Comptroller and Auditor General
Special Report

Delivery of Capital Projects in the Higher Education Sector

Report number 107 March 2019

Report of the Comptroller and Auditor General

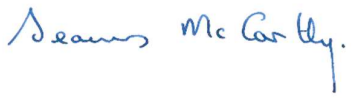
Delivery of Capital Projects in the Higher Education Sector

I have, in accordance with the provisions of Section 9 of the Comptroller and Auditor General (Amendment) Act 1993, carried out an examination of the delivery of capital projects in the higher education sector.

This report was prepared on the basis of information, documentation and explanations obtained from the bodies and persons referred to in the report. The draft report was sent to the Department of Education and Skills, the Higher Education Authority, the Department of Public Expenditure and Reform, and the Office of Government Procurement. In addition, report extracts were sent to the relevant higher education institutions. Where appropriate, responses were incorporated in the final version of the report.

The purpose of this report is to examine the use of exchequer and non-exchequer resources with respect to the construction of buildings in the higher education sector. The sole and exclusive focus of this report is on public bodies, and not on staff members of those bodies or on any third parties. For the avoidance of doubt, this report does not make any criticism or comment or present any view, whether express or implied, with respect to staff members of public bodies or third parties, and should not be understood as doing so.

I hereby submit my report for presentation to Dáil Éireann in accordance with Section 11 of the Act.



Seamus McCarthy
Comptroller and Auditor General

1 March 2019

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Summary

The *National Development Plan 2018 – 2027* provides for investment of €5.1 billion in the higher/further education sector over the next 10 years (€3.1 billion exchequer investment and €2 billion non-exchequer investment) with an additional provision for public private partnerships. Oversight of capital investment rests with the Higher Education Authority.

This report focuses on the capacity of the higher education institutions (HEIs) to plan, manage and deliver large-scale construction projects on schedule, within budget and to the required quality. The review examined ten completed construction projects in the higher education sector. These projects were selected because they incurred significant time and cost overruns and so offered the prospect of yielding lessons for the management of future projects. The report also examines, in relation to the selected projects, the effectiveness and impact of the 2004 Construction Procurement Reform Initiative, which sought to introduce fixed-price lump sum standard forms of contract and new conditions of engagement for construction-related consultants, and was supported by a suite of supporting guidance notes.

Figure 1 provides a summary of the ten projects that were subject to review. For the purposes of this examination, a project cost overrun is the additional cost incurred when measured against the contract sum.

Figure 1 Projects selected for review

Project		Higher Education Institution (HEI)	Date of substantial completion	Final construction cost €m	Cost overrun €m[a]	Time overrun months[a]
A	Engineering building[b]	**Athlone IT**	Sep 2010	**30.3**	4.6	**14**
B	Sports building		Jan 2013	**9.5**	2.2	**7**
C	Engineering building	**NUI Galway**	Feb 2011	**32.3**	5.4	**1**
D	Research bundle[c]		Apr 2015	**60.0**	15.7	**45**
E	Sports complex[b]		Aug 2008	**18.8**	2.1	**4**
F	Campus development[c]	**St Patrick's College**[d]	Jan 2015	**36.3**	4.0	**28**
G	Trinity Biomedical Sciences Institute (TBSI)	**Trinity College Dublin**	Jun 2011	**91.6**	16.7	**6**
H	Student Learning, Leisure and Sports Facility (SLLS)	**University College Dublin**	Mar 2012	**35.5**	9.1	**10**
I	Graduate Entry Medical School (GEMS) building[c]	**University of Limerick**	Nov 2012	**21.0**	4.5	**21**
J	Irish World Academy of Music and Dance (IWAMD) building[b]		Feb 2010	**14.8**	2.9	**3**
				€350.1	**€67.2**	**139**

Source: Higher Education Institutions. Analysis by the Office of the Comptroller and Auditor General.

Notes:
a Difference between the actual cost/date of substantial completion and contract sum/construction schedule as disclosed in the contract documents.
b These projects were procured under the Government Departments and Local Authorities (GDLA) contract — a pre-2007 contract.
c Cost overrun is net of recoupment of performance bond.
d St Patrick's College was incorporated into Dublin City University in October 2016.

The following key findings emerge from the review.

Pre-contract phase

Tender evaluation was the most common weakness at the pre-contract phase. Six projects had cost as the sole criterion at the contract award stage. These projects had combined cost variances of over €20 million.

Three projects had to be re-tendered due to the financial failure of the selected contractor.

Seven projects were constructed under the Construction Procurement Reform Initiative. For these projects, the Reform Initiative objective of optimally transferring risks does not appear to have been achieved. In addition, none of these seven projects were delivered within the Reform Initiative maximum cost increase target of less than 2%.

Contract execution phase

The most common issue during contract execution was changes to the project scope. In some cases, ambiguous and incomplete documents contributed to disputes between the contracting authority and the main contractor. In several others, there was a significant number of change orders, even though these should only be issued for essential requirements that were unforeseeable prior to tender.

Nine of the ten projects ended up in a dispute resolution process. Dispute resolution processes can be expensive with significant legal and professional fees being incurred. In one instance, an institute incurred legal and other professional fees of €3.3 million in relation to resolving contractual disputes.

Post construction phase

In most instances, HEIs identified learning outcomes that could be used on future projects. However, it is unclear if these learning outcomes are shared across the sector.

Overall, there may be a lack of capacity within the higher education sector to manage large scale capital projects. A rigorous risk assessment should take place at the outset with the objective of ensuring that qualitative factors are more explicitly considered at tender evaluation; detailed work requirements are in place; and change orders are limited.

There may also be a lack of capacity within the higher education sector to deal with disputes once they enter a formal conciliation/arbitration process.

Delivery of Capital Projects in the Higher Education Sector

1 Introduction

Capital investment in the higher education sector

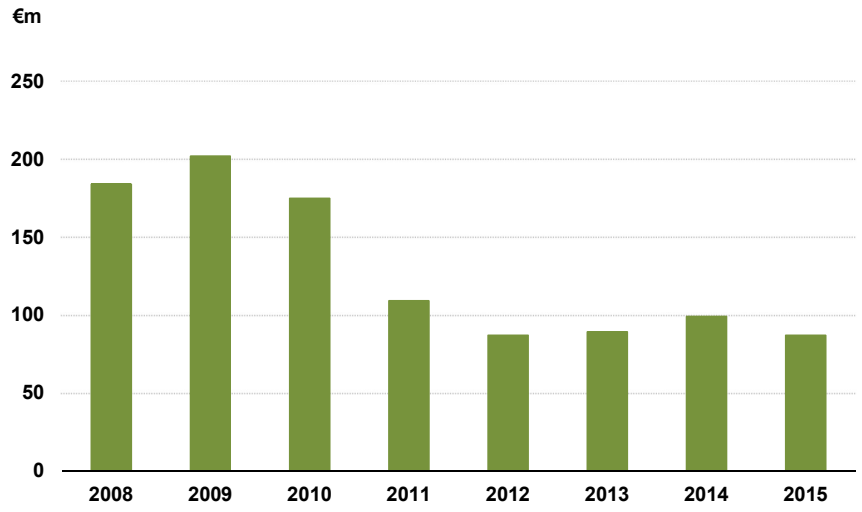
1.1 Full-time student enrolments in 25 Higher Education Authority (HEA) funded institutions for the academic year 2017/2018 was 184,000. In addition, 40,000 part-time and 8,000 remote learning students were enrolled in these institutions.[1]

1.2 Capital investment in the higher education sector includes (or is substantially applied in) the construction of new teaching, research and student services buildings, refurbishment projects, infrastructure development and property acquisition. Oversight of capital investment in the sector rests with the HEA.

1.3 The results of a higher education space survey provided to the HEA in 2010 found that the higher education property portfolio comprised 1,023 buildings, including on-campus student residences, extending to in the region of 2.1 million square metres, with an insurance replacement value of circa €8 billion. Approximately 65% of the space was accounted for by the university sector, 29% in the institute of technology sector and the remainder in other HEA-funded colleges such as colleges of education. Of the 2.1 million square metres of gross space in the system, about 1.8 million square metres gross related to core academic and research activities.[2]

1.4 Figure 1.1 provides an illustration of the extent of exchequer capital expenditure in the higher education sector during the period 2008 to 2015.

Figure 1.1 Exchequer capital expenditure on higher education, 2008 to 2015



Source: *'A Strategy for Funding Higher Education' — report of the expert group on future funding for higher education,* March 2016

1 *Key Facts and Figures 2017/2018*, Higher Education Authority.

2 *Higher Education Space Survey, Preliminary Results and Indicative Capital Investment Demands* — HEA, March 2010.

Demand for capital investment

1.5 During the period 2008 to 2015, just over €1 billion in exchequer capital funding was invested in the higher education sector. It was estimated that in the region of €5.5 billion in spending will be required over the 2016 – 2030 period[1] — approximately €370 million per annum — to cater sufficiently for increased student numbers, capital upgrades, health and safety issues, equipment renewal and ongoing maintenance.

1.6 A number of factors impact on the demand for capital investment in the higher education sector in the medium to long-term, such as

- consolidation of the sector, through institutional mergers and new collaborative arrangements
- emergence of technological universities
- role of HEIs in delivering on the spatial planning objectives of Project Ireland 2040
- strategic priorities of the HEIs e.g. as market-leading research institutions
- skills needs, in particular in the science, technology, engineering and mathematics (STEM) area
- age profile of the capital stock
- demographic trends including increased participation rates in third level education, population growth, and demand for higher per capita space provision[2], and
- technological advances, including remote learning.

1.7 The Department of Education and Skills (the Department) has stated that while there has been a fall-off in exchequer capital funding to the higher education sector in recent years as a result of the recession and demographic pressures in the schools sector, the *National Development Plan 2018 – 2027* signals a commitment to significantly ramping up investment in the sector over the coming decade. The plan provides for investment of €5.1 billion in the higher/further education sector over the next 10 years (€3.1 billion exchequer investment and €2 billion non-exchequer investment) with an additional provision for public private partnerships.[3]

Focus of this examination

1.8 This report focuses on

- The capacity of HEIs to successfully plan, manage and deliver large-scale construction projects on schedule, within budget and to the required quality.
- The effectiveness and impact of the Construction Procurement Reform Initiative[4] (Reform Initiative) on a sample of selected projects.
- The adequacy of post project reviews conducted by HEIs on a sample of selected projects with a view to identifying learning outcomes and measuring projected benefits against actual benefits achieved.

1 *A Strategy for Funding Higher Education — report of the expert group on future funding for higher education*, March 2016.

2 The HEA has reported that international norms for per capita student space are between 10 and 11 square metres, and that Ireland's institutions average between 7 and 8 square metres — a difference of about 25 per cent. *Higher Education System Performance 2014 – 2016*, HEA, December 2016.

3 *Project Ireland 2040: National Development Plan 2018 – 2027*, Department of Public Expenditure and Reform, February 2018.

4 The Government introduced the Construction Procurement Reform Initiative in May 2004 to address time and cost overruns that had occurred on major public infrastructural projects.

Approach and methodology

1.9 This review examined a selection of completed capital projects with time and cost overruns in the higher education sector. The approach was as follows.

