



**NYC**  
Buildings

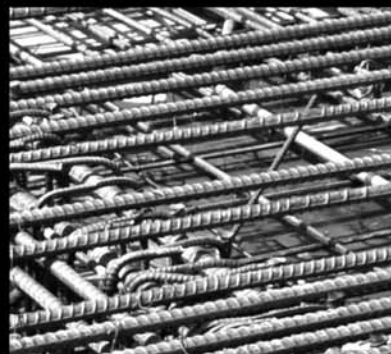
# Creating BIM Site Safety Plans

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BIM Manager, Technical Review



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# Course Descriptions

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Building Models (BIM) have become the construction industry standard. We are now taking it to the next level and adding site safety logistics to this platform. This software provides site managers and construction regulators with interactive models allowing users to take virtual tours of the project and “view” the safety challenges. Building Models allow participants to analyze key elements of the project while early in the pre-construction phase when key resources are most flexible, thus providing value engineering to the project.

Through the use of examples, participants will gain an understanding of the provisions outlined in Chapter 33 of the NYC Building Code and be able to submit acceptable site safety plans as required by the Department of Buildings. Finally, participants will understand the potential saving in time, money, & coordination that pre planning with the use of BIM and the site safety plan to have a safer and a better organized job site.



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# Learning Objectives

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**At the conclusion of the training session, participants will be able to:**

- At the end of this program, participants will have learned:
- Common construction site safety plan mistakes through the use of examples and analyze logistics
- How to virtual tour a project to demonstrate a design that meets the requirements of Chapter 33 of the NYC Building Code
- How to use 3D modeling software to identify potential safety issues
- Participants will learn the benefits of pre-planning and collaboration between the owner, contractor, designer and safety professionals to run a project safely, on time and on budget.



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## Course Outline

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- How to submit plans to DOB
- The review process
- Approval/Disapproval
- DOB's implementation in the field.
- Challenges ahead

# Latest Application Using 3D Site Safety Plans

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- 2011 Pilot Program: 3 projects reviewed and approved electronically in a test program
- May 2012: Launch of public access to 3D site safety plans
- BIM implementation remains underway
- Current submissions are hybrid of 2D and 3D drawings

# Latest Application Using 3D Site Safety Plans

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## Reviews to Date

- Over 147 reviews conducted
- 24 total projects made up of 16 New Buildings and 8 facades projects

# Getting Started

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## How to Submit Plans to the Department

# Getting Started

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- No special visit is required to the Department to start submitting BIM SSP jobs.
- No pre-registration with the Department
- Only need Zoho account

## Why Zoho?

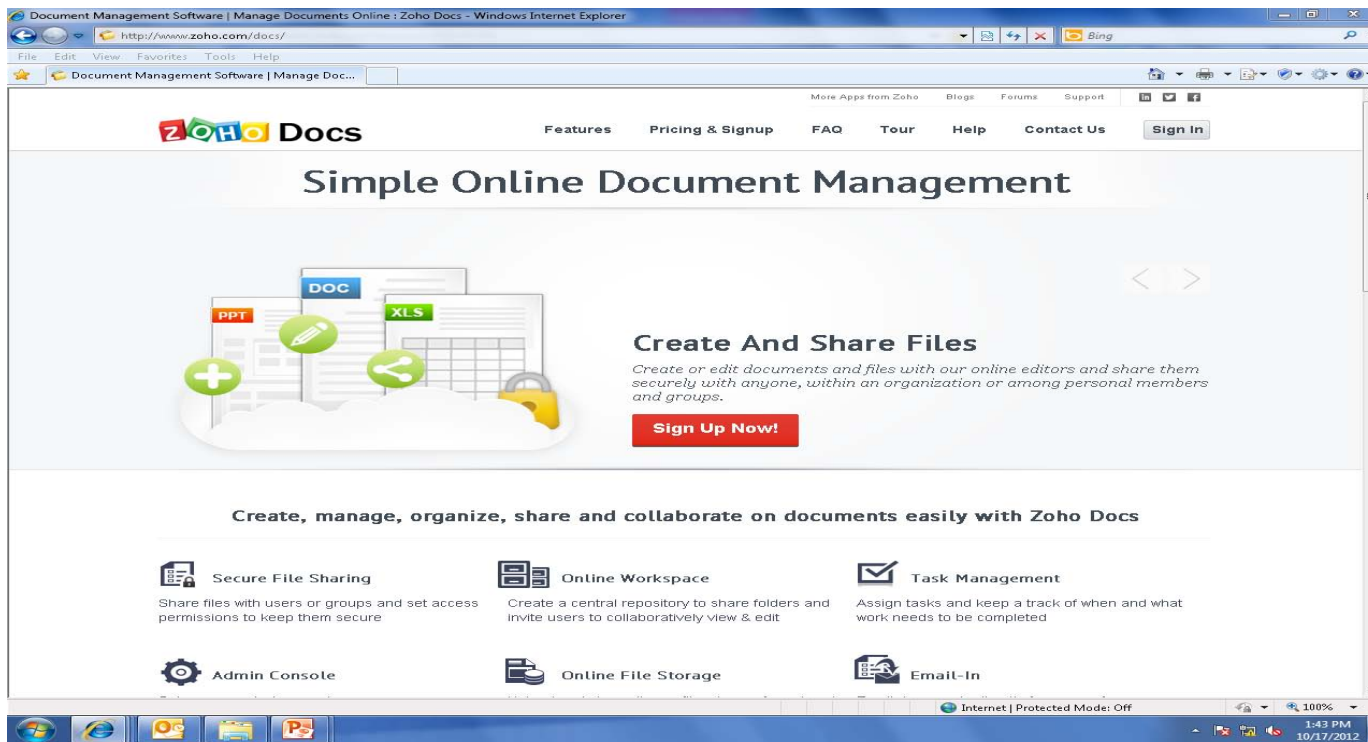
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- **Ease of access.** Zoho Docs supports the current versions of popular web browsers, such as Internet Explorer, Firefox, Opera and Safari; available anywhere with internet access.
- **Mobile-device Compatible.** Zoho Docs is available on Google's Android and Apple's iPhone platform.
- **Large file size sharing.** Up to 500MB files can be uploaded and shared. (Largest 3D Plan submitted so far is 52MB.)
- **Data security.** Zoho documents are secured. Encryption is supported and files get scanned for viruses when uploading.
- **Large, free storage capacity.** Up to 1GB.

# Getting Started

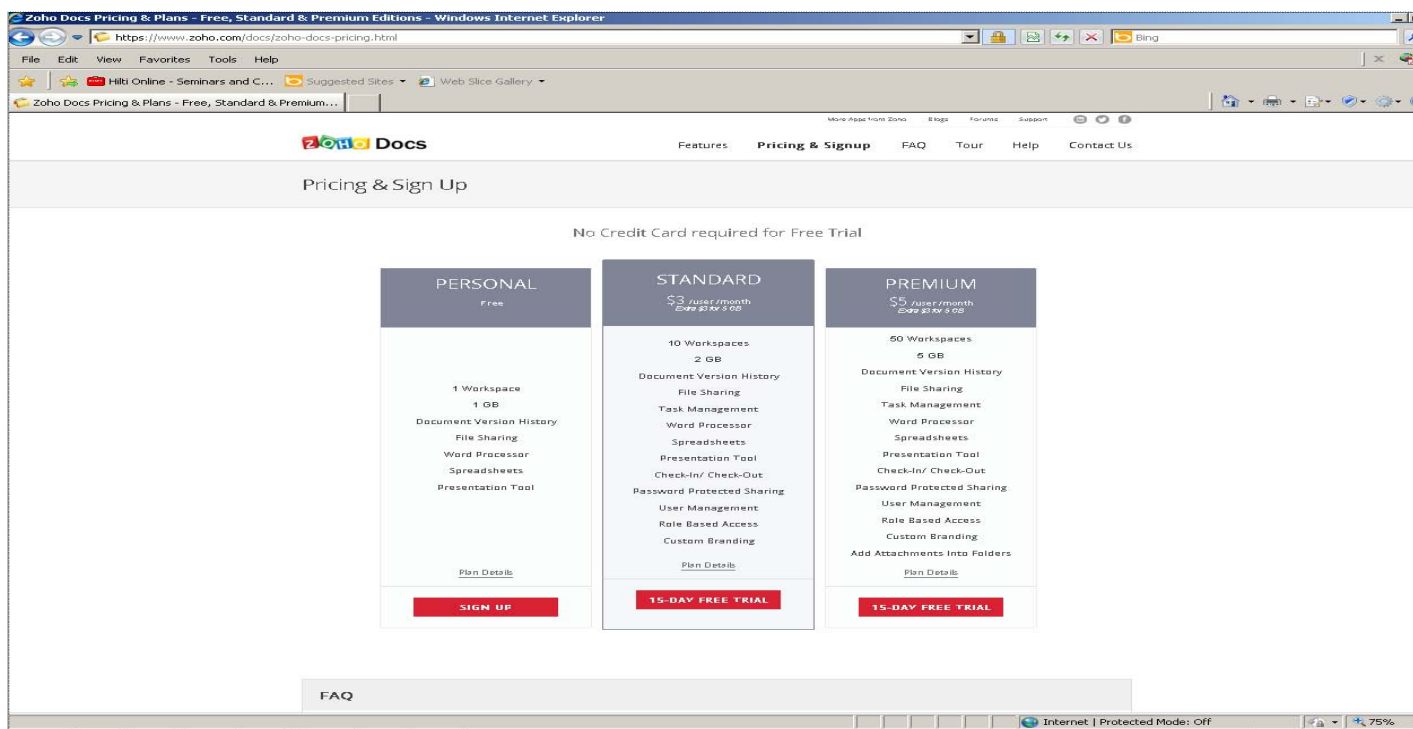
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1. Open your desktop web browser and visit [zoho.com/doc](http://zoho.com/doc).
2. Click on “SIGN UP Now!” It appears in red text box.



# Zoho Registration

- There are three membership levels.
- We chose the “Personal” option for our example.



# Three Levels of Subscription

- This option is free to join and gives the user 1GB of storage space and up to 100MB file size for individual files that can be uploaded and shared.

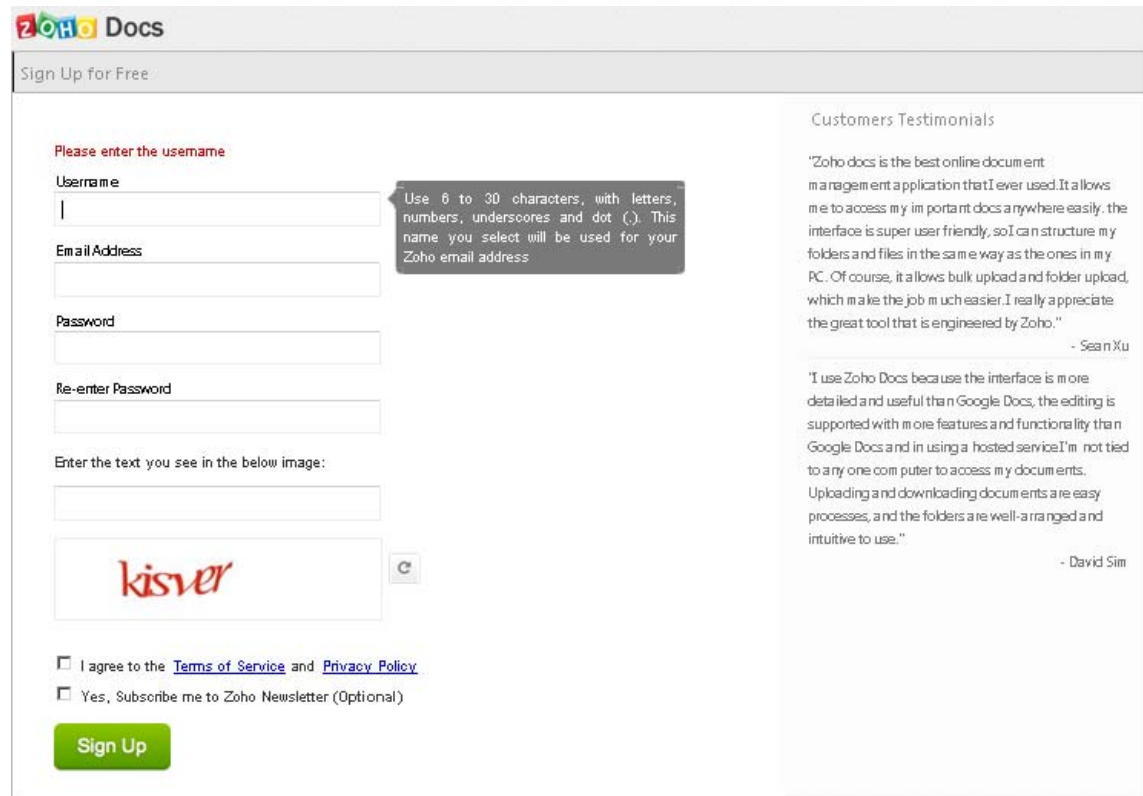
The screenshot shows the Zoho Docs Pricing & Sign Up page. At the top, there's a navigation bar with links: Features, Pricing & Signup, FAQ, Tour, Help, and Contact Us. Below this is a header for 'Pricing & Sign Up' and a note: 'No Credit Card required for Free Trial'.

PERSONAL Free	STANDARD \$3 /user /month Extra \$3 for 5 GB	PREMIUM \$5 /user /month Extra \$3 for 5 GB
1 Workspace 1 GB Document Version History File Sharing Word Processor Spreadsheets Presentation Tool	10 Workspaces 2 GB Document Version History File Sharing Task Management Word Processor Spreadsheets Presentation Tool Check-In/ Check-Out Password Protected Sharing User Management Role Based Access Custom Branding	50 Workspaces 5 GB Document Version History File Sharing Task Management Word Processor Spreadsheets Presentation Tool Check-In/ Check-Out Password Protected Sharing User Management Role Based Access Custom Branding Add Attachments into Folders
<a href="#">Plan Details</a>	<a href="#">Plan Details</a>	<a href="#">Plan Details</a>
<b>SIGN UP</b>	<b>15-DAY FREE TRIAL</b>	<b>15-DAY FREE TRIAL</b>

# Registering to Share 3D Site Safety Plans

The “Account Information” window should then display.

