27 March 2015

IATGN-10
Educational Developments

DUBLIN INSTITUTE OF TECHNOLOGY
College of Engineering + Built Environment
School of Architecture *+ Construction*

Context: A new technical language

DIT
CEBE
DSA
DoES
HEA
DoECLG
SEAI
NSAI
QQI

nZEB
EPBD
20/20/20
H2020
SCC1
EE4

DEAP
NEAP
SBEM
SAP
PhPP
BIM
BIMM
BEAM

BCA
BC(A)R
S.I.9
AC/DC

DAER
ERT
TBA
BEAM
aBIMM

Context: A new technical language

Bodies	EU	Metrics	Regs	DIT programmes
DIT	nZEB	DEAP	BCA	DAER
CEBE	EPBD	NEAP	BC(A)R	ERT
DSA	20/20/20	SBEM	S.I.9	TBA
DoES	H2020	SAP	AC/DC	BEAM
HEA	SCC1	PhPP		aBIMM
DoECLG	EE4	BIM		
SEAI		BIMM		
NSAI		BEAM		
QQI				

Context: AEC (USA)

AEC	Architecture	Engineering	Construction

A **ARCHITECTURE**

E **ENGINEERING**

Civil
Structural
Building Services
Fire
Façade
Fabric

C **CONSTRUCTION**

Building Contractor
Construction Manager

Engineer	Civil	
	Structural	
Surveyor	Property Surveyor (aka Developer)	€
	Quantity Surveyor	€
	Building Surveyor	
	Geo Surveyor	

Context: AEC (USA)

Where is the BC(A)R DC/AC?

A	**ARCHITECTURE**		DC/AC
E	**ENGINEERING**		DC/AC
	Civil		
	Structural		
	Building Services		
	Fire		
	Façade		
	Fabric		
C	**CONSTRUCTION**		
	Building Contractor		
	Construction Manager		
	Engineer	Civil	
		Structural	
	Surveyor	€ Property (aka Developer)	
		€ Quantity	
		Building Surveyor	DC/AC
		Geo Surveyor	

Context: AEC (USA)

Where is the Architectural Technologist?

A	**ARCHITECTURE**	+AT
E	**ENGINEERING**	
	Civil	
	Structural	
	Building Services	+AT?
	Fire	+AT?
	Façade	+AT?
	Fabric	+AT?
C	**CONSTRUCTION**	
	Building Contractor	
	Construction Manager	+AT?
	Engineer — Civil	
	Engineer — Structural	
	Surveyor — € Property (aka Developer)	
	Surveyor — € Quantity	
	Surveyor — Building Surveyor	+AT?
	Surveyor — Geo Surveyor	+AT?

