SPECIFICATIONS FOR

INTERIOR REMODEL TO LOCKER ROOMS

TWINSBURG FITNESS CENTER

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PREPARED BY

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TABLE OF CONTENTS

END OF TABLE OF CONTENTS

SECTION 02410

SELECTIVE INTERIOR DEMOLITION

PART 1 - GENERAL

1.1 DESCRIPTION

A. This section describes the following:
   1. Demolition and removal of selected interior portions of building or structure.
   2. Salvage of existing items to be reused.

1.2 REFERENCES

A. ANSI: American National Standards Institute
   1. ANSI/ A10.6-2006: Safety Requirements for Demolition Operations

B. NFPA: National Fire Protection Association
   1. NFPA 241-00: Standard for Safeguarding Construction, Alteration, and Demolition Operations

1.3 SUBMITTALS

A. Schedule of Selective Demolition Activities: Indicate the following:
   1. Detailed sequence of selective demolition and removal work, with starting and ending dates for each activity.
   2.
   3. Interruption of utility services. Indicate how long utility services will be interrupted.
   4. Coordination for shutoff, capping, and continuation of utility services.
   5.
   6. Locations of proposed dust- and noise-control temporary partitions and means of egress.
   7. Coordination of continuing occupancy of portions of existing building and of partial occupancy of completed work so that operations continue uninterrupted.
   8. Means of protection for items to remain and items in path of waste removal from building.

B. Inventory: After selective demolition is complete, submit a list of items that have been removed and salvaged.

C. Pre-Demolition Photographs or Videotapes: Show existing conditions of adjoining construction and site improvements, including finish surfaces, that might be misconstrued as damage caused by selective demolition operations. Submit before work begins.

1.4 QUALITY ASSURANCE

A. Demolition Firm Qualifications: An experienced firm that has specialized in demolition work similar in material and extent to that indicated for this project.

B. Refrigerant Recovery Technician Qualifications: Certified by an EPA-approved certification program.

C. Regulatory Requirements: Comply with governing EPA notification regulations before beginning selective demolition. Comply with hauling and disposal regulations of authorities having jurisdiction.

D. Standards: Comply with ANSI A10.6 and NFPA 241.

E. Pre-Demolition Meeting: Conduct meeting at project site to review methods and procedures related to selective demolition including, but not limited to, the following:
   1. Inspect and discuss condition of construction to be selectively demolished.
   2. Review structural load limitations of existing structure.
   3. Review and finalize selective demolition schedule and verify availability of materials, demolition personnel, equipment, and facilities needed to make progress and avoid delays.
   4. Review requirements of work performed by other trades that rely on substrates exposed by selective demolition operations.
   5. Review areas where existing construction is to remain and requires protection.

1.5 PROJECT CONDITIONS

A. The areas of selective demolition are within an existing building with ongoing occupant activities. Conduct selective demolition so ongoing operations will not be disrupted.

B. Provide notification of discrepancies between existing conditions and drawings before proceeding with selective demolition.

C. Storage or sale of removed items or materials on-site is not permitted.

D. Utility Service: Maintain existing utilities indicated to remain in service and protect them against damage during selective demolition operations.
   1. Maintain fire-protection facilities in service during selective demolition operations.

1.6 PROTECTION OF EXISTING WARRANTIES

A. Remove, replace, patch, and repair materials and surfaces cut or damaged during selective demolition, by methods and with materials so as not to void existing warranties.

PART 2 - PRODUCTS

Not Used.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Verify that utilities have been disconnected and capped.

B. Survey existing conditions and correlate with requirements indicated to determine extent of selective demolition required.

C. Inventory and record the condition of items to be removed and reinstalled and items to be removed and salvaged.

D. When unanticipated mechanical, electrical, or structural elements that conflict with intended function or design are encountered, investigate and measure the nature and extent of conflict. Promptly submit a written report.

E. Engage a professional engineer to survey condition of building to determine whether removing any element might result in structural deficiency or unplanned collapse of any portion of structure or adjacent structures during selective demolition operations.

F. Perform surveys as the work progresses to detect hazards resulting from selective demolition activities.

3.2 UTILITY SERVICES AND MECHANICAL/ELECTRICAL SYSTEMS

A. Existing Services/Systems: Maintain services/systems indicated to remain and protect them against damage during selective demolition operations.

B. Service/System Requirements: Locate, identify, disconnect, and seal or cap off indicated utility services and mechanical/electrical systems serving areas to be selectively demolished.
   1. The Owner will arrange to shut off indicated services/systems when requested by the Contractor.

   2. Arrange to shut off indicated utilities with utility companies.

   3. If services/systems are required to be removed, relocated, or abandoned, before proceeding with selective demolition provide temporary services/systems that bypass area of selective demolition and that maintain continuity of services/systems to other parts of building.

   4. Cut off pipe or conduit in walls or partitions to be removed. Cap, valve, or plug and seal remaining portion of pipe or conduit after bypassing.

a. Where entire wall is to be removed, existing services/systems may be removed with removal of the wall.

3.3 PREPARATION

A. Temporary Facilities: Provide temporary barricades and other protection required to prevent injury to people and damage to adjacent areas to remain.

1. Provide protection to ensure safe passage of people around selective demolition area and to and from occupied portions of building.

2. Protect walls, ceilings, floors, and other existing finish work that are to remain or that are exposed during selective demolition operations.

3. Cover and protect furniture, furnishings, and equipment that have not been removed.
4. Comply with requirements for temporary enclosures, dust control, heating, and cooling specified elsewhere.

5. Strengthen or add new supports when required during progress of selective demolition.

3.4 GENERAL SELECTIVE DEMOLITION

A. Demolish and remove existing construction only to the extent required by new construction and as indicated. Use methods required to complete the work within limitations of governing regulations and as follows:

1. Proceed with selective demolition systematically, from higher to lower level. Complete selective demolition operations above each floor or tier before disturbing supporting members on the next lower level.

2. Neatly cut openings and holes plumb, square, and true to dimensions required. Use cutting methods least likely to damage construction to remain or adjoining construction. Use hand tools or small power tools designed for sawing or grinding, not hammering and chopping, to minimize disturbance of adjacent surfaces. Temporarily cover openings to remain.

3. Cut or drill from the exposed or finished side into concealed surfaces to avoid marring existing finished surfaces.

4. Locate selective demolition equipment and remove debris and materials so as not to impose excessive loads on supporting walls, floors, or framing.

5. Dispose of demolished items and materials promptly.

B. Reuse of Building Elements: Do not demolish building elements beyond what is indicated on drawings without approval.

C. Removed and Reinstalled Items:
   1. Clean and repair items to functional condition adequate for intended reuse. Paint equipment to match new equipment.

   2. Reinstall items in locations indicated. Comply with installation requirements for new materials and equipment. Provide connections, supports, and miscellaneous materials necessary to make item functional for use indicated.

D. Existing Items to Remain: Protect construction indicated to remain against damage and soiling during selective demolition. When permitted, items may be removed to a suitable, protected storage location during selective demolition, cleaned, and reinstalled in their original locations after selective demolition operations are complete.

3.5 SELECTIVE DEMOLITION PROCEDURES FOR SPECIFIC MATERIALS

A. Concrete: Demolish in small sections. Cut concrete to a depth of at least 3/4 inch at junctures with construction to remain, using power-driven saw. Dislodge concrete from reinforcement at perimeter of areas being demolished, cut reinforcement, and then remove remainder of concrete indicated for selective demolition. Neatly trim openings to dimensions indicated.

B. Masonry: Demolish in small sections. Cut masonry at junctures with construction to remain, using power-driven saw, then remove masonry between saw cuts.

C. Concrete Slabs-on-Grade: Saw-cut perimeter of area to be demolished, then break up and remove.

3.6 DISPOSAL OF DEMOLISHED MATERIALS

A. Except for items or materials indicated to be recycled, reused, salvaged, or reinstalled, remove demolished materials from project site and legally dispose of them in an EPA-approved landfill.
   1. Do not allow demolished materials to accumulate on-site.

   2. Remove and transport debris in a manner that will prevent spillage on adjacent surfaces and areas.

   3. Remove debris from elevated portions of building by chute, hoist, or other device that will convey debris to grade level in a controlled descent.

3.7 CLEANING

A. Clean adjacent structures and improvements of dust, dirt, and debris caused by selective demolition operations. Return adjacent areas to condition existing before selective demolition operations began.

END OF SECTION 024119

SECTION 03300

CAST-IN-PLACE CONCRETE

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.

1.2 SUMMARY

A. This Section specifies cast-in place concrete, including formwork, reinforcement, concrete materials, mixture design, placement procedures, and finishes, for the following:

1. Footings.
2. Foundation walls.
3. Slabs-on-grade.

1.3 DEFINITIONS

A. Cementitious Materials: Portland cement alone or in combination with one or more of the following: blended hydraulic cement, fly ash and other pozzolans, ground granulated blast-furnace slag, and silica fume; subject to compliance with requirements.

1.4 SUBMITTALS

A. Product Data: For each type of product indicated.

B. Design Mixtures: For each concrete mixture. Submit alternate design mixtures when characteristics of materials, Project conditions, weather, test results, or other circumstances warrant adjustments.

1. Indicate amounts of mixing water to be withheld for later addition at Project site.

C. Material Certificates: For each of the following, signed by manufacturers:

1. Cementitious materials.
2. Admixtures.
3. Steel reinforcement and accessories.
4. Fiber reinforcement.
5. Floor and slab treatments.
6. Bonding agents.

7. Adhesives.
8. Vapor retarders.

D. Floor surface flatness and levelness measurements to determine compliance with specified tolerances.

E. Field quality-control test and inspection reports.

1.5 QUALITY ASSURANCE

A. Installer Qualifications: A qualified installer who employs on Project personnel qualified as ACI-certified Flatwork Technician and Finisher and a supervisor who is an ACI-certified Concrete Flatwork Technician.

B. Manufacturer Qualifications: A firm experienced in manufacturing ready-mixed concrete products and that complies with ASTM C 94/C 94M requirements for production facilities and equipment.

1. Manufacturer certified according to NRMCA's "Certification of Ready Mixed Concrete Production Facilities."

C. Source Limitations: Obtain each type or class of cementitious material of the same brand from the same manufacturer's plant, obtain aggregate from one source, and obtain admixtures through one source from a single manufacturer.

D. Welding: Qualify procedures and personnel according to AWS D1.4, "Structural Welding Code--Reinforcing Steel."

E. Concrete Testing Service: Engage a qualified independent testing agency to perform material evaluation tests and to design concrete mixtures.

1.6 DELIVERY, STORAGE, AND HANDLING

A. Steel Reinforcement: Deliver, store, and handle steel reinforcement to prevent bending and damage.[**Avoid damaging coatings on steel reinforcement.**]

B. Waterstops: Store waterstops under cover to protect from moisture, sunlight, dirt, oil, and other contaminants.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. In other Part 2 articles where titles below introduce lists, the following requirements apply to product selection:

1. Available Products: Subject to compliance with requirements, products that may be incorporated into the Work include, but are not limited to, products specified.
2. Products: Subject to compliance with requirements, provide one of the products specified.
3. Available Manufacturers: Subject to compliance with requirements, manufacturers offering products that may be incorporated into the Work include, but are not limited to, manufacturers specified.
4. Manufacturers: Subject to compliance with requirements, provide products by one of the manufacturers specified.

2.2 FORM-FACING MATERIALS

A. Smooth-Formed Finished Concrete: Form-facing panels that will provide continuous, true, and smooth concrete surfaces. Furnish in largest practicable sizes to minimize number of joints.

1. Plywood, metal, or other approved panel materials.
2. Exterior-grade plywood panels, suitable for concrete forms, complying with DOC PS 1, and as follows:

    a. High-density overlay, Class 1 or better.
    b. Medium-density overlay, Class 1 or better; mill-release agent treated and edge sealed.
    c. Structural 1, B-B or better; mill oiled and edge sealed.
    d. B-B (Concrete Form), Class 1 or better; mill oiled and edge sealed.

B. Rough-Formed Finished Concrete: Plywood, lumber, metal, or another approved material. Provide lumber dressed on at least two edges and one side for tight fit.

C. Forms for Cylindrical Columns, Pedestals, and Supports: Metal, glass-fiber-reinforced plastic, paper, or fiber tubes that will produce surfaces with gradual or abrupt irregularities not exceeding specified formwork surface class. Provide units with sufficient wall thickness to resist plastic concrete loads without detrimental deformation.

D. Pan-Type Forms: Glass-fiber-reinforced plastic or formed steel, stiffened to resist plastic concrete loads without detrimental deformation.

E. Void Forms: Biodegradable paper surface, treated for moisture resistance, structurally sufficient to support weight of plastic concrete and other superimposed loads.

F. Chamfer Strips: Wood, metal, PVC, or rubber strips, 3/4 by 3/4 inch (19 by 19 mm), minimum.

G. Rustication Strips: Wood, metal, PVC, or rubber strips, kerfed for ease of form removal.

H. Form-Release Agent: Commercially formulated form-release agent that will not bond with, stain, or adversely affect concrete surfaces and will not impair subsequent treatments of concrete surfaces.

1. Formulate form-release agent with rust inhibitor for steel form-facing materials.

I. Form Ties: Factory-fabricated, removable or snap-off metal or glass-fiber-reinforced plastic form ties designed to resist lateral pressure of fresh concrete on forms and to prevent spalling of concrete on removal.

1. Furnish units that will leave no corrodible metal closer than 1 inch (25 mm) to the plane of exposed concrete surface.
2. Furnish ties that, when removed, will leave holes no larger than 1 inch (25 mm) in diameter in concrete surface.
3. Furnish ties with integral water-barrier plates to walls indicated to receive dampproofing or waterproofing.

2.3 STEEL REINFORCEMENT

A. Reinforcing Bars: ASTM A 615/A 615M, Grade 60 deformed.

B. Low-Alloy-Steel Reinforcing Bars: ASTM A 706/A 706M, deformed.

C. Epoxy-Coated Reinforcing Bars: ASTM A 615/A 615M, Grade 60, deformed bars, epoxy coated, with less than 2 percent damaged coating in each 12-inch (300-mm) bar length.

D. Stainless-Steel Reinforcing Bars: ASTM A 955/A 955M, Grade 60 (Grade 420), Type 304, deformed.

E. Steel Bar Mats: ASTM A 184/A 184M, fabricated from ASTM A 615/A 615M, Grade 60 Grade 420, ASTM A 706/A 706M], deformed bars, assembled with clips.

F. Plain-Steel Wire: ASTM A 82, as drawn

G. Deformed-Steel Wire: ASTM A 496.

H. Epoxy-Coated Wire: ASTM A 884/A 884M, Class A, Type 1 coated, deformed-steel wire, with less than 2 percent damaged coating in each 12-inch (300-mm) wire length.

I. Plain-Steel Welded Wire Reinforcement: ASTM A 185, plain, fabricated from as-drawn steel wire into flat sheets.

J. Deformed-Steel Welded Wire Reinforcement: ASTM A 497, flat sheet.

K. Galvanized-Steel Welded Wire Reinforcement: ASTM A 185, plain, fabricated from galvanized steel wire into flat sheets.

2.4 REINFORCEMENT ACCESSORIES

A. Joint Dowel Bars: ASTM A 615/A 615M, Grade 60, plain-steel bars, cut bars true to length with ends square and free of burrs.

B. Epoxy-Coated Joint Dowel Bars: ASTM A 615/A 615M, Grade 60, plain-steel bars, ASTM A 775/A 775M epoxy coated.

C. Bar Supports: Bolsters, chairs, spacers, and other devices for spacing, supporting, and fastening reinforcing bars and welded wire reinforcement in place. Manufacture bar supports from steel wire, plastic, or precast concrete according to CRSI's "Manual of Standard Practice," of greater compressive strength than concrete and as follows:

1. For concrete surfaces exposed to view where legs of wire bar supports contact forms, use CRSI Class 1 plastic-protected steel wire or CRSI Class 2 stainless-steel bar supports.
2. For epoxy-coated reinforcement, use epoxy-coated or other dielectric-polymer-coated wire bar supports.
3. For zinc-coated reinforcement, use galvanized wire or dielectric-polymer-coated wire bar supports.

2.5 CONCRETE MATERIALS

A. Cementitious Material: Use the following cementitious materials, of the same type, brand, and source, throughout Project:

1. Portland Cement: ASTM C 150

a. Fly Ash: ASTM C 618
b. Ground Granulated Blast-Furnace Slag: ASTM C 989, Grade 100

B. Silica Fume: ASTM C 1240, amorphous silica.

C. Normal-Weight Aggregates: ASTM C 33

1. Size: 3/4 inch (19 mm) nominal.
2. Fine Aggregate: Free of materials with deleterious reactivity to alkali in cement.

D. Water: ASTM C 94/C 94M

2.6 ADMIXTURES

A. Air-Entraining Admixture: ASTM C 260.

B. Chemical Admixtures: Provide admixtures certified by manufacturer to be compatible with other admixtures and that will not contribute water-soluble chloride ions exceeding those permitted in hardened concrete. Do not use calcium chloride or admixtures containing calcium chloride.

1. Water-Reducing Admixture: ASTM C 494/C 494M, Type A.
2. Retarding Admixture: ASTM C 494/C 494M, Type B.
3. Water-Reducing and Retarding Admixture: ASTM C 494/C 494M, Type D.
4. High-Range, Water-Reducing Admixture: ASTM C 494/C 494M, Type F.
5. High-Range, Water-Reducing and Retarding Admixture: ASTM C 494/C 494M, Type G.

6. Plasticizing and Retarding Admixture: ASTM C 1017/C 1017M, Type II.

2.7 FIBER REINFORCEMENT

A. Carbon-Steel Fiber: ASTM A 820, deformed, minimum of 2"

1. Products:

a. Bekaert Corporation; Dramix.
b. Fibercon International, Inc.; Fibercon.
c. or equal

B. Flexible PVC Waterstops: CE CRD-C 572, for embedding in concrete to prevent passage of fluids through joints. Factory fabricate corners, intersections, and directional changes.

1. Manufacturers:

a. Bometals, Inc.
b. Greenstreak.
c. Meadows, W. R., Inc.
d. Murphy, Paul Plastics Co.

2.8 VAPOR RETARDERS

A. Plastic Vapor Retarder: ASTM E 1745, Class A. Include manufacturer's recommended adhesive or pressure-sensitive tape.

1. Products:

a. Fortifiber Corporation; Moistop
b. Raven Industries Inc.; Vapor Block
c. Reef Industries, Inc.; Griffolyn
d. Or equal

B. Granular Fill: Clean mixture of crushed stone or crushed or uncrushed gravel; ASTM D 448, Size 57, with 100 percent passing

2.9 FLOOR AND SLAB TREATMENTS

A. Unpigmented Mineral Dry-Shake Floor Hardener: Factory-packaged dry combination of portland cement, graded quartz aggregate, and plasticizing admixture.

1. Products:

a. Burke by Edoco; NonMetallic Floor Hardener.
b. ChemMasters; Concolor.

c. Conspec Marketing & Manufacturing Co., Inc., a Dayton Superior Company; Conshake 500.
d. Dayton Superior Corporation; Quartz Tuff.
e. Euclid Chemical Company (The); Surflex.

B. Pigmented Mineral Dry-Shake Floor Hardener: Factory-packaged, dry combination of portland cement, graded quartz aggregate, color pigments, and plasticizing admixture. Use color pigments that are finely ground, nonfading mineral oxides interground with cement.

1. Products:

a. Burke by Edoco; NonMetallic Floor Hardener-Color.
b. ChemMasters; Concolor.
c. Conspec Marketing & Manufacturing Co., Inc., a Dayton Superior Company; Conshake 600 Colortone.
d. Dayton Superior Corporation; Quartz Tuff.
e. Euclid Chemical Company (The); Surflex.

2.10 CURING MATERIALS

A. Evaporation Retarder: Waterborne, monomolecular film forming, manufactured for application to fresh concrete.

1. Products:

a. Axim Concrete Technologies; Cimfilm.
b. Burke by Edoco; BurkeFilm.
c. ChemMasters; Spray-Film.
d. Conspec Marketing & Manufacturing Co., Inc., a Dayton Superior Company; Aquafilm.
e. Dayton Superior Corporation; Sure Film.
f. Euclid Chemical Company (The); Eucobar.

B. Absorptive Cover: AASHTO M 182, Class 2, burlap cloth made from jute or kenaf, weighing approximately 9 oz./sq. yd. (305 g/sq. m) when dry.

C. Moisture-Retaining Cover: ASTM C 171, polyethylene film or white burlap-polyethylene sheet.

D. Water: Potable.

E. Clear, Waterborne, Membrane-Forming Curing Compound: ASTM C 309, Type 1, Class B, dissipating.

1. [**Available**]Products:

a. Anti-Hydro International, Inc.; AH Curing Compound #2 DR WB.
b. Burke by Edoco; Aqua Resin Cure.
c. ChemMasters; Safe-Cure Clear.

d. Conspec Marketing & Manufacturing Co., Inc., a Dayton Superior Company; W.B. Resin Cure.
e. Dayton Superior Corporation; Day Chem Rez Cure (J-11-W).
f. Euclid Chemical Company (The); Kurez DR VOX.

2.11 RELATED MATERIALS

A. Expansion- and Isolation-Joint-Filler Strips: ASTM D 1751, asphalt-saturated cellulosic fiber

B. Bonding Agent: ASTM C 1059, Type II, non-redispersible, acrylic emulsion or styrene butadiene.

C. Prepare design mixtures for each type and strength of concrete, proportioned on the basis of laboratory trial mixture or field test data, or both, according to ACI 301.

1. Use a qualified independent testing agency for preparing and reporting proposed mixture designs based on laboratory trial mixtures.

D. Cementitious Materials: Limit percentage, by weight, of cementitious materials other than portland cement in concrete as follows:

1. Fly Ash: 25 percent.
2. Combined Fly Ash and Pozzolan: 25 percent.
3. Ground Granulated Blast-Furnace Slag: 50 percent.
4. Combined Fly Ash or Pozzolan and Ground Granulated Blast-Furnace Slag: 50 percent portland cement minimum, with fly ash or pozzolan not exceeding 25 percent.
5. Silica Fume: 10 percent.
6. Combined Fly Ash, Pozzolans, and Silica Fume: 35 percent with fly ash or pozzolans not exceeding 25 percent and silica fume not exceeding 10 percent.
7. Combined Fly Ash or Pozzolans, Ground Granulated Blast-Furnace Slag, and Silica Fume: 50 percent with fly ash or pozzolans not exceeding 25 percent and silica fume not exceeding 10 percent.

E. Limit water-soluble, chloride-ion content in hardened concrete to [**0.06**] [**0.15**] [**0.30**] [**1.00**] percent by weight of cement.

F. Admixtures: Use admixtures according to manufacturer's written instructions.

1. Use water-reducing and retarding admixture when required by high temperatures, low humidity, or other adverse placement conditions.
2. Use water-reducing admixture in pumped concrete, concrete for heavy-use industrial slabs and parking structure slabs, concrete required to be watertight, and concrete with a water-cementitious materials ratio below 0.50.
3. Use corrosion-inhibiting admixture in concrete mixtures where indicated.

2.12 CONCRETE MIXTURES FOR BUILDING ELEMENTS

A. Footings: Proportion normal-weight concrete mixture as follows:

1. Minimum Compressive Strength: 4000 psi at 28 days.
2. Maximum Water-Cementitious Materials Ratio: [0.50] [0.45] [0.40] <Insert ratio>.
3. Slump Limit: 4 inches (100 mm)
4. Air Content: 6 percent, plus or minus 1.5 percent at point of delivery for 3/4-inch (19-mm)] nominal maximum aggregate size.

B. Foundation Walls: Proportion normal-weight concrete mixture as follows:

1. Minimum Compressive Strength: 4000 psi (27.6 MPa) at 28 days.
2. Maximum Water-Cementitious Materials Ratio: 0.50
3. Slump Limit: [4 inches (100 mm)]
4. Air Content: 6 percent, plus or minus 1.5 percent at point of delivery for 3/4-inch (19-mm) nominal maximum aggregate size.

C. Slabs-on-Grade: Proportion normal-weight concrete mixture as follows:

1. Minimum Compressive Strength: 3000 psi (20.7 MPa)] at 28 days.
2. Minimum Cementitious Materials Content: [470 lb/cu. yd. (279 kg/cu. m)] [520 lb/cu. yd. (309 kg/cu. m)] [540 lb/cu. yd. (320 kg/cu. m)].
3. Slump Limit: [4 inches (100 mm)], plus or minus 1 inch (25 mm).
4. Air Content: 6 percent, plus or minus 1.5 percent at point of delivery for 3/4-inch (19-mm)] nominal maximum aggregate size.
5. Air Content: Do not allow air content of troweled finished floors to exceed 3 percent.
6. Steel-Fiber Reinforcement: Add to concrete mixture, according to manufacturer's written instructions, at a rate of 50 lb/cu. yd. (29.7 kg/cu. m).

2.13 FABRICATING REINFORCEMENT

A. Fabricate steel reinforcement according to CRSI's "Manual of Standard Practice."

2.14 CONCRETE MIXING

A. Ready-Mixed Concrete: Measure, batch, mix, and deliver concrete according to ASTM C 94/C 94M, and furnish batch ticket information.

1. When air temperature is between 85 and 90 deg F (30 and 32 deg C), reduce mixing and delivery time from 1-1/2 hours to 75 minutes; when air temperature is above 90 deg F (32 deg C), reduce mixing and delivery time to 60 minutes.

PART 3 - EXECUTION

3.1 FORMWORK

A. Design, erect, shore, brace, and maintain formwork, according to ACI 301, to support vertical, lateral, static, and dynamic loads, and construction loads that might be applied, until structure can support such loads.

B. Construct formwork so concrete members and structures are of size, shape, alignment, elevation, and position indicated, within tolerance limits of ACI 117.

C. Limit concrete surface irregularities, designated by ACI 347R as abrupt or gradual, as follows:

1. Class A, 1/8 inch (3.2 mm) for smooth-formed finished surfaces.

D. Construct forms tight enough to prevent loss of concrete mortar.

E. Fabricate forms for easy removal without hammering or prying against concrete surfaces. Provide crush or wrecking plates where stripping may damage cast concrete surfaces. Provide top forms for inclined surfaces steeper than 1.5 horizontal to 1 vertical.

1. Install keyways, reglets, recesses, and the like, for easy removal.
2. Do not use rust-stained steel form-facing material.

