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STRUCTURE & SITE

Updates & Information from Klepper, Hahn & Hyatt

Changes to State Building Code Affect Structural Standards

Neil W. Garry, P.E., is a structural engineer who has been with Klepper, Hahn & Hyatt for five years. He currently concentrates his duties in the KHH Building Envelope Systems Division. The technical paper from which this article is derived will be published this summer on www.khhpc.com.

Changes are coming for the New York State Building Code that will affect everyone who works with the built environment. We anticipate that this August, state officials will require compliance with the 2006 New York State Building Code and its ancillary codes. These regulations are based on the 2003 International Building Codes, and impact the practice of structural engineering in important ways.

Following is a summary of notable changes to Chapter 16 of the Building Code, which concerns structural design of new buildings.

Construction Documents - Within these documents, additional earthquake design data will be mandated. Engineers will now have to list the Seismic Importance Factor, the Short Period Response Acceleration, the One-Second Response Acceleration, the Seismic Design Category, the Seismic Response Coefficient, and the Response Modification Factor. These items must be present for a code enforcement official to approve your project for construction. We should note that many engineers have already been listing this additional data to clarify the intent of their designs.

Building Classifications - Two tables have finally been reconciled. Table 1604.5, "Classification of Buildings & Other Structures for Importance Factors," will now coordinate with Table 1-1 of ASCE 7-02, which is based on building use and occupancy. (*Please see the accompanying chart on this page.*)

Wall Anchorage - You may never have considered how the concrete and masonry walls in your buildings are anchored, but

Table 1604.5 has renamed building classifications in descending order from low importance to high importance. Changes in categories are shown below.

Nature of Occupancy	New BCNYS Category	Old BCNYS Category
Low Hazard to Human Life	I	IV
Other	II	I
Substantial Hazard to Human Life	III	II
Essential Facilities	IV	III

structural engineers work with calculations on this all the time. In the new edition of the building code, the minimum anchorage force requirements for those walls have increased. It is a modest increase, but it clarifies the level of force to be used in these designs.

Load Combinations - "Loads" on buildings are forces that result from a combination of factors, including the weight of the building materials, occupants and their possessions, and environmental factors. The load combinations in the soon-to-be-required new building code reflect the collaborative efforts of the American Society of Civil Engineers, the American Concrete Institute and the American Institute of Steel Construction to unify their load factors, the calculations by which these forces on buildings are considered. This will introduce conversion efficiencies for certain structural calculations.

Live Loads - Live loads are those forces on a building produced by the use and occupancy of the building. Two changes in the new code will impact construction costs in specific instances. First, the minimum uniform live load for garages servicing only passenger vehicles

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Going Places With Your Project?

Watch the Road for Highway Work Permits

Jim Palumbo, R.L.A., is an Associate in the Landscape Architecture Division of Klepper, Hahn & Hyatt. This is the second in a series of articles which discusses the aspects of various permits.

For more information about Environmental Impact Assessment in New York State, visit the DEC website at <http://www.dec.ny.gov/permits/357.html> See "Permits and Licenses -- SEQR" in the left side menu column.

Your showcase project can become a showstopper if your site design fails to incorporate all the necessary steps in the coordinated review process. The inability to obtain a highway work permit as a result of inadequate site planning (or no site planning!) can stop that site project dead in its tracks.

In the previous article we discussed the coordinated review process which must be considered and initiated by a state or local agency, designated as the lead agency, which has jurisdiction of a site development project. The review process falls under the State Environmental Quality Review Act (SEQR). This review is the critical path toward requesting and receiving permits and/or approvals from outside agencies, such as the local highway department or the state Department of Transportation. The process can differ depending upon the agency to which you are applying.

A site designer should be on board from the very beginning. Involve a landscape architect in the initial planning and design process. If the site ingress and egress is not designed properly, it will become more difficult and expensive to develop after the fact.

Simple but imperative steps facilitate the review and approval process, and they are integral to good site planning /design. First is the gathering of critical information.

- Do you have current surveys?
- What are the speed limits on the roads impacted by your project?
- What are the site distances for the point(s) at which road access is planned?
- What are the existing conditions, such as:
 - adjacent existing curb cuts
 - drainageways
 - utility and highway boundaries
 - topography.

Keep in mind that highway work permits are required for more than curb cuts; they may pertain to any disturbance within a designated highway boundary.

The next step is communication. Preliminary discussions with the municipalities and governing agencies of the roadway affected by your development can positively influence the project's outcome.

