

FACT SHEET

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Traditional and Industrialized HOUSING CONSTRUCTION

Extension Housing and Home Furnishings Specialists*

Today's housing picture is changing rapidly as a result of new concepts in design, building techniques and materials. This is especially important because housing represents a major lifetime expenditure. The more you know about building materials and methods used in constructing housing, the better you will be able to select the house you choose to live in.

This fact sheet defines and discusses the two methods of housing construction: Traditional and Industrialized.

TRADITIONAL CONSTRUCTION METHOD

Single-family or multi-family residences built by traditional construction methods involve a "bits-and-pieces" approach. A sequence of independent sub-contractors, each one following the other, constructs the house piece by piece. All construction and finish work is begun and completed on the house site. See figure 1.

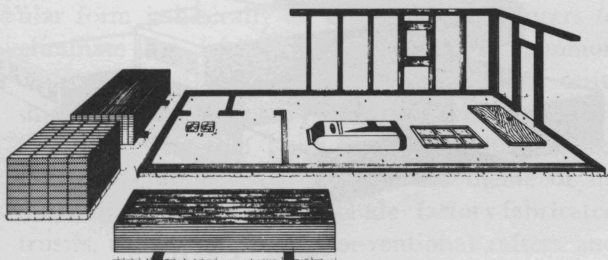


Fig. 1

Advantages

- Housing cost is only limitation to design possibilities.
- Construction is available everywhere.
- Building codes may guarantee increased construction quality and safety. If there are material

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specifications in the code, innovative design and construction techniques and materials may be used.

Disadvantages

- Weather may interfere with construction.
- Trained craftsmen are not always available.
- Construction time is variable and greater than for industrially constructed housing.
- Innovative design, construction techniques and materials may not be acceptable under building codes.

INDUSTRIALIZED CONSTRUCTION METHODS

The term "Industrialized Housing" includes all forms and concepts of housing manufactured by duplicative techniques on a production line. All industrialized housing is transported to its site by trucks, whose movements are controlled by state highway regulations, or by shipment on railroad flat cars. If the site is close to the factory, units may be transported by special helicopters. If they are to be stacked on site, stacking is done with cranes or helicopters.

Advantages

- Rapid production.
- Lower cost per square foot.
- Use of innovative design and construction techniques and materials.

Disadvantages

- Not readily available in all localities.
- Some limitation on design.
- Not all industrial products meet building codes.
- Transportation to site may be difficult or expensive because of the cost per mile.
- Controlled by highway regulations.

Industrialized housing can be divided into three general categories. They are Mobile, Modular and Componentized.

Mobile housing, generally non-code conforming, includes single and double wides and fold-out units. Included in the modular group, which generally conforms to codes, are sectional houses, stack-on's and boxes, fold-outs, mechanical cores and three dimensional units. Componentized, generally code conforming, includes prefabricated or packaged units, shells and miscellaneous portions of a housing unit.

MOBILE

A mobile home is a transportable structure which exceeds either 8 feet in width or 32 feet in length and is designed and built on a chassis.

Single Wide Mobile Home

Mobile homes are often 10, 12, or 14 feet wide and may be up to 80 feet in length. The larger ones, in fact, are only mobile in that they can be moved from the factory to the site. Once on the site, they are rarely moved.

Double Wide Mobile Home

A double wide mobile home is a mobile home consisting of two sections combined horizontally at the site while still retaining their individual chassis for possible future movement. See figure 2.

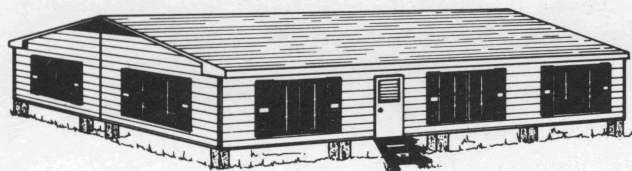


Fig. 2

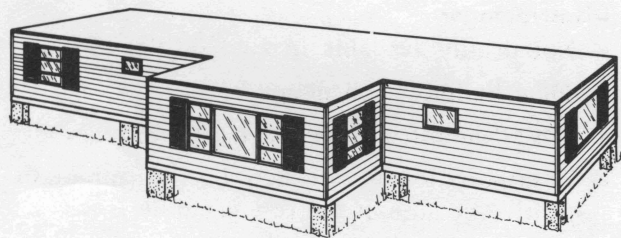


Fig. 3

Expandable or Fold-Out Mobile Home

An expandable or fold-out mobile home is a mobile home with one or more room sections that fold, collapse or telescope into the principal unit when being transported and which can be expanded at the site to provide additional living area. See figure 3.

