

Ireland Handbook **2017**



Opening up a world of data for the Irish construction industry.

Welcome to the Linesight Ireland Handbook 2017.

Each year, we bring together all the important indices and trends in construction in Ireland to give you the most comprehensive industry overview possible. The handbook represents just part of our global Linesight Knowledge Center, which you can find at linesight.com/knowledge.





Velasco, Dublin 2

Contents

Global Review

Geopolitical uncertainty — a major concern to the global economy	4
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Ireland Market Review

Irish construction review and outlook	11
---------------------------------------	----

1. Macro indicators

1.1. Value of construction output 2007–2018	12
1.2. Construction output 2010–2017	12
1.3. Gross National Product (GNP) 2010–2017	12
1.4. Multi annual public capital investment allocations 2017–2019	13
1.5. Public capital investment allocations 2017–2019	13
1.6. PPP programme	14
1.7. Employment in construction	15

2. Linesight average Irish construction costs 2017

	18
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3. Indices

3.1. Linesight tender and cost indices 2007–2017	22
3.2. SCSl tender price index 2006–2016	23
3.3. SCSl construction cost index 2006–2016	23
3.4. Wholesale price index building materials	24
3.5. Consumer vs construction price inflation 2006–2016	24
3.6. Construction Purchasing Managers' Index	25
3.7. Historical property performance total return % per quarter	26

4. Main and sub-contractors' turnover

4.1. Irish main contractors' turnover	28
4.2. Irish services sub-contractors' turnover	29

5. Wage rates and charges

5.1. Basic hourly wage rates	30
5.2. Basic hourly wage rates – mechanical	31
5.3. Basic hourly wage rates – electrical	31
5.4. Planning charges 2017	32
5.5. Fire certificate charges 2017	32

6. Housing

6.1. Annual housing completions 2006–2016	34
6.2. New housing completions by type 2006–2016	35
6.3. House construction cost index	35
6.4. SCSi house rebuilding costs 2016	36

Global Insights

Brexit – What's next?	42
Lean construction – early decision making through collaboration	44
The importance of project schedule integrity	46
Trends in Safety Management	48
EU public procurement rules	50
The NEC3 contract philosophy; collaborative and proactive	54
Bigger, faster, cheaper	56
Life Sciences – a constantly evolving market	58

Global Review

Geopolitical uncertainty — a major concern to the global economy

The year 2016 has been tumultuous to say the least, with a number of unexpected political decisions looking set to shape the global economy over the coming years.

by **Kim Hegarty**, Associate Director

Both the Brexit referendum result and the US presidential election have created uncertainty, which is likely to negatively impact GDP for a number of economies

The Brexit referendum result and the US presidential election have dominated international media discussion over the last year, and this is expected to continue for the foreseeable future. Fundamentally, both have created uncertainty, which is likely to negatively impact GDP for a number of economies.



Brexit

The UK economy has performed better than anticipated following the Brexit referendum. Estimates from the Office of National Statistics suggest that GDP grew 0.5 percent in the third quarter of 2016 when compared to the

second quarter of 2016, and was 2.3 percent higher than the same period in 2015. This is a far cry from the expected recessionary scenario many feared after the referendum; the outcome of the referendum would appear not to have affected the pattern of growth in the economy. However, this growth is largely driven by consumer spending and the services sector, with construction growing by 0.1 percent in 2016.

Sterling has depreciated against the euro, and this is supporting the UK economy in the short term through higher exports. Nonetheless, it is likely that there will be negative impact in the form of import inflation over the coming years. The growth experienced at the end of 2016 is unsustainable if based on a consumer spending spree, and with consumer borrowing increasing at

a rapid rate, the Bank of England is concerned about the formation of a debt bubble.

The full impact of Brexit will not be realised for some time, with the negotiation process for leaving the EU just beginning. The general consensus is that it will take several years before agreement is reached on the terms of the exit and this will have a considerable impact on the common market. Ultimately, the long term effect of Brexit on the UK economy will be determined by the kind of trade agreement negotiated by the EU and the UK.

A tumultuous time for the EU

The EU is facing a challenging period with the two-speed economy, with countries like Ireland recording significant GDP growth while Italy, with its banking system under duress, has yet to face the full consequences of the global financial crisis. The European Central Bank (ECB) is attempting to boost the economy with a stimulus package of quantitative easing, and while lower interest rates may be helping to boost the weaker economies, it also has potentially negative impacts. The Trump administration has accused the ECB of maintaining a grossly undervalued euro, which helps exports and economies such as Germany, in particular, benefit from an unfair trade advantage. However, the ECB asserts that Germany's large trade surplus is based on economic competitiveness and not currency advantage. Such

is the strength of the German economy that German politicians and German members of the ECB's Board campaigned, in vain, for a higher interest rate policy that would instead strengthen the euro.

The European project is facing a challenging period, not only with the Brexit referendum, but with elections due in Germany, the Netherlands, France and possibly Italy this year. Anti-EU sentiment is coming to the fore with the rising popularity of anti-EU political figures, such as Marine le Pen in France. This could be a very tumultuous time for the region, with many unknowns giving rise to economic uncertainty.

President Trump

The new President of the United States and his administration have stated their intention to provide a boost to the economy by means of a more expansionary fiscal policy, based on tax cuts and increased infrastructure and defence spending. This has led to an improved outlook in consumer sentiment, which was clearly indicated when the Dow rose significantly after the outcome of the election was announced. This subsequently went on to break through the 20,000 mark after a sharp increase in infrastructure stocks, when President Trump reaffirmed his commitment to build a wall along the Mexican border.

The administration is, however, also implementing protectionist



policies, with one of the first orders to be drafted titled "Auditing and Reducing US Funding of International Organizations". Furthermore, Trump has stated that they plan to pull out of the Trans-Pacific Partnership (TPP) and re-negotiate the North American Free Trade Agreement (NAFTA). He had indicated that he intended to pick a trade fight with China by recognising Taiwan - a policy which many warned against due to the size of the Chinese economy. He has recently backed down from this policy by agreeing with the One China policy, which forms the bedrock of US-China diplomatic ties.

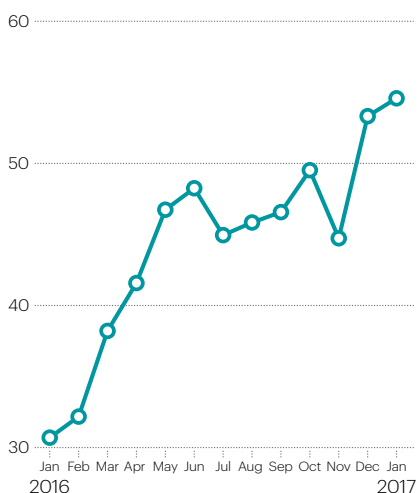
The approach of the administration is creating a lot of uncertainty for the longer-term economic outlook. The President is seeking to create more jobs in the US, particularly in manufacturing, with his promise to bring jobs back to the rust belt. While the US may seek to lay blame for less manufacturing jobs on Mexico and China, most economic commentators are of the belief that the loss of manufacturing jobs is largely attributable to changes in the manufacturing processes, as well as advances in technology.

In the long run, the policy of increased spending on infrastructure, together with the promised reduction in corporation and income taxes, is likely to be counterproductive, resulting in an increase in the government deficit.

Oil prices

Since mid-2014, oil prices have been in freefall, as supply outpaced demand, hitting a low of US\$30.70 per barrel (Brent crude oil price) in January 2016. Since then, prices have been slowly improving, and with the announcement of OPEC's deal to reduce production for six months in late 2016, it is hoped that this will mark an end to the two-year flooding of the market. The oversupply, which caused prices to plummet, impacted negatively on the global economy in recent years and inflicted significant economic damage to some producers.

Average monthly UK Brent crude oil price per barrel



Price in US dollars per barrel

Source: OPEC; IEA

This volatility has had a serious effect on the construction industry in the Middle East in particular, with many infrastructural projects being cancelled or delayed, and other projects being impacted by a significant decline in confidence.

The future of Chinese growth

Over the last 35 years, GDP growth in China averaged an astounding 12 percent per annum, as the country moves from a centrally planned economy towards a market-based economy. The growth over this period was largely driven by a surge in large-scale infrastructure projects, as China became a significant entity in international trade.

The OECD expects the Chinese economy to grow by around 6.2 percent in 2017. With the ongoing urbanisation of China, the principal driver of GDP in 2017 will be personal consumption, facilitated by a stable labour market and steadily rising incomes.

However, a potential housing bubble poses a major risk to the economy at present. Cheap credit has fuelled an increase in debt and a booming housing market. With an enormous accumulation of debt in China over the last ten years, it remains to be seen whether the remarkable Chinese growth rate of the past can be sustained.

Volatility in oil prices and the impending Chinese housing bubble pose significant threats to the global economy, given their scale and potentially far-reaching impacts







Ireland Market Review

Further regional market reviews available
at linesight.com/knowledge

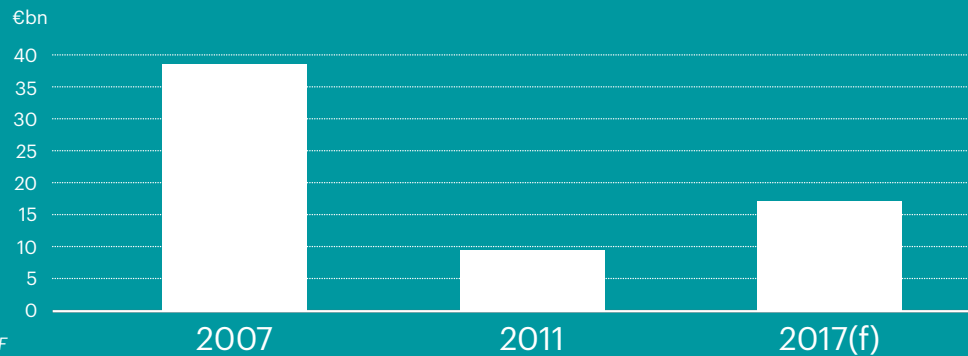
From peak to trough to today

Value of construction output



Note: (f) forecast

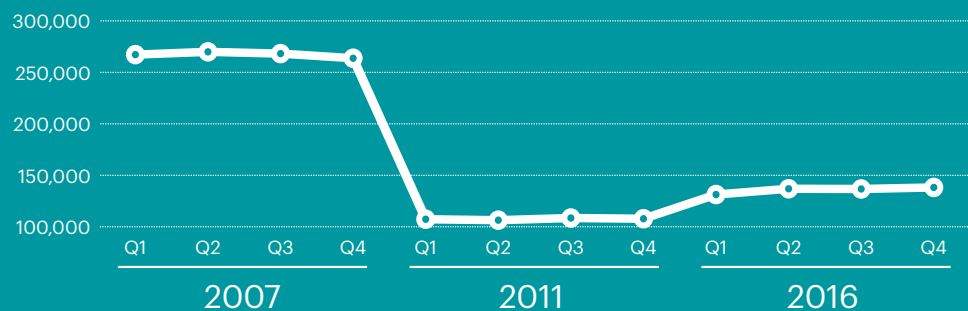
Source: DKM / Dept of Environment / CIF



Employment in construction



Source: CSO

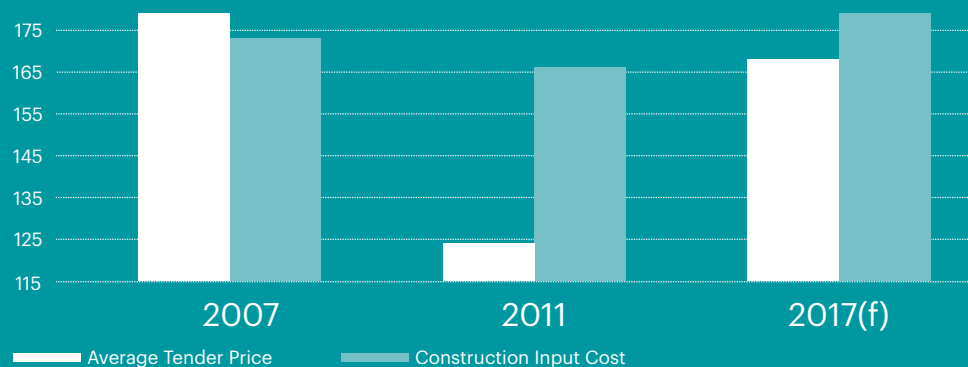


Tender price and cost indices



Note: (f) forecast

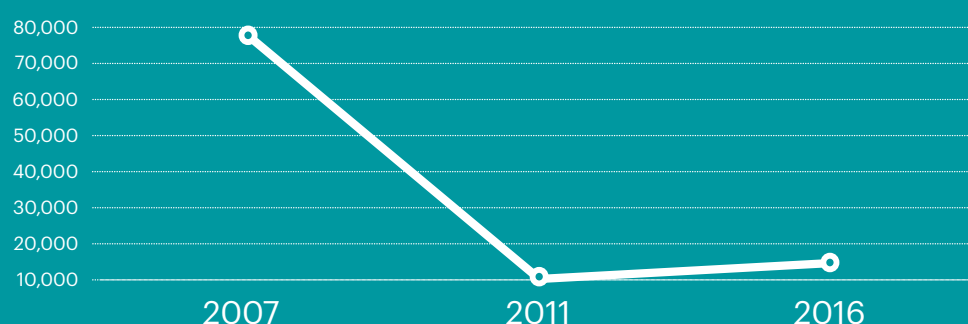
Source: Linesight



Annual housing completions



Source: CSO



Irish construction review and outlook

Derry Scully, Group President, reviews the Ireland construction industry performance over the last number of years and looks forward to 2017 and 2018.