Entering the deep water of a regulated profession

AEC: Architecture

Entering the deep water of a regulated profession

AEC: Engineering

Entering the deep water of a regulated profession

AEC: Surveying

Entering the deep water of a regulated profession

FETAC Level 5 = 1

FETAC Level 6 = 2

Architectural Technology: FETAC 5 + 6

Entering the deep water of a regulated profession

Dip Arch Tech = 3

BSc Arch Tech = 3

Architectural Technology: Level 7

Entering the deep water of a regulated profession

BSc (Hons) Arch Tech = 3+1

Architectural Technology: Level 8 3+1

Entering the deep water of a regulated profession

BSc (Hons) = 4 ab initio

Professional ab initio 4 year Level 8

How sail boats work

Boat

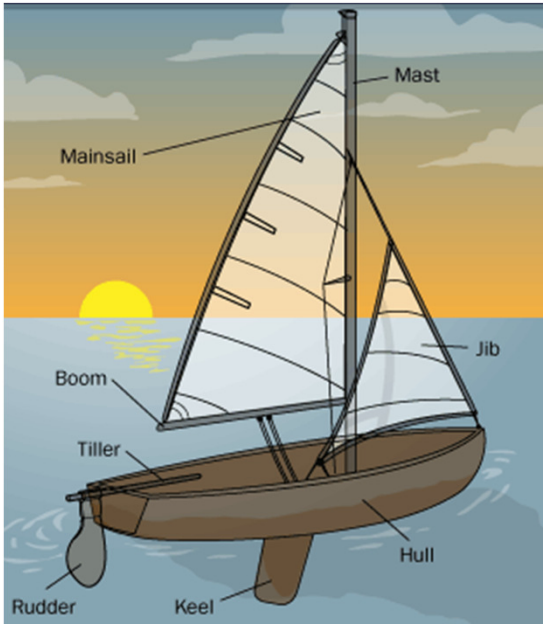
Mast

Sail

Keel

Rudder

Wind



How sail boats work

Boat

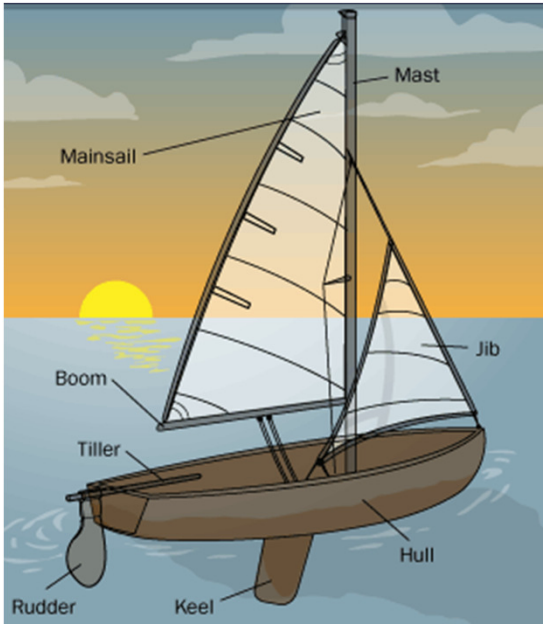
Mast

Sail

Keel

Rudder

Wind



+ Crew

Sailors
Skipper

How sail boats work

Boat

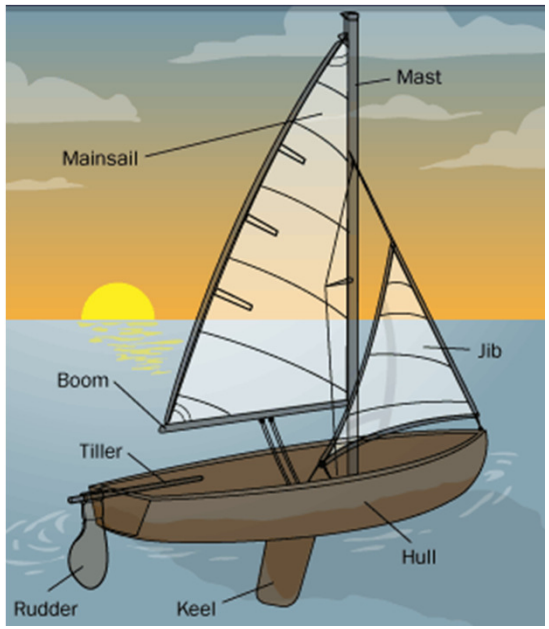
Mast

Sail

Keel

Rudder

Wind



+ Crew	Sailors Skipper
+ Navigation	Where are we going? Who has the plan?

How sail boats work

Boat

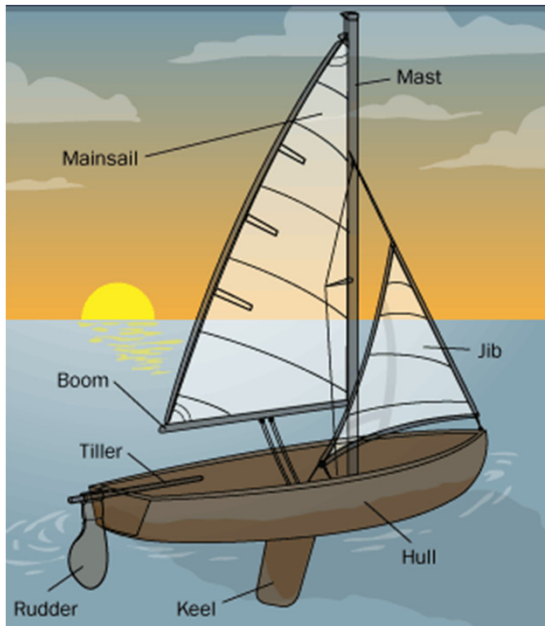
Mast

Sail

Keel

Rudder

Wind



+ Crew	Sailors Skipper
+ Navigation	Where are we going? Who has the plan?
+ Risk	Icebergs? Insufficient supplies for journey!

Entering the deep water of a regulated profession

AEC: Architectural Technology?

Entering the deep water of a regulated profession

Where is the crew?

Entering the deep water of a regulated profession

Wind	Change + opportunity:	Energy Lean € BIM
Crew	Graduates, students, educators	
Boat	Architectural Technology discipline: 1963-2015	
Mast	Educational Institutions: IoTs x 6	
Sails	Education programmes: BSc (Hons) / MSc	
Keel	Education and practice standards: QQI	
Rudder	Regulation: Register	
Navigation	Where are we going?	
Risk	Icebergs? Insufficient supplies for journey!	

WIND

WIND:
Change + opportunity

Global

Energy	EPBD, nZEB, DEAP, NEAP, SBEM, PhPP
LEAN	Factory production to achieve performance
IT	BIM

Domestic

Crash	Emigration:	Loss of knowledge capital
	Springboard:	Upskilling
Education	Architecture x 5 / Architectural Technology x 6	
Priory Hall	BC(A)R DC/AC Register: RIAI CIAT	
DIT	College of Engineering + Built Environment End of Department of Architectural Technology New School: Architecture + Technology + Construction	

CREW

CREW:
Graduates

Graduates: the past

Technician V Technologist

The four 25s:

25	Career change	
25	Architecture	
25	Technician:	working under direction: technical
25	Technologist:	working independently: professional 'hard boiled technologist'

The 5 fives of last 25:

5	Me Feiners	
5	RIAI (Arch Tech)	
5	MCIAT	
5	MRIAI:	Architects Registration Admission Exam (ARAE) Technical Assessment
5	SCSI:	CIOB CABE (via MCIAT)

CREW:
Students

Leaving Certificate and CAO points are a poor measure of suitability!

100 CAO points per subject x 6 = 600 points
240/600 = 40%
300/600 = 50%.....2.2
330/600 = 55%.....an old C when an honour was an honour!

Construction Studies / Engineering / Technical Drawing / DCG / Art

DT175: 55 students admitted to first year

400 CAO Points 2008
300 CAO Points 2014 90% currently on DT175 would not have been admitted in 2008

330 CAO Points	40 students above 330	28 pass 12 fail	70/30
	15 students below 330	5 pass 10 fail	30/70
		33 pass 22 fail	

55 students 33 pass / 22 fail = 60% retention
40 students 28 pass / 12 fail = 70% retention
34 pass / 6 fail = 85% retention…..ie target 6

BOAT

BOAT

ARCHITECTURAL TECHNOLOGY DISCIPLINE

More is now required:

BIM, nZEB, BCAR etc: The bar is higher.

Practices demanding more, require BIM, but also higher technology skills (BIM is the easy it!)

