

The Miller logo is rendered in a white, lowercase, sans-serif font. The letter 'i' is stylized with a white dot and a white swoosh that curves over the top of the letter. The background is a solid blue color that transitions into a sky with white clouds at the bottom.

Miller

BIM – A House Builder's Perspective

Craig Ferrans – Miller Homes Divisional Design Director

Introduction



Fact Finding

Building Information Modelling

Who should take the lead?

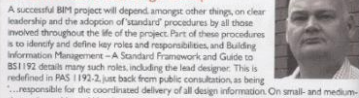
As the pressure to adopt Building Information Modelling (BIM) increases, a collaborative approach to construction is essential in order to carry out a successful project. As the first in a series of forum-based articles, FC&A asks a number of BIM experts who they think should take the lead when it comes to delivering and managing a BIM-tendered project.

Asta Developments Paul Bamford, MD



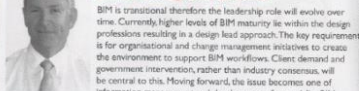
Project managers could find themselves in an ideal position to take a lead role as BIM evolves due to their expertise with planning and scheduling. This will become integral to every stage as it can unify information that makes sense of the flow of activities through the whole chain. While the traditional presence of the project manager has been mainly in the construction phase, the ability to look upstream and downstream with an expert eye on scheduling, key stages, and the marshalling of resources in the right timeframe (especially if supported by tools which create a clear view of the wider process) could open up a range of new opportunities to deliver value. Project managers may find that they can create a new position of authority, supporting not only a single phase but also multiple phases of the construction process.

BSRIA John Sands, Principle Consultant at Sustainable Buildings Group



A successful BIM project will depend, among other things, on clear leadership and the adoption of standard procedures by all those involved throughout the life of the project. Part of these procedures is to identify and define key roles and responsibilities, and Building Information Management – A Standard Framework and Guide to BS1192 details many such roles, including the lead designer. This is redefined in PAS 1192-2, just back from public consultation, as being "...responsible for the coordinated delivery of all design information. On small and medium-sized projects, this could be the same as the Project Delivery Manager". This latter role is described in the PAS as the "...keystone for timely delivery and the output at each of the information exchanges and key decision points". This would seem a good place to start and would ensure a single point of control for the management of the BIM process and model.

Exact Software Simon Lovegrove, Director



BIM is transitional therefore the leadership role will evolve over time. Currently, higher levels of BIM maturity lie within the design professions resulting in a design lead approach. The key requirement is for organisational and change management initiatives to create the environment to support BIM workflows. Client demand and government intervention, rather than industry consensus, will be central to this. Moving forward, the issue becomes one of information management and development of a specialist BIM or Model Management discipline. As software develops, both inherently and through application of Lean and other techniques, the industry will move to BIM – modelling the building as an assembly of manufactured parts. Assembly processes will dictate product design and component sourcing. Supply chain linkages will shorten dramatically, new supply methodologies will emerge, and the industry will undergo profound structural changes.

Building Information Modelling



BIM Technologies Rob Charlton, Chief Executive

At BIM Technologies we are not precious as to who is the leader. Our only stipulation would be whoever is the leader understands the requirements of the role. Traditionally a project has had a lead consultant and this role in the majority of cases falls on the architect. From experience, architects have considerable complexity to embrace on a project at the early stages and sometimes do not have the time to focus on coordination. In practice what happens is the main contractor picks up some of this coordination via their design manager or on site during construction. Building Information Modelling identifies this lack of coordination early and encourages the removal of clashes early in the design process. At present the profession which has the best overall understanding of the complete building is the architect. In the current structure of the industry it is the architect who has the best overview of the design process and who would be best placed as the design coordinator. This may change in the future if there is ever a separate BIM coordinator profession. We do not believe the BIM coordinator replaces the role of the lead consultant but is able to use tools that assist in the coordination part of the role.



Birmingham School of the Built Environment Prof. David Hoyd, Director of Centre for Environment and Society Research

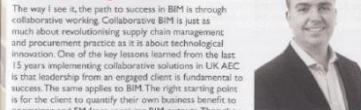
The real economic benefits from BIM are in building production and ultimately building operation. Thus, the lead for the development of BIM needs to come from building contractors using BIM to take more authority of the overall design and construction process. This will involve early involvement in the design in order to maximise its value economically and aesthetically but also a more integrated supply chain to better manage the risks and uncertainties of delivery. Currently the implementation of BIM emphasises design and its associated construction process. This is at the expense of an understanding of effective production both its planning and site implementation. To realise these benefits, clients need to understand what BIM can do for them so that they demand changed practices of procurement so that design and construction can be integrated better through the use of BIM.

NBS Stephen Hamill, Head of BIM



For public sector projects, the UK Government should lead and be taking the lead. Through its spending power and well-considered construction strategy, it is doing exactly the right thing. By mandating BIM, the UK Government aims to make a 20% financial cost saving and greatly reduce environmental impact within the construction industry. By mandating an open standard structured data format at specific points throughout the construction phase, the whole supply chain has a very clear set of requirements. This will not only ensure better value for money for the UK tax payer, but it will continue to stimulate innovation and competition within the whole construction industry. One problem that may arise from a central driver is the risk that small businesses are left behind. However, by ensuring that the requirements can be fulfilled in an open standard data format, expensive proprietary software or complex training programmes should not be necessary.

Asite Nathan Doughty, Chief Operating Officer



The way I see it, the path to success in BIM is through collaborative working. Collaborative BIM is just as much about revolutionising supply chain management and procurement practice as it is about technological innovation. One of the key lessons learned from the last 15 years implementing collaborative solutions in UK AEC is that leadership from an engaged client is fundamental to success. This same applies to BIM. The right starting point is for the client to quantify their own business benefits to operations and FM from receiving BIM outputs. Then they need to set clear direction on the deliverables they want to see from the design and delivery processes, and work with their professional advisers to take these into their forms of contract. Combine this with long-term partnering in procurement practices and we will be that much closer to true collaborative BIM.

38 For a faster response visit www.fc&a-magazine.com or use the free reader-enquiry card.

Ebooks

BIM reveals just how the above projects have combined the level of information beyond what we expect for production of 2D drawings. The high level of detail creates a digital virtual building that can be used to drive every aspect of planning and operations, as well as the 3D construction. In essence, the 3D model has the specific design of a building's individual elements, becoming more valuable than the 2D drawings for the construction.

For a faster response visit www.fc&a-magazine.com or use the free reader-enquiry card.

