SIGNIFY

PROTOCOLLI WELL ® E ILLUMINAZIONE

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Manens-Tifs
INGEGNERIA

WELL Building Standard®

Introduzione alla certificazione WELL®

L'International WELL Building Institute (IWBI) sta guidando il movimento globale per trasformare i nostri edifici e le nostre comunità con l'obiettivo di promuovere il benessere delle persone.
IWBI riunisce e dinamizza la comunità attenta alla salute tramite la gestione delle credenziali dei WELL AP, la ricerca con applicazioni pratiche, lo sviluppo di risorse formative e il supporto alle politiche di promozione della salute e del benessere in ogni ambito.

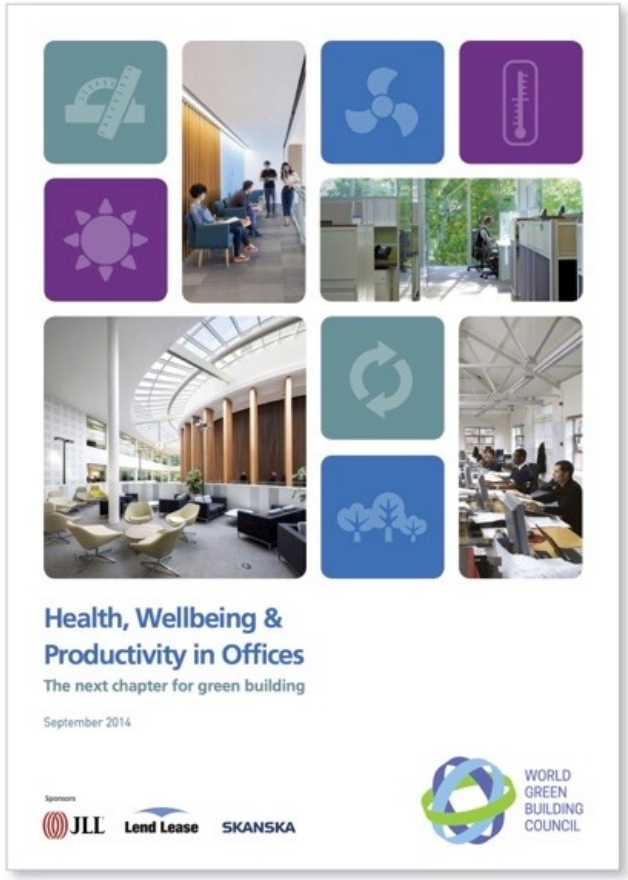
Lanciato nell'ottobre 2014 dopo sei anni di ricerca e sviluppo, WELL è diventato il principale standard globale per gli edifici, gli spazi interni e le comunità che cercano di implementare, convalidare e misurare le caratteristiche che sostengono e promuovono la salute e il benessere umano.

Fonte: https://www.wellcertified.com/about-iwbi/

Introduzione alla certificazione WELL®

Dall'ambiente alla salute dell'uomo

- ✓ Spendiamo il 90% del nostro tempo in luoghi confinati
- ✓ Il benessere costituisce il prossimo settore di investimento da miliardi di dollari
- ✓ Investire su stili di vita salutari rappresenta un sub-trend rispetto al macro-trend salute-benessere
- ✓ Diversi studi dimostrano già l'influenza del comfort ambientale su salute, benessere e produttività dei lavoratori



Introduzione alla certificazione WELL®

I risultati del benessere dei lavoratori

- ✓ **Fisici**. L'ambiente costruito può influire sullo stato fisico degli occupanti:
  - Mal di testa, mal di schiena, …
  - Sforzi/danni oculari
  - Irritazioni cutanee
  - Affaticamento
  - Infezioni
  - Asma e disturbi respiratori
  - Disturbi cardiovascolari
  - Stress e depressione
- ✓ **Mentali**. Oltre al dato oggettivo, è importante come gli occupanti percepiscono il loro benessere in termini di:
  - Salute fisica
  - Salute psicologica
  - Produttività
  - Ambiente di lavoro
- ✓ **Economici**. L'azienda misura il benessere in termini di:
  - Assenteismo/presenzialismo
  - Avvicendamento/mantenimento dello staff
  - Fatturati
  - Spese mediche
  - Efficienza e rispetto delle scadenze
  - Disturbi fisici

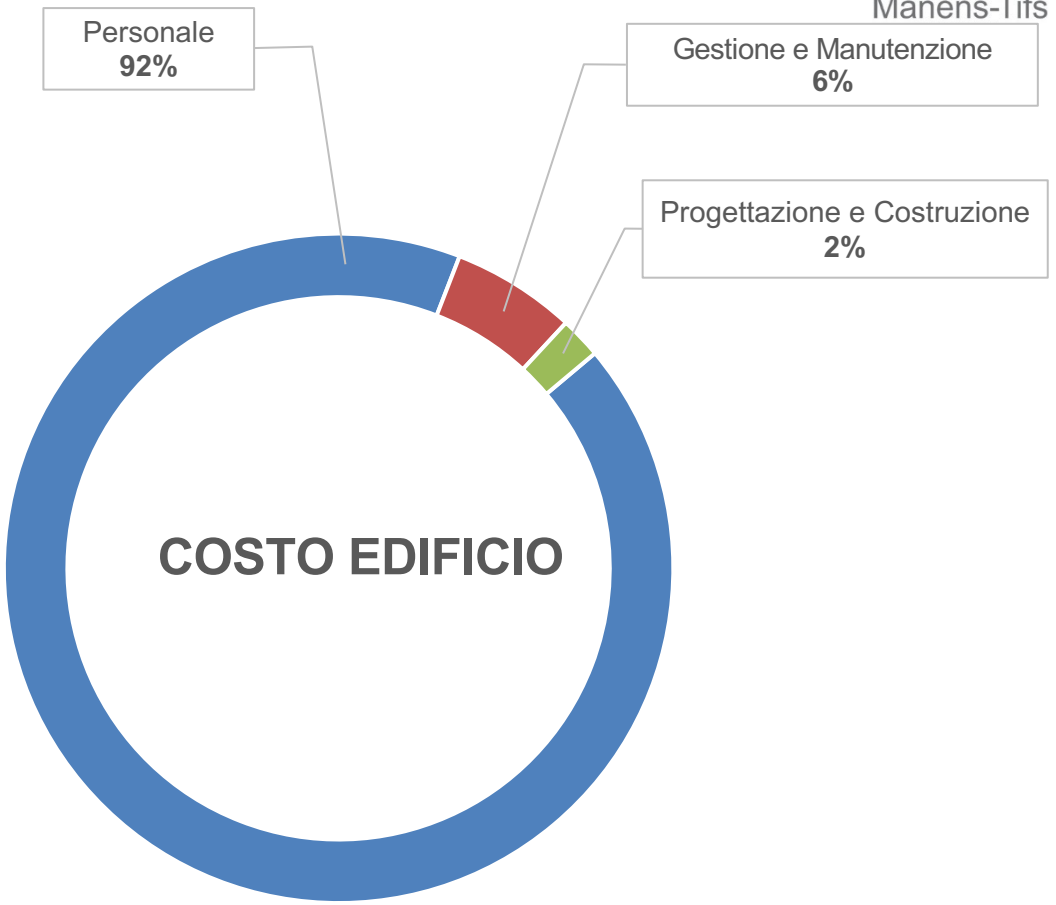
Introduzione alla certificazione WELL®

Investire nel capitale umano

- ✓ Diversi studi dimostrano che investire nel capitale umano ha un interessante ritorno economico

Costi dell'edificio rispetto ai costi del personale

- ✓ Se si considera la vita di un edificio in 30 anni, i costi del personale superano significativamente qualsiasi altro costo di costruzione e di funzionamento.
- ✓ Introducendo la certificazione WELL negli edifici, vi è il potenziale per ridurre i costi del personale (salute, medicina e produttività) nel lungo periodo.



- Knoll Workplace Research, What's Good for People, Moving from Wellness to Well-Being, Kate Lister, 2014
- Studies include those conducted by organizations including Harvard Business Review, World Economic Forum and The America Journal of Health Promotion
- Source: Osso, Annette. Sustainable Building Technical Manual. [Online] 1994. Public Technology, Inc. -http://smartenergy.illinois.edu/pdf/Archive/SustainableBuildingTechManual.pdf. 16

Introduzione alla certificazione WELL®

Che cos'è WELL?

WELL Building Standard è lo strumento leader per la promozione della salute e del benessere negli edifici e negli spazi interni a livello globale.

Cerca di implementare, convalidare e misurare le caratteristiche che migliorano la salute e l'esperienza umana attraverso la progettazione.

La certificazione WELL è un sistema basato sulla misurazione e sul monitoraggio delle prestazioni dell'ambiente costruito che ha un impatto sulla salute e sul benessere umano attraverso concetti fondamentali basati su 3 caratteristiche principali: comportamento, funzionamento e progettazione.

Introduzione alla certificazione WELL®

2014
WELL v1

Lanciata nel 2014, è la prima versione del WELL Building Standard ha aiutato la comunità globale ad applicare i principi della salute ai loro spazi

2018
WELL v2 Pilot

Lanciato nel 2018, la versione pilota WELL v2 sviluppata grazie alla cooperazione con la comunità WELL ha incrementato la qualità dello standard della precedente versione.

2020
WELL v2

Lanciata nel 2020, è l'ultima versione del WELL Building Standard - WELL v2. Il nuovo standard è la versione più resiliente e reattiva del sistema di rating di IWBI fino ad oggi.

Introduzione alla certificazione WELL®

Livelli di certificazione WELL v1

100% delle Preconditions ottenute

100% delle Preconditions ottenute
40% delle Optimizations applicabili

100% delle Preconditions ottenute
80% delle Optimizations applicabili

Livelli di certificazione WELL v2

WEEL BRONZE
40 points

WELL SILVER
50 points

WELL GOLD
60 points

WELL PLATINUM
≥80 points

Introduzione alla certificazione WELL®

Si basa su una checklist di requisiti:

- **PRECONDITIONS**: obbligatori
- **CONCEPTS** : volontari e premiati con un punteggio, la somma dei quali restituisce un punteggio a cui corrisponde un livello di certificazione.

I progetti possono perseguire non più di 12 punti per Concept e non più di 100 punti in totale tra i dieci concetti.

Total points achieved	WELL Certification		WELL Core Certification	
	Minimum points per concept	Level of certification	Minimum points per concept	Level of certification
40 pts	0	WELL Bronze	0	WELL Core Bronze
50 pts	1	WELL Silver	0	WELL Core Silver
60 pts	2	WELL Gold	0	WELL Core Gold
80 pts	3	WELL Platinum	0	WELL Core Platinum

I progetti possono anche conseguire ulteriori dieci punti nel concept "Innovazione". Un progetto può cercare di ottenere punti aggiuntivi nei Concept in cui si è raggiunto il massimo di 12 punti ottenibili

Introduzione alla certificazione WELL®

Air (Aria)	4	Preconditions	10	Optimizations
Water (Acqua)	3	Preconditions	6	Optimizations
Nourishment (Nutrizione)	2	Preconditions	12	Optimizations
Light (Luce)	2	Preconditions	7	Optimizations
Movement (Movimento)	2	Preconditions	9	Optimizations
Thermal Comfort (Comfort termico)	1	Preconditions	8	Optimizations
Sound (Suono)	1	Preconditions	7	Optimizations
Material (Materiale)	3	Preconditions	9	Optimizations
Mind (Mente)	2	Preconditions	9	Optimizations
Community (Comunità)	4	Preconditions	14	Optimizations
Innovation (Innovazione)	0	Preconditions	5	Optimizations
RIEPILOGO	**24**	**Preconditions**	**96**	**Optimizations**

