The Rise of Modular Construction: Emerging Commercial and Legal Issues

November 30, 2016
Presenters

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Agenda

• Why modular?

• Challenges

• Key legal issues

• Resources
Many terms

- Prefabrication
- Modularization
- Off-site construction
- Modern methods of construction
- Assemblies, Sub-assemblies
- Accelerated construction
- Permanent modular construction
- Volumetric modular construction
The Off-Site Construction Council of the National Institute of Building Sciences definition:

Off-site construction is the planning, design, fabrication and assembly of building elements at a location other than their final point of assembly onsite. An integrated planning and supply chain optimization strategy characterizes off-site delivery.
Historical Perspective

Modular construction is not a new concept . . .

- **1910-1940**: Sears, Roebuck & Co. sold over 75,000 prefabricated homes

- **Mid 1940s**: the industry turned to modular when faced with skyrocketing demand for new homes after WWII

- **Late 1950s**: modular expands into the construction of schools and medical facilities
Historical Perspective

Modular Expansion

• **1990-Present:** Innovation drives the use of modular in larger and more complex projects

• **Today:** Modular is used across markets
  – McDonald’s fast-food restaurants
  – SGT steam generator replacement projects
  – B2 Residential Project at Atlantic Yards
Capabilities

Examples of where we are using modular:

– Piping and component modules (MEP)
– Structural modules
– Re-bar modules
– Bathroom pods
– Major plant components
– Data centers
– High-rise
Assemblies and sub-assemblies

| Prefabricated pipe/duct rack | Prefab, multi-story MEP riser (645 parts delivered as one) | Prefab boiler room piping | Patient room headwalls: prefabricate in one area of site, then move to final location |
MEP Rack
MEP Rack Transport
Kerry Foods - Ireland
MEP Riser
Why Modular?
Benefits of Modular Construction

• Better quality control

• Faster construction

• Improved labor productivity

• Better use of space on site
Benefits of Modular Construction

• Safer

• Site a better neighbor

• Sustainability
Challenges
Challenges

• Additional engineering to design modules

• Design freeze!

• Additional handling and preparation

• Freight charges and shipping restrictions
Challenges

• Better coordination required

• Training composite crews to work together

• Early integration of project team a must
Established legal principles and legislative framework — do they apply?
How Do Building Codes Apply to Modular Construction

- Most states use the International Building Code (IBC) as their base model code and amend accordingly.

- IBC is written assuming stick-built construction; There is no “modular construction building code.” Modular construction is a process, and should not be a product.

- Some states have building codes amended with modular construction considerations.
How Do Building Codes Apply to Modular Construction

• Inspection of closed-construction “modules” that are pre-fabricated at an offsite facility fall under the jurisdiction of a statewide modular (or industrialized) building program.

• Thirty-six states have such an agency responsible for the approval of the modular manufacturer, QA/QC, and plan approvals. Local AHJ in other states.

• State label or insignia issued for each module to demonstrate compliance with all applicable codes.

• Modular manufacturers’ responsibility.
Licensing and Permitting

• Depending on the jurisdiction, modular fabricator may need to hold license as a GC, Plumber or Electrician.

• Construction needs to meet all applicable codes and requirements where the building is located, not fabricated.

• The state agencies will determine whether inspections will be on-site or at the factory.

• Make sure modular manufacturer is approved in your state. Tour the factory if possible. MBI has a list of manufacturers and all state agencies.
Safety

• Often different concerns than in field
  – Site—working overhead (high work)
  – Factory—confined spaces, entrapment, escape
  – Different risk profile and training focus

• Transporting big loads—modules may come from next door or next state – who coordinates transportation logistics?

• Cranes & derricks—oversize loads
  – Crane capacity—can you lift it when it gets there?
Subcontractor or supplier?

• Generally better for the module manufacturer to be a subcontractor than a supplier
  – Negotiate and sign a subcontract—don’t issue a purchase order
  – Make clear module manufacturer is building to specification (and not designing a product)
  – Avoid “Product Liability”
Subcontractor or Supplier?

- Avoid Application of the Uniform Commercial Code (which applies to the sale of goods) and its numerous rules which are often not appropriate for construction (e.g., implied warranties of fitness for purpose)
- “Substantial Compliance” vs. “Perfect Tender” Rule
- Specify Who “Owns” the Module and When
  - Risk of loss and insurance
- Amount of Time to Hold Records
How Long Do You Maintain Project Records?

Potential variations for Statutes of Limitations for construction contracts and contracts for the sale of goods:

<table>
<thead>
<tr>
<th>State</th>
<th>Written Contract</th>
<th>Sale of Goods</th>
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How Long Do you Maintain Project Records?

Potential variations for Statutes of Repose for construction contracts and contracts for the sale of goods:

<table>
<thead>
<tr>
<th>State</th>
<th>Construction</th>
<th>Products</th>
</tr>
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<tbody>
<tr>
<td>Georgia</td>
<td>8 years from substantial completion. O.C.G.A. § 9-3-51.</td>
<td>10 years after date of first sale. O.C.G.A. § 51-1-11(b)(2).</td>
</tr>
<tr>
<td>Connecticut</td>
<td>7 years from substantial completion. C.G.S.A. § 52-584a.</td>
<td>10 years from date of sale. C.G.S.A. § 52-577(a).</td>
</tr>
</tbody>
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Legal Implications

• Design freeze and changes

• Design errors

• Coordination on site
Lien and Prompt Payment Statutes—One Tier Too Remote?

**Traditional**
- Owner
  - Prime Contractor
    - Plumbing Subcontractor
      - Plumbing Material Supplier

**Modular**
- Owner
  - Prime Contractor
  - Modular Contractor
    - Plumbing Subcontractor
      - Plumbing Material Supplier

Line Denotes Lowest Tier That May File a Lien Under Some State Law
Insurance Twists

Controlled insurance programs (OCIP/CCIP)

– Amount of labor cost on site usually determines if OCIP/CCIP is feasible
– Typically labor cost is 60% of project cost
– On modular project, much of the labor normally on site is working elsewhere
– Wrap-up policies may not be feasible on modular projects
Builders Risk Insurance—Different Considerations on Modular Projects

- Builder’s risk is basically insurance for property on site
  - Often have extensions for material stored on site or in transit
  - But can the modules be stored on site?
- Or must they be stored elsewhere if project is off schedule?
- Typically, no coverage for storage off site
- If modules will be stored offsite after they leave the manufacturer, get a rider to Builders Risk Policy
Resources

- **The Rise of Modular Construction: A Changing Legal Landscape**, Kevin T. Colby and Lee C. Davis
  American College of Construction Lawyers Journal

- Current listing of State modular programs
• **Off-Site Construction Resources**
  – Glossary of Off-Site Construction Terms
  – Whole Building Design Guide Content
  – Implementation Resources
  – Case Studies
  – Publications
  – Survey Results
  – Webinars

http://www.nibs.org/?page=oscc_resources
• **AGC Resources**
  
  - Project Delivery
    [https://www.agc.org/industry-priorities/project-delivery](https://www.agc.org/industry-priorities/project-delivery)
  
  - ConsensusDocs
    [https://www.agc.org/industry-priorities/contracts-law](https://www.agc.org/industry-priorities/contracts-law)
  
  - Lean Forum
Questions
Thank You

November 30, 2016
I. Introduction

The Rise of Modular Construction: A Changing Legal Landscape

Kevin T. Colby and Lee C. Davis

While modular construction in the United States can trace its roots back to the early 1900s, when companies like Sears Roebuck sold prefabricated houses in mail-order kits, there has not been a steady increase in its domestic use.

Recently, however, the U.S. construction market has followed its international counterparts in exploring markets beyond the manufactured home. Healthcare and education have seen exceptional cost benefits and efficiency, while bolder initiatives have been undertaken in large-scale residential buildings, such as the now-stalled 32-story B2 Project in Atlantic Yards. Modular construction is not limited to large residential or commercial construction, as industrial projects also are built using pre-fabricated modules.

The construction of the B2 tower, the first residential component in the Brooklyn Atlantic Yards Project, began with great enthusiasm. Developer Forest City Ratner was working with FCS Modular LLC + Skanska to create a 32-story building comprised of stacked modular apartments. Although it now is mired in litigation, it was conceived to be the tallest modular building in the United States.

The Broad Group is attempting to build the world's tallest building entirely out of prefabricated modules.
modules. The 202-story Sky City project would contain 4,450 apartments for 30,000 residents and supposedly will be completed on a 120-day schedule.

A notable project using modular construction technology in the power sector is Georgia Power Company's massive Plant Vogtle nuclear power plant in Georgia. Here, critical pieces of the project are prefabricated modules, including an 180,000 pound steel structure that was recently hoisted into place on Unit 3. While this project is the subject of regular press reports about delays, cost overruns and litigation, and Georgia Power stated that its contractor "has recognized the existence of challenges to several long-term activities, including fabrication, assembly and installation of structural modules and shield building modules," it also states that "we believe the project remains overwhelmingly positive and represents the most economic energy option for customers over the next 60 years."

II. Issues Unique to Modular Construction

A. Benefits of Modular v. Traditional Construction

The construction industry remains under substantial pressure to produce facilities and structures better, faster and cheaper. Among the potential advantages to modular construction are:

- Reduced lead times and schedule delays.
- Improved quality and consistency due to prefabrication.
- Lower labor costs and reduced site impacts.
- Increased productivity and efficiency.
- Flexibility to adapt to changes in design.
- Reduced waste and environmental impact.
- Lower overall project costs.
1. Increased Quality Control

In a traditional build, most construction activity occurs at the site. With a modular build, up to 90% of the work is completed in a factory and delivered to the site. Constructing the building in a controlled environment allows, in theory, for increased quality assurance and quality control measures. For example, an initial module—whether it be a hospital room, apartment unit, industrial component or classroom—can be constructed within the first few weeks after contract award, allowing for immediate correction of any defects before the module is replicated and permitting future modules to be manufactured error-free.

2. Shortened Schedule

Perhaps the biggest draw to modular construction is the time savings that proponents say will flow from performing work concurrently. While there may be additional time needed in the design planning stages in modular construction, by the time a contractor receives its notice to proceed, the traditional construction schedule, at least on the project site, can be truncated with a modular build. Concurrent Ceci occurs from the outset of building when site work is being performed simultaneously with construction, and the project is divided into modular sections of an industrial facility, permitting the delivery of an entire module’s construction at one time, with the remainder of the building to follow. Therefore, the time between the delivery of a module and its installation can be reduced significantly, allowing for faster completion of the project.

In addition to simultaneous building on-site and off-site, and thereby shortening the schedule, other characteristics of modular construction include:

- Increased Quality Control: Modules can be designed and built according to the same—or stricter—codes and standards due to the controlled environment within a factory. Such a process can ensure that defects are eliminated before the building is transported to the site.
- Shortened Schedule: Modular construction allows for concurrent construction on-site and off-site, reducing the time between delivery and installation of modules.
- Labor Savings: With a modular build, work is performed in a controlled environment, reducing risk and allowing for faster completion.
- Cost Savings: By completing up to 90% of the work in a factory, costs are reduced due to streamlined processes and economies of scale.
- Improved Site Safety: Construction is conducted in a controlled environment, reducing the risk of accidents on-site.

In traditional construction, most construction activity occurs at the site, which can be a more dangerous environment. Modular construction allows for a controlled environment, which can improve quality and safety.
construction also save time. Since the building components—or modules—are being built off-site, there is significantly less on-site staging, such as scaffolding, required. The erection and disassembly of scaffolding thus can be removed from the schedule. Time is also saved through close trade coordination inherent in modular construction. No longer are multiple trades jockeying for position and time on the site, impacting the schedule. Rather, by the extensive use of a Building Information Model (BIM) during the design phase, the trades can be placed into collaborative teams for module construction at the factory, reducing delays (and claims) due to work sequencing issues, and an increased change of design incorporated into project designs due to trade scheduling delays. The design phase can shorten the duration of construction activity on site, as well as reduce the manpower peak. In many construction projects, there can be crowding when the number of workers on-site peaks. On a major job, this could mean having 1,000 workers on-site, with the distinct possibility of inefficiencies due to trade stacking, delays caused by work sequences issues, and an increased chance of safety incidents. Using modular construction, Skanska officials report that the expected workforce of 700 workers was actually less than half of that estimate. Similarly, with the build of the Texas Health Harris Methodist Hospital in Fort Worth, the expected workforce of 700 workers was actually 700 workers. Through the use of off-site fabrication, general contractors have reduced this manpower peak significantly. For example, during the build of the Texas Health Harris Methodist Hospital Heart and Orthopedic Center in Fort Worth, the actual workforce on-site was less than half of that estimate.
Foot structure in Fort Worth, Texas—project management reported a 30% decrease in labor costs using prefabrication shops to manufacture the complex headwalls, patient bathrooms, and portions of the HVAC and plumbing systems. This cost savings was a direct result of reducing the estimated manpower peak by 20%.

