



## Tools of Today and Tomorrow

New technology, such as laser levels, global positioning systems, computer-aided-design programs and sustainable, energy-efficient green design, is changing how buildings are constructed. Building information models (BIMs) allow owners to use multi-dimensional digital representations of a structure before breaking ground, and can track essential information over the building's life cycle.

The International Code Council is focused on streamlining building safety. Instead of the lengthy, time-consuming, paper-based process many building departments currently have in place, the Code Council is developing a way to automate the code compliance checking process. SMARTcodes

will allow users to check their buildings against the International Codes, which are currently used in all 50 states at the state or local level, as well as for federal, state and local amendments.

SMARTcodes is not a replacement for the valuable insight and experience a code official can provide; rather, it is a tool that automates the mundane portion of code checking, allowing building officials to focus their expertise to other areas in the field needing their attention. With this new technology, state and local governments will end up saving time, effort and money.

## Support Building Safety!

For more information about building safety codes and local requirements, contact your local building department below:



People Helping People Build a Safer World™

## Building Technology: Then and Now



Developed and provided by



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# Rome Wasn't Built in A Day, but...

*From mountain caves and sod huts to massive modern skyscrapers and energy-efficient homes, human progress is the story of buildings as much as it is the history of tools.*

*In fact, the great civilizations whose structures remain to this day combined protection from the elements with advances in technology and self-expression. Whether to proclaim national greatness, promote commerce, declare love or honor deities, these buildings gave structural expression to human achievement, innovation and hope. Some took immense forms that have survived through millennia despite earthquakes, wars, storms, erosion, scavenging and theft. Egypt's pyramids, the Greek Parthenon, Roman Colosseum, China's Great Wall and India's Taj Mahal are examples of how human strength and ingenuity crafted sophisticated structures to meet human needs.*



## DESIGN THROUGH THE AGES

The design of a building—whether it was a breathtaking castle, soaring church, or modest cottage—usually began, until quite recently, with a hand-drawn sketch to put the concept on paper. The designer then developed this idea into elaborate, large-scale drawings with precisely notated features and dimensions. The drafting process was slow and systematic and the more sophisticated the structure, the longer it took. Then construction began with erection of the building itself, taking decades or even centuries. For example, Michelangelo's design for the Vatican Basilica in Rome required almost ten years to develop and the structure, more than 100 years to complete.

These amazing structures, often built for titled nobility, were so well-constructed that they lasted through the centuries. But more importantly for their regal owners, they had to be safe for the intended occupants; otherwise the designer and builder risked dire consequences.

## BUILDING SAFETY GOES BACK TO ANCIENT TIMES

In fact, more than 4,000 years ago, the Code of Hammurabi, circa 2200–1800 B.C.E., prescribed the execution of any builder whose faulty construction of a house caused the death of its owner.

Building safety codes since then are far more precise, and the penalties far less drastic. The first building codes in the United States, established in 1625, addressed fire safety and specified materials for roof coverings. In 1630, Boston outlawed wood chimneys and thatch roof coverings. The first known formal U.S. building code was written in 1788 in Old Salem—now Winston-Salem, North Carolina, entirely in German. Larger American cities began instituting building codes in the early 1800s. In 1865, New Orleans became the first city to enact a law requiring inspections of public places.



## Adapting Tools and Techniques

Throughout the centuries builders adapted their techniques to their surroundings. For example, New England colonists used poles, stones and string to help them set posts upright and deep into the ground. During the long, frigid winters, frost heaves would forcibly move posts that were not set deeply enough as the ground froze and thawed. Gradually, each town learned to set posts to a depth below the frost

line, the point below which the ground remained unfrozen. Accrued experience guided construction efforts so successfully that a number of those original houses are standing today. Much of that expertise became part of the local building code.

In addition to stones and string, tools such as levels, straight edges, hammers, axes and surveyors' transoms have been around for

centuries. Although electricity has made many tools more powerful and easier to use, their basic purposes remain the same. But innovation continues. Recent technological advances are enabling architects, engineers, city planners, builders, code officials and others in the construction industry to achieve levels of precision and efficiency our ancestors could not have imagined.