Introduzione alla certificazione WELL®

Manens-Tifs INGEGNERIA

THE **WELL** BUILDING STANDARD ™

AIR					0 POINTS
Y	?	N	Weight	ID	Part Name
Y			Required	A01.1	Meet Thresholds for Particulate Matter
Y			Required	A01.2	Meet Thresholds for Organic Gases
Y			Required	A01.3	Meet Thresholds for Inorganic Gases
Y			Required	A01.4	Meet Thresholds for Radon
Y			Required	A01.5	Monitor Air Parameters
Y			Required	A02.1	Prohibit Indoor Smoking
Y			Required	A02.2	Prohibit Outdoor Smoking
Y			Required	A03.1	Ensure Adequate Ventilation
Y			Required	A04.1	Mitigate Construction Pollution
			2 points	A05.1	Meet Enhanced Thresholds for Particulate Matter
			1 point	A05.2	Meet Enhanced Thresholds for Organic Gases
			1 point	A05.3	Meet Enhanced Thresholds for Inorganic Gases
			2 points	A06.1	Increase Outdoor Air Supply (30% 1pt)
			1 point	A06.2	Improve Ventilation Effectiveness
			1 point	A07.1	Provide Operable Windows
			1 point	A07.2	Provide Operable Windows
			1 point	A08.1	Install Indoor Air Monitors
			1 point	A08.2	Promote Air Quality Awareness
			1 point	A09.1	Design Healthy Entryways
			1 point	A09.2	Perform Envelope Commissioning
			1 point	A10.1	Manage Combustion
			1 point	A11.1	Manage Pollution and Exhaust
			1 point	A12.1	Implement Particle Filtration
			1 point	A13.1	Improve Supply Air
			1 point	A14.1	Implement Ultraviolet Air Treatment

MOVEMENT					0 POINTS
Y	?	N	Weight	ID	Part Name
Y			Required	V01.1	Design Active Buildings and Communities
Y			Required	V02.1	Support Visual Ergonomics
Y			Required	V02.2	Provide Height-Adjustable Work Surfaces
Y			Required	V02.3	Provide Chair Adjustability
Y			Required	V02.4	Provide Support at Standing Workstations
Y			Required	V02.5	Provide Workstation Orientation
			1 point	V03.1	Design Aesthetic Staircases
			1 point	V03.2	Integrate Point-of-Decision Signage
			1 point	V03.3	Promote Visible Stairs
			2 points	V04.1	Provide Cycling Infrastructure
			1 point	V04.2	Provide Showers, Lockers and Changing Facil
			2 points	V05.1	Select Sites with Pedestrian-friendly Streets
			2 points	V05.2	Select Sites with Access to Mass Transit
			2 points	V06.1	Offer Physical Activity Opportunities
			2 points	V07.1	Provide Active Workstations
			1 point	V08.1	Provide Indoor Activity Spaces
			1 point	V08.2	Provide Outdoor Physical Activity Space
			1 point	V09.1	Offer Physical Activity Incentives
			1 point	V10.1	Provide Self-Monitoring Tools
			1 point	V11ß.1	Implement an Ergonomics Program
			1 point	V11ß.2	Commit to Ergonomic Improvements
			1 point	V11ß.3	Support Remote Work Ergonomics

MIND					0 POINTS
Y	?	N	Weight	ID	Part Name
Y			Required	M01.1	Promote Mental Health and Well-being
Y			Required	M02.1	Provide Connection to Nature
Y			Required	M02.2	Provide Connection to Place
			1 point	M03.1	Offer Mental Health Screening
			1 point	M03.2	Offer Mental Health Services
			1 point	M03.3	Offer Workplace Support
			1 point	M03.4	Support Mental Health Recovery
			1 point	M04.1	Offer Mental Health Education
			1 point	M04.2	Offer Mental Health Education for Managers
			2 points	M05.1	Develop Stress Management Plan
			1 point	M06.1	Support Healthy Working Hours
			1 point	M06.2	Provide Nap Policy and Space
			1 point	M07.1	Provide Restorative Space
			1 point	M08.1	Provide Restorative Programming
			1 point	M09.1	Provide Nature Access Indoors
			1 point	M09.2	Provide Nature Access Outdoors
			1 point	M10.1	Provide Tobacco Cessation Resources
			1 point	M10.2	Limit Tobacco Availability
			1 point	M11.1	Offer Substance Use Education
			1 point	M11.2	Provide Substance Use and Addiction Services

Introduzione alla certificazione WELL®

Manens-Tifs INGEGNERIA

WATER — 0 POINTS

Y	?	N	Weight	ID	Part Name
Y			Required	W01.1	Verify Water Quality Indicators
Y			Required	W02.1	Meet Chemical Thresholds
Y			Required	W02.2	Meet Thresholds for Organics and Pesticides
Y			Required	W03.1	Monitor Chemical and Biological Water Quality
Y			Required	W03.2	Implement Legionella Management Plan
			1 point	W04.1	Meet Thresholds for Drinking Water Taste
			2 points	W05.1	Assess and Maintain Drinking Water Quality
			1 point	W05.2	Promote Drinking Water Transparency
			1 point	W06.1	Ensure Drinking Water Access
			1 point	W07.1	Design Envelope for Moisture Protection
			1 point	W07.2	Design Interiors for Moisture Management
			1 point	W07.3	Implement Mold and Moisture Management Plan
			2 points	W08.1	Provide Bathroom and Handwashing Accommoda
			1 point	W08.2	Enhance Bathroom Accommodations
			1 point	W08.3	Support Effective Handwashing
			2 points	W09ß.1	Implement Safety Plan for Non-Potable Water Capture and Reuse

NOURISHMENT — 0 POINTS

Y	?	N	Weight	ID	Part Name
Y			Required	N01.1	Provide Fruits and Vegetables
Y			Required	N01.2	Promote Fruit and Vegetable Visibility
Y			Required	N02.1	Provide Nutritional Information
Y			Required	N02.2	Address Food Allergens
Y			Required	N02.3	Label Sugar Content
			1 point	N03.1	Limit Total Sugars
			1 point	N03.2	Promote Whole Grains
			1 point	N04.1	Optimize Food Advertising
			1 point	N05.1	Limit Artificial Ingredients
			1 point	N06.1	Promote Healthy Portions
			1 point	N07.1	Provide Nutrition Education
			2 points	N08.1	Support Mindful Eating
			1 point	N09.1	Accommodate Special Diets
			1 point	N09.2	Label Food Allergens
			1 point	N10.1	Provide Meal Support
			1 point	N11.1	Implement Responsible Sourcing
			2 points	N12.1	Provide Gardening Space
			1 point	N13.1	Ensure Local Food Access
			1 point	N14ß.1	Limit Red and Processed Meats

THERMAL COMFORT — 0 POINTS

Y	?	N	Weight	ID	Part Name
Y			Required	T01.1	Provide Acceptable Thermal Environment
Y			Required	T01.2	Monitor Thermal Parameters
			3 points	T02.1	Survey for Thermal Comfort
			2 points	T03.1	Provide Thermostat Control
			1 point	T04.1	Provide Personal Cooling Options
			1 point	T04.2	Provide Personal Heating Options
			1 point	T04.3	Allow Flexible Dress Code
			1 point	T05.1	Implement Radiant Heating
			1 point	T05.2	Implement Radiant Cooling
			1 point	T06.1	Monitor Thermal Environment
			1 point	T07.1	Manage Relative Humidity
			1 point	T08ß.1	Provide Windows with Multiple Opening Mod
			1 point	T09ß.1	Manage Outdoor Heat
			1 point	T09ß.2	Avoid Excessive Wind
			1 point	T09ß.3	Support Outdoor Nature Access

SOUND — 0 POINTS

Y	?	N	Weight	ID	Part Name
Y			Required	S01.1	Label Acoustic Zones
Y			Required	S01.2	Provide Acoustic Design Plan
			3 points	S02.1	Limit Background Noise Levels
			1 point	S03.1	Design for Sound Isolation at Walls and Doors
			2 points	S03.2	Achieve Sound Isolation at Walls
			2 points	S04.1	Achieve Reverberation Time Thresholds
			2 points	S05.1	Implement Sound Reducing Surfaces
			1 point	S06ß.1	Provide Minimum Background Sound
			2 points	S06ß.2	Provide Enhanced Speech Reduction
			1 point	S07ß.1	Specify Impact Noise Reducing Flooring
			2 points	S07ß.2	Meet Thresholds for Impact Noise Rating
			1 point	S08ß.1	Provide Enhanced Speech Intelligibility
			1 point	S08ß.2	Prioritize Audio Devices and Policies

COMMUNITY — 0 POINTS

Y	?	N	Weight	ID	Part Name
Y			Required	C01.1	Provide WELL Feature Guide
Y			Required	C02.1	Facilitate Stakeholder Charrette
Y			Required	C02.2	Promote Health-Oriented Mission
Y			Required	C03.1	Develop Emergency Preparedness Plan
Y			Required	C04.1	Select Project Survey
Y			Required	C04.1	Administer Survey and Report Results
			1 point	C05.1	Utilize Enhanced Survey
			1 point	C05.2	Utilize Pre- and Post-Occupancy Survey
			1 point	C05.3	Implement Action Plan
			1 point	C05.4	Facilitate Interviews, Focus Groups and/or Observa
			2 points	C06.1	Promote Health Benefits
			1 point	C06.2	Offer On-Demand Health Services
			1 point	C06.3	Offer Sick Leave
			1 point	C07.1	Promote Culture of Health
			1 point	C07.2	Health Promotion Leader
			3 points	C08.1	Offer New Parent Leave
			1 point	C09.1	Offer Workplace Breastfeeding Support
			2 points	C09.2	Design Lactation Room
			1 point	C10.1	Offer Childcare Support
			1 point	C10.2	Offer Family Leave
			1 point	C10.3	Offer Bereavement Support
			1 point	C11.1	Promote Community Engagement
			1 point	C11.2	Provide Community Space
			3 points	C12.1	Promote Diversity and Inclusion
			2 points	C13.1	Integrate Universal Design
			1 point	C14.1	Promote Emergency Resources
			1 point	C14.2	Provide Opioid Response Kit and Training
			1 point	C15ß.1	Promote Business Continuity
			1 point	C15ß.2	Support Emergency Resilience
			1 point	C15ß.3	Facilitate Healthy Re-entry
			2 points	C16ß.1	Allocate Affordable Units
			1 point	C17ß.1	Disclose Labor Practices
			2 points	C17ß.2	Implement Responsible Labor Practices

Introduzione alla certificazione WELL®

Manens-Tifs INGEGNERIA

LIGHT				0 POINTS
Y	?	?	Weight	ID	Part Name
Y			Required	L01.1	Provide Indoor Light
Y			Required	L02.1	Provide Visual Acuity
			3 points	L03.1	Meet Lighting for Day-Active People
			2 points	L04.1	Manage Glare from Electric Lighting
			2 points	L05.1	Implement Daylight Plan
			2 points	L05.2	Integrate Solar Shading
			2 points	L06.1	Conduct Daylight Simulation
			1 point	L07.1	Balance Visual Lighting
			1 point	L08.1	Enhance Color Rendering Quality
			2 points	L08.2	Manage Flicker
			2 points	L09.1	Enhance Occupant Controllability
			1 point	L09.2	Provide Supplemental Lighting

MATERIALS					0 POINTS
Y	?	N	Weight	ID	Part Name
Y			Required	X01.1	Restrict Asbestos
Y			Required	X01.2	Restrict Mercury
Y			Required	X01.3	Restrict Lead
Y			Required	X02.1	Manage Asbestos Hazards
Y			Required	X02.2	Manage Lead Paint Hazards
Y			Required	X02.3	Manage Polychlorinated Biphenyl (PCB) Haza
Y			Required	X03.1	Manage Exterior CCA Hazards
Y			Required	X03.2	Manage Lead Hazards
			1 point	X04.1	Assess and Mitigate Site Hazards
			1 point	X05.1	Select Compliant Interior Furnishings
			1 point	X05.2	Select Compliant Architectural and Interior Pr
			2 points	X06.1	Limit VOCs from Wet-Applied Products
			2 points	X06.2	Restrict VOC Emissions from Furniture, Archit
			1 point	X07.1	Select Products with Disclosed Ingredients
			1 point	X07.2	Select Products with Enhanced Ingredient Dis
			1 point	X07.3	Select Products with Third-Party Verified Ingr
			1 point	X08.1	Select Materials with Enhanced Chemical Rest
			1 point	X08.2	Select Optimized Products
			1 point	X09.1	Implement a Waste Management Plan
			1 point	X10.1	Manage Pests
			1 point	X11.1	Improve Cleaning Practices
			1 point	X11.2	Select preferred cleaning products
			1 point	X12ß.1	Reduce Respiratory Particle Exposure
			1 point	X12ß.2	Address Surface Hand Touch

INNOVATION				0 POINTS
Y	?	N	Weight	ID	Part Name
			10 points	I01	Propose Innovations (Concept overages)
			1 point	I02	Achieve WELL AP
			1 point	I03	Offer WELL Educational Tours
			1 point	I04	Complete Health and Wellness Programs
			5 points	I05	Achieve Green Building Certification

