The good, the bad and the darn right impossible.

Hoare Lea – 2017
Agenda

• OUR FIRM
• WHERE WE WERE
• WHERE WE ARE AND HOW DID WE GET HERE
• WHERE ARE WE GOING?
Our firm

Specialist MEP designers for over 150 years

We are a highly successful, international firm of MEP consulting engineers.

We are the largest firm of MEP consulting engineers in the UK and provide an expanding range of complementary specialist services to our clients across the entire life span of their projects; from strategic definition through design, handover, occupation and in use.

Our client-focused and design-led service is underpinned by our commitment to collaboration and our passion for innovative sustainable design.

Our firm remains wholly owned by our partners, enabling us to better focus on the needs of our clients.
Our firm

**Great people**

We use our industry leading professional development scheme to nurture and develop the very best people.

We promote inquisitiveness and innovation.

Within a supportive and collaborative environment we produce individuals who enjoy working with us, delivering simple, elegant and efficient designs.

**Respected reputation**

We have influence in the wider industry and are in a unique position to make a real difference in the industry.

Connected to decision makers we sit on many advisory committees, contributing to complex agendas and help guide policy.

**Industry recognition**

We are very proud of the fact that what we do and how we do it gets recognised regularly by the wider construction industry.

We are the current holder of the CIBSE Building Performance Awards: Consultant of the Year, as voted by many of our peers in the industry.

We have been awarded this accolade more times than anyone else since this award was inaugurated.
Partner led sector expertise

We provide partner led expertise to our clients operating in all of the major construction sectors.

We deliver all this expertise wherever our clients need it through a successful system of sharing sector knowledge, skill and resources around the firm.

We consistently work on a wide range of high quality projects that ensures our sector expertise always remains relevant and valuable to our clients.
### AIR HANDLING UNIT SCHEDULE

**PROJECT**: Chemical Engineering & Biotechnology  
**No**: 26/01013  
**SYSTEM**: Primary Supply Air

### SCHEDULE OF LV SWITCHBOARDS

**CHEMICAL ENGINEERING & BIOTECHNOLOGY**  
**26/01013**

**Notes:**
1. All panel building works for alarm panels are to incorporate a red panel.
2. All devices by reference and function.
3. All switchgear and associated controls to be provided to all panels to supply all motorised devices as required.

<table>
<thead>
<tr>
<th>Board Ref.</th>
<th>Function</th>
<th>Construction</th>
<th>Form</th>
<th>IP</th>
<th>Device Pattern</th>
<th>Access</th>
<th>Cabling Power</th>
<th>Controls</th>
<th>Finish</th>
</tr>
</thead>
<tbody>
<tr>
<td>W111/LV1</td>
<td>Main LV Panel within Services Compound</td>
<td>Indoor multicubical, freestanding</td>
<td>4b Type 2</td>
<td>31</td>
<td>ACBs withdrawable, all others fixed</td>
<td>Front and Rear</td>
<td>In: Down, Out: Up</td>
<td>In:Out: Up</td>
<td>Standard</td>
</tr>
<tr>
<td>W111/LV2</td>
<td>2nd Floor Plantroom LV Panel</td>
<td>Indoor multicubical, freestanding</td>
<td>4b Type 2</td>
<td>31</td>
<td>ACBs withdrawable, all others fixed</td>
<td>Front and Rear</td>
<td>In:Out: Up</td>
<td>In:Out: Up</td>
<td>Standard</td>
</tr>
<tr>
<td>W111/ACD</td>
<td>Autochangeover panel supplying W111/ESB from either normal or generator sources.</td>
<td>Indoor wall mounted panel board</td>
<td>2 Type 2</td>
<td>31</td>
<td>Fixed</td>
<td>Front Only</td>
<td>In: Down, Out: Up</td>
<td>In:Out: Down</td>
<td>Standard</td>
</tr>
<tr>
<td>W111/ESB</td>
<td>Generator LV Panel Board</td>
<td>Indoor wall mounted panel board</td>
<td>4b Type 2</td>
<td>31</td>
<td>Fixed</td>
<td>Front Only</td>
<td>In: Down, Out: Up</td>
<td>In:Out: Down</td>
<td>Standard</td>
</tr>
<tr>
<td>LUG0/N SB</td>
<td>Lab Block LG Floor North Panel Board</td>
<td>Indoor wall mounted panel board</td>
<td>4b Type 2</td>
<td>31</td>
<td>Fixed</td>
<td>Front Only</td>
<td>In: Down, Out: Up</td>
<td>In:Out: Down</td>
<td>Standard</td>
</tr>
<tr>
<td>LUG/S SB</td>
<td>Lab Block LG Floor South Panel Board</td>
<td>Indoor wall mounted panel board</td>
<td>4b Type 2</td>
<td>31</td>
<td>Fixed</td>
<td>Front Only</td>
<td>In: Down, Out: Up</td>
<td>In:Out: Down</td>
<td>Standard</td>
</tr>
<tr>
<td>LUG/NSB</td>
<td>Lab Block UG Floor North Panel Board</td>
<td>Indoor wall mounted panel board</td>
<td>4b Type 2</td>
<td>31</td>
<td>Fixed</td>
<td>Front Only</td>
<td>In: Down, Out: Up</td>
<td>In:Out: Down</td>
<td>Standard</td>
</tr>
<tr>
<td>LUG/MRC</td>
<td>Lab Block UG Floor NMR Panel Board</td>
<td>Indoor wall mounted panel board</td>
<td>4b Type 2</td>
<td>31</td>
<td>Fixed</td>
<td>Front Only</td>
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<td>In: Down, Out: Up</td>
<td>In:Out: Down</td>
<td>Standard</td>
</tr>
<tr>
<td>L01/NSB</td>
<td>Lab Block First Floor North Panel Board</td>
<td>Indoor wall mounted panel board</td>
<td>4b Type 2</td>
<td>31</td>
<td>Fixed</td>
<td>Front Only</td>
<td>In: Down, Out: Up</td>
<td>In:Out: Down</td>
<td>Standard</td>
</tr>
<tr>
<td>L01/SSB</td>
<td>Lab Block First Floor South Panel Board</td>
<td>Indoor wall mounted panel board</td>
<td>4b Type 2</td>
<td>31</td>
<td>Fixed</td>
<td>Front Only</td>
<td>In: Down, Out: Up</td>
<td>In:Out: Down</td>
<td>Standard</td>
</tr>
<tr>
<td>RAC01</td>
<td>Autochangeover panel located at the top of Researchers' House North Lift shaft to changeover from normal to emergency supply</td>
<td>Indoor wall mounted panel board</td>
<td>2 Type 2</td>
<td>31</td>
<td>Fixed</td>
<td>Front Only</td>
<td>In:Out: Down</td>
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</table>
Where We Were
Where We Were
Where We Were

