

timber UPdate



Workplaces/ Productivity/ Environmental Responsibility

Natural surfaces
deliver deep gains
in workplaces

Productivity
increases with
wood indoors

Benefits rise
with taller timber
structures

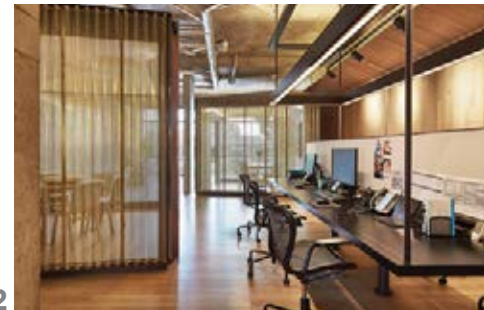
Environmental
Product
Declarations –
essential information

Natural wood and stone surfaces in the workplace are linked with increased employee wellbeing and productivity.

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Building designers are increasingly incorporating natural elements into indoor environments based on growing evidence associated with biophilia, the principle that connection to nature is essential to human wellbeing.

Now world-first research has revealed natural looking wooden surfaces in the workplace are strongly associated with increased employee wellbeing and satisfaction, affording potential significant improvements to their productivity.

The new study of 1000 Australian indoor workers was conducted by strategic market research agency Pollinate for Forest and Wood Products Australia (FWPA), and further analysed by Associate Professor Jacki Schirmer of the University of Canberra.

The study showed natural-looking, sustainably sourced wood has a key role in the design of green buildings and cities.

This latest evidence is key to the business case for using wood and other elements of nature in the workplace, according to Dr Schirmer, who addressed the Green Cities conference in Melbourne.

“Previous studies had looked at individual elements, such as plants, and found benefits, but there had not been any research of this scale and breadth focusing on wood,” Dr Schirmer says.

“Now there is evidence for the first time that there are real and measurable benefits associated with including natural-looking wood in the workplace. The research was robust, and represents ground-breaking evidence that wood in the workplace is associated with better work satisfaction and wellbeing.”

“That’s very important because we know from other research that better workplace satisfaction and wellbeing leads to better productivity in the form of reduced absenteeism, employees being more willing to invest in their work, and less office conflict.”

Over 80 per cent of workers (82 per cent) of workers exposed to eight or more wooden surfaces reported being “satisfied or very satisfied” with their work compared to half (53 per cent) with no wooden surfaces and over two thirds (69 per cent) who were exposed to between five and seven wooden surfaces.

The research results held true when controlled for factors including occupation, age, gender, income, workplace noise and workplace culture.

Employees in the study with natural wooden surfaces on average also reported higher personal productivity, mood, concentration, clarity, confidence and optimism – and were more likely to find their workplaces relaxing, calming, natural-feeling, inviting and energising.

More than two thirds of indoor workers surveyed were based in an office, with the remainder split among shops, factories and warehouses.

The study – Workplaces: Wellness + Wood = Productivity – highlighted that, on average, almost half of employees who work indoors spend less than an hour outdoors on work days.

This is of concern given the long-established connection between wellbeing and spending time in nature, especially amid the increasing urbanisation of populations.

Natural elements that can be brought indoors include materials like stone and wood, water features, plants, natural light and imagery depicting the natural world.



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1. ACU INSTITUTES AT SPRING ST - BOWER ARCHITECTURE
2. BRESIC WHITNEY HUNTERS HILL - CHENCHOW LITTLE
3. BHP BILLITON WORKPLACE BY BVN/
PHOTO: CHRISTOPHER FREDERICK JONES
4. PLUS ARCHITECTURE - PLUS ARCHITECTURE OFFICE
5. HDR RICE DAUBNEY, NOVARTIS PHARMACEUTICALS/
PHOTO: TYRONE BRANIGAN

It's easier to add wood to an existing workplace than some other natural design features, such as access to natural light that cannot be easily retrofitted.

In some work environments, it's challenging to include biophilic design elements due to requirements for sterility (for instance, in operating theatres or factories) or because of design constraints (e.g. can't install new windows in an existing building, can't change the view).

