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This MANU-SPEC® utilizes the Construction Specifications Institute (CSI) *Project Resource Manual* (PRM), including *MasterFormat*™, *SectionFormat*™ and *PageFormat*™. A MANU-SPEC is a manufacturer-specific proprietary product specification using the proprietary method of specifying applicable to project specifications and master guide specifications. Optional text is indicated by brackets [ ]; delete optional text in final copy of specification. Specifier Notes precede specification text; delete notes in final copy of specification. Trade/brand names with appropriate product model numbers, styles and types are used in Specifier Notes and in the specification text Article titled "Acceptable Material." Metric conversion, where used, is soft metric conversion.

This MANU-SPEC specifies borosilicate glass pipe and fittings, as manufactured by SCHOTT North America, Inc. Revise MANU-SPEC section number and title below to suit project requirements, specification practices and section content. Refer to CSI MasterFormat for other section numbers and titles.

**SECTION 22 66 00**  
**CHEMICAL WASTE SYSTEMS FOR LABORATORY AND HEALTHCARE FACILITIES**

**PART 1 GENERAL**

**1.01 SUMMARY**

- A. Section Includes: This Section specifies borosilicate glass pipe and fittings.

Specifier Note: Revise Paragraph below to suit project requirements. Add section numbers and titles per CSI *MasterFormat* and specifier's practice.

- B. Related Requirements:

Specifier Note: Include in this Paragraph only those sections and documents that directly affect the work of this section. If a reader of this section could reasonably expect to find a product or component specified in this section, but it is actually specified elsewhere, then the related section number(s) should be listed in the Subparagraph below. Do not include Division 00 documents or Division 01 sections, since it is assumed that all technical sections are related to all project Division 00 documents and Division 01 sections to some degree. Refer to other documents with caution since referencing them may cause them to be considered part of the Contract.

1. Section 07 84 00 Firestopping.
2. Section 22 66 83 Chemical Waste Tanks.

Specifier Note: Paragraph below may be omitted when specifying manufacturer's proprietary products and recommended installation. Retain References Paragraph when specifying products and installation by an industry reference standard. List retained standard(s) referenced in this section alphabetically. Indicate issuing authority name, acronym, standard designation and title. Establish policy for indicating edition date of standard referenced. Contract Conditions Section 01 42 00 - References may establish the edition date of standards. This Paragraph does not require compliance with standard(s). It is a listing of all references used in this section. Only include here standards referenced in the body of the specification in PARTS 1, 2 or 3. Do not include references to building codes at any level.

**1.02 REFERENCES**

- A. Reference Standards:

1. ASTM International (ASTM):
  - a. ASTM C1053 Standard Specification for Borosilicate Glass Pipe and Fittings for Drain, Waste, and Vent (DWV) Applications.

- b. ASTM E438 Standard Specification for Glasses in Laboratory Apparatus.
- 2. Military Standards (MIL):
  - a. MIL MIL-P-22561 Standard for Pipe and Pipe Fittings, Acid Resistant.
- 3. Underwriters Laboratories Inc. (UL):
  - a. UL 723 Tests for Surface Burning Characteristics of Building Materials

### 1.03 ADMINISTRATIVE REQUIREMENTS

- A. Coordination: Coordinate work of this Section with work of other trades for proper time and sequence to avoid construction delays. Comply with Section [01 31 00 - Project Management and Coordination].

Specifier Note: Add text to specify unusual or detailed coordination requirements affecting the work results of this Section.

- 1. [\_\_\_\_\_].
- B. Preinstallation Meetings: Conduct preinstallation meeting [1 week] prior to commencing [work of this Section] [and] [on-site installations] to verify project requirements, substrate conditions and coordination with other building substrates, and to review manufacturer's installation instructions and manufacturer's warranty requirements. Comply with Section [01 31 19 - Project Meetings].

Specifier Note: Add text to describe requirements for meetings in order to coordinate products and techniques and to sequence related work for sensitive and complex items.

- 1. [\_\_\_\_\_].
- C. Sequencing: Sequence work of this section in accordance with Section [01 12 16 - Work Sequence] [and manufacturer's written recommendations for sequencing construction operations].

Specifier Note: Specify text, as needed, to describe the particular sequence of events required to coordinate work that must be done in sequence with, or at the same time as, work in another section.