WHAT MEMBERSHIP MEANS ABOARD
DO TEAM-BUILDING TRIPS WORK?
CPD: THE LOCALISM ACT
INSIDE: CONTACT NEWSLETTER



CONSTRUCTION MANAGER



estions

FOR CPD
REGISTRATION VISIT
www.bim-builder.com

Build
Mod
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Inform

NHBC
Housing

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BI
20

Fact Finding



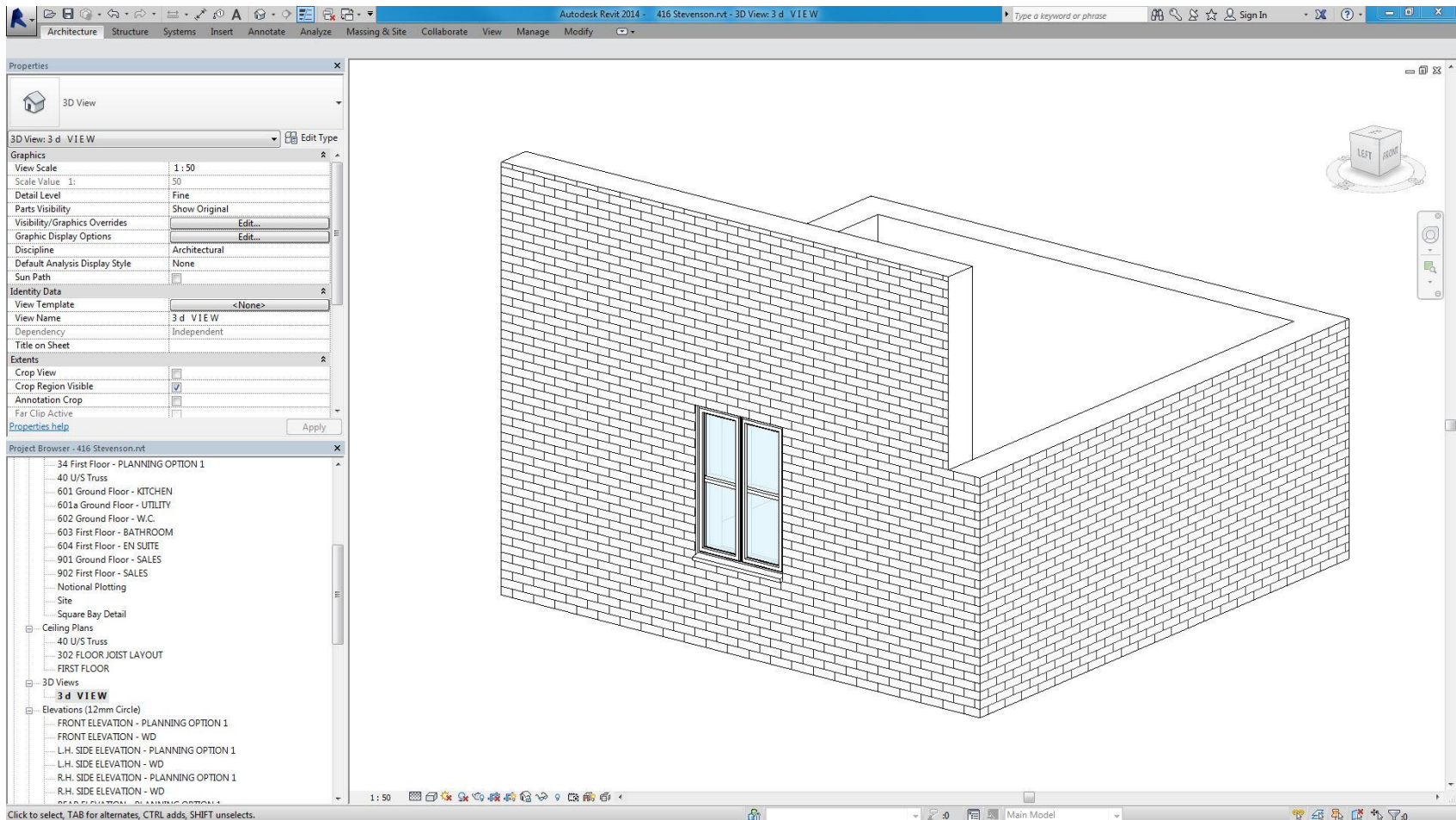
Collaboration



First impressions



First impressions



Building the Business Case

4 Main Areas

- ❑ Standardisation
- ❑ Fabric changes
- ❑ Procurement support
- ❑ Collaboration



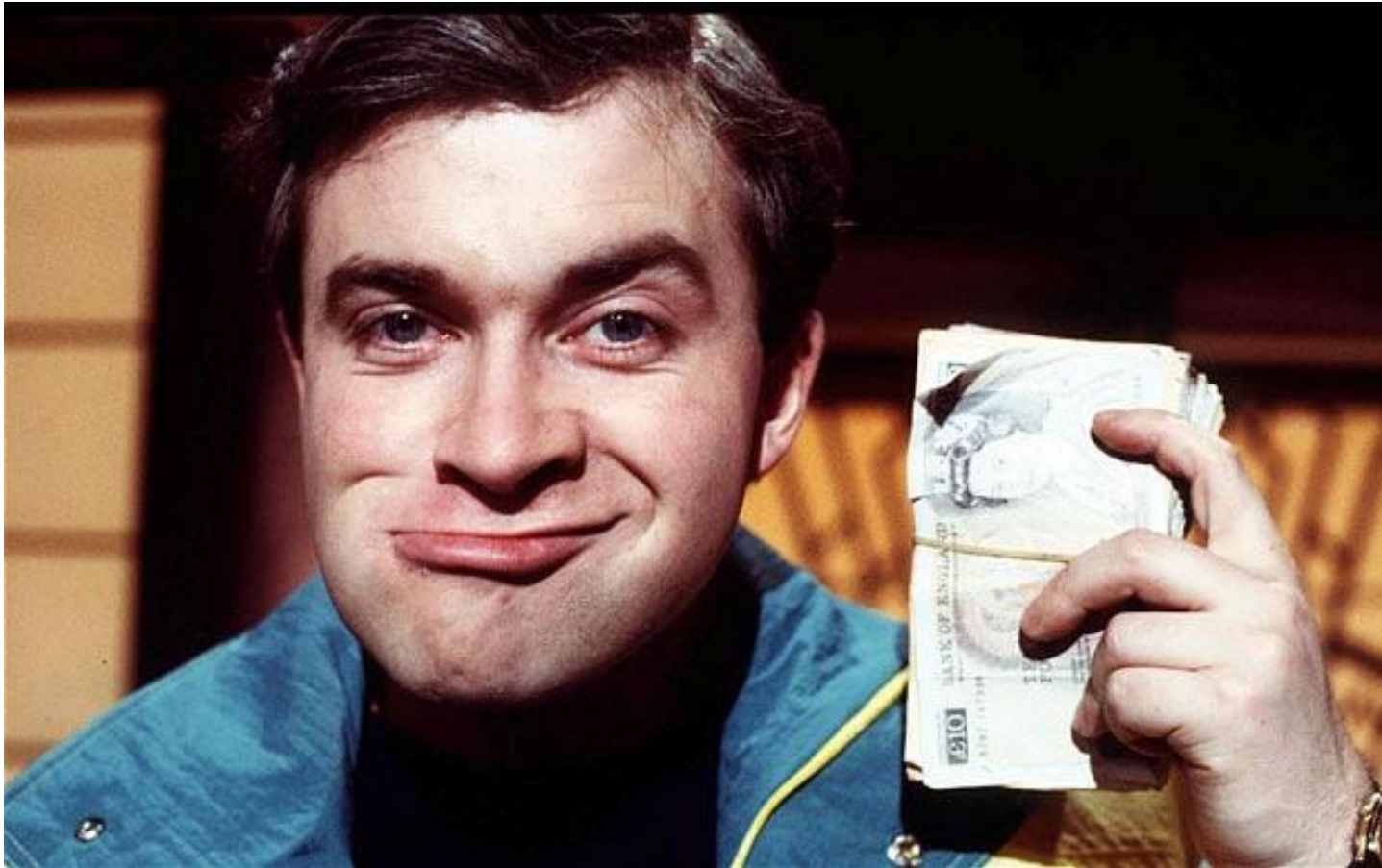
Updating the Business



Setting Out Your Stall



Costs



Software Costs

- ❑ Revit LT 2014 - £1,125 plus £170 1Yr subscription
- ❑ AutoCAD and Revit LT 2014 Suite - £1,550 plus £235 1Yr Subscription
- ❑ Revit Architecture 2014 - £5,100 plus £765 1Yr Subscription
- ❑ Building Design Suite (Premium) 2014 £6,200 plus £930 1Yr Subscription
- ❑ Upgrades for existing AutoCAD license's maybe possible

