



NYC
Buildings

Christopher M. Santulli, PE Asst. Commissioner

Site Safety Plans: The BIM Advantage



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CONFERENCE

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Safety Responsibility

Building Code 3301.1 Responsibility for safety (*abbr.*)

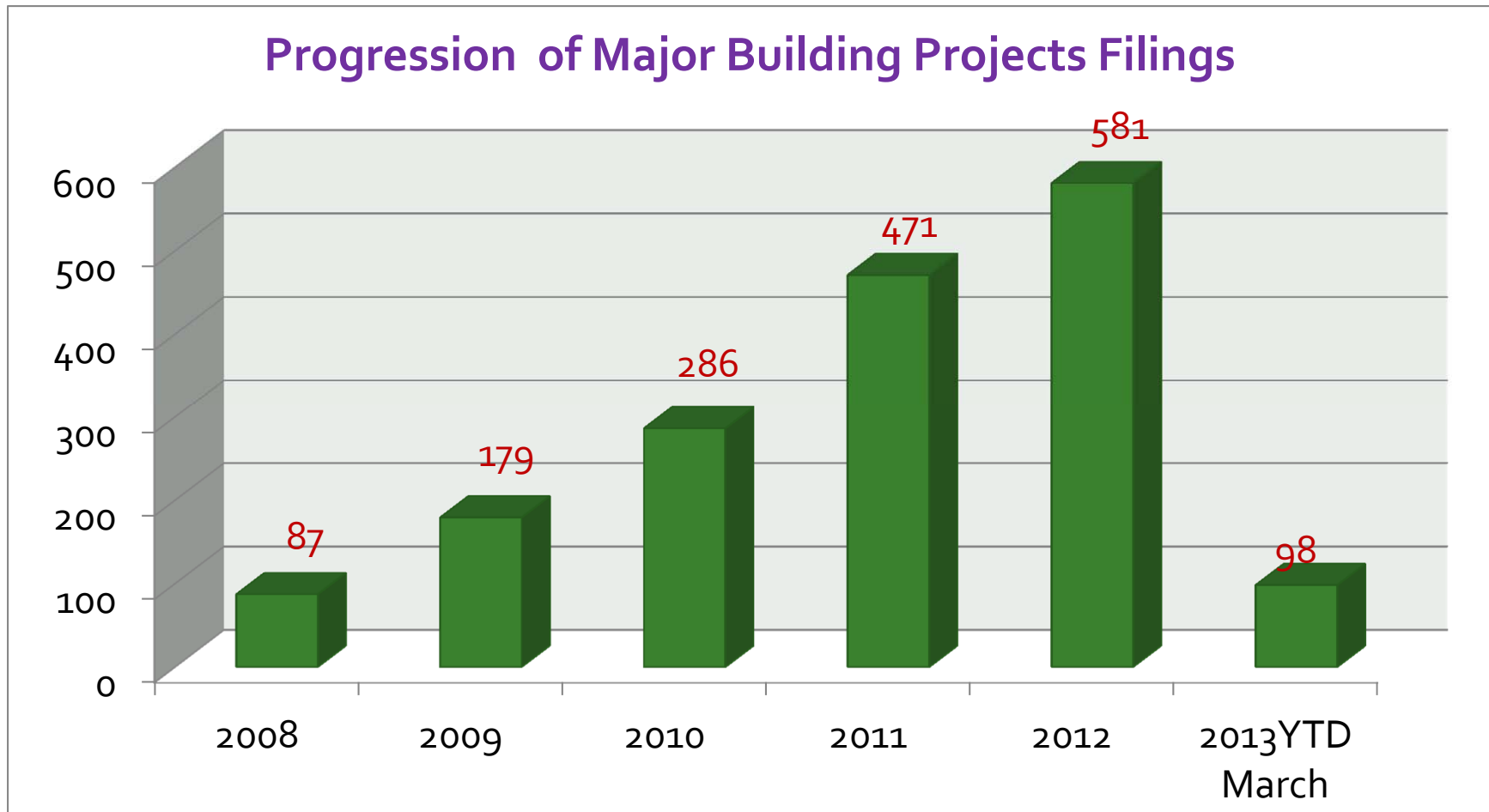
Nothing in this chapter shall be construed to relieve persons engaged in construction or demolition from complying with law, nor is it intended to diminish any obligation on the owner, construction manager, contractor, material men or other party to engage in safe construction or demolition practices, and to act in a reasonable and responsible manner to maintain a safe construction or demolition site



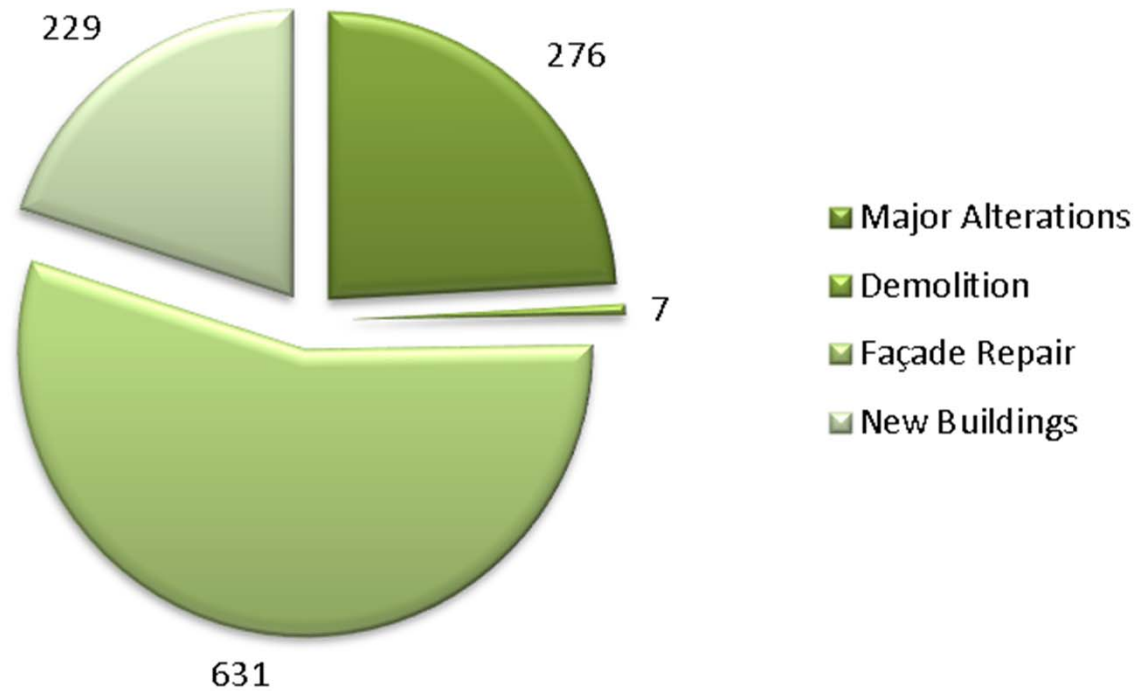




Progression of Site Safety Program Filings



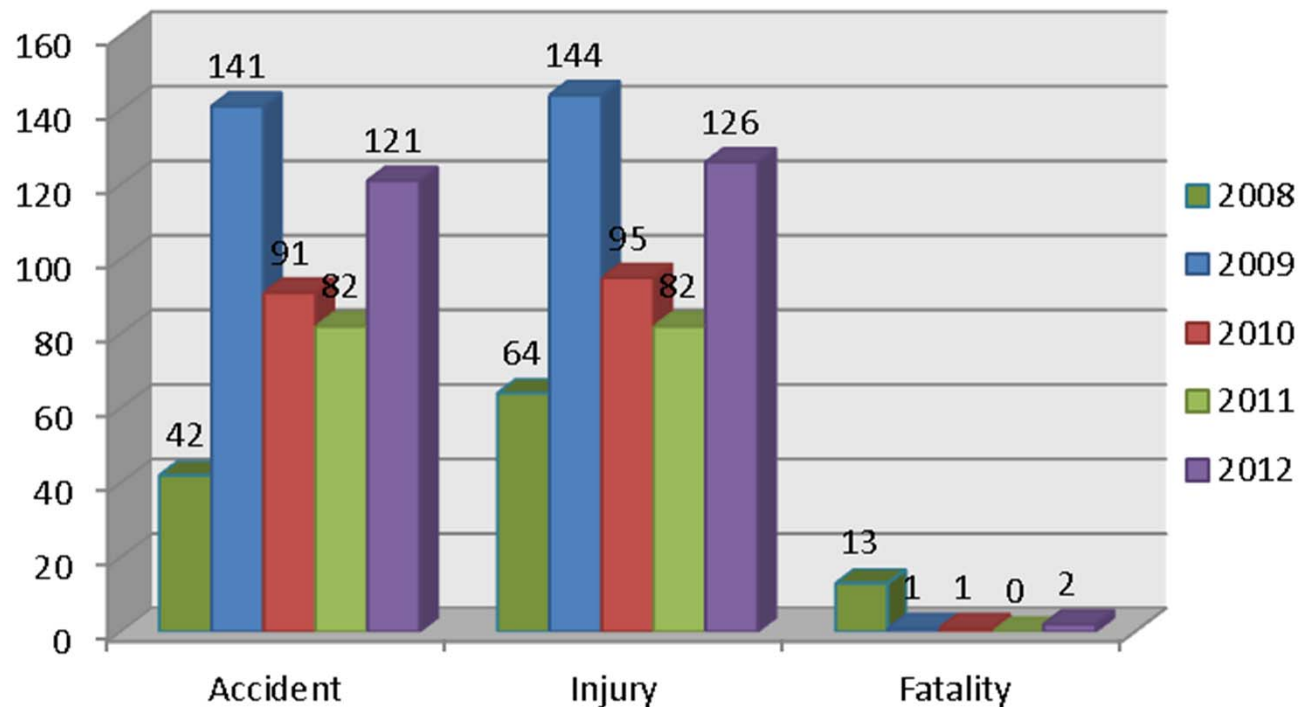
Breakdown - Active Site Safety Projects



1143 Active Projects

Accidents at Site Safety Program Projects

Major Building Project Accidents up 47% in 2012 vs 2011



2008 Versus 2012 Site Safety Program Results

87 Versus 581 **Jobs Filed** – Up by Factor of 7

42 Versus 121 **Accidents** - Up by Factor of 3

64 versus 126 **Injuries** – Up by Factor of 2

13 Versus 2 **Fatalities** - Down by Factor of 7

Agency Initiatives

Education – Industry sessions, Major Projects Initiative

Enforcement- Stop Work Order Program

Advancing innovative practices and technology

SERVICE UPDATE

Major Projects Program: Acceptance Criteria

Construction projects that pose the greatest risks or challenges may be eligible to participate in the **Major Projects Program**, where inspectors and managers work closely with developments – increasing site safety before work begins and for the duration of the project. In this initiative's pilot program, participating developments had 40% fewer accidents, 49% fewer violations and 82% fewer full Stop Work Orders with 380 more days at work, compared to similar projects before the program's launch.

Program Overview

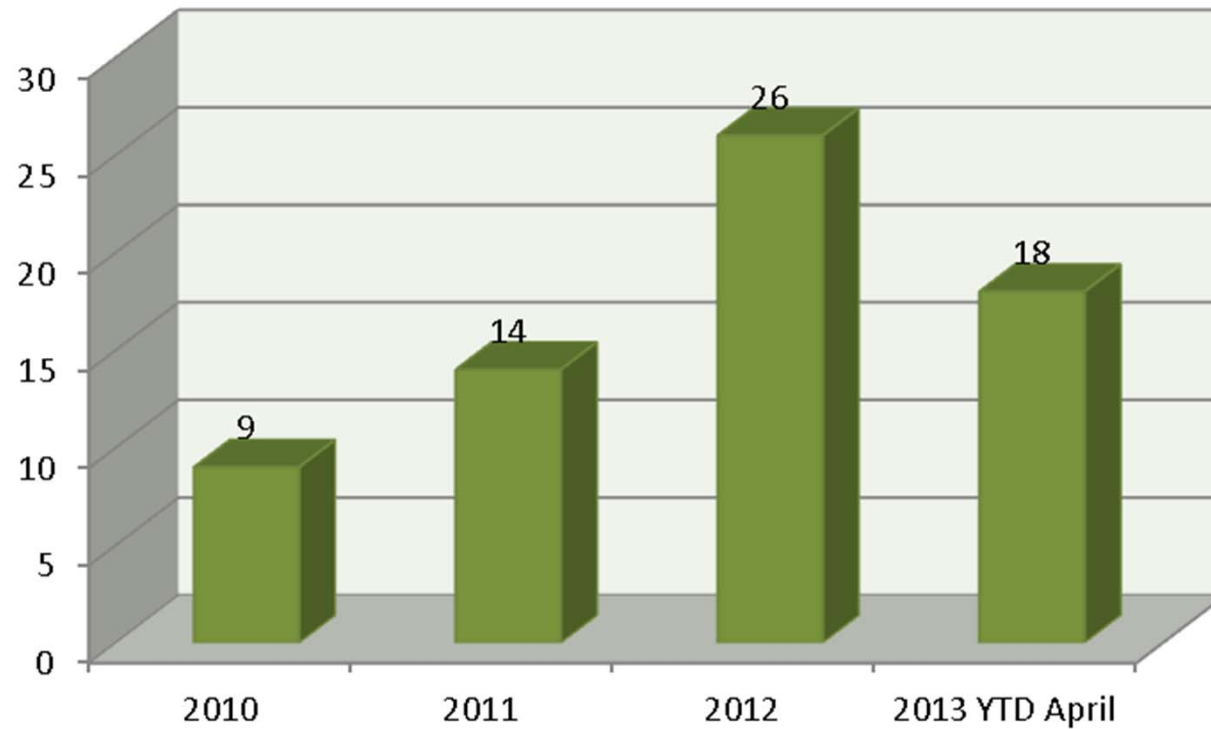
In the Major Projects Program, we provide a single point of contact to serve as the Department's representative during the project. We also expand upon our standard duties, working with developers, contractors and construction managers in preconstruction planning and biweekly meetings sharing best practices – and we coordinate joint inspections with multiple governmental agencies. This collaborative process enables us to better communicate and enforce expectations. Participating projects will be encouraged to use innovative technology and practices, such as Building Information Modeling, to prepare site safety plans.

Acceptance Criteria

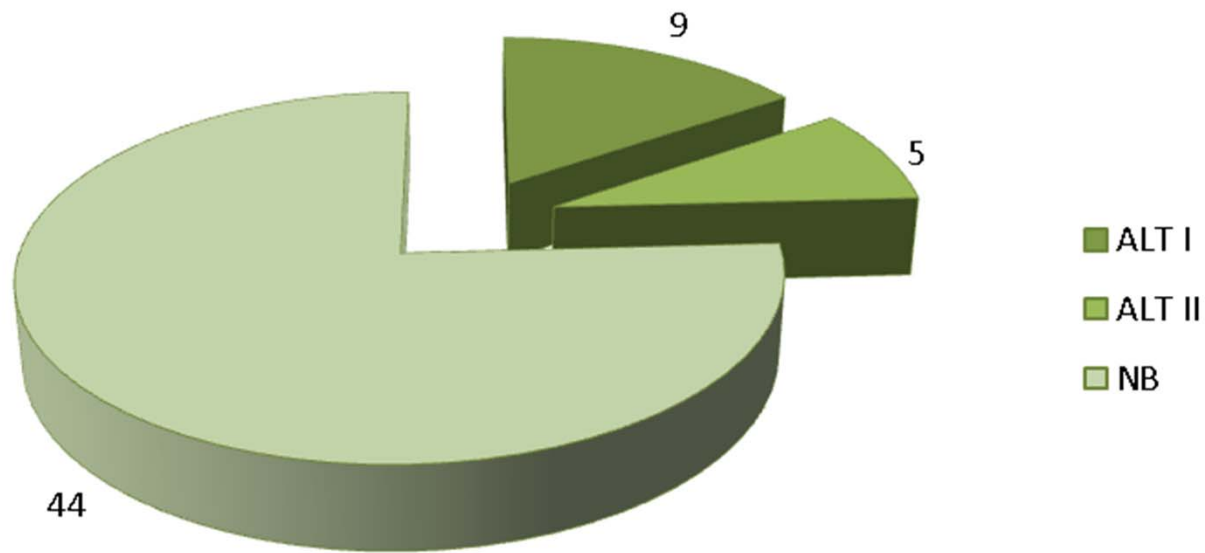
The following types of projects may be admitted to the Major Projects Program:

1. Major Buildings, as defined in 2008 NYC Building Code §3310.2 (10 or more stories; 125 feet or higher; 100,000 sq. ft. or more lot coverage; or designated by the Commissioner); **or**
2. Heightened Safety Challenges (congested areas; high-risk construction, such as demolitions or excavations; work during occupancy; or high-occupancy load); **or**
3. Multiple City, State and/or Federal Regulation.

