



## Design Tips

*Technical Bulletin #36*

### INSPECTION AND ACCEPTANCE

On site inspection and acceptance of Cast Stone should be performed at time of delivery and again after all material has been installed, pointed and cleaned. Final Inspection should be done prior to application of water repellents. The on site inspector should be familiar with the project specification as well as the applicable referenced standards. Test reports of compressive strength, absorption and other physical properties should be on file as well as the approved sample.

Before installation, check the color and texture of the approved sample against the delivered product. Cast Stone should approximate the color and texture of the approved sample when viewed under good typical lighting conditions at a 10 foot distance and should show no obvious imperfections other than minimal color and texture variations from a 20 foot distance. In addition to issues concerning color and texture, the inspector (and stone setter) must be familiar with the dimensional requirements of the installation as they pertain to joint sizes and interfaces with other materials.

Stones should always be appraised for color when dry as dampness will darken the surface color and make it appear blotchy. Curing time differentials may affect color since moisture will be retained within units for 6 months even in dry weather. Samples which have been stored indoors for long periods of time may look considerably different than product which was manufactured only a short time before delivery.

Texture of Cast Stone should be approximately equal to the approved sample when viewed from a 10' distance in good typical lighting. Do not appraise texture under a sun wash when sunlight is skimming across the surface parallel to the plane of the stone face as this will unfairly accentuate minor irregularities.

Minor variations in color and texture from stone to stone should be accepted within the limits of the accepted range, either established by several samples or mockups or by deviations from instrumentally measured color coordinates. In general, expect color variation to be approximately equal to a good natural cut limestone project. More color variation should be expected than from building materials with painted or applied finishes.

Some projects will show more color variation than others. Units containing gray cement will show more light-dark variations than those containing white cement. Colors which require high amounts of integral pigments such as reds and browns will vary more than moderately neutral shades such as buff. Special mixes containing contrasting and multi-colored aggregates may be subject to extreme color deviations when compared to homogeneous facing mixes.

Variations in color within the same stone may be caused by efflorescence or free lime migrating to the outer surface. This can usually be remedied by proper washdown. Staining, mortar smears or uneven washing can also cause color variations within stones and the manufacturer should be consulted for recommended treatment of these problems.

Patching is perhaps the greatest source of dissatisfaction with finished installations. When months have elapsed between the date of manufacture and the date of repairs, significant differences in color may exist between properly repaired areas and the remainder of the stone. These areas should be left alone and will blend in over time through curing, natural weathering and ultraviolet light. It is a mistake to require an instant color match at time of repair since this will usually cause dark patches later on.

Common deficiencies which are not normally acceptable in high quality Cast Stone installations include:

1. Bug holes or air voids on the finished surfaces.
2. Ragged or chipped edges on formed edges.
3. Stains on exposed faces from foreign substances.
4. Twist, warp, out of square or bow exceeding tolerances.
5. Out of plane or pie shaped joints, or large or small joints out of tolerance.
6. Areas of rough texture or smoothness not matching sample from 10'.
7. Backup concrete bleeding through exposed faces.
8. Visible cracks exceeding 0.005".
9. Reinforcing shadows or exposure on face.
10. Rust on surface caused by staining, reinforcement or iron pyrites.
11. Installation not matching joint layout on approved shop drawings.
12. Form marks or local depressions in excess of 0.030".

Building owners and their representatives will often apply some wishful thinking when viewing and touching a small 12" sample and then trying to imagine the way an entire facade will look. Wherever possible, an investment should be made in mockup panes and/or sample units. The sample units should demonstrate a variety of shapes and casting configurations, including vertically cast surfaces if they are to be encountered.

Careful quality control of Cast Stone units by competent personnel at the plant combined with qualified ongoing inspection and acceptance at the job site ensures that all parties are aware of each

others expectations. This eliminates disappointing results at the end of the job since very little can be done to change the appearance of Cast Stone after it has been set into the structure.

*This Technical Bulletin is provided by the Cast Stone Institute<sup>SM</sup>, and is intended for guidance only. Specific details should be obtained from the manufacturer or supplier of the Cast Stone units.*

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