Output of the Irish construction industry in 2016 was just under €15 billion, which represented an impressive increase of 18 percent above the 2015 level. The recovery in industry output is expected to continue during 2017 and 2018, growing to approximately €17 billion and €19.5 billion respectively. These projections represent increases of almost 15 percent per annum. However, even with these sizeable growth rates, the output in 2018 will still only be at 2001 levels and approximately half of the 2007 peak output of over €38 billion. While this peak output was unsustainably high, the predicted output level for 2017 only represents 7.5 percent of GNP, which is well below the recognised European sustainable level of between 10 to 12 percent. Using these benchmarks, the output of the Irish construction industry in 2017 should be between €23 and €27 billion.

All sectors of the industry are now starting to contribute to its recovery. The private sector revival was initially led by new commercial office space and office fit-outs in the Greater Dublin Area. This recovery is now starting to be seen in other major urban centres, and there is increased activity in the Hospitality and Retail sectors also. The IDA continues to attract FDI and multinational companies from the

High-Tech Industrial, Data Centre and Life Sciences sectors to invest in Ireland.

In the public sector, the Government published its Multi-Annual Public Capital Investment Allocations for 2017–2019. These show planned expenditure of €4.5 billion in 2017, €5.3 billion in 2018 and just over €6 billion in 2019. The major areas of Government expenditure will be in transport, education, enterprise, housing and health, which together account for over 70 percent of the planned outlay. These numbers do not include non-exchequer investment by semi-state bodies including ESB, Irish Water and Ervia, which will add significantly to the total of public sector capital expenditure.

Residential construction has traditionally represented a major component of the overall industry, but output in recent years has been well below the annual requirement, which has led to significant accommodation shortages and increased rental costs. Thankfully, this important sector is now also showing signs of recovery, prompted by Government initiatives, the increasing viability of residential construction and easing of funding restrictions. Hopefully these improvements will continue and the industry will be able to reach the required output targets in coming years.

While it is encouraging to see the recovery in the construction industry, there are a number of challenges and risks which are already impacting, or may impact on this recovery. The most pressing

concern at present is the level of resources in the industry. During the recession, employment in construction fell to a quarter of its peak level. These skills shortages are now manifesting themselves across both main contractor and specialist sub-contractor organisations, as well as the design professions. Given that it takes four to five years to train

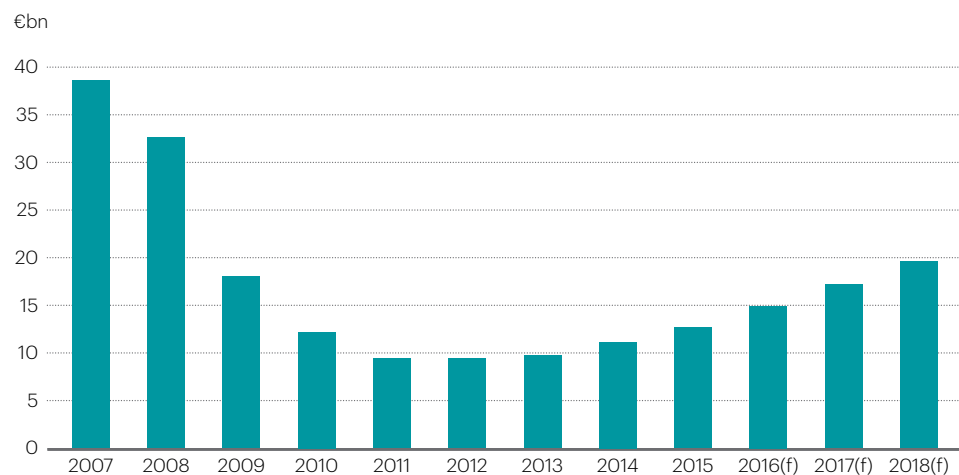
The most pressing concern for the industry at present is the skills shortage manifesting itself across all disciplines, and impacting on tender levels, and construction inflation levels

construction professionals, and a similar timescale to train skilled craftsmen, the industry will take some time to remedy this shortfall, even with resources being attracted from abroad. These shortages are impacting on tender levels, and construction inflation levels are running well ahead of general inflation.

There are also external influences which could impact the recovery of the industry in Ireland – primarily Brexit in the UK and the new Trump administration in the US. It is uncertain how these will affect both the construction industry and the Irish economy as a whole. Brexit could be positive in the short term, if multinational financial institutions decide to relocate out of the UK and choose Ireland. In contrast, the Trump administration could have a negative impact if it implements policies which discourage US firms from investing abroad.

1. Macro indicators

1.1. Value of construction output 2007–2018



Note: (f) forecast

Source: DKM / Dept of Environment / CIF

1.2. Construction output 2010–2017

	2010	2011	2012	2013	2014	2015	2016(f)	2017(f)
Value of Output at Current Prices (€m)	12,189	9,408	9,395	9,723	11,147	12,650	14,935	17,172
Change in Value of Output (%)	-32%	-23%	0%	3%	15%	13%	18%	15%
Construction Output as % of GNP	8.8%	6.8%	6.6%	6.4%	6.8%	6.2%	6.9%	7.5%

Source: DKM / Dept of Environment / CIF

1.3. Gross National Product (GNP) 2010–2017

	2010	2011	2012	2013	2014	2015	2016(f)	2017(f)
GNP at Current Prices (€m)	138,667	139,282	142,203	151,899	163,445	202,642	215,143	228,960
% Change in GNP	-1.6%	0.4%	2.1%	6.8%	7.6%	24.0%	6.2%	6.4%

Source: CSO / DKM(f)

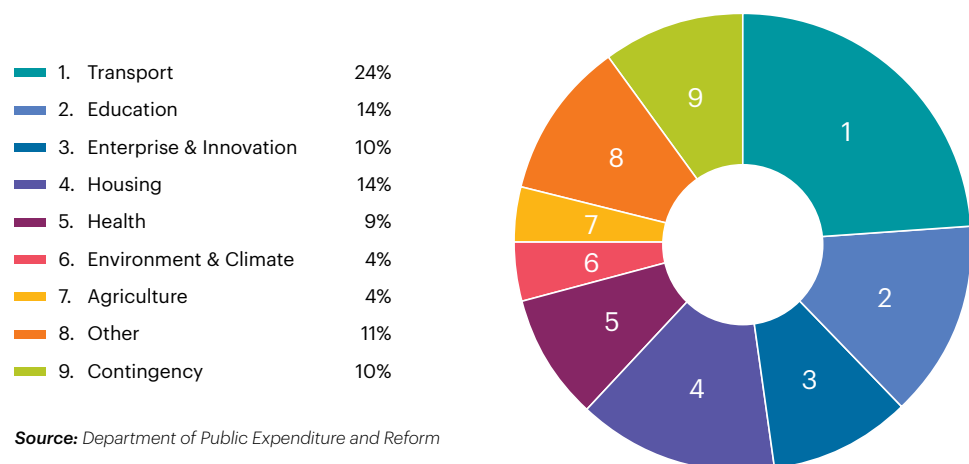
1.4. Multi annual public capital investment allocations 2017–2019

	2017	2018	2019	Total 2017–2019
	€m	€m	€m	€m
Agriculture, Food and the Marine	238	238	238	714
Arts, Heritage, Regional, Rural and Gaeltacht Affairs*	119	116	119	353
Children and Youth Affairs*	26	25	25	76
Communications, Climate Action and Environment	171	201	256	628
Defence	74	74	85	233
Education and Skills	693	714	745	2,152
Finance*	25	25	25	76
Foreign Affairs and Trade	11	11	11	33
Health*	454	473	550	1,477
Housing, Planning and Local Government	705	788	764	2,257
Jobs, Enterprise and Innovation	555	520	530	1,605
Justice and Equality*	180	141	173	494
Public Expenditure and Reform*	151	176	178	504
Social Protection	10	9	9	28
Transport, Tourism and Sport*	1,130	1,281	1,328	3,739
Contingency in Public Capital Plan			100	100
Contingency		500	933	1,433
Total Gross Capital Expenditure Ceilings*	4,541	5,292	6,069	15,902

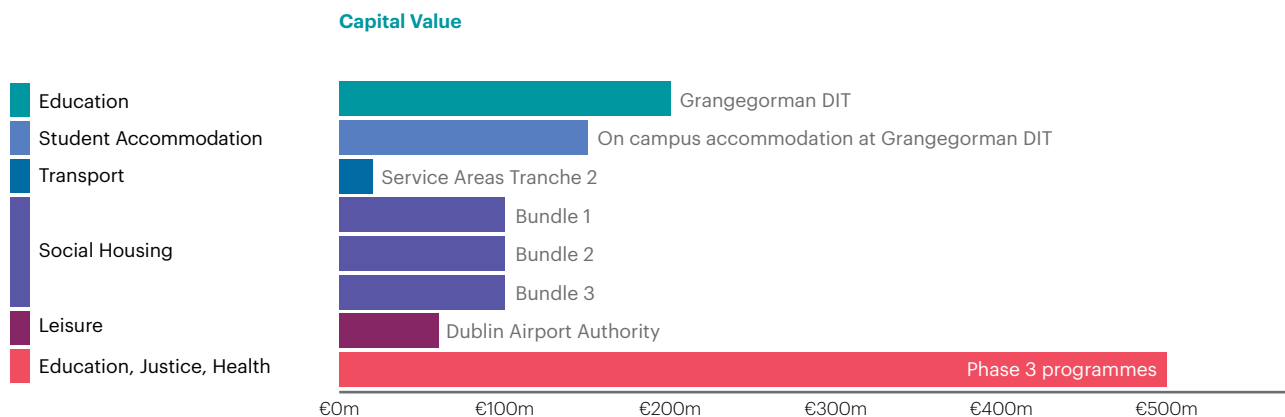
Note: *Rounding affect totals

Source: Department of Public Expenditure and Employment

1.5. Public capital investment allocations 2017–2019



1.6. PPP programme



Sector	Capital Value	Details	Status
Education	c. €200m	Grangegorman DIT Third Level Campus	PT Appointed
Student Accommodation	c. €150m	Provision of on campus accommodation at Grangegorman DIT	Pre-Procurement
Transport	c. €20m	Service Areas Tranche 2: Athlone, Kilcullen and Gorey	PT Appointed
Social Housing	c. €100m	Bundle 1: Development of up to 560 social housing units on 6 sites	Pre-Procurement
	c. €100m	Bundle 2: Development of up to 476 social housing units on 8 sites	Pre-Procurement
	c. €100m	Bundle 3: Scope not yet defined	Pre-Procurement
Leisure	c. €60m	Dublin Airport Authority: DBFOT of a 402 key terminal-linked hotel	Procurement
Education, Justice, Health	c. €500m	Phase 3 programmes	Pre-Procurement

PPP & Concession Projects Closed

13 major inter-urban motorways / by-passes

8 Education PPPs, including 35 schools delivered under 1 pilot scheme and 5 subsequent schemes, Maritime College and Cork School of Music

International Convention Centre

Criminal Courts Complex

Regional Courthouses: 7 locations (Cork, Drogheda, Letterkenny, Limerick, Mullingar, Wexford & Waterford)

Primary Care Centres: 14 sites nationwide

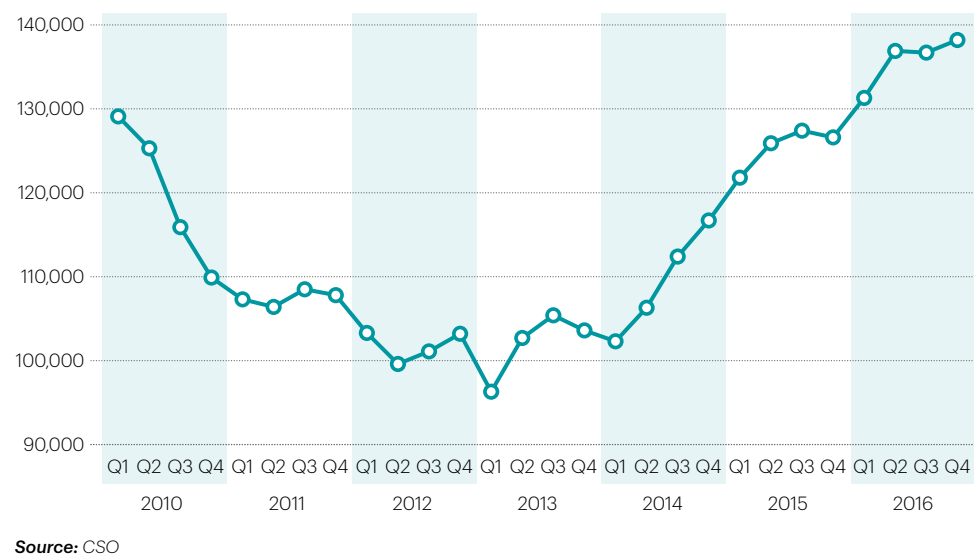
Service Areas Tranche 1

Dublin Waste to Energy

Property PPP (land swap): Charlemont Street

Sources: National Development Finance Agency, Department of Public Expenditure and Reform

1.7. Employment in construction



Our vision is to be recognised as having the best people, delivering the best outcomes, for the world's best clients.

