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Author: Robert Lau, Roosevelt University

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# Partial Occupancies for Phased and Multi-Use Tall Buildings



Robert Lau

Author  
**Robert Lau**

Roosevelt University  
430 S. Michigan Avenue  
Chicago, IL 60605-1394, USA  
e: laurobe@iit.edu

Robert M. Lau received his Bachelor of Architecture degree from the Illinois Institute of Technology (host institution for the CTBUH) and his Master of Business Administration at the Chicago School of Real Estate at Roosevelt University.

He has worked with Myron Goldsmith and Lucien Lagrange at Skidmore, Owings, and Merrill (Chicago office) and with Helmut Jahn and Jim Goettsch at Murphy/Jahn in Chicago. He is an advocate of the Chicago School of Architecture, beginning with William LeBaron Jenny, John Root, and Louis Sullivan and continuing through Fazlur Khan and Myron Goldsmith.

He has written several articles for the CTBUH Journal. He presented the paper 'A Platonistic Program for Block 37 in Chicago's Loop' at the December 2001 CTBUH conference Building for the 21st Century in London and the paper 'Financial Aspects That Drive Design Decisions' at the October 2005 conference in New York City. He was also a member of the NY conference's committee that reviewed the papers to be presented.

In addition to practicing architecture in Chicago, he is a Construction Committee member with the Windy City Habitat for Humanity (local affiliate).

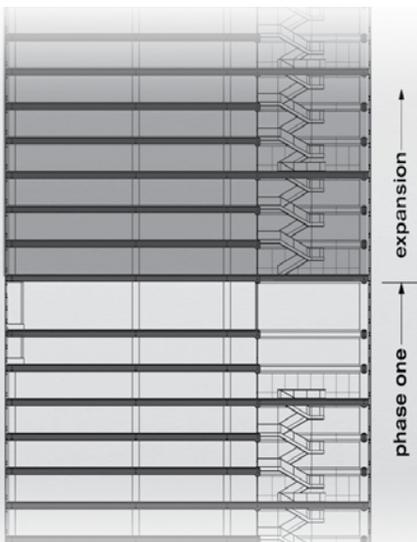
## "What if parts of a building could be occupied before the entire building is completed?"

In the Spring 2004 issue of the CTBUH journal I wrote an article 'Multiple Phase Construction for a Multi-Use Tall Building'. This article noted the financial risk that multi-use buildings can be exposed to because they can be constructed without becoming fully occupied upon completion. Another issue has been the long time-frame required for constructing large multi-use high-rise buildings. What if parts of a building could be occupied before the entire building is completed? What if a large high-rise project could be constructed in phases, so that only the spaces that the current market can support will be constructed?

While any construction project involves risks, to construct above an occupied space has inherently more risks. Planning can remedy some of these risks. Each stakeholder has differing attitudes regarding the execution of the construction. City building departments are skeptical about issuing a permit for only occupying part of the building instead of the entire structure. How the remainder is constructed, while tenants occupy the spaces below, is a concern to all involved. This paper will discuss Partial Occupancy issues from the views of designers, contractors, building owners, the city government that the project is constructed in, and the current tenants while the construction is taking place. While there are several examples of partial high-rise occupancy, identifying and addressing these special concerns will be important for issuing future permits.

spaces can open as independent entities before the office and/or residential components are completed above. In some cases, this time lag could be months to over a year. Some examples include:

1. One Rincon Hill in San Francisco by Solomon Cordwell Buenz (Post 2008)
  - a. Floors 8-27 occupied in Jan. 2008
  - b. Floors 28-35 occupied in Feb. 2008
  - c. Residences to floor 60 occupied in Aug. 2008
2. Trump Tower Chicago by Skidmore, Owings, and Merrill (Bergen 2008)
  - a. Hotel floors 14-27 occupied in Jan. 2008
  - b. Residence floor 92 topped out in August 2008
  - c. Completion to be in 2009



### INTRODUCTION

#### Partial Occupancy

In most construction projects, an Occupancy Permit is secured after the construction has been completed. The city issuing this permit defines the project as safe and complete for human habitation in which it was intended. A Partial Occupancy permit allows only a portion of the completed project to be open for occupancy. The remainder of the construction can continue until its completion. This type of arrangement will benefit multi-use towers since the lower-floor commercial and retail