- 1. [\_\_\_\_\_].
- D. Scheduling: Schedule work of this Section in accordance with Section [01 32 13 - Scheduling of Work].

Specifier Note: Specify additional text to include requirements for coordinating work that requires unusual scheduling with work of other sections.

- 1. [\_\_\_\_\_].

Specifier Note: Article below includes submittal of relevant data to be furnished by Contractor before, during or after construction. Coordinate this article with Architect's and Contractor's duties and responsibilities in Contract Conditions and Section 01 33 00 - Submittal Procedures.

### 1.04 ACTION SUBMITTALS

- A. General: Submit listed submittals in accordance with Contract Conditions and Section [01 33 00 - Submittal Procedures].
- B. Product Data: Submit specified products as follows.
  - 1. Manufacturer's product data, including confirmation that the product conforms to specified regulatory requirements.
  - 2. Manufacturer's installation instructions.
  - 3. Catalog pages illustrating products to be incorporated into project.
  - 4. Material Safety Data Sheets (MSDS).
- C. Shop Drawings: Indicate information on shop drawings as follows.
  - 1. Layout of drain and vent system showing pipe sizes, fittings, traps, neutralization sump and locations of cleanouts and accessories. Indicate slopes of horizontal piping.
  - 2. Details of couplings, hangers and riser clamps.

3. Details of connections to other types of piping materials and sump.
4. Details of underground installation.

#### 1.05 INFORMATION SUBMITTALS

Specifier Note: Specify submittal of test reports or evaluation service reports intended to document required tests without repeating test requirements specified in Division 01.

- A. General: Submit listed submittals in accordance with Contract Conditions and Section [01 33 00 - Submittal Procedures].
- B. Test and Evaluation Reports:
  1. Certified test reports showing compliance with specified performance characteristics and physical properties.

Specifier Note: Specify submittals intended to document manufacturer installation, storage and other instructions.

- C. Manufacturer's Instructions: Submit manufacturer's [storage] [and] installation instructions.
- D. Source Quality Control: Submit documentation verifying that components and materials specified in this Section are from single manufacturer.
- E. Qualification Statements:
  1. Submit letter of verification for Manufacturer's Qualifications.
  2. Submit letter of verification for Installer's Qualifications.

#### 1.06 CLOSEOUT SUBMITTALS

- A. General: Submit listed submittals in accordance with Contract Conditions and Section [01 33 00 - Submittal Procedures].
- B. Operation and Maintenance Data:
  1. Submit operation and maintenance data for installed products in accordance with Section [01 78 23 - Operation and Maintenance Data]. Include:

Specifier Note: Edit or expand list of operation and maintenance data submittal inclusions to suit project requirements.

- a. Manufacturer's instructions detailing maintenance requirements.
- b. Parts catalog showing complete list of available parts.
- c. Replacement parts with cuts and identifying numbers.

#### 1.07 QUALITY ASSURANCE

- A. Qualifications:
  1. Manufacturer:
    - a. Having [10] years experience manufacturing components similar to or exceeding requirements of project.
    - b. Having sufficient capacity to produce and deliver required materials without causing delay in work.
    - c. Capable of providing field service representation during construction.
  2. Installer: [Acceptable to the manufacturer, experienced in performing work of this section and having specialized in installation of work similar to that required for this project] [Acceptable to manufacturer].

#### 1.08 DELIVERY, STORAGE & HANDLING

- A. Delivery and Acceptance Requirements:
  1. Deliver material in accordance with Section [01 61 00 - Common Product Requirements] and in accordance with manufacturer's written instructions.
  2. Deliver materials in manufacturer's original packaging, with identification labels intact and in sizes to suit project.
- B. Storage and Handling Requirements:
  1. Store materials protected from exposure to harmful weather conditions and at temperature conditions recommended by manufacturer.

### C. Packaging Waste Management:

Specifier Note: The disposal of packaging waste into landfill sites demonstrates an inefficient use of natural resources and consumes valuable landfill space. Specifying appropriate packaging and construction waste management and disposal procedures may contribute to points required for USGBC's LEED® construction project certification.

Specifier Note: Include the following Subparagraphs to specify information that will provide direction to the Contractor for the disposal of construction waste materials using environmentally responsible methodology other than landfill resources.