- Capital projects in the higher education sector with time overruns and cost variances were identified through the annual financial audit process.
- Ten capital projects with a combined build cost of €350 million were selected for an in-depth review.[1] Collectively, these projects had experienced cost overruns totalling €67 million and average time delays of 14 months. The contracting authorities were Athlone Institute of Technology, National University of Ireland Galway, St Patricks College (Drumcondra), Trinity College Dublin, University College Dublin and the University of Limerick.
- For the selected projects, sufficient time had passed since the completion of the project to allow for a comprehensive examination.
- Where key factors contributing to the negative events have been identified, recommendations have been made in order to mitigate these risks.
- The report assesses capital project outcomes against the Reform Initiative maximum cost increase and time overrun targets.

Funding

1.10 Exchequer funding comes primarily from the capital funding programme of the Department and from the Programme for Research in Third Level Institutions (PRTLI). Philanthropic donations and third party loan facilities are examples of non-exchequer funds.

1.11 Six of the ten projects received exchequer funding from the capital allocation of the Department. Of these six projects, five were funded through the HEA and one was funded directly by the Department. At the time, the Department had direct responsibility for capital funding to institutes of technology; however, this function has since transferred to the HEA.

1.12 The capital allocation for the Programme for Research in Third Level Institutions (PRTLI) transferred from the Department to the (now) Department of Business, Enterprise and Innovation in 2010. The two projects that received PRTLI funding (Projects D and G) were therefore funded from the capital allocation of the Department of Business, Enterprise and Innovation, with funding provided through the HEA.

1 The final costs of construction are based on self-reported returns in response to questionnaires issued by the examination team.

Report structure

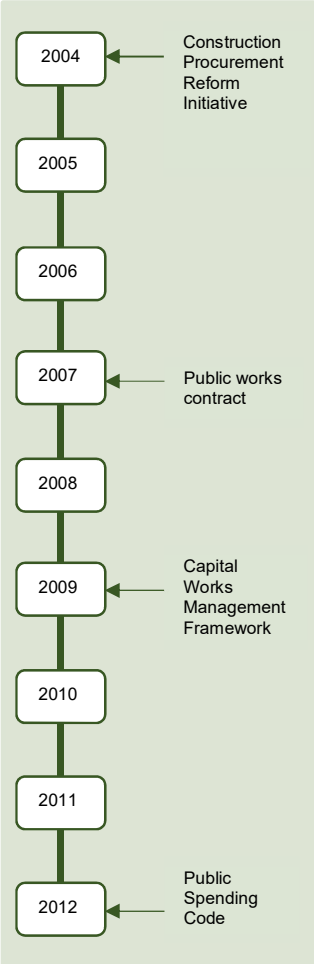
1.13 Chapter 2 of the report focuses on the key features of capital procurement in the public sector and provides some background to the Reform Initiative. The chapter also provides some analysis on the construction sector at a time when the capital projects under review were being planned and delivered.

1.14 Chapter 3 summarises findings, conclusions and recommendations at the following stages of the project lifecycle

- pre-contract
- contract execution
- post-contract, including post project review.

1.15 Chapter 4 provides key facts relating to individual projects.

2 Key features of public sector capital procurement



Construction Procurement Reform Initiative

2.1 Primary risks in undertaking large publicly funded capital projects include potential significant time and cost overruns. The Government sought to address these issues in May 2004 through the introduction of the Construction Procurement Reform Initiative (Reform Initiative). This sought to introduce fixed-price lump sum standard forms of contract and new conditions of engagement for construction-related consultants, and was supported by a suite of supporting guidance notes.[1]

2.2 The high-level objectives of the Reform Initiative were

- greater cost certainty at tender stage
- better value for money outcomes; and
- timelier and more effective delivery of projects.

2.3 The Reform Initiative set maximum cost increase targets of less than 2% of the contract sum and a time overrun target of less than 10%.

Capital Works Management Framework

2.4 The key output from the Reform Initiative was the Capital Works Management Framework (the Framework). The Framework is an integrated set of contractual provisions, guidance material and technical procedures. Work on the Framework commenced in October 2006 and it was published on the Department of Finance website in August 2009.

2.5 In addition to the Framework, the *Public Spending Code*[2] sets out procedures for project appraisal, planning, implementation and post project review. The Framework is closely aligned and compliments these procedures.

2.6 The Framework came at a time when the higher education sector was gearing up for significant capital investment following recommendations in the *Review and Prioritisation of Capital Projects in the Higher Education Sector* report (often referred to as the Kelly Review) published in 2004.[3]

Public Works Contracts

2.7 Prior to 2007, the 'government department and local authorities' contract was in place for building works. A key feature of the contract was that, for pricing purposes, some of the quantities for the works to be carried out by the contractor are estimated provisionally at the outset and then subject to more detailed measurement as work is being executed. A Department of Finance review concluded that these measurement contracts *'resulted in a relaxation in relation to early project planning which led to weaknesses at the design and development stage of project delivery. This militated against the effective control of project costs during the construction stage'*.[4]

1 *Value for Money and Policy Review of the Construction Procurement Reform Initiative*, Department of Finance, January 2011.

2 *The Public Spending Code — Expenditure Planning, Appraisal and Evaluation in the Irish Public Service: Standard Rules and Procedures*, Department of Public Expenditure and Reform, September 2012.

3 This report followed a request by the Minister for Education and Skills to the HEA to work with his Department to review all capital projects in the third level sector with a view to prioritisation and phasing.

4 As note 1.

2.8 The revised standard forms of construction contracts were a key component of the Framework by which the objectives of the Reform Initiative were to be achieved with the aim of transferring appropriate risks to those parties best able to manage them. The contracting authority seeks to transfer the optimal amount of risk to the contractor, resulting in greater price certainty while also ensuring that value for money is obtained.

2.9 Fixed-price lump sum contracts were identified as the optimum means of delivering cost certainty. The contracts were introduced in 2007[1] for use by all government departments, bodies under their aegis, local authorities and non-commercial semi-state entities. Commercial semi-state bodies, such as the ESB, must use the contracts where more than 50% of the funding for the project is provided from public funds. Public bodies must secure a derogation from the Government Contracts Committee for Construction if they wish to deviate from the standard form of contract.

Procurement

2.10 A key decision during the planning of any capital project is the method of delivery. Public sector bodies are obliged to comply with complex national and EU procurement guidelines and directives. Public bodies must ensure that they have robust procedures and practices in place to minimise any risk of non-compliance, which would potentially allow unsuccessful bidders to challenge the award of the contract.

2.11 A common procurement strategy for large scale capital projects in the public sector is the 'traditional method'. Building works are designed by the contracting authority (usually engaging an external design team) and a construction firm is then engaged to build the facility. Advantages of this method are that

- control of the design is retained by the contracting authority, and
- the contracting authority can amend designs prior to employing the main contractor.

2.12 A key feature of the 'traditional method' is design risk. Inadequate or ambiguous design elements can lead to disputes with the construction firm, with subsequent claims for additional work in order to rectify any design weaknesses. It is a significant challenge for the contracting authority to achieve cost certainty with this approach (irrespective of whether a fixed price contract has been entered into) when the design and build elements are separated.

2.13 One alternative approach is to engage a single entity to design and build the project based on detailed requirements specified by the contracting authority. The advantages of this approach are

- the contracting authority has only one point of contact
- the construction firm will often have expertise in design solutions and benefits from having the flexibility to amend design elements during the construction phase
- it reduces the potential for conflict between the contracting authority and the construction firm.

2.14 The Department has stated that in its experience, design and build offers greater cost certainty once client changes are kept to a minimum. This is possible on school buildings due to the standardised nature of school design. However, it is considerably more challenging in the case of large one-off higher education buildings.

1 Effective date is 19 February, 2007 — Circular 33/06, Department of Finance, October 2006.

2.15 A key disadvantage of a design and build strategy is that the contracting authority loses control over material and product selection and this can have a detrimental impact on the building's performance. This can arise when the contractor seeks to control costs by using the least costly items or finishes.

2.16 Both the Department and the Office of Government Procurement (OGP) have stated that a design and build contract may attract a smaller number of tenders than the traditional approach, due to the higher costs of preparing a bid and the greater transfer of risk to the contractor.

2.17 Another procurement option is a public private partnership (PPP). This is a contractual arrangement between public and private partners for the delivery of public infrastructure and/or public services. Commitments under PPPs give rise to financing obligations usually extending over 25 to 30 years.

Dispute resolution process

2.18 Disputes often arise between the contractor and the contracting authority. The two levels of formal intervention to aid the resolution of disputes between a HEI and the main building contractor are conciliation and arbitration.

Conciliation

2.19 Under a conciliation process, the two parties jointly appoint an independent conciliator who acts as a facilitator to resolve the dispute. The primary purpose is to assist the parties to achieve an agreed settlement, but if there is no resolution to the dispute during the agreed resolution timeframe, the conciliator will issue a written recommendation that must be based 'on the parties' rights and obligations under the contract'. The recommendation, if not rejected, becomes final and binding. The conciliation process is confidential.

Arbitration

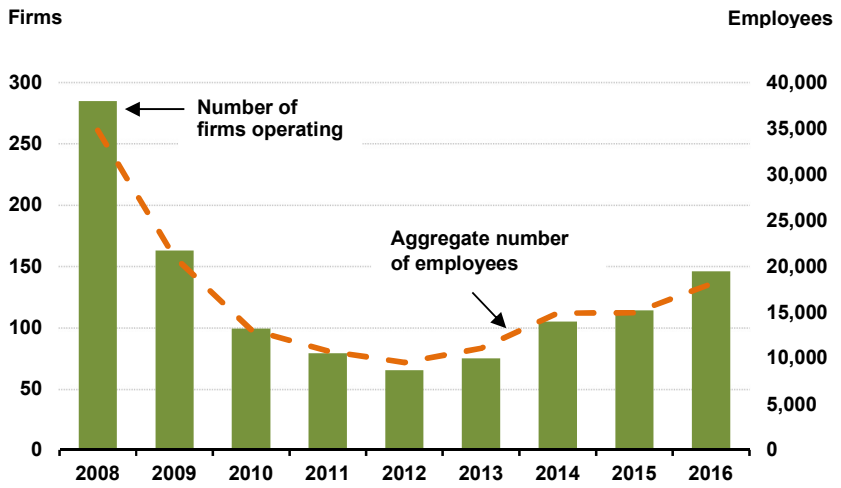
2.20 Disputes not resolved by conciliation are referred to arbitration under the Framework. Under the latest version of arbitration rules issued by OGP, the arbitrator must send a copy of each award to OGP. The parties and the Minister for Public Expenditure and Reform are free to make the award public.[1]

1 *Arbitration Rules, Section 6.3,* Office of Government Procurement, September 2014.

Construction sector trends 2008 – 2016

2.21 The ten projects selected for review were delivered during the period 2008 to 2015. This was a period when the construction sector experienced significant contraction. Figure 2.1 illustrates the trends in the number of large and medium construction firms operating in the sector and the related employment levels during the period 2008 to 2016.[1]

Figure 2.1 Medium and large construction firms, 2008 to 2016



Source: Central Statistics Office

2.22 The following points are noted

- The number of medium sized construction firms dropped from 259 in 2008 to 56 in 2012 — a drop of 78%.
- The number of large construction firms dropped from 26 in 2008 to 9 in 2012 — a drop of 65%.

