Thesis:
Prefab (short for prefabricated, or modular) homes have received praise as an alternative means of housing because they are considered to be inexpensive, customizable, quick to build, and in some cases, environmentally friendly. Some critics, however, believe the negative aspects of prefab heavily outweigh the positive aspects.

Core Concepts/Keywords:
Prefab homes, prefabricated homes, modular homes, inexpensive, customizable, quick to build, environmentally friendly

Primary Source:

Citation:

Annotation:
This interview with architect Michelle Kaufmann by Inhabitat.com's founder and editor-in-chief Jill Fehrenbacher is about Kaufmann's new prefabricated modern home, called the mkLotus. As described by Kaufmann, the pre-designed house has numerous sustainable features. The living roof provides insulation and reduces rainwater runoff. A rainwater catchment system provides water for landscaping. A grey water system reuses water from the washing machine and shower to run the toilets. Floor to ceiling windows, windows on corners, and skylights eliminate the need for artificial light during the day. Air conditioning is made possible by opening skylights. The design, including accordion glass doors, makes the house feel twice its size. It’s also outfitted with low flow shower heads, dual flush toilets, Energy Star appliances, LED lighting, radiant heating, a high velocity mini duct system, concrete countertops, and FSE certified wood. It’s also all powered by photovoltaic solar panels. The eco-jargon spoken throughout the interview is best understood by individuals familiar with sustainable architecture; for example people who regularly read the Inhabitat.com blog. Overall, the innovative design and sustainable features definitely makes eco-prefab
incredibly appealing. On the other hand, although Kaufmann’s goal was to make green homes easily available and cost effective, the price of the house makes it rather difficult for many to afford (see annotation “Costs”).

**Print Reference Source:**

_Citation:_

“Prefabricate.” Def. 1, 2. _Webster’s Universal College Dictionary._

ANNOTATION: This is the official definition for Prefabricate by Webster’s Universal College Dictionary by the well-known publisher Merriam-Webster. Prefabricate means 1. to fabricate or construct beforehand. 2. to manufacture in standardized parts or sections ready for quick assembly and erection, as buildings.

**Electronic Reference Source:**

_Citation:_


ANNOTATION: This encyclopedia article briefly covers a few aspects of prefabrication. At first it provides a succinct description of prefabrication. It just barely touches on prefabrication’s history. Also, the article describes a few technical elements of prefab and how there are also various prefabricated concrete units, roof trusses, and steel frames produced and used in modern construction. Features of prefabrication like assembly line construction, mass production, and standardized units make it cheaper. On the down side, because prefabricated units can be designed, produced, and shipped in many different places, structural integrity is compromised. Although this article is reliable, unbiased, and discusses some pros and cons, it lacks depth.

**Web Sites:**

_Citation:_


ANNOTATION: This website is intended to inform potential homebuyers about the pros and cons of purchasing a modular home and declares to be unbiased. It is a commercial website, however, and at first glance, the advertisements in the margins could lead one to believe that the site is trying to sell something. Regardless, cross-referencing shows that the pros and cons are accurate, minus conflicting information about available financing. These pros include how modular homes are generally less expensive than site built homes, are faster to construct, have a large variety of design styles to choose from, have environmentally friendly options available, and they appreciate in value over time just like a site built home. The cons include having to wait for your home to be built, purchasing land on which to build your home, in addition to paying for the home itself, and being required to pay the builder up front for the entire project. At the end of the pros and cons list, there is a paragraph emphasizing the importance of doing your own research and shopping around. This website may not have an author or documented sources, but it still manages to give objective information. It acts as an informative guide while also linking potential homebuyers to various modular-housing companies.

_Citation:_

“Modular Homes FAQ.” _Modular Center._ Homeworks Modular Homes. 23 Nov. 2008 <http://modularcenter.com/modularfaq/>.