1. Separate waste materials for [reuse] [and] [recycling] in accordance with [Section 01 74 19 - Construction Waste Management and Disposal].

Specifier Note: LEED certification includes credits for the diversion of construction waste from landfill. Diversion can be tracked by either weight or volume, but must be consistent for all materials. Manufacturer may reclaim packaging and delivery materials for recycling.

2. Remove packaging materials from site and dispose of at appropriate recycling facilities.
3. Collect and separate for disposal [paper] [plastic] [polystyrene] [corrugated cardboard] packaging material [in appropriate onsite bins] for recycling.
4. Fold metal and plastic banding, flatten and place in designated area for recycling.

Specifier Note: Add additional Subparagraphs to include pallets, crates, padding and other packing materials that are typically associated with the specified products.

5. Remove:
  - a. Pallets from site [and return to supplier or manufacturer].
  - b. [\_\_\_\_\_].

## PART 2 PRODUCTS

Specifier Note: Retain Article below for proprietary method specification. Add product attributes, performance characteristics, material standards and descriptions, as applicable. Use of such phrases as "or equal," "or approved equal" or similar phrases may cause ambiguity in specifications. Such phrases require verification (procedural, legal and regulatory) and assignment of responsibility for determining "or equal" products.

### 2.01 DRAIN AND VENT PIPING

Specifier Note: Include in the following Paragraph manufacturer's name, address, phone number, fax number, e-mail address and website URL.

#### A. Manufacturer: SCHOTT North America, Inc.

1. Contact: 555 Taxter Road, Elmsford, NY 10523; Telephone: 800-633-4505; Fax: 914-831-2201; E-mail: [info@us.schott.com](mailto:info@us.schott.com); website: [www.us.schott.com](http://www.us.schott.com).

Specifier Note: Substitution procedures must either be in the Contract Conditions or in Section 01 25 00 - Substitution Procedures. Do not include substitution procedures here.

2. Single Source Responsibility: Provide components and materials specified in this section from a single manufacturer.
3. Substitution Limitations:
  - a. Substitutions: [In accordance with [Contract Conditions] [Section 01 25 00 - Substitution Procedures] [No substitutions permitted].

Specifier Note: Include an overall description of the system, assembly, product or material. Include required properties or characteristics that do not obviously belong under other titles, such as configuration, size and color.

B. Description:

Specifier Note: Paragraph below should list obligations for compliance with code requirements particular to this section. General statements to comply with a particular code are typically addressed in Contract Conditions and Section 01 41 00 - Regulatory Requirements. Repetitive statements should be avoided.

1. Regulatory Requirements:
  - a. In accordance with Section [01 41 00 - Regulatory Requirements].
  - b. Listed with UL 723 for use in fire-rated assemblies.
  - c. Listed with International Association of Plumbing and Mechanical Officials.
2. Compatibility:
  - a. Ensure components and materials are compatible with specified accessories and adjacent materials.

Specifier Note: The term "Design Criteria" is used when describing the intended characteristics of a product for which the Contractor is assigned design responsibility.

- C. Design Criteria: Provide a complete acid waste drain and vent system, as indicated, including, but not limited to, straight lengths of glass pipe, fittings and traps, couplings, hanger supports and accessories. Provide protected pipe for underground burial and recommended adapter couplings to connect other piping materials.
- D. Materials:
  1. Glass Pipe: KIMAX Glass Drainline.

Specifier Note: Standard pipe lengths are 5 feet (1.5 m) and 10 feet (3 m); custom lengths are available. Refer to manufacturer's catalog and modify the following to suit project requirements.

- a. Above Ground:
  - 1) 5 Foot (1.5 m) Pipe Lengths: 6500 Series.
  - 2) 10 Foot (3 m) Pipe Lengths: 6501 Series.
  - 3) Other: [\_\_\_\_\_].
- b. Underground: 6502 Series.
- c. Comply with the following standards:
  - 1) ASTM E438.
  - 2) ASTM C1053.
  - 3) MIL-P-22561-B.
2. Connectors: KIMAX compression type bead-to-bead (#6650) and bead-to-plain end (#6661) couplings.
  - a. Outer Shell: Encapsulating stainless steel band, 300-series stainless steel.
  - b. Coupling Compression Liner: Buna-N-Rubber.
  - c. Seal Ring Gasket: Tetra-fluoro ethylene (TFE).
  - d. Nut, Bolt: Stainless steel.