Progression of Safe Major Building Projects

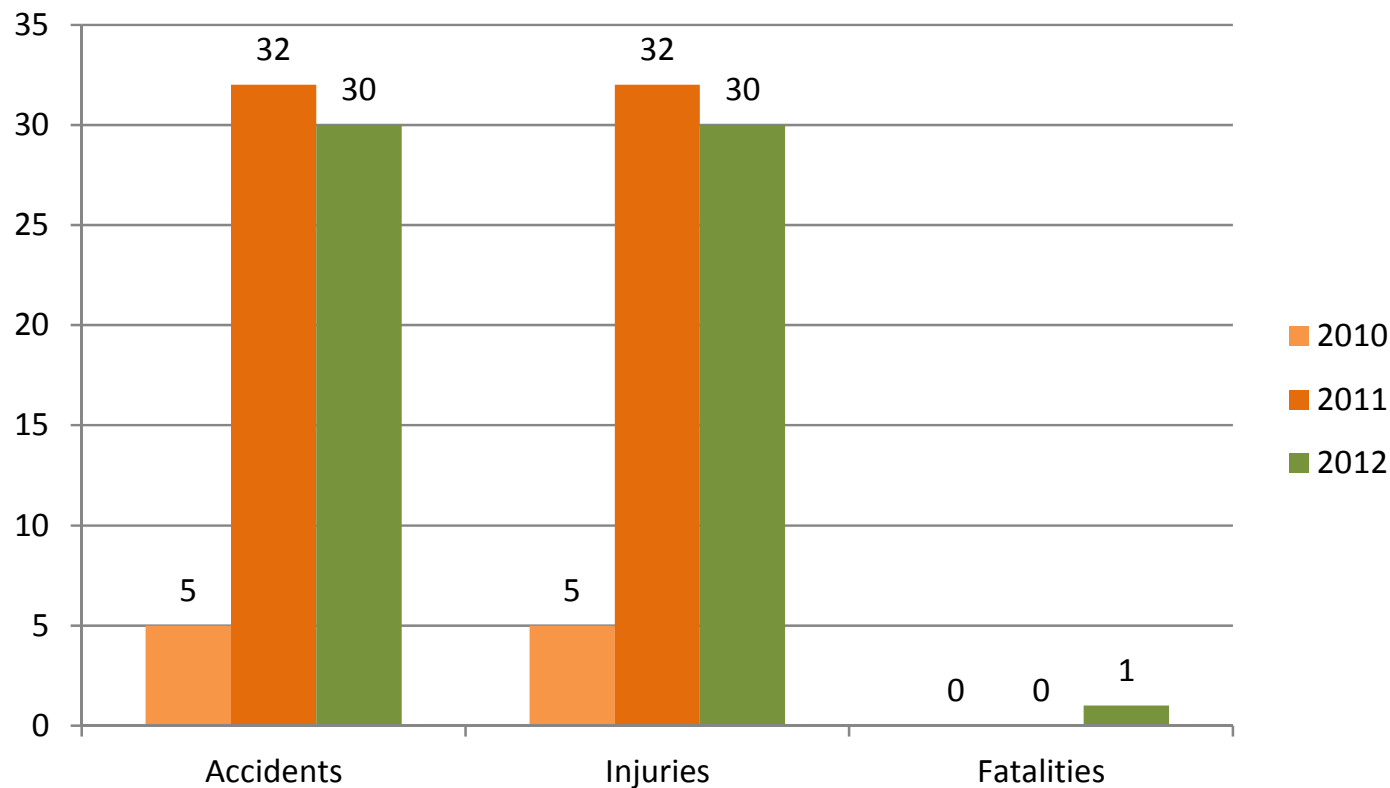


Breakdown of Current Safe Major Building Filing Types



Accidents at Safe Major Building Projects

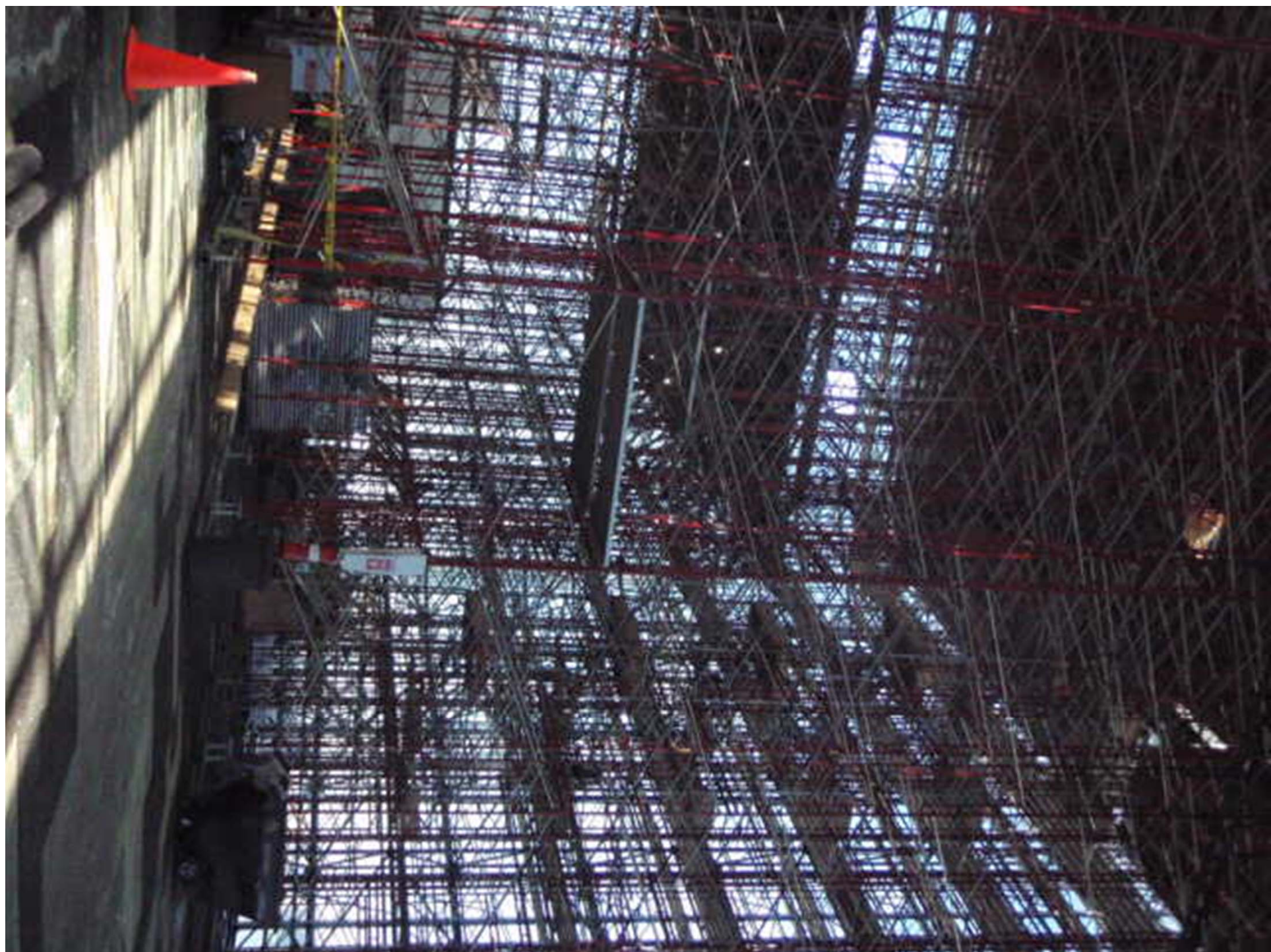
Accidents – Safe Major Projects Program down 6.25%
2012 versus 2011



















ALCOB II - JAVITZ ROOF RANET
ATLANTIC SCAFFOLDING & POSTING
330 NORTH HENRY STREET
BRIDGEVIEW, NY 11712
716-438-4200

MAXIMUM LOAD = 20,000 TOTAL
MAXIMUM WIND SPEED DURING
OPERATION = 125 MPH

HARRINGTON ROOF CRANE CHAIN FALL
TALL ROOF - MAXIMUM TOLLO
EIGHT (8) CAR SUPPLEMENTAL BRIDGE
LAST DATE OF INSPECTION





















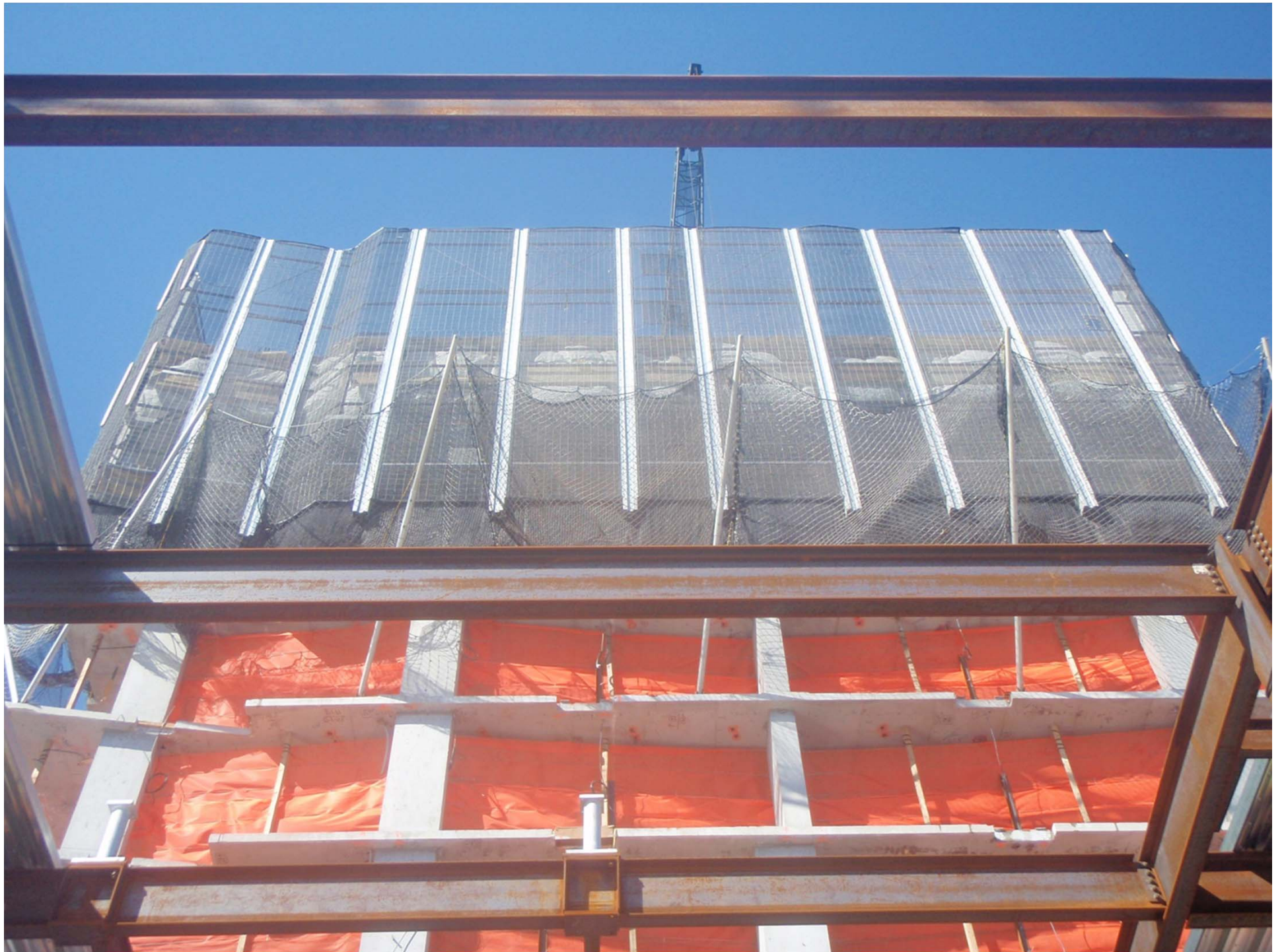






UNIVERSAL BUILDERS SUPPLY INC.
11 JEROME AVE.
NEW YORK, NY 10013
914-235-0064

03/09/2011









Improve the Jobsite Culture

Promote safe work practice

Plan Ahead

Take advantage of improved methods

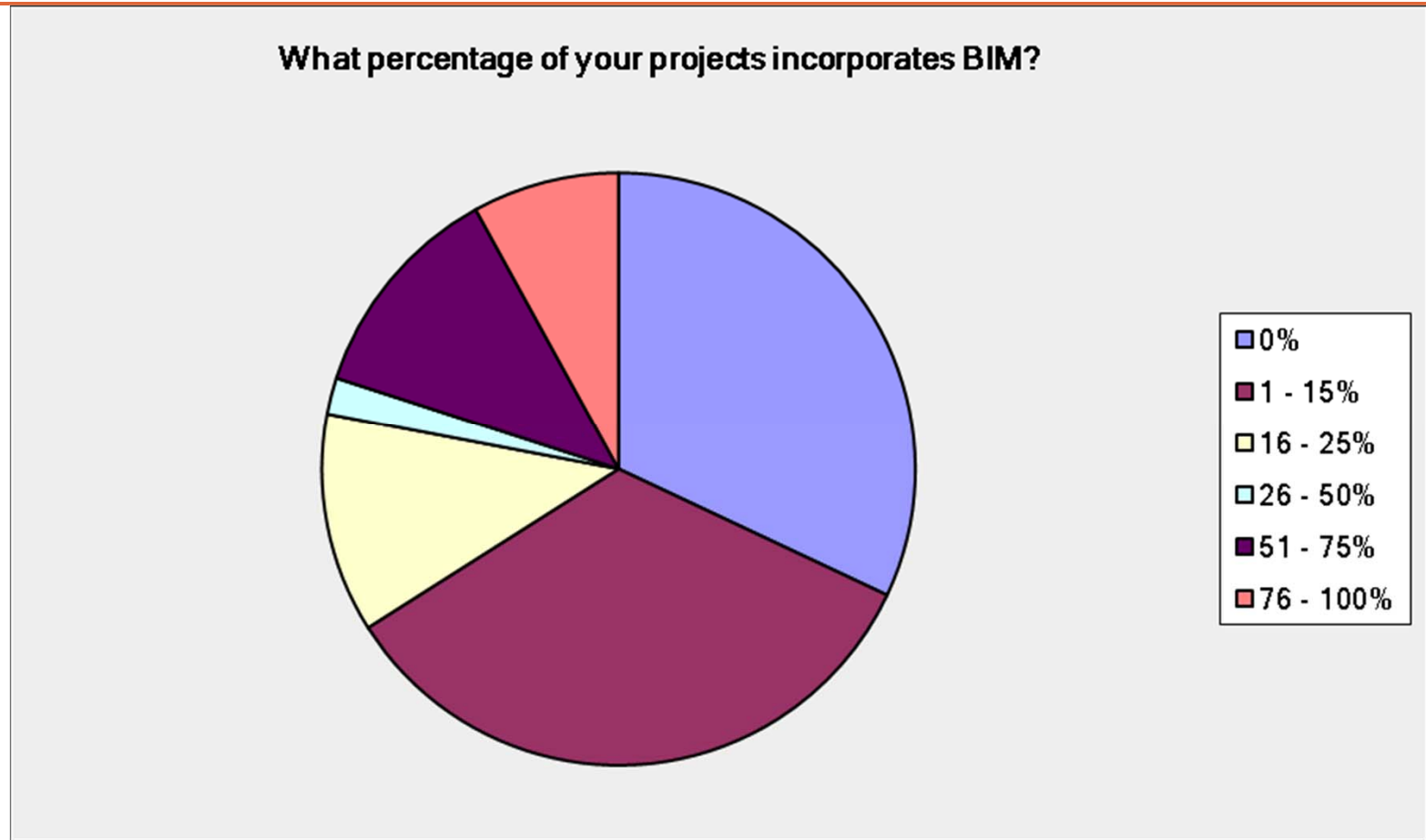
Take advantage of improved technology

Monitor Performance

BIM in Architecture/Engineering/Construction

- **BIM** :Building Information Modeling (BIM) is a digital representation of physical and functional characteristics of a facility. A BIM is a shared knowledge resource for information about a facility forming a reliable basis for decisions during its life-cycle; defined as existing from earliest conception to demolition. *(National BIM Standard - United States).*

Two Thirds of A&E Projects Incorporating BIM

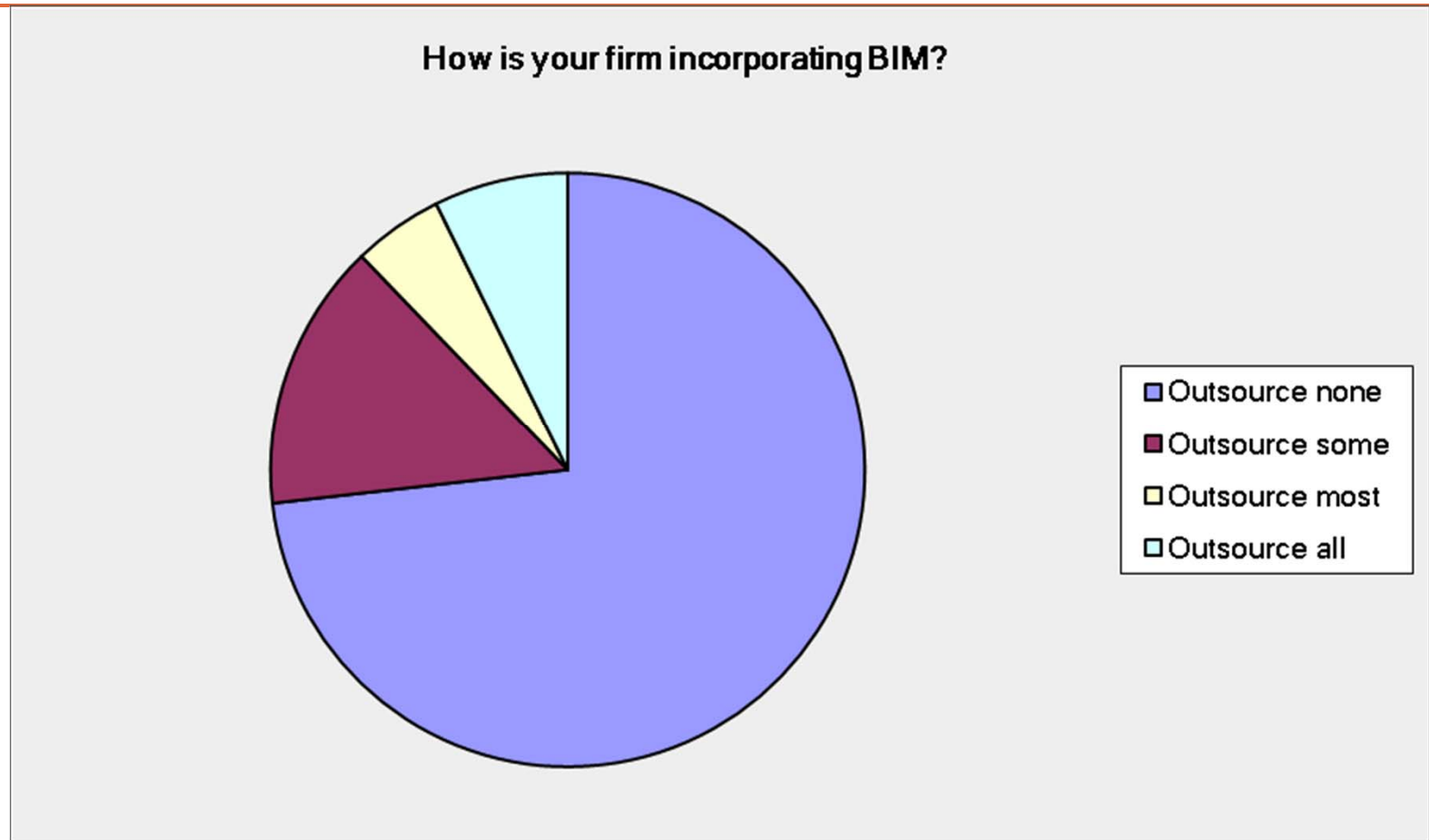


Source: **2013 A&E Market Outlook Survey**

Prepared and presented by: **Grassi & Co.** and **Zetlin & De Chiara LLP**

Sponsored by: **ACEC New York** and **AIA New York State**

One Quarter A&E Firms Outsource BIM

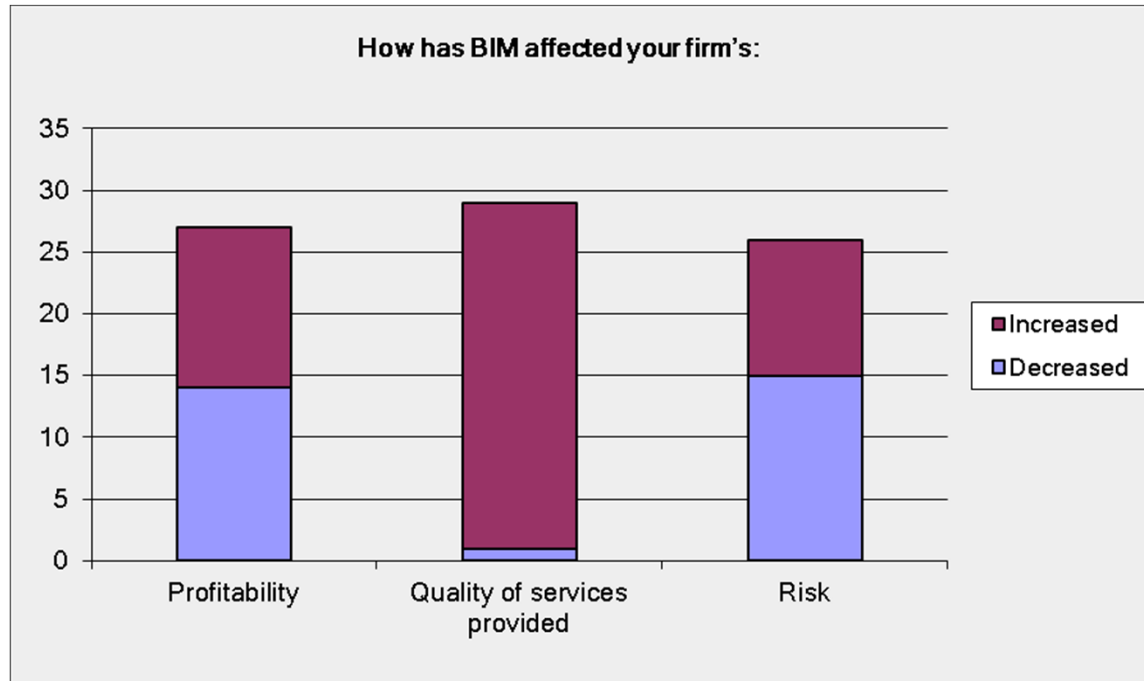


Source: **2013 A&E Market Outlook Survey**

Prepared and presented by: **Grassi & Co.** and **Zetlin & De Chiara LLP**

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Firms Agree BIM Improves Quality