Not only may modular construction reduce the overall work force, but savings also occur using "shop" instead of field labor. In 2013, FMI conducted a Prefabrication and Modularization in Construction Survey that found 67% of respondents reporting that the lower hourly rates for on-site labor contributed to a reduced overall project cost.

In markets with traditionally higher labor costs, completing the majority of the build on-site can be exceedingly alluring. Similarly, if finding an adequate supply of qualified local labor becomes an issue, prefabrication can be exceptionally useful. Simultaneously, it is an advantage in that prefabricated building elements are manufactured in a controlled environment, resulting in a higher level of quality control over the production process. These factors contribute to a reduced overall project cost, as reported by 67% of respondents to FMI's 2013 Survey.

Skilled labor shortages are an increasingly serious issue recently highlighted when an inadequate supply of qualified welders in the New York area led to contractors bringing in robots to facilitate the installation of the piles on the Tappan Zee Bridge $3.9-billion project.

Regardless of the impetus for turning to modular construction—whether it lies in seeking a reduced labor rate, overall labor hour savings, or as a solution to a skilled worker shortage—the use of non-union labor is causing a stir in some of construction’s largest markets. Potential issues with union/non-union and skilled/unskilled labor were consistently identified as a major hurdle in the use of prefabrication, according to FMI’s report. In some of these surveys, respondents identified craft labor shortages as one of the biggest drivers behind the increase in using prefabrication services.

A lawsuit was filed in late 2013 by the Mechanical Contractors Association of New York against one of the New York-area contractors to bring in robots to facilitate the installation of the piles when an inadequate supply of qualified welders was an issue. This incident highlights the importance of ensuring that the supply of qualified local labor becomes an issue in prefabrication projects.

While the increased use of prefabrication in recent years has brought a number of benefits, it is important to note that the use of non-union labor is causing concern in some of the largest markets. According to FMI’s 2013 Survey, many respondents can mitigate the problem by focusing on the qualifications of the workforce, ensuring that the necessary skills are in place. In 2013, FMI conducted a Prefabrication and Modularization in Construction Survey that found 52% of respondents reported a 30% decrease in labor costs using prefabrication shops. This cost savings was a direct result of reducing the estimated manpower peak by 20%.

Not only may modular construction reduce the overall workforce in the construction industry, but it can also be an effective solution to the challenges of skilled labor shortages. However, the use of non-union labor is causing concern in some of the largest markets. According to FMI’s 2013 Survey, many respondents can mitigate the problem by focusing on the qualifications of the workforce, ensuring that the necessary skills are in place.
Association and Plumbing Foundation of New York City regarding unlicensed workers employed at the prefabrication site.

17 Treatment of modular construction projects under building codes and this legal challenge in particular, is discussed in more detail below in Section II.B.

While proponents stress that the overall cost of labor can be decreased on modular projects, many experienced in this method insist that design costs, at the front end of a project, go up to accommodate the more detailed design of various components. Thus, some question whether modular construction, on balance, saves money.

4. Site Safety

The majority of a modular build occurs off-site, theoretically following that the number of on-site safety incidents drops significantly. Fewer daily activities on the site—fewer trucks entering/leaving, fewer on-site labor hours—means fewer opportunities for an accident. In addition to the lessened site activity, the remaining work is inherently safer. Less work is done on scaffolding or ladders; and fewer trades are working concurrently in the same confined spaces on-site. Further, BIM—the same technology that allows a team to map out prefabrication tasks with exactitude so that various trades can work closely together—also can be employed to analyze and optimize safety on-site. The more thorough analysis that takes a team to map out prefabrication tasks with exactitude so that various trades can work closely together means fewer safety issues or hazardous environments, such as two crews working on separate floors at the same time. Thus, some question whether modular construction projects under building codes and this legal challenge in particular, is discussed in more detail below in Section II.B.
All in all, a large percentage of contractors report that by using modular construction, site safety has increased.

Some, however, report more site safety issues with the use of prefabrication. Such reports usually are tied to incidents with the installation of the modules at the site—a process that requires a careful approach due to the vast size and weight of the prefabricated pieces being assembled by crane.

While there may be fewer safety incidents on site (e.g., when A working above B drops a tool, or A falls off a ladder), when there is an accident on site, it may be more dramatic (e.g., when a heavy module, of an unusual shape, is dropped by a crane during a complicated pick).

5. Sustainability

Sustainable construction and achieving LEED certification are increasingly desirable in today’s market—and occasionally mandated by owners. Proponents insist that modular building methods are an ideal way to build greener. The on-site work lends itself to a significant reduction in material waste and the hands-on process to a 40 percent reduction in water use. Additionally, with the majority of work being done in a factory or warehouse, there is less noise and disturbance at the site. Finally, the modules themselves can be disassembled, refurbished, and reallocated, if desired. It is not yet clear whether emissions generated when transporting materials to the site would be increased or decreased.

Using prefabrication to construct the Fort Sam Houston Medical Education and Training Complex Barracks project was reported as a natural fit. The project not only had a tight 42-month schedule and budget constraints, but it also met the Army Corps of Engineers requirement for LEED Silver certification. Completed in 2011, the project included installing more than one million square feet of permanent modular construction. The modules assisted in achieving LEED-performance goals for LEED certification.

When McGraw Hill commissioned a survey in 2011 to confirm the

6. Cost Savings

able nature of the buildings, it was expected that the improvements to the sustainability of traditional stick-built barracks would be greater. The results, however, showed that prefabrication resulted in fewer safety incidents than traditional methods. Additionally, the on-site work lends itself to a significant reduction in material waste and the hands-on process to a 40 percent reduction in water use. Additionally, with the majority of work being done in a factory or warehouse, there is less noise and disturbance at the site. Finally, the modules themselves can be disassembled, refurbished, and reallocated, if desired. It is not yet clear whether emissions generated when transporting materials to the site would be increased or decreased.

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tors, architects, and engineers, of the 809 respondents, 65% reported that using modular construction reduced a project budget by 6% or more.

In an industry with tight pro/142t margins and increasingly competitive bidding, saving even a small per-
centage makes a large impact. Less costly prefabricated materi-
als, shortened project schedule, reduced overall manpower, and recycling materials during construction,
result in an overall cost savings by building modular.

B. Applicability of Building Codes

Proponents of modular construction boast that its prefabri-
cated buildings are a better, safer product, due to the tighter
quality control in a manufacturing facility and adherence to the
general—and mostly stricter—building codes. Some state agen-
cies tasked with building and construction oversight have been
accounting for modular builds for quite some time, while others
have experienced recent problems trying to apply existing code
requirements to modular construction.

To regulate the fast-growing use of modular homes, Florida's
Manufactured Building Act (MBA) dates back to 1979. These
statutes add to, not supersede, the Florida Building Code (Code).
Among other things, the MBA states that the Florida Building
Commission shall adopt within the Code certain inspection
criteria specific to prefabricated builds. For example, in addition
to traditional site inspections, the MBA describes inspection
criteria specific to prefabricated builds, such as:
- Observation of the first assembly from start to
  finish. The requirements include an additional inspection
  of the first assembly to ensure it meets all Code
  requirements.

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Manufactured Building Act (MBA) dates back to 1979. These
requirements specific to modular construction:

B. Applicability of Building Codes

The most comprehensive building codes in the United States:
the New York City, due to the particular challenges faced when
building in an insular, high-density environment.
In this crowded metropolis, the City developed its own building code, in addition to the New York State Code. Despite this added layer of regulation, the current NYC Building Code does not include a specific section on modular construction.

Recent events, however, have caused the NYC Department of Buildings (NYC DOB) to interpret the existing code for application to modular construction—an undertaking that has received mixed reviews by members of the industry and spawned at least one lawsuit.

The lawsuit stems from NYC DOB's Buildings Bulletin 2011-009, issued in April 2011, whereby the NYC DOB establishes "temporary guidelines for approval of fabricators." The effect of these guidelines, which treated "manufactured homes" as a type of modular building, was to eliminate the need for licensed plumbers and fire suppression contractors to perform or oversee the plumbing and fire suppression work done on "manufactured" homes while the modules are under construction off-site. By eliminating the requirement for licensed tradesmen to execute or certify this work, the April 2011 Bulletin arguably directly contradicts what is mandated under the Building Code for traditional stick construction. At least, this was the chief argument presented by the Mechanical Contractors Association of New York and the Plumbing Foundation City of New York when they led an Article 78 petition in the Supreme Court of New York, seeking relief from the NYC DOB's interpretation of its Code. Although the Court denied the Article 78 petition in December 2013, thereby deferring to the NYC DOB on how it applies and interprets its Code, the suit did inspire an additional adjustment by the Department. On January 27, 2014, the NYC DOB issued a new bulletin addressing the application of its Code to modular construction.

The new bulletin gives owners two options for certifying plumbing, fire suppression piping, electrical, or oil-burning equipment assemblies within the modules. They can (1) hire the appropriate New York City contractors, or (2) submit a package of engineering and design drawings with a request for approval by the NYC DOB. The bulletin also includes a "temporary guideline" for modular construction, which is intended to provide additional flexibility for modular projects.

Although the bulletins do not change the requirements for modular construction, they do provide additional guidance for developers and contractors. The NYC DOB has also issued a "Supplier's Guide" to help modular builders understand their responsibilities under the Building Code.

Rise of Modular Construction
licensees to oversee and certify the work being performed on-site, as is done in the traditional site builds; or (2) hire an "in-shop monitor" that is acceptable to the Department, who will act in a similar fashion to the licensee and certify that the modular units are constructed in compliance with the Code.

This recent litigation exposes the difficult balance between cutting labor costs and working with trade unions. Where, for example, do the professional tradesmen in the modular scheme? This is especially troubling to union workers and similarly licensed individuals who are accustomed to bringing their specialized knowledge to a site and performing separately and apart from other trades. In a modular build, the emphasis is on collaboration and cross-training workers to perform a number of tasks, such as installing plumbing, electrical, and fire-suppression piping at one time. As modular builds rise in popularity in traditionally high-cost, heavily unionized markets, more proceedings like the one in New York can be expected, unless and until the governing agencies write code regulations specifically addressing modular construction.

OSHA Oversight

C. Safety Concerns in Modular Construction and OSHA Oversight

Addressing modular construction

Until the governing agencies write code regulations specifically addressing modular construction, the Occupational Safety and Health Administration (OSHA) is faced with the traditional safety of the site, the fabrication process, and more dimensions to consider—just as any other construction project. Safety concerns in modular buildings and modular builds must be evaluated at the factory, on the ground level, and at the building site. The success of the process, however, depends on a balance of industrial safety and industrial efficiency. This is especially true when such a method is being used on a large industrial facility or high-rise, where there is a safety hazard. This is especially true when such a facility is being used as an office building or as a factory. On the other hand, if a large build is being permitted in a factory on 70 or 80 percent of a large build to be performed in a factory, an office, or other high-rise facility, the same considerations apply.

From the outset, it appears that any method that allows for 60, 70 or 80 percent of a large build to be performed in a factory, on the ground level, without weather concerns intrinsically would be safer for trade workers. This is especially true when such a method is being used as an office building or as a factory. The success of the process, however, depends on a balance of industrial safety and industrial efficiency. This is especially true when such a method is being used as an office building or as a factory.
The Alliance formed to enhance the safety and health of workers in the commercial modular building industry. One of the primary goals of the Alliance was to facilitate the delivery of OSHA's 10-hour Small Contractor and Construction courses to members of the MBI. Initially, the Alliance was primarily concerned with safety issues involving material handling, fall protection, and trenching and excavation. However, in later years, the Alliance revamped its training to include a focus on confined spaces and Personal Protective Equipment (PPE).