To achieve our vision we have identified four strategic pillars. These pillars will build on the good reputation and strong relationships at the heart of our success to date.



Enhanced services

New services will be introduced and existing services strengthened to enhance our attractiveness and value to our clients.

Areas already in train are:

- Schedule Management
- Risk Management
- Audit Services
- Procurement Services



Grow and attract talent

People are our greatest asset. We will continue to grow the skills and expertise within our team while actively seeking to attract the best new talent. We will also continue to build and support a coherent and dynamic culture that offers opportunities for professional development across all markets.



Foster strategic partnerships

We will foster deeper and more valuable relationships by offering more clients the benefits of enhanced term contracts across their building programs. We will expand our Partnering Division to support this ambition.



Market as one brand

We will establish a single brand that represents our enhanced business offer. Our brand will be supported by an integrated marketing strategy and a new brand name and identity which will be applied across all markets to sustain, grow and attract the best talent and clients.



City Quay, Dublin 2

2. Linesight average Irish construction costs 2017

The average construction costs table is generated using Linesight's Cost Database and sets out typical building construction costs. Our database is the largest construction cost database in Ireland.

Average Costs	Cost Range			M&E
Commercial Offices				
Suburban Naturally Ventilated				
Shell & Core	€1,370	€1,800	per sq.m.	10-15%
Developer Standard	€1,500	€1,950	per sq.m.	15-20%
Extra for Air Conditioning	€195	€390	per sq.m.	-
City Centre Air Conditioned				
Shell & Core	€1,800	€2,600	per sq.m.	15-20%
Developer Standard	€2,000	€2,850	per sq.m.	20-25%
Office Fit-Out				
95% Open Plan, No Catering	€520	€780	per sq.m.	20-30%
75% Open Plan, Limited Catering	€720	€980	per sq.m.	20-30%
60% Open Plan, Full Catering	€980	€1,500	per sq.m.	25-35%
Corporate HQ	€1,560	€1,950	per sq.m.	25-35%
Open Plan Work Station	€1,170	€3,300	each	-
High Tech Industrial				
Shell & Core	€980	€1,560	per sq.m.	20-25%
Developer Standard	€850	€1,560	per sq.m.	25-45%
Residential				
Estate House (Approx. 100m²)	€1,170	€1,500	per sq.m.	10-20%
Developer Standard Apartments	€1,600	€2,200	per sq.m.	10-20%
Individual House Rebuilding Costs	(see chart - House Rebuilding Costs per sq.m.)			
Shopping Centres				
Anchor Unit	€780	€980	per sq.m.	10-15%
Unit Shops	€980	€1,500	per sq.m.	10-15%
Mall	€1,760	€3,100	per sq.m.	20-25%
Retail Fit-Out	€1,370	€1,950	per sq.m.	25-30%
Site Development Business Parks				
Roads & Primary Services	€182,000	€580,000	per hectare	
Warehouses				
Without Offices	€650	€850	per sq.m.	8-12%
With 10% Offices	€780	€1,240	per sq.m.	10-15%

Average Costs	Cost Range			M&E
Healthcare				
Acute Hospitals, Average Costs	€2,800	€3,300	per sq.m.	20-30%
Ward Blocks	€2,300	€2,800	per sq.m.	20-25%
General Operating Theatres	€4,200	€7,900	per sq.m.	45-60%
Nursing Homes	€2,000	€3,000	per sq.m.	20-25%
Accident & Emergency	€2,900	€4,200	per sq.m.	25-30%
Car Park				
Surface	€1,250	€1,560	per space	-
Multi-Storey	€10,400	€20,800	per space	-
Single Level Basement*	€14,900	€33,200	per space	-
Double Level Basement*	€19,500	€42,900	per space	-
Education				
Primary Level (DOE)**		€1,210	per sq.m.	10-15%
Second Level (DOE)**		€1,210	per sq.m.	15-20%
Third Level	€1,630	€2,640	per sq.m.	20-25%
Leisure				
Hotel Building	€1,760	€3,000	per sq.m.	25-35%
FF&E	€330	€780	per sq.m.	-
Restaurant	€1,900	€2,860	per sq.m.	25-35%
Cinema	€1,500	€2,500	per sq.m.	20-30%
Sports Hall	€1,050	€1,600	per sq.m.	10-15%
Swimming Pool	€2,400	€3,300	per sq.m.	20-35%
Municipal				
Fire Station	€2,200	€2,700	per sq.m.	15-25%
Prison	€2,000	€2,900	per sq.m.	20-30%
Courthouse	€3,000	€3,800	per sq.m.	20-30%

Notes:

- Costs are based on January 2017 prices.

- Average costs as indicated should not be used for insurance valuation purposes. The costs are representative of typical specifications for each type of project. Unique designs or challenging sites may not be within the cost range shown. The rates shown are average construction build only costs and do not include VAT, professional fees or allow for future inflation.

* Costs are based on a grossing factor not exceeding 28 sq.m. per space.

** Basic Building Cost only (incl. VAT). External allowances of 12.5% and abnormal costs should be added.

Source: Linesight



What we do

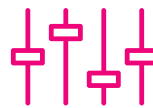
Our services are tailored for your project, delivering maximum efficiency from inception to completion. We specialise in eight key areas to provide faster project delivery, greater cost efficiency, and maximum value for money.



Program
Management



Project
Management



Project Controls



Cost Management



Supply Chain
Management



Health and Safety



Consultancy



Procurement

3. Indices

3.1. Linesight tender and cost indices 2007–2017

As the Irish construction industry continues to recover, tender prices are rising steadily and the gap between these and the input costs of labour and materials continues to close. Linesight's research shows that, on average, tender prices rose by approximately 7 percent during 2016 while construction input costs rose on average by just under 2 percent.

During 2017 we expect to see input costs increase by slightly more at 2.3 percent, reflecting pressure to increase wage rates and also increased costs of some materials. We predict that tender prices will increase at a faster pace of 7.5 percent on average, due to the shortage of resources throughout both the main contractor and sub-contractor pools. These shortages are now being experienced in the traditional steelfixing, masonry and wet trades as well as the more specialist mechanical and electrical trades.

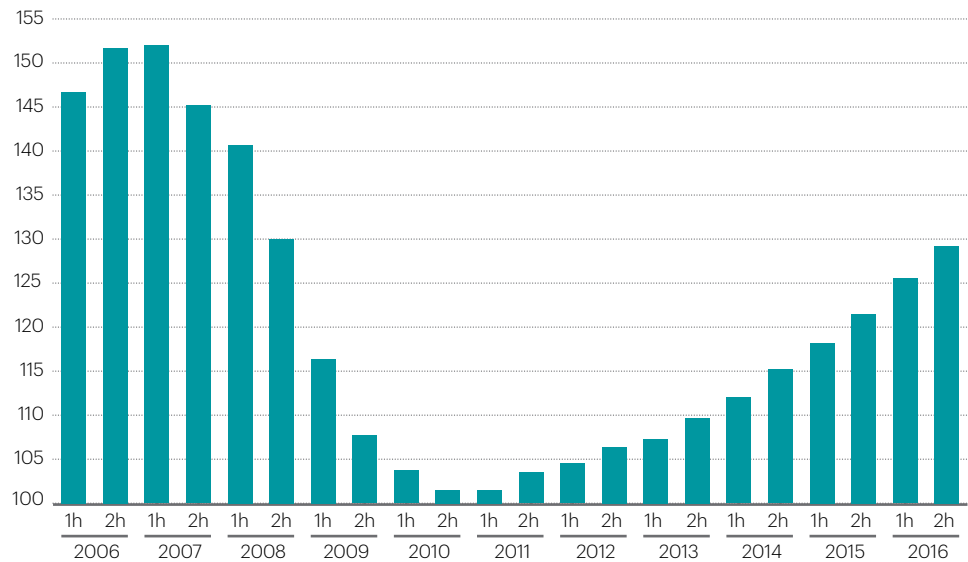
The percentages above are average increases across Ireland. However we are seeing significantly greater increases in the Dublin area than in provincial locations. For 2017 we are predicting that increases in Dublin could be 9 percent, or even higher for complex city centre projects. This contrasts with predicted increases of 6 percent outside of the Greater Dublin Area.

The increase in tender prices, which we expect to continue, emphasises the importance of providing for future construction inflation in feasibility studies and cost plans. It is also becoming more important to conduct detailed pre-qualification / due diligence when preparing tender lists for new projects and to consider the most appropriate procurement strategy for each project.



Source: Linesight

3.2. SCSI tender price index 2006–2016



Source: Society of Chartered Surveyors Ireland

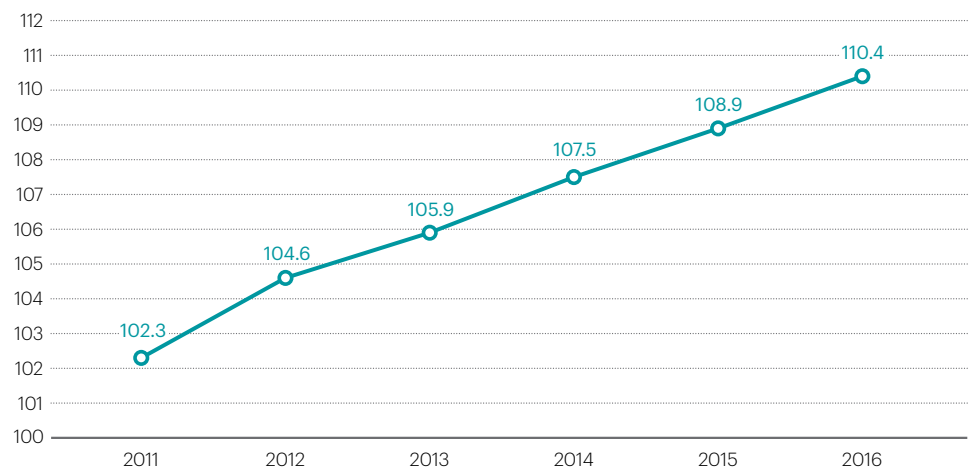
3.3. SCSI construction cost index 2006–2016



* Average to year end September

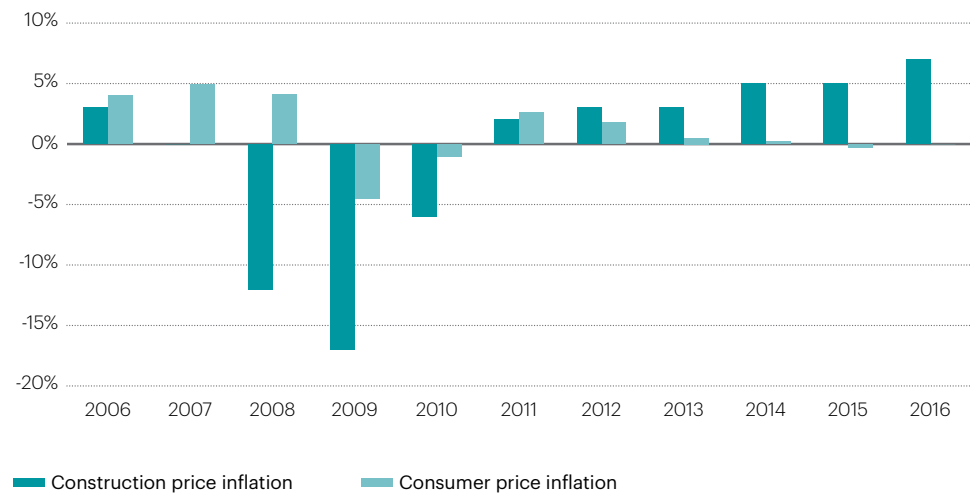
Source: Society of Chartered Surveyors Ireland