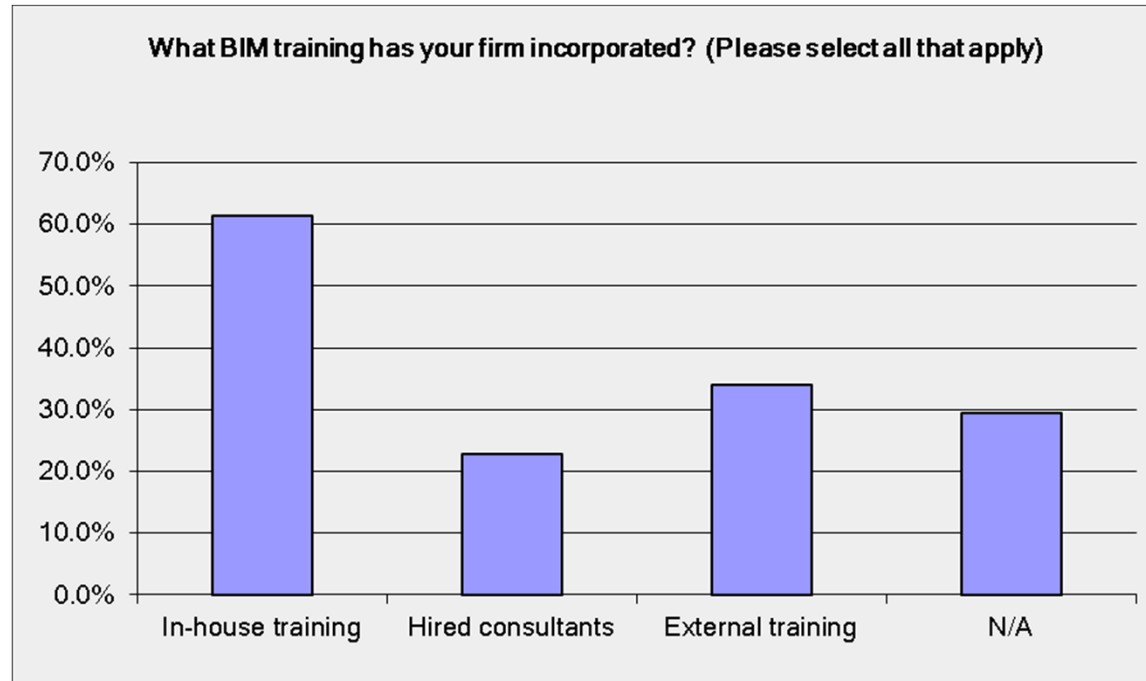
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BIM Training is being done in - house



Source: **2013 A&E Market Outlook Survey**

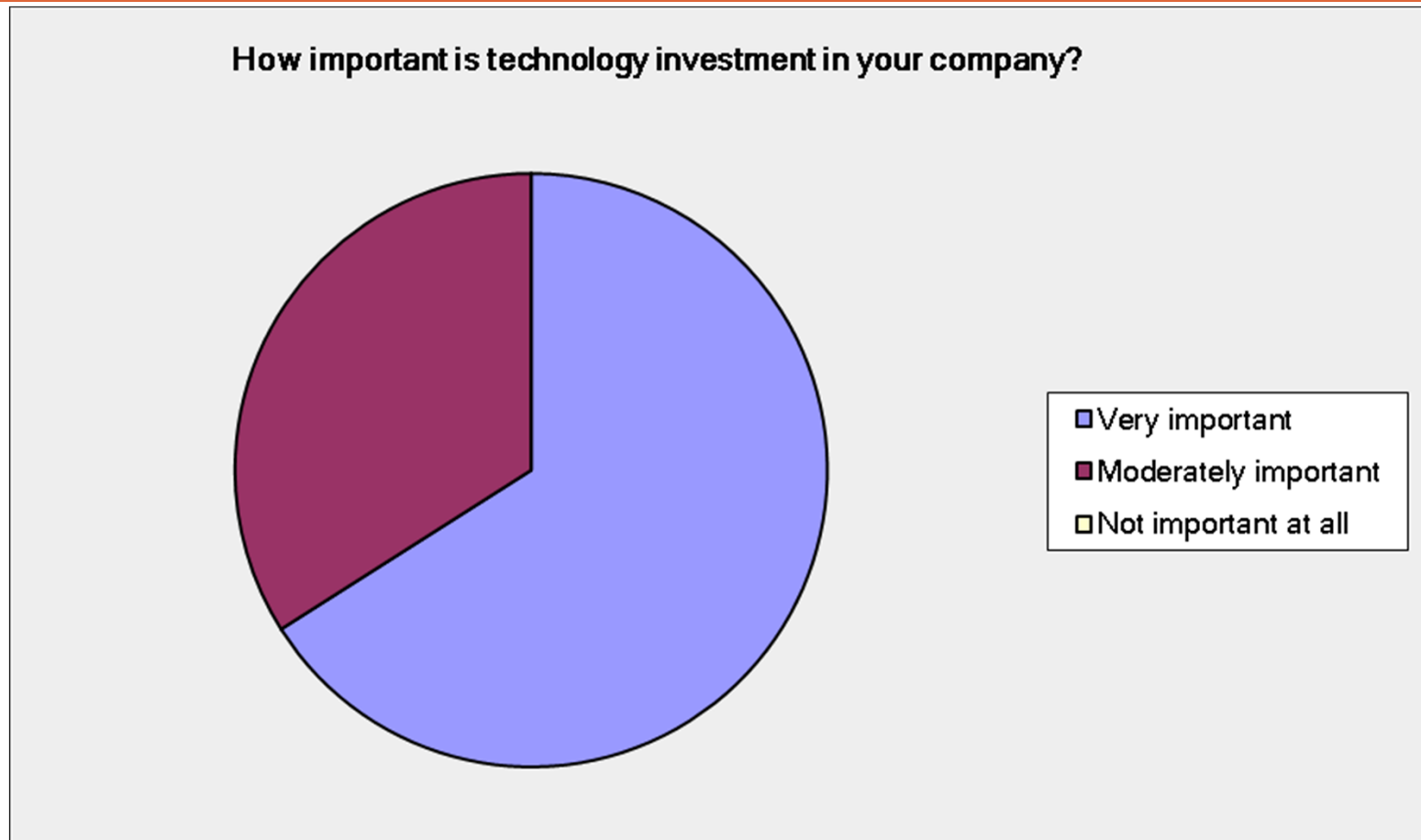
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Technology Investment is Important

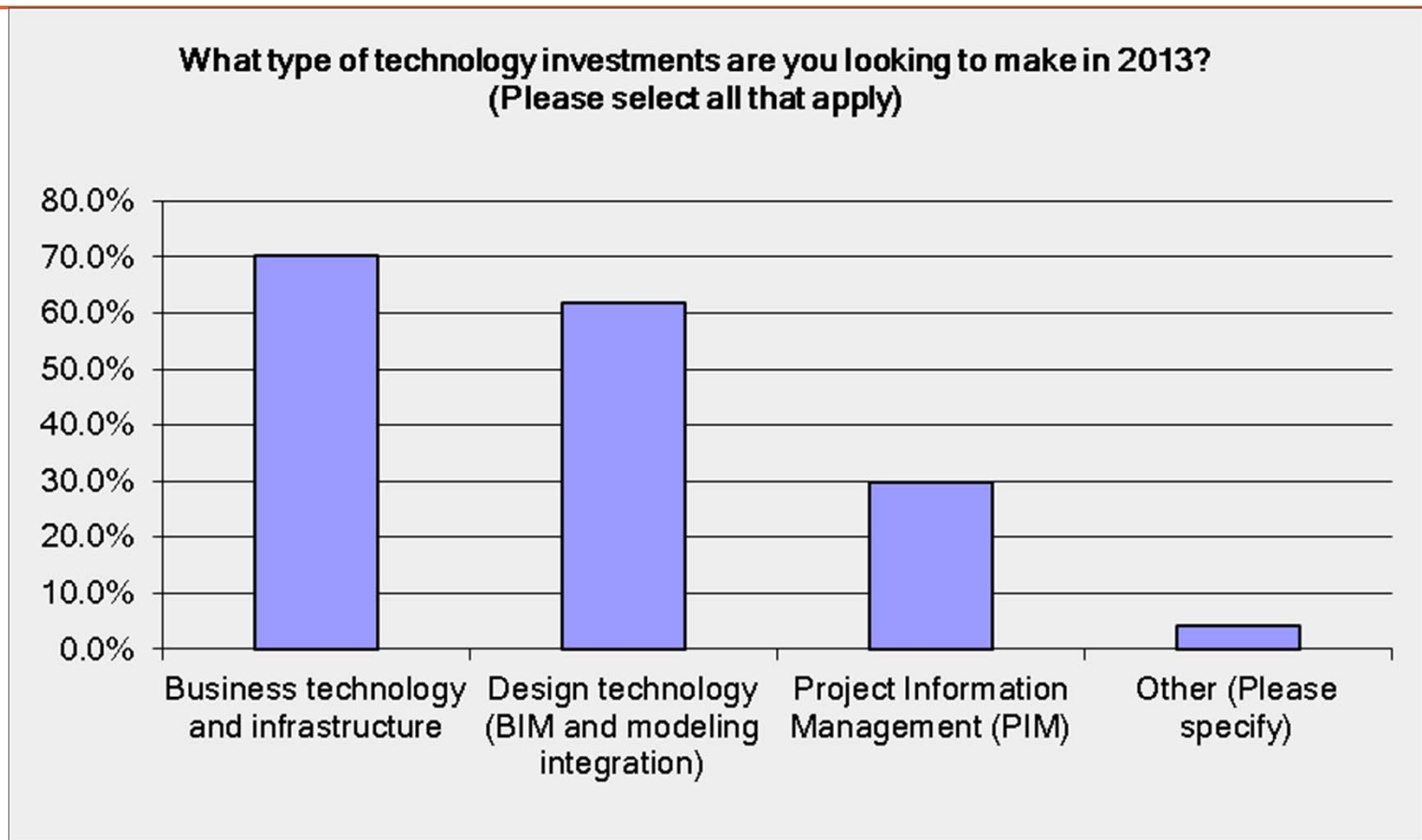


Source: **2013 A&E Market Outlook Survey**

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Sixty percent plan BIM Investments 2013



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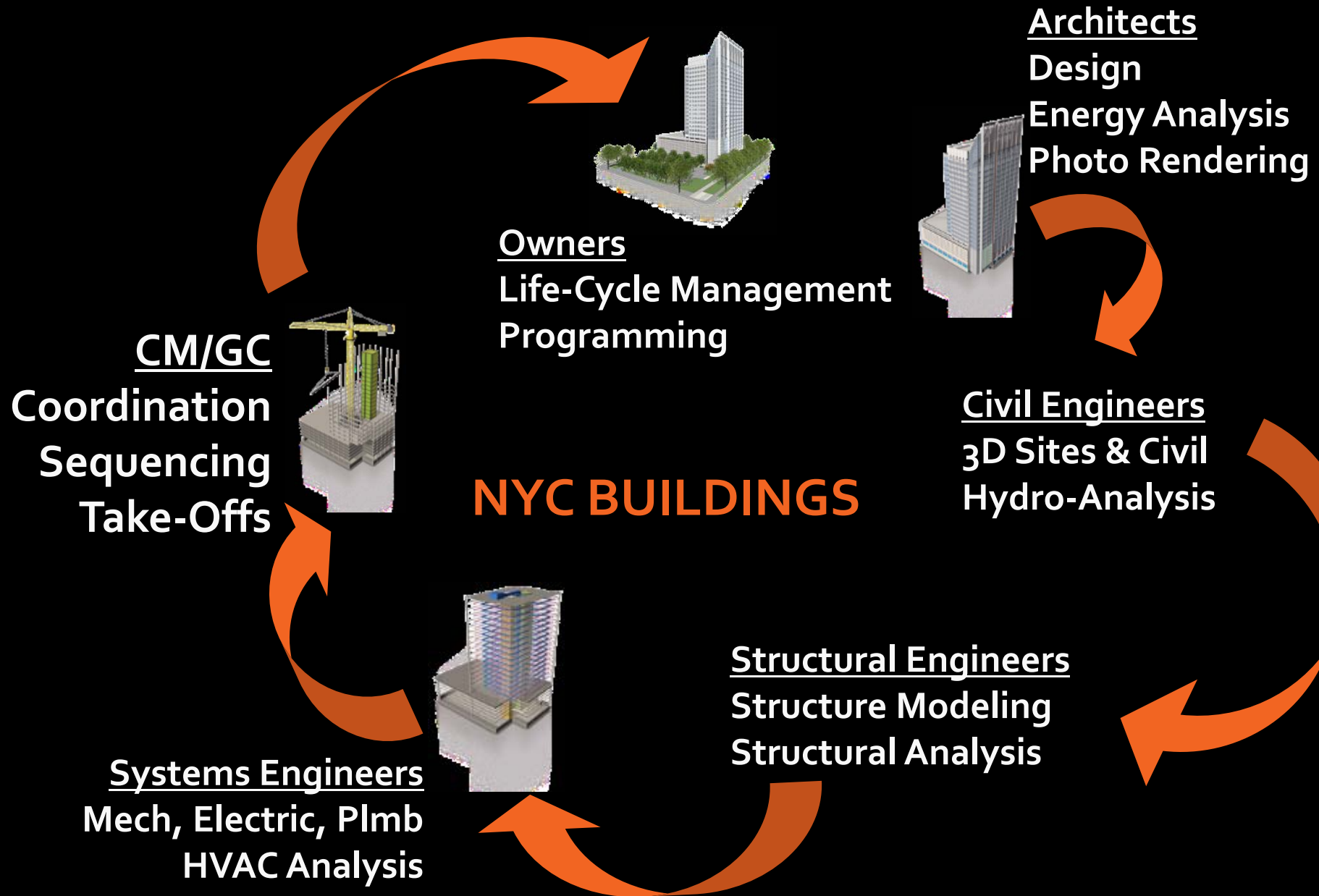
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Current **Applications -Construction**

- BIM used to deliver a zero conflict design model coordinating all trades
- Modeling & tracking shop drawings and fabrication – factory to field
- Weekly virtual coordination meetings using cloud technology
- Tracking as-built conditions for progress/payment

NYC Implementations-Public Sector

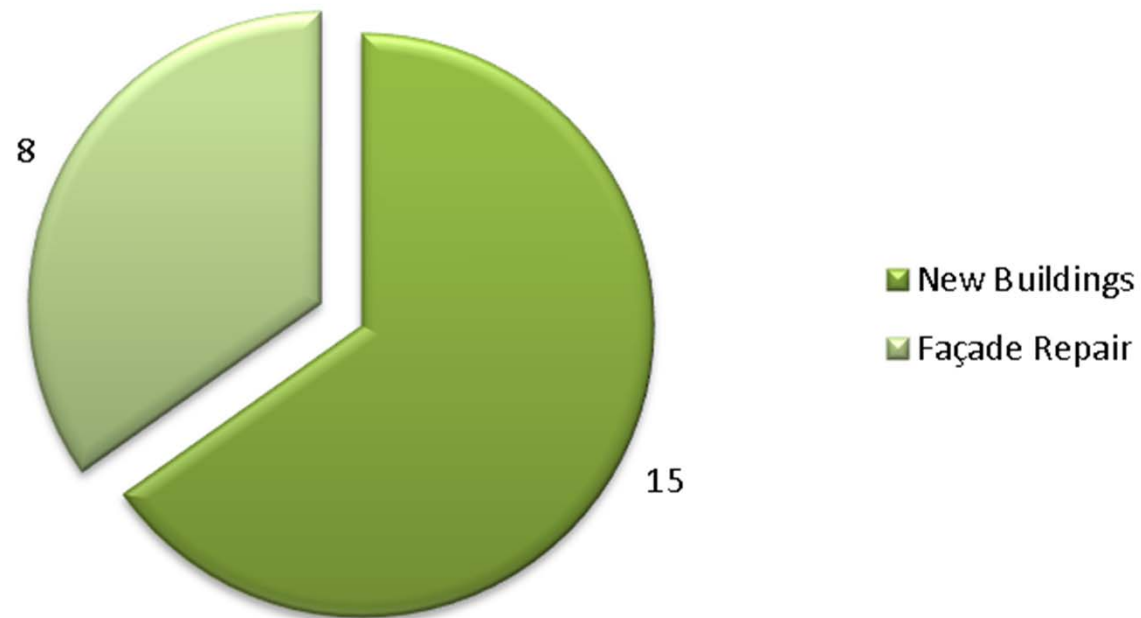
- Port Authority
 - BIM standards in place
 - Projects underway
- NYC SCA
 - BIM standards in place
 - Projects underway
- NYC DDC
 - BIM standards in place
 - BIM standards to launch May 2012
- DASNY
 - BIM design standard in place
 - BIM construction protocol in place
 - OMH Bronx Medical Center Project Underway