Biophilic design stems from biophilia, meaning the love of nature, a term made popular by American psychologist Edward O. Wilson in the 1980s, when he noted how urbanisation led to a detachment from the natural world.

The principle brings into focus our innate attraction to nature and implies we all have an inherent connection to the natural world through centuries of living in agricultural settings. The common urge for a sea (or tree) change is very real.

Researchers and academic institutions are increasingly focusing on biophilia. It is, for example, now included on the civil engineering curriculum at Griffith University.

The managing director of industry services company Forest and Wood Products Australia (FWPA), Ric Sinclair, said that individual businesses, and the Australian economy as a whole, could benefit from increasing access to nature inside the workplace.

"Forest and Wood Products Australia collaborates with government, academia and industry to grow the market, delivering real-world outcomes that are good for business, the environment and society," he said.

"We invested in this research on behalf of our members because it provides hard data supporting the use of wood, not just in terms of attractiveness and environmental benefits, but in terms of business."

By proving the benefits associated with wood, designers who want to bring natural elements into workplaces now have an extra tool in their armoury.

"It's logical that better workplace satisfaction and wellbeing leads to better productivity," said Professor Schirmer.



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Designers interested in using wood in an office setting can now consult a new WoodSolutions publication: *Interior Design Guide 43: Reimagining Wood-Based Office Fit-Out Systems*, that shows the average office furnishing cycle of "fit-out, strip out, repeat" can be improved. See the next page for more details.

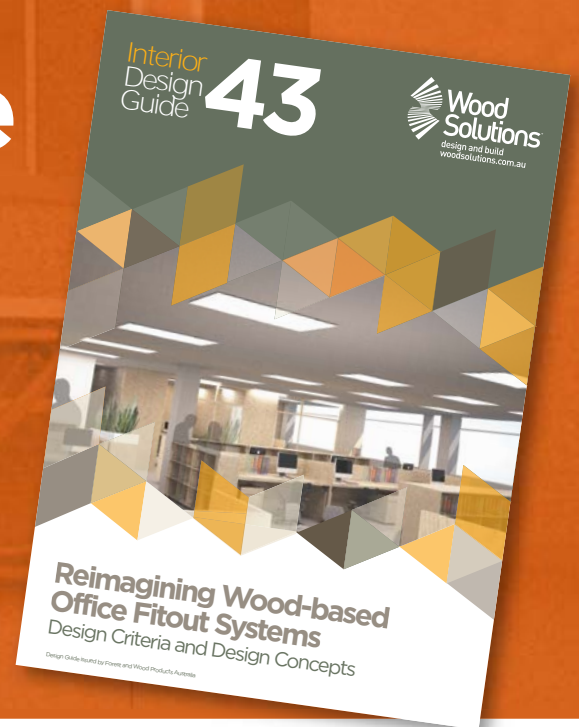
The benefits of bringing nature to work

In 2017, Sydney strategic research consultancy Pollinate conducted a survey of more than 1000 Australian indoor workers, whose collective ages and locations were representative of the broader Australian workforce. The infographic below summarises the differences between respondents whose work environment comprised less than 20% visible wood and those who had more than 60%.



| <20% | Visibility of wood in the working environment | >60% |
|---|--|---|
| 47% | Physical workplace satisfaction | 81% |
| 56% | Satisfaction with working life | 81% |
| 44% | Optimistic about the future - most of the time | 61% |
| 49% | Confident - most of the time | 68% |
| 42% | Stress levels - low | 65% |
| 65% | Ability to Concentrate | 83% |
|  | Productivity |  |

Rethinking office fitouts to raise productivity and lower environmental impacts



New information about the effects of biophilic design and assessments of the environmental cost of the regular churn of the usual office fitouts are providing food for thought for companies looking to improve their productivity and reduce their environmental cost of doing business.

The sight of a dumpster stacked full of office partition systems outside a recently re-leased or refurbished office is all too common. It seems that the expectations of new tenants are wide open spaces (into which they can install their own, new, but often similar to, the last fitout system), or that ongoing occupiers have to refit their spaces to refresh their working environments.