2.02 ACCESSORIES

Specifier Note: Refer to manufacturer's accessory catalog and retain required accessories below. Coordinate with the drawings.

- A. Pipe Fittings: Sweeps, bends, reducers, tees, cleanouts, wyes, cup sinks and traps, as provided by the piping manufacturer.
- B. Hardware: Adapters, sink outlet assemblies, tailpiece assemblies, gaskets, couplings and pipe hangers, as provided by the piping manufacturer.

Specifier Note: A neutralization sump is required for chemical waste and corrosive acid waste removal. Manufacturer's recommended neutralization sump is Koch Knightware® Acid Proof Chemical Stoneware Sump.

- C. Neutralization sump.
- D. Other: [\_\_\_\_\_].

### PART 3 EXECUTION

#### 3.01 EXAMINATION

- A. Verification of Conditions: Verify that conditions of substrates previously installed under other sections or contracts are acceptable for product installation in accordance with manufacturer's instructions prior to drain and vent piping system installation.
  - 1. Inform [Owner] [Architect] [Consultant] of unacceptable conditions immediately upon discovery.
  - 2. Proceed with installation only after unacceptable conditions have been remedied [and after receipt of written approval from [Owner] [Architect] [Consultant]].
  - 3. [\_\_\_\_\_].

Specifier Note: Specify actions required to prepare the surface, area or site for incorporation of the section's primary products. Describe requirements for exposure or removal of existing assemblies, components, products or materials.

#### 3.02 PREPARATION

Specifier Note: Specify preparatory work required prior to installation/application/erection of primary products.

- A. Ensure structure or substrate is adequate to support drain and vent piping system.

Specifier Note: Specify preparatory work, such as selective removal of existing work, required prior to execution of new work. Specify requirements for exposure or removal of existing assemblies, components, products or materials.

- B. Demolition/Removal:
  - 1. [\_\_\_\_\_].

#### 3.03 INSTALLATION

- A. Coordinate installation of drain and vent piping system in accordance with [01 73 19 - Installation] and with manufacturer's instructions.
- B. Coordinate drain and vent piping system work with work of other trades for proper time and sequence to avoid construction delays.
- C. Install drain and vent piping system plumb or sloped, as indicated.
- D. Accurately fit, align, securely fasten and install free from distortion or defects.

#### 3.04 FIELD QUALITY CONTROL

Specifier Note: Specify requirements for quality control and related quality assurance for onsite activities and installed materials, manufactured units, equipment, components and accessories.

- A. [Field] [Site] Tests, Inspection: Coordinate [field] [site] test with Section [01 45 00 - Quality Control].
  - 1. Test installation in accordance with the manufacturer's recommendations and the requirements of code authorities.

#### 3.05 CLEANING

- A. Perform cleanup in accordance with Section [01 74 00 - Cleaning and Waste Management] and Section [01 74 13 - Progress Cleaning].
- B. Upon completion, remove surplus materials, rubbish, tools and equipment in accordance with Section [01 74 23 - Final Cleaning].

Specifier Note: Specify special measures needed to minimize waste, collect recyclable waste and dispose of or recycle field-generated construction waste created during demolition, construction or final cleaning.

C. Waste Management:

1. Coordinate recycling of waste materials with [01 74 19 - Construction Waste Management and Disposal].
2. Collect recyclable waste and dispose of or recycle field generated construction waste created during demolition, construction or final cleaning.
3. Remove recycling containers and bins from site.
4. [\_\_\_\_\_].

Specifier Note: Specify protection methods completed after installation, but prior to acceptance by the owner. Protection of surrounding areas and surfaces during application or installation is included under PART 3, Preparation. Include only statements unique to this Section. Coordinate the following Article with Section 01 76 00 - Protecting Installed Construction.

3.06 PROTECTION

- A. Protect installed product from damage during construction in accordance with Section [01 76 00 - Protecting Installed Construction].
- B. Repair damage to adjacent materials caused by [insert section subject matter] installation.
- C. [\_\_\_\_\_].

**END OF SECTION**