have 100 percent building load capacity for each transformer.

2514.08.C.2 Provide main switchboard with provisions that will allow scheduled maintenance on main switchgear without hotel power interruption. **Canada | United States:** Not Applicable to this Brand

2514.08.C.3 In areas where normal power sources are interrupted more than once per day, provide either full on-site power or two sources of utility supplied power.

2514.08.C.4 In the event of loss of standard electrical power, an Emergency Power Supply (EPS) must provide power to the following systems as a minimum:

- **2514.08.C.4.a** Computer room cooling system and equipment.
- **2514.08.C.4.b** Computer equipment located at the front desk, PBX and administrative areas including key encoders.
- **2514.08.C.4.c** One meeting room (full power and lighting) designated as an Emergency Command Center.
- **2514.08.C.4.d** General manager and security offices' computers and telephones.
- **2514.08.C.4.e** One walk-in freezer and one walk-in refrigerator.
- **2514.08.C.4.f** One exhaust fan over cooking line in main kitchen.
- **2514.08.C.4.g** All lighted steps within the restaurant/lobby.
- **2514.08.C.4.h** Sump pumps
- **2514.08.C.4.i** Sewer lift stations
- **2514.08.C.4.j** Pool light
- **2514.08.C.4.k** All cash stations
- **2514.08.C.4.l** Minimum lighting in engineering control room.

2514.08.C.5 Locate primary power switchgear in locations where it will not flood.

2514.08.C.6 Provide separate sub-meters for guestroom tower, food service, laundry, central plant and retail spaces.

2514.08.C.7 Main panels must be form 4 type minimum with distribution board as form 2. Incoming supplies must be by a minimum of two transformers capable of providing changeover and load share.

2514.08.D Not Applicable to this Brand

2514.08.E Copper Conductors

- Use copper conductors. Aluminum branch and feeder wiring is only allowed on circuits 100 amp and larger, subject thermal imaging to confirm proper termination.

2514.08.F Panels and Service Equipment

- **2514.08.F.1** Install only in non-public and protected service areas. Mechanical or linen room locations are allowed as long as they are not subject to water piping and have adequate clearances that will not be compromised by storage of other materials.

- **2514.08.F.2** Provide securable panel covers and circuit interrupting devices that can be locked and tagged out.
2514.08.G Outlet Devices
2514.08.G.1 Install at least 6"/150 mm above the finished floor.
2514.08.G.2 Install at least 50'0"/15.0 m on center, maximum, in all guest and service corridors.
2514.08.G.3 The use of extension cords or power strips, even if surge protected, is not allowed.
2514.08.G.4 All hardware components of the Property Management System must be plugged directly into a power outlet (socket outlet) on a dedicated and ground circuit.
2514.08.G.5 All UPS outlets must be of a different color and, where allowed, a different style compared to normal outlets. Outlets must be clearly labeled.

2514.08.H Raceways/Conduits
2514.08.H.1 Conceal all raceways and/or conduit in public, finished back-of-house and guest areas.
2514.08.H.2 Exposed raceways and/or conduit are only allowed in unfinished service corridors, mechanical or electrical spaces, and parking garages.
2514.08.H.3 Not Applicable to this Brand

2514.08.I Minimum Foot-Candles/Lux Levels

The following table represents the minimum foot-candles/lux levels required within all properties, unless otherwise noted. In the event an area is not listed below, reference the most current version of the Illuminating Engineering Society guidelines (www.ies.org), local codes and/or a professional third party lighting consultant for guidance. Exterior lighting must reference local codes & lighting zone 0-4, fixture BUG ratings requirements IES CH26 Exterior lighting guidelines. Additional requirement lighting requirements can be found in the Fire & Life Safety Section 2516.05.F Egress Lighting.

<table>
<thead>
<tr>
<th>Area</th>
<th>Horiz Spec FC/Lux</th>
<th>Horiz. Measure Location at</th>
<th>Horiz Gauge</th>
<th>Vertical FC/Lux</th>
<th>Vertical Measure Location at</th>
<th>Vertical Gauge</th>
<th>Light source Kelvin color temperature Maximum.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Surface Parking Areas</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Drive Entrances/Porte Cochere</td>
<td>10 / 100</td>
<td>grade</td>
<td>Avg</td>
<td>n/a</td>
<td>n/a</td>
<td>n/a</td>
<td>4000</td>
</tr>
<tr>
<td>Drive Lanes</td>
<td>1 / 10</td>
<td>grade</td>
<td>Avg</td>
<td>2 / 20</td>
<td>5' AFG</td>
<td>Avg</td>
<td>5000</td>
</tr>
<tr>
<td>Parking Stalls</td>
<td>1 / 10</td>
<td>grade</td>
<td>Avg</td>
<td>2 / 20</td>
<td>5' AFG</td>
<td>Avg</td>
<td>5000</td>
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<tr>
<td>Parking Structures</td>
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<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Entrances - Canopied</td>
<td>5 / 50</td>
<td>grade</td>
<td>Avg</td>
<td>2 / 20</td>
<td>5' AFG</td>
<td>Avg</td>
<td>4000</td>
</tr>
<tr>
<td>Drive Lanes</td>
<td>5 / 50</td>
<td>grade</td>
<td>Avg</td>
<td>n/a</td>
<td>n/a</td>
<td>n/a</td>
<td>5000</td>
</tr>
<tr>
<td>Parking Stalls</td>
<td>5 / 50</td>
<td>grade</td>
<td>Avg</td>
<td>n/a</td>
<td>n/a</td>
<td>n/a</td>
<td>5000</td>
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<tr>
<td>Outdoor Miscellaneous</td>
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<td></td>
<td></td>
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<tr>
<td>Exterior Paths &amp; Walkways</td>
<td>1 / 10</td>
<td>grade</td>
<td>Avg</td>
<td>n/a</td>
<td>n/a</td>
<td>n/a</td>
<td>4000</td>
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<tr>
<td>Guest Areas - Lobby</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Area</td>
<td>Width</td>
<td>Length</td>
<td>Typical</td>
<td>Avg Width</td>
<td>Avg Length</td>
<td>Typical Count</td>
<td>Avg Width</td>
</tr>
<tr>
<td>--------------------------------------------------</td>
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<td>------------</td>
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<td>-----------</td>
</tr>
<tr>
<td>Lobby Entrance (day)</td>
<td>10 / 100</td>
<td>floor</td>
<td>Avg 3 / 30</td>
<td>5' AFF</td>
<td>Avg</td>
<td>3000</td>
<td></td>
</tr>
<tr>
<td>Lobby Entrance (night)</td>
<td>5 / 50</td>
<td>floor</td>
<td>Avg 2 / 20</td>
<td>5' AFF</td>
<td>Avg</td>
<td>3000</td>
<td></td>
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<tr>
<td>Service Desks (Registration, Concierge etc)</td>
<td>20 / 200</td>
<td>top desk</td>
<td>Avg 5 / 50</td>
<td>top desk</td>
<td>Avg</td>
<td>3000</td>
<td></td>
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<tr>
<td>Lobby Guest Circulation</td>
<td>2 / 20</td>
<td>floor</td>
<td>Avg n/a</td>
<td>n/a</td>
<td>n/a</td>
<td>n/a</td>
<td>3000</td>
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<tr>
<td>Guestroom Corridor at Guestroom Entrance - Under Door</td>
<td>10 / 100</td>
<td>floor under door lock</td>
<td>Avg n/a</td>
<td>n/a</td>
<td>n/a</td>
<td>n/a</td>
<td>3000</td>
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<tr>
<td>Guestroom Corridor at Guestroom Entrance - door lock</td>
<td>15 / 150</td>
<td>door Lock</td>
<td>Avg n/a</td>
<td>n/a</td>
<td>n/a</td>
<td>n/a</td>
<td>3000</td>
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<tr>
<td>Guestroom Corridor Middle</td>
<td>2 / 20</td>
<td>floor</td>
<td>Min 2 / 20</td>
<td>5' AFF</td>
<td>Avg</td>
<td>3000</td>
<td></td>
</tr>
<tr>
<td>Restrooms (inside partitions)</td>
<td>5 / 50</td>
<td>floor</td>
<td>Avg 3 / 30</td>
<td>3-5' AFF</td>
<td>Avg</td>
<td>4000</td>
<td></td>
</tr>
<tr>
<td>Restrooms (countertop)</td>
<td>15 / 150</td>
<td>at counter top</td>
<td>Avg 20 / 200</td>
<td>3-5' AFF</td>
<td>Avg</td>
<td>4000</td>
<td></td>
</tr>
<tr>
<td>Exit Stairs (typical)</td>
<td>5 / 50</td>
<td>floor</td>
<td>Avg 3 / 30</td>
<td>5' AFF</td>
<td>Avg</td>
<td>4000</td>
<td></td>
</tr>
<tr>
<td>Elevators - lobby</td>
<td>5 / 50</td>
<td>floor</td>
<td>Avg 3 / 30</td>
<td>5' AFF</td>
<td>Avg</td>
<td>4000</td>
<td></td>
</tr>
<tr>
<td>Elevators - cab interior</td>
<td>5 / 50</td>
<td>floor</td>
<td>Avg 3 / 30</td>
<td>5' AFF</td>
<td>Avg</td>
<td>4000</td>
<td></td>
</tr>
<tr>
<td>Food and Beverage Outlets</td>
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<td></td>
<td></td>
<td></td>
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<td></td>
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<tr>
<td>Dining - Casual</td>
<td>10 / 100</td>
<td>table</td>
<td>Avg 5 / 50</td>
<td>4' AFF</td>
<td>Avg</td>
<td>3000</td>
<td></td>
</tr>
<tr>
<td>Dining - Fine</td>
<td>3 / 30</td>
<td>table</td>
<td>Avg 1 / 10</td>
<td>4' AFF</td>
<td>Avg</td>
<td>2700</td>
<td></td>
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<tr>
<td>Dining - 3 meal breakfast</td>
<td>10 / 100</td>
<td>table</td>
<td>Avg 3 /30</td>
<td>4' AFF</td>
<td>Avg</td>
<td>3000</td>
<td></td>
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<tr>
<td>Dining - 3 meal lunch</td>
<td>5 / 50</td>
<td>table</td>
<td>Avg 2 / 20</td>
<td>4' AFF</td>
<td>Avg</td>
<td>3000</td>
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<tr>
<td>Dining - 3 meal dinner</td>
<td>3 / 30</td>
<td>table</td>
<td>Avg 1 / 10</td>
<td>4' AFF</td>
<td>Avg</td>
<td>3000</td>
<td></td>
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<tr>
<td>Café / Grab &amp; Go</td>
<td>10 /100</td>
<td>table</td>
<td>Avg 3 / 30</td>
<td>4' AFF</td>
<td>Avg</td>
<td>3000</td>
<td></td>
</tr>
<tr>
<td>Lounge / Bar</td>
<td>4 / 40</td>
<td>bar top</td>
<td>Avg 1.5 / 3</td>
<td>3-5' AFF</td>
<td>Avg</td>
<td>2700</td>
<td></td>
</tr>
<tr>
<td>Lounge - Bar</td>
<td>10 / 100</td>
<td>table</td>
<td>Avg 5.5 / 11</td>
<td>5' AFF</td>
<td>Avg</td>
<td>2700</td>
<td></td>
</tr>
<tr>
<td>Lounge - Reading / Work Areas</td>
<td>15 / 150</td>
<td>table</td>
<td>Avg 5.5 / 11</td>
<td>4' AFF</td>
<td>Avg</td>
<td>2700</td>
<td></td>
</tr>
<tr>
<td>Lounge - Social / Waiting Areas</td>
<td>10 /100</td>
<td>floor</td>
<td>Avg 5.5 / 11</td>
<td>5' AFF</td>
<td>Avg</td>
<td>2700</td>
<td></td>
</tr>
<tr>
<td>Executive Lounge</td>
<td>10 /100</td>
<td>table</td>
<td>Avg 3 / 30</td>
<td>4' AFF</td>
<td>Avg</td>
<td>3000</td>
<td></td>
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<tr>
<td>Commercial Facilities</td>
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<td></td>
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<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Specialty retailer - circulation</td>
<td>15 / 150</td>
<td>floor</td>
<td>Avg 5 / 50</td>
<td>5' AFF</td>
<td>Avg</td>
<td>4000</td>
<td></td>
</tr>
<tr>
<td>Specialty retailer - general retail</td>
<td>40 / 400</td>
<td>floor</td>
<td>Avg 15 / 150</td>
<td>3-5' AFF</td>
<td>Avg</td>
<td>4000</td>
<td></td>
</tr>
<tr>
<td>Service Type</td>
<td>Units / Floors</td>
<td>Area</td>
<td>Avg</td>
<td>3-5' AFF</td>
<td>Avg</td>
<td>Cost</td>
<td></td>
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<tr>
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<tr>
<td>Specialty retailer - feature displays</td>
<td>120 / 1200</td>
<td>floor</td>
<td>Avg</td>
<td>75 / 750</td>
<td>3-5' AFF</td>
<td>4000</td>
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<tr>
<td>Specialty retailer - Perimeter</td>
<td>na</td>
<td>na</td>
<td>na</td>
<td>40 / 400</td>
<td>5' AFF</td>
<td>4000</td>
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<tr>
<td>Business Center - Computer</td>
<td>15 / 150</td>
<td>table</td>
<td>Avg</td>
<td>5 / 50</td>
<td>3' AFF</td>
<td>3000</td>
<td></td>
</tr>
<tr>
<td>Business Center - Print Area</td>
<td>30 / 300</td>
<td>table</td>
<td>Avg</td>
<td>7.5 / 75</td>
<td>3' AFF</td>
<td>3000</td>
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<tr>
<td>Business Center - Informal Mtg Area</td>
<td>7.5 / 75</td>
<td>table</td>
<td>Avg</td>
<td>4 / 40</td>
<td>4' AFF</td>
<td>3000</td>
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<tr>
<td>Guest Laundry</td>
<td>30 / 300</td>
<td>floor</td>
<td>Avg</td>
<td>15 / 150</td>
<td>3-5' AFF</td>
<td>4000</td>
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<tr>
<td>Vending Room / Ice Room</td>
<td>10 / 100</td>
<td>floor</td>
<td>Avg</td>
<td>10 / 100</td>
<td>3-5' AFF</td>
<td>4000</td>
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<tr>
<td>SPA - Treatment Rooms</td>
<td>1 / 10</td>
<td>floor</td>
<td>Avg</td>
<td>n/a</td>
<td>n/a</td>
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<tr>
<td>SPA - Changing Rooms</td>
<td>5 / 50</td>
<td>floor</td>
<td>Avg</td>
<td>10 / 100</td>
<td>5' AFF</td>
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<td></td>
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<tr>
<td>SPA - Make-up Stations</td>
<td>30 / 300</td>
<td>floor</td>
<td>Avg</td>
<td>30 / 300</td>
<td>4' AFF</td>
<td>2700</td>
<td></td>
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<tr>
<td>SPA - Manicures (hand rest)</td>
<td>50 / 500</td>
<td>hand rest</td>
<td>Avg</td>
<td>15 / 150</td>
<td>4' AFF</td>
<td>2700</td>
<td></td>
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<tr>
<td>SPA - Pedicures (foot rest)</td>
<td>50 / 500</td>
<td>foot rest</td>
<td>Avg</td>
<td>15 / 150</td>
<td>4' AFF</td>
<td>2700</td>
<td></td>
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<tr>
<td>SPA - Salon (Barber)</td>
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<tr>
<td>Pre-Function Area - Circulation</td>
<td>5 / 50</td>
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<td>1.5 / 15</td>
<td>5' AFF</td>
<td>3000</td>
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<tr>
<td>Pre-Function Area - No Event Off Hrs</td>
<td>5 / 50</td>
<td>floor</td>
<td>Avg</td>
<td>1.5 / 15</td>
<td>5' AFF</td>
<td>3000</td>
<td></td>
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<tr>
<td>Pre-Function Area - Registration Table</td>
<td>20 / 200</td>
<td>table</td>
<td>Avg</td>
<td>3 / 30</td>
<td>4' AFF</td>
<td>3000</td>
<td></td>
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<tr>
<td>Pre-Function Area - Social Function</td>
<td>10 / 100</td>
<td>floor</td>
<td>Avg</td>
<td>4 / 40</td>
<td>4' AFF</td>
<td>3000</td>
<td></td>
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<tr>
<td>Ballrooms - Casual</td>
<td>20 / 200</td>
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2500-191 CONFIDENTIAL DoubleTree (Hotels) - Brand Standards - North America 2500 - Design, Construction & Renovation Standards Effective July 01, 2019
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Effective July 01, 2019
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<tr>
<td>Receiving/Trash Area - Receiving</td>
<td>30 / 300</td>
<td>floor</td>
<td>Avg 10 / 100</td>
<td>4'</td>
<td>Avg</td>
<td>4000</td>
</tr>
<tr>
<td>Valet</td>
<td>10 / 100</td>
<td>floor</td>
<td>Avg 5 / 50</td>
<td>5'</td>
<td>Avg</td>
<td>4000</td>
</tr>
</tbody>
</table>

2514.08.J Lighting
2514.08.J.1 Not Applicable to this Brand
2514.08.J.2 Surface mount strip fluorescent fixtures are not permitted (including vending, guest laundry, business center, etc.).

2514.08.K Power Density and Lighting Efficiency
2514.08.K.1 Comply with ASHRAE Standard 90.1 ([www.ashrae.org](http://www.ashrae.org)) or applicable Energy Codes. Submit written documentation to Hilton to show compliance with the applicable energy codes and that all fixtures are UL listed.
2514.08.K.2 All lighting must meet Correlated Color Temperature (CCT) of 2700-3000 Kelvin and Color Rendering Index (CRI) minimum of 80.

2514.08.L Controls
2514.08.L.1 Not Applicable to this Brand
2514.08.L.2 Service corridors: Switch from local control panels whenever practical.
2514.08.L.3 Lobby: switch from control panels or controlling dimmer.
2514.08.L.4 Restaurants, pre-function, ballrooms/meeting rooms, lobby and spa: dimmer control with local bypass switching.
2514.08.L.5 General interior lighting: switch locally
2514.08.L.6 Stairway and exit lights: switch from panels
2514.08.L.7 Guest corridors: switch at panel located in electrical closet
2514.08.L.8 Guest areas: control from back-of-house areas or with local switches accessible only to staff.
2514.08.L.9 Link dimmer panels with building automation system for monitoring and automated on/off switching functions for all or selected circuits.

2514.08.M BOH Electrical Lamp Protection
Back-of-house electrical lamps must be protected by lens or safety tube covers.
2514.08.N Not Applicable to this Brand

2514.08.O Motion-sensored Light Fixtures
   Motion-sensored light fixtures are allowed in the back-of-house locked spaces. Motion-sensored light fixtures are not allowed in guestrooms unless required by local code.

2514.09 Technology

2514.09.A Wiring Requirements
   Refer to Section 2518.00, Technology Wiring Standards, for specific requirements regarding voice, data, television and the Property Management System wiring.

2514.09.B Telephone
   2514.09.B.1 Comply with the specifications provided in Section 712.00 - Telephones.

2514.09.C Internet Access Location Requirements
   Internet access must be provided in the following areas. The type of internet access listed must be provided as a minimum. Additional types are allowed. See Section 710.00 - Internet Access for specific requirements.

2514.09.C.1 Guestrooms/Suites – wireless required; wired optional
2514.09.C.2 Lobby - wireless
2514.09.C.3 Meeting rooms – wireless and wired
2514.09.C.4 Boardroom – wireless and wired
2514.09.C.5 Business center – wireless and wired
2514.09.C.6 All restaurants – wireless
2514.09.C.7 Bar – wireless
2514.09.C.8 Buffet (if applicable) – wireless
2514.09.C.9 All public spaces – wireless
2514.09.C.10 Ballroom – wireless and wired
2514.09.C.11 Pre-function area – wireless and wired
2514.09.C.12 Pool – wireless
2514.09.C.13 Guest vending areas (if applicable) – wireless
2514.09.C.14 Executive lounge – wireless
2514.09.C.15 Not Applicable to this Brand
2514.09.C.16 Not Applicable to this Brand
2514.09.C.17 Fitness Center - wireless
2514.09.C.18 Function lawns, outside lounges & patios - wireless
2514.09.C.19 Team Member Back of House Areas

2514.09.D Television

2514.09.D.1 Televisions must comply with the specifications listed below and those provided in Section 713.00.

- Widescreen (16:9) HDTV screen
- At least 1080P vertical resolution
- Support MPEG4 decoding
- Digital tuners and/or decryption capable of receiving HD Free to Guest TV content in the country in which the hotel is located (e.g., QAM/DVB-T/DVB-C/DVB-T2/MPEG-4/Pro:Idiom/Digital Rights Management).
- C.E./U.L. (CCC in China) listed for commercial/hospitality use.
- Televisions must not exceed seven years of age.
- Power and cable outlets and cords must be concealed from view behind the television or using cable management.
- Interactive Program Guide (IPG) is required in guestrooms.

**United States:** Televisions must comply with the specifications listed below and those provided in Section 713.00.

- Widescreen (16:9) HDTV screen
- At least 1080P vertical resolution
- Support MPEG4 decoding
- Digital tuners and/or decryption capable of receiving HD Free to Guest TV content in the country in which the hotel is located (e.g., QAM/DVB-T/DVB-C/DVB-T2/MPEG-4/Pro:Idiom/Digital Rights Management).
- C.E./U.L. (CCC in China) listed for commercial/hospitality use.
- All new televisions must be equipped with an MPI/MTI port.
- Televisions must not exceed seven years of age.
- Power and cable outlets and cords must be concealed from view behind the television or using cable management.
- Interactive Program Guide (IPG) is required in guestrooms.

2514.09.D.1.a Televisions must comply with the sizes listed below:

- **Lobby** - Minimum 55" commercial HDTV
- **Bar** - Must have at least one minimum 55" commercial HDTV. Additional TV's are optional and must be a minimum of 43" commercial HDTV.
- **Executive Lounge** - Minimum 55" commercial HDTV
- **Boardroom** - Minimum 55" commercial HDTV
- **Fitness Center** - Minimum 49" commercial HDTV
- **Guestroom** - One-room suites require a minimum 55" commercial HDTV. Suites with two TVs require a minimum 55" commercial HDTV in the bedroom and a minimum 55" commercial HDTV in the parlor.
- **Kid's Club/Day Lounge** - Minimum 55" commercial HDTV
- **Employee Breakroom** - Minimum 49" commercial HDTV. Dependent upon size of room. The television must be easily viewable from all locations. If the television is not easily viewable from all locations, hotel must install one or more additional televisions of the same size.

**United States:** Televisions must comply with the sizes listed below:

- **Lobby** - Minimum 55" commercial HDTV
Bar - Must have at least one minimum 55" commercial HDTV. Additional TV's are optional and must be a minimum of 43" commercial HDTV.
Executive Lounge - Minimum 55" commercial HDTV
Boardroom - Minimum 55" commercial HDTV
Fitness Center - Minimum 49" commercial HDTV
Guestroom - One-room suites require a minimum 55" commercial HDTV. Suites with two TVs require a minimum 55" commercial HDTV in the bedroom and a minimum 55" commercial HDTV in the parlor. Internet Protocol TV (IPTV) is prohibited. IPTV may be supported with the installation of Connected Room. Refer to the HDTV website (www.hiltonhdtv.com) for additional information.
Kid's Club/Day Lounge - Minimum 55" commercial HDTV
Employee Breakroom - Minimum 49" commercial HDTV. Dependent upon size of room. The television must be easily viewable from all locations. If the television is not easily viewable from all locations, hotel must install one or more additional televisions of the same size.

2514.09.D.2 Televisions must be connected to a master antenna system or cable that is capable of passing high definition (HD) content to all televisions.
2514.09.D.3 Guestroom televisions must be attached securely to a swivel base or mount. Refer to Section 713.00 for additional television requirements.
2514.09.D.4 Wall-mounted televisions are allowed on non-demising walls. If mounted on demising walls, it must be pre-approved and subject to sound transmission studies. Sufficient blocking must be provided to ensure that the television/mount is not easily pulled off of the wall.
2514.09.D.5 Not Applicable to this Brand
2514.09.D.6 Not Applicable to this Brand
2514.09.D.7 If a set-top box is required with the television, it must be hidden from view and space for it included in the design of the furniture supporting the television.
**United States**: Not Applicable to this Brand

2514.09.E Sound System
2514.09.E.1 See Section 711.01 - Music System for detailed requirements. A high quality sound system is required in the following areas:
   2514.09.E.1.a Not Applicable to this Brand
   2514.09.E.1.b Porte cochere
   2514.09.E.1.c Lobby
   2514.09.E.1.d Not Applicable to this Brand
   2514.09.E.1.e Not Applicable to this Brand
   2514.09.E.1.f Not Applicable to this Brand
   2514.09.E.1.g Not Applicable to this Brand
   2514.09.E.1.h Not Applicable to this Brand
   2514.09.E.1.i Public restrooms
   2514.09.E.1.j All restaurants/ bars
   2514.09.E.1.k Not Applicable to this Brand

2500 - Design, Construction & Renovation

2500-196 CONFIDENTIAL
DoubleTree (Hotels) - Brand Standards - North America 2500 - Design, Construction & Renovation Standards
Effective July 01, 2019
2514.09.E.1.I  Meeting rooms
2514.09.E.1.m  Boardroom
2514.09.E.1.n  Ballrooms
2514.09.E.1.o  Pre-function area
2514.09.E.1.p  Pool/whirlpool area
2514.09.E.1.q  Passenger Elevator/Lifts Lobbies
2514.09.E.1.r  Secondary guest entry points
2514.09.E.1.s  Sundries shop
2514.09.E.1.t  Business center (if over 100 ft²/10 m²; local on/off and volume control required)
2514.09.E.1.u  Executive lounge
2514.09.E.1.v  Fitness center
2514.09.E.1.w  Spa
2514.09.E.1.x  Not Applicable to this Brand
2514.09.E.1.y  Ground floor corridors
2514.09.E.1.z  Not Applicable to this Brand
2514.09.E.1.aa  Not Applicable to this Brand
2514.09.E.1.bb  Team Member Back of House Area

2514.09.E.2  System must have volume and zone controls that are located conveniently to the function area and concealed from guest views.

2514.09.F  Paging System
2514.09.F.1  A paging system is required in all guest areas including atriums, pre-function areas, ground floor corridors, restaurants, pool areas and lobby. System must have volume and zone controls and be located at or near the hotel’s telephone operator station.

2514.09.G  Emergency Communication
2514.09.G.1  All properties must have emergency telephones/communications.
2514.09.G.2  Dedicated emergency telephones are to be installed in the following areas:
   2514.09.G.2.a  Self-park parking garages -- one minimum per level
   2514.09.G.2.b  Within each elevator/lift including service elevators/lifts.
   2514.09.G.2.c  Spa treatment rooms
   2514.09.G.2.d  Spa locker rooms
   2514.09.G.2.e  Spa registration desk
2514.09.G.3  Not Applicable to this Brand
2514.09.G.4 Dedicated panic buttons are to be installed in the following areas:
   2514.09.G.4.a Sauna
   2514.09.G.4.b Steam Room
   2514.09.G.4.c Cash handling areas
   2514.09.G.4.d Areas of potential gas release
   2514.09.G.4.e Front desk at each workstation

2514.09.H Two-Way Radio Communication
   2514.09.H.1 A base station must be located within the security dispatch office (when provided) or alternately, will be placed at a constantly attended location (telephone operators’ room or front desk for smaller hotels).
   2514.09.H.2 All hotels over six stories or encompassing multiple buildings must be equipped with a repeater. The base station must be located in the security dispatch office provided that this area is staffed on a continuous basis. If unachievable, an additional base station in the telephone room is required.
   2514.09.H.3 All base station communications equipment and repeater(s) must be connected to an emergency power supply or have sufficient battery backup (four hours minimum).

2514.09.I Security Systems
   2514.09.I.1 A security study must be performed on each hotel to verify requirements of such systems. Security devices and cameras must be recorded in a secured area. CCTV camera systems, where provided, must be recorded and provided with an uninterruptible power system.
   2514.09.I.2 Security Alarm System
      2514.09.I.2.a Intruder detection systems must be compliant with all regional/national standards applicable and required to facilitate local law enforcement attendance in the event of a qualified incident.
      2514.09.I.2.b Manually activated silent alarms (money-clip or panic button) are required for the human resources office, front office, restaurant cashier positions and other non-concessionaire fixed outlets handling cash. The signals from these devices are to be wired to an alarm annunciator panel located at a constantly monitored position such as a security dispatch office or PBX. Signals must have the capability to go off premises to a central station alarm monitoring service or law enforcement department, if available. Alarm annunciator must indicate the location and type of alarm by visible and audible signal and have a printer to record the activity including date and time.
      2514.09.I.2.c All alarm systems are to be connected to the building’s emergency power supply or have sufficient battery backup (24 hours minimum to all equipment).
      2514.09.I.2.d Where the security dispatch office is not constantly attended or does not exist, additional remote alarm panels are to be installed at the PBX.
      2514.09.I.2.e Security door contacts and silent alarm buttons will automatically activate the nearest camera into full event recording. Where the camera is a PTZ it will automatically pan to this area and begin motion monitoring of the event.
      2514.09.I.2.f Device activation will trigger on screen alerts via the CCTV monitoring station. Alerts will automatically associate with CCTV images where applicable.
2514.09.I.3 Closed Circuit TV Surveillance System (CCTV)

2514.09.I.3.a Not Applicable to this Brand

2514.09.I.3.b Not Applicable to this Brand

2514.09.I.3.c Standards

2514.09.I.3.c.1 The system will be supported on a backbone incorporating individual routers and switches capable of TCP/IP networks. The system design will include all necessary firewalls to prevent unwanted intrusion and will incorporate security level access.

2514.09.I.3.c.2 For an IP system, switches must be a minimum of 10/100 Base-T and incorporate Power Over Ethernet (POE) where appropriate. System design must be in line with all relevant structured cabling parameters.

2514.09.I.3.c.3 The cameras will run over a Cat 6 horizontal network and a fiber backbone. Bandwidths and requirements will be designed in conjunction with the structured wiring team within Hilton.

2514.09.I.3.c.4 The system will be capable of connection and access to a head end based in the security office and the system recording and control platform will be installed allowing for 20 percent spare capacity in respect of both camera connection and video storage required.

2514.09.I.3.c.5 The CCTV system must be integrated into the intruder alarm system to give alarm indication and functions on the screen for door activations, silent alarm activations as described in the intruder alarm section.

2514.09.I.3.c.6 The quantity and location of cameras will be site specific. They must meet the requirements identified for the standards given below.

2514.09.I.3.c.7 The minimum areas of the hotel to be provided with recorded surveillance by the hotel's closed circuit television system are:

- 2514.09.I.3.c.7.a Loading docks and receiving areas
- 2514.09.I.3.c.7.b Parking garages (when contiguous to the hotel) to capture both the vehicle license plate and view of the driver upon entry
- 2514.09.I.3.c.7.c Not Applicable to this Brand
- 2514.09.I.3.c.7.d Remote entrances
- 2514.09.I.3.c.7.e Passenger elevator/lift lobbies -- all non-guestroom levels
- 2514.09.I.3.c.7.f Porte cochere
- 2514.09.I.3.c.7.g Front desk
- 2514.09.I.3.c.7.h Safety deposit box area
- 2514.09.I.3.c.7.i Luggage room both inside and at the entrance to view entry and activity within the room
- 2514.09.I.3.c.7.j Game rooms and arcades
- 2514.09.I.3.c.7.k Computer/Telecom Room (placed outside the room covering the entry)
- 2514.09.I.3.c.7.l Cashiers (counting rooms)
- 2514.09.I.3.c.7.m Grade level exit doors (for newly constructed hotels or CCTV upgrades) doors shall record at 12 IPS at all times
- 2514.09.I.3.c.7.n At all ATM machines. Such cameras will be in addition to any camera included with the machine, and must be connected to the hotel system. Camera must not focus on key pad.
2514.09.I.3.c.7.o Staff entry
2514.09.I.3.c.7.p Service elevator/lift lobbies - Service elevator landings that allow service to public areas (Cameras within elevators are allowed)
2514.09.I.3.c.7.q Additional locations may be required upon review by the Architecture and Construction Department.
2514.09.I.3.c.8 Not Applicable to this Brand
2514.09.I.3.c.9 The system design will ensure that the following parameters can be utilized to enable accurate identification of offenders and events.
2514.09.I.3.c.10 When selecting cameras and locations the following will be the minimum requirement:

2514.09.I.3.c.10.a All external pan tilt and zoom cameras must be capable of “identification” at a distance of 115‘-0”/35 m and “recognition” at 312‘-0”/95 m.
2514.09.I.3.c.10.b All static cameras must be capable of “recognition” at a distance of 26‘-3”/8 m.
2514.09.I.3.c.10.c Each scenario is subject to minimum light levels as described by equipment manufacturers.
2514.09.I.3.c.10.d The guidance for the above parameters will be as defined below:
   1. For identification, not less than 120 percent of screen height.
   2. For recognition, not less than 50 percent of screen height.
   3. For detection of intruders, not less than 10 percent of screen height.
   4. For general monitoring, not less than 5 percent of screen height.

2514.09.I.3.c.11 Electrical power for cameras, DVR’s and monitors must be supplied from an emergency power circuit and, for new installations and major upgrades, an uninterruptible/power supply. The UPS supplied must support the cameras, the monitors and the recorders during an alarm state.
2514.09.I.3.c.12 Cameras must have the following features:

2514.09.I.3.c.12.a All cameras must produce color images under normal light conditions to enable accurate identification of offenders. Color rendition (for new or replacement units).
2514.09.I.3.c.12.b All cameras must be day/night switching in areas susceptible to light level variances.
2514.09.I.3.c.12.c Weather proof (NEMA Type 3 (www.nema.org) or equal) housing when located in non-conditioned space.
2514.09.I.3.c.12.e All external public access doors must be fitted with cameras which enable clear, unobstructed images of all persons entering/exiting the premises. Where practicable, these cameras must be mounted internally and externally to give face recognition and must be mounted at a suitable height - looking towards, rather than down at the doorway. These cameras must be capable of producing Identification standard images (a minimum of 500TVL resolution and 120 percent screen target height) at the monitor.
2514.09.I.3.c.12.f All internal cameras must be capable of producing recognition standard images (a minimum of 500TVL resolution and 50 percent screen target height) at the monitor.
2514.09.I.3.c.12.g CCTV cameras must be fitted with robust anti-tamper housings.
2514.09.I.3.c.12.h All cameras must be a minimum standard of 500 TVL. They must have back light compensation and wide dynamic range functionality.

2514.09.I.3.c.13 Minimum system performance required:
- 2514.09.I.3.c.13.a Analogue System - 4CIF Resolution at 6ips recorded + 12ips on alarm
- 2514.09.I.3.c.13.b IP System - D1 Resolution at 6ips recorded + 12ips on alarm
- 2514.09.I.3.c.13.c For larger/critical areas, megapixel must be considered and storage implications considered to adhere to the above.

2514.09.I.3.c.14 Digital/network video recorders must include the following features:
- 2514.09.I.3.c.14.a Digital recording format (for new or replacement units). On board or RAID type storage as required by application. In each case, the storage medium must be expandable for future use.
- 2514.09.I.3.c.14.b Selectable recording speed from minimum record rate to real time at 15ips minimum.
- 2514.09.I.3.c.14.d Automatic "alarm command" speed-up that automatically switches from minimum record rate to real time upon alarm activation. Time lapse must automatically resume when the alarm condition ceases or when a pre-selected time expires.
- 2514.09.I.3.c.14.e The recorder must be sized to record for 31 days. A calculation must be provided to show on a camera by camera basis how this recorded storage will be met.
- 2514.09.I.3.c.14.f Where mega-pixel solutions are to be specified, storage and bandwidth implications must be considered and documented.

2514.09.I.3.c.15 Video monitors must include the following features:
- 2514.09.I.3.c.15.a Color rendition (for new or replacement units)
- Additional monitors will also be housed within the back office behind reception and be capable of picking up all repeat images from any camera.

2514.09.J Door Alarms
- 2514.09.J.1 Door alarm devices are to be installed to detect the opening of certain doors whose use is restricted to authorized personnel or specific times. Door alarm devices (magnetic contacts) or motion detectors (infrared or ultrasonic detectors) are required for:
  - 2514.09.J.1.a Stairway doors at the exit level from the hotel
  - 2514.09.J.1.b All roof doors or hatches
  - 2514.09.J.1.c General cashier's office
2514.09.J.1.d  Primary food and beverage storeroom(s) and operating equipment storage
2514.09.J.1.e  Not Applicable to this Brand
2514.09.J.1.f  Grade level exit doors that open to the outside of the hotel:

1. Kitchen exit doors (local alarms must be added to deter use)
2. Meeting room doors

2514.10  Guardrails

Provide guardrails at all grading differences over 42"/1.0 m. Railings must be a minimum of 42"/1.0 m in height and must have intermediate rails or ornamental pattern such that a 4"/100 mm diameter sphere is not able to pass through and that children cannot climb (i.e. horizontal rails). Refer to 2516.05.D.1.

2514.11  Hazardous Materials

Materials are not allowed if they pose potential harm to guests or team members or to the environment. Materials are considered harmful if they have the potential to fail in practice, either during their installation or during their life including long-term disposal or degradation. The following materials are not recommended for use. They include, but are not limited to, the following:

2514.11.A  Deleterious Materials
2514.11.A.1  Asbestos
2514.11.A.2  CFCs
2514.11.A.3  Crystalline silica
2514.11.A.4  Formaldehyde
2514.11.A.5  Lead
2514.11.A.6  Man-made mineral fibers
2514.11.A.7  Polychlorinated biphenyls (PCBs)
2514.11.A.8  Vermiculite
2514.11.A.9  Volatile organic compounds (VOCs)
2514.11.A.10  Wood preservatives
2514.11.A.11  Brick slips and brick panels
2514.11.A.12  Calcium chloride
2514.11.A.13 Calcium silicate brickwork
2514.11.A.14 Cem-fil
2514.11.A.15 High alumina cement (HAC) concrete
2514.11.A.16 Mundic
2514.11.A.17 Sea dredged aggregates
2514.11.A.18 Wood wool slabs or wood wool cement boards

2514.11.B Problematic Materials
2514.11.B.1 Cement fiber slates
2514.11.B.2 Composite panels
2514.11.B.3 Galvanized steel wall tiles
2514.11.B.4 Hollow clay pot floors
2514.11.B.5 Nickel sulphides
2514.11.B.6 RAAC planks
2514.11.B.7 Tesserae
2514.11.B.8 Thin stone panels

2514.11.C Other Materials
2514.11.C.1 Hair plaster
2514.11.C.2 Masonry and steel—coke breeze/furnace ash and filler joist construction, “Regent Street Disease”

2515.00 Furnishings, Fixtures and Equipment

Additional requirements for the guestrooms are located in Section 2510.00.

2515.00.A Soft Good/Casegood Replacement Cycles

For existing hotels, any soft good or casegood must be replaced when condition, design style and/or relevance warrants as determined by the Brand or at the following ages (whichever comes first):

> 7 years for soft goods (e.g., drapes, bedding, etc.)
> 14 years for furniture, fixtures and equipment

2515.01 Furniture

2515.01.A Soft Good/Casegood Replacement Cycles

Furniture and its hardware must be manufacturer's commercial furniture or better.
2515.01.B.1  Not Applicable to this Brand

2515.01.B.2  General Construction

2515.01.B.2.a  Joints must be splined, mortised and tenoned, tongued or doweled, or full length blocked, glued and screwed in two directions, following the best practice of commercial construction. All work must be carefully corner-blocked, well fitted, glued and reinforced with wood screws.

2515.01.B.2.b  All excess glue must be cleaned from surfaces exposed during normal use.

2515.01.B.2.c  All structural members must be glued and screwed in place.

2515.01.B.2.d  All screws must be turned in, in such a way as to not strip the hole or the screw head, and not split or swell the joining member.

2515.01.B.2.e  All plastic laminate tops must be surfaced with high pressure laminate with a minimum 45 lb/20 kg density industrial grade particle board core with fine face particles and proper backing sheet to prevent warping. Tops must be laminated using contact, semi-rigid (PVAC) or rigid (ureas, resorcinol) adhesives to provide for type two bonding. All plastic laminate tops must be an exact match to the veneers. A sample must be presented to Hilton for approval.

2515.01.B.2.f  All post laminated veneer edges must be 3-ply face/double crossed veneer construction, no less than 1.3 mm thickness.

2515.01.B.2.g  Solid wood panels must float within the frames of doors or drawer fronts.

2515.01.B.2.h  Off-the-floor cases over 60"/1.5 m in length must have turn-buckles or center support.

2515.01.B.2.i  Caster blocks are to be glued and attached with screws.

2515.01.B.2.j  Double lagged leg bolts and leg stretchers must be utilized on all desks.

2515.01.B.2.k  Where natural stone, granite or similar approved tops are specified, a sub-top of 1/2"/12.0 mm (minimum) plywood must be provided.

2515.01.B.2.l  Where glass tops are used, they must be securely fitted to the base and must not be loose.

2515.01.B.2.m  If a casegood is sitting on the floor, it must have a closed base; if a casegood has legs, it must have minimum clearance of 8"/200 mm. If a toe kick is used, a high pressure laminate must be specified.

2515.01.B.3  Material Requirements

2515.01.B.3.a  Endangered wood species are not permitted.

2515.01.B.3.b  Casegoods must be of good quality with solid timber edge bands, veneered interiors, etc. and kiln dried with minimum moisture levels depending on species.

2515.01.B.3.c  Exposed veneer surfaces must be select sliced hardwood, and must be carefully matched as to pattern and color. Type or species of veneer must be spelled out on all factory quotes. All face veneers and balancing back veneers must be applied with waterproof glue under controlled pressure.

2515.01.B.3.d  Minimum veneer thickness is 0.06 cm/0.61 mm.

2515.01.B.3.e  To control and contain veneer checking, all crossbands for fancy-faced plywood must have uniform multi-directional strengths.

2515.01.B.3.f  Back panels must be glued and securely fastened by screws or gun staples. Fasteners must be flush with outside back and must not swell, split or protrude through finished surfaces.
2515.01.B.3.g Optional wooden dust bottoms must have one good side, with the good side exposed when the drawer is removed.

2515.01.B.3.h Top edges of drawer sides and backs must be sanded flat with beveled edges and rounded bottom and covered with a clear sealer coat and finished with a catalyzed top coat. Discoloration, mineral streaks and excessive machine marks will not be permitted. Glued-up stock must match in color.

2515.01.B.3.i Drawers must be well sealed on the inside backs, fronts, side partitions, bottoms, outside sides and backs. They must be free of dirt, dust, glue or any foreign matter prior to rubbing, waxed with the required material and wiped dry to remove sand and sealer dust. Manufacturer to provide heavy duty commercial ball bearing drawer glides with stops at 2/3 the depth of the drawer.

2515.01.B.3.j Dovetails must be well glued, fitted, putted if necessary, and sanded.

2515.01.B.3.k Drawers must have hardwood or 7-ply veneer sides and backs finished smooth with a clear sealer coat and a catalyzed top coat. All joints must be multi dovetail or linear (French) dovetail. Drawer bottoms must be plywood, and in all cases must be contained in dadoes on all four sides; glue-blocked in place to assure continuing squareness. Drawer inside must be stained and finished with a catalyzed top coat. Drawer glides must be soft closing.

2515.01.B.3.l All exposed metal must be of a gauge appropriate to piece and have no visible welded joints. Metal finishes must have clear enamel matte coating, clear rust inhibitor, baked enamel, or powder coated finish for humidity protection to prevent rust and corrosion. Manufacturer to ensure materials are non-corrosive and suitable for use in high humidity and salt air locations as required.

2515.01.B.3.l.1 Wood particleboard cores must conform to commercial standards Type I, Grade B, Class II.

2515.01.B.3.l.2 Tops must be particle board if they are core or veneer banded on all four edges and do not have an unsupported span of more than 25"/635 mm. Tops with unsupported spans of 30"/760 mm or more must have anti-snag strips or backing sheets.

2515.01.B.3.l.3 No exposed particle board will be allowed in any furnishings. This includes routed and stained edges on tops.

2515.01.B.3.l.4 Lock-mitered cases must have core bands on fronts and backs of particle board.

2515.01.B.3.l.5 Particle board is allowed to be used in doors if it is banded on four sides.

2515.01.B.3.l.6 Hardware must have applied rust-proof and tarnish-proof sealers.

2515.01.B.3.m The hardwood plywood must be constructed as specified. Bondage must be Type 2 or better, and face and back veneers must not be less than 1/32"/79 mm to 1/42"/56 mm thick before sanding. When face and back veneers are not of the same species, the two veneers must be of the same density and thickness.

2515.01.B.3.n Face veneers must be Grade 1 flat cut quartered veneers. All face veneers in one panel must be matched for color and grain to present a uniform appearance. This requirement applies to all paneled surfaces which can be viewed in normal position of use and, in addition, the back of the desk, top side of shelves and the interior of bookcases and various other visible compartments and surfaces.

2515.01.B.3.o Face side of drawer bottoms or mirror backs and various other unexposed surfaces must be Grade II or better, and may be rotary cut veneers.

2515.01.B.3.p Veneer cores must be Grade II or better and any voids at panel edges must be fitted. The entire exposed edge of the core must be banded with the same kind of wood as other exposed parts.
2515.01.B.3.q Back of drawer bottoms must be Grade III or better. Lumber core panels must be regular grade except that no butt joints or knots in excess of 1.2”/12.5mm diameter will be permitted.

2515.01.B.3.r Crossbands must not be less than 1/32”/79 mm thick and must be Grade II or better.

2515.01.B.3.s Crossbands, veneer cores and lumber cores must be of medium or low-density wood.

2515.01.B.3.t All toe kicks require a high pressure laminate.

2515.01.B.3.u Rattan/Wicker: Skin off is required to allow stain to be absorbed evenly and lacquer to protect the finish. Skin on is a natural finish and requires a sealer to maintain natural color.

2515.01.B.4 Workmanship

2515.01.B.4.a Doors must be free of rattle, squeaking, warp or rubbing. All doors must be approximately uniform in clearance. All catches must be properly aligned and installed.

2515.01.B.4.b Drawers must have free-running action with no binding or sticking. Drawers with side mounted metal glides must operate freely with no squeaking or rattling and be well lubricated. Drawer guides and runners must be securely fastened and properly positioned to assure correct drawer alignment. Drawer glides must be soft closing.

2515.01.B.4.c Route lines, cut-outs or grooves must be smoothly machine and/or sanded. Shapes, carvings and 'U' cuts are to be finished smoothly with no visible unfinished or rough areas.

2515.01.B.4.d Drawer interiors and storage compartments are to be sanded smooth and free of glue or finish runs and PVC bonded to prevent moisture absorption. Sides, ends and bottoms are to be free of splinters, snags, slivers, staples, nails and screws.

2515.01.B.4.e All hardware, such as hinges, pulls, latches, catches, glides, etc., must be attached so that they fit and operate properly and serve their purposes during transit and use.

2515.01.B.4.f Mitered corners are to be square, flush, tight and well glued.

2515.01.B.4.g Interior screws must be flush or countersunk with the surface of the part where used.

2515.01.B.4.h All glides, casters and ferrules must be properly attached so as to remain permanently in place at all times and capped.

2515.01.B.4.i Face-nailed molding and overlaps must be nailed as inconspicuously as possible with nails countersunk and filled. Back nailing must be used whenever possible.

2515.01.B.4.j All cane must be applied straight with no broken or loose strands and must be smooth after rubbing.

2515.01.B.4.k All items furnished under this section must be guaranteed against manufacturing defects in workmanship and materials. Repairs of such defects during the first year, after final completion and acceptance, must be made by the manufacturer at their cost and expense, without charge to the purchaser or hotel. All such replacements and repairs must be made at one time and at hours mutually satisfactory to both owner and factory.

2515.01.B.4.l Not Applicable to this Brand

2515.01.B.4.m All dining tables must have adjustable glides.

2515.01.B.5 Appearance and Finish
2515.01.B.5.a Color of like finishes must be color-fast, uniform and compatible between pieces manufactured in the same plant; between pieces made in various plants, and from one production cut to another.

2515.01.B.5.b Each finishing material must be formulated and individually batch-checked to insure compatibility with the batch and every other material used to produce a color-fast finishing system.

2515.01.B.5.c Distressing, shading, highlighting and spatter in any one group must be consistent and uniform between pieces and plants and from one cut to another.

2515.01.B.5.d Interior surfaces of compartments and drawers must be free of dirt, dust, shavings or any foreign matter before finishing.

2515.01.B.5.e Finish must be rubbed to required smoothness and sheen and must be sufficiently dry to prevent marring or printing on the surface when packed. Finishes rubbed through are not acceptable.

2515.01.B.5.f Edges and backs of doors and drawers must be finished to be compatible with exterior.

2515.01.B.5.g Excess pumice, oil, wax and rubbing compound must be wiped clean after rubbing.

2515.01.B.5.h Finishing:
   2515.01.B.5.h.1 Spray with stain and/or washcoat and/or toner.
   2515.01.B.5.h.2 Spray with filler as required to properly fill wood pores, remove all excess filler and allow to dry.
   2515.01.B.5.h.3 Spray with sealer of not less than 16 to 20 percent solid content.
   2515.01.B.5.h.4 Sand sealer smooth, finishing with paper.
   2515.01.B.5.h.5 Shade with shading stain as required to obtain uniform color and effect.
   2515.01.B.5.h.6 Glaze when required for effect and wipe.
   2515.01.B.5.h.7 Spray two coats of moisture-resistant catalyzed finish.
   2515.01.B.5.h.8 Rub with steel wool, wet or dry finishing paper, wax and wipe clean as desired for the required sheen specified.
   2515.01.B.5.h.9 Clean laminate surfaces with cleaning agents and wipe dry.

2515.01.B.5.h.10 Finishing must be performed according to local guidelines of Finish System Standards for a ‘Premium Grade’ better in the US or custom grade quality in Asia Pacific and Europe. All wood must be finished with a commercial grade conversion lacquer finish to withstand water and alcohol.

2515.01.B.5.h.11 For Closed Grain Woods, finishing steps must be as follows:
   1. Vinyl Washcoat
   2. Stain
   3. Vinyl Sealer
   4. Sand (220 Grit)
   5. Top Coat
   6. Top Coat
2515.01.B.5.h.12 For Open Grain Woods, finishing steps must be as follows:

1. Stain
2. Vinyl Sealer
3. Sand (220 Grit)
4. Top Coat
5. Top Coat

2515.01.B.5.i Lacquer painted surfaces are not allowed.

2515.01.B.5.j Lacquer Finishes

2515.01.B.5.j.1 Polyurethane Lacquer
   2515.01.B.5.j.1.a The use of polyurethane lacquer (PU) is required when there is no glass, stone or laminate top. This finish is for interior use only, as to maintain the appearance of the piece for a minimum of ten years.
   2515.01.B.5.j.1.a.1 PU 100 Gloss - This finish is a polyurethane Clear Lacquer with a H99-03 (NY)Polyfunctional Isocyanurate Hardner leaving a clear gloss of greater than 90 degrees.
   2515.01.B.5.j.1.a.2 PU 50 Matt - This finish is a Polyurethane Satin Clear Lacquer with a 98- HO Polyfunctional Isocyanurate Hardner leaving a milky appearance with a gloss of 45-50 degrees.

2515.01.B.5.j.2 Catalyzed Lacquer
   2515.01.B.5.j.2.a They are a two part system, the lacquer and the catalyst. A post cat conversion varnish is the standard of the industry for most cabinetry. It is a hard, durable and chemical resistant finish. It is slower to dry than a pre cat or nitrocellulose lacquer. But because there is a high catalyst ratio it will cure to about 85 percent within a 24 hour period. You must use it in a controlled environment. It needs to be greater than 65° F/18° C to be used, otherwise it will fail to crosslink properly and you will get a much reduced durability. Catalyzed Lacquer is a solvent based finish that has cross-linking properties to form a more durable surface.
   2515.01.B.5.j.2.a.1 Pre-catalyzed has the catalyst added at the factory, where with post-catalyzed, you add the catalyst at the time of use. Pre-cats are generally a little slower in dry time and cure because the catalyst is not as powerful, or "hot." There are also blocker solvents in the lacquer that help prevent the chemical reaction from taking place in the can. This results in long pot lives, six months or better, and no hassle with adding catalyst.
   2515.01.B.5.j.2.a.2 Post-catalyzed lacquers dry and cure faster, and are better for high production uses.

2515.01.B.5.k Furniture must have the same quality finish on all sides.

2515.01.B.6 Performance
   2515.01.B.6.a Drawers and doors must be fitted, properly aligned and must operate smoothly under various atmospheric conditions.
   2515.01.B.6.b All doors, drawers, leg mechanisms, trays and other operating parts must be well fitted, properly aligned and operate smoothly without loose or sloppy action.
   2515.01.B.6.c Doors must not rub, rattle or be warped. Hinges must operate smoothly and quietly with no binding or other defect to affect performance.
2515.01.B.6.d  All tops and structural members must be warp-free.
2515.01.B.6.e  Hardware, both trim and functional, must be straight and firmly attached.

2515.01.C  Upholstered Furniture
2515.01.C.1  Not Applicable to this Brand
2515.01.C.2  Not Applicable to this Brand
2515.01.C.3  Upholstered furniture may not be fully upholstered in vinyl. Vinyl is permitted on seats only. Vinyl welts are not allowed.
2515.01.C.4  Upholstered furniture must meet the following requirements:
   2515.01.C.4.a  Adhesive reinforced seams as necessary
   2515.01.C.4.b  Lined flounces
   2515.01.C.4.c  Sleeper deck flap
   2515.01.C.4.d  Non-corrosive rust proof zippers
   2515.01.C.4.e  Non-corrosive, heavy duty, nylon carpet glides to fit the footprint of the leg. The appropriate glides are required on all dining chairs and bar stools to eliminate damage to the flooring material.
   2515.01.C.4.f  Components (fabric, decking material, filling/padding, Welt Cord and barrier material, if used) must be tested in accordance with local fire regulations. Salt-base flame-retardant chemicals are not to be used.
   2515.01.C.4.g  All flame retardant certificates of compliance must be provided to the hotel for all components of the upholstered items.
   2515.01.C.4.h  Frame requirements:
      2515.01.C.4.h.1  Joints are double doweled, glued and screwed.
      2515.01.C.4.h.2  Corner blocked, gusseted, glued and screwed as necessary.
      2515.01.C.4.h.3  Metal or sleigh base for some applications.
   2515.01.C.4.i  Seat spring requirements:
      2515.01.C.4.i.1  Sinuous (No-sag) construction
      2515.01.C.4.i.2  8 gauge spring wire
      2515.01.C.4.i.3  4"/102 mm or less spacing on center
      2515.01.C.4.i.4  Noise abating coated spring clips
      2515.01.C.4.i.5  Lateral stabilizing wrapped edge wire
      2515.01.C.4.i.6  2 oz. bonded polyester deck insulator
      2515.01.C.4.i.7  Springs must be hand-tied, connecting insulated wire
      2515.01.C.4.i.8  Universal springs must have lifetime guarantees
   2515.01.C.4.j  Back spring requirements:
2515.01.C.4.j.1 Sinuous (No-sag) construction
2515.01.C.4.j.2 11 or 12 gauge wire
2515.01.C.4.j.3 Lateral stabilizing wrapped edge wire
2515.01.C.4.j.4 Noise abating coated spring clips

2515.01.C.4.k Body padding requirements:
2515.01.C.4.k.1 1.8 density polyurethane of appropriate I.L.D. (Initial Load Deflection)
2515.01.C.4.k.2 Minimum of 2 oz. bonded polyester fiber

2515.01.C.4.l Seat cushion requirements:
2515.01.C.4.l.1 Guestrooms:

2515.01.C.4.l.2 Public Areas:
   a. Seats: Minimum 2.2 density polyurethane with an I.L.D. (Initial Load Deflection) of 24-32 foam with a soft crown.

2515.01.C.4.l.3 Wherever urethane foam cushioning is utilized in seating, it must be combustion modified high resiliency (ICMR foam in the US and CMHR in Europe).
2515.01.C.4.l.4 Cushions and back pillows must be poly-dacron and wrapped with muslin and must pass local, state, and federal code requirements. Cushion covers must have security clips in US and non-corrosive zippers as required for cleaning ease.

