

Planning to Minimize Damage to Buildings Adjacent to Construction Sites in Urban Environments

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This is the second in a three-part series on the topic of planning and managing building response to adjacent construction. The first, *Monitoring Building Response to Adjacent Construction*, was published in the November 2008 issue of *STRUCTURE*[®] magazine. The third will appear in an upcoming issue.



A photo of a building elevation can be used as a key map for identification of individual distress, shown separately on detailed, up-close photos.

People and businesses continue to concentrate in large metropolitan centers because keen competition in a city makes services and commerce better. As a result, land values are typically at a premium, requiring development of structures that optimize use of space. Taller and “deeper” structures are being constructed, existing structures are expanded or modified, the urban infrastructure is constantly maintained, replaced, and expanded, while the existing and often historic fabric of mature cities must be maintained. During this continuum of urban rejuvenation, providing protection and needed maintenance for the remaining, adjacent structures is not a trivial task.

Common issues associated with urban development can be political, commercial, and technical in nature. Urban communities have multiple interests – historic preservation, traffic control, and vehicular and pedestrian access. Developers are often faced with significant cost restraints, especially when expanding into adjacent properties, so construction alternatives are selected by balancing risk and costs. Adjacent neighbors are concerned with property damage, disruption of access, disruption to operation (noise, dust, vibration), and safety. Design team members must manage expectations of owners and neighbors. Their role, which includes determining the reasonable construction methodology and evaluation of loads and margins of safety, is extremely difficult in urban environments. Due to unpredictable existing conditions, tight boundaries, and



Detailed observations from a condition survey can be shown on individual photos linked to a key plan.

the relative imprecision of construction tolerances in underground work, the designer's risk exposure often is not commensurate with their level of control and compensation.

Some of the more common issues encountered in planning for construction in this complex environment are described next.

Well Managed Development Projects Limit Damage Risks

Urban structures often consist of fragile, archaic, and not well understood construction components and systems. They can be founded on unknown and potentially deteriorated foundations, or can potentially bear on inadequate soils or soils whose condition changed since the original construction (e.g. due to past dewatering or consolidation). Therefore, most projects in urban environments can and probably will result in some level of movement to adjacent buildings. Properly conceived and executed projects, however, can effectively limit the risk of significant damage. To achieve that, the developer and their design team must begin planning, communicating, and acting long before the first shovel hits the ground.

Some of the more critical tasks to be addressed in the process include:

- Engage the design professional to perform (pre)condition assessments of adjacent buildings in an attempt to document and understand their present condition and fragility. Share information with adjacent building owners and reach agreement regarding issues contained in the survey reports. Conduct post-construction surveys at the appropriate time.
- Evaluate the effects of excavation and the new foundation system on adjacent buildings using estimated or observed information regarding existing foundations (type and depth). Evaluation of potential risks can be used to develop construction methodology and plans to mitigate damage. Sequencing of anticipated construction processes should be well planned and executed (all too often excavation proceeds ahead of lateral support work, for example).
- Engage in open communication with adjacent building owners. Provide them descriptions of planned activities and controls. Solicit and address their concerns. Coordinate with them all work affecting their property.
- Establish a well-defined construction monitoring plan (building-performance monitoring and construction diagnostic monitoring) that includes monitoring of groundwater elevations, ground-borne vibrations, movements of the excavation

support elements, and movements of adjacent properties. Establish threshold and limiting criteria for each aspect of measured response. If necessary, especially fragile components should be braced or protected.

- Require that the contractor's specialty engineer make frequent site visits to observe conditions, review and comment on monitoring results, and react quickly to any unforeseen conditions.

