

Best Practice Exemplar Nomura London

The UK's Largest LED Lighting Project

Presented by
Roger Dangell & Peter Le Manquais



WILA



Content

- Introduction
- Project Background
- Project Challenges
- Trading Floor Lighting Solution
- Lighting Options
- Challenge of LED Solution
- How well did it work.
- Questions



Introduction

- Who are MEIT Associates
- Why were we involved
- What was our role



Project Background

- Collapse of Lehman Brothers
- Overnight Growth of Nomura
- Need for Larger HQ Building
- Building Search
- Challenges

Size - > 500,000sqft

Location

Trading Floor Space

Programme



Project Challenges

- High Quality
- High Resilience
- Sustainable Solutions
- Cost
- Expansion
- Flexibility
- Blending East & West
- Programme



Trading Floor Design

- Design Team – TTSP & MEIT
- Size of Floor Plate
- Occupation Density
- Cooling Solution
- Flagship Status
- Ceiling Solution
- Lighting Design



Trading Floor Lighting Design

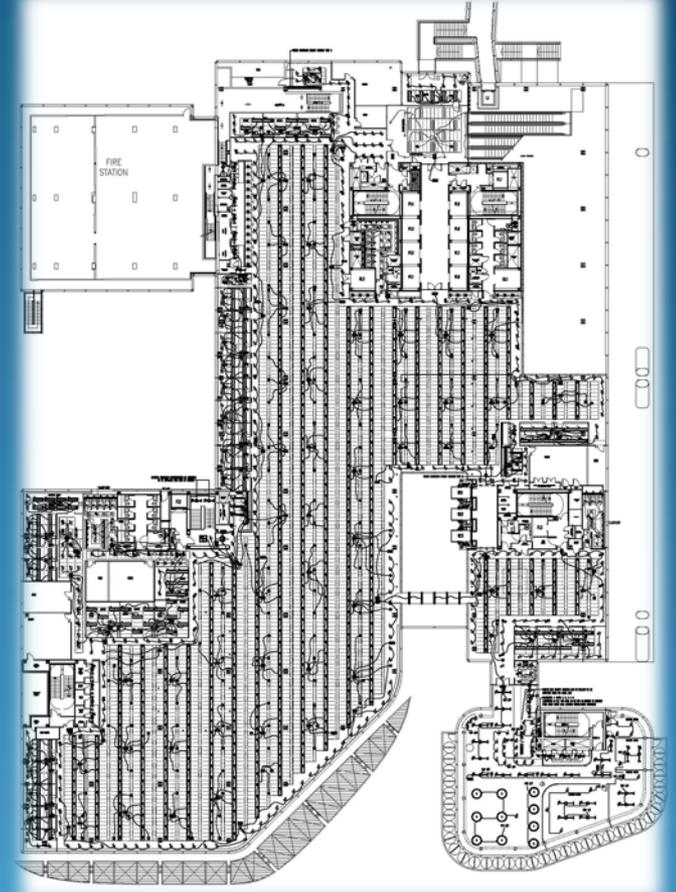
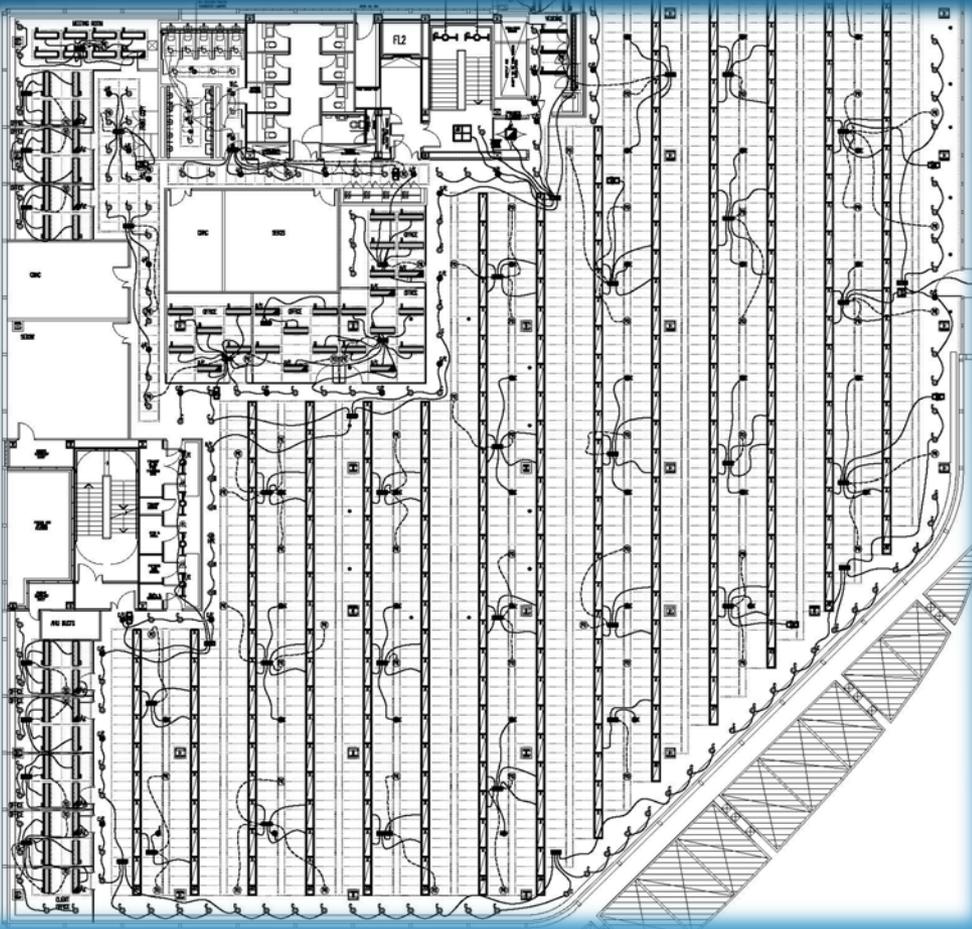
- Mega Panels
- Continuous Linear Feature
- Material selection
- Lamp Selection
- Lighting Levels
- LED Challenge (2009)



Challenge of Being First

- Feasibility
- Bench Marking
- Manufacturers
- Convincing Ourselves
- Convincing the Client
- USPs
- Programme & Cost



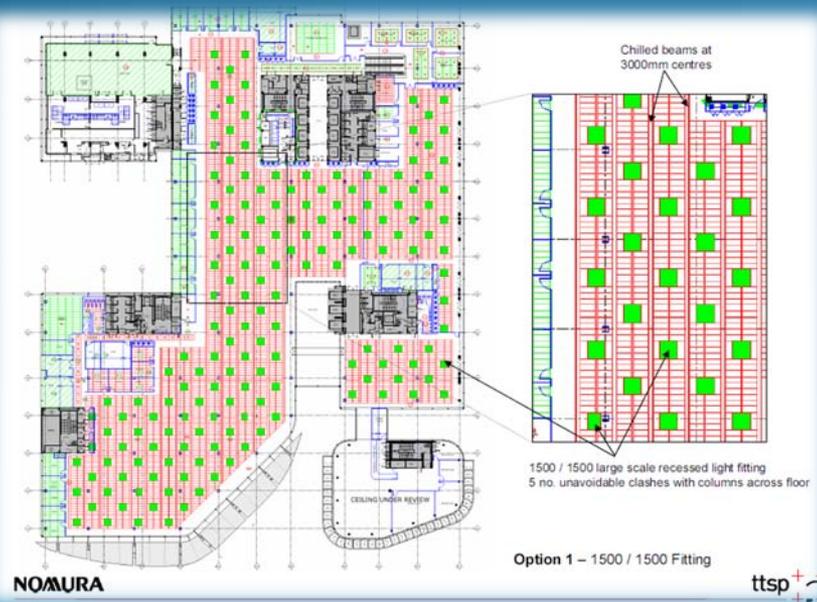


WILA



Trading Floors – October 2009

- WILA were presented with 2 lighting options
 - Large format Luminaire



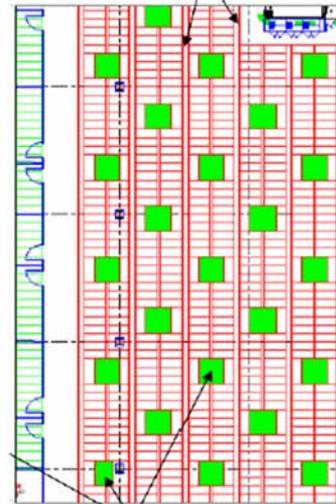
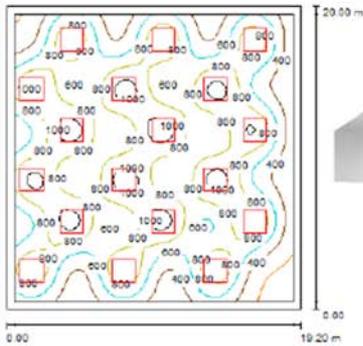
Trading Floors

- WILA were presented with 2 lighting options
 - Continuous Lighting



Trading Floors – initial calculations

Dealer Floor - 1500 x 1500mm skylight / Summary



Height of Room: 3.050 m, Mounting Height: 3.150 m, Maintenance factor: 0.80

Surface	ρ [%]	E_{ref} [lx]
Workplane	/	706
Floor	20	541
Ceiling	70	131
Walls (4)	50	270

Position of surface in room:
Marked point: (7.500 m, 9.500 m,
0.750 m)



Grid: 16 x 16 Points

E_{av} [lx]	E_{min} [lx]	E_{max} [lx]	u_0
888	652	1103	0.735

No.	Pieces	Designation (Correction Factor)	Φ [m]	P [W]
1	18	WILA Lighting Limited Triple Layer SKYLIGHT-FROSTED ACRYLIC 1500MM X 1500MM RECESSED (1.000)	26400	302.0
Total:			475200	5436.0

Specific connected load: 14.16 W/m² = 2.01 W/m²/100 lx (Ground area: 384.00 m²)