2515.01.C.4.m Back pillow requirements:
2515.01.C.4.m.1 2.25 density high resilience polyurethane with an I.L.D. (Initial Load Deflection) of 18 I.L.D.
2515.01.C.4.m.2 Wrapped in polyester fiber or down proof bag enclosing non-bonded polyester fiber

2515.01.C.4.n Fabric requirements:
2515.01.C.4.n.1 Not Applicable to this Brand
2515.01.C.4.n.2 Stain resistant finish is required.
2515.01.C.4.n.3 Fabric backing must be acrylic, latex or knit.
2515.01.C.5 Upholstered furniture must be fully upholstered on all sides unless a decorative, wood-frame and/or arms are integral to the design, and finished per 2515.01.B.5.
2515.01.C.6 Decorative Pillows insert must be microfiber; 0.7 denier hollow conjugated siliconized microfiber or finer than 1.3 denier.

2515.01.D  Sofa Bed
2515.01.D.1 General Requirements
2515.01.D.1.a Solid double-doweled hardwood frame and platform base reinforced with metal with no protruding metal bars, springs or casters under the bed with a standard bed height of 20"/508 mm with solid birch hardwood slats. Traditional eight-way, hand-tied suspension is optional. Single coil springs are attached with links and hand-tied to each other for elasticity in the seat.
2515.01.D.1.b Not Applicable to this Brand
2515.01.D.1.c High quality 4/4 kiln dried hardwood and laminate panel board construction with fasteners and reinforced mechanisms. Cushions must be 8 gauge sinuous construction with 1.8 # of highly resilient foam or 25 innersprings per cushion wrapped with Dacron.
2515.01.D.1.d All materials to meet or exceed CA TB – 117, TB-1633 and local regulatory guidelines.

2515.01.D.2 Sleeper Mechanism
2515.01.D.2.a Mechanism is a one-piece heavy gauge tubular steel.
2515.01.D.2.b No metal bars or springs under the bed.
2515.01.D.2.c Heavy duty square tubular frame construction.
2515.01.D.2.d Mattress platform must be removable.
2515.01.D.2.e Mechanism not to require lifting to exceed 1”/25 mm.
2515.01.D.2.f Mechanism must roll out on four heavy duty wheels.
2515.01.D.2.g Available Sizes:
   60”/1.5 m width
   52”/1.3 m width
2515.01.D.2.h 5 year warranty on mechanism

2515.01.D.3 Sleeper Mattress
2515.01.D.3.a Mattress Options:

   All sleeper mattresses must fit the sleeper sofa mechanism.
Heavy Duty Contract: 72”/1.82 m long, 5.25”/1.33 mm high, 294 coil count, 13 gauge steel wire, CFR TB 1632 and CFR TB 1633 compliant.

Pillow Top: 76”/1.93 m long, 8.5”/216 mm high with Z-coil construction.

Memory Foam: 80”/2.03 m long, 5”/125 mm high thick plush, premium high-density, fire retardant foam throughout entire mattress with no coils or springs that is easily replaced through a concealed zipper cover.

2515.01.D.3.b Not Applicable to this Brand
2515.01.D.3.c Ticking made of Crypton fabric and used with standard flat sheets.
2515.01.D.3.d Mattress must be high grade 2.5 # density foam easily replaced through concealed zipper cover using standard size sheets.
2515.01.D.3.e Damask ticking fabric quilted to a layer of 1.5 oz. hypoallergenic fiber.
2515.01.D.3.f 1”/25 mm layer of 1.5 oz. hypo-allergenic densified fiber to be upholstered between quilted top panel and two pieces of ¼”/6.0 mm fiber insulator pad.
2515.01.D.3.g 6”/150 mm premium innerspring unit, 4-turn contract spring unit made of 13.5 gauge wire coils.
2515.01.D.3.h Coil count: queen – 345, full – 299

2515.01.E Outdoor Furniture
2515.01.E.1 All pool and balcony furniture must be weighted for coastal and areas with high winds and suitable for outdoor use.
   Weight guidelines:
   Chaise: 40 lbs/18.1 kg-50 lbs/22.7 kg
   Dining Chair: 20 lbs/9.1 kg
   Barstool: 20 lbs/9.1 kg
   Dining Table Bases: 110 lbs/49.9 kg
   Dining Table Tops: 50 lbs/22.7 kg
   Tea Table Top and Base: 10 lbs/4.5 kg

2515.01.E.2 Frames/Table Bases
   2515.01.E.2.a Metal Finishes: All outdoor furniture frames must be made of wrought aluminum, cast aluminum or steel; sealed; powder coat finish to avoid corrosion and rusting.
   2515.01.E.2.b Wood Finishes: If wood is used, the minimum wood used must be a natural premium teak (if intended to patina or age); sealed premium teak (if original color is to be maintained); no other types of woods are acceptable.
   2515.01.E.2.c Woven: Woven must consist of an all-weather product (i.e., A026 Polystrap) or polyurethane resin fibers; resistant to harsh weather; UV rated.
   2515.01.E.2.d Composite/Synthetic:
2515.01.E.2.d.1 Composite: woods must be made of Marine Grade Polymer (MGP)
2515.01.E.2.d.2 Synthetic: woods 100 percent recycled polyethylene plastic; pre-dyed coloring to avoid against fading; UV stabilizers; seat slats must have slight flex for extra comfort.
2515.01.E.2.d.3 Polywood: Lumber must be made from high-density polyethylene (HDPE), UV-inhibited pigment systems, foaming compounds, and selected process additives. The HDPE primary raw material must be derived from post-consumer bottle waste, such as milk and detergent bottles or other HDPE post industrial material. This material must be cleaned by a decontamination process to a high purity level, which removes contaminants such as food residue, paper, and adhesives. It must then compounded into a rigid board stock material; with the resulting finished product containing over 90 percent recycled plastic by weight.

2515.01.E.3 Table Tops
2515.01.E.3.a Glass: Glass tops are not acceptable.
2515.01.E.3.b Wood: Wood tops must be sealed with a clear coat polyurethane.
2515.01.E.3.c Composite/Synthetic Wood:
   2515.01.E.3.c.1 Composite: Woods must be made of Marine Grade Polymer (MGP)
   2515.01.E.3.c.2 Synthetic: Woods 100 percent recycled polyethylene plastic; pre-dyed coloring to avoid against fading; UV stabilizers.
2515.01.E.3.d Stone: Stone tops must be sealed; with smooth edges and secured to the table base.
2515.01.E.3.e Composite/Synthetic Stone:
   Quarizz: This is an MDF center with a sealed concrete exterior; epoxy undercoat with Tiger Drylac top coat and is suitable for outdoor areas.

2515.01.E.3.f Acrylic: Requires a removable metal rim with diameter cross supports; minimum thickness of .22”/5.6 mm for tea tables; minimum .50”/12.7 mm for dining tables and of a textured pattern, as not to show scratches.

2515.01.E.4 Table Glides: Outdoor tables exceeding 24”/600 mm must have heavy duty nylon (plastic not acceptable) adjustable glides that are weather resistant and suitable for various types of flooring finishes.

2515.01.E.5 Cushions
2515.01.E.5.a Dacron Foam: minimum of 2.8 lb/1.3 kg density with a polyester cushion padding resistant to harsh weather conditions; quick drying; mildew resistant; meets CAL TB Section 3; ASTM D 3675 Flame Spread; ASTM E 662 Smoke Density.
2515.01.E.5.b Dry Ease Foam: 50 ILD EZ-Dry Foam with pore size of 35 psi; density 2.0 lbs./ft³; tensile 8.0 psi; elongation 25 percent; tear 2.0 lbs/in; IFD 25R (15” x 15” x 4”/375 mm x 375 mm x 100 mm) 50 lbs; 50 percent compression set at 15 percent.
2515.01.E.5.c Fabric: must be a solution dyed acrylic fabric; rated specifically for outdoor use; stain treatment; meets all regulatory guidelines.
2515.01.E.5.d Cushions: must be removable and have a non-corrosive, coordinating zipper; color must coordinate with complimentary fabric.
2515.01.E.6 Chaise lounges used in sandy areas are required to use a sleigh/sled style base frame.

2515.01.E.7 Lounge chairs must have a minimum seat height of 16.5"/420 mm.

2515.02 Fabrics

2515.02.A Fabric Selection Requirements

All fabric selections must meet the following:

2515.02.A.1 Be of heavy duty contract quality.

2515.02.A.2 Not Applicable to this Brand

2515.02.A.3 Comply with the following rub tests:

2515.02.A.3.a Upholstery and pillow fabrics: 30,000 DR Wyzenbeeck or equivalent.

**Canada | United States:** Upholstery fabrics: 30,000 DR Wyzenbeeck or equivalent.

**Canada | United States:** Pillow fabrics: must meet or exceed 15,000 DR Wyzenbeeck, 20,000 Martindale or equivalent.


2515.02.A.4 Comply with the local fire regulations or the following, whichever is more stringent.

2515.02.A.4.a Interior drapery fabrics used must meet the following codes:

2515.02.A.4.a.1 NFPA 701

2515.02.A.4.a.2 Proof of compliance is required by either a sewn-in manufacturer’s tag or a letter on file from the manufacturer.

2515.02.A.4.b Upholstery fabrics used must meet the following codes:

2515.02.A.4.b.1 CAL 117/NFPA 260

2515.02.A.4.c Decorative pillow and bed valance/skirt fabric used must meet the following codes:

2515.02.A.4.c.1 CAL 117, NFPA 260/ UFAC Class 1 or NFPA 701.

2515.02.A.5 Flame retardant certificates of compliance must be provided to the property.

2515.02.A.6 Stain treatment is required on all upholstery and decorative pillow fabrics.

2515.02.A.7 General Requirements

a. Headboard fabrics (not vinyls) must have a triple action finish or include three separate finishes: soil and stain release, stain repellency and anti-microbial.
b. Upholstery fabrics (not vinyls) must have a dual action finish or include two separate finishes: soil and stain release and stain repellency.

c. Certificates must be provided for all treatments.

2515.02.A.8

Upholstery vinyls must be 100% polyvinyl chloride (PVC) or polyurethane (PU) faced vinyl. PU must come with testing to show that the product exceeds ISO 1419 (Tropical Test Method C, 5 weeks).

a. Backings: Single direction knits and suede backing are not acceptable.

b. Stain resistance: Guestroom vinyl to exhibit durable stain resistance and release of stains from food, drinks and writing instruments using common cleaning agents. Vinyl must demonstrate release of stains such as black coffee, red wine, ballpoint pen, mustard, iodine and denim color transfer after being pressed into the surface at a load of one psi for one minute followed by an aging period of 24 hours. The minimal stain rating following cleaning should be a 4.5 using the AATCC gray scale (5.0 = no change). The stain resistance must not be imparted using a sacrificial top layer; rather, cleaning resistance must be repeatable and the appearance must not be changed by cleaning. These properties must exist after 30,000 double rubs on the Wyzenbeek machine.

2515.03 Window Treatment

2515.03.A Window Treatment

2515.03.A.1 Window treatments are not required on transom, clerestory, pool (exterior windows), and fitness center (exterior windows). For security purposes window treatments are not permitted on vision panels and/or side lights at Business Center, Guest Laundry, and Fitness Center entry doors.

2515.03.A.2 Wood plantation shutters are required to have an applied paint or catalyzed lacquer finish. Exposed wood is not allowed.

2515.03.A.3 Draperies must be constructed of material with a minimum width of 54”/1.37 m and a weight of 1.70 pounds per linear yard. All exposed edges must be covered by drapery returns. All draperies must be 1/2”/12 mm off the finished floor.

2515.03.A.4 All batons must be heavy duty, minimum 3/8” diameter and installed on the front of panels 42”/1.07 m AFF in a color complimentary to the fabric.

2515.03.A.5 Public Areas

2515.03.A.5.a Public area windows must be covered with draperies, sheer curtains, and/or plantation blinds and/or wood plantation shutters (2”/50 mm slats).

2515.03.A.5.b Not Applicable to this Brand

2515.03.A.5.c Vision panels and/or side lights at the entry door to public spaces are not to receive window treatments and must be left uncovered for security purposes.

2515.03.A.5.d All windows in public areas must have a valance. The valance must be fabric or painted wood cornices.

2515.03.A.6 Not Applicable to this Brand
2515.03.A.7 Guestroom Window Treatment

2515.03.A.7.a Window treatments in typical guestrooms must include over drapery that is blackout lined and a decorative sheer or a decorative sheer over colored blackouts. Three (3) pass blackout is required.

2515.03.A.7.b Window treatments must be custom-tabled for exact size. All selvages to be removed. All patterns must be horizontally & vertically matched.

2515.03.A.7.c Not Applicable to this Brand

2515.03.A.7.d Window treatments must have a 1/4”/6.0 mm clearance at the ceiling mount.

2515.03.A.7.e Bottom of window treatments must be ½”/12.0 mm clear above the finished floor; actual clearance may vary from 1/4”/6.0 mm to 1/2”/12.0 mm.

2515.03.A.7.f Not Applicable to this Brand

2515.03.A.7.g All window treatments must have a minimum of 4”/100 mm overlap.

2515.03.A.7.h Not Applicable to this Brand

2515.03.A.7.i Top Treatment

2515.03.A.7.i.1 Fabric valances or cornices are not allowed; architectural details such as window pockets, soffits, crown moldings, etc., which conceal the drapery hardware is required. Overlapping is required.

2515.03.A.7.j Over Drapery

2515.03.A.7.j.1 Over drapes must be full traversing, stationary side panels, or tied back, to complement the design format. All over drapery must be lined with the exception of colored blackouts.

2515.03.A.7.j.2 Over drapery lined fullness must be twice the width of the opening when measured across the finished hem plus overlaps and returns. This equates to 250 percent for Pinch Pleat drapery fabrication, 120 percent for sheer fabrication and 100 percent for Ripplefold drapery fabrication.

2515.03.A.7.j.3 Not Applicable to this Brand

2515.03.A.7.j.4 Fabric for over drapery must be as follows:

2515.03.A.7.j.4.a 100 percent cotton, 100 percent polyester and 100 percent Trevira CS is acceptable. All polyester fabric to be of a low pill continuous filament fiber.

2515.03.A.7.j.4.b Not Applicable to this Brand

2515.03.A.7.j.4.c Over drapery fabric used for side panels must be lined with blackout material or inherently act as blackout.

2515.03.A.7.j.4.d Drapery fabrics, excluding sheers and blackouts must maintain a minimum weight of 7 oz per linear yard based on 54”/1.37 m width.

2515.03.A.7.j.4.e Cotton at 180 (1.8 yd /lb) - 133 (1.33 yd /lb).

2515.03.A.7.j.4.f 100 percent polyester at 7-11 oz /yd based on 54”/1.37 m width (9 oz/yd preferred).

2515.03.A.7.k Blackout Drapery

2515.03.A.7.k.1 Fabric for blackout drapery must be as follows:
2515.03.A.7.k.1.a Three-pass soft blackout lining is the minimum requirement for guestrooms.

2515.03.A.7.k.1.b Color: White or ecru to outside, gray unfinished cotton mesh to inside. If over drapery is a light color, then blackout material must be finished on both sides (three pass).

2515.03.A.7.k.1.c Fiber content: 70 percent polyester/30 percent cotton or 100 percent polyester with two foam passes to create blackout.

2515.03.A.7.k.1.d Thread count: 78 x 44 per square inch or equal.

2515.03.A.7.k.1.e A printed blackout drapery is allowed.

2515.03.A.7.k.2 Blackout drapery fullness must be twice the width of the opening when measured across the finished hem plus overlaps and returns. This equates to 200 percent for Pinch Pleat drapery fabrication and 120 percent for Ripplefold drapery fabrication.

2515.03.A.7.k.3 Three-Pass blackout lining is required for all separate blackout drapery and with over drapery fabric which may be adversely affected from bleed-through of the unfinished gray side of a two pass blackout material. It must comply with the following:

2515.03.A.7.k.3.a Weight: 1.16 yd/lb (48”/1.20 m wide) and 1.12 yd/lb (54”/1.37 m wide)

2515.03.A.7.k.3.b Color: White or ecru to outside, white or ivory to inside (NOTE: Other colors to inside may be acceptable depending on design. Brand Management approval required.)

2515.03.A.7.k.3.c Fiber content and process: 100 percent polyester with three foam passes to create blackout.

2515.03.A.7.k.3.d Thread count: 78 x 54 per square inch or equal.

2515.03.A.7.l Side Panels

2515.03.A.7.l.1 Side panels must be 200 - 250 percent fullness. Finished widths of stationary side panels are 28”/71 cm (1-1/2 widths of 48”/1.20 m wide fabric) and 30”/76 cm (1-1/2 widths of 54”/1.37 m wide fabric).

2515.03.A.7.m Sheers

2515.03.A.7.m.1 Sheer or casement drapery fullness must be 2-1/2 times the width of the opening when measured across the finished hem plus overlaps and returns. This equates to 250 percent for Pinch Pleat drapery fabrication and 120 percent for Ripplefold drapery fabrication.

2515.03.A.7.n Not Applicable to this Brand

2515.03.A.7.o Not Applicable to this Brand

2515.03.A.7.p Not Applicable to this Brand

2515.03.A.7.q Drapery Hardware

2515.03.A.7.q.1 All hardware must be affixed by drill and plug method. "Shot" installation is not allowed.

2515.03.A.7.q.2 Installation must be a two-track or three-track system.

2515.03.A.7.q.2.a Three-track systems must have individual tracks for sheers, blackouts and over drapery. When fixed side-hanging over drapes are used, short tracks or rods approximately equal in length to the over drapes are required.

2515.03.A.7.q.2.b Two-track installations must consist of individual rods for sheers and full-traverse over drapes with sewn-in blackout lining.
2515.03.A.7.q.3 Cordless hand-drawn track must be used.
2515.03.A.7.q.4 All draperies with lined and unlined headings must be pinned and hung evenly with non-corrosive heavy duty stainless steel hooks and/or Microflex pins.
2515.03.A.7.q.5 Exposed drapery tracks are not allowed.
2515.03.A.7.q.6 All batons must be heavy duty and installed on the front of panels 42”/1.07 m AFF.
2515.03.A.7.q.7 All batons must be in a color complimentary to the fabric.
2515.03.A.7.q.8 Not Applicable to this Brand
2515.03.A.7.q.9 When used, roman valances must be attached by means of Velcro fastener; one part of which must be sewn to valance, one part of which must be glued to the track. Ensure that there are no light leaks at the perimeter.

2515.03.A.7.r Motorized Blinds
2515.03.A.7.r.1 Must be contract grade.
2515.03.A.7.r.2 Must be inside window mount.
2515.03.A.7.r.3 Must be 99% blackout.
2515.03.A.7.r.4 COM must be of contract grade and meet local fire regulations.
2515.03.A.7.r.5 No more than 1/16”/1.6 mm clearance is allowed on each side.
2515.03.A.7.r.6 Wall switch or remote controls are acceptable.

2515.03.A.7.s Manual Blinds
2515.03.A.7.s.1 Must be contract grade.
2515.03.A.7.s.2 Must be inside window mount.
2515.03.A.7.s.3 Must be 99% blackout.
2515.03.A.7.s.4 COM must be of contract grade and meet local fire regulations.
2515.03.A.7.s.5 No more than 1/16”/1.6 mm clearance is allowed on each side.
2515.03.A.7.s.6 Chain pulls must be secured at the bottom.

2515.04 Top Surfaces
2515.04.A Top Surfaces Definition
Top surfaces are all tabletops or countertops or other horizontal interior architectural element that people can touch.
2515.04.B Top Surface Material Requirements
Materials used must meet the performance criteria that follows:
2515.04.B.1 Structural integrity as required for intended use without deflection
2515.04.B.2 Solid, non-porous material or veneer without exposed veneer edges
2515.04.B.3 Impact and scratch resistant
2515.04.B.4 Resistant to damage from standing water
2515.04.B.5 Non-corrosive material
2515.04.B.6 Washable with standard non-toxic housekeeping chemicals
2515.04.B.7 Marble must be 3/4"/20 mm thick with polished edges on exposed sides and must have a tuff skin protective coating.
2515.04.B.8 Countertop materials used in food preparation and serving areas must be resistant to damage from heat.

2515.04.C Fully Supported Tempered Glass Surfaces
   Tempered glass surfaces must be a minimum of ¼"/6.0 mm when fully supported.

2515.04.D Unsupported Tempered Glass Surfaces
   Tempered glass surfaces must be 3/8"/10.0 mm– ½"/12.0 mm when not fully supported.

2515.04.E Overall Top Surface
   An overall top surface minimum thickness of ¾"/19 mm is required when a laminate top is used.

2515.04.F Porous Stone Tops
   All porous stone tops must be properly sealed upon installation. The use of a tuff skin sealer or an equivalent is required.

2515.04.G Fixed Glass & Bumpers
   Glass must be fixed. Provide clear acrylic bumpers adequate for size of top of table/case piece.

2515.04.H PLAM Requirements
   Plastic laminate tops must be surfaced with high pressure laminate with a minimum 45 lb/20 kg density industrial grade MDF core with fine face particles and proper backing sheet to prevent warping. Tops must be laminated using contact, semi-rigid (PVAC), or rigid (ureas, resorcinol) adhesives, to provide for type two bonding. A “V” groove 1/16”/2 mm deep is required for all inset laminate tops with a solid wood edging sanded smooth. All patterned plastic laminate must be matched exactly at joints. The finished appearance of the plastic laminate must be free from blisters, cracks or any other defects due to faulty workmanship.

2515.04.I Stone Top Requirements
   Stone top must have plywood sub-top, painted black. Top must be glued and screwed to base of casegood. All exposed surfaces must be sealed with an approved impregnator and penetrating sealer to protect stone from water, alcohol, and chemical stains.

2515.04.J Top Surface Construction Approval
   The construction of the top surface must be approved on an individual basis by Hilton as being aesthetically appropriate for the Brand and the specific context of the design.

2515.05 Art
   2515.05.A Artwork Framing Standards - Public Areas:
      2515.05.A.1 Mounting
2515.05.A.1.a Paper art must be dry mounted to prevent buckling with the following exceptions:  
  2515.05.A.1.a.1 Expensive pieces whose value will be jeopardized. Proper conservational mounting techniques may be used, such as T hinges made from acid free linen tape.  
  2515.05.A.1.a.2 Dimensional art or where dry mounting is impossible.  
  2515.05.A.1.a.3 Free floating pieces  
2515.05.A.1.b Photographs must be mounted if possible. Valuable photographs may be mounted using conservation adhesive tissues and backing boards.

2515.05.A.2 Matboards  
2515.05.A.2.a Conservation of artwork requires either an acid free rag matboard, or at minimum an alpha cellulose board. Approved brands are Bainbridge Alphamat, Crescent Rag, Larson Juhl Artique and Rising.  
2515.05.A.2.b White core matt must be used for all matt situations.

2515.05.A.3 Glass  
2515.05.A.3.a Regular framer’s glass is acceptable. A conservation glass, such as 98 percent UV protected, is preferred for valuable pieces.  
2515.05.A.3.b Plexiglas is acceptable for larger pieces in excess of 48”/1.2 m in width; however, it must be a UV Plexiglas product if the art is of significant value. UV Plexiglas does have some coloration to it and may obscure the artwork.  
2515.05.A.3.c Reflection controlled glass or Plexiglas must be used at bright sunlight areas.  
2515.05.A.3.d Museum quality glass must be used for artwork of the highest caliber.  
2515.05.A.3.e A minimum glass thickness of 3/16”/5.0 mm is required.

2515.05.A.4 Frames  
2515.05.A.4.a Wooden moldings are preferred.  
2515.05.A.4.b Framers must minimize the potential of powder post beetles and avoid wood species that may be prone to infestations.  
2515.05.A.4.c All frames must be sealed with either a paper moisture barrier or tape.

2515.05.A.5 Boxing and Crating  
2515.05.A.5.a Artwork must be boxed and crated to minimize risk of damage in transit.  
2515.05.A.5.b Frame corners must be applied and adhered so that they do not come off until removed by the installation teams. Some form of protection, such as bubble wrap, must be used around each of the frames.  
2515.05.A.5.c When boxing/crating canvases, the surface of the artwork must be protected from potential damage caused by movement or scuffing while in transit.  
2515.05.A.6 Signage identifying artwork must not be used without prior approval from Hilton.

2515.05.B Contract Framing Standards - Guestrooms  
2515.05.B.1 Mounting  
2515.05.B.1.a Wet or dry mount to foamcore is acceptable.
2515.05.B.1.b Unique specifications or art type require an alternative method of display, such as shadow boxing.

2515.05.B.2 Matboards
2515.05.B.2.a Matboards must be white core regular matboard or better.

2515.05.B.3 Glass
2515.05.B.3.a Regular framer’s glass is acceptable.
2515.05.B.3.b Reflection control glass must be used in areas affected by sunlight.

2515.05.B.4 Frames
2515.05.B.4.a Wooden moldings are preferred.
2515.05.B.4.b MDF core frames are acceptable upon prior approval by Hilton.
2515.05.B.4.c When fitted, all frames must be sealed with either a backing paper or tape.

2515.05.B.5 Boxing/Crating
2515.05.B.5.a Artwork must be boxed and palletized.
2515.05.B.5.b Frames must be cornered to prevent damage both in shipping and for movement during installation.
2515.05.B.5.c Frames must be boxed face to face and back to back. Where necessary, additional cardboard must be used between the faces to prevent potential damage to moldings.

2515.05.B.6 Security Hardware
2515.05.B.6.a Artwork must be supplied with a T-screw locking system or other approved method.
2515.05.B.6.b Lighter artwork may utilize standard brackets at top. Heavier items, especially mirrors, must use a Z-bar or similar cleat at top as well as a T-screw lock at bottom.

2515.05.B.7 Signage identifying artwork must not be used without prior approval from Hilton.

2515.06 Mirrors
2515.06.A Mirror Requirements
Mirrors must be 3/16”/4 mm – 1/4”/6 mm polished with vinyl backing/vinyl safety back, free of distortion. Mirrors must be fabricated of polished plate glass. All mirrors must be guaranteed against silver oxidation. All mirrors must be mounted on hardwood or masonite backing at a minimum 3/16” thickness.

2515.06.B Frames
2515.06.B.1 Wooden moldings are preferred.
2515.06.B.2 Framers must minimize the potential of powder post beetles and avoid wood species that may be prone to infestations.
2515.06.B.3 All frames must be sealed with either a paper moisture barrier or tape.
2515.06.B.4 MDF frames are not allowed in bathrooms or other areas in close proximity to moisture.
2515.06.C  Mirror Installation Requirements
All mirrors must be installed with tamper-proof 3-point (4-point must be used on larger pieces) security mounting hardware appropriate for wall condition and weight of mirror for a complete and finished installation.

2516.00  Fire Protection and Life Safety Requirements

2516.01  Administration
2516.01.A  Applicability
2516.01.A.1  This standard details fire and life safety requirements for the design and construction of new properties, conversion of existing properties and the renovation of existing properties under the Hilton Portfolio of Brands. These requirements are applicable to all properties within the Hilton system including owned, managed and franchised properties.
2516.01.A.2  The requirements are performance-based with the goal of safeguarding guests and team members from fire incidents within all Hilton properties.

2516.01.B  Compliance with Standards
2516.01.B.1  Technical standards and governing agency applicable to the design, construction and continuing operation of each property shall be identified. Where the requirements of local, regional and/or national authorities (i.e. the Authority Having Jurisdiction hereafter, AHJ) exceed those prescribed by Hilton, the more stringent standard must be followed. Conflicts between applicable standards must be referred to Hilton’s Architecture, Design, Construction & Technical Services Team for review and resolution. Where a clearly recognized AHJ does not exercise jurisdiction, Hilton reserves the right to specify additional fire and life safety standards applicable to a project or property.
2516.01.B.2  In the event of unusual circumstances, alternative design approaches may be considered. Nothing within these standards is intended to prevent the use of systems, methods or devices of equivalent or superior quality, strength, fire resistance, effectiveness, durability and safety.

2516.02  Fire Rated Construction
2516.02.A  Minimum Fire Ratings
Minimum fire ratings for construction elements must be utilized in accordance with the construction codes as identified per the requirements of Section 2500.00. Where construction codes referenced in Section 2500.00 are not current and compatible with Section 2516.00, Hilton reserves the right to stipulate the use of alternate or supplemental construction codes. In addition, the following minimum standards apply.

2516.02.B  Roof System Requirements
Roof systems, except for ancillary detached buildings, must be “class A, B, or C” rated as defined by Underwriters Laboratories (www.ul.com).

2516.02.C  Fire-Resistive Construction Requirements
Fire-resistive construction is required for the following areas:

<table>
<thead>
<tr>
<th>Area</th>
<th>Combustible Construction &lt; 14 metres / 46 ft</th>
<th>Combustible Construction 14 metres / 46 ft &gt;</th>
<th>Non-Combustible Construction &lt; 30 metres / 98.4 ft</th>
<th>Non-Combustible Construction 30 metres / 98.4 ft &gt;</th>
</tr>
</thead>
<tbody>
<tr>
<td>All floors, load-bearing walls, columns, and beams</td>
<td>1 - hour</td>
<td>2 - hour</td>
<td>1 - hour</td>
<td>1 - hour</td>
</tr>
</tbody>
</table>
Between guest rooms | 1 - hour | 1 - hour | 1 - hour * | 1 - hour *
--- | --- | --- | --- | ---
Between corridors and guest rooms | 1 - hour | 1 - hour | 1 - hour * | 1 - hour *
Stairs and Elevator/Lift | 1 - hour | 2 - hours | 1 - hour | 2 - hours
Shafts & Risers - Gas / Electrical - Hazard | 1 - hour | 2 - hours | 1 - hour | 2 - hours
Shaft & Risers - Mech / Plumb - low Hazard | 1 - hour | 1 - hour | 1 - hour | 1 - hour
Flue enclosure / **Linen Chute | 1 - hour | 2 - hours | 1 - hour | 2 - hours *
Mech / Plant Rooms containing gas-fired equipment | 1 - hour | 1 - hour | 1 - hour | 1 - hour
Laundry area perimeter | 1 - hour | 1 - hour | 1 - hour | 1 - hour
Trash collection / Recyclable storage rooms | 2 - hours * | 2 - hours | 2 - hours * | 2 - hours *

* The rating may be reduced by half when the building is protected throughout with automatic sprinklers, full evacuation sequence occurs upon alarm and where allowed by the local AHJ.

### Doors

<table>
<thead>
<tr>
<th>Doors</th>
<th>Sprinklered</th>
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</thead>
<tbody>
<tr>
<td>One-Hour Fire Resistive Walls</td>
<td>20 minute</td>
<td>20 minute</td>
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<tr>
<td>Two-Hour Fire-Resistive Walls</td>
<td>60 minute</td>
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<tr>
<td>Elevator Doors</td>
<td>30 minute</td>
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** Linen chute discharge doors must be top-hinged with fusible link release, fire/smoke seals and when closed must be at least 6'-0"/1.8 m above the finished floor. The linen chute must have self-closing, self-locking doors. Doors must be interlocked unless the chute area is locked off from the public.

2516.02.D Doors in Fire-Resistive Partitions

Doors in fire-resistive partitions must be self closing with the following ratings where allowed by the local AHJ: In buildings that meet the Exception in 2516.02.C, the door ratings shall be no less than half the overall rating of the wall and never less than 30 minutes, where allowed by the local AHJ.
<table>
<thead>
<tr>
<th>Area</th>
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<tr>
<td>Flue enclosure / **Linen Chute</td>
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* The rating may be reduced by half when the building is protected throughout with automatic sprinklers, where allowed by the local AHJ.

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2516.02.E Mixed-Use Buildings Fire Separation

Mixed-use buildings must have a two-hour fire separation between the property and adjacent occupancy. This may be reduced to one-hour when the entire building is protected throughout with automatic sprinklers. Accessory areas, such as retail spaces, comprising less than 10 percent of the floor area are excluded from the separation requirement. Parking garages are not considered a separate use, unless the garage is shared as part of a mixed use complex with the following criteria: the garage must have a continuous two hour separation from all hotel areas, the garage must have smoke and CO detection interfaced to the hotel alarm panel, mechanical ventilation if 60 percent of the walls are not open to natural air flow, and standpipe system with hose stations (piping, hose and nozzles) located to allow for 100 percent coverage of the garage area.

2516.02.F Fire-rated Doors and Frames

Fire-rated doors and frames must be independently certified as fire rated by a national fire body authorized to certify such systems. A proprietary metal seal/sticker must be attached to the edge of the door and frame indicating the rating or proper documentation from a professional testing agency is on file.

2516.02.G Fire Dampers

Fire dampers rated for 90 minutes must be provided in penetrations through two-hour partitions. Exception bathroom exhaust subducts extend at least 22"/559 mm vertically into the main exhaust shaft and there is continuous airflow upwards to the exterior.

2516.02.H Fire-Resistive Construction Penetrations

All penetrations in fire-resistive construction must be protected with through penetration systems approved by Underwriters Laboratories, [www.ul.com](http://www.ul.com), or equal.

2516.03 Fire Suppression

2516.03.A General

2516.03.A.1 All buildings must be provided with comprehensive automatic fire sprinkler capability, except as noted within this Section.

2516.03.A.1.a Buildings less than 98'-4"/30 m in height are not required to be sprinkler protected. The height of the building is measured from the level of means of egress to the floor slab of the highest normally occupied guest level.

2516.03.A.1.b Guestroom bathrooms less than 90 ft²/8.4 m² with non-combustible fixtures and closets less than 24 ft²/2.2 m² are not required to be sprinkler protected.

2516.03.A.1.c High ceiling areas, including atriums, greater than 55'-0"/16.8 m are not required to be provided with automatic sprinkler protection at the ceiling level. Floor areas opening to such space require automatic sprinkler protection. Also reference Section 2516.04.C.12 for additional smoke detection requirements.

2516.03.A.1.d Small, typically non-occupied auxiliary structures, located remotely from principal buildings and containing non-critical functions are not required to be sprinkler protected.
2516.03.A.1.e Sprinklers are required in garages except when detached, above grade and having walls that are open at minimum 60 percent or as defined in 2516.02.E combined with a dedicated smoke control system.

2516.03.A.1.f Sprinklers are required in below grade spaces except when the aggregate occupant load is less than 50 persons for all below grade spaces. If the below grade occupancy load for the back of house is < 15 and there are two dedicated means of egress for the public areas, provide sprinklers in the public areas only as long as 2-hour construction separates the public areas from the back of house areas.

2516.03.A.2 Protective systems must be specified, installed and successfully commissioned in conformance with one of the following standards:

- 2516.03.A.2.a NFPA 13 Standard for the Installation of Sprinkler Systems – latest edition (www.nfpa.org)
- 2516.03.A.2.d Australia AS 2118 (WMTS) – latest edition
- 2516.03.A.2.e New Zealand NZS 4541 – latest edition
- 2516.03.A.2.f Korean Fire Protection KFPA – latest edition
- 2516.03.A.2.g Japan Standards Association JSA – latest edition

2516.03.A.3 Automatic water mist systems may be substituted for automatic sprinklers only with approval from Hilton Engineering. Confirmation of fire tests of the system and component testing as required by NFPA 750, Vds, FM Global and other local required standards (listed above) must be submitted in full for Hilton Engineering approval.

2516.03.B Automatic Sprinkler Protection

2516.03.B.1 Automatic sprinkler systems must be hydraulically designed by experienced and licensed fire protection design professionals subject to Hilton approval. At a minimum, systems must be designed using the following criteria:

- 2516.03.B.1.a Design areas shall be suitable to the hazard protected. Example occupancy classifications include: Light Hazard-Guestrooms, Meeting Rooms and Offices; Ordinary Hazard (Group 1)-Restaurants, Kitchens, Laundries and Mechanical Rooms. Large meeting/convention spaces should be evaluated on the basis of potential fuel load of displays/booths. Special hazards shall be managed per Section 2516.03.G.

- 2516.03.B.1.b A hose stream allowance, appropriate for the hazard calculated, shall be included in hydraulic calculations to allow simultaneous flow of sprinkler protection and manual firefighting operations.

- 2516.03.B.1.c A safety factor of 10 percent must be applied to hydraulic demand calculations.

- 2516.03.B.2 Except for areas subject to freezing, wet pipe style automatic sprinkler protection must be provided in all areas. In areas subject to freezing, dry-pipe or anti-freeze style sprinkler protection must be provided. Antifreeze solutions must be listed for use in automatic sprinkler systems. Electric heat tracing of piping and system components is prohibited.

- 2516.03.B.3 Reliable measures must be provided to maintain wet pipe fire protection piping and equipment at a minimum temperature of 40 °F/4 °C.
2516.03.B.4 Quick Response (QR) sprinklers must be used throughout automatic sprinkler systems, subject to installation criteria published by the manufacturer. The use of standard response sprinklers in existing buildings is permitted until such time as major renovation of the automatic sprinkler system(s) occurs. Standard response heads are acceptable in garages.

2516.03.B.5 Non-concealed or recessed (ceiling or sidewall) sprinkler heads must have appropriate signage to discourage interaction with the device. Locations where concealed sprinklers heads are required are listed within each area of Sections 2500.00 - 2514.00.

2516.03.B.6 Not Applicable to this Brand

2516.03.B.7 Consideration must be given to design and system component selection in areas subject to freezing (including unheated interior building spaces and freezers/coolers), corrosive atmospheres (pool areas, saunas and laundries) and exposure to salt air.

2516.03.B.8 Exposure to natural hazards must be included in the design and installation of systems as warranted including seismic loads, flood exposure and tornadoes.

2516.03.B.9 Systems must be zoned, at a minimum by guestroom floor.

2516.03.B.10 Provide an electrically supervised valve tamper switch for each system control valve. Electrically supervised water flow switches must be provided for each system zone as well as each riser.

2516.03.B.11 Properties being converted to a Hilton brand must be evaluated for the presence of failing, deteriorating, obsolete or recalled automatic sprinkler components. Continued service of these components must not be permitted:

- **2516.03.B.11.a** Automatic sprinkler piping systems containing polybutylene piping, or ultra-thin wall piping such as Poz-Lok tubing.
- **2516.03.B.11.b** CPVC piping exposed to incompatible chemicals, fire stopping material and other substances known to cause pipe failure.
- **2516.03.B.11.c** Sprinkler components exhibiting microbiologically influenced corrosion (MIC).
- **2516.03.B.11.d** Automatic sprinklers subject to recall and replacement by manufacturers notably Central Omega (recall date 1998) and Central O-Ring (recall date 2003) model sprinklers.

2516.03.C Standpipe and Hose Systems

2516.03.C.1 All properties must be provided with interior hose connections supplied by dedicated standpipe systems, or piping combined with automatic sprinkler systems, except as noted in this Section and if the exception is allowed by the local AHJ:

- **2516.03.C.1.a** Buildings with the highest occupied floor less than 98’-4”/30 m above the level of exit discharge do not require a standpipe system unless building configurations or floor layouts do not permit hose deployment by local fire forces.

2516.03.C.2 For buildings protected by automatic sprinklers, standpipe systems and hose connections may be designed and installed for fire department or brigade service use only.

2516.03.C.3 For those buildings not provided with automatic sprinklers, standpipe systems must include complete hose stations (piping, hose and nozzles on every floor). Water supply must be of the wet/automatic style.

- **2516.03.C.3.a** The water supply must be designed to provide a minimum flow rate of 500 gpm/1895 Lpm.
- **2516.03.C.3.b** The minimum duration of flow must be 30 minutes.
2516.03.C.4 When the standpipe system is provided with a fire department connection, the local fire department must be consulted regarding available water supply.

2516.03.C.5 Diameter and threading of hose connections must be consistent with those used by firefighting forces responding to the property. Verify with the local AHJ.

2516.03.C.6 Pressure at the nozzle tip must be 100 psi/6.9 bar.

2516.03.C.7 Pressure reducing mechanisms must be utilized where hose connection outlets exceed 175 psi/12 bar.

2516.03.D Water Supply Requirements

2516.03.D.1 A reliable water supply, capable of supplying the calculated, hydraulic requirements of the installed fire suppression systems, for a minimum period of 30 minutes, must be provided. Coordinate supply and connection requirements with the local AHJ.

2516.03.D.2 The water supply must be provided by one or more of the following components:

2516.03.D.2.a Connection to a reliable municipal water supply.

2516.03.D.2.b Connection to a municipal water supply augmented with booster fire pump(s) to meet calculated requirements.

2516.03.D.2.c Connection to a fire pump(s) supplied by a water tank of sufficient capacity to meet calculated demands. As a minimum 15,000 gallons of dedicated fire water must be provided. In the event two or more fire pumps are provided, pump drivers must vary between electric motor driven and fuel driven engine driven units.

2516.03.D.2.d Connection to an elevated water storage tank.

2516.03.D.3 Exposure to natural hazards including seismic loads, flood exposure, severe wind load and tornadoes must be considered.

2516.03.D.4 Water supply components must be specifically designed and rated for fire protection service. See 2516.03.A.2.

2516.03.E Kitchen Hood and Duct Protection

2516.03.E.1 Where a kitchen hood exhaust system is used to control grease-laden vapors, the following fire protection systems and hood/duct construction criteria must be provided:

2516.03.E.1.a A fire suppression system designed for the installation in a kitchen hood to protect kitchen appliances and the kitchen hood exhaust system. The suppression system must provide protection of the kitchen cooking appliances, the kitchen exhaust hood, and the exhaust plenum portion of the hood connection to the exhaust duct.

2516.03.E.1.b The kitchen exhaust hood and the exhaust ducting must be solely dedicated to the exhaust of grease laden vapors and must be separated from all other exhaust systems.

2516.03.E.1.c Kitchen ducts shall be constructed and supported of carbon steel with minimum thickness of .060 in. (1.52 mm) or stainless steel with minimum thickness of .048 in. (1.21 mm) or Galvalume meeting the Japan Building Codes for thickness. Factory-built grease ducts listed to UL 1978 or equivalent regional standard shall be permitted.

2516.03.E.1.d Kitchen exhaust duct system must be constructed and installed so that grease cannot collect or leak from any joint in any portion of the exhaust system.
2516.03.E.1.e Grease duct cleanout access panels must be provided to allow inspection and cleaning of all sections of the duct system. Access hatches must not be spaced more than 19'-8"/6 m apart.

2516.03.E.1.f In all buildings more than one story in height exhaust ducts shall be provided with a fire resistive enclosure. For buildings less than or equal 46'-0"/14 m enclosures shall have a 1 hour fire resistance rating. Buildings greater than 46'-0"/14 m shall have a two hour fire resistance rating.

2516.03.E.1.g Clearance of non-enclosed kitchen exhaust ducts to the surface of: combustible materials must not be less than 18"/457 mm, limited combustible materials 3"/76 mm, noncombustible material 0"/0 mm. Clearance criteria may be modified by the use of equipment/assemblies specifically listed for use with kitchen hoods and approval by Hilton.

2516.03.E.2 New and replacement kitchen hood fire suppression systems referred to in 2516.03.E.1.a must be pre-engineered wet-chemical fire extinguishing systems rated compliant with UL 300 (www.ul.com). Activation of system must automatically shut down the fuel source to the cooking equipment and signal an alarm to the building fire alarm system.

2516.03.E.3 A manual shut off and reset valve for the gas supply must be provided along the means of egress from the cooking area.

2516.03.F Fire Extinguishers

2516.03.F.1 Portable fire extinguishers must be provided and installed in accordance with the AHJ.

2516.03.F.2 Fire extinguishers must be contained in recessed cabinets in public spaces as allowed by the AHJ.

2516.03.F.3 At a minimum, fire extinguishers must be provided in the following non public areas:

2516.03.F.3.a Office areas
2516.03.F.3.b Laundry
2516.03.F.3.c Engineering and mechanical spaces
2516.03.F.3.d Kitchens
2516.03.F.3.e Storage rooms (exempt where allowed by the AHJ when under 500 ft2/46 m2 or within a travel distance of 75'-0"/23 m of another readily available extinguisher)

2516.03.G Special Hazards

2516.03.G.1 Special hazards must be reviewed by a qualified engineer. These hazards include, but are not limited to electrical transformer vaults, large gas or chemical storage facilities, and critical IT and/or PBX rooms. Suppression system is not required if the room is 2 hour rated construction and has an Addressable Smoke Detector.

2516.03.H Commissioning of Fire Suppression Systems

2516.03.H.1 All fire suppression systems must be formally and successfully tested based on the requirements of the standard referenced at Section 2516.03.A.2, prior to turnover for operational purposes. Commissioning activities must be witnessed by a qualified, independent third-party engineer.
2516.03.H.2 Project documentation, including specifications, test documentation and as-built shop drawings must be provided to the property operations staff.

2516.03.H.3 Testing and commissioning must verify the correct operation of all interfaces with ancillary systems, including the building fire alarm system.

2516.03.H.4 Provide demonstration and instruction of the installed equipment to selected members of the property operations staff.

2516.03.H.5 Provide written verification of testing, utilizing standard forms required by Section 2516.03.A.2. Where required, testing documentation must be furnished to the AHJ.

2516.04 Fire Detection, Communication and Alarm System

2516.04.A General

2516.04.A.1 All buildings must be provided with reliable capability to detect a fire incident, report the incident to hotel staff and initiate appropriate evacuation sequences.

2516.04.A.2 Fire alarm and detection systems must be designed by experienced and licensed fire protection design professionals subject to Hilton approval.

2516.04.A.3 All new and retrofit systems must utilize the point-addressable, distributed processing, distributed amplification technology providing a discrete system "address" for each individual initiating device.

2516.04.A.4 The design, installation and commissioning for a new fire detection and alarm system must provide a fully automatic fire detection and alarm system to satisfy the area coverage, and operational and performance criteria as outlined in this section.

2516.04.A.5 For new, renovated or altered systems, specifications meeting one of the following standards must apply:


2516.04.A.6 All equipment including cabling must be supported and approved by one of the following testing laboratories:

2516.04.A.6.a UL (Underwriters Laboratories), USA, www.ul.com

2516.04.A.6.b Vds (Verband der Sachversicherer), Germany, www.vds.de

2516.04.A.6.c BS (British Standards), www.bsigroup.com

2516.04.A.6.d CEN (European Committee for Standardization), www.cen.eu

2516.04.A.6.e 3C China Compulsory Certification by the “Certification and Accreditation Administration of the PRC”, www.cnca.gov.cn or www.gcc-cn.org


2516.04.A.6.g New Zealand NZS 4512 – latest edition


2516.04.B Basic Design Principles
2516.04.B.1 All new and retrofit systems must be capable of expansion to support at least a ten percent increase in initiating, control and, notification appliance circuits.

2516.04.B.1.a Control cabinets, power supplies and amplifier capacities must be sized accordingly.

2516.04.B.1.b Spare cabinet and power supply capacity must be evenly distributed throughout the system.

2516.04.B.2 Where permitted by local code, all new and retrofit systems must incorporate an alarm verification function in the control panel for system-type smoke detectors. Alarm verification must not be provided for manual fire alarm boxes or water flow alarm switches.

2516.04.B.3 Pre-signal alarms allowing time to investigate a detection device prior to general alarm are permitted provided the following conditions are met:

2516.04.B.3.a The local AHJ allows such arrangement.

2516.04.B.3.b Heat detectors and suppression system detection cause immediate evacuation sequence.

2516.04.B.3.c Subsequent devices in the same zone cause immediate evacuation sequence.

2516.04.B.3.d The time to investigate before a general evacuation sequence is less than four minutes.

2516.04.B.3.e The property has sufficient staff on-duty to conduct an investigation of the incident.

2516.04.B.4 Where reliable conditioned commercial power and/or emergency power is not anticipated and in areas subjected to severe lightning, a UPS must be configured to protect the fire alarm central control equipment, and peripheral printers and terminals, against brownout and voltage transients. Upon utility power failure, the UPS must provide power to all connected loads per above. Design and installation must be coordinated with Section 2516.06.

2516.04.B.4.a At a minimum, provide a Power Conditioner/Voltage Regulator (PC/VR) for the fire alarm panel.

2516.04.B.4.b The PC/VR kVA output must be capable of supporting the fire alarm equipment.

2516.04.B.4.c The PC/VR must have Automatic Voltage Regulation capable of maintaining output voltage to within five percent of its nominal voltage rating with an input voltage variation of +15 percent to -25 percent.

2516.04.B.5 Transient surge suppression must be provided for each circuit connected to the fire alarm system that enters or exits the building housing the fire alarm control panel, or sub-panel.

2516.04.B.6 Where devices are located in unconditioned space, they must be suitable for such areas as determined by the manufacturer and protected from weather and corrosion.

2516.04.B.7 Hotels located within a mixed-use development must have a dedicated, hotel fire detection, communication and alarm system with equipment capable of interfacing with fire alarm signals from the entire development. Fire alarm interface equipment must be tied to an emergency power source.

2516.04.C Fire Detection

2516.04.C.1 Local hard wired single-station smoke alarms or addressable smoke detection with sounder base must be installed in each sleeping area and sitting room of suites. Alarm signals can be supervisory.

2516.04.C.1.a Where two or more smoke alarms are located in a suite, they must be interconnected to alarm simultaneously.
Smoke alarms must be provided with integral battery-back up. Properties can utilizing wireless single-station alarms where the battery life is monitored by the panel and batteries are utilized with a shelf life rated at over 10 years and long-term discharge under low-discharge conditions rated at over 6 years.

For buildings protected throughout by monitored suppression systems, addressable smoke detectors must be provided within each area as follows:

- Interior guestroom corridors
- Elevator lobbies
- Mechanical and electrical rooms
- Computer/telecom/PBX rooms
- Storage rooms

The use of smoke detectors must be limited, unless local codes require additional units or prohibit the removal of existing detectors. Existing detectors that provide serviceable control hardware, exhibit no false alarms and are generally stable are not required to be removed.

In buildings that are not protected throughout by monitored fire suppression systems, fully addressable fire detection must be provided in all spaces. Except voids less than 32"/800 mm and public toilets.

In-duct smoke detectors must be provided downstream of air filters and prior to branch connections in air conditioning systems having a capacity greater than 2,000 ft³ per minute/944 L per second, and at each connection to a vertical duct or riser serving two or more stories.

Duct detectors must provide a supervisory alarm only and not cause evacuation unless required by local code.

Any detection device not accessible from the floor level must be provided with a remote test switch and indicator light.

A manual fire alarm (manual call) station must be located in close proximity to the front desk.

Manual fire alarm stations must be provided at each floor exit and exit to the exterior. If permitted by local code, manual fire alarm stations may be omitted on guest floors in sprinkler-protected buildings.

Special fire suppression systems and kitchen hood systems must be monitored by the fire alarm system.

Fire pump, emergency generator, sprinkler and standpipe system alarm and supervisory devices must be monitored by the fire alarm system.

Projected beam-style smoke detection must be used within atriums. Individual, spot-type detectors must not be provided within atriums, unless required by the local AHJ.

Provide projected beam smoke detectors installed at every third level in accordance with the listing parameters of the selected device.

For irregular shaped atriums, more than one beam may be needed on each level, or an aspirating system may be necessary to provide required coverage.

Fire modeling must be used to determine type, location and style of coverage and to demonstrate that a smoke layer is maintained 6'-0"/1.83 m above the highest floor level of exit access, or unprotected opening to adjoining spaces.

Notification
2516.04.D.1 At a minimum, the following devices must provide fire alarm annunciation:
2516.04.D.1.a Main fire alarm control panel and printer
2516.04.D.1.b Remote annunciator in the security office
2516.04.D.1.c Remote annunciator at the front desk, PBX or other 24-hour staffed area
2516.04.D.1.d Color display terminal(s) with graphic capability (required at properties greater than 1,000 guestrooms and/or multi-building facilities)

2516.04.D.2 Audible notification appliances must be installed, spaced and tapped so as to produce a sound output on alarm that is clearly audible above the ambient noise level throughout the building.
2516.04.D.2.a In no case must the audible alarm be less than 15 dBA above the ambient room noise level or less than 5 dBA above the maximum ambient noise level in public and common areas, with a minimum of 65 dBA, and a maximum of 110 dBA.
2516.04.D.2.b In no case must the audible alarm be less than 75 dBA at the pillow level in all guestrooms, with intervening doors closed during the alarm.

2516.04.D.3 A speaker, local voice chip or horn must be provided in each guestroom and area used for sleeping purpose.

2516.04.D.4 Not Applicable to this Brand

2516.04.D.5 Notification appliance circuits must be arranged so that no single cut or fault will result in the failure of multiple zones.

2516.04.D.6 In-Building Fire Emergency Voice/Alarm Communication Systems (EVACS)
2516.04.D.6.a EVACS must be provided for areas in buildings where the highest occupied floor is greater than 98'-4"/30 m above the level of exit discharge and/or buildings containing assembly areas designed for 1,000 or more persons. Exception: A voice chip installation will be acceptable where a Hilton approved third party FLS consultant provides an engineered strategy supporting this type of solution, the installation is approved by the local AHJ and there is a full simultaneous building evacuation strategy demonstrating the correct means of managing an evacuation that will not produce a higher risk to the building occupants.

2516.04.D.6.b Speakers must be equipped with variable watt input taps and provide voice instructions in the local language and English, at a minimum.

2516.04.D.6.c Speakers must be located in the following areas:
2516.04.D.6.c.1 Each guestroom and parlor
2516.04.D.6.c.2 Public assembly rooms
2516.04.D.6.c.3 Corridors and elevator lobbies
2516.04.D.6.c.4 Rooms over 1000 ft²/92 m²
2516.04.D.6.c.5 Every fifth floor in interior exit stairs
2516.04.D.6.c.6 Mechanical rooms
2516.04.D.6.c.7 Roof areas accessible by exit stairs

2516.04.D.7 Speakers must be zoned by floor, except stairs must be zoned by individual stairway. No Single cut or fault shall render more than one floor inoperative.
Visible notification appliances must be installed in the following areas, which must activate automatically upon any alarm within the building, including but not limited to:

a. Guestroom corridors - Adjacent to the exits and transition points unless a risk assessment study, provided by a professional FLS Consultant, proves not necessary.

b. Accessible/hearing impaired guestrooms

c. Public restrooms - 1 Speaker/Horn combination unit min/room unless a risk assessment study proves not necessary.

d. Meeting rooms - 1 Speaker/Horn combination unit min/room unless a risk assessment study proves not necessary.

e. Dining rooms - 1 Speaker/Horn combination unit min/room unless a risk assessment study proves not necessary.

f. Ballrooms - 1 Speaker/Horn combination unit min/room unless a risk assessment study proves not necessary.

g. Common area corridors - Adjacent to the exits and transition points unless a risk assessment study proves not necessary.

h. Back-of-house areas having high ambient noise conditions

Activation of the smoke detector in the accessible/hearing impaired guestroom must cause activation of the visible notification appliance in that room and other devices as required by local codes.

Activation of the corridor notification appliance circuit must cause activation of the visible notification appliance in the accessible/hearing impaired room(s) on that floor and other devices as required by local codes.

Interfaces and Other Devices

Fire alarm signals must be coordinated with the building management systems, mechanical systems and security systems in the design of the fire alarm system.

Magnetic door holders must be provided for self-closing fire doors that are required to be in the open position for business operations.

Control devices must be provided to shut off music and other entertainment devices that would interfere with the operation of notification systems.

Door locking systems must be de-energized during a fire alarm event.

Elevator lobby smoke detectors operation must cause all elevator cars to recall in the elevator bank affected. In buildings under 46'-0"/14 m the local AHJ will determine.

Carbon monoxide detectors must be provided in the room or area of origin for all areas utilizing fuel-fired equipment, including fireplaces. Combination smoke/carbon monoxide detectors are permissible. Refer to local codes and ordinances for additional requirements.