PRECONDITIONS
48 YES
0 MAYBE **100%**
0 NO

OPTIMIZATION POINTS
0 YES
0 MAYBE
0 NO

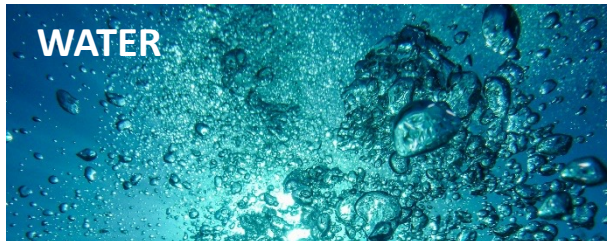
Project Name:
Date

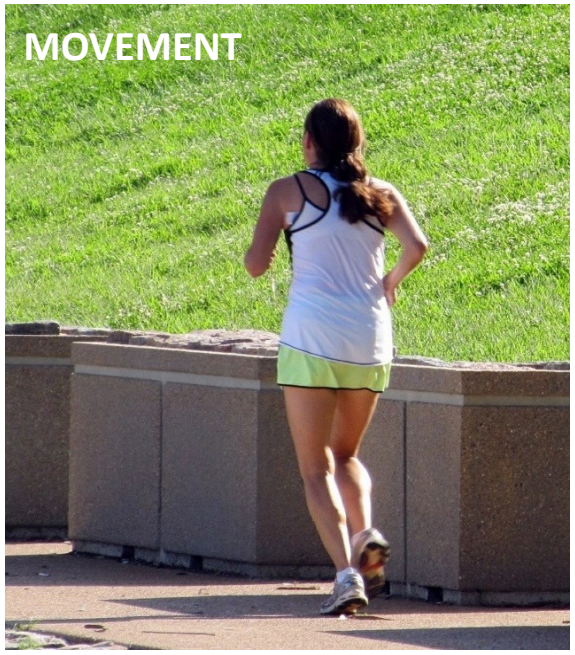
Enrollment type: **WELL Certification**
Applicable Version: **v2 Q4 2020**

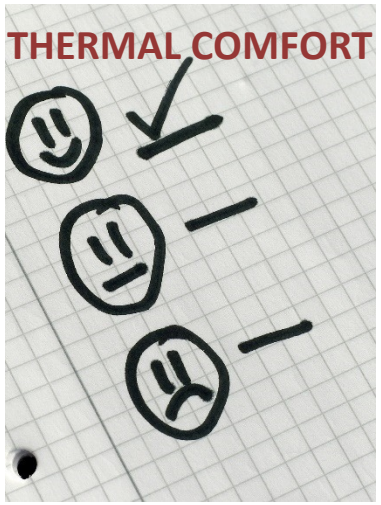
Projected point total: **0**
Anticipated milestone level: **Not Certified**

Introduzione alla certificazione WELL®

Aree Tematiche





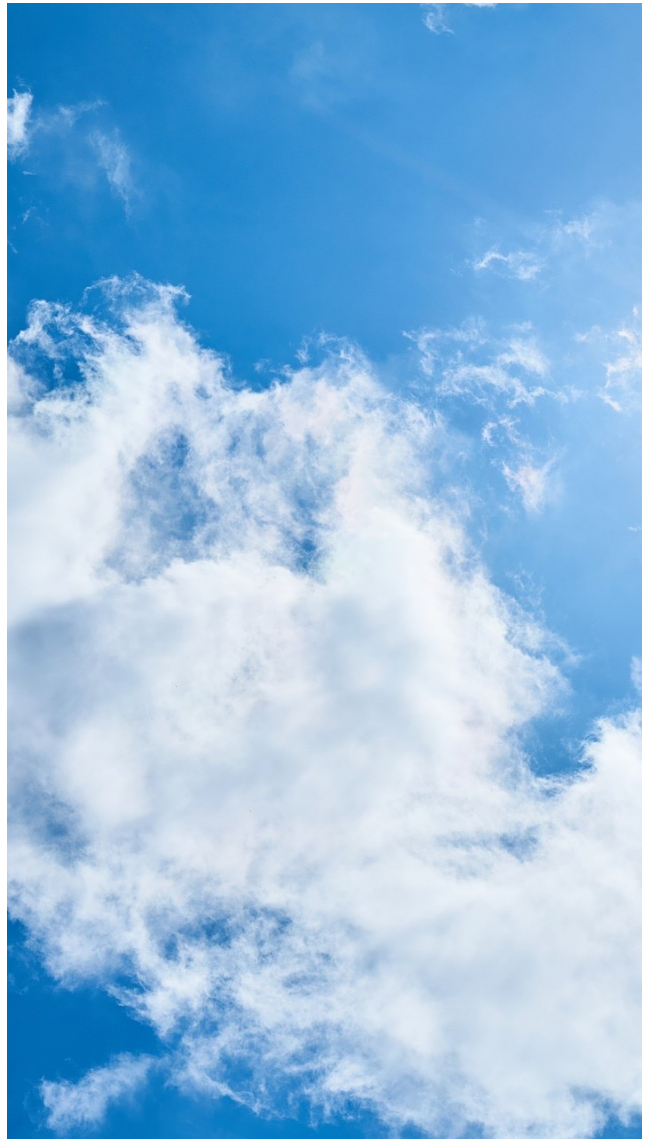


Introduzione alla certificazione WELL®

Aree Tematiche: ARIA

- Creare una qualità dell'aria interna ottima al fine di supportare la salute ed il benessere degli occupanti dell'edificio

- Temi correlati:
  - ✓ Selezione dei materiali
  - ✓ Ventilazione
  - ✓ Filtrazione
  - ✓ Controllo dell'umidità
  - ✓ Protezione dalle fonti contaminanti
  - ✓ Manutenzione
  - ✓ Processi costruttivi



Introduzione alla certificazione WELL®

Aree Tematiche: ACQUA

- Promuovere l'uso di acqua sana e pulita attraverso un'adeguata filtrazione e altri metodi, richiedere la qualità appropriata per i vari usi

- Temi correlati:
  - ✓ Verifica della qualità
  - ✓ Trattamento
  - ✓ Manutenzione
  - ✓ Promozione dell'idratazione

Introduzione alla certificazione WELL®

Aree Tematiche: NUTRIZIONE

- Richiedere la disponibilità di cibi freschi e salutari, limitando ingredienti dannosi alla salute ed incoraggiare migliori abitudini alimentari e la cultura del cibo

- Temi correlati:
  - ✓ Porzioni salutari
  - ✓ Alimentazione consapevole
  - ✓ Accesso a cibi sani
  - ✓ Preparazione dei cibi
  - ✓ Allergie e alternative
  - ✓ Trasparenza
  - ✓ Segnali ambientali

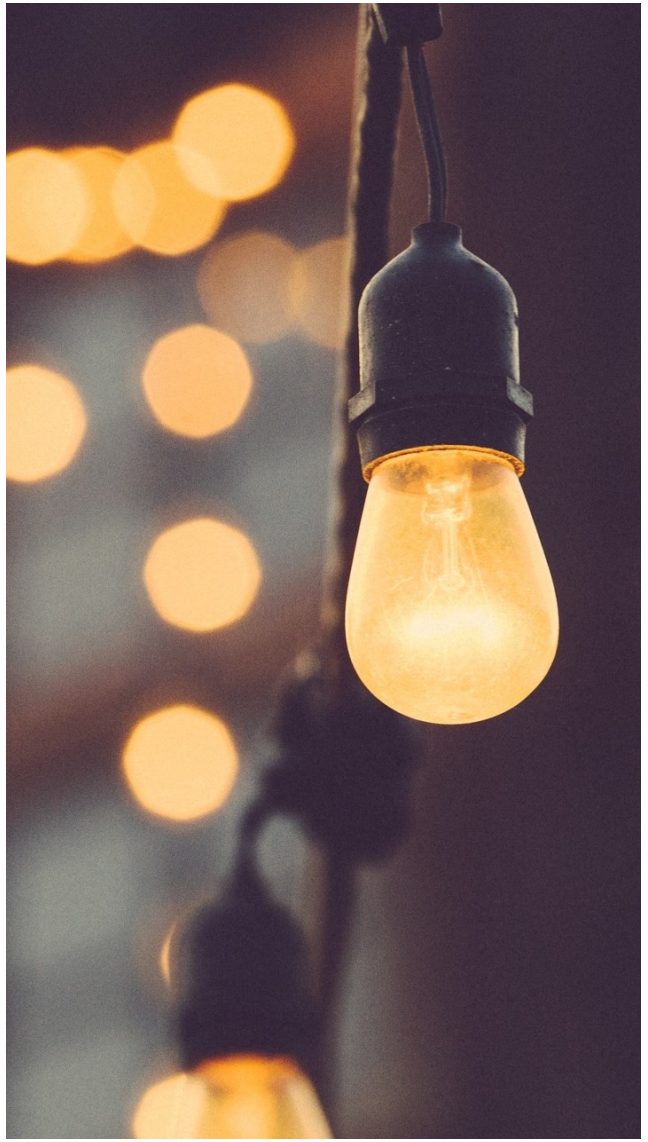
Introduzione alla certificazione WELL®

Aree Tematiche: LUCE

- Fornire le linee guida per un'illuminazione che minimizzi il disturbo dei cicli circadiani del corpo umano, migliori la produttività e fornisca un'adeguata acuità visiva

- Richiedere sistemi illuminotecnici specializzati progettati per migliorare la prontezza, l'esperienza degli occupanti dell'edificio e favorire il sonno

- Temi correlati:
  - ✓ Progettazione circadiana
  - ✓ Luce naturale
  - ✓ Controllo dell'abbagliamento
  - ✓ Qualità del colore
  - ✓ Livelli di luce basati sull'attività
  - ✓ Acuità visiva

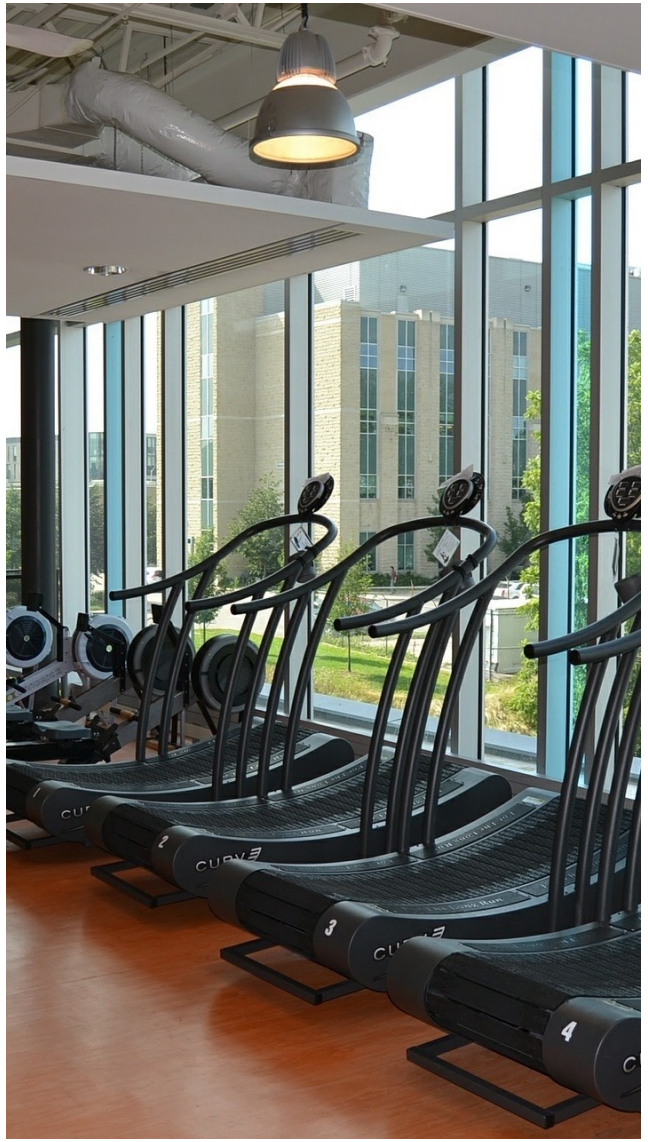


Introduzione alla certificazione WELL®

Aree Tematiche: MOVIMENTO

- Permettere un'integrazione dell'esercizio fisico nella vita di tutti i giorni, fornendo caratteristiche degli spazi e componenti fisici che supportino uno stile di vita attivo e salutare