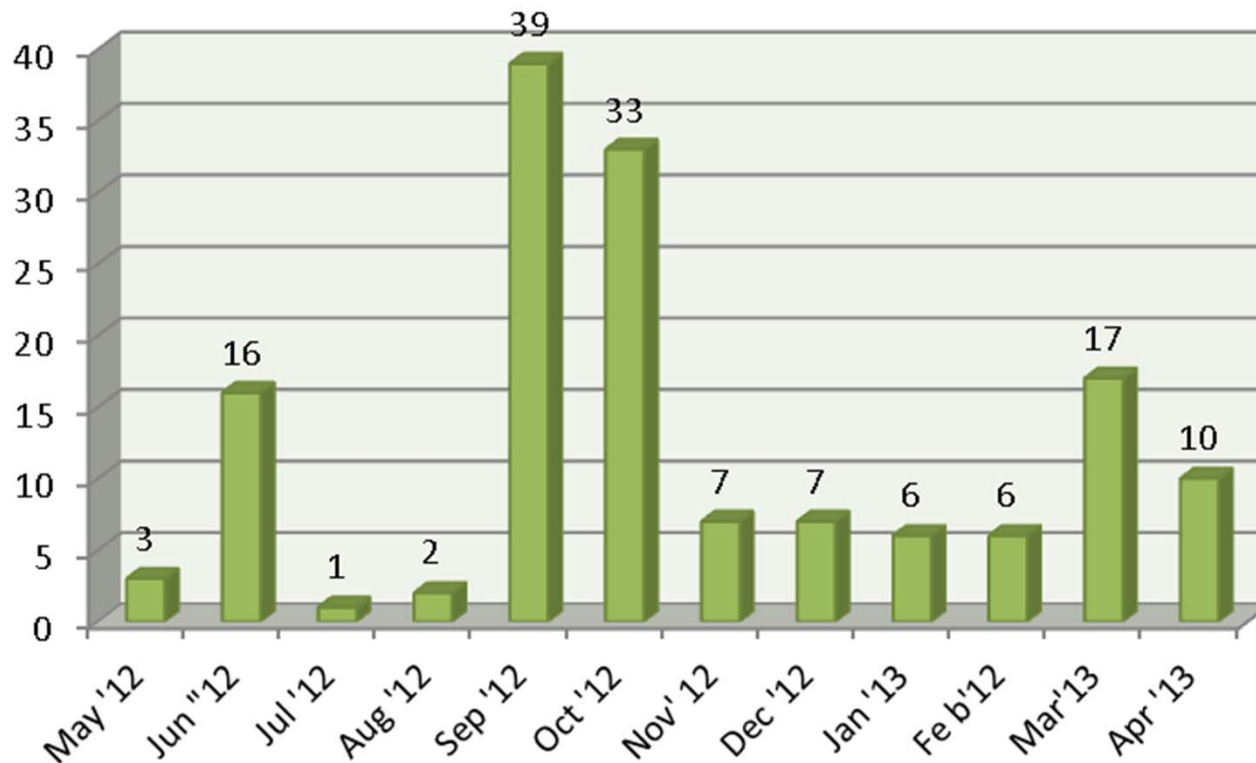
NYC Buildings:3D Site Safety Plans

- First Regulatory implementation May 2012
- **147** reviews performed with **23** projects reviewed and approved electronically in first year
- Inspections conducted on wireless hand-held devices - implementation ongoing

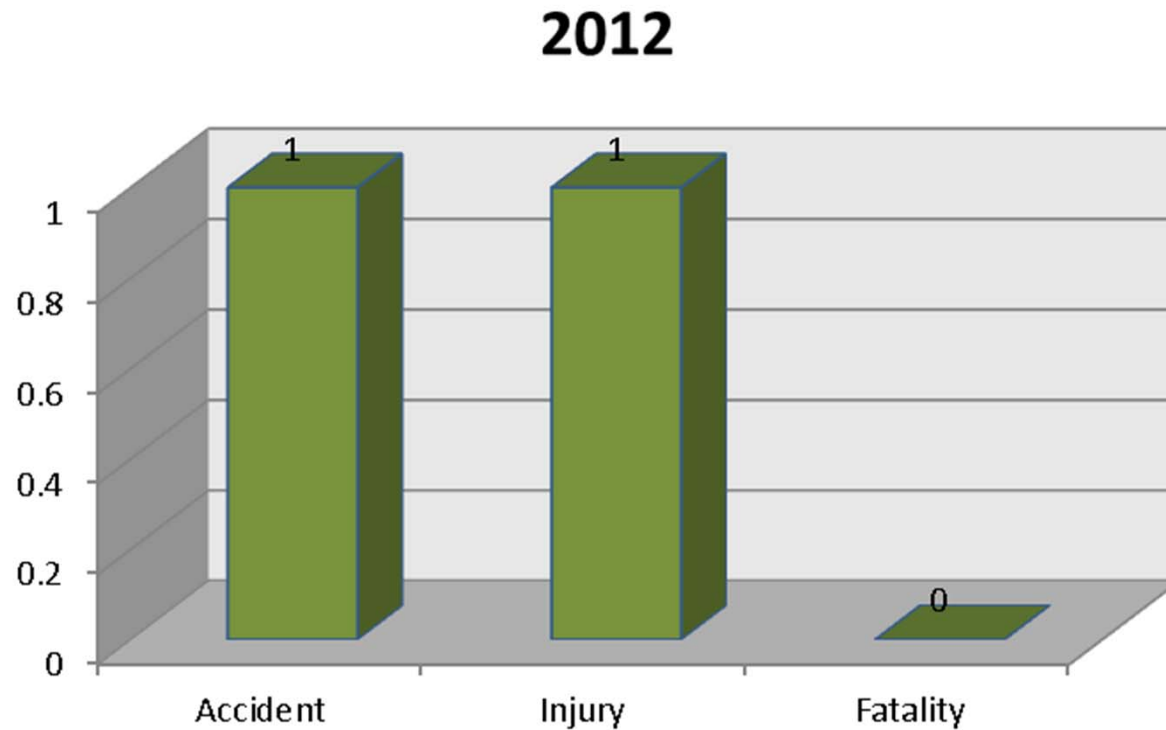
Breakdown of Current Major Building BIM Filings



Progression of Major Buildings Projects BIM Filings



2012 Accidents at BIM Major Building Projects



BIM implementation at DOB

- Advance planning = Increased Site Safety
- Better Service/Fewer Office Visits = Faster Approvals
- Enhance Inspections = Quality Assurance.

680 Madison



Demo Penthouse and Roof

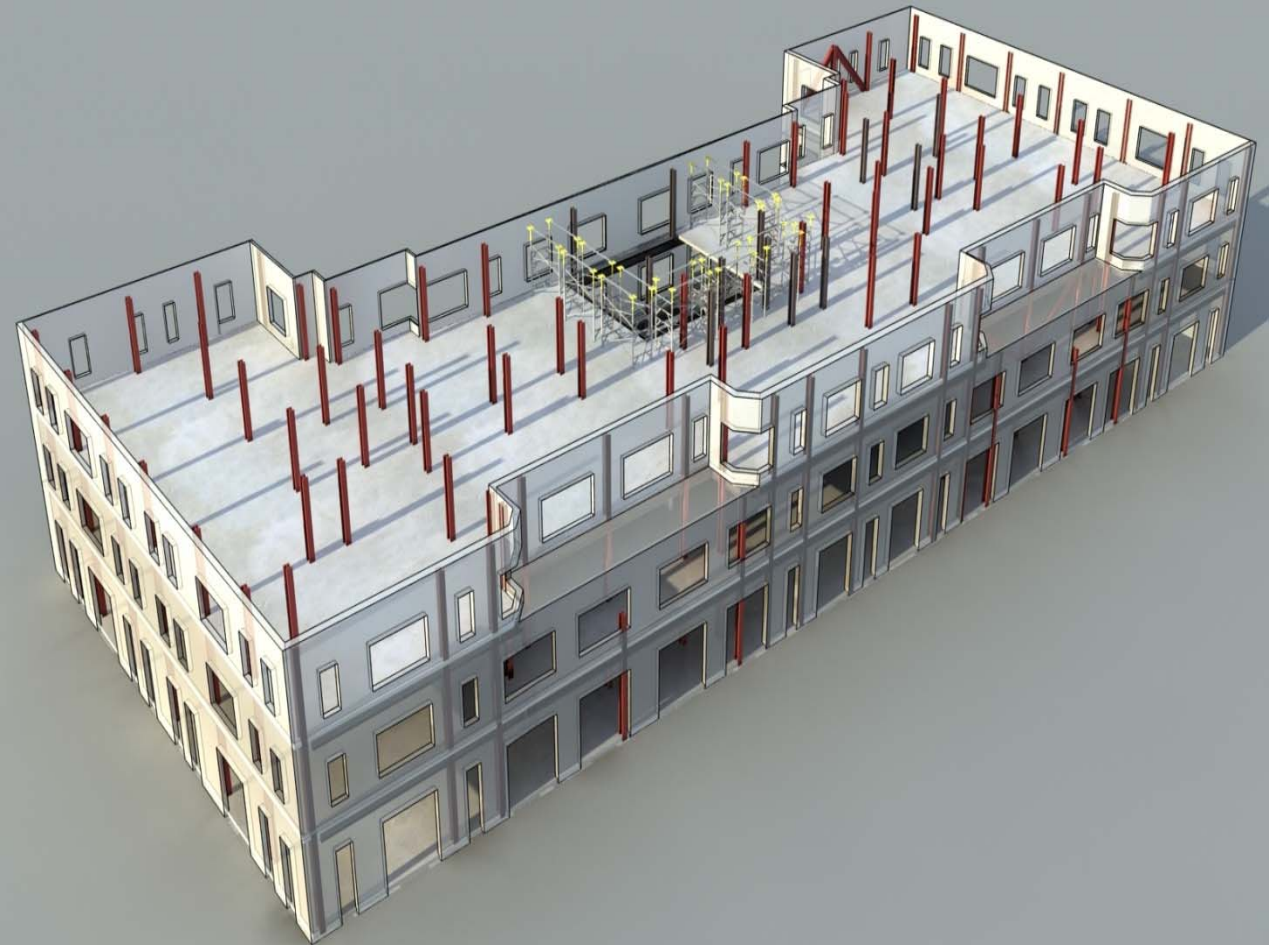


Demo and shore for new
core
Demo elevator enclosures

Continue down building
demolishing openings in
each floor slab

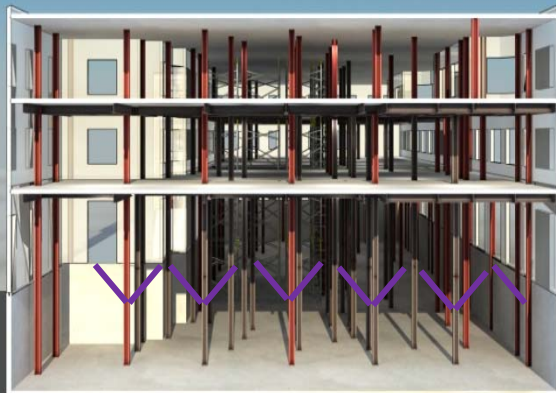
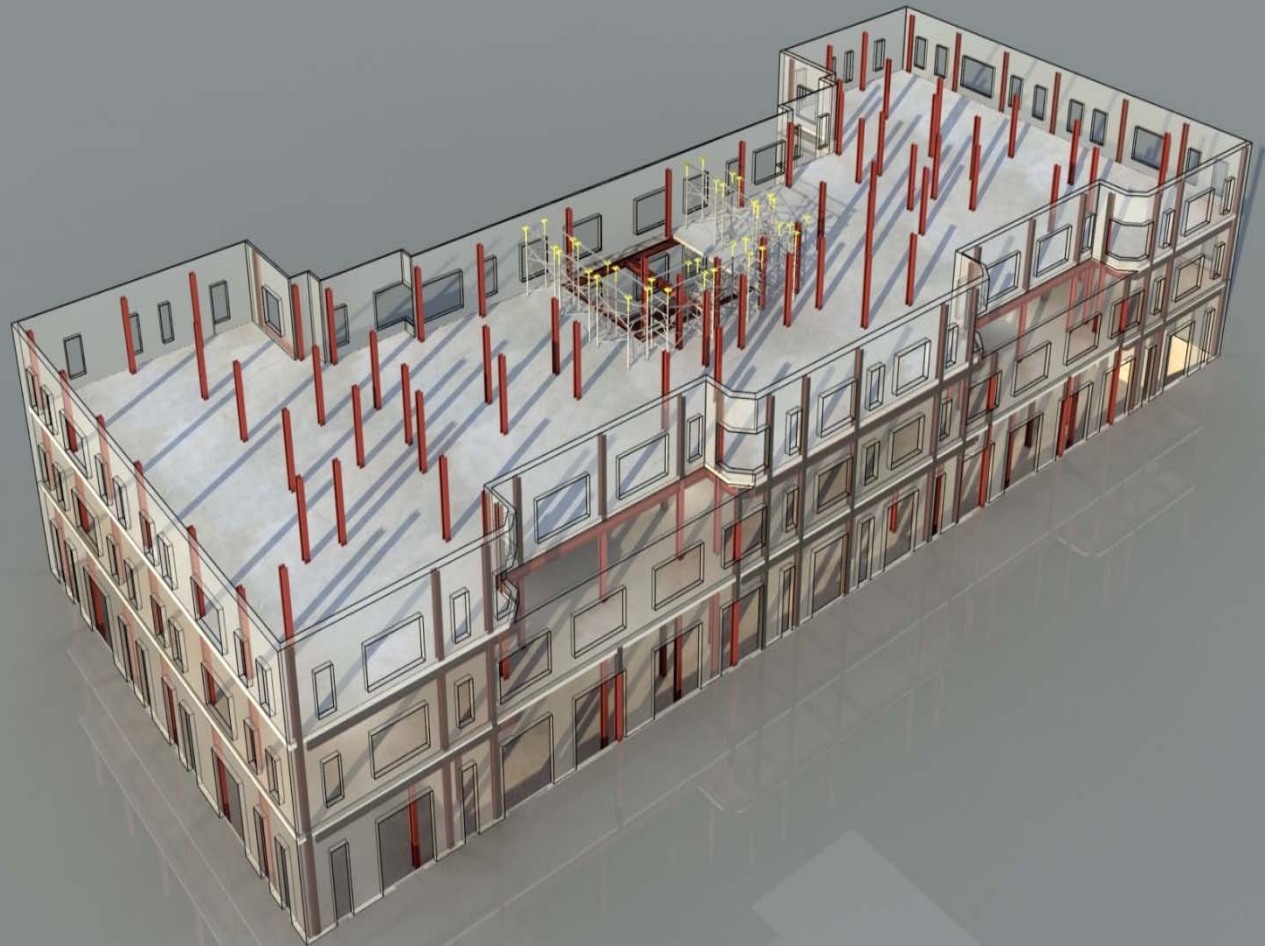


Bottom 4 floors of building
with core demo and
shoring complete

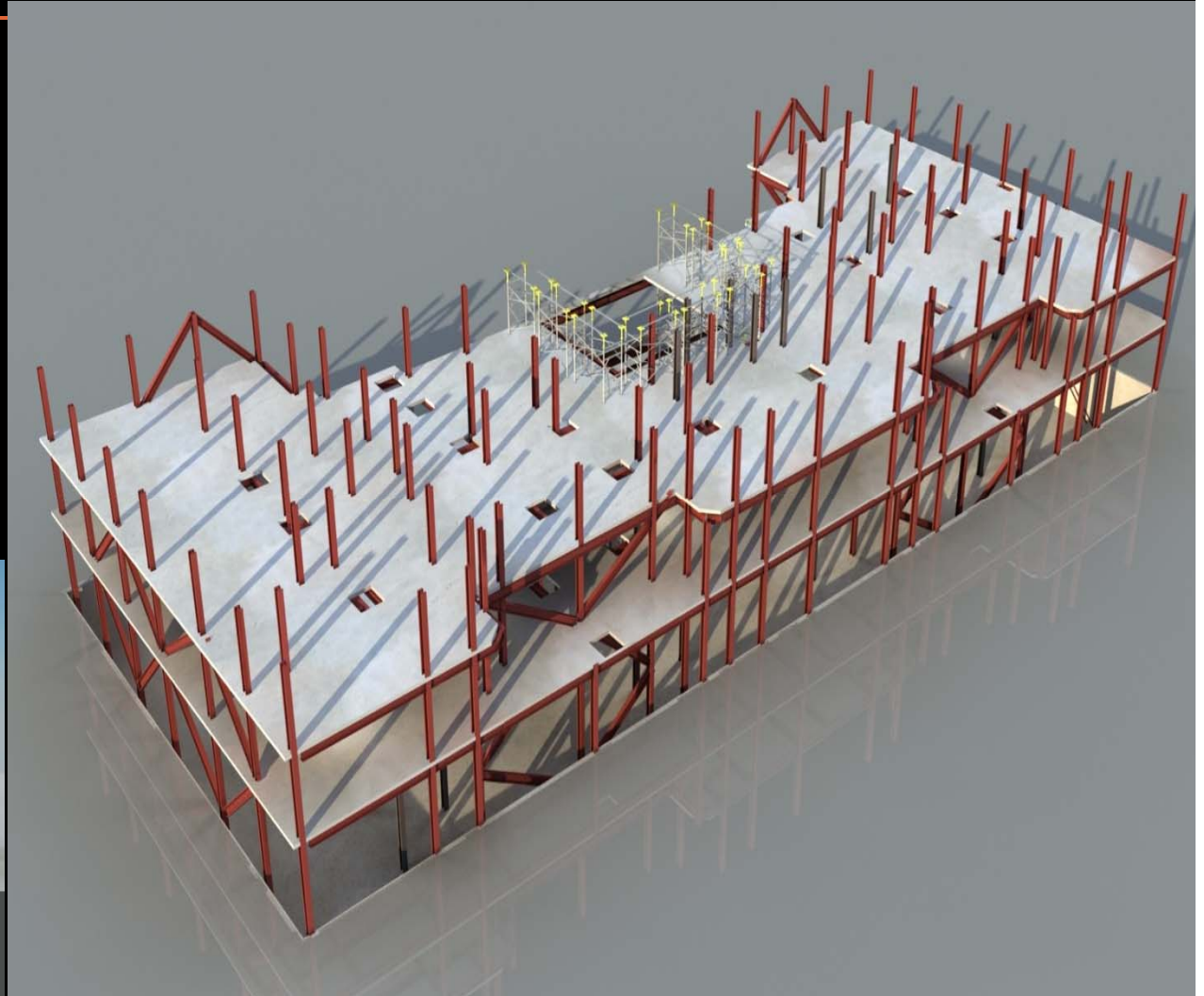
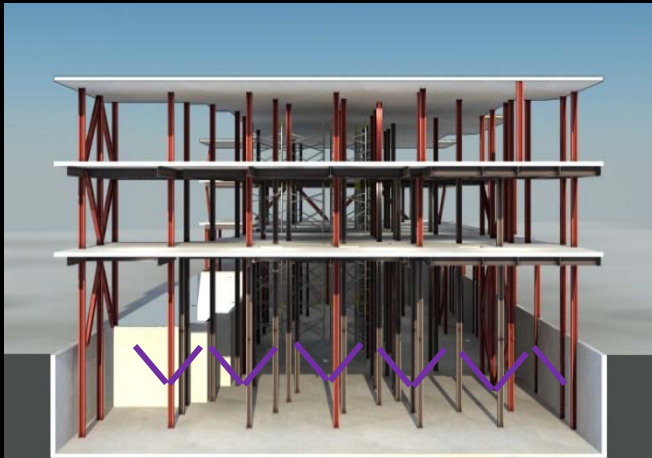


Provide shoring at all interior columns from above splice to underside of 2nd floor. **Shoring not shown in illustration (3d)**

Demo 1st floor.