2.23 The trends in the construction sector impact on the procurement process. In a 2014 review of the 2007 public works contract, OGP reported that *'in a very competitive tendering environment, the commercial strategy of pricing low and claiming additional amounts becomes more commonplace and any attempt to reject a tender on the basis that it is an abnormally low tender (ALT) may be strongly resisted, possibly to the extent that a tenderer rejected for submitting an ALT may challenge the subsequent award of the contract and delay the project'*.[2]

2.24 Seven of the ten projects examined in this report were procured under the 2007 public works contract. The lack of case law surrounding the 2007 contract at the time may have contributed to contractual clauses being challenged by both parties.

1 For the purposes of this examination, a medium-sized enterprise has between 50 and 249 employees and a large enterprise has 250 and above employees.

2 *Report on the Review of the Performance of the Public Works Contract*, Government Contracts Committee for Construction, December 2014.

3 Review of project outturns

3.1 Public works contracts should set out clearly defined circumstances where the contract sum or the date for completion may be adjusted e.g. change orders issued by the contracting authority or claims by the contractor for additional work carried out.

3.2 When the public works contract was first introduced in 2007, a ten-year implementation period was envisaged. As a consequence, the project management teams of the projects procured under the new contract may not have had the benefit of the full suite of relevant guidance, supporting documents and training that was developed under the Capital Works Management Framework.

3.3 Figure 3.1 provides a summary of the outturns in relation to the capital projects selected for review, including cost and time outturns. Final construction costs have been reported directly by the individual HEIs. Costs are inclusive of VAT, apart from Project B, where VAT is reclaimable as it is a commercial project.

Figure 3.1 Projects selected for review

	Project	Higher Education Institution	Date of substantial completion	Final construction cost €m	Cost overrun €m[a]	Time overrun months[a]
A	Engineering building[b]	**Athlone IT**	Sep 2010	**30.3**	4.6	**14**
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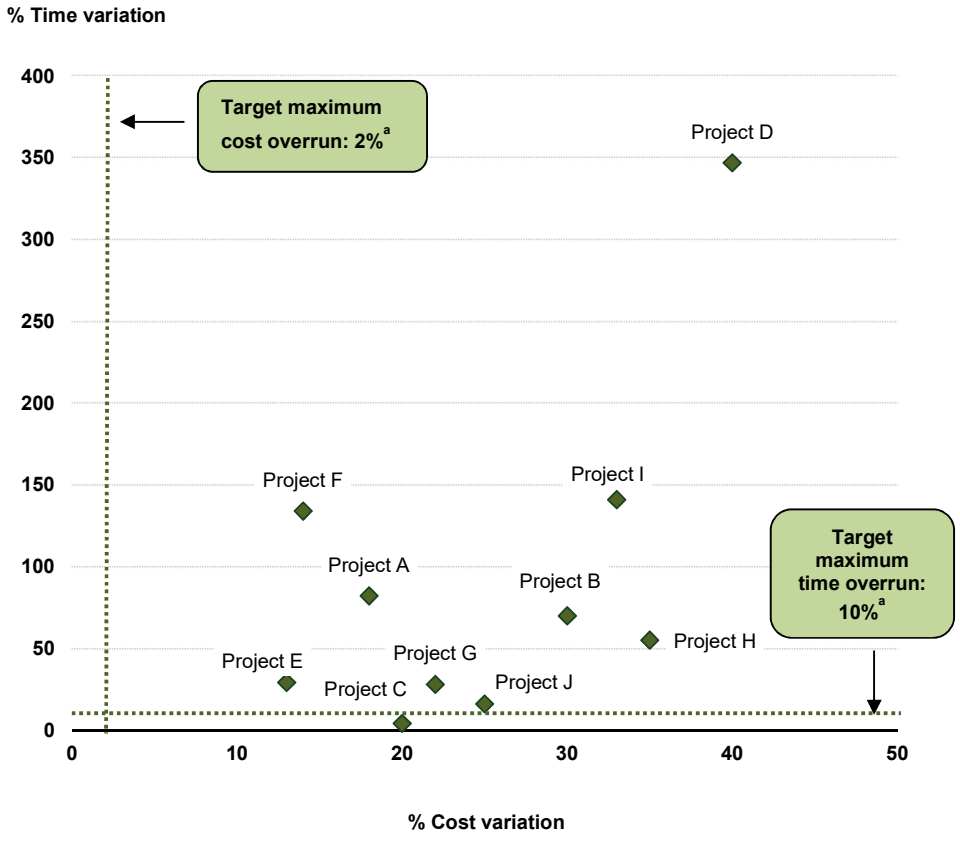
Source: Higher Education Institutions. Analysis by the Office of the Comptroller and Auditor General.

Notes:
a Difference between the actual cost/date of substantial completion and contract sum/construction schedule as disclosed in the contract documents.
b These projects were procured under the Government Departments and Local Authorities (GDLA) contract — a pre-2007 contract.
c Cost overrun is net of recoupment of performance bond.
d St Patrick's College was incorporated into Dublin City University in October 2016.

3.4 Figure 3.2 illustrates the individual project cost and schedule outcomes when measured against the contract sum and construction schedule.

Figure 3.2 Project outcomes



Source: Analysis by the Office of the Comptroller and Auditor General.

Notes: a Target applied to projects constructed under the 2007 public works contract.

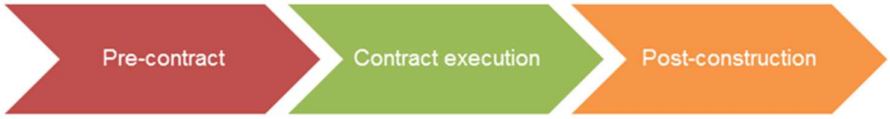
Project lifecycle

3.5 The ten projects have been examined across three phases

- pre-contract phase
- contract execution phase (i.e. construction) and
- post-construction phase, including post-project review.

3.6 Figure 3.3 illustrates the key inputs, processes and outputs required at each stage of the project lifecycle.

Figure 3.3 Capital project lifecycle



Key inputs include	Key processes/outputs include	Key processes/outputs include
▪ clear business case ▪ stakeholder buy-in ▪ comprehensive cost-benefit analysis ▪ clearly defined project scope ▪ adequate funding ▪ detailed design and planning documentation ▪ effective tender process	▪ expert project management ▪ good communication between contracting authority and contractor ▪ strong control of project schedule and costs ▪ restrictive change order process that minimises any deviations from the original project scope ▪ effective conflict management	▪ robust post-project review that measures projected benefits against actual benefits achieved and identifies learning outcomes[a]

Source: Adapted from *Review of major capital projects in Scotland, Appendix 3, Model of good project management practice,* Audit Scotland, June 2008

Notes: a This is a requirement for large capital projects under the *Public Spending Code*, Department of Public Expenditure and Reform, September 2012.

Pre-contract phase

3.7 The pre-contract phase is a key stage in the project lifecycle. Any weaknesses or failures at this stage can have a significant negative impact on the delivery of the project brief.

3.8 In the pre-contract phase, the business case for the project, including the case for prioritising the project over other competing demands for resources, should be well documented. A feasibility assessment that includes a review of alternative procurement options is required.

3.9 Works requirements set out the contracting authority's requirements in relation to the proposed works — they define the scope of the works in the form of developed designs, plans and specifications. Comprehensive and complete requirements should be in place prior to tendering for the main building contract. This area is further examined in the section on the contract execution phase.

3.10 Tender evaluation is a key process. Public bodies are obliged to base the award of public contracts on the 'most economically advantageous tender' (referred to as the MEAT principle). The criteria for awarding the contract and the weightings assigned to these criteria needs to be set out in tender documentation.

Findings

3.11 Figure 3.4 illustrates the findings in relation to the ten projects at the pre-contract stage.

Figure 3.4 Pre-contract phase

Across the ten projects, tender evaluation was the most common area of weakness….

Source: Office of the Comptroller and Auditor General

Tender evaluation

3.12 The restricted procedure is a two-stage procurement procedure — a pre-qualification stage open to all interested parties who wish to submit an expression of interest (e.g. a suitability assessment questionnaire and supporting documentation), and an award stage where shortlisted candidates are invited to submit tenders and are assessed against award criteria set out in the request for tender.

3.13 Although HEIs assessed qualitative criteria at the pre-qualification stage in accordance with EU and national procurement procedures, it was noted that six projects had cost alone as the award criteria at the award stage. Under the 2004 European Union Procurement Directive, 2004/18/EC, Article 53 permitted contracts to be awarded either on the basis of MEAT or lowest price only. These projects had combined cost overruns of €20.3 million (19%).

3.14 Under current European Union procurement directives, effective from April 2016, Member States now have the option to allow contracting authorities *not to* use price only or cost only as the sole award criterion, in order to encourage a greater quality orientation of public procurement.[1]

3.15 The following examples provide some insight into the difficulties of assessing tenders on cost.

- In one project, a construction contract was terminated six months after having been awarded, following the financial failure of the contractor. A review of the tender report indicates that the winning bid was assessed as being 'substantially below costs'. This had a significant impact on project progress because it took two years to procure a replacement contractor. After settlement of a performance bond claim, the final cost of this project was a net €4 million (14%) above the initial contracted cost (Project F).[2]
- Even when qualitative factors are assigned a weighting, cost will often remain the deciding factor due to its weighting. In one example, the successful bidder scored sixth on quality and was awarded the contract as their lowest cost bid resulted in the highest combined cost and quality score. It was noted from a review of the tender report that the four lowest tenders were at 'exceptionally low levels which incorporate anticipation of further reductions in construction costs and sub-contractor prices over the duration of the project'. This project had a final cost of €32.3 million — this was €5.4 million (20%) above the initial contracted cost (Project C).

1 Article 67(2) of Directive 2014/24/EU.

2 A performance bond is effectively a contract of guarantee whereby the guarantor or surety undertakes to pay damages to the employer, arising from a breach of contract or insolvency, for losses sustained by the employer due to non-performance by the contractor — *Public Works Contracts*, *Guidance Note 1.5.1, Managing the pre-contract phase,* Office of Government Procurement, July 2018.

3.16 Although risks were identified in relation to the financial position of some construction firms, this could not impact on the award of the contract to the MEAT bid. The following example illustrates this point.

- The tender report drafted by external consultants on the lowest tender rated the impact of two financial risks, if they occur, as 'very high', namely; 'financial failure/bankruptcy of the contractor' and 'decline in contractor's working capital'. The tender report disclosed that the likelihood of these risks occurring was not assessed as 'the information required to undertake such an assessment is not available'. The HEI has reported that it undertook its own review of these financial risks and decided on a strategy of risk mitigation, including entering into a performance bond. The HEI also reported that a decision not to appoint the contractor carried its own risks e.g. the contractor may challenge any decision to award the contract to another contractor. This contract was terminated by the HEI nine months after it was awarded following the financial failure of the contractor. This project had a net cost overrun of €15.7 million (40%) after settlement of a performance bond claim (Project D).

Risk transfer

3.17 A key objective of the Reform Initiative was greater cost certainty for contracting authorities. This was to be achieved by assigning the optimum amount of project risks to the main contractor. Seven of the projects were procured under the Reform Initiative — none of these were delivered within the maximum cost increase target of less than 2%.

3.18 It was noted that when HEIs sought to transfer risks to contractors, the risks were in fact retained in a number of cases. For example, it was noted on a completion contract (i.e. when a replacement contractor is engaged to complete the project following the financial failure of the original contractor) that the additional work required to remediate the work of the original contractor led to project delays (Project I).