Unfortunately, many projects in larger US cities are not designed and planned to succeed, especially relative to maintenance, care, and damage protection for adjacent buildings. Too often:

- Responsibility is often blurred between the designer, contractor, and the contractor's specialty engineer;
- communication channels with adjacent building owners are non-existent or break down;
- design professionals are not retained to perform a thorough condition assessment or to evaluate potential risk of damage;
- the preconstruction survey, monitoring, and protection of adjacent structures are not budgeted;
- the design team does not adequately communicate project requirements, or such requirements are ignored;
- risky excavation activities seem to be under no one's purview; or,
- the developer/contractor rely on their insurance to cover any "collateral damage".

As a result, problems arise.

Legal Responsibilities and Issues

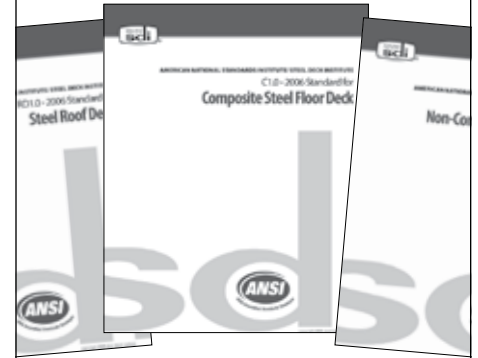
Most building codes and common laws encourage construction on rightfully owned land, with certain provisions and requirements regarding the remaining adjacent properties. For example, the developing party may have a duty to inspect the adjacent property, to give reasonable notice regarding construction activities that affect the building next door, or to obtain insurance to protect the adjacent owners. Owners of adjacent buildings may be required to grant access to perform inspections, and ready the adjacent building to resist construction impact.

In addition, most building codes have requirements regarding protection of adjacent buildings during construction activities. A frequent common law right is to have the owned land naturally supported. If natural soil support is removed or modified during construction activities, the adjacent site owners or operators will likely be found liable for any ensuing damage. If adjacent development requires excavation near or at the lot line, underpinning of nearby building wall foundations will