Safety hazards associated with working in confined spaces are traditionally covered by OSHA regulations that must be considered when developing a prefabrication process for modules. A "confined" work space, under OSHA regulations, is a space that is generally small, with limited access that could hinder the activities of those workers who enter, work in, or exit the confined space. Consequently, confined spaces must be adequately protected to prevent injury to workers.

In addition to addressing safety concerns in the factory, modular builds require attention to potential hazards from transporting the large, heavy modules to the site and lifting them into place on the structure. Transportation was identified by respondents to FMI's 2013 Survey as being one of the hurdles to increasing the use of modular construction. Ideally, the factory would be close to the structure, such as the case with the B2 Project, which utilizes the adjacent Brooklyn Navy Yard for fabrication. If, however, large modules must be transported a great distance, then consideration must be paid to state and federal regulations that address the hazards associated with transporting and handling large, heavy modules.
federal highway regulations when designing the size of the
modules.

Once the modules get to the site, another OSHA concern is
triggered: cranes and derricks. Cranes and derricks recently have
been the subject of a number of OSHA regulatory measures that
impact modular construction. A currently proposed OSHA
regulation mandates that construction crane operators receive
appropriate certification by November 10, 2014. It appears,
however, that enforcement of this standard may be postponed by
as much as three years. This delay is under consideration after
numerous comments were received from the construction com-
mittee that largely rejected the current regulation, which
requires certification on both the type and the capacity of the
equipment. Critics argue that the Cranes and Derricks Rulemak-
ing Advisory Committee (C-DAC), which was formed in 2003 to
assist in drafting the new regulations, did not intend to make
this requirement. A crane cannot move a module unless the
operator has the appropriate certification.

Crane capacity is vital in designing modular construction
projects. It is irrelevant how much time and money is saved by
constructing modules in a factory if the resulting products can-
not be safely and effectively lifted into place by a crane. For the
B2 Project at Atlantic Yards, the tower crane’s maximum capa-
ty of 26.5 tons was taken into account when designing the
modules, the heaviest of which is 24 tons.

If OSHA’s proposed certification for crane operators stands as
written, then contractors will need to ensure not only that the
modules are designed to be within the crane’s capability, but that a
propriately certified worker is operating the crane. One can imagine
project delays if the appropriate certification is not received.

III. Role of Traditional Legal Doctrines in The Modular
Build

Most courts consider construction agreements to be contracts
for services. The owner hires a contractor to build the project at
the site. However, modular builds give the owner the ability to
procure pre-fabricated components or the modules themselves, and
the modules are subsequently moved to the site to be assembled.

In jurisdictions where modular builds are common, courts have
developed case law to address the unique issues that arise in these
projects. For example, in one case, a modular builder was held
liable for damages when a crane operator failed to follow proper
safety protocols. The crane operator was operating a crane that
was not certified for the job. The court held that the builder was
negligent in hiring the unqualified operator.

Modular construction is often referred to as prefabrication. This
refers to the process of building components in a factory and
then transporting them to the construction site for assembly.

Unlike traditional construction, where the building is erected on
site, modular construction allows for a significant portion of the
work to be done off-site. This can result in significant cost savings
and time savings for large-scale projects. However, it also
presents unique challenges, such as ensuring that the modules
are properly designed and constructed to meet the
requirements of the project.

The use of modular construction has become increasingly
popular in recent years, particularly for large-scale projects such
as schools, hospitals, and commercial buildings. This trend is likely
to continue as the benefits of modular construction become more
apparent.
from third-parties, a contract for goods—not services—may be in play, potentially involving the Uniform Commercial Code ("UCC") and product liability concerns.

A. Modular Construction and the Uniform Commercial Code

Historically, disputes between contractor and subcontractor have been governed by statutory or common law outside the UCC. The rise of modular construction, however, brings with it the very real possibility that provisions of the UCC, or each state's version of it, will play a role. This is especially true if an owner or the contractor does not have its own internal fabrication facility, and components to construct the modules, or the very modules themselves, come from a third-party. In those instances, the body of construction law governing traditional stick-built projects, so familiar to experienced construction attorneys, may take a back seat to the UCC. Discussed in this Section are certain UCC provisions that may be of particular interest to the construction attorney, including the "Battle of the Forms," warranties, security interests, performance, risk of loss, remedies, and damages. We describe the language and effect of the UCC provisions applied in the absence of agreement, with a reminder that parties can (and often should) contract around any, or all, of the UCC's provisions.

1. Contracts in a Modular Build: Goods or Services?

The UCC does not apply to contracts that are purely for services. A modular construction transaction between a general contractor and a subcontractor or supplier may combine both goods and services, begging the question whether the UCC or statutes and common law outside the UCC govern. Most courts apply the "predominant factor" test to determine which aspect of the contract, the provision of goods or the provision of services, is more important to the overall transaction. If the "primary factor" is the provision of goods, provisions of the UCC will apply. If the "primary factor" is the provision of services, provisions outside the UCC will apply. The overwhelming majority of courts apply this test by focusing on the type of transaction, with a heavy emphasis on the nature and purpose of the transaction itself.
plies to the entire transaction. If the sale of goods is merely ancillary to the
provision of a service, the UCC does not govern any portion of the transaction.

To date, the majority of courts have found traditional stick-built construction
contracts to be primarily for services, and thus have decided the UCC does not apply.

Modular construction, however, has the potential to shift the predominant
nature of a transaction from the act of erecting a building (a service) to providing
discrete, individual components of a building (sale of goods).

No court decisions have been found stating whether the UCC applies to modular
construction transactions but prior treatment of mixed transactions demonstrates
the test for inclusion or exclusion is not whether they are mixed but whether
they are mixed in a manner that their predominant factor, their predominant
purpose, reasonably stated, is the rendition of service, with goods incidentally
involved (e.g., contract with artist for painting) or is a transaction with labor incidentally
involved (e.g., installation of a water heater in a bathroom).

Some courts have separated hybrid transactions into their component parts and apply the
UCC only to the contract provisions dealing with goods. See
Foster v. Colorado Radio Corp., 315 F.2d 222, 2 U.C.C. Rep. Serv. 260 (10th Cir. 1963)
(bifurcating the UCC application to modular home construction). Courts applying
the UCC to modular construction, however, are the minority approach. Most courts apply the
UCC to the entire transaction.

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the UCC to modular construction, however, are the minority approach. Most courts apply the
UCC to the entire transaction.
Rise of Modular Construction


The UCC, and specifically Article 2, was designed to facilitate greater commerce by making it easier for parties to form contracts.

...
legitimate claim of each party because forms apply only to
contracts formed on the basis of the forms, U.C.C. § 2-207(c), which
stipulates that an additional term on the party's form will be
incorporated into the contract unless the other party accepts or
objects in a reasonable time. If the parties proceed to act as if a
contract had been formed (e.g., by supplying and paying for the
delivered goods), U.C.C. § 2-207(c) states that a contract is formed
consisting of the terms on which the parties agree, and if there are
any remaining gaps in the contract, the UCC will supply
them. Thus, it is entirely possible that the parties will be governed by
UCC supply terms. If the terms on the competing forms conflict, they are
likely to cancel each other and not be incorporated into the
contract. If the parties agree to the contract on the competitive forms
contract, then the UCC will govern the contract unless the
additional terms become part of the contract.

Forms. Absent are the parties' standard forms. The same
forms provide that a party can accord an offer even if it
 kteres terms will prevail in a "battle of the forms" U.C.C. § 2-207,
ten agreement on every term. The UCC determines which party's
terms will prevail in a "battle of the forms" U.C.C. § 2-207,
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terms will prevail in a "battle of the forms" U.C.C. § 2-207,
ten agreement on every term. The UCC determines which party's

default terms to which neither side agreed. For parties wishing to avoid the UCC, it would be prudent to avoid using standard purchase orders when procuring components for modular builds. Instead, parties should spell out all of the terms of the transaction, with an integration clause stating that the signed agreement constitutes the entire contract. This eliminates the risk surrounding standardized forms and uncertainty about which terms might be supplied by the UCC.

3. UCC Warranties—Express & Implied

Article 2 of the UCC covers warranties and places certain responsibilities on sellers. If a seller or manufacturer breaches a warranty, then of course there has been a breach of the contract and remedies may be sought. In essence, an express warranty is any promise about the quality or features of the goods being sold. These promises can be oral or written, or can be based on samples or models of the goods.

Implied warranties, by contrast, are created regardless of whether they are specifically mentioned by the seller at the time of purchase. The UCC creates two types of implied warranties: (1) a warranty of merchantability and (2) a warranty that the goods are fit for a particular purpose.

The implied warranty of merchantability is a promise that the goods shall be merchantable, meaning the goods must "pass without objection in the trade[,] . . . [be] fit for the ordinary purposes for which such goods are used[,] . . . [and] run, within the variations permitted by the agreement, of even kind, quality and management." Article 2 of the UCC covers warranties and provides certain requirements.

Rise of Modular Construction

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A claim for breach of an implied warranty of merchantability is similar to a claim brought under the tort doctrine of strict liability; to recover, a buyer need only prove the goods deviated from the standard of merchantability and that the deviation injured the buyer.

Most implied merchantability claims—much more likely if the parties have not effectively negotiated contract terms governing the existence or extent of such warranties when transacting to buy or sell construction modules—turn on whether the good is "suitable for the ordinary purpose for which such goods are used." 59

(Emphasis added.) Specially manufactured goods, however, have no ordinary purpose. 60

In Binks Manufacturing Company v. National Presto Industries, Inc. 61, Presto, a manufacturer of electrical appliances, entered into a contract whereby Binks would "manufacture a custom designed, custom built automatic spray application and oven curing system intended to apply coatings to various Presto products." 62 When the system failed to work properly, Presto sued for breach of the warranty of merchantability. The court ultimately found that because the system was complex and custom-built to fit within Presto's facility, there was no ordinary purpose for a good of this nature and thus, no implied warranty of merchantability could attach. 63

To the extent that manufacturers construct modules to the exact specifications of a particular facility or design, there may not be an ordinary purpose for the modules. However, as modular construction becomes more mainstream and manufacturers routinize the construction of modules, it is possible that an "ordinary purpose" will be created for certain construction modules. For example, if the same modular apartment complex design is used in various locations around the country, there may be an "ordinary purpose" for whole-apartment modules.

59 U.C.C. § 2-314.
60 White, Summers & Hillman, supra note 5, at § 10:30.
62 Binks, 709 F.2d at 1111.
63 Binks, 709 F.2d at 1111.
The warranty of fitness for a particular purpose is likely to be more relevant in modular construction. The warranty of fitness for a particular purpose is implied in a contract when, at the time of sale, the seller knows or has reason to know of the buyer’s particular purpose for purchasing the goods and the “buyer is relying on the seller’s skill and judgment to select or furnish suitable goods.”

One of the critical inquiries is the relative knowledge and skill of the parties. Many courts hold that “there can be no justifiable reliance by a buyer possessing equal or superior knowledge about the particular requirements or design specifications to disclaim the implied warranty of merchantability.”

In the construction context, the party responsible for the design and specifications for the individual modules may be a determining factor in deciding whether a warranty of fitness for particular purpose is implied in the contract. If the manufacturer/seller creates the design of the module to fit the building’s overall requirements, then there is an argument that the warranty of fitness for a particular purpose will be implied. An owner or contractor buying a module designed by a manufacturer for a particular purpose, one could argue, should be able to rely on the manufacturer’s design and construction expertise absent contract language to the contrary. If, on the other hand, the facility owner, or its engineer or architect, is the mastermind behind the designing and planning phases and the manufacturer merely builds modules to meet those specifications, there is less of a chance the warranty will be implied into the contract. In this latter case, it may seem harder to argue that the purchaser was relying on the manufacturer’s expertise in designing and fabricating a building module that is fit for the buyer’s particular purpose.

When it comes to warranties, it often happens that what the UCC giveth, the UCC taketh away. Under UCC 2-316, a seller may disclaim or negate certain implied warranties. There are fairly specific requirements to disclaim the implied warranty of merchantability and the implied warranty of particular purpose. Those requirements are summarized in the Table below.