Provide a system operational matrix for all components, specific to the property and systems. The following matrix is intended as an example only. The project-specific matrix must be approved by Hilton Architecture & Construction during design development.
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<th>Output (across)</th>
<th>Audible Signal In Guest Room</th>
<th>Visible Signal In Guest Room</th>
<th>Alarm Receipt At Control Panel</th>
<th>Receipt At System Printer</th>
<th>Alarm Receipt At Central Control Station</th>
<th>Trouble Signal Receipt At Control Panel</th>
<th>Supervisory Signal Receipt At Control Panel</th>
<th>Audible/Visible Signal At Fire Area</th>
<th>Activate Smoke Mode In Fire Area</th>
<th>Release Door Holders In Fire Area</th>
<th>Elevator Recall</th>
<th>Music/Entropy Shut Down</th>
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<td>Switch</td>
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<td>Manual Fire</td>
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<td>Special Suppression Systems</td>
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<td>Valve Supervisory Switch</td>
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<td>Signals</td>
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</table>
2516.04.F Installation

2516.04.F.1 New and retrofit fire detection and alarm systems must be installed meeting the requirements of the standard referenced at Section 2516.04.A.5 and the manufacturer. The following provisions are supplemental requirements:

2516.04.F.1.a Fire detection and alarm cable, where used and not installed in metal conduit or raceway, must be mechanically protected by building construction. Installation must be in areas not subjected to mechanical damage.

2516.04.F.1.b All cable that is not enclosed by conduit must be supported and anchored with nylon straps or clamps. Staples are prohibited. Fire alarm cable must be supported by the building structure at intervals not greater than 10'-3"/3.05 m. Cable installed above drop ceilings must not be laid on ceiling tiles. Circuits must not be fastened in such a manner that puts tension on the cable.

2516.04.F.1.c All cable runs must be continuous between devices, without splices. Where a continuous run is not feasible, connections must be made using terminal blocks installed in a metal electrical box. All other connections must be to terminal blocks. Wire nuts must not be permitted. Cables connected together must have the same color insulation.

2516.04.F.1.d All cable must be sized, twisted and shielded and installed as required by protocols established by the fire alarm system manufacturer.

2516.04.F.1.e All electrical enclosures, raceways and conduits must contain only those electrical circuits associated with the fire detection, emergency communications and alarm system and must not contain any circuits that are unrelated to the system.

2516.04.F.1.f All electrical circuits must be numerically identified at both ends with wire taped numbers.

2516.04.F.1.g All underground cabling must be listed for fire alarm service and for direct burial. Underground cabling must be installed in liquid-tight PVC conduit with no splicing below ground. Provide additional ground wire within conduit to maintain reference ground on system between buildings.

2516.04.F.1.h All conduit, junction boxes and enclosures subjected to moisture must be weatherproof.
2516.04.G  Commissioning and Acceptance
2516.04.G.1 All systems must be formally and successfully tested, based on the requirements of the standard referenced at Section 2516.04.A.5, prior to turnover for operational purposes. Commissioning activities must be witnessed by a qualified, independent third-party.
2516.04.G.2 Testing must be documented in accordance with the standard referenced at Section 2516.04.A.5. Project documentation, including specifications, test documentation and as-built shop drawings must be provided to property operations staff.
2516.04.G.3 System software, including security of stored information and reprogramming capability must be provided to property operations staff.
2516.04.G.4 Where required, testing documentation must be furnished to the applicable AHJ.
2516.04.G.5 Testing and commissioning must verify the correct operation of all interfaces with ancillary systems, including automatic sprinklers, heating and air conditioning, elevators, smoke control and emergency generators.
2516.04.G.6 Provide demonstration and instruction to selected members of the property operations staff of the installed equipment.
2516.04.G.7 Provide written verification of testing utilizing standard forms required by the standard referenced at Section 2516.04.A.5.

2516.05 Means of Egress
2516.05.A  General
2516.05.A.1 Fire/emergency exits must be provided as follows:
   2516.05.A.1.a A minimum of two exits must be provided for each floor, new build properties must provide a minimum separation of one third of the diagonal distance of the floor.
   2516.05.A.1.b A minimum of two exits must be provided from within an individual room where room occupant load exceeds 50 persons. New build properties must provide 2 exits separated at a minimum of one third of the diagonal distance of the room.
   2516.05.A.1.c Where occupant load exceeds 500 persons on a floor or within a room, a minimum of three exits must be provided.
   2516.05.A.1.d When occupant load exceeds 1000 persons on a floor or within a room, a minimum of four exits must be provided.
2516.05.A.2 Occupant loads, for calculating egress width, must be calculated using the following:

<table>
<thead>
<tr>
<th>Use</th>
<th>ft² / person</th>
<th>m² / person</th>
</tr>
</thead>
<tbody>
<tr>
<td>Assembly – no fixed seating, concentrated (chairs only)</td>
<td>7 net</td>
<td>0.65 net</td>
</tr>
<tr>
<td>Assembly – no fixed seats, less concentrated (tables and chairs – such as restaurants)</td>
<td>15 net</td>
<td>1.4 net</td>
</tr>
<tr>
<td>Assembly – Pre-function area</td>
<td>5</td>
<td>0.47</td>
</tr>
<tr>
<td>Kitchens</td>
<td>100</td>
<td>9.3</td>
</tr>
<tr>
<td>Swimming Pools</td>
<td>50</td>
<td>4.6</td>
</tr>
<tr>
<td>Swimming pool deck areas</td>
<td>30</td>
<td>2.8</td>
</tr>
<tr>
<td>Hotel Guest room areas</td>
<td>200</td>
<td>18.6</td>
</tr>
<tr>
<td>Storage/Mechanical</td>
<td>500</td>
<td>46.5</td>
</tr>
<tr>
<td>Sundries/Gift Shop/Retail</td>
<td>30</td>
<td>2.8</td>
</tr>
<tr>
<td>Fitness Center with equipment</td>
<td>50</td>
<td>4.6</td>
</tr>
</tbody>
</table>

2516.05.A.3 Occupant load calculations in assembly areas must be based on the higher of either the pre-function or assembly area loads.

2516.05.A.4 Total exit width provided must be calculated based on capacity factors of inches/mm per person as follows:

- 2516.05.A.4.a Stairways - 0.3”/7.6 mm or develop a model based on NFPA 101
- 2516.05.A.4.b Doorways and level travel - 0.2”/5 mm or follow NFPA 101

2516.05.A.5 Travel distances must comply with the following or provide a timed egress analysis, by a professional Fire Life Safety Consultant as an alternative:

<table>
<thead>
<tr>
<th>Travel Distance Requirements</th>
<th>With Sprinklers</th>
<th>Without Sprinklers</th>
</tr>
</thead>
<tbody>
<tr>
<td>Travel distance from a guestroom door to an exit</td>
<td>200 ft/61 m</td>
<td>150 ft/46 m</td>
</tr>
<tr>
<td>Travel distance to an exit for all other areas</td>
<td>250 ft/76 m</td>
<td>200 ft/61 m</td>
</tr>
<tr>
<td>Common path of travel to an exit</td>
<td>100 ft/30 m</td>
<td>75 ft/23 m</td>
</tr>
<tr>
<td>Maximum dead-end corridors</td>
<td>65 ft/20 m</td>
<td>50 ft/15 m</td>
</tr>
</tbody>
</table>

2516.05.A.6 Egress corridors must be a minimum of 44”/1.12 m clear width. Existing properties can be a min 36”/900 mm.

2516.05.A.7 Headroom clearance in all egress paths must be a minimum of 80”/2.03 m. Exception, non guest access routes can have limited points due to structure or mechanical obstruction at no less than 75”/1.9 m with warning pads mounted at both sides of the obstruction.
2516.05.A.8 Exit paths through an intervening room or space is allowed when all of the following are met:
   2516.05.A.8.a The intervening room or area is of no greater hazard.
   2516.05.A.8.b There is a clear and unobstructed path to an exit.
   2516.05.A.8.c There is not more than one intervening room or space to pass through.

2516.05.B Stairs
   2516.05.B.1 A minimum of two exit stairs must serve each floor above or below grade. Existing properties can utilize one stair if the highest occupancy load is less than 15 persons total and the building is sprinklered. See 2516.03.A.1.f
   2516.05.B.2 Stairs must have a minimum clear width of 44"/1.1 m. Existing properties can be a min 36"/900 mm.
   2516.05.B.3 Tread depth for the full width of exit capacity must be:
      2516.05.B.3.a New stairs – a minimum of 11"/279 mm.
      2516.05.B.3.b Existing stairs – a minimum of 9"/225 mm.
   2516.05.B.4 Riser height must be:
      2516.05.B.4.a New stairs – a maximum of 7"/179 mm.
      2516.05.B.4.b Existing Stairs – a maximum of 8"/203 mm.
   2516.05.B.5 Egress stairs serving occupied floors above 98'-4"/30 m to the level of exit discharge must be classified as smoke proof enclosures using one of the following methods:
      2516.05.B.5.a Mechanical ventilation
      2516.05.B.5.b Natural ventilation
      2516.05.B.5.c Enclosure pressurization
   2516.05.B.6 Open external egress stairs serving floors within one level of the level of exit discharge are allowed when designed to prevent the accumulation of water. Open external egress stairs serving floors more than one level away from the level of exit discharge are allowed except in areas subject to freezing where the stairs must be protected from ice and snow built-up.
   2516.05.B.7 Scissor stairs may be utilized, where allowed by local code, provided no penetrations exist between the stairs and each stair is separated by rated construction as required in Section 2516.02.C and Section 2516.02.D.
   2516.05.B.8 All stairs must discharge to the exterior.
      2516.05.B.8.a Where local code allows, and the building is protected by automatic suppression, 50 percent of occupant load may discharge to a lobby with a clear path to the exit when the lobby is at level of exit discharge. Alternative exit discharge arrangements must be supported by approved performance based design by a professional Fire Life Safety Consultant.
   2516.05.B.9 Enclosed egress stairs must not be used for any other use.
   2516.05.B.10 Storage is prohibited under egress stairs.
   2516.05.B.11 Normally unoccupied spaces, such as mechanical or storage rooms, must not open directly to egress stairs.
2516.05.B.12 No wiring or ductwork is permitted within the exit enclosure except for that which is necessary to serve the exit.
2516.05.B.13 All exits must discharge to an open area considered as a public way, or lead to a public way via an unobstructed path.
2516.05.B.14 Buildings that are not fully sprinklered must have an area of refuge with communication to the PBX that accommodates one wheelchair per 200 persons for each floor.

2516.05.C Doors
2516.05.C.1 All doors in a path of egress must have a minimum of 32”/800 mm of clear width, including guestroom doors.
2516.05.C.2 All egress doors must swing in the direction of egress when serving 50 or more persons.
2516.05.C.3 All egress doors serving an exit enclosure or exit discharge must swing in the direction of egress.
2516.05.C.4 Door latches must have active lever hardware, requiring an obvious one-hand method of operation. For instances when panic hardware is required instead of lever hardware, refer to 2516.05.C.5.
2516.05.C.5 When latching hardware is provided at doors serving 100 or more persons, panic hardware must be provided instead of levers. Panic hardware is also required at all exit doors to the exterior.
2516.05.C.6 Electronically access-controlled doors in an egress path must meet all of the following:
   2516.05.C.6.a Open upon activation of the fire detection and alarm system.
   2516.05.C.6.b Provided with a manual releasing device within 5’-0”/1.52 m.
   2516.05.C.6.c Unlock upon loss of power to the device.
2516.05.C.7 Opening force for any door in an egress path must not exceed the following:
   2516.05.C.7.a 15 lbf/67N to release latch
   2516.05.C.7.b 30 lbf/133N to set in motion
   2516.05.C.7.c 15 lbf/67N to fully open
2516.05.C.8 Locks, if provided, must not require the use of a key, a tool, or special knowledge or effort for operation from the egress side.

2516.05.D Handrails and Guards
2516.05.D.1 Handrails must be provided at all stairs and ramps.
2516.05.D.2 Inside handrails at turns of stairs must be continuous.
2516.05.D.3 Handrails must be located between 34”/860 mm and 38”/965 mm above the surface of the tread.
2516.05.D.4 A minimum clearance of 2.25”/57 mm must be provided between the handrail and the wall.
2516.05.D.5 Guards must be provided at the top landing area for all stairs and along the stairs and intermediate landings when there is a gap between runs wider 10”/250 mm.
2516.05.D.6 Guards must be not less than 42”/1.0 m high.
2516.05.D.7 Open guards must have intermediate rails or ornamental pattern such that a 4”/102 mm diameter sphere is not able to pass through.
2516.05.D.8 Ornamental patterns must be designed to minimize the ability to climb handrails.
2516.05.E  Egress Signage
  2516.05.E.1 Exits and exit access must be marked with exit signs that are readily visible in the path of egress.
  2516.05.E.2 Exit signs must be internally or externally illuminated at all times.
  2516.05.E.3 In the event of power failure, emergency power must be supplied for the exit signage for a minimum of 60 minutes.

2516.05.F  Egress Lighting
  2516.05.F.1 Emergency lighting must be designed to provide sub circuit protection in all areas via a central battery cubicle or by self contained fittings. The lights and circuits must also be included on the generator supplies under total building failure.
  2516.05.F.2 The means of egress, paths leading to a public way, and the public way must be illuminated at all times the building or space is occupied.
  2516.05.F.3 Emergency light levels must reach 50 percent output within five seconds and 100 percent output within 60 seconds.
  2516.05.F.4 Mandatory lighting must achieve a minimum illumination level of 1 ft-candle/10 lux at the floor for the following locations: stairs landings, change of levels, change of direction, intersections, at emergency stairwell doors (corridor side), at emergency exit doors from areas of risk such as kitchens and public assembly spaces and at emergency exit doors from back of house spaces (plant rooms, plumbing/sprinkler rooms, switchgear/transformer rooms, etc.)
  2516.05.F.5 Mandatory lighting must achieve a minimum illumination level of 0.5 ft-candle/5.4 lux at the floor directly in front of all firefighting equipment/appliances, fire panels and pull stations, throughout the entire property.
  2516.05.F.6 Infill lighting between mandatory lighting along the means of egress, must achieve an average minimum illumination level of 0.5 ft-candle/5.4 lux at the floor and, not less than 0.1 ft-candle/1.1 lux at any point, along the entire means of egress at floor level and at the public way.
  2516.05.F.7 In the event of power failure, emergency power must be supplied for the egress lighting for a minimum of 60 minutes.

2516.06  Emergency Power
  2516.06.A  General
    2516.06.A.1 All properties must be provided with reliable emergency electrical power capability. In the event of loss of normal power service, the emergency service must be designed to provide power to building systems critical to the safety/security of property guests and team members. Requirements for business critical systems and functions must be referenced at Section 2514.08.
    2516.06.A.2 Failure of normal electrical power must result in the automatic transfer of critical electrical loads to an Emergency Power Supply (EPS). Acceptable sources of emergency power include:
      2516.06.A.2.a Dedicated emergency generators
      2516.06.A.2.b Batteries
      2516.06.A.2.c Power feed from a reliable electrical supply verified to be independent of the property’s primary electrical feed.
    2516.06.A.3 Critical loads must be permanently and reliably connected to the EPS.
2516.06.A.4 Technical requirements for EPS components including generators, fuel tanks, controllers and automatic transfer switches; design and installation methodology; and commissioning practices must be consistent with recognized standards as specified by the equipment manufacturers and accepted by the responsible AHJ.

2516.06.A.5 Emergency generator(s) provided to satisfy EPS requirements must be in a weatherproof enclosure, and consider:
  2516.06.A.5.a Separation between adjacent equipment and building spaces
  2516.06.A.5.b Ventilation requirements
  2516.06.A.5.c Fuel system safety
  2516.06.A.5.d Vibration and noise, and exhaust discharge
  2516.06.A.5.e Exposure to seismic activity, wind loading, hurricane/cyclone and tornado exposure

2516.06.A.6 In the event of loss of standard electrical power, at a minimum, EPS capability must be provided to:
  2516.06.A.6.a Safely maintain guests and team members within the property until restoration of standard power.
  2516.06.A.6.b Maintain the ability to safely evacuate the property including:
    2516.06.A.6.b.1 The provision of lighting levels through designated means of egress and at control points (front desk, security, fire command)
    2516.06.A.6.b.2 Emergency signage
    2516.06.A.6.b.3 Power for emergency operations of elevators when required by the local AHJ
    2516.06.A.6.b.4 Power for communications including the building fire alarm system and telephone equipment
  2516.06.A.6.c Maintain systems critical to life safety and security in operational readiness, including:
    2516.06.A.6.c.1 Fire pump(s) when required to meet the standards set forth in 2516.03.C and 2516.03.D
    2516.06.A.6.c.2 Smoke control and stairwell pressurization equipment
    2516.06.A.6.c.3 All security-related equipment and devices including security office(s), remote sensors/detectors and cameras
    2516.06.A.6.c.4 All electrically-controlled locking/unlocking mechanisms

2516.06.A.7 Electrical loads critical to life safety, fire protection and security must take precedence over all other electrical loads.

2516.06.A.8 For properties subject to natural events including hurricanes/cyclones, earthquakes, flooding/tidal waves, tornadoes, significant winter storms, wildfires and/or located in an area with unreliable standard power, consideration must be given to the provision of additional EPS capability. Duration of the EPS must be designed based on likely exposure to the identified hazard(s) and available fuel to resupply the property. No less than two days’ supply of fuel must be provided based on the calculated loads where fuel resupply may be interrupted.

2516.06.B Testing and Documentation
  2516.06.B.1 The EPS must be formally and successfully tested for the automatic transfer and operation of equipment supplied.
  2516.06.B.2 Provide demonstration and instructions to selected members of the property operations staff in the proper operation of the installed equipment.

2517.00 Accessibility Guidelines
2517.00.A ADA Requirements

**Puerto Rico | United States:** All hotels must comply with Title III of the Americans with Disabilities Act ("ADA"). Refer to Section 902.00 - Accessibility and to www.ada.gov for more information.

2517.00.B Disabled Codes/Laws Requirements

All properties within the Hilton Portfolio of Brands must be designed in compliance with local, regional and national codes or laws for disabled or universal access. The applicable code must be identified and provisions agreed upon in advance with Hilton in the country of operation. For countries without applicable codes, refer to the Hilton Accessibility Design Guide (HADG) for recommendations.

2517.00.C Existing Properties

Existing properties must comply at the time of refurbishment or as required by the local jurisdiction.

2517.00.D Owner Responsibility

The owner of the property is responsible for compliance with and the provision of all applicable codes. The owner is urged to seek appropriate council to ensure compliance. Hilton does not and cannot warrant conformance with or interpretation of any codes, laws or regulations relating to accessibility for individuals with disabilities.

2518.00 Technology Wiring Standards

2518.01 Application

Section 2518.00 details wiring requirements for the design and construction of new properties, conversion of existing properties, renovation of existing properties and new installations of cabling infrastructure under the Hilton Portfolio of Brands. These requirements are applicable to all properties within the Hilton system including owned, managed and franchised licences.

2518.02 Approved Supplier

All systems must be supplied and installed by a supplier approved by Hilton who are Panduit Certified Installer (PCI) partner.

2518.03 Wiring Standards (Voice and Data)

2518.03.A Structured Cabling System

The Structured Cabling System (SCS) must have a certified TIA/EIA or ISO standards based 25 year channel end to end performance warranty.

2518.03.B Distribution Tray of Cable Trays and Baskets

The building must be equipped with a distribution network of cable trays, baskets tray, and or J-hooks. The containment must be located within communications risers, ceiling channels and raised floor voids. Separate containment must be installed for voice/ data and power cabling. All components shall be installed to the following standards. ANSI/NECA/BICSI-568-2006 -- Standard for Installing Commercial Building Telecommunications Cabling TIA-569 -- Commercial Building Standard for Telecommunications Pathways and Spaces TIA/EIA-606 -- Administration Standard for Commercial Telecommunications Infrastructure

2518.03.C Enhanced Category 6 (Cat6) Cabling System
Category Cat6 channel compliant. Category 6 cable shall be either CMR or CMP, 100 ohm, 24 AWG, 4 pair, Unshielded Twisted Pair (UTP) In compliance with ANSI/TIA 568.2-D.2 for Category 6 performance, with swept frequency testing to at least 350MHz. The outermost jacket must be indelibly printed by the manufacturer with the name of the manufacturer, the UL rating, and incremental footage markings. CSA C22.2 approval or equivalent.

2518.03.C.1 System Specification

2518.03.C.1.a The telecommunications cabling networks cabling system must be designed, manufactured, tested, and install per manufacturer’s requirements and in accordance with latest revision of the NFPA-70 (National Electrical Code®), state codes, local codes, requirements of Authorities Having Jurisdiction (AHJs), and the following standards, including the most current revisions, addendums, and any Technical Service Bulletins (TSBs) released at the time of bid ANSI/NECA/BICSI 607 – Standard for Telecommunications Bonding and Grounding Planning and Installation Methods for Commercial Buildings ANSI/BICSI 002 Data Center Design and Implementation Best Practices ANSI/TIA 568 Series – Telecommunications Cabling Standards TIA-569 – Commercial Building Standard for Telecommunications Pathways and Spaces TIA-606 – Administration Standard for Commercial Telecommunications Infrastructure TIA-607 – Generic Telecommunications Bonding and Grounding (Earthing) for Customer Premises TIA-526 Series – Standard Test Procedures for Fiber Optic Systems NECA/FOA 301– Installing and Testing Fiber Optic Cables TIA-942 – Telecommunications Infrastructure Standard for Data Centers ISO/IEC 11801 – Generic Cabling for Customer Premises - Include only for International Projects

2518.03.C.1.a.1 BS EN 50173-1:2002 Class E

2518.03.C.1.a.2 ANSI/EIA-568-B

2518.03.C.1.b The cabling system must meet the permanent link and channel performances defined in these standards or better. The telecommunications cabling networks cabling system must be designed, manufactured, tested, and install per manufacturer’s requirements and in accordance with latest revision of the NFPA-70 (National Electrical Code®), state codes, local codes, requirements of Authorities Having Jurisdiction (AHJs), and the following standards, including the most current revisions, addendums, and any Technical Service Bulletins (TSBs) released at the time of bid ANSI/NECA/BICSI 607 – Standard for Telecommunications Bonding and Grounding Planning and Installation Methods for Commercial Buildings ANSI/BICSI 002 Data Center Design and Implementation Best Practices ANSI/TIA 568 Series – Telecommunications Cabling Standards TIA-569 – Commercial Building Standard for Telecommunications Pathways and Spaces TIA-606 – Administration Standard for Commercial Telecommunications Infrastructure TIA-607 – Generic Telecommunications Bonding and Grounding (Earthing) for Customer Premises TIA-526 Series – Standard Test Procedures for Fiber Optic Systems NECA/FOA 301– Installing and Testing Fiber Optic Cables TIA-942 – Telecommunications Infrastructure Standard for Data Centers

2518.03.C.2 Components Specification

2518.03.C.2.a Cable

2518.03.C.2.a.1 Category Cat6 channel compliant. Category 6 cable shall be either CMR or CMP, 100 ohm, 24 AWG, 4 pair, Unshielded Twisted Pair (UTP) In compliance with ANSI/TIA 568-C.2 for Category 6 performance, with swept frequency testing to at least 350MHz. The outermost jacket must be indelibly printed by the manufacturer with the name of the manufacturer, the UL rating, and incremental footage markings. CSA C22.2 approval or equivalent

2518.03.C.2.a.2 The cable must have current independent third party approval status and must be audited and certified as ‘fit for purpose’ before handing to hotel.
2518.03.C.2.a.3 Existing buildings that have CAT5e cabling already installed and certified are not required to re-cable CAT6 unless undergoing major refurbishment; however, valid network cable certification is required. Properties entering with pre CAT5e cabling or already within the Hilton system that perform a refresh or new installation of cabling infrastructure must meet current Wiring Brand Standards (2518.02 – 2518.10).

2518.03.C.2.b Connecting hardware

2518.03.C.2.b.1 Patch panels
- 2518.03.C.2.b.1.a Must be 19"/480 mm rack mounting; in exact multiples of 1U in height.
- 2518.03.C.2.b.1.b Cable termination must be LSA or 110 Insulation Displacement Connectors.
- 2518.03.C.2.b.1.c Front connectors must be RJ45 style ISO/IEC 11801, ANSI/TIA 568-C, IEC 60603-7-2/3 or EN 50173-2 568B wired depending on the location of the installation at a minimum. ('A' wired may be selected as an option.)
- 2518.03.C.2.b.1.d Electrical performance must be Category 6 (ANSI/TIA-568-C.2) or better.

2518.03.C.2.b.2 Connectors
- 2518.03.C.2.b.2.a Cable termination must be LSA or 110 IDC.
- 2518.03.C.2.b.2.b Connectors must be RJ45 style ISO/IEC 11801, ANSI/TIA 568-C, IEC 60603-7-2/3 or EN 50173-2 568B wired depending on the location of the installation at a minimum. ('A' wired may be selected as an option.)
- 2518.03.C.2.b.2.c Electrical performance must be Category 6 (ANSI/TIA-568-C.2) or better.

2518.03.C.3 Wall outlets
- 2518.03.C.3.a White plastic, 106C style or 1"/25 mm x 1-1/2"/37 mm modules. two or four-gang density.
- 2518.03.C.3.b Outlets in public areas that are connected to the Hilton network must be lockable and secured from external access. For Jack Module block-out Device Panduit part# PSL-DCJB-BL. For jacks that have Patch Cable inserted use Panduit part# PSL-DCLX-BL.

2518.03.C.4 Floor outlets
- 2518.03.C.4.a White plastic, 106C style or 1"/25 mm x 1-1/2"/37 mm modules.

2518.03.C.5 Patch leads
- 2518.03.C.5.a Must be Category 6/Class E, UTP, small diameter patch cord constructed of 28 AWG with a nominal diameter of 0.150 in. (3.8mm), unshielded, twisted pair, stranded copper (dual-rated CM/LSZH) cable with high performance RJ45 modular plugs.
- 2518.03.C.5.b Connectors must be RJ45 Modular Plug style, and compliant with ANSI/TIA-568.2-D Category 6 and ISO 11801 Class E electrical performance requirements for frequencies up to 250 MHz.
- 2518.03.C.5.c Electrical performance must be Category 6 or better. Must meet all ANSI/TIA 568.2-D, ISO/IEC 11801 standards.

2518.03.D Installation specification
- 2518.03.D.1 The entire cabling system must be procured from one manufacturer and must be installed according to the manufacturer’s instructions by certified installers.
2518.03.D.2 Planning, quality control, and documentation must be according to ANSI/TIA/EIA 606A or BS EN 50174:2002 parts 1 and 2. External cables must be installed according to ANSI/TIA/EIA 758 or BS EN 50174-3:2003. Grounding and bonding must be in accordance with ANSI-J-STD-607-A or BS EN 50310:2000.

2518.03.D.3 100 percent of the installed cables must be tested. 100 percent of the test data must be reviewed and approved by the manufacturer and an independent third party before any warranty certificate is released.

2518.03.D.4 The Permanent Channel must be tested to IEC 61935 with a Level III (or higher) cable tester set to Class E Permanent Link referencing the Permanent Channel performance standards detailed in ISO 11801:2002, or Class E detailed in BS EN 50173-1:2002, or Cat 6 detailed in ANSI/TIA/EIA-568-B.

2518.03.D.5 The results must be stored in an electronic database compatible with the tester manufacturer's cable management program.

2518.03.D.6 The cabling must be covered by a Manufacturer's 25-year product and application warranty and installed by an installer accredited and trained by the manufacturer. Proof of training, which must be less than two years old, Training Certificate must accompany the test results submittals.

2518.03.D.7 A labeling and administration system must be designed into the cable system in line with BS EN 50174-1:2001 or ISO/IEC 14763-2 or ANSI/TIA/EIA-606-A. The numbering scheme must be Cabinet/Patch Panel/Patch Point – 2B/03/26, which would be Remote Cabinet 2B, Patch Panel in Cabinet 03, and Point 26. For guestrooms, it would be Room Number/ Patch Point – 101/A, which would be room 101 and Point A (Bedside).

2518.03.D.8 The cabling system must be Bonded and Grounded (earthed) according to the manufacturer’s instructions and ANSI/TIA/EIA-607 or BS EN50174-3:2003.

2518.03.D.9 Separation of power and data cables must be according to ANSI/TIA-569-C or EN 50174-2:2001 except where local or national electrical safety regulations require a greater separation.

2518.03.D.10 Optional: A cable containment system must be supplied according to BS EN 50174-2:2001, ANSI/TIA/EIA 569-B or ISO 14763-2.

2518.03.E LAN Application

2518.03.E.1 Any communications protocol designed for use on 100-Ohm (nominal) characteristic impedance Category6/Class E cabling system must operate satisfactorily on the installed cabling system. ‘Satisfactory’ means better than one in ten-to-the-power of 10 bit error rate whilst in the presence of up to 3 V/m external interference over 100 MHz for at least thirty minutes.

2518.03.E.2 LAN operation must be Gigabit Ethernet and follow IEEE 802.3ab standard.

2518.03.F EMC (Electromagnetic Compatibility) Performance

2518.03.F.1 The structured cabling system must comply with cable balance and EMC requirements of BS EN 50288-3-1:2003 and ISO 11801:2002 and must not degrade the EMC performance of any electrical device connected to it. The manufacturer must guarantee this facility.

2518.04 Horizontal Sub System

2518.04.A Horizontal Wiring

2518.04.A.1 In the context of this specification, horizontal wiring covers all copper Category 6 cabling between the MDF/IDF and the terminated RJ45 socket at the outlet location.
2518.04.A.2 Horizontal cabling must be arranged in a physical star topology radiating directly from the MDF/IDF to the outlet. Each outlet must be individually connected back utilizing a single cable to the MDF/IDF, no outlets must be connected in parallel or chain. There must also be no intervening connections between the outlet and the MDF/IDF, the cable must be continuous end-to-end.

2518.04.B Horizontal Cable Containment
2518.04.B.1 All horizontal Cat 6 cabling must be installed upon dedicated cable trays/baskets, J-Hooks or within conduits/multiple compartment trunks between the MDF/IDF and the outlet socket.
2518.04.B.2 The voice and data cables must not be installed within the same containment as any other services, and the minimum segregation spacing must be maintained to minimize data interference.

2518.04.C Patch Panels/Frames in General
2518.04.C.1 Voice and data patch panels must be manufactured to Category 6 Standard.
2518.04.C.2 The voice and data patch panels within the local computer rooms must be Modular Patch Panels mounted within equipment cabinets. The patch panels must have Insulation Displacement Connections (IDC) on the rear and RJ-45 8 position sockets on the front. The voice and data patch panels must have no fewer than 24 x RJ-45.

2518.04.D Voice Service Frames
2518.04.D.1 The Main Distribution Frame (MDF) within the main communications room must distribute voice services and must be of Krone type 108A Dual Vert complete with all necessary terminations as Krone type 237A.
2518.04.D.2 The frame must be secured to a 1”/20 mm plywood mounting board located adjacent to the PBX and the horizontal cabling racks within the main communications room.

2518.04.E Fiber Optic Patch Panels
2518.04.E.1 Fiber optic patch panels must be capable of housing no fewer than 12 x LC connectors. All fiber optic cores must be fusion spliced using pigtails onto LC connectors. Each fiber patch panel must use 1U of cabinet space and be located above the active components within the same cabinet or patch panels within the local communications rooms.
2518.04.E.2 Two categories of copper based, rack mounted patch frames are required within each communications room to support:
2518.04.E.2.a Termination of horizontal cabling from information outlets; on these panels there must be a definitive demarcation separating voice and data cabling. Patch panels must be RJ-45 modular in construction.
2518.04.E.2.b Termination of intra-building voice backbone cables, providing connectivity between voice services and the information outlet patch panels outlined above. The voice patch panels must be modular in construction and must contain no fewer than 24 x RJ-45 ports.

2518.04.F Backbone Cabling Within the Building
2518.04.F.1 Voice Backbone
2518.04.F.1.a Star topology copper based UTP backbone cables must distribute voice services from the MDF located within the main computer room to each of the local computer rooms. Sufficient wire pairs must be included to provide a service based on 1-pair modularity, plus 25 percent spare capacity.
2518.04.F.2 Data Backbone
2518.04.F.2.a The data backbone cabling between the main computer room and the local computer rooms must be plenum grade, 12 core 50/125 multimode and tight buffered fiber optic cable (OM3 or better). LC connectors must be used for all fiber optic connection. 10Gig Fiber Optic Cable is designed to support network transmission speeds up to 10 Gb/s for link lengths up to 300 meters for OM3 with an 850nm source per IEEE 802.3ae 10 GbE standard

2518.04.F.3 Intra-building Backbone Cable Routing
2518.04.F.3.a The main vertical and horizontal intra-building backbone cabling must be routed via a network of cable trays.

2518.05 Communications Cabinets
2518.05.A Specifications
2518.05.A.1 Communications cabinets must have 42U of usable frame height, 31”/800 mm x 42”/1070 mm and must provide a sufficient degree of protection to BS.5490 IP 20. Must also be UL Listed 2416, EIA-310-E TIA/EIA-942, and RoHS Compliant, The cabinets are required within each communications room (main and local) for the housing of the active components, modular patch panels (copper cables) and fiber optic patch panels. In the absence of active components specification details, it is assumed that the equipment will take up 17U of frame space. In instances where space is limited, a smaller dimension communications cabinet can be used but still must maintain the same protection to BS.5490 IP 20 standards while also being UL Listed 2416, EIA-310-E TIA/EIA-942, and RoHS Compliant.

2518.05.A.2 All cabinets must be uniform in manufacture, appearance and color (light grey / black). Each cabinet must be fitted with a lockable smoked glass or mesh front door and a lockable rear door. All cabinet doors must have locks operated by a single key. Each cabinet must incorporate removable side panels and cable management rings and brackets for the dressing of patch leads and cords.

2518.05.A.3 All cabinets must incorporate integrated surge protected power distribution unit (PDU) - 20A, 120V horizontal single phase PDU has (12) 5-20R receptacles, a 10’ (3m) power cord with a NEMA 5-20P plug, and measures 1.6”H x 17.5”W x 2.0”D (40.6mm x 444.5mm x 50.8). UL Listed. Color: Black

2518.05.A.4 A gap of at least 6”/150 mm must be maintained between the front of the patch panels and the front of the cabinet.

2518.05.B Patch Cords / Leads
2518.05.B.1 Fiber Optic patch leads of 3’-3”/1.0 m length OM3 2-fiber, 1.6mm jacket, patch cord, Riser (OFNR) rated, LC duplex to LC duplex. Must be the same manufacture as all other products.

2518.05.C Device Leads
2518.05.C.1 Device leads from the data outlets to the user workstation must be provided with quantities and lengths confirmed by Hilton.

2518.06 Implementation and Hand-Over
2518.06.A Installation Quality
2518.06.A.1 The complete structured cabling system must be installed in accordance with the quality standards as applicable and in accordance with the manufacturer’s guidelines by manufacturer certified installers to obtain a 25 year full application channel warranty.

2518.06.A.2 Not Applicable to this Brand
2518.06.A.3 Where the structured cabling contractor is involved in the design element of the project, the nominated designer must be BICSI registered and hold the accredited RCDD status. And must be a full time W2 employee of the contractor's; MUST NOT be a subcontractor.

2518.06.B Testing
2518.06.B.1 Testing of fiber optic cables must be carried out using an OTDR, and must be carried out at both 850 and 1300nm for multimode, along with 1310 and 1550nm for single mode, from each end of the cable. Each trace must be recorded along with the test engineers name and signature.

2518.06.B.2 Should the testing identify a failure, this must be immediately rectified and noted with the hand-over documentation under test failure. Where rectification is not possible then the cable and associated components must be replaced and removed from site.

2518.06.B.3 The cabling contractor must undertake to provide Hilton IT with advance knowledge of all testing activities and allow witness to the testing as required.

2518.06.C Manuals and Documentation
2518.06.C.1 The structured cabling contractor must provide the following items as hand-over documentation to Hilton nominated representatives at the conclusion of the project.

2518.06.C.1.a Two paper copies and a CD-ROM of all fitted drawings showing the cabling schematics, connectivity drawings, cabinet and frame schematics, all clearly showing label designations. All drawings must be produced using the latest version of AutoCAD for Windows and saved in .DWG or .DXF file format.

2518.06.C.1.b Communications cabinets and patch panel layouts.

2518.06.C.1.c A schedule of information outlets containing label designations and locations. The schedule must be presented in the form of a Microsoft Excel spreadsheet and be provided in both paper and CD-ROM formats.

2518.06.C.1.d Test results (copper and fiber) on paper and CD-ROM.

2518.06.C.1.e 25 year warranty application assurance certificate.

2518.07 Wireless Distribution
2518.07.A Wi-Fi UTP Cable, Category 6

The provisioning of Wireless Internet (Wi-Fi) services in the Hilton portfolio of brands require the installation of UTP cable, Category 6, from main computer room or intermediate data cabinets to locations throughout the hotel (see below) for the mounting, installation and servicing of Wireless Access Points (WAPs). All previous reference to conduit, cable placement and termination requirements for Category 6 cabling in this document must be adhered to for installation of this Wi-Fi cabling. The scope of this definition relates only to the design and installation of the cabling system for this Wi-Fi network. Reference to WAPs in this document is intended to give a point of reference for design of the cabling system.

2518.07.B Areas of Coverage
2518.07.B.1 Care must be taken to ensure the installation of enough infrastructure in these areas such that their subsequent division by mechanical or other partitions does not deteriorate signal reception in any one partitioned area. Guestrooms to include all space within all guestrooms, suites and parlors. These also include coverage for all fractional ownership or condominium units as may reside within the property.

2518.07.C Installation Parameters
2518.07.C.1 The installed infrastructure defined here must provide for the installation of WAPs such that the following criteria are met: WAPs must be securely mounted with a manufacturer’s bracket in a subdued and aesthetic manner. WAPs must be permanently accessible after installation to facilitate repair or replacement. WAPs must meet the engineering standards provided in the "Guest_Internet_Access_Network_Standards_Guide_Global.pdf" published on https://teamsites.hilton.com/sites/InfrastructureandTechnology/Architecture/Networks/Wireless.aspx.

2518.07.C.2 Cable runs for the Wi-Fi network must be terminated in 8pin RJ-45 female jacks at the access point location. Jacks must be installed in wall plates if the WAP is to be mounted aesthetically in a visible location, and interconnected with the shortest possible patch cord to maintain a neat and tidy look and also to minimize tampering.

2518.08 Patch Cable Standards
2518.08.A Patch Panel Standards / Lead Colors
2518.08.A.1 Patch leads colors must be used to differentiate amongst various vendors / systems in all patch cabinets, for example, Internet access, digital TV systems, minibar, guest telephones, and cordless telephones.

2518.08.A.2 The Cat6 cables used must adhere to the following color code:

<table>
<thead>
<tr>
<th>Main &amp; Remote Computer Rooms</th>
<th>Color</th>
</tr>
</thead>
<tbody>
<tr>
<td>Voice &amp; Fax Lines</td>
<td>Light Blue</td>
</tr>
<tr>
<td>Server Connections</td>
<td>Red</td>
</tr>
<tr>
<td>Point of Sale</td>
<td>Black</td>
</tr>
<tr>
<td>Printers</td>
<td>Green</td>
</tr>
<tr>
<td>Guest Internet (incl Wireless Access Points)</td>
<td>Purple</td>
</tr>
<tr>
<td>Guest Minibar System</td>
<td>Orange</td>
</tr>
<tr>
<td>TV System</td>
<td>Yellow</td>
</tr>
<tr>
<td>Keycard System</td>
<td>White</td>
</tr>
<tr>
<td>Interfaces</td>
<td>Pink</td>
</tr>
<tr>
<td>Wireless Access Points (DECT, Hilton)</td>
<td>Brown</td>
</tr>
<tr>
<td>Electronic Meeting Signs</td>
<td>Light Grey</td>
</tr>
<tr>
<td>Cross-over Cables</td>
<td>Dark Blue</td>
</tr>
<tr>
<td>Desktops</td>
<td>Dark Grey</td>
</tr>
</tbody>
</table>

2518.08.B Patch Lead Standards - Devices
2518.08.B.1 All patch leads connecting devices to the network Cat6 sockets, i.e. desktop PCs, laptops, printers, etc must be grey.

2518.09 Guest Room Technology Services
2518.09.A Cabling Requirements
2518.09.A.1 In order to ensure quality of service and flexibility, a minimum of 2; (1 at B or C and 1 at E) and up to 4 x 4-pair cables (CAT6-RJ45) for new hotels or hotels undergoing major refurbishment are required to provide data services and be labeled accordingly (x). Placement requirements must be verified within Sections 2510.00 and 2512.00.

2518.09.A.2 At the desk area and/or living room
   2518.09.A.2.a (A) Telephone - if required in Sections 2510.00 - 2511.00
   2518.09.A.2.b (B) Guest Internet access - Wi-Fi Access Point and Wired Internet (when provided)

2518.09.A.3 For the TV/ Credenza
   2518.09.A.3.a (C) Digital TV/Connected Room
   2518.09.A.3.b (D) Minibar - if required in Sections 2510.00-2512.00

2518.09.A.4 By the bedside
   2518.09.A.4.a (E) Telephone - if required in Sections 2510.00 - 2511.00

2518.09.A.5 In the bathroom
   2518.09.A.5.a (F) Telephone - if required in Sections 2510.00-2512.00

2518.10 Wiring Standards (Coaxial – MATV, CATV)
   Hotels must install coaxial cable, homerun to each guestroom. The following provides detailed specifications about the coaxial cabling. Hotels must consult their intended in-room entertainment provider to determine if there are additional wiring specifications or documentation. Hotels must work with a professional cable installer to design and install the cable plant. For IPTV installations, see CAT6 documentation in Section 2518.03.

2518.10.A System Specifications
   System Specifications All installations must conform to relevant standards and safety specifications for the appropriate region. These may include:
   2518.10.A.1 MATV Installations: ANSI/SCTE 40 2004 (US), BS EN 50083 (UK)
   2518.10.A.2 Coaxial Cables: ANSI/SCTE 74 2003 (US), BS EN 50117 (UK)
   2518.10.A.3 Grounding of coaxial antenna systems: outlined in NEC Article 250 (US), ANSI/NFP 70 (US), BS EN 50310 and section 2518.8.5 (UK)

2518.10.B Cable Types
   2518.10.B.1 Coax The cable must meet or exceed specifications in ANSI/SCTE 74 2003 (US), BS EN 50117 (UK) or local equivalent standards, as follows:
      2518.10.B.1.a Room drop maximum 150ft: RG-6 dual-shielded, Belden or Commscope or equivalent
      2518.10.B.1.b Feed trunk cable maximum – 230ft: RG-11 dual-shielded, Hard-line/.500 or greater, Belden or Commscope or equivalent
      2518.10.B.1.c Not Applicable to this Brand
2518.10.B.1.d Core trunk cable between MDF and all IDFs: RG-11 dual-shielded, Hard-line/.500 or greater, Belden or Commscope or equivalent

2518.10.B.1.e Cabling must be 60% braid, solid copper center conductor rated for 5MHz - 1GHz

2518.10.B.2 Fibre

Use if the satellite dish is located more than 150m/500ft from the head end:

2518.10.B.2.a Single Mode G.657.A 3mm armoured or equivalent, terminated with SC/APC terminations

2518.10.C Connections

All coaxial network connections must be as follows:

2518.10.C.1 Compression F-type connectors

2518.10.C.2 Properly mated and tightened to approximately 30 in/lbs of torque

2518.10.D Signal Level

Measured at room outlet:

2518.10.D.1 Head End System Wiring (HD/QAM256)

2518.10.D.1.a Bandwidth sweep tested from: 5MHz to 1GHz, signal level: -10 to +10dB

2518.10.D.1.b Modulation Error Ratio (MER): 37-40dBmV

2518.10.E Antenna

2518.10.E.1 All UHF antennas must incorporate a balun to ensure the matching of the dipole to the feeder cables.

2518.10.E.2 Antenna must be cabled from rooftop to MDF head end. See above for cabling length requirements.

2518.10.E.3 The aerial system, mounts, and support structures must be capable of withstanding winds of 100mph/160kph and take into account local environmental conditions (snow, ice, extreme wind etc.).

2518.10.F Satellite Dishes

2518.10.F.1 Satellite dishes must be constructed to withstand a wind speed of 60mph/100kph and be of an adequate size for the system concerned and take into account local environmental conditions (snow, ice, extreme wind etc.).

2518.10.F.2 Satellite must be cabled from rooftop to MDF head end and able to produce a 15dB carrier-to-noise level at the installations site for the given transponders being received. See above for cabling length requirements.

2518.10.F.3 Dishes must be aligned for maximum signal strength and carrier-to-noise ratios. The LNB must be aligned so that the horizontal and vertical transponders appear equal and give maximum rejection of the opposite polarity.

2518.10.G Coax Topology

2518.10.G.1 Head End System Wiring (i.e., HD/QAM/DVB-T/DVB-T2/DVB-C/digital signal distribution)
2518.10.G.1.a Wiring must be star topology or home run to each television. Run a single cable trunk feed from MATV head end (MDF) to a central point within each hotel corridor/riser/IDF closet. Use multi-output taps to distribute the signal; from the IDF, run one coaxial cable to each television.

2519.00 Signage and Graphics

2519.01 General Signage

2519.01.A All Signage

All signage, existing and replacement, must comply with these standards. Refer to Section - Signage for Identity and Marketing requirements.

2519.01.B Relicensing/Change of Ownership Signage Requirement

Upon relicensing or change of ownership, existing signage must be brought up to current signage specifications as directed by Hilton.

2519.01.C Signage Approval

All signage must be approved by Hilton. Written approval must be obtained prior to fabrication and installation.

2519.01.D Non-English Speaking Locations

Signage in non-English speaking locations must be bilingual, in both English and the local language.

2519.01.E Etched Trademark Requirements

Trademarks owned by Hilton must not be etched in any construction surface where they become permanent and cannot be easily removed.

2519.01.F Construction Project Identification Sign

A construction project identification sign must be installed once construction begins.

2519.02 Interior Signage

2519.02.A Interior Signage Design & Approval

Interior signage must be designed specifically for each individual property.

2519.02.B Not Applicable to this Brand

2519.02.C Public Area Glass Panels

In all public areas, glass panels (e.g., windows, glass doors, sidelights, etc.) which extend to the floor without a horizontal break or partition, or without decorative framing, must be identified with customized graphics where required by applicable law.

2519.02.D Directional Signage

2519.02.D.1 Interior corridor signage must be brought up to the current standard at the time of any renovation within the corridor.

2519.02.D.2 A comprehensive system of informational/directional signs must be installed directing guests and Team Members to all appropriate facilities contained within the building.

2519.02.D.2.a From the hotel entry to the restaurant and bar when entered through the hotel.

2519.02.E Lobby Area Signage
2519.02.E.1 100 percent non-smoking hotels must have signage at the front entrance visible for any guest entering the building. It must not be displayed directly on the front doors or at the front desk.

2519.02.E.2 “No Solicitation” signage is required at the main entrance of the hotel: “Solicitation, distribution, and/or trespassing anywhere on these premises by non-team members are prohibited at all times.”

2519.02.F Public Restrooms
2519.02.F.1 Public restrooms must be clearly identified using international symbols.

2519.02.G Food & Beverage
2519.02.G.1 Hours of operation must be posted for the following areas:
   - Restaurant
   - Bar

2519.02.G.2 Restaurants that are entered through the hotel must have clearly identifiable signage.

2519.02.H Commercial Facilities
2519.02.H.1 Hours of operation must be posted for the following areas:
   - Sundries/Gift Shop (if not open 24 hours)
   - Guest Laundry (if applicable)

2519.02.I Executive Lounge
2519.02.I.1 Hours of operation must be posted for the Executive Lounge.

2519.02.J Meeting Facilities
2519.02.J.1 The primary entrance to the meeting facilities must have a digital wall-mounted event board.
2519.02.J.2 Meeting rooms must have the function room name and an integrated LED/LCD display for information services.
2519.02.J.3 Not Applicable to this Brand
2519.02.J.4 Hours of operation must be posted for the Business Center (24 hour availability).

2519.02.K Fitness Center Signage
2519.02.K.1 The facility must be clearly marked and identified.
2519.02.K.2 Hours of operation must be posted for the Fitness Center.
2519.02.K.3 Instructional signage must conform to the graphics and identity standards. In addition to any local law requirements and unless there is a conflict with local law, instructional signage must include the following fitness center guidelines at a minimum:
   - Consult a physician before beginning an exercise program.
2519.02.K.3.b For your safety, please follow posted instructions when using equipment.
2519.02.K.3.c Use equipment at your own risk.
2519.02.K.3.d Children under 16 years of age are not permitted in the fitness center.
2519.02.K.3.e Stop exercising if you feel faint, dizzy, exhausted or have any feeling of discomfort.
2519.02.K.3.f In the interest of hygiene, please wipe down equipment after use.
2519.02.K.3.g [Brand] is not liable for personal injury, loss of property or any other claims arising out of the use of this facility or the equipment.
2519.02.K.3.h Lockers are available on a first come first serve basis, for day use only. The Hotel does not supply locks. (if applicable)

2519.02.K.4 Each piece of strength equipment must have signage displaying instructions on its proper use.
2519.02.K.5 Not Applicable to this Brand
2519.02.K.6 Not Applicable to this Brand
2519.02.K.7 Signage must be provided in the fitness center for emergencies. The signage must include details regarding emergency services/requirements as outlined by local ordinance.
2519.02.K.8 The fitness center must have dual-language signs to meet international hotel standards where applicable.

2519.02.L Pool/Whirlpool/Spa Signage
2519.02.L.1 Hours of operation must be posted for the following areas:
   Pool
   Spa
2519.02.L.2 The following information must be included in the pool signage, plus any additional information required by regional and local ordinances:
   2519.02.L.2.a Pool for use by registered guests only.
   2519.02.L.2.b Children under 16 must be supervised by an adult at all times.
   2519.02.L.2.c Shower before entering pool.
   2519.02.L.2.d No running/horseplay in the pool area. Persons with skin lacerations, infections or blisters must not enter the pool.
   2519.02.L.2.e Breakable service ware and glass bottles are prohibited in the pool or deck area.
   2519.02.L.2.f No lifeguard on duty. (unless required by local code)
   2519.02.L.2.g No diving.
   2519.02.L.2.h Pool hours are __ a.m. to __ p.m.
   2519.02.L.2.i Maximum pool depth: feet and _____ meters
   2519.02.L.2.j Maximum load capacity: ______
   2519.02.L.2.k Swim at your own risk. Owner and management are not responsible for accidents and injuries.

2519.02.L.3 The following information must be included in the whirlpool signage, plus any additional information required by regional and local ordinances:
2519.02.L.3.a Whirlpool for use by registered guests only.
2519.02.L.3.b Children under 16 must be supervised by an adult at all times.
2519.02.L.3.c Shower before entering whirlpool.
2519.02.L.3.d Elderly persons, pregnant women, infants and those with health conditions requiring medical care must consult a physician before entering the whirlpool.
2519.02.L.3.e Persons under the influence of alcohol or drugs must not use the whirlpool.
2519.02.L.3.f Persons with skin lacerations, infections or blisters must not enter the whirlpool.
2519.02.L.3.g No glass allowed in the whirlpool area.
2519.02.L.3.h No lifeguard on duty. (unless required by local code)
2519.02.L.3.i No diving.
2519.02.L.3.j Whirlpool hours are ___ a.m. to ___ p.m.
2519.02.L.3.k Maximum whirlpool depth: _____feet and _____meters
2519.02.L.3.l Maximum load capacity: ______
2519.02.L.3.m Use whirlpool at your own risk. Owner and management are not responsible for accidents and injuries.

2519.02.L.4 Provide a sign clearly stating “Emergency equipment shut-off” directly above the shut-off switch for the whirlpool pumps.

2519.02.L.5 **Puerto Rico | United States:** Pool lifts must have identification and instructional signage that matches all other signage in the pool area. Sample verbiage at the lift: "POOL LIFT Reserved for guests with mobility disabilities only. For lift assistance or instructions, contact the front desk."

2519.02.L.6 Signage must be provided in the spa for emergencies. The signage must include details regarding emergency services/requirements as outlined by local ordinance.

2519.02.M Circulation Signage
2519.02.M.1 Not Applicable to this Brand
2519.02.M.2 Elevator lobbies and elevator cabs must have signs that state during a fire emergency the exit stairs must be used instead of the elevator.
2519.02.M.3 Not Applicable to this Brand
2519.02.M.4 Not Applicable to this Brand
2519.02.M.5 Not Applicable to this Brand
2519.02.M.6 All floor levels, within enclosed stairs, must be clearly numbered at each landing. The letters must be 6”/150 mm minimum high and reflective.
2519.02.M.7 Exit stair doors must have signs that state they are fire doors and must remain closed at all times.

2519.02.N Guestroom Signage
2519.02.N.1 Guestroom signage must be provided on corridor wall adjacent to strike side of each guestroom door.
2519.02.N.2 Not Applicable to this Brand
2519.02.N.3 The international "no smoking" symbol must be clearly displayed at all guestrooms designated as "non-smoking". The graphic must be included with the guestroom numeral signage. As an alternate, entire floors may be designated as non-smoking with "no smoking" graphics in each elevator/lift lobby, rather than on each guestroom door.

2519.02.N.4 The back of the guestroom door must include a sign containing fire evacuation information. This sign must be centered on the door below the door viewer. The following must be included:

- Emergency exit plan
- Pull station and fire extinguisher locations
- Maximum room rate (where required by law)
- Check-in and check-out times (where required by law)
- Safety deposit box availability
- Local laws/standards
- For your privacy and security, always use your deadbolt to double lock your room from inside. The safety latch and door viewer must be used to visually identify anyone outside your door. Follow these general guidelines at all applicable passage doors.

2519.02.O Back-of-House Signage

2519.02.O.1 “No Solicitation” signage is required at the team member entrance of the hotel: “Solicitation, distribution, and/or trespassing anywhere on these premises by non-team members are prohibited at all times.”

2519.03 Digital Signage System (if provided)

2519.03.A Digital Signage Approval
   The digital signage system must be approved by Hilton.

2519.03.B Digital Signage Meeting Area Location Requirements
   Digital signage must be provided outside each ballroom, meeting room, board room and in the pre-function area. It must display the name of the room and company details (where requested).

2519.03.C Digital Signage Wiring Distribution
   Each digital sign must have a 20amp service CAT6 wiring distribution from a central MDF or IDF.

2519.03.D Digital Signage Installation Requirements
   The following guidelines must be included for the physical installation of the digital signage:

   - Center of screen must be 60”/1.50 m from the floor.
   - Signage must be properly ventilated to prevent overheating.
   - Signage must be accessible for servicing after the installation.

2519.03.E Digital Signage Location Requirements
   Digital signage must be located in the following locations:
2519.03.E.1 Hotel main lobby entrance - 40”/1.02 m Monolith/Freestanding screen
2519.03.E.2 Elevator/Lift Cabs - 15”/381 mm screens
2519.03.E.3 Meeting Room/Business Center entrance - 32”/810 mm In-wall screen
2519.03.E.4 Meeting Room/Boardroom entrances - 15”/381 mm In-wall screens
2519.03.E.5 Ballroom way finder from main lobby - 32”/810 mm In-wall screen
2519.03.E.6 Ballroom pre-function entrance - 40”/1.02 m In-wall portrait screen
2519.03.E.7 Ballroom pre-function - 40”/1.02 m In-wall portrait screen
2519.03.E.8 Ballroom registration desks - 32”/810 mm Screens on mobile stands
2519.03.E.9 Ballroom entrances - 15”/381 mm In-wall screens

2519.04 Exterior Signage

2519.04.A Property Identification Signage Reference

2519.04.B Main Entry Door Property Identification Sign
An approved sign manufacturer, licensed by Hilton, must fabricate and install all property identification signs. Contact information may be found online at https://designinformation.hilton.com.

2519.04.C Property Identification Signs
2519.04.C.1 A minimum of one internally illuminated ground monument sign and one internally illuminated building mounted sign is required for all properties. Additional signage may be required by Hilton dependent upon building orientation and visibility.

2519.04.C.2 Not Applicable to this Brand

2519.04.C.3 The ground sign pedestal or base must be protected from damage by planter box, landscaping or other means.

2519.04.C.4 Blade signs are allowed at urban locations when a mount location is not available for ground signs. Blade signs must be internally lit and comply with brand standards. Neon is not allowed.

2519.04.C.5 Illuminated signs must be time switched and photo-cell controlled.