Complete the information requested in the window and click on “Sign Up Now” to continue.



The screenshot shows the Zoho Docs registration page. At the top, it says 'Zoho Docs' and 'Sign Up for Free'. The form fields are: Username (with a tooltip: 'Use 6 to 30 characters, with letters, numbers, underscores and dot (.). This name you select will be used for your Zoho email address'), Email Address, Password, and Re-enter Password. Below these is a CAPTCHA section with the text 'Enter the text you see in the below image:' and an image of the word 'kisser' in a stylized font. At the bottom, there are two checkboxes: 'I agree to the Terms of Service and Privacy Policy' and 'Yes, Subscribe me to Zoho Newsletter (Optional)'. A green 'Sign Up' button is at the bottom right. On the right side of the page, there is a 'Customers Testimonials' section with two quotes from users.

**Zoho Docs**  
Sign Up for Free

Please enter the username

Username  
|

Email Address

Password

Re-enter Password

Enter the text you see in the below image:

kisser

☐ I agree to the [Terms of Service](#) and [Privacy Policy](#)

☐ Yes, Subscribe me to Zoho Newsletter (Optional)

**Sign Up**

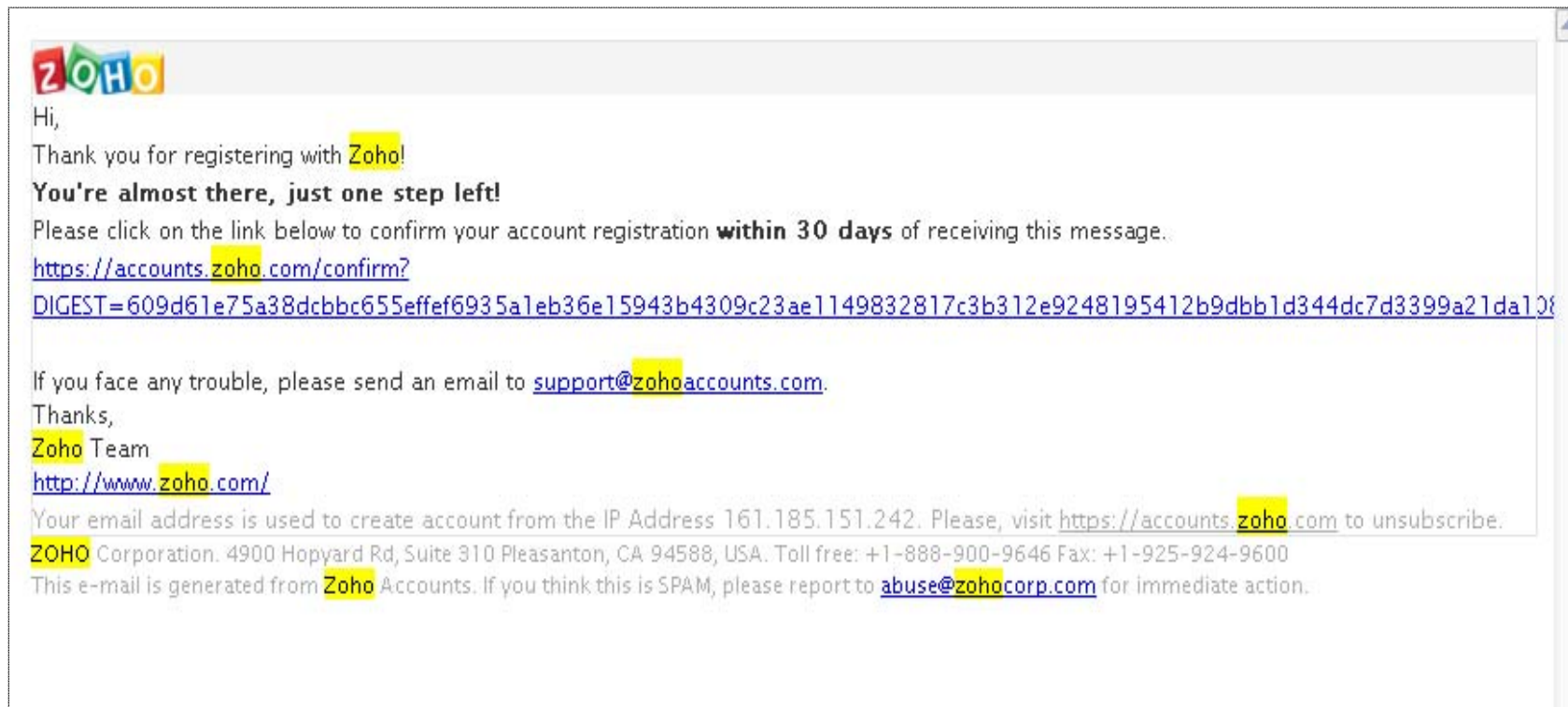
**Customers Testimonials**

"Zoho docs is the best online document management application that I ever used. It allows me to access my important docs anywhere easily, the interface is super user friendly, so I can structure my folders and files in the same way as the ones in my PC. Of course, it allows bulk upload and folder upload, which make the job much easier. I really appreciate the great tool that is engineered by Zoho."  
- Sean Xu

"I use Zoho Docs because the interface is more detailed and useful than Google Docs, the editing is supported with more features and functionality than Google Docs and in using a hosted service I'm not tied to any one computer to access my documents. Uploading and downloading documents are easy processes, and the folders are well-arranged and intuitive to use."  
- David Sim

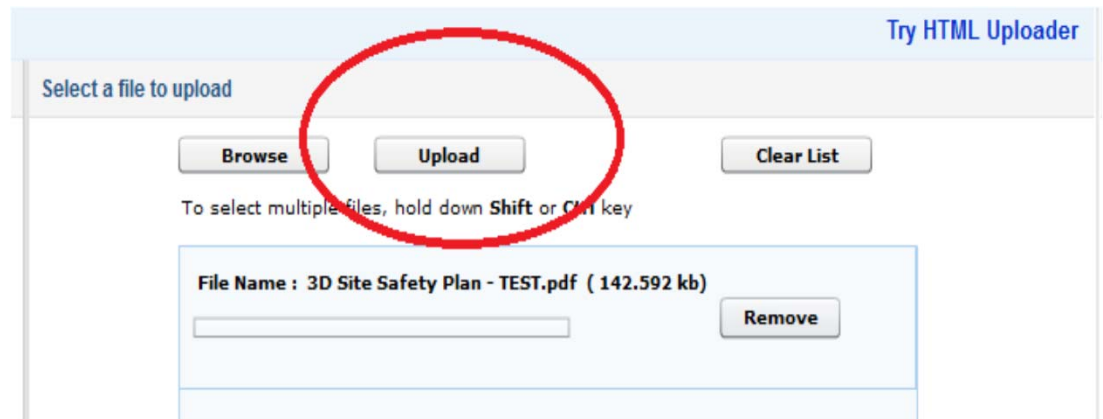
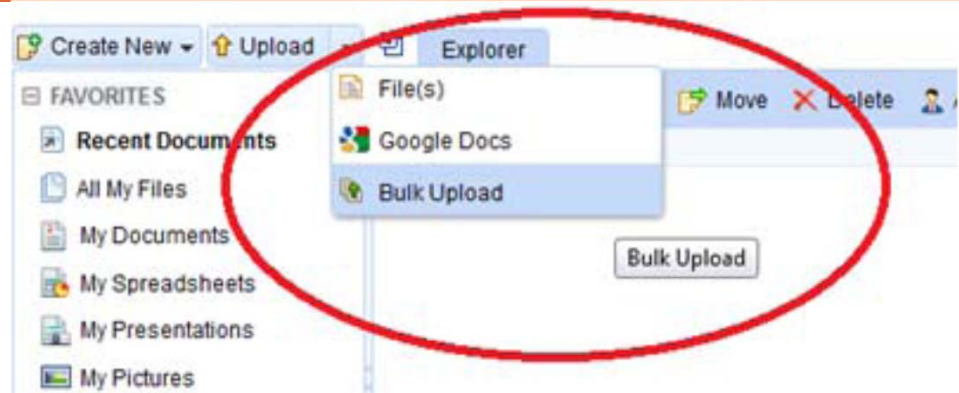
# Registering to Share 3D Site Safety Plans

When creating a new account, an email is sent to provided email address for confirmation.



# Uploading 3D Site Safety Plans

- Log into your Zoho Docs account.
- Click the down arrow next to “Upload” and select the Bulk Upload.
- Click on “Browse” to find the file on your local computer to upload. Then click on “Upload” when you are ready to upload that file to Zoho Docs. (Maximum file size is 500MB.)



# Uploading 3D Site Safety Plans

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- An “Upload” box appears where you can leave the “Convert” box unchecked.

## Upload

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Selected files will be uploaded to **My Folders**

[Click here](#) to change **Folders or Files**

(File size limit is 100 MB)

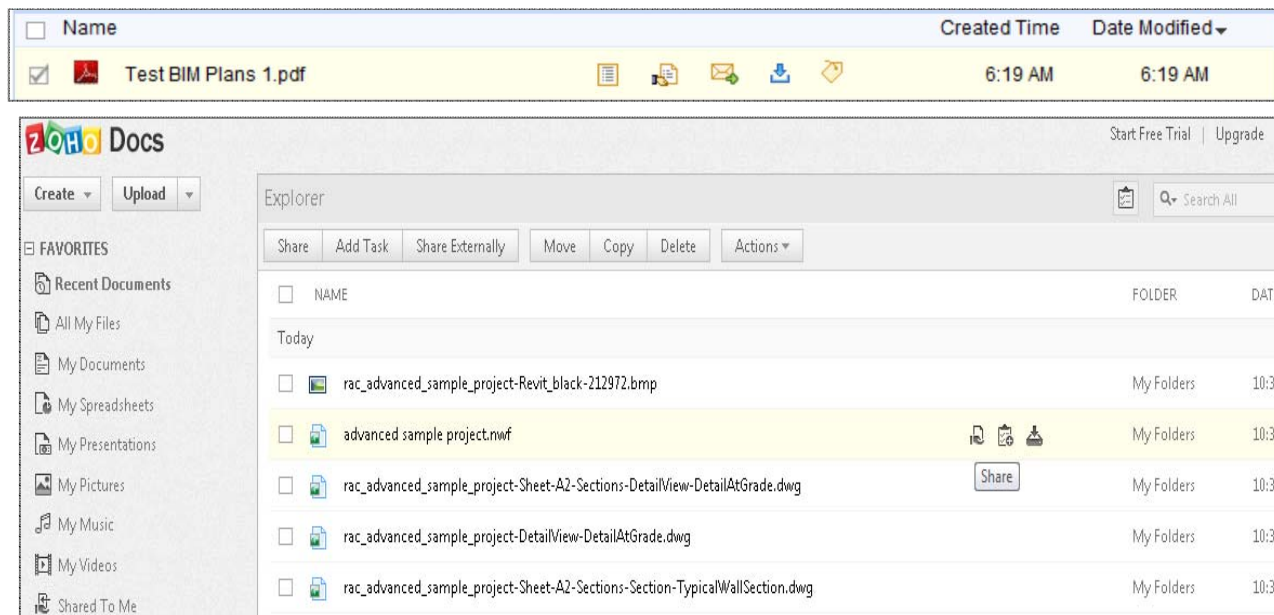
☐ Convert documents to the corresponding Zoho Docs format

(Supported formats doc,docx,txt,rtf,odt,html,htm,xls,xlsx,tsv,csv,ods,sxc,ppt,pps,odp,sxi,pptx)

Start UploadCancel

# Uploading 3D Site Safety Plans

- From your Zoho Docs main page, click the check box next to the file(s) you want to share with/submit to the Department.
- Click on the “Share” tab at the top of the page or on the share icon to the right of the file you want to share with the Department.



# Uploading 3D Site Safety Plans

- On the “Share Settings” screen, enter **NYCBuildings.BIM** or **BIM@buildings.nyc.gov**. Under “Add Members” and click “Share”.

**Share Settings** [X]

Add Members:

NYCBuildings.BIM

☒ Notify through email - [Add Message](#)

Share Cancel

Read Only [v]  
✓ Read Only  
Read/Write  
Co-Owner

Shared Members List:

0 Members

# Uploading 3D Site Safety Plans

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If your file was shared successfully with the Department, “Shared Successfully” will appear.

Share Settings

Add Members:

Enter names, email addresses or group names

Shared Members List:

 bim	Read/Write ▾	×

# Uploading 3D Site Safety Plans

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- A Site Safety cover sheet and prequalifying check list is required with all submissions
- For Zoho-submitted projects, a confirmation email will be sent from from DOB BIM stating that file was submitted to DOB.



**SITE SAFETY LOG IN COVER SHEET**

Date of drop off \_\_\_\_\_

Address \_\_\_\_\_

Borough \_\_\_\_\_

Job # \_\_\_\_\_

# Uploading 3D Site Safety Plans

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- The contractor's email address required on the coversheet so confirmation email can be sent.

