INTRODUCTION

CAST STONE is a highly refined architectural precast building stone manufactured to simulate natural cut stone. One of the oldest known types of concrete, it is the most aesthetically refined form of concrete known today. Cast Stone is a masonry product which provides architectural trim, ornamentation or functional features to buildings and other structures. The earliest known use of Cast Stone was in the year 1138. The product was first used extensively in London in the year 1900 and in America around 1920. The Cast Stone Institute was incorporated in 1927. Since the early 1920's, Cast Stone has earned widespread acceptance in the architectural community as a superior replacement for many masonry materials and for all types of natural cut building stone.

Cast Stone is made from fine and coarse aggregates such as limestone, marble, calcite, granite, quartz, natural sands, Portland cement, mineral oxide coloring pigments, chemical admixtures and water. Not surprising, then, Cast Stone is available in any color and can look like limestone, brownstone, bluestone, granite, slate, travertine or marble. It can match terra-cotta or brick and makes a perfect substitute for brick shapes.

The raw material mixtures are proportioned for maximum density and to produce the required "fine grained texture similar to natural stone with no bug-holes permitted" dictated by industry standards. White Portland cement (ASTM C 150) is usually used to achieve lighter colors and color consistency. Blending of grey Portland cement and coloring pigments (ASTM C 979) with the white cement to achieve color is a fairly common practice. Sands are naturally available in a wide variety of colors and they can be crushed from quarried stones as well. Reinforcement can be added to provide the structural advantages of precast concrete with the beauty of natural stone.

Since a rich cement/aggregate ratio of 1:3 is normally used, a properly (warm-moist) cured Cast Stone unit will have a higher compressive strength (6,500 psi) and a lower cold water absorption rate (6%) than natural limestone or normal concrete. Testing methods include ASTM C 1194, Standard Test Method for Compressive Strength of Architectural Cast Stone, and ASTM C 1195, Standard Test Method for Absorption of Architectural Cast Stone. Wet cast products may be tested under ASTM C 39 and ASTM C 642. These tests are evaluated according to the latest specification (04720) published by the Cast Stone Institute. Testing for color variation may also be performed according to ASTM D 2244, Standard Test Method for Calculation of Color Differences from Instrumentally Measured Color Coordinates. Expect color variation to be about equal to a good limestone installation. Freeze-thaw resistance may be tested according to ASTM C 666, Method A; look for less than 5% weight loss after 300 cycles (about 100-125 years of weathering). Specifiers should be aware that C 666 tests can take months (and thousands of dollars) to perform so it is wise to find a manufacturer who has already tested the proposed materials.

Since Cast Stone is a type of architectural precast concrete, the question is often asked: ***"What is the difference between Cast Stone***

and architectural precast concrete?" The short answer is that Cast Stone is used in place of natural stone. As a type of building stone, Cast Stone is specified under the masonry division 04720. It is usually set by a masonry contractor using standard building stone anchors. Perhaps most important, unless otherwise specified, Cast Stone looks like natural, dimensional, cut building stone. Upon close examination, the finish of Cast Stone looks like limestone; some call it a "sugarcube finish" to distinguish it's appearance from the "pebbly with voids" appearance which is normally associated with concrete. This dense finish is more resistant to weather and dirt; and the fine aggregates retain the granular texture through decades of exposure to the elements. Sandblast or chemical retardation finishing methods (normally used in finishing of architectural precast concrete panels) are seldom used with Cast Stone because of the dulling of aggregates and the loss of fine detail which are not acceptable in quality Cast Stone work.

The manufacture of Cast Stone is the most labor-intensive of all concrete products. Specialized work is usually carried out on a departmental basis consisting of the Drafting/ Engineering, Pattern/ Mould, Casting/ Curing and Finishing/ Shipping areas. Workers develop their various skills in both procedure-oriented and craft-oriented ways. The manufacturers have developed procedures that work for the different job functions, but craftsmanship, talent and technique are passed along by the *workers*; sometimes for generations.

THE PLANNING PHASE

To assure the success of the project, the detailer (draftsperson) assigned to a Cast Stone job must have knowledge of architectural styles and designs as well as experience with the manufacturing techniques and the installation methods. The manufacturer details each piece with an aim toward simplification and standardization. As with any custom product, a great deal of economy is achieved by taking advantage of repetition. Shop drawings should be specified as needed - usually to show details and sizes of stones, arrangement of joints, relationship with adjacent materials and the location of each piece on the structure. Some builders and manufacturers, however, prefer to simply work with "shop tickets" which only show the part to be furnished; leaving jointery and fit up to the people in the field.

Cast Stone can be formed in a greater variety of shapes than other types of natural cut stone. Lengths should be within 15 times the minimum profile thickness whenever possible. Consult your manufacturer if longer lengths are absolutely necessary. Longer lengths invite cracking and handling problems. Try to keep the back side flat and unexposed to view. Remember, most shapes are cast into a mould with four sides and a bottom. One side will always be *unformed*; typically the bottom of the stone. Never design a piece with a thin projection; one which has thickness less than twice the length of the projection. Weight is approximately 144 lbs. per cubic foot. To figure weights per lineal foot simply multiply cross section dimensions in inches. For instance, a window sill measuring 6" high x 10" deep = 60 lbs. per lineal foot.