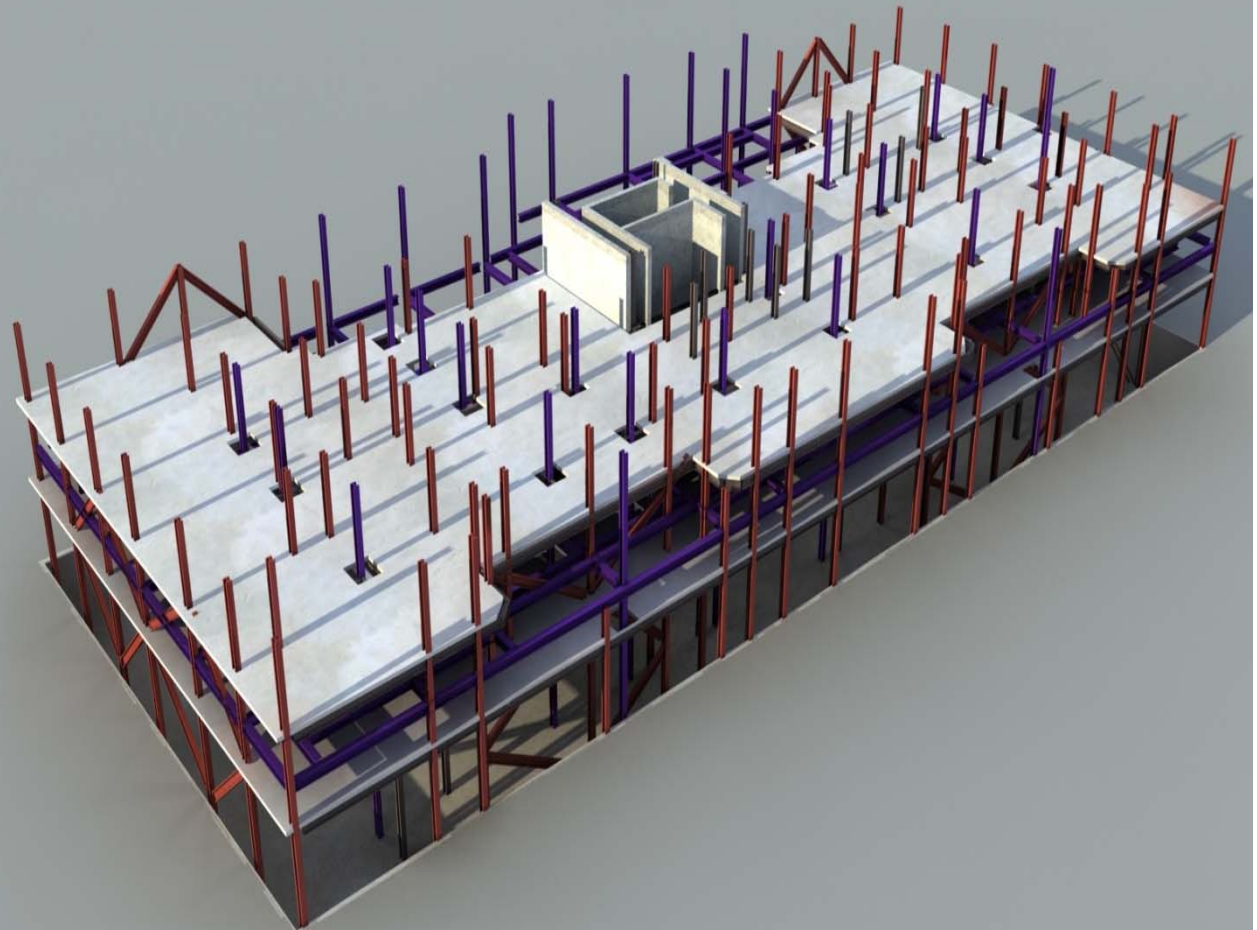
Bracing associated with exterior demo and openings in 2nd and 3rd slab for new columns. Existing framing shored with temporary grillage not shown in illustration.



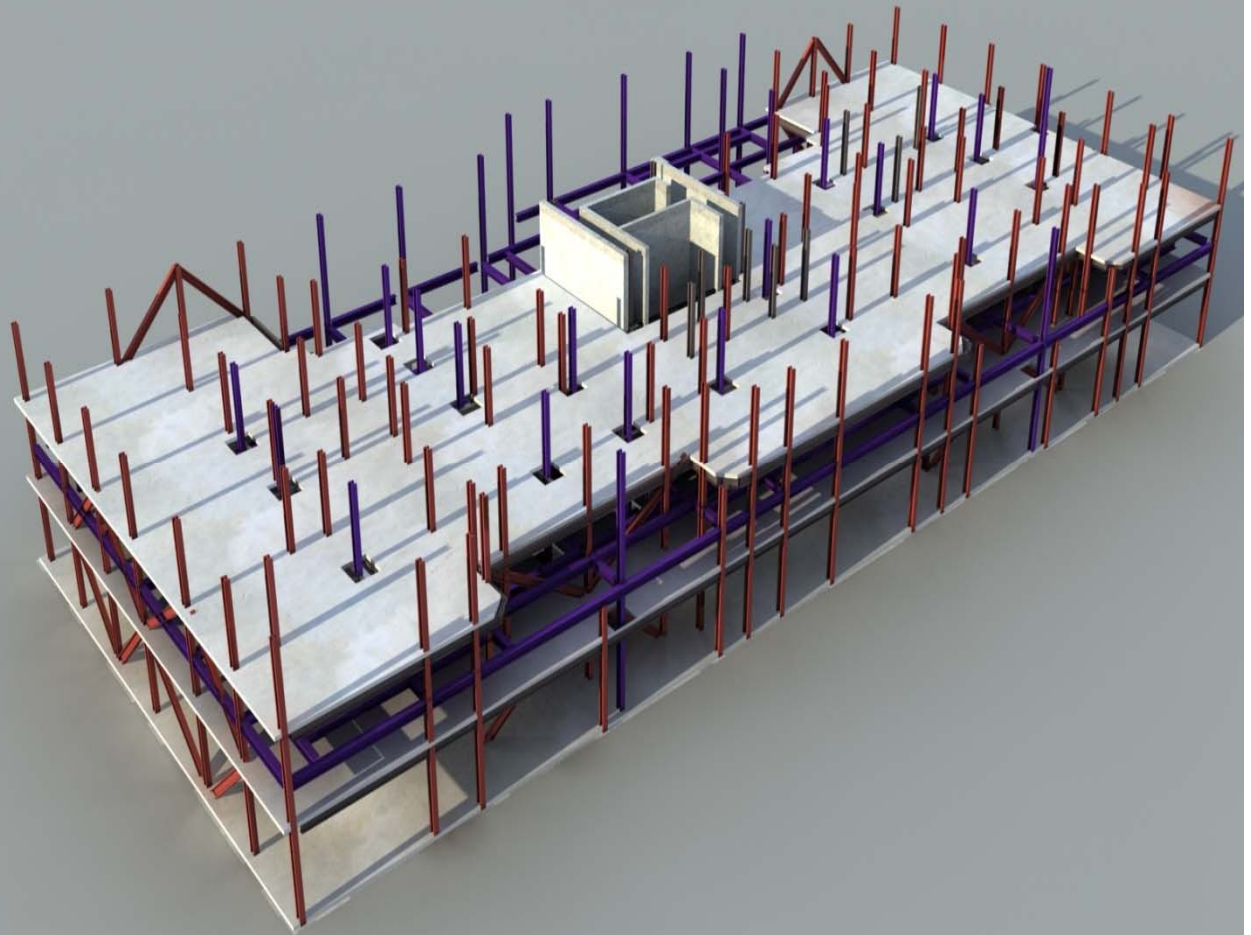
New columns and new core
and new 2nd floor framing.

Some 2nd floor members
left aside where they clash
with existing column

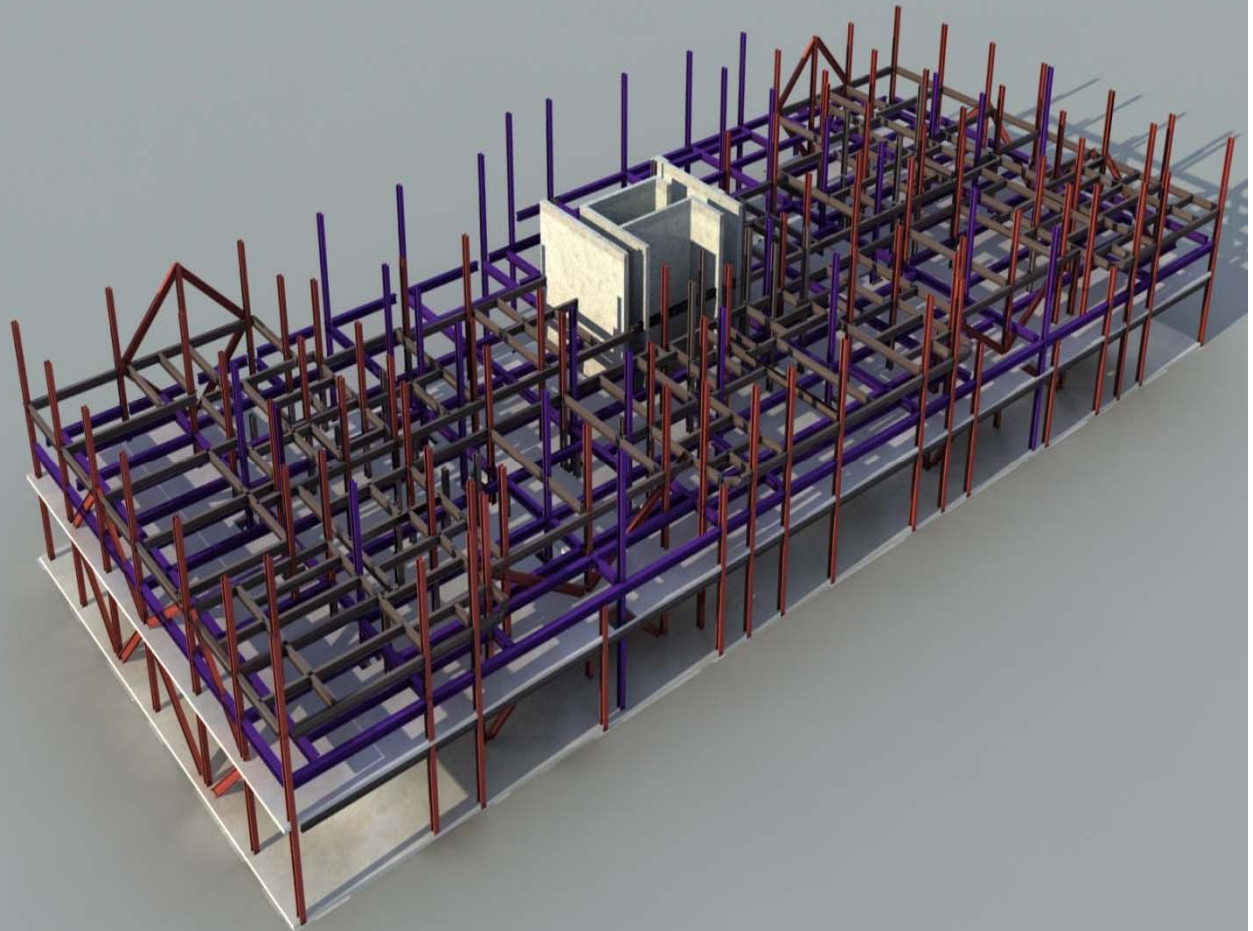
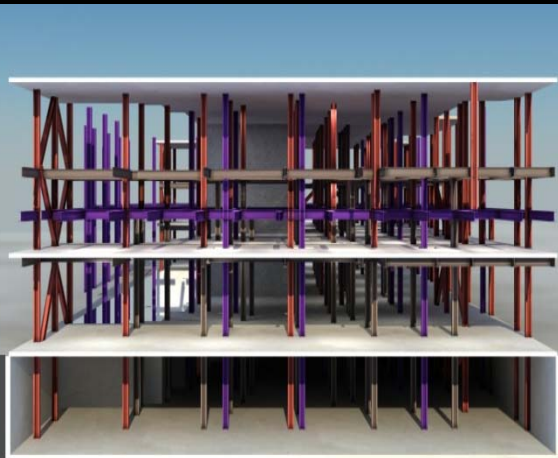
Tie new columns into 4th
floor transfers.



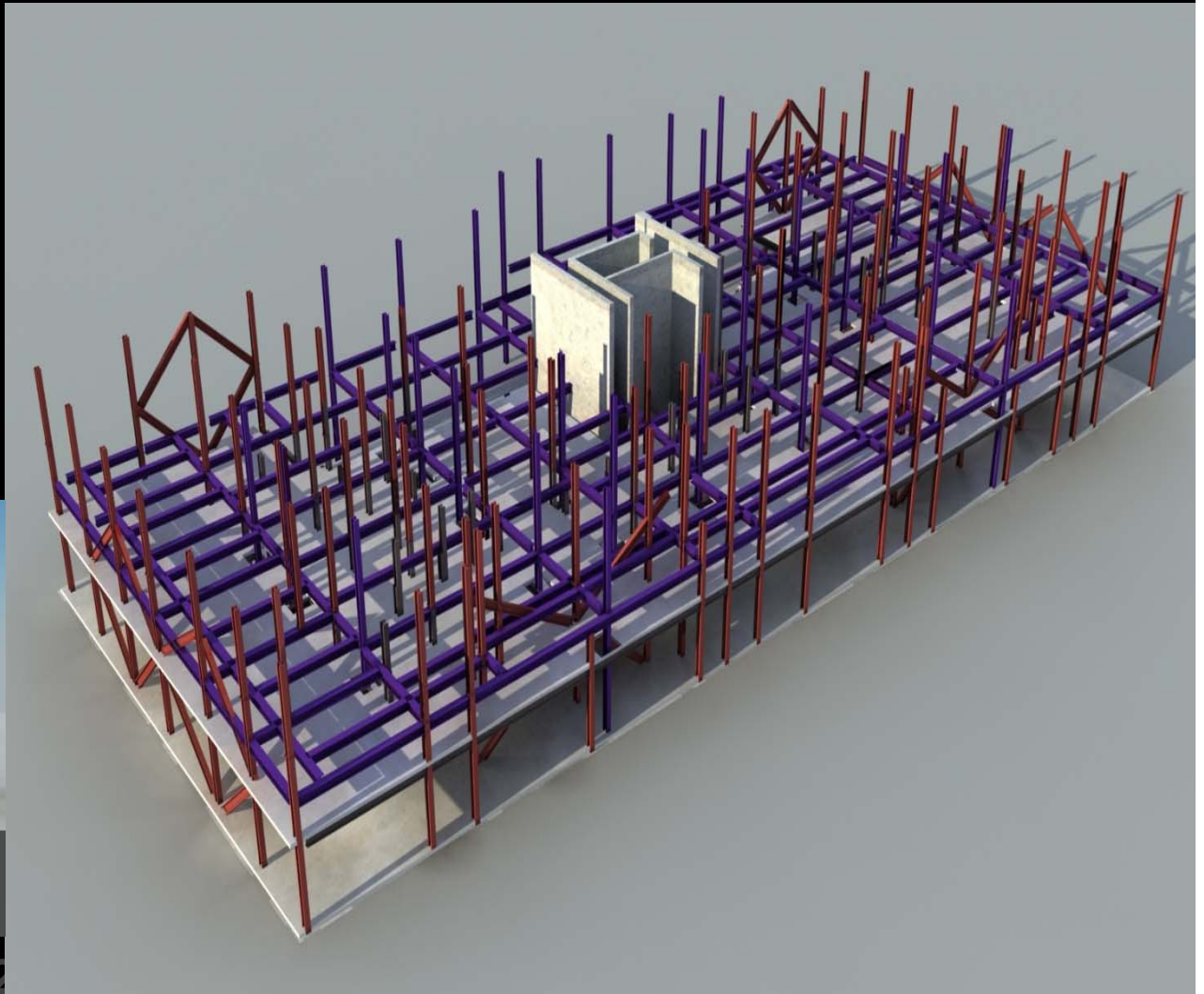
New 1st floor slab installed
Column bracing removed.