F. Set edge forms, bulkheads, and intermediate screed strips for slabs to achieve required elevations and slopes in finished concrete surfaces. Provide and secure units to support screed strips; use strike-off templates or compacting-type screeds.

G. Provide temporary openings for cleanouts and inspection ports where interior area of formwork is inaccessible. Close openings with panels tightly fitted to forms and securely braced to prevent loss of concrete mortar. Locate temporary openings in forms at inconspicuous locations.

H. [**Chamfer**] [**Do not chamfer**] exterior corners and edges of permanently exposed concrete.

I. Form openings, chases, offsets, sinkages, keyways, reglets, blocking, screeds, and bulkheads required in the Work. Determine sizes and locations from trades providing such items.

J. Clean forms and adjacent surfaces to receive concrete. Remove chips, wood, sawdust, dirt, and other debris just before placing concrete.

K. Retighten forms and bracing before placing concrete, as required, to prevent mortar leaks and maintain proper alignment.

L. Coat contact surfaces of forms with form-release agent, according to manufacturer's written instructions, before placing reinforcement.

3.2 EMBEDDED ITEMS

A. Place and secure anchorage devices and other embedded items required for adjoining work that is attached to or supported by cast-in-place concrete. Use setting drawings, templates, diagrams, instructions, and directions furnished with items to be embedded.

1. Install anchor rods, accurately located, to elevations required and complying with tolerances in Section 7.5 of AISC's "Code of Standard Practice for Steel Buildings and Bridges."
2. Install reglets to receive waterproofing and to receive through-wall flashings in outer face of concrete frame at exterior walls, where flashing is shown at lintels, shelf angles, and other conditions.
3. Install dovetail anchor slots in concrete structures as indicated.

3.3 REMOVING AND REUSING FORMS

A. General: Formwork for sides of beams, walls, columns, and similar parts of the Work that does not support weight of concrete may be removed after cumulatively curing at not less than 50 deg F (10 deg C) for 4 hours after placing concrete, if concrete is hard enough to not be damaged by form-removal operations and curing and protection operations are maintained.

1. Leave formwork for beam soffits, joists, slabs, and other structural elements that supports weight of concrete in place until concrete has achieved[at least 70 percent of] its 28-day design compressive strength.
2. Remove forms only if shores have been arranged to permit removal of forms without loosening or disturbing shores.

B. Clean and repair surfaces of forms to be reused in the Work. Split, frayed, delaminated, or otherwise damaged form-facing material will not be acceptable for exposed surfaces. Apply new form-release agent.

C. When forms are reused, clean surfaces, remove fins and laitance, and tighten to close joints. Align and secure joints to avoid offsets. Do not use patched forms for exposed concrete surfaces unless approved by Architect.

3.4 SHORES AND RESHORES

A. Comply with ACI 318 (ACI 318M) and ACI 301 for design, installation, and removal of shoring and reshoring.

1. Do not remove shoring or reshoring until measurement of slab tolerances is complete.

B. In multistory construction, extend shoring or reshoring over a sufficient number of stories to distribute loads in such a manner that no floor or member will be excessively loaded or will induce tensile stress in concrete members without sufficient steel reinforcement.

C. Plan sequence of removal of shores and reshore to avoid damage to concrete. Locate and provide adequate reshoring to support construction without excessive stress or deflection.

3.5 VAPOR RETARDERS

A. Plastic Vapor Retarders: Place, protect, and repair vapor retarders according to ASTM E 1643 and manufacturer's written instructions.

1. Lap joints 6 inches (150 mm) and seal with manufacturer's recommended tape.

B. Bituminous Vapor Retarders: Place, protect, and repair vapor retarders according to manufacturer's written instructions.

C. Granular Course: Cover vapor retarder with granular fill, moisten, and compact with mechanical equipment to elevation tolerances of plus 0 inch (0 mm) or minus 3/4 inch (19 mm).

1. Place and compact a 1/2-inch- (13-mm-) thick layer of fine-graded granular material over granular fill.

3.6 STEEL REINFORCEMENT

A. General: Comply with CRSI's "Manual of Standard Practice" for placing reinforcement.

1. Do not cut or puncture vapor retarder. Repair damage and reseal vapor retarder before placing concrete.

B. Clean reinforcement of loose rust and mill scale, earth, ice, and other foreign materials that would reduce bond to concrete.

C. Accurately position, support, and secure reinforcement against displacement. Locate and support reinforcement with bar supports to maintain minimum concrete cover. Do not tack weld crossing reinforcing bars.

1. Weld reinforcing bars according to AWS D1.4, where indicated.

D. Set wire ties with ends directed into concrete, not toward exposed concrete surfaces.

E. Install welded wire reinforcement in longest practicable lengths on bar supports spaced to minimize sagging. Lap edges and ends of adjoining sheets at least one mesh spacing. Offset laps of adjoining sheet widths to prevent continuous laps in either direction. Lace overlaps with wire.

F. Epoxy-Coated Reinforcement: Repair cut and damaged epoxy coatings with epoxy repair coating according to ASTM D 3963/D 3963M. Use epoxy-coated steel wire ties to fasten epoxy-coated steel reinforcement.

G. Zinc-Coated Reinforcement: Repair cut and damaged zinc coatings with zinc repair material according to ASTM A 780. Use galvanized steel wire ties to fasten zinc-coated steel reinforcement.

3.7 JOINTS

A. General: Construct joints true to line with faces perpendicular to surface plane of concrete.

B. Construction Joints: Install so strength and appearance of concrete are not impaired, at locations indicated or as approved by Architect.

1. Place joints perpendicular to main reinforcement. Continue reinforcement across construction joints, unless otherwise indicated. Do not continue reinforcement through sides of strip placements of floors and slabs.
2. Form keyed joints as indicated. Embed keys at least 1-1/2 inches (38 mm) into concrete.
3. Locate joints for beams, slabs, joists, and girders in the middle third of spans. Offset joints in girders a minimum distance of twice the beam width from a beam-girder intersection.
4. Locate horizontal joints in walls and columns at underside of floors, slabs, beams, and girders and at the top of footings or floor slabs.
5. Use a bonding agent at locations where fresh concrete is placed against hardened or partially hardened concrete surfaces.
6. Use epoxy-bonding adhesive at locations where fresh concrete is placed against hardened or partially hardened concrete surfaces.

C. Contraction Joints in Slabs-on-Grade: Form weakened-plane contraction joints, sectioning concrete into areas as indicated. Construct contraction joints for a depth equal to at least one-fourth concrete thickness as follows:

1. Grooved Joints: Form contraction joints after initial floating by grooving and finishing each edge of joint to a radius of 1/8 inch (3.2 mm). Repeat grooving of contraction joints after applying surface finishes. Eliminate groover tool marks on concrete surfaces.
2. Sawed Joints: Form contraction joints with power saws equipped with shatterproof abrasive or diamond-rimmed blades. Cut 1/8-inch- (3.2-mm-) wide joints into concrete when cutting action will not tear, abrade, or otherwise damage surface and before concrete develops random contraction cracks.

D. Isolation Joints in Slabs-on-Grade: After removing formwork, install joint-filler strips at slab junctions with vertical surfaces, such as column pedestals, foundation walls, grade beams, and other locations, as indicated.

1. Extend joint-filler strips full width and depth of joint, terminating flush with finished concrete surface, unless otherwise indicated.
2. Terminate full-width joint-filler strips not less than 1/2 inch (13 mm) or more than 1 inch (25 mm) below finished concrete surface where joint sealants, specified in Division 7 Section "Joint Sealants," are indicated.

3. Install joint-filler strips in lengths as long as practicable. Where more than one length is required, lace or clip sections together.

E. Doweled Joints: Install dowel bars and support assemblies at joints where indicated. Lubricate or asphalt coat one-half of dowel length to prevent concrete bonding to one side of joint.

3.8 WATERSTOPS

A. Flexible Waterstops: Install in construction joints and at other joints indicated to form a continuous diaphragm. Install in longest lengths practicable. Support and protect exposed waterstops during progress of the Work. Field fabricate joints in waterstops according to manufacturer's written instructions.

B. Self-Expanding Strip Waterstops: Install in construction joints and at other locations indicated, according to manufacturer's written instructions, adhesive bonding, mechanically fastening, and firmly pressing into place. Install in longest lengths practicable.

3.9 CONCRETE PLACEMENT

A. Before placing concrete, verify that installation of formwork, reinforcement, and embedded items is complete and that required inspections have been performed.

B. Do not add water to concrete during delivery, at Project site, or during placement unless approved by Architect.

C. Before test sampling and placing concrete, water may be added at Project site, subject to limitations of ACI 301.

1. Do not add water to concrete after adding high-range water-reducing admixtures to mixture.

D. Deposit concrete continuously in one layer or in horizontal layers of such thickness that no new concrete will be placed on concrete that has hardened enough to cause seams or planes of weakness. If a section cannot be placed continuously, provide construction joints as indicated. Deposit concrete to avoid segregation.

1. Deposit concrete in horizontal layers of depth to not exceed formwork design pressures and in a manner to avoid inclined construction joints.
2. Consolidate placed concrete with mechanical vibrating equipment according to ACI 301.
3. Do not use vibrators to transport concrete inside forms. Insert and withdraw vibrators vertically at uniformly spaced locations to rapidly penetrate placed layer and at least 6 inches (150 mm) into preceding layer. Do not insert vibrators into lower layers of concrete that have begun to lose plasticity. At each insertion, limit duration of vibration to time necessary to consolidate concrete and complete embedment of reinforcement and other embedded items without causing mixture constituents to segregate.

E. Deposit and consolidate concrete for floors and slabs in a continuous operation, within limits of construction joints, until placement of a panel or section is complete.

1. Consolidate concrete during placement operations so concrete is thoroughly worked around reinforcement and other embedded items and into corners.
2. Maintain reinforcement in position on chairs during concrete placement.
3. Screed slab surfaces with a straightedge and strike off to correct elevations.
4. Slope surfaces uniformly to drains where required.
5. Begin initial floating using bull floats or darbies to form a uniform and open-textured surface plane, before excess bleedwater appears on the surface. Do not further disturb slab surfaces before starting finishing operations.

F. Cold-Weather Placement: Comply with ACI 306.1 and as follows. Protect concrete work from physical damage or reduced strength that could be caused by frost, freezing actions, or low temperatures.

1. When average high and low temperature is expected to fall below 40 deg F (4.4 deg C) for three successive days, maintain delivered concrete mixture temperature within the temperature range required by ACI 301.
2. Do not use frozen materials or materials containing ice or snow. Do not place concrete on frozen subgrade or on subgrade containing frozen materials.
3. Do not use calcium chloride, salt, or other materials containing antifreeze agents or chemical accelerators unless otherwise specified and approved in mixture designs.

G. Hot-Weather Placement: Comply with ACI 301 and as follows:

1. Maintain concrete temperature below 90 deg F (32 deg C) at time of placement. Chilled mixing water or chopped ice may be used to control temperature, provided water equivalent of ice is calculated to total amount of mixing water. Using liquid nitrogen to cool concrete is Contractor's option.
2. Fog-spray forms, steel reinforcement, and subgrade just before placing concrete. Keep subgrade uniformly moist without standing water, soft spots, or dry areas.

3.10 FINISHING FORMED SURFACES

A. Rough-Formed Finish: As-cast concrete texture imparted by form-facing material with tie holes and defects repaired and patched. Remove fins and other projections that exceed specified limits on formed-surface irregularities.

3.11 FINISHING FLOORS AND SLABS

A. General: Comply with ACI 302.1R recommendations for screeding, restraightening, and finishing operations for concrete surfaces. Do not wet concrete surfaces.

B. Float Finish: Consolidate surface with power-driven floats or by hand floating if area is small or inaccessible to power driven floats. Restraighten, cut down high spots, and fill low spots. Repeat float passes and restraightening until surface is left with a uniform, smooth, granular texture.

C. Trowel Finish: After applying float finish, apply first troweling and consolidate concrete by hand or power-driven trowel. Continue troweling passes and restraighten until surface is free of trowel marks and uniform in texture and appearance. Grind smooth any surface defects that would telegraph through applied coatings or floor coverings.

D. Broom Finish: Apply a broom finish to exterior concrete platforms, steps, and ramps, and elsewhere as indicated.

1. Immediately after float finishing, slightly roughen trafficked surface by brooming with fiber-bristle broom perpendicular to main traffic route. Coordinate required final finish with Architect before application.

E. Slip-Resistive Finish: Before final floating, apply slip-resistive [**aggregate**] [**aluminum granule**] finish where indicated and to concrete stair treads, platforms, and ramps. Apply according to manufacturer's written instructions and as follows:

1. Uniformly spread [**25 lb/100 sq. ft. (12 kg/10 sq. m)**] <**Insert rate**> of dampened slip-resistive [**aggregate**] [**aluminum granules**] over surface in 1 or 2 applications. Tamp aggregate flush with surface, but do not force below surface.
2. After broadcasting and tamping, apply float finish.
3. After curing, lightly work surface with a steel wire brush or an abrasive stone and water to expose slip-resistive [**aggregate**] [**aluminum granules**].

3.12 MISCELLANEOUS CONCRETE ITEMS

A. Filling In: Fill in holes and openings left in concrete structures, unless otherwise indicated, after work of other trades is in place. Mix, place, and cure concrete, as specified, to blend with in-place construction. Provide other miscellaneous concrete filling indicated or required to complete the Work.

B. Curbs: Provide monolithic finish to interior curbs by stripping forms while concrete is still green and by steel-troweling surfaces to a hard, dense finish with corners, intersections, and terminations slightly rounded.

C. Equipment Bases and Foundations: Provide machine and equipment bases and foundations as shown on Drawings. Set anchor bolts for machines and equipment at correct elevations, complying with diagrams or templates from manufacturer furnishing machines and equipment.

D. Steel Pan Stairs: Provide concrete fill for steel pan stair treads, landings, and associated items. Cast-in inserts and accessories as shown on Drawings. Screed, tamp, and trowel-finish concrete surfaces.

3.13 CONCRETE PROTECTING AND CURING

A. General: Protect freshly placed concrete from premature drying and excessive cold or hot temperatures. Comply with ACI 306.1 for cold-weather protection and ACI 301 for hot-weather protection during curing.

B. Evaporation Retarder: Apply according to manufacturer's written instructions after placing, screeding, and bull floating or darbying concrete, but before float finishing.

C. Formed Surfaces: Cure formed concrete surfaces, including underside of beams, supported slabs, and other similar surfaces. If forms remain during curing period, moist cure after loosening forms. If removing forms before end of curing period, continue curing for the remainder of the curing period.

D. Unformed Surfaces: Begin curing immediately after finishing concrete. Cure unformed surfaces, including floors and slabs, concrete floor toppings, and other surfaces.

E. Cure concrete according to ACI 308.1, by one or a combination of the following methods:

1. Moisture Curing: Keep surfaces continuously moist for not less than seven days with the following materials:

    a. Water.
    b. Continuous water-fog spray.
    c. Absorptive cover, water saturated, and kept continuously wet. Cover concrete surfaces and edges with 12-inch (300-mm) lap over adjacent absorptive covers.

2. Moisture-Retaining-Cover Curing: Cover concrete surfaces with moisture-retaining cover for curing concrete, placed in widest practicable width, with sides and ends lapped at least 12 inches (300 mm), and sealed by waterproof tape or adhesive. Cure for not less than seven days. Immediately repair any holes or tears during curing period using cover material and waterproof tape.

    a. Moisture cure or use moisture-retaining covers to cure concrete surfaces to receive floor coverings.
    b. Moisture cure or use moisture-retaining covers to cure concrete surfaces to receive penetrating liquid floor treatments.
    c. Cure concrete surfaces to receive floor coverings with either a moisture-retaining cover or a curing compound that the manufacturer certifies will not interfere with bonding of floor covering used on Project..

3. Curing Compound: Apply uniformly in continuous operation by power spray or roller according to manufacturer's written instructions. Recoat areas subjected to heavy rainfall within three hours after initial application. Maintain continuity of coating and repair damage during curing period.

    a. After curing period has elapsed, remove curing compound without damaging concrete surfaces by method recommended by curing compound manufacturer[unless manufacturer certifies curing compound will not interfere with bonding of floor covering used on Project].

4. Curing and Sealing Compound: Apply uniformly to floors and slabs indicated in a continuous operation by power spray or roller according to manufacturer's written instructions. Recoat areas subjected to heavy rainfall within three hours after

initial application. Repeat process 24 hours later and apply a second coat. Maintain continuity of coating and repair damage during curing period.

3.14 LIQUID FLOOR TREATMENTS

A. Penetrating Liquid Floor Treatment: Prepare, apply, and finish penetrating liquid floor treatment according to manufacturer's written instructions.

1. Remove curing compounds, sealers, oil, dirt, laitance, and other contaminants and complete surface repairs.
2. Do not apply to concrete that is less than [**three**] [**seven**] [**14**] [**28**] days' old.
3. Apply liquid until surface is saturated, scrubbing into surface until a gel forms; rewet; and repeat brooming or scrubbing. Rinse with water; remove excess material until surface is dry. Apply a second coat in a similar manner if surface is rough or porous.

B. Sealing Coat: Uniformly apply a continuous sealing coat of curing and sealing compound to hardened concrete by power spray or roller according to manufacturer's written instructions.

3.15 JOINT FILLING

A. Prepare, clean, and install joint filler according to manufacturer's written instructions.

3.16 FIELD QUALITY CONTROL

A. Concrete Tests: Testing of composite samples of fresh concrete obtained according to ASTM C 172 shall be performed according to the following requirements:

1. Testing Frequency: Obtain one composite sample for each day's pour of each concrete mixture exceeding 5 cu. yd. (4 cu. m), but less than 25 cu. yd. (19 cu. m), plus one set for each additional 50 cu. yd. (38 cu. m) or fraction thereof.
2. Testing Frequency: Obtain at least one composite sample for each 100 cu. yd. (76 cu. m) or fraction thereof of each concrete mixture placed each day.

    a. When frequency of testing will provide fewer than five compressive-strength tests for each concrete mixture, testing shall be conducted from at least five randomly selected batches or from each batch if fewer than five are used.

3. Slump: ASTM C 143/C 143M; one test at point of placement for each composite sample, but not less than one test for each day's pour of each concrete mixture. Perform additional tests when concrete consistency appears to change.
4. Air Content: ASTM C 231, pressure method, for normal-weight concrete; [ASTM C 173/C 173M, volumetric method, for structural lightweight concrete;]one test for each composite sample, but not less than one test for each day's pour of each concrete mixture.

5. Concrete Temperature: ASTM C 1064/C 1064M; one test hourly when air temperature is 40 deg F (4.4 deg C) and below and when 80 deg F (27 deg C) and above, and one test for each composite sample.
6. Unit Weight: ASTM C 567, fresh unit weight of structural lightweight concrete; one test for each composite sample, but not less than one test for each day's pour of each concrete mixture.

7. Compressive-Strength Tests: ASTM C 39/C 39M; test one set of two laboratory-cured specimens at 7 days and one set of two specimens at 28 days.

    a. Test one set of two field-cured specimens at 7 days and one set of two specimens at 28 days.
    b. A compressive-strength test shall be the average compressive strength from a set of two specimens obtained from same composite sample and tested at age indicated.

8. When strength of field-cured cylinders is less than 85 percent of companion laboratory-cured cylinders, Contractor shall evaluate operations and provide corrective procedures for protecting and curing in-place concrete.
9. Strength of each concrete mixture will be satisfactory if every average of any three consecutive compressive-strength tests equals or exceeds specified compressive strength and no compressive-strength test value falls below specified compressive strength by more than 500 psi (3.4 MPa).
10. Test results shall be reported in writing to Architect, concrete manufacturer, and Contractor within 48 hours of testing. Reports of compressive-strength tests shall contain Project identification name and number, date of concrete placement, name of concrete testing and inspecting agency, location of concrete batch in Work, design compressive strength at 28 days, concrete mixture proportions and materials, compressive breaking strength, and type of break for both 7- and 28-day tests.
11. .

END OF SECTION 03300

SECTION 06651
SOLID SURFACE FABRICATIONS

PART 1 — GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the contract, including general and supplementary conditions and Division 1 Specification Sections, apply to this Section.

1.2 SUMMARY

A. This Section includes the following horizontal and trim solid surface product types:

1. Lavatory tops with integral bowls
2. Vanity tops

B. Related Sections include the following:

1. Division 1 Section “LEED Requirements” for additional LEED requirements.
2. Division 5 Section “Metal Fabrications” for Blocking.

1.3 DEFINITION

A. Solid surface is defined as nonporous, homogeneous material maintaining the same composition throughout the part with a composition of acrylic polymer, aluminum trihydrate filler and pigment.

1.4 SUBMITTALS

A. Samples:

1. For each type of product indicated.
    a. Submit minimum 6-inch by 6-inch sample in specified gloss.
    b. Cut sample and seam together for representation of inconspicuous seam.
    c. Indicate full range of color and pattern variation.
2. Approved samples will be retained as a standard for work.

B. Product data:

1. Indicate product description, fabrication information and compliance with specified performance requirements.

C. Maintenance data:

1. Submit manufacturer’s care and maintenance data, including repair and cleaning instructions.
    a. Maintenance kit for finishes shall be submitted.
2. Include in project closeout documents.

1.5 QUALITY ASSURANCE

A. Qualifications:

1. Shop that employs skilled workers who custom fabricate products similar to those required for this project and whose products have a record of successful in-service performance.

B. Fabricator/installer qualifications:

1. Work of this section shall be by a certified fabricator/installer, certified in writing by the manufacturer.

C. Applicable standards:

1. Standards of the following, as referenced herein:
    a. American National Standards Institute (ANSI)
    b. American Society for Testing and Materials (ASTM)

c. National Electrical Manufacturers Association (NEMA)
d. NSF International

2. Fire test response characteristics:
   a. Provide with the following Class A (Class I) surface burning characteristics as determined by testing identical products per UL 723 (ASTM E84) or another testing and inspecting agency acceptable to authorities having jurisdiction:
      1) Flame Spread Index: 25 or less.
      2) Smoke Developed Index: 450 or less.

1.6 DELIVERY, STORAGE AND HANDLING

A. Deliver no components to project site until areas are ready for installation.
B. Store components indoors prior to installation.
C. Handle materials to prevent damage to finished surfaces.
   1. Provide protective coverings to prevent physical damage or staining following installation for duration of project.

1.7 WARRANTY

A. Provide manufacturer's warranty against defects in materials.
   1. Warranty shall provide material and labor to repair or replace defective materials.
   2. Damage caused by physical or chemical abuse or damage from excessive heat will not be warranted.

1.8 MAINTENANCE

A. Provide maintenance requirements as specified by the manufacturer.

PART 2 — PRODUCTS

2.1 MANUFACTURERS

A. Manufacturers:
   1. Subject to compliance with requirements, provide products by one of the following:
      a. Corian® surfaces from the DuPont company (basis of design).

2.2 MATERIALS

A. Solid polymer components
   1. Cast, nonporous, filled polymer, not coated, laminated or of composite construction with through body colors meeting ANSI Z124.3 or ANSI Z124.6, having minimum physical and performance properties specified.
   2. Superficial damage to a depth of 0.010 inch (.25 mm) shall be repairable by sanding and/or polishing.
B. Thickness:
   1. 1/2 inch
C. Integral vanity:
   1. Model number:
      a. #810
   2. Color:
      a. Designer White
   3. Mounting:
      a. Seamed undermount.
D. Backsplash:
   1. Coved.
E. Sidesplash:
   1. Coved.

I. Performance characteristics:

Property	Typical Result	Test
Tensile Strength	6,000 psi	ASTM D 638
Tensile Modulus	1.5 x 10^{-6} psi	ASTM D 638
Tensile Elongation	0.4% min.	ASTM D 638
Flexural Strength	10,000 psi	ASTM D 790
Flexural Modulus	1.2 x 10^{-6} psi	ASTM D 790
Hardness	>85	Rockwell "M" Scale ASTM D 785
	56	Barcol Impressor ASTM D 2583
Thermal Expansion	3.02 x 10^{-5} in./in./°C (1.80 x 10^{-5} in./in./°F)	ASTM D 696
Gloss (60° Gardner)	5–75 (matte—highly polished)	ANSI Z124
Light Resistance	(Xenon Arc) No effect	NEMA LD 3-2000 Method 3.3
Wear and Cleanability	Passes	ANSI Z124.3 & Z124.6
Stain Resistance: Sheets	Passes	ANSI Z124.3 & Z124.6
Fungus and Bacteria Resistance	Does not support microbial growth	ASTM G21&G22
Boiling Water Resistance	No visible change	NEMA LD 3-2000 Method 3.5
High Temperature Resistance	No change	NEMA LD 3-2000 Method 3.6
Izod Impact (Notched Specimen)	0.28 ft.-lbs./in. of notch	ASTM D 256 (Method A)
Ball Impact Resistance: Sheets	No fracture—1⁄2 lb. ball: 1⁄4" slab—36" drop 1⁄2" slab—144" drop	NEMA LD 3-2000 Method 3.8
Weatherability	ΔE^*_{94}<5 in 1,000 hrs.	ASTM G 155
Specific Gravity †	1.7	
Water Absorption	Long-term 0.4% (3⁄4") 0.6% (1⁄2") 0.8% (1⁄4")	ASTM D 570
Toxicity	99 (solid colors) 66 (patterned colors)	Pittsburgh Protocol Test ("LC50"Test)
Flammability	All colors (Class I and Class A)	ASTM E 84, NFPA 255 & UL 723
Flame Spread Index	<25	
Smoke Developed Index	<25	

† Approximate weight per square foot: 1⁄4" (6 mm) 2.2 lbs., 1⁄2" (12.3 mm) 4.4 lbs.
Shapes meet or exceed the ANSI Z124.3 and ANSI Z124.6 standards for plastic sinks and lavatories.
NEMA results based on the NEMA LD 3-2000

2.3 ACCESSORIES

A. Joint adhesive:

1. Manufacturer's standard one- or two-part adhesive kit to create inconspicuous, nonporous joints.

B. Sealant:
1. Manufacturer's standard mildew-resistant, FDA-compliant, NSF 51-compliant (food zone — any type), UL-listed silicone sealant in colors matching components.