Now, two new sources of information not only question this practice but provide evidence of benefits in changing to a new paradigm.

The first, referred to elsewhere in this Timber Update, looks at the effect of biophilic design (or the use and perception of natural elements, nature-based design)

on worker feelings of wellbeing and consequent reductions in absenteeism and increases in productivity.

The second is the publication of the WoodSolutions Interior Design Guide Reimagining Wood-based Office Fitout Systems: Design Criteria and Design Concepts.

The authors of the new guide, Professor Perry Forsythe and Kevin Bradley, from School of the Built Environment Faculty of Design Architecture and Building University of Technology Sydney, observe that while timber is common in residential construction, its application has declined in commercial office fitouts. In instances in which timber may have been used in office partitioning, it has been almost completely replaced by steel-framed plasterboard.

At best, today timber is used as an aesthetically appealing outer skin. In such applications, many of the workstations and other products are manufactured overseas and the environmental provenance of the timber used may be unknown.

However, opportunities to introduce timber are emerging as trends toward open plan offices move away from constructed solutions and toward furniture-based design.

The increasing emphasis on sustainability assessment, new ways of working, office workers who value richer engagement with their workspaces, and a broader awareness of the recurring embodied energy/carbon in each office re-fit, all point to new possibilities in office fitout.

This guide includes information to help the reader to expand the view of timber as an 'aesthetic skin' to include new forms of engagement. It contains detailed drawings and examples of prototypes that embody new systems and connections.

The emphasis is on reducing the recurring physical waste and embodied carbon/energy brought about by the 'fitout-stripout-repeat' cycle that commonly arises from lease churn over the life of office buildings.

Available for free download from Woodsolutions.com.au.



Create a well workspace for boom business

A new snapshot of the Australian workplace paints a bleak picture of employees' access to nature.

Of 1000 indoor workers surveyed, less than half (47 per cent) enjoyed access to natural light, only two in five (38 per cent) were able to see indoor plants and a quarter (26 per cent) were unable to see any natural-looking wooden surfaces.

Conducted by the strategic market research agency Pollinate and Associate Professor Jacki Schirmer of the University of Canberra, the new research found almost half of employees who work indoors spent less than an hour outdoors on work days, and almost a third spent less than half an hour a day.

A previous study by the Resilience Institute of 16,261 workers across 250 companies revealed that 81 per cent of staff experience intense work environments with very concerning levels of worry, chronic stress symptoms, distress and disengagement. This inevitably spills over into all areas of life with devastating fallout for both employees and business.

Productivity was once – and arguably still is in some quarters – the sole goal set for workers, fundamental to which was to bring one's "work-only" version to the office, shop or factory floor.

The "whole person" was not really considered, including in space design. Instead, the focus was on functional requirements that supported the work persona: tasks, technology and processes.

But when employers provide work environments that support user control, natural elements and daylight, and changing postures, they address the physical and psychological health of their workers. This in turn enhances engagement, creativity, innovation, and retention – all of which leads to business success.

Workplace wellness programs have long been in place; encouraging healthy choices in eating, and promoting exercise.

Separate from wellness programs, sustainability initiatives have addressed physical health by minimising exposure risks to harmful chemicals and materials through standards such as LEED certification.

Ergonomic standards have been developed to reduce risk of musculoskeletal injuries in office workers. However, these disparate programs fail to address a complete sense of the whole person at work.

Today, there is an emerging opportunity to use workplace design to promote a holistic state of wellbeing. The role of workplace design is evolving.

A focus on wellbeing now represents a shift from a "space-centric" to a "people-centric" approach, with outcomes related to quality of life, such as reduced stress. This represents a significant opportunity for businesses to unlock the potential of their workspace as a means of enhancing wellbeing, leading to a healthier, more engaged and highperforming workforce.

Businesses do not need to take an "all or nothing" approach to this concept. It is likely not feasible to scrap the existing surrounds and start again. Introducing elements of nature is a relatively simple step that can have a significant impact.

The concept of biophilia suggests that humans have a biological need to connect with nature on physical, mental and social levels, which can affect personal wellbeing, productivity and societal relationships. Biophilic design is based on this concept.