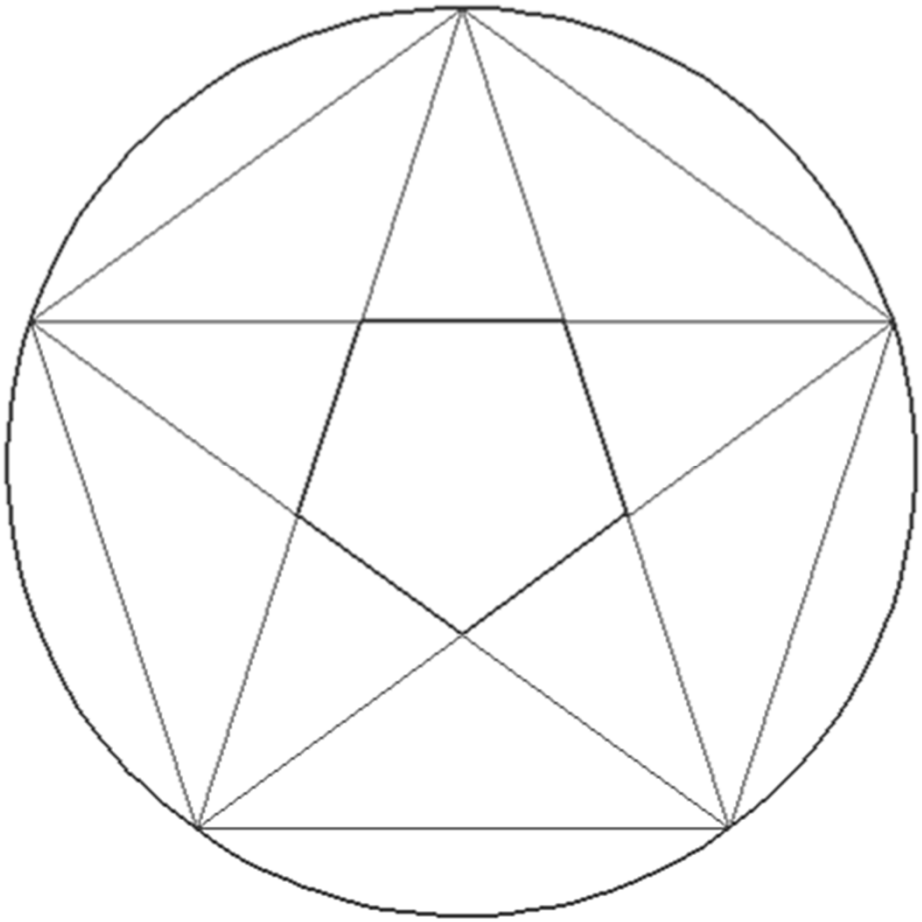
Energy design is difficult: nZEB requires understanding of science and technology theory and principles, with a capacity for numeracy.

And also…

- BCAR
- Specification
- Contract

Huge implications for education undergraduate
postgraduate
CPD

12 Competences



1. 3D problem solving
2. Construction information
3. Materials and technology
4. Legislation
5. Theory, principles, calculation and performance

6. Coordination and integration: Architect
7. Coordination and integration: Engineer
8. Coordination and integration: Cost Control
9. Coordination and integration: Subcontractor
10. Coordination and integration: Contractor

11. Management and quality

12. Professionalism

‘’Graduate”	BSc (Hons) Arch Tech
‘’Professional”	PG Cert (AAT)

MAST

MAST:
Educational Institutions / Institutes of Technology

2005
Two Schools of Architecture: UCD, DIT
Three Architectural Technology: DIT, WIT, CIT *(LIT closed)*

2015
Five Schools of Architecture: UCD, DIT, WIT, UL, CCAE (CIT/UCC)
Six Architectural Technology: DIT, WIT, CIT, ITC, GMIT, LyIT

Architectural Technology:
- Reduced student numbers
- Reduced CAO points
- Increased attrition to maintain standards
- Increased expectation for higher technical capacity

Architecture
- Programmes not becoming more technical

MAST:
Educational Institutions / Institutes of Technology

	CAO
Dublin Institute of Technology	
Level 8 BSc (Hons) Architectural Technology (4 year ab initio)	300 (330?)
Waterford Institute of Technology	
Level 7 BSc Architectural Technology	205
Level 8 BSc (Hons) Architectural + BIM Technology (4 year ab initio)	*300*
Cork Institute of Technology	
Level 7 BSc Architectural Technology	220
Level 8 BSc (Hons) Architectural Technology (4 year ab initio)	285
Level 8 BSc (Hons) Architectural Technology (4 year ab initio)	n/a
Institute of Technology Carlow	
Level 7 BSc Architectural Technology	180
Level 8 BSc (Hons) Architectural Technology (4 year ab initio)	260
Galway Mayo Institute of Technology	
Level 6 Higher Certificate in Architectural Technology	185
Level 7 BSc Architectural Technology	140
Level 8 BSc (Hons) Architectural Technology (4 year ab initio)	220
Letterkenny Institute of Technology	
Level 7 BSc Architectural Technology	235

MAST:
Educational Institutions / Institutes of Technology

Europe

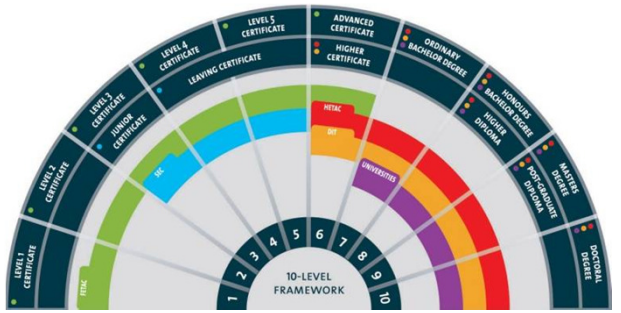
International Congress on Architectural Technology (ICAT)

Denmark	Copenhagen 2008
Netherlands	Amsterdam 2010
Ireland	Dublin 2011
UK/England	Sheffield 2013
UK/Scotland	Aberdeen 2014
Spain	Alicante 2016
Germany	There are no architectural Technologists in Germany

