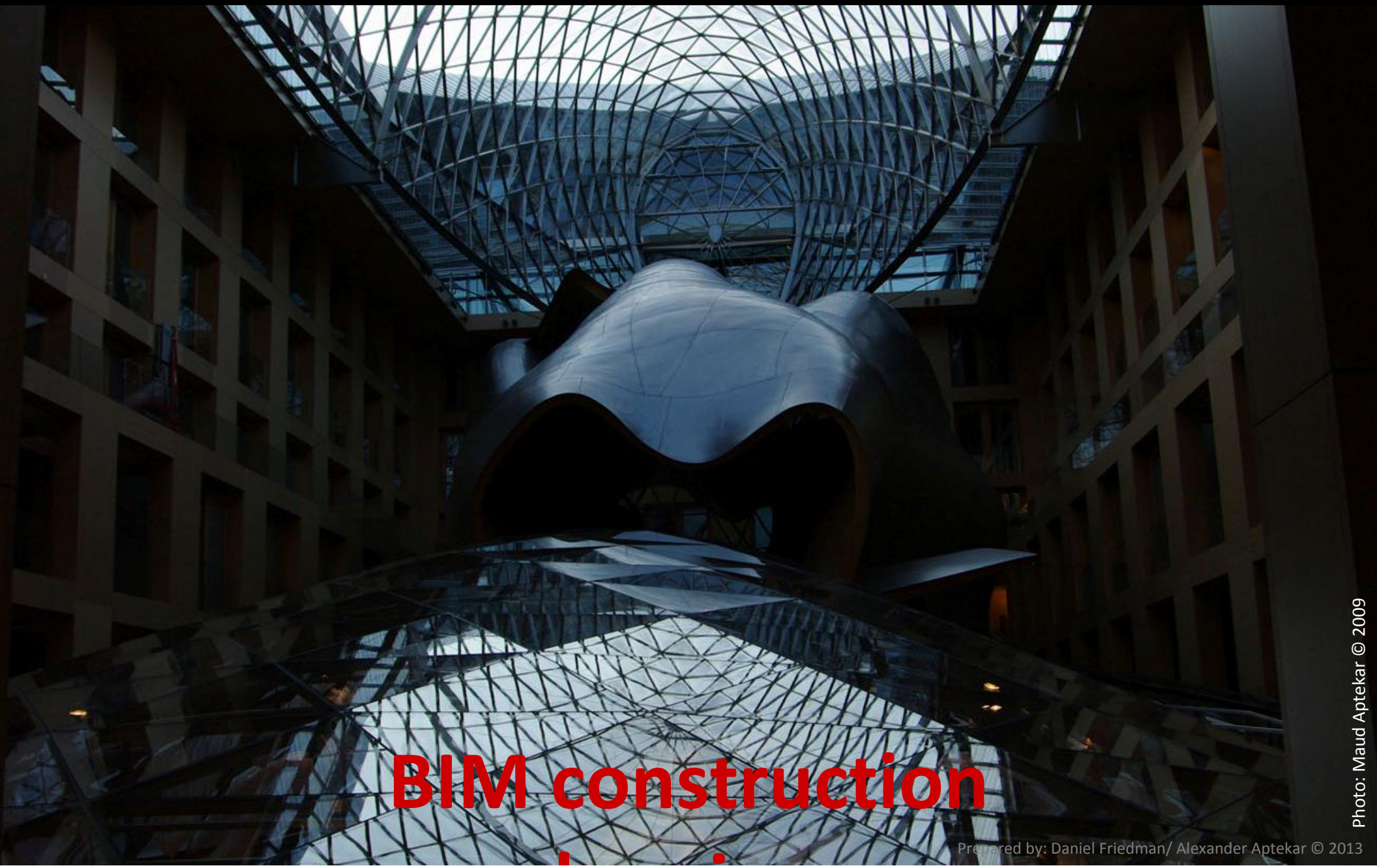
WELCOME TO: ARCH 2430,
BUILDING TECHNOLOGY IV



BIM construction

Prepared by: Daniel Friedman/ Alexander Aptekar © 2013

WELCOME TO:
ARCH 2430
BUILDING TECHNOLOGY IV

Section: E160-LEC(82407)

Monday 6:00PM - 8:05PM

Wednesday 6:00PM - 8:05PM

WELCOME TO:
ARCH 2430
BUILDING TECHNOLOGY IV

Section: D619-LEC(28422)

Wednesday 8:00AM - 10:05PM 834A

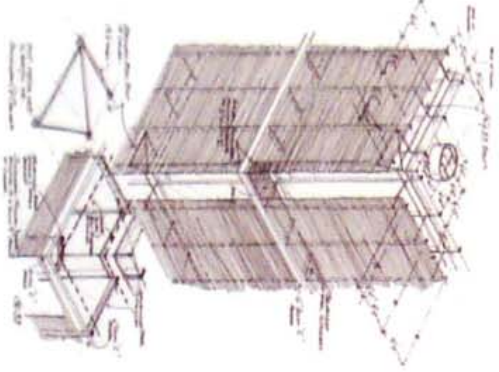
Friday 8:00AM - 10:05PM 812

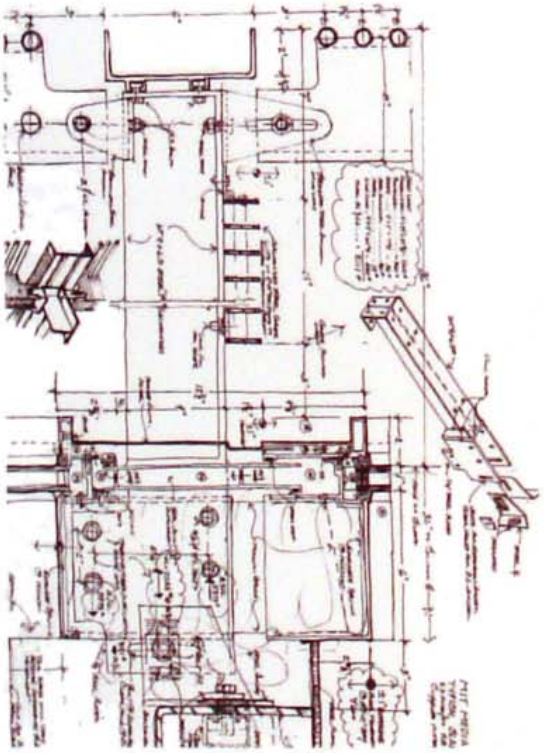
Introduction

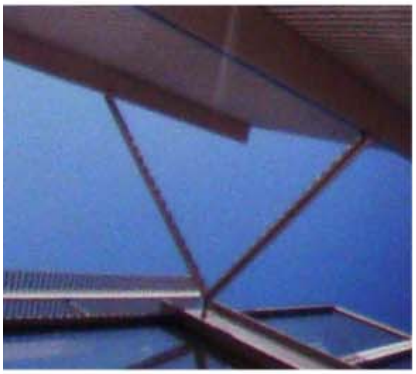
- Prof.: Daniel Friedman EMail: dfriedman@CityTech.Cuny.Edu
- Office Hours :
  - Monday 8:05pm – 8:40pm,
  - Wednesday 8:05pm – 8:40pm
  - and by appointment
-
- 3 CREDITS: 1 Classroom Hour and 2 Lab Hours
- **Prerequisites:**
  ARCH 2330: Building Technology III with a grade of C or higher.
  Or ARCH 2340 and ARCH1290 with a grade of C or higher.

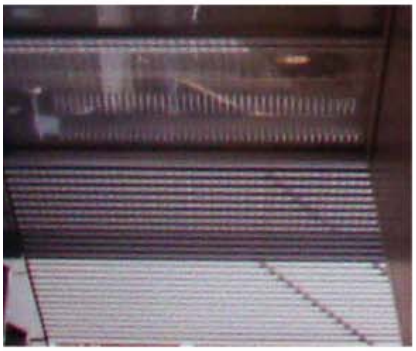
Note: ARCH 1290 (Architectural CADD) can be substituted for one of the above classes under some circumstances.