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**SITE SAFETY LOG IN COVER SHEET**

Date of drop off \_\_\_\_\_

Address \_\_\_\_\_

Borough \_\_\_\_\_

Applicant Name \_\_\_\_\_ Phone \_\_\_\_\_

Email \_\_\_\_\_

Expediter / Courier Name \_\_\_\_\_ Phone \_\_\_\_\_

Email \_\_\_\_\_

# Prequalifying Checklist for New Buildings

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## NB & Alt 1 Prequalifying Checklist

Draft 3/22/13

- 1- The address on the plan must be the same as the "Filed At" in BIS

### 1 Location Information (Filed At)

House No(s): 280 Street Name: BROADWAY  
Borough: Manhattan Block: 153 Lot: 1 BIN: [1079215\\*](#) CB No: 101  
Work on Floor(s): PEN 001 thru 007 Apt/Condo No(s): Zip Code: 10007

- 2- Box 9C must be marked Yes

### 9 Additional Considerations, Limitations or Restrictions

Yes No

☒ ☐ Site Safety Job / Project

# Prequalifying Checklist for Facades

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## Façade Prequalifying Checklist

Draft 3/29/13

- 1- The address on the plan must be the same as the "Filed At" in BIS

**1 Location Information (Filed At)**

House No(s): 280 Street Name: BROADWAY  
Borough: Manhattan Block: 153 Lot: 1 BIN: [1079215\\*](#) CB No: 101  
Work on Floor(s): PEN 001 thru 007 Apt/Condo No(s): Zip Code: 10007

- 2- Box 9C must be marked [Yes](#)

# Prequalifying Checklist for Demolitions

## Demolition Prequalifying Checklist

Draft 3/29/13

- 1- The address on the plan must be the same as the “Filed At” in BIS

**1 Location Information (Filed At)**

House No(s): 280 Street Name: BROADWAY  
Borough: Manhattan Block: 153 Lot: 1 BIN: [1079215\\*](#) CB No: 101  
Work on Floor(s): PEN 001 thru 007 Apt/Condo No(s): Zip Code: 10007

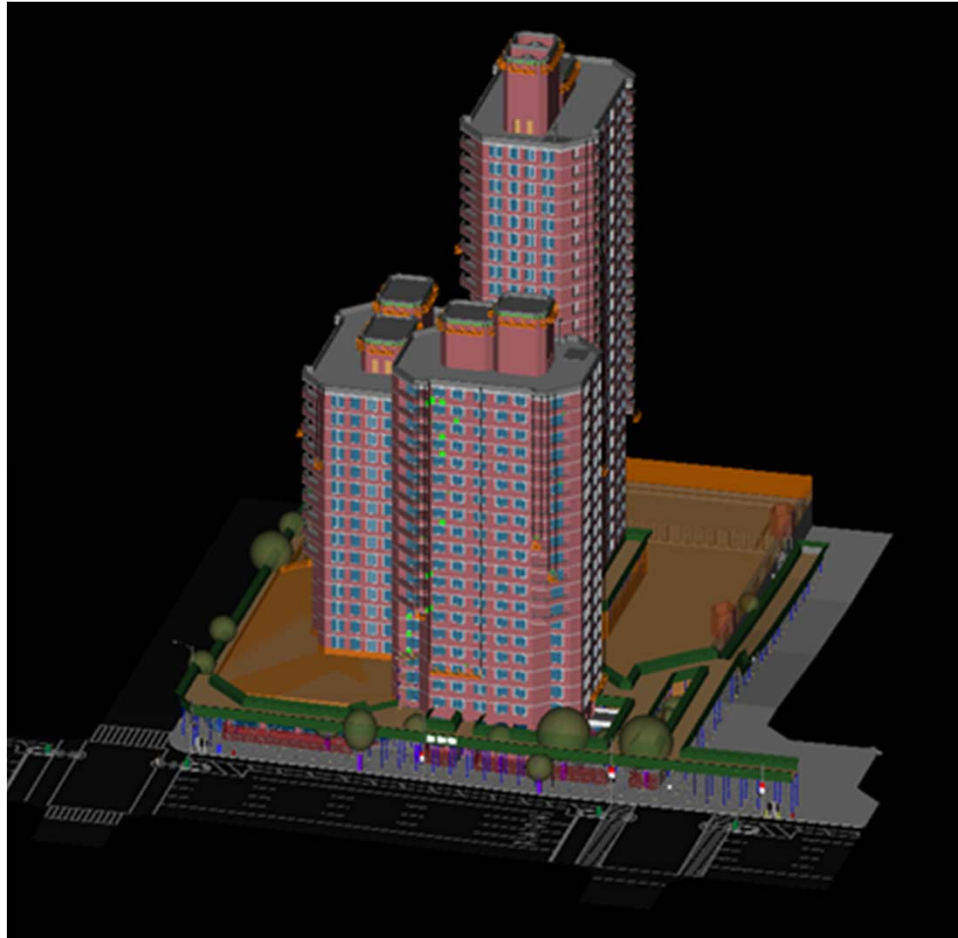
- 2- Box 9C must be marked [Yes](#)

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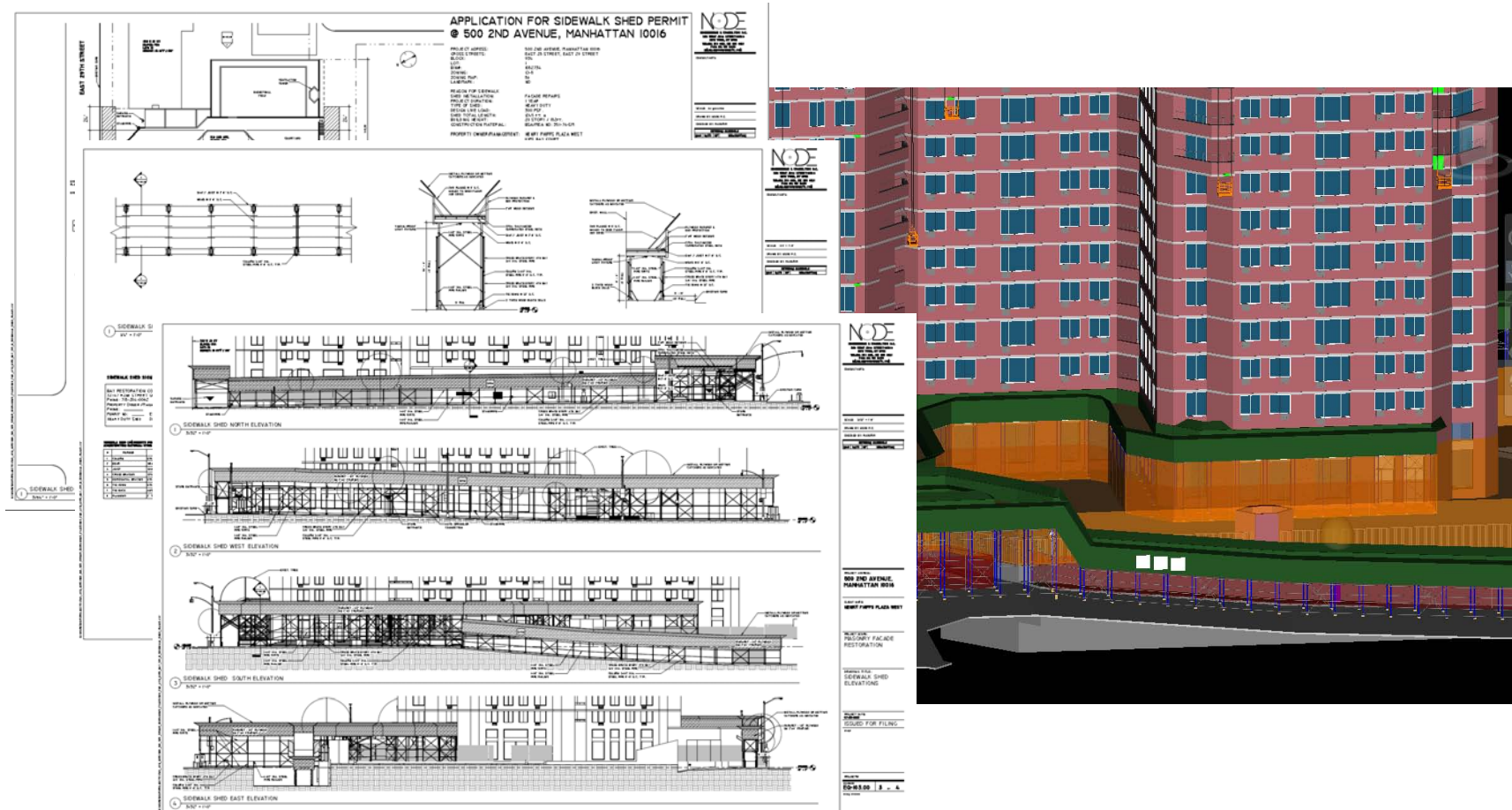
# The Review Process

# BIM Model of a Local Law Façade

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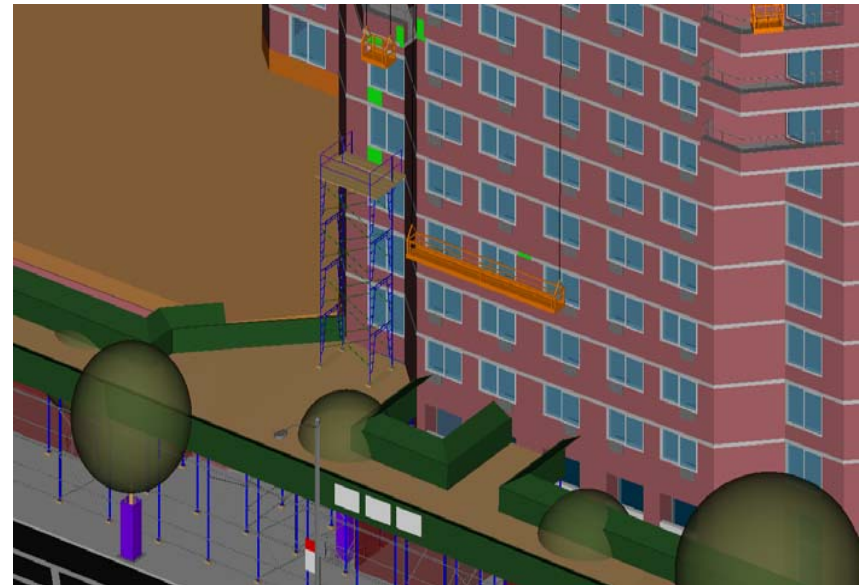
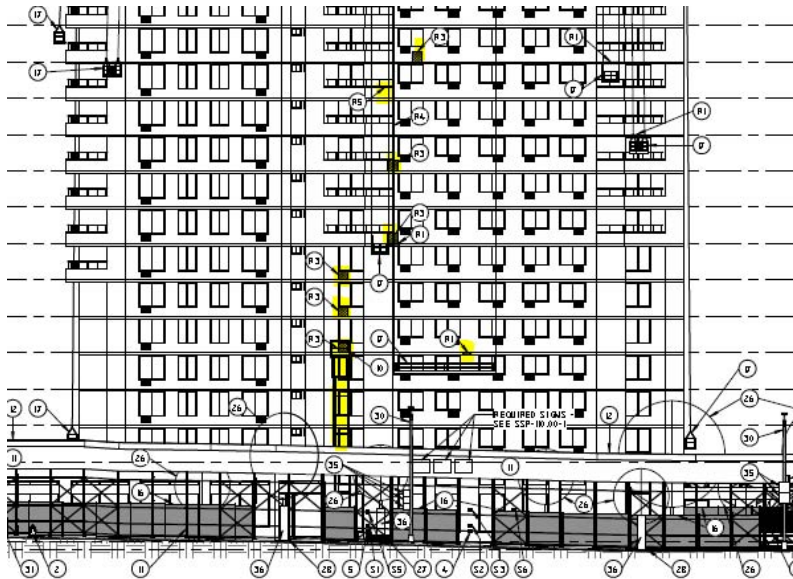


# BIM Model of a Local Law Façade



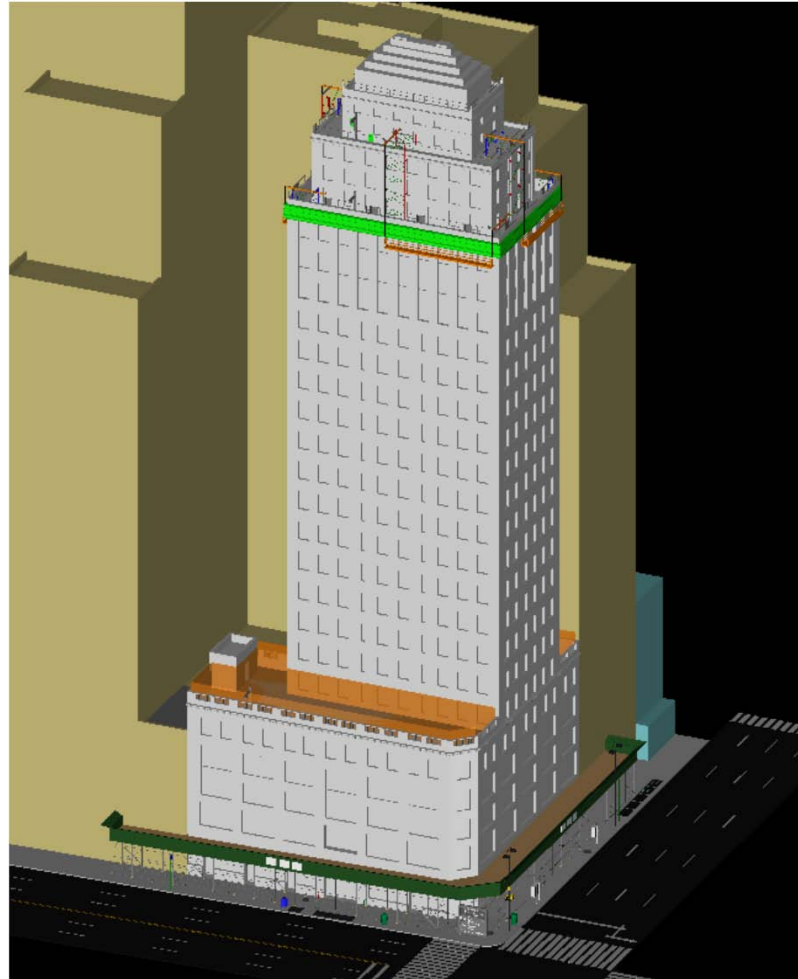
# BIM Model of a Local Law Façade

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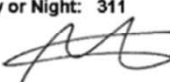