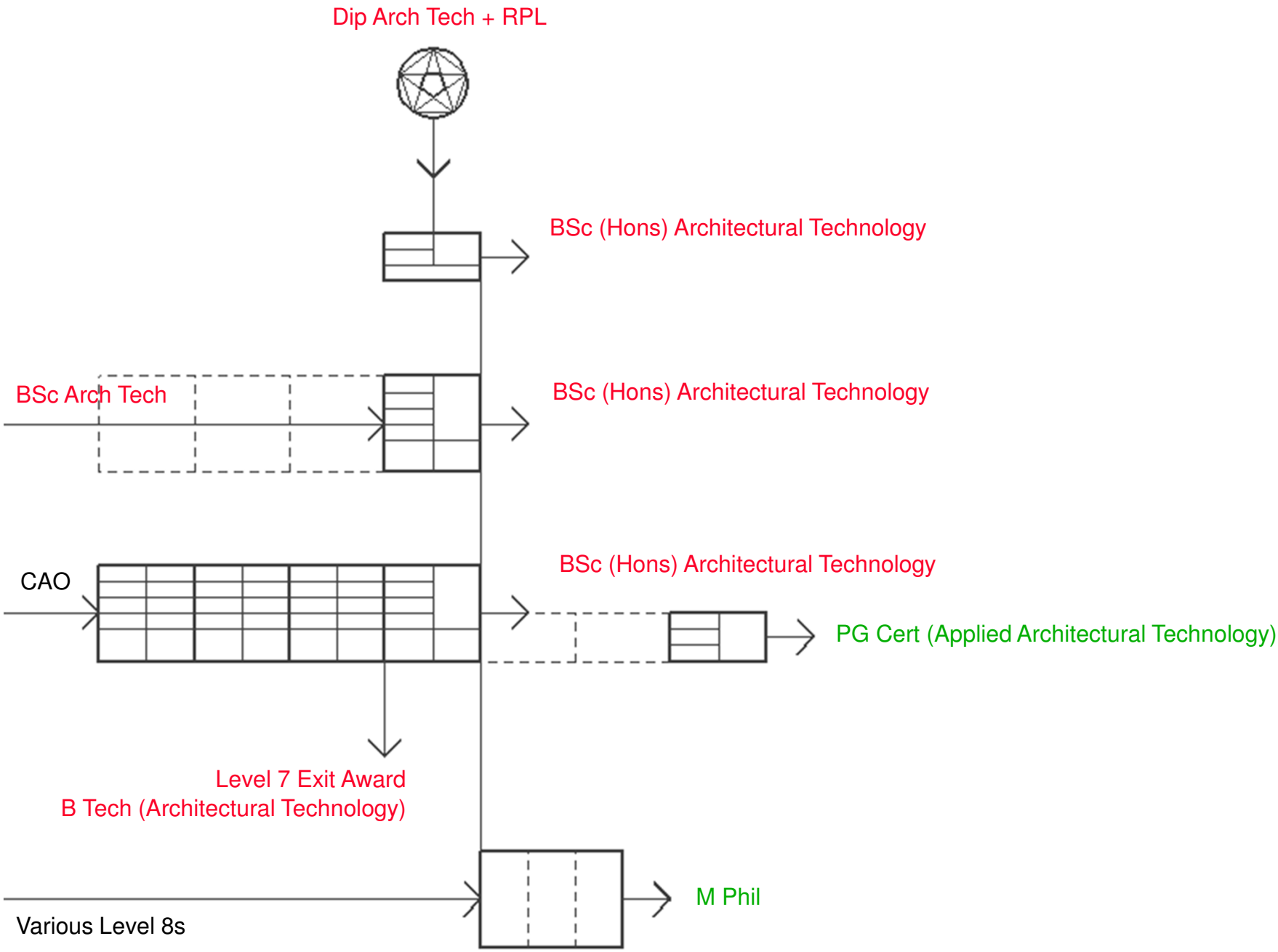
SAILS

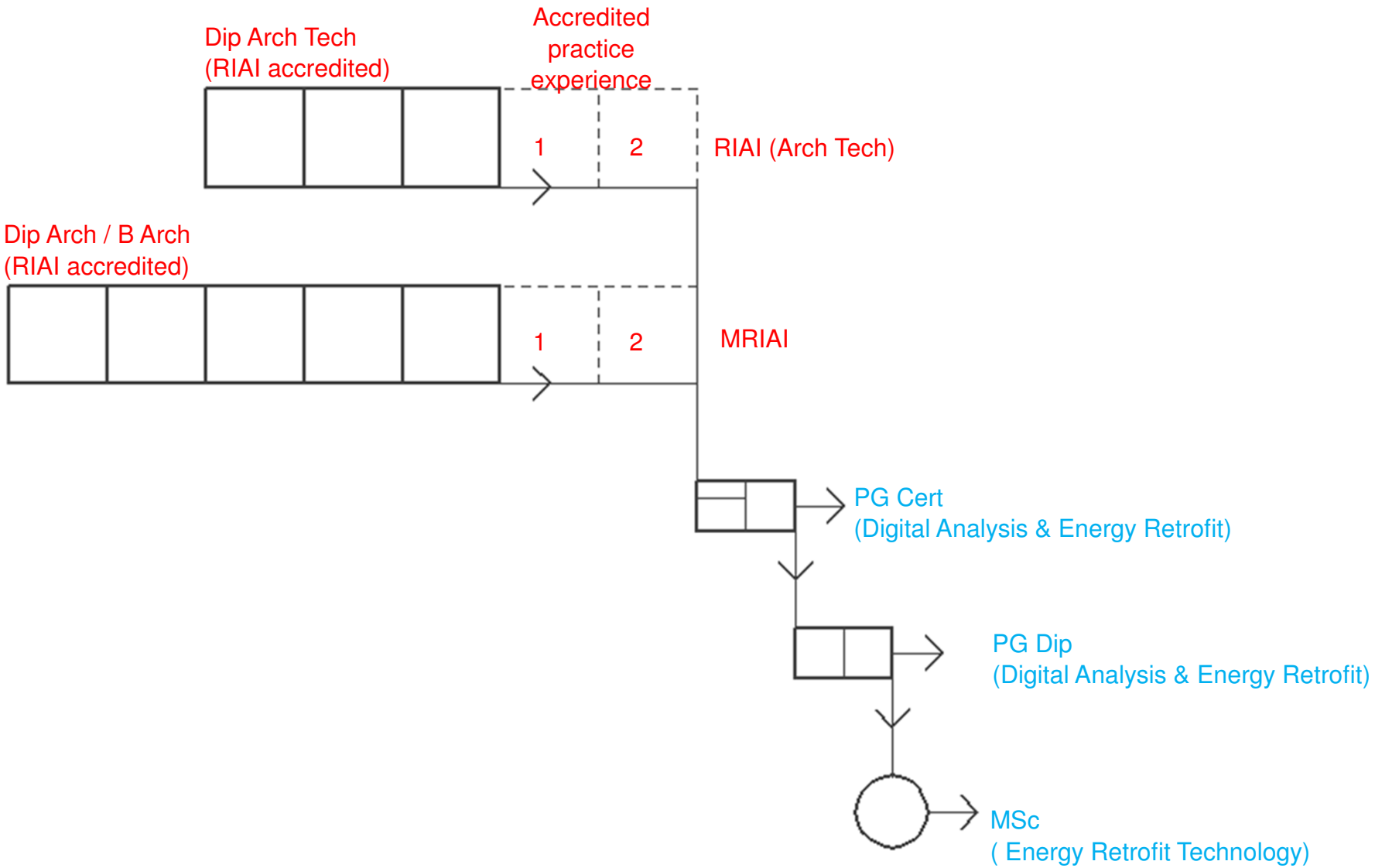
SAIL:
Education

Education context



- Bologna Accord
- National Framework of Qualifications Levels 1-10
- European Credit Transfer System (ECTS)
- Learning hours
  20 learning hours = 1 ECTS credits
  100 learning hours = 5 ECTS credits
  300 learning hours = 15 ECTS credits
  600 learning hours = 30 ECTS credits
  Contact + self directed learning
- Modularisation
  Multiples of 5 ECTS credits
  Module can be assembled to form qualifications
- Semesters
  15 weeks
  15 ECTS credits = 20 hours per week: 6 contact + 14 self learning
  5 ECTS module = 7 hours per week over 15 weeks


Dip Arch Tech + RPL
BSc (Hons) Architectural Technology
BSc Arch Tech
BSc (Hons) Architectural Technology
CAO
BSc (Hons) Architectural Technology
PG Cert (Applied Architectural Technology)