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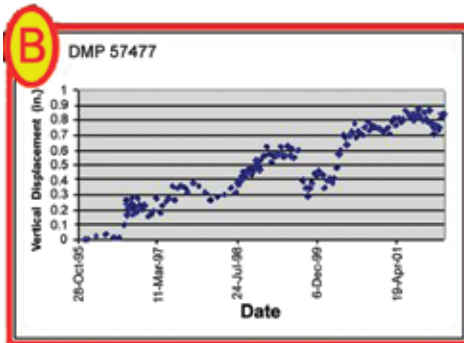
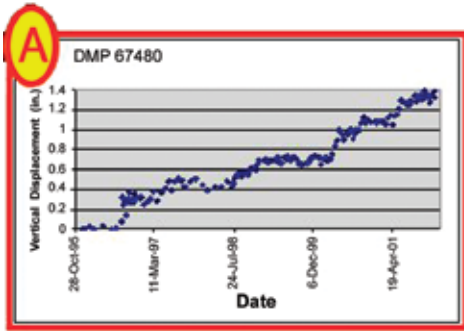
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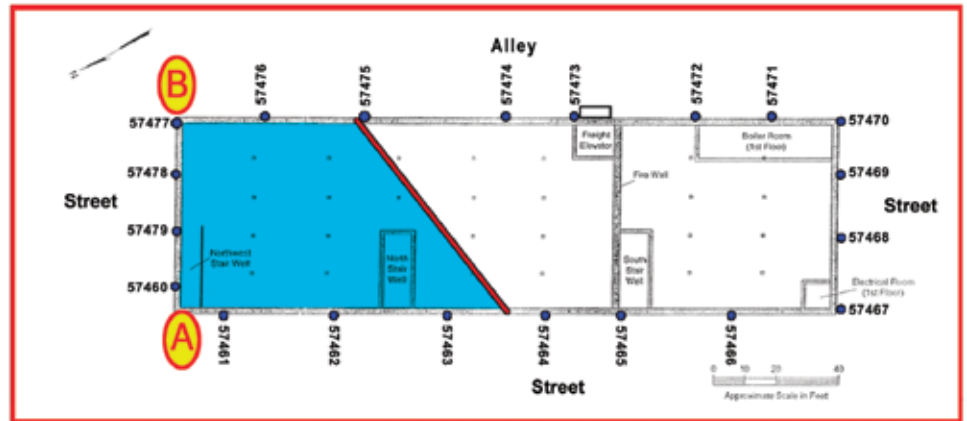
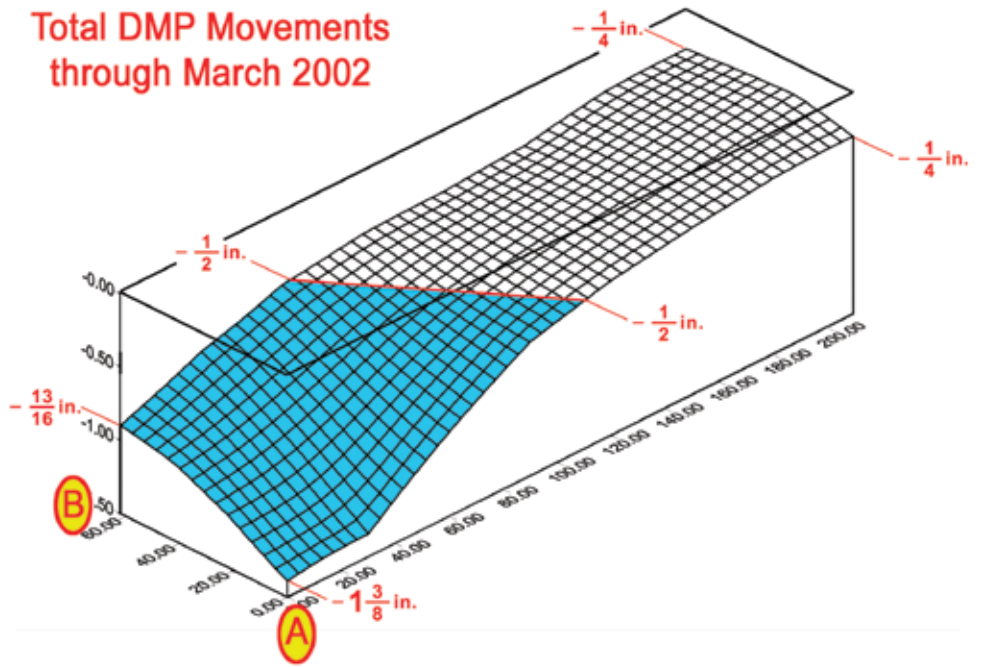
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Monitoring of vertical building displacements. The map on the right shows areas where the threshold limits for displacement established prior to construction were exceeded. Early detection of exceedance can be used to quickly develop a mitigation plan.

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typically be required. In general, responsibility for any damage that is shown to be a result of adjacent-site construction will rest with the party performing the construction. Other building code requirements may include protection of roofs, skylights, and walls, protection against water entry, protection and lateral support of party walls exposed as a result of demolition, installation pedestrian bridges for protection against falling debris, etc.

Despite common sense, common law, and building code requirements, construction in urban areas, once damage is alleged, seldom goes smoothly. Adjacent owners may not be sufficiently informed, are unaware of their rights, or are not familiar with the plans for adjacent development until it is too late. Sometimes building code requirements are vague or incomplete in terms of guidance, requirements, and responsibility of the involved parties. Occasionally, owners of damaged properties inform their insurance companies too late, or blindly request their insurance carriers to pay for damage that is not covered by their policies. At other times, cause of dam-

age is disputed or new damage is not easily discerned from the pre-existing damage. In general, without well-defined and planned project processes in place, disputes regarding causation and amount of damage (no precondition surveys), or disruption, easily develop and occasionally escalate, requiring involvement of experts, consultants, and ultimately attorneys. Ensuing litigation can in turn quickly engulf other parties (architects, engineers, contractors, and insurance carriers) in the dispute.

