



SECTION 46 25 23

GUIDE SPECIFICATIONS FOR PLANT PRECAST GREASE INTERCEPTORS

PART 1 GENERAL

1.1 SECTION INCLUDES

A. GREASE INTERCEPTORS

1.2 RELATED SECTIONS

A. 03 00 00 Concrete

1.3 DEFINITIONS

A. GREASE INTERCEPTOR: Precast concrete tank system designed with built-in internal components and baffle penetration that introduces wastewater in a laminar, non-turbulent flow pattern to reduce disruption of collected grease and solids. Tank system is designed to capture and hold grease and solids to maximize waste retention and optimize Stokes Law separation.

B. GRAVITY GREASE INTERCEPTOR: Interceptor having a liquid capacity of at least 300 gallons and which incorporates an unrestricted flow path (no flow control device) for gravity differential separation to take place based upon Stokes Law.

C. STOKES LAW: mathematical equation that expresses the settling velocities of small spherical particles in a fluid medium. The law, first set forth by the British Scientist Sir George G. Stokes is derived by consideration of the forces acting on a particular particle as it sinks through a liquid column under the influence of gravity.

D. COMPUTATIONAL FLUID DYNAMICS: a branch of fluid mechanics that uses numerical analysis and algorithms to solve and analyze problems that involve fluid flows.

E. FOG: Non-emulsified, free floating *fats, oils and grease* (typically 150 micron or larger) which the interceptor is designed to separate via gravity differential separation.

1.4 REFERENCES

Where applicable, the latest editions of the following standards shall form a part of this specification to the extent referenced. The publications are referenced to in the text of this guide specification by the basic designation only.

AMERICAN ASSOCIATION OF STATE HIGHWAY AND TRANSPORTATION OFFICIALS
(AASHTO)

ACI INTERNATIONAL (ACI)

AMERICAN NATIONAL STANDARDS INSTITUTE (ASTM)

INTERNATIONAL ASSOCIATION OF PLUMBING & MECHANICAL ENGINEERS (IAPMO)

1.5 GENERAL REQUIREMENTS

Precast concrete units shall be designed and fabricated by an experienced and acceptable precast concrete manufacturer. The manufacturer shall have been regularly and continuously engaged in the manufacture of precast concrete units similar to that indicated in the project specifications or drawings for at least 10 years with annual sales of more than \$40 million. In addition, the manufacturer shall employ a professional engineer registered in the state where the product is to be installed.

1.6 SUBMITTALS

The following items shall be submitted unless specified otherwise herein.

A. Preconstruction Submittals

1. Upon request by the customer, submit quality control procedures established by the precast manufacturer's Quality Control Manual

B. Drawings

1. The drawings for precast concrete units shall be furnished by the precast concrete producer for approval. These drawings shall show the design loads and standards have been met. Installation and construction information shall be included on shop drawings upon request. Details of steel reinforcing size and placement shall be submitted. It is the responsibility of the project's engineer-of-record to verify that the design assumptions are suitable for the proposed application. Drawings shall be stamped by a professional engineer registered in the state where this project is located.
2. For custom made precast concrete units, in addition to the requirements in B.1, the drawing for submittal shall show locations and dimensions to all penetrations and special embed items. Product dimensions and thicknesses shall be shown, and the drawing shall be to a common architectural scale with the precast producer's information in the title block.

C. Precast Concrete Unit Data

1. Anchorage, Lifting Inserts and Devices
 - i. For anchors, lifting inserts and other devices, the precast concrete producer shall provide product data sheets and proper installation instructions upon request.
2. Accessory Items
 - i. For items including, but not limited to sealants, gaskets, pipe entry connectors, steps, racks, and other items installed before or after delivery, the precast concrete producer shall include proper installation instructions and relevant product data upon request.