- Temi correlati:
  - ✓ Progettazione attiva degli spazi esterni
  - ✓ Progettazione attiva degli spazi interni
  - ✓ Lavoro basato sull'attività fisica
  - ✓ Spazi per l'attività fisica
  - ✓ Consapevolezza e abitudini
  - ✓ Programmi per l'attività fisica

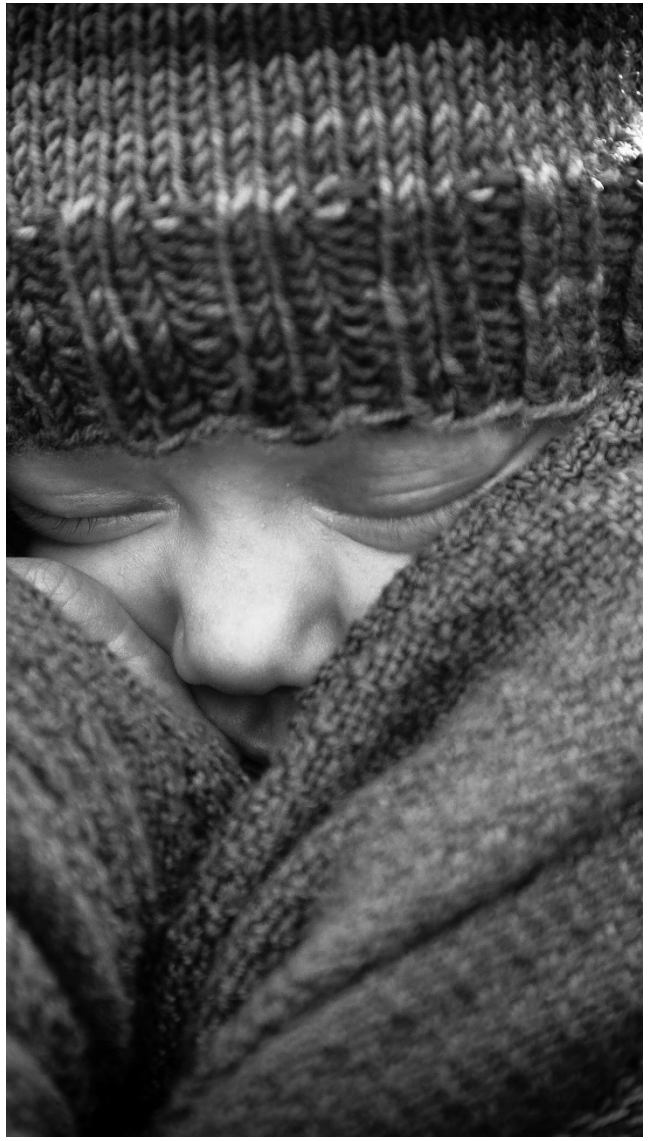


Introduzione alla certificazione WELL®

Aree Tematiche: COMFORT

- Stabilire i requisiti per creare un ambiente interno libero da distrazioni, produttivo e confortevole

- Temi correlati:
  - ✓ Ergonomia
  - ✓ Acustica
  - ✓ Comfort termico
  - ✓ Sensazioni olfattive
  - ✓ Accessibilità



Introduzione alla certificazione WELL®

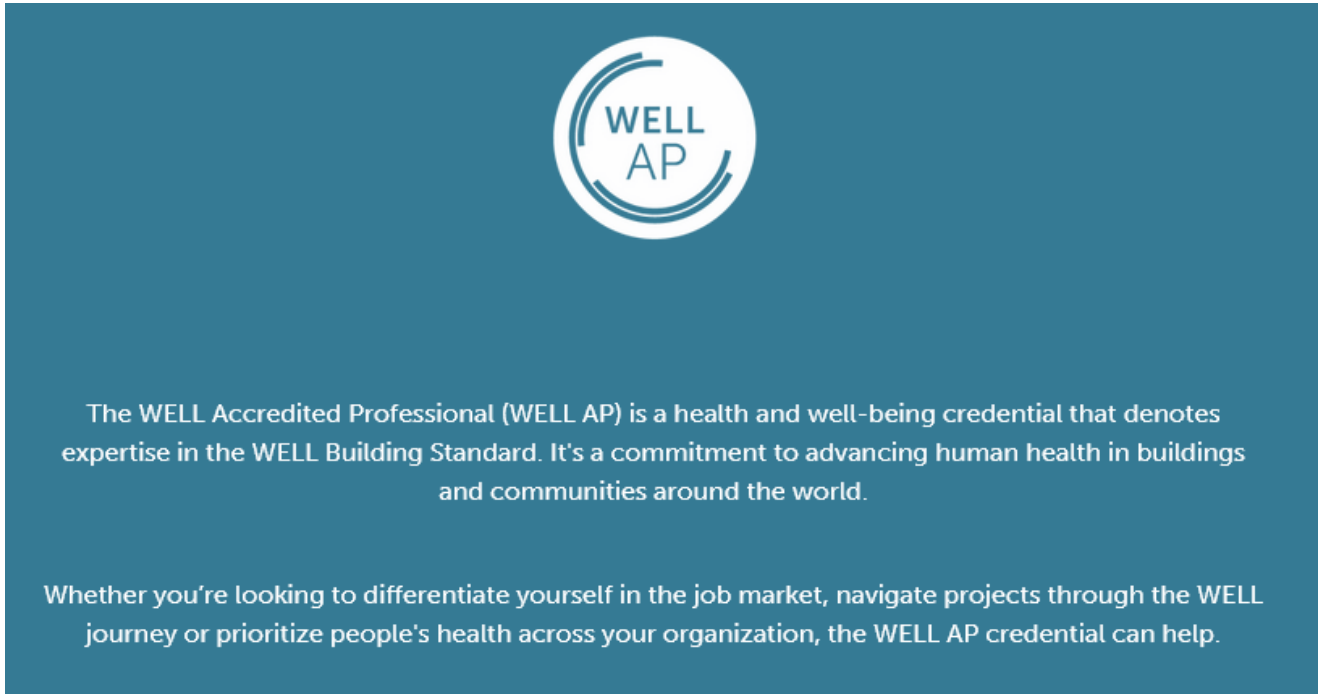
Aree Tematiche: MENTE

- Richiedere progettazione, tecnologia, e strategie per fornire un ambiente fisico che ottimizzi la salute cognitiva ed emotiva

- Temi correlati:
  - ✓ Coinvolgimento degli stakeholder
  - ✓ Trasparenza
  - ✓ Benessere
  - ✓ Consapevolezza e protocolli
  - ✓ Connessione con la natura
  - ✓ Spazi flessibili
  - ✓ Altruismo

Illuminazione nel sistema WELL®

WELL v2 – WELL AP



Il WELL Accredited Professional (WELL AP) è professionista accreditato in materia di salute e benessere che denota la competenza nello standard WELL Building. È un impegno a sostenere la salute umana negli edifici e nelle comunità di tutto il mondo.

IL WELL AP coordinerà il processo di certificazione a partire dalla fase di progettazione sino al completamento dei test in campo e certificazione dell'edificio.

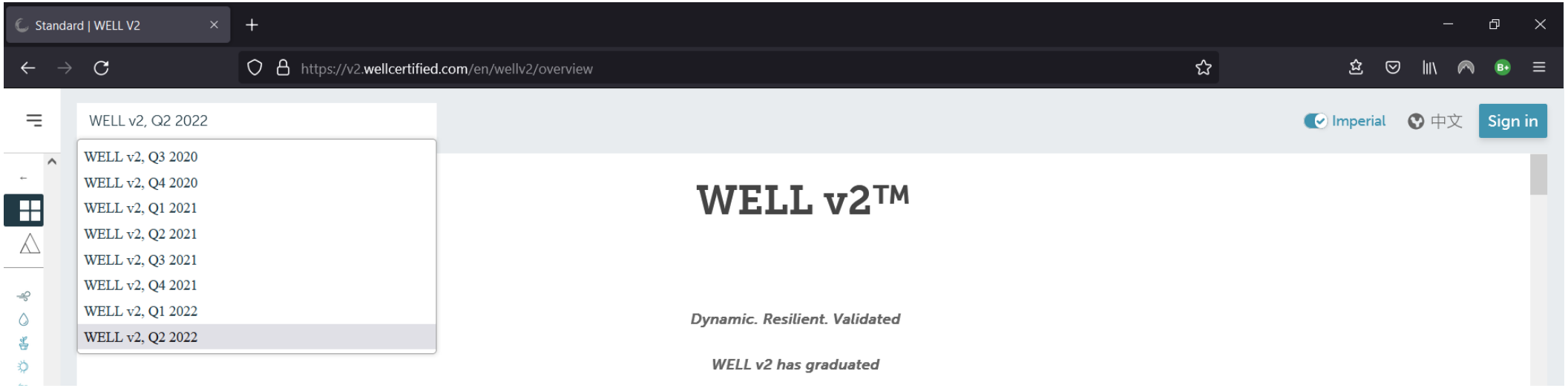
Fonte: https://www.wellcertified.com/well-ap/

Illuminazione nel sistema WELL®

WELL v2 –VERIFICARE LA VERSIONE AL MOMENTO DELLA REGISTRAZIONE DEL PROGETTO

Prima di iniziare un progetto è indispensabile contattare il WELL AP, incaricato dal Committente, che definirà assieme al team di progetto (Committente, Architetti, progettisti MEP, Lighting Designer, Consulenti acustici, ecc.) le migliori strategie per l'ottenimento delle Pre-Condition (Obbligatorie) e le Optimization per raggiungere il punteggio obiettivo richiesto dalla committenza.

IWBI ogni 4 mesi emette una nuova versione del protocollo. E' necessario che sia effettuata la registrazione del progetto per bloccare la versione del protocollo da utilizzare fino all'ottenimento della certificazione



Fonte: https://v2.wellcertified.com/en/wellv2/overview

Illuminazione nel sistema WELL®

WELL v2 - Q1 2021

Link principali di IWBI:
Main page: https://www.wellcertified.com/
WELL v2 main page: https://v2.wellcertified.com/wellv2/en/overview
WELL v2 pilot: https://v2.wellcertified.com/v/en/overview

Illuminazione nel sistema WELL®

WELL v2 - Q1 2021

Manens-Tifs INGEGNERIA

LIGHT

Precond.	Precond.	Optimiz.	Optimiz.	Optimiz.	Optimiz.	Optimiz.	Optimiz.	Optimiz.	Optimiz.	Optimiz.	Optimiz.
L01 Light Exposure	L02 Visual Lighting Design	L03 Circadian Lighting Design	L04 Electric Light Glare Control	L05 Daylight Design Strategies	L05 Daylight Design Strategies	L06 Daylight Simulation	L07 Visual Balance	L08 Electric Light Quality	L08 Electric Light Quality	L09 Occupant Lighting Control	L09 Occupant Lighting Control
Part 1 Provide Indoor Light	Part 1 Provide Visual Acuity	Part 1 Meet Lighting for Day-Active People	Part 1 Manage Glare for Electric Lighting	Part 1 Implement Daylight Plan	Part 2 Integrate Solar Shading	Part 1 Conduct Daylight Simulation	Part 1 Balance Visual Lighting	Part 1 Enhance Color Rendering Quality	Part 2 Manage Flicker	Part 1 Enhance Occupant Controllability	Part 2 Provide Supplemental Lighting

Illuminazione nel sistema WELL®

WELL v2 - Q1 2021

Manens-Tifs INGEGNERIA

LIGHT

Precond.	Precond.	Optimiz.	Optimiz.	Optimiz.	Optimiz.	Optimiz.	Optimiz.	Optimiz.	Optimiz.	Optimiz.	Optimiz.
L01 Light Exposure	L02 Visual Lighting Design	L03 Circadian Lighting Design	L04 Electric Light Glare Control	L05 Daylight Design Strategies	L05 Daylight Design Strategies	L06 Daylight Simulation	L07 Visual Balance	L08 Electric Light Quality	L08 Electric Light Quality	L09 Occupant Lighting Control	L09 Occupant Lighting Control
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Illuminazione nel sistema WELL®

L01.1 Provide Indoor Light

PRECONDITION

Option 1: Daylight simulation

The project demonstrates, through computer simulations, that one of the following conditions are achieved:

a. Regularly occupied spaces achieve one of the following targets:

Calculations per IES LM-83-12		Calculations per Annex A of CEN 17037:2018
Average sDA $_{200,40\%}$ is achieved for > 30% of regularly occupied floor area	OR	Target illuminance 200 lux is achieved for >30% of individual unit area throughout 50% of daylit hours of the year

b. Common spaces that have unassigned seating for at least 15% of regular occupants at any given time achieve one of the following targets:

Calculations per IES LM-83-12		Calculations per Annex A of CEN 17037:2018
Average sDA $_{300,50\%}$ is achieved for > 75% of floor area	OR	Target illuminance 300 lux is achieved for >30% of individual unit area and average illuminance 100 lux is achieved for >95% of individual unit area throughout 50% of daylit hours of the year

Verified by Technical Document

OR

Illuminazione nel sistema WELL®

L01.1 Provide Indoor Light

Option 2: Interior layout

One of the following requirements is met:

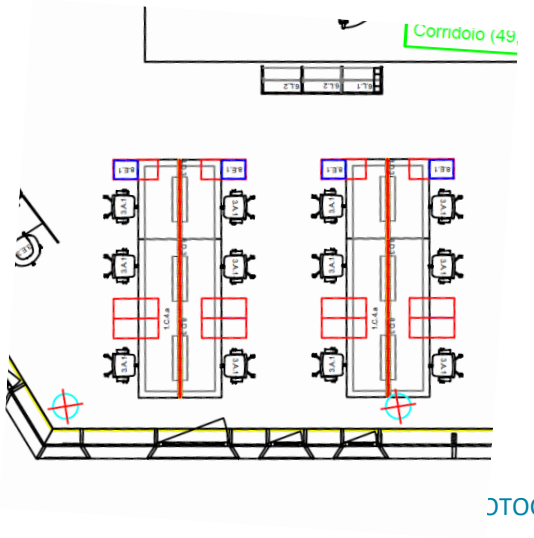
a. At least 30% of the regularly occupied area is within a 6 m horizontal distance of envelope glazing in each floor and/or in each individual unit.

