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Construction Concerns: Recycled Building Materials

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By Gregory Havel

For www.fireengineering.com *Photos by author*.

Recycled building materials are part of the “green” movement and resource sustainability to reduce the amount of demolition debris taken to landfills as well as to reduce the amount of energy needed to produce materials for new construction and remodeling.

Photo 1 shows cleaned brick from a demolished building that is being shipped to a brickyard and which is to be sold for use in a new building. In addition to the other advantages of recycling these materials, there can be a cost savings compared to using all new materials.

(1)

Other building materials that are commonly recycled today include the following:

- Concrete masonry units, structural concrete, and concrete pavement, which are crushed and used as aggregate in new concrete and for compacted fill under buildings and roadways
- Gypsum from drywall board, plaster, and other materials, which is processed for reuse in building materials and for use as a soil additive for agriculture.
- Asphalt pavement, which is crushed and used as aggregate in new asphalt pavement and for compacted fill under roadways.
- Asphalt shingles, which are processed and used in asphalt pavement.
- Metals, which are salvaged, melted down, and manufactured into new materials.
- Plastics of several types, which are re-manufactured into new products.

Although this recycling is often viewed as beginning in the late 20th and early 21st centuries, it is in fact much older, and has been going on for thousands of years.

After the fall of the Roman Empire in the late 5th Century CE, and after the City of Rome was sacked several times by invaders migrating from central and eastern Europe and Asia, the heart of Rome and its buildings fell into disrepair. In later centuries, these ruins were mined for marble, travertine, and other fine stone.

Photo 2 shows a wall in the ruins of the Baths of Caracalla in Rome, from which the finely finished cut marble and Travertine were stripped over the centuries and reused in the construction of churches, public buildings, and monuments in the area. Even some of the brick have been stripped from this wall for use in more common construction, leaving the concrete core of the wall exposed, accelerating weathering and deterioration of the remaining structure.

Other examples of the recycling of building materials include the use of the fine limestone facing from the 5,000-year-old pyramids at Giza in Egypt in public buildings in modern Egyptian cities, the use of bricks from 5,000-year-old Sumerian and Babylonian ruins in the Middle East in new construction, the use of marble from 3,000-year-old Greek ruins in more modern buildings, and the use of wood and stone carvings from the bombed-out cities of Europe after World War II in new buildings.

Although the recycling of building materials has been going on for thousands of years, it has never been done so on such a large scale and with the level of scientific study that is happening today. In addition, a prevailing attitude is that buildings no longer have to be built to last; after their initial use they can be dismantled and the materials reused for another structure.

An example of this is the 10-year-old “big box” business that moves to a newer, bigger big box, leaving its original building vacant. And, after a few years, the vacant building is dismantled, demolished, and at least partially recycled because no one has a use for that building anymore. It is often less expensive to build a new building than to remodel an old one.

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