3.4. Wholesale price index building materials



Source: Central Statistics Office

3.5. Consumer vs construction price inflation 2006–2016



Source: CSO/Linesight

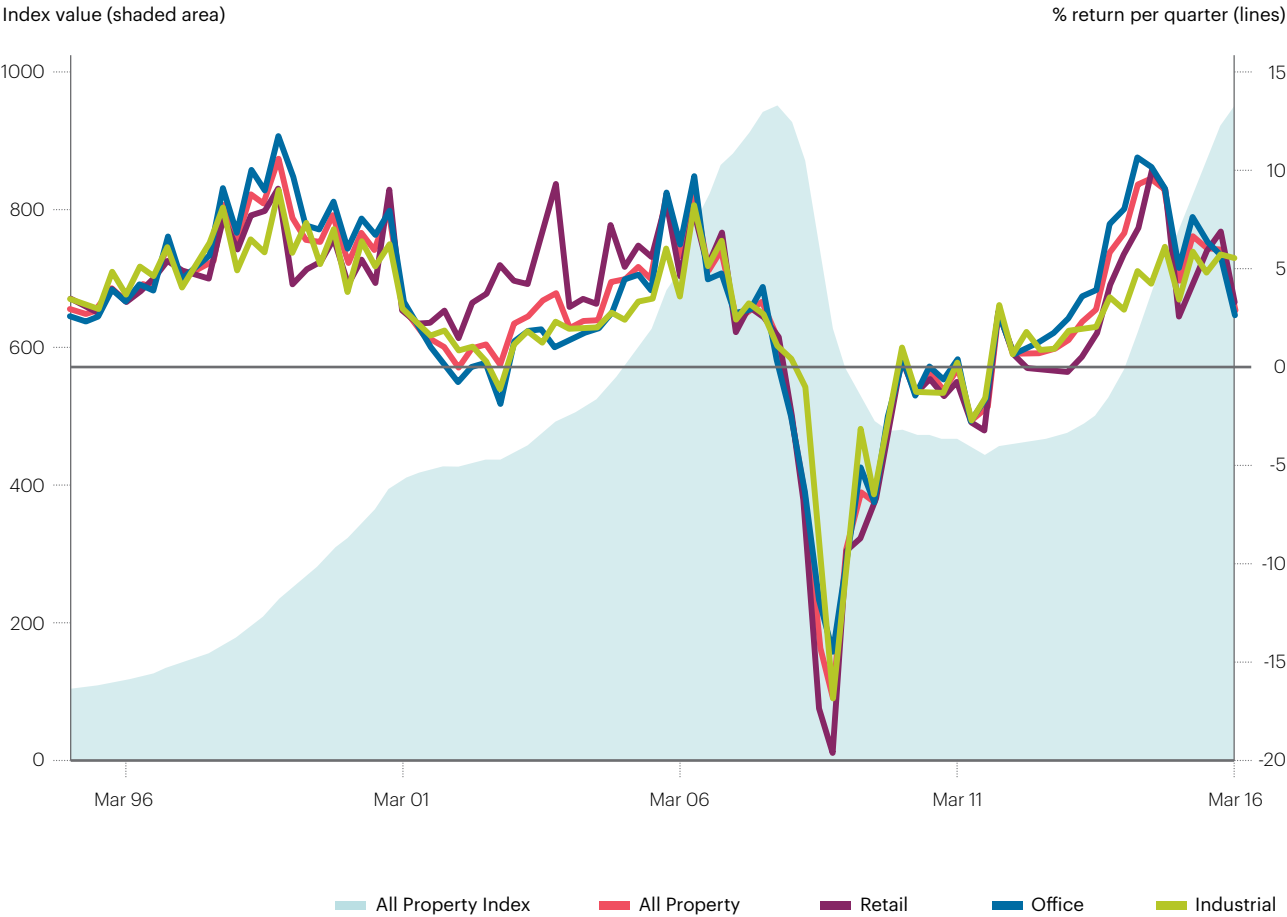
3.6. Construction Purchasing Managers' Index



Ulster Bank Construction PMI	Dec-14	Mar-15	Jun-15	Sep-15	Dec-15	Mar-16	Jun-16	Sep-16	Dec-16
Total Activity (graphed above)	63.1	52.9	65.7	55.8	58.6	62.3	59.7	58.7	58.9
Housing	61.4	50.9	64.9	55.6	58.3	63.6	61.8	59.5	60.6
Commercial	63.3	54.8	66.4	56.4	59.7	65.1	62.0	61.3	61.0
Civil Engineering	57.4	47.4	52.8	51.7	52.0	58.9	55.4	52.4	44.3

Source: Ulster Bank

3.7. Historical property performance total return % per quarter



Source: SCSi / IPD Ireland Quarterly Property Index



4. Main and sub-contractors' turnover

4.1. Irish main contractors' turnover

2016 Rank	2015 Rank	Contractor	Revenue €m	Revenue €m	Revenue €m
			Global 2016	of which Irish	Global 2015
1	1	John Sisk & Son Ltd.	€1,050.00	€700.00	€1,104.76
2	2	Bam Contractors Ltd.	€400.00	€385.00	€385.15
3	3	John Paul Construction Ltd.	€294.00	€235.60	€193.50
4	5	Bennett Construction Ltd.	€238.00	€152.50	€155.00
5	7	PJ Hegarty & Sons	€185.00	€165.00	€144.21
6	8	Roadbridge Ltd.	€180.00	€111.60	€134.48
7	9	JJ Rhatigan & Co Ltd.	€165.10	€122.90	€119.50
8	6	Ward & Burke Construction Ltd.	€156.00	€28.00	€150.00
9	11	Walls Construction Ltd.	€146.00	€146.00	€102.50
10	4	Collen Construction Ltd.	€131.66	€123.50	€192.03
11	15	Mac Interiors Ltd.	€131.60	€101.33	€68.73
12	12	Ardmac Ltd.	€102.76	€48.63	€82.82
13	20	Flynn Management & Contractors Ltd.	€98.00	€98.00	€40.00
14	14	Wills Bros. Ltd.	€90.24	€40.10	€70.04
15	10	Structure Tone Ltd.	€77.43	€77.43	€110.75
16	18	Sammon Group	€75.00	€75.00	€45.00
17	13	Stewart Developments Ltd.	€68.98	€68.98	€73.37
18	16	L&M Keating Ltd.	€60.82	€60.17	€61.04
19	17	Duggan Brothers (Contractors) Ltd.	€55.40	€55.40	€46.45
20	22	Ganson Building & Civil Engineering Contractors Ltd.	€53.29	€44.60	€37.29
21	19	J & K Townmore Construction Ltd.	€47.30	€41.50	€44.13
22	26	Glenbeigh Construction Ltd.	€44.70	€44.70	€20.60
23	23	Clancy Construction Ltd.	€41.02	€41.02	€34.20
24	25	MMD Construction Cork Ltd.	€40.00	€40.00	€21.09
25	21	Purcell Construction Ltd.	€38.50	€38.50	€38.10
26	29	MDY Construction Ltd.	€36.61	€36.61	€17.03
27	24	Monami Construction Ltd	€35.20	€35.20	€25.76
28	30	Manley Construction Ltd.	€27.00	€22.95	€16.26
29	27	Townlink Construction Ltd.	€25.20	€25.20	€20.45
30	28	MJ Conroy & Sons Ltd.	€23.15	€8.85	€17.57

Note: Ranked on Global Turnover

Source: Individual Companies Auditors, Companies Registration Office

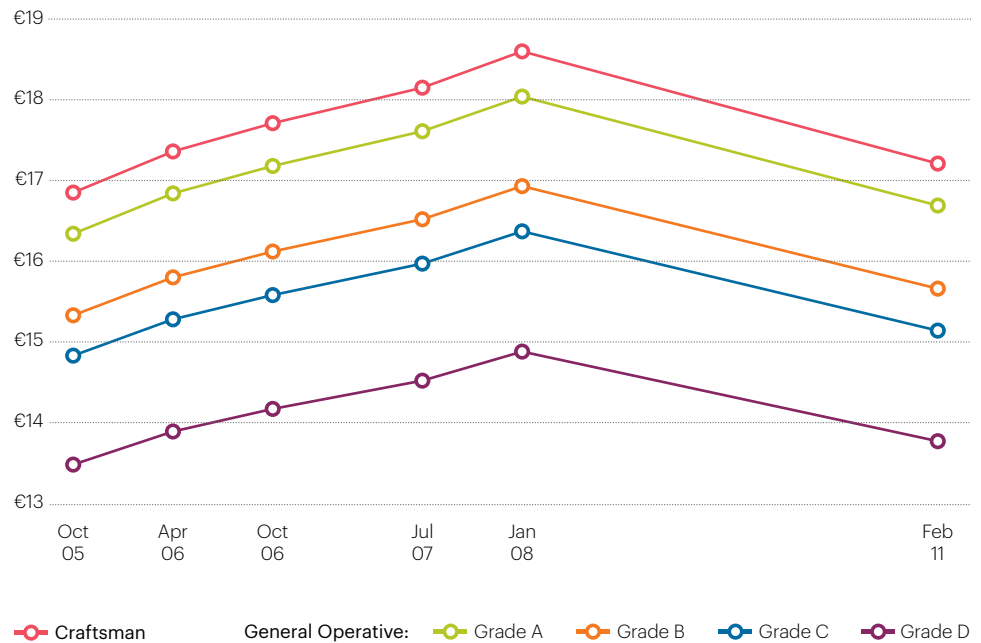
4.2. Irish services sub-contractors' turnover

2016 Rank	2015 Rank	Contractor	Revenue €m	Revenue €m	Revenue €m
			Global 2016	of which Irish	Global 2015
1	2	Jones Engineering Ltd.	€385.00	€192.50	€337.00
2	1	Mercury Engineering Group	€375.00	€144.00	€401.00
3	3	Dornan Engineering Ltd.	€275.00	€55.00	€212.09
4	7	Winthrop Engineering Ltd.	€184.52	€122.00	€76.55
5	4	Kirby Group Engineering Ltd.	€167.30	€109.10	€150.10
6	6	Designer Group Engineering Contractors Ltd.	€104.00	€57.30	€82.80
7	5	Suir Engineering Ltd.	€100.00	€100.00	€86.72
8	9	Specialist Technical Engineering Services	€70.00	€17.00	€41.16
9	8	L. Lynch & Co. Ltd.	€52.00	€48.50	€42.55
10	13	Lynskey Engineering Ltd.	€34.82	€22.60	€23.93
11	12	B.M.D & Co Ltd.	€27.50	€25.58	€24.23
12	10	King & Moffat Ltd.	€26.26	€12.30	€26.00
13	14	The FKM Group	€20.06	€20.06	€14.78
14	11	Precision Electric (Ireland) Ltd.	€19.75	€10.08	€25.51
15	15	DMG Engineering Ltd.	€15.24	€15.24	€11.55
16	20	Rockwell Engineering	€15.20	€15.20	€8.00
17	17	Tritech Engineering Ltd.	€14.54	€14.54	€9.21
18	16	Haughton & Young Ltd.	€11.74	€11.15	€9.41
19	19	CJK Electrical Ltd.	€10.71	€10.71	€8.06
20	18	T Bourke & Co. Ltd.	€8.50	€8.50	€8.52
21	21	Sean Ahern Ltd.	€6.20	€6.20	€5.92



5. Wage rates and charges

5.1. Basic hourly wage rates

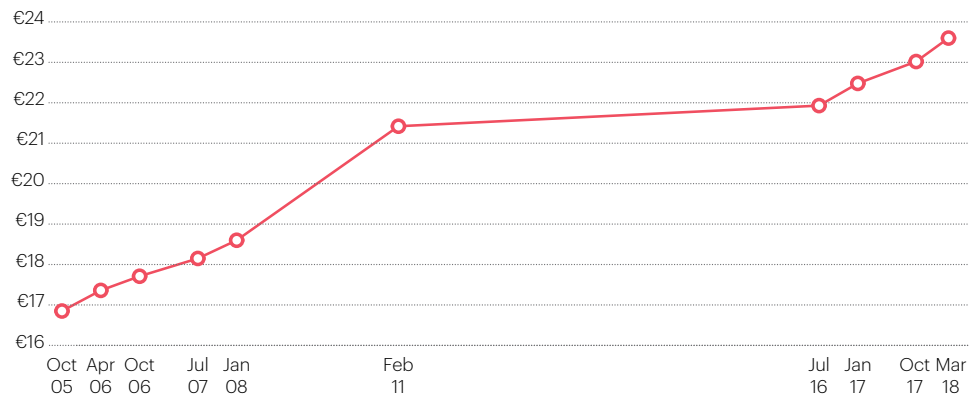


	Craftsman	General Operative			
		Grade A	Grade B	Grade C	Grade D
1 st October 2005	€16.85	€16.34	€15.33	€14.83	€13.48
1 st April 2006 (3%)	€17.36	€16.84	€15.80	€15.28	€13.89
1 st October 2006 (2%)	€17.71	€17.18	€16.12	€15.58	€14.17
1 st July 2007 (2.5%)	€18.15	€17.61	€16.52	€15.97	€14.52
1 st January 2008 (2.5%)	€18.60	€18.04	€16.93	€16.37	€14.88
4 th February 2011 (-7.5%)	€17.21	€16.69	€15.66	€15.14	€13.77

Note: During 2013 Registered Employment Agreements were declared unconstitutional therefore the above rates are no longer legally binding.