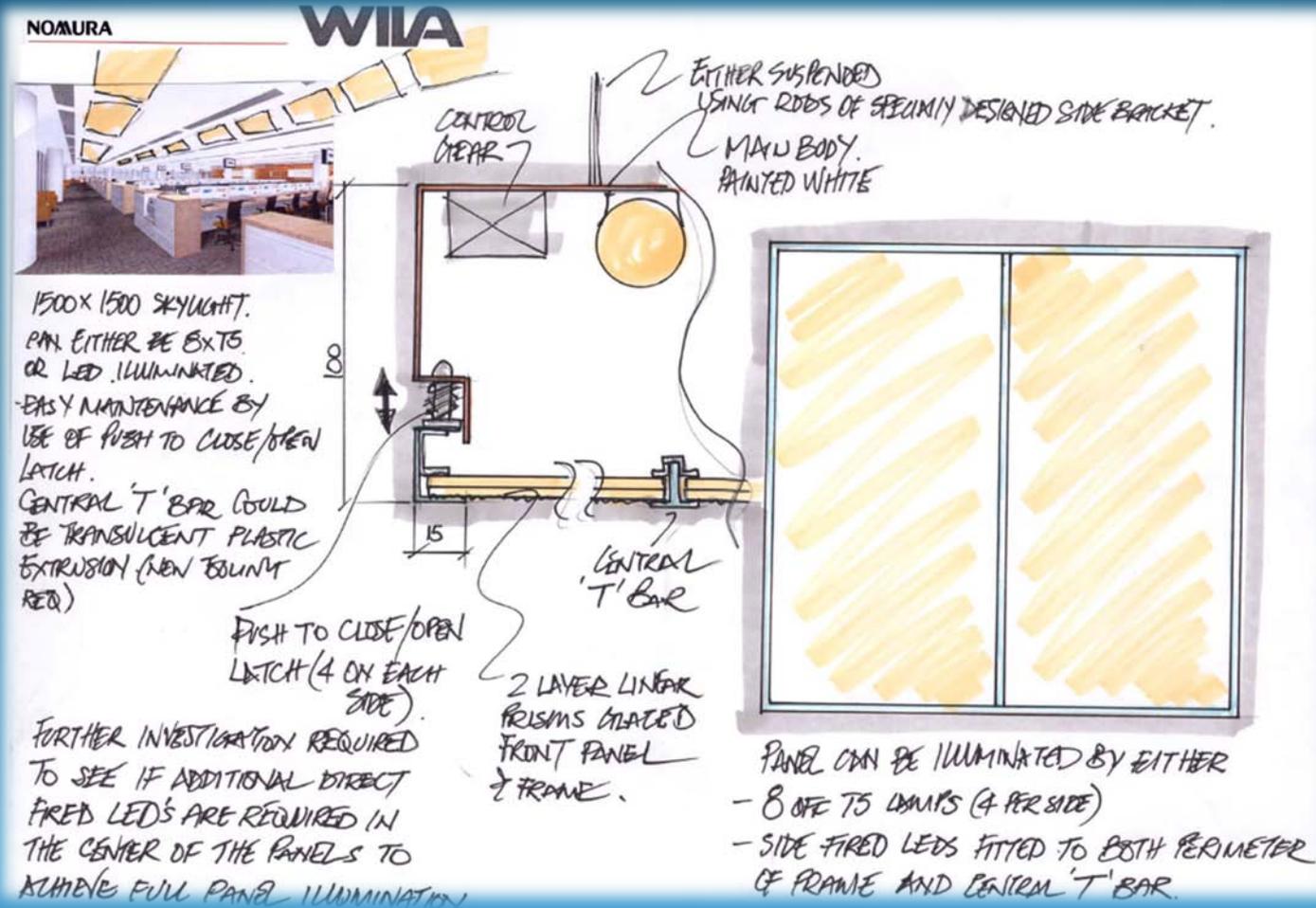
NOMURA

WILA

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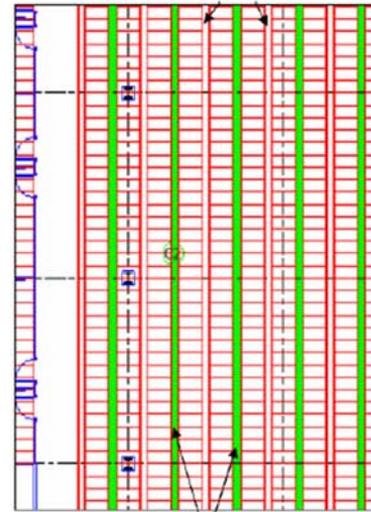
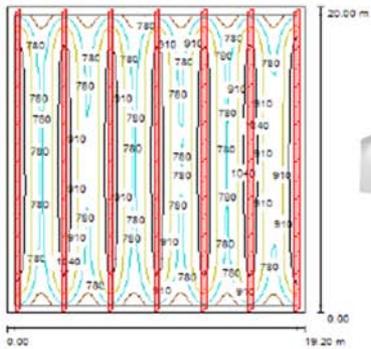
MEIT

Trading Floors – Product Options



Trading Floors - initial calculations

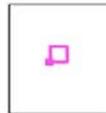
Dealer Floor - 300mm wide 28W T5 overlapping / Summary



Height of Room: 3.050 m, Mounting Height: 3.130 m, Maintenance factor: 0.80

Surface	ρ [%]	E_{av} [lx]
Workplane	/	904
Floor	20	866
Ceiling	70	177
Walls (4)	50	385

Position of surface in room:
Marked point: (7.500 m, 9.500 m,
0.750 m)



Grid: 8 x 8 Points

E_{av} [lx]	E_{min} [lx]	E_{max} [lx]	$u0$
935	764	1107	0.806

No.	Pieces	Designation (Correction Factor)	Φ [lm]	P [W]
1	224	WILA Lichttechnik GmbH LI1000-53 Linic 150, Deckenanbauleuchte, Mikropriismenscheibe (1.000)	2600	30.0
Total:			582400	6720.0

Specific connected load: 17.50 W/m² = 1.93 W/m²/100 lx (Ground area: 384.00 m²)

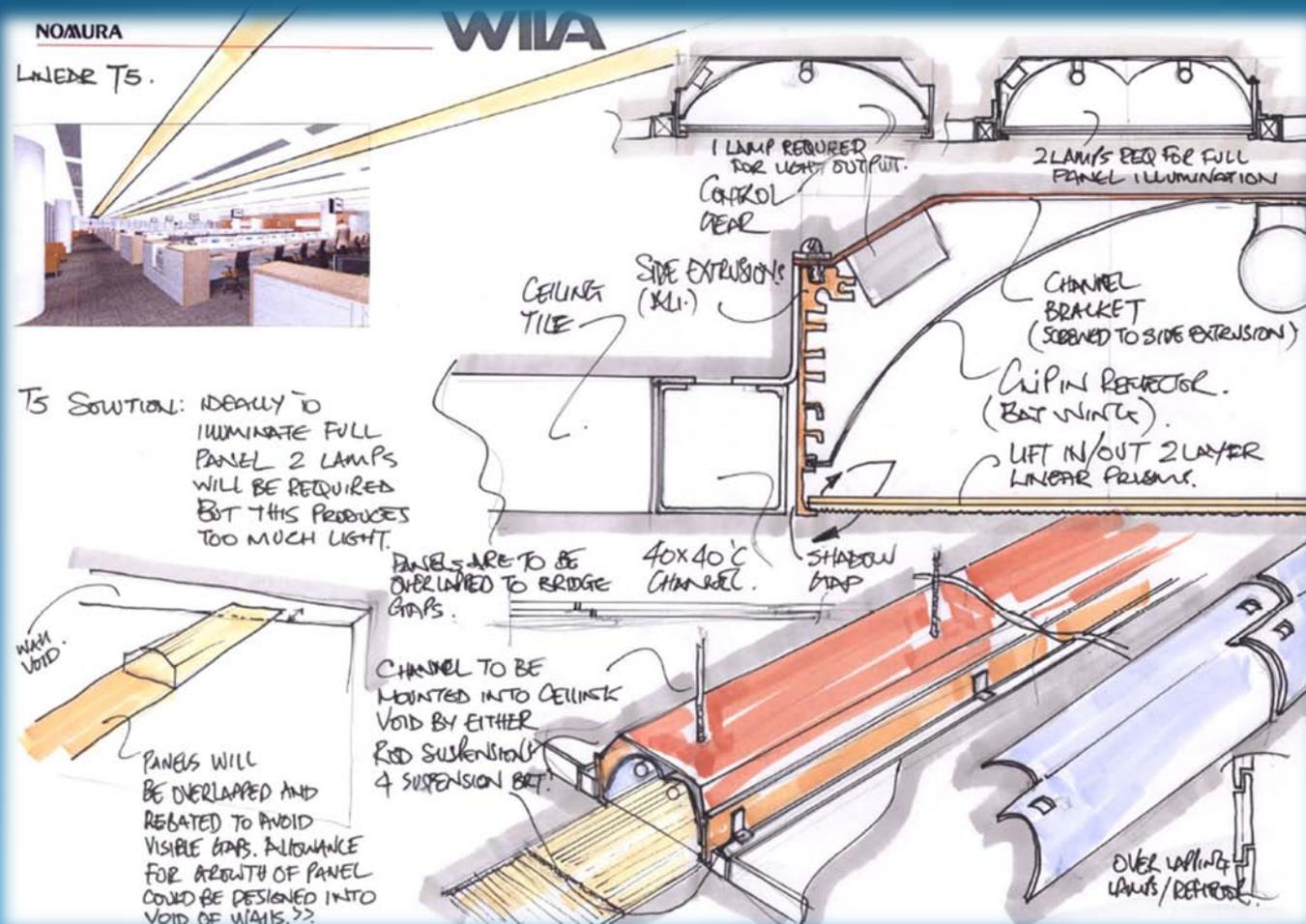
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WILA

WILA

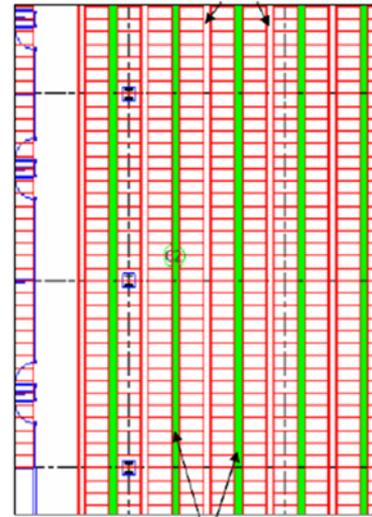
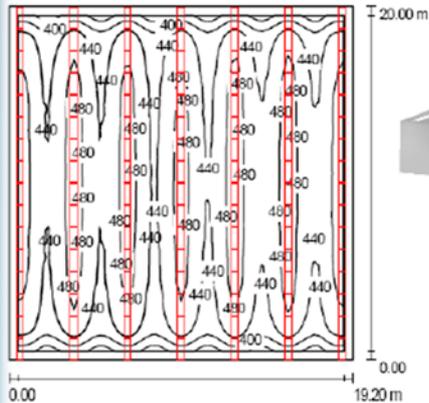