#### Phased Construction (Vertical Expansion)

In master planned projects, components are planned but not designed or intended for construction for years or even decades to come. Master plan projects may (for example) build an office tower first, then a retail mall, and then a residential tower lastly, when the neighborhood has established this market over the past several years. This can be especially true in former industrial areas that are being converted to other zoning uses by the city. It is now possible to construct these independent components as one complete



Figure 1. Hotel entry at Trump Tower on upper Wabash



Figure 2. North elevation of Trump Tower over hotel entry



Figure 3. Blue Cross Blue Shield at start of vertical expansion

tower. Building the first, then the second or third can be described as Vertical Expansion. While the concepts are the same as other master planned projects, the construction takes place within one structure as opposed to many structures within the same site. Some examples include:

1. Bentall 5 in Vancouver by the Musson Cattell Mackey Partnership (bentall5)
  - a. Phase I office floors to 22 occupied in Sept. 2002
  - b. Phase II office floors 23-34 occupied in April 2007
2. Blue Cross Blue Shield in Chicago by Goettsch Partners (Corning 2008)
  - a. Phase I office floors to 32 occupied in 1997, daytime worker population of 4,400
  - b. Phase II office floors 33-57 to be completed in 2009, anticipated daytime worker population of 8,000 total for both phases

### Incentives for Partial Occupancy or Phased Construction Projects

Large-scale multi-use Tall Buildings are complicated structures involving an army of stakeholders. They require vast resources, multi-year planning and multi-year construction scheduling. Besides the large quantities of materials required for construction, financing a project of this magnitude is a major accomplishment. Many risks are inherent in any construction project.

An advantage of Partial Occupancy projects is their ability for some tenants to open for business as soon as possible, without waiting for the completion of the tower. An advantage of Phased Construction Vertical Expansion, as in other master planned projects, is their ability to minimize the risks of constructing large-scale space at one time period and not flooding the market at what could be a vulnerable time. By being able to adjust to the current market, Vertical Expansions can minimize the financial risks inherent in large-scale construction projects. Both Partial Occupancy and Phased Construction projects can benefit the financial bottom-line for investors by their advantages.

### MAJOR STAKEHOLDERS OF THE PROJECT

#### Designers and Developers

While planning is required for the design of any project, advanced planning is required in projects that include either Partial Occupancy or Vertical Expansion. In a designer's mind, the project is considered a combination of separate buildings. Each can be designed and constructed on its own, as part of a complete whole. This approach will include inherent redundancies. By planning for elevators and utility shafts for the entire project, each occupied phase will sustain itself within the context of the whole. Planning this infrastructure for the tower creates the possibility of constructing each use individually and over time, if required.

The financial advantage is occupying as each use is completed instead of at tower completion. In the case of multi-use Tall Buildings, the time-frame for construction can be years. Developers that can complete a space for occupancy by retail or offices, on the lower floors, have a financial advantage over those who must wait until total tower completion. Securing financing may be easier in these scenarios.

While current requirements are sometimes difficult to assess, planning for future requirements can be even more difficult. It is critical that the developer is aware of the risks involved for predicting the future. As construction material costs have risen in the United States in 2008, convincing an owner to invest in materials, knowing that they will not be used for years to come, could be a 'tough sell'. Setting aside certain assets today, to be used in a future addition in the coming years, could be difficult to persuade to a stockholder looking at the balance sheets.

A total planning package needs to be developed at the outset of the project by the designers and the developer. Andrew Weiss of the Trump Organization says, "We planned the entire project so that the different uses within the Trump Tower Chicago could open at different times." Tom Corning of Walsh Construction has been working on the Vertical Expansion of the Blue Cross Blue Shield in ↗

Chicago. He says, "The entire project had to be developed at the outset in 1997 in order for the Vertical Expansion of today to be effective. Otherwise, the assets invested would be unused and a waste of resources." Fortunately, this project was well planned by the designer Jim Goettsch so that, for today's expansion, it can proceed as anticipated. This may not always be the case, especially when designers, building owners, and contractors can evolve or change over the years. The designer of the Trump Tower Chicago is Adrian Smith, who is now a consultant to SOM. The designer of Blue Cross Blue Shield is Jim Goettsch, who is no longer a partner with Dirk Lohan from the Phase I construction of 1997. Economic forecasts are constantly changing. Today's demands can be vastly different in the next decade. No matter how well an owner defines their market or niche, predicting future expansion needs is difficult. Peer reviews of each construction phase as well as the entire project can assist the designers throughout the design process. These reviews can be performed for the design issues but can also include constructability concerns and market trends for the future. The developer should use the expertise of these peer reviews to produce a clear vision for financing this project and promoting it to other investors.