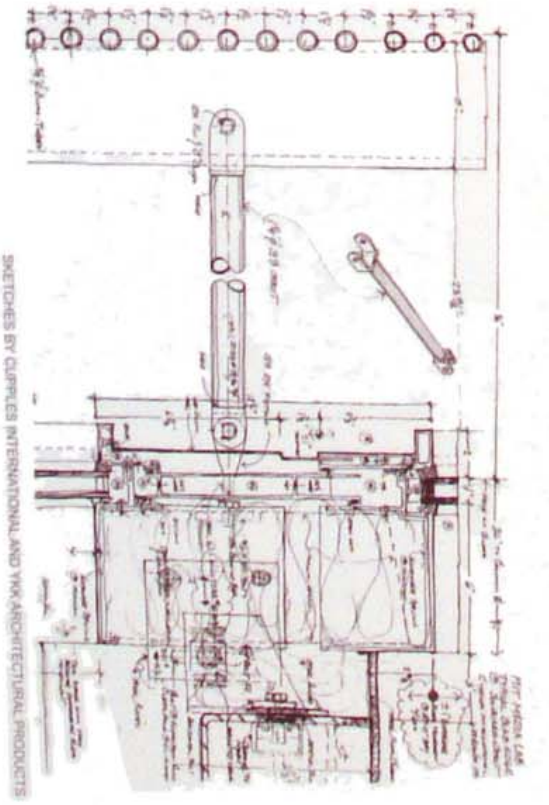
Building technology exhibition 2010; MIT Media Lab, architect Fumihiko Maki







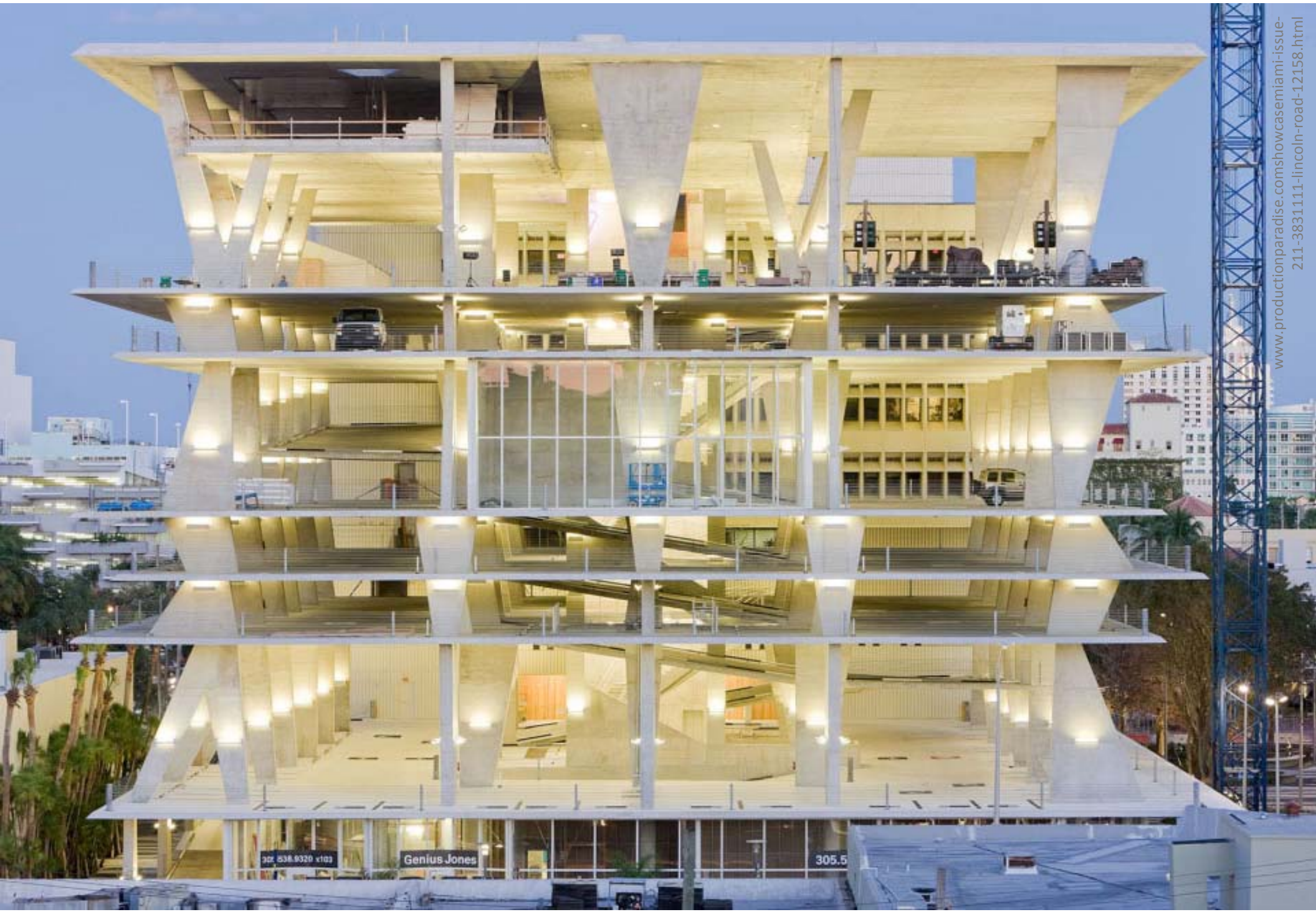




Course Description:

- This course studies the development of building systems as they occur during the design development phase of architecture. Using case study research methods, students analyze factors, such as building assemblies and systems, codes and government regulations, human ergonomics, and sustainability, that affect building construction and use. Their solutions to these issues are integrated into their final building design solutions. The student creates a series of reports and a set of construction drawings using both analog methods (hand sketching and drawing) and digital tools including traditional CAD software and Building Information Modeling techniques.

- Course Context: This is the 4th course in the required sequence of four building technology sequence.



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Texts:

- **Required Texts:**
- Class reader on Blackboard; relevant sections will be posted weekly. Allen, Edward and Joseph Iano. Fundamentals of Building Construction / Materials and Methods.
- John Wiley and Sons, 2008. Ching, Francis. Building Construction Illustrated. John Wiley and Sons, 2008.

- **Recommended Text:**
- Ramsey, Charles George, Harold Reeve Sleeper, and Bruce Bassler. Architectural Graphic Standards: Student Edition (Ramsey/Sleeper Architectural Graphic Standards Series). John Wiley and Sons, 2008.
- James Vandezande, Eddy Krygiel, and Phil Read. Autodesk Revit Architecture 2013 Essentials: Publisher: Sybex; 1 edition 2012.
- Edward Allen, Joseph Iano. The Architect's Studio Companion: Rules of Thumb for Preliminary Design, Wiley; 5 edition

Course Policies:

- **Attendance Policy:** No more than 10% absences are permitted during the semester. For the purposes of record, two lateness are considered as one absence. Exceeding this limit will expose the student to failing at the discretion of the instructor.

- **Course Structure:** Lectures and lab work. Assignments include a series of reports, class presentation, sketching, quizzes and set of construction drawings. Digital tools learned in prior building technology courses are reinforced.

- **Grading:**

60%	Comprehensive Drawing Set (including midterm, progress and final submissions)
15%	Studio Lab Assignments (# 1-12)
10%	Research Projects (Concrete, Cladding & Details)
10%	Sketching Assignments ((SK) & redlines (student redlines))
5%	Class Participation

Course Policies:

- **Academic Integrity:**

- Students and all others who work with information, ideas, texts, images, music, inventions and other intellectual property owe their audience and sources accuracy and honesty in using, crediting and citation of sources. As a community of intellectual and professional workers, the college recognizes its responsibility for providing instruction in information literacy and academic integrity, offering models of good practice, and responding vigilantly and appropriately to infractions of academic integrity. Accordingly, academic dishonesty is prohibited in The City University of New York and is punishable by penalties, including failing grades, suspension and expulsion.

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Course Policies:

Learning Objectives

Upon successful completion of this course, the student will:

- **Understand** the process and requirements of developing a design from a schematic concept into design development drawings. (Knowledge)
- **Execute** work through a collaborative process (Gen Ed)
- **Generate** clear and concise talking points to guide oral presentations of lab assignments. (Gen Ed)
- **Understand** the advantages and limitations of BIM (building information modeling) as a tool for design development and project delivery. (Skill)
- **Apply** knowledge of materials and methods of construction, including sustainable principles, to the development of details and assemblies. (Skill)
- **Sketch** and **draft** details in orthographic and 3-D views in analogue and digital media. (Skill)
- **Design** and **analyze** exterior wall system based on environmental performance.
- **Apply** knowledge of professional construction drawing standards for page composition, title blocks, annotation, and schedules. (Skill)
- **Develop** a professional quality coordinated, edited, and organized set of design development documents for a given building design using BIM and CAD. (Skill)

Course Policies:

Assessment

To evaluate the students' achievement of the learning objectives, the professor will do the following