Level 7 Exit Award
B Tech (Architectural Technology)
Various Level 8s
M Phil


Dip Arch Tech
(RIAI accredited)
Accredited
practice
experience
1
2
RIAI (Arch Tech)
Dip Arch / B Arch
(RIAI accredited)
1
2
MRIAI
PG Cert
(Digital Analysis & Energy Retrofit)
PG Dip
(Digital Analysis & Energy Retrofit)
MSc
(Energy Retrofit Technology)

SAIL:
Postgraduate progression opportunities: IoTs

Waterford Institute of Technology
MSc in Sustainable Energy Engineering

Cork Institute of Technology
MSc Architectural Technical Design

Institute of Technology Carlow
MSc Management in the Built Environment

Galway Mayo Institute of Technology
MSc Environmental Resource Management
Post-Grad Higher Diploma in BIM

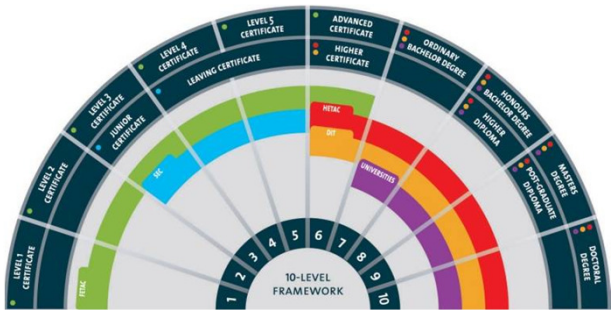
Letterkenny Institute of Technology
BSc (Hons) in Fire Safety Engineering
BSc (Hons in Sustainable Construction Management