2519.04.C.6 Exposed conduit and/or raceways are prohibited from view at building face signs. Supporting signage equipment (including conduit and raceways) are prohibited from view at all public area and guest room interior spaces. Access panels, where required, are to match the adjacent finish with keyed access for maintenance personnel.

2519.04.C.7 Not Applicable to this Brand

2519.04.C.8 At time of replacement, materials including the light source must match any remaining/existing materials. Full signage replacement must comply with current specification standards.

2519.04.C.9 Exterior signage must be installed prior to opening, including conversion properties.

2519.04.D Exterior Miscellaneous Signs
2519.04.D.1 External way finding signage must be provided for properties where travel path decision points occur forcing a guest to turn left, right or continue straight ahead.

2519.04.D.2 Not Applicable to this Brand

2519.04.D.3 Not Applicable to this Brand

2519.04.D.4 Not Applicable to this Brand

2519.04.D.5 Porte cochere clearance signage must be provided for clearances less than 15'-0"/4.5 m. Letter height must be 6"/15 cm minimum and the color must contrast the adjacent building color.

2519.04.D.6 Separate restaurant and bar exterior entrances must be clearly identified with awnings or canopies with graphics bearing the establishment’s name.

2519.04.D.7 No additional advertising (banners, billboards and interior or exterior reader boards) are permitted on the building.

2519.04.E Parking Signage

2519.04.E.1 Directional signage to the parking area must be clearly visible when not obvious.

2519.04.E.2 Floor level and area signs must be provided in parking garages for ease of locating vehicles.

2519.04.E.3 A disclaimer must be posted in all guest parking areas on the site that user assumes all risks, that all valuables should be removed from vehicle, and that owner and management have no liability for loss or damage. Signs must be located along parking lanes and be mounted to light poles or independent poles with spacing not to exceed 100'-0"/30 m.

2519.04.E.4 In addition to brand required parking signage, all hotels with on-site parking must install five brand approved Diamond Elite guest parking signs. At least three spots must be located near the main entrance of the hotel – all others can be in proximity to secondary entrances. Refer to marKIT for specifications. Diamond member reserved parking signs must display the current Hilton Honors branding. Non-compliant signage must be replaced by January 1, 2019.

2519.04.E.5 Signage identifying designated accessible parking spaces must be provided at guest parking areas.

2519.04.E.6 Signage must be provided designating parking space(s) reserved for electric vehicle charging stations.
### Abbreviations

<table>
<thead>
<tr>
<th>Abbreviation</th>
<th>Definition</th>
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<tbody>
<tr>
<td>°F</td>
<td>Fahrenheit</td>
</tr>
<tr>
<td>AFF</td>
<td>Above the Finished Floor</td>
</tr>
<tr>
<td>CFLs</td>
<td>Compact Fluorescent Lamp</td>
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<tr>
<td>CYP</td>
<td>Computer Yarn Placement</td>
</tr>
<tr>
<td>DDM</td>
<td>Distributed Data Management</td>
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<tr>
<td>DX</td>
<td>Direct Expansion</td>
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<tr>
<td>FDB</td>
<td>Fahrenheit Dry Bulb</td>
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<tr>
<td>FT</td>
<td>Feet or Ft² (Feet squared)</td>
</tr>
<tr>
<td>GPF</td>
<td>General Protection Fault</td>
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<tr>
<td>HD</td>
<td>High Definition</td>
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<tr>
<td>HVAC</td>
<td>Heating Ventilation Air Conditioning</td>
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<tr>
<td>kg</td>
<td>Kilograms</td>
</tr>
<tr>
<td>lb</td>
<td>Pounds</td>
</tr>
<tr>
<td>M</td>
<td>Meters</td>
</tr>
<tr>
<td>MCDB</td>
<td>Mean Coincident Dry Bulb</td>
</tr>
<tr>
<td>MERV</td>
<td>Minimum Efficiency Reporting Value</td>
</tr>
<tr>
<td>OSA</td>
<td>Outside Air</td>
</tr>
<tr>
<td>PTAC</td>
<td>Package Terminal Air Conditioner</td>
</tr>
<tr>
<td>SCR</td>
<td>Silicon Controlled Rectifier</td>
</tr>
<tr>
<td>STC</td>
<td>Sound Transmission Coefficient</td>
</tr>
<tr>
<td>V</td>
<td>Volts</td>
</tr>
<tr>
<td>ACT</td>
<td>Acoustical Ceiling Tile</td>
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<tr>
<td>CDB</td>
<td>Celsius Dry Bulb</td>
</tr>
<tr>
<td>CPU</td>
<td>Central Processing Unit</td>
</tr>
<tr>
<td>dBA</td>
<td>A-weighted decibel</td>
</tr>
<tr>
<td>DP</td>
<td>Dew Point</td>
</tr>
<tr>
<td>EIFS</td>
<td>Exterior Insulation Finish System</td>
</tr>
<tr>
<td>FPM</td>
<td>Feet Per Minute</td>
</tr>
<tr>
<td>GFI</td>
<td>Ground Fault Interrupter</td>
</tr>
<tr>
<td>H</td>
<td>Height</td>
</tr>
<tr>
<td>HSIA</td>
<td>High Speed Internet Access</td>
</tr>
<tr>
<td>IIC</td>
<td>Impact Insulation Class</td>
</tr>
<tr>
<td>L</td>
<td>Length</td>
</tr>
<tr>
<td>LED</td>
<td>Light Emitting Diode</td>
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<tr>
<td>MC</td>
<td>Metallic Conduit</td>
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<tr>
<td>MDF</td>
<td>Medium Density Fiberboard</td>
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<tr>
<td>NIC</td>
<td>Noise Isolation Class</td>
</tr>
<tr>
<td>PSI</td>
<td>Pounds per Square Inch</td>
</tr>
<tr>
<td>PVS</td>
<td>Personal Viewing Screen</td>
</tr>
<tr>
<td>SRI</td>
<td>Solar Roof Index</td>
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<tr>
<td>TDD</td>
<td>Telecommunications Device for the Deaf</td>
</tr>
<tr>
<td>W</td>
<td>Width</td>
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</table>

### Acronyms

<table>
<thead>
<tr>
<th>Acronym</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>A&amp;C</td>
<td>Architecture &amp; Construction</td>
</tr>
<tr>
<td>AAMA</td>
<td>American Architectural Manufacturers Association</td>
</tr>
<tr>
<td>ABA</td>
<td>Architectural Barriers Act</td>
</tr>
<tr>
<td>ADA</td>
<td>American Disabilities Act</td>
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<tr>
<td>AMCA</td>
<td>Air Moving and Conditioning Association</td>
</tr>
<tr>
<td>ANSI</td>
<td>American National Standards Institute</td>
</tr>
<tr>
<td>ASA</td>
<td>American Standards Association</td>
</tr>
<tr>
<td>ASHRAE</td>
<td>American Society of Heating, Refrigerating and Air Conditioning Engineers</td>
</tr>
<tr>
<td>ASTM</td>
<td>American Society for Testing and Materials</td>
</tr>
<tr>
<td>AWMA</td>
<td>Air &amp; Waste Management Association</td>
</tr>
<tr>
<td>AATCC</td>
<td>American Association of Textile Chemists and Colorists</td>
</tr>
<tr>
<td>AGA</td>
<td>American Gas Association</td>
</tr>
<tr>
<td>ARI</td>
<td>Air Conditioning and Refrigeration Institute</td>
</tr>
<tr>
<td>ASME</td>
<td>American Society of Mechanical Engineers</td>
</tr>
<tr>
<td>AWS</td>
<td>American Welding Society</td>
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</tbody>
</table>
### Acronyms

<table>
<thead>
<tr>
<th>Acronym</th>
<th>Full Form</th>
</tr>
</thead>
<tbody>
<tr>
<td>BS</td>
<td>British Standard</td>
</tr>
<tr>
<td>DHSI</td>
<td>Door and Hardware Systems, Inc.</td>
</tr>
<tr>
<td>EPA</td>
<td>Environmental Protection Agency</td>
</tr>
<tr>
<td>FM</td>
<td>Factory Mutual</td>
</tr>
<tr>
<td>IEEE</td>
<td>Institute of Electrical and Electronic Engineers</td>
</tr>
<tr>
<td>NEC</td>
<td>National Electrical Code</td>
</tr>
<tr>
<td>NESC</td>
<td>National Electrical Safety Code</td>
</tr>
<tr>
<td>OSHA</td>
<td>Occupational Safety and Health Act</td>
</tr>
<tr>
<td>SCS</td>
<td>Scientific Certification System</td>
</tr>
<tr>
<td>UL</td>
<td>Underwriters Laboratories</td>
</tr>
<tr>
<td>CFFA</td>
<td>Chemical Fabrics and Film Association</td>
</tr>
<tr>
<td>DIN</td>
<td>Deutsches Institut fur Normung (German Institute for Standardization)</td>
</tr>
<tr>
<td>ETL</td>
<td>Environmental Testing Laboratories</td>
</tr>
<tr>
<td>GB</td>
<td>Guobiao (Chinese Standard)</td>
</tr>
<tr>
<td>ISO</td>
<td>International Standards Organization</td>
</tr>
<tr>
<td>NECA</td>
<td>National Electrical Contractors Association</td>
</tr>
<tr>
<td>NFPA</td>
<td>National Fire Protection Association</td>
</tr>
<tr>
<td>SAE</td>
<td>Society of Automotive Engineers</td>
</tr>
<tr>
<td>SMACNA</td>
<td>Sheet Metal and Air Conditioning Contractors National Association</td>
</tr>
<tr>
<td>UMC</td>
<td>Uniform Mechanical Code</td>
</tr>
<tr>
<td>DHI</td>
<td>Door and Hardware Institute</td>
</tr>
<tr>
<td>EN</td>
<td>Euro Norm (European Standard)</td>
</tr>
<tr>
<td>FIA</td>
<td>Factory Insurance Association</td>
</tr>
<tr>
<td>IBR</td>
<td>Institute of Boiler and Radiator Manufacturers</td>
</tr>
<tr>
<td>MPEG</td>
<td>Moving Picture Experts Group</td>
</tr>
<tr>
<td>NEMA</td>
<td>National Electrical Manufacturers Association</td>
</tr>
<tr>
<td>NSF</td>
<td>NSF International</td>
</tr>
<tr>
<td>SBI</td>
<td>Steel Boiler Institute</td>
</tr>
<tr>
<td>UFAC</td>
<td>Upholstered Furniture Action Council</td>
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<tr>
<td>WH</td>
<td>Warnock Hersey</td>
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</table>

### Terminology/Definitions

<table>
<thead>
<tr>
<th>Term</th>
<th>Definition</th>
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<tbody>
<tr>
<td><strong>AACHEN</strong></td>
<td>Measurement for dimensional stability</td>
</tr>
<tr>
<td><strong>Alarm verification</strong></td>
<td>A feature internal to automatic fire detection and alarm systems, wherein the report of smoke detection is confirmed within a specific period of time before initiating an alarm</td>
</tr>
<tr>
<td><strong>Area of refuge</strong></td>
<td>An area where persons unable to use stairways may remain for a period of time, waiting for assistance or instructions during an emergency</td>
</tr>
<tr>
<td><strong>Common path of travel</strong></td>
<td>The portion of an egress path traveled before two or more distinct paths to an exit are available</td>
</tr>
<tr>
<td><strong>Dead end corridor</strong></td>
<td>The portion of a corridor where only one path of travel is available before two or more distinct paths to an exit are available</td>
</tr>
<tr>
<td><strong>Lux</strong></td>
<td>Unit of measurement for illumination</td>
</tr>
<tr>
<td><strong>Manual fire alarm box</strong></td>
<td>A manually operated device used to initiate an alarm signal</td>
</tr>
<tr>
<td><strong>Manual fire alarm box</strong></td>
<td>A manually operated device used to initiate an alarm signal</td>
</tr>
<tr>
<td><strong>Normal occupied spaces</strong></td>
<td>Spaces that are occupied on a regular basis, either permanently or temporarily</td>
</tr>
<tr>
<td><strong>Pre-signal alarm</strong></td>
<td>Wherein a fire alarm signal sounds only in an attended location, providing a predetermined amount of time to investigate a detection notice, before initiating an automatic alarm evacuation sequence</td>
</tr>
<tr>
<td><strong>Public way</strong></td>
<td>A space, street, alley or land dedicated to the public, for public use that is open to the outside air and is of sufficient size to accommodate those exiting from a building</td>
</tr>
<tr>
<td><strong>Response time index (RTI)</strong></td>
<td>A standardized measurement of the thermal sensitivity of an automatic sprinkler. Quick Response (QR) sprinklers are those units with RTI of 50 or less.</td>
</tr>
<tr>
<td><strong>Smoke alarm</strong></td>
<td>A single or multiple-station alarm device responsive to smoke, connected to building electrical service and not connected to the building fire alarm system</td>
</tr>
<tr>
<td><strong>Smoke detector</strong></td>
<td>A low-voltage device that senses visible or invisible particles of combustion integrated and listed for service with the building fire alarm system.</td>
</tr>
</tbody>
</table>
Electronic Sensor Faucets

Product Type
Deck Mounted Single Hole EQ High Arc Series Lavatory Sink Faucet with Hands-free Infrared Detection

Features & Specifications
- Single Hole
- 0.5 GPM (1.9 L/min) Vandal Proof Non-Aerating Spray
- Dual Supply for Hot and Cold Water Service
- 6 Volt signal from 4 "AA" Alkaline Batteries (Included) - Up to 5 Year Battery Life
- Stainless Steel Braided Hose(s) (Included)
- Concealed Thermostatic Mixing Valve (Included)
- On Demand IR detection for hands-free actuation and maximum water savings
- 20 seconds standard maximum run time; drops to 10 seconds in high use environments for additional water savings
- ECAST® design provides durable construction with total lead content equal to or less than 0.25% by weighted average

Performance Specification
- Minimum flow rate for proper functioning of thermostatic protection: 0.35 GPM (1.3 LPM). Maximum pressure differential between hot and cold water supplies: 20%. Minimum inlet water supply temperature differential: 20°F (9°C). Integral check valves for cross-flow protection. WARNING! Water temperatures in excess 110°F (43°C) are dangerous and may cause scalding, severe injury or death! This fitting is NOT factory preset and can be adjusted to deliver water at temperatures exceeding 110°F (43°C).

Warranty
- Lifetime Limited Faucet Warranty
- 1-Year Limited Finish Warranty
- 5-Year Limited Mechanical Warranty
- 3-Year Limited Electronics and Solenoid Warranty

Codes & Standards
- ASME A112.18.1/CSA B125.1
- Certified to NSF/ANSI 61, Section 9 by CSA
- Vermont Bill S.152
- NSF/ANSI 372 Low Lead Content
- ADA ANSI/ICC A117.1
- CALGreen
- Certified to ASSE 1070 by CSA

ECAST products are intended for installation where state laws and local codes mandate lead content levels or in any location where lead content is a concern.

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Des Plaines, IL
P: 847/803-5000
F: 847/803-5454
Technical: 800/TEC-TRUE
www.chicagofaucets.com

Last Revision: 02/12/2019 • Date Printed: 08/12/2019 • Product specifications subject to change without notice
EQ-C11A-13ABBN

Electronic Sensor Faucets

Architect/Engineer Specification

Chicago Faucets No. EQ-C11A-13ABBN, EQ High Arc Series Lavatory Sink Faucet with hands-free infrared detection, single-hole deck mount. PVD brushed nickel plated. 0.5 GPM (1.9 L/min) vandal-proof, pressure compensating, Econo-Flo non-aerating spray outlet. Dual supply for hot and cold water service. Powered by 4 "AA" alkaline batteries (included) - up to 5-year battery life. Includes stainless steel braided hose(s). Includes concealed thermostatic mixing valve. On-demand IR detection for hands-free actuation and maximum water savings. 20 seconds standard maximum run time; drops to 10 seconds in high use environments for additional water savings. ECAST® construction with less than 0.25% lead content by weighted average. CALGreen compliant. This product meets ADA ANSI/ICC A117.1 requirements and is tested and certified to industry standards: ASME A112.18.1/CSA B125.1, Certified to NSF/ANSI 61, Section 9 by CSA, ASSE 1070, California Health and Safety Code 116875 (AB1953-2006), Vermont Bill S.152, NSF/ANSI 372 Low Lead Content, and California Green Building Standards Code (CALGreen).

Operation and Maintenance

Installation should be in accordance with local plumbing codes. Flush all pipes thoroughly before installation. After installation, remove spout outlet or flow control and flush faucet thoroughly to clear any debris. Care should be taken when cleaning the product. Do not use abrasive cleaners, chemicals or solvents as they can result in surface damage. Use mild soap and warm water for cleaning and protecting the life of Chicago Faucets products. For specific operation and maintenance refer to the installation instructions and repair parts documents that are located at www.chicagofaucets.com.

Chicago Faucets, member of the Geberit Group, is the leading brand of commercial faucets and fittings in the United States, offering a complete range of products for schools, laboratories, hospitals, office buildings, food service, airports and sport facilities. Call 1.800.TECTRUE or 1.847.803.5000 Option 1 for installation or other technical assistance.

www.chicagofaucets.com

2100 South Clearwater Drive
Des Plaines, IL
P: 847/803-5000
F: 847/803-5454
Technical: 800/TEC-TRUE
www.chicagofaucets.com
ELECTRONIC-DC FAUCETS
EQ-B11A-13ABBN
Electronic Sensor Faucets

Product Type
Deck Mounted Single Hole EQ Angular Series Lavatory Sink Faucet with Hands-free Infrared Detection

Features & Specifications
• Single Hole
• 0.5 GPM (1.9 L/min) Vandal Proof Non-Aerating Spray
• Dual Supply for Hot and Cold Water Service
• 6 Volt signal from 4 “AA” Alkaline Batteries (Included) - Up to 5 Year Battery Life
• Stainless Steel Braided Hose(s) (Included)
• Concealed Thermostatic Mixing Valve (Included)
• On Demand IR detection for hands-free actuation and maximum water savings
• 20 seconds standard maximum run time; drops to 10 seconds in high use environments for additional water savings
• ECAST® design provides durable construction with total lead content equal to or less than 0.25% by weighted average

Performance Specification
Minimum flow rate for proper functioning of thermostatic protection: 0.35 GPM (1.3 LPM). Maximum pressure differential between hot and cold water supplies: 20%. Minimum inlet water supply temperature differential: 20°F (9°C). Integral check valves for cross-flow protection. WARNING! Water temperatures in excess 110°F (43°C) are dangerous and may cause scalding, severe injury or death! This fitting is NOT factory preset and can be adjusted to deliver water at temperatures exceeding 110°F (43°C).

Warranty
• Lifetime Limited Faucet Warranty
• 1-Year Limited Finish Warranty
• 5-Year Limited Mechanical Warranty
• 3-Year Limited Electronics and Solenoid Warranty

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ECAST products are intended for installation where state laws and local codes mandate lead content levels or in any location where lead content is a concern.
EQ-B11A-13ABBN
Electronic Sensor Faucets

Architect/Engineer Specification

Chicago Faucets No. EQ-B11A-13ABBN, EQ Angular Series Lavatory Sink Faucet with hands-free infrared detection, single-hole deck mount. PVD brushed nickel plated. 0.5 GPM (1.9 L/min) vandal-proof, pressure compensating, Econo-Flo non-aerating spray outlet. Dual supply for hot and cold water service. Powered by 4 "AA" alkaline batteries (included) - up to 5-year battery life. Includes stainless steel braided hose(s). Includes concealed thermostatic mixing valve. On-demand IR detection for hands-free actuation and maximum water savings. 20 seconds standard maximum run time; drops to 10 seconds in high use environments for additional water savings. ECAST™ construction with less than 0.25% lead content by weighted average. CALGreen compliant. This product meets ADA ANSI/ICC A117.1 requirements and is tested and certified to industry standards: ASME A112.18.1/CSA B125.1, Certified to NSF/ANSI 61, Section 9 by CSA, ASSE 1070, California Health and Safety Code 116875 (AB1953-2006), Vermont Bill S.152, NSF/ANSI 372 Low Lead Content, and California Green Building Standards Code (CALGreen).

Operation and Maintenance

Installation should be in accordance with local plumbing codes. Flush all pipes thoroughly before installation. After installation, remove spout outlet or flow control and flush faucet thoroughly to clear any debris. Care should be taken when cleaning the product. Do not use abrasive cleaners, chemicals or solvents as they can result in surface damage. Use mild soap and warm water for cleaning and protecting the life of Chicago Faucet products. For specific operation and maintenance refer to the installation instructions and repair parts documents that are located at www.chicagofaucets.com.

Chicago Faucets, member of the Geberit Group, is the leading brand of commercial faucets and fittings in the United States, offering a complete range of products for schools, laboratories, hospitals, office buildings, food service, airports and sport facilities. Call 1.800.TECTRUE or 1.847.803.5000 Option 1 for installation or other technical assistance.

Last Revision: 02/12/2019 • Date Printed: 08/12/2019 • Product specifications subject to change without notice
ELECTRONIC-DC FAUCETS

EQ-A11A-13ABBN

Electronic Sensor Faucets

Product Type
Deck Mounted Single Hole EQ Curved Series Lavatory Sink Faucet with Hands-free Infrared Detection

Features & Specifications
- Single Hole
- 0.5 GPM (1.9 L/min) Vandal Proof Non-Aerating Spray
- 0.17 GPC (0.6 LPC) maximum consumption per cycle
- Dual Supply for Hot and Cold Water Service
- Powered from 4 "AA" Alkaline Batteries (Included) - Up to 5 Year Battery Life
- Stainless Steel Braided Hose(s) (Included)
- Concealed Thermostatic Mixing Valve (Included)
- On Demand IR detection for hands-free actuation and maximum water savings
- 20 seconds standard maximum run time; drops to 10 seconds in high use environments for additional water savings
- ECAST® design provides durable construction with total lead content equal to or less than 0.25% by weighted average

Performance Specification
- Operating static pressure: 20-125 PSI (138-862 kPa). Minimum static pressure for mixing 30 PSI (207 kPa). Cold water inlet temperature range: 39-80°F (4-27°C). Hot water inlet temperature range: 100-180°F (38-82°C). Mixed water temperature range: 80-120°F (27-49°C). Adjustable temperature control. Accurate within +/- 3°F (1.7°C). Minimum flow rate for proper functioning of thermostatic protection: 0.35 GPM (1.3 LPM). Maximum pressure differential between hot and cold water supplies: 20%. Minimum inlet water supply temperature differential: 20°F (9°C). Integral check valves for cross-flow protection. WARNING! Water temperatures in excess 110°F (43°C) are dangerous and may cause scalding, severe injury or death! This fitting is NOT factory preset and can be adjusted to deliver water at temperatures exceeding 110°F (43°C).

Warranty
- Lifetime Limited Faucet Warranty
- 1-Year Limited Finish Warranty
- 5-Year Limited Mechanical Warranty
- 3-Year Limited Electronics and Solenoid Warranty

Codes & Standards
- ASME A112.18.1/CSA B125.1
- Certified to NSF/ANSI 61, Section 9 by CSA
- Vermont Bill S.152
- NSF/ANSI 372 Low Lead Content
- ADA ANSI/ICC A117.1
- CALGreen
- Certified to ASSE 1070 by CSA

ECAST products are intended for installation where state laws and local codes mandate lead content levels or in any location where lead content is a concern.
Chicago Faucets No. EQ-A11A-13ABBN, EQ Curved Series Lavatory Sink Faucet with hands-free infrared detection, single-hole deck mount. PVD brushed nickel plated. 0.5 GPM (1.9 L/min) vandal-proof, pressure compensating, Econo-Flo non-aerating spray outlet. 0.17 GPC (0.6 LPC) maximum consumption per cycle. Dual supply for hot and cold water service. Powered by 4 "AA" alkaline batteries (included) - up to 5-year battery life. Includes stainless steel braided hose(s). Includes concealed thermostatic mixing valve. On-demand IR detection for hands-free actuation and maximum water savings. 20 seconds standard maximum run time; drops to 10 seconds in high use environments for additional water savings. ECAST½® construction with less than 0.25% lead content by weighted average. CALGreen compliant. This product meets ADA ANSI/ICC A117.1 requirements and is tested and certified to industry standards: ASME A112.18.1/CSA B125.1, Certified to NSF/ANSI 61, Section 9 by CSA, ASSE 1070, California Health and Safety Code 116875 (AB1953-2006), Vermont Bill S.152, NSF/ANSI 372 Low Lead Content, and California Green Building Standards Code (CALGreen).

Operation and Maintenance

Installation should be in accordance with local plumbing codes. Flush all pipes thoroughly before installation. After installation, remove spout outlet or flow control and flush faucet thoroughly to clear any debris. Care should be taken when cleaning the product. Do not use abrasive cleaners, chemicals or solvents as they can result in surface damage. Use mild soap and warm water for cleaning and protecting the life of Chicago Faucet products. For specific operation and maintenance refer to the installation instructions and repair parts documents that are located at www.chicagofaucets.com.

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Towel Ring 363TR
Specification Submittal

Model Numbers
- 363TR Towel Ring

Finish Options / Modifications
Append appropriate -suffix to model number
- BBZ Brushed Bronze finish
- MB Matte Black finish
- STN Satin Nickel finish
  - Polished Chrome (standard finish)

Feature Highlights
- Metal construction
- Mounting hardware included
- Standard finish is polished chrome

Warranty
- Limited Lifetime - to the original end purchaser in residential/consumer installations.
- 5 years - for commercial installations

Dimensions  Duro Towel Ring, 363TR

Note: Dimensions subject to change without notice

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Robe Hook 363RH

Specification Submittal

Model Numbers
☐ 363RH Robe Hook

Feature Highlights
- Metal construction
- Mounting hardware included
- Standard finish is polished chrome

Warranty
- Limited Lifetime - to the original end purchaser in residential/consumer installations.
- 5 years - for commercial installations

Finish Options / Modifications
Append appropriate -suffix to model number
☐ -BBZ Brushed Bronze finish
☐ -MB Matte Black finish
☐ -STN Satin Nickel finish
- Polished Chrome (standard finish)

Dimensions Duro Robe Hook, 363RH

Note: Dimensions subject to change without notice
# SYMMONS® Duro™

**Towel Shelf 363TS-22**

## Specification Submittal

### Model Numbers

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>363TS-22  Towel Shelf</td>
</tr>
</tbody>
</table>

### Finish Options

Append appropriate -suffix to model number.

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>-STN  Satin nickel finish</td>
</tr>
</tbody>
</table>

### Feature Highlights

- Metal construction
- Mounting hardware included
- Standard finish is polished chrome

### Warranty

- **Limited Lifetime** - to the original end purchaser in residential/consumer installations.
- **5 years** - for commercial installations

### Dimensions  Duro Towel Shelf, 363TS-22

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>22&quot; (560 mm)</td>
</tr>
<tr>
<td></td>
<td>23-13/16&quot; (605 mm)</td>
</tr>
<tr>
<td></td>
<td>9-5/8&quot; (245 mm)</td>
</tr>
<tr>
<td></td>
<td>5-7/8&quot; (147 mm)</td>
</tr>
<tr>
<td></td>
<td>4-7/8&quot; (123 mm)</td>
</tr>
<tr>
<td></td>
<td>1-7/8&quot; (46 mm)</td>
</tr>
</tbody>
</table>

**Note:** Dimensions subject to change without notice
# 363GBTP
**ADA Toilet Paper Holder with Assist Bar**

## Specification Submittal

### Model Numbers

<table>
<thead>
<tr>
<th>□ 363GBTP</th>
<th>Toilet Paper Holder with Assist Bar</th>
</tr>
</thead>
</table>

### Feature Highlights

- Supports up to 250 lbs. as an assist bar
- 7/8" bar diameter
- 2" square flange
- Bar extends 2-1/8" from wall
- Concealed mounting for a clean look
- Pivoting tissue holder for easy loading
- Mounting hardware and mounting plate included
- Metal construction in standard polished chrome finish
- WingIts compatible

### Finish Options

<table>
<thead>
<tr>
<th>□ -STN</th>
<th>Satin Nickel finish</th>
</tr>
</thead>
</table>

### Warranty

**Limited Lifetime** - to the original end purchaser in consumer/residential installations.

**5 Years** - for industrial/commercial installations.

Refer to www.symmons.com/warranty for complete warranty information.

### Note:
Append appropriate -suffix to model number.

### Dimensions

![Diagram of 363GBTP](attachment:diagram.png)

**Measurements**

<table>
<thead>
<tr>
<th>A</th>
<th>8&quot;, 203 mm</th>
</tr>
</thead>
<tbody>
<tr>
<td>B</td>
<td>Load bearing surface supports up to 250 lbs. as an assist bar</td>
</tr>
<tr>
<td>C</td>
<td>Ø 7/8&quot;, 22 mm</td>
</tr>
<tr>
<td>D</td>
<td>(2x) Sq. 2&quot;, 51 mm</td>
</tr>
<tr>
<td>E</td>
<td>19/32&quot;, 15 mm</td>
</tr>
<tr>
<td>F</td>
<td>6&quot;, 152 mm</td>
</tr>
<tr>
<td>G</td>
<td>(2x) Hole Size Ø 7/64&quot;, 3 mm</td>
</tr>
<tr>
<td>H</td>
<td>3-3/16&quot;, 81 mm</td>
</tr>
<tr>
<td>I</td>
<td>3-3/8&quot;, 86 mm</td>
</tr>
<tr>
<td>J</td>
<td>3/8&quot;, 10 mm</td>
</tr>
<tr>
<td>K</td>
<td>2-1/8&quot;, 54 mm</td>
</tr>
<tr>
<td>L</td>
<td>4-11/16&quot;, 119 mm</td>
</tr>
</tbody>
</table>

### Note:
Dimensions subject to change without notice.

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Model Numbers
- 363TP  Toilet Paper Holder

Finish Options / Modifications
Append appropriate -suffix to model number
- BBZ  Brushed Bronze finish
- MB  Matte Black finish
- STN  Satin Nickel finish
  - Polished Chrome (standard finish)

Feature Highlights
- Metal construction
- Mounting hardware included
- Standard finish is polished chrome

Warranty
- Limited Lifetime - to the original end purchaser in residential/consumer installations.
- 5 years - for commercial installations

Dimensions  Duro Toilet Paper Holder, 363TP

Note: Dimensions subject to change without notice
Model Numbers

☐ **363GBTB-18** 18” Towel Bar with Assist Bar
☐ **363GBTP-24** 24” Towel Bar with Assist Bar

### Feature Highlights

- Supports up to 250 lbs. as an assist bar
- 18”/24” bar length
- 7/8” bar diameter
- 2” square flange
- Bar extends 2-1/4” from wall
- Concealed mounting for a clean look
- Mounting hardware and mounting plate included
- Metal construction in standard polished chrome finish
- WingIts compatible

### Finish Options

☐ **-STN** Satin Nickel finish

### Warranty

**Limited Lifetime** - to the original end purchaser in consumer/residential installations.

**5 Years** - for industrial/commercial installations.

Refer to www.symmons.com/warranty for complete warranty information.

### Dimensions

<table>
<thead>
<tr>
<th>Measurement</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>2-1/4”, 57 mm</td>
</tr>
<tr>
<td>B</td>
<td>20”, 508 mm</td>
</tr>
<tr>
<td>C</td>
<td>Ø 7/8”, 22 mm</td>
</tr>
<tr>
<td>D</td>
<td>Load bearing surface supports up to 250 lbs. as an assist bar</td>
</tr>
<tr>
<td>E</td>
<td>4-1/4”, 108 mm</td>
</tr>
<tr>
<td>F</td>
<td>(2x) Sq. 2”, 51 mm</td>
</tr>
<tr>
<td>G</td>
<td>1/2”, 13 mm</td>
</tr>
<tr>
<td>H</td>
<td>18”, 457 mm</td>
</tr>
<tr>
<td>I</td>
<td>(2x) Hole Size Ø 7/64”, 3 mm</td>
</tr>
<tr>
<td>J</td>
<td>3-3/8”, 86 mm</td>
</tr>
<tr>
<td>K</td>
<td>3/8”, 10 mm</td>
</tr>
</tbody>
</table>

**Note:** Dimensions subject to change without notice.
Towel Bar 363DTB-18 and 363DTB-24

Model Numbers

- [ ] 363DTB-18 Towel Bar
- [ ] 363DTB-24 Towel Bar

Finish Options

*Append appropriate -suffix to model number.*

- [ ] -STN Satin nickel finish

Feature Highlights

- Metal construction
- Mounting hardware included
- Standard finish is polished chrome

Warranty

- **Limited Lifetime** - to the original end purchaser in residential/consumer installations.
- **5 years** - for commercial installations

Dimensions  *Duro Double Towel Bar, 363DTB-18 and 363DTB-24*

- **1-13/16" (46 mm)**
  - 18" (457 mm)
  - 24" (610 mm)
  - 19-13/16" (503 mm)
  - 25-13/16" (656 mm)

*Note:* Dimensions subject to change without notice
**Towel Bar 363TB-18, 363TB-24**

**Model Numbers**
- 363TB-18  18 inch Towel Bar
- 363TB-24  24 inch Towel Bar

**Finish Options / Modifications**
Append appropriate -suffix to model number
- -BBZ  Brushed Bronze finish
- -MB   Matte Black finish
- -STN  Satin Nickel finish
  - Polished Chrome (standard finish)

**Feature Highlights**
- Metal construction
- Mounting hardware included
- Standard finish is polished chrome

**Warranty**
- Limited Lifetime - to the original end purchaser in residential/consumer installations.
- 5 years - for commercial installations

**Dimensions  Duro Towel Bar, 363TB-18 and 363TB-24**

**Note:** Dimensions subject to change without notice

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### Feature Highlights
- Duro Hand Shower Trim
- Requires Temptrol® Pressure Balancing Shower Valve
- Metal lever handle
- 30" slide bar for hand shower wand
- Dual checks for backflow protection
- 60' flexible metal hose
- 1 mode hand shower wand
- 2.5 gpm (9.5 L/min) flow restrictor
- Tub spout and showerhead not included
- Components shall be metal and nonmetallic construction, plated in standard Polished Chrome finish
- Available with TA-10 flow control spindle and T-12A cap assembly for Temptrol valve bodies installed with Test Cap (order p/n 3603H321TRMTC)
- For optional in-line vacuum breaker order p/n EF-109

### Options/Modifications

<table>
<thead>
<tr>
<th>Code</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>-1.5</td>
<td>1.5 gpm (5.7 L/min) flow restrictor</td>
</tr>
<tr>
<td>-2.0</td>
<td>2.0 gpm (7.6 L/min) flow restrictor</td>
</tr>
<tr>
<td>-72</td>
<td>72&quot; hose in place of 60&quot; hose</td>
</tr>
<tr>
<td>-ADACHS</td>
<td>ADA hand shower wand (chrome)</td>
</tr>
<tr>
<td>-ADAHS</td>
<td>ADA hand shower wand (white)</td>
</tr>
<tr>
<td>-EX</td>
<td>Exposed column/slide bar, hand shower bracket and hand shower wand (36EX)</td>
</tr>
<tr>
<td>-H323-V</td>
<td>3 mode hand shower unit with slide bar</td>
</tr>
<tr>
<td>-H323-V-48</td>
<td>3 mode hand shower unit with 48&quot; slide bar</td>
</tr>
<tr>
<td>-H3624</td>
<td>24&quot; decorative slide/grab bar with ADA wand</td>
</tr>
<tr>
<td>-H3636</td>
<td>36&quot; decorative slide/grab bar with ADA wand</td>
</tr>
<tr>
<td>-L2</td>
<td>Less hand shower wand</td>
</tr>
<tr>
<td>-QD</td>
<td>Quick-disconnect on hand shower units</td>
</tr>
<tr>
<td>-R</td>
<td>60&quot; white vinyl hose in place of 60&quot; metal hose</td>
</tr>
<tr>
<td>-REB</td>
<td>Rebuild trim kit, includes TA-10 and TA-4</td>
</tr>
<tr>
<td>-T724</td>
<td>24&quot; slide bar/grab bar with ADA wand</td>
</tr>
<tr>
<td>-T736</td>
<td>36&quot; slide bar/grab bar with ADA wand</td>
</tr>
<tr>
<td>-T748</td>
<td>48&quot; slide bar/grab bar with ADA wand</td>
</tr>
<tr>
<td>-VB</td>
<td>Elevated vacuum breaker</td>
</tr>
<tr>
<td>-VP</td>
<td>Vandal resistant escutcheon screws in place of standard screws</td>
</tr>
<tr>
<td>-BBZ</td>
<td>Brushed Bronze finish</td>
</tr>
<tr>
<td>-MB</td>
<td>Matte Black finish</td>
</tr>
<tr>
<td>-STN</td>
<td>Satin Nickel finish</td>
</tr>
</tbody>
</table>

### Model Numbers
- 3603-H321-V-TRM Hand Shower Trim, Temptrol Pressure Balancing Shower Valve ordered separately
- 3603H321TRMTC Hand Shower Trim with TA-10 flow control spindle and T-12A cap assembly, must order Temptrol valve with Test Cap

### Compliance
- ASME A112.18.1/CSA B125.1

### Warranty
**Limited Lifetime** - to the original end purchaser in consumer/residential installations.
**5 Years** - for industrial/commercial installations.
Refer to www.symmons.com/warranty for complete warranty information. Go to www.symmons.com/register to register your Symmons product.

**Note:** Append appropriate -suffix to model number.

3603-H3636-V-STN-TRM
Notes:

1) Valve body and piping not included and shown as reference only.
2) Plaster shield (p/n T-176) for dry wall, plaster or other type walls 1/2" or greater.
3) All dimensions measured from nominal rough-in (see H as reference).
4) Dimensions subject to change without notice.

<table>
<thead>
<tr>
<th>Measurements</th>
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<tbody>
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<td>A</td>
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<td>F</td>
</tr>
<tr>
<td>G</td>
</tr>
<tr>
<td>H</td>
</tr>
</tbody>
</table>
Hand Shower Trim

Specification Submittal

Location:

- Duro Hand Shower Trim
- Requires Temptrol® Pressure Balancing Shower Valve
- Metal lever handle
- 30” slide bar for hand shower wand
- Dual checks for backflow protection
- 60” flexible metal hose
- 1 mode hand shower wand
- 2.5 gpm (9.5 L/min) flow restrictor
- Tub spout and showerhead not included
- Components shall be metal and nonmetallic construction, plated in standard Polished Chrome finish
- Available with TA-10 flow control spindle and T-12A cap assembly for Temptrol valve bodies installed with Test Cap (order p/n 3603H321TRMTC)
- For optional in-line vacuum breaker order p/n EF-109

Model Numbers

☑ 3603-H321-V-TRM
   Hand Shower Trim, Temptrol Pressure Balancing Shower Valve ordered separately

☐ 3603H321TRMTC
   Hand Shower Trim with TA-10 flow control spindle and T-12A cap assembly, must order Temptrol valve with Test Cap

Compliance

- ASME A112.18.1/CSA B125.1

Warranty

Limited Lifetime - to the original end purchaser in consumer/residential installations.
5 Years - for industrial/commercial installations.
Refer to www.symmons.com/warranty for complete warranty information.
Go to www.symmons.com/register to register your Symmons product.

Options/Modifications

- ☐ -1.5 1.5 gpm (5.7 L/min) flow restrictor
- ☐ -2.0 2.0 gpm (7.6 L/min) flow restrictor
- ☐ -72 72” hose in place of 60” hose
- ☐ -ADACHS ADA hand shower wand (chrome)
- ☐ -ADAHS ADA hand shower wand (white)
- ☐ -EX Exposed column/slide bar, hand shower bracket and hand shower wand (36EX)
- ☐ -H323-V 3 mode hand shower unit with slide bar
- ☐ -H323-V-48 3 mode hand shower unit with 48” slide bar
- ☐ -H3624 24” decorative slide/grab bar with ADA wand
- ☐ -H3636 36” decorative slide/grab bar with ADA wand
- ☐ -L2 Less hand shower wand
- ☐ -QD Quick-disconnect on hand shower units
- ☐ -R 60” white vinyl hose in place of 60” metal hose
- ☐ -REB Rebuild trim kit, includes TA-10 and TA-4
- ☐ -T724 24” slide bar/grab bar with ADA wand
- ☐ -T736 36” slide bar/grab bar with ADA wand
- ☐ -T748 48” slide bar/grab bar with ADA wand
- ☐ -VB Elevated vacuum breaker
- ☐ -VP Vandal resistant escutcheon screws in place of standard screws
- ☐ -BBZ Brushed Bronze finish
- ☐ -MB Matte Black finish
- ☐ -STN Satin Nickel finish

Note: Append appropriate -suffix to model number.
**Dimensions**

**Notes:**

1) Valve body and piping not included and shown as reference only.
2) Plaster shield (p/n T-176) for dry wall, plaster or other type walls 1/2" or greater.
3) All dimensions measured from nominal rough-in (see H as reference).
4) Dimensions subject to change without notice.

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<td>C</td>
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<td>D</td>
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<td>E</td>
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<td>F</td>
</tr>
<tr>
<td>G</td>
</tr>
<tr>
<td>H</td>
</tr>
</tbody>
</table>

FLOOR

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LET THE DISHMACHINE DO ALL THE WORK

Leasing a dishmachine from PureForce® allows you to focus on your business with the security of knowing your warewashing operation is properly managed.

FEATURES
- Low water usage, 1.25 gallons per rack
- High temperature machine
- Self-cleaning internal sump helps ensure a clean final rinse
- Patented Vapor Vent System

BENEFITS
- Lower operating and energy costs
- Improves drying time
- Simplifies cleaning
- Prevents clogging
- Saves thousands of dollars in construction costs since no vent hood is required*
ES-2000HT VAPOR VENT SPECIFICATIONS:

LEGEND:
A - WATER INLET O IN (IN)
B - ELECTRICAL CONNECTION POINT
C - DRAIN (O IN) (IN)
D - STANDARD CLEARANCE BETWEEN MACHINE AND WALL (MINIMUM 3"
E - DOOR INLET WATER (PLUMBING) (IN) REQUIRED FOR COLD WATER INSTALLATION

NOTE: All sizes are approximate and may vary due to available space.

OPERATING CAPACITY
Racks per Hour 37

OPERATING CYCLE (NORMAL)
Wash Time 41
Dwell Time 8
Rinse Time 5
Load Time 32
Total Cycle Time 97

OPERATING TEMPERATURES
Wash (minimum) 150°F
Sanitizing Rinse (min) 180°F

WATER CONSUMPTION
Gallons per Rack 1.25

ELECTRICAL RATING
Wash Pump 3/4 HP

WASH CHAMBERS
Height 17"

WEIGHT
Machine Weight 300 lbs

UTILITY REQUIREMENTS ELECTRICAL
Voltage/Frequency/Phase:
230V/60Hz/3 Ph
Total Amperage 43 A
Minimum Electrical Circuit 60 A

Voltage/Frequency/Phase:
230V/60Hz/1 Ph
Total Amperage 68.8 A
Minimum Electrical Circuit 90 A

Voltage/Frequency/Phase:
208V/60Hz/3 Ph
Total Amperage 46.8 A
Minimum Electrical Circuit 60 A

Voltage/Frequency/Phase:
208V/60Hz/1 Ph
Total Amperage 75.2 A
Minimum Electrical Circuit 100 A

WATER
Waterline Size (min) 1/2"
Flow Pressure (required) 15-25 psi
Incoming Temperature (min) 110°F
Cold Waterline Size (min) 3/8"
Cold Flow Pressure (required) 20 psi

DRAIN
Drainline Size (minimum) 2"

Vapor Vent
- No external ventilation system required - saves thousands of dollars in construction costs*
- Significant energy savings each month with less demand on heating and air conditioning system
- Vapor Vent system requires no additional space

*Check with local building official to determine if an exhaust hood is required.

Available through your US Foods or PureForce Representative.
Contact PureForce at: 1_866_444_7450

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### Feature Highlights
- Single lever faucet with red & blue indicators on handle
- Ceramic control components and handle limits stop
- Supply has 3/8 inch copper tubing
- 4 inch (102mm) centers
- Metal construction
- Polished chrome finish (standard)
- Aerator with 2.2 gpm flow rate (8.3 L/min)
  *Optional aerator available in lower flow rates*

### Standards / Certifications
- ASME A112.18.1/CSA B125.1
- NSF/ANSI 61.9; NSF/ANSI 372
- WaterSense: 1.5 gpm (5.7 L/min)

### Warranty
- **Limited Lifetime** - to the original end purchaser in residential / consumer installations
- **5 years** - for commercial installations

### Handle Options / Modifications
Append appropriate -suffix to model number.
- **LP** Loop handle with metal finish
- **LCT** Clear acrylic handle  (only available with 20 inch braided supply hose, option -BH)
- **W** 6 inch (152 mm) lever handle with metal finish, handle with red & blue indicators on handle (polished chrome finish only)

### Other Options / Modifications
Append appropriate -suffix to model number.
- **LST** 16 inch copper supply tubing
- **BH** 20 inch braided supply hose
- **IPS** 1/2 inch IPS connections
- **OFG** Offset grid strainer (model S-20-2-G only)
- **-0.35** Aerator flow restrictor, 0.35 gpm (1.3 L/min)
- **-0.5** Non-aerated laminar spray, 0.5 gpm (1.9 L/min)
- **-1.0** Aerator flow restrictor, 1.0 gpm (3.8 L/min)
- **-1.5** Aerator flow restrictor, 1.5 gpm (5.7 L/min)
- **-VP** Vandal resistant aerator (not available for -0.5)
Dimensions  Symmetrix Lavatory Faucet, S-20-2

Note: Dimensions subject to change without notice.

Dimensions  Symmetrix Lavatory Faucet, S-20-2-BH (with braided supply hose)

Note: Dimensions subject to change without notice.

Dimensions  Symmetrix Lavatory Faucet, S-20-2-W
(S-20 Series with optional lever handle, option W)

Dimensions  Symmetrix Lavatory Faucet, S-20-2-LCT
(S-20 Series with acrylic handle, option LCT)
Robinets de lavabo  S-20 Series
Présentation des spécifications

Principales caractéristiques
- Robinet à levier unique livré avec pastilles rouge et bleue sur la poignée
- Composants des commandes et limite d'arrêt de la poignée en céramique
- Alimenté par un tuyau de cuivre de 3/8 pouces
- Centres de 4 pouces (102 mm)
- Construction métallique
- Finition chromée polie (standard)
- Aérateur avec un débit de 2,2 gpm (8,3 L/min)
  Aérateur disponible en option avec des débits plus faibles

Normes/certifications
- ASME A112.18.1/CSA B125.1
- NSF/ANSI 61.9; NSF/ANSI 372
- WaterSense: 1.5 gpm (5.7 L/min)

Garantie
- Garantie à vie limitée - à l'acheteur final original dans les installations
- 5 ans - pour les installations commerciales

Options de poignées de la série S-20

<table>
<thead>
<tr>
<th>Standard</th>
<th>LP</th>
<th>W</th>
<th>LCT</th>
</tr>
</thead>
<tbody>
<tr>
<td>Robinet standard</td>
<td>Robinet avec trou de tige de levage</td>
<td>Robinet avec tige de levage</td>
<td>Robinet avec bonde mécanique et tige de levage</td>
</tr>
<tr>
<td>Robinet avec assemblage de grille d'égouttage</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Numéros de modèles
Joindre le -suffixe approprié au numéro de modèle.
- S-20
- S-20-0
- S-20-1
- S-20-2
- S-20-2-G

Options/modifications de la poignée
Joindre le -suffixe approprié au numéro de modèle.
- -LP Poignée en boucle avec finition métallique
- -LCT Poignée en acrylique transparent (disponible seulement avec un boyau d'alimentation fileté de 20 pouces, option -BH)
- -W Poignée en levier de 6 pouces (152 mm) avec finition métallique, poignée avec indicateurs rouges et bleus sur la poignée (finition chromée polie seulement).

Options/modifications du fini
Joindre le -suffixe approprié au numéro de modèle.
- -STN Nickel satinié*
*Remarque les poignées avec pastilles rouges et bleues ne sont pas disponibles avec des finitions décoratives.

Autres options/modifications
Joindre le -suffixe approprié au numéro de modèle.
- -LST Tuyau d'alimentation en cuivre de 16 pouces
- -BH Boyau d'alimentation fileté de 20 pouces
- -IPS Raccords IPS de 1/2 pouce
- -OFG Filtre de la grille de décalage (modèle S-20-2-G seulement)
- -0.35 Aérateur avec réducteur de débit de (1,3 L/min)
- -0.5 Pulvérisateur laminaire sans aération (1,9 L/min)
- -1.0 Aérateur avec réducteur de débit de (3,8 L/min)
- -1.5 Aérateur avec réducteur de débit de (5,7 L/min)
- -VP Aérateur résistant au vandalisme (non disponible pour -0.5)
**Dimensions Symmetrix Robinet de lavabo, S-20-2**

**Dimensions** Symmetrix Robinet de lavabo, S-20-2-BH (avec boyau d’alimentation fileté)

**Dimensions Robinet de lavabo Symmetrix, S-20-2-W** (Série S-20 avec poignée de levier en option, option W)

**Dimensions Robinet de lavabo Symmetrix, S-20-2-LCT** (Série S-20 avec poignée en acrylique, option LCT)

Remarque: Les dimensions sont sujettes à changer sans préavis.

Symmons Industries, Inc.  ■  31 Brooks Drive  ■  Braintree, MA  02184
Phone: (800) 796-6667  ■  Fax: (800) 961-9621
Website: symmons.com  ■  Email: gethelp@symmons.com
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SRT-0231
Single Handle Roman Tub Faucet

**Specification Submittal**

<table>
<thead>
<tr>
<th>Model Numbers</th>
<th>Specification</th>
</tr>
</thead>
<tbody>
<tr>
<td>✓ SRT-0231</td>
<td>Single Handle Roman Tub Faucet shall include quarter turn ceramic cartridge and 1/2&quot; IPS inlet connections. Roman Tub Faucet shall be made from metal construction, plated in standard polished chrome finish.</td>
</tr>
</tbody>
</table>

**Warranty**

Limited Lifetime - to the original end purchaser in consumer/residential installations.

5 Years - for industrial/commercial installations. Refer to www.symmons.com/warranty for complete warranty information.

**Options/Modifications**

- STN  Satin Nickel finish

**Note:** Append appropriate -suffix to model number.

**Dimensions**

<table>
<thead>
<tr>
<th>Measurements</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
</tr>
<tr>
<td>B</td>
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<tr>
<td>C</td>
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<tr>
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<tr>
<td>E</td>
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<td>F</td>
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<td>G</td>
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<td>J</td>
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<td>K</td>
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<td>L</td>
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<td>M</td>
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<tr>
<td>N</td>
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<tr>
<td>O</td>
</tr>
<tr>
<td>P</td>
</tr>
<tr>
<td>Q</td>
</tr>
</tbody>
</table>

**Note:** Dimensions subject to change without notice.
Duro®

Model Numbers

- SPP-3610
  Pull-Out Kitchen Faucet

Specifications

- Pull-Out Kitchen Faucet shall include single hole mount configuration, ceramic cartridge, braided hose connections and standard 2.2 gpm (8.3 L/min) aerator. Faucet shall be made from metal construction, plated in standard polished chrome finish.

- SPP-3610-STN

Warranty

Limited Lifetime - to the original end purchaser in consumer/residential installations.
5 Years - for industrial/commercial installations. Refer to www.symmons.com/warranty for complete warranty information.

Compliance

- ASME A112.18.1/CSA B125.1
- NSF/ANSI 61.9, NSF/ANSI 372

Dimensions

<table>
<thead>
<tr>
<th>Measurements</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
</tr>
<tr>
<td>B</td>
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<tr>
<td>C</td>
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<tr>
<td>D</td>
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<tr>
<td>E</td>
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<td>F</td>
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<td>J</td>
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<tr>
<td>K</td>
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<tr>
<td>L</td>
</tr>
<tr>
<td>M</td>
</tr>
<tr>
<td>N</td>
</tr>
</tbody>
</table>

Notes:

1) Hoses removed for clarity.
2) Dimensions subject to change without notice.
**Duro®**

**3603-H321-V-TRM, 3603H321TRMTC**

**Hand Shower Trim**

**Specification Submittal**

### Feature Highlights

- **Duro Hand Shower Trim**
- Requires Temptrol® Pressure Balancing Shower Valve
- Metal lever handle
- 30’ slide bar for hand shower wand
- Dual checks for backflow protection
- 60’ flexible metal hose
- 1 mode hand shower wand
- 2.5 gpm (9.5 L/min) flow restrictor
- Tub spout and showerhead not included
- Components shall be metal and nonmetallic construction, plated in standard Polished Chrome finish
- Available with TA-10 flow control spindle and T-12A cap assembly for Temptrol valve bodies installed with Test Cap (order p/n 3603H321TRMTC)
- For optional in-line vacuum breaker order p/n EF-109

### Options/Modifications

<table>
<thead>
<tr>
<th>Option</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>-1.5</td>
<td>1.5 gpm (5.7 L/min) flow restrictor</td>
</tr>
<tr>
<td>-2.0</td>
<td>2.0 gpm (7.6 L/min) flow restrictor</td>
</tr>
<tr>
<td>-72</td>
<td>72” hose in place of 60” hose</td>
</tr>
<tr>
<td>ADAHCS</td>
<td>ADA hand shower wand (chrome)</td>
</tr>
<tr>
<td>ADAHS</td>
<td>ADA hand shower wand (white)</td>
</tr>
<tr>
<td>EX</td>
<td>Exposed column/slide bar, hand shower bracket and hand shower wand (36EX)</td>
</tr>
<tr>
<td>H323-V</td>
<td>3 mode hand shower unit with slide bar</td>
</tr>
<tr>
<td>H323-V-48</td>
<td>3 mode hand shower unit with 48” slide bar</td>
</tr>
<tr>
<td>H3624</td>
<td>24” decorative slide/grab bar with ADA wand</td>
</tr>
<tr>
<td>H3636</td>
<td>36” decorative slide/grab bar with ADA wand</td>
</tr>
<tr>
<td>L2</td>
<td>Less hand shower wand</td>
</tr>
<tr>
<td>QD</td>
<td>Quick-disconnect on hand shower units</td>
</tr>
<tr>
<td>R</td>
<td>60” white vinyl hose in place of 60” metal hose</td>
</tr>
<tr>
<td>REB</td>
<td>Rebuild trim kit, includes TA-10 and TA-4</td>
</tr>
<tr>
<td>T724</td>
<td>24” slide bar/grab bar with ADA wand</td>
</tr>
<tr>
<td>T736</td>
<td>36” slide bar/grab bar with ADA wand</td>
</tr>
<tr>
<td>T748</td>
<td>48” slide bar/grab bar with ADA wand</td>
</tr>
<tr>
<td>VB</td>
<td>Elevated vacuum breaker</td>
</tr>
<tr>
<td>VP</td>
<td>Vandal resistant escutcheon screws in place of standard screws</td>
</tr>
<tr>
<td>BBZ</td>
<td>Brushed Bronze finish</td>
</tr>
<tr>
<td>MB</td>
<td>Matte Black finish</td>
</tr>
<tr>
<td>STN</td>
<td>Satin Nickel finish</td>
</tr>
</tbody>
</table>

### Model Numbers

- **3603-H321-V-TRM**
  - Hand Shower Trim, Temptrol Pressure Balancing Shower Valve ordered separately
- **3603H321TRMTC**
  - Hand Shower Trim with TA-10 flow control spindle and T-12A cap assembly, must order Temptrol valve with Test Cap

### Compliance

- ASME A112.18.1/CSA B125.1

### Warranty

**Limited Lifetime** - to the original end purchaser in consumer/residential installations.

**5 Years** - for industrial/commercial installations.

Refer to [www.symmons.com/warranty](http://www.symmons.com/warranty) for complete warranty information. Go to [www.symmons.com/register](http://www.symmons.com/register) to register your Symmons product.

---

Note: Append appropriate -suffix to model number.

**3603-H3636-V-STN-TRM**
**Notes:**

1) Valve body and piping not included and shown as reference only.
2) Plaster shield (p/n T-176) for dry wall, plaster or other type walls 1/2" or greater.
3) All dimensions measured from nominal rough-in (see H as reference).
4) Dimensions subject to change without notice.