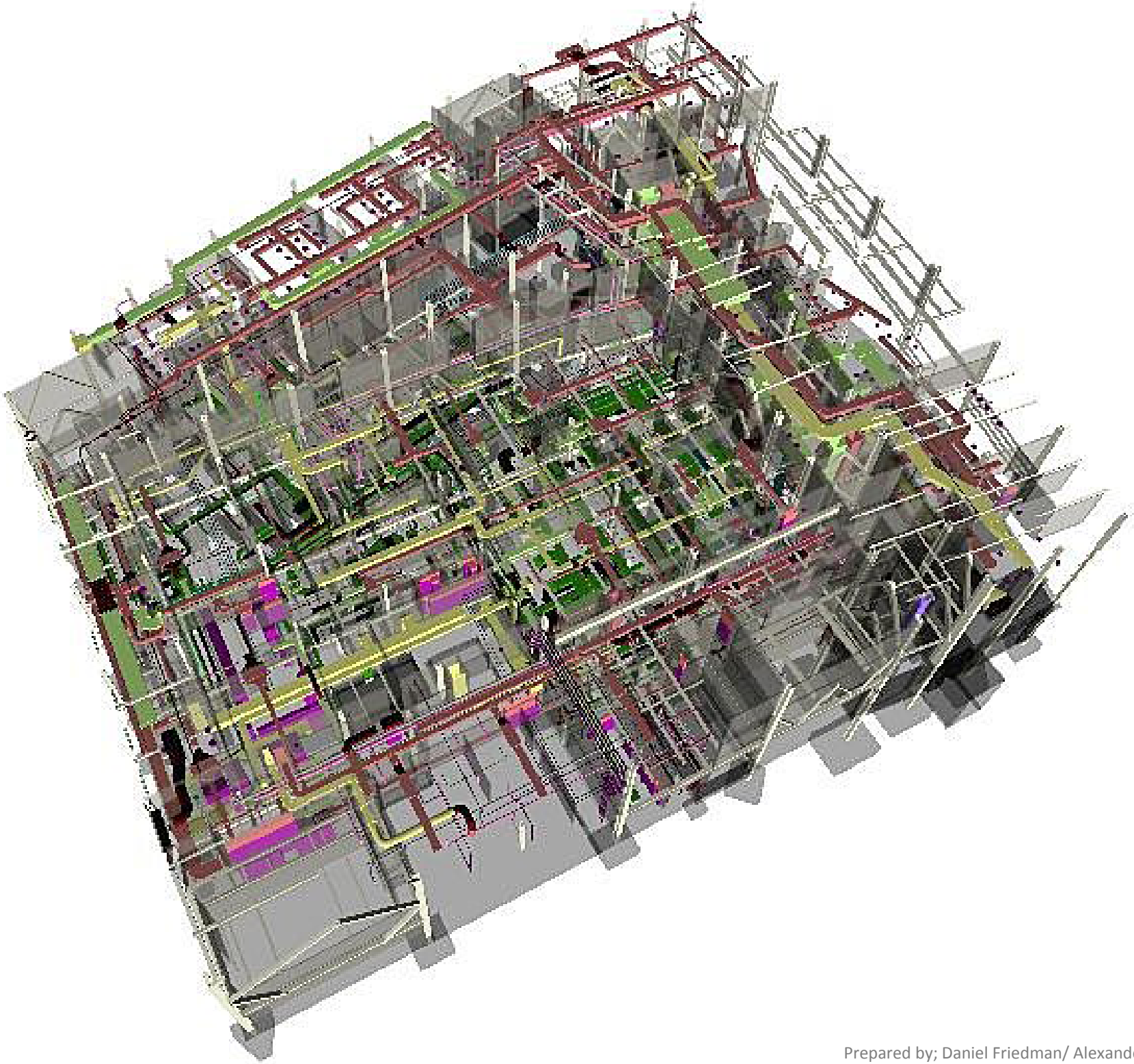
- **Review** students' drawing and modeling work where students must exhibit their visual representation skills (2-D and 3-D). (Los: 6, 8, 9)
- **Assess** the students' use of professional vocabulary during oral presentations.(Lo:3)
- **Review** the effectiveness of student team organization and their management of the project work by frequent meetings. (Lo: 2)
- **Inspect** student submissions for the efficient and effective use of BIM tools. (Lo: 4)
- **Confirm** the proper coordination of the students' submitted drawing sets. (Lo: 9)
- **Review** the quality and accuracy of the students' submitted analogue and digital models of construction assemblies (Los: 6, 7)
- **Review** the effectiveness of the design and the accuracy of the analysis of the environmental performance of the submitted exterior wall system. (Los: 5, 7)
- **Compare** the content and quality of final submission of the design development set to a specific professional standard. (Los 1, 8, 9)

Course Policies:

- **Term Project / Assignments:** Each student is responsible for turning in an assignment even if absent the day the assignment is given. It is the student's responsibility to have the email address or telephone number of another student in the class, or to speak with the instructor when absent. Late assignments will be downgraded 1/3 grade for each class date they are late. If the assignment deserves an A-, but was delivered two classes late, the student will receive a B.

- **Course Requirements:** The student should spend at least 8 hours per week outside of class time preparing assignments by hand and at the computer. Computer lab hours are posted after the first week of classes. The lab is open on Saturdays and Sundays during the semester.

  Deadline note: Unless otherwise instructed the due assignments must be posted to the class blackboard website by 10pm on the day before the class meets.



Blackboard:

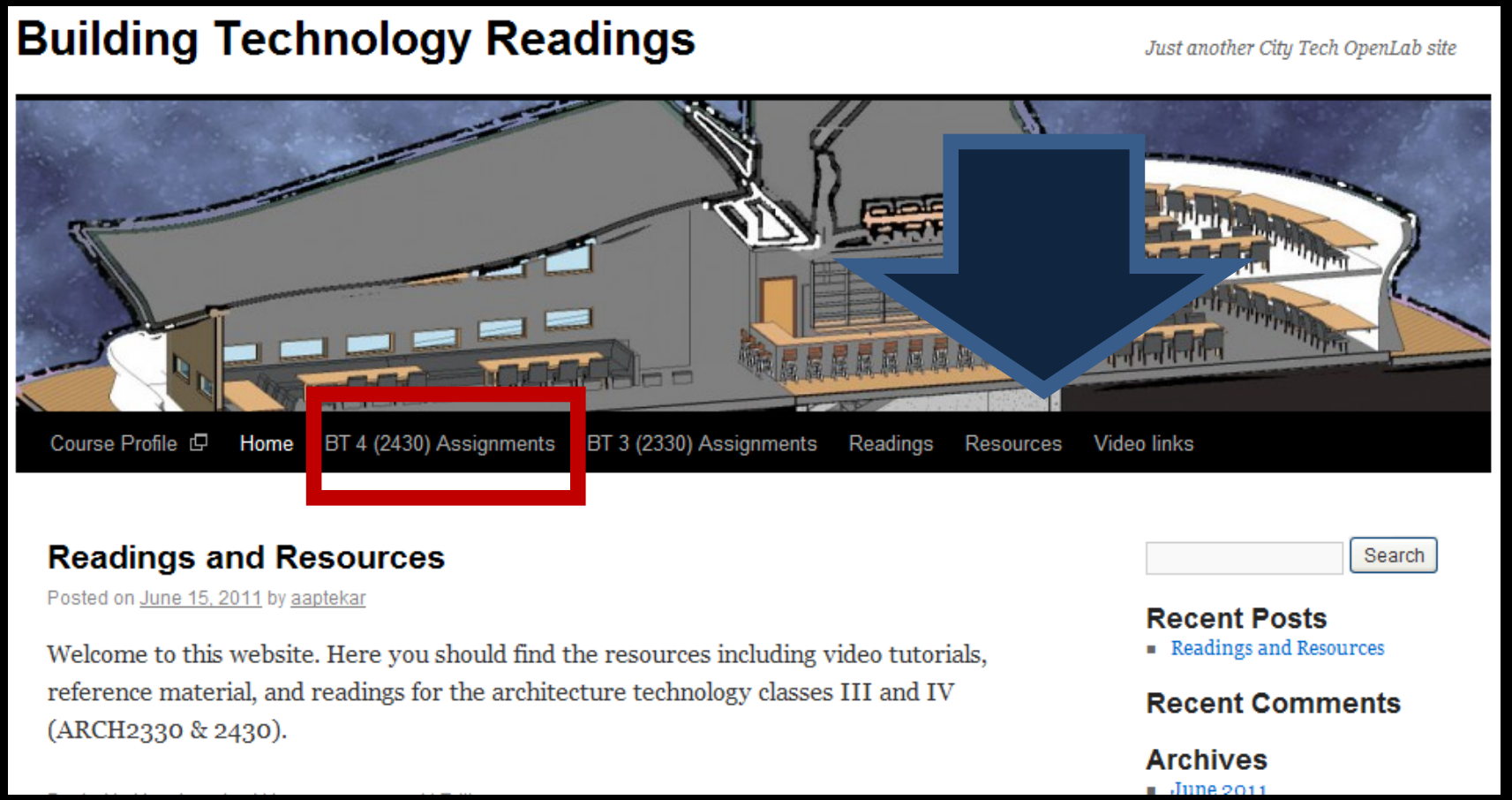
Login : http://portal.cuny.edu/portal/

Student Blackboard and CUNY Portal:
Location: G-604
Walk-in, no registration required
Basic student instruction will be provided in how to get the portal ID and use Blackboard for class assignments.

The schedule of classes can be found at:
http://websupport1.citytech.cuny.edu/studentworkshops.html

Open Lab:

Login: http://openlab.citytech.cuny.edu/



Overview

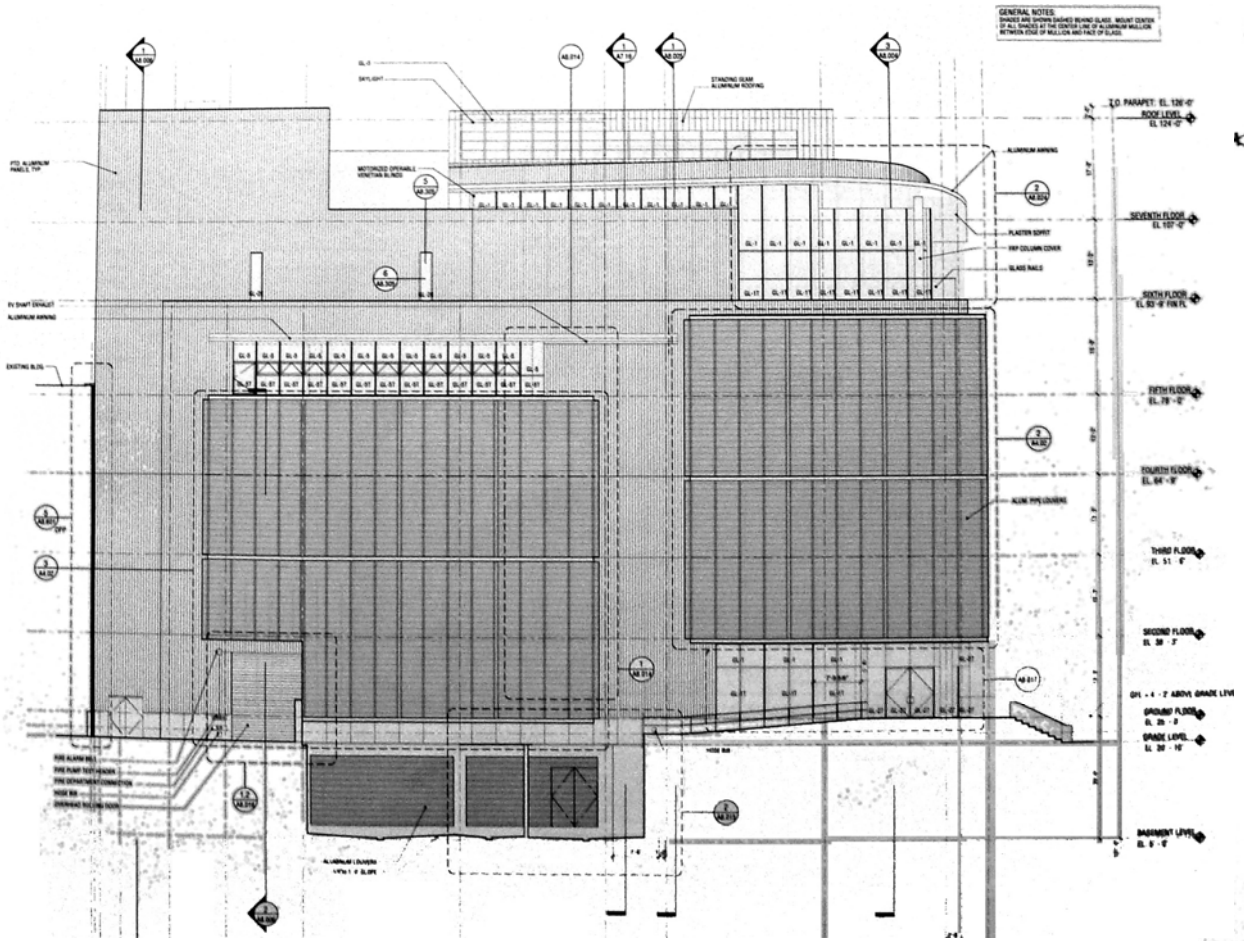
Week One: Class 01

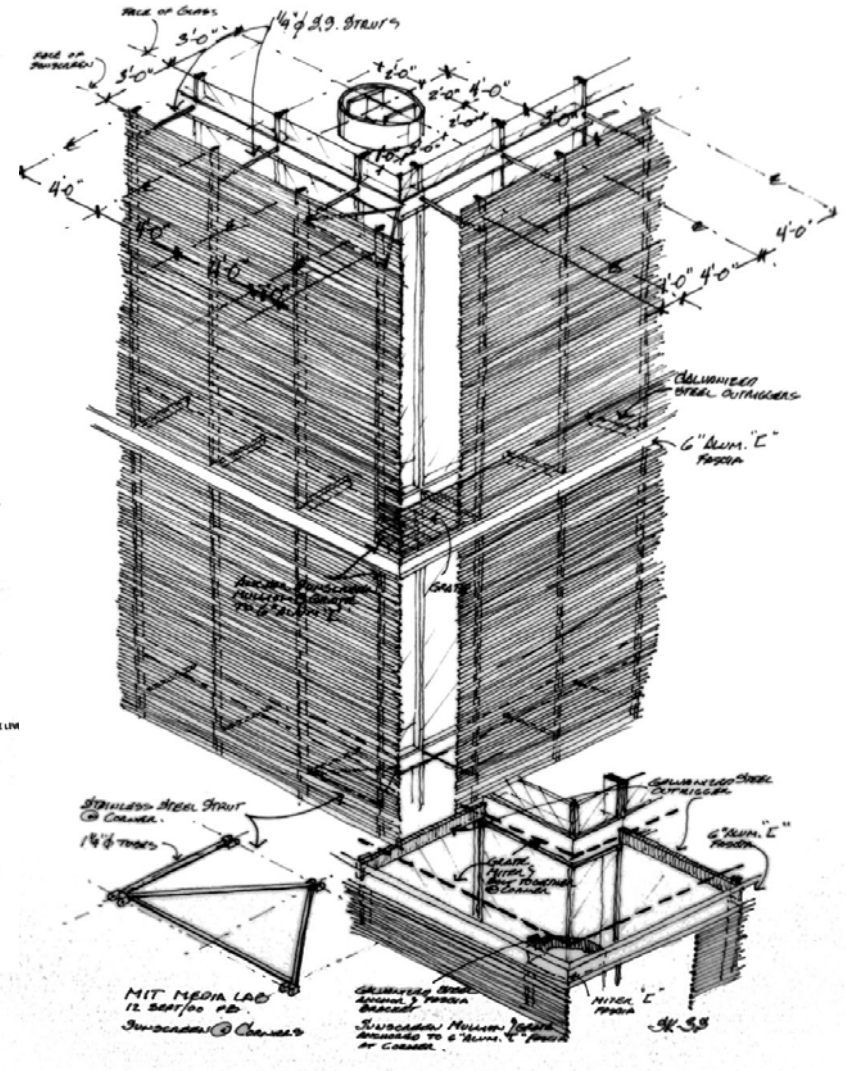
Lecture: Course Introduction:
a.Introduction and course outline.
b.File naming and protocols
c.Course project and development process
d.Assignments
e.Teams
f.Site
g.Sketch assignment: **SK 1**

Lab [Computer Topics]:
a.Take skills survey
b.Logo Development
c.title block creation
d.Presentation

Media Arts and Sciences Building, Maki and Associates, MIT, Cambridge, Mass. 2010

building documentation





Building technology exhibition 2010; MIT Media Lab, architect Fumihiko Maki

File naming and protocols

All file names should include student's name (last then first), assignment number, assignment name, and date (year, month, day). The date used for naming your assignment should be the date the assignment is due. All work must be submitted using the same version of Revit or AutoCAD that is installed in the lab.

Last name_First name_project number/project name_date(yymmdd)

Example:
Wright_Frank_01Grid_120830.dwg
Only files named appropriately will be accepted. Any other format will be rejected and considered as not submitted.

At the end of the semester, you will be required to submit your work for archiving. The file format will be different. Here the file format will include course number, course section, semester, professor's name, project name, drawing title, your name (last then first).
Examples:
ARCH2430_0000_semester_ProfessorsName_Project_xxTitle_Last_First.dwg
ARCH2430_9619_Fall_Smith_Project_03SitePlan_Trubin_Alex.dwg

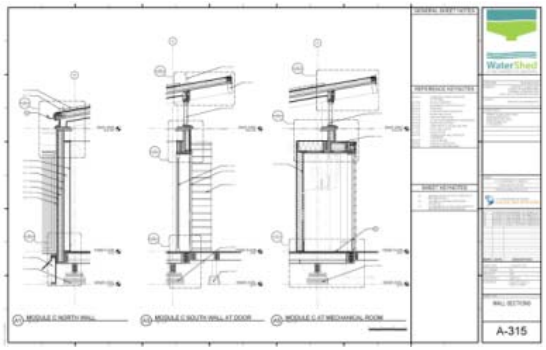
We will discuss this requirement further towards the end of the semester.

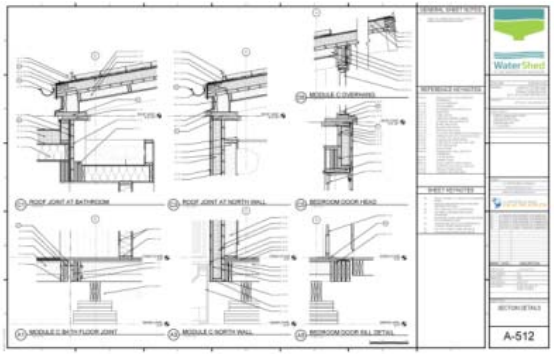
Course project and development process

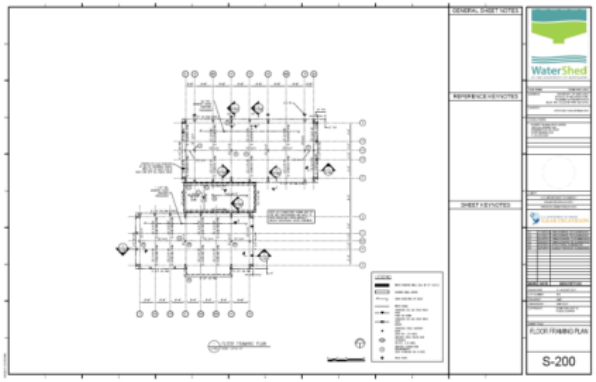
The semester project will be a Multi-story concrete structure multi-use building.

As in the architectural office, this course requires you the student to complete a variety of tasks in order to accomplish the ultimate project - a set of construction drawings for a commercial concrete mixed-use building with a curtain wall enclosure. The schedule is complex and demanding- just like the professional office.

The project will concentrate on the creation of Approximately 40 sheets of construction drawings (CD's) conforming to industry standards and course requirements.