2.4 FACTORY FABRICATION

A. Shop assembly
1. Fabricate components to greatest extent practical to sizes and shapes indicated, in accordance with approved shop drawings and manufacturer's printed instructions and technical bulletins.
2. Form joints between components using manufacturer's standard joint adhesive without conspicuous joints.
a. Reinforce with strip of solid polymer material, 2" wide.
3. Provide factory cutouts for plumbing fittings and bath accessories as indicated on the drawings.
4. Rout and finish component edges with clean, sharp returns.
a. Rout cutouts, radii and contours to template.
b. Smooth edges.
c. Repair or reject defective and inaccurate work.

2.5 FINISHES

A. Select from the manufacturer's standard color chart.
B. Finish:
1. Provide surfaces with a uniform finish.

a. Matte; gloss range of 5–20.

PART 3 — EXECUTION

3.1 EXAMINATION

A. Examine substrates and conditions, with fabricator present for compliance with requirements for installation tolerances and other conditions affecting performance of work.
B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 INSTALLATION

A. Install components plumb, level and rigid, scribed to adjacent finishes, in accordance with approved shop drawings and product data.
1. Provide product in the largest pieces available.
2. Form field joints using manufacturer's recommended adhesive, with joints inconspicuous in finished work.
a. Exposed joints/seams shall not be allowed.
3. Reinforce field joints with solid surface strips extending a minimum of 1 inch on either side of the seam with the strip being the same thickness as the top.
4. Cut and finish component edges with clean, sharp returns.
5. Rout radii and contours to template.
6. Anchor securely to base cabinets or other supports.
7. Align adjacent countertops and form seams to comply with manufacturer's written recommendations using adhesive in color to match countertop.
8. Carefully dress joints smooth, remove surface scratches and clean entire surface.
9. Install countertops with no more than 1/8-inch (3 mm) sag, bow or other variation from a straight line.
B. Coved backsplashes and sidesplashes:
1. Provide coved backsplashes and sidesplashes at all walls and adjacent millwork.

2. Fabricate radius cove at intersection of counters with backsplashes to dimensions shown on the drawings.
3. Adhere to countertops using manufacturer's standard color-matched Joint Adhesive.

C. Integral sinks/vanities:

1. Provide solid surface materials bowls and/or lavatories sinks with overflows in locations shown on the drawings.
2. Secure sinks and lavatory bowls to tops using manufacturer's recommended sealant, adhesive and mounting hardware to maintain warranty.

3.3 REPAIR

A. Repair or replace damaged work which cannot be repaired to architect's satisfaction.

3.4 CLEANING AND PROTECTION

A. Keep components clean during installation.

B. Remove adhesives, sealants and other stains.

SECTION 07840
FIRESTOPPING

PART 1 GENERAL

1.1 SUMMARY

A. Provide firestopping.

1.2 SUBMITTALS

A. Product Data: Submit manufacturer's product data and installation instructions for each material and product used.

B. Submit for approval test reports.

1.3 QUALITY ASSURANCE

A. Comply with governing codes and regulations. Provide products of acceptable manufacturers, which have been in satisfactory use in similar service for three years. Use experienced installers. Deliver, handle, and store materials in accordance with manufacturer's instructions.

B. Fire Performance: UL 2079, ASTM E 814, and local regulations.

PART 2 PRODUCTS

2.1 MATERIALS

A. Firestopping Systems:
1. Manufacturers:3M Fire Protection Products;HOLDRITE.
2. Applications as Applicable to Assembly: Through-penetrations, fire-resistive joints, perimeter fire containment, smoke seals.
3. Types as Applicable to Assembly: Endothermic and intumescent sealants, pillows, putty and wrap strips.

PART 3 EXECUTION

3.1 INSTALLATION

A. Review extent of work with authorities having jurisdiction and obtain approval of installation thicknesses and methods.

B. Sequence work to avoid need for removal of firestopping by work of other trades.

C. Comply with manufacturers' instructions and recommendations. Securely anchor insulation with safing clips. Install firestopping without gaps or voids.

D. Protect, inspect and repair work until final acceptance.

END OF SECTION

SECTION 07900
JOINT SEALERS

PART 1 GENERAL

1.1 SUMMARY

A. Provide joint sealers and fillers.

1.2 SUBMITTALS

A. Product Data: Submit manufacturer's product data and installation instructions for each material and product used.

B. Samples: Submit two representative samples of each material specified indicating visual characteristics and finish. Include range samples if variation of finish is anticipated.
1. Include manufacturers full range of color and finish options if additional selection is required.

1.3 QUALITY ASSURANCE

A. Comply with governing codes and regulations. Provide products of acceptable manufacturers, which have been in satisfactory use in similar service for three years. Use experienced installers. Deliver, handle, and store materials in accordance with manufacturer's instructions.

B. Field-Constructed Mock-Ups: Each joint type.

PART 2 PRODUCTS

2.1 MATERIALS

A. Exterior Joints in Vertical Surfaces, Preformed Compression Seals:
1. Manufacturers:Watson Bowman Acme Corp. A BASF Construction Chemicals Business;Willseal LLC.

B. Interior Joints, Sanitary Silicone:
1. Manufacturers:Momentive Performance Materials - GE Exclusive Licensee.
2. Materials: One-part mildew-resistant silicone sealant, ASTM C 920.

PART 3 EXECUTION

3.1 INSTALLATION

A. Examine substrate; report unsatisfactory conditions in writing. Beginning work means acceptance of substrates.

B. Provide sealants in colors as selected from manufacturer's standards.

C. Install materials and systems in accordance with manufacturer's instructions and approved submittals. Install materials and systems in proper relation with adjacent construction and with uniform appearance. Coordinate with work of other sections. Clean and prime joints, and install bond breakers, backer rods and sealant as recommended by manufacturers.

D. Depth shall equal width up to 1/2 inch wide; depth shall equal 1/2 width for joints over 1/2 inch wide.

E. Cure and protect sealants as directed by manufacturers. Replace or restore damaged sealants. Clean adjacent surfaces to remove spillage.

END OF SECTION

SECTION 09600
Interior Wall Coating System

Part 1 - General

1.01 Work Included

A. Furnish all necessary material, labor, and equipment required to prepare designated areas and install an Interior Wall Coating System.

1.02 Related Work

A. All drawings and general provisions of contract including General and Special Conditions and Division I, excepting special Submittal and Quality Assurance provisions in this section.

1.03 Quality Assurance

A. Manufacturer's Qualifications
Obtain Interior Wall Coating System materials from a single manufacturer with a minimum of 3 years verifiable field installation experience providing antimicrobial system materials of the type specified in this section.

B. Contractor's Qualifications
The following installers are recommended;

Greg Mata : Cutting Edge Flooring 330-958-0179

Tony Pariano : Industrial Flooring 330-323-8307

Mel Grubaugh : Advanced Floor Coatings : 800-288-9589

1.04 Warranty

A. The contractor and the manufacturer shall furnish a standard guarantee of the Interior Wall Coating System for a period of one year after installation. This labor and material guarantee shall include loss of bond and wear-through to the substrate through normal wear and tear.

B. Not included in the warranty are damage due to structural design deficiencies including but not limited to slab cracking from lateral, vertical or rotational movement, and gouging or other damage due to fork lifts, other equipment, delamination caused by sub-surface hydrostatic pressure, Acts of God, or other elements beyond the scope of protection of this system nor causes not related to the system materials.

C. In case of a warranty claim, the owner will notify the manufacturer and contractor in writing within 30 days of the first appearance of problems covered under this warranty, and will provide free access to the area during normal working hours. Property protection is also the owner's responsibility. Remedy is limited to direct repair of the Wall Surfacing System.

1.05 Submittal

A. Product Data

Submit manufacturer's specifications on cured system and individual components of the Interior Wall Coating System, including physical properties and performance properties and

all tests described in part 2.01 B in this section and submit all Material Safety Data Sheets. Each individual component of the system will be evaluated on the basis of these standards. For any of these tests not listed in the manufacturer's standard nationally published data, the manufacturer must supply the missing data from an independent test laboratory tested according to the referenced standard.

B. The contractor shall submit a 3" x 3" system sample for verification purposes and finish texture approval.

C. Contractor Experience

The contractor shall furnish a list of 3 projects using either specified material or another material pre-approved for this project that they have installed during the last 3 years. Information shall include: project name, square footage, contact name with owner address and phone number. Also, the contractor shall furnish resumes detailing the experience of key project personnel including supervisors and technicians.

D. No substitutions will be considered after contract bid date.

E. The contractor shall submit a copy of the manufacturer's packing slip, tagged for this specific job, along with calculations, signed by an officer of the primary material supplier demonstrating that the quantity of material furnished for the project will achieve the specified coverage and mil thickness.

1.06 Material Delivery, Handling and Storage

A. Primary system materials shall be delivered in the manufacturer's undamaged, unopened containers. Each container shall be clearly marked with the following:
•Product name(s) and/or Number(s)
•Manufacturer's name
•Component designation (A, B, etc.)
•Product Mix Ratio
•Health and Safety Information
•CHEMTREC Emergency Response Information

B. Provide equipment and personnel to handle the materials by methods which prevent damage.

C. The contractor shall promptly inspect direct jobsite material deliveries to assure that quantities are correct, comply with requirements and are not damaged.

D. The contractor shall be responsible for materials furnished by him, and he shall replace, at his own expense, such materials that are found to be defective in manufacture or that have become damaged in transit, handling or storage.

E. Store material(s) in accordance with manufacturer's instructions, with seals and labels intact and legible. Maintain temperatures within the required range. Do not use materials which exceed the manufacturer's maximum recommended shelf life.

1.07 Job Conditions

A. The contractor shall visit the jobsite prior to beginning the installation of the Interior Wall Coating System to evaluate substrate condition, including substrate moisture content, and the extent of repairs required, if any. Concrete substrates shall be tested to verify that the moisture content of the substrate does not exceed Interior Wall Coating System manufacturers' recommendations. Cost of repair and remediation of the substrate cannot be predicted prior to inspection and testing, and therefore is not encompassed within the installation estimates.

B. The contractor should exercise care during surface preparation and system installation to protect surrounding substrates and surfaces, as well as in-place equipment. The contractor shall use his discretion as to the physical means used for preparation and protection. Any costs incurred for resultant damage from negligence or inadequate protection shall be the sole responsibility of the contractor.

C. Job area to be free of and protected from the activities of other trades during installation and for a period of time recommended by the manufacturer upon completion of the job.

D. The minimum substrate temperature must be conditioned to 60° F before commencing installation, during installation, and for at least 72 hours after installation is complete.

E. Use of respirators and/or adequate ventilation must be provided.

F. Maintain lighting at a minimum uniform level of 50 or more foot candles in all areas where the Interior Wall Coating System is being installed. It is the recommendation of the manufacturer that the permanent lighting be in place and working during the installation.

G. All leaks from pipes and other sources must be corrected prior to the installation of the Interior Wall Coating System.

Part 2 - Products

2.01 Materials

A. System Overview

The Interior Wall Coating System shall be the General Polymers SANIGLAZE High Build Wall System, as manufactured by Sherwin-Williams consists of a Heavy Duty Block Filler, two coats of 3479 Water-Based Epoxy Wall Coating and 4408 WB Polyurethane as Optional finish coat.

B. Typical Physical Properties @ 73°F (unless otherwise noted)

Colors	White
Hardness, Shore D ASTM D 2240	65/60
Tensile Strength ASTM D 412	6,000 psi
Adhesion ACI 503R	300 psi Substrate Failure
Flammability	Self Extinguishing on Substrate
Thermal Cycling ASTM C 884 (24 hours, 6°F to 77°F)	No cracking
Permeability MIL-I-16923 @ 95% humidity	$\leq$ 0.01 gm/ft² /24 hrs /inch thickness

Part 3 - Execution

3.01 Surface Preparation

A. Proper surface preparation prior to installation of materials is essential for interior wall coating systems. Read the following recommended methods of surface preparation carefully. Consult manufacturer for answers to questions prior to installation.
1. Closely examine all substrates for undulation, cleanliness, holes, cracks and soundness.
2. Surface contaminants must be removed by mechanical abrasion or other approved methods to ensure proper adhesion of the system.
3. Substrate finish will affect the final appearance of the wall coating.
    Drywall: Must be finish to a minimum of Level #4 Finish utilizing materials compatible with the wall board product and the resinous wall coating system.
    Cast-in-Place Concrete: Fill bugholes with compatible material and apply skim coat as needed for desired smoothness.
    Unit Masonry: Apply block filler recommended by manufacturer.
4. Surface and air temperature should be a minimum of 50° F / 15° C
5. Air movement must be present in application area to prevent surface condensation during installation.

3.02 Installation

A. General

Apply each component of the Interior Wall Coating System in compliance with manufacturer's written installation instructions and strictly adhere to mixing and installation methods, recoat windows, cure times and environmental restrictions.

If necessary, install Pre-formed Vinyl Corner Moldings with fast setting, high strength adhesive.

B. Optional Surface leveling material of GP 3513 Bughole Filler.
-Heavy Duty Block Filler for Walls Only

C. Primer

3479 Water-Based Epoxy Wall Coating

D. Base Coat

3479 Water-Based Epoxy Wall Coating (two coats)

E. Finish Coat

4408 WB Polyurethane

3.03 Curing, Cleaning and Protection

A. Cure all Interior Wall Coating System materials in compliance with manufacturer's directions, taking care to prevent contamination during stages of the installation and prior to completion of the curing process.

B. Protect the Interior Wall Coating System from damage and wear during other phases of the construction operation, using temporary coverings as recommended by the manufacturer, if required. Remove temporary covering just prior to final inspection.

C. Clean the Interior Wall Coating System just prior to final inspection, using materials and procedures suitable to the system manufacturer.

D. Some cleaners will affect the color or texture of your polymer wall surfaces. To determine how your cleaner will perform, first test each cleaner, in a small area, utilizing your cleaning technique. This precaution will demonstrate the effect of your cleaner and technique. If no deleterious effects are observed, continue with the procedure. If deleterious effects do occur, modify the cleaning material and/or procedure.

--END OF SECTION--

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SECTION 09650
BREATHABLE DECORATIVE QUARTZ FLOORING SYSTEM

Part 1 - General

1.01 Work Included

A. Furnish necessary material, labor, and equipment required to prepare designated areas and install a Breathable Decorative Quartz Flooring System.

1.02 Related Work

A. Drawings and general provisions of contract including General and Special Conditions and Division I, excepting special Submittal and Quality Assurance provisions in this section.

1.03 Quality Assurance

A. Manufacturer's Qualifications

Obtain Breathable Decorative Quartz Flooring System materials from a single manufacturer with a minimum of 3 years verifiable experience providing materials of the type specified in this section.

B. Contractor's Qualifications

B. Contractor's Qualifications
The following installers are recommended;

Greg Mata : Cutting Edge Flooring 330-958-0179

Tony Pariano : Industrial Flooring 330-323-8307

Mel Grubaugh : Advanced Floor Coatings : 800-288-9589

C. Floor System Thickness Verification

At the owner's discretion and under his supervision the contractor shall take ___3__ 1" random cores per 1,000 sq. ft. through the system into the substrate to verify proper system thickness. Cored areas less than specified thickness shall be removed and replaced or increased in thickness by the installing contractor, in a manner that does not affect the performance or integrity of the system. Cored areas that comply with the recommended system thickness shall be built-up to match the surrounding surface elevation prior to applying the seal coat(s). Cores taken and patched will be noticeable, therefore, cores should be taken from areas where aesthetics are less critical.

1.04 Warranty

A. The contractor and the manufacturer shall furnish a standard guarantee of the Breathable Decorative Quartz Flooring System for a period of one year after installation. The labor and material guarantee shall include loss of bond and wear-through to the concrete substrate from normal use.

B. Not included in the warranty are damage due to structural design deficiencies including but not limited to slab cracking from lateral, vertical or rotational movement, and gouging or other damage due to fork lifts, other equipment, delamination caused by vapor transmission, Acts of God, or other elements beyond the scope of protection of this system nor causes not related to the system materials.

C. In case of a warranty claim, the owner will notify the manufacturer and contractor in writing within 30 days of the first appearance of problems covered under this warranty. The owner will provide free and unencumbered access to the area during normal working hours for warranty rework. Property protection is also the owner's responsibility. Remedy is limited to direct repair of the Breathable Decorative Quartz Flooring System.

1.05 Submittal

A. System Data

Submit manufacturer's specifications on cured system and individual components of the Breathable Decorative Quartz Flooring System, including physical properties and performance properties and tests described in part 2.01 B and submit Material Safety Data Sheets. Each individual component of the system will be evaluated on the basis of these standards. For any tests not listed in the manufacturer's standard nationally published data, the manufacturer must supply the missing data accompanied by the independent testing laboratory's test results which prove compliance in accordance with the referenced standard(s).

B. The contractor shall submit a 3" x 3" cured system sample which the contractor has made for verification purposes and finish texture approval.

C. Contractor Experience

The contractor shall furnish a list of projects using either specified material or equivalent that they have installed during the last 3 years. Information shall include: project name, square footage, owner, contact name with owner's address and phone number. Also, the contractor shall furnish résumés detailing the experience of key project personnel including supervisors and mechanics.

D. It is the intention of this Section to provide the products as named. Substitutions will be considered only when received by the Architect, Engineer or Design Professional through a bidding Prime Contractor at least ten days prior to the date set for receipt of bids. Upon receipt of any such submission, the Architect, Engineer or Design Professional will determine whether or not the proposed product is an equal. In the event the Architect, Engineer or Design Professional determines that a proposed system is an approved equal, he will issue an addendum and notify all bidders at least 48 hours prior to receipt of bids. No substitutions will be considered after contract bid date.

E. The contractor shall submit a copy of the manufacturer's packing slip, tagged for this specific job, along with calculations, signed by an officer of the primary material supplier demonstrating that the quantity of material furnished for the project will achieve the specified coverage and mil thickness.

1.06 Material Delivery, Handling and Storage

A. Primary system materials shall be delivered in the manufacturer's undamaged, unopened containers. Each container shall be clearly marked with the following:

•Product name(s) and/or number(s)
•Manufacturer's name
•Component designation (A, B, etc.)
•Product Mix Ratio
•Health and Safety Information
•CHEMTREC Emergency Response Information

B. Provide equipment and personnel to handle the materials by methods which prevent damage.

C. The contractor shall promptly inspect direct jobsite material deliveries to assure that quantities are correct, comply with requirements and are not damaged.

D. The contractor shall be responsible for materials furnished by him, and he shall replace, at his own expense, such materials that are found to be defective in manufacture or that have become damaged in transit, handling or storage.

E. Store material(s) in accordance with manufacturer's instructions, with seals and labels intact and legible. Maintain temperatures within the required range. Do not use materials which exceed the manufacturer's maximum recommended shelf life.

1.07 Job Conditions

A. The contractor shall visit the jobsite prior to beginning the installation of the Breathable Decorative Quartz Flooring System to evaluate substrate condition, including substrate moisture content, and the extent of repairs required, if any. Concrete substrates shall be tested to verify that the moisture content of the substrate does not exceed Breathable Decorative Quartz Flooring System manufacturers' recommendations.

B. The contractor should exercise care during surface preparation and system installation to protect surrounding substrates and surfaces, as well as in-place equipment. The contractor shall prepare the substrate to remove laitance and open the surface. This shall be achieved by light brush grit blasting. Surface profile achieved shall be similar to medium grit sandpaper and free from bond-inhibiting contaminants. Costs incurred that are associated with damage from negligence or inadequate protection shall be the sole responsibility of the contractor.

C. Each drain in the installation area must be working and raised or lowered to the actual finished elevation of the Urethane Decorative Flooring System.

D. System must be protected by the General Contractor or, as a separate bid item, by the installing contractor until it is inspected and turned over to the owner.

E. The minimum slab temperature must be conditioned to 40°F before commencing installation, during installation, and for at least 72 hours after installation is complete.

F. Maintain lighting at a minimum uniform level of 50 or more foot-candles in areas where the Breathable Decorative Quartz Flooring System is being installed. It is the recommendation of the manufacturer that the permanent lighting be in place and working during the installation.

G. Leaks from pipes and other sources must be corrected prior to the installation of the Breathable Decorative Quartz Flooring System

Part 2 – Products

2.01 Materials

A. System Overview

The General Polymers FasTop Ceramic Carpet Flooring System as manufactured by Sherwin-Willams consists of 4080 Binder Resin, with 5035 Neutral Aggregate as slurry, 3744 Self-Leveling Epoxy as bonding coat, grout and seal coat, 5900 Ceramic Quartz for broadcast.

B. Typical Physical Properties @ 73°F (unless otherwise noted)

Typical Physical Properties

Color Decorative		Pre-Blended Colors, Custom color Blends available
Cure Time	Recoat	8-12 hours
	Foot Traffic	18-24 hours
	Full Service	36-48 hours
Abrasion Resistance		20-30 mgs lost
ASTM D 4060, CS-17 Wheel, 1,000 Cycles		
Hardness, Shore D		75
ASTM D 2240		
Tensile Strength		550-600 psi
ASTM C 307		
Compressive Strength		5,000 psi
ASTM C 579		
Flexural Strength		3,700 psi
ASTM C 580		
Impact Resistance MIL-D-3134, Sec. 4.7.3		Withstands 16 ft. lbs. without cracking, delamination or chipping

Part 3 - Execution

3.01 Surface Preparation

For thorough instructions regarding preparation of concrete substrates consult General Polymers "Instruction for Concrete Surface Preparation" (Form G-1). Remove all tile and mortar bed as required and shotblast.

3.02 Installation

A. General

Apply each component of the Breathable Decorative Quartz Flooring System in compliance with manufacturer's written installation instructions and strictly adhere to mixing and installation methods, recoat windows, cure times and environmental restrictions. The Breathable Decorative Quartz Flooring System may be installed directly over non-moving control joints and cracks which have been treated with semi-rigid epoxy and the Breathable Decorative Quartz Flooring System will terminate at the edge of isolation and expansion joints as designated by the Architect, Engineer or Design Professional. Integral cove base shall be installed where specified in the drawings.

B. Cracks
For information pertaining to the treatment of cracks in concrete substrates, consult General Polymers Concrete 102.

C. Control Joints
For information pertaining to the treatment of control joints in concrete substrates, consult General Polymers Concrete 103.

D. Isolation/Expansion and Other Joints Subject to Movement
For information pertaining to the above, consult General Polymers Concrete 105.

E. Slurry Installation
4080 Binder Resin
5035 Neutral Aggregate
5900 Color Quartz

F. Bonding Coat / Broadcast
3744 Self-Leveling Epoxy
5900 Color Quartz

G. Grout Coat
3744 Self-Leveling Epoxy

H. Seal Coat
4844 Polyaspartic Pacecote

3.03 Curing, Cleaning and Protection

A. Cure Breathable Decorative Quartz Flooring System materials in compliance with manufacturer's directions, taking care to prevent contamination during stages of the installation and prior to completion of the curing process.

B. Protect the Breathable Decorative Quartz Flooring System from damage and wear during other

phases of the construction operation, using temporary coverings as recommended by the manufacturer, if required. Remove temporary covering just prior to final inspection. Clean the Breathable Decorative Quartz Flooring System just prior to final inspection, using materials and procedures suitable to the system manufacturer.

C. Some cleaners will affect the color, gloss or texture of your polymer floor surfaces. To determine how your cleaner will perform, General Polymers recommends that you first test each cleaner, in a small area, utilizing your cleaning technique. This precaution will demonstrate the effect of your cleaner and technique. If no deleterious effects are observed, continue with the procedure. If deleterious effects do occur, modify the cleaning material and/or procedure. For recommendations regarding types of cleaners, contact the Breathable Decorative Quartz Flooring System manufacturer.

--END OF SECTION—

Revised 01/15

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CEILING HUNG TOILET PARTITION SPECIFICATIONS
(STAINLESS STEEL – STANDARD)
SECTION 10210

PART 1 GENERAL

1.01 SUMMARY

A. Section Includes

Furnish, deliver and install all Toilet Partitions as indicated on the drawings and as required by actual conditions at the building. The Toilet Partitions shall include the furnishing of all necessary screws, special screws, bolts, special bolts, expansion shields and all other devices necessary for the proper installation and application of the Toilet Partitions.

B. Related Sections

Section: 10500 Lockers
Section: 10800 Washroom Accessories

1.02 REFERENCES

A. Standard

All Toilet Partitions must be scheduled, supplied and installed in accordance with: Local Building Code, CGSB (Canadian Government Specifications Board), CSA (Canadian Standards Association), ANSI (American National Standards Institute), ADA (Americans with Disabilities Act). In all cases the above references shall be taken to mean the latest edition of that particular standard including all revisions.

1.03 SUBMITTALS

A. General Requirements

Make all submittals in accordance with Section: 01300

B. Schedules

1. Submit (4) copies of detailed shop drawings for the Consultant's/Owner's review within (2) weeks of being awarded this subcontract.

C. Product Data

1. Submit (2) copies of product sheets and/or catalogue cuts, of all products listed in the shop drawings.

D. Samples

1. Upon request, a returnable sample of the Toilet Partitions shall be submitted to the Consultant/Owner for approval not later than (10) days after requested. All samples must be properly identified including: name of supplier, and name of manufacturer.

E. Operations and Maintenance Data

1. At completion of the job, furnish to the owner (2) copies of an Owners Operation and Maintenance Manual. The Manual shall consist of a hard cover three ring binder with the project name in the front. Include in the manual the following information: Maintenance instructions, Catalogue pages for each product, Name/Address and phone number of the Manufacturer and their Sales Agent, Copy of the final shop drawings.

1.04 QUALITY ASSURANCE

A. Substitutions

1. Manufacturers and model number listed are to establish a standard of quality. Similar items by approved manufacturers that are equal in design, function, quality and finish may be accepted upon prior written approval from the Architect/Owner.

2. All requests for acceptable substitutions must be made in writing and submitted to the Architect at least 14 days prior to tender closing. If requested, all requests for substitutions must be accompanied by product literature and actual product samples.

B. Supplier Qualifications

1. Toilet Partition shop drawings and Toilet Partitions shall be procured from a source of supply approved by the Consultant/Owner/Architect. Supplier is responsible for the complete Toilet Partition subcontract.

1.05 DELIVERY, STORAGE AND HANDLING

A. Marking and Packaging

1. Toilet Partitions must be delivered to the job site in the manufacturers' original packages and marked to correspond with the approved shop drawings.

B. Delivery

1. Toilet Partitions must be delivered in an amount of time deemed appropriate by the Consultant/Owner.

1.06 WARRANTY

A. Written Guarantee

1. The Toilet Partition manufacturer shall guarantee all Toilet Partitions by written certification, for a period of (5) years from date of receipt by customer, against any defects in design, materials and workmanship.