<table>
<thead>
<tr>
<th>Requirement</th>
<th>Description</th>
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<tbody>
<tr>
<td>U.C.C. § 2-316</td>
<td></td>
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</table>
Merchantability

Disclaimer

Particular Purpose

Disclaimer

1. Disclaiming language must mention "merchantability"
2. The writing must be conspicuous

Both of the implied warranties can be excluded if the seller uses language that refers to the exclusion of warranties and makes plain that there is no implied warranty.

68 U.C.C. § 2-314(b).

4. UCC Article 9 Security Interests

The UCC also may create new security interests in modular construction. Parties and their counsel should understand what gives rise to these warranties and, if they wish to avoid the UCC imposing unexpected contract terms in a manner they might not desire, negotiate the terms of their modular procurement contracts carefully. Otherwise, the UCC may fill in the blanks.

4. UCC Article 9 Security Interests

Warranties. Otherwise, the UCC may fill in the blanks. Parties express agreements that call the buyer's attention to the exclusion of warranties and that the UCC may imply warranties that parties express agreements do not cover the existence—or not—of all warranties. Express agreements cover the existence—or not—of all warranties. Express agreements that call the buyer's attention to the exclusion of warranties and that the UCC may imply warranties that parties express agreements do not cover the existence—or not—of all warranties.

similar modular project B wants to buy the unused modules, modular project A is stopped, and the owner of modular project A is in a situation where the modular project is probably most applicable. In the situation where the modular project is probably most applicable, the owner of the modular project has had an opportunity to check samples for defects. This situation calls the buyer's attention to the exclusion of warranties.

Expressions like "as is," "what all faults, or "buyer takes title as is" are not disposition of goods, and the UCC must be conspicuous.

"As is" means must be written
"what all faults, or "buyer takes title as is" means must be written.

merchantability

specifics

if it must be

specifics

merchantability

Particular Purpose

Disclaimer

I. Disclaimer

2. If there is a writing

2. If there is a writing

merchantability

1. Disclaiming language

merchantability

I. There must be a writing

2. The writing must be conspicuous

3. If there is a writing

Journal of the ACCL
The central question is who is considered a "buyer in the ordinary course of business." The UCC defines "buyer in the ordinary course" to mean "a person that buys goods in good faith, without knowledge that the sale violates the rights of another person in the goods, and in the ordinary course from a person...in the business of selling goods of that kind.

Generally, one is considered a buyer in the ordinary course when s/he purchases goods out of the seller's inventory. In the modular construction context, it would be unusual to fall outside the scope of the UCC's definition of buyer in the ordinary course. While acquiring goods at a liquidation sale, bulk transfer, or as full or partial satisfaction of a debt would not be considered a sale in the ordinary course, most other transfers would likely qualify as sales in the ordinary course, that is, sales in the ordinary course that are not considered a sale in the ordinary course of the seller's business. The UCC's liberal definition of buyer in the ordinary course means that the seller's knowledge of the existence of a security interest does not affect the buyer's status as a buyer in the ordinary course.
The modular construction project is completed when the contractor purchases the modular units from the fabricator. Once the modular units are fabricated, the contractor assembles them into a modular unit, which is then incorporated into the modular construction project. Any security interests created by the contractor's seller to secure the modular construction project are perfected by the contractor's purchase. Article 9 of the Uniform Commercial Code allows a perfected security interest in a modular unit to be perfected in the completed project. Once the modular units are incorporated into the project, any security interests created by the contractor's seller are perfected.

**State lien laws** deal with similar situations. Most of the state lien laws deal with situations where the contractor of a modular construction project is competing for the supply chain for the construction project. If there is a deluge of unfamiliar and competing security interests, there is a risk that entities at the beginning of the supply chain may become additional players in the competition to perfect their security interests in the completed project. It is not hard to imagine a situation where a modular unit fabricator purchases modular units from a supplier, and the modular unit fabricator then incorporates the modular units into the modular construction project. If the modular unit fabricator is unaware of a security interest that was created at the beginning of the supply chain, it is not hard to imagine the modular unit fabricator being faced with a deluge of unfamiliar and competing security interests. If the modular unit fabricator is aware of the security interest, it can perfect its security interest in the modular units.

Consider the following hypothetical: Coal Mining Company A secures a loan from a bank to fund its mining operations and secures that debt with an interest in the coal that it extracts. Due to a variety of economic factors, the mining company sells virtually all of its inventory to its competitor, Coal Mining Company B. Coal Mining Company B sells coal to a steel manufacturer, who uses it to make steel, and in turn sells its steel to a steel fabrication company. After fabricating the steel to the designs specified by the modular unit fabricator, the modular unit fabricator purchases the fabricated steel and incorporates it into its modular units. Once the modular units are fabricated, the modular unit fabricator sells its units to the contractor of a large commercial building project. Can Coal Mining Company A's bank assert an action against the contractor to recover the debt owed by Coal Mining Company B?

Because Coal Mining Company A sold its coal inventory to the steel manufacturer, who then sold the steel to the modular unit fabricator, the bank's security interest in the coal traveled with the coal as it was incorporated into the modular units. The bank's security interest then traveled with the modular units as they were fabricated and incorporated into the modular construction project. If the contractor of the modular construction project is unaware of the security interest that was created at the beginning of the supply chain, it is not hard to imagine a situation where the contractor is completely unaware of a security interest that was created at the beginning of the supply chain.
interest in the completed building.

The UCC expands the universe of security interests of which contractors should be aware. The point where construction modules are incorporated into a structure can be critically important to determining whether an entity in the supply chain has a UCC security interest in the modular units. The later stages of modular construction present a complex intertwining of the UCC with real property law. Once the modular units are placed into the building they begin to lose their characteristics of movable “goods” and begin to look more like real property. What happens to the UCC security interests once the modular units and all of their component parts become integrated into the building?

Consider this addition to the previous hypothetical:

The contractor completes construction of a new commercial building using the modules constructed from the steel that was manufactured using the coal mined by Coal Mining Company A. Can Coal Mining Company A’s bank enforce its security interest in the coal against the building owner?

The answer to this question turns on how the modules are defined under the UCC. U.C.C. § 9-334 states that “a security interest . . . may be created in goods that are fixtures or may continue in goods that become fixtures. A security interest does not exist . . . in ordinary building materials incorporated into an improvement on land.” (emphasis added).

At least one court has defined ordinary building materials as follows:

Ordinary building materials are the materials from which houses . . . are built. They include, for example, wooden and metal studs, rafters and joists, pipes and duct work, nails and screws. Some building materials are pre-assembled at a factory such as framed doors, windows, stairs, and prefabricated roofs. Ordinary building materials are also subject to a lien when they are part of the building.

Given this analysis, modular units look a lot like the ordinary building materials used in traditional construction, and it might seem that no security interest would follow them as separate goods. Once incorporated into the structure, however, they lose their characteristics as separate chattels and are now fixtures. The UCC does not impose a lien on ordinary building materials before they are incorporated into the building, but it does so once they are.

For a complete understanding of the UCC with real property law, the reader is referred to Sections 9-334 and 9-335 of the UCC. The UCC provides that a security interest in goods that become fixtures continues as a security interest in the completed building. The UCC thus expands the universe of security interests of which contractors should be aware.

Rise of Modular Construction
structure. However, other courts have declined to include modules fabricated for construction within the UCC's definition of "ordinary building materials," and have found that a security interest in the modules can indeed follow the modular goods even after they are affixed to real property.

In a case involving two-story modular townhouses built off-site and then affixed to the owner's land, in which the unpaid modular builder/seller claimed a perfected security interest in the townhomes superior to that of the mortgage on the real property to which they were affixed, a New York appellate court stated the following:

"Because there is no dispute that the townhouses were attached to the real estate with the intent that the annexation be permanent, we agree with the Supreme Court [N.Y.'s highest court] that the modular homes constitute "fixtures" as defined by UCC 9-313(1) [citations omitted]. That being the case, defendant's [module seller] perfected security interest [follows the modular townhomes as goods and] is entitled to priority [over the mortgage on the real estate] pursuant to UCC 9-313(4). We reject plaintiff's [mortgage creditors] contention that no security interest was created because the units fall within the exception of UCC 9-313(2) applicable to "ordinary building materials incorporated into an improvement on land". In our view, there is little support in logic or in law for the premise that because pre-manufactured modular structures are fabricated from ordinary building materials, such as wood, wallboard, aluminum siding, windows, doors and plumbing, such structures are "ordinarily business tools or raw materials that lose their identity as such when incorporated into pre-manufactured building components".

It would thus appear that the security interest of a modular builder/seller follows the modules into the structure, and is arguably superior to a real estate mortgage and perhaps a construction mortgage, as to that module, depending on the wording of local statutes and case law.

But this part of the New York court's decision, indicating that security interests in modular components follow the goods into a structure, may be limited to its particular facts and may not apply to large-scale, commercial or industrial projects. Indeed, it may not apply to real estate mortgages or other unpaid construction liens, at least in those states where the UCC does not define "fixtures" in terms of permanence of installation. In any event, a real estate mortgagee or other unpaid construction lien creditor (whether secured by a real estate mortgage, a construction mortgage, or a materialman's lien) would appear to be entitled to a security interest in the modules only after they are affixed to real property, as secured by the mortgagee's or other lien creditor's security interest in the real estate.
appropriate
features by reasoning that "unlike ordinary building materials, which cannot be removed from a completed structure without substantial destruction, [these particular] modular structures . . . can be disassembled and removed from the site without damage to the foundation and other site improvements." 

Large-scale modular construction may more likely be considered permanent than a modular or mobile home. The modular units are often part of the facility's overall structure and, in large part, make up the raw materials used to construct the building. The construction project may be damaged when modules are removed. Therefore, the security interest in the modular units that attached because they were considered "goods" may well be extinguished once the units are installed into the building's frame, even under the teaching of the New York case discussed herein. At the point of integration, traditional lien and mortgage laws may well govern security interests in the property. The law on how Article 9 security interests affect modular construction is likely to develop. It is possible that security interests in construction modules or "goods" will follow the modules as goods under U.C.C. § 9-609. After default, a secured party: (1) may proceed under U.C.C. § 9-609(a) (1) to enforce the security interest by taking possession of the collateral and disposing of it, or by selling it; and (2) may proceed under U.C.C. § 9-609(a) (2) to use the proceeds of the sale to discharge the debt. The secured party's claim against the debtor for the proceeds of the sale may be satisfied in whole or in part with the proceeds of the sale. The proceeds of the sale may be used to satisfy the secured creditor's claim in whole or in part. If the proceeds of the sale are not sufficient to satisfy the secured creditor's claim, the secured creditor may pursue a deficiency judgment against the debtor. The deficiency judgment may be obtained by filing a separate action or by amending the complaint to add the deficiency claim. If the deficiency judgment is obtained, the secured creditor will have a judgment against the debtor for the difference between the amount owed and the proceeds of the sale.
5. Performance under UCC Contracts—the Perfect Tender Rule

The UCC potentially creates a heightened standard of performance under construction contracts. Ordinarily, a party to a construction contract does not materially breach if it performs its obligations in "substantial compliance" with the contract. In this case, it remains entitled to payment of the contract price, less the cost to remedy any performance deficiency or associated damages.

The UCC departed from the more lenient "substantial compliance" test and adopted the "perfect tender" rule. Under that standard, "if the goods or the tender of delivery fail in any respect to conform to the contract, the buyer may (a) reject the whole; or (b) accept the whole; or (c) accept any commercial unit or units and reject the rest."

To reject the non-conforming goods, the buyer must, within a reasonable time after delivery, notify the seller of its intent to reject the goods. Failure to notify the seller renders rejection ineffective. The UCC has not defined what amount of time is "reasonable," which leaves open a question as to what impact the ability to reject the delivery of individual modules could have on the overall construction project. Generally, absent agreement, what is a reasonable time is a question of fact based on the unique circumstances of the transaction and the industry.

Factors can include:

(i) the change of position by and amount of inconvenience to the buyer; (ii) the change of position by and amount of inconvenience to the seller; (iii) the time needed to cure the defect; (iv) the time needed to cure the defect and the amount of damage; and (v) the time needed to cure the defect and the amount of inconvenience to the seller.