Trading Floors – Product Options



Trading Floors – Initial Calculations

Dealer Floor - 380mm wide LED's / Summary



Height of Room: 3.050 m, Mounting Height: 3.130 m, Maintenance factor: 0.80 Values in Lux, Scale 1:257

Surface	ρ [%]	E_{av} [lx]	E_{min} [lx]	E_{max} [lx]	$u0$
Workplane	/	454	338	501	0.745
Floor	20	429	283	472	0.860
Ceiling	70	89	68	183	0.767
Walls (4)	50	256	119	1032	/

No.	Pieces	Designation (Correction Factor)	Φ [lm]	P [W]
1	112	add luminaire description if desired (1.000)	2000	26.0
Total:			224000	2912.0

Specific connected load: $7.58 \text{ W/m}^2 = 1.67 \text{ W/m}^2/100 \text{ lx}$ (Ground area: 384.00 m^2)

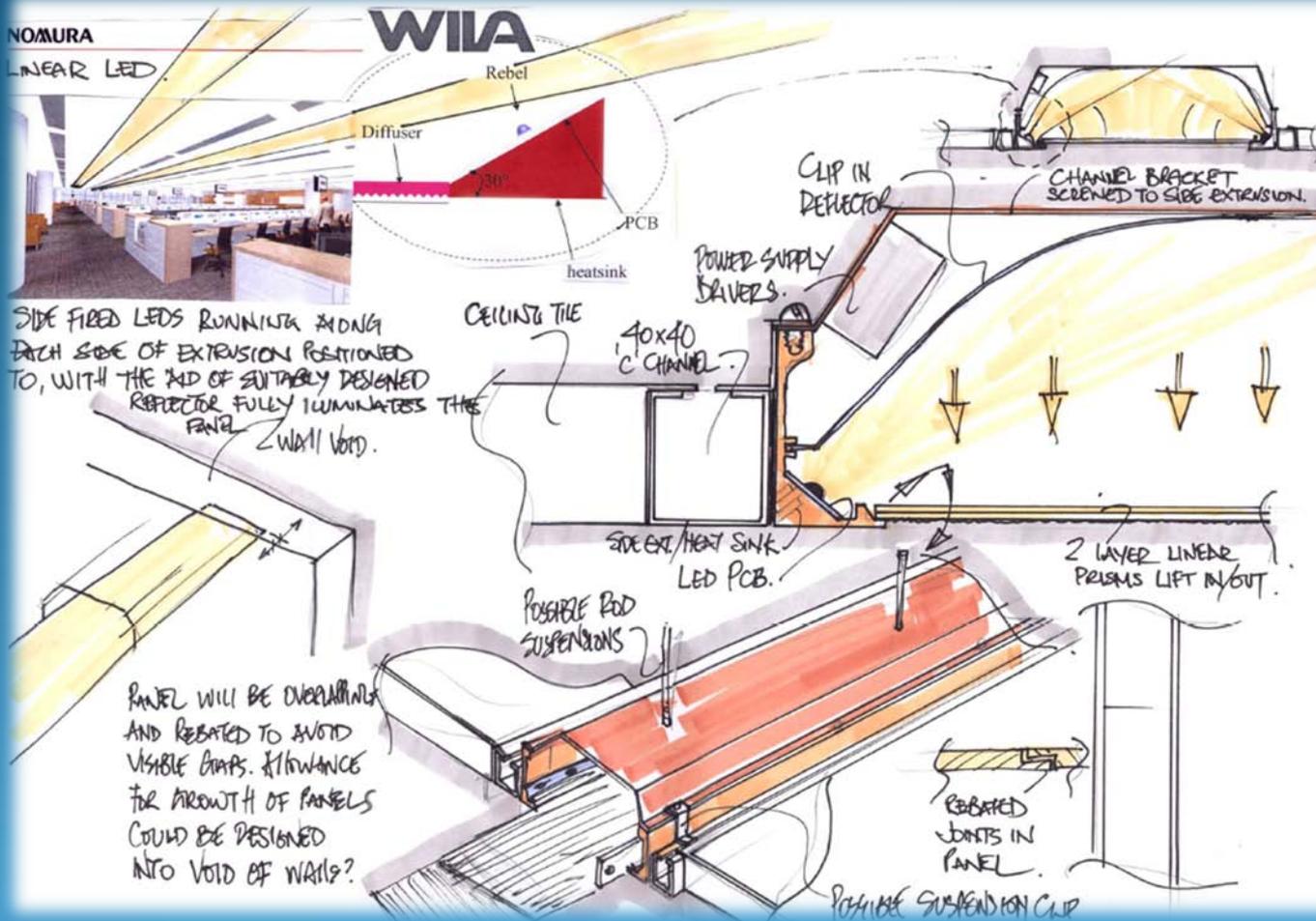
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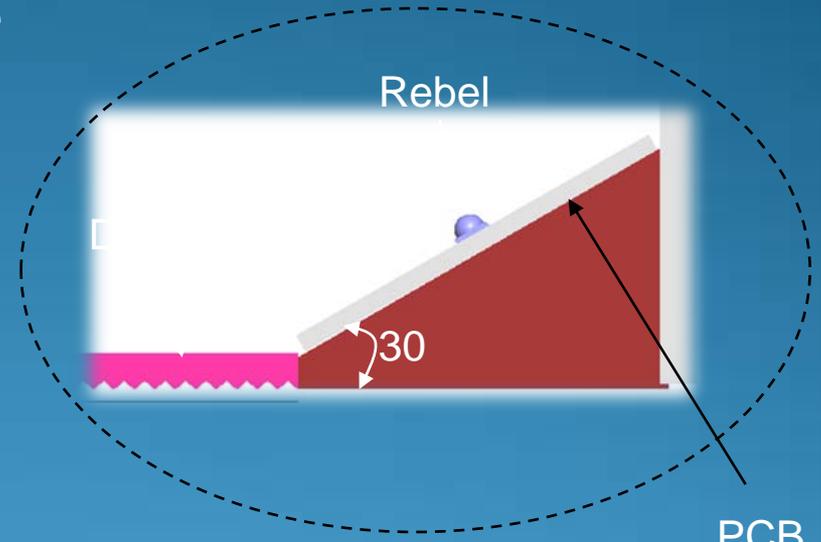
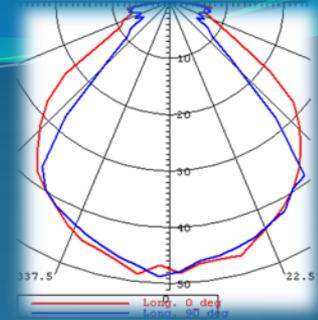
Trading Floors – Product Options



LED Solution

- The initial W/m² and benefit of homogenous continuous light gave the LED solution 'legs'
- The LED photometric data was based on computer simulation with a prediction of a 72% efficient fixture

Fixture Housing – 92% lambertian reflector, ie. White paint



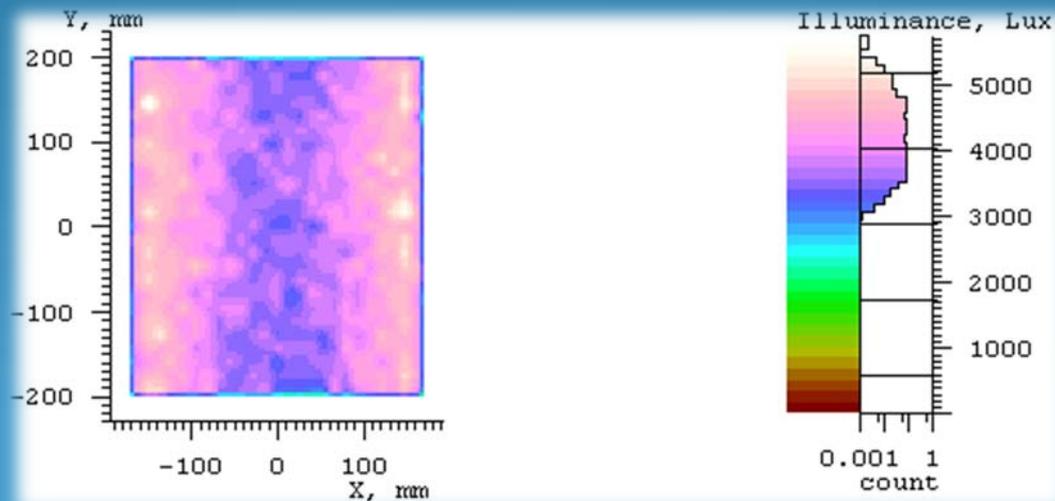
Cross- section

Diffuser provided by WILA



LED Solution

- Plotted below is the illuminance of a 400mm section at the exit surface of the fixture
 - Rebel spacing is 67mm on both sides of fixture



Prototyping

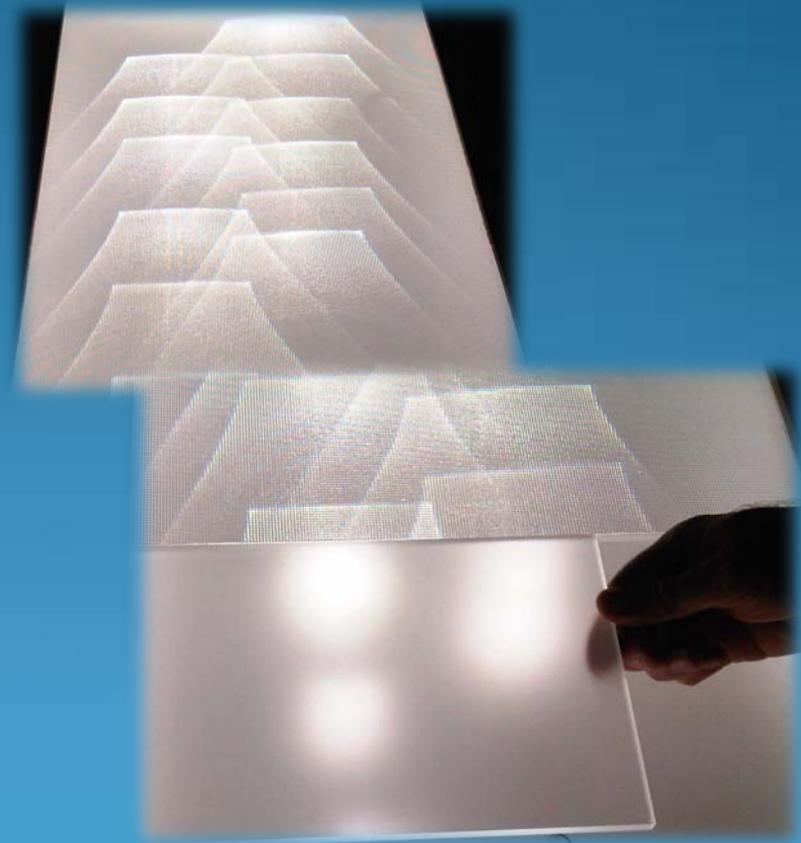
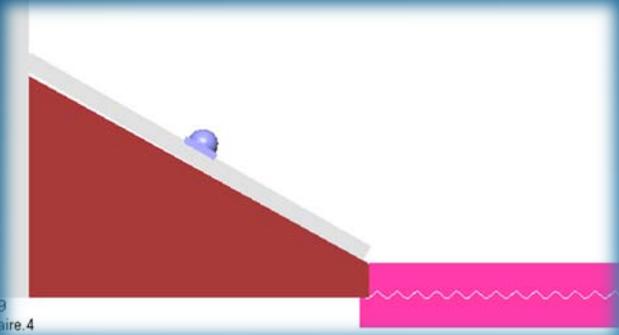
- WILA built a prototype to prove the design