# BIM Model of a Local Law Façade

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[illegible]

# BIM Model of a Local Law Façade

<b>NYC</b> Buildings		
<b>Work Permit Department of Buildings</b>		
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 <a href="http://www.nyc.gov/buildings">www.nyc.gov/buildings</a> .		
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

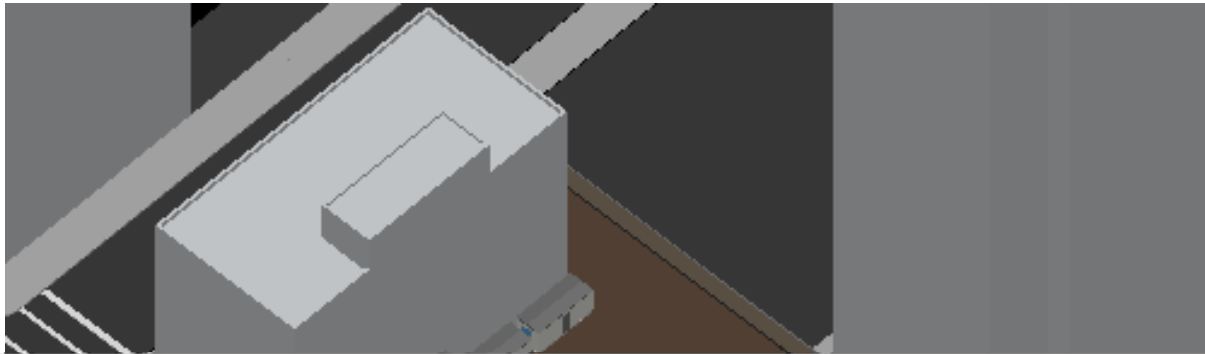
RENCE

## 2013 BUILD SAFE | LIVE SAFE CONFERENCE



# BIM Model of New Building Make-Ready Phase

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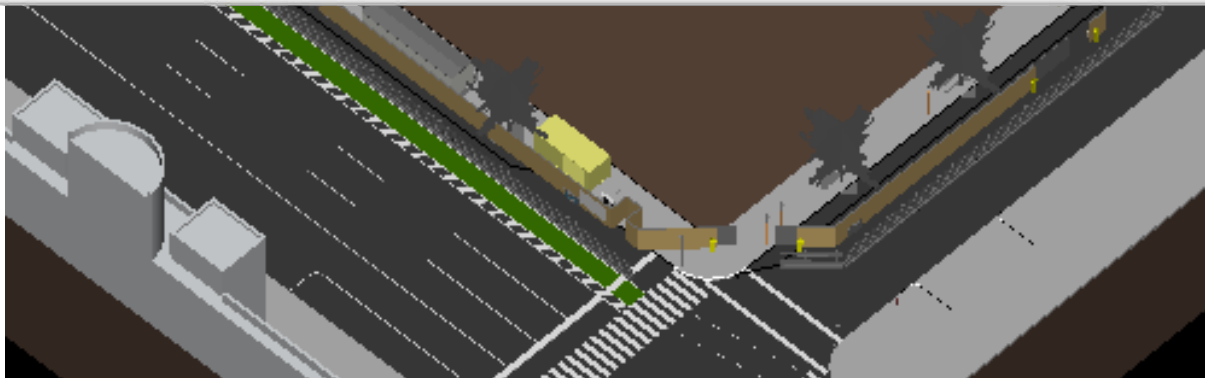


01/26/2012 121181176 04 NB R PERMIT-ENTIRE 02/22/2012 0024633 RA THOMAS

AMENDED  
12/18/2012

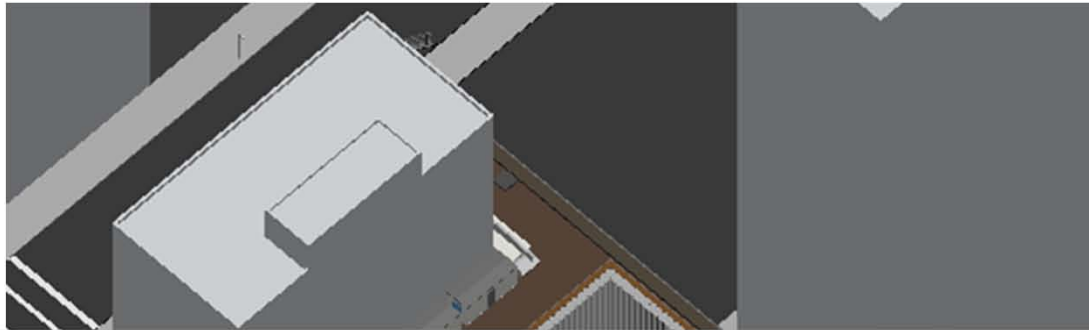
FILING FOR CONSTRUCTION FENCE IN CONJUNCTION WITH NEW BUILDING.

Work on Floor(s): OSP



# BIM Model of New Building Make-Ready Phase

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02/10/2012 [120974865](#)

01

A2 R PERMIT-ENTIRE

04/04/2012 0044464 PE SHAPIRO

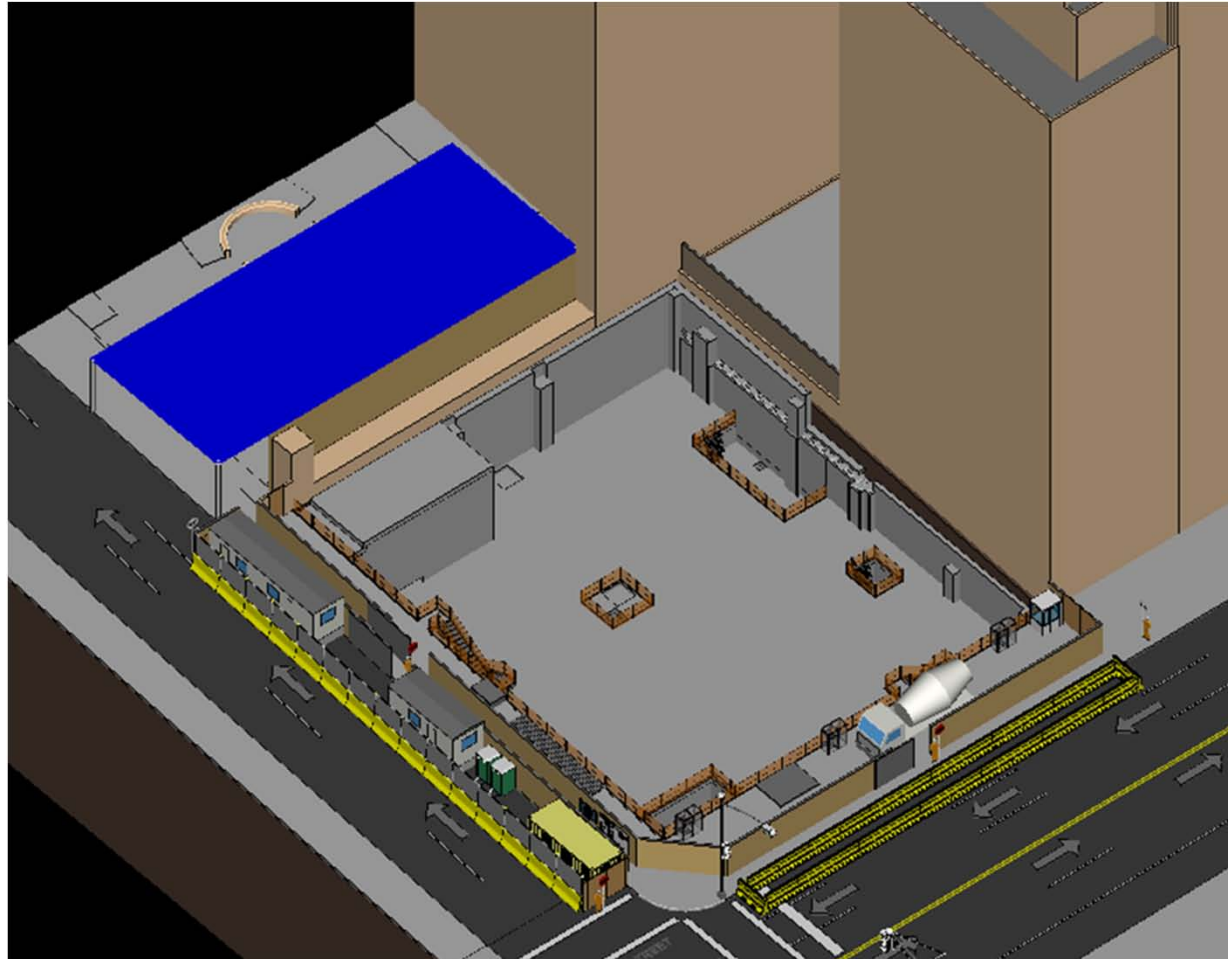
NOT  
APPLICABLE

FILING HERewith TEMPORARY BRACING AND SHORING DURING EXCAVATION AND FOUNDA  
Work on Floor(s): OSP



# BIM Model of New Building Foundation Phase

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# BIM Model of New Building Superstructure Below 75'

## Mechanical Data Query

Premises: 433 1 AVENUE MANHATTAN

BIN: [1083651](#) Block: 931 Lot: 24

Device Number: 1V22521

Device Status: REMOVED

Filed At: 433 1 AVENUE

Record: 37954

Status Date: 10/03/2011

## NYC Department of Buildings

### Cranes & Derricks Query by Bin

Page: 1 of 1

Premises: 433 1 AVENUE MANHATTAN

[View Limited Use \(0\)](#)

BIN: [1083651](#) Block: 931 Lot: 24

CN	History	Filed Date	Expiration Date	Status	Equipment Type	Job
<a href="#">045012</a>	<a href="#">History</a>	06/08/2012	07/10/2013	APPROVED FOR USE	MOBILE CRANE - ROUGH TERRAIN	<a href="#">121181176</a>
<a href="#">064312</a>	<a href="#">History</a>	02/04/2013	09/14/2013	APPROVED FOR USE	MOBILE CRANE - ROUGH TERRAIN	<a href="#">121181176</a>

GOVERNOR ROPES

Quantity:

Size:

Kind: S

Governor Type: C

Machine Type: OH

Car Buffer Type: S

Safety Type: G

Mode Operation: A

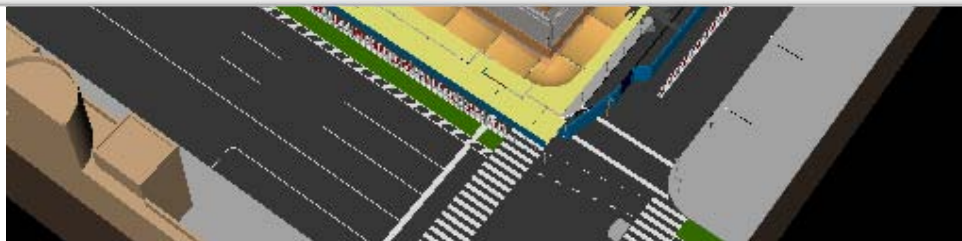
Fireman's Service: N

# BIM Model of a New Building Superstructure Above 75'

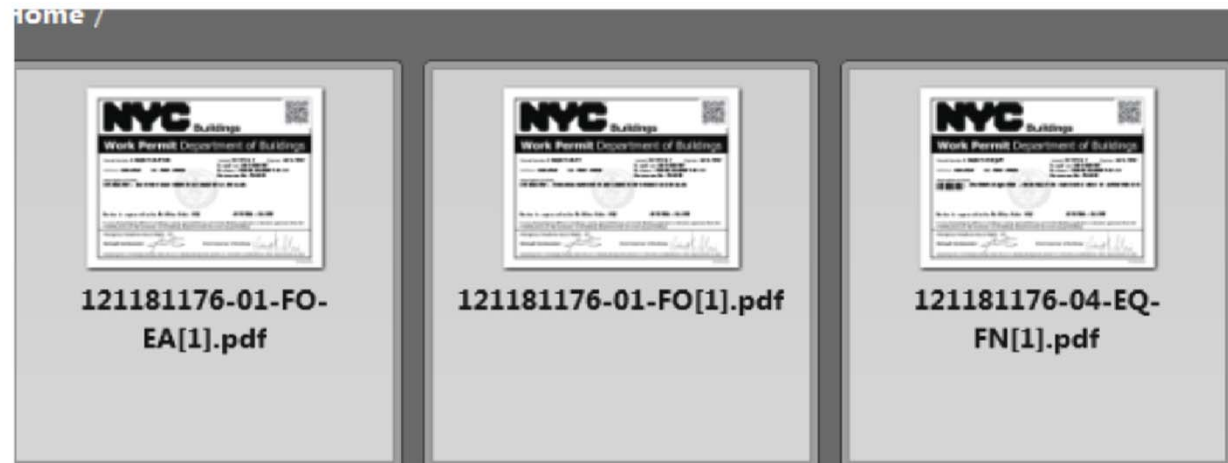
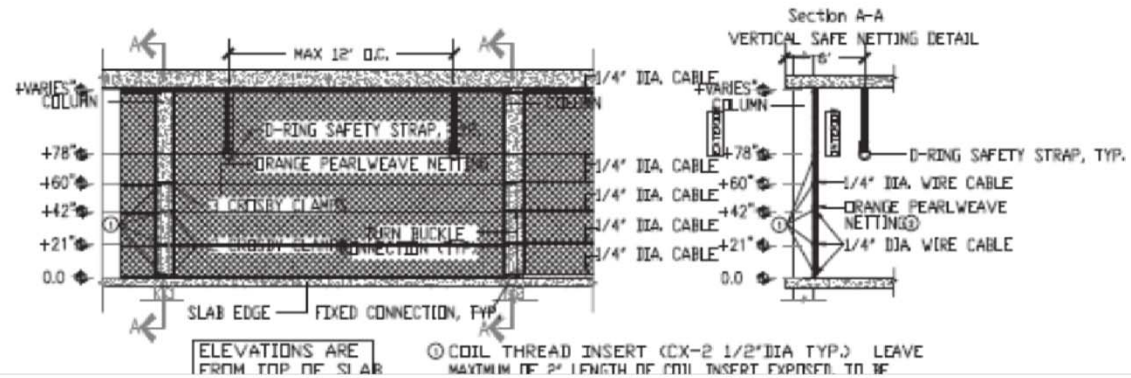
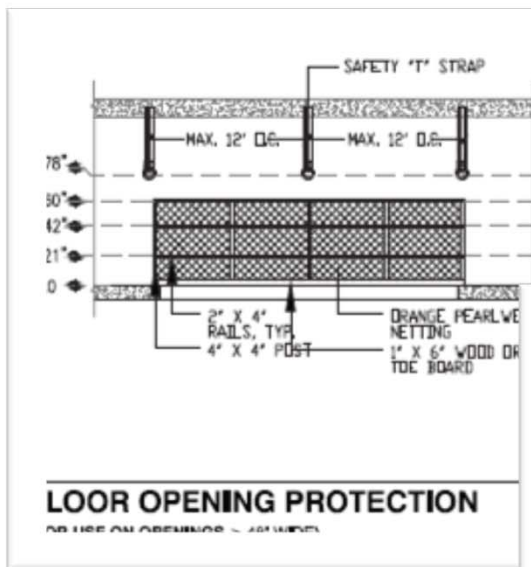
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12/18/2012	<a href="#">121464441</a>	01	A3	D A/P ENTIRE	12/18/2012	0085870 PE	WESTRICK	NOT APPLICABLE
INSTALLATION OF OVERHEAD PROTECTION AS PER PLANS DURING NB CONSTRUCTION. N Work on Floor(s): 001								
12/19/2012	<a href="#">121465486</a>	01	A3	R PERMIT-ENTIRE	12/19/2012	0085870 PE	WESTRICK	NOT APPLICABLE
INSTALLATION OF OVERHEAD PROTECTION AS PER PLANS DURING NB CONSTRUCTION. N Work on Floor(s): 001								



# BIM Model of a New Building

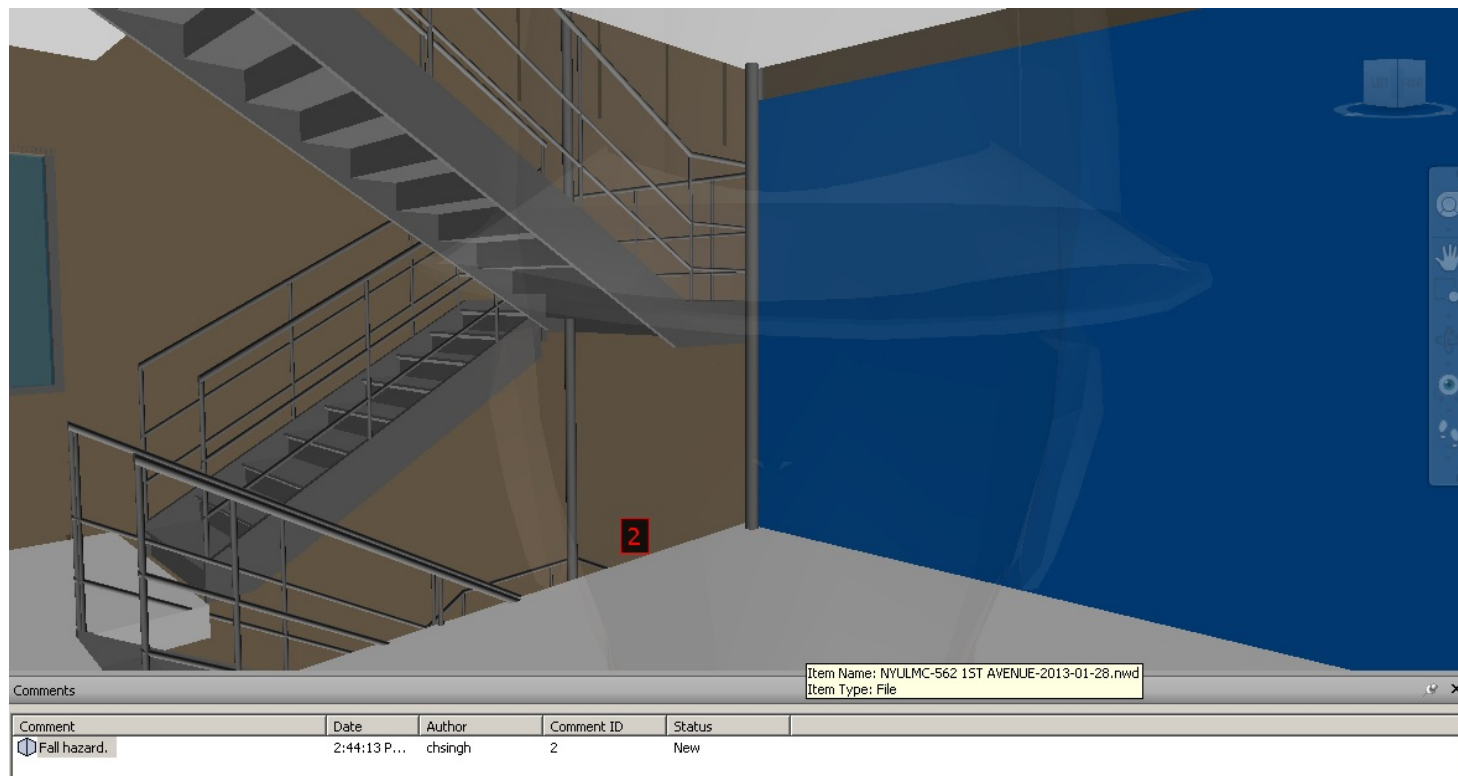


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# Common Mistakes

# Review Process for 3D Site Safety Plans

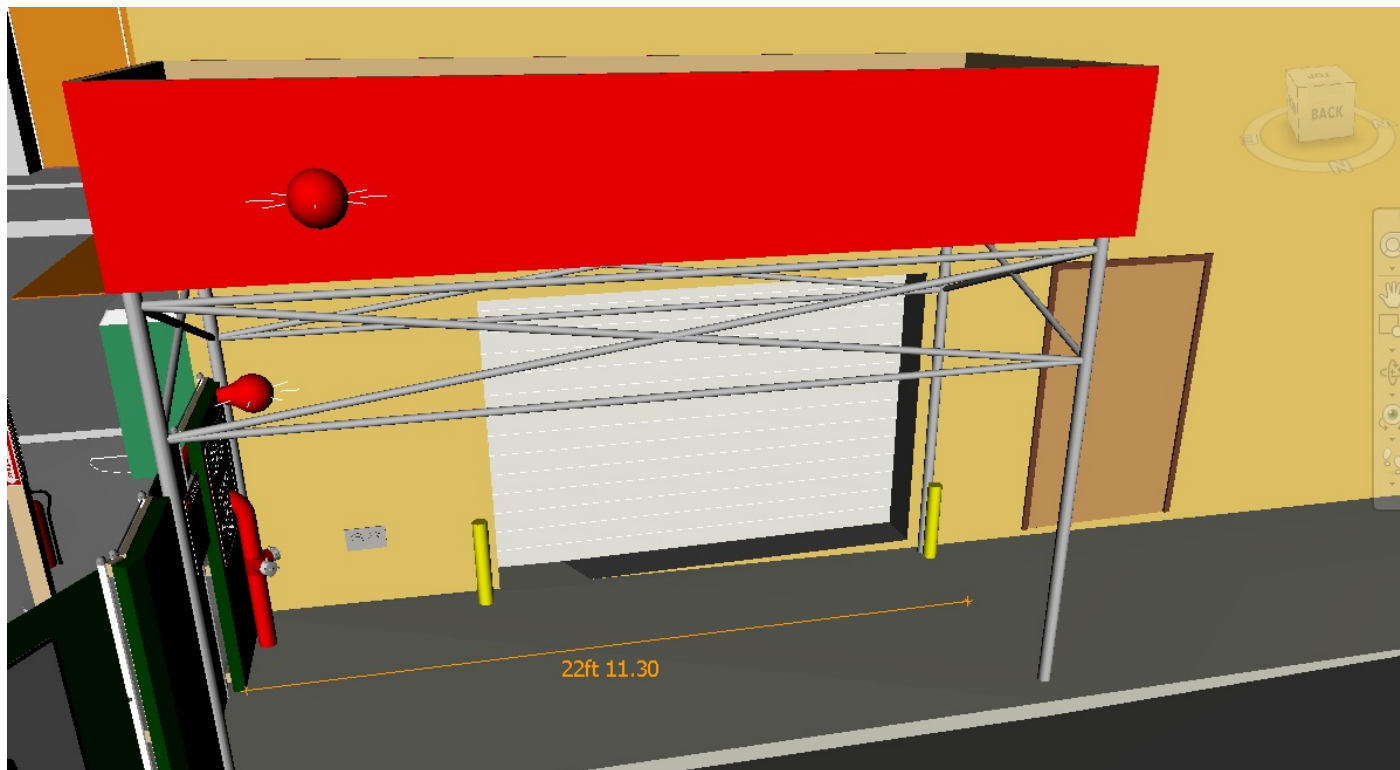
During the review process, any deficiencies found in the model are tagged with comments, bringing the designer right to the problem area as if they are sitting next to the plan examiner – making this process seamless.



# Review Process for 3D Site Safety Plans

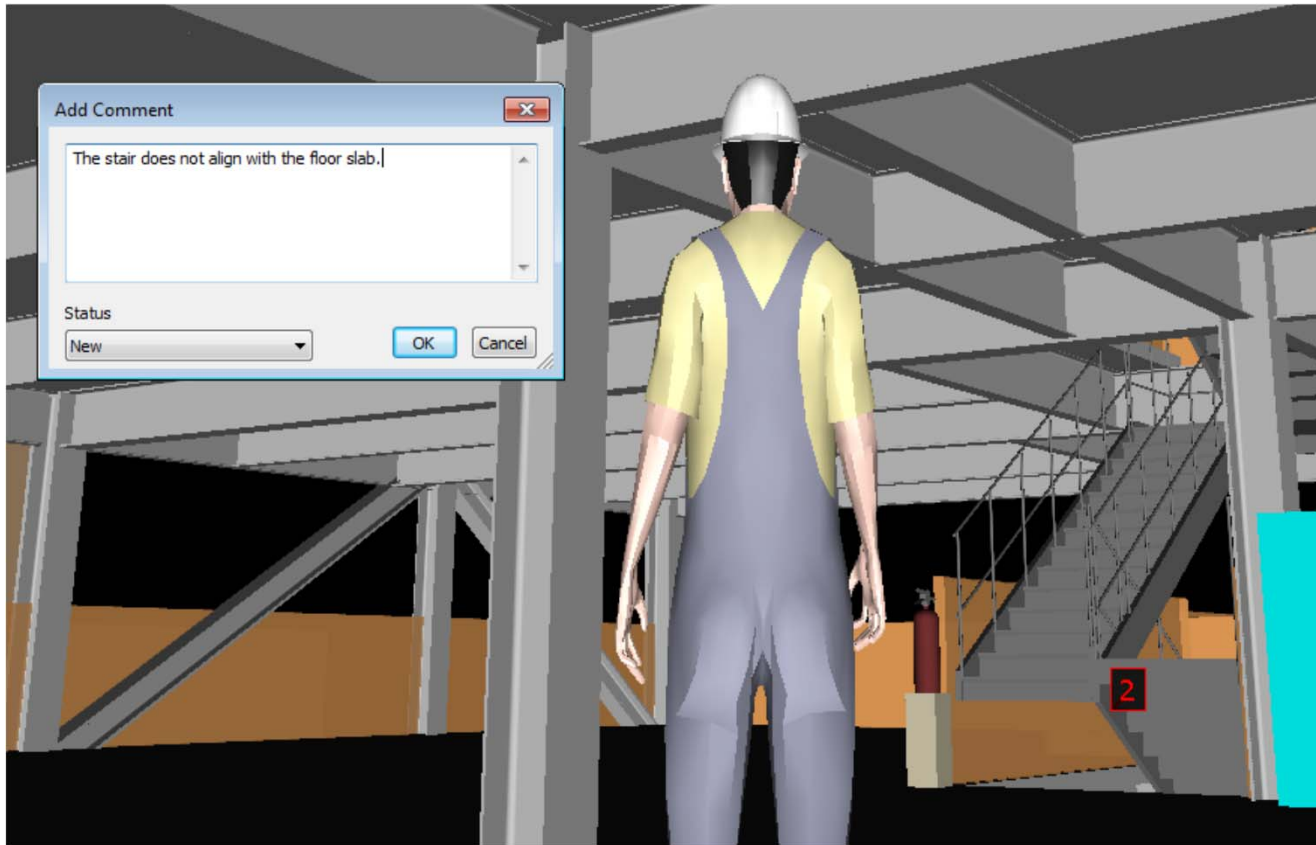
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Measurements of various objects can be easily made verifying code compliance.