Demo 3rd floor slab through
new 2nd floor framing

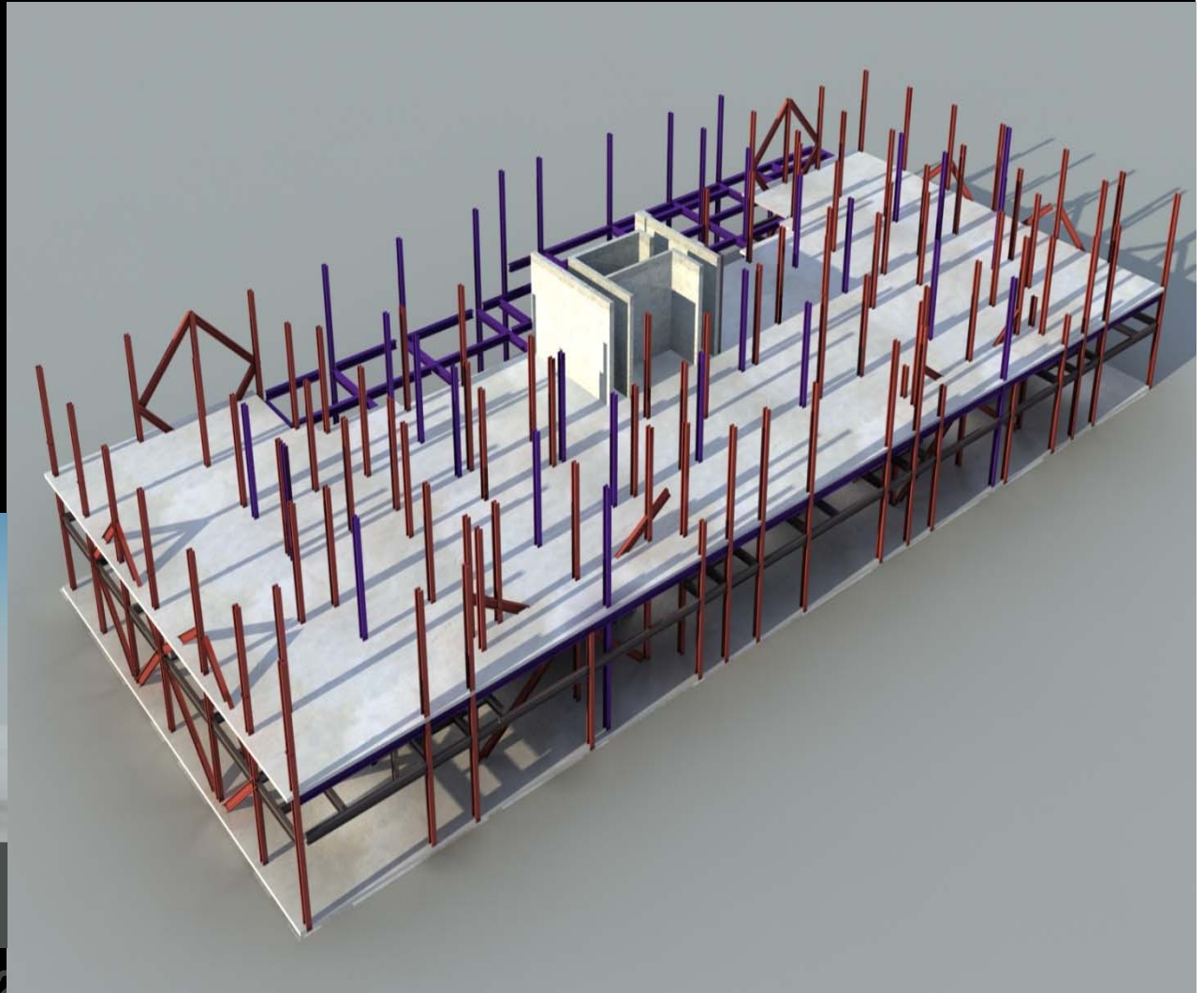


Demo 3rd floor steel and
existing columns

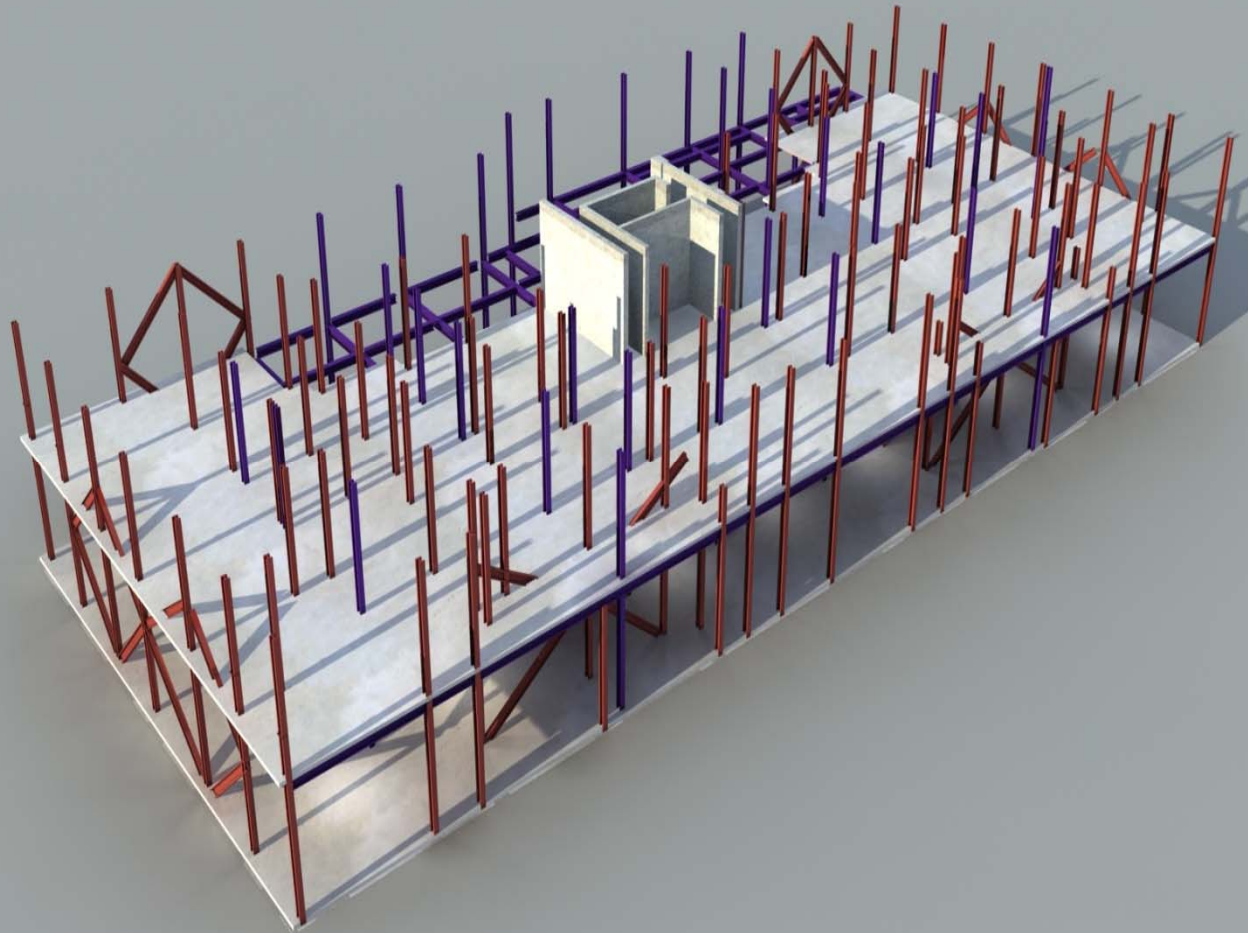


Demo existing 2nd floor slab
and existing columns above

Install New 2nd floor slab



Demo existing 2nd floor
framing and columns to
cellar



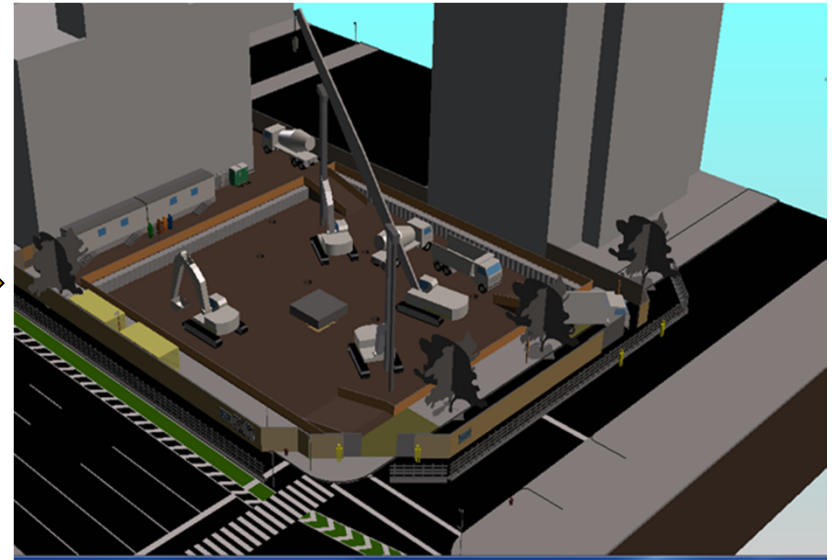
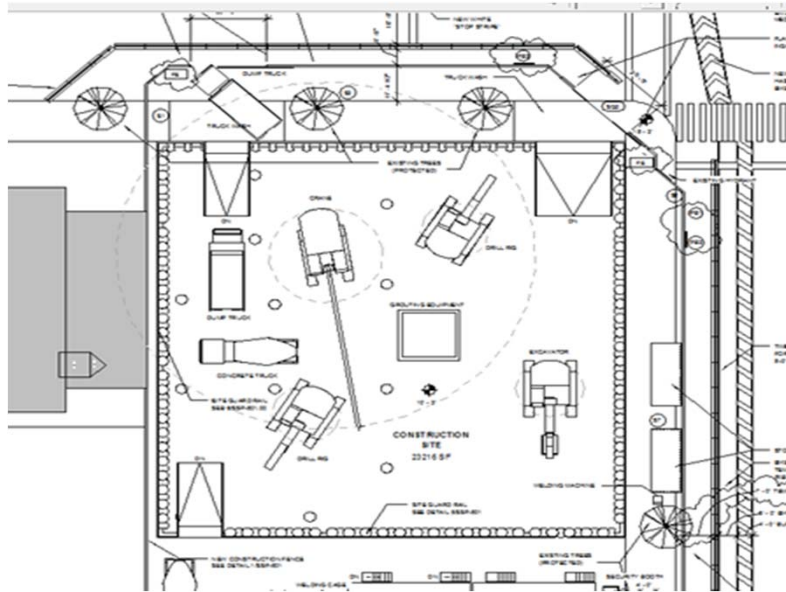
BIM Site Safety Plan Review at DOB

How to use 3D Models to Identify Safety Issues

- Sequencing Work
- Edge protection interior /exterior
- Elevation changes and protective measures
- Checking clearance issues
- Perimeter/adjacent property protection

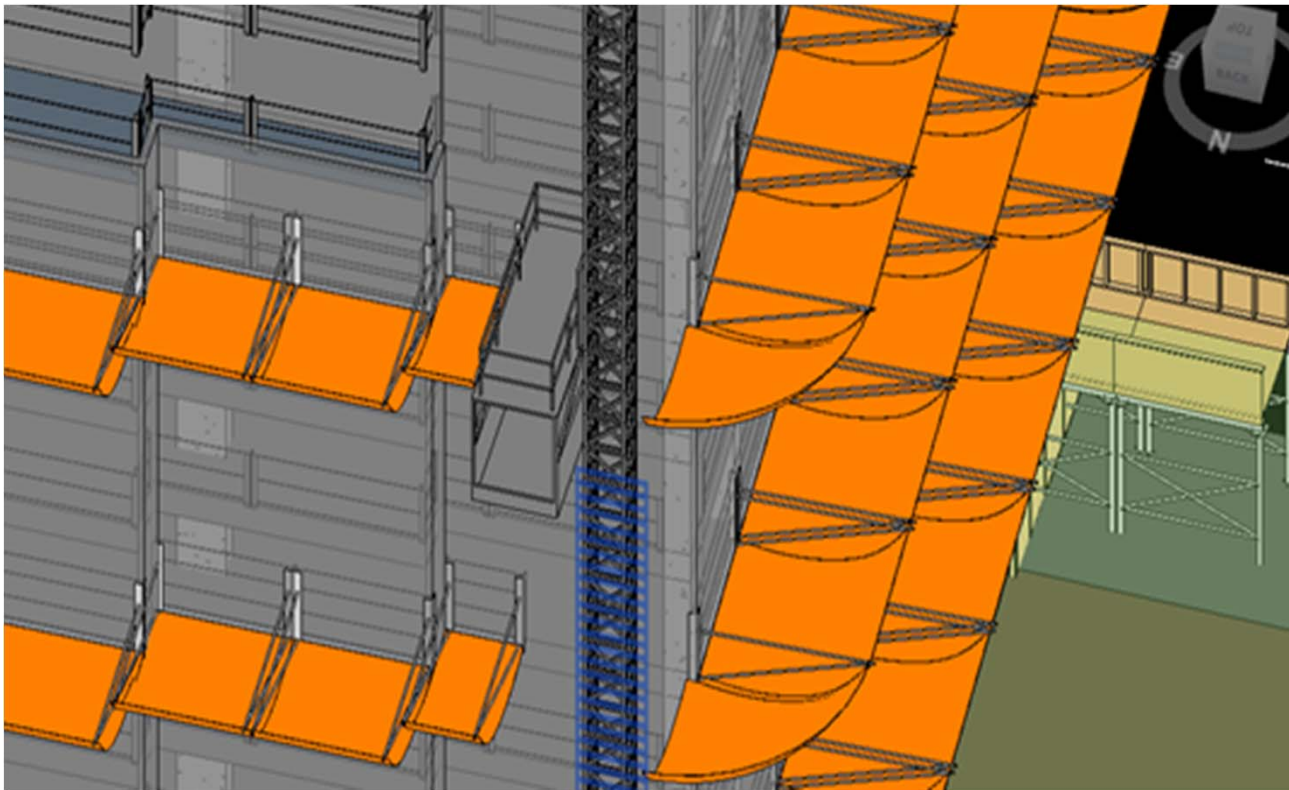
Site Logistics Traditional vs. New

Where we are heading?
Pictures come to life.