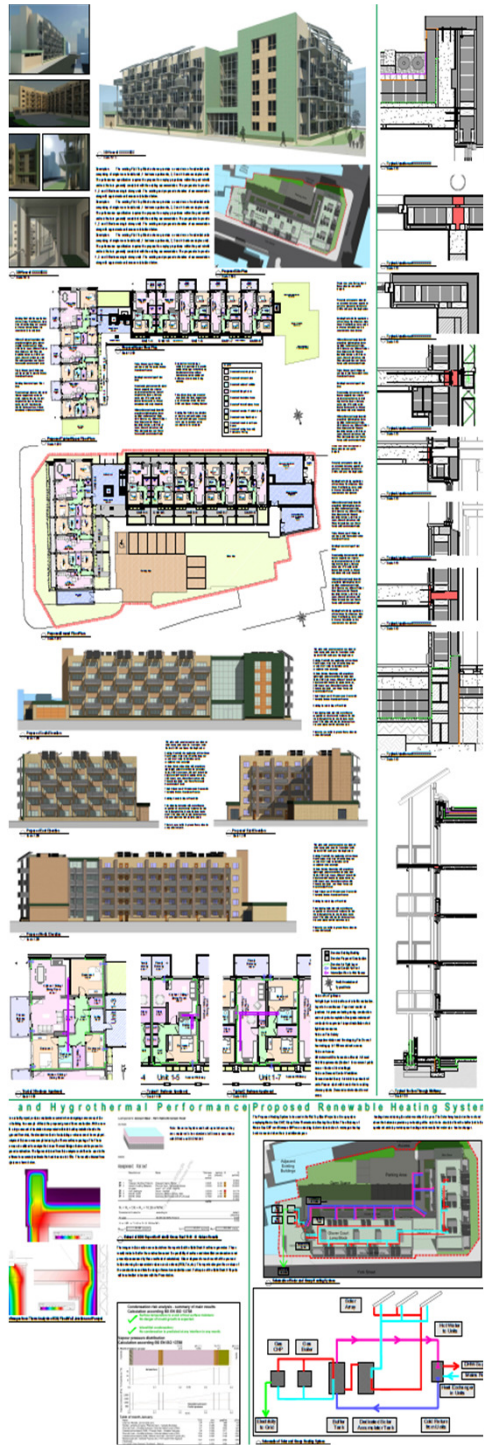
SAIL:
Education

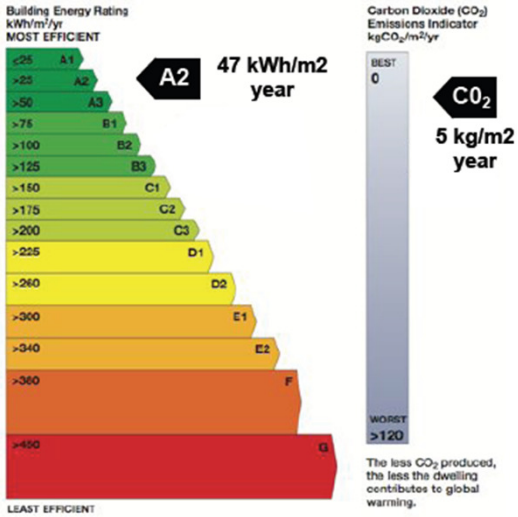
Postgraduate progression opportunities: Energy Retrofit

Level 9

Code	Programme	Credits
DT774	PGCert (Digital Analysis and Energy Retrofit)	30
DT774a	PGDip (Digital Analysis and Energy Retrofit)	60
DT774b	MSc (Energy Retrofit Technology)	90
DT775b	CPD Diploma (Thermal Bridge Assessment)	15
DT775c	CPD Diploma (Hygrothermal Assessment)	15
DT775d	Postgraduate Certificate (Thermal Performance Modelling)	30
DT774c	CPD Diploma (Energy Analysis)*	15







You are cordially invited to

flatTOP-RETROFIT 2013

A Dublin School of Architecture presentation of

Springboard supported programmes
MSc (Energy Retrofit Technology)
CPD Certificate (Thermal Bridge Assessment)
CPD Diploma (BIM Technologies)
CPD Certificate (BIM Architecture)

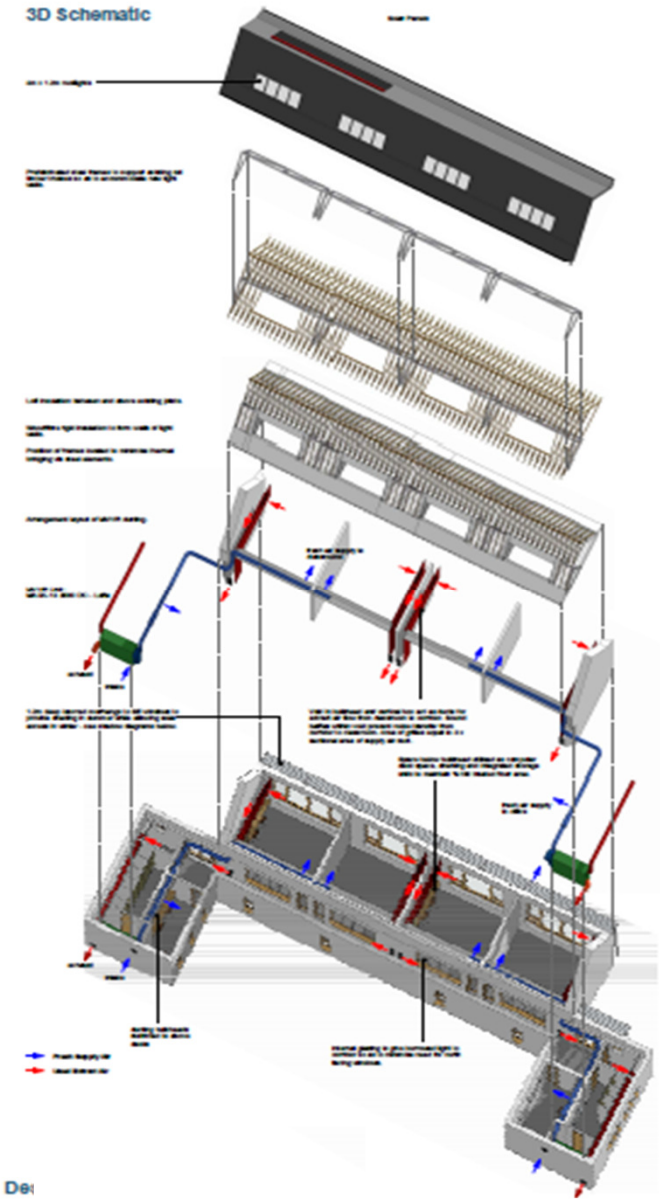
featuring the Near Zero Energy Building (NZEB) sustainable retrofit of
flatTOP
a 5-storey apartment block for DCC