Other

3.19 In one case, the funding model for the project included €3 million from 'grants, further contributions and borrowings'. However, the HEI could not secure approval from the HEA for a €3 million third-party loan facility and had to reduce the scope of the building works post-contract. This contributed to contractual disputes between the HEI and the main contractor. Following a conciliation process, an award of €2.2 million was made — €950,000 payable to the contractor for losses and €1,250,000 for agreed additional works (Project B). The HEA has stated that the funding model should not have included borrowings as there was no framework in place. Consequently, there was no scope for the HEI to secure sanction from the HEA to borrow the required funds.

3.20 Of the seven projects that were procured under the new form of contract (i.e. the new public works contracts introduced in 2007), design teams were appointed in two cases on a fee percentage basis. This potentially provides consultants with an incentive not to control costs rigorously. In one of those cases, the HEI subsequently converted the fee to a lump sum.

Subsequent developments

3.21 OGP notes that risk management is a vital aspect of successful project management. It firstly requires risk to be identified; tender documentation to define the risk; evaluation of the tender to determine how the identified risk is to be managed; and finally, robust contract administration and dispute resolution to ensure both parties comply with their obligations under the contract.

3.22 The lack of risk identification and management was highlighted in the 2014 *Report on the Review of the Public Works Contracts*. It notes that under previous forms of public works contract, risk was not properly identified and it was consequently paid for as and when it arose. It further notes that under the 2007 public works contract, risk was still not being identified, evaluated or properly managed. The contract makes provision for risk transfer but OGP considers that, even in a design and build contract, risk cannot be transferred if the contractor has no capacity to manage it, and that it is not possible for a contractor to price a risk that has not even been identified. In a design and build contract, while the client may not suffer an immediate financial penalty should a risk materialise, there may be long-term service quality issues if corners are cut by the contractor so as to keep the project on budget when risks materialise.

3.23 Two of the recommendations made in the 2014 report are designed to address the lack of proper detailed interrogation, recording and descriptions of design risks i.e.

- employer retains the risk of the bill of quantities[1] in employer-designed contracts
- direct tendering of specialist works.

OGP report that these recommendations were implemented in the public works contracts in 2016. These requirements are mandatory on all contracts with a value in excess of €1 million.

3.24 Making the **bill of quantities an 'employer risk item'** (on contracts where the employer undertakes the design) is intended to reinstate the natural review process that a competent quantity surveyor undertakes on the design information. Design information gaps often highlight gaps in general risk analysis — for example the lack of a detailed foundation design often points to a lack of ground investigation data upon which to base that design.

3.25 **Direct tendering of specialist works** reduces the quantum of the project for which the contractor bears the price risk. OGP's view is that specialist areas are often poorly defined in tender documentation, opening the door for claims in the construction stage. By directly tendering to the specialist market, the price will more accurately reflect the work required.

1 A bill of quantities is a document that provides project specific descriptions and measured quantities for the work to be undertaken to complete a contract — *Public Works Contracts*, *Guidance Note 1.5.3, The Pricing Document,* Office of Government Procurement, June 2016.

Conclusions and recommendations — pre-contract phase

3.26 For the projects examined, the 2007 contract did not succeed in its objective of optimally transferring risks. Nine projects availed of the 'traditional' method of procurement and retained control over the design of the project. A consequence of this approach is that HEIs are also retaining the design risk i.e. the risk of conflict with the contractor due to incomplete or ambiguous works requirements and designs. In practical terms, it is difficult to draft a contract where all significant risks can be transferred to the main building contractor. OGP has sought to address this area with a revised public works contract in 2016.

3.27 Key risks are not being identified at the outset. The tender process did not adequately address the risk of unrealistically low pricing, in particular the risk of increased claims by the contractors. In addition, the assessment of the financial position of firms was not sufficiently rigorous. Three projects had to be retendered due to the financial failure of the main contractor.

Recommendation 3.1

It is recommended that OGP encourages public bodies to assign an appropriate weighting to qualitative criteria at the award stage — cost alone should not be the deciding factor. An expert panel, with at least one external member, should carry out this assessment. Tender prices should not be disclosed to the panel in order to mitigate any risk of bias.

OGP response

Agreed. Significant work is required to develop a robust set of technical merit criteria that can be deployed across the range of works projects procured by the State. A focus will be on technical merit criteria that address specific, long-term performance characteristics of the completed project. A significant awareness and training campaign will then be necessary, failing which there is a risk of an increase in challenges to the award of contracts.

On most medium to high-value contracts — i.e. greater than €10 million — a restricted procedure is used to generate a shortlist of appropriately qualified contractors who are invited to tender. The pre-qualification stage is evaluated on a qualitative basis with the highest ranked contractors invited to tender. A MEAT award is always used on these contracts but it is acknowledged that it is a price-based MEAT unless the contracting authority includes technical merit criteria. The technical merit criteria must be based on the performance of the contract and criteria such as methodology and approach to the delivery of the project are often deployed. Given the field of contractors that are usually shortlisted for this category of project, the scores in the technical merit criteria will, more often than not, result in very close scoring meaning that price is the determinant.

One of the interim recommendations arising out of the review of the public works contract by OGP was that quality-based MEAT awards be used on all projects in excess of €2 million. In the initial stages of engagement on this, it was discovered that significant time needed to be devoted to developing practical criteria that could be objectively evaluated. This will be further explored in the development of the medium term strategy. A focus will be on technical merit criteria that address specific, long-term performance characteristics of the completed project.

Recommendation 3.2

It is recommended that OGP provide additional guidance to public bodies to ensure that a robust review of the financial stability of shortlisted firms is carried out. The risk of financial failure should be quantified and assigned an appropriate weighting. In addition to turnover requirements, contracting authorities, for example, could request information on a firm's ratio of assets and liabilities. This could provide additional evidence that the financial capacity of economic operators is sufficient.[1]

OGP response

Agreed. A draft guidance note on *Financial Appraisal of Works Contractors* has been developed but has not been issued (it is currently being reviewed). A key objective of the guidance is to move away from reliance on turnover and performance guarantees (bonds) as a means to determine financial capacity. It recommends instead a simple 'net asset test', which is based on the monthly working capital of the project. A single aspect review is insufficient however. Contracting authorities need to widen their evaluation of financial criteria considerably, but the financial expertise is not available to do so. There is a tiered approach in the guidance depending on the value of the project.

Financial evaluation is based on the last full-year financial accounts and not 'real time'. However, historical financial data has limitations in predicting future capacity. In a sector as dynamic as construction, where margins are tight, it is difficult to establish the financial capacity of a building contractor on data that is at least a year out of date. A recent high-profile insolvency came just six months after a profit warning was issued with no examinership stage prior to that insolvency. The challenge faced in managing the impact of insolvency is considerable but given the lack of reliable real time data, it is really a case of risk management rather than fully eliminating the possibility.

The National Development Finance Agency (NDFA) *Guidelines to State Authorities* (2007) sets out that public bodies may seek NDFA financial advice for projects of a capital cost less than €20 million. In such cases, the NDFA may decline to provide advice, having regard to the most effective and efficient use of resources.

1 Article 58(3) of Directive 2014/24/EU.

Contract execution phase

3.28 This phase of the project involves the construction of the facility. Robust project management and control are required in order to measure project progress, take corrective action in a timely manner (if required) and limit any deviations from the project scope.

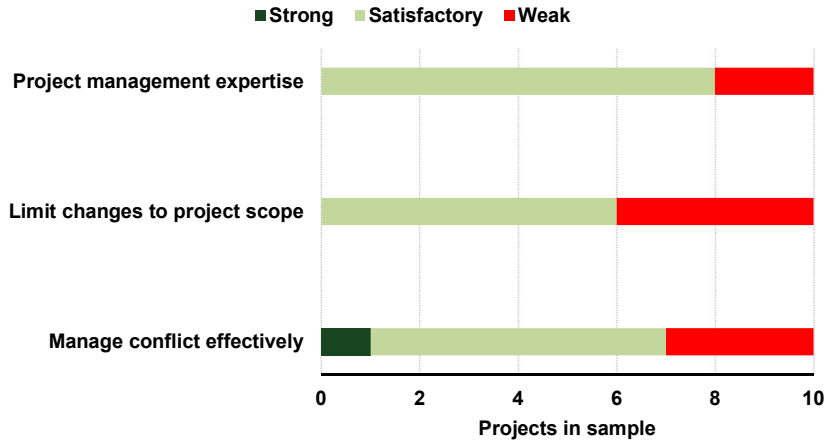
3.29 In the interests of ensuring that tender cost certainty is maintained up to outturn cost stage, it is important that the project scope in the works requirements is not changed after the contract has been awarded.[1]

Findings

3.30 Figure 3.5 illustrates the findings in relation to the ten projects examined.

Figure 3.5 Contract execution phase

Weaknesses in limiting changes to project scope were directly linked to weaknesses in the specification of works requirements at the pre-contract phase....



Source: Office of the Comptroller and Auditor General

Specification of works requirements

3.31 Issues may arise in relation to the works requirements and related documentation. This in turn may contribute to disputes between the contracting authority and the main contractor. In one instance where disputes arose, works requirements had been defined simply as 'construction of an indoor multi-sport facility' — drawings and specifications were not incorporated into the contract (Project B). On a separate project, a conciliator noted that there was a disagreement between the HEI and the main building contractor 'over the content of the works requirements and hence the extent of the works' (Project I).

1 *Public Works Contracts*, *Guidance Note 1.5,* Office of Government Procurement, June 2016.

Change orders

3.32 There were a significant number of change orders (variations) on several projects. Change orders are a departure from the original project scope and works requirements and should only be issued for essential requirements that were unforeseeable prior to tender.[1] In one instance, a change order — the building of an additional unit — was initiated by the HEI. This had an additional project cost of €8 million (Project G).

3.33 Incomplete designs can lead to change orders variations. In one instance, some design documents were not provided at tender stage and the HEI had to issue change orders to the main contractor with a cost of over €1 million. It was also noted that the 2007 form of construction contract was not used on this project, even though the contract was awarded 16 months after its introduction (Project J).

Dispute resolution

3.34 Nine out of the ten projects examined ended up in a dispute resolution process. In one instance, there was a significant delay in the commencement and conclusion of the conciliation process i.e. four years after substantial completion date. This project was executed under the earlier GDLA contract — the 2007 public works contract has a strict time provision for raising any disputed issues. The project had a variance of €2.1 million (13%) over the initial contracted cost (Project E).

3.35 There is a lack of central government guidance available in relation to managing the conciliation or other dispute resolution process. In some instances, the HEIs used 2008 Department of Environment, Heritage and Local Government guidelines when managing the conciliation process with the main contractor.[2]

3.36 The conciliation process and settlement agreements are confidential in nature and the detail and commentary in conciliators' reports varies widely.

3.37 Dispute resolution processes can be expensive with significant legal and professional fees being incurred. In one instance, the HEI received €2.1 million in settlement of a dispute with the contractors ahead of a court date; however, the HEI had incurred €3.3 million in legal fees during the course of several disputes on this project (Project A).

Subsequent developments

3.38 OGP reports that design reviews should be undertaken regularly at all stages up to just before the tender is issued. Different aspects of the design are tested as it develops but all key design decisions should be signed off by the contracting authority prior to the planning application stage. Project review stage 3, as outlined under the Framework, calls for an assessment of the project design at the point before the project is submitted for planning approval.