1.07 MAINTENANCE

A. Maintenance

1. Upon request, at completion of the project, the Toilet Partition supplier may be required to brief Owner's maintenance staff regarding proper care of Toilet Partitions, such as: required lubrications, adjustments, cleaning, etc.

PART 2 PRODUCTS

2.01 MANUFACTURERS

A. Approved Manufacturers
Only those manufacturers names and product numbers listed herein, are approved for use on this project. All other manufacturers must request approval as per section (1.04 - A - Substitutions). Absolutely no variations from listed and preapproved items will be permitted.

Approved manufacturer(s):
1. Hadrian Manufacturing Inc.

2.02 MATERIALS

A. Construction: Doors, Panels and Pilasters shall be constructed of two sheets of panel flatness Type 304, #4 brushed finish stainless steel, laminated under pressure to a "Verticel" (1/2") honeycomb core for impact resistance, rigidity and sound deadening. Formed edges to be welded together and interlocked, under tension, with a roll-formed oval crown locking bar, mitred, welded and ground smooth at the corners. Honeycomb to be of virgin, long fiber paper with a maximum 12.5mm (1/2") cell size.

B. Doors: Shall be 25mm (1") thick with cover sheets not less than 22-gauge (0.8mm).

C. Panels: Shall be 25mm (1") thick with cover sheets not less than 22-gauge (0.8mm).

D. Pilasters: Shall be 32mm (1.25") thick with cover sheets not less than 18-gauge (1.2mm).

E. Hardware and Fittings: All panel and pilaster brackets and all door hardware shall be chrome plated zinc die castings, standard. Fasteners are 12 x 1-3/4 and 12 x 5/8 TR-27 6-lobe security screws. Doors shall be equipped with a gravity type hinge mounted on the lower pilaster hinge bracket. Doors shall be equipped with a gravity type hinge mounted on the lower pilaster hinge bracket. Door hinges shall be the wraparound type and adjustable to permit the door to come to rest at any position when not latched. Each door to be fitted with a combined coat hook and bumper and a concealed latch, with face mortised flush with edge strip of door Barrier-free doors shall include thumbturn lever to activate latch without fingertip grip application. Both standard and barrier-free latches shall have a turn slot designed to allow emergency access from exterior. The combined stop and keeper shall have a 19mm (0.75") diameter bumper locked in place. Threaded upper hinge pin shall have a metal core and self-lubricating nylon sleeve to ensure smooth, quiet operation. Pilaster shoes shall be a welded one-piece design made from polished stainless steel. Two-piece shoes that can disassemble when kicked are unacceptable.

Stainless Steel Hardware Option:

- All pilaster, panel and screen brackets are stamped stainless steel, #4 brushed finish.
- All door wrap around hinge brackets are cast stainless steel, #4 brushed finish.
- All 12 x 1-3/4 and 12 x 5/8 TR-27 6-lobe security screws are stainless steel, #4 brushed finish.
- All pilaster shoes are stainless steel, #4 brushed finish.
- All inner, barrier free inner, outer, door pulls, stop and keepers, coat hooks and door castings are standard zinc die castings, #4 brushed finish.
- All other components not outlined here are standard Hadrian hardware items.

2.03 FINISH

A. Type 304, #4 brushed finish.

PART 3 EXECUTION

3.01 EXAMINATION

A. Site Preparation
1. The contractor must examine all site conditions that would prevent the proper application and installation of Toilet Partitions. Any defect must be immediately identified and corrected, prior to the installation of the Toilet Partitions.

3.02 INSTALLATION

A. Mounting
1. All Toilet Partitions must be mounted according Manufacturers' standard locations and those specified on the drawings.
2. Pilasters shall be rigidly fastened to structural steel or pre-cast concrete supporting member (wood support is NOT acceptable) by means of two heavy hanging studs permitting vertical adjustment between the bottom of supporting member and finished ceiling line. MANUFACTURER SUPPLIED CEILING STUDS MUST BE USED TO CREATE A SECURE INSTALLATION. The bottoms of all pilasters shall be truly aligned and the top connection shall be concealed by a 4" (102mm) high die-formed stainless steel pilaster shoe.
3. This specification does not include the supplying, installing, drilling or tapping of any of the structural members required for the support of these units. Only the studs are supplied for installation by others.

3.03 FIELD QUALITY CONTROL

A. Inspection
1. After installation has been completed, provide for a site inspection of all Toilet Partitions to determine that all items have been supplied and installed as per the enclosed details. Also, check the operation and adjustment of all Toilet Partitions. Any discrepancies, or malfunctioning product, must be reported to the Architect immediately.

3.04 ADJUSTMENT AND CLEANING

A. Final Preparation
1. At final completion, Toilet Partitions shall be left clean and free from disfigurement. Make all final adjustments. Where Toilet Partitions are found defective, repair or replace or otherwise correct as directed.

3.05 PROTECTION

A. Site Protection
1. The Contractor must provide for the proper protection of all Toilet Partitions until the owner accepts the project as complete.

3.06 TOILET PARTITION SCHEDULE

A. Schedule
1. Provide Toilet Partitions as specified in all above sections and as per the detailed Architectural Drawings.

Hadrian Manufacturing Inc., 965 Syscon Road, Burlington, Ontario L7L 5S3 Tel: 905-333-0300 Fax: 905-333-1841
Hadrian Inc., 7420 Clover Avenue, Mentor, Ohio 44060 Tel: 440-942-9118 Fax: 440-942-9618
www.hadrian-inc.com

CORE BY DIGILOCK® LOCKER SPECIFICATION
Section 10510

- Applies to one wide, 1 tier (1W1T) Core Lockers with laminated phenolic doors in European White Elm color with a glossy texture and a NextLock ATS recess mount keypad electronic lock.

PART 1 – GENERAL

1.1 SUMMARY
Furnish and install Core lockers with installed mechanical or electronic locks as shown or indicated on approved drawings.

1.2 SUBMITTALS
Provide in accordance with submittal procedures:
Lockers: Submit drawings showing locker types, sizes and quantities, including all necessary details relating to anchoring, trim installation and relationship to adjacent surfaces.
Locks: Submit product data for locks including lock type, orientation, lock interface, quantities and all necessary details related to installation instructions.
Lock Management: Indicate lock management by key and required number of keys to be delivered directly to owner's representative.

PART 2 – PRODUCTS

2.1 MANUFACTURER:
Digilock 9 Willowbrook Court, Petaluma, CA 94954; 800-989-0201; www.digilock.com. Requests to use equivalent products of other manufacturers shall be submitted in accordance with Product Substitution Procedures and may be approved provided they meet the detailed written specifications below.

2.2 LOCKERS:
The locker frame shall not be larger than 15"w x 20"d x 76"h.
1: The locker shall be one wide, with two openings per tier (1W-2T) and 15" (w) doors.
2: The locker shall be one wide, with three openings per tier (1W-3T) and 15" (w) doors.
3: The locker shall be one wide, with six openings per tier (1W-6T) and 15" (w) doors.
4: The locker shall be three wide, with two openings per tier (3W-2T) and 15" (w) doors.

2.2.1 Materials: All major steel parts shall be made of milled cold rolled steel with a powder coat finish (body parts). All door parts shall be made of a laminated phenolic finish (doors).

2.2.2 Finish: Surfaces of steel and phenolic shall be cleaned and prepared for finish in accordance with manufacturer's instructions.

2.2.3 Door Frames: Door frames shall be welded cross-body frames, integrated with locker uprights in channel shape, providing a continuous vertical door strike.

2.2.4 Phenolic Doors: Doors shall be .47" (1.2cm) thick phenolic. Door shall contain formation and punching to accept a NextLock mechanical lock: Padlock Hasp, Laser Camlock, or Dial Lock, or a NextLock electronic lock: 4th generation ATS or APS recess mount keypad or RFID lock or Sola Camlock.

2.2.6 Hinges: Hinges shall be continuous hinges, with riveted attachment both to door and to frame.

2.2.7 Body Components: All locker body components shall be 1.5mm frame, 0.8mm side walls and shelves. Tops, bottoms and shelves are flanged on all four sides and riveted to uprights/frame and back. Backs shall contain two sections of square perforations to provide full ventilation of locker interior. Single, double and triple tier lockers include two single prong hooks. Single tier lockers include coat rod.

2.2.8 Number Plates: Self-adhesive number plates in number series as provided by owner or owner's representative are supplied for application to door in field.

2.2.9 Color: All locker body components shall be finished in color 01 Black. Laminated phenolic locker doors are supplied in European White Elm color (10428-32).

2.2.10 Texture: Phenolic locker doors are supplied with a glossy texture (01).

2.2.11 Roof Type: The locker shall come with a flat top roof.

2.2.12 Assembly: Lockers shall be fully assembled prior to delivery using rivets for a strong mechanical connection.

2.3 LOCKS
2.3.1 Type: Door shall contain formation and punching to accept a NextLock 4th generation ATS recess mount keypad electronic lock.

PART 3 – EXECUTION

3.1 DELIVERY AND INSTALLATION

Deliver lockers in manufacturer's original, labeled cartons. Lockers must be installed in accordance with owner's approved drawings and installation instructions. Installation shall be level such that lock operates without binding.

3.2 PROGRAMMING

Upon completion of installation, inspect locks for proper factory default operation. For code-managed Sola Camlock, transfer instructions for setting owner and manager code to owner. For electronic keypad and RFID locks and key-managed Sola Camlock, transfer programming and electronic manager key(s) to owner.

3.3 QUALITY ASSURANCE

Digilock reserves the right to modify the design and/or function of lock and locker or change specifications to maintain compliance with corporate quality assurance policies.

SECTION 10800
TOILET ACCESSORIES

PART 1 GENERAL

1.1 SUMMARY

A. Provide toilet, bath and laundry accessories.

1.2 SUBMITTALS

A. Product Data: Submit manufacturer's product data and installation instructions for each material and product used.

B. Shop Drawings: Submit shop drawings indicating material characteristics, details of construction, connections, and relationship with adjacent construction.

1.3 QUALITY ASSURANCE

A. Comply with governing codes and regulations. Provide products of acceptable manufacturers, which have been in satisfactory use in similar service for three years. Use experienced installers. Deliver, handle, and store materials in accordance with manufacturer's instructions.

PART 2 PRODUCTS

2.1 MATERIALS

A. Toilet and Bath Accessories:
1. Manufacturers:Access-Able Designs, Inc.;American Dryer, Inc.;American Specialties, Inc.;Bobrick Washroom Equipment, Inc.;Bradley Corp.;Excel Dryer Inc.;Foundations Worldwide, Inc.;Ketcham Medicine Cabinets & Accessories div. of Fred Silver & Co., Inc.;SANIFLOW Hand Dryer Corporation;World Dryer Corp..
2. Accessory: Paper towel dispensers.
3. Accessory: Toilet tissue dispensers, single roll.
4. Accessory: Waste receptacles.
5. Accessory: Combination towel dispenser/waste receptacle units.
6. Accessory: Grab bars.
7. Accessory: Soap dispensers, wall mounted.
8. Accessory: Seat cover dispensers.
9. Accessory: Soap dishes, surface mounted.
10. Accessory: Robe hooks.
11. Accessory: Baby changing stations.
12. Accessory: Undercounter lavatory pipe guards.
13. Accessory: Electric hand dryers.

PART 3 EXECUTION

3.1 INSTALLATION

A. Install materials and systems in accordance with manufacturer's instructions and approved submittals. Install materials and systems in proper relation with adjacent construction and with uniform appearance. Coordinate with work of other sections.

B. Restore damaged finishes and test for proper operation. Clean and protect work from damage.

END OF SECTION

SECTION 15050
GENERAL PLUMBING

PART 1 GENERAL

1.1 SUMMARY

A. Provide common work results for plumbing systems.

1.2 SUBMITTALS

A. Product Data: Submit manufacturer's product data and installation instructions for each material and product used.

B. Shop Drawings: Submit shop drawings indicating material characteristics, details of construction, connections, and relationship with adjacent construction.

1. Shop drawings shall be prepared and stamped by a qualified engineer licensed in the jurisdiction of the project.

C. Operation and Maintenance Data: Submit manufacturer's operation and maintenance data, including operating instructions, list of spare parts and maintenance schedule.

1.3 QUALITY ASSURANCE

A. Comply with governing codes and regulations. Provide products of acceptable manufacturers, which have been in satisfactory use in similar service for three years. Use experienced installers. Deliver, handle, and store materials in accordance with manufacturer's instructions.

PART 2 PRODUCTS

2.1 PRODUCTS

A. Common Work Results for Plumbing:

1. Manufacture: Sloan; Bradley;Noble Co.;Zurn Industries LLC.or Equal
2. Application: Locations indicated.
3. Sustainable Design: Utility efficient equipment and fixtures.
4. Pipes and Fittings:
   a. Drawn Temper Copper Pipe and Tube Material: ASTM B 88, Type L.
   b. Annealed Temper Copper Pipe and Tube Material ASTM B 88, Type K.
   c. Steel Pipe: ASTM A 53, Schedule 10 black steel pipe.
   d. Steel Pipe: ASTM A 53, Schedule 40 black steel pipe.
   e. Plastic Pipe: ASTM D 2846 CPVC pipe.
   f. Fittings: Suitable for piping type and service class.
   g. Joints: Solder, gaskets, grooved mechanical joints, press-seal fittings.
5. Valves: Gate, ball, plug, globe, butterfly, and check valves.
6. Expansion Joints for Piping Systems: 200 percent absorption capacity.
7. Meters and Gages: Temperature and indicator ranges for services required.
8. Supports and Anchors: MSS SP-58.
9. Motors: NEMA MG 1 motors with suitable phase, frequency rating, voltage rating.
10. Mechanical Identification: ASME A13.1 as applicable, color coded.
11. Vibration Control: Pads, isolators, hangers and flexible connectors.

PART 3 EXECUTION

3.1 INSTALLATION

A. Install materials and systems in accordance with manufacturer's instructions and approved submittals. Install materials in proper relation with adjacent construction and with uniform appearance for exposed work. Coordinate with work of other sections. Comply with applicable regulations and code requirements. Provide proper clearances for servicing.

B. Maintain indicated fire ratings of walls, partitions, ceilings and floors at penetrations. Seal with firestopping to maintain fire rating.

C. Clearly label and tag all components.

D. Test and balance all systems for proper operation.

E. Restore damaged finishes. Clean and protect work from damage.

F. Instruct Owner's personnel in proper operation of systems.

END OF SECTION

TWINSBURG LOCKER ROOM
TYPE: #1

AFWALL® MILLENIUM™ 1.6 GPF FLUSHOMETER TOILET SYSTEM

with EVERCLEAN® SELECTRONIC® FLUSH VALVE

BARRIER FREE

AFWALL® MILLENIUM™ 1.6 GPF FLUSHOMETER TOILET SYSTEM with EVERCLEAN®

☑ **3351.660** 1.6 gpf Exposed Top Spud Bowl and Selectronic® Flush Valve

SEE REVERSE FOR ROUGHING-IN DIMENSIONS

BOWL:
- Wall-mounted elongated flushometer valve toilet
- Vitreous china
- High Efficiency. Operates in the range of 1.1 gpf to 1.6 gpf (4.2 Lpf to 6.0 Lpf)
- Permanent EverClean® surface inhibits the growth of stain and odor-causing bacteria, mold, and mildew on the surface
- Condensation channel
- Powerful direct-fed siphon jet action
- 1-1/2" inlet spud
- Fully-glazed 2-1/8" trapway
- 10" x 12" water surface area
- 100% factory flush tested
- Bolt caps and seat not included
- Model 3351.101

SELECTRONIC® FLUSH VALVE:
- Factory-Installed CR-P2 Lithium Battery
- Self-Cleaning Piston with integral wiper spring significantly reduces clogging and maintenance
- Selectronic® Proximity System with universal sensor provides hygienic, "hands free" operation
- State-of-the-Art Electronics prevent ghost flushing
- Dezincification Resistant semi-red brass alloy
- Fully Mechanical Manual Override Button can flush the valve without power
- Fail-Safe: Valve automatically closes upon loss of power or water pressure and does not need to be reset
- Adjustable Sanitary Flush cleans the fixture & maintains the trap seal.
- Chemical Resistant EPDM Seals for extended life
- Adjustable Tailpiece for rough-in flexibility
- Can be installed left or right handed
- Model 6065.161

Includes:
- 047007-0070A Inlet Spud (furnished with bowl)
- 1" I.P.S. angle stop with back-flow protection and vandal resistant cap
- 1" Sweat solder kit including cover tube and wall flange
- 1-1/2" High back pressure vacuum breaker, spud coupling and flange

System MaP* Score:
- 1,000 grams of miso @ 1.6 gpf

* Maximum Performance (MaP) testing performed by IAPMO R&T Lab. MaP Report conducted by Veritec Consulting, Inc. and Koeller and Company.

BATTERY LIFE:
- 4 years @ 4,000 flushes per month

Operating Pressure:
25 psi (flowing) - 80 psi (static)

Flow Requirement:
25gpm (94.6 L/min.)

Nominal Fixture Dimensions:
660 x 356 x 381mm (26" x 14" x 15")

To Be Specified:
- ❑ Color: ☑ White
- ❑ Seat:
  - ☑ American Standard #5901.100 Heavy duty open front less cover
  - ❑ American Standard #5905.100 Extra heavy duty open front less cover

EVERCLEAN® Surface

AFWALL® MILLENIUM™
1.6 GPF FLUSHOMETER TOILET SYSTEM
with EVERCLEAN® SELECTRONIC® FLUSH VALVE

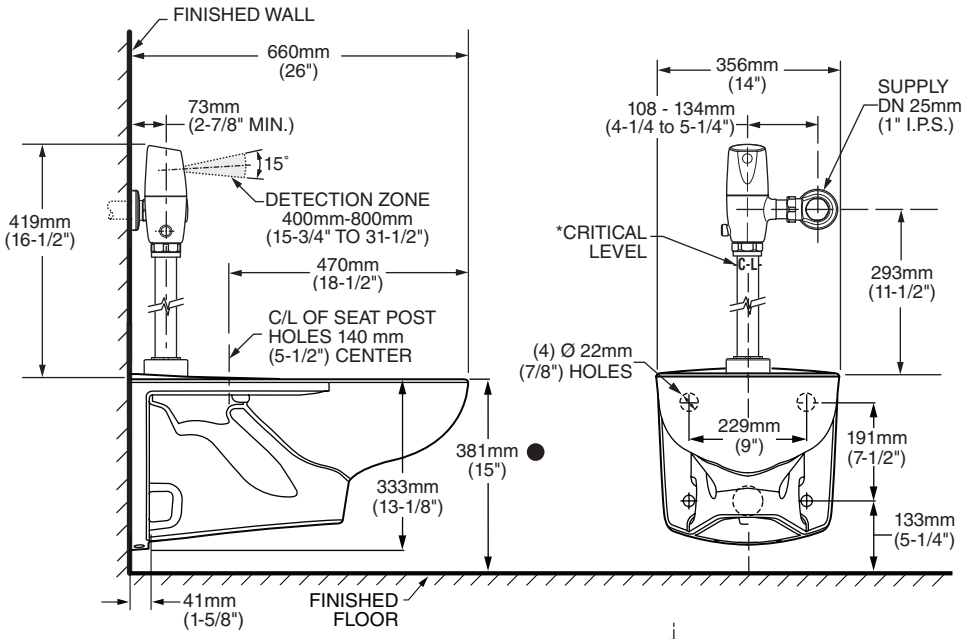
BARRIER FREE

Fixture Compliance Certifications - Meets or Exceeds the Following Specifications:

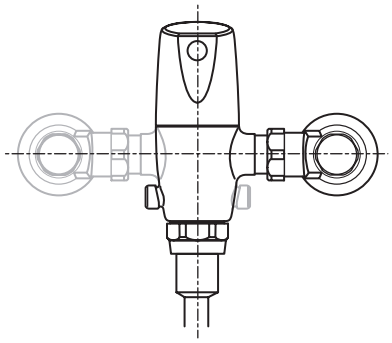
- ASME A112.19.2-2008 / CSA B45.1-08 for Vitreous China Fixtures

Valve Listings:

- ASSE 1037
- ANSI/ASME A112.19.2
- ADA Compliant



*Note: The Critical Line (-C-L-) on Vacuum Breaker must typically be a minimum of 6" (152mm) above fixture. Consult Codes for details.



VALVE LEFT or RIGHT HAND INSTALLATION

MEETS THE AMERICANS WITH DISABILITIES ACT GUIDELINES AND ANSI A117.1 ACCESSIBLE AND USABLE BUILDINGS AND FACILITIES - CHECK LOCAL CODES.

● When installed so that top of seat is 432 to 483mm (17" to 19") from the finished floor.

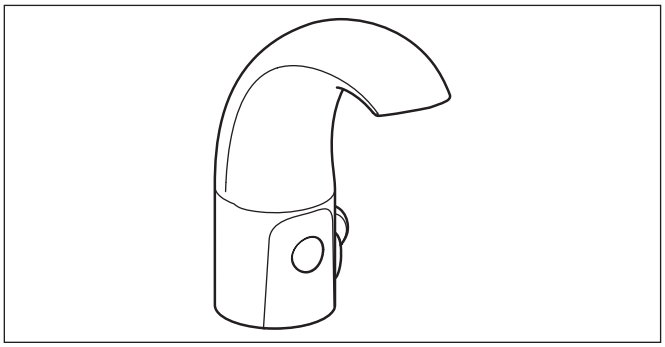
NOTES:
WASTE OUTLET SEAL RING MUST BE NEOPRENE OR GRAPHITE-FELT (WAX RING NOT RECOMMENDED).
SUGGESTED 2mm (1/16) CLEARANCE BETWEEN FACE OF WALL AND BACK OF BOWL.
TO COMPLY WITH AREA CODE GOVERNING THE HEIGHT OF VACUUM BREAKER ON THE FLUSHOMETER VALVE, THE PLUMBER MUST VERIFY DIMENSIONS SHOWN FOR SUPPLY ROUGHING.
CARRIER FITTING AS REQUIRED TO BE FURNISHED BY OTHERS.
PROVIDE SUITABLE REINFORCEMENT FOR ALL WALL SUPPORT.

IMPORTANT: Dimensions of fixtures are nominal and may vary within the range of tolerances established by ANSI Standard A112.19.2.
These measurements are subject to change or cancellation. No responsibility is assumed for use of superseded or voided pages

S53-328, S53-329

Aerada™ 1100 Series High Arc Faucets with Infrared Control

- ADA Compliant External Temperature Control
- Reliable Infrared Activation
- Adjustable Operating Modes
- Vandal Resistant Cast Brass Spout
- Chrome-Plated Finish
- Above-Deck Water-Tight Electronics
- 6V Lithium Battery Operation (Battery Included)
- 12V AC Transformer Available (Not Included)



Standard Equipment

Infrared Sensor

The IR Sensor uses a twin-beam system to respond quickly when needed, and to eliminate false activations. The electronics can be adjusted between static mode sensing the complete IR beam and dynamic mode sensing only hand motion.

Valve

The electronically activated solenoid valve provides reliable performance since there are few moving parts and its operation is unaffected by most chemicals and minerals found in municipal water supplies. The faucet includes (2) stainless steel supply hoses with check stops to prevent backflow into the supply lines.

Flow Control/Rate

Operating range 20–80 PSI. The vandal-resistant aerator produces a .5 GPM flow rate.

Faucet Body

Chrome-plated solid cast brass body. Centershank mounting with optional 4" centerset trim plate available.

Sanitary

No-touch operation reduces water/soap splatter and addresses the public's increasing awareness and concern about communicable diseases.

Vandal Resistant

The sensor module, circuit board and solenoid valve are enclosed in the solid cast brass faucet body. The faucet also features a vandal-resistant aerator.

Code Compliance and Certifications

CSA

The 1100 Series High Arc Faucets are certified to meet CSA B125 test standards for plumbing fixtures. The faucets are CSA approved in Canada and the United States.

ASME A112.18.1

The 1100 Series High Arc Faucets are certified to meet the ASME A112.18.1 standard for plumbing fixtures.

ADA Compliance

The infrared sensor produces a broad detection zone that allows disabled users to easily activate the faucet from either a front or side approach; the external temperature control does not require tight grasping or rotating and turns on less than 5 pounds of pressure, meeting ADA guidelines provided by ANSI A117-1.

Verify all rough-in dimensions prior to installation.
Consult local and national codes. Conformity and compliance to local and national codes is the responsibility of the installer.

Check Your Surroundings

Certain factors, such as intense direct sunlight, other infrared devices, or other site conditions may interfere with the activation of infrared faucets. Contact your Bradley Representative to discuss any application concerns.

Sample Specification

No-touch infrared faucet shall be (S53-329) Bradley Aerada™ 1100 Series High Arc IR Faucet. The faucet shall be powered by a 6-volt DC lithium battery (included). All Electronics shall be above deck within watertight enclosure. The external temperature control shall be constructed of solid cast brass and shall comply with ADA guidelines. The faucet shall include a chrome-plated, forged brass body with centershank mounting, .5 GPM vandal-resistant aerator and (2) stainless steel flexible supply hoses. The faucet shall be UPC approved and certified to CSA standards.

Models

Faucet Only:

☐	**S53-328**	AC High Arc IR Faucet Centershank
☑	**S53-329**	DC High Arc IR Faucet Centershank

Optional Selections

Trim Plate:

☐	**150-221**	4" Chrome-plated trim plate

Transformer: (options only used with S53-328 AC faucet, cannot be used on S53-329 DC Faucet)

☐	**232-008**	Plug-in Transformer 12V
☐	**232-009**	Hardwire Transformer 12V (1–8 Faucets)

Flow Control:

☐	**269-1922**	2.2 GPM Laminar Flow Control (The 2.2 GPM flow control does not meet California Energy Commission 20 CCR T.20, Div. 2, 1601-1609.)

Drain Assembly:

☑	**269-1839**	D-ASSY, Drain, Strainer, and Tailpiece

☑ Standard product selections contained within this document are third party **CERTIFIED** to NSF/ANSI 372 meeting the Lead-Free content requirement. Any product configured with custom options will be **COMPLIANT** with NSF/ANSI 372 meeting the Lead-Free content requirement.