MODULAR

Structures which are completely built and finished in a factory and require only to be connected together at the building site are called "modular."

Modular

Modular housing is built or erected from one or more three-dimensional cubical or box shaped units. This includes single and multi-family configurations including row houses, townhouses, apartments and high-rises, as well as other building types. The element that sets modular housing apart from mobile homes is construction specifications. Modular units are designed and fabricated to meet the same basic building code requirements used by traditionally built housing. Mobile homes generally follow design and fabrication standards which will not meet local building code requirements. When units do meet local codes and are affixed to permanent foundation systems, they should be called "modular." See figure 4.

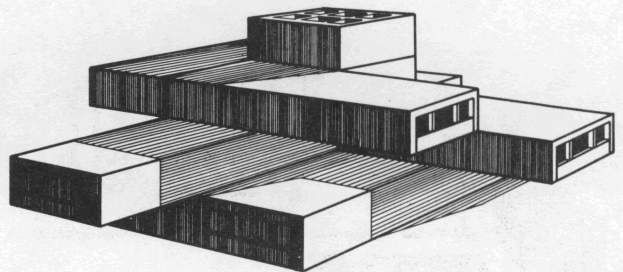


Fig. 4

Sectional House

A sectional house is fabricated with materials and methods of construction which meet or exceed local building code requirements. Typically, it is fabricated in half-house (two or more) modular sections. Each section may vary in width from 10 to 14 feet, the average being about 12 feet. They may range from 38 to 70 feet, with most being 38 to 56 feet. This housing form is frequently produced in

three or four units to form larger and more complex houses. As a rule, individual sections leaving the factory production line are completely finished, with flooring, carpeting, painting, mechanical and electrical systems, and sometimes draperies and other accessory items installed. A section is trucked to the job site on temporary wheels and then erected on a previously prepared permanent foundation. The most common shape of the completed sectional house is rectangular, but with a larger number of smaller size sectional units, shape variations including carports, garages, false gables and the like may be obtained. Unless a folding roof system is employed, the factory-built trussed roof has little slope. A low-sloped roof is necessitated by established maximum shipping-height limitations. Sectionalized housing is limited to single-family detached dwellings. See figure 5.

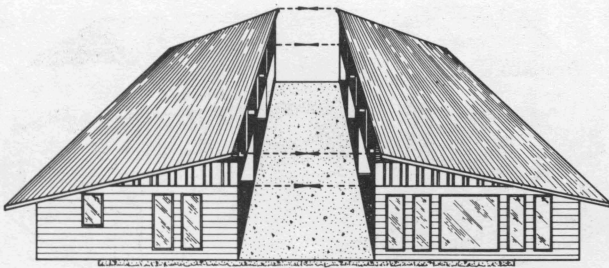


Fig. 5

Sectional Box

The sectional box is simply a sectional house without its factory-installed roof system. This modular form is basically an attempt by producers to eliminate the low-profile roof lines so common with sectional houses and other similar units shipped from the factory with roof systems already installed. The roof types employed with the sectional box at least partially fit the theme of industrialization, as they include factory-fabricated trusses, rafters or pre-cut conventional rafters and joists. These are usually included and shipped as part of the total sectional level. Sectional boxes are used for both single-story residential construction and two-story single-family units, as well as for industrial and commercial flat roof buildings, schools, and other types of structures.