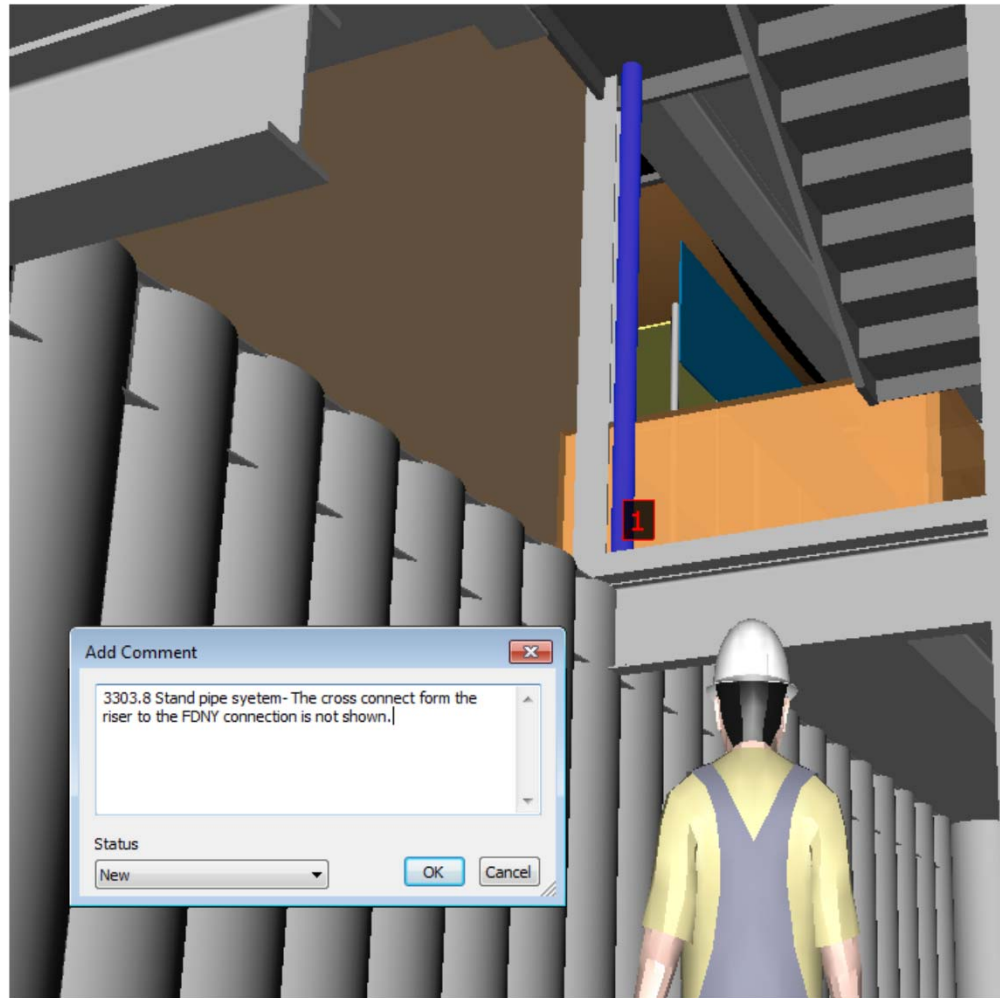
# Review Process for 3D Site Safety Plans

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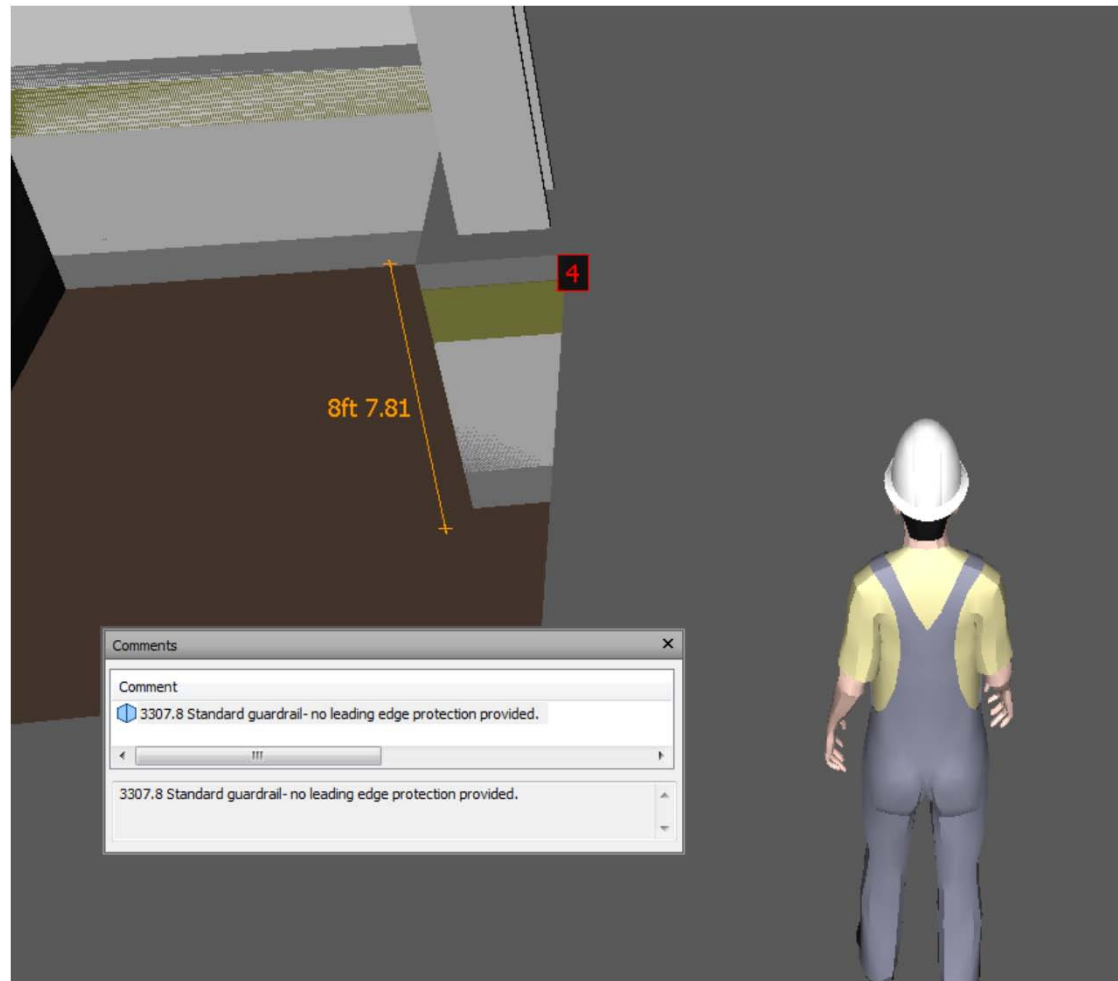
# Review Process for 3D Site Safety Plans

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# Review Process for 3D Site Safety Plans

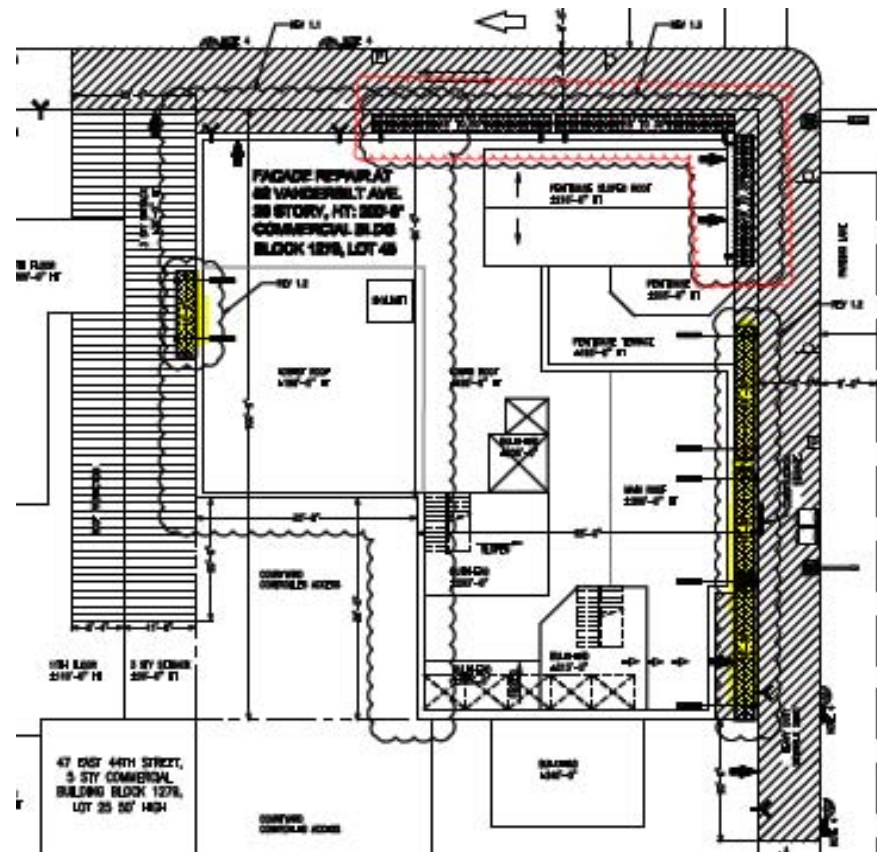
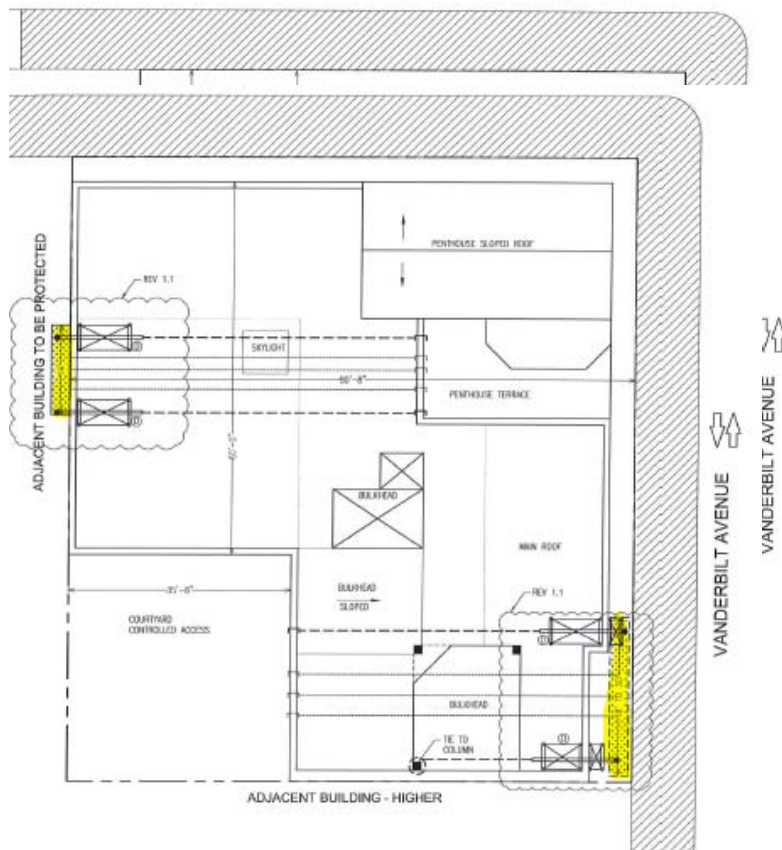
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# Review Process for 3D Site Safety Plans

CD5

Site Safety Plan



CD5 approval does not match the site safety plan.

[illegible]

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# Approval / Disapproval

# Review Process for 3D Site Safety Plans

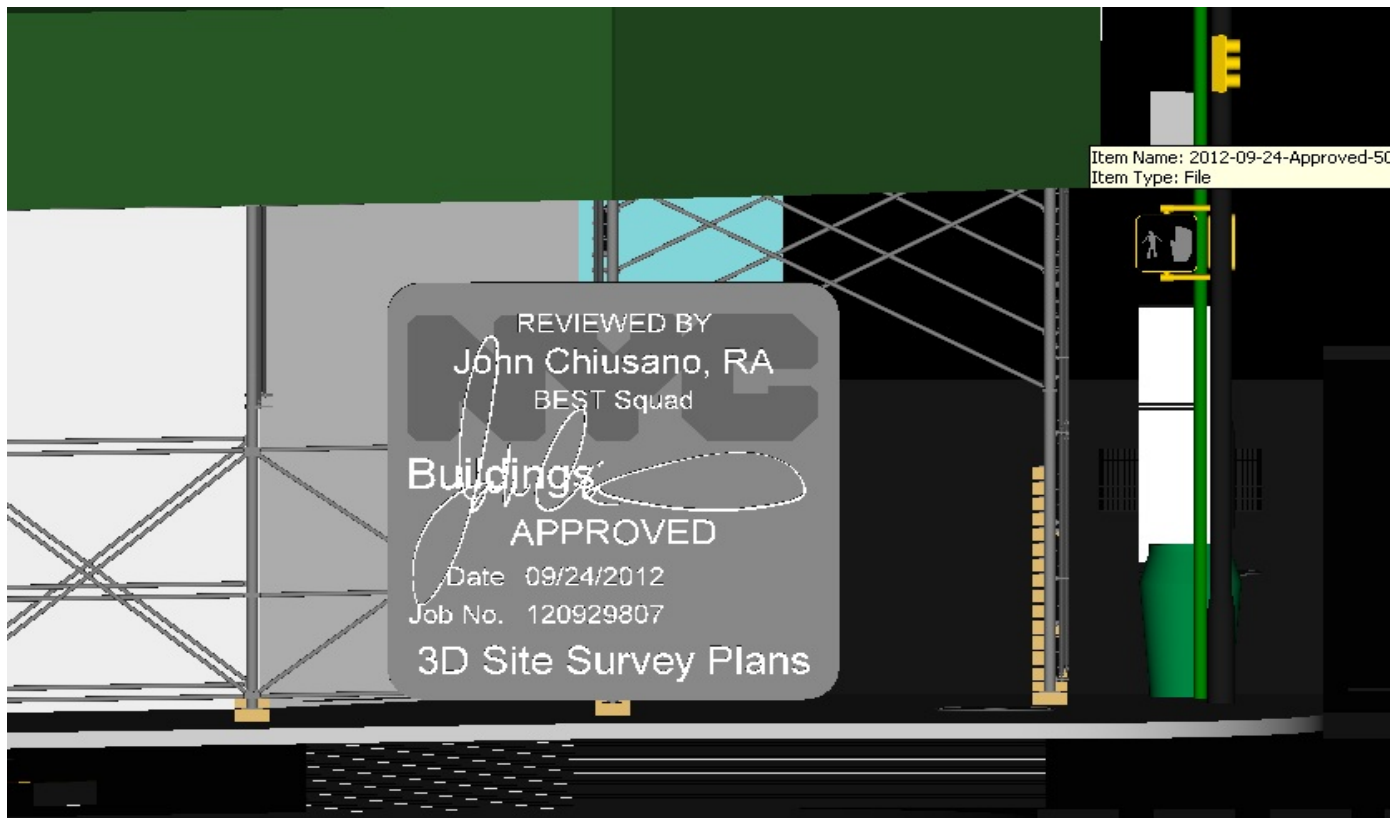
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- Use of BIM in SSP planning results in better coordination between parties involved resulting in increased site safety.
- Digital “Pre-Qualifying” of the model makes sure minimum standards have been met, resulting in better service and fewer office visits.
- Ability to embed design documents and necessary approvals in BIM models helps deliver complete application package to the Department for SSP approval. This also helps in field inspections.