Certified to NSF/ANSI 372

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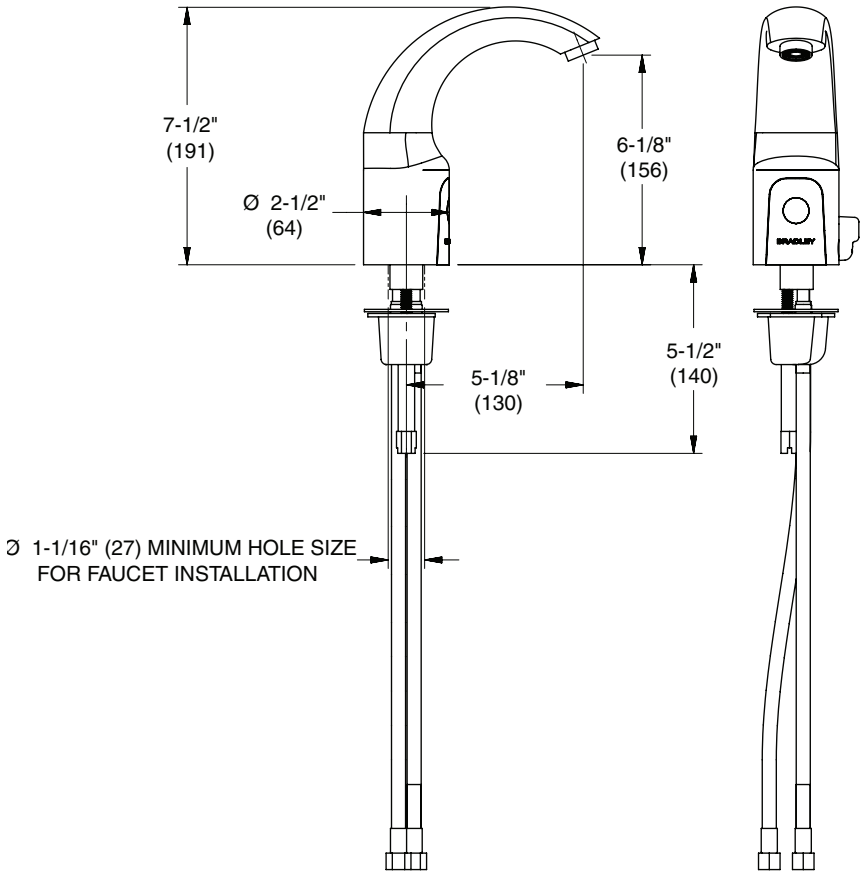
800 BRADLEY (800 272 3539) +1 262 251 6000
bradleycorp.com

Distributor/Wholesaler:	**Date:** 9/27/16
Project & Location: Twinsburg Locker Room	
Model Number: S53-329	**Qty:** 4

(mm)



Verify all rough-in dimensions prior to installation.
Consult local and national codes. Conformity and compliance to local and national codes is the responsibility of the installer.

This information is subject to change without notice.
Bradley_Faucets_S53-328_329

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Distributor/Wholesaler:	**Date:** 9/27/16
Project & Location: Twinsburg Locker Room	
Model Number:	**Qty:**

Small Urinals
WEUS-7000.1201-0.125 SOLIS®

▶ Code Number:
70001402

▶ Code Number
70001201

▶ Description
Complete HEU system with solar powered, sensor activated Sloan Solis® urinal Flushometer and vitreous china urinal.

▶ SPECIFICATIONS
Specifications
Quiet, exposed, diaphragm type, chrome plated urinal flushometer for either left or right hand supply and vitreous china urinal with the following features:

- ADA compliant Sloan Battery powered infrared Sensor for automatic "no Hands" operation
- Sensor assembly powered by a solar cell that will harvest power from artificial indoor light, either in candescent or fluorescent light, providing approxi mately 100% power with 650 lluminance (lux).
- infraredSensorwithMultiple-focused,Lobular Sensing fields for high and low target detection
- Four (4) Size AA Battery power source factory installed
- "Low Battery" flashing LED
- "User in View" flashing LED
- Infrared Sensor Range Adjustment Screw and Reset Button
- High copper, low zinc brass castings for dezincification resistance
- No external volume adjustment to ensure water conservation
- Adjustable Tailpiece
- PERMEX® Synthetic Rubber Diaphragm with Dual Filtered Fixed Bypass
- 3/4" IPS screwdriver Bak-Chek® angle stop with free spinning, vandal resistant stop cap
- High back pressure vacuum breaker flush connection w/one-piece bottom hex coupling nut
- Spud coupling and flange for 3/4" top spud
- Sweat solder adapter w/cover tube and cast wall flange w/set screw
- Stop seat and vacuum breaker to be molded from PERMEX rubber compound for chloramine resistance

Valve body, cover, tailpiece and control stop shall be in conformance with ASTM Alloy Classification for Semi-Red Brass. Valve shall be in compliance to the applicable sections of ASSE 1037 and ASME A112.19.2/CSA B45.1

Fixture Specifications
- Integral flushing rim
- Compliant with Buy American Act when purchased as a combination
- 100% factory flush tested
- Wall hung vitreous china
- Washdown flushing action
- 3/4" IPS top spud inlet
- 2" NPT outlet flange included
- All mounting hardware included
- Carrier not included
- Vandal resistant strainer assembly included

▶ FEATURES
Automatic
Sloan SOLIS® Flushometers activate via multi-lobular sensor detection to provide the ultimate in sanitary protection and automatic operation. A solar powered infrared sensor sets the flushing mechanism after the user is detected and completes the flush when the user steps away.

Functional & Hygienic
Touchless, sensor operation eliminates the need for user contact to help control the spread of infectious diseases. The Sloan SOLIS® Flushometer is provided with an Optional Override Button to allow a "courtesy flush" for individual user comfort.

Economical
Automatic operation and a very low flush volume provides water savings over other flushing devices. Reduces maintenance and operation costs. Installation and battery replacement does not require turning off water to the valve.

▶ Compliance & Certifications
ASME A112.1.3

▶ NOTE
Plumbing System Requirements

Minimum Flowing Pressure: 25 PSI / Minimum Flow Rate: 18 GPM / Maximum Fixture Static Pressure: 80 PSI

This space for Architect/Engineer Approval

Twinsburg Locker Room
Type: #3

- Compliant to the applicable sections of ASME A112.19.2/CSA B45.1

► ELECTRICAL SPECIFICATIONS

Control Circuit
Solid state, 6 VDC input

Sensor Type
Infrared Convergence Type Object Lock Detection

Sensor Range
Nominal 22" – 42" (559 mm – 1067 mm)

Adjustable ± 8" (203 mm)

Battery Back-up Type
(4) AA Alkaline

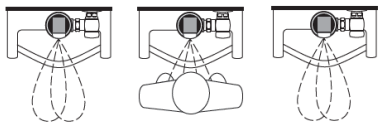
Battery Type
(4) C Alkaline

Battery Life
6 Years @ 4,000 flushes/month

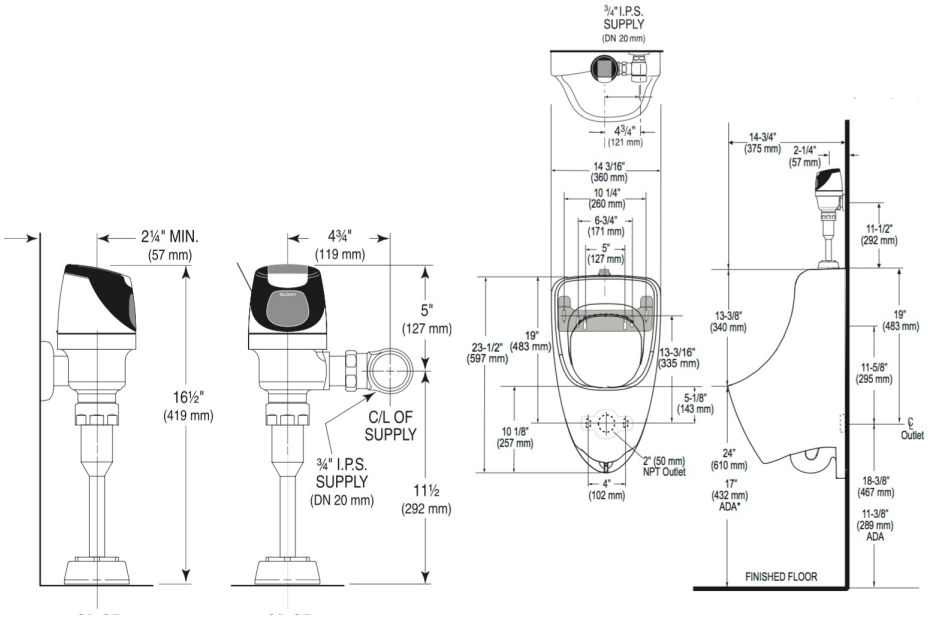
Indicator Lights
User in View

Valve Operating Pressure (Flowing)
15 - 100 psi (104 - 689 kPa)

► OPERATION



1. A continuous, invisible light beam is emitted from the Sloan SOLIS® Sensor.
2. As the user enters the beam's effective range (15° to 30°) the beam is reflected into the Sloan SOLIS® Scanner Window and transformed into a low voltage electrical circuit. Once activated, the Output Circuit continues in a "hold" mode for as long as the user remains within the effective range of the Sensor.
3. When the user steps away from the Sloan SOLIS® Sensor, the Sensor initiates an electrical signal that operates the Solenoid. This initiates the flushing cycle to flush the fixture. The Circuit then automatically resets and is ready for the next user.



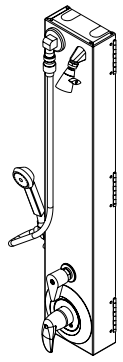
► Disclaimer

NOTE: All vitreous china dimensions shown in these drawings are nominal and not to scale. Dimensions can vary within the tolerances established in the governing ASME A112.19.2/CSA B45.1 standard. It is important to consider this when planning rough-in and plumbing layouts.

All information contained within this document subject to change without notice.

WS-1X-HN
Individual Pivoting Barrier-Free Wall Shower

- Ideal for Barrier-Free Shower Room
- Industry Unique Hinge Design for Quick and Easy Installation and Maintenance
- Completely Preassembled and Ready to Mount to a Wall
- Flexible Supply Connections



WS-1X-HN

Specifications

Materials

Shower panel is type 300 Series stainless steel. All other exposed parts are stainless steel or chrome-plated brass. Supply inlets are flexible stainless steel hoses.

Standard Equipment

Shower Panel

Shower panel is constructed of 18 gauge stainless steel. Top and bottom covers are riveted onto shower panel.

Hinges

Stainless steel barrel hinges to mount shower to wall.

Showerhead

Showerhead is chrome plated brass with 2.0 GPM (7.6 LPM) flow control, ball joint and adjustable spray pattern control.

Control Valve

All exposed parts are chrome plated or stainless steel, all valves are ADA compliant. Control valve can be hot and cold type, single temperature type or metering.

Diverter Valve

Lever handle operation for easy transfer of water flow between fixed showerhead and hand-held shower spray.

Hand-Held Shower Spray

Consisting of hand shower with on-off control, a 60" stainless steel flexible hose and post style mounting bracket to hold to shower panel. Elevated in-line backflow preventer with quick disconnect for flexible hose.

Supply Inlets

Supply inlets are 24" flexible, stainless steel hoses with 1/2" NPT connections. Inlets are accessible through back of shower or through knockouts in the top and bottom covers.

ADA Requirements

☑ *This shower complies with most, but not all, ADA dimensional requirements. Check local codes prior to installation.*

Standard Selections (Must select one)

Valve Type (select one)

Hot/Tempered and Cold Supplies

- ☐ **EF** Equa-Flo Pressure Balancing Valve
- ☐ **HD** Equa-Flo HD Pressure Balancing Valve
- ☑ **TMV** Thermostatic Mixing Valve

Single Tempered/Cold Supply

- ☐ **AST** Air Metering Valve
- ☐ **SVL** Single Compression Valve
- ☐ **TT** TouchTime® Metering Valve

Optional Selections

Showerheads

- ☐ **S** Standard Institutional Showerhead

Flow Control (Available with S Showerhead Only)

- ☐ **G** 1.5 GPM (5.7LPM) Flow Control (Shower and Hand Shower)

Ball Joint (Available with S Showerhead Only)

- ☐ **LBJ** Lockable Ball Joint

Miscellaneous

- ☐ **SB** 24" Slide Bar
- ☐ **B30** 30" Slide Bar (currently available on WS-1X-HN model only)
- ☑ **SL** Sloped Top
- ☐ **SD** Wall Mounted Cake Soap Dish
- ☐ **SHV** Vertical Shroud:
  - Showerhead Height _____
  - Floor to Ceiling Height _____
- ☐ **SHH** Horizontal Shroud* **
- ☑ **VS** Vandal Resistant Screws

*Non-cancelable, non-returnable

** Submittal drawings required.

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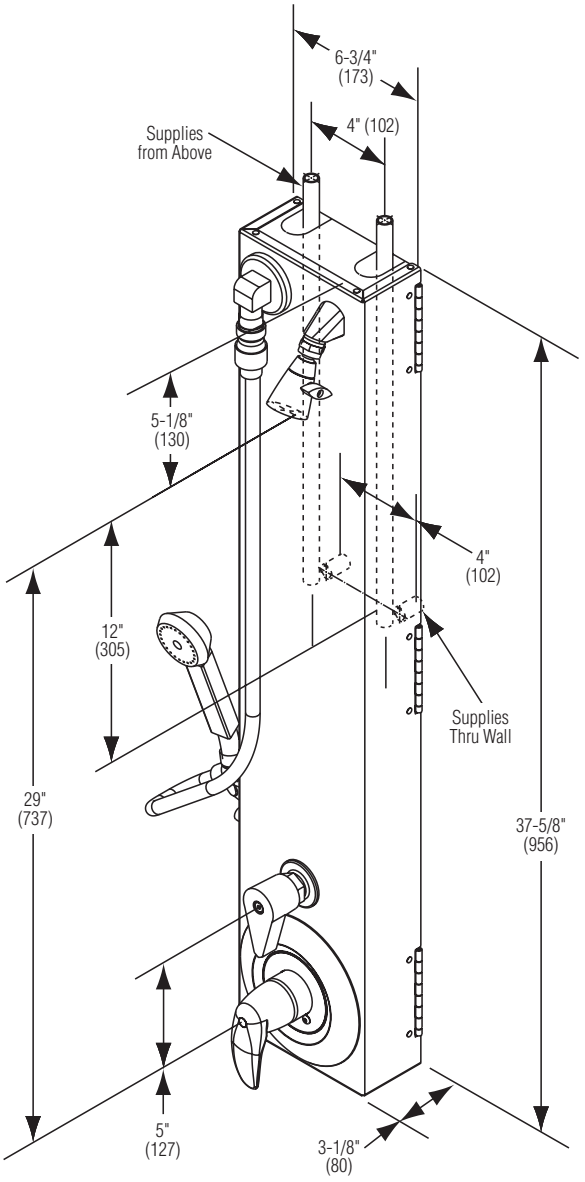
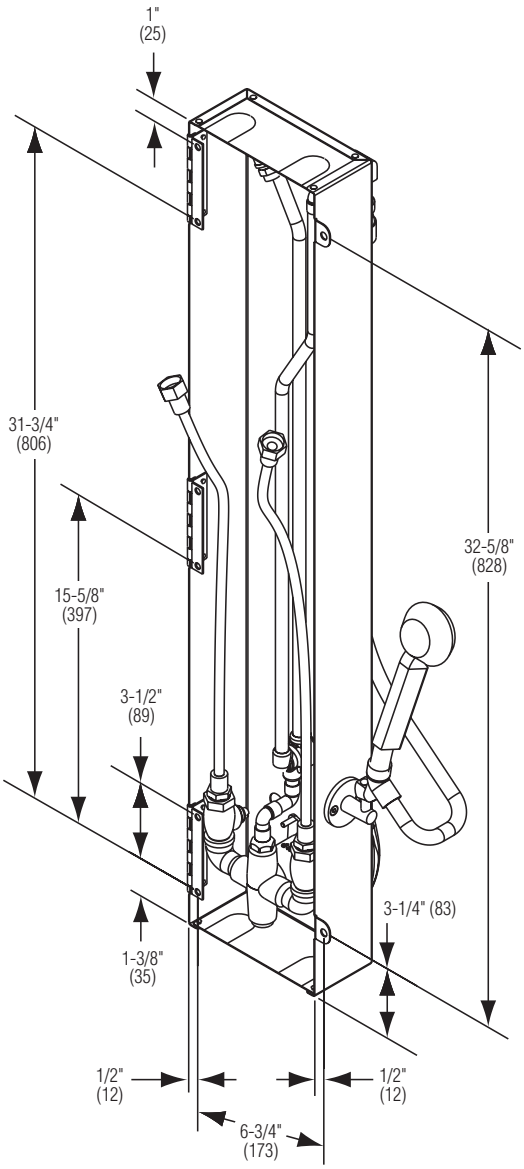
Distributor/Wholesaler:	**Date:** 9/27/16
Project & Location: Twinsburg Locker Room	
Model Number: WS-1X-HN	**Qty:** 8

Rough-In Dimensions **(mm)**





Equa-Flo Valve shown. Valve location and rough-ins same for other valves.

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bradleycorp.com

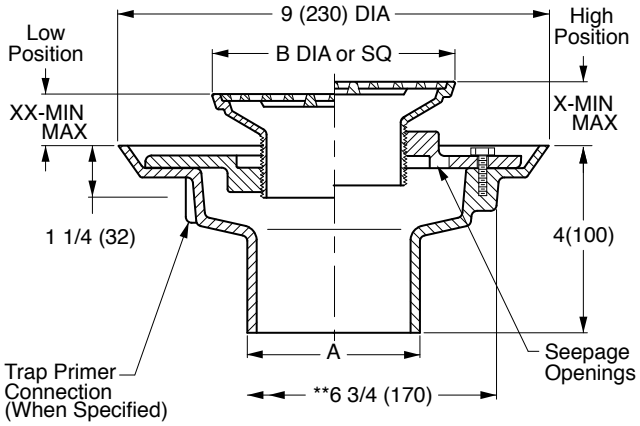
Distributor/Wholesaler:	**Date:** 9/27/16
Project & Location: Twinsburg Locker Room	
Model Number:	**Qty:**

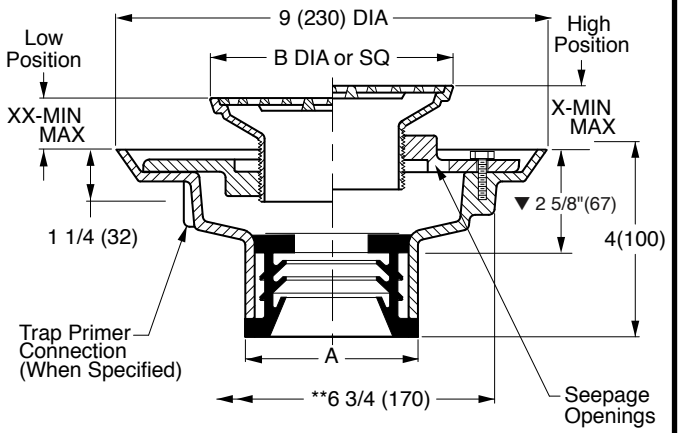
SMITH® JAY R. SMITH MFG. CO.®
MEMBER OF MORRIS GROUP INTERNATIONAL
POST OFFICE BOX 3237
MONTGOMERY, ALABAMA 36109-0237 (USA)
TEL: 334-277-8520 FAX: 334-272-7396 www.jrsmith.com
CUSTOMER DRIVEN SINCE 1926
MEMBER OF:

LOCATION: Twinsburg Locker Room

FLOOR OR SHOWER DRAINS
WITH ADJUSTABLE STRAINER HEADS

FUNCTION: General service floor drain for use in showers, toilets, kitchens and other finished areas where foot traffic is expected. The round top strainer head is used for all types of poured finished floors. The square top is particularly adaptable to floors that are finished in material of square or straight line pattern. Reversible flashing collar permits adjustment of the strainer to meet finished floor level.





A (Pipe Size) = 02(50), 03(75), 04(100), 05(125) or 06(150)

NO-HUB OUTLET

- [X] **Fig. 2005Y.....(A) ROUND TOP**
- [ ] **Fig. 2005Y.....(B) SQUARE TOP**

SPEEDI-SET OUTLET

- [ ] **Fig. 2005L.....(A) ROUND TOP**
- [ ] **Fig. 2005L.....(B) SQUARE TOP**

	Outlet Size	Nickel Bronze Strainer Head
▲	02(50)	05(125) DIA or SQ
▲	03(75)	06(150) DIA or SQ
▲	04(100)	08(205) DIA or SQ

	Strainer Size B DIA or SQ	*Collar In High Position X MIN	MAX	*Collar In Low Position XX MIN	MAX	Free Area SQ IN (SQ CM) ROUND	SQUARE
[ ]	05 (125)	1 1/4(32)	2 1/4(57)	3/4(19)	1 5/8(41)	7(45)	6.5(42)
[X]	06 (150)	1 1/4(32)	2 1/4(57)	3/4(19)	1 5/8(41)	9(58)	12.5(81)
[ ]	07 (180)	1 1/4(32)	2 1/4(57)	7/8(22)	1 7/8(48)	14(90)	11(71)
[ ]	08 (205)	1 1/2(38)	2 1/2(64)	1(25)	1 7/8(48)	17(110)	14(90)
[ ]	•09 (230)	1 1/2(38)	2 3/8(60)	1(25)	1 7/8(48)	18(116)	16(103)
[ ]	•10 (255)	1 1/2(38)	2 3/8(60)	1(25)	1 7/8(48)	23(48)	16(103)

▼ This dimension to internal stop of speedi-set gasket.
• Add 3/8"(10) to all min/max dimensions for round strainers.
* Collar is reversible to obtain extreme high and low strainer positions.
•• Not available for 5"(125) size strainer.
** MIN 6 3/4"(170) hole required for core drilled application.

REGULARLY FURNISHED:
Duco Cast Iron Body with Flashing Collar and Adjustable Strainer Head as Indicated by Suffix Letter Selected.

VARIATIONS:

- [ ] Flapper Type Backwater Valve -V
- [X] •• Hinged Grate -H
- [ ] L Speedi-Set Service Weight 2(50), 3(75) & 4"(100) only
- [ ] LXH Speedi-Set Extra Heavy 2(50), 3(75) & 4"(100) only
- [X] Sediment Bucket -B
- [X] Trap Primer Connection -P050 1/2" (13) & -P075 3/4" (19)
- [ ] Vandal Proof Screws -U
- [ ] Wide Flanged Strainer (Specify Fig. DX2005)
- [ ] T Threaded Outlet
- [ ] Heelproof Grate -HP -AHP (Round) or -BHP (Square)
- [ ] Quad Close Trap Seal (Specify Fig. 2692)

OPTIONAL MATERIALS:

- [ ] Bronze Body -BB
- [ ] Chrome Plated Strainer -CP
- [ ] Galvanized Cast Iron Body -G
- [X] Nickel Bronze Strainer -NB
- [ ] Polished Bronze Strainer -PB
- [ ] Stainless Steel (Specify Fig. 9700-A)

NOTE: Dimensions shown in parentheses are in millimeters.

▲ **Meets ASME Standard A112.6.3-2001 02(50), 03(75) or 04"(100) sizes only.**

SEE PM0457 FOR OPTIONAL STRAINER HEADS.

REV.	DATE	DESCRIPTION	BY	CKD. BY
R	6-10-15	Revised Variations	TBW	CL
Q	11-18-11	Rev. Dwg., Var.	TBW	CR
P	11-20-09	Revised Variations	RN	BW
N	12/18/08	Addition to Variations	JJ	BW

WEIGHT POUNDS | VOLUME CUBIC FEET | **FIGURE NUMBER 2005**

FIGURE NUMBER: 2005 | DRAWN BY: PJ | CHECKED BY: TD | APPROVED BY: TD | DATE: 5-17-85 | SCALE: NONE | SIZE A | DRAWING NUMBER S2005 | R

SMITH® JAY R. SMITH MFG. CO.®
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TEL: 334-277-8520 FAX: 334-272-7396 www.jrsmith.com
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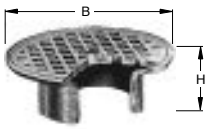
MEMBER OF:

LOCATION

OPTIONAL STRAINER HEADS

ROUND STRAINER



MATERIALS:
Chrome Plated -CP
Polished Bronze -PB
Nickel Bronze -NB

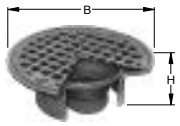
VARIATIONS:
*Hinged Grate (Specify Suffix -AH)
Sediment Bucket -B
Vandal Proof Screws -U

B DIA		05 (125)	06 (150)	07 (180)	08 (205)	09 (230)	10 (255)
H		2 (51)	2 (51)	2 1/4 (57)	2 1/2 (64)	2 1/2 (64)	2 3/4 (70)
X	MIN	1 1/4 (32)	1 1/4 (32)	1 1/4 (32)	1 1/2 (38)	1 1/2 (38)	1 1/2 (38)
	MAX	2 1/4 (57)	2 1/4 (57)	2 1/4 (57)	2 1/2 (64)	2 1/2 (64)	2 3/4 (70)

Specify Type, Size & Finish eg: A05NB
*Not available for 05" (125) size

SUFFIX -A

FLAPPER TYPE BACKWATER VALVE



FUNCTION: Provides backwater protection at point where protection is needed.