Note that the costs relate to NEW standalone license's and are standard retail prices

Training

- ❑ Revit Architecture 2014 Essentials 3 Days - £740/person
- ❑ Revit Architecture 2014 Advanced 1-2 Days - £270 - £540/person
- ❑ Family Creation 2 Days - £540/person
- ❑ Consultancy – Project set up on suite 1 Day - £675
- ❑ BIM overview session 1-2 hours incl. CPD – No Charge

Websites



WIKIPEDIA

Revit Forum
www.revitforum.org



Hardware

**IBM announces
the new
5100 Portable
Computer**

Key Components

- ❑ Dedicated graphics cards
- ❑ Core i7 or Xeon processors
- ❑ Plenty of RAM
- ❑ Good display devices



Hardware



File size increase from 1.3mb to 60mb

Myth Busting



Terminology



Blocks



Family

Family Creation

Autodesk Revit 2014 - FMTWDS Double-Brick Cill.rfa - 3D View: View1

Properties

Family: Windows

Constraints: Host: Wall

Identity Data: OmniClass Number: 23.30.20.00, OmniClass Title: Windows

Other: Always vertical: , Cut with Voids When Loaded: , Shared: , Room Calculation Point:

Project Browser - FMTWDS Double-Brick Cill.rfa

Views (all), Sheets (all), Families, Groups, Revit Links

Family Types

Name: 1247.5mm x 1350mm

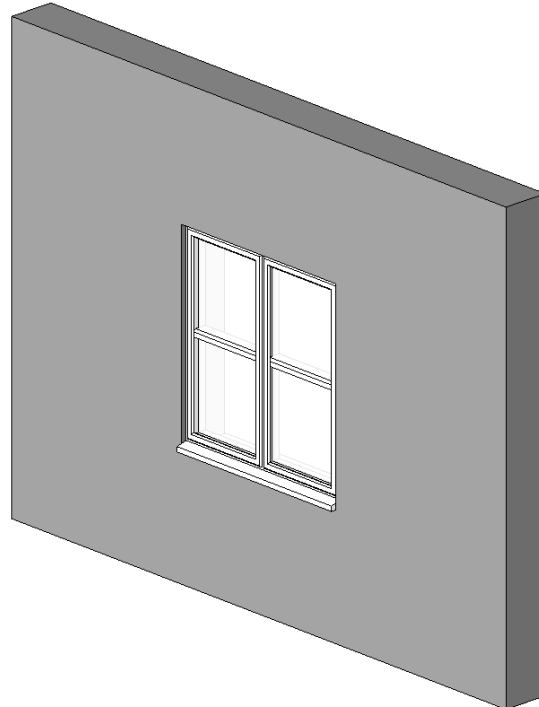
Parameter	Value	Formula	Lock
Construction			
Wall Closure	By host	=	<input type="checkbox"/>
Construction Type		=	<input type="checkbox"/>
Text			
TOUGHENED SAFETY	NO	=	<input type="checkbox"/>
STONE CILL	NO	=	<input type="checkbox"/>
RESTRICTOR	NO	=	<input type="checkbox"/>
NON OPENING CAS	DIRECT GLAZED	=	<input type="checkbox"/>
GLAZING STYLE	PLAIN	=	<input type="checkbox"/>
CASEMENT CONFIG	SIDE HUNG	=	<input type="checkbox"/>
BRICK CILL	YES	=	<input type="checkbox"/>
Materials and Finishes			
Material Glazing	Glass	=	<input type="checkbox"/>
Material Frame	Plastic - White	=	<input type="checkbox"/>
Dimensions			
Window Board Proj	25.0	=	<input checked="" type="checkbox"/>
Window Board Exten	25.0	=	<input type="checkbox"/>
Plasterboard Thicken	25.0	=	<input type="checkbox"/>
Height	1350.0	=	<input checked="" type="checkbox"/>
EXT CILL OVERHAN	35.0	=	<input type="checkbox"/>
Width	1247.5	=	<input type="checkbox"/>
Cavity Width	90.0	=	<input type="checkbox"/>
Rough Width		=	<input checked="" type="checkbox"/>
Rough Height		=	<input checked="" type="checkbox"/>
IFC Parameters			
Operation		=	<input type="checkbox"/>
Analytical Properties			
Analytic Construction	<None>	=	<input type="checkbox"/>
Visual Light Transmi		=	<input type="checkbox"/>
Solar Heat Gain Coef		=	<input type="checkbox"/>
Thermal Resistance (=	<input type="checkbox"/>
Heat Transfer Coeffi		=	<input type="checkbox"/>
Other			
Default Sill Height	800.0	=	<input type="checkbox"/>
Identity Data			

Family Types: New..., Rename..., Delete

Parameters: Add..., Modify..., Remove

Lookup Tables: Manage...

OK Cancel Apply Help



BACK LEFT

Ready

Scheduling

Autodesk Revit 2014 - 509 Chichester.rvt - Schedule: MILLER STANDARD WINDOW SCHEDULE

Modify Schedule/Quantities

Columns Rows Titles & Headers Appearance Element

<MILLER STANDARD WINDOW SCHEDULE>												
A	B	C	D	E	F	G	H	I	J	K	L	M
REF	PRODUCT CODE	LOCATION	WIDTH (mm)	HEIGHT (mm)	CASEMENT CONFIGURATION	NON-OPENING CASEMENTS	GLAZING STYLE	GLAZING PATTERN	EGRESS WINDOW	TOUGHENED SAFETY GLASS	RESTRICTOR	CILL TYPE
W1	FMTWDS1812	LOUNGE	1810	1200	SIDE HUNG	DUMMY SASH	FULL MID TRANSOM	CLEAR LOW - E	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	STONE
W2	FMTWDS1812	STUDY	1810	1200	SIDE HUNG	DUMMY SASH	FULL MID TRANSOM	CLEAR LOW - E	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	STONE
W3	PCW1810	KITCHEN	1810	1050	SIDE HUNG	DIRECT GLAZED	PLAIN	CLEAR LOW - E	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	BRICK
W4	PCW9110	FAMILY / BRE	910	1050	SIDE HUNG	DIRECT GLAZED	PLAIN	CLEAR LOW - E	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	BRICK
W5	PCW9110	FAMILY / BRE	910	1050	SIDE HUNG	DIRECT GLAZED	PLAIN	CLEAR LOW - E	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	BRICK
W6	FMTWDS1812	BED 3	1810	1200	SIDE HUNG	DUMMY SASH	FULL MID TRANSOM	CLEAR LOW - E	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	STONE
W7	FMTWDS1212	BED 4	1248	1200	SIDE HUNG	DUMMY SASH	FULL MID TRANSOM	CLEAR LOW - E	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	STONE
W8	FMTWDS1812	BED 1	1810	1200	SIDE HUNG	DUMMY SASH	FULL MID TRANSOM	CLEAR LOW - E	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	STONE
W9	PWC6810	E/S	685	1050	SIDE HUNG	N/A	PLAIN	OBSCURE LOW - E	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	BRICK
W10	PCW1212	BED 5	1248	1200	SIDE HUNG	DIRECT GLAZED	PLAIN	CLEAR LOW - E	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	BRICK
W11	PCW1212	BED 2	1248	1200	SIDE HUNG	DIRECT GLAZED	PLAIN	CLEAR LOW - E	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	BRICK
W12	PWC6810	E/S 2	685	1050	SIDE HUNG	N/A	PLAIN	OBSCURE LOW - E	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	BRICK
W13	PWC6810	BATH	685	1050	SIDE HUNG	N/A	PLAIN	OBSCURE LOW - E	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	BRICK