Figure 4. Blue Cross Blue Shield at current construction

Elements for the designers and developers to plan for are:

1. Multiple entries for each function from garage and grade. While some of these entries may not be constructed in the first phase, their location is pivotal at the outset. These could be on different levels as well as different street accesses. Preplanning is important. The entire project must be considered, even if only part of the building will be constructed in the first phase.
2. Elevators and utility shafts may change functions as the construction proceeds from one phase to the next. Concerning the Trump Tower Chicago, Lucas Tryggestad of SOM says, "The Fireman's elevator must reach every floor of the building, thus precluding it from operation prior to completions of the floors. Therefore, another elevator must be sized to accommodate the sizing and functionality of a Fireman's elevator during construction."
3. Phased design. Consider it as a building-on-top-of-a- building. Each use is a separate building that fits into one complete project. Tryggestad goes on to say, "In the Trump Tower each phase of occupancy must represent a total completed building in which all building systems and components must be operational."
4. As much as possible, consider future technology trends for the future construction phases.
5. Utility shafts from subgrade connection up to the occupied levels for each use.
6. Construction deliveries separated from tenant deliveries. Future elevator or duct shafts may be used for concrete pumping or fireproofing delivery in a construction stage. Provide ample loading docks as construction staging areas.
7. During construction, access for construction workers is separate from tenant entries.
8. Distinct HVAC, electrical, plumbing and communication systems for each use. As construction continues or as phase two construction commences, the tenants are not affected by the construction activities.

9. Peer reviews at various stages of the design process.

While planning can help prepare for encountering future problems during construction, a certain amount of flexibility is required. Market demand is flexible along with changes in personnel of designers and developers. Record keeping during the design's progress is important. It may be impossible to have seamless construction that takes place over several phases. Integrating flexibility and adapting to changing conditions can help the project as a whole.

### Contractors

Construction that takes place in several phases is challenging. While it is easier to construct at one time and adjust to different parts of the building being occupied at various times, there are still challenges. The greatest challenge for a contractor is to resume phase two or three of construction several years after the previous construction. Not only may the use's market have changed but also the designers, developer, and construction material suppliers may have changed. In the case of Blue Cross Blue Shield, the original curtain wall supplier for Phase I was Antemex International of Toronto. The supplier for Phase II is Permasteelisa Group SPA of Italy (Barner 2008). To make the completed tower's facade look like one project could be the biggest challenge.

Construction activities must remain separate from the tenants. Besides the use of separate entries and elevators, the noise, vibration and dust of construction activities must also not affect tenants. Corning says, "Noises, especially loud ones, are a concern because of the disruption of the employees' work day but also they can cause concerns from their uncertainty of the cause." Daytime workers do not wish to adjust their established patterns because of construction that does not affect them. Contractors must be aware of their imposition to those that they share the site (but not the zone) with. Additional meetings with the tenants and the building owner may

be required in order to address their issues during construction. Additionally Corning says, "These issues are planned and discussed in a separate weekly building facilities and security meeting." Concerns for the contractor include the following:

1. Staging construction. Instead of one construction zone, the project may have several work platforms at different elevations. Materials may have to be handled several times before they reach their final installed position.
2. Delivery of materials. Construction deliveries at grade may conflict with tenant deliveries. Both Trump Tower and Blue Cross Blue Shield have upper and lower street levels (Wabash and Randolph, respectively) to deliver construction materials at lower level and allow normal tenant activities at upper level.
3. Crane and construction elevator locations are critical. Preplanning may help in establishing these locations, but plans can change as construction phases proceed. Temporary cranes and elevators for a specific use may also be required at various phases during construction. Corning notes that, "For Blue Cross Blue Shield a small crane was dismantled and lifted up by an elevator, to be assembled on the roof. This small crane assembled a medium sized crane, which in turn assembled the large lifting cranes on the roof. Temporary beams were installed to support these large cranes for construction operations." Not only does this increase the construction budget, it also requires additional foresight and resources.
4. As a matter of safety, sizes and weights of the materials being transported by the cranes and elevators must be limited. On windy or snowy/icy days, lifting and installing of certain materials may be delayed. As a safety precaution, the delivery location of materials may vary compared to where it will actually be lifted into place by the cranes.
5. Utility connections by the contractor cannot interrupt tenants utilities. Each use is separated so that one, under construction, does not affect another that is