When it comes to demonstrating the benefits of bringing nature into indoor environments, such as workplaces, most research to date has focused on the benefits of plants, natural light, and access to nature views.

Now world-first research has revealed another relatively simple solution to the issue – sustainably sourced, natural-looking wooden surfaces can provide a pathway to

increase the level of nature in the workplace, enhancing employee wellbeing, while being environmentally responsible.

The survey of 1000 Australian indoor workers found employees working in offices with natural wooden surfaces on average reported greater wellbeing and work satisfaction as well as higher personal productivity, mood, concentration, clarity, confidence and optimism.

Dr Schirmer said the association between wood and wellbeing was clear, statistically significant and consistent. "The greater the number of natural-looking (unpainted) wooden surfaces the workers were exposed to, the higher their wellbeing and workplace satisfaction, even after controlling for these various other factors known to influence wellbeing," she said.

"The association between wood and wellbeing held true not just for well-paid workers, but for people who were on low salaries, or in a challenging workplace culture and spanned not just offices but other indoor workplaces like shops."

This study also confirmed the association of wellbeing with other natural elements, namely a window with a view of nature, indoor plants, a water feature or natural light.

The more types of natural elements people were exposed to, the greater their workplace satisfaction and wellbeing.

The managing director of Forest and Wood Products Australia (FWPA), Ric Sinclair, said the research proved that the business case for including wood and other natural elements in the workplace is strong. "In all organisations people are the greatest asset – and using more wood is a relatively easy way to increase their wellbeing," he said.

"It's worth investing in wood. Not only is it carbon positive and attractive, but it benefits employee wellbeing – which has a real impact on the bottom line ... in their work and less office conflict."



TOP: JEMENA, SYDNEY - WOODS BAGOT

BOTTOM: HDR RICE DAUBNEY, NOVARTIS
PHARMACEUTICALS/ PHOTO: TYRONE BRANIGAN



**The more types
of natural
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Branches of the city

Everywhere you look these days, there's a new block of units. Huge skyscrapers spring from the earth across Australia with train-like regularity, each prepared to house hundreds of thousands of people during its lifespan. That's the good news.

The bad news is that every time a building is erected, the environment suffers. Whenever humankind builds another structure, so plays out another move in the longest game of tug-of-war in history.

As big as you might imagine a building's environmental footprint to be, it's always bigger. There's always something else to consider, from the impact on the surroundings at the site of the foundation to the materials used in the construction itself.

"More than ever, people want to know about environmental impacts," says thinkstep Australasia managing director Barbara Nebel.

"The problem is that credible information has always been at a premium."

No matter the industry, there's a tendency to look back on the "good old days", when things were just generally better. In the

construction industry, there's a mixed legacy: for every gorgeous colonial-era timber house, there's an asbestos-laden housing commission site.

As consumers become aware of how dwellings affect their wellbeing, health and the environment, environmental practices and considerations have become more urgent in the built environment.

"We can thank the timber industry for pushing for EPDs in Australia," Nebel says.

Recent advancements such as the environmental product declaration (or EPD) system provide a clear vision of the environmental viability of using timber.

"An EPD is a summary of a resource's life-cycle assessment," says Stephen Mitchell, chair of the Australasian EPD Programme.

For timber, that life cycle begins when it's still a carbon dioxide-hungry tree.

"Timber actually has a negative carbon footprint," Mitchell says. "It spends a lifetime absorbing carbon dioxide, which offsets whatever carbon expenditure that accompanies its use in building."

The cold, hard facts provided by an EPD have given timber a shot in the arm. Long regarded as a solid resource for building, timber's barebones qualities led to it being overlooked for decades.

Now, with its environmental benefits quantified and verified, timber is back.

"For a long time, timber was only seen as a pre-fabricated solution for low-rise residential projects, with no further application," says Paolo Lavischi, program development manager mid-rise construction at WoodSolutions.

"Timber is durable and it is one fifth the weight of a concrete structure," Lavischi says. That makes it ideal for building on weak soil or as an extension of existing buildings."