# Review Process for 3D Site Safety Plans

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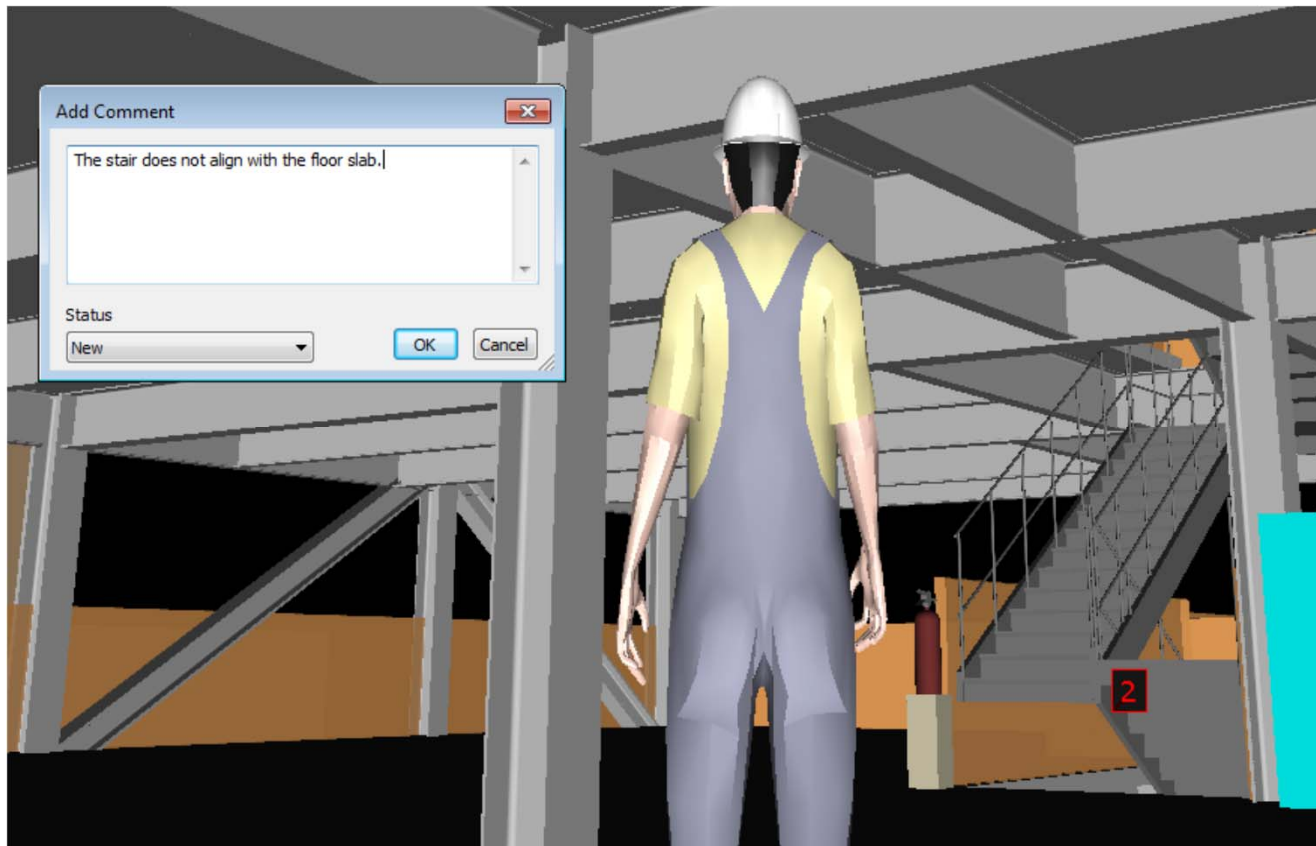
Approved models are stamped with plan reviewer's 3D stamp and saved as a web file so the approval stamp cannot be extracted.



# Review Process for 3D Site Safety Plans

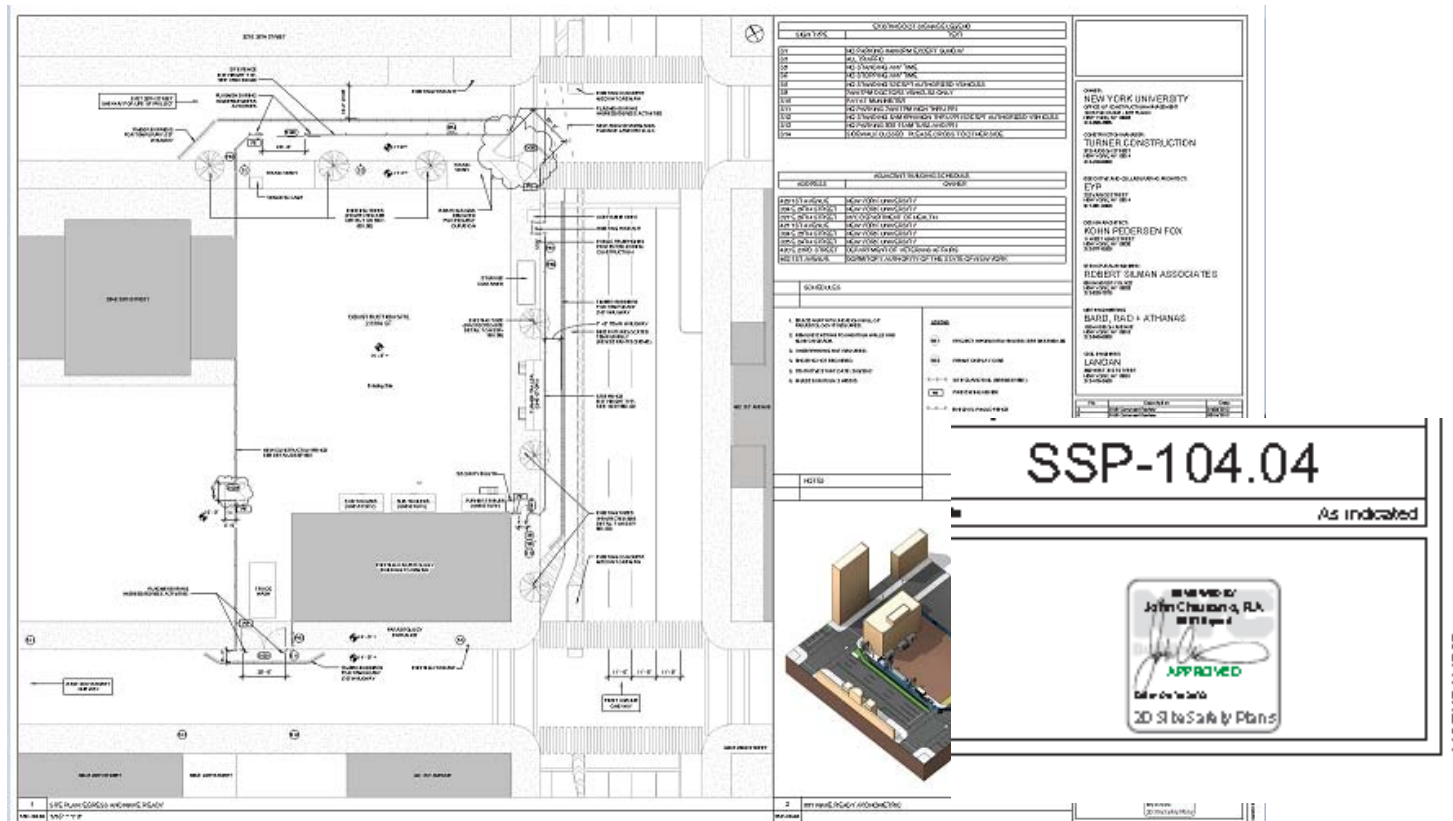
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Objections are tagged.



# Review Process for 2D Electronic Site Safety Plans

Approved drawings are stamped with plan reviewer's 2D stamp and saved as a web file so the approval stamp cannot be extracted.





# Review Process for 3D Site Safety Plans

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Approved or rejected files are uploaded back to Zoho and shared with the design professional.

An email from BIM is sent to the design professional and the GC listed on the project coversheet, letting them know if job has been approved or disapproved.

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# Field Usage

# Field Implementation

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Today, our inspectors use Toughbooks in the field.



The Department will be using iPads for SSP inspections



# Field Implementation

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## Advantages of Using an iPad:

- Less cumbersome.
- Faster boot-time and better touch-screen capability.
- Built in camera
- Can be preloaded with 3D models.
- Allows use of Glue-360 an online collaboration tool provided by Autodesk.
- Inspectors can get a virtual “walkthrough” of the site.
- Good training tools for inspectors.

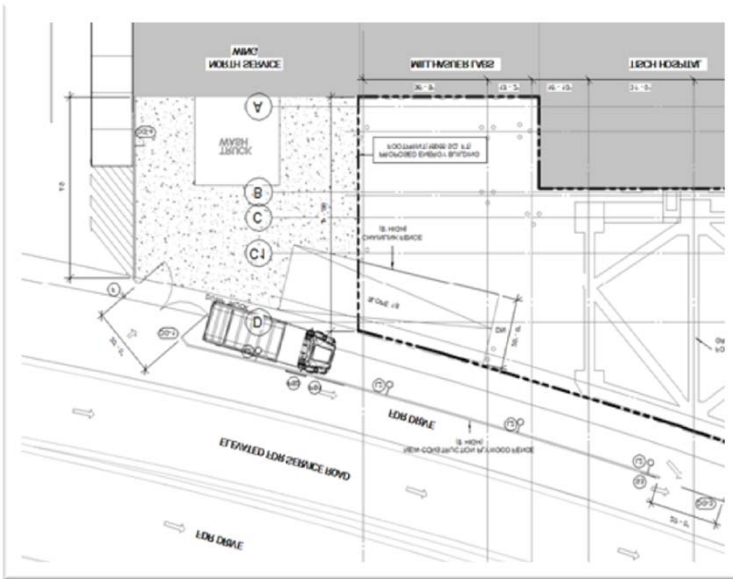
# Field Implementation

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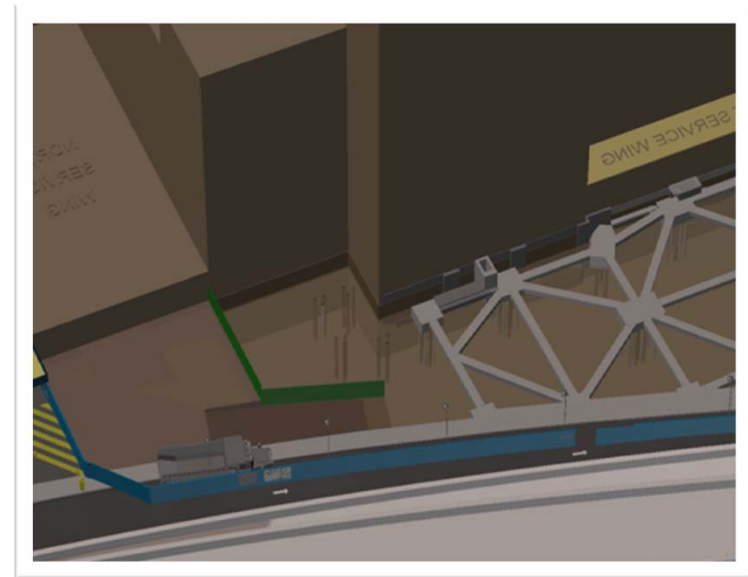
Inspections are conducted on wireless, hand-held devices as part of our pilot program.