MATERIALS:
Chrome Plated -CP
Polished Bronze -PB
Nickel Bronze -NB

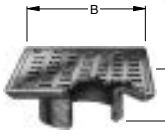
VARIATIONS
*Hinged Grate (Specify Suffix -AH)
Vandal Proof Screws -U

B DIA		05 (125)	06 (150)	07 (180)	08 (205)
H		2 (51)	2 (51)	2 1/4 (57)	2 1/2 (64)
X	MIN	1 1/4 (32)	1 1/4 (32)	1 1/4 (32)	1 1/2 (38)
	MAX	2 1/4 (57)	2 1/4 (57)	2 1/4 (57)	2 1/2 (64)

Specify Type, Size & Finish eg: AV05NB
*Not available for 05" (125) size

SUFFIX -AV

SQUARE STRAINER



MATERIALS:
Chrome Plated -CP
Polished Bronze -PB
Nickel Bronze -NB

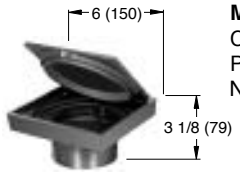
VARIATIONS:
Flapper Type Backwater Valve (Specify Suffix -BV) 05 (125), 06 (150), 07 (180) or 08" (205) sizes only
*Hinged Grate (Specify Suffix -BH)
Sediment Bucket -B
Vandal Proof Screws -U

B DIA		05 (125)	06 (150)	07 (180)	08 (205)	09 (230)	10 (255)
H		2 (51)	2 (51)	2 1/4 (57)	2 1/2 (64)	2 1/4 (57)	2 1/4 (57)
X	MIN	1 1/4 (32)	1 1/4 (32)	1 1/4 (32)	1 1/2 (38)	1 1/2 (38)	1 1/2 (38)
	MAX	2 1/4 (57)	2 1/4 (57)	2 1/4 (57)	2 1/2 (64)	2 1/4 (57)	2 3/8 (60)

Specify Type, Size & Finish eg: B05NB
*Not available for 05" (125) size

SUFFIX -B

STRAINER HEAD w/SQUARE HINGED COVER



MATERIALS:
Chrome Plated -CP
Polished Bronze -PB
Nickel Bronze -NB

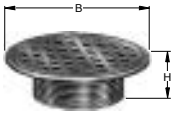
VARIATIONS:
Gasketed Water Tight Cover -GC
Secured Cover -SC
Secondary Strainer Grate-SG

Specify Type, Size & Finish
eg: BSNB

SUFFIX -BS

REINFORCED ROUND STRAINER

FUNCTION: Used in finished floors where light wheeled loads are anticipated.



MATERIALS:
Chrome Plated -CP
Polished Bronze -PB
Nickel Bronze -NB

VARIATIONS:
Flapper Type Backwater Valve (Specify Suffix -CV)
Sediment Bucket -B
Vandal Proof Screws -U

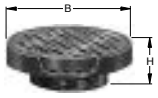
B DIA	05 (125)	06 (150)	08 (205)	10 (255)
H	2 (51)	2 (51)	2 1/2 (64)	2 3/4 (70)
MIN	1 1/4 (32)	1 1/4 (32)	1 1/2 (38)	1 7/8 (48)
MAX	2 1/4 (57)	2 1/4 (57)	2 1/2 (64)	2 3/4 (70)

Specify Type, Size & Finish eg: C06NB

SUFFIX -C

REINFORCED TRACTOR STRAINER

FUNCTION: Used in finished floors where medium weight wheeled loads are anticipated and loose set non-tilt tractor grate is desired.



MATERIALS:
Cast Iron -CI
Chrome Plated -CP
Polished Bronze -PB
Nickel Bronze -NB

VARIATIONS:
Flapper Type Backwater Valve (Specify Suffix -DV or -EV)
Sediment Bucket -B
Vandal Proof Screws -U

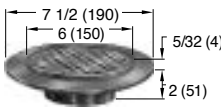
SUFFIX	B DIA	H	X MIN	X MAX
-D	07 (180)	3 1/4 (83)	2 5/8 (67)	3 1/2 (89)
-E	09 (230)	3 1/2 (89)	2 3/4 (70)	3 1/2 (89)

Specify Type, Size & Finish eg: D09PB E09PB

SUFFIX -D-E

TILE FLANGE

FUNCTION: Provides integral flange set 5/32" (4) below rim to receive floor covering. Flange may have option of tapped holes for securing pan and gasket.



MATERIALS:
Chrome Plated -CP
Polished Bronze -PB
Nickel Bronze -NB

VARIATIONS:
Flapper Type Backwater Valve (Specify Suffix -FV)
Holes in Flange -SH
Sediment Bucket -B
Vandal Proof Screws -U

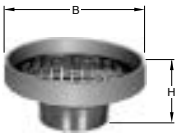
X MIN	X MAX
1 1/4 (32)	2 1/8 (54)

Specify Type, Size & Finish eg: F06NB

SUFFIX -F

ADJUSTABLE STRAINER HEAD

FUNCTION: Used in a non-traffic area when a funnel type strainer head is required and space does not allow use of the 3500 series funnel. The extended rim allows use as an anti-flood and anti-splash drip pan.



VARIATIONS:
Flapper Type Backwater Valve (Specify Suffix -F37V or F38V)

SUFFIX	-F37	-F38
B DIA	07 (180)	09 (230)
H	3 1/4 (83)	3 1/2 (89)
X MIN	2 5/8 (67)	2 3/4 (70)
X MAX	3 1/2 (89)	3 1/2 (89)

MATERIALS:
Cast Iron -CI
Chrome Plated -CP
Galvanized Cast Iron -G
Polished Bronze -PB
Nickel Bronze -NB

SUFFIX -F37-F38

Specify Type, Size & Finish eg: F37NB F38CP

REV.	DATE	DESCRIPTION	BY	CKD. BY
G	10-4-01	Revised Suffix-BS	RN	CL
E	8-24-99	Revised	TBW	
F	6-11-99	Revised Tables	CMD	BS
E	11-4-97	Added Nickel Bronze	EMB	BS

FIGURE NUMBER
2010 SERIES OPTIONAL STRAINER HEADS
1 0f 2

NOTE: Dimensions shown in parentheses are in millimeters.

FIGURE NUMBER: 2010 SERIES OPTIONAL STRAINER HEADS
DRAWN BY: PJ
CHECKED BY: TD
APPROVED BY: TD
DATE: 5-17-85
SCALE: NONE
SIZE: A
DRAWING NUMBER: PM0457 SH 1 of 2
G

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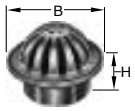
MEMBER OF:

LOCATION

OPTIONAL STRAINER HEADS

LOW DOME STRAINER

FUNCTION: Used in gutters and recessed areas where excessive debris build-up is expected. Dome insures drainage even when partly covered.



MATERIALS:
Chrome Plated -CP
Polished Bronze -PB
Nickel Bronze -NB

VARIATIONS:
Flapper Type Backwater Valve (Specify Suffix -GV)
Sediment Bucket -B
Vandal Proof Screws -U

B DIA	05 (125)	06 (150)	08 (205)
H	2 (51)	2 (51)	2 1/2 (64)
MIN	1 1/4 (32)	1 1/4 (32)	1 1/2 (38)
MAX	2 1/4 (57)	2 1/4 (57)	2 1/2 (64)

SUFFIX -G Specify Type, Size & Finish eg: G08PB

SOLID HINGED COVER

FUNCTION: Used in areas where intermittent drain use is required. Solid cover prevents intrusion of chips, saw-dust, etc., which are swept up before cover is opened for washdown. The secondary strainer prevents debris from entering the waste line.

MATERIALS:
Cast Iron -CI
Chrome Plated -CP
Polished Bronze -PB
Nickel Bronze -NB

VARIATIONS:
Flapper Type Backwater Valve (Specify Suffix -GV)
Vandal Proof Screws -U

B DIA	05 (125)	06 (150)	07 (180)	08 (205)
H	2 (51)	2 (51)	2 1/4 (57)	2 1/2 (64)
X MIN	1 1/4 (32)	1 1/4 (32)	1 1/4 (32)	1 1/2 (38)
X MAX	2 1/4 (57)	2 1/4 (57)	2 1/4 (57)	2 1/2 (64)

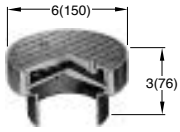
SUFFIX -H Specify Type, Size & Finish eg: H05CP

SPANNER WRENCH COVER

FUNCTION: Solid gas tight, vandal proof, threaded cover for areas where intermittent drain use is required.

MATERIALS:
Chrome Plated -CP
Polished Bronze -PB
Nickel Bronze -NB

VARIATIONS:
Flapper Type Backwater Valve (Specify Suffix -JV)
Sediment Bucket -B



X	
MIN	MAX
2 (51)	3 (76)

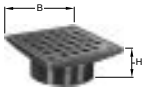
SUFFIX -J Specify Type, Size & Finish eg: J06NB

REINFORCED SQUARE STRAINER

FUNCTION: Used in finished floors where some light wheeled traffic is anticipated.

MATERIALS:
Chrome Plated -CP
Polished Bronze -PB
Nickel Bronze -NB

VARIATIONS:
Flapper Type Backwater Valve(Specify Suffix -KV)
Sediment Bucket -B
Vandal Proof Screws -U



B SQ	05 (125)	06 (150)	07 (180)	08 (205)
H	2 (51)	2 (51)	2 1/4 (57)	2 1/2 (64)
X MIN	1 1/4 (32)	1 1/4 (32)	1 1/4 (32)	1 1/2 (38)
X MAX	2 1/4 (57)	2 1/4 (57)	2 1/4 (57)	2 1/2 (64)

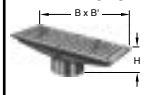
SUFFIX -K Specify Type, Size & Finish eg: K07CP

RECTANGULAR STRAINER

FUNCTION: Used in finished floors where light wheeled loads and or heavy foot traffic are anticipated.

MATERIALS:
Chrome Plated -CP
Polished Bronze -PB
Nickel Bronze -NB

VARIATIONS:
Sediment Bucket -B
Vandal Proof Screws -U

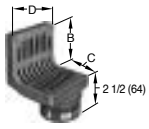


SUFFIX	L	M	N	P	R	T
B x B'	4 1/2(115)x8(205)	4(100)x12(305)	5(125)x9(230)	5(125)x13(330)	6(150)x10(255)	5(125)x17(430)
H	2 1/4 (57)	2 1/2 (64)	2 1/4 (57)	3 (76)	2 1/4 (57)	3 (76)
X MIN	1 3/8 (35)	1 7/8 (48)	1 3/8 (35)	2 1/8 (54)	1 3/8 (35)	2 1/4 (57)
X MAX	2 3/8 (60)	2 3/4 (70)	2 3/8 (60)	3 (76)	2 3/8 (60)	3 1/8 (79)

SUFFIX -L-M-N-P-R-T Specify Type,Size & Finish eg: LNB

ANGLE STRAINER

FUNCTION: Shower room drain set at wall and floor junction. Vertical grate openings prevent drain stoppage should flat surface become covered.



MATERIALS:
Cast Iron -CI
Chrome Plated -CP
Polished Bronze -PB
Nickel Bronze -NB

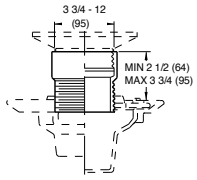
VARIATIONS:
Vandal Proof Screws -U

SUFFIX	B	C	D	X	
				MIN	MAX
-V	3 1/2 (89)	3 1/2 (89)	4 1/2 (115)	1 5/8 (41)	2 5/8(67)
-W	6 3/4 (170)	6 3/4 (170)	6 1/2 (165)	1 5/8 (41)	2 5/8(67)

SUFFIX -V -W Specify Type, Size & Finish eg: VPB, WNB

EXTENSION ADAPTOR

FUNCTION: Used when a strainer head must be raised to accommodate deeper floor fill.



REGULARLY FURNISHED:
Duco Cast Iron -CI

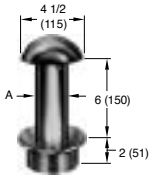
MATERIALS:
Cast Bronze -CB
Galvanized Cast Iron -G

NOTE: Extension can be stacked for increased maximum adjustment.

SUFFIX -X

OVERFLOW WITH STANDPIPE

FUNCTION: Used as overflow drain in decorative pools, fish ponds or similar areas. Dome prevents floating objects from entering drain line.



MATERIALS:
Chrome Plated -CP
Nickel Bronze -NB
Polished Bronze -PB

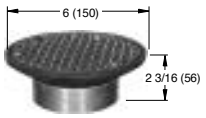
VARIATIONS:
Less Dome -LD
Standpipe Height other than 6" (150) (Specify Height)

SUFFIX	A	X	
	SIZE	MIN	MAX
-Y	2 (51)	3/4 (19)	2 1/8 (54)
-Z	3 (76)	3/4 (19)	2 1/8 (54)

SUFFIX -Y-Z Specify Type, Size & Finish eg: YCP, ZCP

HEAVY DUTY ADJUSTABLE

FUNCTION: Used in finished floors where light wheeled loads and or heavy foot traffic are anticipated.



MATERIALS:
Polished Bronze -PB
Rough Bronze -RB
Nickel Bronze -NB

VARIATIONS:
Flapper Type Backwater Valve(Specify Suffix -69V)
Sediment Bucket -B
Vandal Proof Screws -U

SUFFIX -69 eg: A06NB-69

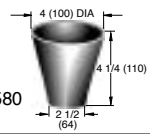


Fig. 3580

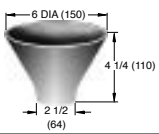


Fig. 3581

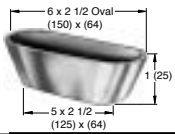


Fig. 3590

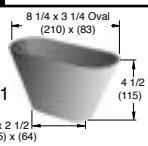


Fig. 3591

REV.	DATE	DESCRIPTION	BY	CKD. BY
J	1-17-12	Rev. Variations of Suffix -J	TBW	AM
H	8-24-99	Revised	TBW	BS
G	6-11-99	Revised Tables	CMD	
F	1-22-99	T Strainer was S Strainer	TBW	BS
E	11-4-97	Added Nickel Bronze	EMB	BS

FIGURE NUMBER
2010 SERIES OPTIONAL STRAINER HEADS
2 of 2

NOTE: Dimensions shown in parentheses are in millimeters.

FIGURE NUMBER: 2010 SERIES OPTIONAL STRAINER HEADS
DRAWING NUMBER: PM0457 SH 2 of 2
SIZE: A
SCALE: NONE
DATE: 5-17-85
APPROVED BY: TD
CHECKED BY: TD
DRAWN BY: PJ
J

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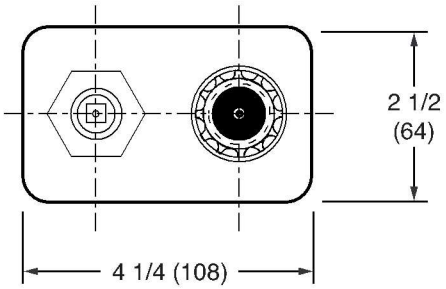
TEL: 334-277-8520 FAX: 334-272-7396 www.jrsmith.com
CUSTOMER DRIVEN SINCE 1926
MEMBER OF:

LOCATION
Twinsburg Locker Room
Type 7

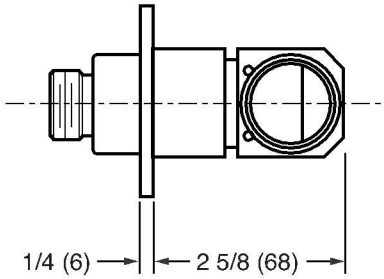
NARROW WALL WARM CLIMATE HYDRANT

EXPOSED HOSE CONNECTION WITH INTEGRAL VACUUM BREAKER

FUNCTION: For installation in interior or exterior walls of building where an exposed hose connection is acceptable and there is no danger of freezing. Hydrant features an integral type vacuum breaker. Removable key prevents unauthorized use.

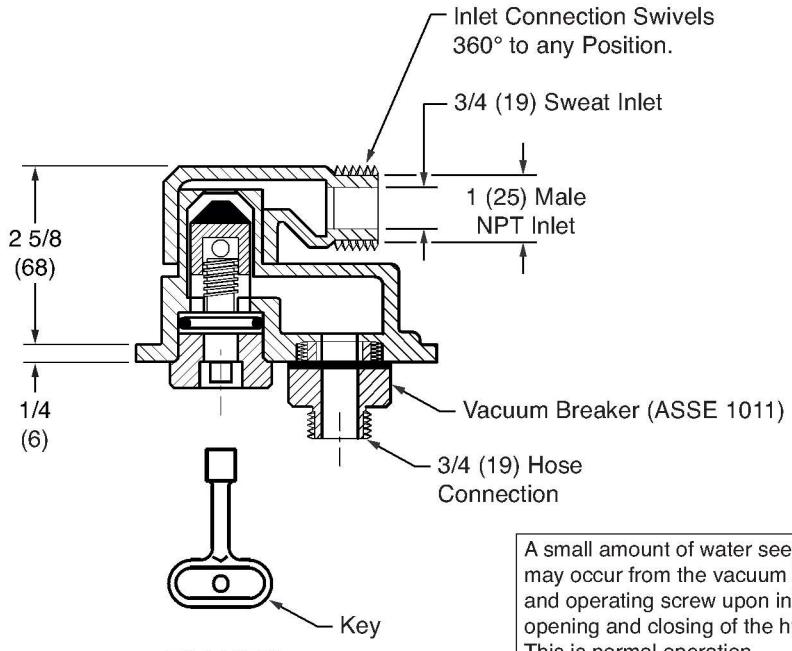


FRONT VIEW



SIDE VIEW

NOTES:
1. Recommended wall opening: 2 (51) x 3 3/4 (95).
2. All Jay R. Smith Hydrants are manufactured with "NO LEAD" brazing rings and USDA approved lubricants.
3. The AB1953, California Lead Law, and NSF/ANSI Standard 61-2008 - Drinking Water System Components are not applicable to Jay R. Smith hydrants as they do not convey/dispense water for human consumption through drinking or cooking.
4. Dimensions shown in parentheses are in millimeters.
5. **FOR IRRIGATION PURPOSES ONLY.**
6. Lead Free Construcion/Materials.



TOP VIEW

A small amount of water seepage may occur from the vacuum breaker and operating screw upon initial opening and closing of the hydrant. This is normal operation.

REGULARLY FURNISHED:
All Bronze Warm Climate Hydrant with Chrome Plated Face, Hose Connection and Integral ASSE 1011 Vacuum Breaker, 360° Swivel Inlet Connection and "T" Handle Key.

COMPLIES WITH LEAD PLUMBING LAW
•CERTIFIED BY IAPMO R&T•
FILE NO. 6127
(NSF/ANSI 372)

REV.	DATE	DESCRIPTION	BY	CKD. BY
D	11-19-13	Added Lead Free Note	TBW	SJM
C	4-23-13	Added Note 6	TBW	SJM
B	2-4-13	Revised Notes	TBW	CL
A	10-7-09	Revised Notes	RN	CL

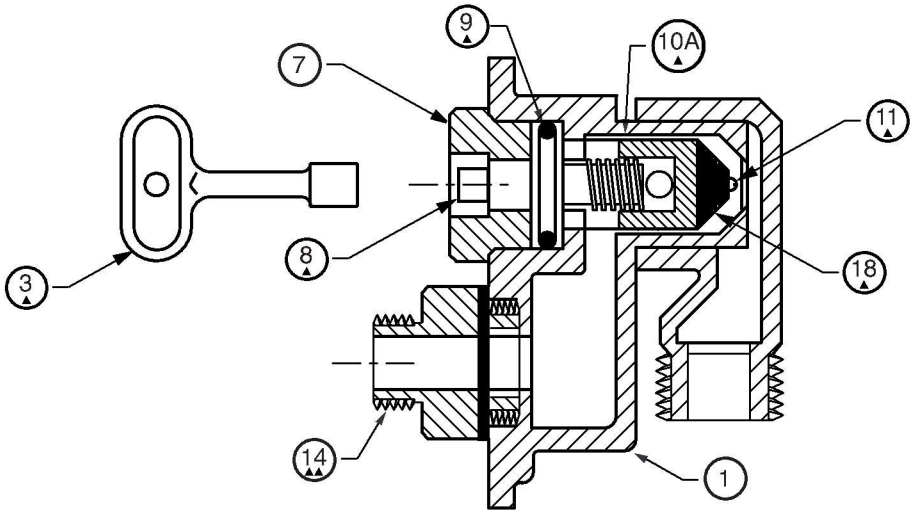
WEIGHT POUNDS | VOLUME CUBIC FEET | **FIGURE NUMBER 5618**

FIGURE NUMBER **5618** | DRAWN BY: JJ | CHECKED BY: CL | APPROVED BY: CL | DATE: 08/06/09 | SCALE: NONE | SIZE A | DRAWING NUMBER S5618 | D

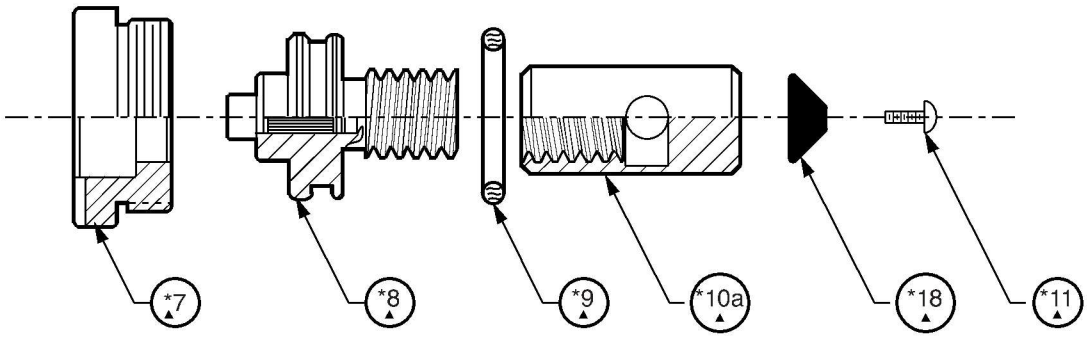
SMITH® JAY R. SMITH MFG. CO.®
MEMBER OF MORRIS GROUP INTERNATIONAL™
POST OFFICE BOX 3237
MONTGOMERY, ALABAMA 36109-0237 (USA)
TEL: 334-277-8520 FAX: 334-272-7396 www.jrsmith.com
CUSTOMER DRIVEN SINCE 1926
MEMBER OF:

LOCATION
Type 7

PARTS LIST WITH MAINTENANCE INSTRUCTIONS



▲▲ THESE REPLACEMENT PARTS AVAILABLE IN HPRK-18VB



▲ THESE REPLACEMENT PARTS AVAILABLE IN HPRK-18

MAINTENANCE INSTRUCTIONS:
1. Shut off water supply.
2. Remove face nut.
3. Pull stem out for complete access to all working parts.
4. Check all working parts for replacement.
5. Replace complete stem assembly and face nut.

* These Parts are accessible from face of hydrant by removing face nut.

HYDRANT PARTS LIST			
No.	Description	No.	Description
1	Head/Casing Assembly	10a	Coupling
3	Key	11	Washer Screw
7	Face Nut	14	Vacuum Breaker
8	Operating Screw	18	Plunger Washer
9	Operating Screw "O" Ring		

REV.	DATE	DESCRIPTION	BY	CKD. BY
A	12-3-12	Rev. Replacement Parts	TBW	CL

WEIGHT POUNDS | VOLUME CUBIC FEET | FIGURE NUMBER 5618BS

FIGURE NUMBER 5618BS | DRAWN BY: JJ | CHECKED BY: CL | APPROVED BY: CL | DATE: 08/26/09 | SCALE: NONE | SIZE A | DRAWING NUMBER S5618BS | A

SECTION 16050
COMMON WORK RESULTS FOR ELECTRICAL

PART 1 GENERAL

1.1 SUMMARY

A. Provide common work results for electrical systems.

1.2 SUBMITTALS

A. Comply with governing codes and regulations. Provide products of acceptable manufacturers which have been in satisfactory use in similar service for three years. Use experienced installers. Deliver, handle, and store materials in accordance with manufacturer's instructions.

PART 2 PRODUCTS

2.1 MATERIALS

A. Common Work Results for Electrical:
1. Manufacturers: Marking Services, Inc. or Equal
2. Application: Locations indicated.
3. Sustainable Design: Utility efficient equipment and fixtures.
4. Sustainable Design: Commissioning.
5. Medium-Voltage Cables:

a. Single and Multiple Conductor Types: UL 1072.
b. Cable: Cross-linked polyethylene, XLP, insulated, NEMA WC 7.
c. Cable: Ethylene propylene rubber, EPR, insulated, NEMA WC 8.
d. Conductors: Class B stranded, annealed copper.
e. Conductors: Class B stranded, aluminum.
f. Cable Jacket: PVC.
g. Cable Jacket: PVC extruded over metal armor.
h. Cable Jacket: Cross-linked polyolefin.
i. Metallic Shielding: Copper shielding tape.
j. Metallic Shielding: Solid copper wires.
k. Cable Voltage Rating: 15 kV phase to phase.
l. Insulation Thickness: Corresponding to referenced standard.
m. Circuit Identification: Color-coded tape.
n. Three-Conductor Cable Assembly: Shield conductors with grounding conductor.
o. Type MC Cable Armor: Aluminum interlocked armor.
p. Type MC Cable Armor: Galvanized steel interlocked armor.
q. Splices, Terminations, Kits, Cable Seals, Junctions: Suitable for service.
r. Arc-Proofing Materials: UL fireproofing intumescent tape.
s. Fault Indicators: Manual reset fault indicator to clamp to cable sheath.

6. Low-Voltage Cables:
7.

a. Armored Cable: UL Types AC.
b. Metal-Clad Cable in Cable Trays: UL Type MC.
c. Nonmetallic-Sheathed Cable for Lighting Wiring: UL Type NM and NMC.
d. Portable Cord for Flexible Pendant Leads to Outlets and Equipment: UL Type S.
e. Control/Signal Transmission Media: Single conductor coaxial type.

f. Flat Cabling System for Power Under Carpet Tile: Factory-laminated assembly.
g. Flat Cabling System for Tel/Data Transmission Under Carpet Tile: Flat cable.
h. Fiber Optic Cables: Single channel low-loss glass type.
i. 7.Wire Components:
j. Conductors, No. 10 AWG and Smaller: Solid.
k. Conductors, No. 8 AWG and Larger: Stranded.
l. Insulation: THW, THHN/THWN or XHHW as applicable.
m. Jackets: Factory-applied nylon or PVC.
n. Conductor Material: Copper.
o. Conductor Material: Aluminum.

8. Metal Conduit and Tubing:

a. Rigid Steel Conduit: ANSI C80.1.
b. Flexible Metal Conduit: UL 1 zinc-coated steel.
c. Liquid tight Flexible Metal Conduit and Fittings: UL 360.

9. Nonmetallic Conduit and Ducts:

a. Electrical Nonmetallic Tubing (ENT): NEMA TC 13.
b. Rigid Nonmetallic Conduit (RNC): NEMA TC 2 and UL 651, PVC.
c. Underground PVC and ABS Plastic Utilities Duct: NEMA TC 6.
d. PVC and ABS Plastic Utilities Duct Fittings: NEMA TC 9.
e. Liquid tight Flexible Nonmetallic Conduit and Fittings: UL 1660.