ANNOTATION: This webpage answers frequently asked questions about modular homes. The site explains what modular homes are, how they’re built, what modular homes look like, how long they take to build, the difference between a modular home and a manufactured (mobile) home, conditions regarding custom designed
homes, how banks and lenders treat modular homes just like site built homes, and the how they're relatively less expensive than site built homes. All the answers aim to convey that modular homes are advantageous over site built homes. The question “Is a modular home better than a site built home?” is immediately answered with “The decision is clear”, which indicates the site is somewhat biased. Regardless, most of the information about modular construction is correct, with the exception of conflicting information about available financing. The parent company of ModularCenter.com is a company called Homeworks Modular Homes. The purpose of the website it to inform potential homebuyers of the advantages of modular homes and to act as the site slogan says “The Modular Home Industry Matchmaker!” for customers. Unfortunately for homebuyers, there are no websites about modular homes that are purely informative and completely unbiased.

Books:

Citation:

Annotation:
This book is covers the technical aspects of prefab design. The format of the book includes an introduction that covers a brief history of prefabrication, prefabs’ relationship with the landscape, the feasibility of testing prototypes, the role of the architect in prefab design, and the possibilities of sustainability in prefab. It also states the main goal of prefab is to maintain high quality and a high degree of precision while efficiently building prefabricated units through the employment of specially skilled individuals and specific technologies to subsequently lower the cost and time spent on a building site. Next are 7 chapters on different prefab building systems. Each chapter contains a few pages describing a particular prefab building system in great detail, followed sections on buildings, conceptual renderings, or experiments exemplifying that specific building system. Within the examples, there is a rich assortment of construction photographs, photographs of the completed project, photographs of models, maps, development plans, elevations, floor plans, site plans, computer generated technical drawings, exploded views, a parts list, assembly order, sketches, and drawings. The after word discusses the importance of reusing and recycling in the context of prefab. Overall this is an extremely thorough source on prefab construction, but it fails to see any possible shortcomings of prefab. It also uses some construction jargon that not all readers may be familiar with.

Citation:

Annotation:
This book is about prefab in the past and of the future. Prior to the introduction, the authors set their own definition of prefab, which to them means to incorporate some aspect of prefabrication. First there is a brief introduction addressing the current problems with prefab like homogeneity, lack of financing, and architects who fear for their job as a result of its existence. Nevertheless, the authors remain hopeful that by showing what prefab is truly capable of, its negative connotation will be lifted. Next is a chapter on the history of prefabricated housing. This gives some insight on prefabs’ rough past, including many photographs and descriptions of innovative projects by forward thinking architects that were simply rejected by consumers. The next three chapters explore prefab houses in production, custom prefab houses, and conceptual prefab projects that are still in the design phase. These chapters each consist of 8–9 innovative projects with beautiful photographs or illustrations and in-depth descriptions. It is obvious to the reader that Allison Arieff, editor at large for Sunset, former editor-in-chief at Dwell Magazine, and writer of the column “By Design” for the New York Times, really knows prefab. She also effectively presents the advantageous qualities of prefab as well as its shortcomings in spite of her apparent optimism. This book provides a wealth of information about prefab, is accessible to all by avoiding confusing architecture jargon, and is enjoyable to read.

Citation:
**Annotation:**
This book is divided into 5 parts with an informal introduction. The introduction proposes that prefab is more than just a means of saving time and money; it's also capable of solving complex structural circumstances. During the 20th century, prefab was known as manufactured concrete panels and modular homes that could house rapidly rising populations that resulted from the growth of cities. The rigid nature of these units, however, hindered the progress of their design. Today, serial architecture is possible due to technological advances in design, materials, and construction methodology. These advances allow for individualized solutions for each client and unique site condition. Thus the book uses characteristic features to organize prefab architecture into 5 distinct building typologies, including: mobile, adaptable, lightweight, modular, and dismantling. This book is great for providing various, highly conceptual examples of prefab structures that are not just residential. Each project provides an in-depth description and is shown through many colorful photographs or computer illustrations, plans and sections. Unlike the other sources, however, there is a general assumption that the problems associated with prefab have dissipated and there is a new outlook on prefab as a viable option for all building needs. Perhaps this is due to the fact that the book was originally written and published in Spain where prefab is regarded as something totally different than in the US.