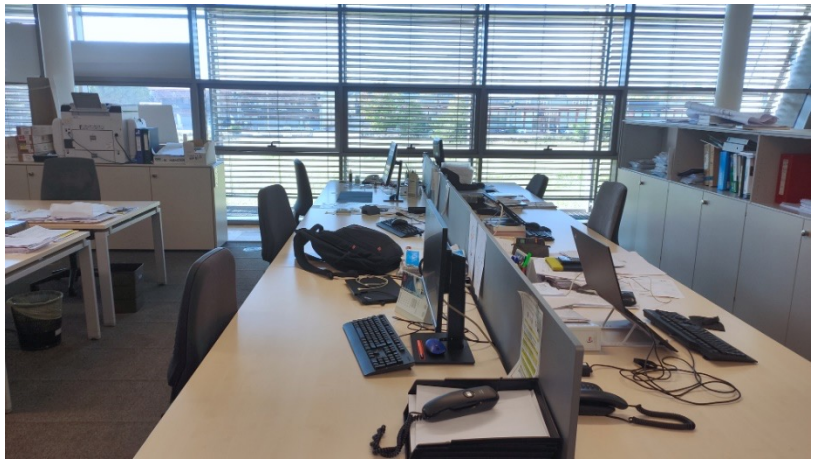
b. Common spaces have unassigned seating and can accommodate at least 15% of regular occupants at any given time. At least 70% of all seating in the spaces is within a 5 m horizontal distance of envelope glazing.

Verified by Technical Document

PRECONDITION

OR





Illuminazione nel sistema WELL®

L01.1 Provide Indoor Light

PRECONDITION

Option 3: Building design

One of the following requirements is met:

a. The envelope glazing area is no less than 7% of the regularly occupied floor area for each floor level or individual unit.

b. The floor plate is no more than 20 m between opposite walls that each have transparent envelope glazing, and there are no opaque obstructions higher than 1 m within a 6 m horizontal distance of the transparent envelope glazing.

Verified by Technical Document

OR

Option 4: Circadian lighting design

The following requirement is met:

a. The project achieves at least one point in Feature L03: Circadian Lighting Design.

Verified by Technical Document

Illuminazione nel sistema WELL®

WELL v2 - Q1 2021

Manens-Tifs INGEGNERIA

LIGHT

Precond.	Precond.	Optimiz.	Optimiz.	Optimiz.	Optimiz.	Optimiz.	Optimiz.	Optimiz.	Optimiz.	Optimiz.	Optimiz.
L01 Light Exposure	L02 Visual Lighting Design	L03 Circadian Lighting Design	L04 Electric Light Glare Control	L05 Daylight Design Strategies	L05 Daylight Design Strategies	L06 Daylight Simulation	L07 Visual Balance	L08 Electric Light Quality	L08 Electric Light Quality	L09 Occupant Lighting Control	L09 Occupant Lighting Control
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Illuminazione nel sistema WELL®

L02.1 Provide Visual Acuity

Choose between the following:

Option 1: Visual lighting design

The following requirements are met:

a. All indoor and outdoor spaces (including transition areas) comply with the illuminance thresholds specified in one of the following lighting reference guidelines:
1. IES Lighting Handbook 10th Edition.[3]
2. EN 12464-1&2: 2011.[4]
3. ISO 8995-1:2002(E) (CIE S 008/E:2001).[5]
4. GB50034-2013.[6]
5. CIBSE SLL Code for Lighting.[7]

b. The illuminance thresholds take into consideration the tasks and the age groups of the occupants.

Verified by Technical Document, Performance Test

OR

Nella Versione V2 Q2-2022: 2. EN 12464-1&2: 2011 or EN 12464: 2022.[4]

PRECONDITION

Illuminazione nel sistema WELL®

L02.1 Provide Visual Acuity

PRECONDITION

Option 2: Predetermined light levels

The following requirements are met:

a. More than 50% of the occupants are under the age of 65.

b. At least 90% of the project area is comprised of the following space types and meets the associated illuminance thresholds:

1. Offices and classrooms: minimum 320 lux at task surface.[8]
2. Lobby, atrium and transition (including corridor and outdoor pathways): minimum 110 lux at floor level.[8]
3. Storage spaces: minimum 110 lux at floor level.[8]
4. Dining, Lounge and Restrooms: minimum 110 lux at task surface.[8]

Verified by Performance Test, Letter of Assurance – Owner

Note: Multifamily residential projects may achieve WELL Certification at the Bronze or Silver level without testing in dwelling units, but cannot achieve Gold or Platinum without testing in dwelling units. See Sampling Rates for Multifamily Residential in the WELL Performance Verification Guidebook for further details.

Illuminazione nel sistema WELL®

WELL v2 - Q1 2021

Manens-Tifs INGEGNERIA

LIGHT

Precond.	Precond.	Optimiz.	Optimiz.	Optimiz.	Optimiz.	Optimiz.	Optimiz.	Optimiz.	Optimiz.	Optimiz.	Optimiz.
L01 Light Exposure	L02 Visual Lighting Design	L03 Circadian Lighting Design	L04 Electric Light Glare Control	L05 Daylight Design Strategies	L05 Daylight Design Strategies	L06 Daylight Simulation	L07 Visual Balance	L08 Electric Light Quality	L08 Electric Light Quality	L09 Occupant Lighting Control	L09 Occupant Lighting Control
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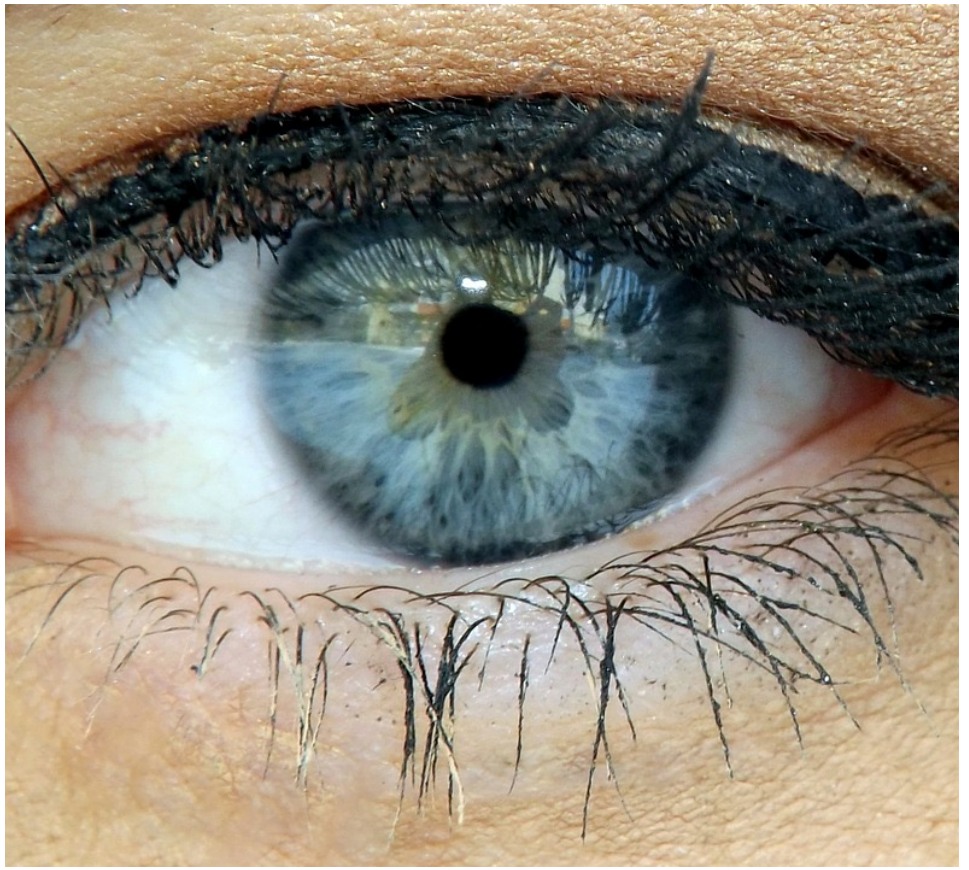
Illuminazione nel sistema WELL®

L03.1 Meet Lighting for Day-Active People

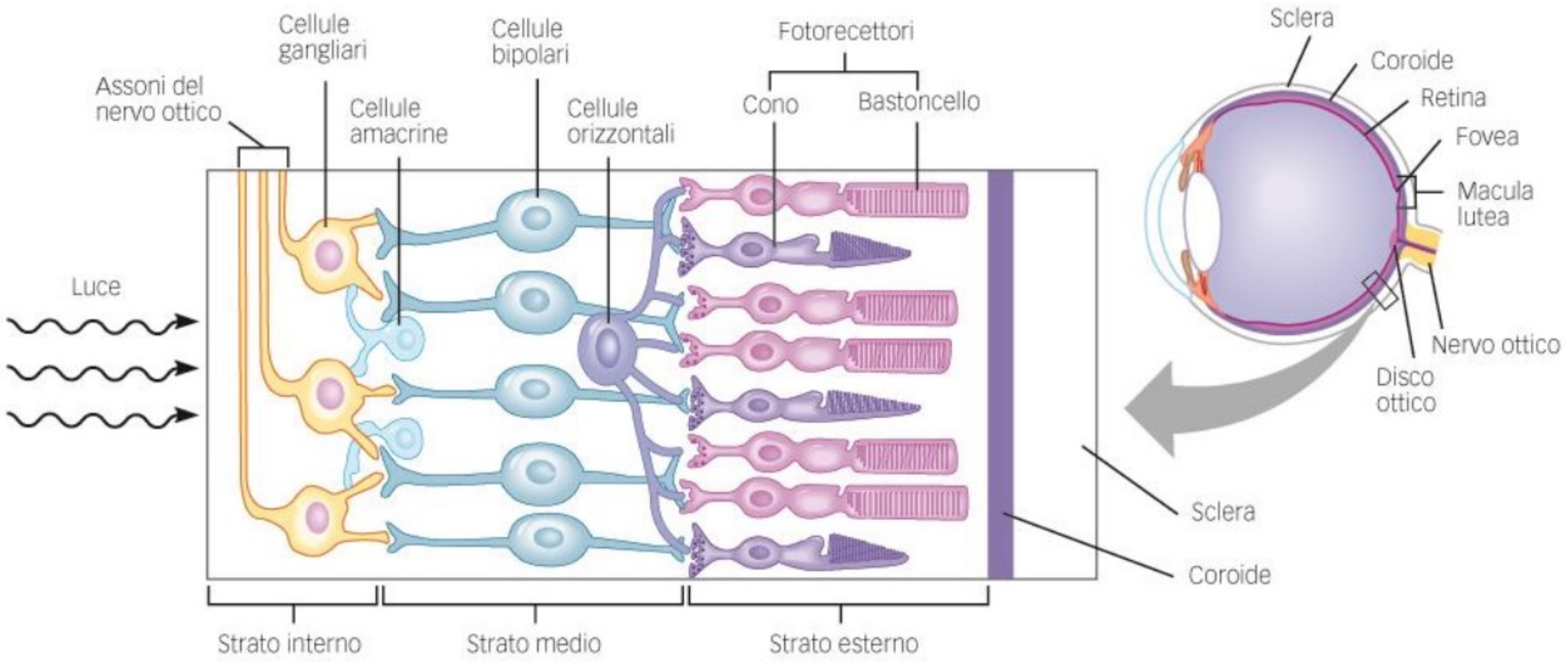
APPARATO VISIVO
COME I NOSTRI OCCHI VEDONO



OPTIMIZATION

Illuminazione nel sistema WELL®

L03.1 Meet Lighting for Day-Active People



Ogni retina è composta mediamente da circa 7 milioni di coni e 12 milioni di bastoncelli.