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Assignment types

Drawing submissions
DS 01 25% progressset
DS 02 50% progressset
DS 03 75% progressset
DS 04 100% Final drawing set

Sketch drawings
SK-01 site drawings
SK-02 concrete construction
SK-03 curtain wall details
SK-04 façade details
SK-05 connections
cladding-structure

Weekly Assignments:
Assignment #1: TeamLogo/ Titleblock
Assignment #2: Zoning Analysis/ Massing
Assignment #3: Zoning sheets
Assignment #4: Concrete Framing Systems
Assignment #5: Structural Analysis
Assignment #6: Freeform Roof Design
Assignment #7: Cladding Systems
Assignment #8: Energy Analysis
Assignment #9: Shading Strategies
They are due the following class
after they are listed. They are subject to change:

Assignment #10: Curtain wall Details
Assignment #11: Indoor Lighting Analysis
Assignment #12: Environmental Performance Studies

They are due the following class
after they are listed. They are subject to change:

They are subject to change

Assignment types

Research Projects:
RP 01 Concrete research
RP 02 Cladding research
RP 03 Cladding details Research

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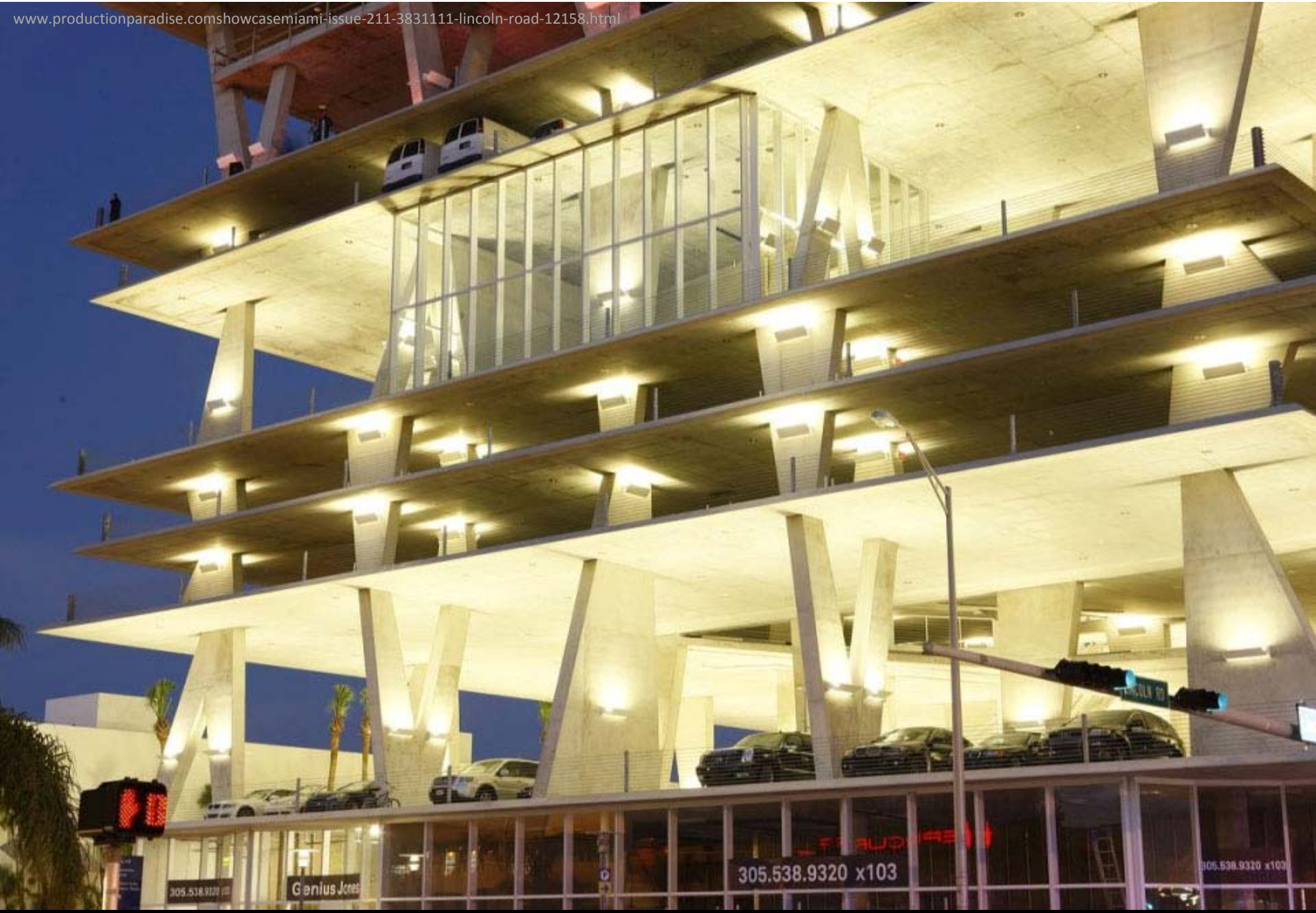

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GROUND FLOOR

A	Existing Building
B	New Car Park Building
C	New Bank Building

1	Car park entrance
2	Car park exit
3	Bank drive-through
4	Alley
5	Bank parking
6	Lincoln Road Promenade
7	Rooftop restaurant entrance
8	Retail service
9	Passage and elevator/
10	Garage parking
11	Office building lobby
12	Retail
13	Mechanical
14	Access to second-floor residences
15	Penthouse roof garden
16	Penthouse pool

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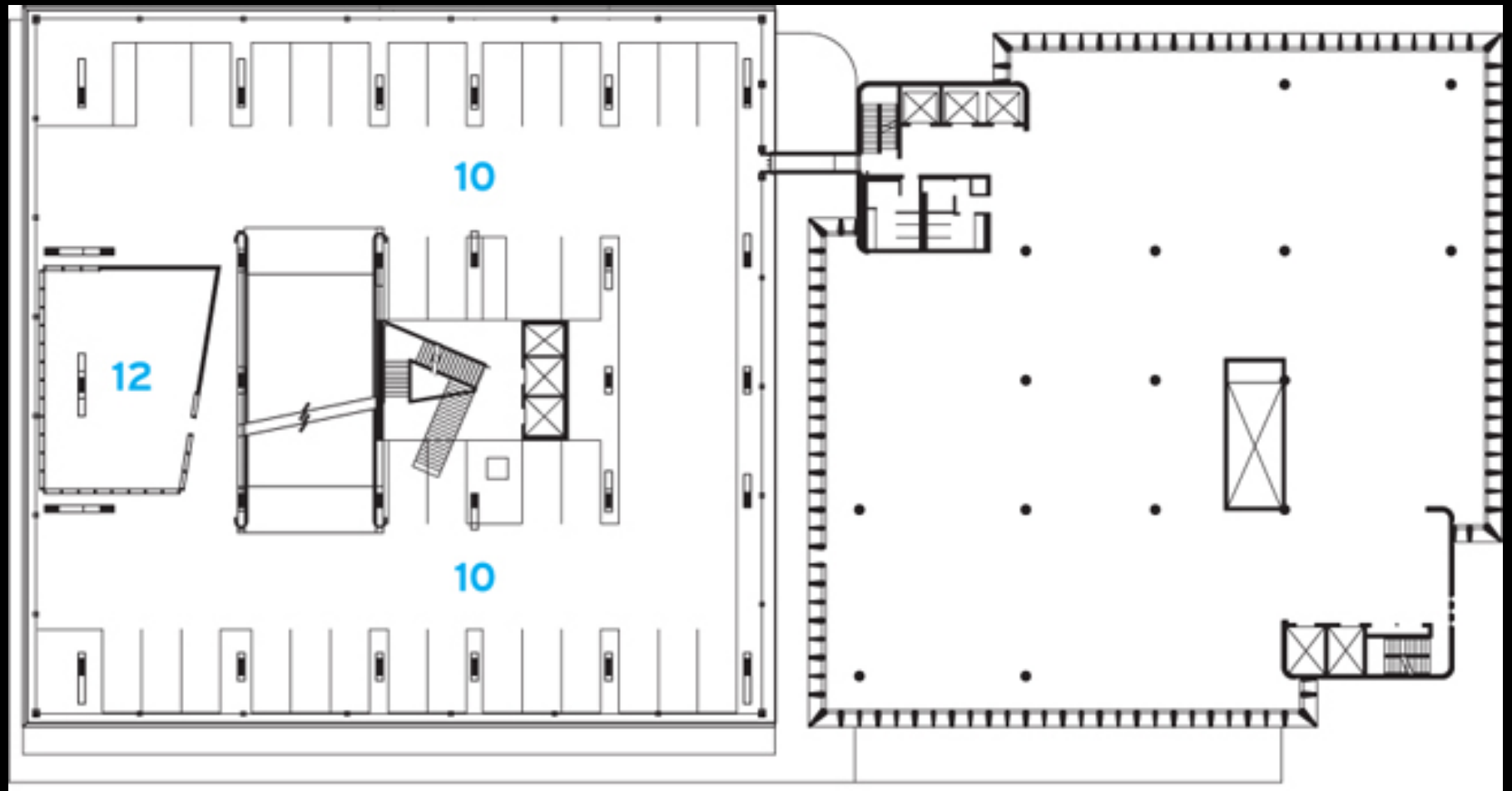

FIFTH FLOOR

1	Car park entrance	9	Passage and elevator/
2	Car park exit	10	Garage parking
3	Bank drive-through	11	Office building lobby
4	Alley	12	Retail
5	Bank parking	13	Mechanical
6	Lincoln Road Promenade	14	Access to second-floor residences
7	Rooftop restaurant entrance	15	Penthouse roof garden
8	Retail service	16	Penthouse pool