Think!



Live Views

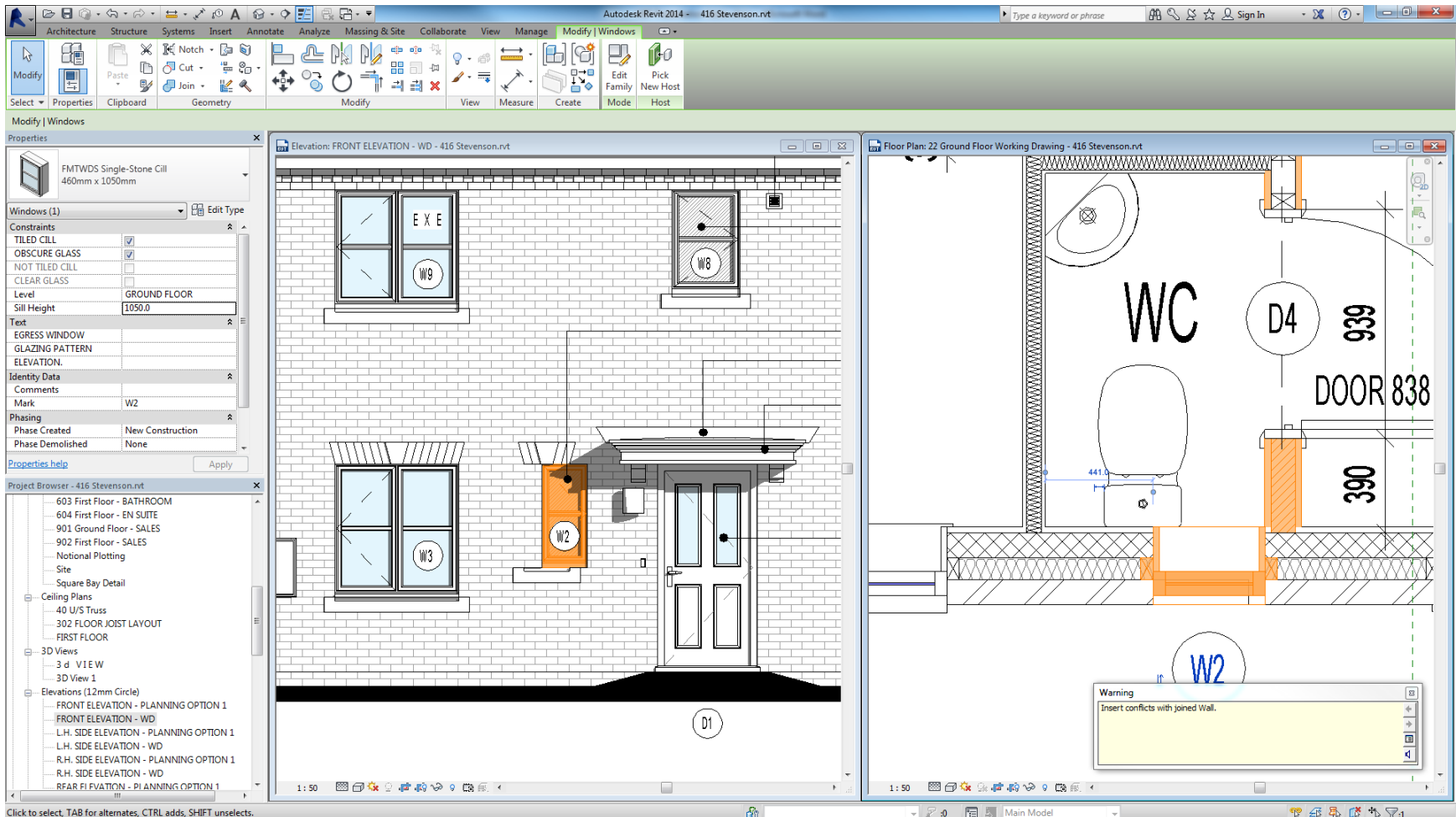
The screenshot displays the Autodesk Revit 2014 interface with the following views:

- Elevation: 4011 Front Elevation - WD - 307 Darwin.rvt**: A 2D architectural elevation of the front of the house, showing windows, doors, and roof details. Scale: 1:50.
- Section: 1 - 307 Darwin.rvt**: A vertical cross-section through the house, showing the dining and kitchen areas. It includes structural details like joists and trusses. Scale: 1:50.
- Schedule: Window Sc...**: A data table for window schedules.

<Window Schedule>		
A	B	C
Mark	Width	Height
W1	1248	1350
W2	1248	1050
W3	460	1050
W4	1248	1200
W5	685	1050
W6	1248	1200
W7	1248	1200
W8	1248	1200
W9	685	1050
- Floor Plan: 201 Ground Floor - WD - 307 Darwin.rvt**: A 2D floor plan of the ground floor, showing room layouts, doors, and utility lines (GAS, ELEC). Scale: 1:50.
- 3D View: [3D] - 307 Darwin.rvt**: A 3D perspective view of the house, showing the brick exterior, windows, and entrance. Scale: 1:100.