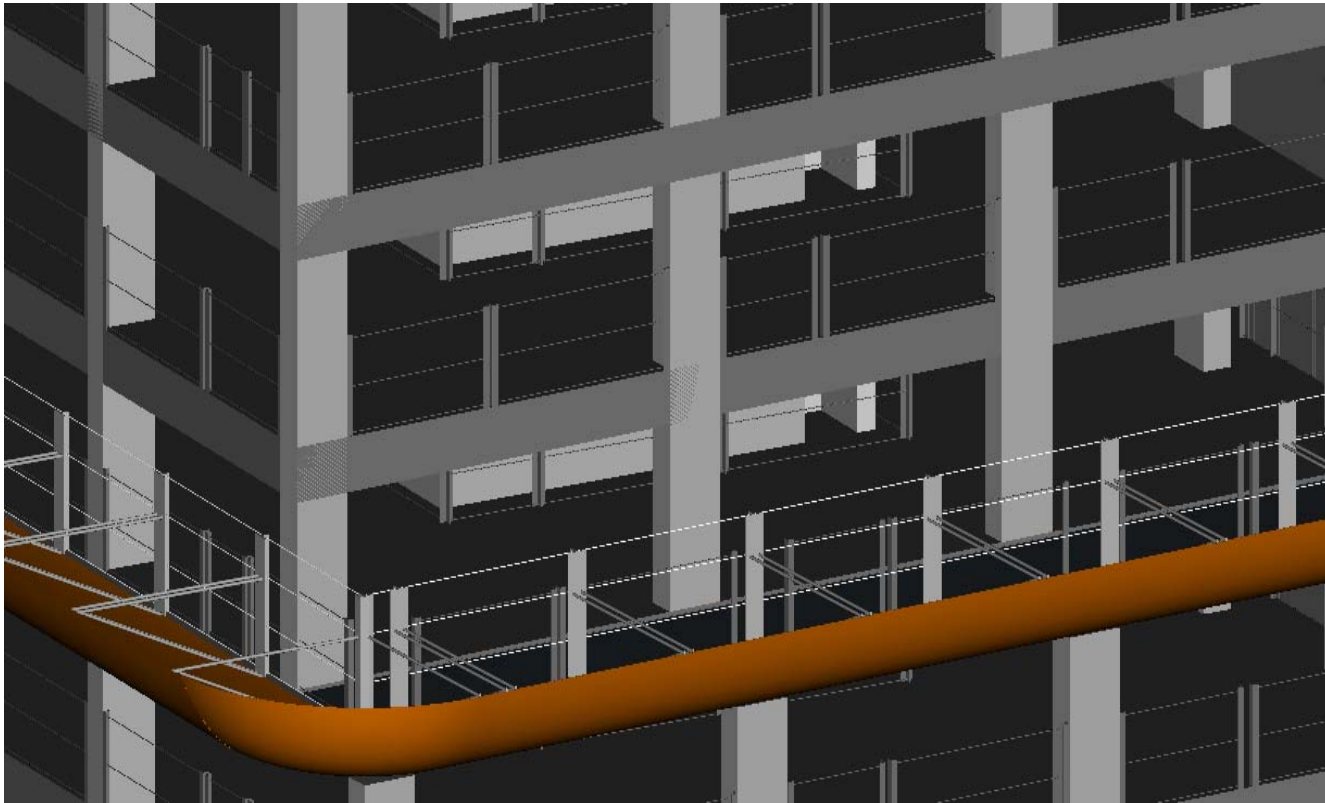
Site Safety with BIM at DOB

Protected Perimeter



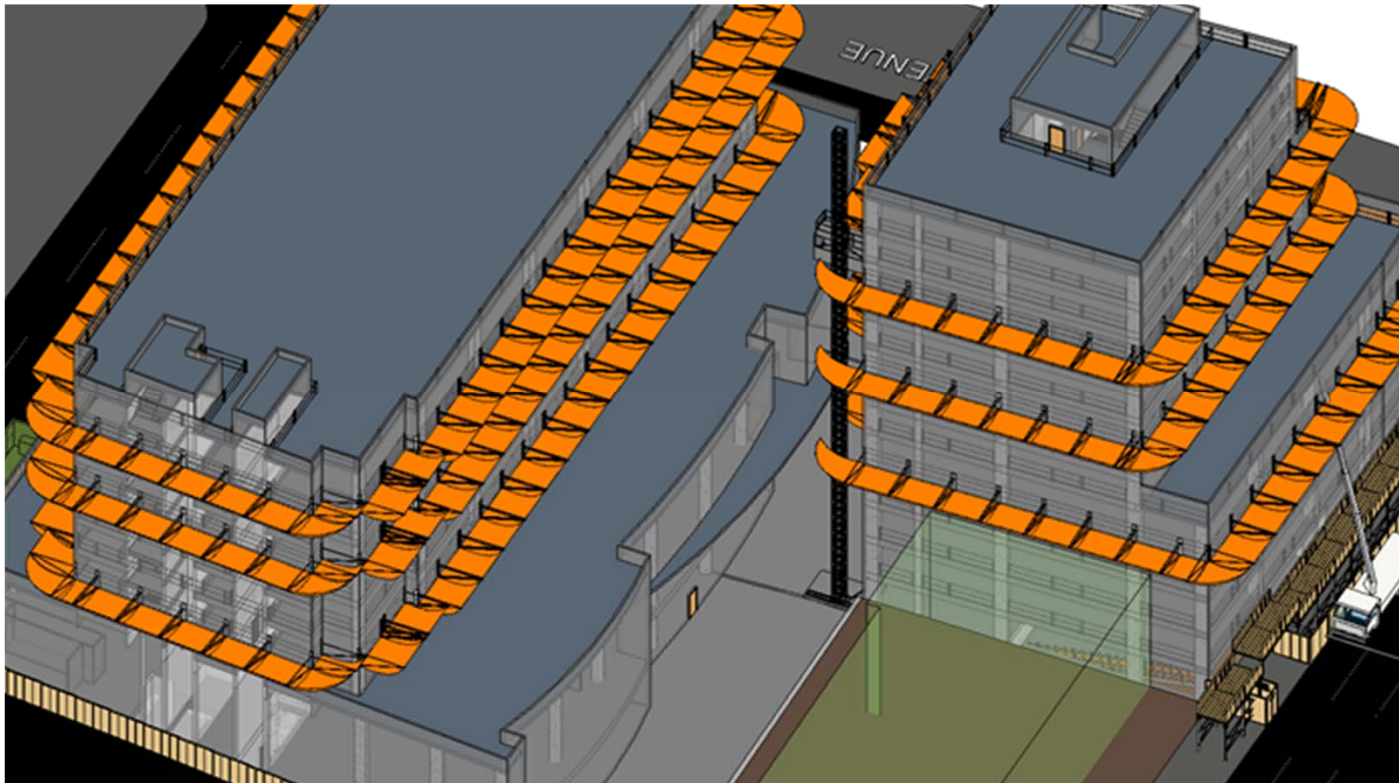
Site Safety with BIM at DOB

Protected Perimeter



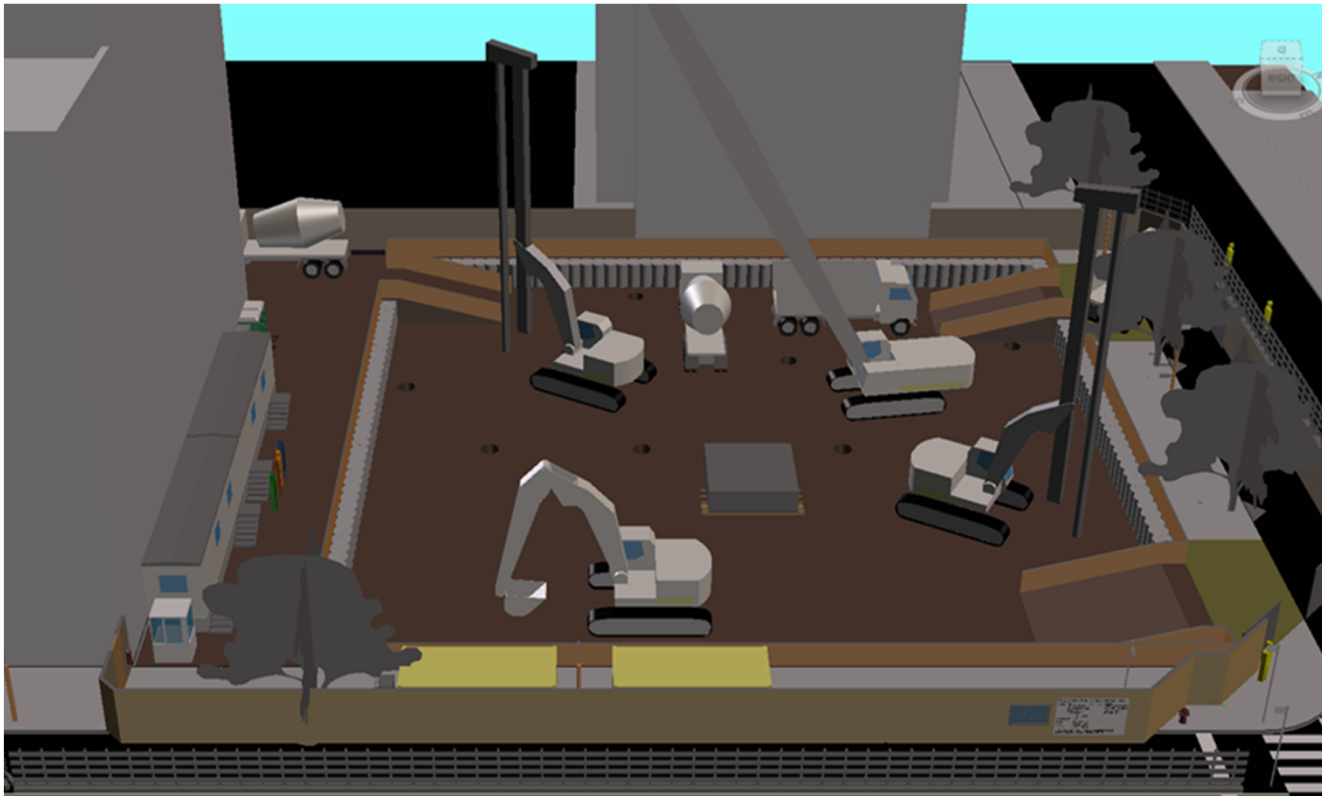
Site Safety with BIM at DOB

Protected Perimeter



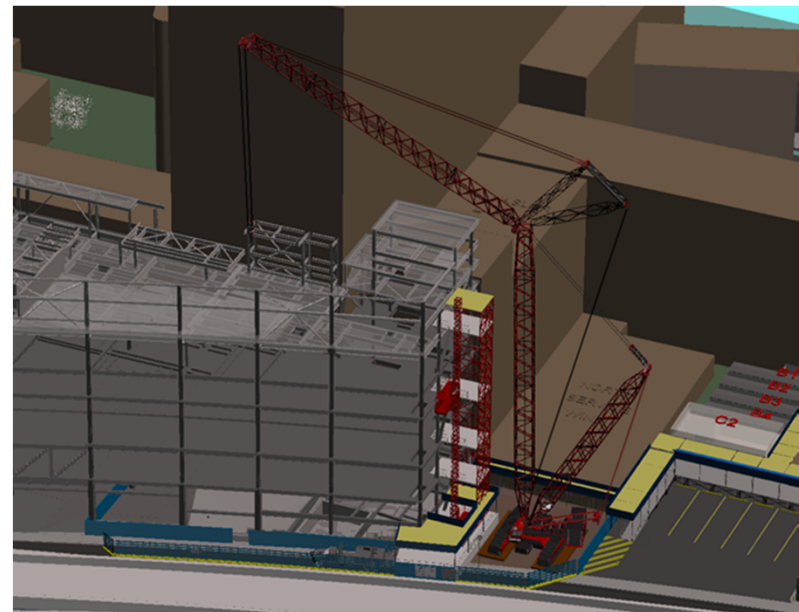
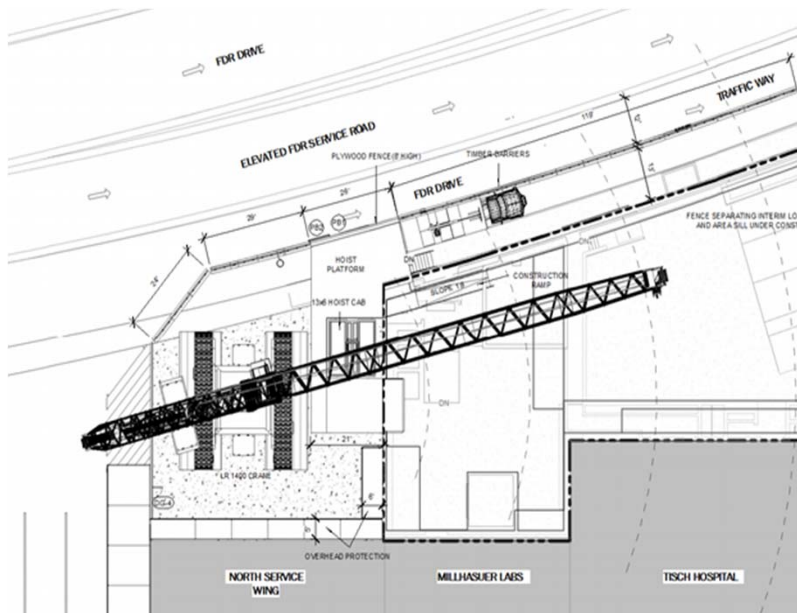
Site Safety with BIM at DOB

Excavation & Foundation elevation changes



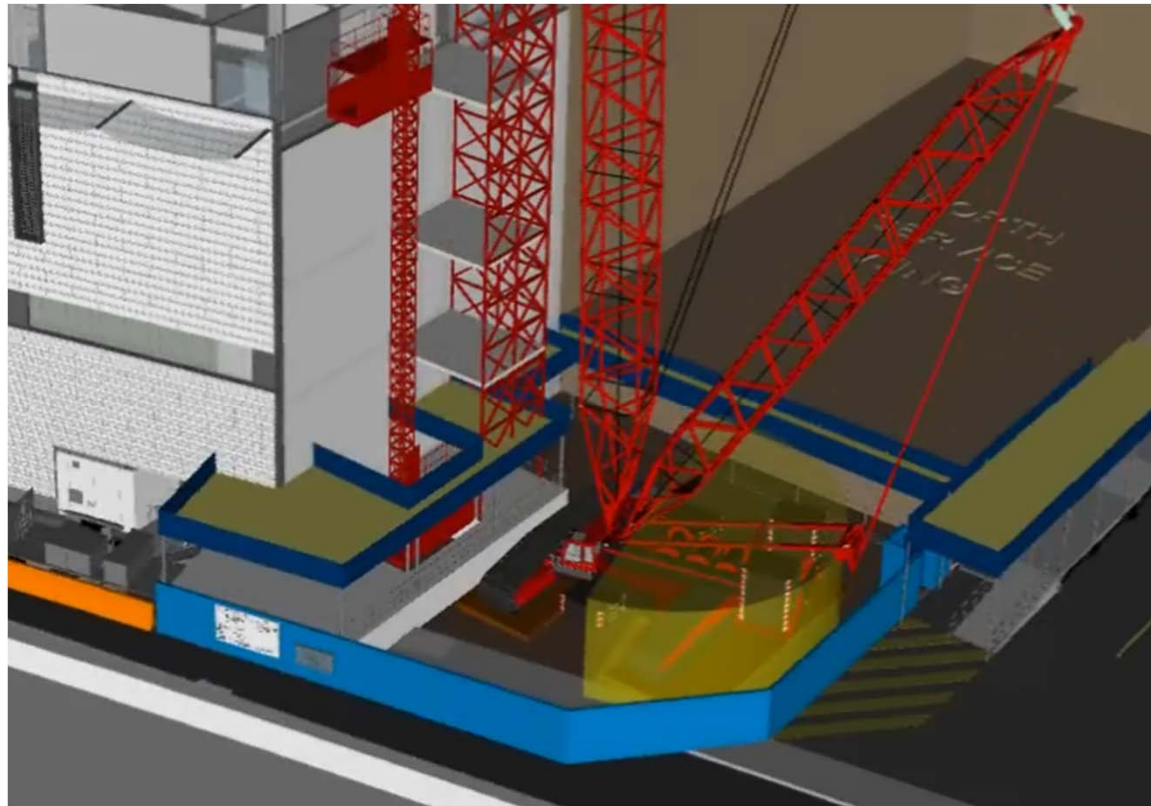
Site Safety with BIM at DOB

Clearance Issues



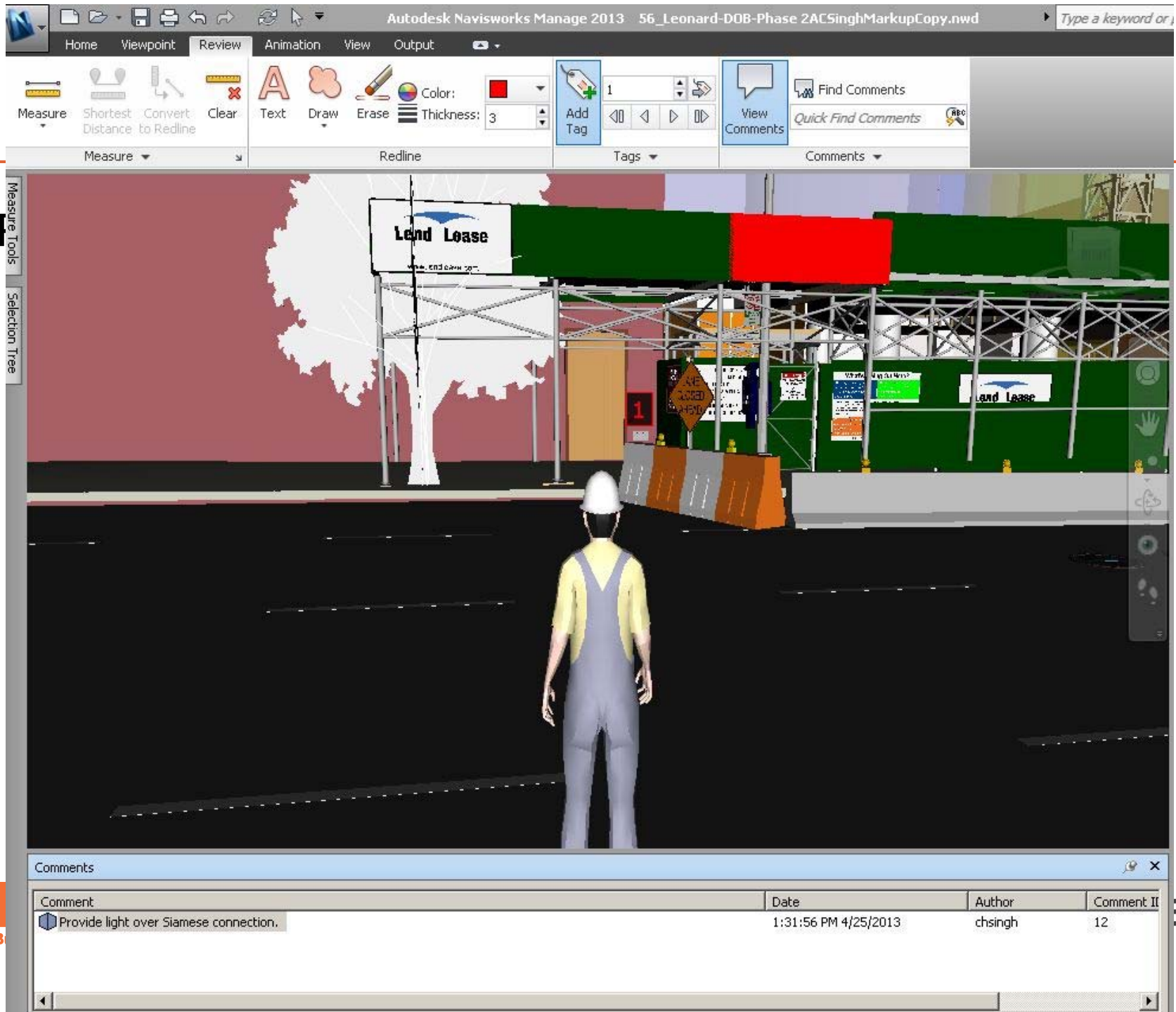
Site Safety with BIM at DOB

Clearance Issues

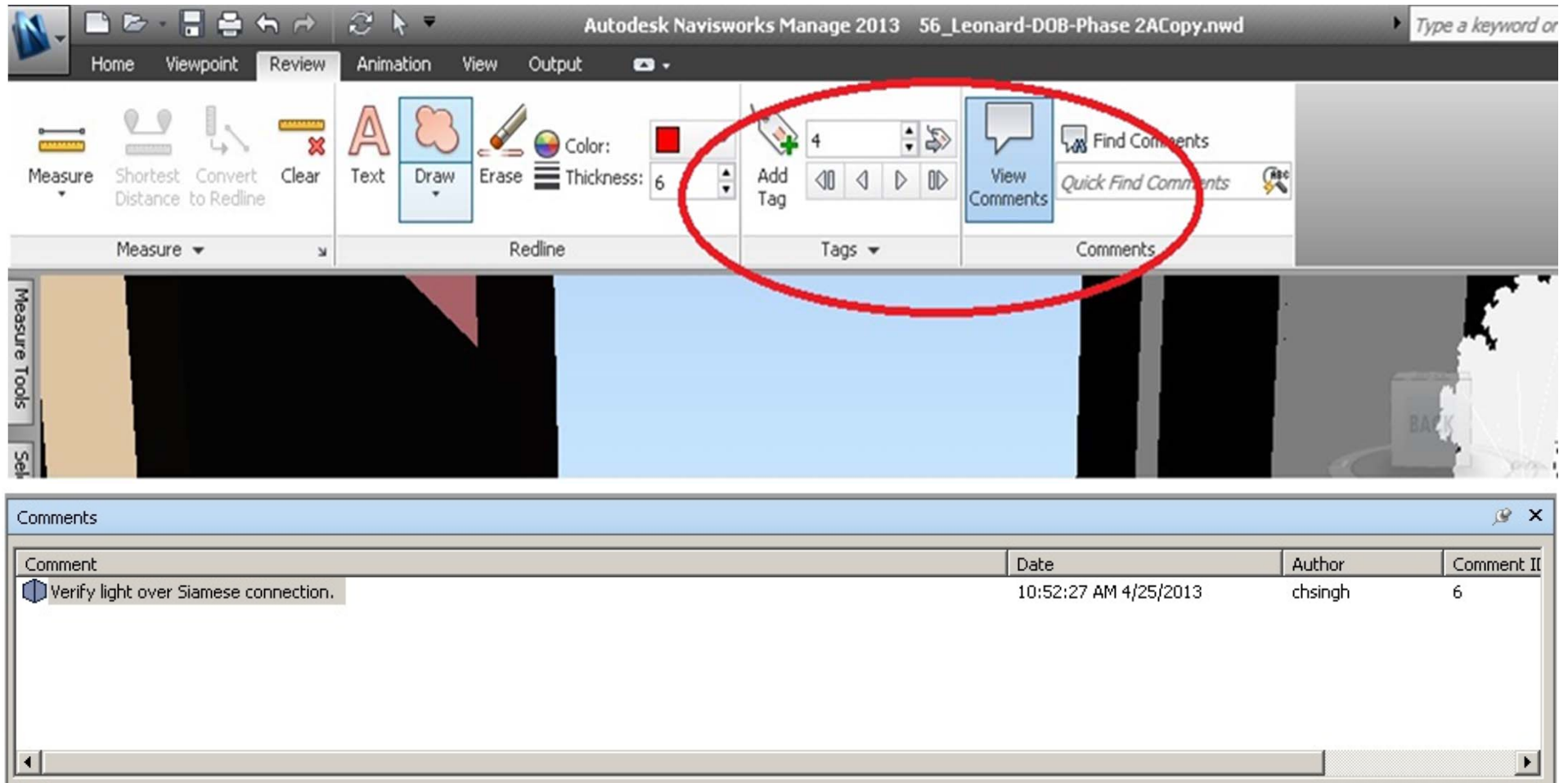


Site Safety Plan Exam

Plan exam objection embedded
in model at location of
deficiency



Adding Tags for Review Comments



The screenshot displays the Autodesk Navisworks Manage 2013 software interface. The top ribbon shows the 'Review' tab selected, with sub-tabs for 'Home', 'Viewpoint', 'Review', 'Animation', 'View', and 'Output'. The 'Review' sub-tab contains several tool groups: 'Measure' (with tools like Measure, Shortest Distance, Convert to Redline, and Clear), 'Text' (with Text and Draw), 'Erase' (with Erase), 'Color' (with Color and Thickness), 'Add Tag' (with a green plus icon and a dropdown menu showing '4'), and 'View Comments' (with a speech bubble icon). A red circle highlights the 'Add Tag' and 'View Comments' tool groups. Below the ribbon, a 3D model of a building is visible. At the bottom, a 'Comments' window is open, displaying a table with the following data:

Comment	Date	Author	Comment ID
Verify light over Siamese connection.	10:52:27 AM 4/25/2013	chsingh	6

Video Examples

Plan Review [Video](#)

BIM



Work Permit Department of Buildings

Permit Number: 121023597-01-EQ-SH

Issued: 03/06/2013

Expires: 02/24/2014

Address: MANHATTAN 50 EAST 42 STREET

Issued to: ANDON IKSINO

Business: XINOS CONSTRUCTION CORP

Contractor No: GC-8573

Description of Work:

ALTERATION TYPE 3 - CONSTRUCTION EQUIPMENT - SIDEWALK-SHED HEAVY DUTY SIDEWALK SHED INSTALLATION AS PER 2008 CODE, CHAPTER 33.



Review is requested under Building Code: 2008

Electrical Application Number for Shed Lighting: M325151

To see a Zoning Diagram (ZD1) or to challenge a zoning approval filed as part of a New Building application or Alteration application filed after 7/13/2009, please use "My Community" on the Buildings Department web site at www.nyc.gov/buildings.

Emergency Telephone Day or Night: 311

Borough Commissioner:

Commissioner of Buildings:

Tampering with or knowingly making a false entry in or falsely altering this permit is a crime that is punishable by a fine, imprisonment or both.