3.39 OGP reports that many contracting authorities do undertake a third-party review but this is usually on the higher value projects. The re-introduction of the bill of quantities as an 'employer risk' imposes a rigorous review by the cost adviser on the project in preparing the bill of quantities. In preparing the detailed list of items set out in a bill of quantities, the quantity surveyor is best positioned in the design team to identify gaps in the information supplied in the works requirements; such gaps often give rise to claims.

1 *Public Works Contracts, Guidance Note 1.5*, Office of Government Procurement, June 2016.

2 *Dispute Resolution Procedures and Risk Assessment in Public Sector Construction Contracts — a Guidance Document*, Department of Environment, Heritage and Local Government, November 2008.

3.40 OGP states that change orders should be subject to a rigorous approval process, as required by the *Public Spending Code* (and the *Capital Appraisal Guidelines*) and by the amendments to the public works contracts implemented in 2016. The Framework goes to some lengths to spell out

- the role of the sanctioning and contracting authority in change control
- that scope changes should not occur during the construction stage
- that projects should be comprehensively defined at tender stage and outline the expense and delay that is incurred during the project's delivery should it arise.

Nonetheless, the Framework recognises that changes in projects are often necessary, and the contract makes provision for this eventuality.

3.41 OGP has identified dispute resolution as a significant issue in its *Report on the Review of the Public Works Contracts*. The extremely competitive tendering environment from 2009 – 2014 served to heighten the risk of disputes and the contract has extensive alternative dispute resolution mechanisms built in. Conciliation is the first process that must be undertaken by the parties. This process initially seeks to facilitate a resolution between the parties and failing that the conciliator makes a recommendation as to how to resolve the issue. It is not binding unless the parties agree to be bound by it.

3.42 The 2014 *Report on the Review of the Public Works Contracts* concluded that in some cases the contract is not being operated correctly and decisions are taken that lead to alternative dispute resolution mechanisms being triggered far too early. Amendments to the contracts were introduced in 2016 to encourage contracting authorities (rather than their design teams) to actively engage with contractors on projects in excess of €5 million. On projects in excess of €10 million, a standing conciliator is now to be appointed from the outset of the project. Their role is primarily to head off disputes before they arise. Guidance note GN 3.1.1 has been prepared to assist contracting authorities in this regard.

3.43 In relation to the broader issue of project management, OGP reports that there is a long-standing requirement to ensure capital projects are adequately structured and resourced e.g. *Capital Appraisal Guidelines*, *Public Spending Code*, Framework — they all set out the importance of ensuring that the proper expertise is retained to oversee large projects.

3.44 OGP believes that sanctioning authorities with responsibility for large capital budgets should have in-house expertise equivalent to that available to the National Development Finance Agency and Transport Infrastructure Ireland necessary to meet their obligations under the *Public Spending Code*. It considers that a review of the capacity of the State's delivery apparatus is urgently required in advance of the increases predicted to capital expenditure in the coming years.

3.45 The Department of Public Expenditure and Reform (DPER) has stated that this capacity issue is already under consideration by the Project Ireland 2040 Delivery Board. Substantial expertise in major project delivery has been developed in many areas of infrastructure provision. In order to ensure maximum value for money in future investment, the Delivery Board will consider the capacity of certain bodies to appraise, plan and deliver the public capital programme. This issue will also be relevant to the work of the Construction Sector Group.

Conclusions and recommendations — contract execution phase

3.46 Incomplete or ambiguous works requirements are a significant risk factor. In the projects examined, this led to contractual disputes, delays on project progress and increased costs. The re-introduction of the bill of quantities as an employer/contracting authority risk is intended to result in a more rigorous review of designs.

3.47 Material change orders initiated by the contracting authority point to a weakness in project planning and design and lead to time delays and increased costs. These increased costs, in some instances, also include additional compensation for delay costs and loss of profit. Therefore, it is important that change orders are subject to a rigorous approval process, supported by a clear business case.

3.48 Issues in relation to incomplete and ambiguous contract documents/works requirements and the change order approval process have been addressed by OGP in the form of additional guidance notes and amendments to the public works contracts since its introduction in 2007. However, reviews of these projects suggests that there may be a lack of capacity within the higher education sector to manage large scale capital projects.

Recommendation 3.3

It is recommended that the HEA/Department of Education and Skills establish a 'centre of excellence' to advise and assist HEIs in the delivery of large capital projects.

HEA response

Agreed. The HEA is working with the Department to build capacity to advise and assist HEIs in the delivery of capital projects on foot of the planned increased capital investment in the higher education sector.

Department response

Agreed. The Department is aware of the need to progressively enhance capacity both in the HEA and within its own Planning and Building Division to plan for, support and manage the forthcoming increase in capital investment in the higher education sector. This should include staff with the necessary technical skills and expertise to advise and assist HEIs in the delivery of large scale projects. This work will, as appropriate, be informed by the work of the Department of Public Expenditure and Reform (DPER) and the Project Ireland 2040 Delivery Board in assessing capacity across the system, ensuring value for money and that existing resources are deployed in the most effective and efficient way.

3.49 There may also be a lack of capacity within the higher education sector in dealing with disputes once they enter a formal conciliation/arbitration process.

Recommendation 3.4

As part of its development of a medium term strategy for the procurement of public works projects, it is recommended that DPER undertake a review of the expertise that is available within the public sector in relation to dispute resolution management. If it is established that there is a lack of expertise or that public bodies do not have access to the expertise available, it is further recommended that DPER consider the merits of establishing an expert body for the public sector as a whole.

DPER response

Agreed. OGP is currently developing a new medium term strategy for the procurement of public works projects, which will encompass a comprehensive review of the way that the public sector engages the construction sector through public procurement. It will address many of the issues currently affecting the successful delivery of public works projects and will include topics such as risk management; awarding contracts using the MEAT; adoption of building information modelling[1] on public works projects; liability, indemnity and insurance requirements; performance evaluation; and encouraging collaborative working. Once this new medium term strategy has been finalised, and subject to it identifying a lack of expertise, further consideration could be given to the merits of establishing an expert body with respect to dispute resolution management.

1 Building information modelling provides a means of structuring the information required to design, build and manage building and infrastructure assets. In so doing it offers opportunities to deliver efficiencies and savings in the construction and operation of built assets that are owned or managed by the State on behalf of its citizens.

Post construction phase

3.50 The post-construction phase involves the management of project completion and post-project review. An effective post-project review should assist in measuring actual outcomes against projected outcomes set out in the business case, and should identify any gaps. An effective post-project review should also identify any learning outcomes that can be used on future projects.

Findings

Post project review

3.51 In most instances, effective post-project reviews took place and HEIs identified learning outcomes that could be used on future projects. Figure 3.6 provides a summary of the key learning outcomes, as reported by the HEIs.

Conclusions and recommendations — post construction phase

3.52 Key learning outcomes are incorporated into guidance material for future capital projects. However, there is little evidence to suggest that these learning outcomes are being shared across the higher education sector.

Recommendation 3.5

It is recommended that a mechanism be put in place that allows for the sharing of learning outcomes across the higher education sector.

HEA response

Partially agreed. The HEA partially agrees with this recommendation. Responsibility for post-project reviews is the responsibility of the HEIs and not the HEA. However, since the HEA collates copies of these reviews and carries out capital spot checks, it would be worthwhile to establish a mechanism that would allow for the sharing of learning outcomes arising from post-project reviews across the higher education sector.

Figure 3.6 Overview of key learning points reported by HEIs

Area	Learning points/recommendations
Works requirements	• Consider a peer review of designs. • Identify if there is a need for specialist design expertise. • Ensure design is complete prior to tender process. • Where known risks are identified, mitigation strategies should be established.
Procurement	• Below cost tenders lead to difficulties on the project — consider financial scoring mechanism which takes account of range of tenders rather than lowest and scoring relative to lowest. • Consider alternative procurement/delivery mechanisms e.g. design and build form of contract to reduce 'completeness of design' claim opportunity. • Cannot assign all risks to the contractor — particularly on a 'completion' project.[a] • A challenging economic climate requires careful consideration of contractors and therefore selection criteria and financial standing checking are vital.
Funding	• Adequate funding needs to be in place prior to tender process.
Stakeholders	• Restrict end users input to point of design freeze, with controlled project success-dependant inputs thereafter. • Give authority for the 'buildings office' to 'shortcut' extensive internal discussions should the programme overall be in jeopardy.
Project management	• Assignment of an experienced project manager is important to the success of the project. • Good communication between client and design team is required. • Manage project programme by challenging contractors' assertions of their programme compliance from the outset of the project. • Ensure there is rigorous scope and change order management processes throughout all stages of the project.
Conflict management	• Procurement of expert legal advice is important when entering a dispute resolution process — greater interrogation of legal counsel is necessary. • Legal fees accrued on conflict resolution processes can be high. If critical technical issues arise, a risk assessment of the likely legal cost versus the real cost on the ground of resolving the problem should be considered.

Source: Higher Education Institutions. Analysis by the Office of the Comptroller and Auditor General.

Notes: a Three projects reviewed required a replacement contractor following the financial failure of the original contractor.

4 Project summaries

Project A — Athlone Institute of Technology (AIT) Engineering Building

Key facts

13,000m^2 building

1 year 2-month delay

Cost €30.3m (18% overrun)

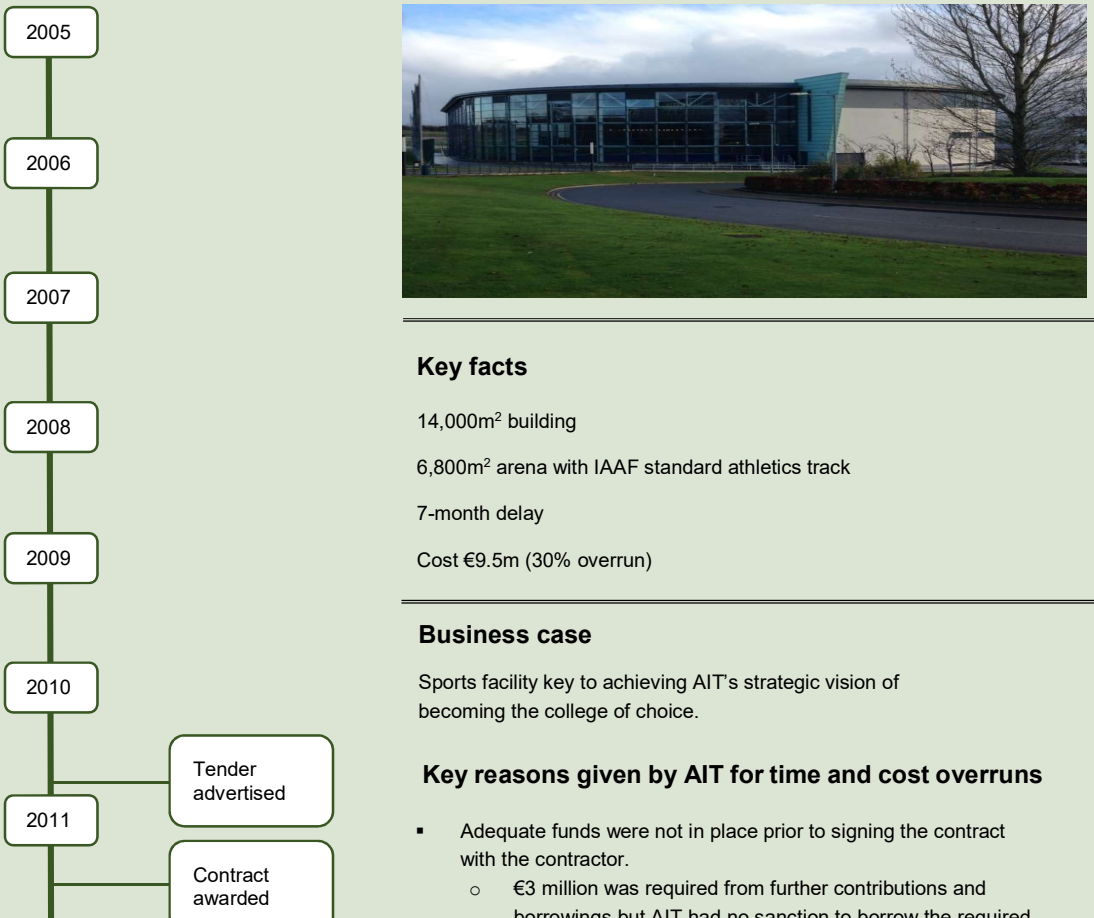
Business case

New engineering school to be consolidated into one purpose-built and dedicated building.