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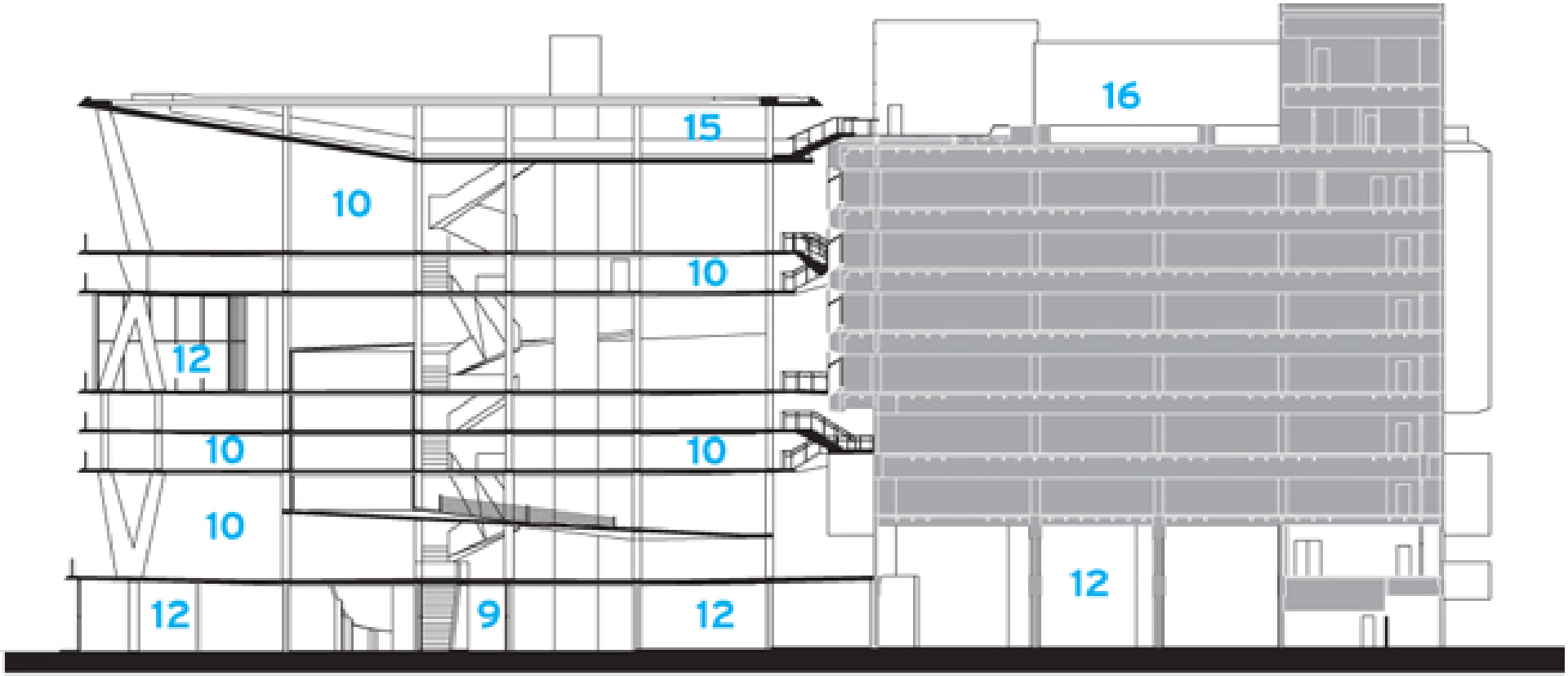

SECTION A-A

1	Car park entrance	9	Passage and elevator/
2	Car park exit	10	Garage parking
3	Bank drive-through	11	Office building lobby
4	Alley	12	Retail
5	Bank parking	13	Mechanical
6	Lincoln Road Promenade	14	Access to second-floor residences
7	Rooftop restaurant entrance	15	Penthouse roof garden
8	Retail service	16	Penthouse pool

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Teams

Teams 3 or less

assigned by the professor

Location:

10th Ave. between 18th and 19th St. ---- Fall 2013

ARCH 2430

Google Maps

Course project and development process

The semester project site is located between Tillery Street and Tech Place (285 Jay Street, Brooklyn)

Computer Lab:

Autodesk Revit Architecture
this is not (BIM)
Revit is a software that helps build BIM models

Free Software Downloads for Students and Educators
http://usa.autodesk.com

Assignment: **1**

Project Description:
The class will be divided into five groups; these groups will be working together throughout the semester. Each student will interview one member of his or her team. Using the questions (listed below), students will interview each other.

Each student needs to create four sketches based on the interview he/she did of the other student. These sketches should be based on positive ideas or thoughts that come to you after creating the interview. Pay a particular attention to the questions on architecture and strengths when creating your images. Each team member must create 2 to 5 images of at least 4”x4”.

Assignment: **1**

Project Description:
After creating each image, students should post these images on a wall together, so they can combine elements of at least two different students' images to create a team logo. After creating this logo, it will be added to your team title block.

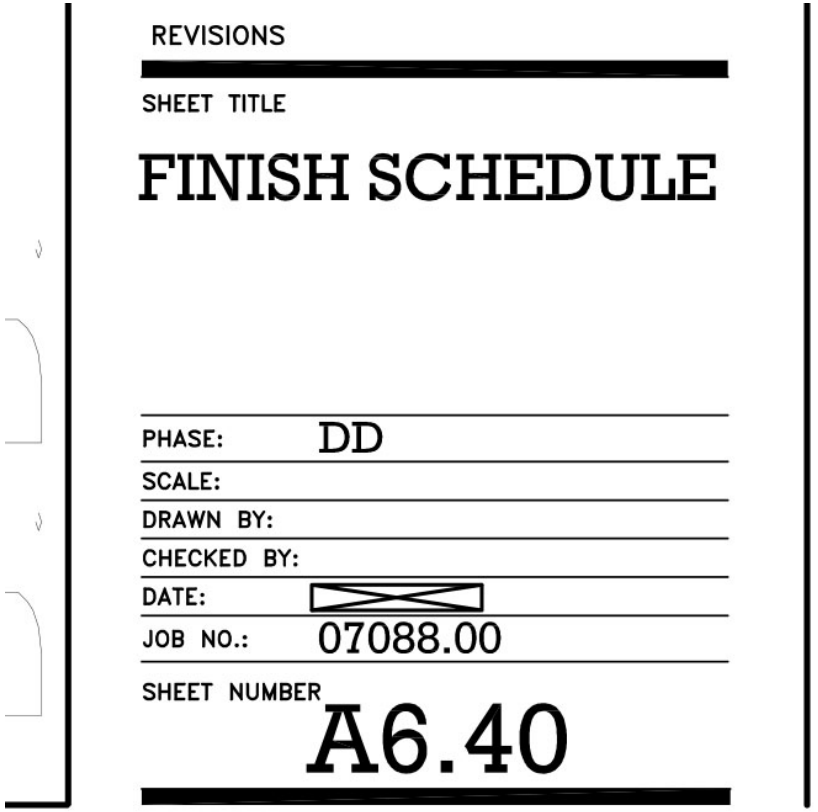
Your title block is required to have several specific things as part of it. During the development of this project, you will be creating particular areas of the same project; specific areas/sections need to be authored by particular students, you need to have a both your team name and a place to indicate the specific student responsible for the particular sheet being worked on.

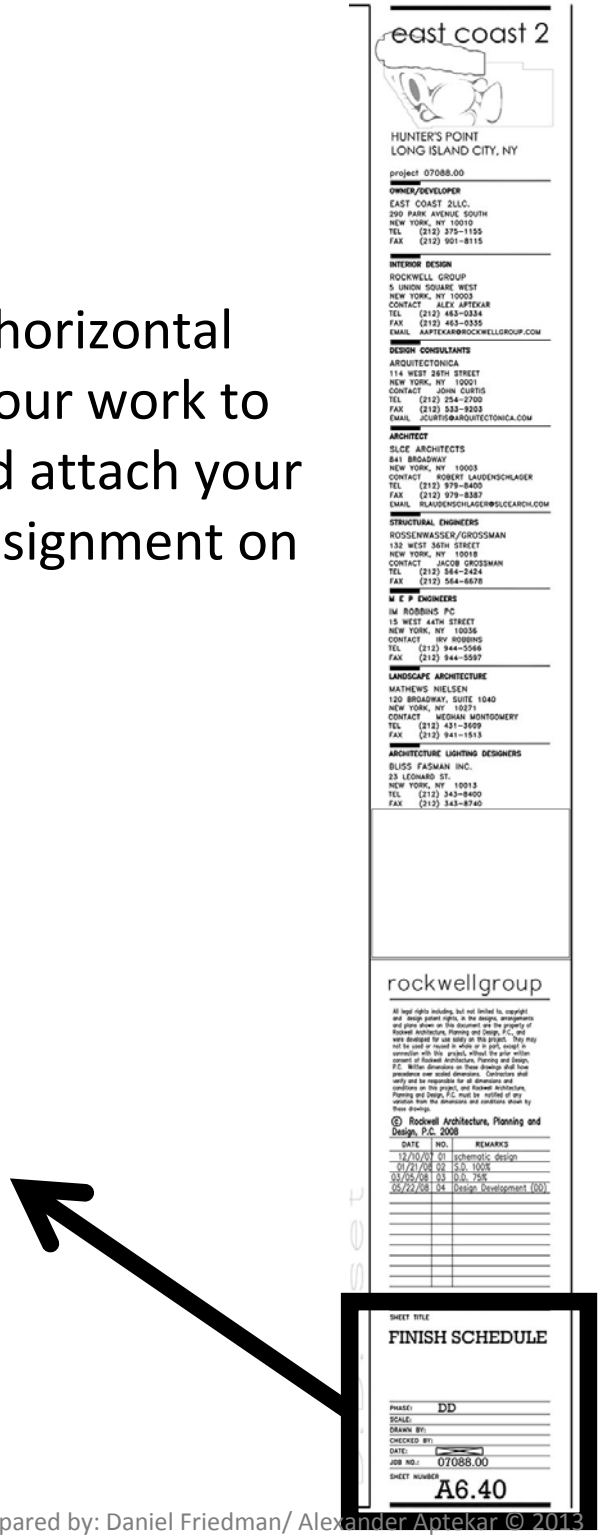
Parts to be included and always filled out on your title block are as follows:
Drawn by:
Checked by:
Team members:
Date drawn:

Assignment: **1**

Project Description:

Your team's Revit title block should be sized to work on an horizontal sheet of 22"x34". This size will allow a half-size version of your work to be printed on 11"x 17" paper. Complete your title block and attach your logo sketches, print and posts your sheets as PDFs to the assignment on blackboard.