10. Boxes and Fittings:

a. Cabinet Boxes: UL 50, sheet steel, NEMA 1.
b. Pull and Junction Boxes: UL 50, steel boxes.
c. Metal Outlet, Device and Small Wiring Boxes: UL 514A and OS 1.
d. Nonmetallic Outlet, Device and Small Wiring Boxes: NEMA OS 2.

PART 3 EXECUTION

3.1 INSTALLATION

A. Install materials and systems in accordance with manufacturer's instructions and approved submittals. Install materials in proper relation with adjacent construction and with uniform appearance for exposed work. Coordinate with work of other sections. Comply with applicable regulations and code requirements. Provide proper clearances for servicing.

B. Maintain indicated fire ratings of walls, partitions, ceilings and floors at penetrations. Seal with firestopping to maintain fire rating.

C. Clearly label and tag all components.

D. Test and balance all systems for proper operation.

E. Restore damaged finishes. Clean and protect work from damage.

F. Instruct Owner's personnel in proper operation of systems.

END OF SECTION

Peerless® Lighting for People®

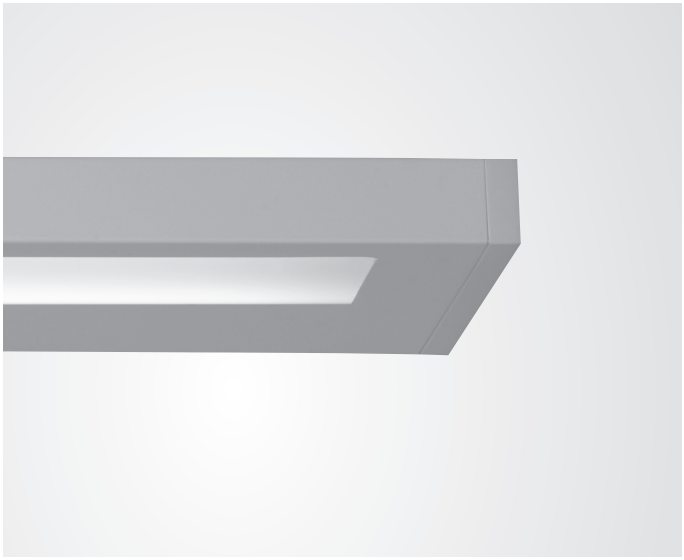
Bruno Wall LED Softshine®

BRW9L | LED | Indirect/Direct | Wall

SPECIFICATIONS

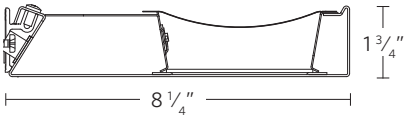
Type: A

Project: Twinsburg Locker Room



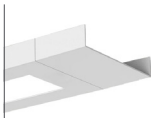
DIMENSIONS

☐ **BRW9L**



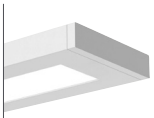
DETAILS

Flat end cap



Sculptured end cap

COMPANION LUMINAIRE(S)



BRM9L Bruno LED

CUSTOMIZATION

Ask us about the following possibilities: Integrated nLight module for system networking, higher lumen outputs, section lengths in 2' increments, alternate distributions, alternate voltages, additional mounting options, custom colors, higher CRI and R9 values and other modifications.

HIGHLIGHTS

- Peerless 360° Total System Integration features 5-year limited warranty by Acuity Brands covering all components and construction
- 4' and 8' sections
- Up to 108 lm/W
- Two lumen packages
- Softshine®-engineered comfort optics
- Enhanced asymmetric distribution through optical film
- Flicker-free dimming to dark (0.1%) powered by eldoLED® driver
- Flat or sculptured end caps
- White, black, aluminum or custom color
- LED Lighting Facts® partner; DesignLights Consortium® qualified

DLC qualification may be limited to specific model configurations. Please search DesignLights.org/QPL by keyword "Peerless" to confirm whether or not a specific model number qualifies.

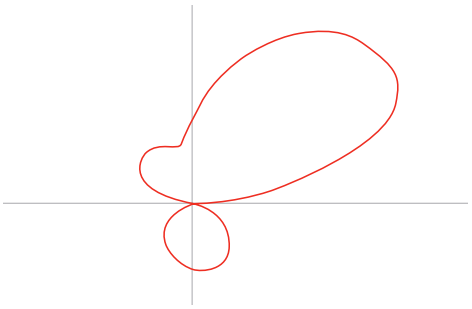
LUMEN PACKAGES

Data based on 3500K. Additional color temperatures available.

Indirect /Direct LED Ouput	ID400LMF	ID600LMF
Delivered Lumens Per Foot	458	600
Input Watts Per Foot	4.5	5.8
Lumens Per Watt	102	104

DISTRIBUTION

70% Up | 30% Down



PeerlessLighting.com
510.845.2760 | TechSupport@PeerlessLighting.com
Rev. 05/18/16

SPECIFICATIONS

Housing
Nominal 8 1/4" x 1 3/4" rectangular housing is formed from cold-rolled steel.

End Caps
Die-cast end caps are mechanically attached with no exposed fasteners. Flat end caps standard. For sculptured end caps, choose option SCEP.

Color
Color for housing and end caps is white, black or painted aluminum. Consult factory for custom colors.

Luminaire Length
4' and 8' nominal lengths in a single section . For total luminaire length, add 5/8" for each flat end cap and 4" for each sculptured end cap. Using internal joiners, 4' and 8' sections can be joined to form longer rows.

Source
Two LED lumen packages and three available color temperature options (3000K, 3500K and 4000K) — all within 2.5 MacAdam ellipses.

Optics
Softshine® optical system consists of high performance lens, diffusers and metal reflectors.

Dimming Driver
eldoLED® driver provides "natural dimming" with smooth, continuous and flicker-free dimming to dark (0.1%). Syncing for controls: 2mA max. THD: < 20%. Insignificant inrush current at 120 and 277VAC. FCC Class A and B tested for EMI and RFI.
For 0-10V driver details go to: PeerlessLighting.com/561M

Lumen Management
For constant lumen output at 80% of initial light output, choose lumen management (CL80).

Electrical
LED light engine — consisting of modular LED boards and eldoLED® dimming driver — is rated for 50,000 hours (L_{80}) at 25° C ambient temperature. Specify 120V or 277V. Pre-wired with 16AWG fixture wire. For special circuiting or wire gauge, consult factory. Plug-in electrical connectors included.

Environment
Ambient operating temperature between 0° C and 25° C. For damp location label, choose option DL.

Validation
CSA/CUS listed. LM-79 tested. Individual sections meet FCC Part 15 requirements. Lighting Facts partner. Design Lights Consortium qualified.
DLC qualification may be limited to specific model configurations. Please search DesignLights.org/QPL by keyword "Peerless" to confirm whether or not a specific model number qualifies.

Packaging
100% post-consumer recycled cardboard box and inserts. Biodegradable, protective luminaire bag. Recycled kraft paper tape.

Warranty
5-year limited warranty. Complete warranty terms located at www.acuitybrands.com/CustomerResources/Terms_and_conditions.aspx

Note: Actual performance may differ as a result of end-user environment and application.
All values are design or typical values, measured under laboratory conditions at 25°C.

MODEL NUMBER

Example: BRW9L LLP 16FT MSL8 80 CRI 35K ID600LMF DARK ZT 120 SCT C110

BRW9L	LSL	4FT	MSL4	80CRI	35K	ID400LMF
Luminaire	**Linear Length Plan**	**Total Run Length**	**Maximum Section Length**	**LED Color Rendering**	**LED Color Temperature**	**Indirect/Direct LED Ouput**
BRW9L	**LLP** Linear longest possible **LSL** Longest same length	**__FT** *Indicate luminaire row length in 4' increments. Ex: 12FT*	**MSL4** 4' section(s) **MSL8** 8' section(s)	**80CRI** 80+ CRI	**30K** 3000K **35K** 3500K **40K** 4000K	**ID400LMF** 400 nomial lumnens per foot **ID600LMF** 600 nomial lumnens per foot

DARK	ZT	277	SCT	EN7W
Minimum Dimming Level	**Control Input**	**Voltage**	**Wiring Option**	**Emergency Options**
DARK Constant current, dimming to < 1%	**ZT** 0-10V	**120** 120V **277** 277V	**SCT** Single circuit	**(Blank)** None **1EC** (1) emergency circuit module **2EC** (2) emergency circuit module **__EC** ___ emergency circuit modules **__E7W** ___ 7-watt emergency battery pack (575 lumens) **__EN7W** ___ 7-watt emergency battery pack (575 lumens) – night light circuit **Emergency type is installed in last 4' of luminaire sections. Separate feed required.*

	C110	DL
Lumen Management	**Color**	**Options**
(Blank) None **CL80*** Constant lumen ouput, 80% **Available with ZT or NLIGHT. Only dims to 1%.*	**C110** Painted aluminum (low gloss) **C210** White white (fine textured) **C202** Black (fine textured) **C099** Custom color	**CSA** Manufactured to Canadian standards **DL** Damp location listed **DU** Dust cover **ELH*** Emergency through wiring w/ separate feed **ELS2*** Emergency through wiring w/ normal feed (2 neutral) **GLR** Fast blow **GMF** Slow blow **SCEP** Sculptured end caps **Not available with CSA*

Peerless® Lighting for People®

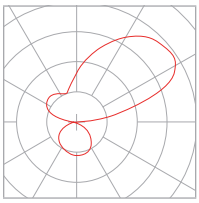
Bruno Wall LED Softshine®

BRW9L | LED | Indirect/Direct | Wall

Type: A

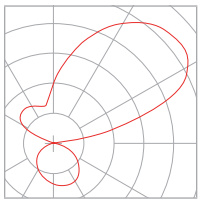
Project: Twinsburg Locker Room

PHOTOMETRICS



ID400LMF 80CRI 35K
102 lm/W
1830 delivered lumens per 4' section

70% up / 30% down



ID600LMF 80CRI 35K
104 lm/W
2493 delivered lumens per 4' section

70% up / 30% down

CONFIGURATIONS

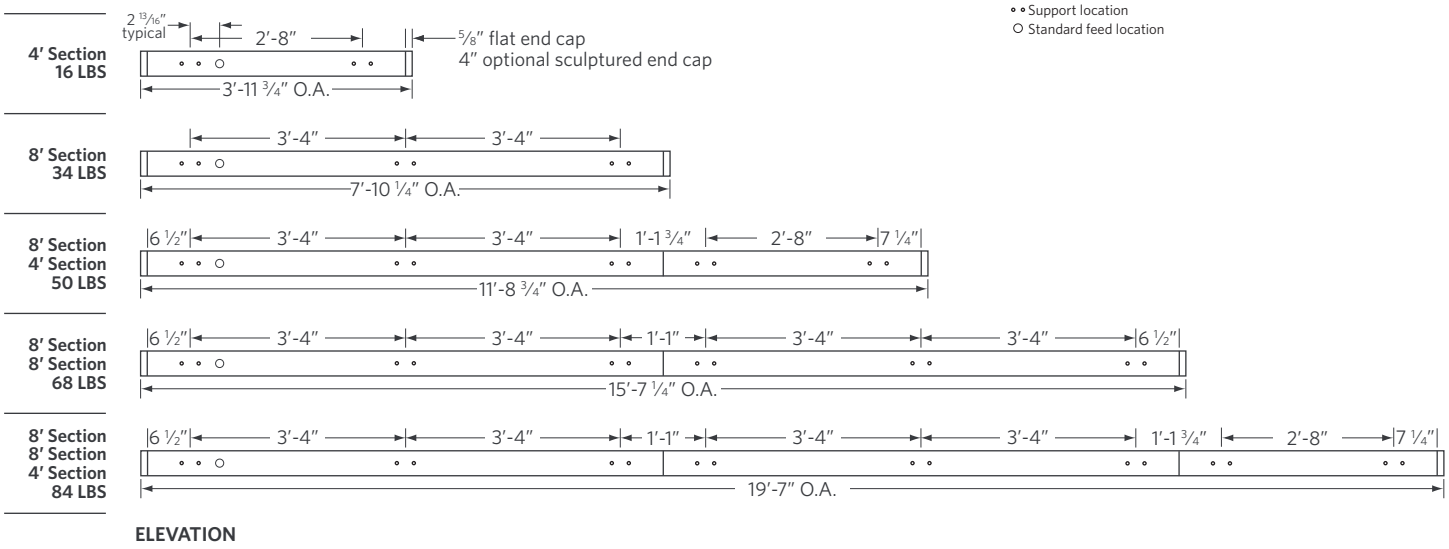
Tenon inside, outside and straight connectors available for wall configurations.
Reference Pattern Connector Guide for additional details.

WEIGHTS & SUPPORT SPACING

Mounting spacing equals section length. Default location shown.

STANDARD SECTIONS

Key:
∘ ∘ Support location
○ Standard feed location



ELEVATION

LINEAR PLAN:

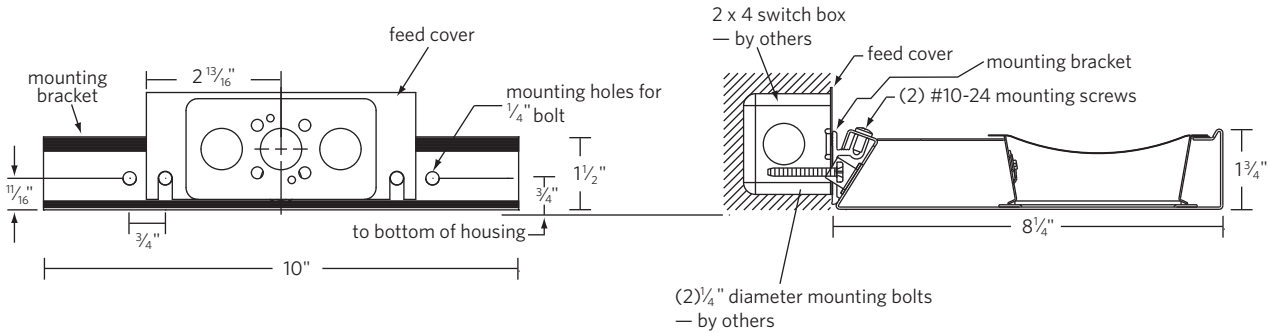
PEERLESS offers the ability to provide a continuous run plan to suit your requirements by optionally offering three different methods of configuration.

LSL- Linear Same Length:
In this configuration, each segment is the same length and is standardized based on the longest length available and is the only option provided. Because it is dependent on one segment length there are mathematical limitations on what overall row lengths can be achieved. Example: 20 FT row would be achieved with 5, 4 FT long segments equaling 20 FT (nominal).

LLP- Linear Longest Possible
In this configuration, the longest length available is optimized, resulting in the fewest segments and mounting locations. Caution, should be used where balanced appearance is a concern. Example: 20 FT run would have 2, 8 FT segment and 1, 4 FT segment at the end of the run.

LLP	8 FT		8 FT		4FT
LSL	4FT	4FT	4FT	4FT	4FT

MOUNTING DETAIL



PENDANT MOUNT

ÉCLAIRAGE axis LIGHTING
1.800.263.AXIS
[T] 514.948.6272
[F] 514.948.6271
www.axislighting.com

PROJECT INFORMATION

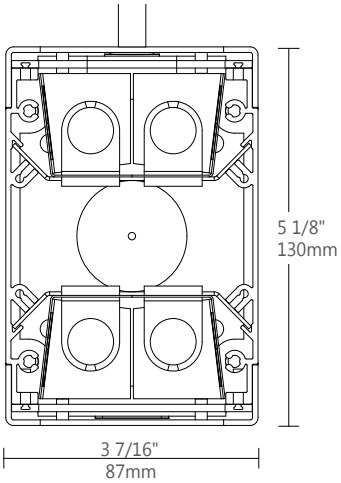
Project: Twinsburg Locker Room

Type: B

Notes:

DIMENSIONS

SECTION VIEWS



ORDERING CODE

WBDI	AV	4	T5	2	0	W	277	E	+E	SA#			
1	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**	**13**	**14**

PRODUCT SPECIFICATIONS

1	PRODUCT ID
WBDI	pendant

2	OPTICS
S	satin lens
F	frosted lens
AV	clear anti-vandal polycarbonate
PL	semi spec para. louvers(1)

(1) Available only with an AV lens not available in up lamp

3	LENGTH/FT
2	2′
3	3′
4	4′
5	5′
6	6′
8	8′
12	12′
S#	System Run

4	LAMP
T5	T5
T5HO	T5HO
T8	T8

5	DOWN LAMP
0	0 lamp
1	1 lamp
2	2 lamps(2)

(2) Not available for T8 lamp

6	UP LAMP
0	0 lamp
1	1 lamp
2	2 lamps(3)

(3) Not available for T8 lamp

7	FINISH
AP	aluminum paint
W	white
BLK	black
C	custom

8	VOLTAGE
120	120V
277	277V
347	347V(4)
UNV	universal

(4) Please consult factory

9	BALLAST
D	dimming
E	instant start(5)
ERS	program start
BI	bi-level dimming

(5) Available with T8 lamp only

10	CIRCUITS
1	1 regular
2	2 regular
2A/B	2 alternating
+E(#)	emergency section
+NL(#)	night light section
+GTD(#)	generator transfer device

11	MOUNTING/SUSPENSION
SA#	drywall+stem length >48" (18" std.)

See ceiling mounting guide for further details

12	BATTERY (OPTIONAL)
B#	battery pack 4′ sections

Requires 120V or 277V

13	OTHER (OPTIONAL)
F	fuse
EF	end feed

14	CUSTOM (OPTIONAL)
C	custom

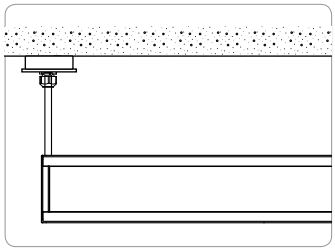
Please specify

FILE NAME:WBDI.SPEC March 7, 2016

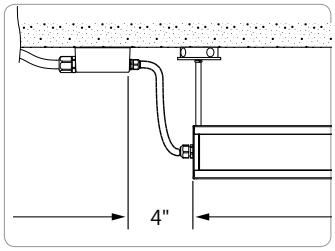
PENDANT MOUNT

ÉCLAIRAGE axis LIGHTING
1.800.263.AXIS
[T] 514.948.6272
[F] 514.948.6271
www.axislighting.com

MOUNTING OPTIONS



STANDARD - POWER FEED TROUGH STEM
Please consult factory for number of wire **limit**

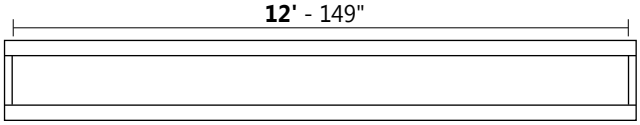


EF **END FEED**

MOUNTING POINTS

T5/T5HO/T8 LAMP

4' - 49"
8' - 99"
12' - 149"



OTHER MOUNTING OPTIONS

WET BEAM DI is also available with wall mounting options.

CONSTRUCTION

Housing	Extruded Aluminum (0.062'' nominal) Up to 70% Recycled Content
End Cap	Die Cast Zinc (0.070" nominal)
Interior Brackets	Die Formed Sheet Steel (16 ga)
Gaskets	Moulded Elastomer (0.100" nominal)
Lens Gaskets	Extruded Elastomer (0.100" nominal)
Satin Lens	Extruded Acrylic (0.125'' nominal) Satin: 67% transmissive
Frosted Lens	Extruded Acrylic (0.125'' nominal) Frosted: 85% transmissive
Anti-vandal Lens	Extruded Polycarbonate (0.125'' nominal) Clear: 90% transmissive
Louver	Die formed Semi-Specular Aluminum (22ga) Extruded aluminum (0.060" nominal)

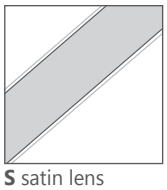
WEIGHT

4 ft	15 lbs / 6.8 kg
8 ft	30 lbs / 13.6 kg

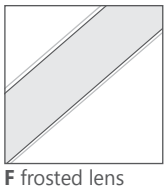
GASKETTED FIXTURE

With it's gasketted end cap and lens the Wet Beam DI is made for wet locations, it is ideal for exterior soffits and canopies of malls, hospitals and other institutions.

OPTICS

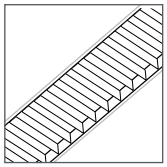


S satin lens



F frosted lens

SATIN & FROSTED LENS
(acrylic snap-in lens)
satin: 68% trans.
frosted: 85% trans.



PL semi-specular parabolic louvers

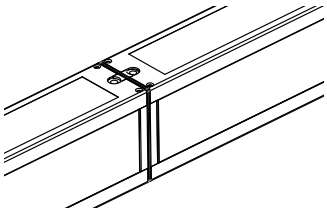
LOUVERS
(semi-spec. parabolic louver)
9/16" deep blades – 5/8" spacing
72 blades per 4'

AV clear anti-vandal polycarbonate lens

ANTI-VANDAL LENS
Extruded Polycarbonate
(0.125'' nominal)
Clear: 90% trans.

JOINER SYSTEM

WET BEAM DI modular system consist of smaller modules joined and gasketted together allowing for system runs in lengths of 4', 8' and 12'.



FINISH

Aluminium paint, Powder Coated and custom finishes are also available.

ELECTRICAL

Ballast	Electronic IS, Electronic Rapid Start, Dimming (0-10V, Line, EcoSystem, DALI), BI-level dimming With preinstalled ballast disconnect as per NEC & CEC
Emergency	Emergency battery pack or emergency circuit
Voltage	120V, 277V, 347V, UNV

Incorporating these components may have limitations or effect the length of the luminaire, please contact factory for more details.

APPROVALS

Certified wet locations to UL and CUL standards

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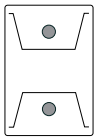
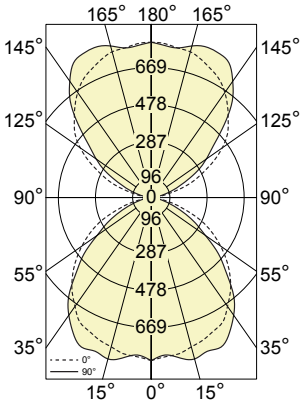
● PHOTOMETRIC DATA

2 T5



PHOTOMETRIC CURVE



Test Lamp: 2xF28T5
IES FILE: WBDI-AV-4-T5-1-1

Efficiency: 79.6%

CANDELA DISTRIBUTION

Vertical Angle	Horizontal Angles 0	22.5	45	67.5	90	Zonal Lumens
0	839	839	839	839	839	
5	822	810	805	833	813	44
15	796	800	817	852	860	196
25	758	772	799	837	849	340
35	684	720	760	757	739	445
45	573	623	617	570	545	470
55	435	480	426	358	340	399
65	283	286	218	197	184	269
75	115	98	77	70	67	122
85	8	10	11	14	13	26
90	1	3	5	5	5	
95	14	15	15	17	16	10
105	125	115	92	82	78	76
115	284	298	230	200	192	207
125	446	492	420	355	346	344
135	560	630	624	556	531	439
145	660	706	755	745	731	462
155	728	748	791	796	820	390
165	776	784	798	809	808	260
175	795	792	788	806	785	112
180	799	799	799	799	799	

COEFFICIENTS OF UTILIZATION (%)

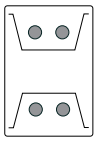
Ceiling	80				70				50		
Wall	70	50	30	10	70	50	30	10	50	30	10
0	85	85	85	85	79	79	79	79	66	66	66
1	78	75	72	69	72	69	67	65	59	57	55
2	71	66	61	57	66	61	57	53	52	49	46
3	65	58	52	48	60	54	49	45	46	42	39
4	60	51	45	40	55	48	42	38	41	37	33
5	55	46	39	35	50	43	37	33	36	32	29
6	50	41	35	30	46	38	32	28	33	28	25
7	47	37	31	26	43	34	29	25	30	25	22
8	43	33	27	23	40	31	26	22	27	23	20
9	40	31	25	21	37	29	23	20	25	20	17
10	38	28	22	18	35	26	21	17	23	19	16

Based on floor reflectance of 20

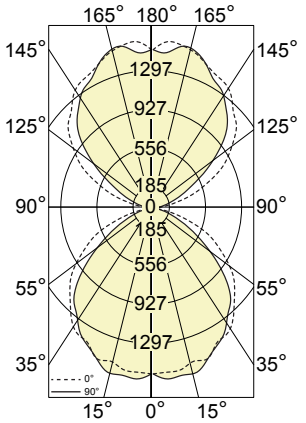
LUMINANCE DATA (CD/M2)

Vertical Angle	Horizontal Angles 0	45	90
45	6599	3687	2784
55	5938	2563	1703
65	4935	1358	932
75	2880	513	356
85	365	83	76

4 T5



PHOTOMETRIC CURVE



Test Lamp: 4xF28T5
IES FILE: WBDI-AV-4-T5-2-2

Efficiency: 72.9%

CANDELA DISTRIBUTION

Vertical Angle	Horizontal Angles 0	22.5	45	67.5	90	Zonal Lumens
0	1612	1612	1612	1612	1612	
5	1601	1545	1549	1668	1668	87
15	1540	1594	1626	1622	1652	382
25	1454	1513	1514	1499	1473	639
35	1348	1366	1340	1299	1267	805
45	1122	1145	1075	1055	1016	849
55	867	847	779	646	609	731
65	579	523	393	317	295	483
75	226	183	129	118	112	215
85	17	17	19	21	23	44
90	1	5	7	8	8	
95	33	23	24	26	27	17
105	263	208	138	133	121	130
115	585	546	401	325	306	361
125	896	862	792	650	611	626
135	1147	1119	1037	1027	989	802
145	1328	1344	1267	1241	1228	823
155	1436	1484	1486	1435	1386	716
165	1567	1536	1556	1557	1583	507
175	1627	1498	1597	1631	1519	224
180	1543	1543	1543	1543	1543	

COEFFICIENTS OF UTILIZATION (%)

Ceiling	80				70				50		
Wall	70	50	30	10	70	50	30	10	50	30	10
0	78	78	78	78	72	72	72	72	61	61	61
1	72	69	66	64	66	64	61	59	54	52	51
2	66	60	56	53	60	56	52	49	48	45	43
3	60	53	48	44	55	49	45	41	42	39	36
4	55	47	42	37	51	44	39	35	38	34	31
5	50	42	36	32	46	39	34	30	34	30	27
6	46	38	32	28	43	35	30	26	30	26	23
7	43	34	28	24	40	32	27	23	27	23	20
8	40	31	25	21	37	29	24	20	25	21	18
9	37	28	23	19	34	26	21	18	23	19	16
10	35	26	21	17	32	24	19	16	21	17	15