Forethought about the design is essential. Since the roadway will be impacted by your site, you must understand those impacts and what is acceptable to the governing agencies.



For example, what are the municipality's plans for the road your site accesses, in the near or the long term? Do they intend to widen it? To improve it? It is not uncommon for an agency to request the project developer to add either a signal light at an intersection, or a turning lane at an existing light for sites that will generate higher traffic volume.

The more information you can obtain, the better. The lack of required information can greatly delay a project during construction, which is the worst possible time.

That dearth of information can have unforeseen consequences. Negative impacts on projects could include:

- relocation of an entry driveway during construction
- elimination of curb cuts after the fact
- addition of signage and/or traffic signals
- request for full traffic impact studies
- extensive requirements for temporary traffic control measures at the roadway during construction.



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Obtaining the highway work permit is often the responsibility of the contractor in charge of the project. However, it is the responsibility of the design team to make certain the plan encompasses all of the prerequisites determined during the information-gathering phase. Adherence to the standards facilitates the highway work permit process and moves the project toward completion.

- James A. Palumbo, R.L.A.

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has decreased from 50 pounds per square foot (PSF) to 40 PSF. However, the requirement for garages servicing buses and trucks remains at 50 PSF.

Second, the minimum uniform live load for corridors servicing “private rooms” in hotels and multifamily dwellings is 40 PSF, whereas that for corridors servicing “public rooms” is 100 PSF. This may result in construction cost savings where applicable.

Footnotes for the table listing live loads also appear to abandon the former 65 pounds per cubic foot book weight for libraries in favor of limitations on the size and layout of the book stacks. This will impact the design of future libraries, as well as additions to existing libraries.

Snow Loads - The Ground Snow Load map has been entirely replaced with a new map (*see illustration on page 4*) that is based on recent snow pack studies by Cornell University. In addition, the 2006 code also indicates that “Ground Snow Loads at elevations above 1,000 feet shall be increased by 2 PSF for every 100 feet above” the 1,000-foot elevation. The structural engineer therefore must be cognizant of the site elevation relative to sea level. These changes

For State Permits --

The New York State Department of Transportation website contains information on how to determine if you need a state permit for a planned project. There are department representatives in each county who will help you with permit information and applications. In addition, you can download the Policies and Standards for Entrances to State Highways, as well as permit forms for all types of highway work permits and other transportation permits. Go to <https://www.nysdot.gov/portal/page/portal/about-nysdot/faq/contact-for-permit-or-plan-project> for this and additional information.

translate to higher snow loads in certain areas of the state, lower snow loads in others, and no change in others.

Wind Loads - Wind Exposure Category “A” has been dropped for major metropolitan areas. This reflects the philosophy that design wind loads for metropolitan high-rises are best governed by wind tunnel tests and city codes incorporating regional climatic data.

Soil Lateral Load - The new code now specifies minimum at-rest pressures for the design of basement walls and other walls supported at both their tops and their bases. This minimizes any disparity among design professionals as to how these loads should be calculated.

Rain Loads - The 2006 version of the code still mandates incorporation of a secondary roof drainage system, higher than the primary drains. The roof structure must be capable of supporting the weight of any related water accumulations.

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Earthquake Loads - Significant changes in this section may have a positive economic impact on project owners and builders. These changes will have the potential net result of improving the Seismic Design Category and reducing the Seismic Base Shear (level at which horizontal ground motions impact the structure) of certain buildings in New York State.

Each building project will have to be considered according to its site, use, design and other factors, but a typical project may qualify for decreased basic seismic design levels, thereby costing less to construct.

Another change in this section of the new code reflects the preference of many structural



Figure 1608.2
Ground Snow Loads for New York State

engineers and permits untopped steel and plywood decks to be considered flexible diaphragms. Where applicable, this simplifies calculations for the horizontal distribution of seismic loads.

- Neil W. Garry, P.E.

Appendix K – Went Away

Although it was not part of Chapter 16 of the 2002 New York State Building Code, former Appendix K has been replaced with the 2006 New York State Existing Building Code. Much of the language is similar, but there are some notable differences relevant to the practice of structural engineering

The former classification of “Reconstruction” has been replaced with three levels of “Alterations.” How does this impact your project? Here is an example: reroofing is considered a Level 1 Alteration and in some instances may trigger improvements to any roof deck connections that are part of the Main Windforce-Resisting System. This system is composed of the interconnected elements that provide support and stability for the overall structure. So an improvement to one portion of an existing building may determine that other elements need to be amended, as well.