The UCC has not defined what amount of time is "reasonable." The perfect tender rule creates a heightened standard of performance that potentially creates a more level playing field for construction projects. Consider, for example, the first of many pre-fabricated apartment modules arriving on a multi-story project site, with plumbing connections that do not meet the standards set forth in the contract. Under the perfect tender rule, the buyer may reject the module or accept a portion of it and reject the rest, depending on the nature of the defect and the impact on the overall project.
just one inch out of position as compared to plumbing already embedded in the building's concrete slabs. Other modules are already in transit. Invoking the perfect tender rule, and claiming the right to reject all shipments, the purchaser-contractor might contend that the playing field is quite different than the situation where it is required to pay the contract price, less correction damages, if the "substantial completion" doctrine applied. The contractor might take the position that no money is owed to the module builder unless and until the defects, big or small, are remedied. The UCC's perfect tender rule thus has the potential to change how the parties deal with each other concerning "defective construction."

6. Risk of Loss

Modular construction expands the construction site beyond just the metes and bounds of the parcel upon which a building is to be erected. As modules are constructed at remote job sites and shipped, potentially, transcontinental distances, new risks and issues surrounding transportation and insurance will emerge. Who bears the risk of loss if the modules are destroyed while at the remote fabrication site? Who is responsible for damage to a module that occurs during shipping? Which party should be insured? The UCC has designed a fairly elaborate scheme that shifts the risk of loss between the parties based on certain criteria. As is customary with UCC provisions, the parties may contract out of or around the terms set by the code. The general rule is that when the seller is a UCC merchant, the risk of loss passes to the buyer upon receipt. If the seller is not a merchant, the risk of loss passes to the buyer on tender of delivery.

In contrast to this general rule, a different risk of loss analysis applies if the seller ships the goods by carrier (e.g., ship, railroad, truck, plane) or a bailee holds the goods to be delivered. When the goods are shipped by carrier, the risk of loss occurs when the carrier first delivers the goods to the consignee. If the contract does not require the seller to deliver the goods to a particular destination, the risk of loss passes to the buyer upon receipt of the goods by the carrier. If the contract requires that the seller deliver the goods to a specific location, the risk of loss passes to the buyer when the consignee first receives the goods. The UCC defines "delivery" as "the giving of possession to the buyer of the goods by the seller at the place where the buyer is to take delivery of the goods." The rules governing risk of loss in the context of the UCC are set forth in Sections 2-503 and 2-504.

Rise of Modular Construction

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Rise of Modular Construction

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Journal of the ACCL

Vol. 9 No. 1
of loss passes to the buyer at the moment the seller delivers the goods to a particular destination. The risk of loss passes when the goods are delivered in the usual manner. If the goods are delivered to a particular destination, however, the risk of loss passes when the goods are delivered to the buyer.

If the goods are held by a bailee (perhaps, for example, an o/c site storage facility or laydown area) without being moved, the risk of loss passes to the buyer in the following three circumstances: (1) upon the buyer’s receipt of a negotiable document of title covering the goods; (2) upon acknowledgement by the bailee of the buyer’s right to possession of the goods; or (3) after the buyer’s receipt of a non-negotiable document or other written direction to deliver. The analysis changes yet again, if there has been a breach of the contract. If a seller tendered or delivered goods that fail to conform to the contract, and that failure was such that it would give the buyer the right to reject the goods, the risk of loss remains with the seller, until the seller cures the defect.

If a buyer accepts deficient goods, but later the buyer rightfully revokes acceptance, the seller is responsible for any deficiency the buyer’s insurance failed to cover. So, while the risk of loss had transferred to the buyer, the buyer is still responsible for any deficiency the buyer’s insurance failed to cover. If a buyer accepts deficient goods, but later the buyer rightfully revokes acceptance, the seller is still responsible for any deficiency the buyer’s insurance failed to cover. If a buyer accepts deficient goods, but later the buyer rightfully revokes acceptance, the seller is still responsible for any deficiency the buyer’s insurance failed to cover.

When the goods are held by a bailee (perhaps, for example, an o/c site storage facility or laydown area) without being moved, the risk of loss passes to the buyer. When the goods are delivered in the usual manner, the risk of loss passes when the goods are delivered to the buyer. When the goods are delivered to a particular destination, however, the risk of loss passes when the goods are delivered to the buyer.
If there is a complete loss, then the contract is avoided. If there is a partial loss, the buyer may demand inspection of the goods, and the buyer then has two options: (1) the buyer may treat the contract as avoided; or (2) the buyer may accept the goods subtracting the due allowance from contract price for deterioration, but the buyer loses other rights against the seller, such as cover damages, market price damages, incidental and consequential damages, or specific performance.

The UCC grants specific remedies to both buyers and sellers in the event of a breach of contract. The UCC allows buyers to cancel the contract and recover any money already paid or resell the modules if the seller does not deliver the modules or the modules do not conform to the contract specifications. If the buyer chooses to resell the modules, the buyer may recover the difference between the contract price and the resale price. If the buyer chooses to keep the modules, the buyer may recover the difference between the market price and the contract price.

The Rise of Modular Construction
Journal of the ACCL
Vol. 9 No. 1
incidental or consequential damages ("Market Price Damages").

97 Modular construction, however, may not develop in a market where modular units for a particular project are readily available. Rather, each unit likely will be designed and manufactured according to particularized plans and specifications. Thus, it likely will be difficult to readily locate substitute modules for "cover" (or, for that matter, to establish market price in a breach of contract action by comparison to a non-existent market, other than by reference to the original contract price). So the UCC provides buyers an additional remedy when unique and hard-to-replace goods are involved: specific performance.

98 Specific performance may be ordered by a court where the contract goods are "unique or in other proper circumstances." Specific performance is not a remedy unique to the UCC, but applying the remedy to contracts for the sale of goods historically has been limited at common law. Even as courts began to expand specific performance to contracts for goods, they limited the remedy to "unique" goods (i.e. heirlooms, works of art, antiques, or goods having a special value not measurable in dollars).

100 The drafters of the UCC intended Section 2-716 to "further a more liberal attitude" towards specific performance of contracts of sale. Although courts have not adopted a uniform definition of "unique goods," the UCC instructs that "the test of uniqueness . . . must be made in terms of the circumstances of the case." The traditional policy has been that courts of equity were without jurisdiction unless the remedy at law was inadequate. Accordingly, the rule has been that specific performance of a contract for goods was not available because the damages at law, based on market value, would enable the buyer to purchase substitute goods, thus providing an adequate remedy. So the UCC also provides the buyer with a right of replevin. U.C.C. § 2-718.

One can see that a module specifically designed for use in a particular project might be considered unique, triggering possible application of the specific performance remedy against a fabricator/seller who wrongfully fails to deliver.

Sometimes, however, a buyer may accept non-conforming modules, after giving notice of the non-conformance. Under U.C.C. § 2-714(1), a buyer facing the option of accepting non-conforming modules (and thus waiving the right to specific performance) may do so only if the buyer has a reasonable time to reject the non-conforming modules and elect other cover. If a buyer accepts the modules, it may, after giving notice of the non-conformity, recover damages for any loss resulting from the seller's breach; U.C.C. § 2-714(2). After rejection, a buyer can recover as damages any amount paid on the contract, or withhold future payments, and elect either cover. To reject goods, a buyer must, within a reasonable time, seasonably notify the seller of the rejection; U.C.C. § 2-602(1).

The contract, or withholds future payments, and elect other cover. If any incidental or consequential damages, the value they would have had then been as warranted, the value of the goods accepted and agreed to be delivered, at the time and place of delivery; U.C.C. § 2-714(1). The buyer is not entitled to recover incidental or consequential damages, as such damages are considered compensation for breach of warranty; U.C.C. § 2-714(2). These damages are loss resulting from the seller's breach. If a buyer accepts the non-conforming modules, it forfeits the option of acceptance; U.C.C. § 2-714(2). The buyer may choose whether to accept the non-conforming modules, delay acceptance of the non-conforming modules, or reject the non-conforming modules at any time after the buyer accepts the non-conforming modules, and if a buyer accepts the non-conforming modules, it waives the right to reject the non-conforming modules at any time after the buyer accepts the non-conforming modules; U.C.C. § 2-714(2).

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damages or market price damages (with the proof difficulties that may entail when dealing with a construction module).

109 A buyer may also reject construction modules, even after acceptance, if the nonconformity substantially impairs the goods’ value and the goods were accepted either (a) on the assumption that the nonconformity would be cured and the seller failed to do so, or (b) the defects were difficult to discover or the buyer accepted the goods upon the seller’s assurance, with only a difference in the calculation of non-conformity damages.

110 A module fabricator/seller’s right to cure any defect, however, restricts a buyer’s ability to reject insubstantial defects.

8. Seller’s Remedies Under the UCC

The UCC equips module sellers with a vast array of remedies in the event a buyer breaches the contract. Specifically, an aggrieved seller may, among other things:

- withhold delivery of modules;
- stop delivery by any bailee;
- resell the modules and recover damages; or
- recover damages for nonacceptance.

Under the UCC, a seller has special remedies when the buyer becomes insolvent, something perhaps particularly relevant on troubled or thinly-capitalized projects. If a buyer is insolvent, the seller can refuse to deliver goods unless the buyer pays cash for the goods, as well as for any other previously delivered goods. If the buyer fails to pay, the seller can reclaim the goods. While the aforementioned remedies are important in their own right, their presence can make the goods unacceptably damaged as it relates to the place of tender of the goods.

109 These damages are substantially the same as damages available to the buyer upon a seller’s repudiation, with only a difference in the calculation of market price damages.

110 U.C.C. § 2-608.

111 U.C.C. § 2-703.

112 U.C.C. § 2-702(1).

113 U.C.C. § 2-702(2).
the contract amount (or (b) § 2-509).
the total performance for which the party is obligated under the contract (often
seller to the extent those performances exceed the lesser of (a) 20% of the value of
close, the buyer is entitled to restitution of any amounts previously paid and the
delivery of goods due to the buyer's breach, but there is no abandonment if the
needs exceed liquidated damages. When a seller justifiably withholds
(U.C.C. § 2-718). In a case where a seller justifiably withholds delivery of
115. U.C.C. § 2-706.

9. Modulation of Available Remedies Under the
The UCC allows both buyers and sellers to agree to liquidated
and one can derive a potential for under-
sive or unreasonable or unfeasible or obtain-
in the context of the perfect tender rule, the case law on those
specifications is determined. By the perfect tender rule, as well as
shop drawings are acceptable to the buyer, absent contract
specifications. What are reasonable grounds to believe nonconformity?
rejection decision when the goods delivered by the
reasonably expected that goods delivered by the
seller deliver goods in accord with the shop drawings, but not the
specification is a condition precedent. For example, if a seller's shop
Section 2-508, of course, does not answer a host of questions.
the buyer, with or without a discount, if the buyer justifiably
nonconformities, goods would be acceptable to the buyer, with or
(2) when the goods were rejected because of non-conformity,
(1) when the goods were rejected because of non-conformity,
Rise of Modular Construction
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For example, a modular fabricator (seller) can limit a buyer’s remedies to return of the modules and a refund of the purchase price, or it can offer to repair or replace non-conforming modules. Parties also may agree to waive consequential damages, so long as such a waiver is not unconscionable. Equally important, the parties can agree that these are the exclusive remedies available to the buyer.

At first glance, this ability appears to shield sellers against virtually every buyer’s remedy. However, if the exclusive or limited remedy “fails of its essential purpose,” the remedy is void. Generally, a limited remedy fails of its essential purpose when the buyer cannot obtain the benefit of the remedy for which it bargained.

An exclusive remedy fails of its essential purpose when the buyer cannot obtain the benefit of the remedy for which it bargained. Thus, most courts first determine the purpose of the provision (the benefit for which the buyer bargained), and then determine whether the remedy has failed to achieve that purpose. For example, an exclusive remedy fails of its essential purpose when the seller is unable or unwilling to repair or replace goods within a reasonable time, or the defect is undiscoverable by a reasonable inspection within the time period.

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Thus, if a modular fabricator limits its liability to the duty to repair or replace a defective module, and fails to do so within the time contemplated, its limitation of liability clause may "fail of its essential purpose" and will no longer apply.