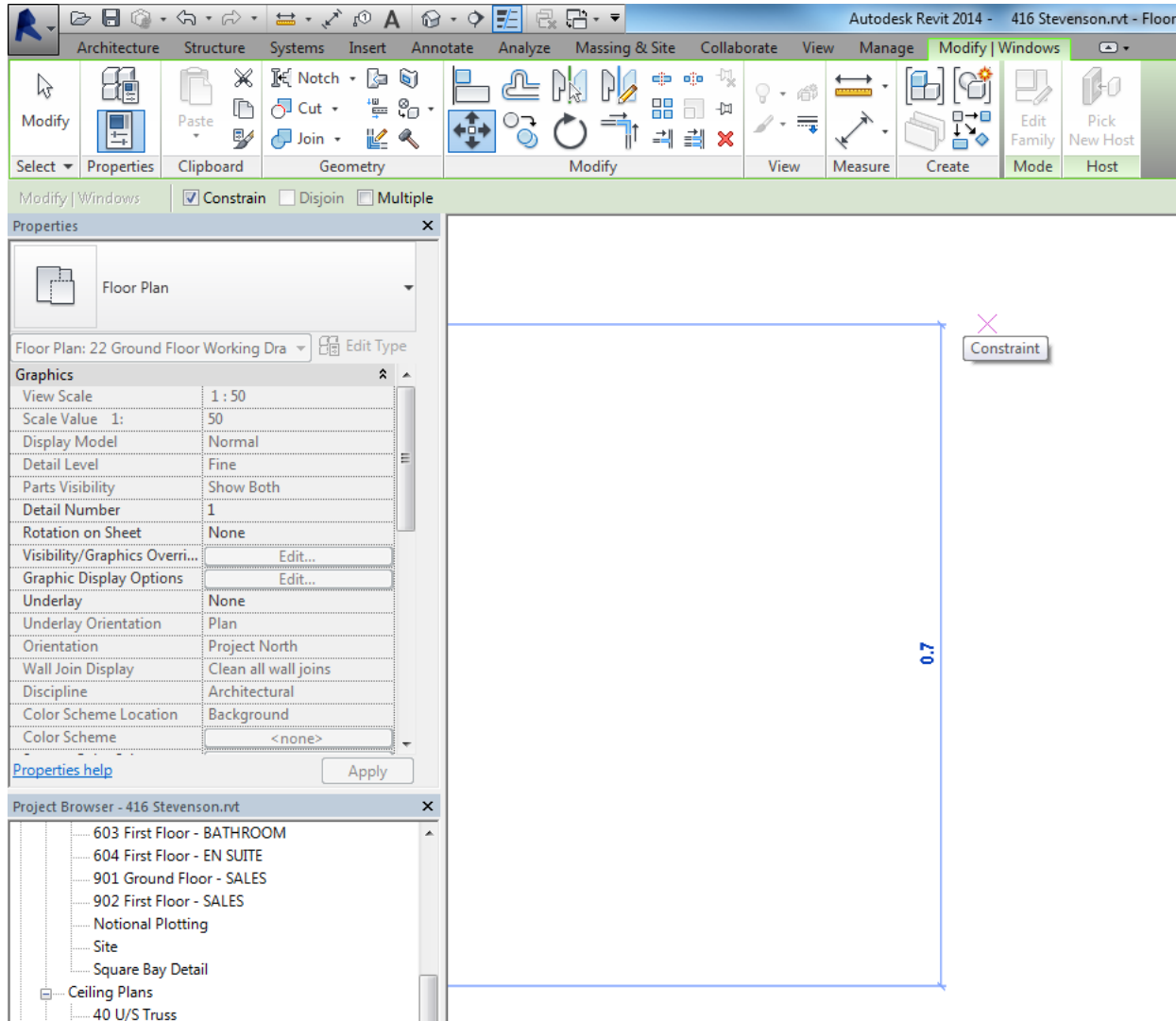
At the bottom of the interface, there is a status bar with the text: "Click to select, TAB for alternates, CTRL adds, SHIFT unselects."

Conflicts



Click to select, TAB for alternates, CTRL adds, SHIFT unselects.