**Measurements**

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>6&quot;, 152 mm</td>
</tr>
<tr>
<td>B</td>
<td>Male 1/2-14 NPT thread must be recessed 1/4&quot; (6 mm) from finished wall</td>
</tr>
<tr>
<td>C</td>
<td>Sq. 7-1/2&quot;, 191 mm</td>
</tr>
<tr>
<td>D</td>
<td>3-1/2&quot;, 89 mm</td>
</tr>
<tr>
<td>E</td>
<td>Ref. 42&quot;, 1067 mm</td>
</tr>
<tr>
<td>F</td>
<td>3-1/8&quot;, 79 mm</td>
</tr>
<tr>
<td>G</td>
<td>3-1/2&quot;, 89 mm</td>
</tr>
<tr>
<td>H</td>
<td>Rough-in 2-3/8&quot; ± 1/2&quot;, 60 mm ± 13 mm</td>
</tr>
</tbody>
</table>
**Duro® Feature Highlights Options/Modifications**

- Duro Hand Shower Trim
- Requires Temptrol® Pressure Balancing Shower Valve
- Metal lever handle
- 30" slide bar for hand shower wand
- Dual checks for backflow protection
- 60" flexible metal hose
- 1 mode hand shower wand
- 2.5 gpm (9.5 L/min) flow restrictor
- Tub spout and showerhead not included
- Components shall be metal and nonmetallic construction, plated in standard Polished Chrome finish
- Available with TA-10 flow control spindle and T-12A cap assembly for Temptrol valve bodies installed with Test Cap (order p/n 3603H321TRMTC)
- For optional in-line vacuum breaker order p/n EF-109

**Model Numbers**

- **☑ 3603-H321-V-TRM**
  Hand Shower Trim, Temptrol Pressure Balancing Shower Valve ordered separately
- **☐ 3603H321TRMTC**
  Hand Shower Trim with TA-10 flow control spindle and T-12A cap assembly, must order Temptrol valve with Test Cap

**Compliance**

- ASME A112.18.1/CSA B125.1

**Warranty**

- **Limited Lifetime** - to the original end purchaser in consumer/residential installations.
- **5 Years** - for industrial/commercial installations.

Refer to www.symmons.com/warranty for complete warranty information. Go to www.symmons.com/register to register your Symmons product.

**Options/Modifications**

- **☐ -1.5**
  1.5 gpm (5.7 L/min) flow restrictor
- **☐ -2.0**
  2.0 gpm (7.6 L/min) flow restrictor
- **☐ -72**
  72" hose in place of 60" hose
- **☐ -ADAHS**
  ADA hand shower wand (white)
- **☐ -EX**
  Exposed column/slide bar, hand shower bracket and hand shower wand (36EX)
- **☐ -H323-V**
  3 mode hand shower unit with slide bar
- **☐ -H323-V-48**
  3 mode hand shower unit with 48" slide bar
- **☐ -H3624**
  24" decorative slide/grab bar with ADA wand
- **☐ -H3636**
  36" decorative slide/grab bar with ADA wand
- **☐ -L2**
  Less hand shower wand
- **☐ -QD**
  Quick-disconnect on hand shower units
- **☐ -R**
  60" white vinyl hose in place of 60" metal hose
- **☐ -REB**
  Rebuild trim kit, includes TA-10 and TA-4
- **☐ -T724**
  24" slide bar/Grab bar with ADA wand
- **☐ -T736**
  36" slide bar/Grab bar with ADA wand
- **☐ -T748**
  48" slide bar/Grab bar with ADA wand
- **☐ -VB**
  Elevated vacuum breaker
- **☐ -VP**
  Vandal resistant escutcheon screws in place of standard screws
- **☐ -BBZ**
  Brushed Bronze finish
- **☐ -MB**
  Matte Black finish
- **☐ -STN**
  Satin Nickel finish

**Note:** Append appropriate -suffix to model number.
Notes:
1) Valve body and piping not included and shown as reference only.
2) Plaster shield (p/n T-176) for dry wall, plaster or other type walls 1/2" or greater.
3) All dimensions measured from nominal rough-in (see H as reference).
4) Dimensions subject to change without notice.
**WARRANTY**

**Limited Lifetime** - to the original end purchaser in consumer installations.

**5 Years** - for commercial installations. Refer to www.symmons.com/warranty for complete warranty information.
### Feature Highlights
- Duro Shower Trim
- Requires Temptrol® Pressure Balancing Shower Valve
- Metal lever handle
- 1 mode showerhead
- 2.5 gpm (9.5 L/min) flow restrictor
- Tub spout not included
- Components shall be metal and nonmetallic construction, plated in standard Polished Chrome finish
- Available with TA-10 flow control spindle and T-12A cap assembly for Temptrol valve bodies installed with Test Cap (order p/n 3601TRMTC)

### Options/Modifications

<table>
<thead>
<tr>
<th>Option</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>☐ -1.5</td>
<td>1.5 gpm (5.7 L/min) flow restrictor</td>
</tr>
<tr>
<td>☐ -2.0</td>
<td>2.0 gpm (7.6 L/min) flow restrictor</td>
</tr>
<tr>
<td>☐ -EX</td>
<td>Exposed column/slide bar, hand shower bracket and hand shower wand (36EX)</td>
</tr>
<tr>
<td>☑ -L1</td>
<td>Less showerhead</td>
</tr>
<tr>
<td>☐ -REB</td>
<td>Rebuild trim kit, includes TA-10 and TA-4</td>
</tr>
<tr>
<td>☐ -SH1</td>
<td>Alternative 352SH Dia showerhead</td>
</tr>
<tr>
<td>☐ -SH2</td>
<td>Alternative 352SH-3, 3 mode showerhead</td>
</tr>
<tr>
<td>☐ -SH4</td>
<td>Alternative 361SH square showerhead</td>
</tr>
<tr>
<td>☑ -VP</td>
<td>Vandal resistant escutcheon screws in place of standard screws</td>
</tr>
<tr>
<td>☐ -BBZ</td>
<td>Brushed Bronze finish</td>
</tr>
<tr>
<td>☐ -MB</td>
<td>Matte Black finish</td>
</tr>
<tr>
<td>☑ -STN</td>
<td>Satin Nickel finish</td>
</tr>
</tbody>
</table>

### Model Numbers
- ☑ 3601-TRM
  - Shower Trim, Temptrol Pressure Balancing Shower Valve ordered separately
- ☐ 3601TRMTC
  - Shower Trim with TA-10 flow control spindle and T-12A cap assembly, must order Temptrol valve with Test Cap

### Compliance
- ASME A112.18.1/CSA B125.1

### Warranty
- **Limited Lifetime** - to the original end purchaser in consumer/residential installations.
- **5 Years** - for industrial/commercial installations.

Refer to www.symmons.com/warranty for complete warranty information. Go to www.symmons.com/register to register your Symmons product.

### Note:
Append appropriate -suffix to model number.

**3601-L1-STN-TRM**
**Dimensions**

**Notes:**
1) Valve body and piping not included and shown as reference only.
2) Plaster shield (p/n T-176) for dry wall, plaster or other type walls 1/2" or greater.
3) All dimensions measured from nominal rough-in (see I as reference).
4) Dimensions subject to change without notice.

**Measurements**

<table>
<thead>
<tr>
<th>Letter</th>
<th>Description</th>
<th>Measurement</th>
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</thead>
<tbody>
<tr>
<td>A</td>
<td>Ø 2-1/2&quot;, 64 mm</td>
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</tr>
<tr>
<td>B</td>
<td>6&quot;, 152 mm</td>
<td></td>
</tr>
<tr>
<td>C</td>
<td>Ref. 77&quot;, 1956 mm</td>
<td></td>
</tr>
<tr>
<td>D</td>
<td>3-1/2&quot;, 89 mm</td>
<td></td>
</tr>
<tr>
<td>E</td>
<td>Sq. 7-1/2&quot;, 191 mm</td>
<td></td>
</tr>
<tr>
<td>F</td>
<td>Ref. 42&quot;, 1067 mm</td>
<td></td>
</tr>
<tr>
<td>G</td>
<td>3-1/8&quot;, 79 mm</td>
<td></td>
</tr>
<tr>
<td>H</td>
<td>3-1/2&quot;, 89 mm</td>
<td></td>
</tr>
<tr>
<td>I</td>
<td>Rough-in</td>
<td>2-3/8&quot; ± 1/2&quot;, 60 mm ± 13 mm</td>
</tr>
<tr>
<td>J</td>
<td>6-3/4&quot;, 171 mm</td>
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<tr>
<td>K</td>
<td>6-3/4&quot;, 171 mm</td>
<td></td>
</tr>
<tr>
<td>L</td>
<td>5-5/8&quot;, 143 mm</td>
<td></td>
</tr>
</tbody>
</table>
**Feature Highlights**

- Duro Tub/Shower Trim
- Requires Temptrol® Pressure Balancing Tub/Shower Valve
- Metal lever handle
- 7” diverter tub spout
- 1 mode showerhead
- 2.5 gpm (9.5 L/min) flow restrictor
- Components shall be metal and nonmetallic construction, plated in standard Polished Chrome finish
- Available with TA-10 flow control spindle and T-12A cap assembly for Temptrol valve bodies installed with Test Cap (order p/n 3602TRMTC)

**Model Numbers**

- **3602-TRM**
  Tub/Shower Trim, Temptrol Pressure Balancing Tub/Shower Valve ordered separately
- **3602TRMTC**
  Tub/Shower Trim with TA-10 flow control spindle and T-12A cap assembly, must order Temptrol valve with Test Cap

**Compliance**

- ASME A112.18.1/CSA B125.1

**Options/Modifications**

<table>
<thead>
<tr>
<th>Options/Modifications</th>
<th>Details</th>
</tr>
</thead>
<tbody>
<tr>
<td>☐ -1.5 CG</td>
<td>1.5 gpm (5.7 L/min) flow restrictor</td>
</tr>
<tr>
<td>☐ -2.0</td>
<td>2.0 gpm (7.6 L/min) flow restrictor</td>
</tr>
<tr>
<td>☐ -EX</td>
<td>Exposed column/slide bar, hand shower bracket and hand shower wand (36EX)</td>
</tr>
<tr>
<td>☑ -L1</td>
<td>Less showerhead</td>
</tr>
<tr>
<td>☐ -REB</td>
<td>Rebuild trim kit, includes TA-10 and TA-4</td>
</tr>
<tr>
<td>☐ -SH1</td>
<td>Alternative 352SH Dia showerhead</td>
</tr>
<tr>
<td>☐ -SH2</td>
<td>Alternative 352SH-3, 3 mode showerhead</td>
</tr>
<tr>
<td>☐ -SH4</td>
<td>Alternative 361SH square showerhead</td>
</tr>
<tr>
<td>☐ -SS</td>
<td>Slip spout on any tub/shower unit</td>
</tr>
<tr>
<td>☐ -T2</td>
<td>Alternative 361DTS, square diverter tub spout</td>
</tr>
<tr>
<td>☐ -VP</td>
<td>Vandal resistant escutcheon screws in place of standard screws</td>
</tr>
<tr>
<td>☐ -BBZ</td>
<td>Brushed Bronze finish</td>
</tr>
<tr>
<td>☐ -MB</td>
<td>Matte Black finish</td>
</tr>
<tr>
<td>☑ -STN</td>
<td>Satin Nickel finish</td>
</tr>
</tbody>
</table>

**Note:** Append appropriate -suffix to model number.

3602-L1-STN-TRM

**Warranty**

- **Limited Lifetime** - to the original end purchaser in consumer/residential installations.
- **5 Years** - for industrial/commercial installations.

Refer to www.symmons.com/warranty for complete warranty information.

Go to www.symmons.com/register to register your Symmons product.
Notes:
1) Valve body and piping not included and shown as reference only.
2) Plaster shield (p/n T-176) for dry wall, plaster or other type walls 1/2" or greater.
3) All dimensions measured from nominal rough-in (see K as reference).
4) Dimensions subject to change without notice.

Measurements

<table>
<thead>
<tr>
<th></th>
<th>Description</th>
<th>Measurement</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>Ø 2-1/2&quot;, 64 mm</td>
<td>64 mm</td>
</tr>
<tr>
<td>B</td>
<td>6&quot;, 152 mm</td>
<td>152 mm</td>
</tr>
<tr>
<td>C</td>
<td>Ref. 77&quot;, 1956 mm</td>
<td>77&quot;, 1956 mm</td>
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<tr>
<td>D</td>
<td>3-1/2&quot;, 89 mm</td>
<td>89 mm</td>
</tr>
<tr>
<td>E</td>
<td>Sq. 7-1/2&quot;, 191 mm</td>
<td>7-1/2&quot;, 191 mm</td>
</tr>
<tr>
<td>F</td>
<td>Ø 2-1/2&quot;, 64 mm</td>
<td>64 mm</td>
</tr>
<tr>
<td>G</td>
<td>Ref. 32&quot;, 813 mm</td>
<td>32&quot;, 813 mm</td>
</tr>
<tr>
<td>H</td>
<td>Ref. 12&quot;, 305 mm</td>
<td>12&quot;, 305 mm</td>
</tr>
<tr>
<td>I</td>
<td>3-1/8&quot;, 79 mm</td>
<td>3-1/8&quot;, 79 mm</td>
</tr>
<tr>
<td>J</td>
<td>3-1/2&quot;, 89 mm</td>
<td>3-1/2&quot;, 89 mm</td>
</tr>
<tr>
<td>K</td>
<td>Rough-in 2-3/8&quot; ± 1/2&quot;, 60 mm ± 13 mm</td>
<td>5-1/2&quot;, 140 mm</td>
</tr>
<tr>
<td>L</td>
<td>Male 1/2-14 NPT fitting must protrude 5-1/2&quot; (140 mm) from finished wall</td>
<td></td>
</tr>
<tr>
<td>M</td>
<td>Male 1/2-14 NPT fitting must protrude 4-7/16&quot; (113 mm) from finished wall</td>
<td></td>
</tr>
<tr>
<td>N</td>
<td>7&quot;, 178 mm</td>
<td>7&quot;, 178 mm</td>
</tr>
<tr>
<td>O</td>
<td>6-3/4&quot;, 171 mm</td>
<td>6-3/4&quot;, 171 mm</td>
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<tr>
<td>P</td>
<td>6-3/4&quot;, 171 mm</td>
<td>6-3/4&quot;, 171 mm</td>
</tr>
<tr>
<td>Q</td>
<td>5-5/8&quot;, 143 mm</td>
<td>5-5/8&quot;, 143 mm</td>
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<tr>
<td>R</td>
<td>2-1/4&quot;, 57 mm</td>
<td>2-1/4&quot;, 57 mm</td>
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<tr>
<td>S</td>
<td>2-1/2&quot;, 64 mm</td>
<td>2-1/2&quot;, 64 mm</td>
</tr>
<tr>
<td>T</td>
<td>5/8&quot;, 16 mm</td>
<td>5/8&quot;, 16 mm</td>
</tr>
<tr>
<td>U</td>
<td>5-5/8&quot;, 143 mm</td>
<td>5-5/8&quot;, 143 mm</td>
</tr>
</tbody>
</table>

1) Valve body and piping not included and shown as reference only.
2) Plaster shield (p/n T-176) for dry wall, plaster or other type walls 1/2" or greater.
3) All dimensions measured from nominal rough-in (see K as reference).
4) Dimensions subject to change without notice.
## Model Numbers

<table>
<thead>
<tr>
<th>Model Number</th>
<th>Feature Highlights</th>
</tr>
</thead>
<tbody>
<tr>
<td>SLS-3622-1.5</td>
<td>Single Handle Lavatory Faucet with lift rod and metal drain assembly</td>
</tr>
</tbody>
</table>

### Feature Highlights

- Single hole mount configuration
- Quarter turn ceramic cartridge
- 25 inch braided hose water supply connections
- 4-1/2" height
- Lift rod and metal drain assembly (SLS-3622-1.5)
- Standard 1.5 gpm (5.7 L/min) flow rate
- Faucet shall be metal construction, plated in standard polished chrome finish

### Finish Options/Modifications

<table>
<thead>
<tr>
<th>Option</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>-0.5</td>
<td>0.5 gpm (1.9 L/min) flow restrictor</td>
</tr>
<tr>
<td>-1.0</td>
<td>1.0 gpm (3.8 L/min) flow restrictor</td>
</tr>
<tr>
<td>Delete Suffix 1.5</td>
<td>2.2 gpm (8.3 L/min) flow restrictor</td>
</tr>
<tr>
<td>-DP4</td>
<td>4&quot; deck plate</td>
</tr>
<tr>
<td>-BBZ</td>
<td>Brushed Bronze finish</td>
</tr>
<tr>
<td>-MB</td>
<td>Matte Black finish</td>
</tr>
<tr>
<td>-STN</td>
<td>Satin Nickel finish</td>
</tr>
</tbody>
</table>

**Note:** Append appropriate -suffix to model number.

### Compliance

- ASME A112.18.1/CSA B125.1
- NSF/ANSI 61.9; NSF/ANSI 372
- WaterSense 1.5 gpm

### Warranty

**Limited Lifetime** - to the original end purchaser in consumer/residential installations.

**5 Years** - for industrial/commercial installations.

Refer to www.symmons.com/warranty for complete warranty information.
**Dimensions**

**Note:** Dimensions subject to change without notice.

<table>
<thead>
<tr>
<th>Measurements</th>
</tr>
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<tbody>
<tr>
<td>A</td>
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<td></td>
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<tr>
<td>C</td>
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<tr>
<td>D</td>
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<tr>
<td>E</td>
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<tr>
<td>F</td>
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<tr>
<td>G</td>
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<tr>
<td>H</td>
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<tr>
<td>I</td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td>J</td>
</tr>
<tr>
<td>K</td>
</tr>
</tbody>
</table>
Thank you for buying this energy efficient water heater. We appreciate your confidence in our products.

WARNING: If the information in these instructions is not followed exactly, a fire or explosion may result causing property damage, personal injury or death.

— Do not store or use gasoline or other flammable vapors and liquids in the vicinity of this or any other appliance.

— WHAT TO DO IF YOU SMELL GAS:
  • Do not try to light any appliance.
  • Do not touch any electrical switch; do not use any phone in your building.
  • Immediately call your gas supplier from a neighbor’s phone. Follow the gas supplier's instructions.
  • If you cannot reach your gas supplier, call the fire department.

— Installation and service must be performed by a qualified installer, service agency or the gas supplier.

Read and understand this instruction manual and the safety messages herein before installing, operating or servicing this water heater.

Failure to follow these instructions and safety messages could result in death or serious injury.

This manual must remain with the water heater.

PLACE THESE INSTRUCTIONS ADJACENT TO HEATER AND NOTIFY OWNER TO KEEP FOR FUTURE REFERENCE.
SAFE INSTALLATION, USE AND SERVICE

The proper installation, use and servicing of this water heater is extremely important to your safety and the safety of others. Many safety-related messages and instructions have been provided in this manual and on your own water heater to warn you and others of a potential injury hazard. Read and obey all safety messages and instructions throughout this manual. It is very important that the meaning of each safety message is understood by you and others who install, use, or service this water heater.

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>![Safety Alert Symbol]</td>
<td><strong>DANGER</strong> indicates an imminently hazardous situation which, if not avoided, will result in injury or death.</td>
</tr>
<tr>
<td>![Safety Alert Symbol]</td>
<td><strong>WARNING</strong> indicates a potentially hazardous situation which, if not avoided, could result in injury or death.</td>
</tr>
<tr>
<td>![Safety Alert Symbol]</td>
<td><strong>CAUTION</strong> indicates a potentially hazardous situation which, if not avoided, could result in minor or moderate injury.</td>
</tr>
<tr>
<td>![Safety Alert Symbol]</td>
<td><strong>CAUTION</strong> used without the safety alert symbol indicates a potentially hazardous situation which, if not avoided, could result in property damage.</td>
</tr>
</tbody>
</table>

All safety messages will generally tell you about the type of hazard, what can happen if you do not follow the safety message, and how to avoid the risk of injury.

APPROVALS

GAS-FIRED

UL®

LISTED

AHRI CERTIFIED®

CLASSIFIED

WATER QUALITY

ANSI/NSF-5

ASME HLW

CSA®

LOW LEAD CONTENT

NOTE: ASME construction is optional on the water heaters covered in this manual.
PRECAUTIONS

DO NOT USE THIS APPLIANCE IF ANY PART HAS BEEN EXPOSED TO FLOODING OR WATER DAMAGE. Immediately call a qualified service agency to inspect the appliance and to make a determination on what steps should be taken next.

If the unit is exposed to the following, do not operate heater until all corrective steps have been made by a qualified service agency.
1. External fire.
2. Damage.
3. Firing without water.

GROUNDING INSTRUCTIONS

This water heater must be grounded in accordance with the National Electrical Code and/or local codes. These must be followed in all cases. Failure to ground this water heater properly may also cause erratic control system operation.

This water heater must be connected to a grounded metal, permanent wiring system; or an equipment grounding conductor must be run with the circuit conductors and connected to the equipment grounding terminal or lead on the water heater.

Hydrogen gas can be produced in a hot water system served by this water heater that has not been used for a long period of time (generally two weeks or more). Hydrogen gas is extremely flammable. To reduce the risk of injury under these conditions, it is recommended that a hot water faucet served by this water heater be opened for several minutes before using any electrical appliance connected to the hot water system. If hydrogen is present there will probably be an unusual sound such as air escaping through the pipe as the water begins to flow. THERE SHOULD BE NO SMOKING OR OPEN FLAME NEAR THE FAUCET AT THE TIME IT IS OPEN.

GENERAL SAFETY INFORMATION

Read and understand this instruction manual and the safety messages herein before installing, operating or servicing this water heater. Failure to follow these instructions and safety messages could result in death or serious injury.

This manual must remain with the water heater.

Water temperature over 125°F (52°C) can cause severe burns instantly resulting in severe injury or death.

Children, the elderly and the physically or mentally disabled are at highest risk for scald injury.

Feel water before bathing or showering.

Temperature limiting devices such as mixing valves must be installed when required by codes and to ensure safe temperatures at fixtures.

CAUTION

- Do not operate water heater if flood damaged.
- Inspect and anode rods regularly, replace if damaged.
- Install in location with drainage.
- Fill tank with water before operation.
- Properly sized thermal expansion tanks are required on all closed water systems.

Refer to this manual for installation and service.
GENERAL SAFETY INFORMATION

⚠️ WARNING

Fire or Explosion Hazard

- Do not store or use gasoline or other flammable vapors and liquids in the vicinity of this or any other appliance.
- Avoid all ignition sources if you smell gas.
- Do not expose water heater controls to excessive gas pressure.
- Use only the gas shown on the water heater rating label.
- Maintain required clearances to combustibles.
- Keep ignition sources away from faucets after extended periods of non-use.

Read instruction manual before installing, using or servicing water heater.

⚠️ WARNING

Breathing Hazard - Carbon Monoxide Gas

- Do not obstruct water heater air intake with insulating blanket.
- Gas and carbon monoxide detectors are available.
- Install water heater in accordance with the instruction manual.

Breathing carbon monoxide can cause brain damage or death. Always read and understand instruction manual.

CAUTION

Property Damage Hazard

- All water heaters eventually leak.
- Do not install without adequate drainage.

⚠️ WARNING

Electrical Shock Hazard

- Turn off power at the branch circuit breaker serving the water heater before performing any service.
- Label all wires prior to disconnecting when performing service. Wiring errors can cause improper and dangerous operation.
- Verify proper operation after servicing.
- Failure to follow these instructions can result in personal injury or death.

⚠️ WARNING

Fire Hazard

For continued protection against risk of fire:

- Do not install water heater on carpeted floor.
- Do not operate water heater if exposed to flooding or water damage.

⚠️ WARNING

Fire and Explosion Hazard

- Use joint compound or Teflon tape compatible with propane gas.
- Leak test gas connections before placing the water heater in operation.
- Disconnect gas piping at main gas shutoff valve before leak testing heater.
- Install sediment trap in accordance with NFPA 54 or CAN/CSA 149.1.

⚠️ WARNING

Fire and Explosion Hazard

- Do not use water heater with any gas other than the gas shown on the rating label.
- Excessive gas pressure to gas valve can cause serious injury or death.
- Turn off gas lines during installation.
- Contact a qualified installer or service agency for installation and service.

⚠️ WARNING

Jumping out control circuits or components can result in property damage, personal injury or death.

- Service should only be performed by a qualified service technician using proper test equipment.
- Altering the water heater controls and/or wiring in any way could result in permanent damage to the controls or water heater and is not covered under the limited warranty.

Any bypass or alteration of the water heater controls and/or wiring will result in voiding the appliance warranty.
Thank You for purchasing this water heater. Properly installed and maintained, it should give you years of trouble free service.

**ABBREVIATIONS USED**

Abbreviations found in this Instruction Manual include:

- ANSI - American National Standards Institute
- ASME - American Society of Mechanical Engineers
- AHRI - Air Conditioning, Heating and Refrigeration Institute
- NEC - National Electrical Code
- NFPA - National Fire Protection Association
- UL - Underwriters Laboratory
- CSA - Canadian Standards Association

**QUALIFIED INSTALLER OR SERVICE AGENCY**

Installation and service of this water heater requires ability equivalent to that of a Qualified Agency (as defined by ANSI below) in the field involved. Installation skills such as plumbing, air supply, venting, gas supply and electrical supply are required in addition to electrical testing skills when performing service.

**ANSI Z223.1 2006 Sec. 3.3.83:** “Qualified Agency” - “Any individual, firm, corporation or company that either in person or through a representative is engaged in and is responsible for (a) the installation, testing or replacement of gas piping or (b) the connection, installation, testing, repair or servicing of appliances and equipment; that is experienced in such work; that is familiar with all precautions required; and that has complied with all the requirements of the authority having jurisdiction.”

If you are not qualified (as defined by ANSI above) and licensed or certified as required by the authority having jurisdiction to perform a given task do not attempt to perform any of the procedures described in this manual. If you do not understand the instructions given in this manual do not attempt to perform any procedures outlined in this manual.

**ICOMM™ & BACNET COMPATIBLE**

This water heater is compatible with the iCOMM™ remote monitoring system. The iCOMM™ system hardware and monitoring service is purchased separately. It allows users to monitor critical operational, diagnostic and energy usage data from a secure web site.

The iCOMM™ system can automatically notify selected personnel via email and/or cellular phone text messages if operational problems or user defined Alert Conditions occur.

iCOMM™ system hardware is compatible with BACnet compliant supervisory controls and building management systems. For more information call 888-928-3702.

**PREPARING FOR THE INSTALLATION**

1. Read the entire manual before attempting to install or operate the water heater. Pay close attention to the General Safety Information on pages 4 and 5. If you don’t follow the safety rules, the water heater may not operate safely. It could cause property damage, injury and/or death.

This manual contains instructions for the installation, operation, and maintenance of the water heater. It also contains warnings throughout the manual that you must read and be aware of. All warnings and all instructions are essential to the proper operation of the water heater and your safety.

Detailed installation diagrams are also found in this manual. These diagrams will serve to provide the installer with a reference. It is essential that all venting, water piping, gas piping and wiring be installed as shown.

Particular attention should be given to the installation of thermometers at the locations indicated in the piping diagrams as these are necessary for checking the operation of the water heater.

The principal components of the water heater are identified in Features And Components on page 7 in this manual. Use this reference to locate and identify various components on the water heater.

See the Installation Checklist and Troubleshooting page 56. By using this checklist the user may be able to make minor operational adjustments and avoid unnecessary service calls. However, service and diagnostic procedures should only be performed by a Qualified Service Agency.

**NOTE:** Costs to correct installation errors are not covered under the limited warranty.

2. Be sure to turn off power when working on or near the electrical system of the water heater. Never touch electrical components with wet hands or when standing in water.

3. The installation must conform to all instructions contained in this manual and the local code authority having jurisdiction. These shall be carefully followed in all cases. Authorities having jurisdiction should be consulted before installation begins if there are any questions regarding compliance with local, state or national codes.

In the absence of local codes, the installation must comply with the current editions of the National Fuel Gas Code, ANSI Z223.1/NFPA 54 and the National Electrical Code, NFPA 70 or CAN/CSA-B149.1, the Natural Gas and Propane Installation Code and CSA C22.1, the Canadian Electrical Code. All documents are available from the Canadian Standards Association, 8501 East Pleasant Valley Road, Cleveland, OH 44131. NFPA documents are also available from the National Fire Protection Association, 1 Batterymarch Park, Quincy, MA 02269.

4. If after reading this manual you have any questions or do not understand any portion of the instructions, call the toll free number on the back cover of this manual for technical assistance. In order to expedite your request, please have the full Model, Serial and Series number of the water heater you are working with available for the technician. This information is located on the water heater’s rating label.

5. Carefully plan the placement of the water heater. Examine the location to ensure that it complies with the requirements in Rough In Dimensions on page 10 and Locating the Water Heater on page 11.

6. For installation in California this water heater must be braced or anchored to avoid falling or moving during an earthquake. See instructions for correct installation procedures. Instructions may be obtained from California Office of the State Architect, 1102 Q Street, Suite 5100, Sacramento, CA 95811.

7. Massachusetts Code requires this water heater to be installed in accordance with Massachusetts 248-CMR 2.00: State Plumbing Code and 248-CMR 5. See Commonwealth of Massachusetts on page 20.
FEATURES AND COMPONENTS

BASIC OPERATION

The water heaters covered in this manual have a helical coil shaped heat exchanger that is submerged in the storage tank. The water heater’s Main Burner is a radial design burner, it is mounted on the top and fires downward through the heat exchanger. This is a forced draft burner; hot burning gases are forced through the heat exchanger under pressure and exit through the exhaust/vent connection located at the bottom of the water heater. See Figure 1 and Figure 2.

MODULATION

The water heaters covered by this manual are capable of modulating their firing rate. The CCB monitors the water temperature in the tank and regulates the firing rate to achieve the target temperature setpoint. The firing rate is dictated by the hot water draw, proximity to the tank temperature setpoint, and various other temperature limitations. Periodically, when the heater is in modulation mode, the CCB will increase the blower speed for a short period of time to clear out any condensation that has accumulated in the heat exchanger then decreases the blower speed back to the modulating firing rate required to maintain the desired tank temperature setpoint. This ramping up and down of the blower speed is considered normal operation of the water heater.

BLOWER/BURNER ASSEMBLY DETAIL

Figure 2

Spark Electrode
The control system energizes the spark ignition control with 120 VAC during the ignition period. The spark ignition control then sends a high-voltage electrical current to the spark igniter which in turn ignites the main burner air/gas mixture.

Flame Sensor
The control system also monitors the flame sensor to confirm a flame is present at the Main Burner. If a flame is not verified during the ignition trial period (3-5 seconds) the control system will immediately de-energize the 24 VAC Gas Valve. See the Sequence of Operation Flow Chart on page 57.
COMPONENTS (All Models)

IMPORTANT. The Enable/Disable switch listed in this manual is NOT an "on/off" switch and does not disconnect 120 volt power to the CCB and other heater components.

1. Water Heater's Enable/Disable Switch. When in the "Disabled" position the switch removes electrical power from the gas valve so that water heating is disabled. The display, CCB, and other electrical components will still be energized and the display will read "Water Heating Disabled".

2. Powered anode rods. The water heater’s covered in this manual are equipped with two powered (non sacrificial) anode rods. Protective current is fed by the control system to the titanium electrodes at the end of each anode rod. This current flows through the water to the conductive surfaces inside the storage tank which diminishes the corrosive effect of water when it comes in contact with steel.

3. Central Control Board (CCB) enclosure. This enclosure houses the control system’s main circuit board, power supply board, power transformer, and configuration key. The CCB regulates water temperature and controls all water heater functions, see Control System Operation on page 44.

4. 120 VAC junction box. Incoming power supply, ground connections, and other field installed electrical connections are made here. See Power Supply on page 13 and Power Supply Connections on page 40.

5. Intake air connection - 4 inch PVC.

6. Blocked Intake Air switch. Normally closed contacts that open on fall in pressure. This switch is used to insure intake (combustion) air to the water heater is not restricted. The control system monitors this switch and will disable heating operation if its contacts are open during a heating cycle.

7. Water heater's 24 VAC Gas Valve.

8. Supply gas line connection. See the requirements for the Supply Gas Line on page 10.

9. Low Gas Pressure switch. Normally open contacts that close on a rise in pressure. This switch is used to insure supply gas pressure is above minimum requirements. The control system monitors this switch and will disable heating operation if its contacts are open during a heating cycle. See Table 4 and the Gas Pressure Requirements on page 10.

10. Blower Prover switch. Normally open contacts that close on a rise in pressure. This switch is used to insure the Combustion Blower is operating properly. The control system monitors this switch and will disable heating operation if its contacts are closed before the Combustion Blower is energized or open any time during a heating cycle. See Sequence Of Operation on page 56.

11. Vent connection (exhaust/condensate elbow) - 4 inch aluminum.


13. Blocked Exhaust (vent) switch. Normally closed contacts that open on a rise in pressure. This switch is used to insure the Exhaust (vent) piping connected to the water heater is not restricted. The control system monitors this switch and will disable heating operation if its contacts are open during a heating cycle.

14. VFD (variable frequency drive) blower motor drive.

15. Temperature-Pressure Relief Valve. See Temperature-Pressure Relief Valve on page 15.

16. Upper Temperature Probe, 1 of 2 temperature probes. The water heater’s control system monitors this probe to detect water temperature in the upper portion of the storage tank. The Upper Temperature Probe also houses the ECO (energy cut out) switch. This is a non adjustable high temperature limit switch. The ECO switch contacts are normally closed and will open on a temperature rise. See High Temperature Limit Control (ECO) on page 43.

17. Water outlet connection 1 1/2" NPT.

18. UIM (user interface module). The UIM includes the display circuit board, the control system’s LCD display and operational buttons. Used to adjust various user settings and view operational information. See Control System Operation on page 44.

19. Spark Ignition Control. When energized, sends the electrical current to the spark igniter.
SIDE VIEWS

1. Cleanout access panel, covers water heater cleanout opening and ASME plate where applicable.
2. CCB enclosure - see Figure 3 on page 8 for description.
3. 120 VAC junction box. Incoming power supply, ground connections, and other field installed electrical connections are made here. See Power Supply on page 13 and Power Supply Connections on page 40.
4. Intake air connection - 4 inch PVC.
6. Low Gas Pressure switch, see description under Figure 3 on page 8. See Table 4 and the Gas Pressure Requirements on page 10.
8. Water outlet - 1 1/2” NPT connection.
9. VFD (variable frequency drive) blower motor drive - - see Figure 3 on page 8 for description.
10. UIM (user interface module). The UIM includes the display circuit board, the control system’s LCD display and operational buttons. Used to adjust various user settings and view operational information. See Control System Operation on page 44.
11. Temperature-Pressure Relief Valve. See Temperature-Pressure Relief Valve on page 15.
12. Temperature-Pressure Relief Valve discharge pipe - see T&P Valve Discharge Pipe Requirements on page 15.
13. Lower Temperature Probe, 1 of 2 temperature probes. The water heater’s control system monitors this probe to detect water temperature in the lower portion of the storage tank.
14. Water inlet connection - 1 1/2” NPT connection.
15. Water heater drain valve.
17. Vent connection (exhaust/condensate elbow) - 4 inch aluminum.
18. Recirculation loop return connection - 3/4” NPT.
19. Spark Ignition Control, When energized, sends the electrical current to the spark igniter.
These designs comply with the current edition of the American National Standard for Gas Fired Water Heaters, Volume III, ANSI Z21.10.3-CSA 4.3. BTH 300 and 400 are Automatic Circulating Tank or Automatic Storage Water Heaters. BTH 500 is Automatic Circulating Tank or Automatic Instantaneous Water Heater.

**GAS LINE CONNECTION SIZE**

<table>
<thead>
<tr>
<th>MODEL</th>
<th>SERIES</th>
<th>NATURAL GAS</th>
<th>PROPANE GAS</th>
</tr>
</thead>
<tbody>
<tr>
<td>BTH 300</td>
<td>200/201</td>
<td>1 1/2&quot; NPT</td>
<td>1 1/2&quot; NPT</td>
</tr>
<tr>
<td>BTH 400</td>
<td>200/201</td>
<td>1 1/2&quot; NPT</td>
<td>1 1/2&quot; NPT</td>
</tr>
<tr>
<td>BTH 500</td>
<td>200/201</td>
<td>1 1/2&quot; NPT</td>
<td>1 1/2&quot; NPT</td>
</tr>
</tbody>
</table>

This table shows connections sizes only. Depending on the installed equivalent length, and/or the number of appliances connected, the supply gas line size may have to be increased beyond the minimum required sizes - see Gas Line Sizing on page 39.

**STORAGE CAPACITIES**

<table>
<thead>
<tr>
<th>Model</th>
<th>U.S. Gallons</th>
<th>Liters</th>
</tr>
</thead>
<tbody>
<tr>
<td>ASME Standard</td>
<td>119</td>
<td>450.96</td>
</tr>
</tbody>
</table>

**RECOVERY CAPACITIES**

<table>
<thead>
<tr>
<th>Model</th>
<th>Type of Gas</th>
<th>Input (Btu/hr)</th>
<th>Thermal Efficiency %</th>
</tr>
</thead>
<tbody>
<tr>
<td>BTH 300</td>
<td>Natural</td>
<td>300,000</td>
<td>96</td>
</tr>
<tr>
<td>BTH 400</td>
<td>Propane</td>
<td>399,900</td>
<td>117</td>
</tr>
<tr>
<td>BTH 500</td>
<td>Natural</td>
<td>499,900</td>
<td>146</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Model</th>
<th>Type of Gas</th>
<th>Input (kW)</th>
<th>Thermal Efficiency %</th>
<th>°F</th>
<th>30°F</th>
<th>40°F</th>
<th>50°F</th>
<th>60°F</th>
<th>70°F</th>
<th>80°F</th>
<th>90°F</th>
<th>100°F</th>
<th>110°F</th>
<th>120°F</th>
</tr>
</thead>
<tbody>
<tr>
<td>BTH 300</td>
<td>Natural</td>
<td>88</td>
<td>96</td>
<td>°C</td>
<td>17°C</td>
<td>22°C</td>
<td>28°C</td>
<td>33°C</td>
<td>39°C</td>
<td>44°C</td>
<td>50°C</td>
<td>56°C</td>
<td>61°C</td>
<td>67°C</td>
</tr>
<tr>
<td>BTH 400</td>
<td>Natural</td>
<td>117</td>
<td>95</td>
<td>°C</td>
<td>17°C</td>
<td>22°C</td>
<td>28°C</td>
<td>33°C</td>
<td>39°C</td>
<td>44°C</td>
<td>50°C</td>
<td>56°C</td>
<td>61°C</td>
<td>67°C</td>
</tr>
<tr>
<td>BTH 500</td>
<td>Natural</td>
<td>146</td>
<td>95</td>
<td>°C</td>
<td>17°C</td>
<td>22°C</td>
<td>28°C</td>
<td>33°C</td>
<td>39°C</td>
<td>44°C</td>
<td>50°C</td>
<td>56°C</td>
<td>61°C</td>
<td>67°C</td>
</tr>
</tbody>
</table>

**GAS PRESSURE REQUIREMENTS**

<table>
<thead>
<tr>
<th>Model</th>
<th>MANIFOLD PRESSURE</th>
<th>MINIMUM SUPPLY PRESSURE</th>
<th>MAXIMUM SUPPLY PRESSURE</th>
</tr>
</thead>
<tbody>
<tr>
<td>BTH 300</td>
<td>Natural Gas</td>
<td>0&quot; W. C. (0 kPa)</td>
<td>0&quot; W. C. (0 kPa)</td>
</tr>
<tr>
<td></td>
<td>Propane Gas</td>
<td>4.8&quot; W. C. (1.19 kPa)</td>
<td>4.8&quot; W. C. (1.19 kPa)</td>
</tr>
<tr>
<td>BTH 400</td>
<td>Natural Gas</td>
<td>0&quot; W. C. (0 kPa)</td>
<td>0&quot; W. C. (0 kPa)</td>
</tr>
<tr>
<td></td>
<td>Propane Gas</td>
<td>4.8&quot; W. C. (1.19 kPa)</td>
<td>4.8&quot; W. C. (1.19 kPa)</td>
</tr>
<tr>
<td>BTH 500</td>
<td>Natural Gas</td>
<td>0&quot; W. C. (0 kPa)</td>
<td>0&quot; W. C. (0 kPa)</td>
</tr>
<tr>
<td></td>
<td>Propane Gas</td>
<td>4.8&quot; W. C. (1.19 kPa)</td>
<td>4.8&quot; W. C. (1.19 kPa)</td>
</tr>
</tbody>
</table>

* The manifold pressure is the factory setting and is not adjustable. A negative pressure will be seen with just the blower running without the Gas Control Valve open.

**MINIMUM SUPPLY GAS LINE SIZE**

<table>
<thead>
<tr>
<th>Model</th>
<th>NATURAL GAS</th>
<th>PROPANE GAS</th>
</tr>
</thead>
<tbody>
<tr>
<td>BTH 300</td>
<td>1 1/4&quot; NPT</td>
<td>1 1/4&quot; NPT</td>
</tr>
<tr>
<td>BTH 400</td>
<td>1 1/4&quot; NPT</td>
<td>1 1/4&quot; NPT</td>
</tr>
<tr>
<td>BTH 500</td>
<td>1 1/2&quot; NPT</td>
<td>1 1/4&quot; NPT</td>
</tr>
</tbody>
</table>

† Note that BTH 500 natural gas models require a 1 1/2" minimum supply gas line size. Depending on the installed equivalent length, and/or the number of appliances connected, the supply gas line size may have to be increased beyond the minimum required sizes shown in this table - see Gas Line Sizing on page 39.
LOCATING THE WATER HEATER

Carefully choose a location for the new water heater. The placement is a very important consideration for the safety of the occupants in the building and for the most economical use of the water heater.

CAUTION

Property Damage Hazard

- All water heaters eventually leak.
- Do not install without adequate drainage.

Whether replacing an existing water heater or installing the water heater in a new location observe the following critical points:

1. The water heater must be located indoors.
2. The water heater must not be located in an area where it will be subject to freezing temperatures.
3. Locate the water heater so it is protected and not subject to physical damage by a moving vehicle.
4. Locate the water heater on a level surface.
5. Locate the water heater near a floor drain. The water heater is a very important consideration for the safety of the occupants in the building and for the most economical use of the water heater.

6. Locate the water heater close to the point of major hot water usage.
7. Locate the water heater close to a 120 VAC power supply. See Power Supply on page 13 for requirements.
8. Locate the water heater where an adequate supply of fresh air for combustion and ventilation can be obtained. See Air Requirements on page 17.
9. Locate the water heater where the vent and intake air piping, when installed, will remain within the maximum equivalent lengths allowed. See Venting Requirements on page 22.
10. Do not locate the water heater where noise (such as the Combustion Blower) during normal operation will be objectionable in adjacent areas.
11. Do not locate the water heater where the subsequent installation of the vent (exhaust) or intake air terminations would be objectionable due to noise at the termination(s). This includes locations close to or across from windows and doors. See Venting Installation on page 21.

WARNING

Fire or Explosion Hazard

- Do not store or use gasoline or other flammable vapors and liquids in the vicinity of this or any other appliance.
- Avoid all ignition sources if you smell gas.
- Do not expose water heater controls to excessive gas pressure.
- Use only the gas shown on the water heater rating label.
- Maintain required clearances to combustibles.
- Keep ignition sources away from faucets after extended periods of non-use.

Read instruction manual before installing, using or servicing water heater.

There is a risk in using fuel burning appliances such as gas water heaters in rooms, garages or other areas where gasoline, other flammable liquids or engine driven equipment or vehicles are stored, operated or repaired. Flammable vapors are heavy and travel along the floor and may be ignited by the water heater's igniter or Main Burner flames causing fire or explosion.

Flammable items, pressurized containers or any other potential fire hazardous articles must never be placed on or adjacent to the water heater.

CLEARANCE TO COMBUSTIBLE MATERIALS

The water heaters covered in this manual are approved for installation on combustible flooring. The clearance to combustible and non combustible construction materials is 0 inches on the back and sides of the water heater. These water heaters are also approved for installation in an alcove.

When the water heater is installed directly on carpeting, the water heater shall be installed on a metal or wood panel extending beyond the full width and depth of the water heater by at least 3 in (76.2 mm) in any direction or, if the water heater is installed in an alcove or closet, the entire floor shall be covered by the panel. The panel must be strong enough to carry the weight of the heater when full of water.

NOTE: Adequate clearance for servicing should be maintained on all installations. See Service Clearance below.

Figure 7

SERVICE CLEARANCE

A service clearance of 24 inches (61 cm) should be maintained from serviceable parts such as the T&P valve, control system components, gas valve, clean out opening, drain valve, the vent connection (exhaust/condensate elbow) and the condensate drain. Leave as much room as possible above the water heater and near the exhaust elbow for this reason.

INTAKE AIR AND VENT PIPE CLEARANCES

The minimum clearance from combustible materials for the vent (exhaust) and intake air piping shall be 6 inches. Vent or intake air piping passing through a combustible wall or ceiling must be a continuous run (no joints).

EXTENDED VENT TERMINATIONS

The water heaters covered by this manual can be installed using 4 inch pipe for the intake air and/or vent piping up to a maximum of 70 equivalent feet (21.3 m). The intake air and/or vent piping can be extended up to 120 equivalent feet (36.5 m) by installing 6 inch pipe. See the Venting Requirements on page 22.

The water heater ships from the factory with two (2) 4 inch terminations that are 45° PVC elbows with a debris screen installed. When 6 inch intake air or vent pipe is installed, factory supplied 6 inch terminations must be used.

Contact your local distributor or call the parts department phone number listed on the back cover of this manual to order 6 inch termination(s).
OPTIONAL DIRECT VENT TERMINATIONS

The water heaters covered by this manual can be installed in a Direct Vent configuration using optional concentric or low profile terminations.

See the Venting Requirements on page 22, Concentric Termination Installation on page 29 and Low Profile Installation on page 33.

Concentric and low profile terminations must be ordered separately. Contact your local distributor or call the parts department phone number listed on the back cover of this manual to order.

HARD WATER

Where hard water conditions exist, water softening or the threshold type of water treatment is recommended. This will protect the dishwashers, coffee urns, water heaters, water piping and other equipment.

See Maintenance on page 63 for sediment and lime scale removal procedures.

CIRCULATION PUMPS

A circulating pump is used when a system requires a circulating loop or there is a storage tank used in conjunction with the water heater. The tank is provided with a 3/4" NPT recirculation loop return connection. Refer to Figure 6 for its location. See the Water Piping Diagrams beginning on page 68 for installation location of circulating pumps.

See Circulation Pump Wiring Diagrams on page 67 for electrical hookup information. Install in accordance with the current edition of the National Electrical Code, NFPA 70 or the Canadian Electrical Code, CSA C22.1.

Stainless Steel circulators are recommended for use with commercial water heaters.

Refer to the circulating pump manufacturer’s instructions for its operation, lubrication and maintenance instructions.

INSULATION BLANKETS

Do not obstruct water heater air intake with insulating blanket.

Gas and carbon monoxide detectors are available.

Install water heater in accordance with the instruction manual.

Breathing carbon monoxide can cause brain damage or death. Always read and understand instruction manual.

Insulation blankets are available to the general public for external use on gas water heaters but are not necessary with these products. The purpose of an insulation blanket is to reduce the standby heat loss encountered with storage tank heaters. The water heaters covered by this manual meet or exceed the Energy Policy Act standards with respect to insulation and standby heat loss requirements, making an insulation blanket unnecessary.

Should you choose to apply an insulation blanket to this heater, you should follow these instructions. See the Features and Components section of this manual for identification of components mentioned below. Failure to follow these instructions can restrict the air flow required for proper combustion, potentially resulting in fire, asphyxiation, serious personal injury or death.

• DO NOT apply insulation to the top of the water heater, as this will interfere with safe operation of the blower assembly.
• DO NOT cover the control system LCD on top of the water heater.
• DO NOT cover the Temperature-Pressure Relief Valve.
• DO NOT cover the instruction manual. Keep it on the side of the water heater or nearby for future reference.
• DO obtain new warning and instruction labels from the manufacturer for placement on the blanket directly over the existing labels.
• DO inspect the insulation blanket frequently to make certain it does not sag, thereby obstructing combustion air flow.
GAS SUPPLY SYSTEMS

Low pressure building gas supply systems are defined as those systems that cannot under any circumstances exceed 14" W.C. (1/2 PSI Gauge). These systems do not require pressure regulation. Measurements should be taken to insure that gas pressures are stable and fall within the requirements stated on the water heater rating plate. Readings should be taken with all gas burning equipment off (static pressure) and with all gas burning equipment running at maximum rate (dynamic pressure). The gas supply pressure must be stable within 1.5" W.C. from static to dynamic pressure to provide good performance. Pressure drops that exceed 1.5" W.C. may cause rough starting, noisy combustion or nuisance outages. Increases or spikes in static pressure during off cycles may cause failure to ignite or in severe cases damage to appliance gas valves. If your low pressure system does NOT meet these requirements, the installer is responsible for the corrections.

High Pressure building supply systems use pressures that exceed 14" W.C. (1/2 PSI Gauge). These systems must use field supplied regulators to lower the gas pressure to less than 14" W.C. (1/2 PSI Gauge). Water heaters require gas regulators that are properly sized for the water heater input and deliver the rating plate specified pressures. Gas supply systems where pressure exceeds 5 PSI often require multiple regulators to achieve desired pressures. Systems in excess of 5 PSI building pressure should be designed by gas delivery professionals for best performance. Water heaters connected to gas supply systems that exceed 14" W.C. (1/2 PSI Gauge) at any time must be equipped with a gas supply regulator.

All models require a minimum gas supply pressure of 4.8" W.C. for natural gas and 8.5" W.C. for propane gas. The minimum supply pressure is measured while gas is flowing (dynamic pressure). The supply pressure should never fall below 4.8" W.C. for natural gas and 8.5" W.C. for propane gas. The supply pressure should be measured with all gas fired appliances connected to the common main firing at full capacity. If the supply pressure drops more than 1.5" W.C. as gas begins to flow to the water heater then the supply gas system including the gas line and/or the gas regulator may be restricted or undersized. See Supply Gas Regulator section and Gas Piping section of this manual. The gas valve on all models has a maximum gas supply pressure limit of 14" W.C. The maximum supply pressure is measured while gas is not flowing (static pressure).

SUPPLY GAS REGULATOR

The maximum allowable gas supply pressure for this water heater is 14.0" W.C. (3.49 kPa) for natural and propane gas. Install a positive lock-up gas pressure regulator in the gas supply line if inlet gas pressure can exceed these pressures at any time.

If a positive lock-up regulator is required follow these instructions:

1. Positive lock-up gas pressure regulators must be rated at or above the input Btu/hr rating of the water heater they supply.
2. Supply gas regulators shall have inlet and outlet connections not less than the minimum supply gas line size for the water heater they supply. See Table 13, page 39.
3. Positive lock-up gas pressure regulator(s) should be installed no closer than 3 feet (1 meter) and no farther than 8 feet (2.4 meters) from the water heater's inlet gas connection.
4. After installing the positive lock-up gas pressure regulator(s) an initial nominal supply pressure setting of 7.0" W.C. while the water heater is operating is recommended and will generally provide good water heater operation. Some addition adjustment maybe required later to maintain a steady gas supply pressure.
5. When installing multiple water heaters in the same gas supply system it is recommended that individual positive lock-up gas pressure regulators be installed at each unit.

POWER SUPPLY

The water heaters covered in this manual require a 120 VAC, 1Ø (single phase), 60Hz, 15 amp power supply and must also be electrically grounded in accordance with local codes or, in the absence of local codes, with the National Electrical Code, ANSI/NFPA 70 or the Canadian Electrical Code, CSA C22.1.

DEDICATED POWER WIRING AND BREAKERS

Dedicated power supply wires, ground wiring and dedicated circuit breakers often prevent electrical line noise and are required when installing the water heater.

POWER FLUCTUATIONS AND ELECTRICAL NOISE

The water heater's control system requires a source of stable clean electricity for proper operation. Connecting the water heater to a branch circuit that is subject to fluctuations in voltage level or electrical line noise such as EMI (electro magnetic interference) or RFI (radio frequency interference) may cause erratic control system operation and malfunction.

A high quality power supply filter/suppressor must be installed if the above conditions exist. Call the technical support phone number listed on the back cover of this manual for more information.

NOTE: Malfunctions caused by the power supply and the costs to install power supply filters are not covered under the limited warranty.
MIXING VALVES

**DANGER**

Water temperature over 125°F (52°C) can cause severe burns instantly resulting in severe injury or death.

Children, the elderly and the physically or mentally disabled are at highest risk for scald injury.

Feel water before bathing or showering.

Temperature limiting devices such as mixing valves must be installed when required by codes and to ensure safe temperatures at fixtures.

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Water heated to a temperature which will satisfy clothes washing, dish washing, and other sanitizing needs can scald and cause permanent injury upon contact. Short repeated heating cycles caused by small hot water uses can cause temperatures at the point of use to exceed the water heater’s temperature setting by up to 20°F (11°C).

Some people are more likely to be permanently injured by hot water than others. These include the elderly, children, the infirm and the physically/mentally disabled. Table 6 shows the approximate time-to-burn relationship for normal adult skin. If anyone using hot water provided by the water heater being installed fits into one of these groups or if there is a local code or state law requiring a certain water temperature at the point of use, then special precautions must be taken.

In addition to using the lowest possible temperature setting that satisfies the demand of the application a Mixing Valve should be installed at the water heater (see Figure 8) or at the hot water taps to further reduce system water temperature.

Mixing valves are available at plumbing supply stores. Consult a Qualified Installer or Service Agency. Follow mixing valve manufacturer’s instructions for installation of the valves.

**TABLE 6**

<table>
<thead>
<tr>
<th>Water Temperature °F (°C)</th>
<th>Time for 1st Degree Burn (Less Severe Burns)</th>
<th>Time for Permanent Burns 2nd &amp; 3rd Degree (Most Severe Burns)</th>
</tr>
</thead>
<tbody>
<tr>
<td>110 (43)</td>
<td>(normal shower temp.)</td>
<td></td>
</tr>
<tr>
<td>116 (47)</td>
<td>(pain threshold)</td>
<td></td>
</tr>
<tr>
<td>116 (47)</td>
<td>35 minutes</td>
<td>45 minutes</td>
</tr>
<tr>
<td>122 (50)</td>
<td>1 minute</td>
<td>5 minutes</td>
</tr>
<tr>
<td>131 (55)</td>
<td>5 seconds</td>
<td>25 seconds</td>
</tr>
<tr>
<td>140 (60)</td>
<td>2 seconds</td>
<td>5 seconds</td>
</tr>
<tr>
<td>149 (65)</td>
<td>1 second</td>
<td>2 seconds</td>
</tr>
<tr>
<td>154 (68)</td>
<td>instantaneous</td>
<td>1 second</td>
</tr>
</tbody>
</table>


**DISHWASHING MACHINES**

All dishwashing machines meeting the National Sanitation Foundation requirements are designed to operate with water flow pressures between 15 and 25 pounds per square inch (103 kPa and 173 kPa). Flow pressures above 25 pounds per square inch (173 kPa), or below 15 pounds per square inch (103 kPa), will result in improperly sanitized dishes. Where pressures are high, a water pressure reducing or flow regulating control valve should be used in the 180°F (82°C) line to the dishwashing machine and should be adjusted to deliver water pressure between these limits.

The National Sanitation Foundation also recommends circulation of 180°F (82°C) water. The circulation should be just enough to provide 180°F (82°C) water at the point of take-off to the dishwashing machine.

Adjust flow by throttling a full port ball valve installed in the circulating line on the outlet side of the pump. Never throttle flow on the suction side of a pump. See the Water Piping Diagrams beginning on page 67.

**NOTE:** To comply with NSF Standard 5 installation requirements the bottom of the water heater must be sealed to the floor with a silicone based sealant or elevated 6 inches above the floor.

**CLOSED WATER SYSTEMS**

Water supply systems may, because of code requirements or such conditions as high line pressure, among others, have installed devices such as pressure reducing valves, check valves, and back flow preventers. Devices such as these cause the water system to be a closed system.