Creating Project Awareness
Where We Were

Whilst this is not “BIM”.

It was the start of us trying to create and manage information and drawings from one source and use that information in multiple places.

Our First Revit Project Was in 2009?

• We have since worked on over 300 Revit (BIM) projects across the firm

• Things have changed and moved on a huge amount!
WERE WE ARE AND HOW DID WE GET HERE

Hoare Lea – 2017
Getting to where we are

We we’re early adopters

As an industry leader we adopt BIM technologies early enabling us to provide our clients with the latest services.

We had revit templates and a family library with about 1500 objects.

A huge shared parameter file.

We were starting to automate scheduling and performing some calculations directly in Revit.

We were delivering regular 2 day Revit training courses. Half of our employees were trained.

Use of Revit was starting to catch and in some office overtake the use of AutoCAD.

We were pretty proud of our efforts.
Getting to where we are

BUT!

PAS 1192-4 Came out

We started to get requests for COBie and delivering models with all sorts of classification systems embedded.

We were seeing more and more EIRs.

Projects were getting bigger and more complex. Bigger more complex model.

We were delivering more projects form multiple locations.

And cracks in our methods, family libraries and templates started to show.

We also realised that too much knowledge and knowhow sat within a small group of people who were spread around the business.

SOMEONE HAD A CUNNING PLAN!

We'll just make our families Level 2!

By adding Uniclass 1.4 & 2015 Parameters to our families.

And the fields from COBie as shared parameters to our families and project templates, use the (old version of the) COBie toolkit and we'll be fine.

No one checks the COBie anyway!!! Right
A MORE THOROUGH PLAN WAS REQUIRED

A steering group consisting of delegates from all levels was formed
The business was consulted to identify key challenges and areas of main concern
Key challenges were identified and prioritised
Steering groups were formed at the requisite levels

A thorough strategy and business plan was proposed, reviewed many times and finally signed off a year after it's inception.

During this time many of the critical items were beginning to be addressed.
  - Re-organisation of project teams to align with PAS 192-2 Roles
  - Training and guidance
  - Fixing out libraries and templates

A total of 16 actions were identified.

Split into dealing with External and Internal issues

And how we would and who was responsible for addressing an issue
We strive to have the best staff with the best training in all areas of the firm. BIM is no different.

Over 75% of our Staff are trained to use Revit.

We deliver much of training to our people in-house using best practice knowledge at all levels.

Our training programme includes:

- Revit basics
- Advanced Revit use
- BIM Project Management
- Partner level training

Our BIM training is tailored to integrate with our ways of working.
We have a comprehensive suite of guidance documents

These are aimed at 3 Levels.