Sectional Stack-On

With proper structural design, all sectional units can be stacked one on the other to form two

and three-story apartment complexes, single-family duplexes, two-story detached houses and many other diversified and personal floor plans. From an aesthetic viewpoint, the stack-on sectional concept presents, perhaps, the most acceptable results of all modular forms. This is particularly true with row and staggered apartment types, which are becoming popular for urban and suburban locations. The stack-on system involves the use of a sectional box for the lower half and a unit similar to the sectional house for the upper half. In some instances, sectional boxes may be employed for both upper and lower sections, with the roof system applied at the site.

Three-Dimensional

The term three-dimensional is used to describe a system of modular construction similar to the sectionals in its cubic or box-like shape. It is generally smaller, and a greater number would be required to complete the same building unit. It is also similar to component systems like wall panels and partitions, but components of the three dimensional system have a final finish applied before delivery to the building site.

This modular system makes use of unique devices and methods to effectively combine a number of cubes, boxes and other components to complete the structure. These parts are, for all practical purposes, pre-finished, pre-wired, pre-plumbed and so forth to facilitate fast erection. See figure 6.

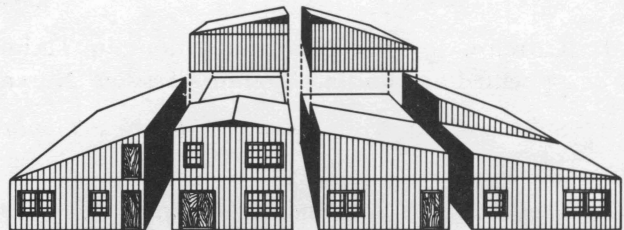


Fig. 6

Mechanical Cores

Mechanical cores are factory-produced modular units which include all mechanical, electrical and related systems. These units generally contain the kitchen, one or more bathrooms, and the utility room complex. All wiring, plumbing, heating and

cooling ducts, and other associated items are factory-installed. In addition, such units typically include stove, range, bath fixtures, lights, finished floors, cabinets, counters, sinks and the like.

Mechanical cores are sometimes referred to as "wet cores" or "utility cores." At the site, they are erected on previously prepared foundations. The remainder of the house is then built around the mechanical core by either conventional construction or component systems. The use of the core units does not preclude their combination with other modular systems. These units generally range in size from 8 by 10 feet to 12 by 20 feet and can be stacked easily one on the other for multi-story constructions. See figure 7.

COMPONENTIZED

Prefabricated or Packaged

Prefabrication is a method of construction in which large, flat components of a house are constructed in a factory. Components include walls, floors, ceilings, roofs and one-unit molded bathrooms and kitchens.

Prefabricated pieces are transported in sections to the site by truck. At the site, units are lifted by machine into position on a previously prepared foundation. See figure 8.

Heating, plumbing and wiring must be done on the site by skilled labor. Prefabrication represents the construction in a factory of the house shell only.

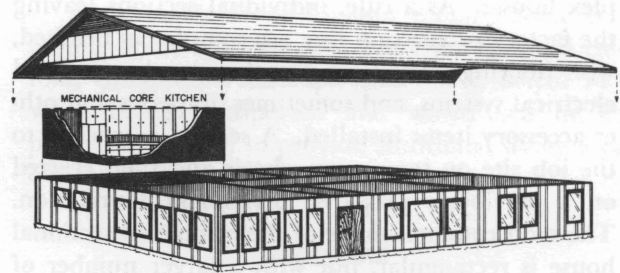


Fig. 7

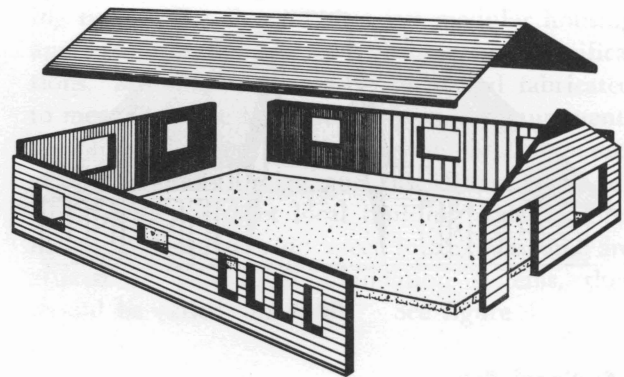


Fig. 8

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