D. Design Data

1. The precast concrete producer shall supply submittals showing design loading and material specifications for supplied products. At a minimum, the following shall be

shown on the submittals:

- i. Live load used in design: HS-20
 - ii. Vertical and lateral earth loads used in design: 120 pcf vertical, 40 pcf lateral
 - iii. Depth of soil fill on the structure: 0 ft to 5 ft
 - iv. Water table depth used in calculations: 2 ft below grade
2. The precast concrete producer shall supply precast concrete unit design calculations and concrete mix design proportions and appropriate mix design test data. Structural design calculations shall be sealed by a licensed professional engineer in the state of this project.

E. Test Reports

1. Upon request, the precast concrete producer shall supply copies of material certifications and/or laboratory test reports, including mill tests and all other test data, for Portland cement, blended cement, pozzolans, ground granulated blast-furnace slag, silica fume, aggregate, admixtures, and curing compound proposed for use on this project
2. Upon request, the precast concrete producer shall submit copies of test reports showing that the mix has been successfully tested to produce concrete with the properties specified and will be suitable for the project conditions. Such tests may include compressive strength, plastic air content, temperature of freshly mixed concrete, and slump of freshly mixed concrete. Special tests for precast concrete items shall be clearly detailed in the specifications
3. Upon request, the precast concrete producer shall supply copies of in-plant QA/QC inspection reports.

1.7 DESIGN

The following items shall be accounted for in the precast unit design.

A. Hydraulic Design

1. Calculations shall be provided for the specific grease interceptor loading rate and design flow rate
 - i. Minimum removal efficiency of 90% of readily separable fats, oils and grease (FOG) given a minimum retention time of 30 minutes.
 - ii. Separation performance shall be based on Stokes' law with proof of laminar, non-turbulent flow through third party Computational Fluid Dynamics (CFD) testing.

B. Precast Concrete Unit Design

1. Design standard precast concrete units to withstand design load conditions in accordance with the applicable industry design standards. Design must also consider stresses induced during handling, shipping, and installation in order to avoid product cracking or other handling damage. Design loads for precast concrete units shall be indicated on the shop drawings, and designed by a licensed professional engineer.

C. Joints and Sealants

1. Joints and sealants between adjacent units shall be of the type and configuration indicated on the shop drawings meeting specified design and performance requirements.

D. Concrete Mix Design

1. Concrete Mixes shall be Self-Consolidating Concrete with a minimum 28-day design strength of 6,000 PSI for reduced porosity and rated traffic loading, and shall be designed by a professional engineer.

1.8 QUALITY ASSURANCE

The precast concrete producer shall demonstrate adherence to the standards set forth in the plant Quality Control Manual. The precast concrete producer shall meet the requirements written in subparagraph 1.7.A.

A. Qualifications, Quality Control and Inspection

1. The precast producer shall maintain a permanent quality control department.
2. The precast concrete producer shall have a quality control program which is audited for compliance annually by persons outside that plant's employee structure.
3. Upon request, the precast concrete producer shall supply a copy of their quality control manual.

B. Quality Control

1. The precast concrete producer shall show that the following quality control tests are performed as required and in accordance with the ASTM International standards.

C. Outside Inspection

1. The customer or customer's agent (specifier) may place an inspector in the plant when the units covered by this specification are being manufactured. The precast concrete producer shall give notice of 3 days prior to the time the precast concrete units will be available for plant inspection

1.9 DELIVERY, STORAGE, AND HANDLING

A. Handling

1. Precast concrete units shall be handled and transported in a manner to minimize damage. Lifting devices or holes shall be consistent with industry standards. Lifting shall be accomplished with methods or devices intended for this purpose as indicated on the shop drawings. Upon request, the precast concrete producer shall provide documentation on acceptable handling methods for the product.

B. Storage

1. Precast concrete units shall be stored in a manner that will minimize potential damage.

C. Delivery

1. Precast concrete units shall be delivered to the site in accordance with the delivery schedule. Upon delivery to the jobsite, all precast concrete units shall be inspected by the customer's agent for quality and final acceptance.

D. Final Acceptance

1. Upon final acceptance, the customer's agent acknowledges and understands the appropriate methods for handling the accepted precast concrete unit(s). Upon acceptance by the customer or customer's agent, the precast concrete manufacturer is not responsible for replacing damaged product resulting from improper handling practices on the job site.