Traditionally a fixture of small and medium scale construction, timber's renewed versatility has recently been put to the test in larger scale projects. In 2012, LendLease built Forte, a 10-storey apartment building made from cross laminated timber, in Melbourne's Docklands precinct.



Australian softwood plantations are extremely efficient. Logs grow at a rate of 30-40 cubic metres every minute.



Forte

"Forte in particular was something of a challenge," Lavisci says. "In Australia, nobody wanted to be a timber pioneer, but LendLease took on that challenge, and now, more will follow."

Already, Forte is no longer alone on the timber frontier. Brisbane will soon be home to 25 King, which when completed will be the world's tallest engineered timber office building. London is home to the innovative timber unit blocks The Cube and Dalton Lane, and Vancouver boasts the 18-storey Tall Wood Residence skyscraper.

"The problem for smaller builders was always that they wanted to see timber used at that higher level before they'd get on board," Lavisci says. "Now these examples are popping up. It's a good sign."

With a boom in timber construction comes concerns about sustainability. How many forests have to disappear for one building to exist?

According to Lavisci, none.

"Australian softwood plantations are extremely efficient," he says. "Logs grow at a rate of 30-40 cubic metres every minute. Once engineered, that's about 11-15 cubic metres."

=



970m³

=



90mins

Engineered logs

A project like Forte requires roughly 970 cubic metres of engineered logs.

"That takes the plantation about an hour and a half to grow."

Lavisci says timber also boasts a much smaller carbon footprint on the road: "Typically, for every truck delivery in a timber project, there are eight for concrete."

Once built, timber constructs enjoy a unique quality known as biophilic design. A hypothesis first popularised by Edward Wilson argued that humans tend to seek connections with nature. In the last 35 years, biophilic design choices such as natural light, plants and water features have been incorporated into construction projects.

Timber buildings are the natural extension of that philosophy, Lavisci says.

Growing time

Natural qualities of timber - biodegradable, robust, durable - mean that it has stood the test of time. Some existing timber projects are 1,000 years old. It's here to stay.

BUILT BY LENDLEASE AND DESIGNED BY BATES SMART, THE 25 KING OFFICE BUILDING IN BRISBANE, WILL BE THE WORLD'S TALLEST ENGINEERED TIMBER OFFICE BUILDING, WHEN COMPLETED IN LATE 2018.



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EPDs are used to understand and ultimately improve environmental impacts of building resources, because the data clearly tells us the story.

When is a door not a door? When it has a large carbon footprint - then it's just a statistic.

The further humans progress into the future, the more resources we burn. The earth could only sustain us and our decadence for so long before we had to make amends. Consequently, sustainability is today on lips and minds across industries worldwide.

There's no mystery surrounding the source of data about environmental impacts within the construction industry. The problem was that for a long time, that data didn't have an outlet.

"As industry and the public became interested in carbon footprints and life cycle assessments, the need for some kind of standardised data system became clear," says Stephen Mitchell, chair of the Australasian EPD Programme and principal consultant at Stephen Mitchell Associates.

Enter the environmental product declaration (EPD). In the late 1990s, a system that would quantify a product's environmental impacts was conceived in Sweden.

That system evolved over time to become the environmental product declaration, an internationally standardised assessment of a

product's environmental impact based on a consistent set of rules developed through stakeholder consultation.

"You can think of the EPD as a summary of a product's life cycle assessment," Mitchell says.

Barbara Nebel, managing director of thinkstep Australasia, says there was a public demand for the kind of information an EPD provides.

"The Paris Agreement put global warming on the world's radar, and EPDs are a way to take action," she says.

"Before EPDs, there was no real public outlet for data about environmental studies related to building. Now, an EPD provides us with quality, comprehensive data that's been independently verified."

A product's environmental impacts are based on a variety of considerations, including energy consumption, emissions and waste generation over its life cycle.

"There's much more than just a carbon footprint in an EPD," Mitchell says.

Australia's entry into the EPD system came in 2014, an initiative of the timber industry.