OP-35A (5/10)

Not Applicable

Previous Applicant of Record

Not Applicable

3 Filing Representative

Name: GRACE KLIMEK

Business Name: XINOS CONSTRUCTION CORP

Business Address: 110-32A 15 AVENUE COLLEGE POINT NY 11356

Business Phone: 718-358-4272

Business Fax: 718-358-4301

Video Examples

Façade Video

Site Safety Issues - Inspections

- Provide site overview for inspectors
- Standardize inspection process
- Transfer knowledge from office to the field
- Guide inspectors to critical areas
- Minimize violations for administrative reasons

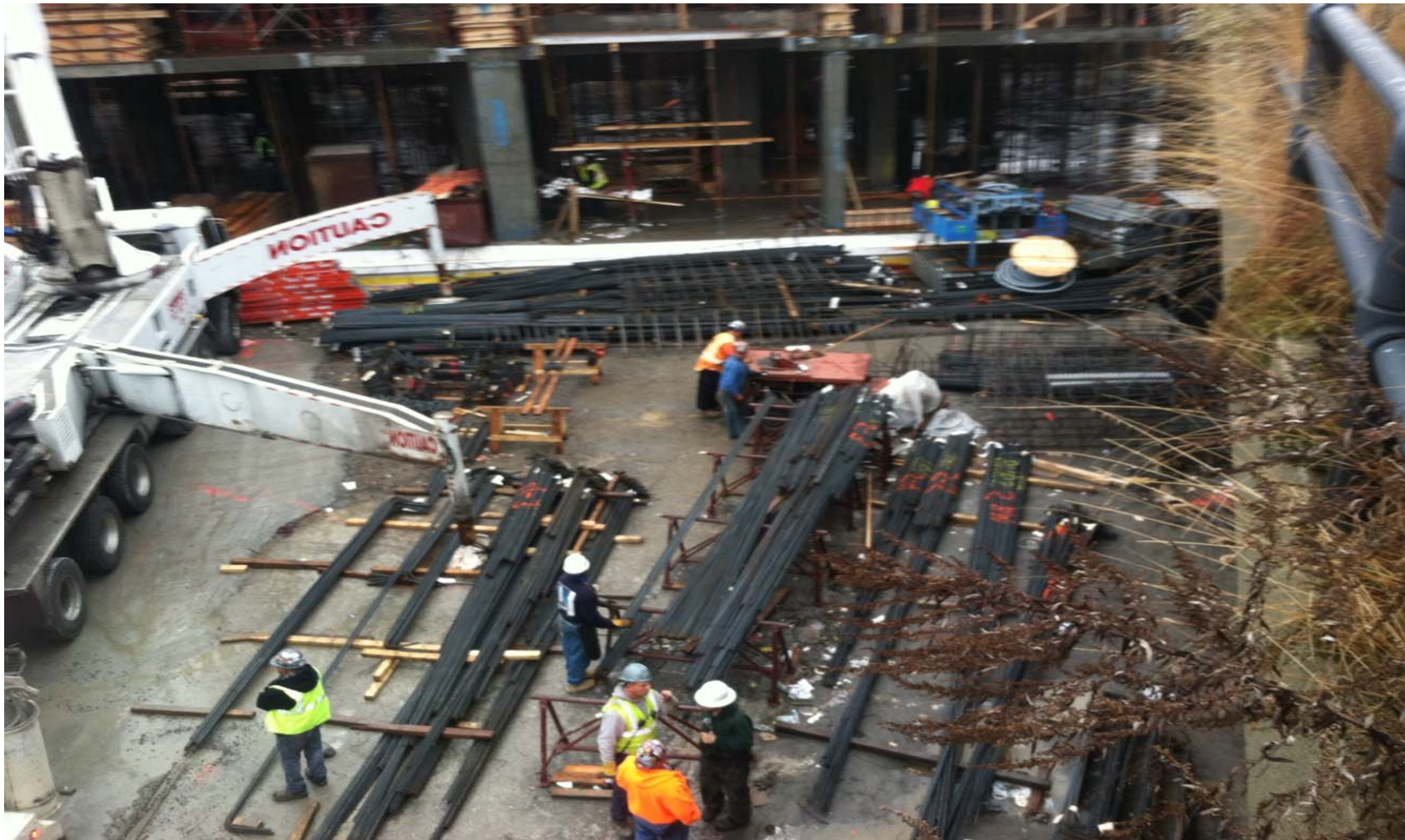
Site Safety Issues - Inspections



Site Safety Issues - Inspections

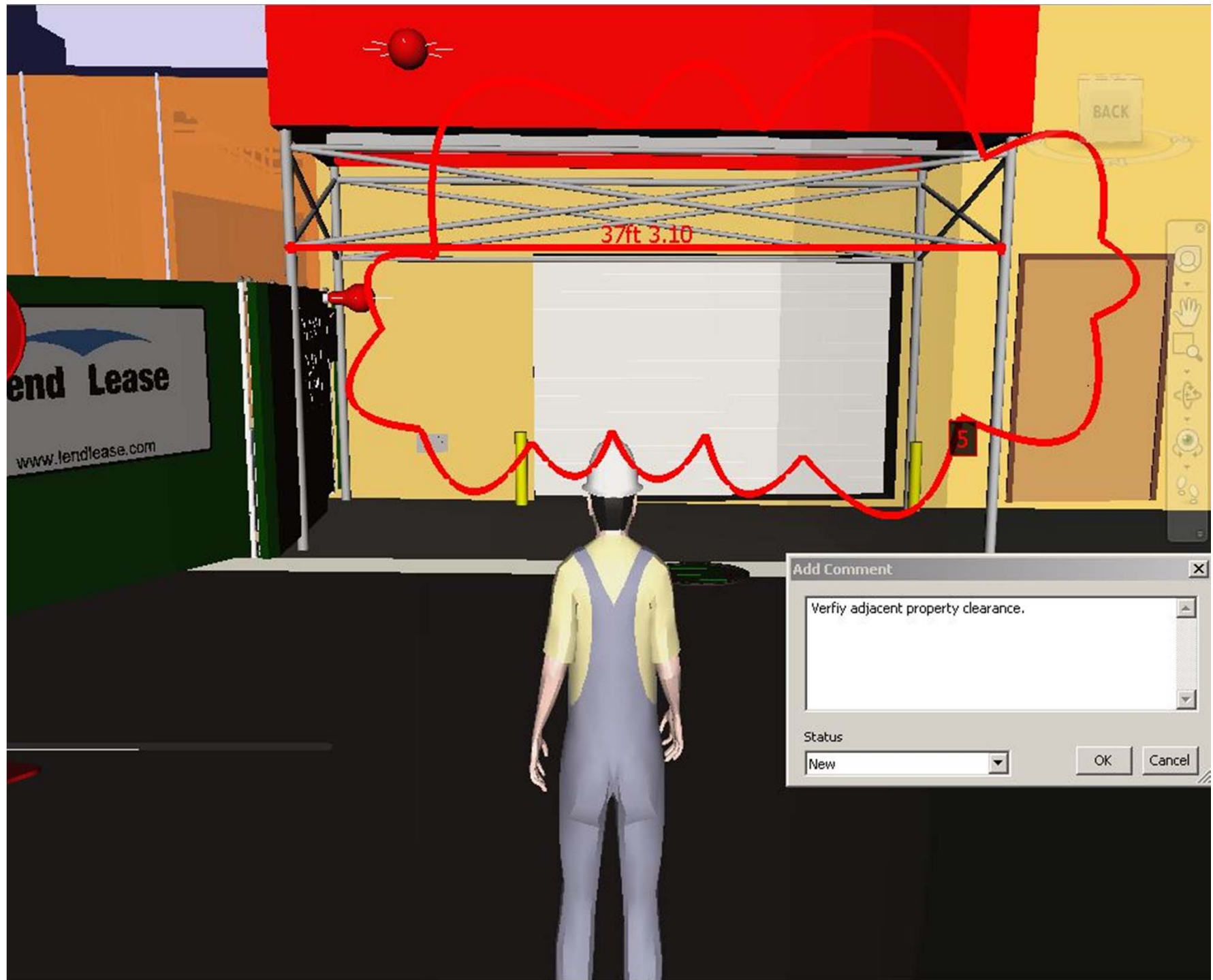


Site Safety Issues - Inspections



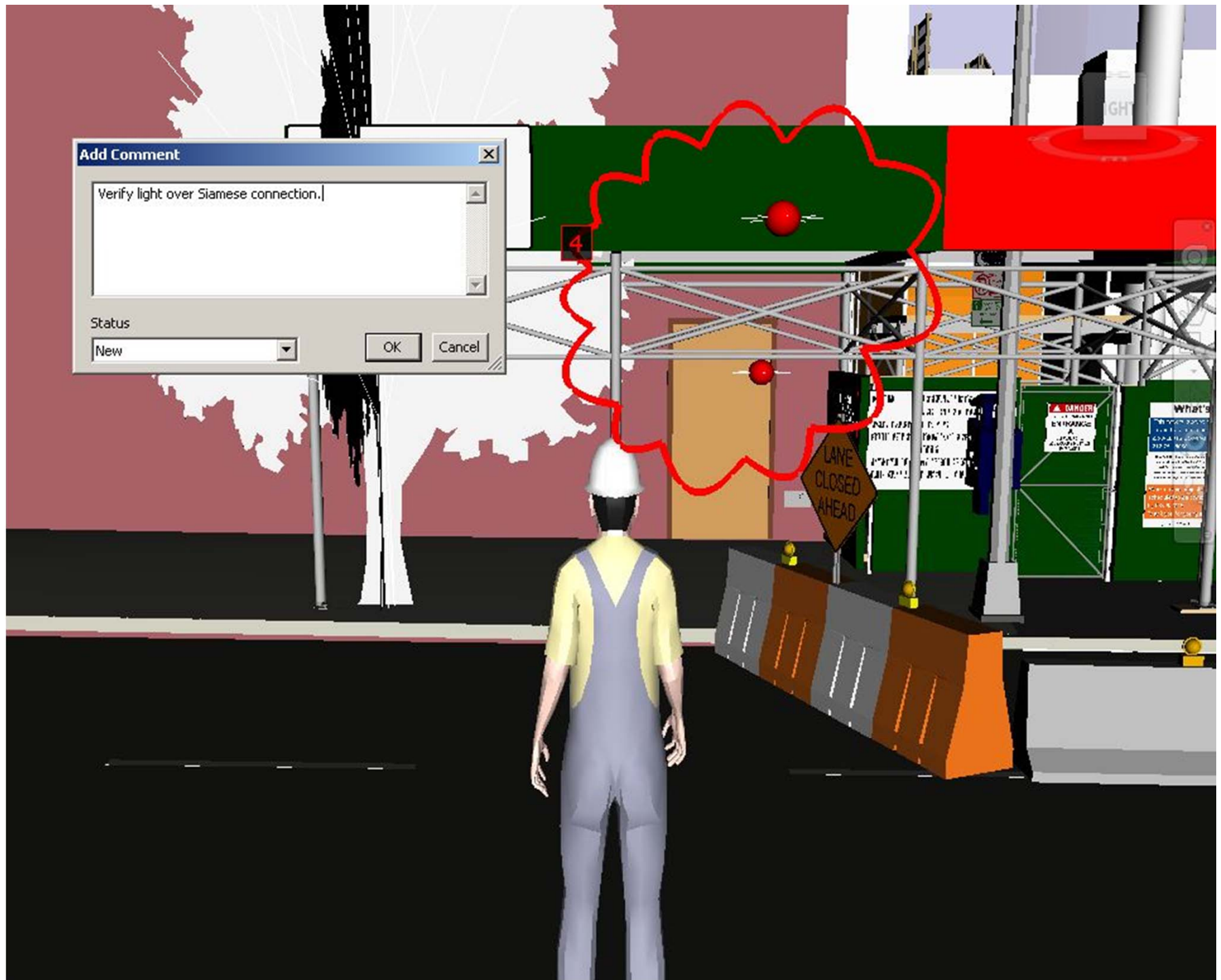
Video Examples

Inspection Video

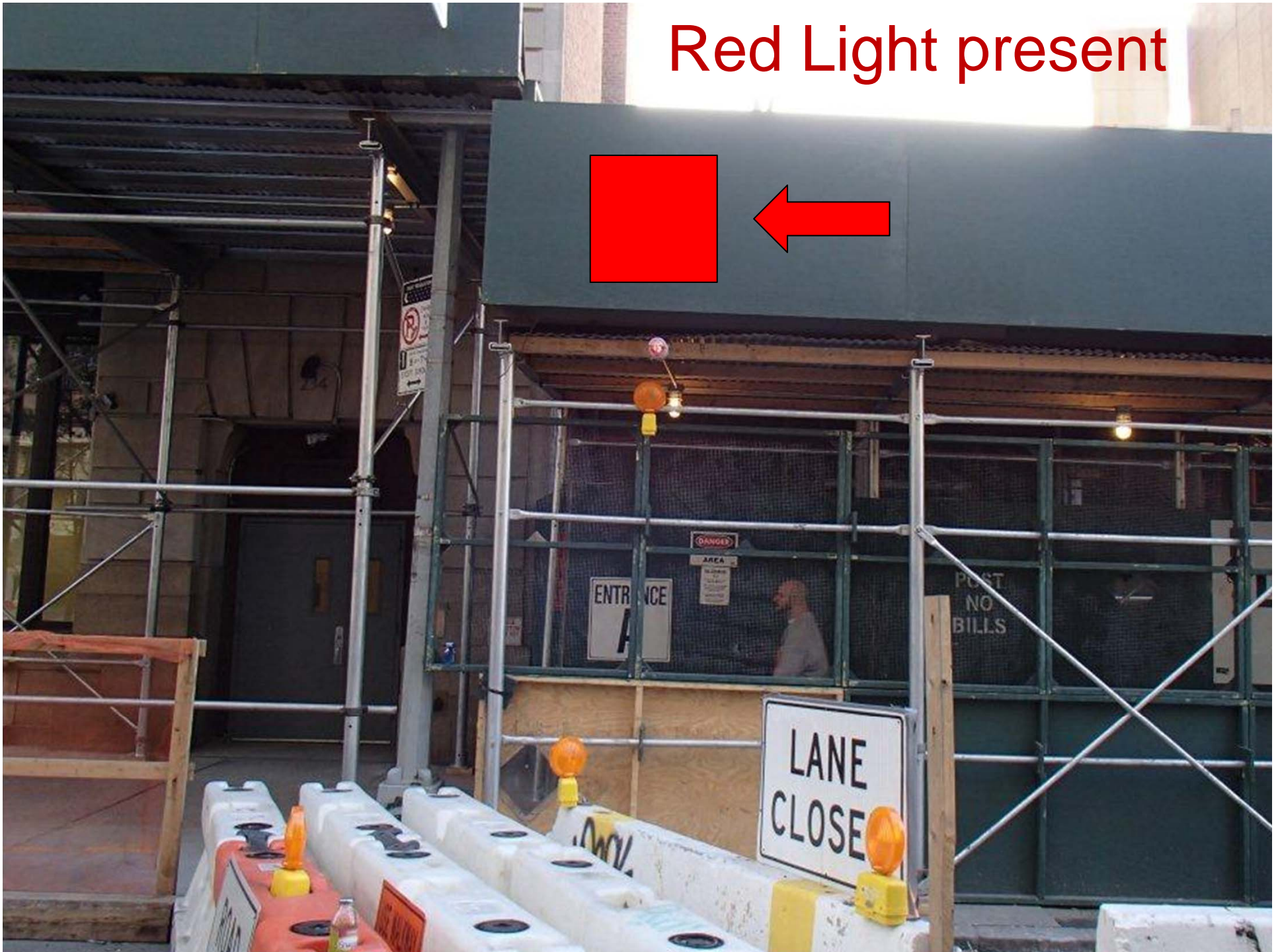
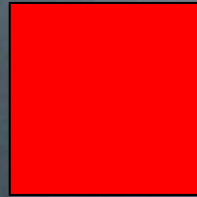




Contrary to plan
Review and Revise



Red Light present



Next Steps - BIM Implementation

Microdesk Hired to Establish Standard Objects for BIM filing at DOB

Streamline filing process

Set standards for future plan review options

Set standards for future inspection phases

Example of submission content



Content Example

Generic Models (1)	
Tower Height	160' 0"
Boom Clear	100' 0"
CW Clearance	25' 7 31/256"
Boom Length	100' 0"
Boom Angle	90.000°
Base Rear	15' 0"
Base Left	20' 0"
Base Right	12' 0"
Base Height	6' 0"
Base Front	10' 0"
Volume	5555909.99 CF

Identity Data	
Tie-In Detail Link	\\Details_TieIn.dwg
Specification Link	\\140002.doc
Safety Category	Cranes
Permit Number	XXXXXXX
Load Capacity	7 Tons
Comments	

[Properties help](#) Apply

The Key data is not model detail, but site safety specific information

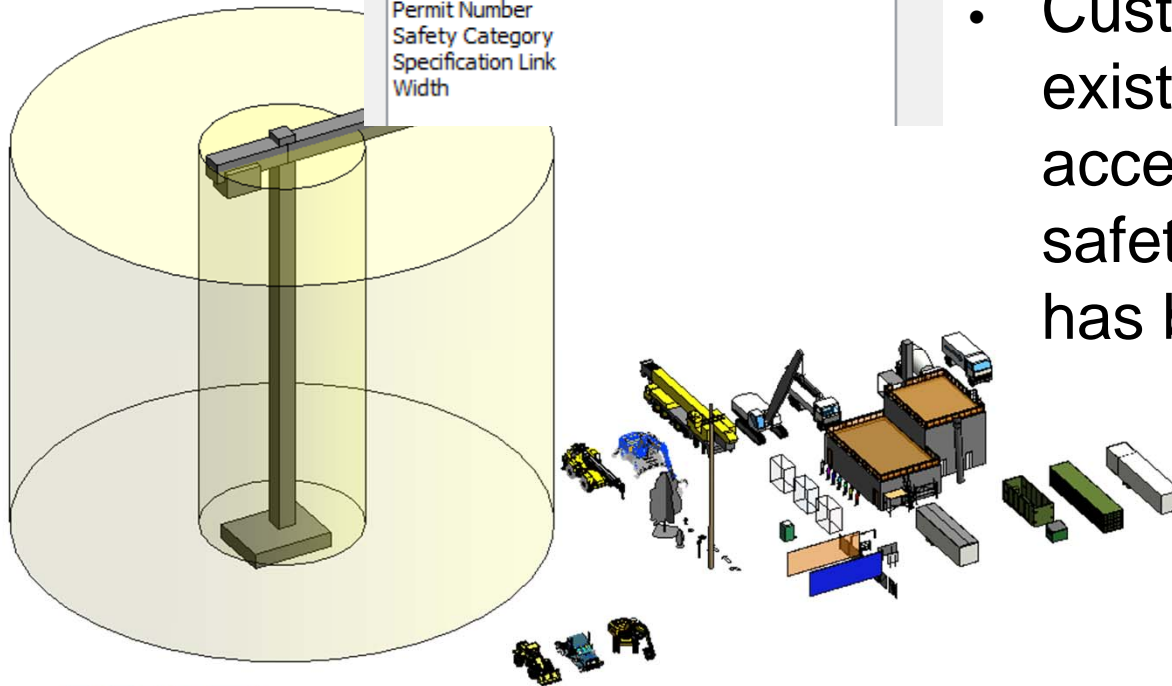
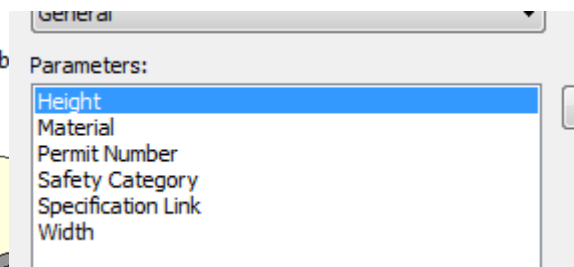
- Clearances of crane booms
- Permit numbers
- Links to specifications and details

Content Sources

4.1.1.4 Site Elements

Construction Fence and Perimeter Protection/ Enclosure

- Height
- Material
- Permit Number



- Basic Content will be supplied via the NYCDOB
- Custom, external or existing content will be accepted providing safety parameters / data has been added.



NYC
Buildings

NYC BIM Site Safety Plan Guidelines & Standards OUTREACH June 12, 2013



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