A notable arbitration involving a limited liability clause that allegedly failed of its essential purpose is Southern California Edison Company v. Mitsubishi Nuclear Energy Systems, Inc., now pending in the International Chamber of Commerce International Court of Arbitration. Simplifying the transaction to focus on points of interest in this context, Southern California Edison Company ("SCE") alleges that it contracted to purchase new steam generators from Mitsubishi Nuclear Energy Systems, Inc. (and/or its affiliates, "Mitsubishi") for SCE's (and other entities') San Onofre Nuclear Generating Station ("SONGS"). SCE alleges that Mitsubishi's liability, although originally limited by contract to the steam generators' purchase price—approximately $136 million—is no longer so limited. Instead, SCE claims that it may recover the full amount of its losses, beyond the $136 million cap, because, among other things, the "limited remedy" in the contract "fails of its essential purpose" (under California's version of the Uniform Commercial Code) because Mitsubishi has been unable to timely remedy the alleged defects in the steam generators.

SCE claims that it may recover the full amount of its losses, as discussed above, because the limitation of liability clause in the contract "fails of its essential purpose." The case is still pending, and illustrates how the U.C.C. "failure of essential purpose" theory might lead to enormous liability on construction contracts.

121 See, e.g., Lincoln Elec. Co. v. Technitrol, Inc., 2010 WL 2219341, *1 (N.D. Ohio 2010) (finding triable issue over whether 30-day repair provision fails of its essential purpose where defect in installation was latent and not readily discoverable); Cox v. Lewiston Grain Growers, Inc., 86 Wash. App. 357, 936 P.2d 1191, 1198, Prod. Liab. Rep. (CCH) P 14952, 33 U.C.C. Rep. Serv. 2d 443 (Div. 3 1997) (holding that limited remedy provision for seeds certified to germinate at a certain rate, which the buyer could not discover until the seeds were planted and failed to germinate in a timely manner, rendering SONGS inoperable, the case is still pending and illustrates how the U.C.C.'s failure of essential purpose provision may fail to protect the party that limits its liability to the duty to repair or replace a defective module, and fails to do so within the time contemplated, the failure of its essential purpose may cause the limitation of liability clause to fail of its essential purpose and become unenforceable.

Having discussed certain ways that the UCC affects the parties’ contractual relationships when engaged in modular construction projects, beyond what the parties originally agreed, under certain facts.

Having discussed certain ways that the UCC affects the parties’ contractual relationships when engaged in modular construction projects, it is worthwhile to turn to select issues concerning claims sounding in tort.

B. Application of Product Liability Principles to Modular Construction

1. Does Products Liability Law Apply to Modular Construction?

Products liability broadly refers to the legal responsibility for injury or damage resulting from the use of a product. Products liability law, however, is not crystal clear as to whether construction modules, assembled into a structure and fixed to real estate, are products. Under the Restatement Second of Torts and case law applying it, a building is not considered a product. To take one example, in Heller v. Cadral Corporation, the court held that a condominium as a whole or in its component parts was not a product as contemplated in products liability laws for the purpose of imposing strict liability.

Other courts have found that Section 402A of the Restatement Second of Torts (Restatement Second): Products Liability applies to "assembly-type situations" and to situations where buildings or parts of buildings are mass-produced. These include when a building contractor sells a building that contains products, especially when the building has been pre-fabricated and later assembled on- or off-site.

More recently, courts have treated sellers of "improved real property" as product sellers in a number of contexts. These include when a building contractor sells a building that contains a variety of appliances or other manufactured equipment, when the building has been pre-fabricated and later assembled on- or off-site, and when dwellings are built, even if on-site.

Under the Restatement Third of Torts (Restatement Third): Products Liability, "one engaged in the business of selling or otherwise handling a product has liability to a plaintiff who is injured by a defect in the product..." where a product is mass-produced and also to the plaintiff if the product is a defective product...

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Modular Construction

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otherwise distributing products who sells or distributes a defective product is subject to liability for harm to persons or property caused by the defect."

The Restatement defines a "product" as "tangible personal property distributed commercially for use or consumption." Other items, such as real property and electricity, are also deemed "products" under the Restatement if "the context of their distribution and use is sufficiently analogous to the distribution and use of tangible personal property that it is appropriate to apply the rules stated in this Restatement." Services, of course, do not constitute products.

An argument can be made that a module for use on a construction project constitutes the Restatement's definition of a product. A module is tangible property distributed commercially for use or consumption, and comment b of the Restatement suggests that what constitutes a product is interpreted liberally. Moreover, the Restatement specifically states that "[c]omponent parts are products whether sold or distributed separately or assembled into the final product." A definition of a product that includes components of a product can be made that a module, or component parts of a module, may be treated as a product. Several jurisdictions have permitted products liability claims against manufacturers of prefabricated buildings. Given this authority and some of the similarities between prefabricated buildings and modular construction, courts may permit product liability claims against module builders and suppliers, as product manufacturers and distributors, for claims for defective pre-manufactured modules. A party may also bring a claim under the state's consumer fraud statute.
A detailed discussion of their elements is beyond the scope of this undertaking. Here, the focus is on the fundamental inquiry for any product liability claim sounding in tort against a module fabricator, seller or distributor under any theory, namely, establishing that the product is defective.

2. Three Product Defect Claims that Support Liability under Products Liability Law

Products liability laws vary across jurisdictions, but in any jurisdiction, to recover in tort, one must prove that a product is defective. A product is defective if, at the time of sale or distribution, it is defective in design, contains a manufacturing defect, or is defective because of inadequate instructions or warnings.

As indicated above, products liability cases arising out of prefabricated buildings provide some guidance concerning the bases for liability in modular construction.

Design Defect Claims

Courts have developed two tests to determine whether a product is defectively designed: the consumer expectations test and the risk-utility balancing test, although some states use a hybrid of the two. Under the consumer expectations test, a product is defectively designed if “it is dangerous to an extent beyond that which would be contemplated by the ordinary consumer who purchases it, with the ordinary knowledge common to the community as to its characteristics.”

The two tests have developed two tests to determine whether a product is defectively designed. The consumer expectations test and the risk-utility balancing test apply in most jurisdictions, but some states use a hybrid of the two. Product defect laws vary across jurisdictions, but in any jurisdiction, the bases for liability in modular construction provide some guidance concerning the elements of a products liability claim.

2. Three Product Defect Claims that Support Liability

Establishing that the product is defective, whether by manufacturer, seller or distributor under any theory, namely, the products liability claim sounding in tort against a module under the fault theory, the focus is on the fundamental inquiry for establishment of their elements, beyond the scope of this detailed discussion of their elements.
Courts reserve the application of this test to cases "where the circumstances of the product's failure are relatively straightforward," rather than technical and mechanical (because consumers will often not know what to expect from a complicated or unfamiliar design).

Like the Restatement Third, other jurisdictions reject the consumer expectations test (with limited exceptions, e.g., for defective foodstuffs) and instead apply the risk-utility balancing test. This test assesses whether "a reasonable alternative design would, at reasonable cost, have reduced the foreseeable risks of harm posed by the product and, if so, whether the omission of the alternative design by the seller or a predecessor in the distributive chain rendered the product not reasonably safe."

This test can lend itself to many factors that must be weighed against each other. The Ohio Products Liability Act, for example, which uses a hybrid test, lists several factors that must be considered in determining the foreseeable risks and benefits of a design. These factors include:

1. The nature and magnitude of the risks of harm associated with that design or formulation in light of the intended or reasonably foreseeable uses, modifications, or alterations of the product;
2. Whether, or to what extent, the seller has warned product users, whether based on warnings, general knowledge, or otherwise, of those risks of harm;
3. The likelihood that harm will occur as the result of the inherent or expected utility of the product, including any performance or safety advantages associated with that design or formulation;
4. The technical and economic feasibility, when the product left the control of its manufacturer, of using an alternative design or formulation.

One can expect that tort claims leveled at module fabricators/sellers, or even module distributors (for common construction modules, such as a "bathroom pod"), will find their way into the courts, employing these principles to prove defective module design.

Manufacturing Defect Claims

In product liability law, a manufacturing defect occurs when a product deviates from its intended design despite all possible precautions taken to ensure its safety. Courts employing these principles to prove defective module manufacturers, unlike an automobile manufacturer or automobile assembler, produce an end product that is assembled from a variety of components, each of which may have been manufactured by different companies. Determining the foreseeability of risks and benefits of a design therefore presents a particularly complex task.

The Ohio Products Liability Act, which provides for a hybrid test, requires courts to consider the following factors:

1. The nature and magnitude of the risks of harm associated with that design or formulation in light of the intended or reasonably foreseeable uses, modifications, or alterations of the product;
2. Whether, or to what extent, the seller has warned product users, whether based on warnings, general knowledge, or otherwise, of those risks of harm;
3. The likelihood that harm will occur as the result of the inherent or expected utility of the product, including any performance or safety advantages associated with that design or formulation;
4. The technical and economic feasibility, when the product left the control of its manufacturer, of using an alternative design or formulation.

One can expect that tort claims leveled at module fabricators/sellers, or even module distributors (for common construction modules, such as a "bathroom pod"), will find their way into the courts, employing these principles to prove defective module design.
care being exercised in the preparation of the product. This can take many forms. For example, the product can be improperly assembled, constructed, or packaged, or the materials or component parts can be flawed or contaminated. In the vast majority of jurisdictions, manufacturing defects are governed by a rule of strict liability, i.e., the plaintiff must prove only that the product deviated from its intended design and that the deviation caused the plaintiff's damages. Manufacturing defect claims do not address whether the manufacturer's design was safe. Instead, a defectively manufactured product is flawed because it deviated from the quality or characteristics that the manufacturer tried or intended to achieve in making the product. To prevail, the plaintiff must prove that the product was in a defective condition (i.e., deviated from others of its kind) when sold by the defendant and that the defect proximately caused a compensable injury for which the plaintiff seeks recovery. Usually, the plaintiff only needs to show that the product departed from the blueprint or design specification, which may require expert testimony. Circumstantial evidence suggesting no change in a product after it left the manufacturer's control is sufficient to show that a defect in the product was, in fact, a manufacturing defect. On occasion, a defect may arise after manufacture, upon shipment or storage. A commercial seller or distributor down the chain of distribution would then be liable as if the product were defectively manufactured. Instead of showing that the plaintiff was a nearest or seller, a commercial seller or distributor down the chain of distribution would show that the product was defectively manufactured when it left the defendant's hands. A defendant need only show that the plaintiff was the nearest or seller, and that the product was in a defective condition when it was received by the plaintiff. In a defective condition, a defectively manufactured product is flawed because it deviated from the quality or characteristics that the manufacturer intended. Instead, a defectively manufactured product is flawed because it deviated from the quality or characteristics that the manufacturer intended. In a defective condition, a defectively manufactured product is flawed because it deviated from the quality or characteristics that the manufacturer intended. A plaintiff need only show that the product was defective when it left the defendant's hands, and that it was in a defective condition when it was received by the plaintiff. In a defective condition, a defectively manufactured product is flawed because it deviated from the quality or characteristics that the manufacturer intended. Instead, a defectively manufactured product is flawed because it deviated from the quality or characteristics that the manufacturer intended. In a defective condition, a defectively manufactured product is flawed because it deviated from the quality or characteristics that the manufacturer intended. Instead, a defectively manufactured product is flawed because it deviated from the quality or characteristics that the manufacturer intended. In a defective condition, a defectively manufactured product is flawed because it deviated from the quality or characteristics that the manufacturer intended. Instead, a defectively manufactured product is flawed because it deviated from the quality or characteristics that the manufacturer intended.
the manufacturer still may be subject to liability for improper assembly based on vicarious liability.

In modular construction, the manufacturer may not be the same entity that transports, stores, and installs the module. In this case, each party in the chain of distribution may be liable for any defects that arise while the module is in their custody or control. Defective installation claims also may arise from the installation of a defective product or from the improper installation of a non-defective product. Products liability principles, however, including liability for manufacturing defects, may not apply to the installer, unless it also supplied the product.

“The obligation that gives rise to a duty to avoid reasonably foreseeable injury to another does not extend to the anticipation of how manufactured components, not themselves inherently dangerous or defective, can become potentially dangerous when integrated into a unit designed, assembled, installed, and sold by another.”

Here, it would seem that defense of the manufacturer’s knowledge about how its component may be used could be relevant. If the manufacturer of the module delegates installation to a subcontractor and the subcontractor installs the module improperly, the manufacturer of the module still may be liable for installation defects performed under its direction.