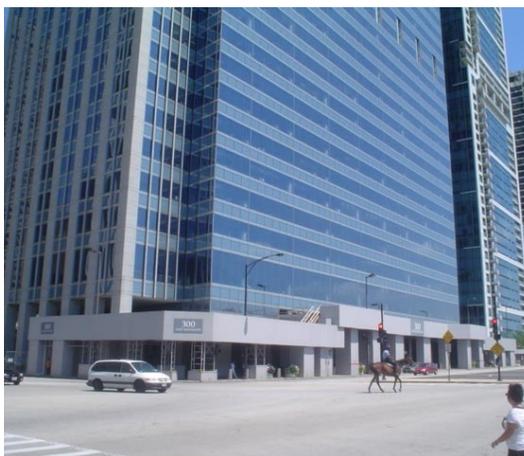


Figure 5. Blue Cross Blue Shield entry canopy on upper Randolph



Figure 6. North elevation crane access for Blue Cross Blue Shield from lower Randolph

in operation. Redundancies will be built into each use. A failure of one will not affect the others.

6. Construction worker safety and tenant safety. While these may seem as distinctly different, they are both a concern while on the same site. Tenants must feel safe while construction takes place overhead. Construction workers must work in safe conditions without endangering others. Additional canopies and netting below the construction work platforms can help ensure this.
7. Past construction errors can continue on into future phases. No construction work is perfect. Adjustments made in the past to tolerance errors should be documented so as not to perpetuate the errors into the next construction phase.
8. Building construction always contains risk. To continue construction above while tenants occupy the spaces below has more risk. To begin an additional phase where another has left off can be fraught with risks. Insurance can protect against some of these risks. Addressing the project as a construction manager instead of a lump sum construction bid is one way for a contractor to minimize risk. The developer/owner and construction manager should negotiate this type of arrangement prior to commencing a contract for the work. These types of alternatives are becoming more popular as these multi-use construction projects are becoming more complex.

### Building Departments

While designers and contractors are becoming familiar with multiple phase and occupancy construction, the city officials that oversee these projects may not. The officials' job becomes more difficult in these types of scenarios. The peer reviews that are performed by the designers can greatly assist the permitting officials. If a city's building department is not familiar with partial occupancy while construction continues, these peer reviews may provide additional information to help them understand the complex intricacies. Dan Murphy, a member of the Chicago Committee on High-Rise Buildings, says, "The presentation process of the project for a building permit is crucial. The peer review can help tremendously for the confidence of the building officials issuing the permit".

Building officials are responsible for ensuring the safety of the general public while a building is under construction. When construction conditions change, as in the case of phased construction, these officials must approve these changes. Not only does this include additional inspections, it may also include reconfiguring exit requirements and occupancy loads. Besides the additional work that is required for phased construction, building officials must also approve the overall concepts and the project's 'philosophy'. Building officials concerns include the following: ➤



Figure 8. Trump Tower south elevation crane and construction elevator access



Figure 7. South crane and construction elevator of Trump Tower with lower Wabash access

1. Safety of the tenants as the construction work proceeds. Whether this includes additional netting or barricades around the work platforms, the safety of the occupants is paramount. Any construction accident can affect the overall project, especially if a tenant is hurt. Enforcing safe procedures,

like limiting crane operations on windy or icy days, may be unpopular but are probably necessary.

2. Inspections as the phased work continues. Temporary construction could be used while the permanent construction is installed. Inspectors need a clear understanding of the progress of the work as they make their inspections. These can differ from the traditional process that building officials are used to.

3. Ensure that insurance is in place to cover risks. The complications inherent in phased construction may produce risks that the contractor should be aware of. A clear understanding of where the contractor's responsibility ends and where the building owner's responsibility begins is important.

4. Work platforms and safe transport of construction materials. Ensuring a safe construction zone is paramount. The day-to-day activities of tenants during construction is also important. Inspections should ensure that these activities are free and independent from each other.

5. Ensure required exits continue to be available to tenants. In the course of construction phasing these exits may shift or transfer. When tenants become familiar with a path of exit, changing that path may produce problems. Safety meetings to identify these issues are important for the contractor to communicate with the tenants, building owner and the building officials. Ensuring these required exits at all times is important.