Key reasons given by AIT for time and cost overruns

- A dispute with the main contractor regarding a faulty roof and issues with the quality of the mortar used.
- The main contractor's position was that these issues were caused by faulty design.
- A mediation process commenced and it became apparent that structural design was an issue.
- The structural engineering consultants went into liquidation and this left AIT exposed to liability.
- AIT agreed a €4.4 million settlement with the main building contractor.
- The architect and the roof supplier agreed a €2.1 million settlement with AIT.
- AIT incurred €3.3 million in legal and other professional fees in the resolution of these disputes.

Project B — Athlone Institute of Technology (AIT) Sports Building



Key facts

14,000m^2 building

6,800m^2 arena with IAAF standard athletics track

7-month delay

Cost €9.5m (30% overrun)

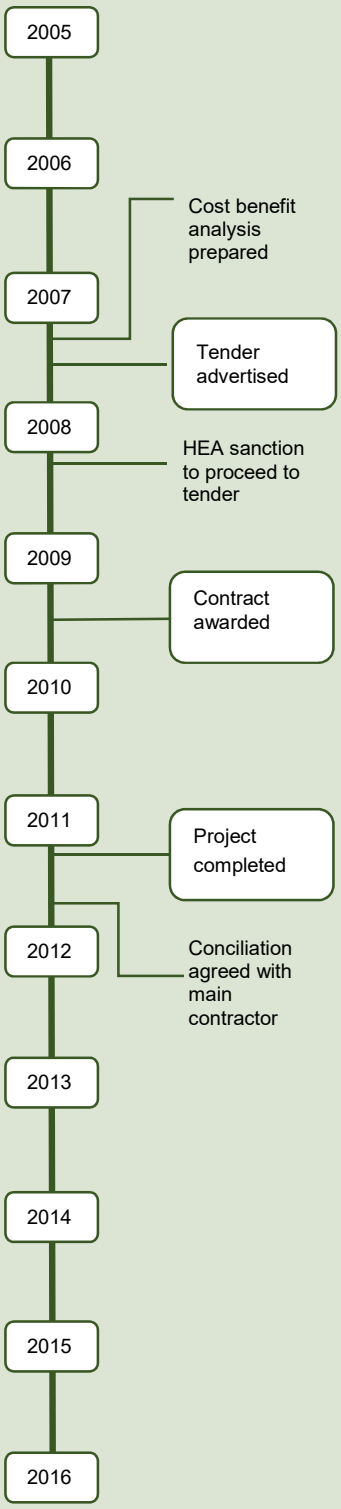
Business case

Sports facility key to achieving AIT's strategic vision of becoming the college of choice.

Key reasons given by AIT for time and cost overruns

- Adequate funds were not in place prior to signing the contract with the contractor.
  - €3 million was required from further contributions and borrowings but AIT had no sanction to borrow the required funds.
  - AIT had to change the plan and reduce the scope of the building works post-contract.
- A preferred 200m running track supplier was identified by AIT.
  - AIT planned to engage the specialist directly and install the track once the building had reached substantial completion.
  - Due to contractual disputes with the main contractor and in order to have the track installed in time for the first planned Irish National Athletics Finals in February 2013, AIT issued a change order for the installation of the track.
- Following a conciliation process, an award of €2.2 million was made — €950,000 payable to the contractor and €1.25 million for additional works.

Project C — National University of Ireland, Galway (NUIG) Engineering Building



Key facts

14,250m^2 building

1-month delay

Cost €32.3 million (20% overrun)

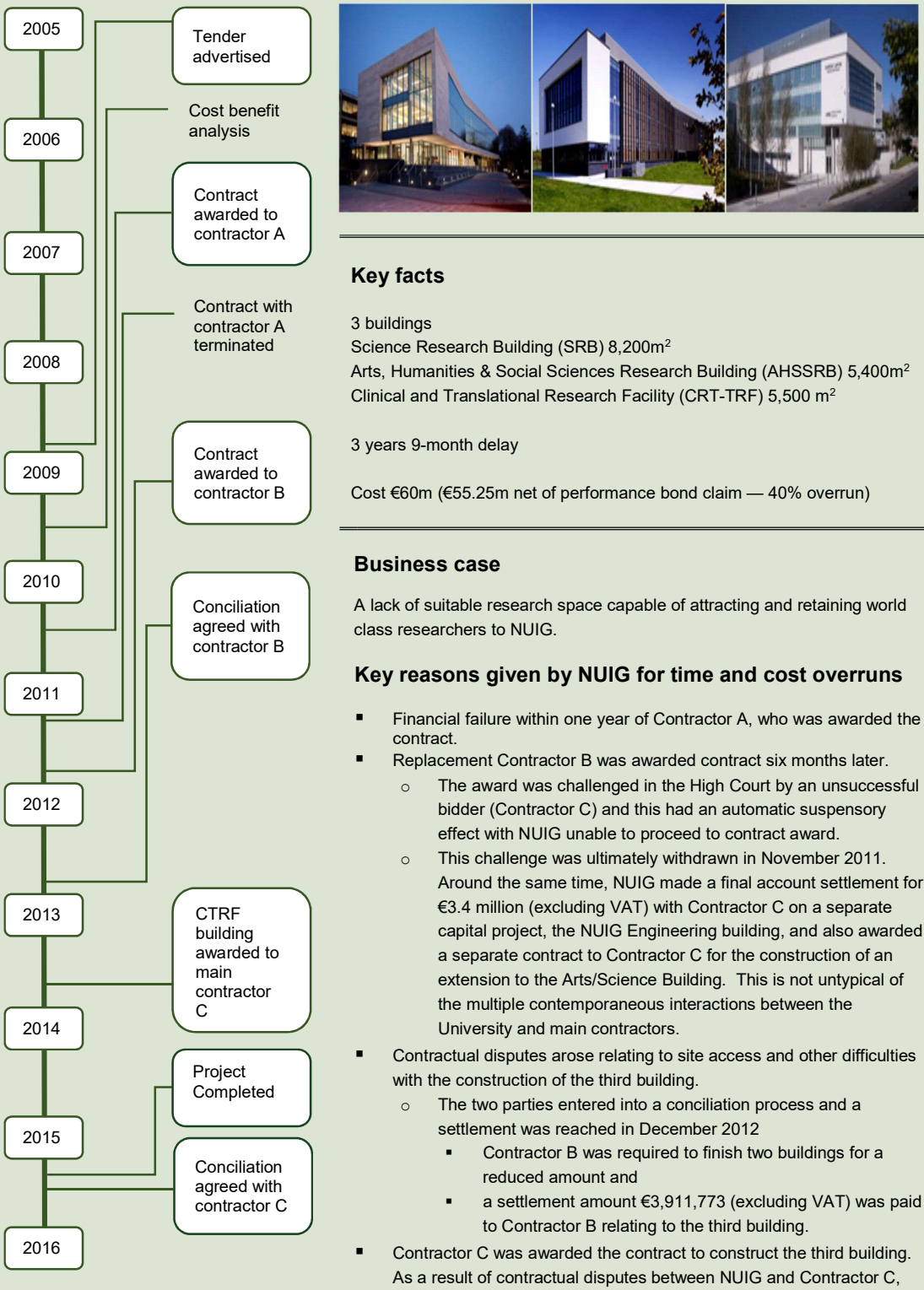
Business case

Existing facilities were unsuitable, from a health and safety perspective and fragmented across 13 separate locations.

Key reasons given by NUIG for time and cost overruns

- The main contactor made claims from the early stages of the project, including claims in relation to
  - delayed start to the project
  - appointment of specialist contractors
  - restrictive specification
  - completeness of design.
- These claims were disputed. The final outcome was an additional €5.4 million payable to the contractor for
  - €1.6 million of pre-approved client variations/claims and
  - €3.8 million agreed following a negotiated settlement (as provided for under the contract).

Project D — National University of Ireland, Galway (NUIG) Research Bundle



Key facts

3 buildings
Science Research Building (SRB) 8,200m^2
Arts, Humanities & Social Sciences Research Building (AHSSRB) 5,400m^2
Clinical and Translational Research Facility (CRT-TRF) 5,500 m^2

3 years 9-month delay

Cost €60m (€55.25m net of performance bond claim — 40% overrun)

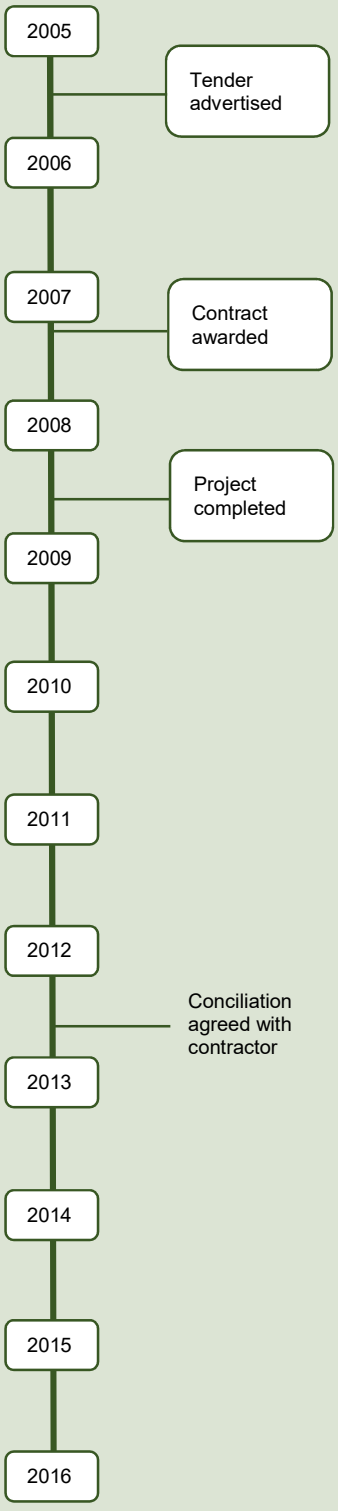
Business case

A lack of suitable research space capable of attracting and retaining world class researchers to NUIG.