As with defective design, one can see how allegations of defective manufacture will find their way into tort claims against modular component fabricators, sellers and distributors.

Informational Defect Claims

Even if a product is not defectively designed and does not suffer from any manufacturing defects, it still may be defective if it does not contain necessary information to warn of actual or potential dangers or to regard the product as defectively designed and does not suit its purpose.

In modular construction, the manufacturer still may be subject to liability for improper assembly based on vicarious liability.

Rise of Modular Construction
is not accompanied by adequate warnings of its dangerous characteristics."

Informational or warning defects may arise when the manufacturer fails to provide adequate warnings or instructions about a risk associated with the product.

The Restatement (Third) of Torts: Product Liability summarizes the rule as follows:

A product is defective because of inadequate instructions or warnings when the foreseeable risks of harm posed by the product could have been reduced or avoided by the provision of reasonable instructions or warnings by the seller or other distributor, or a predecessor in the commercial chain of distribution, and the omission of the instructions or warnings renders the product not reasonably safe.

A manufacturer need only have a general awareness of a risk to trigger the duty to warn; the manufacturer does not necessarily need to appreciate the specific nature of the potential harm. However, the manufacturer has the obligation to be an expert in its product, which includes the testing and monitoring of known and possible hazards relating to its products.

There is no duty to warn where a risk is obvious or generally known to a foreseeable product user.

In Young v. Environmental Air Products, Inc., for example, workmen who were injured when the building they were constructing collapsed brought a products liability action against the seller of a kit for a prefabricated building, and the buyer of the kit, and the foreman in the construction project, to recover for injuries sustained while constructing the prefabricated building. The court found there was no duty to warn because the foreman knew the risks involved in assembling the prefabricated structure without placing temporary cables on a prefabricated structure without placing temporary cables on the construction of the building. The court found where the was no duty to provide adequate warnings, the manufacturer's duty to warn is not triggered. Therefore, the manufacturer need only have a general awareness of its dangerous characteristics about a risk associated with the product. The Restatement (Third) of Torts: Product Liability notes that "informational or warning defects may arise when the manufacturer fails to provide adequate warnings of its dangerous characteristics."
Thus, the manufacturer had no duty to warn of a known risk.

A manufacturer or seller of a modular project may be liable for defective instructions relating to the installation of the module. Commercial product sellers must provide reasonable instructions and warnings related to risks of injury and damage posed by their products.

In Tompkins v. Log Systems, Inc., for example, the father of the decedent—who was killed while constructing a log home—brought a wrongful death suit against the corporation that manufactured and marketed the log home kit. The decedent was installing subflooring when a portion of the north gable wall collapsed and fell on him. The manufacturer represented that the assembly of the home was a “do-it-yourself” project, but failed to furnish adequate directions for construction. The court of appeals reversed the lower court and found that, based on the facts presented, “a reasonable person could conclude that a log home company dealing in prepackaged kits for construction by non-professionals as well as professionals owes a duty to its customers to provide complete and detailed instructions covering all phases of the construction process.”

Of course, one must also prove that the failure to properly instruct or warn caused the injury. It is not hard to see that informational defects or failure to warn claims may work their way into modular construction litigation. Inadequate warning and installation claims can lead to immense liability for manufacturers. To minimize liability, manufacturers often raise the learned intermediary doctrine as a defense. Under this doctrine, a manufacturer fulfills its duty of care when it provides all necessary information to a sophisticated professional who is in a position to reduce the risk to the ultimate consumer. If the professional fails to properly warn the end user, the manufacturer’s duty is considered fulfilled. However, this doctrine is contentious and subject to much debate. The Eighth Circuit was one of the first to recognize the learned intermediary doctrine in situations involving prescription drugs, where the purchaser’s doctor is a learned intermediary between the manufacturer and the end user.

Young, 665 P.2d at 96.


Tompkins, 385 S.E.2d at 545.
As a result, the manufacturer only had a duty to warn the prescribing physician of risks with the drug, not the patient. While this doctrine does not absolve the manufacturer from his duty to provide adequate warnings, it does substitute the intermediary for the consumer as the person to receive the warning. Nonetheless, the manufacturer must use warning methods that will be reasonably effective to warn the intermediary.

The learned intermediary doctrine may not provide a defense if reasonable instructions or warning regarding a foreseeable risk of harm are not provided to the consumer and the manufacturer knows or has reason to know the intermediary will not be in a position to reduce the risk in accordance with the instructions or warnings. While this doctrine is most commonly used by manufacturers of pharmaceutical and medical devices, it is often applied outside that narrow context. In Mays v. Ciba-Geigy Corp., for example, an employee of a pipe-installation company sued the manufacturer of the pipe after a piece of pipe exploded when the pipe was filled with gas during final tests. The plaintiff based his product liability claim in part on the manufacturer's failure to warn. Affirming summary judgment for the manufacturer, the court held that the manufacturer had no duty to warn either the plaintiff's employer, or the plaintiff himself. Both holdings were based on the sophisticated nature of the plaintiff's employer, who was “in the business of hooking up oil and gas wells,” a highly specialized industrial field of endeavor.

The learned intermediary doctrine will apply as an issue in inadequate warning and instruction claims against manufacturers of modules. Similar to pharmaceutical and medical devices, modules are given to a learned intermediary, the contractor or subcontractor. If the intermediary fails to heed the warning, the manufacturer may not be liable for any resulting harm. The manufacturer has a duty to warn the intermediary, but not the consumer, of any foreseeable risk of harm associated with the product. The intermediary is someone knowledgeable about the risks associated with the product.
installer of the module. The contractor or installer likely has knowledge or sophistication comparable to that of the manufacturer. Thus, if the module manufacturer adequately warns the intermediary and can reasonably rely on the intermediary to warn the ultimate consumer or user (such as a developer, apartment dweller or employee installing the module), the manufacturer may avoid liability for inadequate warning or instruction claims. Clearly, a module manufacturer is not without defenses in a product liability claim, and there are others worth mentioning here.

3. Limitations on Recovery under the Products Liability Doctrine

No discussion of the application of product liability law to modular construction would be complete without discussing two doctrines that limit and sometimes preclude a party from recovering for economic losses in modular construction. The economic loss rule and the integrated product doctrine are the issues at hand. No discussion of the application of product liability law to modular construction would be complete without discussing the economic loss rule and the integrated product doctrine.

Economic Loss Rule

The economic loss rule bars recovery of "economic losses" in a tort action, including products liability claims. Economic loss has been defined as "damages for inadequate value, costs of repair and replacement of the defective product, or consequent loss of profits—without any claim of personal injury or damage to other property." Rule 66 Wash. App. 2d 323, 328-29 (1972); see also Restatement (Third) of Torts: Prod. Liab. § 21 cmt. e (1998). The rule is a "boundary-line function" of the economic loss doctrine, which originated in tort liability when parties had allocated risk by contract with specific warranty provisions covering potential product defects. In the seminal case of Seely v. White Motor Co., for example, the Supreme Court of California ruled that tort liability for losses incurred after a truck overturned without injuring anyone or damaging anything but the truck (the product) itself was not appropriate under a strict liability theory. The rule originated in tort liability when parties had allocated risk by contract with specific warranty provisions covering potential product defects. In the seminal case of Seely v. White Motor Co. (1965), the California Supreme Court held that tort liability was not appropriate for losses incurred after a truck overturned without injuring anyone or damaging anything but the truck (the product) itself. The rule is a "boundary-line function" of the economic loss doctrine, which originated in tort liability when parties had allocated risk by contract with specific warranty provisions covering potential product defects. In the seminal case of Seely v. White Motor Co., for example, the Supreme Court of California ruled that tort liability for losses incurred after a truck overturned without injuring anyone or damaging anything but the truck (the product) itself was not appropriate under a strict liability theory.

Integrated Product Doctrine

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The court determined that the buyer of the truck suffered losses solely because the truck failed to perform as expected. Because the harm was deemed purely economic in nature, the court found that the claim was grounded only in contract, not tort, and that product purchasers can "be fairly charged with the risk that the product will not match ... [their] economic expectations unless the manufacturer agrees that it will."

The U.S. Supreme Court subsequently applied the economic loss doctrine outside of the consumer context in *East River Steamship Corp. v. Transamerica Delaval, Inc.* In *East River*, a shipbuilder sued a turbine manufacturer—both commercial entities—after a component in the manufacturer's turbines failed during the ships' first voyages, causing damage to the turbines, but not the rest of the ships. The Court barred the claim on the basis of the economic loss rule, stating that, "[w]hen a product injures only itself the reasons for imposing a tort duty are weak and those for leaving the party to its contractual remedies are strong. Damage only to a product itself—here, the turbines—just means that the product "has not met the customer's expectations," which contract law, not tort law, is designed to address."

Since *Seely* and *East River Steamship*, the economic loss rule has been raised as a defense in all types of construction cases— including, e.g., claims of equipment or product defects, claims of negligent construction against contractors or subcontractors, and claims by owners, contractors, or subcontractors against manufacturers.
It seems safe to conclude that the economic loss rule will be asserted by module fabricators as a defense to tort actions where “economic losses” are alleged. These fabricators may insist that economic losses can be claimed, if at all, only in contract—and economic losses are allocated to a contract action as a defense to any tort actions that might be asserted for negligence, professional malpractice, or strict liability. It follows that in order to conclude that the economic loss rule will be asserted, the plaintiff must prove that the product duties imposed by contract were breached.

Application of the economic loss rule is less clear when only a component part of a larger product or system is defective. What constitutes the “product” when numerous components work together? What counts as damage to the “product itself” when the product consists of multiple components? Is damage to other components within the product enough to escape the economic loss rule? The law long ago recognized that as technology advanced, products became increasingly complex, which makes defining the “product” for purposes of the economic loss rule more difficult. To address this issue, many jurisdictions have adopted the integrated product doctrine. Under the integrated product doctrine, damage by a component of a product to the rest of the product itself constitutes strictly economic losses subject to the economic loss rule. To avoid application of the economic loss rule, the doctrine provides that the defective component must damage “other property,” i.e., something other than the product itself. If a defective component causes damage to a product that is deemed to be an integrated component, the damage is considered to be damage to the product itself. If the damage is limited to other components of the product, the economic loss rule may apply.

The application of the economic loss rule to modular construction has raised unique issues. In modular construction, a product is typically constructed in a factory environment and then transported to the site of installation. This process raises questions about the scope of the economic loss rule and the applicability of the integrated product doctrine. Some jurisdictions have adopted the integrated product doctrine in modular construction cases, while others have not. The decision whether to apply the integrated product doctrine in a particular case may depend on factors such as the nature of the damage, the role of third parties, and the specific facts of the case.
In Koss Construction v. Caterpillar, Inc., for example, the plaintiff sued both the dealer and manufacturer of a vibratory roller after a defective hydraulic hose inside the roller caused damage to the roller itself. In deciding that the plaintiff's tort claims for damage to the roller itself were barred by the economic loss rule, the Koss court relied on the Court's analysis in East River Steamship Corp. Applying the East River analysis, the Koss court rejected the plaintiff's argument that, because only one component of the roller was defective (the hose), and the other parts caused damage to the roller, the plaintiff could recover under tort law. The Koss court noted: "All but the most simple machines have component parts. This does not mean that damage to 'other property' results when one defective part causes damage to another part within the same product."

In Dean v. Barrett Homes, Inc., homeowners who purchased a new home from a builder brought suit in tort against the manufacturer of an Exterior Insulation and Finish System ("EIFS") used in the construction, alleging negligence, breach of warranty, and consumer fraud after the homeowners found extensive damage to structural members behind the EIFS. The trial court dismissed the strict liability claim, finding that the plaintiffs suffered only economic loss and thus could not bring their claim in tort, which the appellate court affirmed. The New Jersey Supreme Court reversed, however, finding that the integrated products doctrine did not apply to the facts before the Court, but that the economic loss rule limited plaintiffs' recovery to damage to the structure other than that sustained by the exterior finish system itself.

Whether homeowners' claims for damage to the structure (other than the EIFS) were barred by the economic loss rule itself depended on whether the EIFS was sufficiently integrated into the home to warrant an integrated product claim. In Koss Construction v. Caterpillar, Inc., the court held that the EIFS was not sufficiently integrated into the home to warrant an integrated product claim, as it was not an integral part of the home's structure. In Dean v. Barrett Homes, Inc., the court held that the EIFS was sufficiently integrated into the home to warrant an integrated product claim, as it was an integral part of the home's structure.
The New Jersey Supreme Court held that it did not. It should also be noted that, as a general rule, a manufacturer of component parts is not liable for harm caused by a component when it is incorporated into a finished product by a third party unless the component itself was unreasonably dangerous at the time it left the manufacturer's control.