Immagine fonte: https://www.dbcf.unisi.it/sites/st13/files/allegati/12-11-2015/sistema_visivo.pdf

OPTIMIZATION

Illuminazione nel sistema WELL®

L03.1 Meet Lighting for Day-Active People

OPTIMIZATION

Visione Scotopica

BASTONCELLI: Sono collegati alle cellule nervose a gruppi e questo fa sì che l'immagine sia più confusa. Permettono di vedere anche in condizioni di scarsa luminosità. La visione è monocromatica perché i bastoncelli sono dotati di un solo fotopigmento.

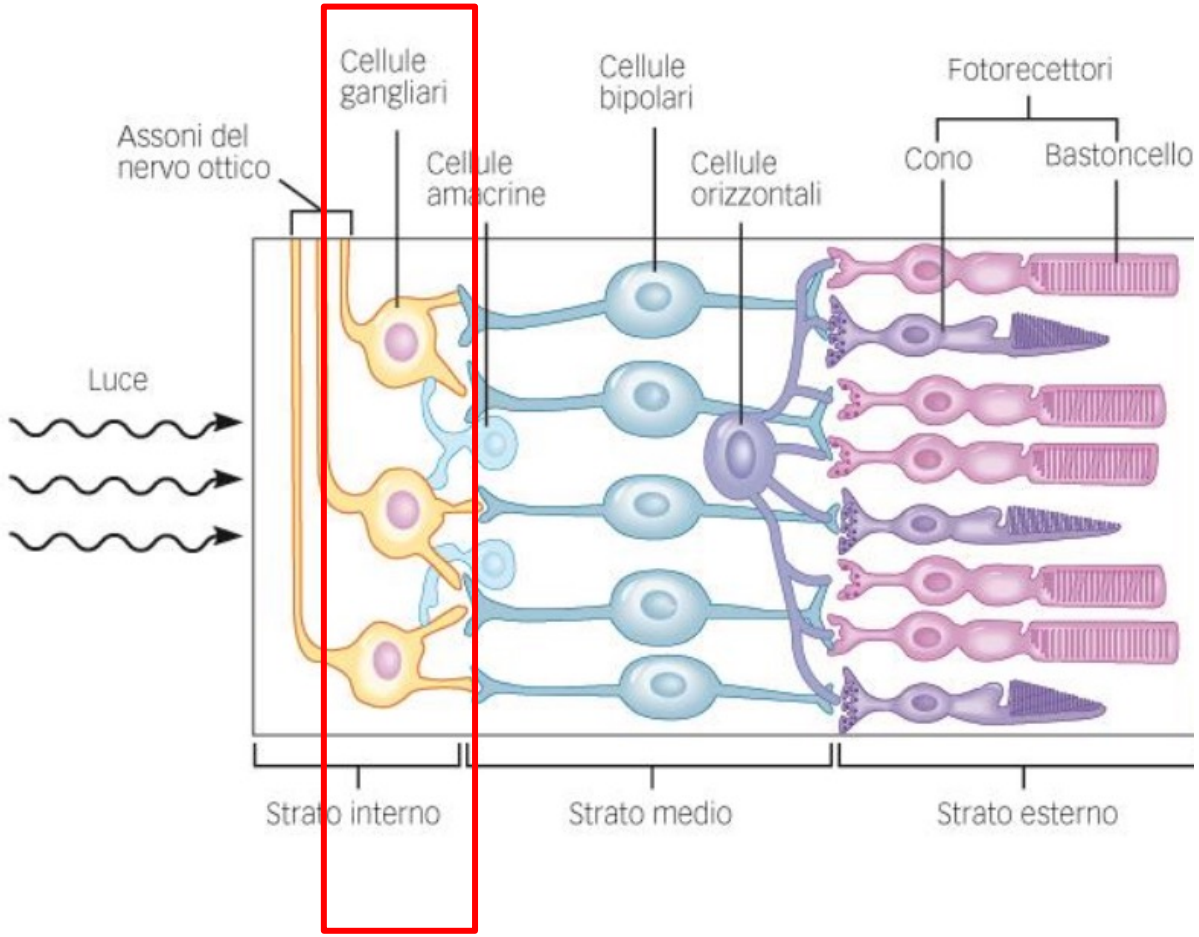
Illuminazione nel sistema WELL®

L03.1 Meet Lighting for Day-Active People

OPTIMIZATION

Illuminazione nel sistema WELL®

L03.1 Meet Lighting for Day-Active People



Le cellule GANGLIARI (IPRGCS Intrinsically photosensitive retinal ganglion cells) sono il terzo fotorecettore. La loro funzione non è deputata alla formazione delle immagini ma quella di recepire la variazione dello spettro luminoso necessaria per il funzionamento dell'orologio biologico al variare della luce naturale.

CICLO CIRCADIANO

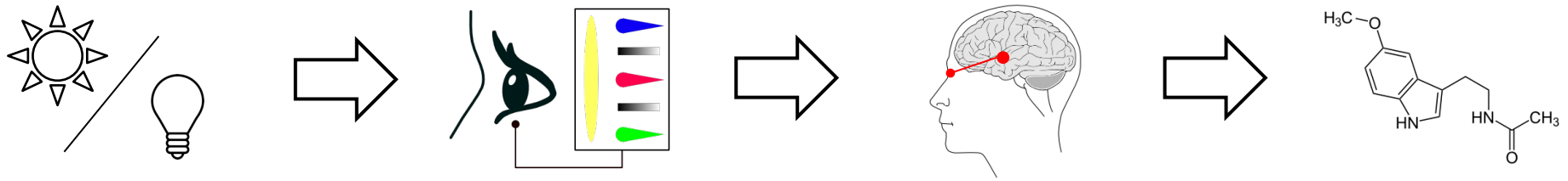
OPTIMIZATION

Immagini fonte:
https://www.dbcf.unisi.it/sites/st13/files/allegati/12-11-2015/sistema_visivo.pdf
Di NoNameGYassineMrabetTalk fixed by Addicted04 - The work was done with Inkscape by YassineMrabet. Informations were provided from "The Body Clock Guide to Better Health" by Michael Smolensky and Lynne Lamberg; Henry Holt and Company, Publishers (2000). Landscape was sampled from Open Clip Art Library (Ryan, Public domain). Vitruvian Man and the clock were sampled from Image:P human body.svg (GNU licence) and Image:Nuvola apps clock.png, respectively., CC BY-SA 3.0, https://commons.wikimedia.org/w/index.php?curid=3017148

Illuminazione nel sistema WELL®

L03.1 Meet Lighting for Day-Active People

Stimolo ambientale	Struttura sensoriale	SCN + Ghiandola pineale	Rilascio ormoni



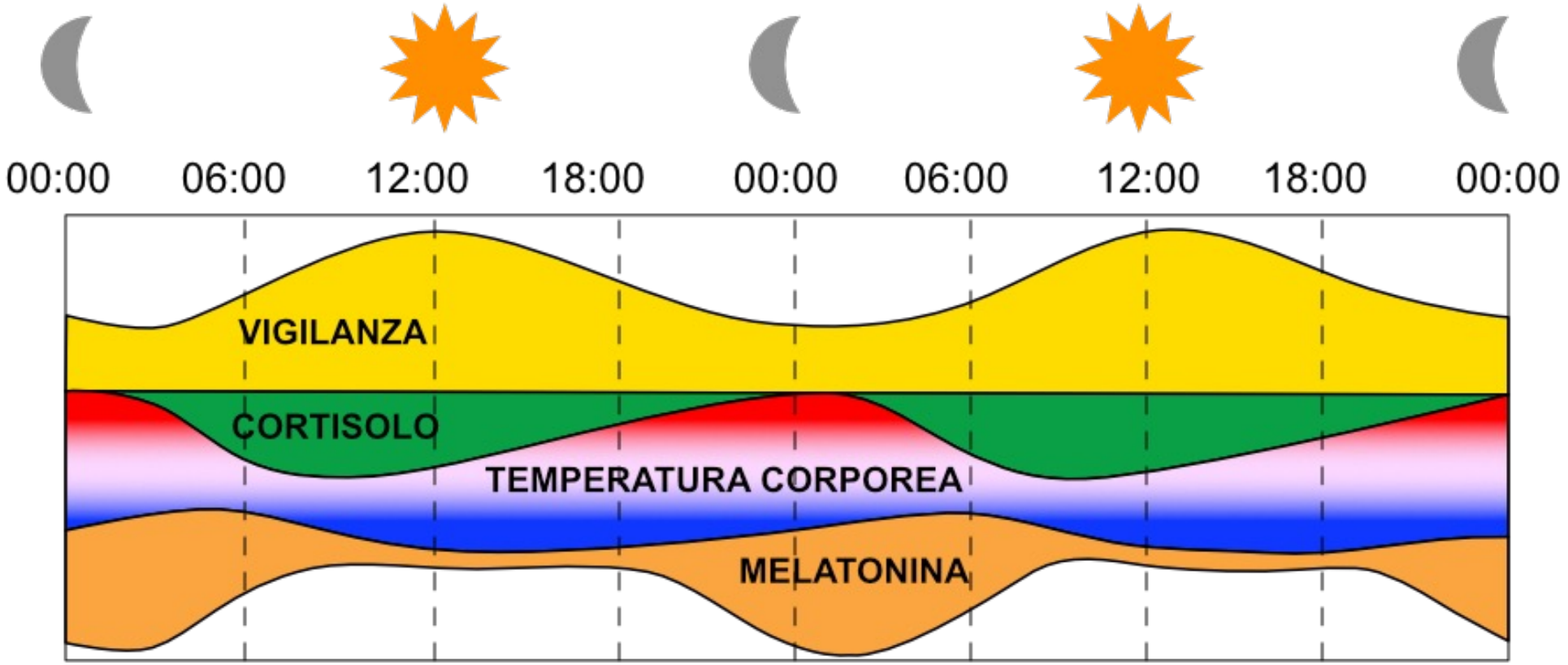
Segnali attivazione Ciclo Circadiano	Recettori nella retina	Ricezione e traduzione degli stimoli	Effetti prodotti
❑ Esposizione • Orario • Quantità • Durata ❑ Composizione spettrale ❑ Direzione dello stimolo	❑ Bastoncelli – visione scotopica ❑ Coni visione fotopica • Onde corte • Onde medie • Onde lunghe ❑ Cellule gangliari ipRGCs (sensibili alle onde corte)	❑ Nucleo Soprachiasmatico riceve info dalle cellule gangliari tramite la Melanospina regolando gli orologi biologici ❑ Ghiandola Pineale quando riceve poca luce produce l'ormone Melatonina.	❑ Produzione Melatonina «Ormone del sonno» ❑ Produzione Cortisolo «Ormone dello stress» ❑ Regolazione della temperatura corporea ❑ Regolazione dell'appetito

OPTIMIZATION

Ispirazione: 2019_Eleonora-MazzocchinSlides.pdf

Illuminazione nel sistema WELL®

L03.1 Meet Lighting for Day-Active People



CICLO GIORNALIERO DI MELATONINA E CORTISOLO

OPTIMIZATION

Illuminazione nel sistema WELL®

L03.1 Meet Lighting for Day-Active People

OPTIMIZATION

EQUIVALENT MELANOPIC LUX (EML)

Illuminazione nel sistema WELL®

L03.1 Meet Lighting for Day-Active People

For All Spaces except Dwelling Units | For Dwelling Units

For workstations used during the daytime, electric lighting is used to achieve the following thresholds:

a. The following light levels are achieved for at least four hours (beginning by noon at the latest) at a height of 45 cm above the work-plane for all workstations in regularly occupied spaces:

Threshold		Threshold for Projects with Enhanced Daylight	Points
At least 150 EML [136 M-EDI(D65)]	OR	The project achieves at least 120 EML [109 M-EDI(D65)] and L05 Part 1 or L06 Part 1	1
At least 240 EML [218 M-EDI(D65)]	OR	The project achieves at least 180 EML [163 M-EDI(D65)] and L05 Part 1 or L06 Part 1	3

b. The light levels are achieved on the vertical plane at eye level to simulate the light entering the eye of the occupant.