Based on floor reflectance of 20

LUMINANCE DATA (CD/M2)

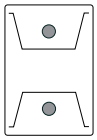
Vertical Angle	Horizontal Angles 0	45	90
45	12917	6430	5187
55	11842	4682	3051
65	10088	2452	1495
75	5673	864	594
85	832	139	132

All IES files for other lamping are available for download at: www.axislighting.com

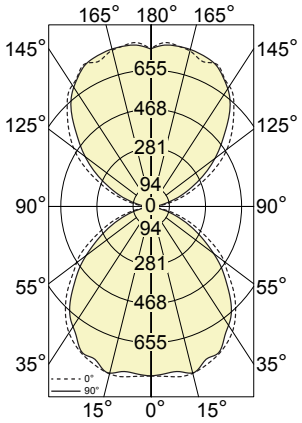
PENDANT T5 LAMPING

● PHOTOMETRIC DATA

2 T5



PHOTOMETRIC CURVE



Test Lamp: 2xF28T5
IES FILE: WBDI-F-4-T5-1-1

Efficiency: 76.3%

CANDELA DISTRIBUTION

	Horizontal Angles					Zonal Lumens
Vertical Angle	0	22.5	45	67.5	90	
0	818	818	818	818	818	
5	824	822	818	793	811	44
15	829	803	813	824	828	194
25	784	785	782	788	779	331
35	704	693	690	678	672	419
45	566	570	559	535	520	432
55	423	401	396	362	354	371
65	255	250	231	207	203	261
75	115	104	91	84	82	133
85	17	14	12	12	12	32
90	2	3	3	3	4	
95	26	22	18	16	16	12
105	129	121	107	97	91	88
115	266	259	240	220	213	208
125	434	421	392	369	361	326
135	565	562	549	522	509	405
145	687	682	679	659	664	429
155	761	737	749	753	755	372
165	775	777	776	783	785	255
175	799	799	775	788	786	112
180	765	765	765	765	765	

COEFFICIENTS OF UTILIZATION (%)

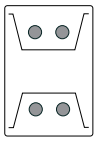
Ceiling	80				70				50		
Wall	70	50	30	10	70	50	30	10	50	30	10
0	82	82	82	82	76	76	76	76	64	64	64
1	75	72	69	67	69	67	64	62	56	55	53
2	69	63	59	55	63	58	54	51	50	47	44
3	63	56	50	46	58	52	47	43	44	40	37
4	57	49	43	39	53	46	40	36	39	35	32
5	53	44	38	33	48	41	35	31	35	31	28
6	48	39	33	29	45	37	31	27	31	27	24
7	45	35	29	25	41	33	28	24	29	24	21
8	42	32	26	22	38	30	25	21	26	22	19
9	39	29	24	20	36	27	22	19	24	20	17
10	36	27	21	18	33	25	20	17	22	18	15

Based on floor reflectance of 20

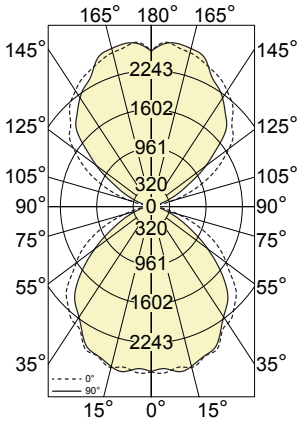
LUMINANCE DATA (CD/M^2)

	Horizontal Angles		
Vertical Angle	0	45	90
45	6520	3342	2657
55	5781	2382	1774
65	4440	1441	1031
75	2878	610	434
85	812	90	68

4 T5HO



PHOTOMETRIC CURVE



Test Lamp: 4xF54T5HO
IES FILE: WBDI-AV-4-T5HO-2-2

Efficiency: 72.9%

CANDELA DISTRIBUTION

	Horizontal Angles					Zonal Lumens
Vertical Angle	0	22.5	45	67.5	90	
0	2768	2768	2768	2768	2768	
5	2793	2812	2779	2770	2726	149
15	2780	2757	2845	2825	2745	665
25	2630	2658	2631	2528	2578	1112
35	2324	2359	2252	2214	2158	1384
45	2014	1986	1844	1746	1725	1459
55	1493	1450	1340	1132	1059	1255
65	961	896	684	560	524	835
75	370	301	215	205	189	371
85	32	32	33	39	38	77
90	4	9	10	15	13	
95	48	38	43	43	51	30
105	454	352	235	221	207	221
115	1018	935	704	561	523	623
125	1551	1486	1362	1141	1074	1081
135	1910	1939	1839	1761	1765	1393
145	2267	2346	2194	2130	2115	1415
155	2477	2559	2549	2488	2391	1229
165	2634	2700	2718	2754	2704	877
175	2741	2770	2624	2696	2720	386
180	2578	2578	2578	2578	2578	

COEFFICIENTS OF UTILIZATION (%)

Ceiling	80				70				50		
Wall	70	50	30	10	70	50	30	10	50	30	10
0	78	78	78	78	72	72	72	72	61	61	61
1	72	69	66	64	66	64	61	59	54	52	51
2	66	60	56	53	60	56	52	49	48	45	43
3	60	53	48	44	55	49	45	41	42	39	36
4	55	47	42	37	51	44	39	35	38	34	31
5	50	42	36	32	46	39	34	30	34	30	27
6	46	38	32	28	43	35	30	26	30	26	23
7	43	34	28	24	40	32	27	23	27	23	20
8	40	31	25	21	37	29	24	20	25	21	18
9	37	28	23	19	34	26	22	18	23	19	16
10	35	26	21	17	32	24	19	16	21	17	15

Based on floor reflectance of 20

LUMINANCE DATA (CD/M^2)

	Horizontal Angles		
Vertical Angle	0	45	90
45	23181	11031	8810
55	20379	8058	5309
65	16748	4268	2660
75	9287	1435	1000
85	1503	248	220

ⓘ All IES files for other lamping are available for download at: www.axislighting.com

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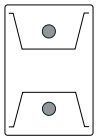
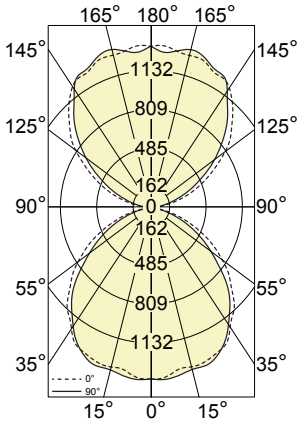
PENDANT T5 LAMPING

PHOTOMETRIC DATA

2 T5HO



PHOTOMETRIC CURVE



Test Lamp: 2xF54T5HO
IES FILE: WBDI-F-4-T5HO-1-1

Efficiency: 76.3%

CANDELA DISTRIBUTION

	Horizontal Angles					Zonal Lumens
Vertical Angle	0	22.5	45	67.5	90	
0	1447	1447	1447	1447	1447	
5	1437	1409	1447	1430	1456	76
15	1389	1394	1423	1413	1410	334
25	1344	1341	1339	1343	1358	571
35	1179	1190	1213	1163	1151	724
45	965	988	946	919	905	748
55	716	706	669	613	600	637
65	441	427	397	358	350	448
75	195	183	158	146	142	229
85	33	26	22	20	20	55
90	6	4	4	6	6	
95	45	36	33	30	30	21
105	223	211	183	162	161	151
115	464	448	409	377	369	358
125	725	716	677	632	619	561
135	966	968	946	900	882	701
145	1178	1186	1179	1131	1126	736
155	1262	1294	1294	1275	1288	640
165	1328	1344	1354	1385	1380	442
175	1372	1376	1373	1401	1318	194
180	1365	1365	1365	1365	1365	

COEFFICIENTS OF UTILIZATION (%)

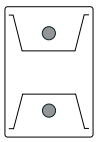
Ceiling	80				70				50		
Wall	70	50	30	10	70	50	30	10	50	30	10
0	82	82	82	82	76	76	76	76	64	64	64
1	75	72	69	66	69	66	64	62	56	55	53
2	69	63	58	55	63	58	54	51	50	47	44
3	63	56	50	46	58	51	47	43	44	40	37
4	57	49	43	39	53	46	40	36	39	35	32
5	53	44	38	33	48	41	35	31	35	31	28
6	48	39	33	29	45	37	31	27	31	27	24
7	45	35	29	25	41	33	28	24	29	24	21
8	42	32	26	22	38	30	25	21	26	22	19
9	39	29	24	20	36	27	22	19	24	20	17
10	36	27	21	18	33	25	20	17	22	18	15

Based on floor reflectance of 20

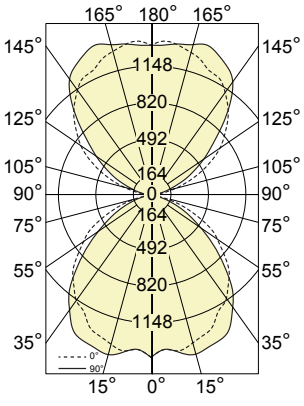
LUMINANCE DATA (CD/M^2)

	Horizontal Angles		
Vertical Angle	0	45	90
45	11105	5658	4622
55	9773	4024	3011
65	7680	2477	1774
75	4912	1057	751
85	1583	165	115

2 T5HO



PHOTOMETRIC CURVE



Test Lamp: 2xF54T5HO
IES FILE: WBDI-AV-4-T5HO-1-1

Efficiency: 79.6%

CANDELA DISTRIBUTION

	Horizontal Angles					Zonal Lumens
Vertical Angle	0	22.5	45	67.5	90	
0	1451	1451	1451	1451	1451	
5	1386	1430	1394	1417	1385	75
15	1381	1386	1414	1450	1476	338
25	1301	1359	1406	1427	1437	588
35	1161	1253	1310	1310	1269	765
45	993	1067	1069	997	953	808
55	744	828	731	637	591	691
65	475	500	381	333	318	463
75	187	173	137	122	117	211
85	15	16	21	23	24	44
90	1	5	8	8	8	
95	22	28	25	29	30	18
105	224	200	159	137	134	132
115	495	522	401	352	342	359
125	765	845	730	608	593	590
135	976	1086	1074	981	920	758
145	1147	1217	1270	1286	1270	797
155	1229	1329	1343	1390	1398	671
165	1329	1343	1380	1411	1392	450
175	1381	1324	1297	1372	1345	194
180	1339	1339	1339	1339	1339	

COEFFICIENTS OF UTILIZATION (%)

Ceiling	80				70				50		
Wall	70	50	30	10	70	50	30	10	50	30	10
0	85	85	85	85	79	79	79	79	66	66	66
1	78	75	72	69	72	69	67	65	59	57	55
2	72	66	61	57	66	61	57	53	52	49	46
3	65	58	52	48	60	54	49	45	46	42	39
4	60	51	45	40	55	48	42	38	41	37	33
5	55	46	39	35	51	43	37	33	37	32	29
6	51	41	35	30	47	38	33	28	33	28	25
7	47	37	31	26	43	34	29	25	30	25	22
8	43	34	27	23	40	31	26	22	27	23	20
9	40	31	25	21	37	29	23	20	25	20	17
10	38	28	22	18	35	26	21	17	23	19	16

Based on floor reflectance of 20

LUMINANCE DATA (CD/M^2)

	Horizontal Angles		
Vertical Angle	0	45	90
45	11425	6396	4865
55	10151	4398	2962
65	8270	2373	1615
75	4709	915	620
85	698	153	139

All IES files for other lamping are available for download at: www.axislighting.com

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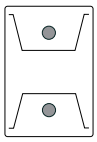
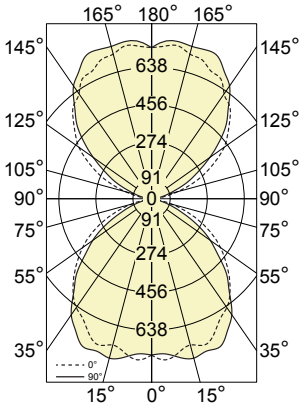
PENDANT T5 LAMPING

● PHOTOMETRIC DATA

2 T8



PHOTOMETRIC CURVE



Test Lamp: 2xF32T8

IES FILE: WBDI-AV-4-T8-1-1

Efficiency: 75.7%

CANDELA DISTRIBUTION

	Horizontal Angles					Zonal Lumens
Vertical Angle	0	22.5	45	67.5	90	
0	771	771	771	771	771	
5	798	761	801	821	768	42
15	746	760	775	805	813	186
25	733	737	771	786	804	325
35	651	675	712	703	692	419
45	543	597	572	541	524	438
55	414	442	403	362	353	380
65	265	270	219	196	182	261
75	110	98	78	65	65	118
85	9	9	11	13	12	24
90	1	3	3	4	5	
95	14	13	14	15	15	9
105	125	110	84	74	73	72
115	284	282	223	205	194	201
125	435	455	406	358	345	331
135	547	582	568	530	522	417
145	627	677	700	676	674	432
155	696	725	752	762	776	370
165	739	739	761	775	779	252
175	758	770	785	762	782	110
180	747	747	747	747	747	

COEFFICIENTS OF UTILIZATION (%)

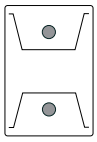
Ceiling	80				70				50		
Wall	70	50	30	10	70	50	30	10	50	30	10
0	81	81	81	81	75	75	75	75	63	63	63
1	75	71	69	66	69	66	64	61	56	54	53
2	68	63	58	54	63	58	54	51	49	46	44
3	62	55	50	45	57	51	46	43	44	40	37
4	57	49	43	38	52	45	40	36	39	35	32
5	52	44	37	33	48	40	35	31	35	31	27
6	48	39	33	29	44	36	31	27	31	27	24
7	44	35	29	25	41	33	27	24	28	24	21
8	41	32	26	22	38	30	25	21	26	22	19
9	38	29	23	20	35	27	22	19	24	19	17
10	36	27	21	18	33	25	20	17	22	18	15

Based on floor reflectance of 20

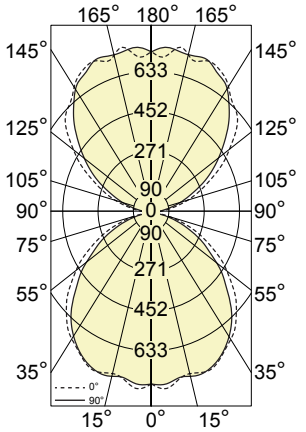
LUMINANCE DATA (CD/M^2)

	Horizontal Angles		
Vertical Angle	0	45	90
45	6253	3423	2678
55	5656	2425	1768
65	4618	1363	922
75	2771	519	342
85	438	81	69

2 T8



PHOTOMETRIC CURVE



Test Lamp: 2xF32T8

IES FILE: WBDI-F-4-T8-1-1

Efficiency: 72.5%

CANDELA DISTRIBUTION

	Horizontal Angles					Zonal Lumens
Vertical Angle	0	22.5	45	67.5	90	
0	791	791	791	791	791	
5	814	802	764	799	793	42
15	766	762	783	774	780	184
25	745	738	744	739	740	314
35	665	656	647	632	639	395
45	546	541	524	499	487	410
55	400	384	368	344	334	350
65	249	238	216	201	198	248
75	108	102	90	82	78	127
85	15	14	11	12	10	30
90	3	2	3	4	3	
95	25	21	18	15	15	12
105	123	112	101	91	90	84
115	254	250	227	212	203	199
125	405	389	371	348	342	309
135	556	530	519	494	480	385
145	639	646	635	622	621	405
155	732	725	715	706	713	353
165	728	749	744	735	748	244
175	722	744	765	771	765	108
180	741	741	741	741	741	

COEFFICIENTS OF UTILIZATION (%)

Ceiling	80				70				50		
Wall	70	50	30	10	70	50	30	10	50	30	10
0	78	78	78	78	72	72	72	72	60	60	60
1	71	68	65	63	66	63	61	59	53	52	50
2	65	60	55	52	60	55	52	48	47	44	42
3	59	53	47	43	55	49	44	41	42	38	35
4	54	47	41	37	50	43	38	35	37	33	30
5	50	42	36	31	46	39	34	30	33	29	26
6	46	37	31	27	42	35	30	26	30	26	23
7	42	34	28	24	39	31	26	23	27	23	20
8	39	31	25	21	36	28	23	20	25	21	18
9	37	28	22	19	34	26	21	18	23	19	16
10	34	26	20	17	32	24	19	16	21	17	14

Based on floor reflectance of 20

LUMINANCE DATA (CD/M^2)

	Horizontal Angles		
Vertical Angle	0	45	90
45	6289	3135	2486
55	5466	2213	1673
65	4335	1349	1006
75	2710	599	416
85	735	80	60

All IES files for other lamping are available for download at: www.axislighting.com

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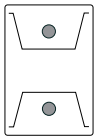
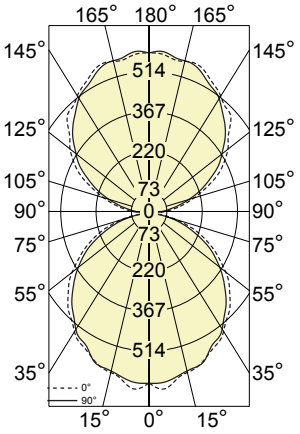
PENDANT T5 LAMPING

PHOTOMETRIC DATA

2 T8



PHOTOMETRIC CURVE



Test Lamp: 2xF32T8
IES FILE: WBDI-S-4-T8-1-1

Efficiency: 60.8%

CANDELA DISTRIBUTION

	Horizontal Angles					Zonal Lumens
Vertical Angle	0	22.5	45	67.5	90	
0	637	637	637	637	637	
5	660	629	637	621	635	34
15	610	596	596	610	604	145
25	560	563	562	552	549	239
35	498	503	499	498	485	302
45	425	422	405	410	400	321
55	332	328	317	312	307	298
65	231	224	219	208	203	235
75	122	120	111	103	103	143
85	32	25	18	15	13	45
90	5	3	3	3	4	
95	40	36	28	23	21	18
105	137	132	122	118	111	105
115	240	230	223	214	216	201
125	343	331	316	313	317	276
135	418	416	400	404	401	312
145	491	494	480	482	473	310
155	547	552	535	529	532	266
165	588	582	582	577	585	188
175	597	609	598	636	608	86
180	601	601	601	601	601	

COEFFICIENTS OF UTILIZATION (%)

Ceiling	80				70				50		
Wall	70	50	30	10	70	50	30	10	50	30	10
0	65	65	65	65	60	60	60	60	51	51	51
1	60	57	55	52	55	53	51	49	45	43	42
2	54	50	46	43	50	46	43	40	39	37	34
3	49	44	39	36	45	40	36	33	34	31	29
4	45	39	34	30	41	36	31	28	30	27	25
5	41	34	29	26	38	32	27	24	27	24	21
6	38	31	26	22	35	29	24	21	24	21	18
7	35	28	23	19	32	26	21	18	22	19	16
8	33	25	20	17	30	23	19	16	20	17	14
9	30	23	18	15	28	21	17	14	18	15	13
10	28	21	16	14	26	20	16	13	17	14	11

Based on floor reflectance of 20

LUMINANCE DATA (CD/M^2)

	Horizontal Angles		
Vertical Angle	0	45	90
45	4895	2421	2043
55	4531	1905	1541
65	4019	1365	1030
75	3055	744	545
85	1541	131	76

All IES files for other lamping are available for download at: www.axislighting.com

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Fail-Safe

DESCRIPTION

Fail-Safe's FSS bridges the gap between vandal resistant durability and architectural aesthetics. In decorative applications where a broken fixture could increase owner liability, the FSS's one-piece, polycarbonate housing/lens provides a low profile, unbreakable, surface-mounted unit, ideal for low ceiling heights and narrow corridors. A maximum of three compact fluorescent lamps provide high illumination while reducing costly maintenance. Designed to decorate as it protects, the FSS will surpass the commercial fixture for a one time installation. Its low profile meets ADA requirements.

Catalog #		Type
Project	Twinsburg	C
Comments		Date
Prepared by	Mayer Architectural	

SPECIFICATION FEATURES

Housing/Lens
Integrated, impact-resistant polycarbonate housing/lens with internal side prisms mounts to base. Textured white housing with prismatic lens standard.

Fasteners
Four captive, stainless steel tamperproof TORX®-head T-20 screws prevent unauthorized access.

Gasket
Wet location only. Non-shrinking, double-baked neoprene gasketing seals out the environment.

Mounting Base
One-piece, cast aluminum mounting base provides a rigid mounting anchor for housing and ensures secure installation.

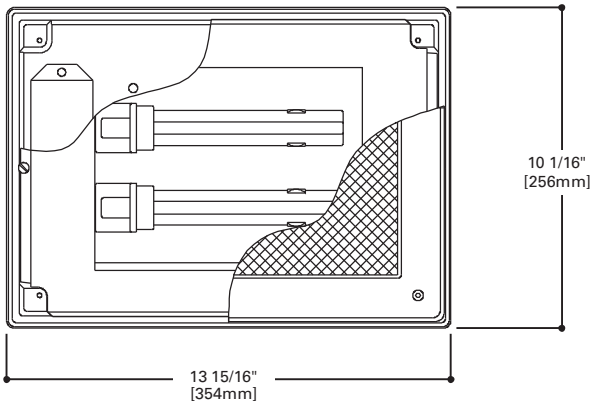
Lamps
By others.

Reflector
Standard white high reflectance polyester powder coat finish. Gloss: 85%; Reflectance: 93%; Hardness Minimum: 2H.

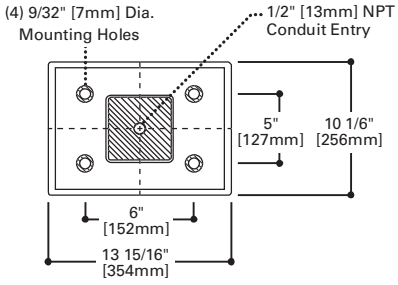
Ballast
Standard Class P, CBM/ETL ballast.

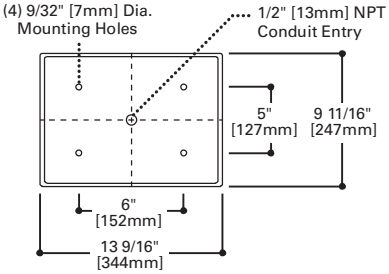
Auxiliary Lighting
During power outages, self-contained EBP option supplies supplemental lighting.

Labels
UL/cUL listed, suitable for damp locations (FSS-D) or wet locations (FSS-W). Low proximity mounting rated.

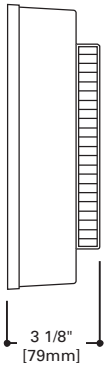


MOUNTING DIMENSIONS





SIDE DIMENSIONS



FSS

Quad
TT
Compact Fluorescent
Vandal Resistant

SURFACE MOUNT
Polycarbonate
Low Profile

ENERGY DATA

For Energy Management related technical data to support the performance of this fixture series, refer to the ordering information for input wattage.

Powering Business Worldwide

TORX® is a registered trademark of Camcar Division of Textron Inc.

ORDERING INFORMATION

SAMPLE NUMBER:FSS-D-226-UNV-EBT2-BRZ

Product Family	Lens Type	Lamp Type	Voltage	Ballast	Options	Accessories (Order Separately)
FSS	D	113	277	EBT1	SCM - WHT	

FSS=High Abuse, Low Profile Surface Luminaire

W=Suitable for wet locations

D=Suitable for damp locations

Twin Tube Fluorescent
113=(1) 13W Lamp
213=(2) 13W Lamps
313=(3) 13W Lamps

Quad Tube Fluorescent
126=(1) 26W Quad
226=(2) 26W Quads

120=120V
277=277V (Fluorescent only)
347=347V
UNV=120-277V

Electronic Ballast [1]
EBT1=(1) Ballast for use with Twin Tube Lamp
EBT2=(2) Ballasts for use with Twin Tube Lamp

GLR=Fuse and Holder
SCM=Surface Conduit Mounting [2]

Housing Finishes
BLK= Black
WHT= White
BRZ = Bronze

VRSD=T20 Center-pin tamperproof TORX® - head bit

Notes:

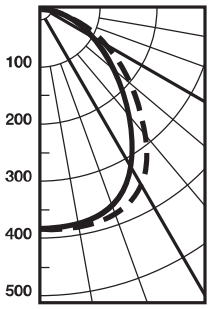
Electronic ballast may cause interference with other electronic devices. If interference occurs, move the device away from the product or plug/connect into a different circuit/outlet.

1 For specific electronic ballast, specify brand and catalog number.

2 SCM option must be factory installed.

PHOTOMETRICS

Candlepower Distribution



Test No. 5452
FSS-2/B13
Lamp=(2) F13TT/21
Lumens=900
Spacing Criteria
⊥=1.3 ||=1.2
Efficiency=54.1%

⊥
||

Candlepower

Deg.	⊥	||
0	379	379
5	378	379
15	375	367
25	365	338
35	324	286
45	241	206
55	139	124
65	86	83
75	56	53
85	26	15
90	6	7

Zonal Lumen Summary

Zone	Lumens	%Lamp	%Luminaire
0-30	303	16.8	31.1
0-40	496	27.5	50.9
0-60	792	44.0	81.4
0-90	967	53.7	99.4
90-180	6.0	0.3	0.6
0-180	973	54.1	100.0

Coefficient of Utilization

rc	80%				70%			50%		30%		10%		0%
rw	70	50	30	10	50	30	10	50	10	50	10	50	10	0
RCR														
0	64	64	64	64	63	63	63	60	60	57	57	55	55	54
1	59	57	55	53	56	54	52	53	50	51	49	49	47	46
2	55	50	47	44	49	46	44	47	43	46	42	44	41	40
3	50	45	41	38	44	40	37	43	37	41	36	40	35	34
4	46	40	36	33	40	36	32	38	32	37	32	36	31	30
5	43	36	32	28	35	31	28	34	28	33	27	32	27	26
6	39	33	28	25	32	28	25	31	24	30	24	29	24	23
7	36	29	25	22	29	25	22	28	21	27	21	27	21	20
8	34	27	22	19	26	22	19	25	19	25	19	24	19	18
9	31	24	19	17	23	19	16	23	16	22	16	22	16	15
10	29	22	17	15	21	17	15	21	15	20	14	20	14	13

rc=Ceiling reflectance, rw=Wall reflectance, RCR=Room cavity ratio
CU Data Based on 20% Effective Floor Cavity Reflectance.