Most jurisdictions do not require a component manufacturer to analyze the design of the completed project that incorporates its nondefective component part. Similarly, most jurisdictions do not require a component manufacturer to anticipate risks that may arise from the nondefective component's incorporation into a defective assembled product. The Restatement, like these jurisdictions, recognizes that it would be unjust and inefficient to impose liability on the manufacturer or seller of a nondefective component solely on the ground that the manufacturer of the integrated product uses the component in a manner that renders the integrated product defective.

Where the component seller or manufacturer is substantially involved in the integration of the component into the design of the integrated product, however, the component seller is subject to liability when the integration results in a defective product and the defect causes harm to another.

Substantial participation can take various forms. For example, the manufacturer or assembler of the integrated product may invite the component manufacturer to participate in the design of the integrated product. In such cases, the component manufacturer may have a duty to warn the manufacturer or assembler of the integrated product of potential dangers. The Restatement recognizes this duty and provides that the component manufacturer has a duty to warn the manufacturer or assembler of the integrated product of potential dangers.

The Restatement also recognizes that a component manufacturer may be liable for injuries caused by the component if the component manufacturer knew or should have known of a defect in the component and failed to take reasonable steps to correct the defect. The Restatement provides that a component manufacturer may be liable for injuries caused by the component if the component manufacturer knew or should have known of a defect in the component and failed to take reasonable steps to correct the defect.
seller to design a component that performs specifically as part of the integrated system. Alternatively, the component seller may play a substantial role in determining which component best serves the needs of the integrated product. Lastly, a component seller may also be subject to liability if the integration of the component causes the product to be defective and the resulting defect causes harm to other property besides the integrated product itself.

Where the component manufacturer does not substantially participate in the integration of the product, it is not liable under the Restatement. Courts frequently absolve the manufacturer by stating that the manufacturer has had “no control” over the design of the integrated product. Different rules also apply if the component part is itself defective: A commercial seller or other distributor of a product component is subject to liability for harm caused by a defect in the component—subject, of course, to the economic loss rule and the integrated products doctrine. This same rule applies when a component seller has a duty to provide reasonable instructions and warnings to the component buyer. Typically, a component seller is required to provide instructions and warnings regarding risks associated with use of the component unless a sophisticated user of the component would understand the risks. A component seller may also be subject to liability if the integration of the component causes the product to be defective and the resulting defect causes harm to other property besides the integrated product. Where the component manufacturer does not substantially participate in the integration of the product, it is not liable under the Restatement. Courts frequently absolve the manufacturer by stating that the manufacturer has had “no control” over the design of the integrated product.
The Economic Loss Rule, the Integrated Product Doctrine, and Modular Construction

The economic loss rule and the integrated product doctrine may play important roles in cases involving modular construction. Pursuant to the Restatement, if the module is not unreasonably defective at the time it leaves the manufacturer’s control, then the manufacturer should not be liable for injuries caused by the module when it is incorporated into the building as a whole. However, if the module is itself defective or defectively designed for its intended use, the manufacturer may be liable.

The issue becomes more complicated as it relates to liability for manufacturers who substantially participate in the integration of a module into the design of the building. Modules are inherently designed to perform specifically as part of the building into which they are integrated. Whether a manufacturer of a module substantially participated in the integration of the module into the building will depend on the amount of control the manufacturer had over the design of the module, and whether the module substantially contributed to the integrated product.

IV. Observations on Insurance in Modular Construction

Modular construction changes both the nature and location of much of the construction work for a given project, and thus it may affect different insurance policies, including Owner or Contractor-Controlled Insurance Programs (CIP), commercial general liability insurance (CGL), professional liability insurance, and Builders Risk Insurance. Several observations and relevant case law are discussed below.

First, CIP programs typically depend on the amount of workers compensation premium to be paid. If a substantial amount of work to build a project occurs off-site, as will be the case in modular construction, the premium to be paid is often determined by the amount of workers on-site. This may affect the type of insurance coverage needed.

Second, CIP programs often include an owner’s liability endorsement, which protects the owner from liability for injuries caused by a third-party on-site. Modular construction may involve the use of off-site modules, which may be integrated into the building at a later time. Therefore, the owner’s liability insurance coverage may need to be expanded to cover the potential liability caused by the modular construction activities.

The Economic Loss Rule, the Integrated Product Doctrine, and the Rise of Modular Construction
modular construction, the amount of payroll for workers on site may not cross the threshold required to make a CIP program viable. For this reason, one may conclude that a CIP does not make economic sense on certain modular construction projects. It would be wise for practitioners to address this issue early in the project planning process.

Second, as noted above, many insist that modular construction will reduce defects in construction because modules are built in a factory or near-factory setting, in a controlled climate, with better material and labor staging and superior quality control and quality assurance theoretically possible. If this in fact proves to be the construction industry’s experience in modular construction, one might expect claims on CGL insurance policies, sometimes owing from construction defects that cause resultant property damage, to decrease. If so, CGL premiums may also decline. As noted above, many insist that modular construction will lead to fewer and less costly claims on CGL insurance policies.

Third, and by contrast, claims against design professionals’ errors and omissions policies may increase due to the narrower tolerance for design error on a modular project. In a traditional stick-built project, much coordination in the installation of various systems components (plumbing risers and plumbing branches, feeder electrical conduit and distribution conduit, supply HVAC ducts and branch ductwork) occurs on site. With modular construction, however, the coordination and distribution conduit, supply HVAC systems components (plumbing lines and plumbing branches, feeder electrical conduit and distribution conduit, supply HVAC ducts and branch ductwork) occur off-site. When modular construction is used, the modular fabricator may have direct or delegated design responsibility and that should be addressed through either the elimination of the professional services exclusion in the CGL insurance policy or through the purchase of contractor’s professional liability insurance.
a prime contractor, the prime contractor, and the subcontractor together are responsible for the design and construction of the project. The subcontractors and the prime contractor may claim a lien on the project for work performed under the contract. For modular construction projects, the subcontractors and the prime contractor have the same rights as for traditional construction projects. The lien law in New York, however, requires that the lien must be filed within a specified period after the work is performed. This can be a challenge for modular projects, where the construction process is likely to be more complex and time-consuming.

The capacity of the subcontractor to perform the work is also a factor in determining whether a lien can be filed. If the subcontractor is not able to perform the work due to circumstances beyond their control, they may not be able to file a lien. This can be a concern for modular construction projects, where the subcontractors may be working on individual modules that are then assembled on site.

Fourth, the approach to Builder's Risk insurance coverage may need adjustment on a modular construction project. A Builder's Risk policy is a form of property insurance that covers the cost of rebuilding the project in the event of damage. This is typically done by endorsement to the policy. The standard Builder's Risk policy does not cover damage to the modules while they are in the fabricator's shop, as these policies are focused on coverage at the project site (except by endorsement). Does the fabricator have correct insurance for his operations? Lastly, it is possible that the modular construction industry will see premiums vary, either up or down, depending on the industry's loss experience under Builder's Risk policies. Fewer but heavier hoists, presumably shorter erection periods on site, and perhaps less labor and equipment activity on site, all of which could add to the cost of modular construction, have been observed in recent years. This could lead to a different loss experience on modular projects, and thus different insurance pricing. Time will tell.

V. Lien and Prompt Payment Statutes: One Tier Too Remote?

The experienced construction practitioner knows that, generally speaking, in most states, only laborers and materialmen of a sufficiently close contracting tier to the owner can claim a lien. For example, in New York, while there is no limit on the tiers of subcontractors that may claim a lien on the project, the subcontractor must be within a certain distance of the owner. This can be a concern for modular construction projects, where the subcontractors may be located far from the project site.

Builder's Risk insurance may not cover the modules during storage, and it might be wise to procure additional insurance by endorsement. Further, it bears remembering that the standard Builder's Risk policy will not cover damage to the modules while they are in the fabricator's shop, as these policies are focused on coverage at the project site (except by endorsement). Does the fabricator have correct insurance for his operations? Lastly, it is possible that the modular construction industry will see premiums vary, either up or down, depending on the industry's loss experience under Builder's Risk policies. Fewer but heavier hoists, presumably shorter erection periods on site, and perhaps less labor and equipment activity on site, all of which could add to the cost of modular construction, have been observed in recent years. This could lead to a different loss experience on modular projects, and thus different insurance pricing. Time will tell.
In modular construction, an additional contracting tier may be introduced. For example, in the example above, if a prime contractor enters into a contract with a module fabricator to construct, say, apartment modules in a factory o/c site, the module fabricator might subcontract with the plumber, who contracts with the plumbing materials supplier. In this case, the plumbing materials supplier would now be in a contracting tier too distant from the project and the owner to claim a lien.

A similar concern presents itself under prompt payment statutes. If an additional tier of contracts is inserted into the chain of privity when a modular fabricator subcontracts with a prime contractor, lower-tier contractors or materialman may lose the protections of the applicable prompt payment statute. Contracting parties, and in particular subcontractors and suppliers and their counsel, will want to keep this in mind so as not to be surprised when it comes time to file a lien or attempt to assert rights under prompt payment statutes.

VI. Statutes of Limitations and Statutes of Repose

Statutes of limitations and statutes of repose sometimes differ if a cause of action is considered one for breach of a construction contract, breach of a contract for the sale of goods and for a claim based on a product deficiency. For a general appreciation of the differences, compare the following:

<table>
<thead>
<tr>
<th>State</th>
<th>Statute of Limitations</th>
<th>Statute of Repose</th>
</tr>
</thead>
<tbody>
<tr>
<td>Arizona</td>
<td>$9-3-24 O.C. A. 4 years</td>
<td>$12-726 O.C. A. 6 years</td>
</tr>
<tr>
<td>Georgia</td>
<td>§ 11-2-275 O.C. A. 4 years</td>
<td>§ 47-48.8 O.C. A. 4 years</td>
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</tbody>
</table>

For materials supplier can claim a lien, but the plumbing manufacturer cannot.
3. It might be advisable for contracting parties to negotiate those terms in their contracts to reflect sympathy with the statutes of limitation and repose.

2. Even if the UCC does apply, the parties can avoid terms supplied by the UCC by adequately addressing the substance of the goods, so that the UCC will not apply. Alternatively, if parties specify in their agreements that the UCC will not apply, then the UCC will not apply.

VIII. Conclusion

The legal landscape for construction projects built using modular construction is different. The principles discussed above are not necessarily new, but their application to large construction projects has the potential to change traditional legal relationships. It will be interesting to see how this area develops as modular construction continues to grow, and as a few of those projects wind their way through the courts and the legal landscape for construction projects built using modular construction changes. The construction practitioner will want to recognize that the standards of limitation and repose may be different on the traditional construction project than in a modular construction project and analyze his/her cause of action carefully to avoid surprises.

<table>
<thead>
<tr>
<th>State</th>
<th>Statute of Repose</th>
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<tbody>
<tr>
<td>Texas</td>
<td>§ 16.008. C.C.P. § 16.012. 15 years from sale.</td>
</tr>
<tr>
<td>Connecticut</td>
<td>C.G.S.A. § 52-577a. 7 years from sale.</td>
</tr>
<tr>
<td>Georgia</td>
<td>O.C.G.A. § 9-9-3. 8 years from sale.</td>
</tr>
<tr>
<td>State Construction Products</td>
<td>O.C.G.A. § 51-11(b)(2). 10 years after date.</td>
</tr>
</tbody>
</table>
and execute contracts or purchase orders for procurement of sophisticated construction modules, rather than using "o/c the shelf" purchase orders, particularly if there is a risk of sellers and buyers exchanging inconsistent purchase documents. This practice would avoid a "battle of the forms" in which the terms of the resulting contract may not be clear until a tribunal makes a ruling.

4. Insurance policies should be scrutinized to ensure that they provide the right coverage, in the right amount, for the parties bearing risk in modular construction.

5. A module fabricator or modular contractor should give consideration to buying product liability insurance, in the event product liability laws apply to construction.