

PRECAST CONCRETE CATCH BASINS AND INLETS



Unmatched Strength and Durability

With their unmatched durability and strength, precast concrete catch basins and inlets are among the most widely used storm drainage products on the market today. Easily customizable, precast concrete catch basins and inlets can be manufactured in a variety of shapes and sizes to meet specific site conditions. With a proven service life of more than 100 years, precast catch basins and inlets provide the long-term solution for nearly every stormwater application.

DESIGN CHARACTERISTICS

- Precast catch basins and inlets come in standard sizes for continuity in the design stage but can be adapted to accommodate any design parameter.
- Can be designed for specific site conditions
- Are steel-reinforced to provide built-in strength and structural integrity
- There is no need to achieve structural strength with imported fill
- Precast concrete structures offer exceptional buoyancy characteristics
- Proven concrete strength through compression tests
- Exceptional corrosion and freeze-thaw characteristics
- Not affected by ultraviolet degradation

LOADING CONDITIONS TO CONSIDER

- Surface surcharge
- Concentrated wheel loads
- Lateral loads
- Presumptive soil bearing capacity
- Buoyant forces
- Connections and penetrations
- Point loads

Inlets are designed with mathematical calculations performed by a qualified professional engineer or by proof of performance. Structural design by performance requires the manufacturer to demonstrate that tank failure will not occur by physically applying loads to the product.

PIPE ORIENTATION

The structural integrity and durability of the precast concrete inlet can be compromised if there are too many pipe openings, if the pipe openings are too close together or if the pipe opening is too big for the structure.

The main criteria in designing inlets are that they must be large enough to accept the maximum pipe size, and that the minimum structural leg width between pipe holes must be maintained.

The minimum pipe opening is assumed to be the pipe's inside diameter plus the wall thickness. The practical minimum structural leg is 6 inches. Anything less than that width may allow cracking, which can lead to leakage, structural distress or durability concerns.

The cutout for the pipe entry is typically 4" larger than the pipe's outside dimension to allow for a little directional tolerance.

When possible, avoid designing a system in which pipes enter into inlet joints and corners, as this may compromise the structural integrity and watertightness of the structure. If it is impossible to avoid placing the pipe in a joint or corner, consult with an experienced precast concrete manufacturer to ensure the integrity of the system.

It is always a good idea to consult with a precast concrete manufacturer and connector supplier early in the design process to discuss exact design requirements and product specifications.

CONCRETE THICKNESS

- Sufficient to meet minimum reinforcement cover and withstand design loading conditions

CONCRETE MIX DESIGN

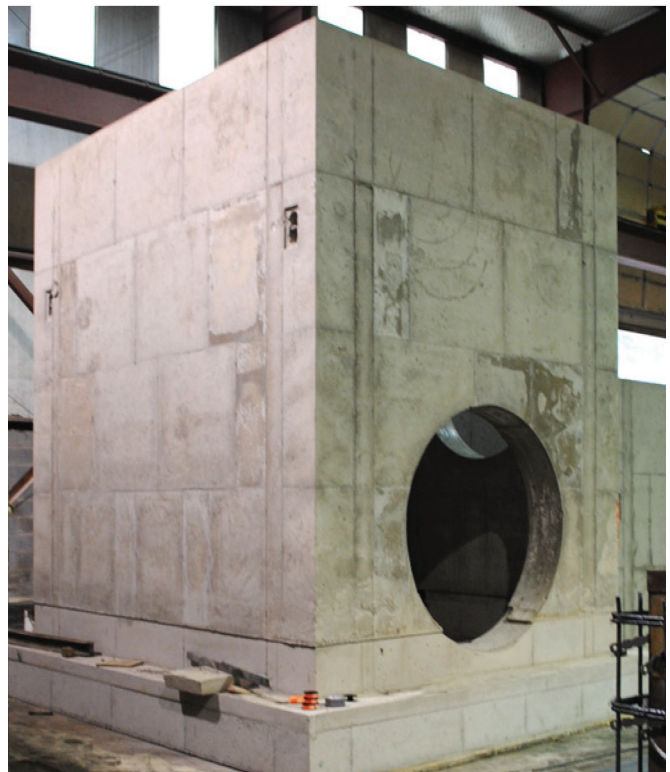
- Concrete Compressive Strength – Minimum 4,000 PSI strength at 28 days
- $w/c < 0.45$ (water/cementitious ratio)
- Quality materials, using well-graded aggregates
- Air entrained in accordance with ACI 318

REINFORCEMENT

- Reinforcement design by structural calculations as required by code or as proven by testing

OTHER ADVANTAGES

Catch basins and inlets are the logical choice for specifiers who want to take advantage of the inherent strength and installation advantages of precast concrete structures. There is no need for imported fill to achieve structural performance, including collars, to achieve H-20 load ratings and buoyancy concerns. The structural strength is built right into the product.



Manufactured by local suppliers with years of precast concrete production experience, concrete catch basins and inlets
Pipe orientation

continue to be the first choice in stormwater design. Here are some additional advantages:

QUALITY

- Documented material properties
- Established design procedures
- Verifiable quality control procedures
- Manufactured in a controlled environment

AVAILABILITY

- Precast concrete catch basins and inlets are common products made by many local manufacturers.
- Standard sizes (dictated by local specifications) will likely be in stock and readily available.

INSTALLATION

- Easy and quick installation. Most products can be handled with smaller equipment, installed and backfilled in less than a day.



- Manufactured with block-outs for a wide range of site conditions, pipe inlets and outlets
- Penetrations can also be pre-installed for specific site conditions and quicker installation.
- Precast concrete structures provide a shorter installation window when compared with poured-in-place structures.

VERSATILITY

- Strength is manufactured into the product. There is no need for a contractor to build a supporting structure through excavation
- Can be used with any type of pipe material
- Easily adaptable to varying sizes, depths and site conditions
- Can be modified years after installation to accommodate future design

NATIONAL PRECAST CONCRETE ASSOCIATION

With nearly 1,000 member companies, NPCA serves as the voice of the precast concrete industry in the United States and Canada. The industry includes a diverse mix of companies, from small single-plant manufacturers to multinational vertically integrated companies that operate in many sectors of the construction industry. NPCA provides an array of services to these manufacturers that include technical engineering support, the industry's largest certification program, safety programming, educational courses and a suite of print and online publications.

In addition to services to members, NPCA provides specialized technical information to owners, contractors, engineers and designers on precast concrete products. This Technical Brief provides an overview of the attributes of precast concrete catch basins and inlets that will prove invaluable when considering implementation of this technology.

Manufacturers of precast concrete catch basins and inlets are located throughout North America and can be found through the search engine at precast.org.



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