Managing the Process to Minimize Damage to Buildings (Anticipate)

So, how does someone avoid getting their building damaged when faced with irresponsible, under-budgeted, under-qualified, or uncommunicative prospective developers of a property next door? The assumption here is that, unless one of the four adjectives above is true, the project would be well-planned, managed, implemented, and designed to minimize damage-risks described earlier. The following

focuses on some common issues and strategies available to building owners.

Up-front Research

At least some information regarding new developments is typically available in the public domain. Specifically, plans for new buildings should be on file with the building department in the appropriate municipality. Owners of adjacent buildings should research the building department records, which are often available on the internet, at the first sign of adjacent development (e.g. the windows of the existing building next door are being boarded up), especially if they have not already been approached by the developing party next door. Generally, even if plans related to operations that are most likely to affect adjacent properties (such as excavation) are not available, sufficient information regarding the identity of involved parties can usually be obtained from the building department records. Additional useful information, such as past violations associated with the development site or with the developer in question, may also be available.

Communication

Owners of adjacent buildings should try to contact, and get properly informed directly from, representatives of the adjacent development. A savvy building owner should be able to recognize if the development is well planned, if due attention is given to demolition, excavation, and construction methods, as well as how the planned activities relate to existing adjacent building(s). For less experienced owners, the appropriate contact person on the development side should be able to walk them through all the processes, and help them understand and anticipate all potential issues. However, if plans and procedures are not made available, if the monitoring plan and staff that will implement protection is not defined or divulged, or if full access to all matters pertaining to the next-door property is not given, there should be reason for concern. Regardless of the response from the developer's side, however, owners may choose to retain an independent consultant (adjacent owner's engineer) to help them through the process and help mitigate risks. The adjacent-owner's engineer would review the design approach and preconstruction-survey data, spot-check monitoring and quality-control programs, review monitoring data and reports, and visit the site periodically to review project progress and condition of the adjacent building. If the project is going well, the adjacent-owner engineer's involvement and time-commitment can be minimal. If the project is not going well, if damage is incurred, if information is not forthcoming, or if any other problem arises, the engineer's role may grow. They may take on some monitoring and evaluation duties ordinarily belonging to the developer and design team or the adjacent property contractor, as well as provide engineering guidance regarding protection and damage management during construction.

Unfortunately, if the adjacent-building owner is faced with an unresponsive developer next door, there are few pleasant options. They may rely on their independent consultant and their insurance company to help them navigate through issues that may arise throughout the project, but this typically puts them in the reactive mode. If they don't become part of the planning process, and if the process is not managed well, they will only be able to deal with issues and damage as they occur; they will not be able to prevent them.

Agreements

One way to attract the attention of an adjacent (and unresponsive) developer is to involve attorneys. This does not necessarily mean that litigation is imminent, or that some level of

damage was already incurred. Attorneys can typically reach the appropriate parties on the other side, and work towards developing a firm, contractual agreement between neighboring parties even before the project is started. Ideally, irrespective of whether attorneys are involved or not, this agreement would typically define steps, procedures, and reimbursements for design and construction review; for access, monitoring, property protection, responsibility for damage and repair; and, other factors that can be anticipated during the course of the project. Although often not ideal, this approach offers a clean, agreed-upon method of resolution for any issues arising from construction, and it is a better alternative to unplanned disputes and litigation. In general, there are three ways for an owner of the adjacent building to get protection against damage: through insurance (their own or the adjacent development owner's), through contractual agreement with the adjacent development owners, or through some form of litigation.

Conclusion

Congested urban construction is difficult and often results in damage to adjacent structures. Damage and associated disputes can usually be avoided if proper project planning, monitoring, and execution are employed. Early coordination between parties can prevent disputes and reduce risks. Preconstruction agreements, whether procured through attorneys or not, are invariably beneficial when it comes to minimizing and resolving damage claims. ■

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Further discussion regarding evaluation and remediation of building damage, once it has already incurred, will be presented in the third article of this series.



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