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Assignment: **2**

Project Description:

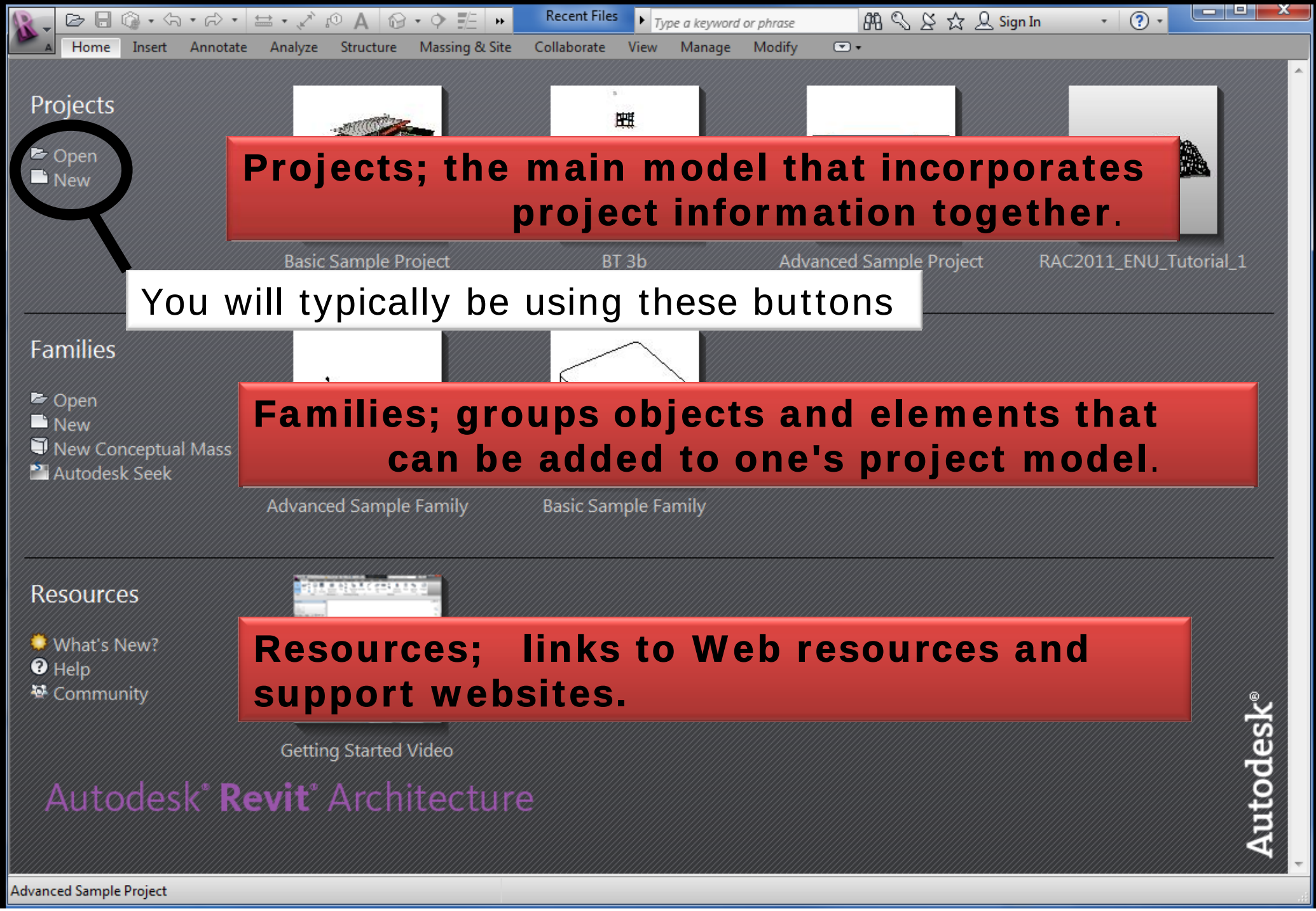
Each team member must bring 2 architectural projects they have developed into class. One of these projects must be student's previous Building Technology III project. The main idea or massing of the project should be available in a form that can be posted on the wall. Additional files and descriptions should be available in the digital file for the teammates to discuss.

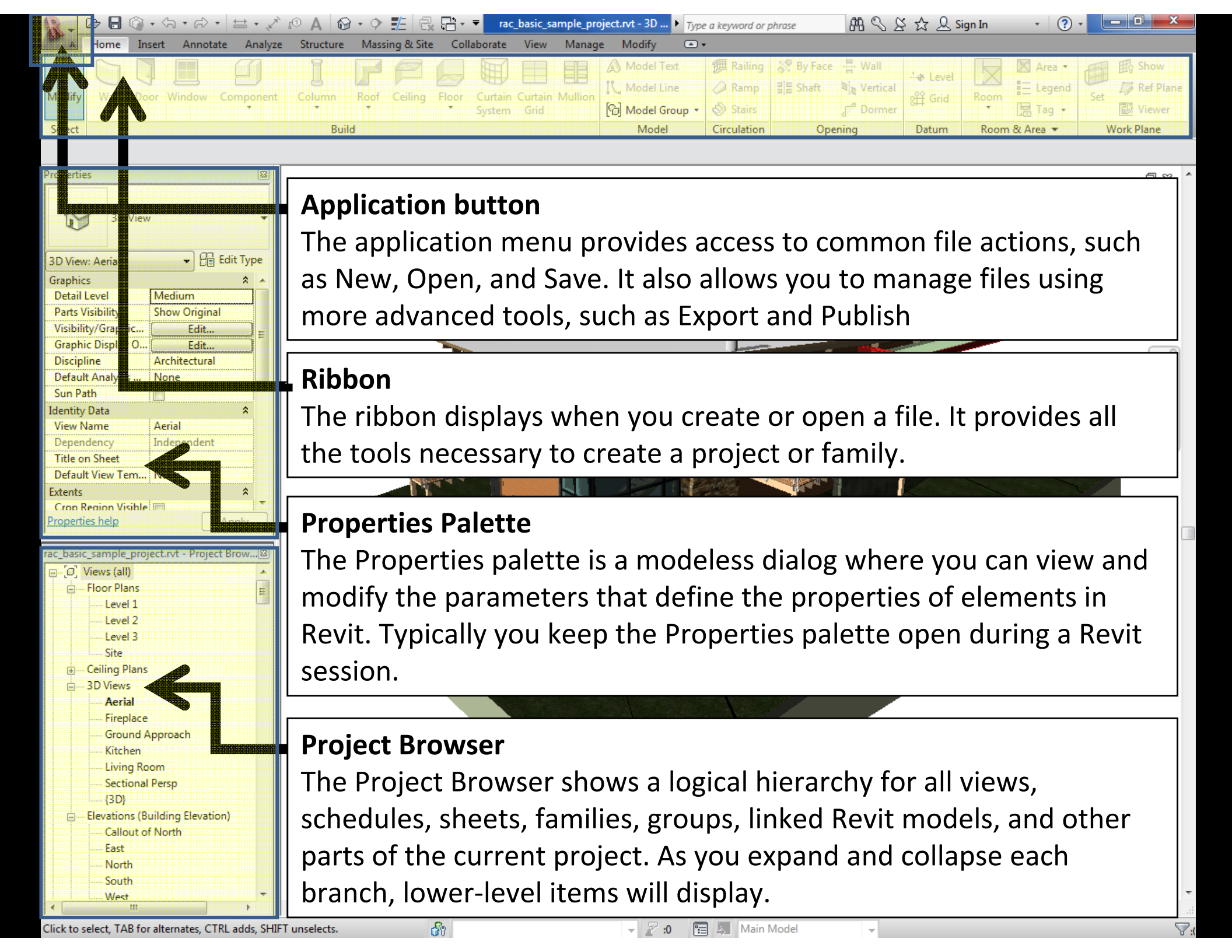
Eligible projects for the remaining required example are as follows;
Previous studio projects (Architectural Design II, III, IV, ect.), the studio projects need to be of large-scale as the site selected is for large-scale high rise building.