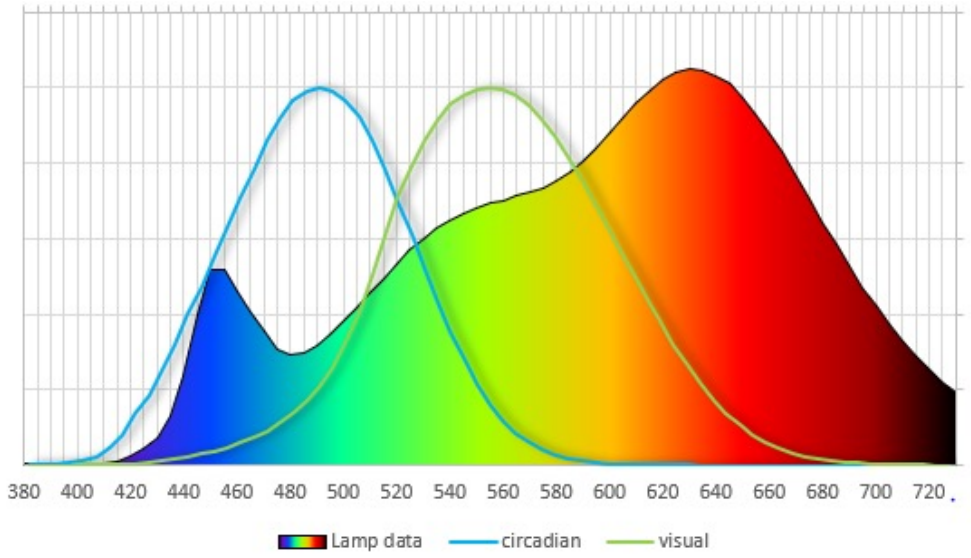
Verified by Performance Test

OPTIMIZATION

Illuminazione nel sistema WELL®

L03.1 Meet Lighting for Day-Active People

Equivalent Melanopic Lux (EML) è la metrica definita per la misura degli effetti biologici della luce sull'essere umano mediante i cicli circadiani (1)



EML si ricava moltiplicando il valore di illuminamento Photopico (lux) con un fattore moltiplicativo (MR) che dipende principalmente dal tipo di sorgente luminosa e temperatura di colore della sorgente

$$\text{Equivalent Melanopic Lux} = Lux * Melanopic\ Ratio$$

EML
Excel

OPTIMIZATION

Source:
(1) Lucas R, Peirson S, Berson D, Brown T, & Cooper H. Measuring and using light in the melanopsin age. Department of Neurology Faculty Papers. 2014.

Illuminazione nel sistema WELL®

L03.1 Meet Lighting for Day-Active People

CCT (K)	LIGHT SOURCE	RATIO
2700	LED	0,45
3000	Fluorescent	0,45
2800	Incandescent	0,54
4000	Fluorescent	0,58
4000	LED	0,76
5450	CIE E (Equal Energy)	1,00
6500	Fluorescent	1,02
6500	Daylight	1,10
7500	Fluorescent	1,11

OPTIMIZATION

Table: Melanopic Ratio provided by WELL Building Standard (WELL,

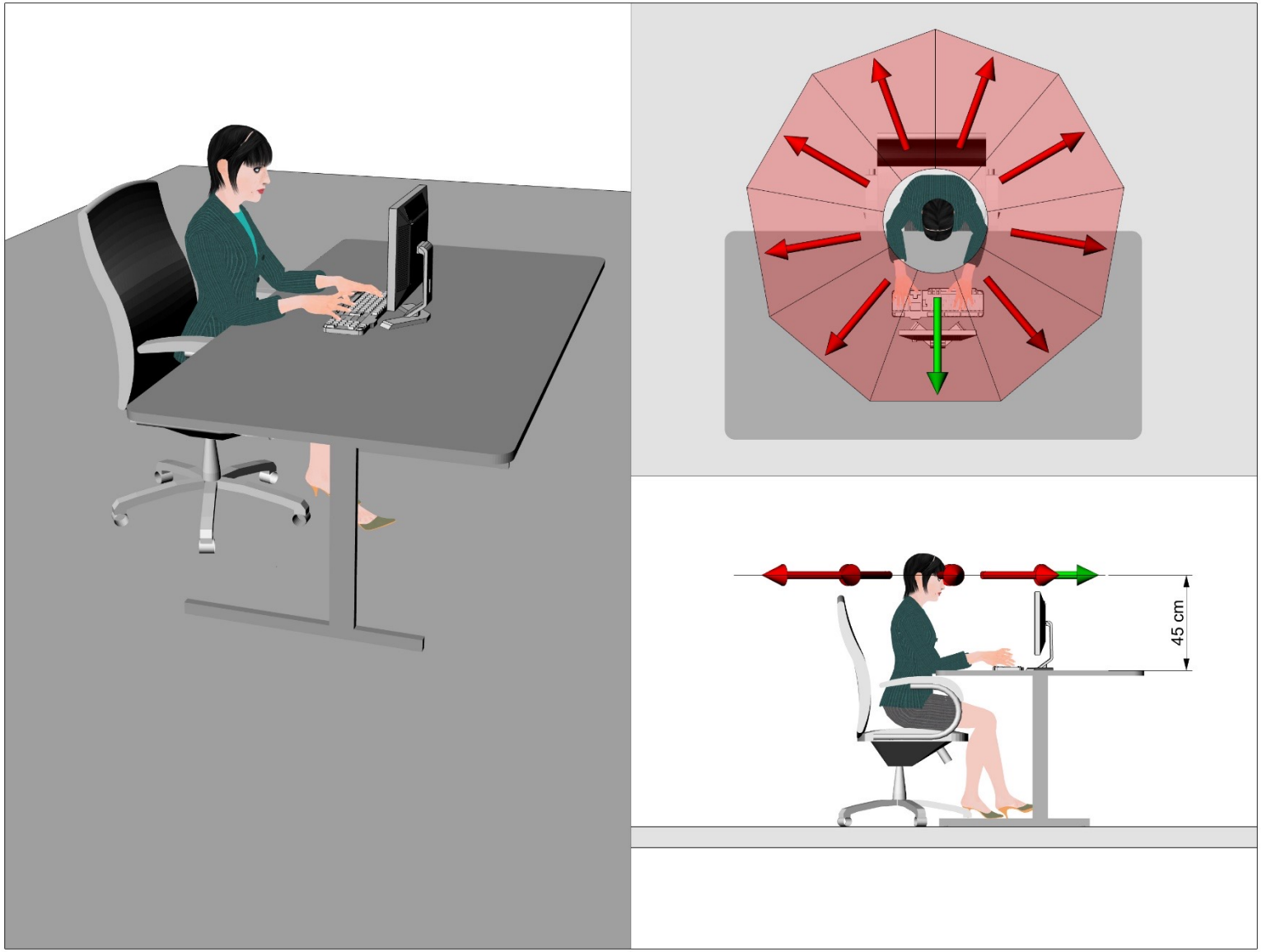
Illuminazione nel sistema WELL®

L03.1 Meet Lighting for Day-Active People

Come Light designer / Light specialist viene sempre richiesto spazi con la massima flessibilità di utilizzo.

Ai fini della certificazione WELL l'ideale è avere il layout degli spazi interni definito prima durante lo sviluppo del progetto illuminotecnico per verificare tramite software di simulazione gli EML nella giusta direzione della vista (freccia verde)

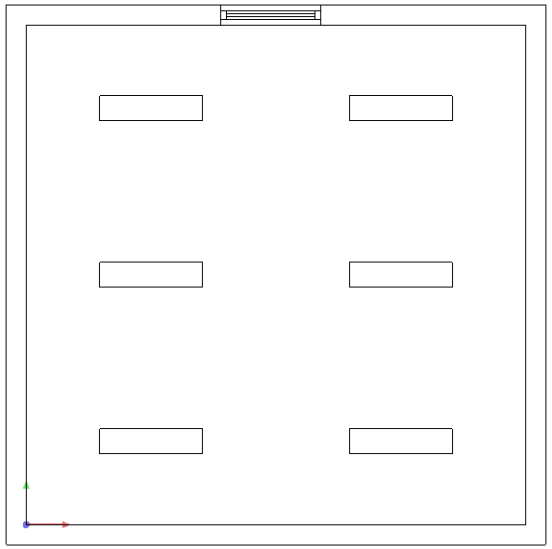
In caso contrario il suggerimento è di fare una serie di simulazioni per dare indicazione all'interior design dove si hanno EML corretti

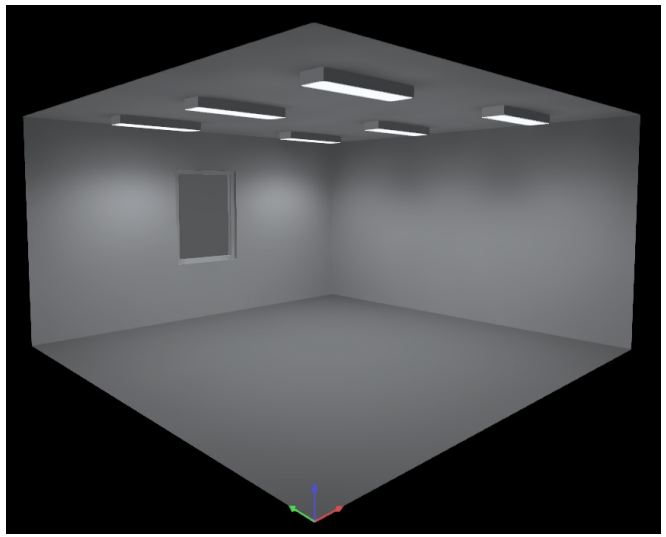


OPTIMIZATION

Illuminazione nel sistema WELL®

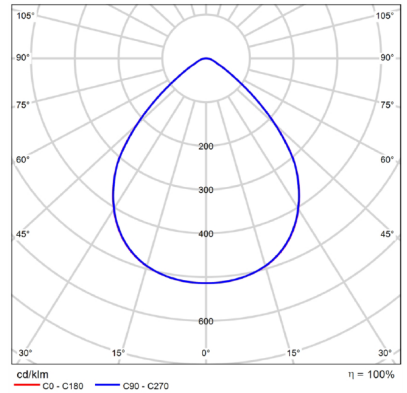
L03.1 Meet Lighting for Day-Active People





Philips - RC461B PSD W30L120 PSD W60L60 VPC PIP LED34S/- NO

P	26.0 W
$\Phi_{Lampadina}$	3400 lm
$\Phi_{Lampada}$	3400 lm
η	100.00 %
Efficienza	130.8 lm/W
CCT	3000 K
CRI	100