Source: Registered Agreement for the Construction Industry

5.2. Basic hourly wage rates – mechanical

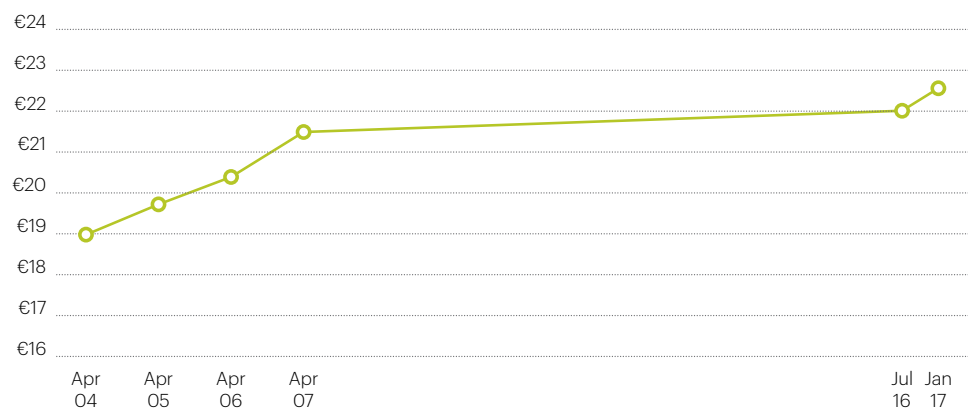


1 st October 2005	€16.85
1 st April 2006	€17.36
1 st October 2006	€17.71
1 st July 2007	€18.15
1 st January 2008	€18.60

4 th February 2011	€21.42
1 st July 2016	€21.93
1 st January 2017	€22.48
1 st October 2017	€23.02
1 st March 2018	€23.60

Source: MEBSA/ECA

5.3. Basic hourly wage rates – electrical



1 st April 2004	€18.98
1 st April 2005	€19.72
1 st April 2006	€20.39

1 st April 2007	€21.49
1 st July 2016	€22.01
1 st January 2017	€22.56

Note: Current Electrical Agreement expires 30th April 2017

Source: MEBSA/ECA

5.4. Planning charges 2017

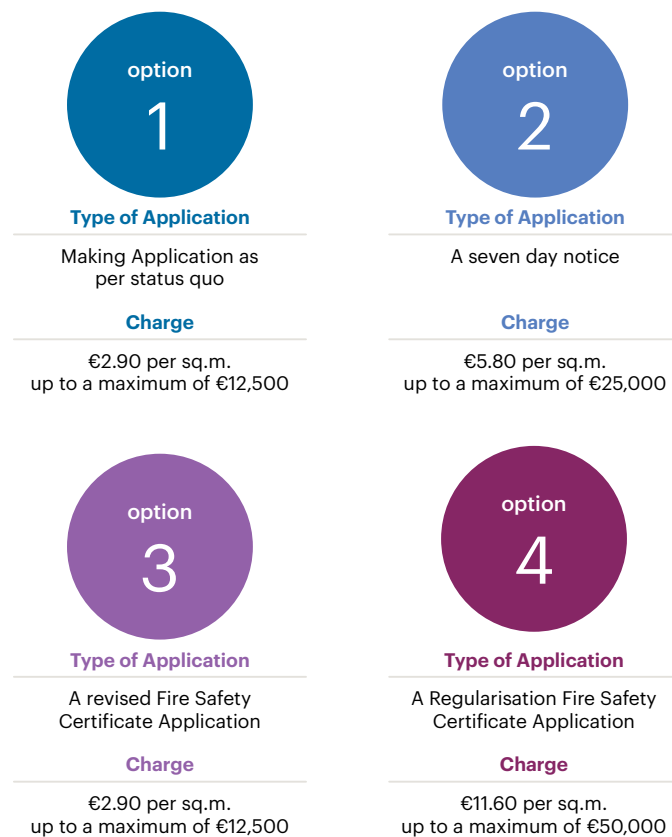
Class of Development	Charge
Most Building Types	€80 or €3.60 per sq.m. whichever is greater
New Houses	€65 for each dwelling
House Alterations	€34
Golf Courses	€50 per hectare
Outline Planning Permission	75% of full planning permission charge

Maximum Scale of Charges for Planning Applications

Full Application Most Building Types	€38,000
Outline Application Most Building Types	€28,500
Retention Application	€125,000

Source: Local Planning Authorities

5.5. Fire certificate charges 2017

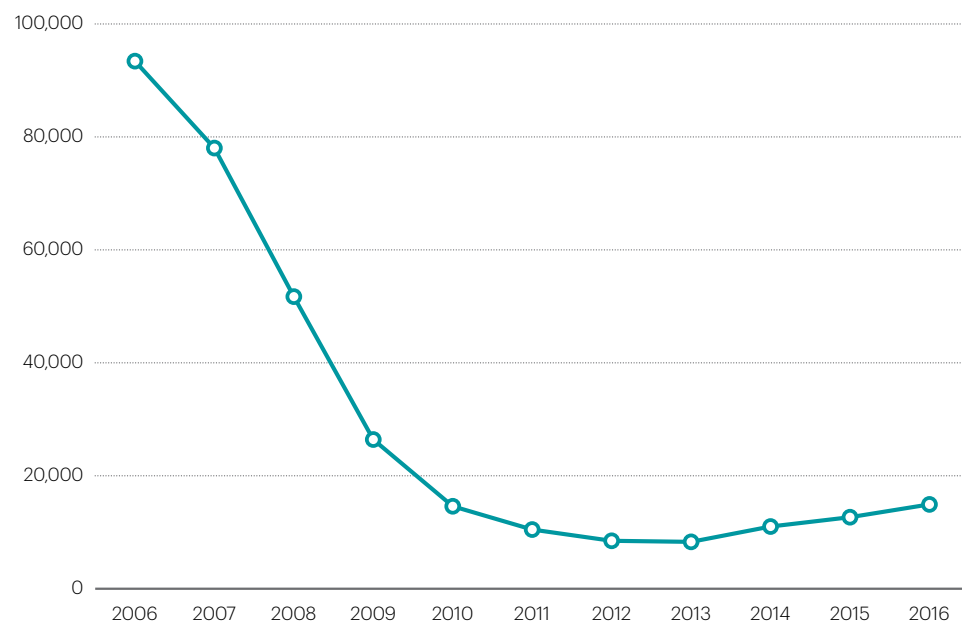


Source: Local Planning Authorities



6. Housing

6.1. Annual housing completions 2006–2016



Year	Social	%	Private	%	Total
2006	5,208	5.57%	88,211	94.43%	93,419
2007	6,671	8.55%	71,356	91.45%	78,027
2008	6,801	13.15%	44,923	86.85%	51,724
2009	5,344	20.23%	21,076	79.77%	26,420
2010	2,069	14.17%	12,533	85.83%	14,602
2011	1,231	11.75%	9,249	88.25%	10,480
2012	1,016	11.97%	7,472	88.03%	8,488
2013	504	6.07%	7,797	93.93%	8,301
2014	515	4.68%	10,501	95.32%	11,016
2015	476	3.76%	12,190	96.24%	12,666
2016	N/A	N/A	N/A	N/A	14,932

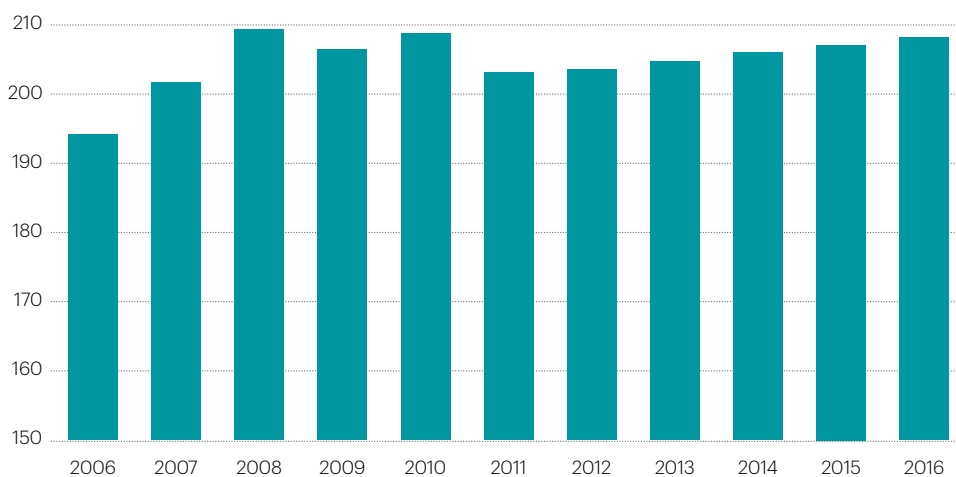
Source: Department of Housing, Planning, Community and Local Government

6.2. New housing completions by type 2006–2016

Year	House	%	Apartment	%	Total
2006	73,073	78.6%	19,946	21.4%	93,019
2007	58,936	75.9%	18,691	24.1%	77,627
2008	38,513	75.0%	12,811	25.0%	51,324
2009	21,272	80.5%	5,148	19.5%	26,420
2010	12,514	85.7%	2,088	14.3%	14,602
2011	9,140	87.2%	1,340	12.8%	10,480
2012	7,495	88.3%	993	11.7%	8,488
2013	7,379	88.9%	922	11.1%	8,301
2014	8,766	79.6%	2,250	20.4%	11,016
2015	11,025	87.0%	1,641	13.0%	12,666
2016	12,625	84.5%	2,307	15.5%	14,932

Source: Department of Housing, Planning, Community and Local Government

6.3. House construction cost index



Note: The House Building Cost Index monitors labour costs in the construction industry and the cost of building materials. It does not include items such as overheads, profits, interest charges or land development. The labour costs include insurance cover and the building material costs include VAT. The type of construction covered is a typical 3 bedroom, 2 level local authority house.

Source: Central Statistics Office

6.4. SCSI house rebuilding costs 2016

House type	No. of bedrooms	Typical size	Rebuilding cost						
			Dublin area	Cork area	Galway area	Waterford area	Limerick area	North West area	North East area
Terraced	2	70 sq.m. (753 sq.ft.)	€1,918 sq.m. €178 sq.ft.	€1,558 sq.m. €145 sq.ft.	€1,499 sq.m. €139 sq.ft.	€1,478 sq.m. €137 sq.ft.	€1,520 sq.m. €141 sq.ft.	€1,305 sq.m. €121 sq.ft.	€1,539 sq.m. €143 sq.ft.
	3	95 sq.m. (1,023 sq.ft.)	€1,834 sq.m. €170 sq.ft.	€1,477 sq.m. €137 sq.ft.	€1,436 sq.m. €133 sq.ft.	€1,397 sq.m. €130 sq.ft.	€1,438 sq.m. €134 sq.ft.	€1,231 sq.m. €114 sq.ft.	€1,454 sq.m. €135 sq.ft.
Semi-detached	3	95 sq.m. (1,023 sq.ft.)	€1,901 sq.m. €177 sq.ft.	€1,495 sq.m. €139 sq.ft.	€1,471 sq.m. €137 sq.ft.	€1,419 sq.m. €132 sq.ft.	€1,455 sq.m. €135 sq.ft.	€1,242 sq.m. €115 sq.ft.	€1,536 sq.m. €143 sq.ft.
	4	118 sq.m. (1,270 sq.ft.)	€1,864 sq.m. €173 sq.ft.	€1,481 sq.m. €138 sq.ft.	€1,398 sq.m. €130 sq.ft.	€1,395 sq.m. €130 sq.ft.	€1,401 sq.m. €130 sq.ft.	€1,227 sq.m. €114 sq.ft.	€1,414 sq.m. €131 sq.ft.
Detached	4	118 sq.m. (1,270 sq.ft.)	€1,868 sq.m. €174 sq.ft.	€1,524 sq.m. €142 sq.ft.	€1,447 sq.m. €134 sq.ft.	€1,438 sq.m. €134 sq.ft.	€1,474 sq.m. €137 sq.ft.	€1,238 sq.m. €115 sq.ft.	€1,483 sq.m. €138 sq.ft.
Detached Bungalow	4	146 sq.m. (1,572 sq.ft.)	€1,796 sq.m. €167 sq.ft.	€1,486 sq.m. €138 sq.ft.	€1,392 sq.m. €129 sq.ft.	€1,345 sq.m. €125 sq.ft.	€1,468 sq.m. €136 sq.ft.	€1,195 sq.m. €111 sq.ft.	€1,440 sq.m. €134 sq.ft.