Key reasons given by NUIG for time and cost overruns

- Financial failure within one year of Contractor A, who was awarded the contract.
- Replacement Contractor B was awarded contract six months later.
  - The award was challenged in the High Court by an unsuccessful bidder (Contractor C) and this had an automatic suspensory effect with NUIG unable to proceed to contract award.
  - This challenge was ultimately withdrawn in November 2011. Around the same time, NUIG made a final account settlement for €3.4 million (excluding VAT) with Contractor C on a separate capital project, the NUIG Engineering building, and also awarded a separate contract to Contractor C for the construction of an extension to the Arts/Science Building. This is not untypical of the multiple contemporaneous interactions between the University and main contractors.
- Contractual disputes arose relating to site access and other difficulties with the construction of the third building.
  - The two parties entered into a conciliation process and a settlement was reached in December 2012
    - Contractor B was required to finish two buildings for a reduced amount and
    - a settlement amount €3,911,773 (excluding VAT) was paid to Contractor B relating to the third building.
- Contractor C was awarded the contract to construct the third building. As a result of contractual disputes between NUIG and Contractor C, the two parties entered into a conciliation process. A settlement was reached in July 2015 with a settlement amount of €1.5 million (excluding VAT) to be paid to Contractor C.

Project E — National University of Ireland, Galway (NUIG) Sports Building



Key facts

6,500m^2 facilities include basketball courts, swimming pool

4-month delay

Cost €18.8m (13% overrun)

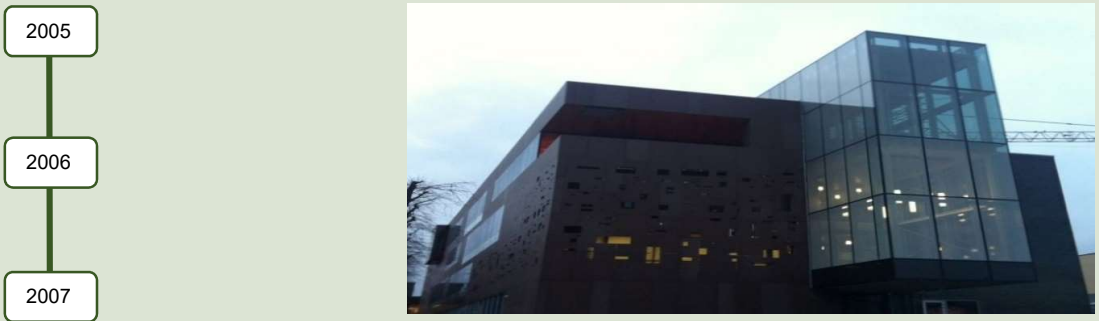
Business case

An investment in sporting, social and cultural infrastructure was necessary to ensure that NUI Galway continues to attract the highest-quality Irish and international students.

Key reasons given by NUIG for time and cost overruns

- There were several disputes between NUIG and the main contractor.
  - Architect instructions/variations — valuations and time extensions needed on foot of these were disputed.
  - Interest — the contractor claimed interest due to NUIG's delay in assessing and finalising the contractor's assessment of the final account.
- These disputes were settled at conciliation in August 2012. The outcome was an agreed final account figure of €18.8 million.

Project F — St. Patrick's College, Drumcondra (SPD) Campus Development



Key facts

Three new buildings and refurbishment of 6,000m^2 of existing space

2 years 4-month delay

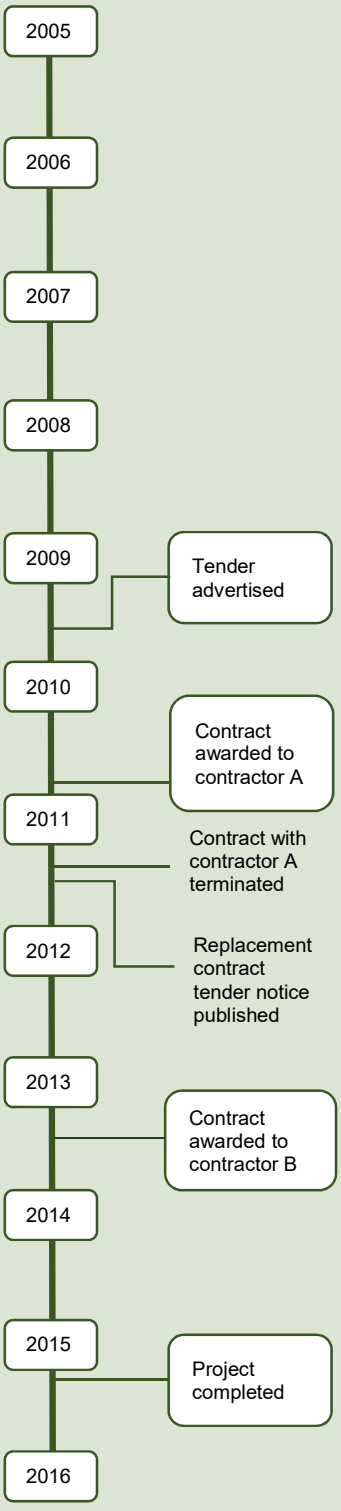
Cost €36.3m (€32.7m net of performance bond claim —14% overrun)

Business case

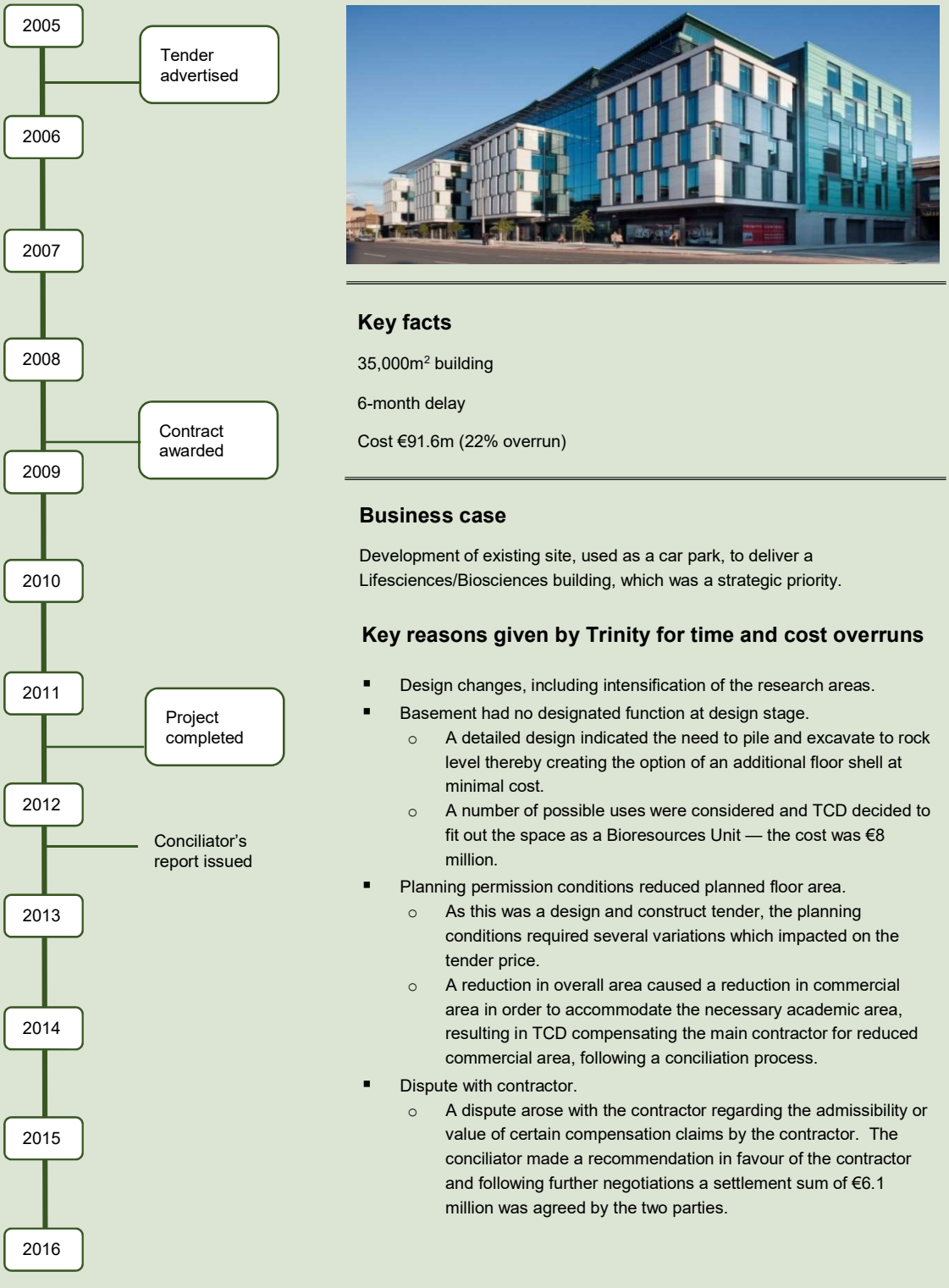
Additional teaching accommodation needed due to rapid increase in student numbers.

Key reasons given by SPD for time and cost overruns

- Following the financial failure of the original contractor, Contractor A, the contract was terminated in April 2011.
- Over two years lapsed between the termination of the original contract and the awarding of a replacement contract.
- Construction prices had increased during this period and when SPD went to the market the second time, prices were significantly above the prices secured on the original tender.



Project G — Trinity College Dublin (TCD) Biosciences Building



Key facts

35,000m^2 building

6-month delay

Cost €91.6m (22% overrun)