[due next class]

END

Revit interface & navigation





Application button

The application menu provides access to common file actions, such as New, Open, and Save. It also allows you to manage files using more advanced tools, such as Export and Publish

Ribbon

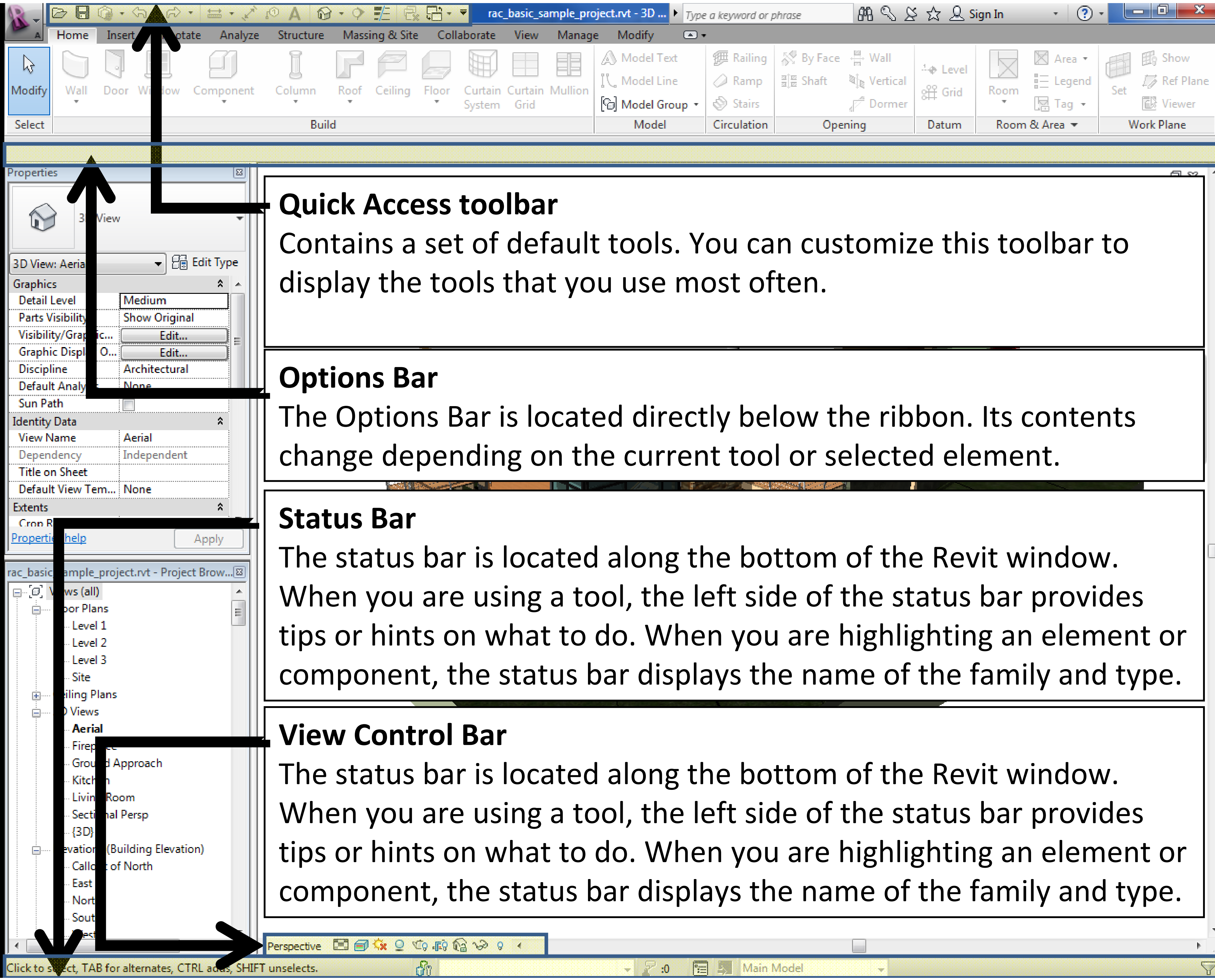
The ribbon displays when you create or open a file. It provides all the tools necessary to create a project or family.

Properties Palette

The Properties palette is a modeless dialog where you can view and modify the parameters that define the properties of elements in Revit. Typically you keep the Properties palette open during a Revit session.

Project Browser

The Project Browser shows a logical hierarchy for all views, schedules, sheets, families, groups, linked Revit models, and other parts of the current project. As you expand and collapse each branch, lower-level items will display.



Quick Access toolbar

Contains a set of default tools. You can customize this toolbar to display the tools that you use most often.

Options Bar

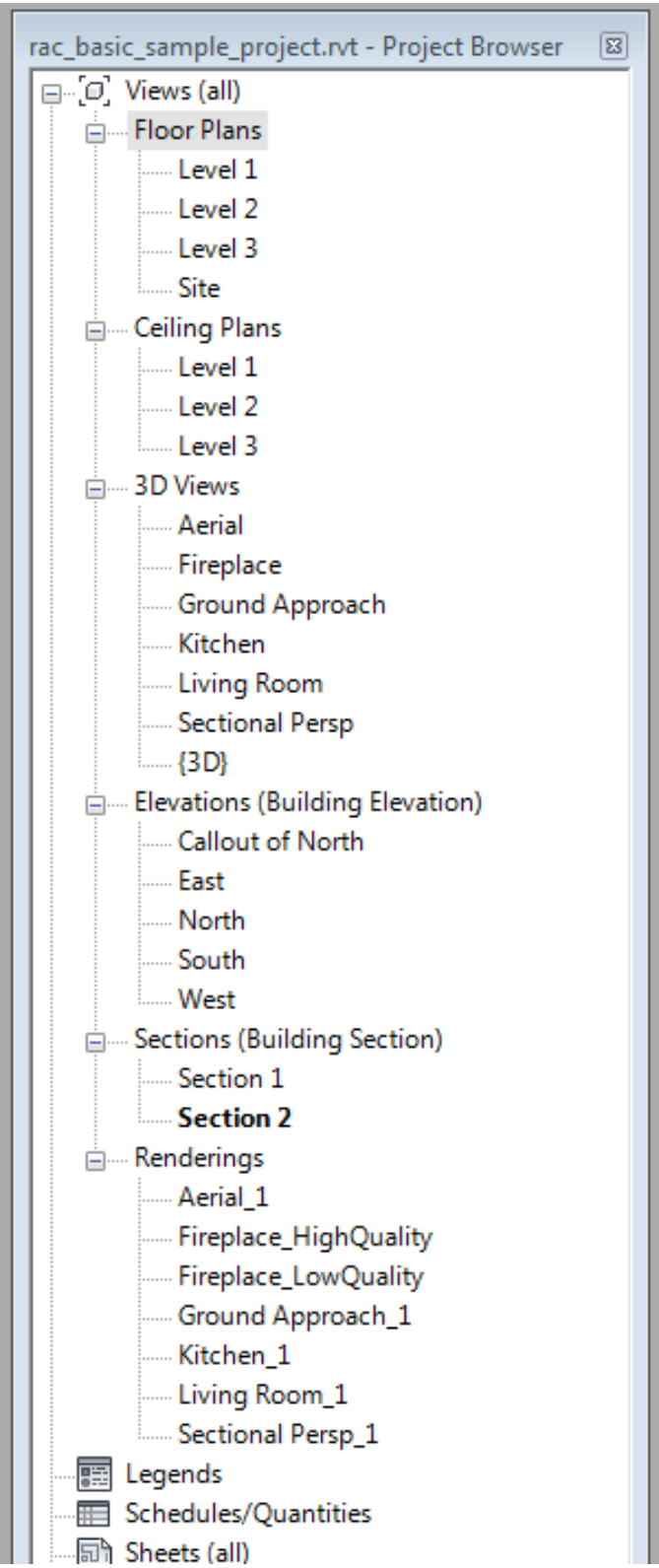
The Options Bar is located directly below the ribbon. Its contents change depending on the current tool or selected element.

Status Bar

The status bar is located along the bottom of the Revit window. When you are using a tool, the left side of the status bar provides tips or hints on what to do. When you are highlighting an element or component, the status bar displays the name of the family and type.

View Control Bar

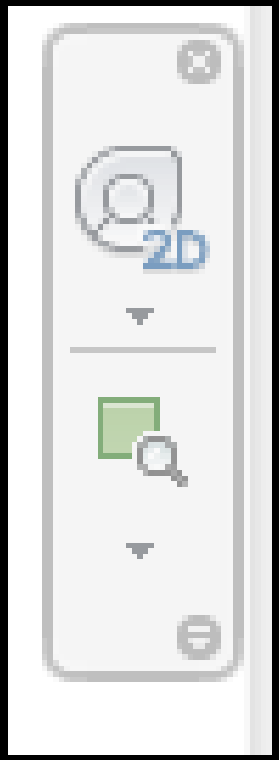
The status bar is located along the bottom of the Revit window. When you are using a tool, the left side of the status bar provides tips or hints on what to do. When you are highlighting an element or component, the status bar displays the name of the family and type.



Views

A Revit Project typically has several views. The most common examples are the Floor Plans and Elevations. These are 2D views on your project. The next section covers the 3D views.

Views are listed in the Project Browser. Floor Plan views are automatically created for each Level you create (unless you deselect 'Make Plan View').



Mouse controls:

Wheel button	= pan
Control key and wheel button	= zoom -/+
Shift key and wheel button	= pivot around point

3D Camera views

You can navigate in a 3D view using the Navigation Wheel (Shift-W):

Zoom
Move the camera closer or further away

Orbit
Rotate around the pivot point of the camera

Pan
Move the camera up/down or sideways (in the plane of the view)

Rewind
Go back through your movement history