WILA

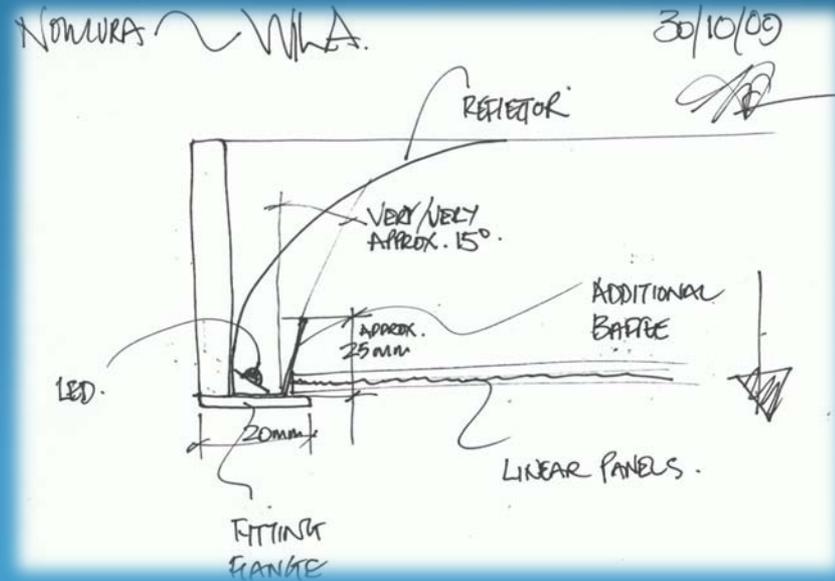


Micro-prisms were problematic



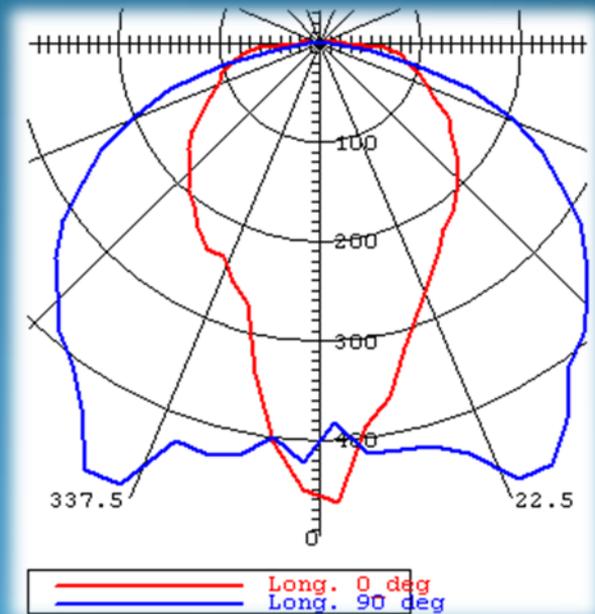
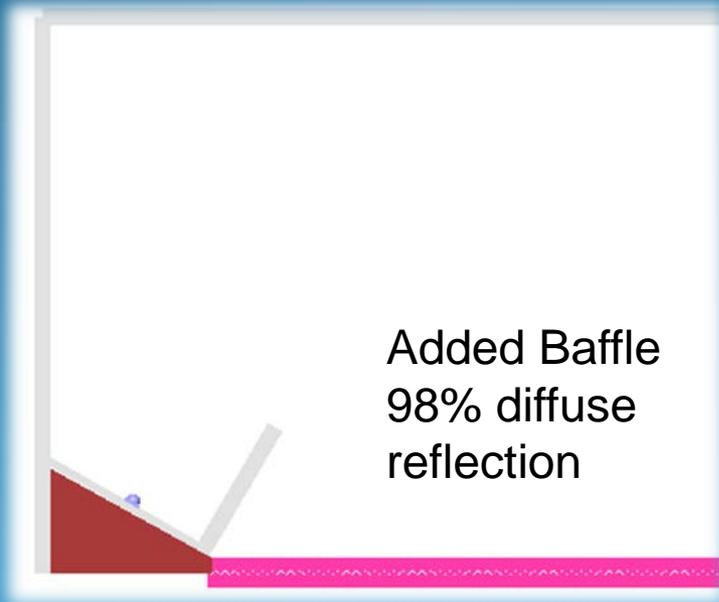
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aire.4
13.0

Baffle



Optical analysis with baffle

- Intensity distribution does not change very much
- Fixture efficiency drops only about 2%
 - 68% efficient

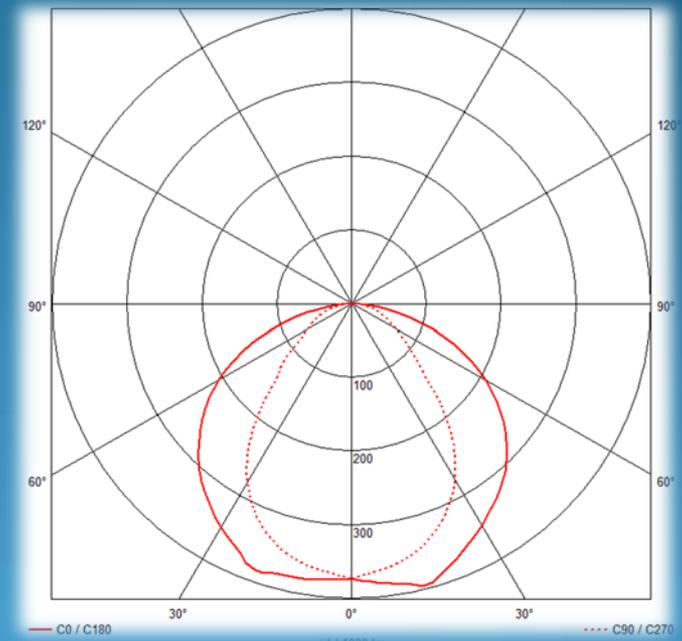


Real photometry

- 625mm sample sent to BSI for testing

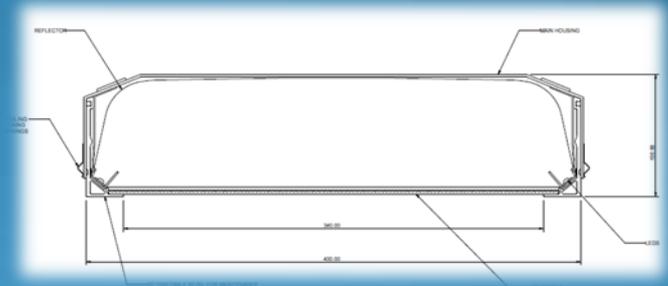
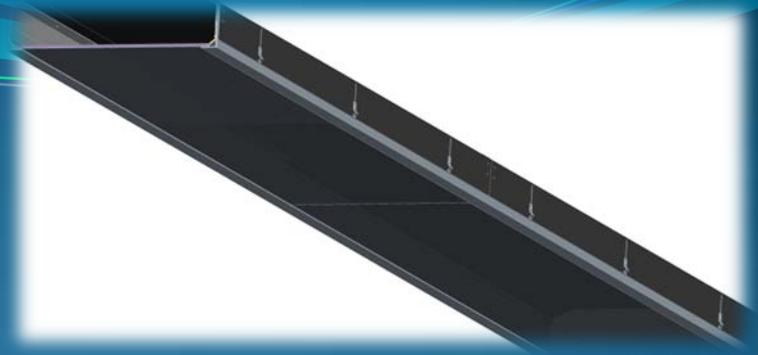
Height of Room: 3.050 m, Mounting Height: 3.130 m, Maintenance factor 0.80

Surface	ρ [%]	E_{av} [lx]
Workplane	/	403
Floor	20	377
Ceiling	70	85
Walls (4)	50	222



On site mock-up

- MEIT's asked us and 2 others to supply a sample to site for an on site mock-up to be evaluated by the design team
- We were asked to make the luminaire so that a join could be shown
- Using double linear prisms we decided to go for overlapping of the panels
- 1700mm long luminaire made