Garage: Total rebuilding costs range from €14,443 for a single attached garage to €25,983 for a double attached garage. This table is a guideline based on a typical speculatively built, estate-type house in the Dublin, Cork, Galway, Waterford, Limerick, North West and North East regions. These figures are June 2016 figures. See important notes below.

1. The figures shown in the table are a MINIMUM base cost guide for your house insurance.

2. The figures assume a basic quality specification with normal foundations, timber frames or brick/block walls, concrete tiled roof, concrete ground floor and timber first floor, softwood flush doors and hardwood double glazed windows, painted plaster to walls, plastered ceilings, standard electrics and central heating. The sum insured should be increased to allow for better than average kitchen fittings, built-in wardrobes, finishes and any other items not normally included in an estate-type house.

3. House contents such as carpets, curtains, furniture, etc., are not covered by the figures.

4. No allowance has been made for the cost of outbuildings or patios. The figures do, however, allow for a concrete path around the house, for driveway repairs and regrassing and fencing.

5. The figures allow for demolition costs, professional fees incurred in reinstatement and VAT at 13.5% on building costs and 23% on professional fees.

6. The amounts included for professional fees have been calculated to cover the following services: Building Surveyor/Architect: prepare working drawings and specification, and administer the building contract. Chartered Quantity Surveyor: invite and examine tenders, process payments and agree final account. Engineer: advice on structural issues. Fees associated with the certification of the house under the Building Control (Amendment) Regulations 2014.

7. The costs are based on building rates in June 2016.

Source: Society of Chartered Surveyors Ireland



Our values, our people



Our values reflect what we believe in and how we behave when engaging with clients and partners, and the society in which we live



Over the years we have developed a way of working that ensures quality and consistency in how we operate. Our five core values inform what we do and how we do it:



Partnership

We are focused on our clients' goals and work closely with them to achieve the best possible results. We believe in collaboration. When we share our experiences and combine our expertise, we can achieve great things.



Progress

We believe in always moving things forward and finding better ways of working. We're not just focused on what we do but also on what we can achieve. We are driven by success – for our clients, our partners and each other.



Integrity

We are fair, open and ethical in everything we do. We challenge things we believe to be wrong and are open to being challenged by others. We take pride in the quality, accuracy and independence of our work.



Resourcefulness

We work around the world, in diverse sectors and for clients with distinct ambitions. This requires us to act effectively and creatively in new and complicated situations. We rely on our individual and collective abilities to resolve any challenges we may face.



Long-term view

We believe in working sustainably, and so we build enduring relationships with our clients and partners. We work together in a way that is respectful and considerate of each other and the wider society in which we live.



The National Maternity Hospital, St Vincent's University Hospital Campus, Dublin 4

A photograph of a modern, multi-story building with a grid of windows. In the foreground, there is a pedestrian plaza with a striped pattern, a small tree, and several people walking. The sky is clear and blue.

Global Insights

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Brexit – What's next?

Following the landmark Brexit referendum, we are facing a period of uncertainty for the construction industry which is likely to have significant impacts.

by **Kevin Kinsella**, Director
and **Michael Riordan**, Director United Kingdom



Brexit dominated international media in 2016, following the surprising result of June's referendum. While an economic nosedive was predicted, and the pound took a severe blow from which it is still recovering, the reality has not yet been as earth-shattering as anticipated. However, with the pivotal negotiation process just getting underway, the uncertainty and difficult decisions are only beginning.

The likely outcome

As a clearer picture of the deal being sought by the UK emerges, it is widely accepted that with the complexities involved, the likelihood of an agreement being reached by summer 2019 is slim.

The British Prime Minister has been vocal about the need for a 'unique' solution, but 20 of the 27 member states, representing 65 percent of the EU population, would have to vote in favour of this. The UK will leave the single market as it leaves the EU, meaning an exit from the Customs Union and an end to the free movement of goods, services, people and capital. It will seek bespoke and comprehensive customs union and free trade agreements, giving the greatest possible access. Whether or not this is achievable remains to be seen, but the UK is standing over its stance that "no deal for Britain is better than a bad deal".

The outcome of the Brexit negotiations will pose considerable implications for Ireland, in particular. Maintaining the common travel area between north and south is one of the UK's core 12 objectives, but some form of a physical border is inevitable, with checking of goods and documentation as vehicles travel across. It is hoped that this will be a customs rather than a security border, and will be as "frictionless" as possible.

Furthermore, the UK and Ireland have historically been allies within the EU, with closely aligned interests, but Brexit marks the loss of this ally and more powerful negotiator. A softer Brexit would have been preferable and involved less risk for Ireland. Irish businesses face a period of uncertainty, with a heavy reliance on the UK market – 37 percent of Irish exports go to the UK, valued at €7.5 billion, and potential tariffs, as well as logistical complexities (customs checks, bureaucracy etc.), could have devastating impacts. Business interest groups continue to raise questions about future trading relationships, business supply chains and access to the market, with Danny McCoy of IBEC asserting that "Ireland is uniquely exposed to the risks given our deep economic ties with the UK."

The anticipated impact on construction

Construction is expected to be one of the high impact sectors, with the movement of people, in particular, presenting a formidable challenge to the industry. In light of the prevalent skills shortage, and the implications of the end of the free movement of goods on imports and exports, there is considerable concern within the industry.

The currency volatility continues, with the pound having lost significant value against both the euro and the US dollar. Sterling is regularly dipping below €1.17, and has dropped roughly 15 percent against the dollar since referendum day.

Its decline in the wake of Brexit is driving price pressures higher, which is reflected in like-for-like increases on imported construction materials. The large external envelope contractors and manufacturing sites that supply the UK are mainly based in continental Europe, so these increases are being reflected in recent tender costs.

Although a report by the Confederation of British Industry indicated that orders in the three months up until February grew at the highest rate in two years, the number of manufacturers who expect to have to change their prices over the coming months rose to its highest in nearly six years. However, it is expected that there will be a lag in higher prices translating to Consumer Price Index (CPI) inflation and that firms will be forced to absorb a proportion of the increased costs, due to heightened competition. The outlook from commentators is mixed, with some believing the devaluing has reached its worst, while others report that the worst is yet to come.

The impact of Brexit on the Irish construction industry is difficult to gauge, given the level of uncertainty about the outcome. Fluctuations in currency have the potential to impact on the competitiveness of companies trading with the UK, in particular those who export materials. The reaction of the industry in the UK will have a knock-on effect on companies who are active in, or targeting the UK market. On the other side, an increasing number of financial firms based in the UK, and London in particular, are proactively seeking space in Dublin to relocate a percentage of their staff, in order to continue to benefit from trading within the EU. This will help to drive both the fit-out and office construction market over the coming few years.

The pound's decline is driving price pressures higher, and being reflected in like-for-like increases on imported construction materials

Lean construction – early decision making through collaboration

Collaboration plays a fundamental role in a project's success, and its adoption at an early stage can add significant value.

by **Pat Unger**, Senior Project Manager



Prefabrication and modularisation are not new concepts – in fact both have been part of the construction industry for many years, but their use has grown extensively in recent years and both are now considered to be within the “toolbox” of lean construction. Prefabrication can be defined as the process of assembling building systems to a nearly-complete state off-site, to later deliver to the project site for installation. Modularisation involves constructing a finished project off-site, and then delivering it to the construction site to assemble with other modules to create the final product. The use of these types of lean construction tools, and the level of complexity involved, will vary depending on the project type.

The core benefits of utilising modules and components which are produced in an off-site facility, and then transferred into a construction project, are that it can reduce not only individual durations, but also the overall construction programme. In addition, it has the potential to reduce overall costs for the project. While one could argue that there are increased costs involved with these off-site processes for the contractor (for example the leasing of suitable premises, insurances, management of the process and transport), it also streamlines their processes, and reduces their resources and material on-site, effectively eliminating waste – the cornerstone of lean construction. With reduced labour on-site, less coordination is required; it will drive increased cost and programme certainty while delivering higher quality installations.

The decision to implement prefabrication or modularisation on a project often occurs at the post-contractor appointment stage. However, this decision often serves better at an earlier stage, at the commencement of the design phase whereby opportunities for these tools can be sought and considered. By having contractors involved in pre-construction activities, they can add value as to where the use of prefabrication and/or modularisation is appropriate when considering the constructability of a particular project. This early decision-making allows for critical design to be progressed, taking advantage of off-site prefabrication during enabling works.

Ultimately, the optimal solution is collaboration – utilising contractor knowledge and pre-construction services at an early stage, and benefitting from their early involvement. Collaboration, when implemented, can play a critical role in the success of a project.

This collaborative relationship can be achieved through strategic partnering and/or an integrated project team, which would be between the client’s team, the design team, the contractor and the supply chain. The supply chain could very well include specialists who, with their knowledge, can provide critical advice on how best to take advantage of prefabrication techniques and processes – for example the prefabrication of headwalls in patient rooms in hospitals. The involvement of the integrated design team at an early stage facilitates active participation in developing the design and constructability of the project (giving early consideration to the use of prefabrication and modularisation). Furthermore, it also allows for comprehensive consideration of a range of elements; the cost of constructing and maintaining the facility, health and safety implications, sustainability, design quality, speed of delivery and the operational efficiency of the completed facility.

In summary, both prefabrication and modularisation are intrinsically linked with lean construction, and offer considerable benefits for a range of projects of various types and scales. Taking time early in the project to carefully consider these options, and incorporating one or both into design and design programmes will improve the predictability in delivering projects on time, within budget and to a higher standard. If the project team is determined to engage in a collaborative relationship from the outset of the project, then this in itself will hopefully lead early decision making on utilising lean construction tools such as using prefabrication and modularisation.

Ultimately, the optimal solution is collaboration – utilising contractor knowledge and pre-construction services at an early stage, and benefitting from their early involvement



The importance of project schedule integrity

The Linesight approach to schedule quality assurance ensures that Project Managers are confident that the data and information is of sufficient quality to make effective business decisions.

by **Anthony Canipa**, Senior Planner

The project schedule

Today, there are numerous software tools available to manage schedules, which are relatively easy to operate and allow for the creation of well-presented and aesthetically pleasing schedules. Yet here lies the problem, despite appearing credible, schedules can misrepresent the true structure and intricacies of a project, and be underpinned by no sound logic.

Project Managers are often not aware of the technical deficiencies that can render the schedule data flawed. The layers of complexity of a schedule can be underestimated and the risk of operating schedule software without sufficient scheduling knowledge, experience and quality control can be erroneously overlooked.

The schedule is a dynamic document and it is inevitable that it will change and evolve from an agreed baseline across the course of a project. Constant variations in the schedule, as it is progressed, single-handedly provide a challenge for a Scheduler to maintain schedule integrity. Couple this with formal change incorporation and the Scheduler has a major challenge to maintain the quality of the deliverable.

Experienced Schedulers will recognise the need for a schedule governed by standards and best practices which enforce quality, providing assurance that scheduling information can be relied upon. On any project, it is imperative that the expectations regarding schedule quality are communicated from the outset, ensuring that quality is established when the first baseline is set, and schedule integrity validated and maintained thereafter.

The Linesight approach

Linesight do not just review a schedule for the forecast finish dates and major milestones. In addition to ensuring that a schedule accurately represents project scope and delivery strategy, our approach questions schedule construction, credibility and conformance to recognised best practices.

A process referred to in Linesight as a 'Schedule Health Check' (SHC), is the method by which schedule integrity is measured, predominantly involving the use of statistical data and analysis.

Our Global Planning Team undertakes SHCs on all of our projects, and these form the foundation of all Linesight scheduling processes that follow.