6. During construction, tenants have a right to uninterrupted utilities. As separately designed buildings under one roof, the phase in construction should not affect the zone occupied by tenants. The work plan should identify the utility connections under construction without involving the completed, occupied spaces.

### Building Owners

A building owner may be involved with the continuing construction or may own only the occupied zone. The owner could be the tenant, a future tenant, the continuing long-term

building's owner, or a short-term developer who is concerned about the immediate future. In any of these cases, the tenants are a prime concern of the owner. As a liaison between the contractor and the tenants, the owner's role is to satisfy the lease responsibilities to the tenants. Safety meetings, communications, and addressing complaints logged by the tenants are important duties. If acting in the developer's role with the designers, the owner should have a clear understanding of the complexities that phased construction produces. The owner should have a willingness to assume the risks of building more than is required for today, to address tomorrow's needs. The owner's responsibilities include the following:

1. Complete understanding of the phased project. Understanding the need for partial occupancy or phasing over time as opposed to occupying or constructing at one time. There should be a complete 'game plan' developed by the owner to clearly indicate the need and the advantages.
2. Liability for risks. Insurance in place to cover these risks of partial occupancy or phased construction. Competent and experienced designers and contractors to execute the design and the construction.
3. Safety of the tenants is paramount for the owner. The safety of the contractor's workers is the contractor's responsibility. The safety of the tenants is the responsibility of the owner and the city officials.
4. In cooperation with the contractor, ensuring separation of the tenants from the construction activities. This includes entries, material deliveries, parking, noise, vibrations, dust, and views.
5. As mentioned previously, ensure that the tenant utilities are uninterrupted during continuing construction activities.
6. Financing for the project can be improved. Weiss of the Trump Organization says, "The length of time until initial occupancy and start of payments on the loan are reduced, thus reducing the length of the loan and reducing some of the time related risks of the loan."

## Tenants

Tenants always have concerns during construction projects. If the construction is not part of their organization, they want their normal activities to continue uninterrupted. Altered entries may not be desirable. If tenants are required to adjust their fire exits after they have become accustomed to existing patterns, clear communication from the building owner is required as to this change. Whether a worker or a resident, tenants have concerns that need to be addressed, which include:

1. A safe environment during entering and exiting, whether from grade entry or the parking garage. Temporary construction netting and barricades can remedy these concerns.
2. Associated with these safety issues are construction dust, noise, and vibrations. Mechanical floors tend to separate the occupied zones from each other and can aid in this. Tenants have a right to co-exist with the construction activities but not be adversely affected by it. This may be impossible for the contractor to comply with in all cases. The contractor should do his best to minimize these tenant concerns.
3. No utility interruptions because of construction activities. Redundancies built into the project should alleviate this concern.
4. Normal deliveries that do not conflict with construction deliveries. Sufficient loading docks planned ahead of time to service all parties. If possible, lower and upper street level access to alleviate potential conflicts.
5. Few obstructed views from tower cranes and construction elevators. The contractor, working with the owner, should find amicable locations for this required equipment. The material deliveries and lifting sequences from the working platforms to final installation should be very well thought out so as not to adversely affect the tenants.
6. Neighbors can also influence the project. Construction projects always affect the neighbors. Height limits, obstructing established views, and unwanted construction traffic are all neighborhood



Figure 9. East and south elevations of Trump Tower during construction

concerns to be addressed. As Corning says, "Residents were upset when we started Phase II construction of Blue Cross Blue Shield after they had moved into their new condominiums at 340 on the Park."

## CONCLUSION

Partial Occupancy permits are not a new idea but they are gaining popularity for phased construction and multi-use towers. As with any construction project, risks exist. The financial advantages of immediate occupancy for some uses can make these risks justifiable. An ability to adjust to a volatile real estate market is also an advantage. As more projects utilize partial occupancy in some form, the concepts are gaining acceptance. It is important for all stakeholders involved to accept the concepts of partial occupancy. Pre-planning by the designers and developer can alleviate many construction problems before they materialize. Addressing concerns in a proactive manner can lead to the success of the completed project. Flexibility of the planning to emerging technology and material resources can also benefit the project. As long as everyone is 'on the same page', including city building officials, partial occupancy projects will flourish for the advantages they provide.



Figure 10. Completed One Rincón Hill, © Michael Dickter, Magnusson Klemencic Associates

Many thanks to the following individuals for their contributions to this article:

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