**\*\* NOTES TO SPECIFIER\*\***

This section is based on the products of:

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Specializing in aquatics projects that require above-grade or elevated installations, Bradford is an American manufacturer of the finest stainless steel pools, spas, and water features in the world.

Since 1982, Bradford has worked with Architects, Aquatic Designers, Owners, and Contractors to create sensational, long-lasting stainless steel aquatic vessels. As a family owned and operated company, Bradford has over 40 years of experience and over 12,000 successful installations in every corner of the US and around the globe.

The following is a comprehensive performance specification for an elevated stainless steel spa system. The advantages of incorporating such a performance specification are as follows:

1. High-Quality Materials and Workmanship

Only the highest quality materials and highly skilled workers are used on every Bradford project.

2. Expert Manufacturers

Elevated aquatic installations pose many risks and challenges, and it is critical to work with a manufacturer that has the experience and proven track record to successfully complete the project.

3. System Performance

All aspects of the spa system have been included, ensuring that all components are designed and installed to work together seamlessly.

4. Clarity and Consistency

A clear understanding of deliverables and responsibility eliminates scope gaps and costly changes in work.

5. Quality Assurance and Compliance

Detailed submittal requirements, stringent quality control, and incorporation of the latest industry standards ensures quality at every step of the process that is so crucial for the safety, performance, and longevity of the system.

6. Robust Warranty Provisions

The industry-leading 25 year warranty of the spa vessel ensures peace of mind for the owner, reduces liability, and ensures long term performance.

7. Commissioning and Maintenance

Effective start up, testing, training, commissioning and maintenance are essential for a successful spa system.

8. Project Efficiency

The streamlined selection process for materials and products leads to faster decision making, improved project efficiency, and avoids costly delays.

This section includes editing notes to assist the user in editing the section to suit project requirements. These notes are highlighted in BLUE text.

This master specification section has been prepared by Bradford Products for use in the preparation of a performance project specification section covering elevated stainless steel spas.

The following should be noted in using this specification:

Hypertext links to specific websites are included after manufacturer names and names of organizations whose standards are referenced within the text, to assist in product selection and further research. Hypertext links are contained in parenthesis and shown in BLUE text.

Optional text requiring a selection or input by the user is enclosed within brackets, e.g.: "Section [09 0000.] [\_\_\_\_\_.]"

1. **GENERAL**
   1. SUMMARY

Edit the following paragraphs to include only those items specified in this section.

* + 1. Section Includes:
       1. Spa shell.
       2. Spa mechanical system.
       3. Spa heating system.
       4. Interior spa finish.
       5. Final testing and demonstration to Owner.

Coordinate the following paragraphs with other sections in the Project Manual.

* + 1. Related Sections:
       1. Division 01: Administrative, procedural, and temporary work requirements.
       2. Section 03 3000 - Cast-in-Place Concrete: [\_\_\_\_\_ - \_\_ \_\_\_\_\_]: Concrete deck.
       3. Section 22 1100 - Facility Water Distribution: [\_\_\_\_\_ - \_\_ \_\_\_\_\_]: Water supply.
       4. Section 22 1300 - Facility Sanitary Sewerage: [\_\_\_\_\_ - \_\_ \_\_\_\_\_]: Drainage system.
       5. Section 26 1000 - Medium Voltage Electrical Distribution: [\_\_\_\_\_ - \_\_ \_\_\_\_\_]: Power supply.
  1. REFERENCES

In the following paragraphs, retain only those reference standards that are used elsewhere in this section.