**THERMAL EXPANSION**

As water is heated, it expands (thermal expansion). In a closed system the volume of water will grow when it is heated. As the volume of water grows there will be a corresponding increase in water pressure due to thermal expansion. Thermal expansion can cause premature tank failure (leakage). This type of failure is not covered under the limited warranty. Thermal expansion can also cause intermittent Temperature-Pressure Relief Valve operation: water discharged from the valve due to excessive pressure build up. This condition is not covered under the limited warranty. The Temperature-Pressure Relief Valve is not intended for the constant relief of thermal expansion.

A properly sized thermal expansion tank must be installed on all closed systems to control the harmful effects of thermal expansion. Contact a local plumbing service agency to have a thermal expansion tank installed.

See Water Line Connections on page 41 and the Water Piping Diagrams beginning on page 68.
This water heater is provided with a properly rated/sized and certified combination Temperature-Pressure Relief Valve (T&P valve) by the manufacturer. The valve is certified by a nationally recognized testing laboratory that maintains periodic inspection of production of listed equipment of materials as meeting the requirements for Relief Valves for Hot Water Supply Systems, ANSI Z21.22 • CSA 4.4, and the code requirements of ASME.

If replaced, the new T&P valve must meet the requirements of local codes, but not less than a combination Temperature-Pressure Relief Valve rated/sized and certified as indicated in the above paragraph. The new valve must be marked with a maximum set pressure not to exceed the marked hydrostatic working pressure of the water heater (150 psi = 1,035 kPa) and a discharge capacity not less than the water heater Btu/hr or kW input rate as shown on the water heater’s model rating label.

NOTE: In addition to the factory installed Temperature-Pressure Relief Valve on the water heater, each remote storage tank that may be installed and piped to a water heating appliance must also have its own properly sized, rated and approved Temperature-Pressure Relief Valve installed. Call the toll free technical support phone number listed on the back cover of this manual for technical assistance in sizing a Temperature-Pressure Relief Valve for remote storage tanks.

For safe operation of the water heater, the Temperature-Pressure Relief Valve must not be removed from its designated opening nor plugged. The Temperature-Pressure Relief Valve must be installed directly into the fitting of the water heater designed for the relief valve. Install discharge piping so that any discharge will exit the pipe within 6 inches (15.2 cm) above an adequate floor drain, or external to the building. In cold climates it is recommended that it be terminated at an adequate drain inside the building. Be certain that no contact is made with any live electrical part. The discharge opening must not be blocked or reduced in size under any circumstances. Excessive length, over 30 feet (9.14 m), or use of more than four elbows can cause restriction and reduce the discharge capacity of the valve.

No valve or other obstruction is to be placed between the Temperature-Pressure Relief Valve and the tank. Do not connect discharge piping directly to the drain unless a 6" (15.2 cm) air gap is provided. To prevent bodily injury, hazard to life, or property damage, the relief valve must be allowed to discharge water in adequate quantities should circumstances demand. If the discharge pipe is not connected to a drain or other suitable means, the water flow may cause property damage.

The Temperature-Pressure Relief Valve must be manually operated at least twice a year. Caution should be taken to ensure that (1) no one is in front of or around the outlet of the Temperature-Pressure Relief Valve discharge line, and (2) the water manually discharged will not cause any bodily injury or property damage because the water may be extremely hot. If after manually operating the valve, it fails to completely reset and continues to release water, immediately close the cold water inlet to the water heater, follow the draining instructions in this manual, and replace the Temperature-Pressure Relief Valve with a properly rated/sized new one.

NOTE: The purpose of a Temperature-Pressure Relief Valve is to prevent excessive temperatures and pressures in the storage tank. The T&P valve is not intended for the constant relief of thermal expansion. A properly sized thermal expansion tank must be installed on all closed systems to control thermal expansion, see Closed Water Systems and Thermal Expansion on page 14.

If you do not understand these instructions or have any questions regarding the Temperature-Pressure Relief Valve call the toll free number listed on the back cover of this manual for technical assistance.
CONDENSATE DRAIN

The water heaters covered in this manual are condensing appliances and require a building drain to be located in close proximity to allow the condensate to drain safely.

Condensate drains from the water heater at the exhaust/condensate elbow located at the bottom. The field installed condensate drain line must not be elevated above the condensate drain connection on the exhaust/condensate elbow, see Figure 9. If the condensate does not drain properly it will build up in the exhaust (vent) elbow. This will restrict the flow of flue gases and cause the Blocked Exhaust pressure switch to open its contacts. The control system monitors all pressure switches, if the Blocked Exhaust Switch contacts are open the control system will lock out and disable heating operation. The “Blocked Exhaust” Fault message will be displayed on the control system’s LCD, see Fault And Alert Conditions beginning on page 59.

The Condensate Cleanout Cap must be on and tight when unit is in operation.

The exhaust elbow has a built in condensate trap. Do not install an additional trap in the condensate drain piping. See Figure 9.

NOTE: If the “Blocked Exhaust “ Fault message is ever displayed on the control system LCD, check the condensate drain first and ensure it is not blocked.

CONDENSATE DRAIN WATER TRAP

Do not remove the factory installed exhaust/condensate elbow for any reason, see Figure 9. The water heater’s vent pipe is under a slight positive pressure while unit is in operation. The water trap prevents flue gases from escaping into the installed space. The exhaust elbow has a "built in" condensate trap. Do not install an additional trap in the condensate drain piping. See Figure 9. See Condensate Drain Installation on page 38.

CONDENSATE PH LEVEL

The condensates drains from the water heater’s covered in this manual have PH levels between 4.3 and 5.0. Install a commercially available neutralizing kit if required by local codes.

NOTE: Lower PH levels are acidic. Do not connect a metal drain line, such as copper, to the water heater for this reason. See Condensate Drain Installation on page 38.

COMBUSTIBLE MATERIAL STORAGE

WARNING

Fire or Explosion Hazard

- Do not store or use gasoline or other flammable vapors and liquids in the vicinity of this or any other appliance.
- Avoid all ignition sources if you smell gas.
- Do not expose water heater controls to excessive gas pressure.
- Use only the gas shown on the water heater rating label.
- Maintain required clearances to combustibles.
- Keep ignition sources away from faucets after extended periods of non-use.

Read instruction manual before installing, using or servicing water heater.

Keep appliance area clear and free of combustible materials, gasoline and other flammable vapors and liquids.

CONTAMINATED AIR

WARNING

Breathing Hazard - Carbon Monoxide Gas

- Install water heater in accordance with the Instruction Manual and NFPA 54 or CAN/CSA-B149.1.
- To avoid injury, combustion and ventilation air must be taken from outdoors.
- Do not place chemical vapor emitting products near water heater.

Breathing carbon monoxide can cause brain damage or death. Always read and understand instruction manual.

Corrosion of the flue ways and vent system may occur if air for combustion contains certain chemical vapors. Such corrosion may result in failure and risk of asphyxiation.

Combustion air that is contaminated can greatly diminish the life span of the water heater and water heater components such as hot surface igniters and burners. Propellants of aerosol sprays, beauty shop supplies, water softener chemicals and chemicals used in dry cleaning processes that are present in the combustion, ventilation or ambient air can cause such damage.

Do not store products of this sort near the water heater. Air which is brought in contact with the water heater should not contain any of these chemicals. If necessary, uncontaminated air should be obtained from remote or outdoor sources. The limited warranty is voided when failure of water heater is due to a corrosive atmosphere. (See limited warranty for complete terms and conditions).

If the water heater will be used in beauty shops, barber shops, cleaning establishments, or self-service laundries with dry cleaning equipment, it is imperative that the water heater(s) be installed in a Direct Vent configuration so that all air for combustion is derived directly from the outdoor atmosphere through a sealed intake air pipe. See Venting Installation on page 21.
**AIR REQUIREMENTS**

**WARNING**

**Breathing Hazard - Carbon Monoxide Gas**

- Install water heater in accordance with the Instruction Manual and NFPA 54 or CAN/CSA-B149.1.
- To avoid injury, combustion and ventilation air must be taken from outdoors.
- Do not place chemical vapor emitting products near water heater.

Breathing carbon monoxide can cause brain damage or death. Always read and understand instruction manual.

For safe operation an adequate supply of fresh uncontaminated air for combustion and ventilation must be provided.

An insufficient supply of air can cause recirculation of combustion products resulting in contamination that may be hazardous to life. Such a condition often will result in a yellow, luminous burner flame, causing sooting of the combustion chamber, burners and flue tubes and creates a risk of asphyxiatiion.

Do not install the water heater in a confined space unless an adequate supply of air for combustion and ventilation is brought in to that space using the methods described in the Confined Space section that follows.

Never obstruct the flow of ventilation air. If you have any doubts or questions at all, call your gas supplier. Failure to provide the proper amount of combustion air can result in a fire or explosion and cause property damage, serious bodily injury or death.

**UNCONFINED SPACE**

An Unconfined Space is one whose volume IS NOT LESS THAN 50 cubic feet per 1,000 Btu/hr (4.8 cubic meters per kW) of the total input rating of all appliances installed in the space. Rooms communicating directly with the space, in which the appliances are installed, through openings not furnished with doors, are considered a part of the unconfined space.

Makeup air requirements for the operation of exhaust fans, kitchen ventilation systems, clothes dryers and fireplaces shall also be considered in determining the adequacy of a space to provide combustion, ventilation and dilution air.

**UNUSUALLY TIGHT CONSTRUCTION**

In unconfined spaces in buildings, infiltration may be adequate to provide air for combustion, ventilation and dilution of flue gases. However, in buildings of unusually tight construction (for example, weather stripping, heavily insulated, caulked, vapor barrier, etc.) additional air must be provided using the methods described in the Confined Space section that follows.

**CONFINED SPACE**

A Confined Space is one whose volume IS LESS THAN 50 cubic feet per 1,000 Btu/hr (4.8 cm per kW) of the total input rating of all appliances installed in the space.

Openings must be installed to provide fresh air for combustion, ventilation and dilution in confined spaces. The required size for the openings is dependent on the method used to provide fresh air to the confined space AND the total Btu/hr input rating of all appliances installed in the space.

**DIRECT VENT APPLIANCES**

Appliances installed in a Direct Vent configuration that derive all air for combustion from the outdoor atmosphere through sealed intake air piping are not factored in the total appliance input Btu/hr calculations used to determine the size of openings providing fresh air into confined spaces.

**EXHAUST FANS**

Where exhaust fans are installed, additional air shall be provided to replace the exhausted air. When an exhaust fan is installed in the same space with a water heater, sufficient openings to provide fresh air must be provided that accommodate the requirements for all appliances in the room and the exhaust fan. Undersized openings will cause air to be drawn into the room through the water heater’s vent system causing poor combustion. Sooting, serious damage to the water heater and the risk of fire or explosion may result. It can also create a risk of asphyxiation.

**LOUVERS AND GRILLES**

The free areas of the fresh air openings in the instructions that follow do not take in to account the presence of louvers, grilles or screens in the openings.

The required size of openings for combustion, ventilation and dilution air shall be based on the “net free area” of each opening. Where the free area through a design of louver or grille or screen is known, it shall be used in calculating the size of the opening required to provide the free area specified. Where the louver and grille design and free area are not known, it shall be assumed that wood louvers will have 25% free area and metal louvers and grilles will have 75% free area. Non motorized louvers and grilles shall be fixed in the open position.
FRESH AIR OPENINGS FOR CONFINED SPACES

The following instructions shall be used to calculate the size, number and placement of openings providing fresh air for combustion, ventilation and dilution in confined spaces. The illustrations shown in this section of the manual are a reference for the openings that provide fresh air into confined spaces only. **DO NOT** refer to these illustrations for the purpose of vent installation. See Venting Installation on page 21 for complete venting installation instructions.

OUTDOOR AIR THROUGH TWO OPENINGS

The confined space shall be provided with two permanent openings, one commencing within 12 inches (300 mm) of the top and one commencing within 12 inches (300 mm) of the bottom of the enclosure. The openings shall communicate directly with the outdoors. See Figure 10.

Each opening shall have a minimum free area of 1 square inch per 4,000 Btu/hr (550 mm² per kW) of the aggregate input rating of all appliances installed in the enclosure. Each opening shall not be less than 100 square inches (645 cm²).

OUTDOOR AIR THROUGH ONE OPENING

Alternatively a single permanent opening, commencing within 12 inches (300 mm) of the top of the enclosure, shall be provided. See Figure 11. The water heater shall have clearances of at least 1 inch (25 mm) from the sides and back and 6 inches (150 mm) from the front of the water heater. The opening shall directly communicate with the outdoors or shall communicate through a vertical or horizontal duct to the outdoors or spaces that freely communicate with the outdoors and shall have a minimum free area of the following:

1. 1 square inch per 3000 Btu/hr (700 mm² per kW) of the total input rating of all appliances located in the enclosure, and
2. Not less than the sum of the areas of all vent connectors in the space.

OUTDOOR AIR THROUGH TWO HORIZONTAL DUCTS

The confined space shall be provided with two permanent horizontal ducts, one commencing within 12 inches (300 mm) of the top and one commencing within 12 inches (300 mm) of the bottom of the enclosure. The horizontal ducts shall communicate directly with the outdoors. See Figure 12.

Each duct opening shall have a minimum free area of 1 square inch per 2,000 Btu/hr (1100 mm² per kW) of the aggregate input rating of all appliances installed in the enclosure.

When ducts are used, they shall be of the same cross sectional area as the free area of the openings to which they connect. The minimum dimension of rectangular air ducts shall be not less than 3 inches.
OUTDOOR AIR THROUGH TWO VERTICAL DUCTS

The illustrations shown in this section of the manual are a reference for the openings that provide fresh air into confined spaces only.

**DO NOT** refer to these illustrations for the purpose of vent installation. See Venting Installation on page 21 for complete venting installation instructions.

![Figure 13](image1)

The confined space shall be provided with two permanent vertical ducts, one commencing within 12 inches (300 mm) of the top and one commencing within 12 inches (300 mm) of the bottom of the enclosure. The vertical ducts shall communicate directly with the outdoors. See Figure 13.

Each duct opening shall have a minimum free area of 1 square inch per 4,000 Btu/hr (550 mm2 per kW) of the aggregate input rating of all appliances installed in the enclosure.

When ducts are used, they shall be of the same cross sectional area as the free area of the openings to which they connect. The minimum dimension of rectangular air ducts shall be not less than 3 inches.

AIR FROM OTHER INDOOR SPACES

The confined space shall be provided with two permanent openings, one commencing within 12 inches (300 mm) of the top and one commencing within 12 inches (300 mm) of the bottom of the enclosure. See Figure 14.

Each opening shall communicate directly with an additional room(s) of sufficient volume so that the combined volume of all spaces meets the criteria for an Unconfined Space.

Each opening shall have a minimum free area of 1 square inch per 1,000 Btu/hr (1100 mm2 per kW) of the aggregate input rating of all appliances installed in the enclosure. Each opening shall not be less than 100 square inches (645 cm2).
COMMONWEALTH OF MASSACHUSETTS

For all side wall terminated, horizontally vented power vent, direct vent, and power direct vent gas fueled water heaters installed in every dwelling, building or structure used in whole or in part for residential purposes, including those owned or operated by the Commonwealth and where the side wall exhaust vent termination is less than seven (7) feet above finished grade in the area of the venting, including but not limited to decks and porches, the following requirements shall be satisfied:

INSTALLATION OF CARBON MONOXIDE DETECTORS

At the time of installation of the side wall horizontal vented gas fueled equipment, the installing plumber or gasfitter shall observe that a hard wired carbon monoxide detector with an alarm and battery back-up is installed on the floor level where the gas equipment is to be installed. In addition, the installing plumber or gasfitter shall observe that a battery operated or hard wired carbon monoxide detector with an alarm is installed on each additional level of the dwelling, building or structure served by the sidewall horizontal vented gas fueled equipment. It shall be the responsibility of the property owner to secure the services of qualified licensed professionals for the installation of hard wired carbon monoxide detectors.

In the event that the side wall horizontally vented gas fueled equipment is installed in a crawl space or an attic, the hard wired carbon monoxide detector with alarm and battery back-up may be installed on the next adjacent floor level.

In the event that the requirements of this subdivision can not be met at the time of completion of installation, the owner shall have a period of thirty (30) days to comply with the above requirements provided that during said thirty (30) day period, a battery operated carbon monoxide detector with an alarm shall be installed.

APPROVED CARBON MONOXIDE DETECTORS

Each carbon monoxide detector as required in accordance with the above provisions shall comply with NFPA 720 and be ANSI/UL 2034 listed and CSA certified.

SIGNAGE

A metal or plastic identification plate shall be permanently mounted to the exterior of the building at a minimum height of eight (8) feet above grade directly in line with the exhaust vent terminal for the horizontally vented gas fueled heating appliance or equipment. The sign shall read, in print size no less than one-half (1/2) inch in size, “GAS VENT DIRECTLY BELOW. KEEP CLEAR OF ALL OBSTRUCTIONS.”

INSPECTION

The state or local gas inspector of the side wall horizontally vented gas fueled equipment shall not approve the installation unless, upon inspection, the inspector observes carbon monoxide detectors and signage installed in accordance with the provisions of 248 CMR 5.08(2)(a) 1 through 4.

EXEMPTIONS

The following equipment is exempt from 248 CMR 5.08(2)(a)1 through 4:

1. The equipment listed in Chapter 10 entitled “Equipment Not Required To Be Vented” in the most current edition of NFPA 54 as adopted by the Board; and
2. Product Approved side wall horizontally vented gas fueled equipment installed in a room or structure separate from the dwelling, building, or structure used in whole or in part for residential purposes.

MANUFACTURER REQUIREMENTS - GAS EQUIPMENT VENTING SYSTEM PROVIDED

When the manufacturer of Product Approved side wall horizontally vented gas equipment provides a venting system design or venting system components with the equipment, the instructions provided by the manufacturer for installation of the equipment and the venting system shall include:

1. Detailed instructions for the installation of the venting system design or the venting system components; and
2. A complete parts list for the venting system design or venting system.

MANUFACTURER REQUIREMENTS - GAS EQUIPMENT VENTING SYSTEM NOT PROVIDED

When the manufacturer of a Product Approved side wall horizontally vented gas fueled equipment does not provide the parts for venting the flue gases, but identifies “special venting systems,” the following requirements shall be satisfied by the manufacturer:

1. The referenced “special venting system” instructions shall be included with the appliance or equipment installation instructions; and
2. The “special venting systems” shall be Product Approved by the Board, and the instructions for that system shall include a parts list and detailed installation instructions.

A copy of all installation instructions for all Product Approved side wall horizontally vented gas fueled equipment, all venting instructions, all parts lists for venting instructions, and/or all venting design instructions shall remain with the appliance or equipment at the completion of the installation.
VENTING INSTALLATION

**WARNING**

Breathing Hazard - Carbon Monoxide Gas

- Install vent system in accordance with codes.
- Do not operate water heater if exposed to flooding or water damage.
- Special consideration must be taken with installations above 10,000 feet (3,048 m) refer to high altitude section of this manual.
- Do not operate if soot buildup.
- Do not obstruct water heater air intake with insulating jacket or blanket.
- Do not place chemical vapor emitting products near water heater.
- Gas and carbon monoxide detectors are available.
- Never operate the heater unless it is vented to the outdoors and has adequate air supply to avoid risks of improper operation, fire, explosion or asphyxiation.
- Analyze the entire vent system to make sure that condensate will not become trapped in a section of vent pipe and therefore reduce the open cross sectional area of the vent.

Breathing carbon monoxide can cause brain damage or death. Always read and understand the instruction manual.

Never operate the water heater unless it is vented to outdoors. The instructions in this section of the manual must be followed to avoid choked combustion or recirculation of flue gases. Such conditions cause sooting of the combustion chamber, burners and flue tubes and creates a risk of asphyxiation.

**GENERAL VENTING INFORMATION**

The water heaters covered in this manual are operationally equivalent to Category IV appliances and may be installed in either a Power Vent or Direct Vent configuration.

**APPROVED MATERIALS**

Approved vent and intake air pipe materials that may be used in the United States:
- PVC pipe materials:
  - DWV ASTM-D2665 or CSA B181.2
  - Schedule 40, 80, 120 ASTM-D1785 or CSA B137.3
  - SDR Series ASTM-2241 or CSA B137.3
- CPVC pipe materials:
  - CPVC 41 ASTM-D2846 or CSA B137.6
  - Schedule 40, 80 ASTM-F441 or CSA B137.6
  - SDR Series ASTM-F442
- Polypropylene - See page 28
  - M & G Duravent PolyPro vent system
  - Centrotherm InnoFlue vent system
  - AL29-4C Stainless Steel - See page 29
  - HeatFab Sat-T Vent
  - Duravent FasNSeal

Approved vent pipe materials that must be used in Canada:
- ULC S636 PVC / CPVC
- ULC S636 Polypropylene - See page 28
- AL29-4C Stainless Steel - See page 29

Approved intake air pipe materials that must be used in Canada:
- PVC pipe materials:
  - DWV ASTM-D2665 or CSA B181.2
  - Schedule 40, 80, 120 ASTM-D1785 or CSA B137.3
  - SDR Series ASTM-2241 or CSA B137.3
- CPVC pipe materials:
  - CPVC 41 ASTM-D2846 or CSA B137.6
  - Schedule 40, 80 ASTM-F441 or CSA B137.6
  - SDR Series ASTM-F442
- Polypropylene - See page 28
  - M & G Duravent PolyPro vent system
  - Centrotherm InnoFlue vent system
  - AL29-4C Stainless Steel - See page 29
  - HeatFab Sat-T Vent
  - Duravent FasNSeal

**NOTE:** The use of cellular core PVC (ASTM F891), cellular core CPVC, or Radel® (polysulfone) in non-metallic venting systems is prohibited. Covering non-metallic vent pipe and fittings with thermal insulation is prohibited.

**CATEGORY IV APPLIANCE**

Category IV appliances operate with a positive vent (exhaust) static pressure and with vent gas temperatures low enough to produce condensate in the vent piping.

**POWER VENT CONFIGURATION**

Power Vent configurations derive all combustion air from the room where they are installed and discharge all flue gases to the outdoor atmosphere through a sealed vent (exhaust) pipe. Power vent configurations have one vent pipe connected to the water heater which can be terminated in a vertical or horizontal arrangement. See Figures 36 and Figure 37 on page 34.

**DIRECT VENT CONFIGURATION**

Direct Vent configurations derive all combustion air directly from the outdoor atmosphere through a sealed intake air pipe and discharge all flue gases to the outdoor atmosphere through a sealed vent (exhaust) pipe. Direct Vent configurations have two pipes connected to the water heater, one vent pipe and one intake air pipe. Direct Vent configurations can be terminated in one of seven different arrangements. See Figure 38 on page 34 through Figure 44 on page 35.

**GENERAL VENTING INSTRUCTIONS**

These instructions must be followed on all installations.

1. **DO NOT** install the water heater in a Power Vent configuration unless there is adequate supply of fresh air. See Air Requirements on page 17. If the installation space does not provide an adequate supply of fresh air the water heater must be installed in a Direct Vent configuration.
2. If the water heater is to be installed in a beauty shop, barber shop, cleaning establishment, a laundry with dry cleaning equipment or any space with contaminated air it is imperative that the water heater be installed in a Direct Vent configuration so that all air for combustion is derived from the outdoor atmosphere.
3. The vent and intake air piping must terminate outdoors.
4. The minimum clearance from combustible materials for the vent (exhaust) and intake air piping shall be 0 inches. Vent piping passing through a combustible wall or ceiling must be a continuous run (no joints).
5. The water heater must be protected from freezing downdrafts during shutdown periods.
6. The vent (exhaust) pipe must not be combined or connected to any other appliance’s vent system or chimney.
7. The intake air pipe must not be combined or connected to any other appliance’s intake air piping.
8. Locate the water heater where the vent (exhaust) and intake air piping will remain within the maximum equivalent lengths allowed. See Venting Requirements on page 22.
9. Do not install the vent or intake air piping in a manner that will allow water to be trapped in the piping.
10. Vent pipes must be pitched a minimum of a 1/4 inch per foot back to the water heater (to allow drainage of condensate).
11. Do not anchor the vent or intake air pipe directly to framed walls, floors or ceilings unless rubber isolation pipe hangers are used to prevent vibration noise from being transmitted.
12. Use only approved vent/ intake air pipe sizes and materials. See Venting Requirements on page 22.
13. Use only factory supplied vent and intake air, concentric or low profile terminations. See the Venting Requirements on page 22.
14. Do not locate the vent (exhaust) or intake air terminations where they would be objectionable due to noise at the termination(s). This includes locations close to or across from windows and doors.
15. Direct venting into dead air spaces such as attics, crawl spaces and inside homes can cause recirculation of flue gases. Recirculation of flue gases will cause sooting, premature failure of the heat exchanger and icing of the combustion air intake during severe cold weather. To prevent the recirculation of flue gases, maintain as much distance as possible between the intake air and vent terminations.
16. Do not locate the vent termination over a public area where condensate or vapor can cause a nuisance or ice hazard.
17. Ensure the screens in the factory supplied terminations are securely installed to prevent blockage in the vent system.
18. Stress levels in pipe/ fittings can be significantly increased by improper installation. If rigid pipe clamps are used to hold the pipe in place, or if the pipe cannot move freely through a wall penetration, the pipe may be stressed, or high thermal stresses may be formed when the pipe heats up and expands. Install accordingly to minimize such stresses.
19. Carefully read the Venting Requirements on page 22 and then proceed to the Venting Installation Sequence on page 23.
VENTING REQUIREMENTS

FIELD SUPPLIED FITTINGS
Field supplied fittings should be equivalent to the piping material being installed. Field installed/supplied fittings will add equivalent feet to the vent or intake air piping as indicated below. All field supplied/installation fittings and piping must be factored into the equivalent feet calculations.

- 90° elbows (short or long radius) are equivalent to 5 linear feet (152 cm) of pipe.
- 45° elbows (short or long radius) are equivalent to 2.5 linear feet (76 cm) of pipe.

Note: Refer to Table 10 and Table 11 for equivalent linear pipe length of AL29-4C® 45° and 90° elbows.

PRIMER AND CEMENT
Tetrahydrofuran (THF) primer should be used to prepare the surfaces of pipe and fittings for solvent welding. If CPVC pipe and fittings are used, then the proper cement must be used for all joints, including joining the pipe to the factory provided terminations (PVC material). PVC Materials should use ASTM D-2564 Grade Cement; CPVC Materials should use ASTM F-493 Grade Cement.

PIPE SIZE REQUIREMENTS
The water heaters covered in this manual are certified for the use of 4 and 6 inch pipe for the vent (exhaust) and intake air piping. If the installed equivalent length for the intake air or vent piping will be 70 feet (21.3 m) or less, 4 inch pipe must be used. If the installed equivalent length will be more than 70 feet (21.3 m), 6 inch pipe must be used.

Note: Install the pipe size required for the installed equivalent length of each pipe independently. IE: If the intake air pipe will be 70 equivalent feet or less and the vent pipe will be more than 70 equivalent feet; the intake air pipe must be installed using 4 inch pipe and the vent must be installed using 6 inch pipe.

MAXIMUM EQUIVALENT LENGTHS
Four Inch Pipe
The water heaters covered in this manual are certified to a maximum length of 4 inch pipe for the exhaust venting arrangement of 70 equivalent feet (21.3 m). The certified maximum length of 4 inch pipe for intake air piping is also 70 equivalent feet (21.3 m). IE: On Direct Vent installations both pipes can be up to 70 equivalent feet (21.3 m).

Six Inch Pipe
The water heaters covered in this manual are certified to a maximum length of 6 inch pipe for the exhaust venting arrangement of 120 equivalent feet (36.5 m). The certified maximum length of 6 inch pipe for intake air piping is also 120 equivalent feet (36.5 m). IE: On Direct Vent installations both pipes can be up to 120 equivalent feet (36.5 m).

INTAKE AIR AND VENT PIPE CLEARANCES
The minimum clearance from combustible materials for the vent (exhaust) and intake air piping shall be 0 inches. Vent or intake air piping passing through a combustible wall or ceiling must be a continuous run (no joints).

MINIMUM EQUIVALENT LENGTHS
Four Inch Pipe
The water heaters covered in this manual are certified to a minimum length of 4 inch pipe for the vent (exhaust) of 15 equivalent feet (4.6 m). There is no minimum equivalent feet requirement for the intake air pipe.

Six Inch Pipe
The water heaters covered in this manual are certified to a minimum length of 6 inch pipe for the vent (exhaust) of 70 equivalent feet (21.3 m). There is no minimum equivalent feet requirement for the intake air pipe.

MAXIMUM NUMBER OF ELBOWS
The vent pipe may have a maximum of six 90° elbows installed. The intake air pipe may have a maximum of six 90° elbows installed. IE: in a Direct Vent configuration each pipe can have up to six (6) 90° elbows installed. Two (2) 45° elbows equal one (1) 90° elbow. Each 90° elbow is equivalent to 5 feet (1.5 m) of linear pipe, 45° elbows are equivalent to 2.5 feet (0.75 m) of linear pipe.

Note: Refer to Table 10 and Table 11 for equivalent linear pipe length of AL29-4C® 45° and 90° elbows.

FACTORY SUPPLIED FITTINGS
The water heater ships with two (2) factory supplied 4 inch terminations (PVC 45° elbows with debris screen). Factory supplied vent and intake air terminations or concentric and low profile terminations must be used. Factory supplied terminations and installed fittings (exhaust elbow and intake air connection) add zero equivalent feet to the vent and intake air piping.

Note: 3 inch vent and/or intake pipe as well as 3 inch terminations previously used on older BTH 300 and 400 models must be replaced with 4 inch or 6 inch pipe and 4 inch or 6 inch terminations depending on installed length.

TABLE 7-PVC/CPVC and Polypropylene

<table>
<thead>
<tr>
<th>Number of 90° Elbows Installed</th>
<th>4 Inch Pipe</th>
<th>6 Inch Pipe</th>
</tr>
</thead>
<tbody>
<tr>
<td>Maximum Feet (Meters)</td>
<td>Maximum Feet (Meters)</td>
<td></td>
</tr>
<tr>
<td>One (1)</td>
<td>65 feet (19.8 meters)</td>
<td>115 feet (35.0 meters)</td>
</tr>
<tr>
<td>Two (2)</td>
<td>60 feet (18.2 meters)</td>
<td>110 feet (33.5 meters)</td>
</tr>
<tr>
<td>Three (3)</td>
<td>55 feet (16.8 meters)</td>
<td>105 feet (32.0 meters)</td>
</tr>
<tr>
<td>Four (4)</td>
<td>50 feet (15.2 meters)</td>
<td>100 feet (30.5 meters)</td>
</tr>
<tr>
<td>Five (5)</td>
<td>45 feet (13.7 meters)</td>
<td>95 feet (29.0 meters)</td>
</tr>
<tr>
<td>Six (6)</td>
<td>40 feet (12.2 meters)</td>
<td>90 feet (27.4 meters)</td>
</tr>
</tbody>
</table>

6 INCH EXTENDED VENT TERMINATIONS
When 6 inch intake air or vent pipe is installed using standard terminations, factory supplied 6 inch terminations must be used. Contact your local distributor or call the parts department (phone number listed on the back cover of this manual) to order 6 inch termination(s). See Optional Direct Vent Terminations on page 12.

The water heaters covered by this manual may be installed in a Direct Vent configuration using a 6 inch concentric or 6 inch low profile termination.

Contact your local distributor or call the parts department phone number listed on the back cover of this manual to order.

- 6” Concentric Termination Part # 9008841005
- 6” Low Profile Termination Part # 9008935005
VENTING INSTALLATION SEQUENCE

1. Read the General Venting Instructions on page 21 and Venting Requirements on page 22 before proceeding. These instructions and requirements must be followed on all installations.

2. Determine whether the water heater will be installed in a Power Vent or Direct Vent configuration and which vent system arrangement will be used for the installation. See the various venting arrangements on pages 34 and 35.

3. Proceed to the applicable installation instructions that follow; Power Vent Installation or Direct Vent Installation.

POWER VENT INSTALLATION

1. Read the General Venting Instructions on page 21 and Venting Requirements on page 22 before proceeding. These instructions and requirements must be followed in addition to the instructions below that are specific for Power Vent configurations.

2. Determine which Power Vent arrangement will be used for the installation; vertical or horizontal termination. See Figure 36 and Figure 37 on page 34.

3. Determine the vent pipe size for the installation, see Venting Requirements on page 22.

4. Plan the layout of the vent piping backwards from the termination point outdoors to the water heater. Layout the vent piping to use a minimum of pipe and elbows.

5. Install the termination first.
   If the vent piping will terminate vertically, through a roof, see Vertical Termination Installation on page 24.
   If the vent piping will terminate horizontally, through a sidewall, see Sidewall Termination Installation on page 26.

6. When installation of the termination(s) is complete Install necessary piping and fittings to route the vent piping back to the water heater.

7. The vent pipe must be supported properly to avoid bending or failure. The water heater manufacturer recommends that the vent and intake air piping be supported every 5 feet (152 cm) or less in length.

8. Do not install the vent piping in a manner that will allow water to be trapped in the piping.

9. All vent (exhaust) pipes must be pitched a minimum of a 1/4 inch per foot back to the water heater (to allow drainage of condensate).

10. If installing 4 inch vent pipe connect the vent pipe to the exhaust elbow on the water heater.

11. If installing 6 inch pipe transition to 4 inch pipe as shown in Figure 15. The field installed 4" pipe between the exhaust elbow and the 6” x 4” reducer coupling should be 18 inches (45 cm) or less in length.

DIRECT VENT INSTALLATION

1. Read the General Venting Instructions on page 21 and Venting Requirements on page 22 before proceeding. These instructions and requirements must be followed in addition to the instructions below that are specific for Direct Vent configurations.

2. Determine which Direct Vent arrangement will be used for the installation. There are seven (7) Direct Vent arrangement options, see pages 34 and 35.

3. Determine vent and intake air pipe size to be used for the installation; see Venting Requirements on page 22.

4. Plan the layout of the vent and intake air piping backwards from the termination point outdoors to the water heater. Layout the vent and intake air piping to use a minimum of pipe and elbows.

5. Install the terminations first.
   If standard terminations are being used and the intake air or vent piping will terminate vertically, through a roof, see Vertical Termination Installation on page 24.
   If standard terminations are being used and the intake air or vent piping will terminate horizontally, through a sidewall, see Sidewall Termination Installation on page 26.

6. When installation of the termination(s) is complete Install necessary piping and fittings to route the intake air and vent piping back to the water heater.

7. The intake air and vent piping must be supported properly to avoid bending or failure. The water heater manufacturer recommends that the vent and intake air piping be supported every 5 feet (152 cm) of vertical run and every 3 feet (91 cm) of horizontal run.

8. Do not install the vent or intake air piping in a manner that will allow water to be trapped in the piping.

9. A field supplied condensate Tee fitting and drain hose must be installed in the intake air piping near the water heater in colder climates with heavy snow accumulations and in areas that regularly experience high humidity. The drain hose must be routed to an adequate floor drain separate from any other condensate drains. See Figure 16 on page 24.

NOTE: Snow being pulled into the intake air piping and then melting can lead to excessive amounts of water accumulation and damage water heater components. Warm, humid outdoor air can lead to excessive condensation inside the intake air piping and may also damage water heater components.

10. All vent (exhaust) pipes must be pitched a minimum of a 1/4 inch per foot back to the water heater (to allow drainage of condensate).

11. If installing 4 inch vent pipe connect the vent pipe to the exhaust elbow on the water heater.

12. If installing 6 inch vent pipe transition to 4 inch pipe at the exhaust elbow on the water heater as shown in Figure 15. The field installed 4” pipe between the exhaust elbow and the 6” x 4” reducer coupling should be 18 inches (45 cm) or less in length.
13. Ensure the Intake Air Screen on the Intake Air Connection is removed before connecting the intake air pipe to the water heater, see Figure 17.

**WARNING**

Breathing Hazard - Carbon Monoxide Gas

- Do not obstruct water heater air intake.
- Gas and carbon monoxide detectors are available.
- Install water heater in accordance with the instruction manual.

Breathing carbon monoxide can cause brain damage or death. Always read and understand instruction manual.

**NOTE:** Do not leave the screen inside the Intake Air connection in Direct Vent installations. Once the intake air pipe is installed the screen will be hidden from view and may become clogged with debris over time. This will cause improper combustion.

14. If installing 4 inch intake air pipe connect the intake air pipe to the intake air connection on the water heater.

15. If installing 6" intake air pipe transition to 4" pipe at the intake air connection on the water heater as shown in Figure 18. The field installed 4" pipe between the intake air connection and the 6" x 4" reducer coupling should be 18 inches (45 cm) or less in length.

**VERTICAL TERMINATION INSTALLATION**

1. Determine the location for the termination(s).

2. If installing only the vent (exhaust) piping in a Power Vent configuration vertically through the roof; ensure that all exterior vertical clearance requirements shown in Figure 19 and Figure 20 on page 25 are being maintained. These clearances and those cited by local and national codes must be maintained.

**NOTE:** On flat roof installations the vent termination must be a minimum of 24 inches (60 cm) above any parapet, vertical wall or structure within 10 feet (3 m) horizontally. See Figure 20 on page 25.

3. If installing both intake air and vent piping in a Direct Vent configuration vertically through the roof; ensure that all exterior vertical clearance requirements shown in Figure 20 and Figure 21 on page 25 are being maintained. These clearances and those cited by local and national codes must be maintained.

**NOTE:** On flat roof installations the intake air and the vent terminations must be a minimum of 24 inches (60 cm) above any parapet, vertical wall or structure within 10 feet (3 m) horizontally. See Figure 20 on page 25.

4. If installing only vent piping in a Power Vent configuration vertically through the roof the following instructions must be followed:

   The vent termination must be oriented facing downward as shown in Figure 19 and Figure 20 on page 25.

   The bottom edge of the vent termination must be a minimum of 12 inches (30 cm), 18 inches (45 cm) in Canada, above the average or expected snow level as shown in Figure 19 on page 25.

5. If installing both intake air and vent piping in a Direct Vent configuration vertically through the roof the following instructions must be followed:

   The intake air and vent pipes must penetrate the same side of the roof as shown in Figure 21 on page 25.

   The intake air and vent terminations must be oriented facing downward and in the same direction as shown in Figure 21 on page 25.

   The intake air and vent terminations must have a minimum
separation of 24" (61 cm) measured on center line as shown in Figure 21 on page 25. In colder climates this separation should be increased to at least 48 inches (122 cm).

The bottom edge of the intake air and vent terminations must be a minimum of 12 inches (30 cm), 18 inches (45 cm) in Canada, above the average or expected snow level as shown in Figure 19 and Figure 21 on page 25.

6. When the intake air and/or vent piping from multiple water heaters will terminate in the same location the vent terminations can be grouped together in close proximity 0 inches/touching. Intake air terminations can also be grouped together in close proximity 0 inches/touching.

The distance between the closest vent and intake air terminations must be a minimum of 24 inches (61 cm) as shown in Figure 21. In colder climates this separation should be increased to at least 48 inches (122 cm).

7. Cut a 5 inch (13 cm) diameter hole for 4 inch pipe or 7 inch (18 cm) diameter hole for 6 inch pipe where the pipe(s) will pass through the roof.

**NOTE:** Beware of concealed wiring and piping when cutting through the roof.

8. Suspend the pipe(s) through center of hole using field supplied metal strapping or equivalent support materials as shown in Figure 19.

9. Slide a roof boot or equivalent flashing over the pipe and secure roof boot or equivalent flashing to roof (see Figure 19) and seal around the flashing.

10. Install the factory supplied intake air and/or vent termination(s) using field supplied pipe and one field supplied 90° elbow as shown in Figure 19. The short section of pipe that connects between the field supplied 90° elbow and the factory supplied termination must not be excessive in length. The exposed portion of this pipe shall be no more than 2 inches (5 cm), see Figure 19.

11. Return to Power Vent Installation on page 23 or Direct Vent Installation on page 23 to complete the installation of the intake air and/or vent piping between the termination(s) and the water heater.
SIDEWALL TERMINATION INSTALLATION

1. Determine the location for the termination(s).

2. If installing only vent (exhaust) piping in a Power Vent configuration through a sidewall; ensure that all exterior sidewall clearance requirements for the termination, shown in Figure 45a on page 36, are being maintained. These clearances and those cited by local and national codes must be maintained.

3. If installing both intake air and vent piping in a Direct Vent configuration through a sidewall; ensure that all exterior sidewall clearance requirements for the terminations, shown in Figure 45b on page 37, for the vent and intake air termination are being maintained. These clearances and those cited by local and national codes must be maintained.

4. If installing both an intake air and vent termination in a Direct Vent configuration through a sidewall there must be a minimum of 24 inches (61 cm) separation, measured on vertical center line, between the intake air and vent terminations, see Figure 22.

**NOTE:** In colder climates this separation should be increased to at least 48 inches (122 cm) between the intake air and vent termination or any other appliance vent that discharges moisture-laden air such as clothes dryers. This will reduce possibility of frost over from side winds blowing exhaust vapors to the intake air termination and is recommended for Canadian installations.

5. If installing both intake air and vent terminations in a Direct Vent configuration through a sidewall the intake air and vent terminations must be installed at the same elevation measured on horizontal center line - see Figure 22.

6. When the intake air and/or vent piping from multiple water heaters will terminate at the same location through a sidewall, the vent terminations can be grouped together in close proximity - 0 inches/touching. The intake air terminations can also be grouped together in close proximity - 0 inches/touching.

However, the distance between the closest vent and intake air terminations must be a minimum of 24 inches (61 cm). In colder climates this separation should be increased to at least 48 inches (122 cm). See Figure 22.

7. Cut a 5 inch (13 cm) diameter hole for 4 inch pipe or 7 inch (18 cm) diameter hole for 6 inch pipe where the pipe(s) will pass through the wall.

**NOTE:** Beware of concealed wiring and piping when cutting through the wall.

8. Cut a length(s) of pipe being installed 3.5 inches (8.9 cm) to 9.5 inches (24.1 cm) longer than the wall thickness at the opening. See Figure 23.

**NOTE:** Vent Termination – exhaust gases of this water heater are less than 140°F. In cold climates water vapor in the exhaust gases will condense into a cloud of vapor where the vent exits the building. This vapor can gradually discolor exterior building surfaces. The vent termination should be located where this vapor cloud and potential discoloration are not a concern. Extending the exposed vent piping up to a maximum of 6 inches (15.2 cm) from the wall helps vapor from being trapped along a building's face. To avoid this problem, the vent can also be terminated vertically through the roof, see Vertical Termination Installation on page 24.

9. Cement the intake air and/or vent termination to the section(s) of pipe cut to length in the above Step.

10. Slide the included metal wall plate(s) over the pipe(s) to stop against the intake air and/or vent termination. Place some silicone caulking (field supplied) on the back of the wall plate(s) to secure it to the wall.

11. Working from outside, slide the pipe and termination(s) assembled in the above steps through the wall. Ensure the termination(s) is pointed down towards the ground. See Figure 23.

12. Place a bead of silicone caulking (field supplied) around the back of the interior wall plate(s) to hold it in place and fill the gap between the pipe(s) and wall.

13. Press the wall plate flush against the outside wall.

14. Working from the inside apply enough silicone caulking on the back of the interior wall plate(s) to hold it in place and slide the wall plate over the installed pipe(s).

15. Install a coupling to the end of the pipe(s) inside the building. Before the silicone caulking has time to completely set go outside the building and ensure the termination(s) is still pointing down towards the ground. See Figure 23.

16. Return to Power Vent Installation on page 23 or Direct Vent Installation on page 23 to complete the installation of the intake air and/or vent piping between the termination(s) and the water heater.

---

**Figure 22**

SIDEWALL TERMINATION - DIRECT VENT STANDARD TERMINATIONS

**Figure 23**

SIDEWALL TERMINATION INSTALLATION

INTAKE AIR AND/OR VENT (EXHAUST)
POLYPROPYLENE INSTALLATIONS

The water heaters covered by this manual have been approved to be installed with Polypropylene vent material as shown in Table 8 and Table 9. The approved application of single wall, non-flexible, non-concentric Polypropylene vent material is offered by two specific manufacturers (Centrotherm ECO Systems and DuraVent Polypropylene). These listed products must be installed by following the vent manufacturer’s instructions. Refer to Table 7-PVC/CPVC and Polypropylene on Page 22 to determine the maximum pipe length and number of elbows that can be used.

Insulation should not be used on Polypropylene venting materials. The use of insulation will cause increased vent wall temperatures, which could result in vent pipe failure.

Use only the adapters and vent system listed in Tables below. DO NOT mix vent systems of different types or manufacturers. Failure to comply could result in severe personal injury, death, or substantial property damage.

**TABLE 8**

<table>
<thead>
<tr>
<th>Nominal Pipe Diameter</th>
<th>Flue Outlet Adapter</th>
<th>Adapter Connector</th>
<th>Ring Connector</th>
<th>90 Degree Elbow</th>
<th>Vent Material</th>
<th>Vent Terminal(s)</th>
</tr>
</thead>
<tbody>
<tr>
<td>4&quot;</td>
<td>4PPS-AD</td>
<td>PPS-PAC</td>
<td>4PPS-LB</td>
<td>4PPS-E90B</td>
<td>PPS</td>
<td>4PPS-E45B for Exhaust; 4PPS-E45B for Intake (Direct Vent only)</td>
</tr>
<tr>
<td>6&quot;</td>
<td>6PPS-06PVC-6PPF</td>
<td>PPS-PACL</td>
<td>6PPS-LBC</td>
<td>6PPS-E90</td>
<td>PPS</td>
<td>6PPS-E45 for Exhaust; 6PPS-E45 for Intake (Direct Vent only)</td>
</tr>
</tbody>
</table>

**TABLE 9**

<table>
<thead>
<tr>
<th>Nominal Pipe Diameter</th>
<th>Flue Outlet Adapter</th>
<th>Adapter Connector</th>
<th>Ring Connector</th>
<th>90 Degree Elbow</th>
<th>Vent Material</th>
<th>Vent Terminal(s)</th>
</tr>
</thead>
<tbody>
<tr>
<td>4&quot;</td>
<td>ISAGL 0404</td>
<td>IAFCO4</td>
<td>IANS04</td>
<td>ISEL0487</td>
<td>Polypropylene</td>
<td>ISELL0445UV for Exhaust; ISELL0445UV for Intake (Direct Vent only)</td>
</tr>
<tr>
<td>6&quot;</td>
<td>ISAGL 0606</td>
<td>IAFCO6</td>
<td>IANS06</td>
<td>ISEL0687</td>
<td>Polypropylene</td>
<td>ISELL0645UV for Exhaust; ISELL0645UV for Intake (Direct Vent only)</td>
</tr>
</tbody>
</table>

Installations must comply with applicable national, state, and local codes. For Canadian installation, Polypropylene vent must be listed as a ULC-S636 approved system. If Polypropylene vent is not required by your local code, you may use either PVC or CPVC pipes for your water heater that allows non-metallic venting material installations.

Polypropylene vent systems do not use cement to connect the pipe and elbow sections but use a push together gasket seal method. Do not attempt to connect Polypropylene with sealant cement. All vent connections MUST be secured by the vent manufacturer’s joint connector. The installer must use a specific vent starter adapter at the flue connection. The adapter is supplied by the vent manufacturer to adapt to its vent system.

In order to be in full compliance with UL 1738 or ULC-S636 and to meet the requirements of the water heater manufacturer, you must use the metal joint connector rings, available from the Polypropylene vent manufacturer, to stiffen the joints of 4” and 6” diameter pipes.
AL29-4C® VENT INSTALLATIONS

(AL29-4C® is a registered trademark of Allegheny Technologies, Inc.)

The water heaters covered by this manual are approved to be installed with AL29-4C® stainless steel vent material using parts from the manufacturers listed in Table 10 and Table 11 below. These listed systems must be installed using the vent manufacturer’s instructions including their listed clearances to combustible and noncombustible materials. Refer to Table 7-PVC/CPVC and Polypropylene on page 22 for the maximum and minimum equivalent linear vent lengths and number of elbows that may be used. However, use Table 10 and Table 11 below to find the appropriate equivalent linear vent lengths for the AL29-4C® elbows.

Note: The equivalent lengths of the AL29-4C® elbows are different than those from smooth walled plastic vents. Consult Table 10 and Table 11 for the correct equivalent linear vent lengths.

Listed vent systems composed of AL29-4C® must not mix parts from the different manufacturers. The joints of these products are sealed by internal gaskets. Do not use any other type of sealant. When assembling these vent systems, follow the vent manufacturer’s instructions for cleaning and lubricating the joints, if required. Each section must be locked together using the method supplied by the vent manufacturer.

The water heaters covered by this manual are approved to be installed using the approved vent terminations shown in this manual. This means that, the installer must use the adapter listed in Table 10 and Table 11 and a short piece of PVC pipe to complete the end of the vent system with an approved termination. In Canada, the PVC pipe length must be listed to ULC636.

**TABLE 10**

<table>
<thead>
<tr>
<th>Diameter</th>
<th>Flue Outlet Adapter</th>
<th>*Straight Pipe (3' Section)</th>
<th>Equivalent Linear Length, 45° Elbow</th>
<th>90° Elbow</th>
<th>Equivalent Linear length, 90° Elbow</th>
<th>Adapter to PVC</th>
</tr>
</thead>
<tbody>
<tr>
<td>4&quot;</td>
<td>9401 PVC</td>
<td>9307</td>
<td>9411</td>
<td>5 feet</td>
<td>9414</td>
<td>10 feet</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>9454CPVC</td>
<td></td>
</tr>
<tr>
<td>6&quot;</td>
<td>9601 PVC</td>
<td>9607</td>
<td>9611</td>
<td>5 feet</td>
<td>9614</td>
<td>10 feet</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>9656CPVC</td>
<td></td>
</tr>
</tbody>
</table>

*Consult vent manufacturer’s catalog for other available lengths.

**TABLE 11**

<table>
<thead>
<tr>
<th>Diameter</th>
<th>Flue Outlet Adapter</th>
<th>*Straight Pipe (3' Section)</th>
<th>Equivalent Linear Length, 45° Elbow</th>
<th>90° elbow</th>
<th>Equivalent Linear Length, 90° Elbow</th>
<th>Adapter to PVC</th>
</tr>
</thead>
<tbody>
<tr>
<td>4&quot;</td>
<td>810005545</td>
<td>FSVL3604</td>
<td>5 feet</td>
<td>FSELB9004</td>
<td>10 feet</td>
<td>810009529</td>
</tr>
<tr>
<td>6&quot;</td>
<td>810005225</td>
<td>FSVL3606</td>
<td>5 feet</td>
<td>FSELB9006</td>
<td>10 feet</td>
<td>81005572</td>
</tr>
</tbody>
</table>

*Consult vent manufacturer’s catalog for other available lengths.
CONCENTRIC TERMINATION INSTALLATION

1. Concentric terminations must be ordered separately. BTH 300 - 500 models must use the 6 inch concentric termination for both 4" & 6" vent diameters; Part Number: 9008841005. Contact your local distributor or call the parts department phone number on the back cover of this manual to order concentric terminations.

2. Determine the location for the termination.

   **NOTE:** Roof termination is preferred since it is less susceptible to damage, has reduced chances to intake contaminants and vent vapors are less visible.

3. When installing a concentric termination vertically through the roof; ensure that all exterior vertical clearance requirements for the concentric termination, shown in Figure 24 on page 29 and Figure 26 on page 30, are being maintained. These clearances and those cited by local and national codes must be maintained.

4. When installing a concentric termination vertically through a flat roof, the termination’s vent cap must be a minimum of 10 feet (3 m) away from any parapet, vertical wall or structure as shown in Figure 24.

   **NOTE:** If this required distance to a parapet, vertical wall or structure cannot be maintained, standard terminations must be used. See Vertical Termination Installation on page 24.

5. When installing a concentric termination through a sidewall; ensure that all exterior sidewall clearance requirements for the termination, shown in Figure 45b on page 37, are being maintained. These clearances and those cited by local and national codes must be maintained.

6. When installing multiple concentric terminations vertically through a roof or horizontally through a sidewall ensure the required clearances between terminations and groupings of multiple terminations are maintained. See pages 31 and 32 for more information.

7. Cut a 7 inch (18 cm) diameter hole for 6 inch concentric terminations where they will pass through the wall or roof.

   **NOTE:** Beware of concealed wiring and piping when cutting through the wall or roof.

8. When installing multiple concentric terminations vertically through the roof in the same location the termination caps for all concentric terminations must be at the same height measured from ground. See Multiple Concentric Termination Arrangements on page 31.

9. Determine if the concentric termination will need to be shortened to accommodate required clearances or to ensure all vent caps are at the same height when installing multiple terminations vertically through the roof in the same location.

   See Figure 25 for the minimum lengths allowed for the 6 inch concentric termination.

   **Note:** When shortening the length of the termination carefully measure and cut the larger (intake air) pipe first. Cut the same amount of pipe off of the smaller (vent) pipe.

   **Note:** Lengthening of the Concentric Vent Termination is not permitted.

---

**Figure 24**

CONCENTRIC TERMINATION(S) MUST BE A MINIMUM OF 10 FEET (3 m) AWAY FROM ANY PARAPET, VERTICAL WALL OR STRUCTURE.

6 INCH CONCENTRIC TERMINATION FLAT ROOF CLEARANCE
Assemble and install the 6 inch concentric termination. Refer to Figure 25, Figure 26 and Figure 27 for these instructions:

1. Cement the Y fitting to the larger diameter intake air pipe.

2. Slide the intake air pipe and Y fitting assembly from inside the building through the hole cut for the termination in the roof or sidewall. Ensure no foreign materials such as insulation accumulate inside the assembly.

3. Secure the intake air Y fitting assembly using field supplied metal strapping or equivalent support materials.

4. On installations installed through the roof slide a field supplied plumbing boot or roof flashing over the intake air Y fitting assembly and secure it to the roof.

5. Seal around the plumbing boot or roof flashing.

6. Cement the vent cap onto the vent pipe. Alternately a field-supplied stainless steel screw may be used to secure the 2 components together when field disassembly is desired for cleaning. A pilot hole must be drilled for the screw to prevent damage/cracking of the vent cap and/or vent pipe.

7. Install the vent cap/vent pipe assembly into the intake air Y fitting assembly. Ensure small diameter vent pipe is cemented and bottomed in the Y fitting.

8. Connect the intake air and vent piping from the water heater to the 6 inch concentric termination using field supplied 6” x 4” reducer couplings as needed.

9. Return to Direct Vent Installation on page 23 to complete the installation of the intake air and vent piping between the concentric termination and the water heater.
MULTIPLE CONCENTRIC TERMINATION CLEARANCES

When installing multiple concentric terminations vertically through a roof or horizontally through a sidewall ensure the required clearances (separation) between terminations are maintained. Ensure multiple terminations are arranged or grouped as required.

NOTE: These clearances must be maintained to prevent the recirculation of vent (exhaust) gases to the intake air. Clearances are measured between the edges of the concentric termination caps.

When installing multiple concentric terminations through a roof or through a sidewall the clearances shown in Figure 28 must be maintained.

See Multiple Concentric Termination Arrangements on page 31.

Close Proximity & Standard Clearance

1. The clearance between multiple termination caps must be 0 inches (touching) to a maximum of 2 inches (5 cm), dimension A - Figure 28, when installing concentric terminations in close proximity. See Figure 28 through 32.

2. The clearance between multiple termination caps must be increased to a minimum of 24 inches (61 cm), dimension B - Figure 28, when installation in close proximity (above) is not possible. This is the standard clearance.

Groups Of Terminations

1. When installing multiple groups of concentric terminations through a roof or through a sidewall in close proximity they can be installed into stacked groups of four as shown in Figure 30 or lateral rows of two as shown in Figure 31.

2. Four is the maximum number of concentric terminations that may be installed in a group where all terminations are in close proximity as shown in Figure 30.
MANY CONCENTRIC TERMINATION ARRANGEMENTS

The illustrations on this page show some of the installation arrangements for multiple concentric terminations that are allowed.

See Multiple Concentric Termination Clearances on page 31 for detailed information on clearances and additional arrangement options.

NOTE: When multiple concentric terminations are installed through a roof in the same location all termination caps must be at the same height measured from the ground.

Two Concentric Terminations

Two concentric terminations may be installed in close proximity as shown in Figure 33 or with standard clearances when this arrangement is not possible. See Figure 28 on page 31 for detailed information on clearances. See Figure 29 on page 31 when installing three concentric terminations.