A unique feature of the new Existing Building Code generally requires the structural engineer

to submit a written report to the code enforcement official that validates either upgrading, or not upgrading, an existing building’s lateral force resisting system. Improvements to that system are therefore described by the code as “voluntary.” To this end, Chapters A1 through A5, guidelines from the old Uniform Building Code, have been included as references for seismic retrofits.



Vertical Expansion Progress

A 200-foot tower crane with a 275-foot projecting arm places an HVAC unit for the six-story vertical expansion at SUNY Upstate Medical University in Syracuse. KHH is the structural engineer for the project.



NEW AND NOTEWORTHY

Paul Twyman Earns P.E. License

Paul B. Twyman has earned his New York State Professional Engineer certification. Paul joined Klepper, Hahn & Hyatt in 2003 as a structural engineer. He has more than seven years of experience on educational, municipal, commercial, industrial, religious and health care projects. Paul's duties as a project engineer include engineering design and inspection of civil and structural engineering projects. In addition to new buildings, building additions and structural and facade reviews,

Paul has worked on civil engineering design for projects that included site grading and drainage systems, hydrology studies, pavement design and site wall design. He lives in the Eastwood area of Syracuse.



Paul B. Twyman, P.E.

James Trevvett Joins KHH

James D. Trevvett, Assoc. A.I.A., has joined Klepper, Hahn & Hyatt in the KHH Building Envelope Services Division. James earned a Bachelor of Science in Environmental Design from the University of Houston School of Architecture, having previously graduated from Onondaga Community College with an Associate's Degree in Applied Science in Architectural Technology. He has nine years

of experience on a variety of projects, including work with school districts, religious facilities, health care facilities and commercial clients. James lives in Verona Beach.



James D. Trevvett

Joseph Ward Receives NYS P.E. License

Joseph W. Ward, P.E., who joined Klepper, Hahn & Hyatt last fall as a project engineer, has received his New York State Professional Engineer license. In 2006 he relocated from Nampa, Idaho, where he had earned his initial P.E. license. New York State supports licensure by endorsement after a formal



Joseph W. Ward, P.E.

evaluation of the out-of-state professional's credentials. Joseph's assignments at KHH include structural engineering work on various projects throughout New York State. He and his wife reside in Manlius.



Celebrating 10 Years of Service

Kelly Covert, P.E., SECB, has attained 10 years with KHH. Kelly is an Associate with the firm, managing a variety of projects for clients.

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New and Noteworthy from page 5

Jim D'Aloisio Publishes Article in *Structural Engineer*

James A. D'Aloisio, P.E., SECB, LEED® AP, has published an article in the June 2007 edition of *Structural Engineer*. Jim's article, "Ten Tenets of Structural Sustainability," was under the magazine's Sustainable Design column heading. The article outlined 10 concepts to provide engineers with "a framework for developing your sense of sustainability for your projects, your workplace, and yourself."

Jim has been presenting these ideas to audiences throughout the state, as part of the Sustainable Speakers Series for the New York Upstate Chapter of the U.S. Green Building Council. The programs have

taken place in Syracuse, Buffalo, Horseheads and Albany. Jim is a member of the Advisory Board of the Upstate Chapter, and a member of the ASCE Structural Engineering Institute's Sustainability Committee.

He also presented a workshop last fall, "Misconceptions About Special Inspections," during the 2006 American Institute of Architects New York State Convention in Garden City, New York. This was Jim's third consecutive presentation at the state convention. He is a principal of KHH and has recently marked his 20th anniversary with the firm. He resides in Jamesville.



KHH Welcomes Structural Intern for Summer

Marie Ostrowski has assumed duties as a summer intern in the structural engineering department at Klepper,



Marie Ostrowski

Hahn & Hyatt. She has just completed her second year at The Pennsylvania State University, where she is enrolled in the program to earn her Master's Degree in Architectural Engineering.

metallurgical engineer who worked for Caterpillar.

Marie enjoys the opportunity to enhance her abilities by exploring the creative aspects of projects. "I like to dive in and see how things work, to go on site visits," she said.

Her avocational pursuits include a love of drawing, along with painting in acrylics. People are her favorite subjects for her art. In addition, she likes to play volleyball and has a strong love of animals. She has a German Shepherd Dog at home in Warners, New York.

Marie's strength and interest in math and science led her to the engineering field. There may be some genetics involved in it, she acknowledged; her grandfather was a



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