* + 1. American National Standards Institute (ANSI) ([www.ansi.org](http://www.ansi.org)) A108/A118/A136.1 - American National Specifications for the Installation of Ceramic Tile.
    2. American National Standards Institute / Association of Pool and Spa Professionals / International Code Council (ANSI/APSP/ICC) [(www.apsp.org](http://www.apsp.org)) 1 - American National Standard for Public Swimming Pools.
    3. American National Standards Institute/American Society of Mechanical Engineers (ANSI/ASME) ([www.asme.org](http://www.asme.org)) A112.19.8 - Suction Fittings for Use in Swimming Pools, Wading Pools, Spas, and Hot Tubs, Includes Addenda A.
    4. American Welding Society (AWS) [(www.aws.org](http://www.aws.org)):
       1. D1.1/D1.1M - Structural Welding Code - Steel.
       2. D1.6/D1.6M - Structural Welding Code - Stainless Steel.
    5. Association of Electrical Equipment and Medical Imaging Manufacturers (NEMA) ([www.nema.org](http://www.nema.org))) 250 - Enclosures for Electrical Equipment (1000 Volts Maximum).
    6. ASTM International (ASTM) ([www.astm.org](http://www.astm.org)):
       1. A240/A240M - Standard Specification for Chromium and Chromium-Nickel Stainless Steel Plate, Sheet, and Strip for Pressure Vessels and for General Applications.
       2. D1784 - Standard Specification for Rigid Polyvinyl Chloride (PVC) Compounds and Chlorinated Polyvinyl Chloride (CPVC) Compounds.
       3. D1785 - Standard Specification for Polyvinyl Chloride (PVC) Plastic Pipe, Schedules 40, 80, and 120.
       4. D2564 - Standard Specification for Solvent Cements for Polyvinyl Chloride (PVC) Plastic Piping Systems.
       5. D2855 - Standard Practice for Two-Step (Primer and Solvent Cement) Method of Joining Polyvinyl Chloride (PVC) or Chlorinated Polyvinyl Chloride (CPVC) Pipe and Piping Components with Tapered Sockets.
    7. International Association of Plumbing and Mechanical Officials / American National Standards Institute (IAPMO/ANSI) [(www.iapmo.org)](http://www.iapmo.org/) - Certification program.
    8. International Organization for Standardization (ISO) [(www.iso.org)](http://www.iso.org/) 9001 - Quality Management Systems - Requirements.
    9. National Fire Protection Association (NFPA) ([www.nfpa.org](http://www.nfpa.org)) 70 - National Electrical Code.
    10. National Sanitary Foundation/American National Standards Institute (NSF/ANSI) ([www.nsf.org](http://www.nsf.org)) Standard 50 - Equipment for Swimming Pools, Spas, Hot Tubs and Other Water Facilities.
    11. Underwriters Laboratories, Inc. (UL) [(www.ul.com)](http://www.ul.com) - Product Directories.
    12. Virginia Graeme Baker Pool and Spa Safety Act (VGBA).
  1. SYSTEM DESCRIPTION
     1. Spa Shell: Fully welded stainless steel floors, walls, stairs, benches, and seats.
     2. Spa Structure: Stainless steel Type 304L structural frame and supports.
     3. Spa Finish: [Non-directional buffed 316L stainless steel.] [316L stainless steel with tile trim finish.] [304L stainless steel with full tile finish.]
     4. Gutters: Stainless steel Type 316L gutters.
     5. Skimmers: Fully welded NSF approved stainless steel skimmers, substitutions not permitted.
     6. Drains: Fully welded VGBA/UL approved stainless steel Suction Outflow Fitting Assembly (SOFA), substitutions not permitted.
     7. Returns: Fully welded stainless steel returns.
     8. Hydrotherapy Jets: Fully welded stainless steel jets.
  2. SUBMITTALS

Limiting submittals to only those actually required helps to minimize liability arising from the review of submittals. Minimize submittals on smaller, less complex projects.

Include the following for submission of shop drawings, product data, and samples for the Architect's review.

* + 1. Submittals for Review:
       1. Shop Drawings:
          1. Show spa layout, dimensions, wall and floor panel layout, and stiffeners.
          2. Include diagrammatic layout for equipment and piping.
          3. Show termination and finish details for interface with adjacent construction.
       2. Product Data: Manufacturer’s descriptive data for:
          1. Piping.
          2. Filters.
          3. Pumps and strainers.
          4. Heaters.
          5. Chemical controller, feeder, and storage tank.
          6. Valves.
          7. Gauges, thermometers, and flow meters.
          8. Inlets and gratings.
       3. Performance Criteria: For products specified by performance criteria only, document conformance with design calculations or past performance records with list of previous installations and contact information.

Include the following for submission of quality control submittals. These submittals are intended for the Owner's record purposes and are not intended to be reviewed by the Architect.

* + 1. Quality Control Submittals:
       1. Certificates of Compliance: Submit certification that spa system complies with requirements of ISO 9001 and applicable codes, ordinances, rules, and regulations, ANSI/APSP/ICC 1, and ANSI/ASME A112.19.8.

Include the following for submission of closeout submittals for the Owner's record purposes.

