

## Technical Information

### CAST STONE

#### Durable Versatile Concrete

Concrete is much more than the most widely used construction material on earth. Dispense with the mental image of a concrete sidewalk, a bridge abutment or curb, and replace it as an artist's medium which can be transformed into beautiful works of furniture and art.

Concrete is an engineered composite of cement, sand, aggregate and potable water. Specialty elements and color pigments can be added to the mix to achieve special properties and characteristics. From this highly versatile medium, Landscape Forms offers tastefully designed, high quality public space furniture, engineered to wear beautifully in the public eye.

#### Concrete Mixture

**Binding material:** Type-I-II-V low sulfate cement with minimum 10% Fly Ash.

**Sand:** Washed, filtered and dried masons or concrete sand.

**Aggregate:** Washed and dried ½" and smaller crushed stone.

**Other proprietary elements:** Added to achieve product-specific properties.

**Water:** Potable

#### Design Strengths

28-day compressive strength 3000 to 6000PSI

#### Reinforcing

Integral cast-in steel reinforcing bars are used for designs requiring structural enhancement. Organic, mineral or metallic reinforcing fibers are also used when the design requires them.

#### Weathering and Aging

The effects of the elements and the environment act to add patina, character and drama to the surface of cast concrete as it ages. Variations in color, porosity and the presence of non-structural hairline cracks are possible and are not considered a manufacturing defect.

#### Maintenance

Generally, cast concrete requires little to no maintenance from the effects of weathering and aging. Maintenance, however, may be performed using the following guidelines:

**Concrete planters:** It is imperative that accumulated dead and decaying organic matter be removed from the soil surface on a regular basis. This material, especially in cold weather can become saturated and freeze. This in turn prevents additional surface water from draining out the bottom of the planter. Enough accumulated surface water can freeze and expand applying enough internal force to break a concrete planter.

**General cleaning of concrete and UHPC:** Routine cleaning can be done with clean soft cloths using water or mild detergents. For more

aggressive cleaning use high-pressure hot water washing. In extreme cases detergents may be required. Never use carbon steel wire brushes as minute amounts of steel from the brush will be embedded into the concrete surface resulting in rust staining. If brushes are required, use natural stiff bristle brushes with clean potable water. This should be sufficient for most general cleaning requirements.

**Graffiti removal:** To clean graffiti, determine what was used to deface the concrete surface. For spray paints, remove as much as possible mechanically with a stiff natural bristle brush. Never use mineral spirits as these will dissolve the paint and can carry pigments deeper into the concrete. Use a cotton cloth soaked with acetone to blot off the paint.

**Smooth sealed surfaces:** To remove food residues and oils on these surfaces, use a small amount of distilled vinegar diluted by half with clean potable water in a clean soft cloth or sponge well wrung out. Similarly, diluted mild detergents and dish soaps are acceptable. Wipe surface, then immediately wipe with clean potable water and dry with a clean dry cloth. Some concrete surfaces are factory-sealed for a degree of stain-resistance (but are not stain-proof). Due to the porous nature of concrete, even with factory-applied sealer, regular maintenance is the best safeguard against staining. Do not allow spills to set. Sealed concrete cannot be warranted against staining, cracking or scratching. Never use non-neutral or abrasive cleaners.

#### Colors and Finishes

Standard and special colors are monolithic. It must be noted that if sandblasting is requested for Larkspur concrete planters using any Davis colors, the effects of sandblasting will alter the appearance of any of the Davis colors from that on as-cast concrete.

The finish of natural concrete surfaces is porous and has a unique texture when fully cured. Consequently, as compared to smooth mechanically applied finishes, the surface of this concrete finish will naturally exhibit some voids as well as absorb discoloring tannins.

#### Surface Treatments

Sandblast (Larkspur)

Acid-etch

Polished

Sealed / Water Proofed

#### Sealers

Some cast stone is impregnated to the point of saturation with ProtectGuard® making the surface repellant to water, oils, stains and pollution. Erosion, degradation and micro-organism growth is significantly reduced. Graffiti resistance may also be improved.

#### Repair Kits

Repair kits are available for acid-etch and polished concrete.

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### ULTRA HIGH PERFORMANCE CONCRETE

*“This is not your father’s concrete”*

#### Overview

Also known as UHPC, this highly engineered type of concrete can achieve high compressive strength, flexibility, ductility, thinness and durability.

#### Mixture Recipes

Aggregates, cement, pozzolans, reinforcing fibers, high-efficiency plasticizers and other elements are all used to create the specific type of UHPC desired.

#### Mechanical Properties

Compressive strengths up to 29,000 psi can be achieved. Flexural strengths up to 5,800 psi are obtainable with the addition of organic, mineral or metallic fibers.

#### Water and Chemical Resistance

Due to the extremely compact matrix density at the micro-scale of UHPC, it is highly resistant to water, deicing chemicals and abrasion.

This feature makes UHPC highly stable in harsh freeze-thaw cycles that would destroy normal concrete. Cleaning off graffiti is also made easier since the minute porousness of UHPC greatly impedes the absorption of paint solvents. UHPC is ideal for marine, pool and other corrosive environments.

In every area where normal concrete is vulnerable, UHPC demonstrates superior performance.

#### Design Flexibility

The “Ultra High Performance” features in UHPC allow designers to achieve geometrical shapes that simply could not be explored with normal concrete. These features just to name a few are:

- High resistance to impact and abrasion
- Achieve very thin and flexible cross-sections
- Light weight and slender designs
- Curvaceous geometry