PDF



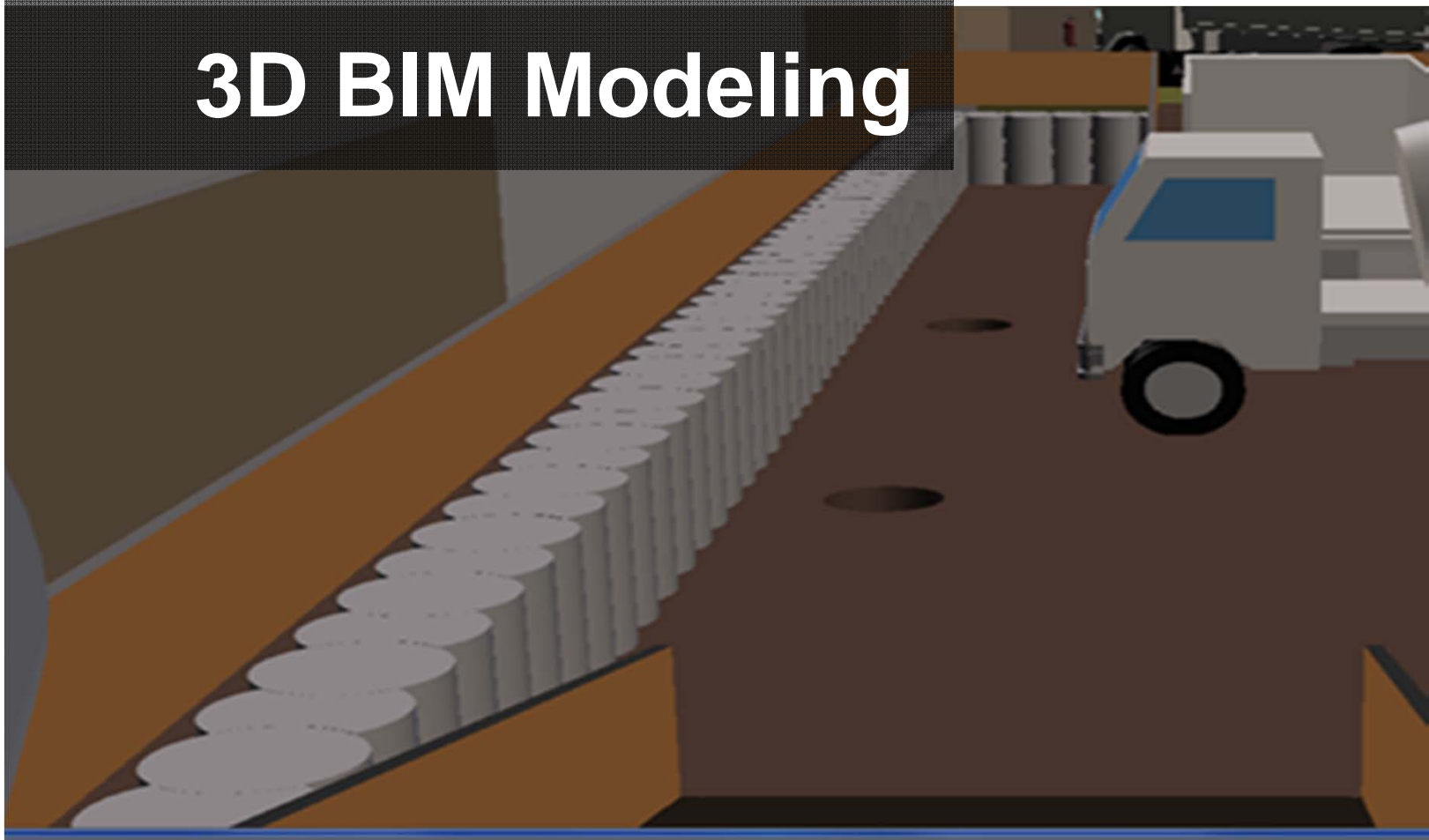
# BIM



## Field Implementation

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### 3D BIM Modeling



# Field Implementation


## Inspection



# Field Implementation

## Site Safety Inspection Checklist

DOB SITE SAFETY INSPECTION CHECKLIST									
Route Sheet #: 3577		Stop #: 02		Tracking #		Insp. Type: Site Safety			
Inspector Name: Md Islam		Inspector Badge #: 2342		Inspection Date: 04/11/12		Rule 52 Notification #: 110265			
Supervisor Name: Philip Krikorian									
BUILDING INFORMATION									
Address: 433 1 Av		Job Type: NB		Construction Type: Steel-Conc		Proposed Stories: 11			
BIN: 1083651		Block: 931		Loc: 24		C9: 106		Zip: 10010	
Owner Name: New York University								Proposed Height (ft): 173	
Address: 10 Astor Place, NY, NY 10003								Phone #: 212-998-1407	
Job Applicant Name: EYP						License #: 24633		License Type: RA	
Address: 225 Varick Street, NY, NY 10014								Phone #: 917-981-6004	
PERMIT - CONTRACTOR INFORMATION									
Job #: 121181176		Permit Type: FO		1 <sup>st</sup> issued: 02/22/12		Expiration Date: 11/01/12			
Contractor Business Name: Turner Construction Company						License #: 2305		GC	
Contact: Mark Manning						Phone #: 212-229-5500			
Site Safety Manager Name: Irving Suriel						License #: M2081			
Address: 399 Hadleigh Lane, N Brunswick, NJ 08902						Phone #: 946-772-3919			
Sub Contractor Business Name									
1. NA		License/D #		Address		Zip		Telephone	
2.									
3.									
A. General Results (Select 1 ONLY)									
<input type="checkbox"/> A1- Full Compliance/No Action Necessary <input type="checkbox"/> A4- Job Not Started <input type="checkbox"/> A7- Access Denied <input checked="" type="checkbox"/> A10- ED / IED									
<input type="checkbox"/> A2- Violation(s) and SWO Issued <input type="checkbox"/> A5- Work Complete <input type="checkbox"/> A8- Unable to perform inspection									
<input type="checkbox"/> A3- Violation(s) without SWO <input type="checkbox"/> A6- No Access <input type="checkbox"/> A9- Stalled Site									
B. Job Status (Select 1 ONLY)									
<input type="checkbox"/> B1- Superstructure <input type="checkbox"/> B4- Filled to Grade and Fenced <input type="checkbox"/> B7- Pre-demo <input type="checkbox"/> B10- Façade Work									
<input type="checkbox"/> B2- Foundation <input type="checkbox"/> B5- Demolition in Progress <input type="checkbox"/> B8- Interior Fit Out									
<input checked="" type="checkbox"/> B3- Excavation <input type="checkbox"/> B6- Demolition Complete <input type="checkbox"/> B9- Curtain Wall Operation									
C. Site Conditions									
Union		Yes		Highest floor stairs are poured		NA		Cocoon system	
Proposed Stories		11		Highest floor Standpipe installed		NA		Building topped off	
Current Stories		NA		Highest floor Curtain Wall		NA		Highest floor serviced w/vertical nets	
Current Height (ft)		NA		Highest floor serviced by personnel hoist		NA		Occupied floors	
Highest poured floor		NA		Highest floor w/horizontal nets		NA			
D. Stop Work Order (SWO) (if necessary): <input type="checkbox"/> Full SWO <input type="checkbox"/> Partial SWO <input type="checkbox"/> Full Rescind <input type="checkbox"/> Partial Rescind									
ECB / DOB / LOD Control #		Issued to / Respondent		Violation Reason w/ Provision of Law		License #		License Type	
1. None									
2.									
3.									
4.									
5.									
General Comments:									
Fence up, sign and permit posted. Excavation and foundation guide wall work in progress.									
Floors inspected: NA									
Inspector's Signature: Md Islam									
Supervisor's Signature:									



# BIM Implementation Status

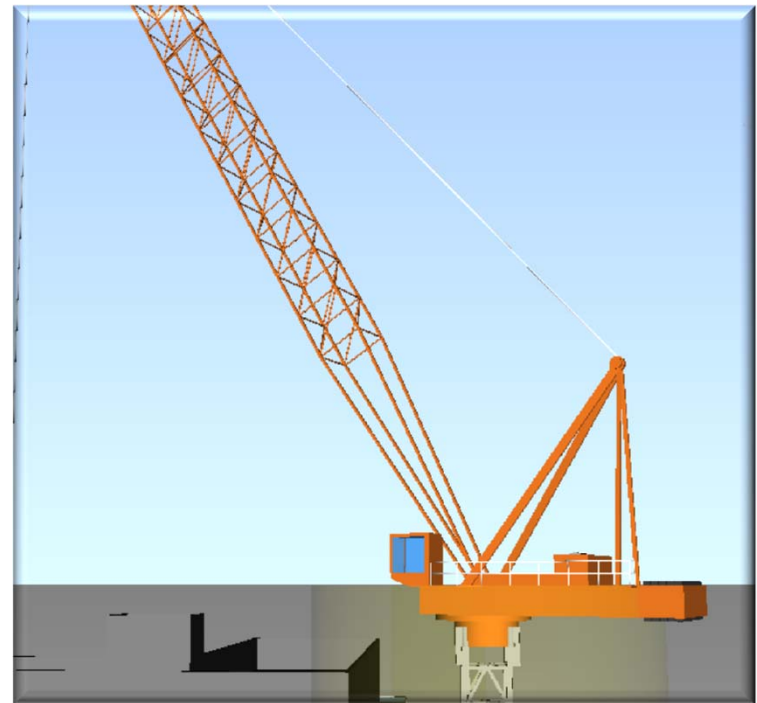
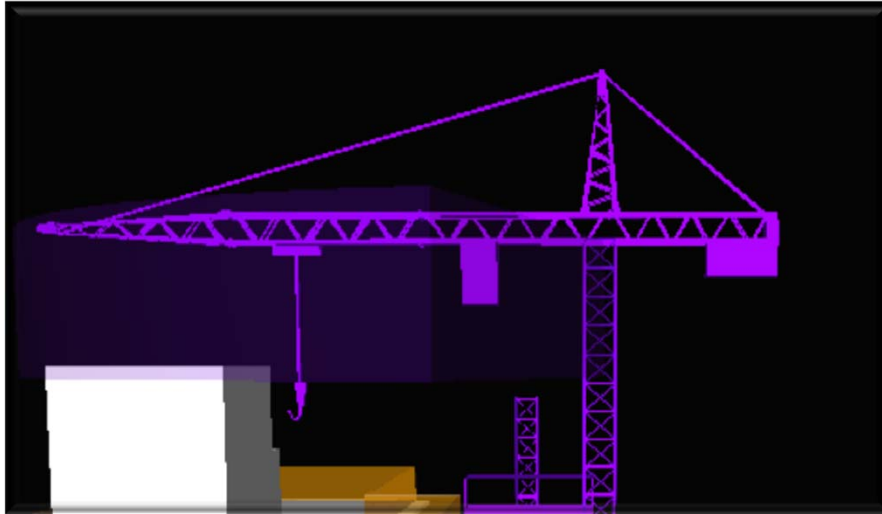
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- Currently we are in an interim phase of implementing BIM at the Department of Buildings.
- Current submissions are a “hybrid” of 3D (actual SSP) and 2D-related design documents.
- Now defining BIM standards with Microdesk.
- Will complete transition to 3D BIM models as standards are defined and we build our knowledge from current submissions.

# BIM Standards

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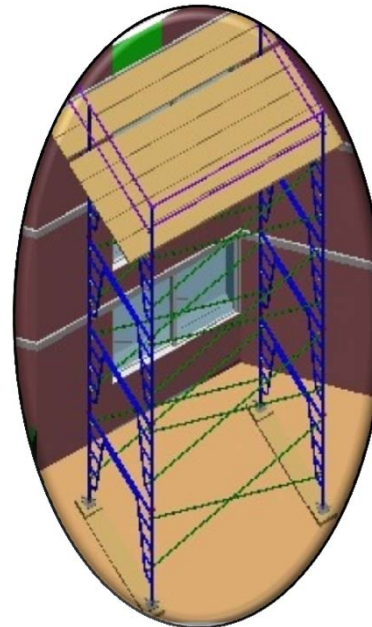
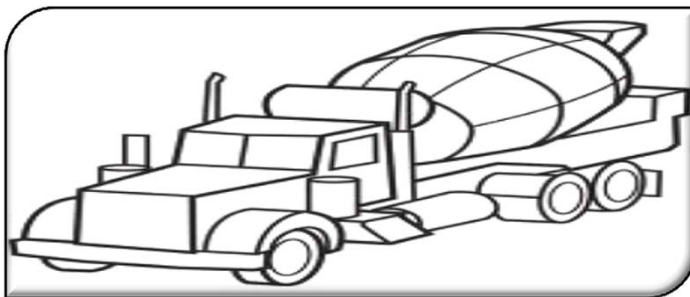
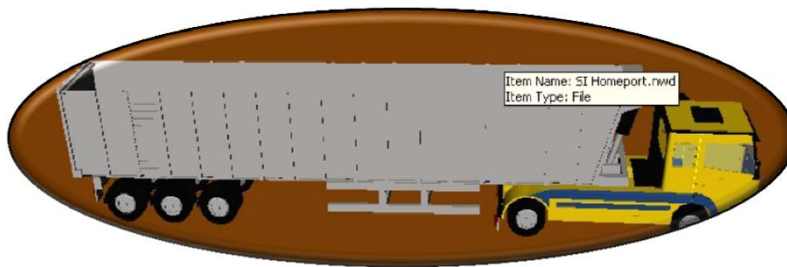
- Standardization of BIM objects and families
- Faster approvals
- Pre-checking with software



# BIM Standards

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- The partnership with Microdesk to deliver BIM standards for the industry.
- In the process of defining commonly used equipment and objects in the industry.



# Challenges Ahead

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- Some contractors hesitant because of the time and money to implement new technology.
- Need additional talent to implement new technology.
- Need additional equipment and software to implement this new technology.
- Lack of motivation (If old method works, why should I change it?)
- Concerns about plagiarism. Concerns that information can be stolen from models and reused. Model becomes public information once approved by the Department.
- Keep informed – team effort.

## Questions?

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This concludes the American Institute of Architects Continuing Education Systems Course.

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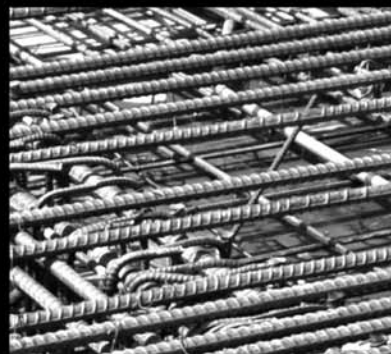
# Creating BIM Site Safety Plans

**John Chiusano, RA**

Assistant Chief Architect, Technical Review

**Charanjeet Singh, PE**

BIM Manager, Technical Review



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