On site mock-up – 16th December 2009



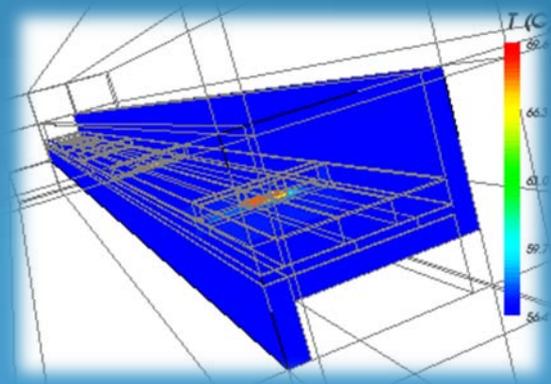
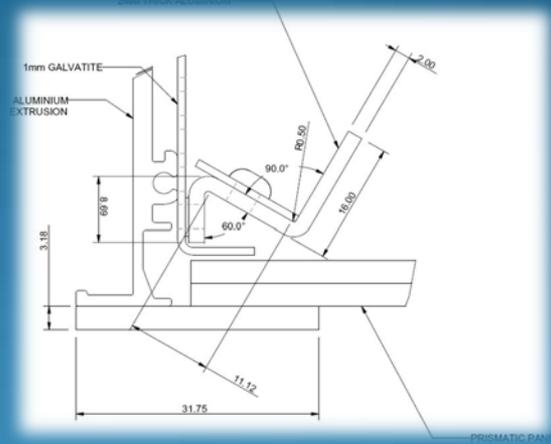
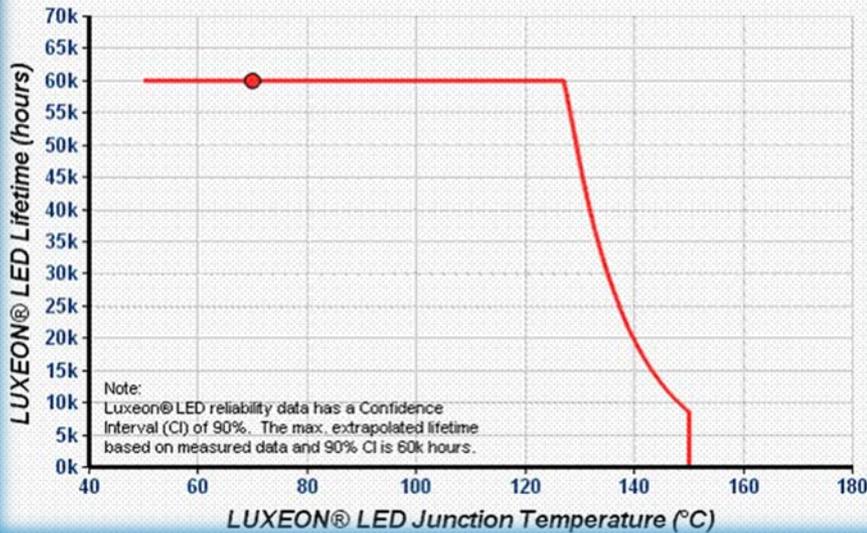
Final presentation – 22nd December 2009

NOMURA
Continuous LED



LUXEON® LED Reliability Results Chart

● LUXEON® Rebel - InGaN (all) - (B10, L70) - 350 mA: ($T_j = 70\text{ }^\circ\text{C}$, Lifetime = 60k hrs.)



WILA

MEIT

Design



Fully installed flush with ceiling

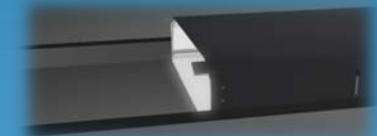


Side catches released in ceiling allowing inner frame to be lowered



Lowered frame allows removal of optics to gain access to LED's

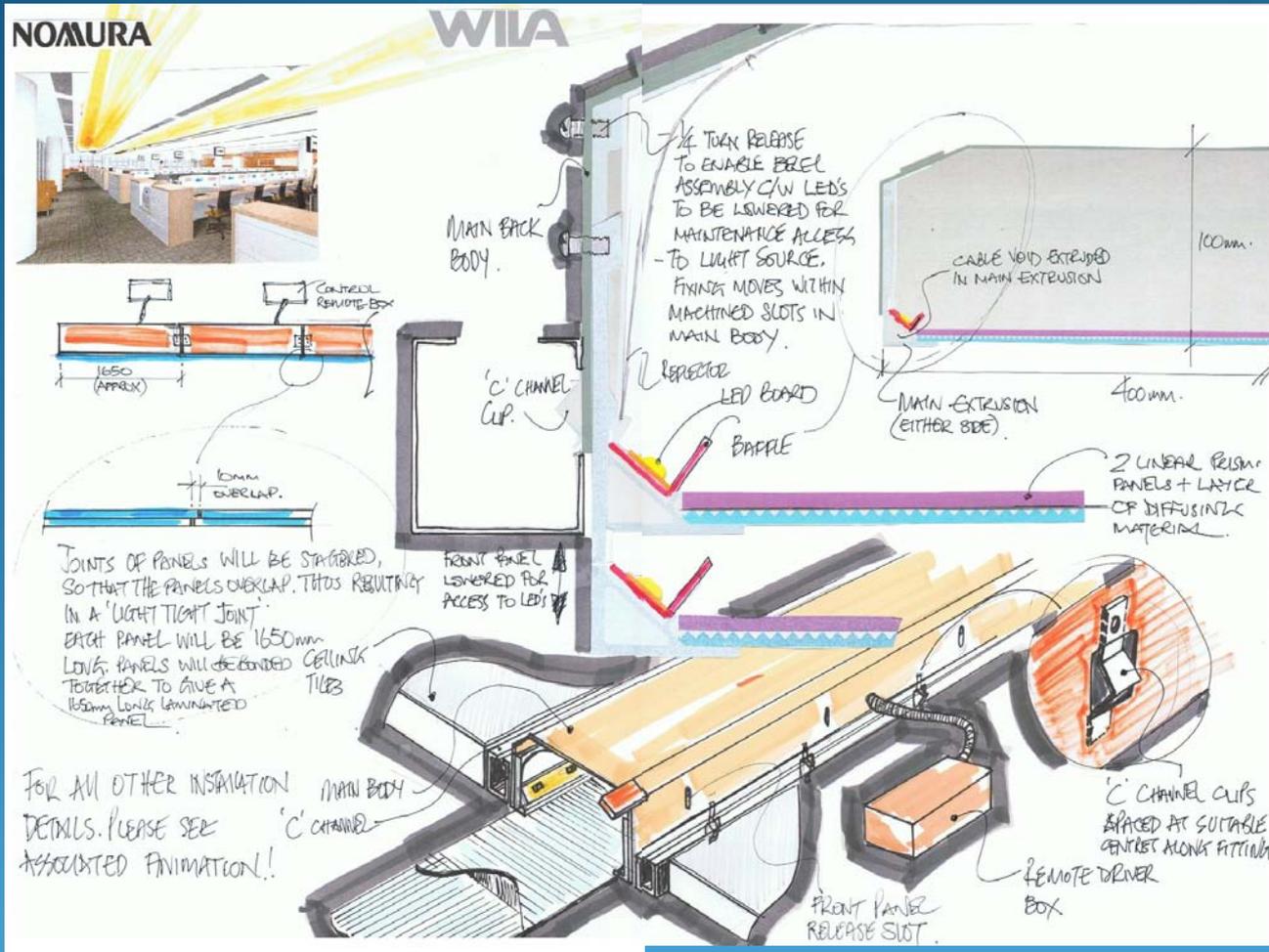
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Animation



Design



Process

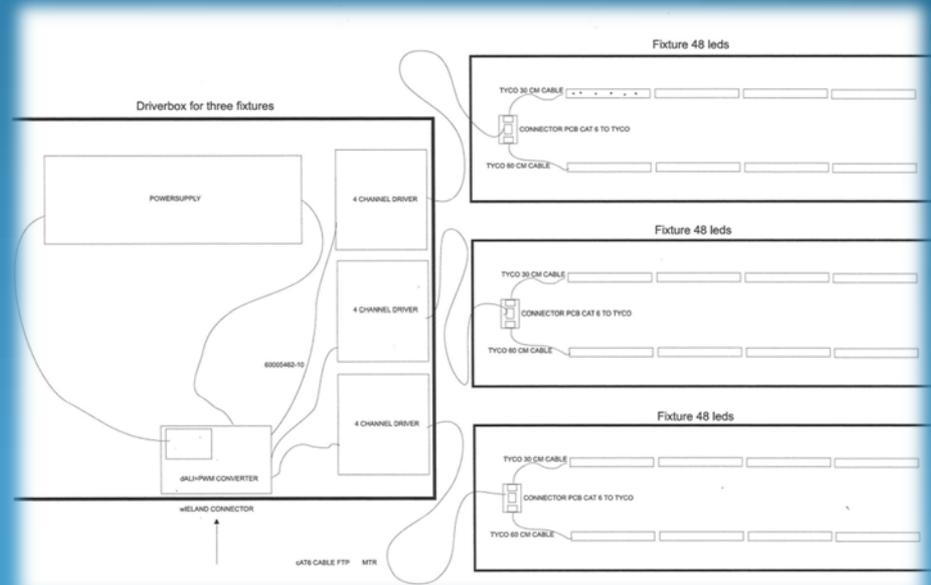
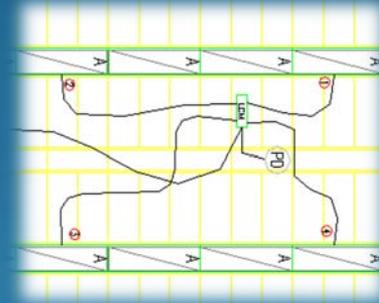
- WILA decided as the manufacturer Jan 2010
- Luminaire signed off except the joining of the optic
- 10th February 2010 Electrical contractor supplied quantities
- Site sample photometered by BSI
- Order received 11th February 2010
- First delivery of luminaires on 19th April 2010

WILA



DALI drivers

- LED driver wiring for 3xA(1.5m) fixture
- Same box for 1.0 and 0.5m fixture with fewer connections/driver channels



EMC tests



WILA



Press – Building Magazine

PROJECTS

design and construction / technical / project management

Investment bank Nomura wanted its traders sitting at their desks in its new £100m office just eight months after work began. The problem was finding a fit-out contractor able to work at that pace. **Thomas Lane** asked Como, Mace's fit-out arm, for its racing tips

SPEED FIENDS

They might not know it, but the traders in investment bank Nomura's new headquarters are enjoying several world firsts. The air on the trading floors stays nice and cool, thanks to the world's largest installation of chilled desks. The crisp, white light is provided by the world's largest installation of linear LED lighting. And, although the project team can't say for sure, this has to be one of the fastest fit-out jobs ever done. It cost more than £100m and the bulk of the work, some 400,000ft² was done in just eight months by Como, the fit-out arm of Mace.

Why the breakneck speed? Well, Nomura had bought Lehman Brothers' European and Asian business when the latter went bust in 2008. The combined business was located in the former Lehman Brothers building at Canary Wharf and Nomura's existing office near St Paul's in the City. The trouble was, the Canary Wharf building was too big, the lease was due to expire in 2009 and Nomura didn't want a base in the Docklands anyway. Meanwhile, the City building was too small. It was clear a new office was needed.

In these situations it's best to phone friends for help. Tony Bartle, Nomura's head of real estate and services had previously

worked with Como's project director Henry Tamunoro and manager director Steve Root. "After Lehman was bought out by Nomura I got a call from Tony," says Tamunoro. "He said, 'have you taken your holiday yet? Because if you haven't, take it now as I've got a job for you.'"

"They then began to look at potential offices, and assess them for suitability and how long they would take to fit out, finally settling on Angel Place, next to the Thames at Southwark bridge for its combination of size, flexibility and trading floor facilities.