Friday 7 June 2013
16.00 – 18.00

Room 259
Dublin School of Architecture
DIT Bolton Street, Dublin 1

and afterwards to the opening of
Dublin School of Architecture
SHOW13

flatTOP-RETROFIT



nZEB14

DIT National Retrofit Conference

nZEB14
DIT National Retrofit Conference

A Dublin School of Architecture presentation of

Springboard supported programmes
Postgraduate Certificate (Digital Analysis & Energy Retrofit)
MSc (Energy Retrofit Technology)
CPD Diploma (Thermal Bridge Assessment)
CPD Diploma (BIM Technologies)
CPD Diploma (Collaborative BIM)

featuring
nZEB DEAP Residential (BRE Scotland)
nZEB PHPP School (Department of Education & Skills)
nZEB NEAP Office (Dublin Airport Authority)

Friday 6 June 2014
14.00 – 17.30

Michael O'Donnell Theatre
DIT Bolton Street, Dublin 1

and afterwards to the opening of
Dublin School of Architecture
SHOW14

RIAI CPD LINKS
RIAI Recognised CPD Providers
3 structured RIAI CPD points

SPRINGBOARD
Improve your job prospects

DIT Dublin Institute of Technology · Institiúid Teicneolaíochta Átha Cliath

nZEB14
DIT National Retrofit Conference

SAIL:
Education

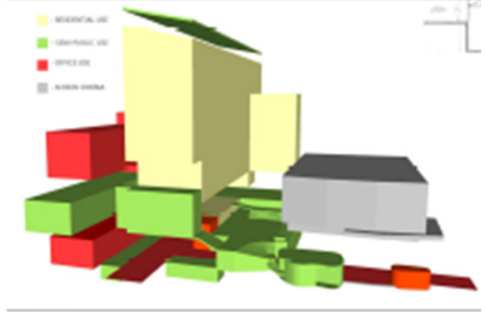

Postgraduate progression opportunities: BIM

Level 9

Code	Programme	Credits
DT9876	PGCert (BIM Technologies)	30
	PGDip (Collaborative BIM)	60
	MSc Applied Building Information Modelling & Management	90

Level 8

Code	Programme	
DT775	CPD Diploma (BIM Technologies)	30
DT775c	CPD Diploma (Collaborative BIM)	30
CPDBEu01	CPD Certificate (BIM Architecture 1)	5
	CPD Certificate (BIM Architecture 2)	5
	CPD Certificate (BIM Architecture 3)	5

Dublin School of Architecture

DIT Bolton Street

www.dit.ie/architecture

Programme title and code:

DT774 Postgraduate Certificate in Digital Analysis & Energy Retrofit

Programme context:

As EU and domestic directives and regulations demand higher levels of energy performance, and with the failure of existing building stock to meet even current building regulation standards, the retrofitting of existing building stock will emerge as perhaps the most significant market for the construction industry in the coming years.

With the majority of architects and architectural technologists having completed their education with limited coverage of the theory and practice of energy performance and sustainability, and with limited training in computer modeling and predictive digital analysis, a need exists for an applied programme of learning which addresses this knowledge and skills deficit.

Programme description:

The DT774 Postgraduate Certificate in Digital Analysis & Energy Retrofit programme is a 1 year part time programme, delivered over two semesters, and which has been designed to enable professionally qualified architects and architectural technologists to develop skills centered on digital analysis, energy performance and retrofitting of multi-unit residential buildings using a variety of digital modeling and environmental design software applications.

The programme is set at Level 9 in the National Framework of Qualifications. Content is focused on the development of knowledge and skills in energy + thermal performance assessment and energy use + fabric heat loss. Real life projects are used to explore performance ranges from Part L compliance to nearly Zero Energy Buildings (nZEB). Projects explore environmental design principles and impacts, energy systems and renewable energy, and retrofit technologies. There is also a focus on hygrothermal modeling to assess the effects of interstitial condensation on building fabric and energy performance.

SPRINGBOARD
Building our Future

Funded in 2014, Funding for 2015 pending application

www.dit.ie/architecture

Programme outcomes:

On successful completion of the PG Cert (DAER) programme the learner will be able to:

- Construct a complex data-rich digital model an existing multi-unit residential building of medium size using the medium of Building Information Modeling.
- Analyze a digital building model using a variety of interoperable computer applications to simulate and predict environmental performance.
- Critically analyze an existing building of medium size to determine under-performance and failure in terms of thermal performance and energy consumption.
- Develop energy retrofit strategies to achieve performance requirements at macro and micro levels.
- Develop technical design solutions which address underlying scientific principles, energy performance criteria and buildability with cognizance for cost implications, and which address energy-related legislative requirements.
- Use a building information model to create a technical information package comprising working drawings at a variety of scales with related performance schedules.
- Work collaboratively in a team comprising architects and architectural technologists through the medium of the digital building model and develop retrofit solutions which address technical and aesthetic performance criteria.

Academic progression:

Graduates of the DT774 Postgraduate Certificate in Digital Analysis & Energy Retrofit, programme are eligible to progress to the related Level 9 Postgraduate Diploma in Digital Analysis & Energy Retrofit, and MSc in Energy Retrofit Technology programmes.

Professional recognition:

MRIAI and RIAI (Arch Tech) graduates of the PG Cert (DAER) programme are eligible to apply for RIAI Environmental CPD accreditation.