Eight Concentric Terminations

Eight concentric terminations may be installed in two stacked groups of four, in close proximity, as shown in Figure 35. See Figure 32 on page 31 for detailed information on clearances.

Lateral groups of four as shown in Figure 31 on page 31 may be a more convenient installation arrangement for multiple groups depending on available space.

Four Concentric Terminations

Four concentric terminations may be installed in close proximity as shown in Figure 34. See Figure 30 and Figure 31 on page 30 for detailed information on clearances and additional arrangement options.
LOW PROFILE VENT INSTALLATION

This water heater is certified for sidewall direct venting with IPEX System 636 Low Profile Vent Kit. Follow instructions below for proper installations.

All termination kits must be located and installed in accordance with local building code and CSA B149.1 Natural Gas and Propane Installation Code.

1. Once the proper location has been determined, cut 2 holes in the wall large enough to accommodate the pipe. Pipe diameters and distance between hole centers can be found in Table 12.

2. Slide both the intake and exhaust pipes through the holes. Solvent cement both pipes to the base of the vent termination kit, follow the solvent cementing procedures outlined in the IPEX System 636 Installation Guide, which is available on the web www.ipexinc.com.

3. To fasten the Base to the wall, use the supplied screws and anchors. A 3/16" (5mm) hole, 1-3/16" (30mm) deep, will need to be drilled for the anchors. Locate the anchor hole using the base as a template.

4. Screw the Cap to the Base using the supplied screws.

5. Once the vent termination and pipes are secured, the wall penetrations will need to be sealed from the interior using a PVC-compatible sealant material.

6. All vent pipes and air inlets must terminate at the same height to avoid possibility of severe personal injury, death, or substantial property damage.

7. Operate heater through 1 heat cycle to ensure combustion-air and vent pipes are properly connected to concentric vent termination

---

**TABLE 12**

<table>
<thead>
<tr>
<th>AOS Kit Number</th>
<th>IPEX Part Number</th>
<th>Description</th>
<th>Pipe Outside Diameter</th>
<th>Hole Spacing (Center to Center)</th>
</tr>
</thead>
<tbody>
<tr>
<td>9008934005</td>
<td>196986</td>
<td>4&quot; Flush Mount Vent Kit</td>
<td>4.50&quot;</td>
<td>5.63&quot;</td>
</tr>
<tr>
<td>9008935005</td>
<td>196080</td>
<td>6&quot; Flush Mount Vent Kit</td>
<td>6.61&quot;</td>
<td>7.63&quot;</td>
</tr>
</tbody>
</table>

**Each Kit Contains**

<table>
<thead>
<tr>
<th>Qty</th>
<th>Item Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Base (two holes)</td>
</tr>
<tr>
<td>1</td>
<td>Cap (one hole)</td>
</tr>
<tr>
<td>8</td>
<td>Stainless Steel Screws</td>
</tr>
<tr>
<td>4</td>
<td>Plastic Anchors</td>
</tr>
</tbody>
</table>
### Vent terminal clearances for “Power Vent” installations. Power Vent configurations use room air for combustion.

<table>
<thead>
<tr>
<th>A</th>
<th>Clearance above grade, veranda, porch, deck or balcony</th>
<th>12 inches (30 cm)</th>
<th>12 inches (30 cm)</th>
<th>H</th>
<th>Clearance to each side of center line extended above meter/regulator assembly</th>
<th>3 feet (91 cm) within a height 15 feet (4.5 m) above the meter/regulator assembly*</th>
</tr>
</thead>
<tbody>
<tr>
<td>B</td>
<td>Clearance to window or door that may be opened</td>
<td>6 inches (15 cm) for appliances up to 10,000 Btu/hr (3 kW), 12 inches (30 cm) for appliances between 10,000 Btu/hr (3 kW) and 100,000 Btu/hr (30 kW), 36 inches (91 cm) for appliances above 100,000 Btu/hr (30 kW)</td>
<td>4 feet (1.2 m) below or to side of opening; 1 foot (30 cm) above opening</td>
<td>I</td>
<td>Clearance to service regulator vent outlet</td>
<td>3 feet (91 cm)</td>
</tr>
<tr>
<td>C</td>
<td>Clearance to permanently closed window</td>
<td>12 inches (30 cm)*</td>
<td>12 inches (30 cm)*</td>
<td>J</td>
<td>Clearance to a non-mechanical air supply inlet into building or combustion air inlet to any other appliance</td>
<td>6 inches (15 cm) for appliances up to 10,000 Btu/hr (3 kW), 12 inches (30 cm) for appliances between 10,000 Btu/hr (3 kW) and 100,000 Btu/hr (30 kW), 36 inches (91 cm) for appliances above 100,000 Btu/hr (30 kW)</td>
</tr>
<tr>
<td>D</td>
<td>Vertical clearance to ventilated soffit located above the terminal within a horizontal distance of 2 feet (61 cm) from the center line of the terminal</td>
<td>12 inches (30 cm)*</td>
<td>12 inches (30 cm)*</td>
<td>K</td>
<td>Clearance to a mechanical air supply inlet</td>
<td>6 feet (1.83 m)</td>
</tr>
<tr>
<td>E</td>
<td>Clearance to unvented soffit</td>
<td>12 inches (30 cm)*</td>
<td>12 inches (30 cm)*</td>
<td>L</td>
<td>Clearance above paved sidewalk or paved driveway located on public property</td>
<td>7 feet (2.13 m)†</td>
</tr>
<tr>
<td>F</td>
<td>Clearance to outside corner</td>
<td>2 feet (60 cm)*</td>
<td>2 feet (60 cm)*</td>
<td>M</td>
<td>Clearance under veranda, porch, deck, or balcony</td>
<td>12 inches (30 cm) ‡</td>
</tr>
<tr>
<td>G</td>
<td>Clearance to inside corner</td>
<td>18 inches (45 cm)*</td>
<td>18 inches (45 cm)*</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

---

1 In accordance with the current CSA B149.1, Natural Gas and Propane Installation Code.

2 In accordance with the current ANSI Z223.1/NFPA 54, National Fuel Gas Code.

† A vent shall not terminate directly above a sidewalk or paved driveway that is located between two single family dwellings and serves both dwellings. Where it may cause hazardous frost or ice accumulations on adjacent property surfaces.

‡ Permitted only if veranda, porch, deck, or balcony is fully open on a minimum of two sides beneath the floor.

* Clearance in accordance with local installation codes and the requirements of the gas supplier and the manufacturer’s installation instructions.
VENT terminal clearances for “Direct Vent” installations. Direct Vent configurations use outdoor air for combustion.

<table>
<thead>
<tr>
<th></th>
<th>CANADIAN INSTALLATIONS 1</th>
<th>US INSTALLATIONS 2</th>
<th>CANADIAN INSTALLATIONS 1</th>
<th>US INSTALLATIONS 2</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>Clearance above grade, veranda, porch, deck or balcony</td>
<td>12 inches (30 cm)</td>
<td>12 inches (30 cm)</td>
<td>Clearance to each side of center line extended above meter/ regulator assembly</td>
</tr>
<tr>
<td>B</td>
<td>Clearance to window or door that may be opened</td>
<td>6 inches (15 cm) for appliances up to 10,000 Btu/hr (3 kW), 12 inches (30 cm) for appliances between 10,000 Btu/hr (3 kW) and 100,000 Btu/hr (30 kW), 36 inches (91 cm) for appliances above 100,000 Btu/hr (30 kW)</td>
<td>6 inches (15 cm) for appliances up to 10,000 Btu/hr (3 kW), 9 inches (23 cm) for appliances between 10,000 Btu/hr (3 kW) and 50,000 Btu/hr (15 kW), 12 inches (30 cm) for appliances above 50,000 Btu/hr (15 kW)</td>
<td>Clearance to service regulator vent outlet</td>
</tr>
<tr>
<td>C</td>
<td>Clearance to permanently closed window</td>
<td>6 inches (15 cm)*</td>
<td>6 inches (15 cm)*</td>
<td>Clearance to a non mechanical air supply inlet into building or combustion air inlet to any other appliance</td>
</tr>
<tr>
<td>D</td>
<td>Vertical clearance to ventilated soffit located above the terminal within a horizontal distance of 2 feet (61 cm) from the center line of the terminal</td>
<td>12 inches (30 cm)*</td>
<td>12 inches (30 cm)*</td>
<td>Clearance to a mechanical air supply inlet</td>
</tr>
<tr>
<td>E</td>
<td>Clearance to unventilated soffit</td>
<td>12 inches (30 cm)*</td>
<td>12 inches (30 cm)*</td>
<td>Clearance above paved sidewalk or paved driveway located on public property</td>
</tr>
<tr>
<td>F</td>
<td>Clearance to outside corner</td>
<td>2 feet (60 cm)*</td>
<td>2 feet (60 cm)*</td>
<td>Clearance under veranda, porch, deck, or balcony</td>
</tr>
<tr>
<td>G</td>
<td>Clearance to inside corner</td>
<td>18 inches (45 cm)*</td>
<td>18 inches (45 cm)*</td>
<td></td>
</tr>
</tbody>
</table>

1 In accordance with the current CSA B149.1, Natural Gas and Propane Installation Code.
2 In accordance with the current ANSI Z223.1/NFPA 54, National Fuel Gas Code.
† A vent shall not terminate directly above a sidewalk or paved driveway that is located between two single family dwellings and serves both dwellings. Where it may cause hazardous frost or ice accumulations on adjacent property surfaces.
‡ Permitted only if veranda, porch, deck, or balcony is fully open on a minimum of two sides beneath the floor.
* Clearance in accordance with local installation codes and the requirements of the gas supplier and the manufacturer’s installation instructions.

Figure 45b

DIRECT VENT
(using outdoor air for combustion)

EXTERIOR CLEARANCES FOR SIDEWALL VENT TERMINATION

Termination clearances side wall direct vent
Installation must conform with these instructions and local building codes.

Condensate neutralizer kits are available. Contact your distributor or Service Agency.

Field supplied materials required for installation include:

- Approved PVC cement and PVC primer.
- 1/2 inch PVC pipe - minimum length to equal the distance between the water heater and a suitable building drain.
- 1/2 inch PVC fittings (elbows, couplings and adapters) necessary to install a condensate drain line between the exhaust/condensate elbow assembly and a suitable building drain.
- Floor mounted standoffs to brace the drain line.

**INSTALLATION NOTES**

1. The condensate drains from the water heater's covered by this instruction have PH levels between 4.3 and 5.0. Install a commercially available neutralizing kit if required by local codes. Lower PH levels are acidic. Do not connect a metal condensate drain line, such as copper pipe, to the water heater for this reason.

2. The field installed condensate drain line must not be less than 1/2 inch PVC in size. The condensate line must slope to an open drain.

3. Do not install an additional trap in the condensate drain piping. DO NOT remove, modify or alter the factory condensate trap.

**INSTALLATION INSTRUCTIONS**

1. Ensure the water heater’s Enable/Disable switch is in the “Disable” position.

2. Install a 1/2 inch PVC condensate drain line between the condensate drain connection on the Exhaust/Condensate Elbow and a suitable building drain. The exhaust elbow has a "built in" condensate trap. Do not install an additional trap in the condensate drain piping, Figure 46.

3. Terminate the condensate drain piping with an elbow above the drain. Ensure that any discharge will exit the condensate drain line no more than 6 inches (15.2 cm) above a suitable building drain, or external to the building, see Figure 46.

**NOTE:** In cold climates it is recommended the condensate drain be terminated at a suitable drain inside the building.

4. Ensure the condensate drain line is not elevated above the condensate drain connection on the exhaust/condensate elbow, see Figure 46.

5. Brace the condensate drain line with floor mounted standoffs every three feet.

6. Ensure the condensate drains freely during start up, see Start Up on page 52.

7. Condensate clean out cap must be on and tight when unit is in operation.

---

**Figure 46**
SUPPLY GAS LINE INSTALLATION

Contact your local gas utility company to ensure that adequate gas service is available and to review applicable installation codes for your area.

Be sure that the gas meter has sufficient capacity to supply the rated gas input of the water heater as well as the requirements of all other gas fired equipment supplied by the meter. If the gas meter is undersized, the gas company will have to install a properly sized gas meter.

**WARNING**

- Do not use water heater with any gas other than the gas shown on the rating label.
- Excessive gas pressure to gas valve can cause serious injury or death.
- Turn off gas lines during installation.
- Contact a qualified installer or service agency for installation and service.
- Contact a qualified installer or service agency for installation and service.

Fire and Explosion Hazard

Make sure gas supplied is same type listed on the water heater's rating label.

The water heaters covered in this manual are not intended for operation at higher than 14.0" W. C. (2.49 kPa) for natural and propane gas supply pressure, see Table 4 on page 10. The water heaters covered in this manual require supply gas regulators to maintain required supply gas pressure. Exposure to higher gas supply pressure may cause damage to the gas controls which could result in fire or explosion. If overpressure has occurred such as through improper testing of gas lines or malfunction of the supply system the water heater's gas valve must be checked for safe operation by a Qualified Service Agency.

Ensure supply regulator vent lines and the safety vent valves are protected against blockage. These are components of the gas supply system, not the water heater. Vent blockage may occur during ice storms.

It is important to guard against gas valve fouling from contaminants in the gas ways. Such fouling may cause improper operation, fire or explosion. If copper supply lines are used they must be internally tinned and certified for gas service.

![Figure 47](image)

Ensure all gas pipe is clean on the inside before installation. To trap any dirt or foreign material in the gas supply line a sediment trap must be installed as shown in Figure 47. The sediment trap must be readily accessible and not subject to freezing conditions. Install in accordance with the recommendations of the local gas utility company.

GAS LINE SIZING

Minimum required supply gas line sizes are shown in Table 5 on page 10. Depending on the developed equivalent length and/or the number of appliances connected to a common main, the size of supply gas lines may have to be increased.

Size the supply/main gas line(s) in accordance with Table 13 or Table 14. The values given in Table 13 and Table 14 are for straight lengths of iron pipe at 0.5" W. C. (125 Pa) pressure drop, which is considered normal for low pressure systems. Note that fittings such as elbows and tees will add to the pipe pressure drop.

Schedule 40 Steel or Wrought Iron Pipe is the preferred material for the gas line of this water heater. It is imperative to follow the sizing recommendations in the latest version of the National Fuel Gas Code if Corrugated Stainless Steel Tubing (CSST) is used as the gas line for this water heater.

SUPPLY GAS LINE SIZING U. S. UNITS

<table>
<thead>
<tr>
<th>LENGTH IN FEET</th>
<th>NORMAL IRON PIPE SIZES (INCHES)</th>
<th>INPUT IN THOUSANDS BTU/HR</th>
</tr>
</thead>
<tbody>
<tr>
<td>10</td>
<td>1 1/4&quot; 1 1/2&quot; 2&quot; 2 1/2&quot; 3&quot; 4&quot;</td>
<td>1400 2100 3960 6300 11000 23000</td>
</tr>
<tr>
<td>20</td>
<td>950 1460 2750 4360 7700 15800</td>
<td></td>
</tr>
<tr>
<td>30</td>
<td>770 1180 2200 3520 6250 12800</td>
<td></td>
</tr>
<tr>
<td>40</td>
<td>660 990 1900 3000 5300 10900</td>
<td></td>
</tr>
<tr>
<td>50</td>
<td>580 900 1680 2650 4750 9700</td>
<td></td>
</tr>
<tr>
<td>60</td>
<td>530 810 1520 2400 4300 8800</td>
<td></td>
</tr>
<tr>
<td>70</td>
<td>490 750 1400 2250 3900 7100</td>
<td></td>
</tr>
<tr>
<td>80</td>
<td>460 690 1300 2050 3700 7500</td>
<td></td>
</tr>
<tr>
<td>90</td>
<td>430 650 1220 1950 3450 7200</td>
<td></td>
</tr>
<tr>
<td>100</td>
<td>400 620 1150 1850 3250 6700</td>
<td></td>
</tr>
<tr>
<td>125</td>
<td>360 550 1020 1650 2950 6000</td>
<td></td>
</tr>
<tr>
<td>150</td>
<td>325 500 950 1500 2650 5500</td>
<td></td>
</tr>
<tr>
<td>175</td>
<td>300 460 850 1370 2450 5000</td>
<td></td>
</tr>
<tr>
<td>200</td>
<td>N/A 430 800 1280 2280 4600</td>
<td></td>
</tr>
</tbody>
</table>

SUPPLY GAS LINE SIZING METRIC UNITS

<table>
<thead>
<tr>
<th>LENGTH IN METERS</th>
<th>NORMAL IRON PIPE SIZES (INCHES)</th>
<th>INPUT IN kW</th>
</tr>
</thead>
<tbody>
<tr>
<td>3.0</td>
<td>1 1/4&quot; 1 1/2&quot; 2&quot; 2 1/2&quot; 3&quot; 4&quot;</td>
<td>410 615 1160 1845 3221 6735</td>
</tr>
<tr>
<td>6.1</td>
<td>278 428 805 1277 2255 4626</td>
<td></td>
</tr>
<tr>
<td>9.1</td>
<td>225 346 644 1031 1830 3748</td>
<td></td>
</tr>
<tr>
<td>12.2</td>
<td>193 290 556 878 1552 3192</td>
<td></td>
</tr>
<tr>
<td>15.2</td>
<td>170 264 492 776 1391 2840</td>
<td></td>
</tr>
<tr>
<td>18.3</td>
<td>155 237 445 703 1259 2577</td>
<td></td>
</tr>
<tr>
<td>21.3</td>
<td>143 220 410 659 1142 2372</td>
<td></td>
</tr>
<tr>
<td>24.4</td>
<td>135 202 381 600 1083 2196</td>
<td></td>
</tr>
<tr>
<td>27.4</td>
<td>126 190 357 571 1010 2108</td>
<td></td>
</tr>
<tr>
<td>30.5</td>
<td>117 182 337 542 952 1962</td>
<td></td>
</tr>
<tr>
<td>38.1</td>
<td>105 161 299 483 864 1757</td>
<td></td>
</tr>
<tr>
<td>45.7</td>
<td>95 146 278 439 776 1610</td>
<td></td>
</tr>
<tr>
<td>53.3</td>
<td>88 135 249 401 717 1464</td>
<td></td>
</tr>
<tr>
<td>61.0</td>
<td>N/A 126 234 375 688 1347</td>
<td></td>
</tr>
</tbody>
</table>
GAS LINE CONNECTION
1. The water heaters covered by this manual are shipped from the factory with a 1 1/2" supply gas connection, see Table 1 on page 10. Connect the supply gas line to the water heater's 24 VAC Gas Valve in accordance with all applicable local and national code requirements, see Figure 48.

2. BTH 500 natural gas models require a 1 1/2" minimum supply gas line. All other water heaters covered by this manual require a 1 1/4" minimum supply gas line. See Table 5 on page 10.

3. Apply thread sealing compounds (pipe dope/ Teflon tape) sparingly and only to the male threads of the pipe joints. Do not apply sealing compound to the first two threads. Use pipe dope or Teflon tape marked as being resistant to the action of liquid petroleum (LP/propane) gases.

4. Use only a smooth jaw adjustable wrench (such as a monkey wrench) as a back up on the body of the 24 VAC Gas Valve when tightening the first pipe nipple into the body of the valve. DO NOT use a standard pipe wrench (Stillson wrench) with metal tooth jaws as this may permanently damage the valve.

5. Use a standard pipe wrench (Stillson wrench) as a back up on the first pipe nipple installed above when connecting other fittings and pipe in the supply gas line to prevent the 24 VAC Gas Valve on the water heater from twisting during installation.

6. To prevent damage, care must be taken not to apply too much torque when connecting the supply gas line to the water heater.

7. Install a sediment trap as shown in Figure 47 on page 39.

8. Install a Main Gas Shutoff valve in the supply gas line as shown in Figure 47 on page 39.

NOTE: Should overheating occur or the gas supply fail to shut off, turn off the Main Gas Shutoff valve to the water heater.

Any time work is done on the gas supply system perform a leak test to avoid the possibility of fire or explosion.

1. For test pressures exceeding 1/2 psi (3.45 kPa) disconnect the water heater and its Main Gas Shutoff Valve from the gas supply piping system during testing, see Figure 47 on page 39. The gas supply line must be capped when disconnected from the water heater.

2. For test pressures of 1/2 psi (3.45 kpa) or less, the water heater need not be disconnected, but must be isolated from the supply gas line by closing the Main Gas Shutoff Valve during testing.

3. Paint all supply gas line joints and connections upstream of the water heater with a rich soap and water solution to test for leaks. Bubbles indicate a gas leak. Do not use matches, candles, flame or other sources of ignition for this purpose.

4. Repair any leaks before placing the water heater in operation.

PURGING
Gas line purging is required with new piping or systems in which air has entered. Purging should be performed per the current edition of NFPA 54 the National Fuel Gas Code.

ELECTRICAL WIRING
All electrical work must be installed in accordance with the National Electrical Code, ANSI/NFPA 70 or the Canadian Electrical Code, CSA C22.1 and local requirements.

When installed, the water heater must be electrically grounded in accordance with local codes or, in the absence of local codes, with the National Electrical Code, ANSI/NFPA 70 or the Canadian Electrical Code, CSA C22.1.

If any of the original wire as supplied with the water heater must be replaced, it must be replaced with 105°C rated wiring or its equivalent, except in the burner housing. In this case 200°C rated wire must be used.

DEDICATED POWER WIRING AND BREAKERS
Dedicated power supply wires, ground wiring and dedicated circuit breakers often prevent electrical line noise and are required when installing the water heater.

POWER SUPPLY CONNECTIONS
Read the requirements for the Power Supply on page 13 before connecting power.

The 120 VAC hot wire from the power supply must connect to the black jumper wire or the "L1" terminal block location in the junction box and the 120 VAC neutral wire must connect to the white jumper wire or the "Neutral" terminal block location in the junction box for correct polarity. See Figure 49.

Power supply connections must be made as follows:
1. Turn off power at the water heater's enable/disable switch and the breaker that supplies power to the water heater.
2. Remove the junction box cover. See Figure 3 on page 8 for junction box location.
3. Connect the 120VAC hot wire from the power supply to the black jumper wire or the terminal block location marked "L1" inside of the junction box located on top of the water heater. If the black jumper wire is used, make the connection inside of the junction box with a properly sized wire nut and wrap electrical tape around the wire nut and wire end. See junction box Figure 41 and wiring diagram Figure 58 on page 66.
4. Connect the 120VAC neutral wire from the power supply to the white jumper wire or the terminal block location marked "Neutral" inside of the junction box located on top of the water heater. If the white jumper wire is used, make the connection inside of the junction box with a properly sized wire nut and wrap electrical tape around the wire nut and wire end. See junction box Figure 41 and wiring diagram Figure 58 on page 66.
NOTE: If electrical connections are made directly to the terminal block remove the jumper wires before making connection.

5. Connect the ground wire from the power supply to the green jumper wire or the ground terminal location inside of the junction box located on top of the water heater. If the green jumper wire is used, make the connection inside of the junction box with a properly sized wire nut and wrap electrical tape around the wire nut and wire end. See junction box Figure 49 and wiring diagram Figure 58 on page 66.

6. Replace the junction box cover when connections are complete.

NOTE: Do not apply power to the water heater before installation is complete and the water heater is filled with water.

**ENABLE/DISABLE CIRCUIT**
(For Building Management Systems)

The water heaters covered in this manual are equipped with an enable/disable circuit for use with field supplied external supervisory controls such as time clocks or Building Management Systems. The enable/disable circuit may be used to disable heating operation during periods when the building is unoccupied or there is no demand for hotwater.

To use the enable/disable circuit it must first be activated by selecting the “Use External Enable” from the UIM. Field supplied wiring is then installed between the water heater’s CCB and a set of “dry contacts” (no voltage or load) on the field supplied external control.

NOTE: The water heater’s enable/disable circuit is a switching circuit only: Do not apply external voltage or connect any load (IE: relay coil) to this circuit. This will damage the CCB circuit board and is not covered under the limited warranty.

**CONNECTING AN EXTERNAL SUPERVISORY CONTROL**
The enable/disable circuit is accessed from the CCB’s J17 plug inside the CCB enclosure; see Figure 3 on page 8 to locate the CCB enclosure and Figure 57 on page 65 for the CCB layout.

Install field wiring to the enable/disable circuit:

1. Turn off power at the water heater’s enable/disable switch and the breaker that supplies power to the water heater.
2. Locate the CCB enclosure.
3. Carefully remove the Temperature Probe connectors and CCB enclosure cover.
4. Locate pins 1 and 2 on the CCB J17 plug. See Figure 57 on page 65.
5. Connect the two field supplied control wires to pins 1 and 2 on the CCB J17 plug.
6. Thread the control wires out of the CCB enclosure with the other wiring and carefully replace the CCB enclosure cover. Ensure all wiring is routed through the intended area provided for strain relief. Ensure no wiring is being pinched.
7. Reinstall the CCB enclosure cover.
8. Route the control wires inside the junction box on the top of the water heater; see Figure 3 on page 8 to locate the junction box. Use an available knock-out to route the wires inside the junction box.
9. Install field supplied control wiring and conduit as required by national and local codes between the water heater’s junction box and the external supervisory control. Connect the wiring from the external control to the control wires inside the junction box using wire nuts and electrical tape.
10. Connect the control wiring to a set of dry contacts on the external control. Follow the control manufacturer’s instructions for making connections.
11. Restore power to the water heater.
12. From the water heaters UIM “Heater Information Screen” select “Use External Enable” and change to “Yes”. See Figure 3 on page 8 to locate the UIM.

NOTE: Whenever the external control opens the set of dry contacts used, water heating operation will be disabled. Whenever the external control closes the set of dry contacts used, water heating operation will be enabled. A diagonal line and circle appears over the thermometer icon on the UIM when water heating operation is disabled. See the Status Icons descriptions in Table 16 on page 45.

NOTE: Ensure the water heater is protected from freezing temperatures when water heating operation is disabled. Damage to the water heater caused by freezing temperatures is not covered under the limited warranty.

**WATER LINE CONNECTIONS**
The water piping installation must conform to these instructions and to all local and national code authority having jurisdiction. Good practice requires that all heavy piping be supported.

Read and observe all requirements in the following sections before installation of the water piping begins:

2. Dishwashing Machines on page 14.
3. Temperature-Pressure Relief Valve on page 15.
5. For multiple water heater installations see Water Piping Diagrams beginning on page 68.

**WATER PIPING DIAGRAMS**
This manual provides detailed water piping diagrams for typical methods of application for the water heaters, see Water Piping Diagrams beginning on page 68.

The water heater may be installed by itself, or with a separate storage tank. When used with a separate storage tank, the circulation may be either by gravity or by means of a circulating pump. When a circulating pump is used, it is important to note that the flow rate should be slow so that there will be a minimum of turbulence inside the water heater storage tank.

Adjust flow by throttling a full port ball valve installed in the circulating line on the outlet side of the pump. Never throttle flow on the suction side of a pump. See the Water Piping Diagrams beginning on page 68.

NOTE: In addition to the factory installed Temperature-Pressure Relief Valve (T&P valve) on the water heater, each remote storage tank that may be installed and piped to a water heating appliance must also have its own properly sized, rated and approved Temperature-Pressure Relief Valve installed.

Call the toll free technical support phone number listed on the back cover of this manual for further assistance in sizing a T&P valve for remote storage tanks.
THERMOMETERS (NOT SUPPLIED)
Thermometers are installed in the water piping system as a means of detecting the temperature of the hot water supply at critical points in the system. Field supplied thermometers should be obtained and installed. See Water Piping Diagrams on page 68.

WATER (POTABLE) HEATING AND SPACE HEATING
1. All water piping components connected to the water heater that are for space heating applications shall be suitable for use with potable water.
2. Toxic chemicals, such as those used for boiler treatment, must NEVER be introduced into this system.
3. The water heaters covered in this manual may never be connected to any existing heating system or component(s) previously used with non-potable water heating appliance.
4. When the system requires water for space heating that exceed safe temperatures at domestic water fixtures a mixing valve must be installed, see Mixing Valves on page 14.
5. These water heaters cannot be used in space heating applications only.

T&P VALVE DISCHARGE PIPE

CAUTION
Water Damage Hazard
- Temperature-Pressure Relief Valve discharge pipe must terminate at adequate drain.

Install a discharge pipe between the T&P valve discharge opening and a suitable floor drain. Do not connect discharge piping directly to the drain unless a 6" (15.2 cm) air gap is provided. To prevent bodily injury, hazard to life, or property damage, the relief valve must be allowed to discharge water in adequate quantities should circumstances demand. If the discharge pipe is not connected to a drain or other suitable means, the water flow may cause property damage.

T&P Valve Discharge Pipe Requirements:
- Shall not be smaller in size than the outlet pipe size of the valve, or have any reducing couplings or other restrictions.
- Shall not be plugged or blocked.
- Shall not be exposed to freezing temperatures.
- Shall be of material listed for hot water distribution.
- Shall be installed so as to allow complete drainage of both the Temperature-Pressure Relief Valve and the discharge pipe.
- Must terminate a maximum of six inches above a floor drain or external to the building. In cold climates, it is recommended that the discharge pipe be terminated at an adequate drain inside the building.
- Shall not have any valve or other obstruction between the relief valve and the drain.
TEMPERATURE REGULATION

HIGH TEMPERATURE LIMIT CONTROL (ECO)

This water heater is equipped with an ECO (energy cut off) non-adjustable high temperature limit switch. The ECO is a normally closed switch that opens (activates) on a rise in temperature.

The ECO is located inside the Upper Temperature Probe (two red wires), see Figure 3 on page 8 for location. The ECO switch contacts will open when the water temperature reaches approximately 202°F (94°C) and close at approximately 140°F (49°C).

If the ECO activates (contacts open) due to abnormally high water temperatures in the storage tank the control system will immediately de-energize the 24 VAC Gas Valve and end the current heating cycle. The control system will "lock out" disabling further heating operation. The control system will display the “Energy Cut Out (ECO)” Fault message on the LCD screen. It is important that a Qualified Service Agent be contacted to determine the reason for the ECO activation before resetting the ECO. Once the reason has been determined and corrected the ECO can be reset as follows:

Should the ECO activate, the water temperature must drop below 140°F (49°C) before the control system can be reset. Once the water temperature has cooled below this point the power supply to the water heater must be turned off and on again to reset the control system.

THERMOSTAT CONTROL

**DANGER**

Hot water temperatures required for automatic dishwasher and laundry use can cause scald burns resulting in serious personal injury and/or death. Table 15 shows the approximate time-to-burn relationship for normal adult skin.

The temperature at which injury occurs varies with the person’s age and duration of exposure. The slower response time of children, the elderly or disabled persons increases the hazards to them. If anyone using hot water provided by the water heater is in modulating mode, the CCB will increase the blower speed for a short period of time to clear the water heater. If the heater is in modulating mode the CCB will increase the blower speed for a short period of time to clear any condensation that has accumulated in the heat exchanger then decreases the blower speed back to the modulating firing rate.

In addition to using the lowest possible temperature setting that satisfies the demand of the application a mixing valve can be installed at the water heater (see Figure 8 on page 14) or at the hot water taps to further reduce system water temperature. Never allow small children to use a hot water tap or draw their own bath water. Never leave a child or disabled person unattended in a bathtub or shower.

The water heater should be located in an area where the general public does not have access to set temperatures.

Setting the Operating Set Point at 120°F (49°C) will reduce the risk of scalds. Some States require settings at specific lower temperatures.

**TABLE 15**

<table>
<thead>
<tr>
<th>Water Temperature °F (°C)</th>
<th>Time for 1st Degree Burn (Less Severe Burns)</th>
<th>Time for Permanent Burns 2nd &amp; 3rd Degree (Most Severe Burns)</th>
</tr>
</thead>
<tbody>
<tr>
<td>110 (43)</td>
<td>(normal shower temp.)</td>
<td></td>
</tr>
<tr>
<td>116 (47)</td>
<td>(pain threshold)</td>
<td></td>
</tr>
<tr>
<td>116 (47)</td>
<td>35 minutes</td>
<td>45 minutes</td>
</tr>
<tr>
<td>122 (50)</td>
<td>1 minute</td>
<td>5 minutes</td>
</tr>
<tr>
<td>131 (55)</td>
<td>5 seconds</td>
<td>25 seconds</td>
</tr>
<tr>
<td>140 (60)</td>
<td>2 seconds</td>
<td>5 seconds</td>
</tr>
<tr>
<td>149 (65)</td>
<td>1 second</td>
<td>2 seconds</td>
</tr>
<tr>
<td>154 (68)</td>
<td>instantaneous</td>
<td>1 second</td>
</tr>
</tbody>
</table>

The water heaters covered in this manual are equipped with an electronic control system to regulate the water temperature inside the storage tank. The control system senses temperature from two factory installed temperature probes, one installed in the top of the storage tank and one installed near the bottom, see Figure 3 on page 8 and Figure 4 on page 9 for location.

The “Operating Set Point” is adjusted to regulate water temperature inside the storage tank. This is an adjustable user setting in the control system’s “Temperatures Menu.” This and all control system menus are accessed through the UIM (user interface module) located on the front of the water heater, see Figure 52.

The Operating Set Point is adjustable from 90°F (42°C) to 180°F (82°C). The factory setting is 120°F (49°C). See Operating Set Point And Differential Adjustment on page 47 for instructions on how to adjust the Operating Set Point and other user settings.

Set the Operating Set Point at the lowest setting which produces an acceptable hot water supply. This will always provide the most energy efficient operation.

**MODULATION**

The water heaters covered in this manual are capable of modulating their firing rate. The CCB monitors the water temperature in the tank and regulates the firing rate to achieve the target temperature setpoint. The firing rate is dictated by the hot water draw, proximity to the tank temperature setpoint, and various other temperature limitations. Periodically, when the heater is in modulating mode, the CCB will increase the blower speed for a short period of time to clear any condensation that has accumulated in the heat exchanger then decreases the blower speed back to the modulating firing rate.

Higher operating temperatures cause more wear on all water heaters and will decrease the life span of the water heater. Consider installing a small booster water heater for high temperature applications, such as commercial dishwashers, to raise the outlet temperature from the larger primary water heater to the desired point of use temperature. Contact your local distributor or call the technical support phone number listed on the back cover of this manual for further technical assistance.

![Figure 50](image_url)

**HIGH TEMPERATURE APPLICATIONS**

- Tank Temperature: 103°F
- Operating Set Point: 120°F
- Status: Heating
OVERVIEW

The water heaters covered in this manual are equipped with an electronic control system that regulates water temperature inside the storage tank. Heating cycles and ignition are managed by the control system. The ECO (energy cut out), flame sensor, pressure switches and temperature probes are monitored by the control system. The Combustion Blower, spark ignition control, 24 VAC Gas Valve and anode rods are all powered by the control system.

The main components of the control system are a UIM (user interface module) and a CCB (central control board). The UIM is located on the top front side of the water heater. The CCB is mounted on top of the water heater inside a protective enclosure. This unit is equipped with an Enable/Disable switch. To operate unit, make sure the switch is set to Enable. See Features And Components on page 7 for location of these and all water heater components.

CONTROL SYSTEM NAVIGATION

All operational information and user settings are displayed and accessed from the UIM. The UIM houses the control system’s LCD (liquid crystal display) and five snap acting (momentary) user input buttons; an up, down and three (3) multi functional operational buttons below the LCD, see Figure 52.

User Input Buttons

- The up and down buttons are used to navigate menus and adjust user settings.
- The operational buttons are used to enter/exit menus, select menu items, activate adjustment modes and confirm or cancel new user settings. The operational buttons are multifunctional, their current function is defined by the text that appears directly above each button on the LCD screen.

THE DESKTOP SCREEN

During normal operation the control system will display the "Desktop" screen on the LCD which is the default screen. The control system will return to the Desktop screen when there are no active Fault or Alert conditions or when there has been no user input for several minutes.

- Manufacturer and water heater model information is displayed in Title Bar at the top of the Desktop screen. Menu titles are displayed in the Title Bar when navigating the control system menus.
- The first temperature shown on the Desktop screen, Tank Temperature, is the temperature of the water inside the water heater's storage tank.
- The second temperature shown on the Desktop screen is the Operating Set Point. The Operating Set Point is the temperature at which the control system will maintain the water inside the storage tank.
- Beneath the Operating Set Point is the "Status" line. The Status line shows the current operational state of the control system in real time, see Table 17 on page 46 for a description of the various operational states.
- The Desktop screen also displays animated "Status Icons" to convey operational information, see Table 16 on page 45 for descriptions of the Status Icons.

UIM (user interface module)

Desktop Screen Shown

<table>
<thead>
<tr>
<th>MANUFACTURER / MODEL INFORMATION</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tank Temperature</td>
</tr>
<tr>
<td>Operating Set Point</td>
</tr>
<tr>
<td>Status: Heating</td>
</tr>
</tbody>
</table>

Enable/Disable Switch

Operational buttons are multi functional. Their current function is defined by the text that appears directly above each button on the LCD screen.

Figure 52
STATUS ICONS
The Status Icons are displayed on the Desktop screen and convey operational and diagnostic information. The icons are described in the table below. See Figure 54 on page 57 and the Sequence Of Operation on page 56.

### TABLE 16

<table>
<thead>
<tr>
<th>Icon</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><img src="image1.png" alt="Icon" /></td>
<td>Water temperature in the tank has fallen. Shaded area of the animated thermometer icon will rise and fall in response to water temperature in the storage tank as sensed from the Upper and Lower Temperature Probes. See Figure 3 on page 8 and Figure 4 on page 9 for location of Temperature Probes.</td>
</tr>
<tr>
<td><img src="image2.png" alt="Icon" /></td>
<td>Water temperature in the tank has reached the Operating Set Point. The control system enters the Standby mode.</td>
</tr>
<tr>
<td><img src="image3.png" alt="Icon" /></td>
<td>The control is unable to initiate a heating cycle. This will happen whenever a Fault condition is detected by the control system or when the Enable/Disable switch on front panel is in disable position or Building Management system Enable/Disable circuit is an open circuit. Display will read “Status: Water Heating Disabled”. For more information see Enable/Disable Circuit on page 41.</td>
</tr>
<tr>
<td><img src="image4.png" alt="Icon" /></td>
<td>The Combustion Blower is being energized.</td>
</tr>
<tr>
<td><img src="image5.png" alt="Icon" /></td>
<td>The Blower Prover pressure switch contacts have closed. The check mark icon is visual confirmation of contact closure. See Figure 3 on page 8 for Blower Prover Switch location.</td>
</tr>
<tr>
<td><img src="image6.png" alt="Icon" /></td>
<td>The spark igniter is being energized. See Figure 2 on page 7 for spark igniter location.</td>
</tr>
<tr>
<td><img src="image7.png" alt="Icon" /></td>
<td>The 24 VAC Gas Valve is being energized.</td>
</tr>
<tr>
<td><img src="image8.png" alt="Icon" /></td>
<td>The control system has sensed flame at the Main Burner from the flame sensor. See the Sequence Of Operation Flow Chart on page 57 and Figure 2 on page 7.</td>
</tr>
<tr>
<td><img src="image9.png" alt="Icon" /></td>
<td>The control system has declared a Fault condition and must be inspected/serviced by a Qualified Service Agent. Fault message details can be viewed in the Current Fault menu. Heating operation is disabled (lock out) until the condition that caused the Fault is corrected. Power to the water heater must be cycled off and on at the breaker to reset the control system. <strong>NOTE:</strong> Cycling power will not reset the control system if the condition that caused the Fault has not been corrected.</td>
</tr>
<tr>
<td><img src="image10.png" alt="Icon" /></td>
<td>The control system has declared an Alert condition and must be inspected/serviced by a Qualified Service Agent. The water heater will continue to operate during an Alert condition.</td>
</tr>
</tbody>
</table>
OPERATING STATES

The current operational state of the water heater is displayed on the Desktop screen as the "Status." The common operational states are described in the table below. See Figure 54 on page 57 and the Sequence Of Operation on page 56.

TABLE 17

<table>
<thead>
<tr>
<th>State</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Standby</td>
<td>The water heater is not in an active heating cycle. IE: the Tank Temperature is at or above the Operating Set Point.</td>
</tr>
<tr>
<td>Input Verification</td>
<td>The control system is conducting a diagnostic check at the beginning of a heating cycle.</td>
</tr>
<tr>
<td>Water heating disabled</td>
<td>A Fault condition is detected by the control or when the Enable/Disable switch on front panel is in disable position or the Building Management system Enable/Disable is an open circuit.</td>
</tr>
<tr>
<td>Pre-Purge</td>
<td>The Combustion Blower is energized to flush residual flue gases from the combustion chamber prior to ignition.</td>
</tr>
<tr>
<td>Spark Igniter Energized</td>
<td>The Spark Igniter is energized.</td>
</tr>
<tr>
<td>Ignition Activation</td>
<td>The 24 VAC Gas Valve is energized and opens to allow fuel gas to flow to the Main Burner.</td>
</tr>
<tr>
<td>Ignition Verification</td>
<td>The control system is monitoring the flame sensor for the required minimum flame sensing current. See the Sequence Of Operation on page 56 for minimum flame sensing current (DC micro amps) information.</td>
</tr>
<tr>
<td>Inter-Purge</td>
<td>The Combustion Blower is energized to flush residual fuel gas from the combustion chamber after a failed ignition attempt.</td>
</tr>
<tr>
<td>Heating</td>
<td>Ignition was successful, flame sensing current has been established. The water in the storage tank is being heated.</td>
</tr>
<tr>
<td>Post-Purge</td>
<td>The Combustion Blower is energized to flush residual flue gases from the combustion chamber at the end of a heating cycle.</td>
</tr>
<tr>
<td>Fault</td>
<td>The control system has detected a Fault condition. Heating operation is disabled until the Fault condition is corrected. Power to the water heater must be cycled off and on at the breaker to reset the control system. NOTE: Cycling power will not reset the control system if the condition that caused the Fault has not been corrected.</td>
</tr>
</tbody>
</table>

CONTROL SYSTEM MENUS

From the Desktop screen pressing the Operational button directly below "Menu" on the LCD will display the "Main Menu" this is where all control system menus are located. The table below describes the control system menus.

TABLE 18

<table>
<thead>
<tr>
<th>Menu</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Temperatures</td>
<td>Most commonly accessed menu. Contains the Operating Set Point and Differential user settings.</td>
</tr>
<tr>
<td>Heater Status</td>
<td>This menu displays the current state of all pressure switches and the ECO (open/closed). The on/off status of the Combustion Blower, gas valve, spark igniter, flame sensor and other monitored water heater components are displayed in this menu.</td>
</tr>
<tr>
<td>Display Settings</td>
<td>Temperature units (°F or °C), the LCD appearance (brightness/contrast) and backlight delay user adjustable settings are located in this menu.</td>
</tr>
<tr>
<td>Heater Information</td>
<td>Elapsed time of operation, total heating cycle time, heating cycle count, heating on time along with UIM and CCB software revisions can be viewed in this menu.</td>
</tr>
<tr>
<td>Current Fault</td>
<td>Displays any current Alert or Fault messages.</td>
</tr>
<tr>
<td>Fault History</td>
<td>This control system menu retains a list of the last nine (9) Fault and Alert messages with a time stamp. The newest event will replace the oldest. Faults will clear after 30 days.</td>
</tr>
<tr>
<td>Fault Occurrence</td>
<td>This control system menu retains a running total of how many times each Fault condition has occurred since the water heater was first installed. This screen does not clear and the information can not be reset.</td>
</tr>
<tr>
<td>Restore Factory Defaults</td>
<td>This control system feature allows the user to restore control system user settings to their factory default settings. Display Settings preferences ARE NOT changed when factory defaults are restored.</td>
</tr>
<tr>
<td>Help Screens</td>
<td>Text based operational and user information explaining how to change user settings, navigate the control system menus and icon descriptions.</td>
</tr>
</tbody>
</table>
USER SETTINGS & CONTROL SYSTEM MENUS

TEMPERATURES MENU

Operating Set Point And Differential Adjustment

The Operating Set Point is adjustable from 90°F (42°C) to 180°F (82°C). The factory setting is 120°F (49°C). The Differential is adjustable from 2° to 20°. The factory setting is 8°. These user settings are accessed from the Temperatures menu. The following instructions will explain how to adjust these settings and navigate the control system menus.

When the water temperature sensed by the control system from the two (upper and lower) Temperature Probes reaches the Operating Set Point the control system will end the heating cycle. A heating cycle will be activated again when the sensed water temperature drops below the Operating Set Point minus the Differential setting.

NOTE: Lower Differential settings may cause excessive heating cycles (short-cycling) which can cause premature failure of components such as the Hot Surface Igniter. Set the Differential at the highest setting which produces an acceptable hot water supply. Set the Operating Set Point to the lowest setting which produces an acceptable hot water supply for most efficient use.

<table>
<thead>
<tr>
<th>DESCRIPTION/ACTION</th>
<th>DISPLAY</th>
</tr>
</thead>
<tbody>
<tr>
<td>From the Desktop screen, press the Operational Button under MENU. The “Main Menu” screen will be displayed.</td>
<td></td>
</tr>
<tr>
<td>The Main Menu is where all control system menus are listed, see Table 18 on page 46 for a complete list and description of control system menus. Use the Up and Down Buttons to view all control system menus from the Main Menu.</td>
<td></td>
</tr>
<tr>
<td>With Temperatures menu selected (highlighted in black) in the Main Menu screen, press the Operational Button under “SELECT” to enter the Temperatures menu.</td>
<td></td>
</tr>
<tr>
<td>If the Temperatures menu is not selected use the Up and Down Buttons to select this menu item.</td>
<td></td>
</tr>
<tr>
<td>With the Operating Set Point selected in the Temperatures menu, press the Operational Button underneath “CHANGE” to activate the adjustment mode for this menu item.</td>
<td></td>
</tr>
<tr>
<td>If Operating Set Point is not selected use the Up and Down Buttons to select this menu item.</td>
<td></td>
</tr>
<tr>
<td><strong>NOTE:</strong> Higher Temperature settings increase wear and operating costs. Set the Operating Set Point to the lowest setting which produces an acceptable hot water supply. This will always provide the most energy efficient operation and longer life.</td>
<td></td>
</tr>
<tr>
<td>With the adjustment mode for the Operating Set Point activated the selection bar will change from a black fill to a black outline.</td>
<td></td>
</tr>
<tr>
<td>Use the Up and Down Buttons to change the current setting.</td>
<td></td>
</tr>
<tr>
<td>Press the Operational Button under &quot;UPDATE&quot; to save the new setting. Press the Operational Button under &quot;CANCEL&quot; to discard changes and return to the previously saved setting.</td>
<td></td>
</tr>
<tr>
<td><strong>NOTE:</strong> Use this same procedure to change the Differential setting and other adjustable user settings in the control system menus.</td>
<td></td>
</tr>
</tbody>
</table>
TEMPERATURES MENU (CONT)

<table>
<thead>
<tr>
<th>DESCRIPTION/ACTION</th>
<th>DISPLAY</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Differential - Adjustable user setting that changes the tank temperature differential with a range of 2° to 20°F. The factory setting is 8°F.</td>
<td></td>
</tr>
<tr>
<td>• Tank Temperature - non adjustable - control system sensed temperature (averaged from upper and lower temperature probes).</td>
<td></td>
</tr>
<tr>
<td>• Tank Probe Offset - adjustable user setting, range -5° to +5° (factory setting 0°).</td>
<td></td>
</tr>
</tbody>
</table>

**NOTE:** These settings should only be used if the hot water supply temperature varies greatly from the Operating Set Point setting.

The Tank Probe Offset is used to calibrate control system temperature sensing. This can improve the precision of temperature control in the storage tank and at points of use. This feature can also be used to compensate for building recirculation loops (hot water returning to the storage tank) that may cause the heating cycles to terminate prematurely.

Example: If the current sensed temperature from a temperature probe is 120°F (49°C) and the Offset setting for that probe is adjusted to a value other than 0°, the control system would calibrate or “offset” the sensed temperature from the probe and the averaged tank temperature. Heating cycles would be activated and deactivated based on the calibrated (offset) temperature. A -5° setting results in +5° hotter water.

These settings are adjusted in the same way described for the Operating Set Point And Differential Adjustment on page 47.

HEATER STATUS MENU

<table>
<thead>
<tr>
<th>DESCRIPTION/ACTION</th>
<th>DISPLAY</th>
</tr>
</thead>
<tbody>
<tr>
<td>Select Heater Status from the Main Menu and press the Operational Button under “SELECT” to enter this menu. This menu contains non adjustable operational information. Use the Up &amp; Down Buttons to navigate the menu.</td>
<td></td>
</tr>
<tr>
<td>• Status - displays the current Operating State, see Table 17 on page 46.</td>
<td></td>
</tr>
<tr>
<td>• ECO Contact, Low Gas PS, Blocked Inlet PS, Blocked Outlet PS, Blower Prover PS - displays the current state of the switch contacts; open or closed.</td>
<td></td>
</tr>
<tr>
<td>• Igniter On, Gas Valve On - displays whether or not the control system is currently energizing these water heater components; yes = energized, no = de-energized.</td>
<td></td>
</tr>
<tr>
<td>• Flame Detected - displays whether or not the control system has detected Main Burner flame during ignition from the flame sensor.</td>
<td></td>
</tr>
</tbody>
</table>

**NOTE:** Menu display is shown with Enable/Disable switch in Enable position.
### DISPLAY SETTINGS

<table>
<thead>
<tr>
<th>DESCRIPTION/ACTION</th>
<th>DISPLAY</th>
</tr>
</thead>
<tbody>
<tr>
<td>Select Display Settings from the Main Menu and press the Operational Button under &quot;SELECT&quot; to enter this menu. This menu contains adjustable display options for viewing information on the UIM's LCD screen. Use the Up &amp; Down Buttons to navigate the menu.</td>
<td></td>
</tr>
<tr>
<td><strong>Temperature Units</strong> - Adjustable user setting that changes temperature units display to Celsius °C or Fahrenheit °F.</td>
<td></td>
</tr>
<tr>
<td><strong>Backlight Delay</strong> - Adjustable user setting that determines how long the UIM's LCD backlight remains illuminated after a key has been pressed. Available settings are; Always Off, 10, 30 or 60 seconds and Always On.</td>
<td></td>
</tr>
<tr>
<td><strong>Contrast</strong> - Adjustable user setting to adjust the UIM's LCD screen contrast between text and background.</td>
<td></td>
</tr>
</tbody>
</table>

**NOTE:** These settings are adjusted in the same way described for the Operating Set Point And Differential Adjustment on page 47.

### HEATER INFORMATION

<table>
<thead>
<tr>
<th>DESCRIPTION/ACTION</th>
<th>DISPLAY</th>
</tr>
</thead>
<tbody>
<tr>
<td>Select Heater Information from the Main Menu and press the Operational Button under &quot;SELECT&quot; to enter this menu. This menu contains non adjustable operational information.</td>
<td></td>
</tr>
<tr>
<td><strong>Elapsed Time</strong> - Total accumulated time the control system (water heater) has been energized.</td>
<td></td>
</tr>
<tr>
<td><strong>Burner On Time</strong> - Total accumulated time the control system has been in the heating operating state; burner run time.</td>
<td></td>
</tr>
<tr>
<td><strong>Total Cycle Count</strong> - Total accumulated count of heating cycles.</td>
<td></td>
</tr>
<tr>
<td><strong>CCB Version</strong> - Software version for central control board.</td>
<td></td>
</tr>
<tr>
<td><strong>UIM Version</strong> - Software version for user interface module.</td>
<td></td>
</tr>
<tr>
<td><strong>Config CRC</strong> - Verifies the configuration key matches the CCB programming.</td>
<td></td>
</tr>
<tr>
<td><strong>Use External Enable</strong> - Enables/Disables the external enable circuit.</td>
<td></td>
</tr>
<tr>
<td><strong>External Enable Status</strong> - displays whether or not the external enable circuit has been activated.</td>
<td></td>
</tr>
<tr>
<td><strong>Ignition Trials</strong> - displays the number of ignition trials allowed.</td>
<td></td>
</tr>
</tbody>
</table>

**NOTE:** Historical data is stored in the configuration key. If this 'key' is replaced during servicing the historical data will be lost. The data stored in the new configuration key will no longer reflect the entire history of the water heater.

The Elapsed Time, Burner On Time and Cycle Count indicate age, usage and wear.

If the Cycle Count per day is high (divide cycle count by days to determine cycles per day) or the cycle duration is short (determine burner on time total minutes, divide burner on time total minutes by cycle count) consider raising the Differential setting to avoid short cycling and excessive component wear, see Operating Set Point And Differential Adjustment on page 47.

This historical data can also be used to assist facilities managers in forecasting planned replacement of equipment to help avoid lengthy and costly hot water supply interruptions.
CURRENT FAULT

**DESCRIPTION/ACTION**
Select Current Fault from the Main Menu and press the Operational Button under "SELECT" to enter this menu. This menu contains non adjustable operational information. Use the Up & Down Buttons to navigate the menu.

This menu contains the current Fault or Alert error message. The time the Fault or Alert message occurred appears directly below. A brief description of what causes the particular Fault or Alert condition appears below that. Pressing the Operational Button under "ADVANCED" will give more detailed service information and a list of possible causes for the Fault or Alert condition. See Fault And Alert Messages on page 59 for more detailed information and diagnostic procedures.

If there is no Fault or Alert condition active this menu will not contain any information, "(none)" will be shown next to Current Fault in the Main menu.

**DISPLAY**

<table>
<thead>
<tr>
<th>Blockage</th>
<th>Restriction in exhaust pipe. Check exhaust pipe and termination for blockage.</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Call a service professional: Your Company Name Here (press [DOWN] for more....)</td>
</tr>
</tbody>
</table>

FAULT HISTORY

**DESCRIPTION/ACTION**
Select Fault History from the Main Menu and press the Operational Button under "SELECT" to enter this menu. This menu contains non adjustable operational information. Use the Up & Down Buttons to navigate the menu.

This menu contains a list of the last nine (9) Fault and Alert messages with a time stamp. The newest event will replace the oldest.

Press the Operational Button under "VIEW" to view details for each Fault or Alert message stored.

**DISPLAY**

<table>
<thead>
<tr>
<th>Fault History</th>
<th>Fault History</th>
</tr>
</thead>
<tbody>
<tr>
<td>1: Blocked Air Intake (A7)</td>
<td>51 mins ago</td>
</tr>
<tr>
<td>2: Blocked Exhaust (A8)</td>
<td>54 mins ago</td>
</tr>
<tr>
<td>3: Low Gas Pressure (A6)</td>
<td>57 mins ago</td>
</tr>
<tr>
<td>4: Blower Prover Failure (AC)</td>
<td>0 mins ago</td>
</tr>
</tbody>
</table>

FAULT OCCURRENCE

**DESCRIPTION/ACTION**
Select Fault Occurrence from the Main Menu and press the Operational Button under "SELECT" to enter this menu. This menu contains non adjustable operational information. Use the Up & Down Buttons to navigate the menu.

This menu contains a running total of how many times each Fault condition has occurred since the water heater was first installed.

**NOTE:** Historical data is stored in the Configuration Key. If this 'key' is replaced during servicing the historical data will be lost. The data stored in the new configuration key will no longer reflect the entire history of the water heater.

**DISPLAY**

<table>
<thead>
<tr>
<th>Fault Occurrence</th>
<th>Ignition Failure</th>
<th>ECO</th>
<th>Low Gas Pressure</th>
<th>Blocked Intake Air</th>
<th>Blocked Exhaust</th>
<th>Blower Prover</th>
<th>Flame Detect Error</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>10</td>
<td>0</td>
<td>10</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>3</td>
</tr>
</tbody>
</table>

RESTORE FACTORY DEFAULTS

**DESCRIPTION/ACTION**
Select Restore Factory Defaults from the Main Menu and press the Operational Button under “SELECT” to enter this menu.

To restore the adjustable user settings to their factory default settings press the Operational Button underneath “YES.” The display will show text confirming the factory default settings have been restored.

Press the Operational Button underneath “BACK” to exit the Restore Factory Defaults menu.