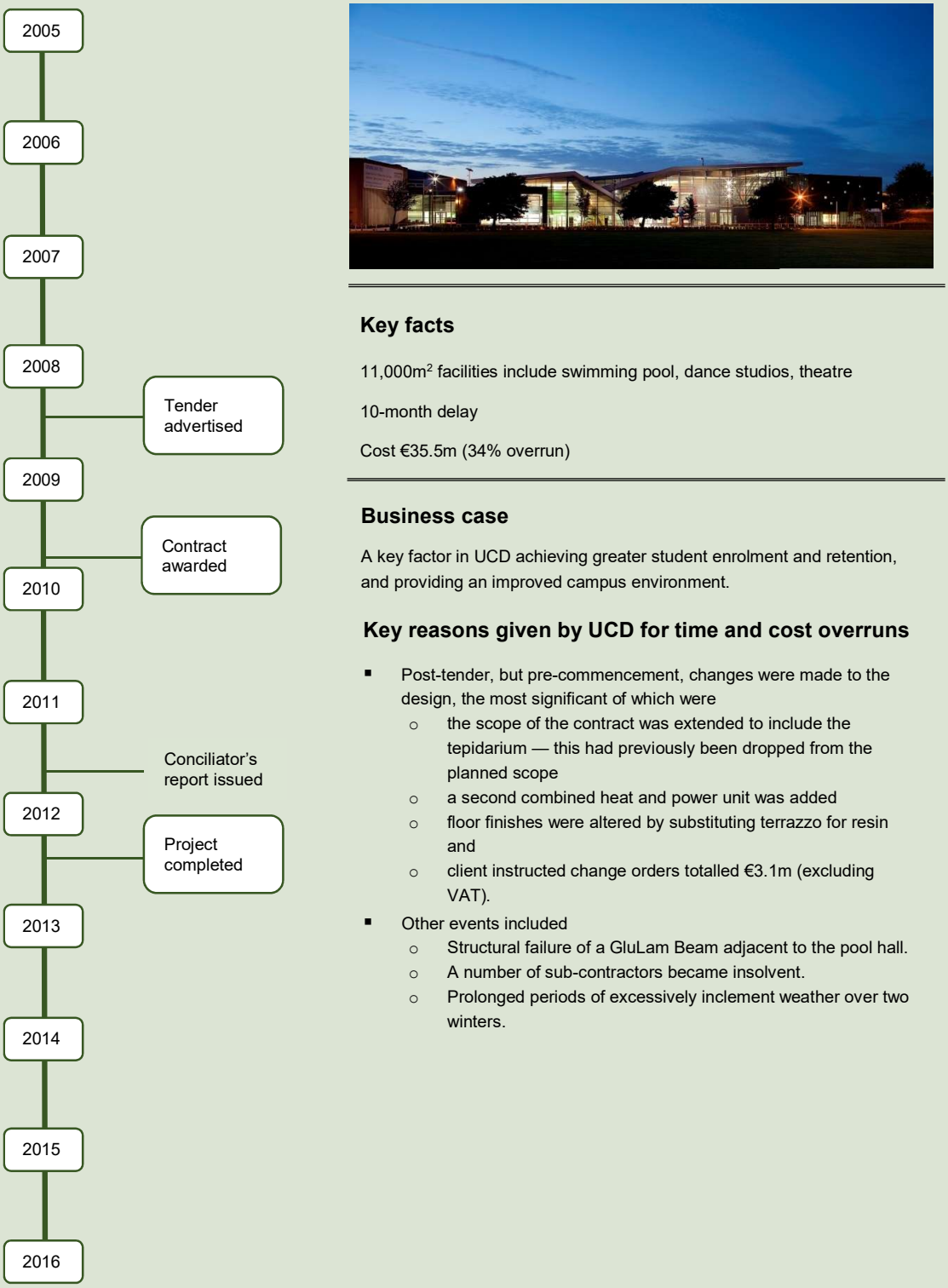
Business case

Development of existing site, used as a car park, to deliver a Lifesciences/Biosciences building, which was a strategic priority.

Key reasons given by Trinity for time and cost overruns

- Design changes, including intensification of the research areas.
- Basement had no designated function at design stage.
  - A detailed design indicated the need to pile and excavate to rock level thereby creating the option of an additional floor shell at minimal cost.
  - A number of possible uses were considered and TCD decided to fit out the space as a Bioresources Unit — the cost was €8 million.
- Planning permission conditions reduced planned floor area.
  - As this was a design and construct tender, the planning conditions required several variations which impacted on the tender price.
  - A reduction in overall area caused a reduction in commercial area in order to accommodate the necessary academic area, resulting in TCD compensating the main contractor for reduced commercial area, following a conciliation process.
- Dispute with contractor.
  - A dispute arose with the contractor regarding the admissibility or value of certain compensation claims by the contractor. The conciliator made a recommendation in favour of the contractor and following further negotiations a settlement sum of €6.1 million was agreed by the two parties.

Project H — University College Dublin (UCD) Student Learning, Leisure and Sports Facility (SLLS)



Key facts

11,000m^2 facilities include swimming pool, dance studios, theatre

10-month delay

Cost €35.5m (34% overrun)

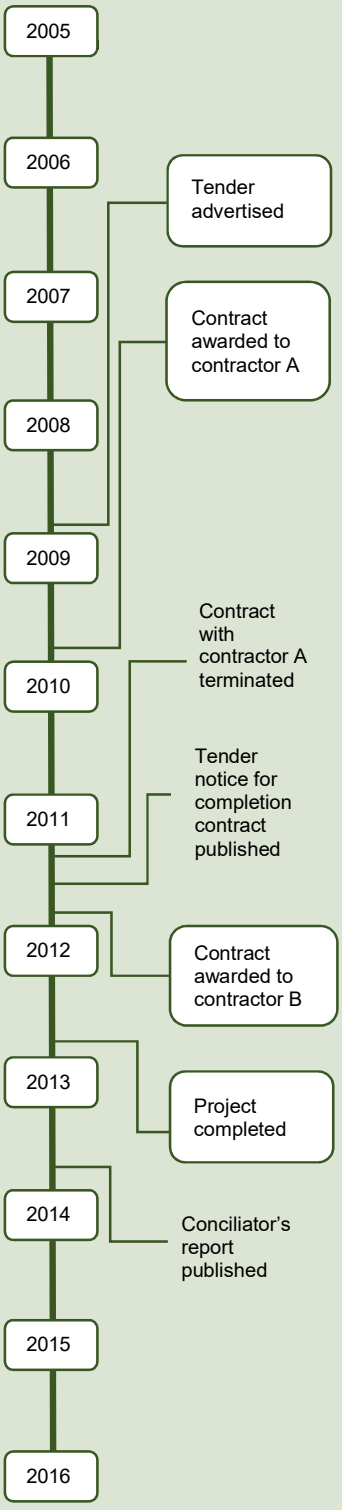
Business case

A key factor in UCD achieving greater student enrolment and retention, and providing an improved campus environment.

Key reasons given by UCD for time and cost overruns

- Post-tender, but pre-commencement, changes were made to the design, the most significant of which were
  - the scope of the contract was extended to include the tepidarium — this had previously been dropped from the planned scope
  - a second combined heat and power unit was added
  - floor finishes were altered by substituting terrazzo for resin and
  - client instructed change orders totalled €3.1m (excluding VAT).
- Other events included
  - Structural failure of a GluLam Beam adjacent to the pool hall.
  - A number of sub-contractors became insolvent.
  - Prolonged periods of excessively inclement weather over two winters.

Project I — University of Limerick (UL) Graduate Entry Medical School (GEMS)



Key facts

Medical school building of 4,300m^2 plus additional student accommodation

1 year 9-month delay

Cost €21m (€18m net of performance bond claim — 33% overrun)

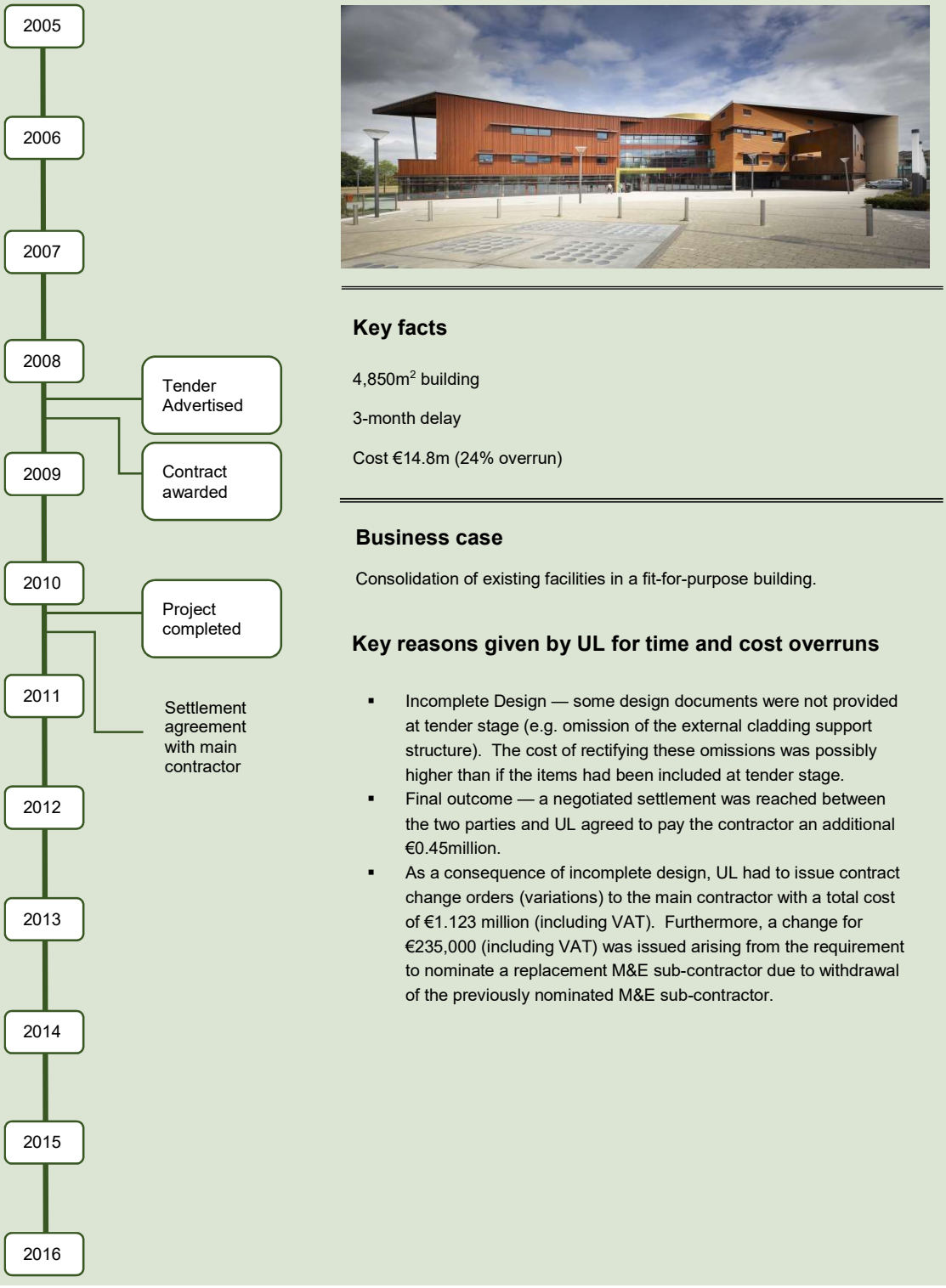
Business case

To cater for an increase in students following Government approval for the establishment of a Graduate Medical School at UL.

Key reasons given by UL for time and cost overruns

- The original contractor, Contractor A, went into liquidation 16 months after contract award.
  - For a significant period of time prior to the contract termination, little work was undertaken.
- Contractor B was awarded the completion contract.
  - Delays were caused due to the amount of extra work required to remediate the work of Contractor A, which had not been identified prior to contract and to deal with the deterioration in the condition of the works during the period in which the works were suspended.
  - A large number of defects were in fact identified in the tender documents at tender stage.
  - Conciliation process found that it was not reasonable to transfer the associated risks entirely to Contractor B.

Project J — University of Limerick (UL) Irish World Academy of Music and Dance (IWAMD)



Key facts

4,850m^2 building

3-month delay

Cost €14.8m (24% overrun)

Business case

Consolidation of existing facilities in a fit-for-purpose building.

Key reasons given by UL for time and cost overruns

- Incomplete Design — some design documents were not provided at tender stage (e.g. omission of the external cladding support structure). The cost of rectifying these omissions was possibly higher than if the items had been included at tender stage.
- Final outcome — a negotiated settlement was reached between the two parties and UL agreed to pay the contractor an additional €0.45million.
- As a consequence of incomplete design, UL had to issue contract change orders (variations) to the main contractor with a total cost of €1.123 million (including VAT). Furthermore, a change for €235,000 (including VAT) was issued arising from the requirement to nominate a replacement M&E sub-contractor due to withdrawal of the previously nominated M&E sub-contractor.