The team had less than a year to design, procure and complete the fit-out. "All we knew was that there was a 550,000ft² office and we had to accommodate 1,800 dealers and a total of 4,500 staff," says Tamunoro. "The bottom line was that's the brief. We had no idea what it was going to look like – all we had was the end date."

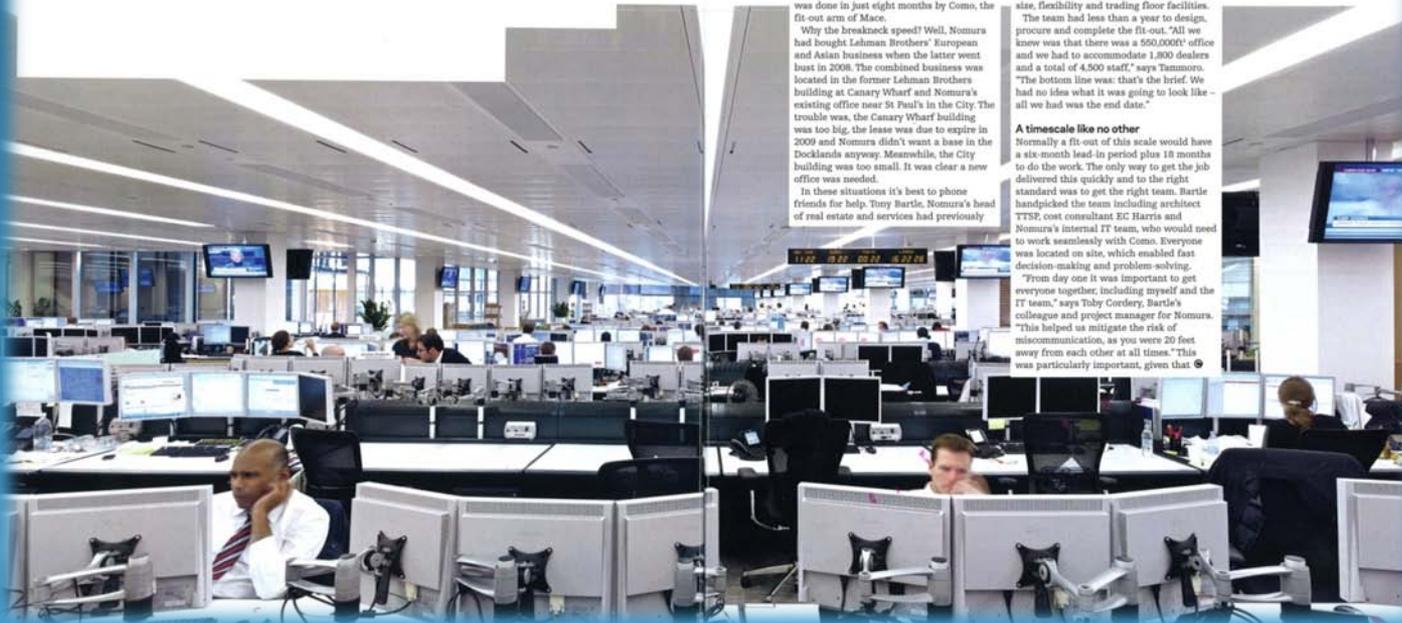
A timescale like no other

Normally a fit-out of this scale would have a six-month lead-in period plus 18 months to do the work. The only way to get the job delivered this quickly and to the right standard was to get the right team. Bartle handpicked the team including architect TTSP, cost consultant EC Harris and Nomura's internal IT team, who would need to work seamlessly with Como. Everyone was located on site, which enabled fast decision-making and problem-solving.

"From day one it was important to get everyone together, including myself and the IT team," says Toby Cordery, Bartle's colleague and project manager for Nomura. "This helped us mitigate the risk of miscommunication, as you were 20 feet away from each other at all times." This was particularly important, given that

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PROJECT TEAM
Client: Nomura
Architect: TTSP
Structural engineer: Waterman Group
MSE engineer: MEIT Associates
Cost consultant: EC Harris
Project manager: Mouchel
Fit out contractor: Como



WILA



Press

● the design team was appointed at the same time as the contractor, which meant the design had to run in parallel with the building work.

Luckily the enabling works didn't need any design input, so Como could commence this part of the job. This included procuring the big back-up generators needed to keep Nomura going in the event of a power cut – no small job, as there had enough output to power 1,600 homes. The enabling works also included extending the floorplates into two atriums to create more space. The designs for this had already been done by the base build team to make the building more flexible and appealing to potential occupiers.

Como was appointed to the job in September 2009 and was on site by October. A steelwork contractor was engaged to extend the floors into the atrium, and as the atriums were being dismantled by cladding specialist Gartner the steel was being fabricated. To speed things up Como erected scaffolding in the atriums so the steelwork specialist could start halfway up and work upwards and downwards simultaneously. "It went like clockwork and we actually finished ahead of programme," says Tammero.

Dite-sized chunks

The main fit-out started on 4 January this year. To break the huge job down, it was

INNOVATION AT NOMURA



There are 2.5km of chilled desks on Nomura's two trading floors at Angel Lane, making it the largest installation in the world. All the computing power needed for trading, which is considerable, is sandwiched between two desks placed back to back. The heat churned out by these computers is locally managed by a small fancoil unit, also placed between the

desks. A manifold hidden in a cupboard at the end of each row of desks supplies the chilled water to the fancoil units. That means the main air-conditioning system only has to cope with normal levels of heat gain from people and the sun. This is provided using chilled beams.

LED lighting has been used on the trading floors as this is low maintenance and long life, which is important for trading floors. It is also cheap to run. There is 1.4km of linear LED lighting in the ceilings, which adds up to a total of 44,800 light sources. Given the sheer amount of lighting needed, the fittings were specially made for this job.



More room was created by extending some of the office floorplates into the atrium (right). This was one of the first jobs tackled by Como (bottom right). Executive areas feature specially sourced teak veneer (top right)

divided up into seven workstreams, each with its own project manager, construction staff and technical support person. Also, the job was configured as two phases, with the office areas making up the first, 400,000m² phase; this phase had to be completed by the end of August. The second, 150,000m² phase includes less critical areas such as a gymnasium, an auditorium and dining areas. The first phase was also divided up, so different areas were progressively handed over to Nomura. The trading floors were the first area to be completed at the beginning of July.

With such a tight programme the team couldn't afford to take the risk of a specialist going bust and delaying the job. Como ensured each trade was duplicated to guard against this. "We got three joinery companies because of the market we were in and the speed of the project," explains Root.

"No one company could do it in the time available and we didn't want to put all our eggs into one basket." Como got each specialist to price for the whole job in case it had to take over another specialist's work. It also broke traditional packages down into smaller chunks, for example the mechanical package was procured separately from the electrical package. The strategy paid off, as a ceiling contractor went bust. "If we had only one package it would have delayed the job by several weeks," says Tammero.

IT IS THE MOST FEROCIOUS PROGRAMME I'VE EVER WORKED ON... ONCE YOU'VE RAISED THE BAR, PEOPLE WILL START TO THINK IT'S THE NORM
HENRY TAMMORO, COMO

Technical challenge

One of the most critical elements of the job was the IT installation. Nomura needed this to be totally resilient, so all IT systems were doubled up in the building and further back-up with connections to two data centres was installed.

Because of the IT-heavy nature of trading operations there are 28 sub-equipment "rooms" that are some 210m² and two even bigger main equipment rooms at 1,950m². All the IT equipment and cabling, plus the external connections, had to be completed by 28 May so it would be ready for the first traders to move into the building on 4 July. The IT cabling was done at night, so it wouldn't interrupt the other trades during the day. In fact, a major feature of this project was that work ran for 24 hours a day, seven days a week for some elements. According to Cordery, the relationship

between Como and his IT team was "second to none". "If it hadn't been like that then we wouldn't be sitting here today," he says.

Finishing touches

The standard office floors were relatively straightforward to fit-out as these had been fitted out to category A levels during the base build. All the lighting and air conditioning systems were stripped out and stored off site, the spaces reconfigured, then the lights and fancoil units brought back and reinstalled.

The executive areas were more involved, owing to the higher specification, so were handed over last to get this right. The doors, skirting, tables and console tables were all finished with a teak veneer. This had to be Forest Stewardship Council (FSC) certified to keep the building's BREFAM "excellent" rating, which was a challenge as sustainable teak is hard to find. Finding FSC teak of the right quality was even more challenging as each sheet of veneer had to be handpicked. According to Cordery the team looked at 20,000m² of teak veneer to source just 3,500m².

Although it wasn't part of Como's contract, each trader's computer was hand built on the premises and a photograph taken of their

existing desk, so when they came into the new building on Monday morning it would be exactly as they left it prior to the move. The moves went seamlessly and Como is well into the second phase of the work. "We are extremely pleased," says Cordery. "We are happy with the quality and that we got into the building when we needed to so the business has been able to operate uninterrupted." And how does Como feel now the most difficult part of the job is over? "It is the most ferocious programme I've ever worked on," says Tammero. "What's scary is someone might want us to do it again. The trouble is if you've done it, once you've raised the bar, people will start to think it's the norm."

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MARKETS

Occupiers

Retailers | Corporates | Industrial | Leisure

Nomura raises its trading standards

Japanese investment bank's new London base is a statement of intent. **Adri Shah** reports

"This office is not designed for an Asian or American bank, but for a business operating in London. It is a new look and feel that shows a new Nomura and a new style," says Tony Bartle (pictured), head of real estate and services, EMEA (Europe, Middle East and Africa), at Nomura.

In 2008 the Japanese investment bank, unencumbered by subprime losses that hit so many international banks, took over former Wall Street giant Lehman Brothers' European and Asian businesses.

By December it will finally conclude the process of moving into its new 546,000 sq ft European headquarters at One Angel Lane in the City of London. The move is significant for the bank, as it signals the integration of more than 3,800 people that now work at Nomura in the UK. So far, 3,000 employees have moved into the new building and the last set of 800 will move in by Christmas.

Bartle says the acquisition was partly about reinventing the organisation. With the acquisition came a need to reorganise its UK portfolio. It had to renegotiate 20 leases in Europe and the Middle East, where Nomura and Lehman Brothers both had properties.

"The idea of 'least meets west' was less pronounced and it was more about bringing two different organisations together," he says. "Nomura, it is safe to say, has been more traditional and Lehman less traditional. Both had different ways of doing business and different types of leaderships, and merging those took time."

Bartle says a big part of that process was deciding where to house its offices in the UK. Its 275,000 sq ft Nomura House, close to St Paul's Tube station in the City, or at the 2m sq ft former Lehman building on Bank Street in Canary Wharf.