Programme fee: €2400 (+ €135 registration)	**Commencement:** September 2014	**Applications:** Application form on http://dit.ie/architecture/
Programme duration: 1 year (2 x 15 week semesters)	**Location:** DIT Bolton Street	**Further information:** cormac.allen@dit.ie

SPRINGBOARD
Building our Future

Funded in 2014, Funding for 2015 pending application

Dublin School of Architecture
DIT Bolton Street
www.dit.ie/architecture

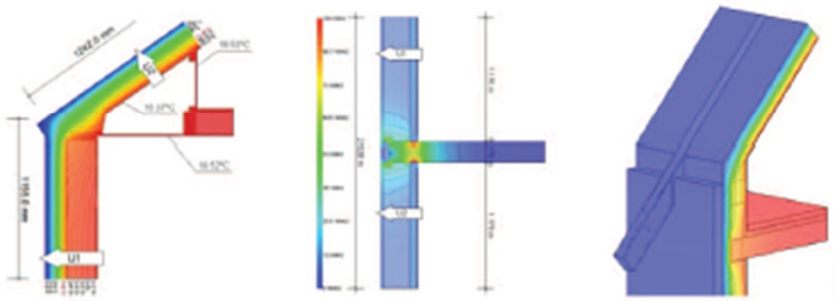
Programme title and code:

DT775b CPD Diploma in Thermal Bridge Assessment

Programme context:

The need for qualified Thermal Bridge Modellers arises from the requirement for increased performance of buildings under the Part L of the Building Regulations.

Thermal bridge modelling is a complex process which demands an understanding of applied building physics principles and an ability to use a variety of inter-related calculation software applications to measure performance in two- and three-dimensional assemblies. Its correct use is central to energy-efficient & healthy sustainable building design and to achieving long term performance of new build and retrofit building solutions.



Programme description:

The DT775b CPD Diploma in Thermal Bridge Assessment is a 1 semester part-time multi-disciplinary re-skilling programme for architects, engineers, building surveyors and architectural technologists.

The programme is set at Level 9 in the National Framework of Qualifications and aims to provide graduates of building design and construction related programmes with an educational setting in which to develop skills in thermal bridge assessment and an ability to apply principles to construction detailing.

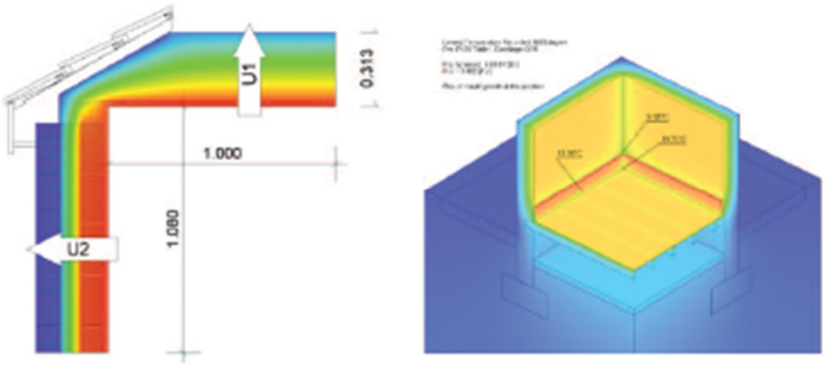
The programme content is focused on thermal bridge modeling which requires an understanding of various thermal performance predictive computer applications.

Industry based building designs will be used as the basis for project work to give realistic context for collaborative and multi-disciplinary work.

Programme outcomes:

On completion of the DT775b CPD Diploma in Thermal Bridge Assessment programme the learner will be able to:

- Apply an understanding of the mathematical calculations underpinning and used by thermal bridge analytical software applications to critique related computer output data.
- Apply the requirements of the codes and standards relating to linear and point thermal bridging, temperature factor determination, and calculation of the Y-factor for a whole building.
- Use a 2D and 3D thermal bridge analytical software application and validate its suitability to thermal bridging analysis in accordance with the examples from ISO 10211 Appendix A.
- Apply analytical software applications to the assessment and resolution of thermal bridging problems.
- Carry out a comprehensive analysis of thermal bridge performance in an existing domestic building through a combination of individual and group project work.
- Determine areas of weak performance and develop design solutions to minimise heat flow and optimise surface temperatures at junctions through a combination of individual and group project work.
- Prepare a technical performance report for the purpose of demonstrating compliance with Building Regulations.



NSAI recognition:

While the National Standards Authority of Ireland (NSAI) now provides a process of thermal modelling registration for practitioners who have acquired skills through practice, this programmes is focussed on providing an educational learning experience to enable up-skilling of those without experience in the process.

The programme is recognised by NSAI and leads to exemption from Part 2 of the registration process, with a related reduced fee.

NSAI

Programme fee:
€1200
(+ €135 registration)

Commencement:
January 2015,
subject to numbers

Applications:
Application form on
http://dit.ie/architecture/

Programme duration:
15 weeks

Location:
DIT Bolton Street

Further information:
cormac.allen@dit.ie

KEEL

KEEL

QUALITY & QUALIFICATIONS IRELAND

QQI

Knowledge Skill and Competence

PETER CULLEN

RUDDER

RUDDER

DEPARTMENT OF ENVIRONMENT
COMMUNITY & LOCAL GOVERNMENT

DoECLG

Register of Architectural Technologists

MARTIN VAUGHAN
Assistant Principal Officer

NAVIGATION

NAVIGATION

Where are we going?

Who has been there before?

Spain:
The oldest…. Apejador / Arquitechnico Technio
Consejo General de la Arquitectura Técnica de España (CGATE)

Denmark:
The newest….. Konstructor
Konstruktørforeningen (KF)
(No longer ‘Constructing Architect’, now ‘Building Expert’….AEEBC)

Germany:
There are no Architectural Technologists in Germany

NAVIGATION:
AEEBC

Association d'experts Europeen du Batiment et de la Construction

Aka

The Association of European Building Surveyors & Construction Experts

AEEBC
The Association of European Building Surveyors & Construction Experts

RISK

RISK

Icebergs

- There are plenty: stay in warm currents!

Resources

- The long tail
- Robust academic standards
- Students capability
- Robust professional standards
- Non engagement with professional bodies

Thank you