* + 1. Closeout Submittals:
       1. Operation and Maintenance Data: Include data for spa and spa equipment, and warranty information.
       2. Project Record Documents.
       3. Owner’s Certificate of Instruction.
  1. QUALITY ASSURANCE

The following paragraphs specifies a minimum level of experience required of the parties performing the work of this section. Retain if required and edit to suit project requirements.

* + 1. Manufacturer and Equipment Supplier Qualifications:
       1. Minimum 10 years of experience in work of this Section, or successful completion of a minimum 5 projects of similar scope and complexity within the past 5 years.
       2. Manufacture all stainless steel components in-house.
       3. ISO 9001:2015 certified.

Include the following for larger, more complex projects where factory observation of spa installation is necessary. Delete for smaller, less complex projects.

* + 1. Spa Shell and Equipment Installer Qualifications:
       1. Minimum 10 years of experience in work of this Section, or successful completion of a minimum 5 projects of similar scope and complexity within the past 5 years.
       2. Trained by manufacturer of spa system.
    2. Regulatory Requirements: Perform work in accordance with applicable codes, ordinances, rules, and regulations.
    3. Spa Equipment System:
       1. Tested to NSF/ANSI 50.

Include the following paragraph when an NSF approval is required.

* + - 1. [Bear NSF Approval Rating.]
      2. Tested to ANSI/APSP/ICC 1; certified by IAPMO.

Include the following for a pre-installation conference attended by the parties performing the work of this section.

* + 1. Pre-Installation Conference:
       1. Convene at site [2] [\_\_] weeks prior to beginning work of this Section.
       2. Attendance: Architect, Contractor, spa installer, [spa manufacturer’s representative,] and related trades whose work affects spa installation.
       3. Review and discuss: Scheduling, delivery, installation, protection, and related work.
  1. DELIVERY, STORAGE AND HANDLING
     1. Store spa system components off ground and protect with waterproof covering.
     2. Protect piping and accessories from exposure to ultraviolet and from contact with chemicals that could cause damage or deterioration.
  2. WARRANTIES
     1. Furnish spa system manufacturer’s 25 year warranty providing coverage against corrosion to perforation of the spa shell.

Include the following paragraph for tile spa finishes.

* + 1. Furnish tile setting material manufacturer’s [5 year warranty against loss of tile adhesion for commercial grade ceramic tile.] [1 year warranty against loss of tile adhesion for commercial grade glass tile.]

1. **PRODUCTS**
   1. MANUFACTURERS
      1. Contract Documents are based on products by Bradford Products. [(www.bradfordproducts.com](http://www.bradfordproducts.com))

Edit the following to indicate whether substitutions will be permitted for the products in this section.

* + 1. Substitutions: [Under provisions of Division 01.] [Not permitted.]
  1. MATERIALS

In the following paragraph, select 304L for full tile finish and 316L for tile trim and all stainless steel finish spas.

* + 1. Stainless Steel: ASTM A240/A240M, Type [304L,] [316L,].
  1. EQUIPMENT
     1. Filtration and Sanitation System:
        1. Provide complete filtration system with all components.
        2. Include pumps, filters, flow meters, gauges, valves, and controls as required.
        3. No salt systems allowed.
     2. Pumps and Motors:
        1. Type and capacity as dictated by spa design to meet required flow rate.
        2. Filtration pumps: Sized to spa capacity.
        3. Motors:
           1. Totally enclosed, fan-cooled (TEFC) or open drip-proof (ODP), with hygroscopic insulation, service factor 1.15, insulation Class F, sized to operate at full load and speed, designed for continuous operation.
           2. Motor starter with current interrupter overload.
           3. Combination motor starters: Hand-off auto switch and positive overload heater coil; as manufactured by Furnas, Square D, or Westinghouse.
           4. Electrical enclosures: NEMA 250, Type 12, suitable for surface mounting.
     3. Heater: [Electric] [Gas] [Heat exchanger] type, sized to suit spa capacity.
     4. Valves and Piping:
        1. Piping: Polyvinyl chloride (PVC) composition; ASTM D1784 or ASTM D1785, Schedule 40 or 80.
        2. Cement: ASTM D2564.
        3. Provide check and ball valves as required; by same manufacturer when practical.
        4. Valve connections: Suitable for connection of adjoining pipe; of pipe size values.
        5. Hangers and supports: Sized to project conditions.
     5. Spa Fittings:
        1. Compatible with spa system components.
        2. Sized to code requirements; ensure proper hydraulic balance.
        3. Stainless steel skimmer: NSF approved.
  2. ACCESSORIES
     1. Fasteners: Stainless steel.