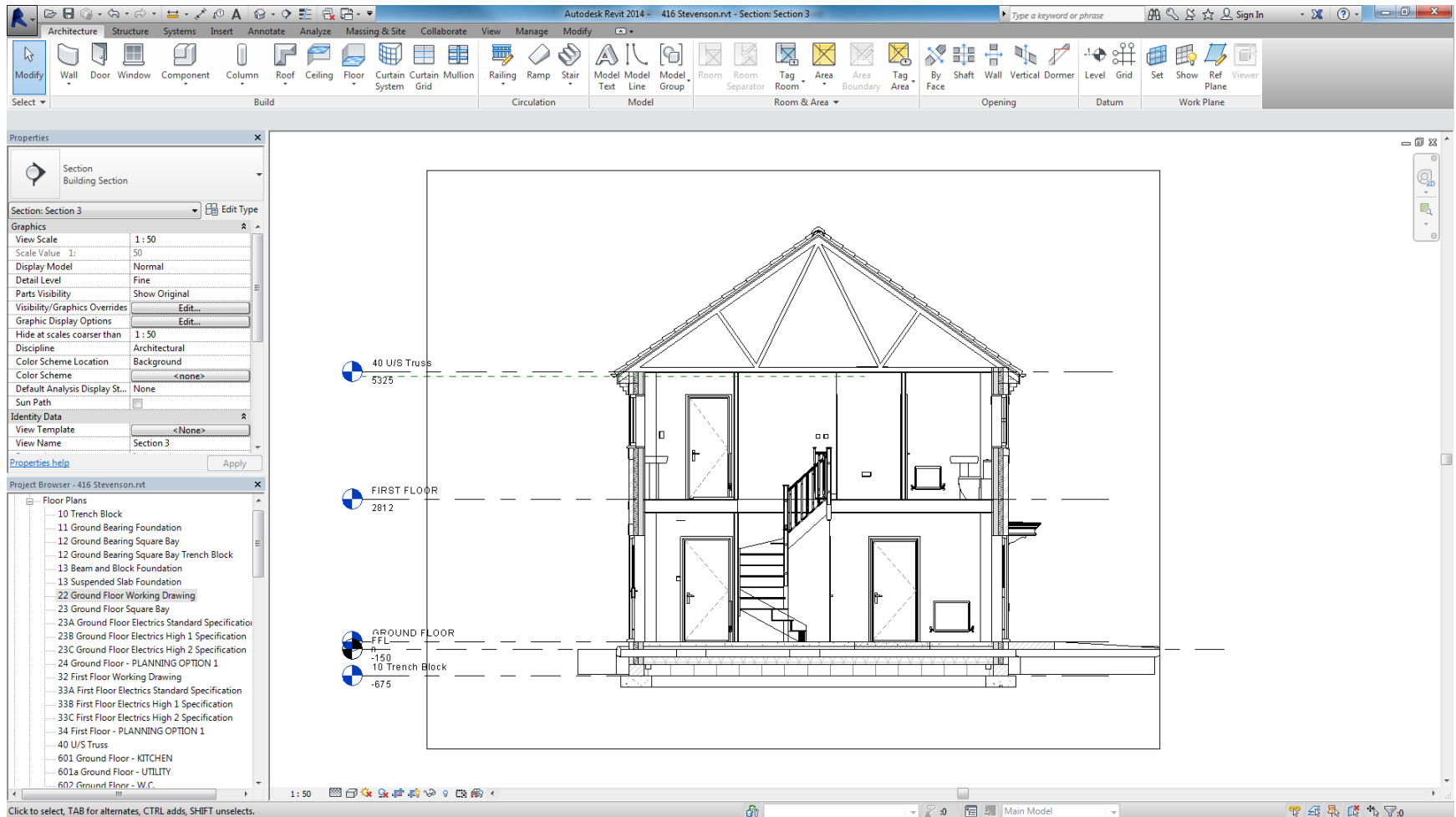
Constraints



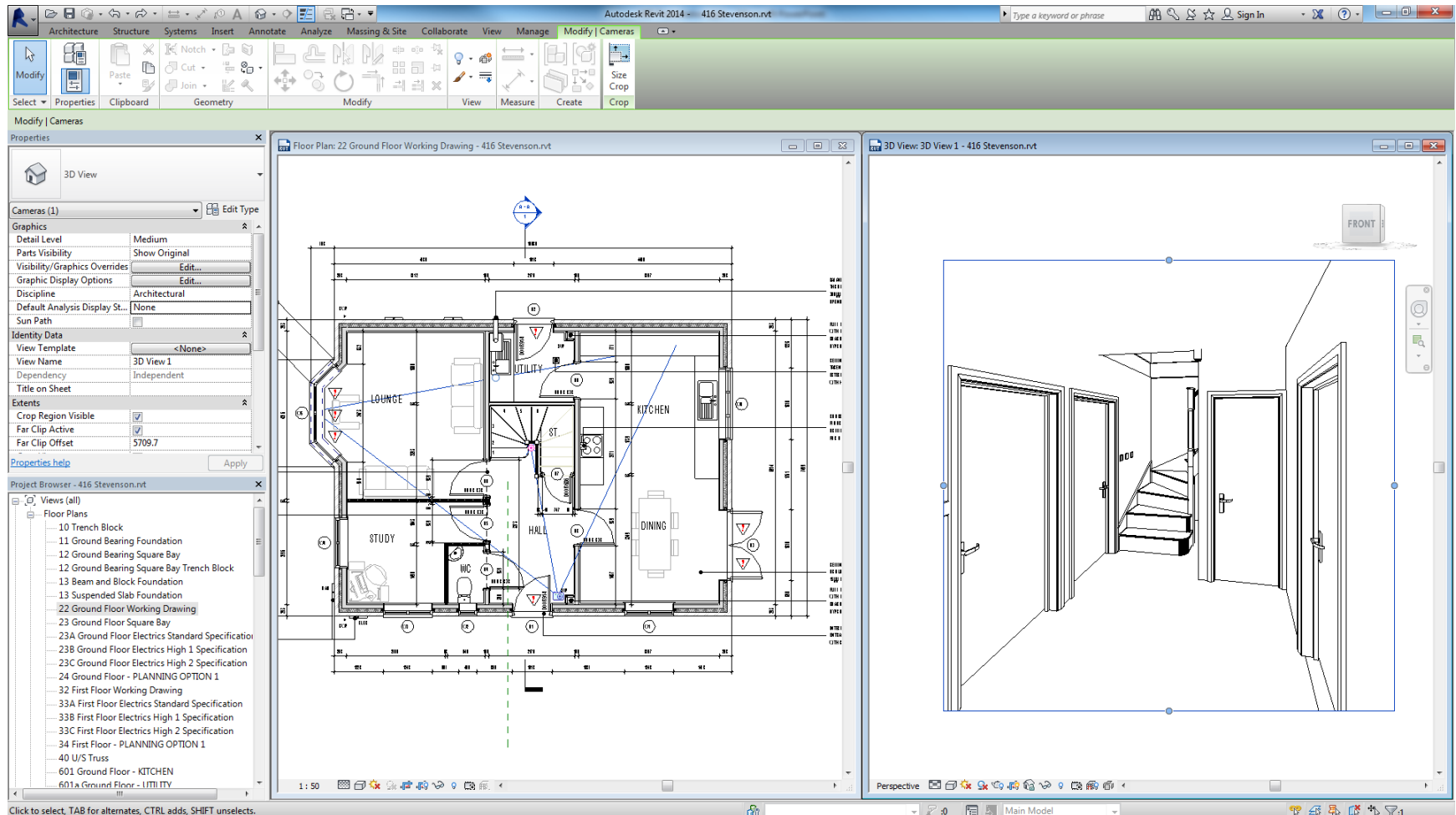
Constraints



Sections



Camera Views



Click to select, TAB for alternates, CTRL adds, SHIFT unselects.

Annotation

The screenshot displays the Autodesk Revit 2014 interface with a building section view. The software title bar indicates the file name '416 Stevenson.rvt - Section:1'. The ribbon shows the 'Annotate' tab, with various tools for creating and editing annotations. The Properties panel on the left is set to 'Section Building Section' and shows settings for 'Section: 1', including a view scale of 1:50 and a scale value of 50. The Project Browser on the left lists various views, including 'FRONT ELEVATION - WD', 'L.H. SIDE ELEVATION - PLANNING OPTION 1', and 'SECTIONS (Building Section)'. The main view area shows a detailed architectural section of a house with a gabled roof. The section includes rooms labeled 'UTILITY', 'HALL', 'LANDING', and 'BATH'. The roof is labeled '2000 PINEAL GABLETOPS'. Numerous dimension lines and text annotations are present, providing technical details about the construction and materials. For example, one annotation reads: 'FRONT ELEVATION: 5.0000' STAIR STEP DOWN CONTINUOUS THROUGH TO LEVEL BELOW TO MEET STAIRCASE (2.2 - 211)'. Another note states: 'WALLS: PAPERFACE: WHEN PERFORMANCE PROGRAMME TO BE USED THIS TYPE IS NOT TO BE USED IN CONNECTION WITH CONCRETE OR OTHER MATERIALS. CHECK THAT THE WALLS ARE CUT AWAY FROM THE AREA OF THE ROOF TO AVOID A STAIRWAY CONTINUOUS THROUGH THE WALLS.' The Properties panel also shows 'Identity Data' and 'Properties help' buttons. The Project Browser shows a tree view of the project's content, including 'Sections (Building Section)' and 'Legends'.

Click to select, TAB for alternates, CTRL adds, SHIFT unselects.

Scaling

Autodesk Revit 2014 - Brick Details.rvt - Elevation: SIDE ELEVATION

Architecture Structure Systems Insert Annotate Analyze Massing & Site Collaborate View Manage Modify

Modify Wall Door Window Component Column Roof Ceiling Floor Curtain System Curtain Mullion Railing Ramp Stair Model Text Model Line Model Group Room Room Separator Tag Room Area Area Boundary Tag Area By Shaft Wall Vertical Dorner Level Grid Set Show Ref Plane Viewer

Properties

Elevation
12mm Circle

Elevation: SIDE ELEVATION Edit Type

Graphics

View Scale	1:10
Scale Value	10
Display Model	Normal
Detail Level	Fine
Parts Visibility	Show Original
Detail Number	4
Rotation on Sheet	None
Visibility/Graphics Overri...	Edit...
Graphic Display Options	Edit...
Hide at scales coarser than	1:5000
Discipline	Architectural
Color Scheme Location	Background
Color Scheme	<none>
Default Analysis Display ...	None
Reference Label	
Run Path	<input type="checkbox"/>

Project Browser - Brick Details.rvt

- Views (all)
 - Floor Plans
 - 3D Views
 - Elevations (12mm Circle)
 - BRICK QUOIN DETAIL - FRONT ELEVATION - FA
 - CORBEL FRONT ELEVATION
 - CORBEL SIDE ELEVATION
 - DENTIL COURSE ELEVATION
 - DOOR SURROUND DETAIL - FRONT ELEVATION
 - DOOR SURROUND DETAIL - FRONT ELEVATION
 - Elevation 1 - c
 - Elevation 2 - a
 - FRONT ELEVATION
 - FRONT ELEVATION - RENDER
 - SIDE ELEVATION**
 - SIDE ELEVATION - RENDER
 - WINDOW DETAIL - FRONT ELEVATION - FACIN
 - Sections (Building Section)
 - Legends
 - Schedules/Quantities
 - Sheets (all)
 - BD/DD/UK/1 - WINDOW REVEAL

Custom...