**DISPLAY**

<table>
<thead>
<tr>
<th>Restore Factory Defaults</th>
<th>Are you sure you want to restore the system to factory defaults?</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>YES</td>
</tr>
<tr>
<td></td>
<td>NO</td>
</tr>
</tbody>
</table>
SERVICE CONTACT INFORMATION

The control system has a discrete menu that installing contractors and/or service agents can access to enter contact information for their customers. This contact information will be displayed with all fault and alert messages.

<table>
<thead>
<tr>
<th>DESCRIPTION/ACTION</th>
<th>DISPLAY</th>
</tr>
</thead>
<tbody>
<tr>
<td>From the Desktop Screen (see Figure 52 on page 44) press and hold down the middle (unmarked) Operational Button for 30 seconds and then release it. This will launch a discrete menu where personalized contact information can be entered. Using the UP and DOWN buttons select (highlighted in black) the &quot;Show Contact Information&quot; menu item. Press the Operational Button under &quot;CHANGE&quot; to activate the adjustment mode for this parameter.</td>
<td><img src="image" alt="Service Contact Information" /></td>
</tr>
<tr>
<td>With the adjustment mode for &quot;Show Contact Information&quot; activated the selection bar will change from a black fill to a black outline. Use the Up and Down Buttons to change the setting from &quot;No&quot; to &quot;Yes&quot; and press the Operational Button underneath &quot;UPDATE&quot; to save the new setting. <strong>NOTE:</strong> The Access Code at the bottom of the Service Contact Information screen is for manufacturing engineering purposes only. There are no user settings or information accessed through this menu item.</td>
<td><img src="image" alt="Service Contact Information" /></td>
</tr>
<tr>
<td>Using the UP and DOWN buttons select (highlighted in black) the &quot;Change Contact Name&quot; menu item. Press the Operational Button under &quot;SELECT&quot; to open the Change Contact Name menu. Follow the on screen instructions to enter your name or the name of your company. There is a maximum of 20 character spaces for this purpose. When finished press the Operational Button &quot;UPDATE&quot; to save the new Contact Name. The control system will return to the discrete menu.</td>
<td><img src="image" alt="Service Contact Information" /></td>
</tr>
<tr>
<td>Using the UP and DOWN buttons select (highlighted in black) the &quot;Change Contact Phone&quot; menu item and press the Operational Button under &quot;SELECT&quot;. Follow the on screen instructions to enter a new Contact Phone number and press the Operational Button under &quot;UPDATE&quot; to save the new phone number. When the new Contact Name and Contact Phone number have both been updated, press the Operational Button under &quot;BACK&quot; to return to the Desktop screen.</td>
<td><img src="image" alt="Service Contact Information" /></td>
</tr>
</tbody>
</table>

Enter the service contact below: Use the -> and <- keys to move between characters. Use the UP and DOWN keys to change the character. NAME: _ **< - > UPDATE**

| Current Contact Info: | YOUR COMPANY NAME HERE (123) 456-7890 Access Code | BACK | HELP |
PRIOR TO START UP
Installation and start up of this water heater requires abilities and skills equivalent to that of a licensed tradesman in the field involved, see Qualifications on page 6.

Do not place the water heater in operation if any part has been under water. Immediately call a qualified service technician to inspect the water heater and to replace any part of the control system and any gas control which has been under water.

Light the water heater in accordance with the Lighting and Operation Instruction label on the water heater and in this manual on page 53.

The water heaters covered by this manual are equipped with an electronic control system (see page 44) which automatically sequences the Combustion Blower, pre and post purging of the combustion chamber, the spark generator, the 24 VAC Gas Valve, Main Burner ignition, and flame sensing. The control system will lock out after three unsuccessful ignition attempts.

Before attempting start up, thoroughly study and familiarize yourself with the exact Sequence Of Operation, see the written Sequence Of Operation on page 56 and the Sequence Of Operation Flow Chart on page 57.

Be certain that the water heater is full of water, that air is purged from the gas and water lines and that there are no leaks in the gas and water lines. Ensure all inlet water valves are open.

FILLING THE WATER HEATER
Follow these steps to fill the water heater prior to start up.
1. Close the heater drain valve.
2. Open a nearby hot water faucet to permit the air in the system to escape.
3. Fully open the cold water inlet valve allowing the piping and water heater to fill with water.
4. Close the hot water faucet opened in Step 2 as water starts to flow.

INITIAL START UP
REQUIRED TEST EQUIPMENT
• One U-tube manometer, recommended ranges; 0-14" W.C. (0–3.5 kPa) and 0-35" W.C. (0-8.7 kPa) or pressure gauges.
• One digital manometer can be used in place of U-tube manometers or pressure gauges. Recommended ranges; -14.00 to + 14.00" W.C. (0-3.5 kPa) resolution 0.01" W.C. and 0-35" W.C. (0-8.7 kPa) resolution 0.10" W.C.

NOTE: All test equipment must be acclimated to ambient temperature before calibration and use.

PREPARATION
1. Using the control system menus, change the Operating Set Point to the lowest temperature setting, see Operating Set Point And Differential Adjustment on page 47.
2. Turn the water heater’s Enable/Disable switch to the “Disable” position.
3. Close the Main Gas Shut Off Valve, see Figure 47 on page 39.
4. Wait five (5) minutes for any residual gas to clear.
5. Connect manometer to the supply gas pressure port on the gas valve see Figure 53.

On the water heaters covered by this manual there are test ports for supply and manifold gas pressure readings on the gas valve. Using a small flat tip pocket screw driver - open the needle valve inside the supply gas pressure test port one full turn only; turn the needle valve screw counter-clockwise to open the valve. Slide the manometer sensing tube over the top of the test port, see Figure 53.
6. Open the Main Gas Shutoff Valve.
7. Measure and record the supply gas pressure, this is a "static" supply gas pressure reading; while the water heater is not firing. Adjust supply gas pressure as necessary, see Supply Gas Pressure Adjustment on page 54.
LIGHTING & OPERATION LABEL

The instruction label below is affixed to the water heater's covered by this manual at the factory and must be followed when lighting and operating the water heater.

FOR YOUR SAFETY READ BEFORE LIGHTING

WARNING: If you do not follow these instructions exactly, a fire or explosion may result causing property damage, personal injury or loss of life.

BEFORE OPERATING: ENTIRE SYSTEM MUST BE FILLED WITH WATER AND AIR PURGED FROM ALL LINES.

A. This appliance does not have a pilot. It is equipped with an ignition device which automatically lights the burner. **Do not try to light the burner by hand.**

B. BEFORE OPERATING smell all around the appliance area for gas. Be sure to smell next to the floor because some gas is heavier than air and will settle on the floor.

WHAT TO DO IF YOU SMELL GAS

- Do not try to light any appliance.
- Do not touch any electric switch; do not use any phone in your building.
- Immediately call your gas supplier from a neighbor's phone. Follow the gas supplier's instructions.

- If you cannot reach your gas supplier, call the fire department.

C. **Use only your hand to push in the control buttons. Never use tools. If the control buttons will not push in, don't try to repair them, call a qualified service technician. Force or attempted repair may result in a fire or explosion.**

D. **Do not use this appliance if any part has been under water. Immediately contact a qualified installer or service agency to replace a flooded water heater. Do not attempt to repair the unit. It must be replaced!**

OPERATING INSTRUCTIONS

1. **STOP! Read the safety information above on this label.**
2. Set the Enable/Disable switch on the control panel to the Enable position.
3. Set the thermostat to the lowest setting.
4. Set the Enable/Disable switch on the control panel to the Disable position.

5. This appliance is equipped with a device which automatically lights the burner. **DO NOT TRY TO LIGHT THE BURNER BY HAND.**

6. Wait five (5) minutes to clear out any gas. If you then smell gas, **STOP!** Follow "B" in the safety information above on this label. If you don't smell gas, go to the next step.

7. Turn on all electrical power to the appliance.
8. Set the Enable/Disable switch on the control panel to the Enable position.
9. Set the thermostat to the desired setting.

**CAUTION: Hotter water increases the risk of scald injury. Consult the instruction manual before changing temperature.**

10. If the appliance will not operate, follow the instructions "TO TURN OFF GAS TO APPLIANCE" and call your technician or gas supplier.

**WARNING: TURN OFF ALL ELECTRIC POWER BEFORE SERVICING.**

TO TURN OFF GAS TO APPLIANCE

1. Set the thermostat to the lowest setting.
2. Set the Enable/Disable switch on the control panel to the Disable position.
3. Turn off all electrical power to the appliance if service is to be performed.
Supply gas pressure shall be measured while the water heater is not firing (static pressure) AND while the water heater is firing at full capacity (dynamic pressure).

If the supply gas pressure to the water heater is not between the required minimum and maximum values given in Table 4 on page 10 adjust the supply gas regulator as necessary. Adjust the supply gas regulator(s) per the regulator manufacturer’s instructions to achieve the required “static” and “dynamic” supply gas pressure.

Multiple Appliance Installations:

In multiple water heater installations or in installations where the installed water heater(s) share a common gas supply main with other gas fired appliances; the supply gas pressures shall be measured at each water heater with all gas fired appliances connected to a common main firing at full capacity.

On multiple water heater installations the supply gas line regulators shall be adjusted to provide gas pressure to each water heater within the minimum and maximum supply pressure requirements listed in Table 4 on page 10 with all gas fired appliances connected to a common gas main firing at full capacity.

NOTE: A pressure drop of more than 1.5” W. C. (0.37 kPa) when the Main Burner ignites is an indication of an inadequate supply of gas and can lead to ignition failure, rough starts and/ or rough operation. If a drop of more than 1.5” W. C. (0.37 kPa) in supply gas pressure occurs when the Main Burner ignites, ensure the supply gas lines and regulator(s) are properly sized and installed. See the requirements for Supply Gas Regulator and Supply Gas Line on page 13. See Supply Gas Line Installation on page 39 and Supply Gas Regulator on page 13. Ensure all requirements and installation instructions are maintained.

CHECKING THE FIRING RATE

If firing rate adjustment is required follow these instructions to determine the actual firing rate of the water heater:

NOTE: The heaters covered by this manual are capable of modulating their firing rate. The firing rate should be checked with the heater operating at it's full firing rate.

1. Ensure there are no other gas fired appliances connected to the gas meter firing during this test.
2. Contact the gas supplier to determine the heating value, in Btu per cubic foot, of the gas supply.
3. Start the water heater and ensure it is firing.
4. Locate the gas meter serving the water heater.
5. Time how long (in seconds) it takes for one cubic foot of gas to be used while the water heater is firing with a stop watch.
6. Use the formula below to “clock” the gas meter and determine the actual firing rate of the water heater based on the heating value (Btu per cubic foot) of the gas supply:

\[
\frac{3600 \times H}{T} = \text{Btu/hr}
\]

Example:

\[
\frac{3600 \times 1050}{12.6} = 300,000 \text{ Btu/hr (87.9 kW)}
\]

- 3600 = seconds in one hour.
- \(T\) = time, in seconds, to burn one cubic foot of gas.
- \(H\) = heating value of gas in Btu per cubic foot.
- Btu/hr = actual firing rate of the water heater.

NOTE: 1050 Btu per cubic foot is a standard value for natural gas. Standard propane gas Btu content is 2500 Btu per cubic foot. Btu values may change in certain areas and at high elevations. Check with the local gas utility company.

TO TURN OFF GAS SUPPLY

1. Change the Operating Set Point to the lowest temperature setting, see Operating Set Point And Differential Adjustment on page 47.
2. When the water heater has completed its shut down sequence and enters the standby mode, turn the water heater’s Enable/ Disable switch to the “Disable” position. When in the "Disable" position the switch only removes electrical power from the gas valve so that water heating is disabled. The display, CCB, and other electrical components will still be energized and the display will read “Water Heating Disabled”.
3. Close the Main Gas Shutoff Valve, see Figure 47 on page 39.
The water heaters covered by this manual are certified for use without modification for altitudes up to 10,100 feet. Most gas utility companies de-rate their gas for high altitudes, making it unnecessary to install high altitude orifices.

For installations above 10,100 feet call the technical support phone number listed on the back cover of this manual for further technical assistance. Call the local gas or utility company to verify Btu per cubic foot content before calling for technical assistance and have that information available.

**NOTE:** The actual firing rate of the water heater must not exceed the input rating on the water heater's rating label under any circumstances.

**NOTE:** Due to the input rating reduction at high altitudes, the output rating of the water heater is also reduced and should be compensated for in the sizing of the equipment.
TROUBLESHOOTING

INSTALLATION CHECKLIST

The list below represents some of the most critical installation requirements that, when overlooked, often result in operational problems, down time and needless parts replacement. This is not a complete list. Before performing any troubleshooting procedures use the list below to check for installation errors. Costs to correct installation errors are not covered under the limited warranty. Ensure all installation requirements and instructions in this manual have been maintained and followed.

WATER HEATER LOCATION

1. Ensure proper clearances to combustibles are maintained and there is sufficient room to service the water heater. See Clearances on page 11.
2. Ensure the area is free of corrosive elements and flammable materials. See the instructions on page 16.

VENTING

1. Ensure the intake air and/or vent (exhaust) piping is the correct size for the installed length. See Venting Requirements on page 22.
2. Ensure the maximum equivalent feet of pipe has not been exceeded for the intake air and/or vent pipe. See Table 7-PVC/CPVC and Polypropylene on page 22.
3. Ensure the maximum number of elbows has not been exceeded in the intake air and/or vent pipe. See Venting Requirements on page 22.
4. Ensure the intake air screen is removed from the intake air connection on the water heater when installing the water heater in a Direct Vent configuration. See Figure 17 on page 24.
5. Ensure all exterior clearances for the intake air, vent, concentric, and low profile terminations are maintained. See Vertical Termination Installation on page 24, Sidewall Termination Installation on page 26, Concentric Termination Installation on page 29, Low Profile Termination Installation on page 33. These clearances and those cited by local and national codes must be maintained.

GAS SUPPLY AND PIPING

1. Ensure a supply gas regulator has been installed for each water heater. See the requirements for a Supply Gas Regulator on page 13.
2. Ensure the supply gas line to each water heater meets the minimum supply gas line size requirements. See the requirements for the Supply Gas Line on page 13 and the installation instructions on page 39 and 40.

CONDENSATE DRAIN

Ensure the condensate drain is properly connected to the exhaust elbow on the water heater with a water trap to prevent vent gases from escaping into the installed space and draining freely to a suitable floor drain. See Figure 9 on page 16 and Condensate Drain Installation on page 38.

ELECTRICAL CONNECTIONS

1. Ensure the power supply connections to the water heater are polarity correct. See the requirements for the Power Supply on page 13 and Electrical Wiring on page 40.
2. Ensure the water heater is properly grounded. Flame sensing requires an adequate earth ground. If the water heater is not properly grounded it will cause Ignition Failure.

SEQUENCE OF OPERATION

Read the Sequence of Operation below before attempting to correct any operational problems. Refer to the Features And Components section beginning on page 7 for the location of various water heater components described below. See the Sequence Of Operation Flow Chart on page 57 also.

1. When the control system is first powered, during boot up, it will display water heater model information during initialization. After a few moments the control system LCD which is part of the UIM (user interface module) will display the default screen known as the "Desktop" screen.
2. If the control system determines that the actual water temperature inside the tank is below the programmed Operating Set Point minus the Differential setting, a heating cycle is activated.
3. The control system then performs selected diagnostic system checks. This includes confirming the low gas pressure, blocked exhaust, blocked intake and ECO (energy cut out) switch contacts are closed. The Blower Prover Switch contacts are confirmed open.
4. If all diagnostic checks are successfully passed, the control system energizes the Combustion Blower for pre-purge.
5. The control system must confirm the Blower Prover Switch contacts close after the Combustion Blower is energized.
6. If the Blower Prover Switch contacts are confirmed closed the control system energizes the spark ignition control.
7. The control system energizes the 24 VAC Gas Valve allowing gas to flow to the Main Burner.
8. The control system monitors the flame sensor to confirm a flame is present at the Main Burner. If a flame is not verified during the ignition trial period the control system will try for ignition up to two more times. If flame cannot be verified after three trials for ignition, the control system will lock out and display the "Ignition Failure" Fault message.
9. If a flame is verified, the control system will de-energize the Spark Ignition Control and enter the heating mode where it will continue heating the water until the Operating Set Point is reached. At this point, the control system will de-energize the 24 VAC Gas Valve and enter the post-purge cycle (approximately 30 seconds).
10. The water heaters covered by this manual are capable of modulating their firing rate. The firing rate is dictated by the hot water draw and various other temperature limitations.
11. The Combustion Blower will run for the duration of the post-purge cycle to purge the water heater of all combustion gases. When the post-purge cycle is complete, the blower is de-energized and will coast to a stop.
12. The control system now enters the standby mode while continuing to monitor the internal storage tank water temperature and the state of other system devices. If the tank temperature drops below the Operating Set Point minus the Differential setting, the control will automatically return to Step 2 and repeat the operating cycle.
Sequence is shown with Enable/Disable Switch in the Enable position

If tank temperature drops below Operating Set Point minus Differential setting a heating cycle is activated

Control System performs diagnostic checks
Normal State of all pressure switches and ECO are checked
Blower Prover pressure switch verified open
All other pressure switches and ECO are verified closed

Combustion Blower is energized
Pre-Purge cycle

Blower Prover switch contacts confirmed closed by control system

Spark Ignition Control is energized.

24 VAC Gas Valve is energized
gas flows to Main Burner

Is flame sensed at the Main Burner?
(control system monitors the flame sensor)

Water is heated to set point

24 VAC Gas Valve de-energized

Post-Purge cycle

Water heater goes into standby mode

24 VAC Gas Valve de-energized

Inter-Purge cycle

Retries up to two more times

Control System Locks Out
"Ignition Failure"
Fault Msg is displayed

Control System Locks Out
Displays Fault Msg

"Blower Prover Open"
Fault Msg is displayed

Figure 54
OPERATIONAL PROBLEMS

WARNING
Read and understand this instruction manual and the safety messages herein before installing, operating or servicing this water heater. Failure to follow these instructions and safety messages could result in death or serious injury.
This manual must remain with the water heater.

This section of the manual is intended to be an aid in correcting common operational problems, it is not all inclusive. The installer may be able to observe and correct certain problems which might arise when the water heater is first put into operation or when it is re-fired after a prolonged shutdown. However, only qualified service agents, as defined in Qualifications on page 6, using appropriate test equipment, should perform any service procedures on the water heater.

NOTE: Call the technical support phone number listed on the back cover of this manual for further technical assistance or to locate a qualified service agent in your area.

INSTALLATION ERRORS
Operational problems on new installations are often the result of installation requirements that have been overlooked rather than failed components. IE: A "Low Gas Pressure" Fault condition is most often caused by low supply gas pressure rather than a defective Low Gas Pressure switch. Rough starting and rough operation are often caused by undersized supply gas lines and/or the absence of a supply gas regulator at the water heater.

Prior to performing any operational checks inspect the water heater installation to ensure all installation requirements and instructions have been maintained and followed. See the Installation Checklist on page 56.

NOTE: Costs to correct installation errors are not covered under the limited warranty.

ROUGH STARTING, ROUGH OPERATION

WARNING
Fire and Explosion Hazard
• Do not use water heater with any gas other than the gas shown on the rating label.
• Excessive gas pressure to gas valve can cause serious injury or death.
• Turn off gas lines during installation.
• Contact a qualified installer or service agency for installation and service.

• Undersized supply gas line (low volume of supply gas) - see Supply Gas Line on page 13.
• Supply gas regulator is not installed per installation requirements (erratic gas supply volume/pressures) - see Supply Gas Regulator on page 13.
• Excessive supply gas pressure - see Table 4 on page 10 and Supply Gas Pressure Adjustment on page 54.
• Vent (exhaust) gas recirculation at the vent and intake air pipe terminations on Direct Vent installations - see Direct Vent Installation on page 23.
• Excessive equivalent lengths of intake air and/or vent (exhaust) piping installed - see Venting Requirements on page 22.
• Debris clogging/blocking the intake air screen(s) - see Figure 17 on page 24 and Figure 22 on page 26.
• Debris clogging/blocking the Main Burner - see Figure 2 on page 7.

MOMENTARY IGNITION

CAUTION
Burn Hazard
• The combustion chamber and burner sleeve and housing become very hot during operation.
• Do not reach into the burner housing or combustion chamber if the water heater is still hot.
• Allow the water heater to cool and always use gloves when handling the main burner.

If the Main Burner ignites momentarily but does not sustain ignition allow the water heater to try to ignite up to two more times until control system locks out and the Ignition Failure Fault message is displayed on the control system’s LCD. If the water heater is experiencing rough starts - see Rough Starting, Rough Operation on this page. For momentary ignition problems without rough starting check the following:

• Undersized supply gas line (low volume of supply gas) - see Supply Gas Line on page 39.
• Supply gas regulator is not installed per installation requirements (erratic gas supply volume/pressures) - see Supply Gas Regulator on page 13.
• See the list of possible causes and things to check and repair for the Ignition Failure Fault message on page 60.
• Debris clogging/blocking the intake air screen(s) - see Figure 17 on page 24 and Figure 22 on page 26.
• Debris clogging/blocking the Main Burner - see Figure 2 on page 7.

NOT ENOUGH OR NO HOT WATER

• No power to the water heater, check breaker or fuses.
• Enable/Disable switch in "Disabled" position. Set to "Enable" to allow unit to operate.
• Hot water supply valve(s) to fixtures closed.
• Operating Set Point is set too low, Differential setting is set too high. See Control System Operation on page 44.
• Tank Probe Offset is causing the heating cycles to terminate prematurely - see Temperatures Menu (cont) on page 48.
• The heating capacity of the water heater has been exceeded, the water heater is unable to meet demand.
• Colder incoming water temperature lengthening the time required to heat water to desired temperature.
• Hot water piping leaks, open faucets, water heater drain valve leaking or open.
• Sediment or lime scale accumulation may be affecting water heater operation. See Maintenance on page 62 for sediment and lime scale removal procedures.
• Water heater not firing at full input rating. Check actual firing rate of the water heater, see instructions on page 54. Note that the water heaters covered by this manual are capable of modulating their firing rate. The firing rate is dictated by the hot water draw and various other temperature limitations.

WATER IS TOO HOT
• Operating Set Point is set too high. See Operating Set Point And Differential Adjustment on page 47.
• If installed check Thermostatic Mixing Valve settings.
• Tank Probe Offset setting improperly set - see Temperatures Menu (cont) on page 48.
• Lime build-up on temperature probes. Inspect and clean.
• Improper water piping - see diagrams beginning on page 68.

NOISY OPERATION
• Sediment or lime scale accumulations can cause rumbling and pounding noises during heating cycles. See the Maintenance section of this manual beginning on page 62 for sediment and lime scale removal procedures.
• Normal operating noise of electrical components; Combustion Blower, transformer hum, relay contact closure.

WATER LEAKAGE IS SUSPECTED
• Ensure the water heater drain valve is tightly closed.
• Check cleanout opening for leaks - see Figure 4 on page 9.
• Check inlet/outlet water connections and system piping.
• Check the Temperature-Pressure Relief Valve.
  • Excessive water temperature.
  • Excessive water pressure.
  • Defective Temperature-Pressure Relief Valve.

NOTE: Excessive water pressure is the most common cause of Temperature-Pressure Relief Valve leakage. Excessive water system pressure is most often caused by "thermal expansion" in a "closed system." See Thermal Expansion and Closed Water Systems on page 14. The Temperature-Pressure Relief Valve is not intended for the constant relief of thermal expansion.

Temperature-Pressure Relief Valve leakage due to pressure build up in a closed system that does not have a thermal expansion tank installed is not covered under the limited warranty. Thermal expansion tanks must be installed on all closed water systems.

REPLACEMENT PARTS
Replacement parts may be ordered from the manufacturer, authorized service agencies or distributors. When ordering parts be sure to have the complete water heater Model Number, Serial Number and Series Number available. This information can be found on the rating label affixed to the water heater.

Refer to the parts list included with the water heater from the factory for more information or call the parts department or technical support phone number listed on the back cover of this manual for further assistance.

FAULT AND ALERT CONDITIONS

FAULT CONDITIONS
When the control system declares a Fault condition it will display a Fault message on the control system's LCD with an exclamation "!” mark. The control system will lock out and disable heating operation until the condition is corrected. The water heater must be serviced by a qualified service agent before operation can be restored.

ALERT CONDITIONS
When the control system declares an Alert condition it will display an Alert message on the control system's LCD with a question "?” mark. The water heater will continue to operate during an Alert condition but the water heater must be serviced by a qualified service agent as soon as possible.

RESETTING CONTROL SYSTEM LOCK OUTS
To reset the control system from a lock out condition; turn the electrical power supply off for approximately 20 seconds and then back on. Keep in mind; if the condition that caused the Fault has not been corrected, the control system will continue to lock out.

DIAGNOSTIC CHECKS

The following section, Fault And Alert Messages on page 60 and 61, lists some of the messages the control system will display on the LCD when there are operational problems. This is not a complete list. Along with each of the Fault and Alert messages described there will be a list of possible causes and things to check and repair.

Only qualified service agents, as defined in Qualifications on page 6, using appropriate test equipment, should perform any service procedures on the water heater.

NOTE: If you are not qualified and licensed or certified as required by the authority having jurisdiction to perform a given task do not attempt to perform any of the diagnostic or service procedures described in the following section.

If you do not understand the instructions in the following section do not attempt to perform any procedures.

Call the technical support phone number listed on the back cover of this manual for further technical assistance or to locate a qualified service agent in your area.

WARNING

Jumping out control circuits or components can result in property damage, personal injury or death.

• Service should only be performed by a qualified service technician using proper test equipment.
• Altering the water heater controls and/or wiring in any way could result in permanent damage to the controls or water heater and is not covered under the limited warranty.

Any bypass or alteration of the water heater controls and/or wiring will result in voiding the appliance warranty.
## FAULT AND ALERT MESSAGES

Call the technical support phone number listed on the back cover for further technical assistance or to locate a qualified service agent in your area.

<table>
<thead>
<tr>
<th>POSSIBLE CAUSES - CHECK/REPAIR</th>
<th>DISPLAYED FAULT/ALERT MESSAGE</th>
</tr>
</thead>
</table>
| • Using a manometer, ensure that gas supply pressure is above minimum requirement listed on heater’s data plate and does not drop more than 1.5” W.C. when unit fires. | ![Ignition Failure](image)  
Fault occurred 2 mins ago  
Flame not detected. Clean flame rod.  
Check gas supply. |
| • Ensure wire connections to gas valve are clean and tight.  
• Ensure wire connections to flame sensor are clean and tight.  
• Ensure wire connections to spark igniter are clean and tight.  
• Inspect flame sensor, clean/replace as needed.  
• Inspect spark igniter, realign igniter gap as needed  
• Ensure adequate electrical ground to heater. | ![Low Gas Pressure](image)  
Fault occurred 2 mins ago  
Gas pressure is below minimum required to operate this unit. Check gas pressure and switch. |
| • Confirm supply gas is turned on.  
• Using a manometer, ensure the supply gas pressure is above minimum pressure requirement listed on heater’s data plate before and during operation.  
• Ensure wire connections to gas pressure switch are clean and tight.  
• If all above conditions are met, replace gas pressure switch. | ![Blocked Exhaust](image)  
Fault occurred 2 mins ago  
Restriction in exhaust pipe. Check exhaust pipe and termination for blockage. |
| • If Blocked Exhaust error occurs when blower is running, check for restrictions in exhaust pipe, including exhaust elbow, condensate drain, and outside termination. Also check exhaust pipe installation (size/length) per manual.  
• If Blocked Exhaust error occurs before blower runs, make sure pressure switch connections are clean and tight. Check pressure switch continuity/resistance. Switch should be closed (continuity/0 ohms). Replace switch if open (no continuity).  
• Other possible causes: high wind conditions and excessive negative air pressure in building. | ![](image)  
Call a service professional:  
Your Company Name Here  
(press [DOWN] for more....) |
| ![Low Gas Pressure](image)  
Fault occurred 2 mins ago  
Gas pressure is below minimum required to operate this unit. Check gas pressure and switch.  
Call a service professional:  
Your Company Name Here  
(press [DOWN] for more....) |
| ![](image)  
Call a service professional:  
Your Company Name Here  
(press [DOWN] for more....) |
Fault and Alert Messages (Cont)
Call the technical support phone number listed on the back cover for further technical assistance or to locate a qualified service agent in your area.

<table>
<thead>
<tr>
<th>Possible Causes - Check/Repair</th>
<th>Displayed Fault/Alert Message</th>
</tr>
</thead>
</table>
| • Ensure excessive wind is not pressurizing the intake air or exhaust pipe.  
• Confirm wire connections of the blower prover switch are clean, tight, and not jumped/shorted.  
• Use multi-meter to check continuity/resistance of blower prover pressure switch. Switch should be open (no continuity) when blower is not operating. Replace switch if contacts are closed when blower is off. | Blower Operation Error  
Fault occurred 2 mins ago  
Blower Prover Pressure Switch may have failed closed. Check/replace pressure switch.  
• Call a service professional: Your Company Name Here (press [DOWN] for more....) |
| • Confirm that blower runs during a call for heat.  
• If blower runs, confirm sensing tube is connected and clear of obstructions, blower port for sensing tube is clear of obstructions, and wire connections for blower prover switch are clean and tight.  
• If all above conditions are met, replace pressure switch. | Blower Prover Open  
Fault occurred 2 mins ago  
The blower prover switch remains open after the blower has been energized.  
• Call a service professional: Your Company Name Here (press [DOWN] for more....) |
| • If Blocked Intake error occurs before blower runs, make sure pressure switch connections are clean and tight. Check pressure switch continuity/resistance. Switch should be closed (continuity/0 ohms). Replace switch if open (no continuity).  
• If Blocked Intake error occurs when blower is running, check for restrictions in intake pipe, including intake air connection, outside termination, and inlet condensate drains (if installed).  
• Other possible causes: High wind conditions, excessive negative air pressure in building. | Blocked Air Intake  
Fault occurred 2 mins ago  
Restriction in air intake. Check intake pipe and termination for blockage.  
• Call a service professional: Your Company Name Here (press [DOWN] for more....) |
| • Ensure wire connections to upper temperature probe are clean and tight.  
• Using a thermometer, check the water temperature of the heater.  
• Use a multi-meter and check for continuity between the two red wires of the upper temperature probe.  
• If the two red wires are open (no continuity) and water temperature is below 160°F, replace upper temperature probe.  
• If the water temperature exceeds 195°F, turn off electric power and gas supply and call Tech Support for further instructions. | Energy Cut Out (ECO)  
Fault occurred 2 mins ago  
Tank temperature is excessive. The water heater has been disabled.  
• Call a service professional: Your Company Name Here (press [DOWN] for more....) |
| • Confirm the water heater is full of water.  
• Confirm the powered anode wire connections are tight and free of debris or moisture (i.e. rust, solder, metal pipe shavings).  
• Confirm proper electrical ground to the water heater.  
• Inspect powered anode(s): clean/replace as needed. | Alert:  
No Water  
Alert occurred 2 mins ago  
No water detected by Powered Anode.  
• Call a service professional: Your Company Name Here (press [DOWN] for more....) |
MAINTENANCE

GENERAL

Keep water heater area clear and free from combustible materials, gasoline, and other flammable vapors and liquids. See Locating The Water Heater on page 11. Water heater maintenance includes periodic tank flushing and cleaning, and removal of lime scale. The water heater should be inspected and adjusted to maintain proper combustion. See Initial Start Up on page 52. A periodic inspection of the venting system should be made. Where used, water circulating pump(s) should be oiled according to the pump manufacturers recommendations.

PRECAUTIONS

**CAUTION**

Do not operate the water heater if it has been exposed to or exhibits the following:

- Exposed to flooding or water damage.
- External damage.
- Firing without water.
- Sooting.

Do not operate the water heater until all corrective steps have been made by a qualified service technician.

Never operate the water heater without first being certain it is filled with water and a properly sized and rated Temperature-Pressure Relief Valve is installed in the relief valve opening on the water heater. See Temperature-Pressure Relief Valve on page 15.

**WARNING**

Explosion Hazard

- Overheated water can cause water tank explosion.
- Properly sized temperature and pressure relief valve must be installed in the opening provided.

Should overheating occur or the gas supply fail to shut off, turn off the Main Gas Shutoff valve. See Figure 47 on page 39.

**DANGEROUS**

- Burn hazard.
- Hot water discharge.
- Keep hands clear of drain valve discharge.

To drain the water heater storage tank:

1. Turn off the electrical supply to the water heater.
2. Turn off the gas supply at the Main Gas Shutoff Valve if the water heater is going to be shut down for an extended period.
3. Ensure the cold water inlet valve is open.
4. Open a nearby hot water faucet and let the water run until the water is no longer hot.
5. Connect a hose to the water heater drain valve and terminate it to an adequate drain.
6. Close the cold water inlet valve.
7. Open the water heater drain valve and allow all the water to drain from the storage tank.
8. Close the water heater drain valve when all water in the storage tank has drained.
10. If the water heater is going to be shut down for an extended period, the drain valve should be left open.

MAINTENANCE SCHEDULE

**TABLE 19**

<table>
<thead>
<tr>
<th>COMPONENT</th>
<th>OPERATION</th>
<th>INTERVAL</th>
<th>REQUIRED</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tank</td>
<td>Sediment Removal</td>
<td>Semi Annually</td>
<td>Flushing</td>
</tr>
<tr>
<td>Tank</td>
<td>Lime Scale Removal</td>
<td>Semi Annually</td>
<td>UN-LIME®</td>
</tr>
<tr>
<td>Anode Rods</td>
<td>Inspection Cleaning</td>
<td>Annually</td>
<td>Clean Scale Deposits</td>
</tr>
<tr>
<td>T&amp;P Valve</td>
<td>Test Operation</td>
<td>Semi Annually</td>
<td>Test</td>
</tr>
<tr>
<td>Vent System</td>
<td>Inspection</td>
<td>Annually</td>
<td>Termination Screens Clean Reseal/Repair</td>
</tr>
</tbody>
</table>

DRAINING AND FLUSHING

It is recommended that the water heater storage tank be drained and flushed every 6 months to reduce sediment buildup. The water heater should be drained if being shut down during freezing temperatures. See Features And Components on page 7 for the location of the water heater components described below.
To Flush the tank perform the following steps:

1. Turn off the electrical supply to the water heater.
2. Ensure the cold water inlet valve is open.
3. Open a nearby hot water faucet and let the water run until the water is no longer hot. Then close the hot water faucet.
4. Connect a hose to the drain valve and terminate it to an adequate drain.
5. Ensure the drain hose is secured before and during the entire flushing procedure. Flushing is performed with system water pressure applied to the water heater.
6. Open the water heater drain valve to flush the storage tank.
7. Flush the water heater storage tank to remove sediment and allow the water to flow until it runs clean.
8. Close the water heater drain valve when flushing is completed.
9. Remove the drain hose.
10. Fill the water heater - see Filling The Water Heater on page 52.
11. Turn on the electrical supply to place the water heater back in operation.
12. Allow the water heater to complete several heating cycles to ensure it is operating properly.

FILLING THE WATER HEATER

See Filling The Water Heater on page 52.

SEDIMENT REMOVAL

Waterborne impurities consist of the particles of soil and sand which settle out and form a layer of sediment on the bottom of the tank.

For convenience, sediment removal and lime scale removal should be performed at the same time.

LIME SCALE REMOVAL

When water is heated dissolved minerals in the water such as calcium and magnesium carbonate (lime scale) become less soluble. As the water temperature rises these minerals will precipitate or “fall out” of solution.

The amount of lime scale released from water is in direct proportion to water temperature and usage. The higher the water temperature or water usage, the more lime deposits are dropped out of the water.

Water hardness also affects lime scale accumulation. With the temperature and usage being the same, hard water will release more lime scale than softer water.

Lime scale reduces heating efficiency as it accumulates inside a water heater. Heating transfer surfaces become coated with lime scale deposits which increases fuel costs to operate the water heater. Lime scale deposits can also cause rumbling and pounding noises as air molecules trapped in the lime scale escape when heated. Lime scale accumulation also reduces the life span of water heaters. For these reasons a regular schedule for deliming should be set up.

The depth of lime accumulation in the bottom of the water heater should be measured periodically. Inspect by removing the cleanout cover once every 6 months at first. Deliming maintenance should then be performed based on the time it takes for 1 inch (2.5 cm) of lime to accumulate in the bottom of the water heater.

Sediment and lime scale removal may be accomplished manually through the cleanout opening furnished on the water heater, see Figure 55.

MANUAL LIME SCALE REMOVAL

NOTE: Contact your local distributor or call the parts department phone number on the back cover of this manual to order a new cleanout gasket. Have the new gasket available before removing the cleanout cover.

The cleanout opening is shown in Figure 55. To remove lime scale manually through the cleanout opening proceed as follows:

1. Turn off the electrical supply to the water heater.
2. The water heater must be drained, see Draining And Flushing on page 62, follow the instructions on how to drain the water heater.
3. Remove outer cleanout access panel from lower side of the water heater jacket.
4. Remove the cleanout cover from cleanout opening.
5. Remove lime, scale and/or sediment using care not to damage the glass-lining.
6. Install a new cleanout gasket if required.
7. Reinstall the cleanout cover. Be sure to draw plate up tight by tightening screws securely.
8. Close the water heater drain valve.
10. Turn on the electrical supply to place the water heater back in operation. See Initial Start Up on page 52.
11. Allow the water heater to complete several heating cycles to ensure it is operating properly.
12. Check for water leakage.
13. Reinstall the cleanout access panel.

CHEMICAL LIME SCALE REMOVAL

To dissolve and remove more stubborn lime scale deposits, UN-LIME® Professional Delimer should be used.

UN-LIME® Professional Delimer is an easy to handle patented food grade acid formulated specifically for lime scale removal from all types of water using equipment. Hydrochloric base acids must not be used to delime the water heaters covered in this manual.

Follow the instructions on the UN-LIME® to delime the water heater.

NOTE: Call the parts department phone number on the back cover of this manual to order UN-LIME® Professional Delimer. See Table 20 for part numbers.
If the Temperature-Pressure Relief Valve on the water heater weeps or discharges periodically, this may be due to thermal expansion.

**NOTE:** Excessive water pressure is the most common cause of Temperature-Pressure Relief Valve leakage. Excessive water system pressure is most often caused by "thermal expansion" in a "closed system." See Thermal Expansion and Closed Water Systems on page 14. The Temperature-Pressure Relief Valve is not intended for the constant relief of thermal expansion.

Temperature-Pressure Relief Valve leakage due to pressure build up in a closed system that does not have a thermal expansion tank installed is not covered under the limited warranty. Thermal expansion tanks must be installed on all closed water systems.

**DO NOT PLUG THE TEMPERATURE-PRESSURE RELIEF VALVE OPENING. THIS CAN CAUSE PROPERTY DAMAGE, SERIOUS INJURY OR DEATH.**

**WARNING**

Explosion Hazard

- Temperature-Pressure Relief Valve must comply with ANSI Z21.22-CSA 4.4 and ASME code.
- Properly sized temperature-pressure relief valve must be installed in opening provided.
- Can result in overheating and excessive tank pressure.
- Can cause serious injury or death.

**VENT SYSTEM**

Examine the vent system once a year. Points of inspection are as follows:

1. Check for obstructions and/or deterioration of the intake air and/or vent piping and the intake air and vent terminations. Replace immediately where needed.
2. The debris screens in the intake air and vent terminations should be cleaned of foreign material and soot. See Figure 22 on page 26.
3. Do not reach inside the vent termination when the heater is in operation.
4. Check all vent system connections for leakage and repair or reseal as necessary.

**POWERED ANODE RODS**

To insure a long, trouble-free operating life, the water heaters covered in this manual are factory equipped with a powered anode system. The anode rods are of a permanent design and do not need replacing unless damaged. Inspection and cleaning should be performed once a year.

**NOTE:** Follow the instructions to drain the water heater storage tank on page 62 first. Remove the powered anodes from the water heater by loosening the 3/4" NPT bushing that forms the top of the anodes. Do not disassemble the retaining nut and wire terminal from the top while installed in the water heater, the anode's electrode may fall inside the tank. Remove the entire anode rod from the water heater prior to inspection. Clean the anode rods with a soft cloth and reinstall. Follow the instructions for filling the water heater on page 52 when finished.

**DRAIN VALVE AND ACCESS PANELS**

The water heaters covered in this manual are equipped with a drain valve, see Features And Components on page 7 for location. The water heaters covered in this manual are also equipped with a cleanout opening for sediment and lime scale removal. See Figure 55 on page 63.

**TEMPERATURE-PRESSURE RELIEF VALVE TEST**

**DANGER**

- Burn hazard.
- Hot water discharge.
- Keep clear of Temperature-Pressure Relief Valve discharge outlet.

It is recommended that the Temperature-Pressure Relief Valve should be cleaned to ensure that it is in operating condition every 6 months.

When checking the Temperature-Pressure Relief Valve operation, make sure that (1) no one is in front of or around the outlet of the Temperature-Pressure Relief Valve discharge line, and (2) that the water discharge will not cause any property damage, as the water may be extremely hot. Use care when operating valve as the valve may be hot.

To check the relief valve, lift the lever at the end of the valve several times, see Figure 56. The valve should seat properly and operate freely.

If after manually operating the valve, it fails to completely reset and continues to release water, immediately close the cold water inlet to the water heater and drain the water heater, see Draining And Flushing on page 62. Replace the Temperature-Pressure Relief Valve with a properly rated/sized new one, see Temperature-Pressure Relief Valve on page 15 for instructions on replacement.

**TABLE 20**

<table>
<thead>
<tr>
<th>Part Number</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>9005416105</td>
<td>4 - 1 gallon (case)</td>
</tr>
<tr>
<td>9005417105</td>
<td>1 - 5 gallon</td>
</tr>
</tbody>
</table>

If the Temperature-Pressure Relief Valve weeps or discharges periodically, this may be due to thermal expansion.

**NOTE:** Excessive water pressure is the most common cause of Temperature-Pressure Relief Valve leakage. Excessive water system pressure is most often caused by "thermal expansion" in a "closed system." See Thermal Expansion and Closed Water Systems on page 14. The Temperature-Pressure Relief Valve is not intended for the constant relief of thermal expansion.

Temperature-Pressure Relief Valve leakage due to pressure build up in a closed system that does not have a thermal expansion tank installed is not covered under the limited warranty. Thermal expansion tanks must be installed on all closed water systems.

**DO NOT PLUG THE TEMPERATURE-PRESSURE RELIEF VALVE OPENING. THIS CAN CAUSE PROPERTY DAMAGE, SERIOUS INJURY OR DEATH.**
CCB (CENTRAL CONTROL BOARD)

Figure 57
CIRCULATION PUMP WIRING DIAGRAMS

CIRCULATING PUMP WIRING DIAGRAM
STORAGE TANK OR BUILDING RECIRCULATION

NOTE: USE SEPARATE 120 VAC POWER SUPPLY FOR PUMP CIRCUIT. DO NOT SHARE POWER WITH APPLIANCE AS THIS MAY CAUSE ELECTRICAL LINE NOISE AND LEAD TO ERRATIC CONTROL SYSTEM OPERATION.

L1 HOT

120 VAC POWER

L2 NEUTRAL

CIRC PUMP MOTOR

FIELD SUPPLIED TEMPERATURE CONTROL INSTALLED IN THE STORAGE TANK OR CIRCULATING LOOP RETURN LINE

Figure 59

CIRCULATING PUMP WIRING DIAGRAM
DISHWASHER LOOP WITH TOGGLE SWITCH

NOTE: USE SEPARATE 120 VAC POWER SUPPLY FOR PUMP CIRCUIT. DO NOT SHARE POWER WITH APPLIANCE AS THIS MAY CAUSE ELECTRICAL LINE NOISE AND LEAD TO ERRATIC CONTROL SYSTEM OPERATION.

L1 HOT

120 VAC POWER

L2 NEUTRAL

CIRC PUMP MOTOR

Figure 60
Before installation of water piping review the following:

1. See Mixing Valves on page 14.
2. See Dishwashing Machines on page 14.
3. See Temperature-Pressure Relief Valve on page 15.

5. See Water Line Connections on page 41.
6. If a pump is being installed between a water heater and storage tank or on a building recirculation loop wire according to Figure 59 on page 67.
7. If a pump is being installed in a recirculation loop between the water heater and a commercial dishwasher wire according to Figure 60 on page 67.

**ONE WATER HEATER, SINGLE TEMPERATURE WITH BUILDING RECIRCULATION**

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**WARNING:** THIS DRAWING SHOWS SUGGESTED PIPING CONFIGURATION AND OTHER DEVICES; CHECK WITH LOCAL CODES AND ORDINANCES FOR ADDITIONAL REQUIREMENTS.

ANY MATERIAL, COMPONENT OR VENDOR CHANGE MUST HAVE PRIOR APPROVAL BY THE APPLICABLE PRODUCT ENGINEERING DEPARTMENT.

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NOTES:
1. Preferred piping method.
2. The temperature and pressure relief valve setting shall not exceed pressure rating of any component in the system.
3. Service valves are shown for servicing unit. However, local codes shall govern their usage.
WATER PIPING DIAGRAMS

Before installation of water piping review the following:

1. See Mixing Valves on page 14.
2. See Dishwashing Machines on page 14.
3. See Temperature-Pressure Relief Valve on page 15.
5. See Water Line Connections on page 41.
6. If a pump is being installed between a water heater and storage tank or on a building recirculation loop wire according to Figure 59 on page 67.
7. If a pump is being installed in a recirculation loop between the water heater and a commercial dishwasher wire according to Figure 60 on page 67.

ONE WATER HEATER, TWO TEMPERATURE WITH HIGH TEMPERATURE LOOP RECIRCULATION WITH BUILDING RECIRCULATION

WARNING: THIS DRAWING SHOWS SUGGESTED PIPING CONFIGURATION AND OTHER DEVICES; CHECK WITH LOCAL CODES AND ORDINANCES FOR ADDITIONAL REQUIREMENTS.

ANY MATERIAL, COMPONENT OR VENDOR CHANGE MUST HAVE PRIOR APPROVAL BY THE APPLICABLE PRODUCT ENGINEERING DEPARTMENT.

NOTES:
1. Preferred piping method.
2. The temperature and pressure relief valve setting shall not exceed pressure rating of any component in the system.
3. Service valves are shown for servicing unit. However, local codes shall govern their usage.
WATER PIPING DIAGRAMS

Before installation of water piping review the following:
1. See Mixing Valves on page 14.
2. See Dishwashing Machines on page 14.
3. See Temperature-Pressure Relief Valve on page 15.
5. See Water Line Connections on page 41.
6. If a pump is being installed between a water heater and storage tank or on a building recirculation loop wire according to Figure 59 on page 67.
7. If a pump is being installed in a recirculation loop between the water heater and a commercial dishwasher wire according to Figure 60 on page 67.

ONE WATER HEATER, SINGLE TEMPERATURE WITH VERTICAL STORAGE TANK FORCED RECIRCULATION WITH BUILDING RECIRCULATION

WARNING: THIS DRAWING SHOWS SUGGESTED PIPING CONFIGURATION AND OTHER DEVICES; CHECK WITH LOCAL CODES AND ORDINANCES FOR ADDITIONAL REQUIREMENTS.

ANY MATERIAL, COMPONENT OR VENDOR CHANGE MUST HAVE PRIOR APPROVAL BY THE APPLICABLE PRODUCT ENGINEERING DEPARTMENT.

NOTES:
1. Preferred piping method.
2. The temperature and pressure relief valve setting shall not exceed pressure rating of any component in the system.
3. Service valves are shown for servicing unit. However, local codes shall govern their usage.
4. The tank temperature control should be wired to and control the pump between the water heater(s) and the storage tank(s).
5. The water heater’s operating thermostat should be set 5 degrees F higher than the tank temperature control.
WATER PIPING DIAGRAMS

Before installation of water piping review the following:
1. See Mixing Valves on page 14.
2. See Dishwashing Machines on page 14.
3. See Temperature-Pressure Relief Valve on page 15.
5. See Water Line Connections on page 41.
6. If a pump is being installed between a water heater and storage tank or on a building recirculation loop wire according to Figure 59 on page 67.
7. If a pump is being installed in a recirculation loop between the water heater and a commercial dishwasher wire according to Figure 60 on page 67.

ONE WATER HEATER, SINGLE TEMPERATURE WITH HORIZONTAL STORAGE TANK FORCED RECIRCULATION WITH BUILDING RECIRCULATION

WARNING: THIS DRAWING SHOWS SUGGESTED PIPING CONFIGURATION AND OTHER DEVICES; CHECK WITH LOCAL CODES AND ORDINANCES FOR ADDITIONAL REQUIREMENTS.

ANY MATERIAL, COMPONENT OR VENDOR CHANGE MUST HAVE PRIOR APPROVAL BY THE APPLICABLE PRODUCT ENGINEERING DEPARTMENT.

LEGEND

NOTES:
1. Preferred piping method.
2. The temperature and pressure relief valve setting shall not exceed pressure rating of any component in the system.
3. Service valves are shown for servicing unit. However, local codes shall govern their usage.
4. The tank temperature control should be wired to and control the pump between the water heater(s) and the storage tank(s).
5. The water heater’s operating thermostat should be set 5 degrees F higher than the tank temperature control.
WATER PIPING DIAGRAMS

Before installation of water piping review the following:
1. See Mixing Valves on page 14.
2. See Dishwashing Machines on page 14.
3. See Temperature-Pressure Relief Valve on page 15.
5. See Water Line Connections on page 41.
6. If a pump is being installed between a water heater and storage tank or on a building recirculation loop wire according to Figure 59 on page 67.
7. If a pump is being installed in a recirculation loop between the water heater and a commercial dishwasher wire according to Figure 60 on page 67.

TWO WATER HEATERS, SINGLE TEMPERATURE WITH BUILDING RECIRCULATION

WARNING: THIS DRAWING SHOWS SUGGESTED PIPING CONFIGURATION AND OTHER DEVICES; CHECK WITH LOCAL CODES AND ORDINANCES FOR ADDITIONAL REQUIREMENTS.

ANY MATERIAL, COMPONENT OR VENDOR CHANGE MUST HAVE PRIOR APPROVAL BY THE APPLICABLE PRODUCT ENGINEERING DEPARTMENT.

NOTES:
1. Preferred piping method.
2. The temperature and pressure relief valve setting shall not exceed pressure rating of any component in the system.
3. Service valves are shown for servicing unit. However, local codes shall govern their usage.
5. See Water Line Connections on page 41.
6. If a pump is being installed between a water heater and storage tank or on a building recirculation loop, wire according to Figure 59 on page 67.
7. If a pump is being installed in a recirculation loop between the water heater and a commercial dishwasher, wire according to Figure 60 on page 67.

WATER PIPING DIAGRAMS

Before installation of water piping, review the following:
1. See Mixing Valves on page 14.
2. See Dishwashing Machines on page 14.
3. See Temperature-Pressure Relief Valve on page 15.

NOTES:
1. Preferred piping method.
2. The temperature and pressure relief valve setting shall not exceed pressure rating of any component in the system.
3. Service valves are shown for servicing unit. However, local codes may govern their usage.

LEGEND

- Temperature & Pressure Relief Valve
- Pressure Relief Valve
- Circulating Pump
- Temperature Control Probe
- Drain
- Full Port Ball Valve
- Temperature Gage
- Water Flow Switch
- Water Supply
- Expansion Tank
- Finished Floor
- Cold Water
- Hot Water
- Pipe to Open Drain
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WATER PIPING DIAGRAMS

Before installation of water piping review the following:
1. See Mixing Valves on page 14.
2. See Dishwashing Machines on page 14.
3. See Temperature-Pressure Relief Valve on page 15.
5. See Water Line Connections on page 41.
6. If a pump is being installed between a water heater and storage tank or on a building recirculation loop wire according to Figure 59 on page 67.
7. If a pump is being installed in a recirculation loop between the water heater and a commercial dishwasher wire according to Figure 60 on page 67.

FOUR WATER HEATERS, SINGLE TEMPERATURE WITH BUILDING RECIRCULATION

WARNING: THIS DRAWING SHOWS SUGGESTED PIPING CONFIGURATION AND OTHER DEVICES; CHECK WITH LOCAL CODES AND ORDINANCES FOR ADDITIONAL REQUIREMENTS.

ANY MATERIAL, COMPONENT OR VENDOR CHANGE MUST HAVE PRIOR APPROVAL BY THE APPLICABLE PRODUCT ENGINEERING DEPARTMENT.

NOTES:
1. Preferred piping method.
2. The temperature and pressure relief valve setting shall not exceed pressure rating of any component in the system.
3. Service valves are shown for servicing unit. However, local codes shall govern their usage.
# COMMERCIAL WATER HEATER LIMITED WARRANTY

## EFFECTIVE

For 3 Years, in the event of a tank leak, we will repair or, at our discretion, replace the defective water heater.

For 1 Year, in the event of part failure, we will repair or, at our discretion, replace the defective part.

We warrant this product against defects in materials or workmanship as described in this document if installed within the United States or Canada and provided the product remains at its original place of installation.

Warranty coverage begins the date of installation OR the date of manufacture if installation cannot be verified.

## WHAT'S COVERED

Subject to these terms, in the event of defect in materials and/or workmanship resulting in a **tank leak** during the **first three years**, we will:

- Replace the water heater should the tank leak.

Subject to these terms, in the event of a defect in materials and/or workmanship appearing during the **first year**, we will:

- Repair or, at our discretion, replace any part of the water heater covered under this limited warranty excluding parts subject to normal maintenance (Example: non-electronic anode rod, filter, etc)

Service/labor, shipping, delivery, installation, handling or any other costs are not covered at any time under this warranty.

Any replacement part or product will be warranted only for the unexpired portion of the original water heater’s limited warranty period.

If an identical model is no longer available due to a change in law, regulation, or standard, we will replace the product with one having comparable capacity and input. In these instances, the owner will have the option of paying the difference between what was paid for the original model and the new model with the additional features, or receiving a refund of the portion of the purchase price, on a pro-rata basis allocable to the unexpired portion of the warranty.

## WHAT'S NOT COVERED

- Problems caused by improper: gas supply line sizing, gas type, venting, connections, combustion air, voltage, wiring, or fusing
- Failure to follow applicable codes
- Failure to follow printed instructions
- Abuse, misuse, accident, fire, flood, Acts of God
- Improper installation, sizing, delivery, or maintenance
- Claims related to rust, noise, smell, or taste of water
- Failure to conduct authorized factory start up if required
- Alterations to the water heater
- Non-outdoor heaters installed outdoors
- Damages due to a failure to allow for thermal expansion
- Heat exchanger failure due to lack of adequate / proper supply of water
- Heaters moved from their original location
- Service trips to explain proper installation, use, or maintenance of the product/unit or to describe compliance requirements under applicable codes and regulations
- Charges related to accessing your heater including but not limited to door/wall removal, equipment rental, etc.
- Replacement parts after expiration of this warranty

## LIMITATIONS

**NOTWITHSTANDING ANYTHING ELSE TO THE CONTRARY, THIS IS YOUR SOLE AND EXCLUSIVE WARRANTY. ALL OTHER WARRANTIES INCLUDING A WARRANTY OF MERCHANTABILITY OR FITNESS FOR PARTICULAR PURPOSE ARE EXPRESSLY DISCLAIMED. SELLER SHALL NOT BE LIABLE FOR ANY CONSEQUENTIAL, INCIDENTAL, SPECIAL, PUNITIVE OR OTHER INDIRECT DAMAGES. TOTAL LIABILITY ARISING AT ANY TIME SHALL NOT EXCEED THE PURCHASE PRICE PAID WHETHER BASED ON CONTRACT, TORT, STRICT LIABILITY OR ANY OTHER LEGAL THEORY.**

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## SERVICE INQUIRIES:

For service inquiries call the telephone number listed below. Be prepared to provide the following information: name, address, and telephone number; the model and serial number of the water heater; proof of installation; and a clear description of the problem.

For your records, fill in the product:

<table>
<thead>
<tr>
<th>Serial: __________________</th>
<th>Model: __________________</th>
</tr>
</thead>
</table>

U.S. Customers:  
**A. O. Smith Corporation**  
500 Tennessee Waltz Parkway  
Ashland City, Tennessee 37015  
800-527-1953  
www.hotwater.com

Canadian Customers:  
**P. O. Box 310 – 768 Erie Street**  
Stratford (Ontario) N5A 6T3  
800-265-8520