The justification is simple – a schedule of sound quality underpins every other aspect of schedule analysis including:

- Delivery performance analysis
- Critical path analysis
- Earned value analysis
- Schedule quantitative risk analysis
- Time-delay impact analysis

Without confirmation of schedule integrity, all schedule outputs can be easily discredited, deemed invalid and result in a loss of schedule confidence, which can be impossible to recover from.

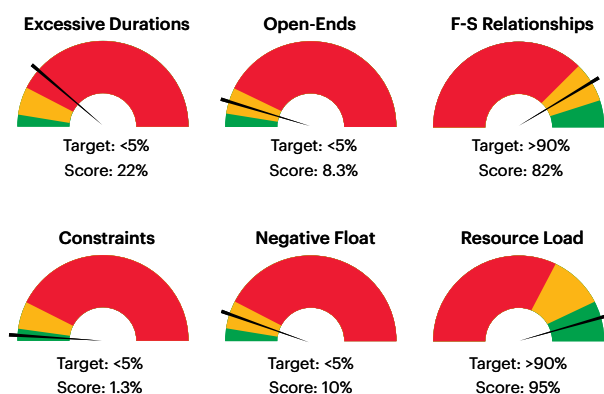
The Schedule Health Check (SHC)

The Linesight SHC is a documented procedure that all of our Schedulers follow globally, maintaining quality and consistency in our practices, irrespective of project or location.

The SHC is based around the 'DCMA 14-point assessment', an approach which was developed by the United States Department of Defense and evaluates schedule conformance to a prescriptive list of criteria, all of which measure norms and thresholds.

A few examples of areas analysed by the assessment include:

- Activity relationships and logic
- Constraints and float levels
- Abnormal durations
- Software and calendar setting
- Resource allocation



Linesight procedures enforce a level of schedule interaction that requires our team to have truly investigated the dynamics of a schedule. Utilisation of multi-user software applications allows our Global Planning team to provide consultation worldwide, ensuring we have business unit expertise to support any project. In addition, Linesight processes recognise industry best practices which are endorsed by professional bodies worldwide including the Chartered Institute of Building (CIOB), AACE International, the Association for Project Management (APM) and the Project Management Body of Knowledge (PMBOK).

The future

Be under no illusions – a better schedule will not single-handedly deliver project success. Nonetheless, avoidable errors within schedules are likely to hinder decision-making and the delivery of project objectives.

In 2011, a study of 35 Capex projects¹, (US\$15 million-US\$30 billion) identified a positive correlation, with 60 percent confidence, that schedule quality drives project execution, corroborating the importance of the scheduling practice.

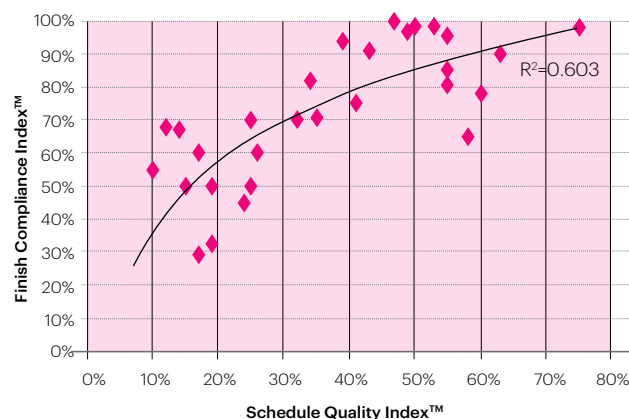


Figure 1 – Correlation Between Schedule Quality Index™ & Finish Compliance™ Index

In support of our clients, we continue to drive and support scheduling practices through improved methodologies, education and reforms that administer greater schedule quality control.

Our aim is to ensure that Linesight Schedulers can provide schedule information of a validated quality, which can assist clients in making the best business decision possible at a given point in time.

1. Patterson, D. & Choi, J.O. (2011) 'Does Better Scheduling Drive Execution Success?'

Trends in Safety Management

Construction is a business where change is the business. Recent trends and changes are set to significantly affect the industry.

by **Niall Harrington**,
Managing Director, Safety Management

We live in a changing world, or so the saying goes. Nowhere is that more true than the construction industry. Construction is a business where change is the business. The impact of change, and failing to manage this, affects construction like no other. A single accident can destroy a business – not just in human terms, which is tragic, but in the cold commercial reality in which every business and employer operates. Fines, adverse publicity and court prosecutions, both for the company and the individual manager involved, can be devastating and very difficult to recover from.

It is a truism to state that good Safety Management is simply good management. What is less well understood is the inevitability of accidents as a result of poor safety planning. Safety incidents will occur, if not on the current project, then potentially on the next. It is vital to keep on top of health and safety trends, and how they will affect you. Some of the recent and forthcoming changes include the following:

Safety legislation and personal liability

In recent years, the industry has seen an increasing trend of court prosecutions moving to include the personal liability of directors and senior managers.



Not everyone is aware of these requirements, nor of the language used to describe these duties, but they should be. The fundamental rule in the corporate world is that if you possess a legal duty to do something, then you need to be aware of this duty and able to demonstrate that you have discharged it. Most of us have very specific duties – possibly more than we are aware, for example, as employer, employee, designer, contractor, client, landlord etc.

Technology

The landscape of how we manage safety is also in flux. Building Information Modelling (BIM) is only one aspect that is having both a direct and an indirect effect on Safety Management. When properly used, BIM can significantly improve the way that safety can be managed during both design and construction, through mapping out the layout and sequencing by which the works can be constructed. 'Buildability' from a design perspective not only makes commercial sense in reducing waste, but is a specific legal responsibility of everyone regarded as a 'Designer' under construction safety legislation. Building in safe access for future inspections and maintenance is another key benefit.

BIM can also improve safety by charting and communicating information on buried services for future excavation works. In other areas, companies are using virtual technology to deliver safety training and offline inductions, and to demonstrate competency requirements for specialist workers, thereby reducing resources and time spent on-site.

Behavioural safety

Contractors can, and do, expend huge resources on Safety Management, building a safety culture and communicating the 'safety message'. The enormity of this challenge should not be underestimated, particularly when you might be dealing with hundreds of employees, each with their own particular mind-set. How does a senior manager communicate with the operative of a subcontractor or even a 'sub subcontractor' effectively? One-to-one micromanagement is neither feasible nor desirable.

Behavioural safety training programmes of some description are now commonplace across many projects. Not all are effective, and most are in addition to existing safety training, as well as being supplemented by additional safety enhancements. Trends in safety posters, for example, have focused very much on the emotional aspects of a serious accident, by concentrating on the impact on loved ones following a workplace fatality. Ultimately, the means by which the message is communicated must also evolve. There is far too much emphasis on PowerPoint, for example, and workers are increasingly switching off from the latest 'Toolbox Talk' or 'Safety Training Module'. More effective means of

communication are increasingly needed. Alternative methods can include role playing, as well as analysis and images from other serious accidents.

Modular construction

Modular construction or prefabrication off-site is not new, but is becoming increasingly popular on large construction projects. The advantages are obvious; off-site construction can reduce risk on-site and reduce the timescales involved. There can be significant challenges however. Often the risks are merely transferred from the main construction site to other work areas – possibly areas where safety is not as well-managed and legal responsibilities can be blurred. While 'control' of a work area can define responsibility for Safety Management, such works may well form part of an overall 'project' as defined by construction safety legislation. Legislation in Ireland, for example, includes a specific duty of care to non-construction personnel including members of the public, visitors etc.

Occupational health

While legislation, procedures and policies have concentrated on physical safety, occupational health-related issues have assumed much greater importance. Often described as 'accidents in slow motion' due to prolonged exposure over time, they are arguably more difficult to identify and therefore manage. Health-related injuries can range from exposure and inhalation of silica dust, to musculoskeletal injuries and occupational stress. As with every other works-related activity, they must be identified, assessed, managed and controlled. Accurate risk assessment is more important here than in the case of many other risks, not least in regard to the range and nature of the activities involved. Communication, training and consultation are vital elements in effective risk assessment, as is the knowledge and awareness of the risks involved.

The industry has seen an increasing trend of court prosecutions moving to include the personal liability of directors and senior managers

EU public procurement rules

The key changes and their implications.

by Terence Woulfe-Flanagan



The EU, in 2014, adopted three procurement directives; the Public Sector and Utilities were replacements and a new directive specifically for Concessions. The aim was to make public procurement less bureaucratic, have better access for SMEs, increase the emphasis on social, sustainable and environmental considerations, embrace new technology and have explicit rules for principles established by significant case law. EU States had until the 18th April 2016 to bring the new rules into national law. Ireland published its regulations for Public Sector and Utilities on the 5th May 2016, but these were applicable from the 18th April. It has yet to publish regulations for Concessions; however the mandatory provisions of the directive apply from the 18th April 2016 by “Direct Effect”.

The new rules, with the exception of the rules on modifications to tenders or contracts, do not apply to existing procurements (defined by the advertisement being published, or bidders being contacted for offers, before 18th April 2016).

The significant changes include:

Market consultation

Pre-tender market consultation is clarified with emphasis on better procurement outcomes whilst maintaining equal treatment of bidders.

Opportunities for SMEs

Encouraging SME participation in public procurement by capping the minimum turnover requirement to twice the contract value and encouraging splitting contracts into lots with a requirement to “Do or Explain” the decision.

Electronic procurement

Procurement communication, with some exceptions, must be electronic with procurement documents available by Internet access on a 24-hour basis.

Different rules for authorities that are not part of central government

Non-central government agencies have added flexibility in the rules relating to their procurements.

No distinction between Part A and Part B services

The distinction between Part A (fully regulated) and Part B (partially regulated) services has been removed.



Dublin Airport Air Traffic Control Tower

“Light touch” procurement

There is a new “Light touch” regime that applies to health, social and specified other services some of which were formerly Part B services. These generally have to exceed a new threshold of €750,000 before being subject to rules which are less onerous than the full EU procurement rules.

More grounds for exclusion of applicants and bidders with self-cleaning provisions

There are additional grounds for mandatory and discretionary exclusion. Most grounds for exclusion are now subject to expiry times. Persistent poor contract performance, resulting in serious sanctions, may now trigger an exclusion. A new provision however, affords applicants/bidders an opportunity to self-cleanse in relation to some grounds for exclusion and, if they do so successfully, they may not be excluded for that particular reason. The purchaser may also run checks during the procurement process to see if bidders are in a position that should result in their exclusion. Again self-cleansing provisions apply.

Conflicts of interest

There is greater emphasis on addressing conflicts of interest.



The UCD Club, Dublin 4

- **Procurement routes**

There are new award procedures for Innovation Partnerships and revised rules for Competitive Dialogue and Competitive Procedure with Negotiation, whose rules are now more flexible with greater scope for their use. Interestingly in the Competitive Procedure with Negotiation, the final tender round may not be subject to negotiation. There is also now an Accelerated Open procedure as well as the existing Accelerated Restricted procedure for urgent procurement.

- **Timescales**

Shorter minimum timescales for tenders and expressing an interest in tendering.

- **Availability of procurement documents**

Full suppliers' access to procurement documentation is required from the date the Contract Notice is published or the sending of an invitation to confirm interest. This significantly changes existing practice for all but the Open procedure.

What does this really mean? The UK Crown Commercial Service suggests that the term "procurement documents" changes at different

stages of the procurement process. It also suggests more of the documents, falling within the wide definition of procurement documents, should be generated and therefore supplied but that at the very early stages of the procurement, fewer of the documents, if any, would be included. This appears to support the purpose behind this regulation that potential bidders should have sufficient information to decide if they wish to participate in the procurement.

- **Selection and award**

Self-declaration to confirm satisfying the procurement's qualification requirements, including using the new European Single Procurement Document. Generally only the bidder being considered for award of contract will be required to submit documentary evidence as proof. Purchasers may, however, require such evidence from all applicants who have been short-listed to tender in a two-stage competition.

All contract awards must be based on "most economically advantageous tender", using a cost-effectiveness approach, for example life-cycle costing, and may include best price-quality ratio. Ireland has not implemented



For suppliers, the level of bureaucracy is reduced and there should be better access to procurement opportunities for SMEs

using environmental and social considerations such as the employment of job-seekers etc. The award stage may now address the qualification and experience of key personnel where such quality could have a significant impact on the level of performance of the contract.

There is a duty to investigate tenders suspected of being abnormally low, but no duty to exclude an abnormally low tender unless it is found that such pricing is due to breaches of environmental, social or labour law.