- 1:1
- 1:2
- 1:5
- 1:10
- 1:20
- 1:50
- 1:100
- 1:200**
- 1:500
- 1:1000
- 1:2000
- 1:5000

450 7.5 7.5 15 75 75 15 75 75 15 15

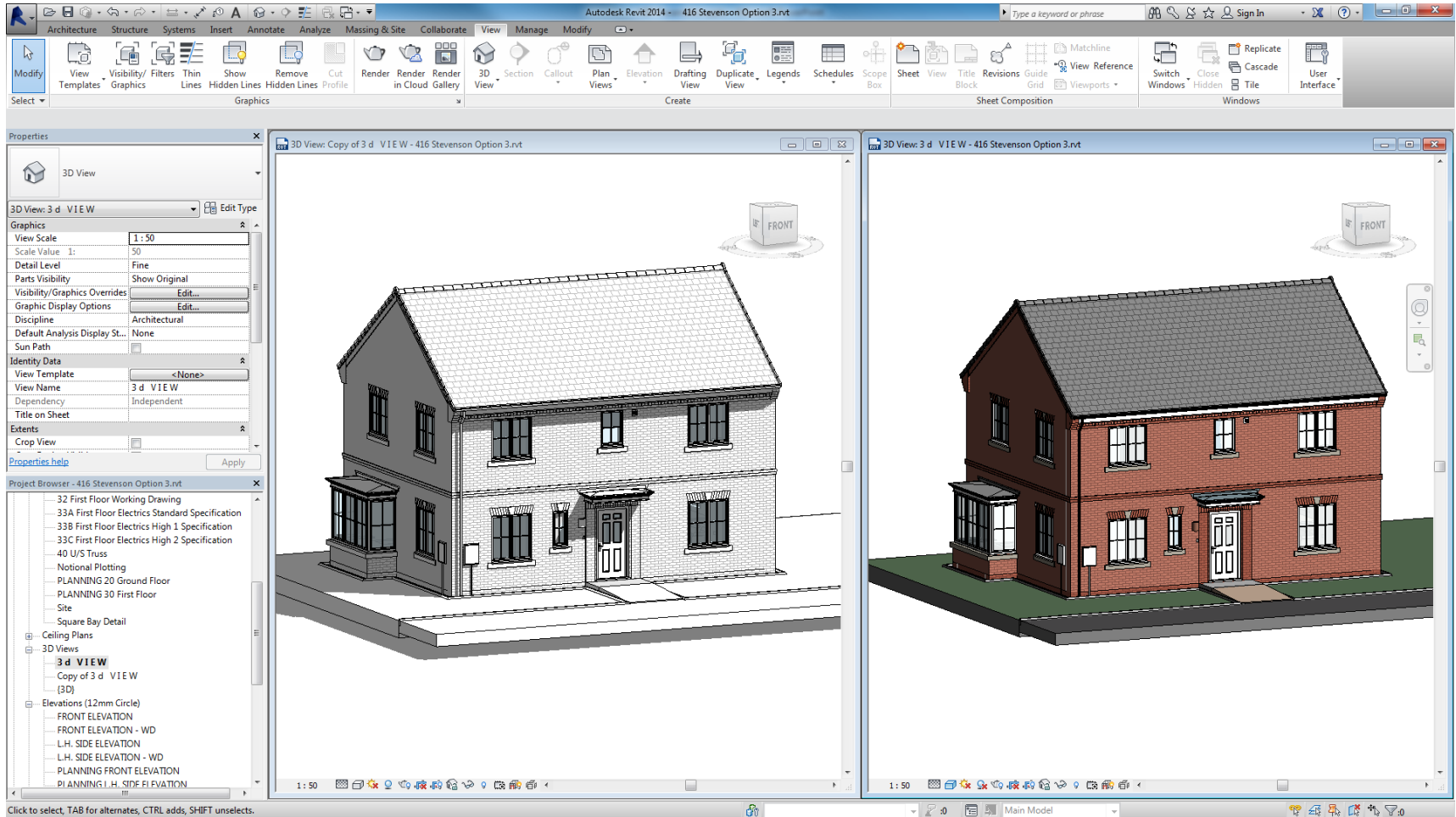
CHECK WITH WORKING DRAWING

SEE WORKING DRAWING

D.P.C.