Include the following two paragraphs for tile spa finishes. Insert desired tile type, size, and color.

* + 1. Tile:
       1. Type: [Commercial grade ceramic.] [Commercial grade glass].
       2. Source: [\_\_\_\_] by [\_\_\_\_].
       3. Size: [\_\_\_\_] inches by [\_\_\_\_] inch thick.
       4. Color: [\_\_\_\_].
    2. Tile Setting Materials: ANSI A118.3, epoxy type, as manufactured by Laticrete International, Inc.
  1. FABRICATION
     1. Fabricate interior of spa using manufacturer’s standard processes and quality control.
     2. Perform welding using AWS certified welders in accordance with AWS D1.1/D1.1M and D1.6/D1.6M.
     3. Utilize Type 316L stainless steel filler metal at welded joints to produce uniform raised weld. Do not grind raised welds.
     4. Wall Panels:
        1. Precision fabricated for welded installation.
        2. Cut perforations for skimmers, lights, and fittings into panels using CNC laser technology.
        3. Support panel-to-panel joints using prefabricated support brace manufactured from 10 gauge stainless steel.
        4. Prevent dissimilar metals from direct contact with stainless steel.
        5. Support panels on stainless steel support frame.
        6. Use stainless steel couplings; plastic through-wall fittings not permitted.
        7. Provide UL approved welded-in stainless steel light niche.
     5. Floor Panels: [3/16 inch stainless steel plate] [7 gauge] [10 gauge].
     6. Tie stainless steel wall stiffeners at 16 inches on center to floor structure for maximum structural rigidity.
     7. Fabricate structural spa frame at 16 inches on center to accommodate spa floor or spa floor slope.

1. **EXECUTION**
   1. EXAMINATION
      1. Prior to beginning installation verify that spa slab:
         1. Has minimum 3-1/2 inches of leveled load-bearing concrete over waterproofing layer.
         2. Is level within 1/8 inch from high to low point across entire floor.
   2. INSTALLATION

Spa system must be installed on a sound, engineered concrete footer, slab, pillar system, or structural I-beams as recommended by spa manufacturer and required by applicable codes.

* + 1. Install equipment and system in accordance with manufacturer’s instructions and approved Shop Drawings.
    2. Perform welding using AWS certified welders in accordance with AWS D1.1/D1.1M and D1.6/D1.6M.
    3. Set equipment on secure foundations.
    4. Make piping joints in accordance with ASTM D2855.
    5. Support overhead piping and at connections to valves, pumps, and equipment.
    6. Install electrical components in accordance with NFPA 70.
    7. Install tile in accordance with ANSI A108.6, thin set with epoxy adhesive.
  1. FIELD QUALITY CONTROL
     1. Piping Testing:
        1. After installation and before covering piping, test to minimum 20 PSI pressure for 12 hours.
        2. If necessary, repair leaks and retest. Do not cover piping until proven watertight.
        3. Furnish test results prior to covering piping.
     2. Flushing: Flush completed piping with clean water prior to making final connections.
     3. Water Treatment:
        1. Submit chemical analysis of source water supply showing:
           1. Total alkalinity in PPM.
           2. Calcium hardness in PPM.
           3. Chlorine in PPM.
           4. pH.
        2. Treat and balance spa water just prior to Substantial Completion.
           1. Establish Total Alkalinity of 80 to 125 PPM.
           2. Establish Calcium Hardness of 100 to 200 PPM.
           3. Establish Saturation Index (SI) of 0.0 to 0.2.
           4. Establish pH of 7.4 to 7.6.
           5. Establish Bromine/Chlorine level of 2.0 to 4.0.
           6. Establish Langelier Saturation Index (LSI) of -0.3 to +0.5.
           7. Balance spa water to local health code requirements.
  2. ADJUSTING
     1. Adjust spa system for proper operation through all cycles.
  3. CLEANING
     1. Clean spa, equipment, and related surfaces.
  4. DEMONSTRATION
     1. Demonstrate proper operation and maintenance of spa system to Owner.

END OF SECTION