"Nomura House was too small and Bank Street too big, so we decided to take the best of breed and class

from both companies, restructure the teams and rebuild a whole new business around it.

"There was a real desire to go somewhere different and use that as a way to restart things. We could not really do that in traditional buildings because it would always be a Bank Street or a Nomura House," he says.

In August 2009, Nomura signed a 20-year lease on One Angel Lane, then known as Watermark Place, with landlords UBS Global Asset Management and Oxford Properties, the property arm of Canada's Ontario Municipal Employees Retirement System pension fund. Last month Oxford Properties bought UBS's 50% stake thought to be valued at £200m.

"The economics were



Back to the floor: One Angel Lane in the City of London will provide Nomura with 546,000 sq ft, almost double the 275,000 sq ft at Nomura House in St Paul's

Vital statistics of Nomura's new home

- Stretching 100 metres at its longest point, the 60,000 sq ft trading floor at Nomura's One Angel Lane office, designed by architect TTSP, is one of the biggest in the UK. To ensure it had an uninterrupted floor, a 14,000 sq ft atrium had to be filled in, which allows it to accommodate 200 additional employees and takes the total capacity to 900.
- To efficiently cool the high-density space, Nomura has used separate cooling systems for machines and people. To cool the machines, it installed one of the biggest, in-built desk-cooling facilities. The office space is air conditioned.
- To make the pillars seem non-intrusive, it incorporated them within the design by using them to hang television screens.
- It installed LED (light-emitting diode) lights, used for the first time on a trading floor, to give a sense of space to the three-metre-high room. At its longest point, the lighting runs for 90 metres.
- To prevent any loss of information because of power cuts, the building's generators can provide enough electricity to run 1,600 homes.
- The building contains 2,500 km of cable, which could stretch from London to Barcelona and back.

Occupiers MARKETS

fantastic and that was a big sway. The building was the right size, shape and location, and we could give our own brand to the door. We're closer to our clients and Nomura has traditionally always been in the City," says Bartle.

Mark Letbridge, partner at Drivers Jones Deloitte, which advised Nomura, says: "The acquisition strategy and tactics were very carefully thought through, but at the end of the day, time was favourable. We were acquiring half a million sq ft very rapidly and in the depths of the recession."

It was the largest speculative letting in the City and a big blow for Canary Wharf, where the 1m sq ft former Lehman Brothers building is empty after Nomura's temporary two-year lease came to an end on 30 September.

"Time was tight and we had to continue driving revenues. We had to get all the 'front office' functions in one place, so the first task was to take a temporary lease at [Lehman's former offices on] Bank Street and move 1,700 people out of Nomura House and into Canary Wharf," he says, adding that it has handed over the building to the Lehman Brothers' administrator, PricewaterhouseCoopers and has no further lease liability for it.

Nomura will, however, retain Nomura House for future expansion space, which will be occupied by 800 people employed by other Nomura companies that are not related to investment banking. It then embarked on fitting out workspaces at One Angel Lane. The process was completed in nine months – a fast turnaround for a building of this size – and cost more than £100m, including infrastructure changes and new technology (box, left).

"We had to be quite adventurous in the way we approached things because we needed to move so quickly," says Bartle. For Nomura, this has not just been another property deal, but a reflection of an image it wants to portray to the City.

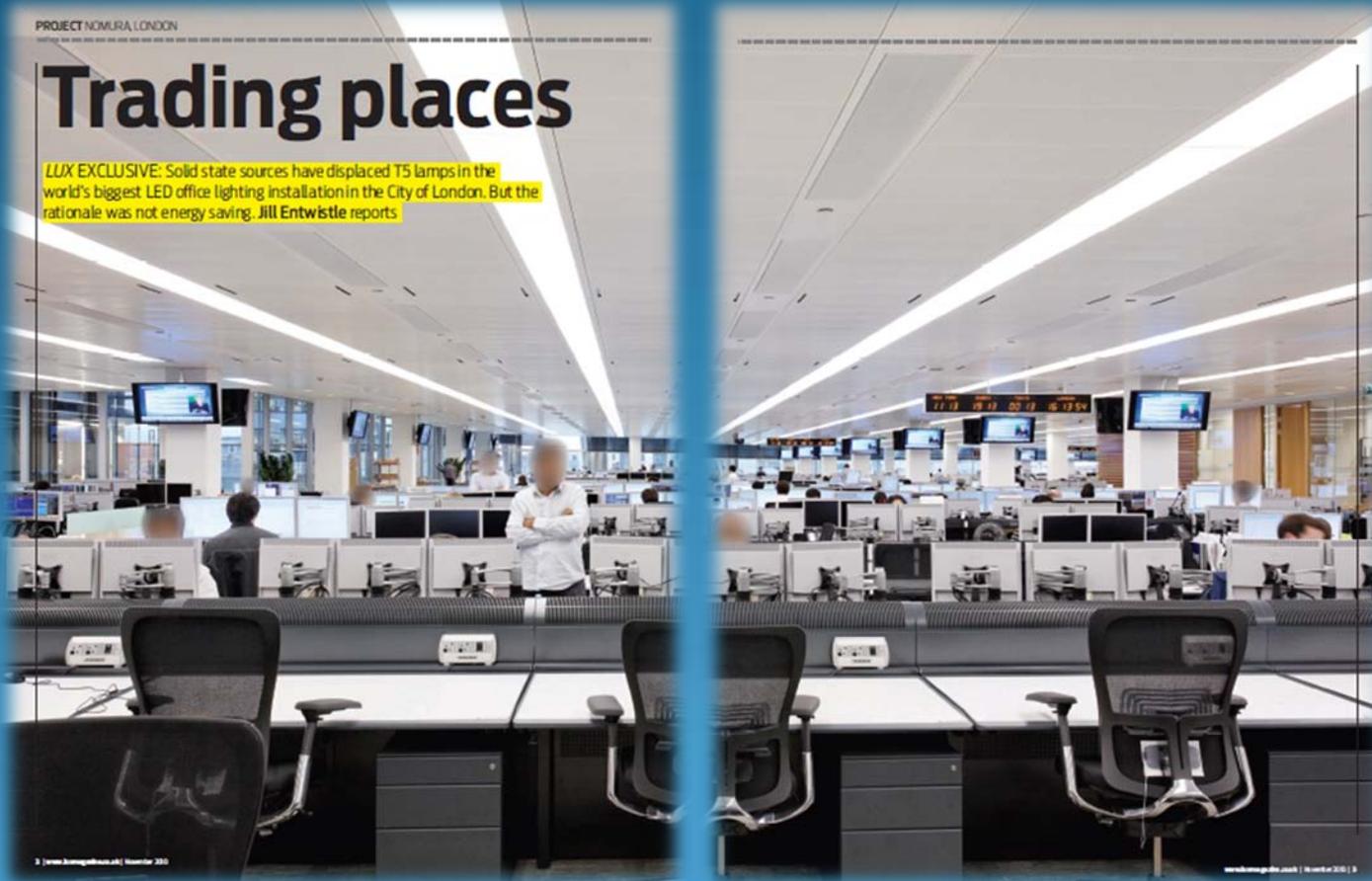
"Buildings are enablers of change and this is a very big statement to make to staff, businesses and the market. We're refreshing the whole business and are ready to take advantage as the market changes," says Bartle. ■

Occupiers @ PropertyWeek.com

You can listen to an interview with Tony Bartle, head of real estate and services, EMEA at Nomura, and see more pictures of One Angel Lane at propertyweek.com/occupiers



Press – Lux Magazine

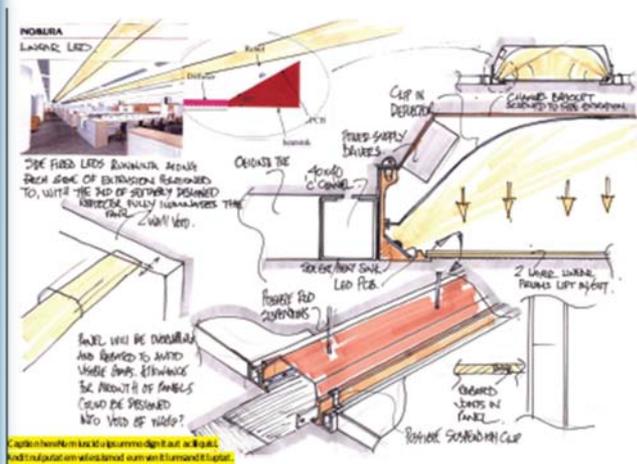


WILA



Press

PROJECT NOMURA, LONDON



Custom luminaire in a custom design that is built and installed on an existing ceiling structure.

When Roger Dargatzis, director of Met Associates, began considering the possibility of using LEDs as the main light source for the trading floor of the Nomura investment bank, he discovered there was no precedent. Which is not surprising – what was being proposed was the largest LED office lighting installation in the world. The decision to use LEDs was not driven primarily by energy efficiency – though it was a key consideration – but by aesthetics and also maintenance. The 8,000 square-metre floor plate is long – about 100 metres at its longest point – and the chilled beams in the ceiling emphasize the linear appearance, drawing the eye south to the view of the Thames.

"The design of the luminaire revolved around the chilled beams," says Dargatzis. "To enhance the linear arrangement, but at the same time provide a stronger feature in the flat ceiling to take the eye away from the chilled beams, the designer wanted to provide a continuous luminaire of greater proportions with a bright, evenly lit appearance. We decided to use LEDs because TS could not do what we

needed or achieve the aesthetic the architect wanted." The problem with TS was that it overdelivered on lighting levels, using overlapping lamps to achieve an even illumination created about 900 lux on the working plane, literally twice what was required. Dimming them down, however, jeopardized its appearance. "It was felt that this would cause the luminaire to appear flicker and we wanted it to be quite bright," says Dargatzis. "We also wanted to see if we could achieve it with LEDs."