**Peer-Reviewed Journal Articles:**

**Citation:**

**Annotation:**
This journal article examined the growing popularity of modern prefab homes in 2005. Dwell magazine introduced a collection of modern prefab homes called Dwell Homes, from which clients could pick their favorite of three floor plans and each was slightly customizable. Allison Arieff, Dwell’s then editor-in-chief, stated Dwell Homes were more affordable compared to traditional houses found in the San Francisco Bay Area. Coincidentally, a study conducted in England two months prior showed that 29% of people would consider buying a prefab home. Other firms and designers, such as Rocio Romero, Alchemy Architects, Lazor Office, Empyrean International, and Resolution: 4 Architecture were on the modern prefab bandwagon as well. The latter three were the designers of the Dwell Homes. At the end of the article, Arieff points out that although there is a common belief that prefab homes lack quality and style, there is a growing trend of people who want modern prefab. She also makes a point to add how prefabs are actually more accurately produced than site built homes because they are mass-produced in a controlled environment. This article showed that even though prefab homes had been stigmatized in the past, a new market for modern prefab homes had been discovered and was becoming more popular as time went on.

**Citation:**

**Annotation:**
This journal article first discussed the McGlasson’s pleasant experience with prefab and their new modern prefab vacation home. Some of the upsides of prefab mentioned in the article were how even upscale prefab homes were 20% to 30% cheaper than a traditionally built, architect-designed home. They are built to meet local building codes or in some cases the codes of all the states in which they are sold, making them as structurally sound as site built homes. Then, the article contrasted panelized and modular prefabs. Mainly, panelized cost more, but have more flexibility with the layout and building site location. Conversely, modular prefabs require a large, level foundation, and have thicker walls so they can be lifted by cranes and therefore, less floor plan options. Regardless, the less expensive price made them the prefab of choice for most buyers. The article then talked about how the amount of work your architectural firm and builder does determines the price of your prefab per square foot. The more work done by them, the higher the price. Since finding a contractor for a prefab has been difficult for owners in the past, it is recommended to have as much work completed in the factory as possible. Prefab homes require a construction loan rather than a mortgage, with interest rates slightly higher than mortgage rates. This
journal article was meant to inform and answer many questions a potential prefab homebuyer might have. It's a reliable source because it's from a peer-reviewed journal.

Newspaper Article:

Citation:

Annotation:
This newspaper article discusses the growing popularity of modular homes in the northeast, as well as reactions to them by new owners. When general contractor Lee Spencer’s home burned down due to a bad-wiring job, he decided his next would be modular. Happy with his decision, he states it’s more efficient to heat and cool. Louis and Diane Del Pizzo have built two modular homes, the first of which is for sale and has appreciated $224,000 in just a few years. Although Billie Ann Meier forgot to include a wall in her design, she’s still pleased with the outcome. She declares her home is quieter and built so well she can save money by lowering the thermostat in the winter. Although modular homes only made up 3 percent of single-family homes in 2005 and were generally less popular in the south, west, and Midwest, modular homes made up 11 percent of all single-family homes in the northeast. The article accredits the growing popularity of modular homes to their fast construction, high quality, how they are 5 to 15 percent less than site built homes in a market where the average price of a new home was increasing quickly, and the proximity of Pennsylvania, considered the leading manufacturer of modular homes. It doesn’t ignore the negative side of modular homes, though. Modular homes are often associated with mobile homes, and it doesn’t help that the two are sometimes produced by the same company. Also, transporting the modules can be extremely difficult sometimes, depending on where the building site is located. This source is useful in that it provides background information on modular homes, why they are gaining mainstream acceptance, and some feedback from people who actually live in them.