Partners and Senior Management

Project Managers and Engineers

Technical Staff

These documents are under constant review and regularly revised

Many of these documents have now become integrated with our standard business and operating procedures blurring the lines between BIM and non BIM projects
Where are we?

We have a central BIM team that includes software developers, engineers, content creation and training specialists.

We have a network of champions in each office representing every level of the business

<table>
<thead>
<tr>
<th>Office</th>
<th>Managing Partner</th>
<th>Partner BIM Champion</th>
<th>Project Manager Champion</th>
<th>Engineering BIM Champion</th>
<th>BIM Manager</th>
</tr>
</thead>
<tbody>
<tr>
<td>Oxford</td>
<td>Matt Jones</td>
<td>Matt Chambers</td>
<td>Paul Cooper</td>
<td>E – Jordan Mason</td>
<td>Grayham Roper</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>I – Monika Nowak</td>
<td>Deputy - Craig Hobbs</td>
</tr>
</tbody>
</table>

We have in house visualisation, R&D, technical control property services and many other teams all looking at the best way to leverage models and data to deliver better projects and value to our clients

These groups do all try and work together and share information and development.

We have even recently employed an external BIM consultant to come and work in our Bristol office to critique what we do!
Our Approach

Automation of routine tasks

Revit to Excel two-way link

Automated builders’ work holes

Automated pipe insulation

Model management tools such as standards checker, viewport copy, archisort, mark updater, room reaper, etc.

This allows us to spend more time concentrating on design.
Our Approach – Using Revit as a design tool
Our Approach – Using Revit as a design tool

Calculations

Intelligent Objects

Typical calculations

Flowrates

Coil Duties

Physical sizing
Our Approach – Interoperability

Our People

Rob Jackson
BA Hons Dip Arch
Associate Director

Contact Rob:
+44 (0)114 2662040
digital@bondbryan.co.uk
Our Approach – Interoperability

Industry Foundation Classes
Compliant Services

Level 2 BIM Compliance

Our range of BIM services are compliant with all current regulations and guidelines.

These include:

• PAS1192 compliant team structures and information sharing processes.

• BS1192 & BS8541 compliant naming standards.

• Regular use of Common Data Environments on all our BIM projects.

• COBie parameters and Uniclass 2015 classification codes embedded in all our content.
Immersive Design Experience

3D modelling is a key part of our BIM offering.

We use these models to help our clients:

- Visualise designs
- Take virtual tours of plant spaces
- Coordinate services

By enabling clients to fully understand their decisions during the design stage we help to ensure that the right decisions are made at the right time.

This in turn reduces the need for future changes and helps to effectively manage project costs.
Contributing to the future of BIM

We pride ourselves on being at the forefront of BIM development and are recognised in the industry as a leader.

In particular, we are continuously pushing the boundaries of using Revit as a design tool, helping Autodesk to improve software capability, and writing our own bespoke add-ins.

We have contributed substantially to BSRIA BG6, helping to shape BIM in the industry today. We continuously offer guidance to the industry through regular worldwide speaker slots, debate panels and journal articles, and we are an active member of the CIBSE Digital Steering Group.
Challenges and Barriers

INTERNAL

Resistance to change

Doing what we’ve always done is easy

Conflicting opinions

Budgets

EXTERNAL

Resistance to change

Conflicting opinions

Managing Change (Incoming Models)

Differing Knowledge and skill levels

Managing expectations

Changing technology

Changing standards
• So far:
  – Familiarising ourselves with Revit
  – Finding our feet with BIM
  – Getting feedback from users and clients
  – Making loads of mistakes
  – Getting ahead of the competition
  – Pushing the boundaries of Revit’s capabilities

• Right Now: Get reliable
  • Collating all that knowledge
  • Re-laying the foundations
  • Tidy up of library, template, parameters, schedules
  • Creation of management guidance
  • Improve our Revit training offer
  • Get more organised about software development

Timeline of Digital Innovation

• 10 Years: Agile, Immediate and Informative
  • Computers will optimise rather than just test
  • Instant feedback on design decisions
  • Close collaboration with team members
  • Designing directly in the virtual environment
  • We will be very involved with in-use data
  • Integrating buildings into smart cities
  • Construction will be modular prefab, carried out by robots and 3D printers

• 5 Years: Efficient and Powerful
  • Routine tasks will be automated
  • Cloud computing
  • More time spent in concept design
  • More time spent with in-use data
  • Specs and schematics linked to models
  • Single database for all project information

• 10 Years: Agile, Immediate and Informative
  • Computers will optimise rather than just test
  • Instant feedback on design decisions
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