That meant an evaluation, with Wila's help – the company had been on board from an early stage when TS was still a option – with the LED alternative having to fulfil three criteria:

- Physical constraints: The luminaire had to be about 350-400mm wide, less than 100mm deep and mounted in continuous rows at three-metre centres. (The overall fitting width was 400mm.)
- Technical requirements: Clear and light levels had to be achieved at the fixed spacing to ensure screen reflections were not an issue.
- Financial case: A compelling argument had to be

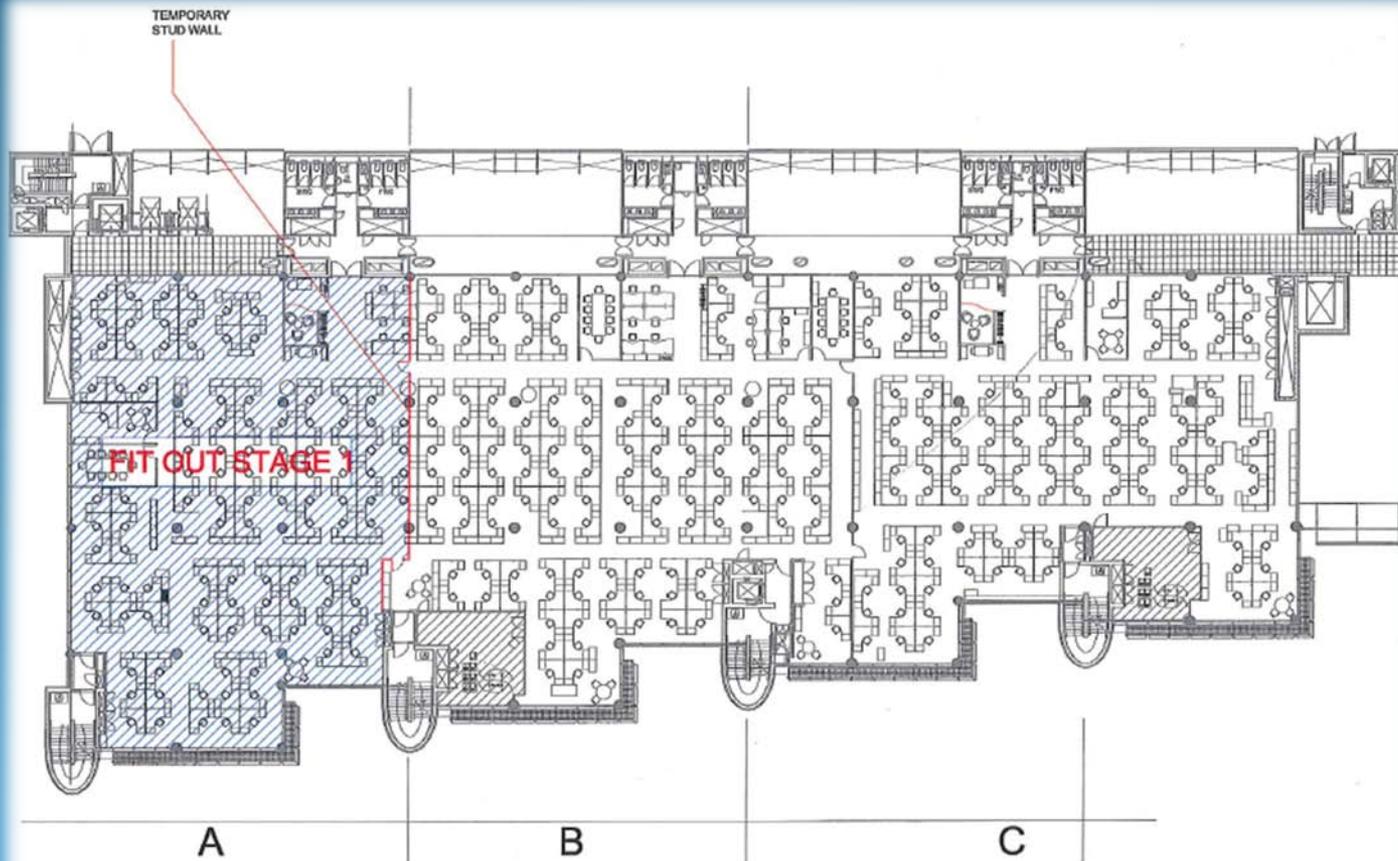
PROJECT Nomura, One Angel Lane, London, UK. LIGHTING Met Associates, INC. CUSTOM LUMINAIRE Wila Lighting. INTERIOR ARCHITECT TTP



Custom luminaire in a custom design that is built and installed on an existing ceiling structure.

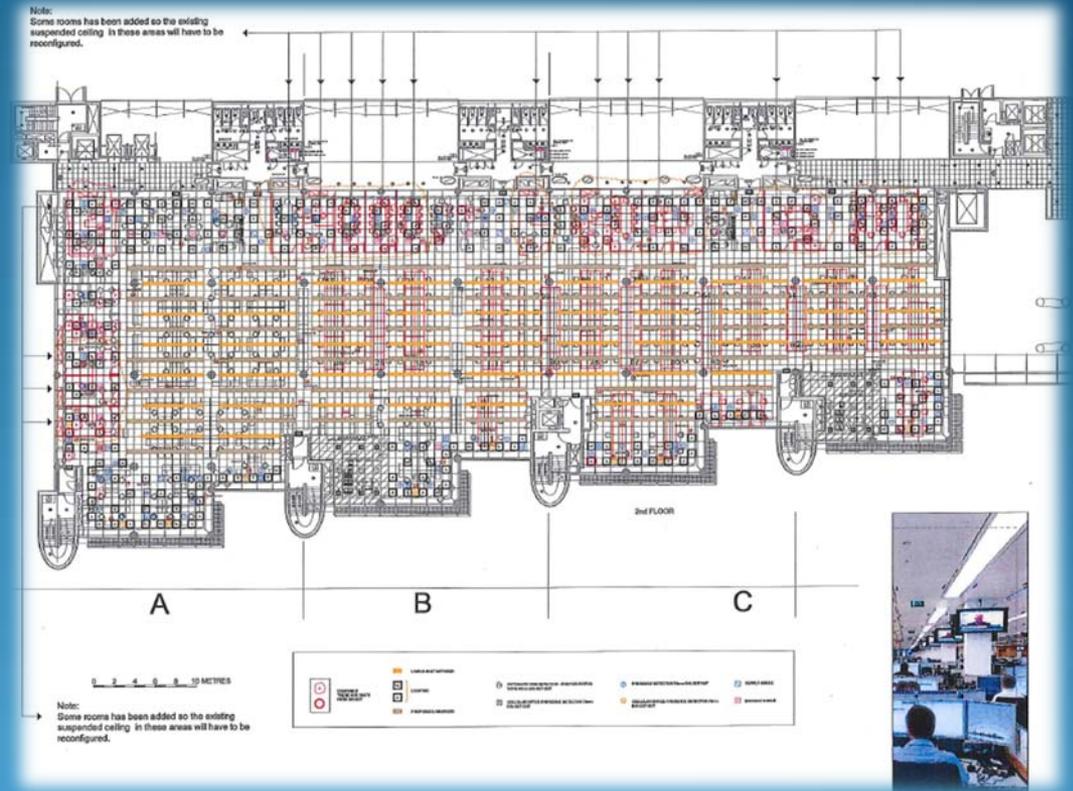


Follow on project

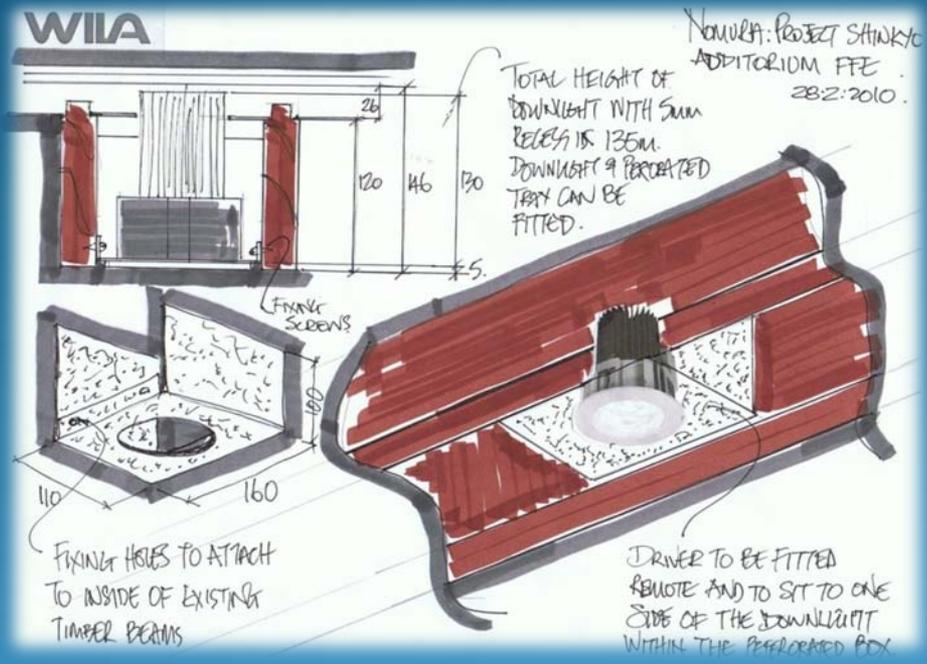


Follow on project

- Using latest Rebel ES
- 1 less LED per 500mm PCB
- 10.6 W/m² for 500 Lux
- Project split into phases
- Delivery 1st Phase next week



Auditorium

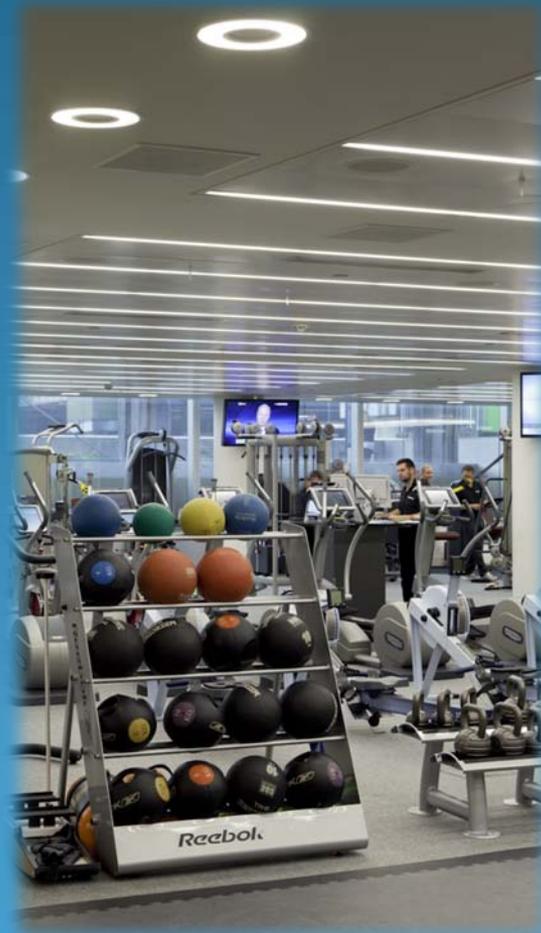


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