Ready 1:10 Main Model

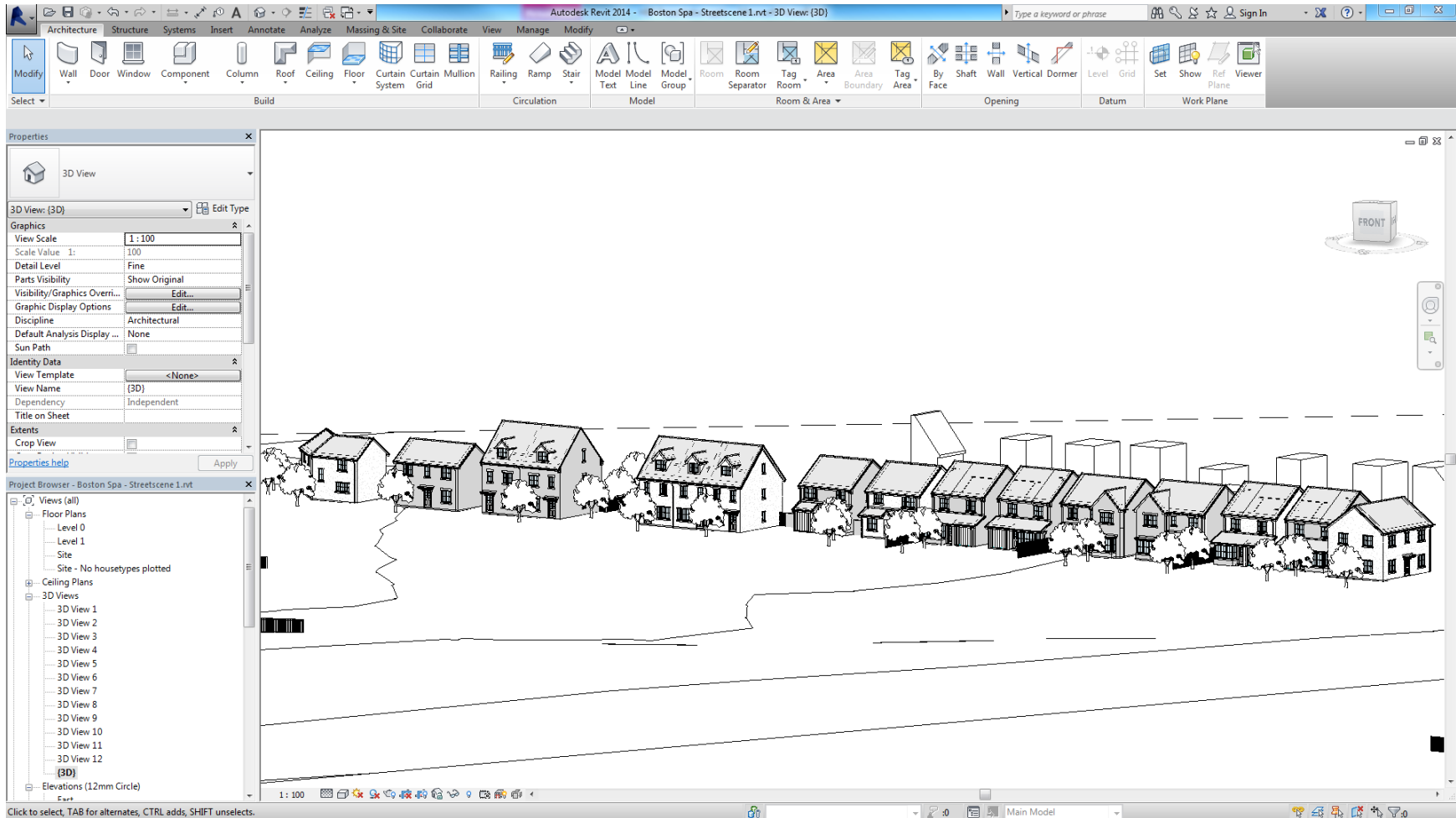
CGI's



CGI's



Site Layouts



Street Scenes



Supply Chain Involvement



nbs National BIM Library

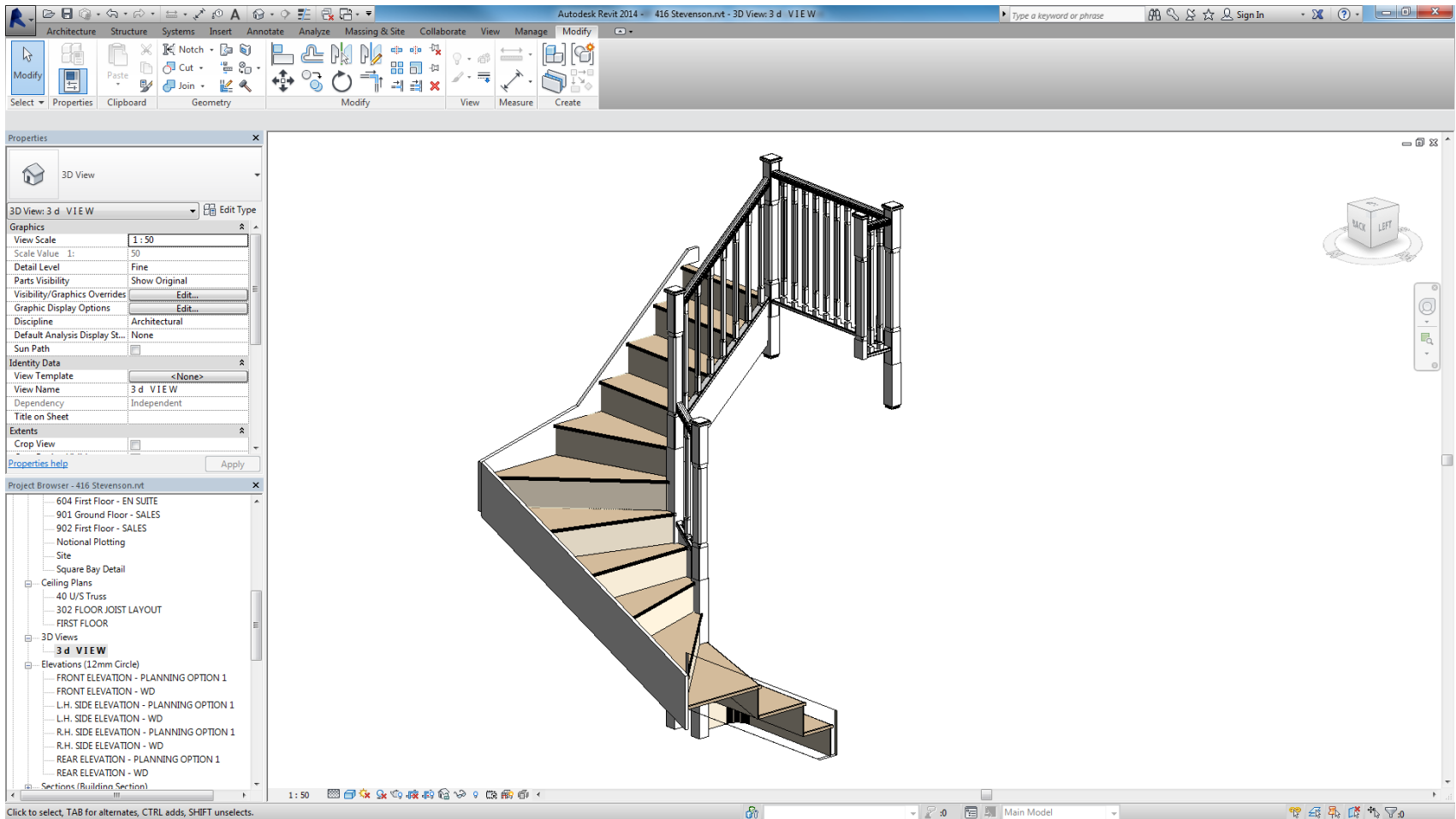
The screenshot shows the nbs National BIM Library website. The browser address bar displays <http://www.nationalbimlibrary.com/Manufacturers>. The website header includes navigation links: Home, About, Object Types, **Manufacturer Objects**, and BIM for Manufacturers. There are also buttons for Register now and Log in. The main content area is titled "Manufacturers" and features a grid of manufacturer profiles:

- Axter Ltd** (8 objects): Axter specialises in the design and supply of complete flat roof waterproofing and thermal insula...
- Burgess Architectural Products Ltd** (8 objects): The Burgess Company name has been synonymous with quality engineered metal ceili for over 60 y...
- Celotex** (13 objects): Celotex is the UK brand leader of PIR thermal insulation solutions for the building and construct...
- Dow Building Solutions** (7 objects): Dow Building Solutions is a division of the Dow Chemical Company Limited. The UK business supplie...
- Dulux Trade, brand of AkzoNobel** (40 objects): Dulux Trade are the market-leading paint manufacturer in the UK, producing internal, exteri and...
- Gerflor Ltd** (10 objects): Gerflor manufactures and markets innovative, design-led and eco-responsible solutions for floorin...
- H+H UK Ltd** (17 objects): H+H is the UK's largest manufacturer of aircrete products. We manufacture the market leading rang...
- Ibstock Brick Ltd** (4 objects): Ibstock is the UK's biggest brickmaker. We have 20 factories nationwide and a range of over 500 d...

The sidebar on the right contains:

- A search bar.
- Buttons for Register now and Log in.
- A "Customer Service" button.
- A "construction news awards 2013 WINNER BIM Initiative of the Year" badge.
- A "CELEBRATING 40 YEARS OF NBS" badge (1973-2013).
- A "nationalBIMlibrary.com" logo.
- A "Will BIM help meet the low carbon agenda?" badge.

Stair Design



Wider Debate

- Initial set up cost
- Reducing error
- Supply chain ready?
- Drawing time reduced
- Training process
- Excellent design tool
- Recruiting Staff
- Consistency
- Collaboration
- Not a one stop shop
- Return to Sender?



Helping Charity



Perseverance



Questions