PART 2 PRODUCTS

2.1 MANUFACTURERS

- A. Acceptable Manufacturer: Oldcastle Precast Inc.
- B. Substitutions: Not permitted.

2.2 MATERIALS

Except as otherwise specified, material shall conform to the appropriate section of ASTM.

PART 3 EXECUTION

3.1 SURVEY

- A. The installation area shall be surveyed using the work print and a checklist to identify the work to be done and to determine that the plans are correct
- B. All underground facilities and structures such as gas, water, sewer, power, telephone cable, and so forth shall be located and identified. Location markings shall be placed by the affected utilities before construction
- C. The survey shall identify and obstacles such as overhead wires, building structures that will interfere with crane operations, work progress, or create a safety hazard.
- D. The survey shall give consideration to the soil structure so that proper shoring, sloping, or both may be planned in advance of the excavation work

3.2 PLANNING

- A. Permits required to do work in accordance with the detail plans shall be secured before starting the job. All permits or a record of the permits shall be retained on the job for immediate reference
- B. All utilities and owners of surface and subsurface facilities and structures in the area shall be given advance notification of proposed excavation. Every effort shall be made to avoid damage to the facilities of others. If any damage occurs, the owner of the damaged facility shall be notified immediately.
- C. Planning shall include the coordination of all responsible parties to ensure that arrangements for removal of excess and damaged material have been made.
- D. Should it appear that a structure location will interfere with traffic, review the situation with the engineer and notify appropriate authorities.

- E. Provide for access to call boxes, fire hydrants, etc.

3.3 SAFETY REQUIREMENTS

- A. Safety requirements for construction shall be in accordance with all federal, state, and local regulations.

3.4 EXCAVATING

- A. If unforeseen facilities or obstructions are encountered, stop excavation operations immediately. Expose the obstruction with wood handled digging tools and investigate them with caution. If there is any doubt as to the type of obstruction exposed, request positive identification from those suspected of owning the facility and then proceed as circumstances dictate.
- B. Inspect excavations after every rainstorm or other hazard-increasing occurrence, and increase the protection against slides and cave-ins, if necessary
- C. In dewatering excavations, make certain that the discharge is carried to a suitable runoff point. Also verify that the design accounts for the level of groundwater encountered.
- D. Excavation size shall be large enough to allow access around the structure after it is installed.

3.5 SHORING

- A. Shoring for construction shall be in accordance with all federal, state, and local regulations

3.6 INSTALLATION

A. Site Access

The general contractor shall be responsible for providing adequate access to the site to facilitate hauling, storage, and proper handling of the precast concrete units.

B. Subgrade Bedding Materials and compaction

The installation contractor shall be responsible for ensuring that the subgrade is compacted to 95% of ASTM D558 density. The subgrade shall be a minimum of 6" in depth. A granular material shall be used to create a level surface for placing the precast concrete unit.

C. Installation

Precast concrete units shall be installed: to the lines and grades shown on the contract documents or otherwise specified; be lifted by suitable lifting devices at points provided by the precast concrete producer; in accordance with applicable industry standards. Upon request, the precast concrete producer shall provide installation instructions

Field modifications to the product shall relieve the precast producer of liability and warranty regardless if such modifications result in the failure of the precast concrete unit.

3.7 BACKFILLING AND RESTORATION

- A. Do the backfilling as soon as possible after the structure has been placed.
- B. No liquid shall be placed in the tank prior to backfill.

- C. Backfill material shall be granular and free from large stones, rocks, and pavement. Expansive soil material shall not be used as backfill around the structure.
- D. Backfilling shall be achieved by lifts (layers) to the required compaction.
- E. Follow up inspections for settlements are required. Should settlement occur, the contractor shall be responsible for all necessary repairs.

3.8 FIELD QUALITY CONTROL

A. Inspection

1. Final field elevations and compaction properties shall be verified and documented.

END OF SECTION