Additional Sources:

Citation:

Annotation:
This magazine article is about Steve Glenn’s new sustainable prefab development company, LivingHomes, and his new prototype. His favorite architect, Ray Kappe, designed the prototype. Ray Kappe is well known for founding SCI-Arc and his own home is iconic of West Coast Modernism. It only took 8 hours to bolt and weld the modules together, and 3 months overall to complete. Following Glenn’s mantra, “Zero energy, Zero water, Zero waste, Zero carbon, Zero emissions”, his prototype was LEED Platinum certified, the highest rating a home can achieve. The green features of the house include a solar energy system for electricity and hot water, a grey water system, a storm water cistern for irrigation, a rooftop garden, and sustainable and non-toxic materials. The down side of the project is how it cost more than expected in the end, as custom prefab designs usually experience more obstacles than pre-designed prefabs. This article is another example that although in theory prefab should be cheaper than site built houses, it cannot always be considered the cheap alternative. It also illustrates the promising possibilities of prefab but is not yet refined enough to be manufactured inexpensively for the masses.

Citation:

Annotation:
This magazine article discusses essentially Michelle Kaufmann’s first experiment with prefab. This idea was born from her frustration with the limited availability of affordable homes in the San Francisco Bay area.
Thus, she designed and had built two environmentally friendly homes. One was site built and referred to as Glidehouse 1, and the other was prefab, Glidehouse 2. Glidehouse 1 is for her and her husband, Kevin Cullen, to be built in Novato, California. Glidehouse 2 is purchased by Andrew Reid to be built in the near Lake Chelan of Washington State. As Kaufmann and her husband began building Glidehouse 1, they found it difficult to find a factory that would build Glidehouse 2. Eventually, she was contacted by Andrew Reid. Although Glidehouse 2 started late, it took only 6 months to build and was completed months before Glidehouse 1, which took 18 months to build. Kaufmann was from then on convinced by the advantages of prefab. Overall, this article provides a real life comparison of site building versus prefab building. It conveys rather powerfully how prefab is considerably faster than site building and yet still entirely capable of being sustainable.

Citation:

Annotation:
This website is rather expansive, so the focus has been placed on webpages regarding costs to illustrate examples. This provides some insight on what one can expect to pay for a Michelle Kaufmann Designs home, considered by some to be the industry leader of sustainable prefab. For example, the basic one bedroom, 700 square foot mkLotus home will cost $125,000, in addition to the cost of the site. A two-bedroom version would be $250,000 plus the cost of the site. This may be considered a deal for the San Francisco Bay Area, but it is considered astronomically expensive for many places in the US. Being as green as possible comes at a steep price as well. A living roof which helps reduce rainwater runoff, adds insulation, and absorbs sunlight while reducing the heat-island effect costs $15,000. A solar panel system, which provides completely renewable, non-polluting energy, is $24,000 before rebates. Thus, one can see the wonderful possibilities of sustainable prefab come at a price that is in conflict with the theoretical inexpensiveness of prefab. Unfortunately, the most environmentally friendly prefab homes are currently only available to the somewhat affluent. If the cost ever does come down and affordable, well-designed, green prefab housing is available for the masses, prefab will loose all of its negative connotations and become known as a great innovation in architecture history.

Citation:

Annotation:
This magazine article was about Anderson Anderson Architecture’s Canti-lever House for Scott Stafne. He wanted a prefab house built on his mountaintop land that completely lacked basic amenities like running water, electricity, and paved roads. The team encountered several difficulties throughout the building process. First, the price of steel spiked and the frame cost thousands more than anticipated. Second, the truckers’ refusal to scale the mountain resulted in the frame left at the foot of the mountain. Getting the frame up the mountain added thousands to the costs. Undeterred, the project moved on. With the frame secured on its foundation and bolted to a rock, the house was erected in just 2 weeks. Third, Stafne’s need for a truly exceptional home, including winding custom built stairs, Douglas fir lined walls, custom stainless steel work, sculptures, and exterior landscaping, consequentially cost substantially more than he had planned. In spite of the obstacles, Stafne was incredibly pleased with the outcome of his Canti-lever House. The story of this house’s development exemplifies the challenges in modernizing the prefab industry. This article also disproved the assertion that prefab is always an inexpensive solution to homebuilding. It emphasized how each custom prefab home brings with it unique circumstances and sometimes challenges, which can result in unforeseen costs.