Precast Vault Manufacturer Approval Process

1. Scope

This work practice covers the process for manufacturers seeking approval to supply precast vaults and accessories to Seattle City Light (SCL) projects.

2. Application

This work practice is directed at manufacturers interested in having their precast concrete vaults and accessories approved for purchase by SCL.

SCL uses many different-sized vaults. Manufacturers are encouraged to plan accordingly as each vault's size and design requires a separate submittal packet.

3. Requirements

The approval process consists of three steps:

1. Preliminary review materials submission
2. Preliminary review post-acceptance materials submission
3. Prototype submission

Standard Coordinator
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Step 1: Preliminary Review Materials Submission

To begin the approval process, manufacturers shall submit a packet of documentation, electronically to SCL.Standards@seattle.gov, with the subject heading "Vault Manufacturer Preliminary Review Materials," to include:

- Documentation confirming conformance to the requirements described in Appendix A.
- A statement indicating review of relevant SCL material standards and ability to meet or exceed requirements described.

Relevant materials standards can be found in the 7203 and 7204 series of material standards in the Seattle City Light Engineering Standards Library:

https://web8.seattle.gov/city-light-engineering-standards/MaterialStandards

Step 2: Preliminary Review Post-Acceptance Materials Submission

Upon review of preliminary review materials, manufacturer will be contacted by SCL. If the initial materials are rejected, manufacturer will be informed of reason for rejection, and, if appropriate, instructed to provide additional information.

If approved, manufacturer will be instructed to submit electronically the following additional review materials:

- Catalog cut sheets of each vault, and any corresponding frames, covers, and risers, proposed to be provided to SCL
- Vault design details (see Appendix B, Vault Design Submittals Requirements)
- Certified pulling iron test report for each size of pulling iron that would be used in the vaults being proposed. See Appendix C, "Pulling Iron Test."

Manufacturer shall provide concrete strength test report upon request.

Step 3: Prototype Submission

Upon acceptance/approval by Standards Engineering of Step 2 Submittal review, manufacturer will be contacted by SCL and instructed to build a sample prototype pad/vault for quality and workmanship review.

Products will be inspected by SCL personnel at the manufacturer's facility.

4. Final Determination and Notification

If the manufacturer's products are approved, Standards Engineering will inform the manufacturer and update the relevant material standard(s) accordingly.

If the manufacturer's products are rejected, Standards Engineering will inform manufacturer with explanation of the rejection.

Note: SCL has numerous vault and handhole material standards. The fact that a manufacturer is approved for some items in this family of standards does not mean that manufacturer is approved for all.

5. Sources

Pacheco, Lulu; SCL Associate Civil Engineer and subject matter expert for 0261.05

Wang, Quan; SCL Standards Engineer, originator, and subject matter expert for 0261.05

Appendix A. Vault Manufacturer Minimum Requirements

The manufacturer's plant shall be located in the Pacific Northwest and be certified by the National Precast Concrete Association (NPCA).

The manufacturer's website shall contain up-to-date contact information as well as a catalog of available vaults and accessories.

In addition, the manufacturer shall:

- Have a minimum of three (3) years of experience manufacturing precast, concrete vaults of size 444 and larger.
- Have a Quality Control program that includes testing and inspection elements to ensure the quality of the product.
- Be able and willing to accommodate requests by SCL (or a contractor working with SCL) to inspect products at the manufacturer's plant for design compliance prior to delivery.
- Have local agents who can provide technical support and are authorized to approve returns and recommend repairs that could be performed by SCL or contractors.
- Have available an assortment of compatible round and rectangular ring risers to elevate frames and covers to grade as well as to allow for future grade and access opening adjustments without needing to alter the ring vault lid.

Appendix B. Vault Design Submittals Requirements

Vault design calculations and shop drawings, stamped by a licensed civil engineer in Washington, shall be submitted to SCL Standards Engineering for review for compliance with SCL standards.

Design calculations shall include the following:

- Material specification notes
- Design loading notes
- Live Load: AASHTO HS-20 or HS-25 truck (per project requirement)
- Load case for 2 ft and 5 ft of soil cover for panel and ring vaults
- Load case for a single controlled density fill pour
- Floor and ceiling design
- Wall design
- Riser design
- Hatch and cover design with impact load factor
- Buoyancy check
- Project information such as customer and vault number
- Professional Engineer Stamp

Shop drawings shall include the following:

- Plan and section views, dimensioning to all features
- Reinforcement placement plan, rebar bend details and cut list
- Bill of material
- Structural design notes
- Cover and hatches detail
- Ductbank knockouts and blockouts
- Pulling iron detail
- Sump detail
- Wall and floor connection details (mechanical and sealing material)
- Product weight
- Vault transporting, handling, storing and installation guidelines
- Shop drawings shall include manufacturer name, vault description, and drawing date

Appendix C. Pulling Iron Test

A test of each pulling iron size shall be conducted and certified by an accredited testing laboratory.

Pulling irons shall be stainless steel with an opening that could accommodate a 1-1/4-inch nominal diameter shackle. See SCL 7203.89, “Pulling Iron and Accessories.”

The manufacturer may either use an actual vault with pulling irons for the test, or a concrete pad. If a concrete pad is used, it must be representative of a vault concrete panel (in terms of concrete thickness, strength, and steel reinforcement layout).

At least two samples of each pulling iron size shall be tested to their rated ultimate strength without exhibiting failures for the following vault types and loads:

Vault Type	Pulling Iron Type and Size, nominal	Rated Ultimate Strength, minimum (lb)
Panel	7/8-inch stainless steel	40,000
Ring or single unit (larger than 577)	7/8-inch galvanized steel	20,000
Ring or single unit (577 and smaller)	1/2-inch galvanized steel	10,000

Tested samples shall not exhibit:

- Permanent deformation in the pulling iron or slippage of iron from the concrete pad
- Crack width 1/16 inches, maximum, or spalling in the concrete pad

Load test shall be:

- Direct in line of the pulling iron
- Minimum pull duration: 5 minutes

Certified test reports shall include:

- Professional Engineer’s design calculations
- Drawing of the test samples and pulling iron (PE stamped)
- Description of test procedures
- Test date
- Test result - failure load and mode of failure
- Concrete compressive strength test results
- Pictures of test set up and failure (or, preferably, inclusion of a test video)

Failure of the pulling iron prototype test shall require resubmission of the pulling iron calculations. Testing shall continue until the pulling iron tensile strength criterion has been met. Repeated failure of pulling irons tests may disqualify the manufacturer.