- **Rules arising from case law**

Rules permitting contract modifications to tenders and contracts have been codified. Safe Harbours, within which change is permissible, have been created for purchasers, some of which require publication of a standard OJEU notice.

the option to prohibit the use of price-only or cost-only as an award criterion. There is also greater emphasis on

Rules exempting from the regulations contracts between public authorities and joint procurements by public authorities (Teckal and Hamburg case exemptions) have been codified.

- **Framework agreements**

There is now a provision for a “hybrid” call off process providing for both direct award and mini-tender competitions in multi-supplier frameworks.

- **Records and reporting**

There are considerably more onerous, and effectively real-time, record keeping and reporting requirements. The justification for decisions taken at all procurement stages must be included.

There are clear benefits in the new regime for both purchasers and suppliers. For purchasers there are wider choices of approach and greater scope to use negotiation and the helpful codification of case law. And there are added benefits for public purchasers who are not part of central government. For suppliers, the level of bureaucracy is reduced and there should be better access to procurement opportunities for SMEs.

The NEC3 contract philosophy; collaborative and proactive

NEC3 is a less adversarial contract, and can offer distinct benefits to particular projects.

by **Willie Aherne**, Director

The NEC3 contract is widely used throughout the public sector in the UK, and is seen by many involved in the construction industry as a less adversarial contract. Aspirations for its use grew considerably after the publication of landmark reports such as Constructing the Team (Latham 1994), Partnering in the Team (CIB 1997) and Rethinking Construction (Egan 1998). While only a handful of projects are using the NEC3 contract in the Republic of Ireland, it is the contract of choice for the public sector in Northern Ireland.

Linesight is currently involved with a number of large infrastructure projects which use the NEC3 Engineering and Construction Contract ('ECC') form of contract. Within this, there are six main options available, including:

- A: Priced contract with activity schedule (lump sum)
- B: Priced contract with bill of quantities (re-measurable)
- C: Target contract with activity schedule
- D: Target contract with bill of quantities
- E: Cost-reimbursable contract
- F: Management contract



The contract is comprised of core clauses (for each main option) used in conjunction with secondary options and other additional conditions of contract. Employer conditions are captured in the contract data and Z clauses.

The principal differences between the options are essentially the level of risk transfer between the contractor and employer, and the payment mechanism.

Option A includes an activity schedule detailing the list of activities that the contractor must complete in order to provide the works. Each activity is priced by the contractor as a lump sum. With option B, a bill of quantities is used and the employer pays for work done on the basis of actual measurement of items with quantities.

Options C and D are target based, which use open book cost reporting. They contain a contractor's share clause, with cost overruns and savings shared between both employer and contractor in a prescribed manner. Open book contracts require extensive contract administration and cost reporting systems.

Option E is cost reimbursable, which is suitable for projects that are difficult to specify. Option F is a cost reimbursable management contract whereby the financial risk is taken largely by the employer.

Looking at the administration pertaining to the NEC3 contract, the Project Manager manages the contract on behalf of the employer, and is authorised to issue instructions, notifications and other communications required under the contract. The role of the Supervisor in NEC3 is independent to the Project Manager and his/her sole responsibility is checking compliance with the works information, undertaking tests and inspections, and issuing defects certificates.

While cost-related duties are the responsibility of the Project Manager under NEC3, these are usually undertaken by a Cost Manager. A Cost Manager will therefore be directly or indirectly involved in valuations, measurement, claims for loss and expense, and for variations on a project.

NEC3 requires the employer, contractor, Project Manager and Supervisor to act in a spirit of mutual trust and collaboration. The contract has a sharp focus on proactive management of risk in addition to allocation. While this is onerous from a contract administration perspective (as it requires risk registers, risk reduction meetings, early warning notifications,



etc.), it is regarded as being highly effective from a cost and program management point of view. For example, early warning clauses require both contractor and Project Manager to notify each other of events or factors which could impact on cost, time or quality, resulting in potential contractor's claims being communicated and dealt with promptly. This compares with the reactive nature of some other contract forms, where an actual risk must have occurred before an obligation is put on the contractor to report it.

The contract deals with compensation events for time and cost together while other contracts may treat them independently. Also, under NEC3 there is a duty to notify of an underlying event or circumstance, which contrasts with other contracts, whereby a duty exists to notify of an entitlement to additional time or money.

The program is a central feature of NEC3 where there exists a concept of an 'Accepted Programme'. The employer sets the frequency by which the contractor must submit initial and revised programs with financial penalties for late submission. The Project Manager is required to accept or reject the program and once accepted, it is used as part of change management, progress monitoring, early warning notification and compensation events assessment.

In essence, the NEC3 contract differs considerably from others in its philosophy. It can have significant advantages, particularly in relation to the achievement of cost certainty and on-time completion. While administration costs may be greater than that of other contract forms, the proactive nature of the NEC3 contract should allow client organisations to promptly deal with issues as they arise, in a collaborative way with the contractor, leading to a successful project delivery.

The NEC3 contract can offer distinct benefits to construction projects, as a less adversarial contract form

Bigger, faster, cheaper

As data traffic and the demand for data storage continue to grow exponentially, the hyperscaling trend is throwing up unique requirements and challenges.

by **Neil Vaughan**, Director and **John Butler**,
Managing Director Asia Pacific

With data traffic growing at 28 percent per annum, and data storage requirements at 40 percent¹, it is not surprising that the big cloud operators have been building everything bigger, and wanting it ever-faster. In 2016, this appetite led not just to big capex spends, but also to a major shift towards the lease space market.

Amazon, Microsoft, Google and IBM comprise over 50 percent of the cloud, and the first three between them invested US\$26 billion in 2015², largely in new hyperscale data centers – campuses with 100MW+ potential installed capacity.

This trend is set to continue as the demand increases which have been forecast, materialise, and the number of global hyperscale data centers is predicted to rise from 300 at present to around 485 by 2020.

So, seemingly all rosy in the garden for the industry, but fluctuations at this scale of growth lead to big headaches. It takes a site-based workforce of around 1,000 people to build one of these projects, and its duration will span anything from two to ten years, depending on how the phases are timed.

That can mean mobilisation and demobilisation several times on one campus – not easy where skill shortages are already appearing as the economic tide rises around the world. Workforces are quick to move to other locations and other sectors, dissipating hard-won experience in doing so.

For the owner / operator, the unpredictability leads to volatility in demand forecasted, and makes short-term investment planning very difficult. More than one of the big operators has scaled back capex plans this year, awaiting a little bit of a catch-up.

Traditionally, lease space has been the flex play in the cloud operators' game plan, offering shorter time-to-market (TTM), which is attractive in this fluctuating demand scenario. By developing sites to a pre-prepared stage as a grey box awaiting fit-out, or at least as a stoned and compacted site with utilities connected, the lease players have long been adept at rapid installation and power-up.

It also offers off-balance sheet options, sometimes attractive to investors. Fewer internal resources are tied up in its acquisition (no internal engineering team required), and simpler, frills-free specifications can deliver genuinely lower infrastructure build costs.

Despite the push for bigger and faster, cost remains a significant factor, as each of the big players eye up their competitors' cost base

However, the large take-up of lease space has attracted new players and stretched the resource base, questioning whether shorter TTMs will actually materialise. Whilst in theory the delivery risk has been transferred, no amount of liquidated damages will bring a delayed schedule back on course, and if milestones are missed the leasee carries the can.

Modularisation is back (if it ever went away) as a trend for 2017, the idea being to sequentially build out these hyperscale data centers in sensible, repeatable lumps, benefiting from procurement and design savings, whilst spreading the delivery timing. As everything has gotten bigger, the data center in a container has been outgrown, but containerised and modularised switchgear, generators and UPS equipment have become very interesting.

Lean construction strategies dovetail nicely with this off-site fabrication approach, so more of that will be seen, as well as a bigger role for the integrator of these different equipment elements.

All of this demand for more data ultimately leads to demand for more power, and several locations are feeling the pinch. Sites with direct access to 400kV power circuits, the super grids of the host countries, are the smart places to be; even the 220kV circuits in urban settings are no longer offering the security of supply at the required capacity that would have been perfectly acceptable five years ago.

Despite the push for bigger and faster, cost remains a significant factor, as each of the big players eye up their competitors' cost base. It is notoriously difficult to compare like with like, but whether the capex cost per MW is \$10 million or \$7 million, it will never be low enough. However, data centers are like a box of chocolates – the fancier they are, the more they will cost.

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1. Cisco Global Cloud Index
 2. MarketRealist.com



Life Sciences – a constantly evolving market

‘Big Pharma’ is evolving towards a more integrated approach in its real estate strategy, and the Project Controls team is playing a fundamental role in this.

by **Joe Cusick**, Projects Director

In recent years, our Life Sciences clients have been focused on streamlining their operating model and looking for efficiencies in every part of their business. This mantra of increasing efficiencies to maximise returns has also influenced the way in which ‘Big Pharma’ executes its real estate strategy. More and more we are seeing these clients move away from a fully outsourced model and traditional project execution strategies. In recent times, our Pharma clients have explored lean construction and Integrated Project Delivery (IPD) methods, while bringing more of the pre-construction expertise back in-house.

These innovative construction delivery models impact the role of consultants as well as contractors, meaning that we all need to be as agile as our clients. Lean construction looks to minimise waste and increase efficiencies in the construction process, with the stated intent of maximising value to the client and increasing speed to market – both key concerns in the highly competitive Life Sciences sector.

The role of Project Controls in this collaborative environment

With these new project delivery methods, clients are engaging with contractors at an earlier stage – relying on them to carry the load of pre-construction activities and drive through design development with the Design team. However, this collaborative environment still has a place for the Project Controls team. As the pre-construction process becomes more involved and intense, the need for the client to have an expert advisor in place to monitor the process and to challenge / validate project costs, schedule and risks as the design evolves increases. Having the Project Controls consultant there as a challenging partner enhances the pre-construction process; providing constructive advice concurrently with design development and maintaining a focus on the outturn impacts of the design decisions being made.

Equally, the post-contract role is evolving away from the traditional cost and schedule “confrontation”.

As our clients' processes change and evolve, the services that we, as consultants, offer need to do the same. Traditional cost and schedule skillsets, while still relevant, need to be enhanced with new, innovative ways to approach service delivery and project advice. Our post-contract role is constantly evolving, and we strive to promote innovation in processes, tools and the presentation of information.

'Big Pharma' is moving away from a fully outsourced model and traditional project execution strategies towards lean construction and Integrated Project Delivery (IPD) methods

is also streamlined by having one project cost report managed by Project Controls, which is fed by inputs directly from all project team members, including the contractors. The Project Controls team works collaboratively with all team members, and has transparency and visibility to all costs from all team members. This is a major evolution from the traditional set-up where everyone jealously guards their information, multiple project reports are produced and there is a lack of trust and co-operation within the team. In many instances we have found ourselves being engaged by both the client and the Integrated

The lean approach to the post-contract effort usually means scaling back the size of the team, minimising or eliminating duplication of effort, and streamlining the reporting deliverables. We have seen this evolve to where there is one master schedule being managed by Project Controls, with multiple sub schedules feeding in to it. Cost Management

Project Delivery (IPD) partners to co-ordinate and facilitate the timely flow of information. Being in this core position, engaging and collaborating with all parties is our target role within this new project environment.

The onus is on the consultant to better understand the client and what their drivers are. Furthermore, it is necessary to engage with them at the right level – recognising what the stakeholders and end users need from their investment. This will lead to us climbing the value "ladder", becoming true consultants and subject matter experts and providing our clients with pro-active, constructive advice in a timely manner; allowing clients to make informed decisions regarding their investment. This is a challenge that Linesight embraces on all our Life Sciences and other complex projects.

Looking forward

Clients are looking for their partners to bring more value to their projects – new implementation models are challenging contractors and designers to produce more innovation and to drive projects to success from much earlier in the project lifecycle. This allows consultants to provide value in advance of the construction phase, when the cost of change is incrementally lower and much more impactful. All too often project controls arrive on a project when procurement is under way and design is charging ahead – there is less value in minimising the cost of changes from this stage. The focus must now be pivoted towards early engagement, in order to allow a Project Controls team provide the true value of having them on board.



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Linesight's dynamic work pace is balanced by a collaborative environment, where everyone is given the support they need to develop both professionally and personally.



"There is a sense that the employees are playing a part in the future of the company. Senior management also are open to opinions and ideas from staff and encourage input and participation in strategic planning for the firm."

John O'Sullivan
Senior Project Manager

"I'm on the Linesight Scholarship Program studying for a BSc in Cost Management and Construction Economics at DIT Bolton Street. A five year part-time course, I work four days a week and spend the fifth day in college. It's a great opportunity for me and the practical skills and experience I learn in work will give me an enormous advantage when I qualify."

Michael Mellows

Trainee Cost Manager





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