“I saw an opportunity to provide the kind of information builders and architects could use to make smart design choices, so various entities within the industry joined forces,” Nebel says.

“They raised the profile of not just EPDs, but the timber industry as well.”

Timber in particular has enjoyed a construction renaissance in the last 20 years thanks to greater understanding of its applications. As the co-author of six timber EPDs, Mitchell says the wood provides the perfect example of the viability of the system.

“EPDs are used to understand and ultimately improve environmental impacts of building resources, because the data clearly tells us the story,” he says.

With clear and accurate data now on the table, inevitably comparisons will be made between resources. One might assume that steel has a higher carbon footprint than timber, but thanks to EPDs it’s never been easier to verify.

“Timber has such a low carbon impact, it’s actually better than carbon neutral,” Mitchell says. “Throughout timber’s lifespan it absorbs carbon dioxide, and that offsets the minimal carbon expenditure required when it’s processed.”

“In the case of timber, that data tells us that from an environmental point of view, there’s no better building material.”

Since the Australian introduction of EPDs, Mitchell says there’s been significant uptake. Big producers in the steel and painting and coating manufacturing industries are on board, and the door swings both ways.

“An EPD allows a producer to be as transparent as possible about their environmental impact because it’s not a rating system,” Mitchell says. “It can be seen as a bit of a risk for these companies because the results may not be flattering. It’s just the facts. There are no value judgements.”

Any judgements or comparisons can then be made by the end user, whether they’re consumers, sustainability rating systems, and the industry itself.

“Companies like LendLease are using EPD data to make sustainable decisions, and rating systems like Green Star use EPDs to make their assessments,” Mitchell says. “The cement industry is looking at a coal-less future on the back of EPD data.”

Project teams can use EPDs to earn Green Star points, or credits in the Infrastructure Sustainability Council of Australia’s rating scheme.

“And it’s all down to the credibility of the data and particularly the transparency of the producers, which is to be commended.”

Given that the EPD assesses a product’s entire life cycle, the data can even be used when considering end-of-life options including recycling and disposal.

Eventually, Mitchell hopes the EPD will be embedded into government building regulation processes.

“It’s voluntary at the moment to include any EPD data in those processes within the built environment, but in Germany it’s mandatory.”

In a promising sign of the future, EPDs are also increasingly required in tender documents.

“The EPD is a long game,” Mitchell says. “It will take a while to develop, but we’re getting more take up now than ever, and for producers it’s a great reward for their transparency.”

All EPDs available for free download from Woodsolutions.com.au.

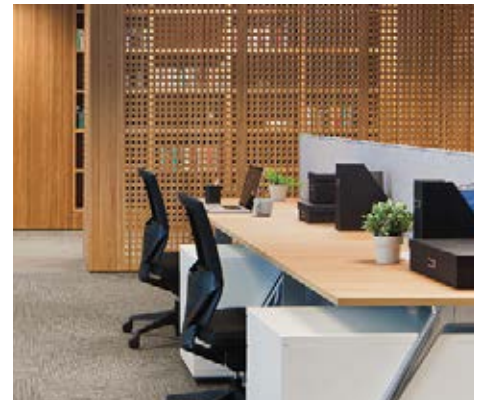
Workplaces: Wellness + Wood = Productivity

“Until recently, we’ve really not had a whole lot of evidence to support that common hypothesis that having things like wooden surfaces in the office would be good for your wellbeing.”*

“What I found and got really excited about was that there’s a really strong association between the presence of wood and wellbeing. I’ve rarely seen a data set or a study which has shown such a clear link.”*



“If you’re a worker and you could see no wooden surfaces at all from your workplace, 53% of that type of worker was satisfied with what was going on in their workplace. When you move that up to having eight or more wooden surfaces - we’re talking things here like wooden chairs, wooden panelling on the walls, wooden floorboards, even quite small wooden items- but if you get to eight or more, then 82% of people were satisfied with their work.”*



**Workplaces:
Wellness +
Wood =
Productivity**



A report prepared for
Forest & Wood Products Australia*
by Andrew Knox,
Howard Parry-Husbands,
Pollinate**
February 2018

Pollinate

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