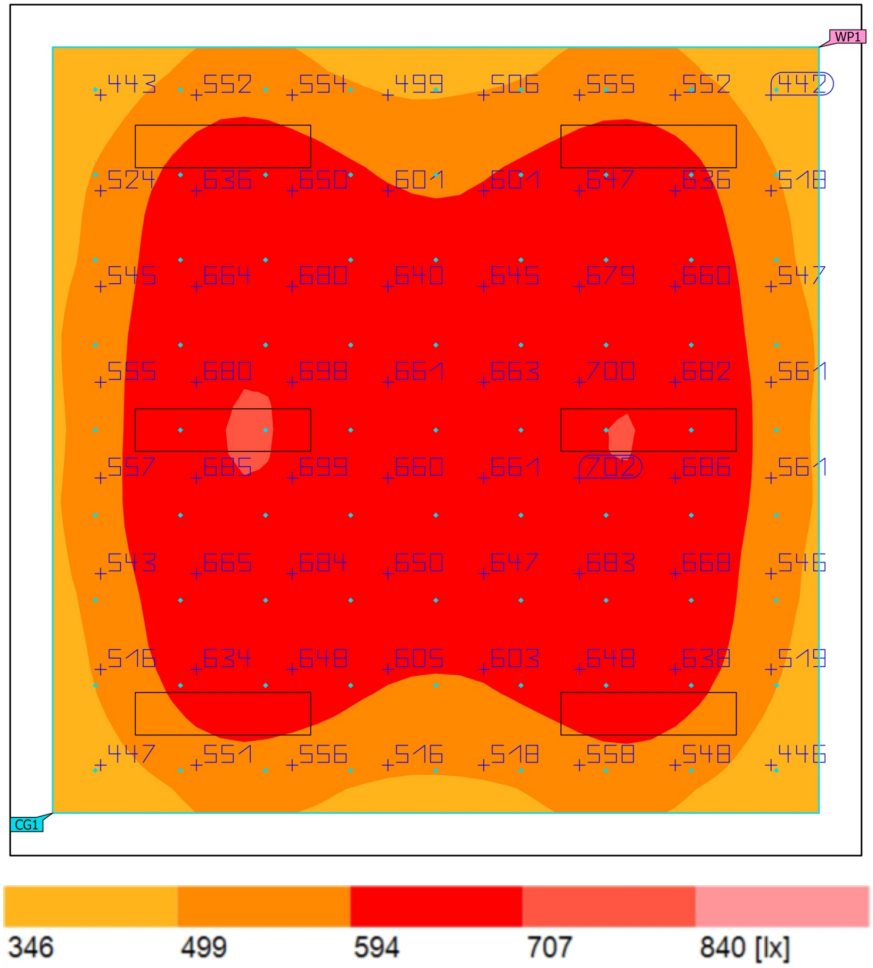


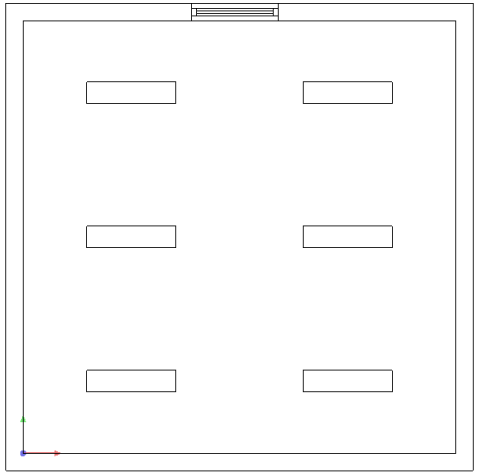
CDL polare

OPTIMIZATION

Illuminazione nel sistema WELL®

L03.1 Meet Lighting for Day-Active People





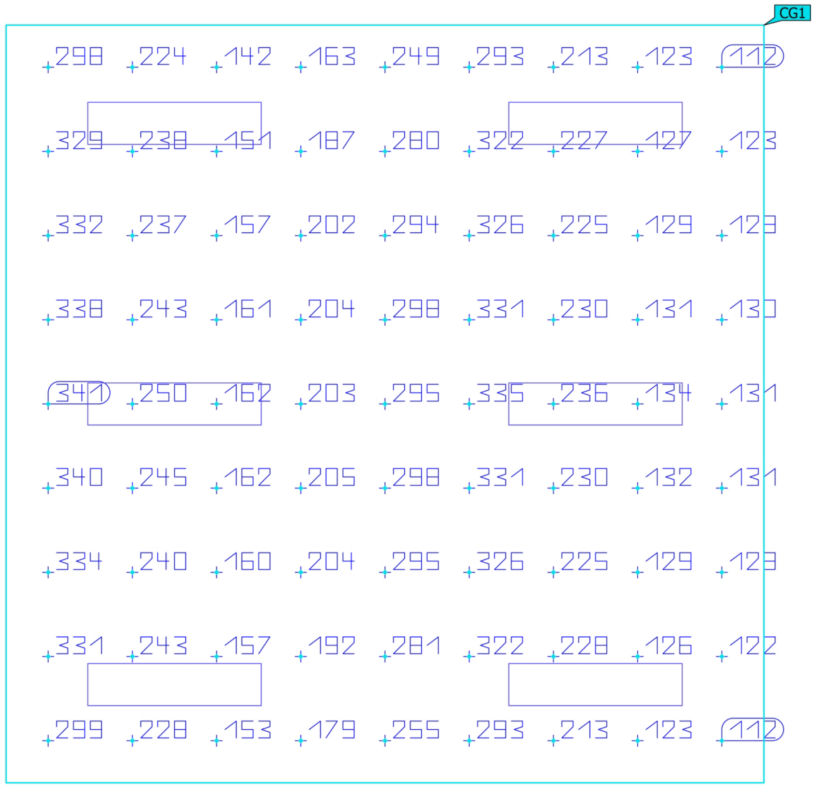
Em [lx]: 598
Emin [lx]: 370
Emax [lx]: 710
Emin / Em: 0,62

Valore allacciamento: 6,24 W/m²

OPTIMIZATION

Illuminazione nel sistema WELL®

L03.1 Meet Lighting for Day-Active People



Illuminamento verticale Fotopico

298	224	142	163	249	293	213	123	112
329	238	151	187	280	322	227	127	123
332	237	157	202	294	326	225	129	123
338	243	161	204	298	331	230	131	130
341	250	162	203	295	335	236	134	131
340	245	162	205	298	331	230	132	131
334	240	160	204	295	326	225	129	129
331	243	157	192	281	322	228	126	122
299	228	153	179	255	293	213	123	112

EML a 3000K
0.61

Illuminamento verticale Melanopico

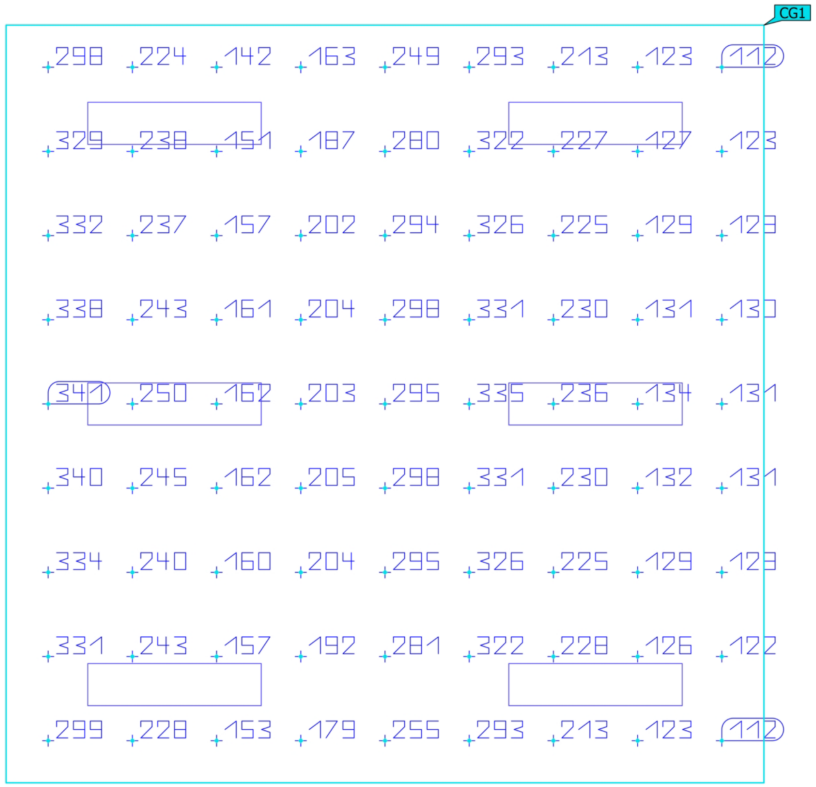
182	137	87	99	152	179	130	75	68
201	145	92	114	171	196	138	77	75
203	145	96	123	179	199	137	79	75
206	148	98	124	182	202	140	80	79
208	153	99	124	180	204	144	82	80
207	149	99	125	182	202	140	81	80
204	146	98	124	180	199	137	79	79
202	148	96	117	171	196	139	77	74
182	139	93	109	156	179	130	75	68

OPTIMIZATION

Vertical Photopic Lux X 0,6 (3000K) = Equivalent Melanopic Lux

Illuminazione nel sistema WELL®

L03.1 Meet Lighting for Day-Active People



Illuminamento verticale Fotopico

298	224	142	163	249	293	213	123	112
329	238	151	187	280	322	227	127	123
332	237	157	202	294	326	225	129	123
338	243	161	204	298	331	230	131	130
341	250	162	203	295	335	236	134	131
340	245	162	205	298	331	230	132	131
334	240	160	204	295	326	225	129	129
331	243	157	192	281	322	228	126	122
299	228	153	179	255	293	213	123	112

EML a 4000K
0.76

Illuminamento verticale Melanopico

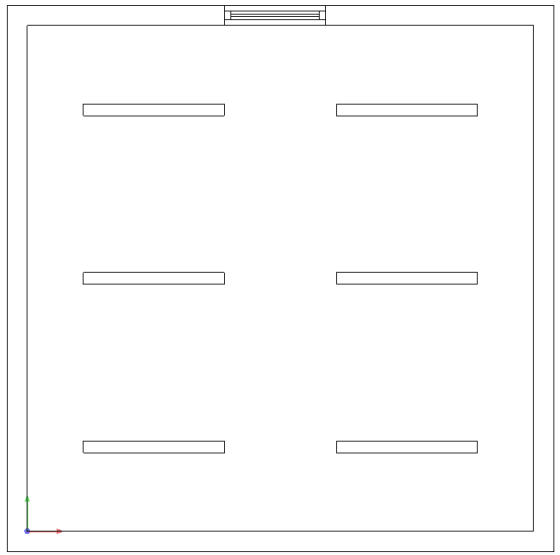
226	170	108	124	189	223	162	93	85
250	181	115	142	213	245	173	97	93
252	180	119	154	223	248	171	98	93
257	185	122	155	226	252	175	100	99
259	190	123	154	224	255	179	102	100
258	186	123	156	226	252	175	100	100
254	182	122	155	224	248	171	98	98
252	185	119	146	214	245	173	96	93
227	173	116	136	194	223	162	93	85

OPTIMIZATION

Vertical Photopic Lux X 0,76 (4000K) = Equivalent Melanopic Lux

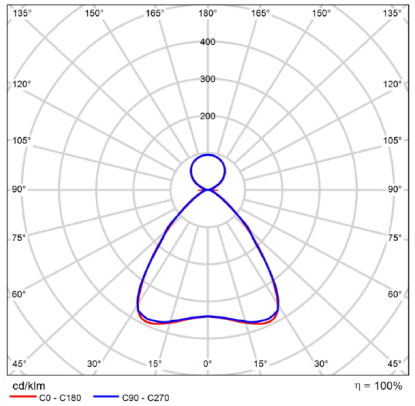
Illuminazione nel sistema WELL®

L03.1 Meet Lighting for Day-Active People

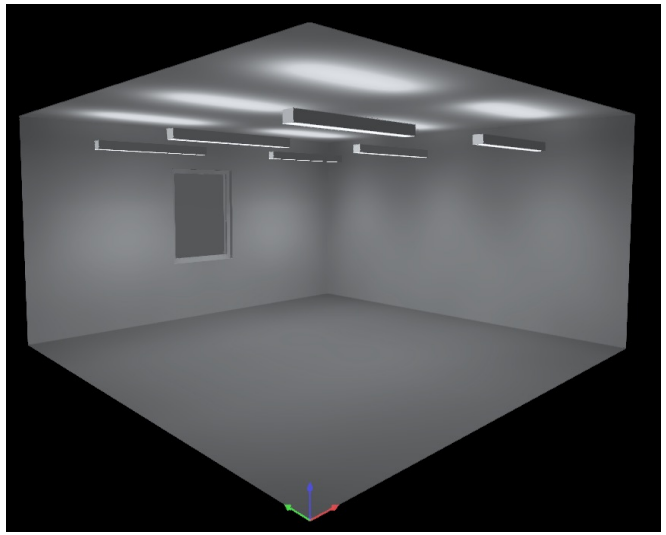


Philips - SP342P PSD L1500 PCS 45S/- NO

P	36.5 W
$\Phi_{Lampadina}$	4500 lm
$\Phi_{Lampada}$	4498 lm
η	99.97 %
Efficienza	123.2 lm/W
CCT	3000 K
CRI	100



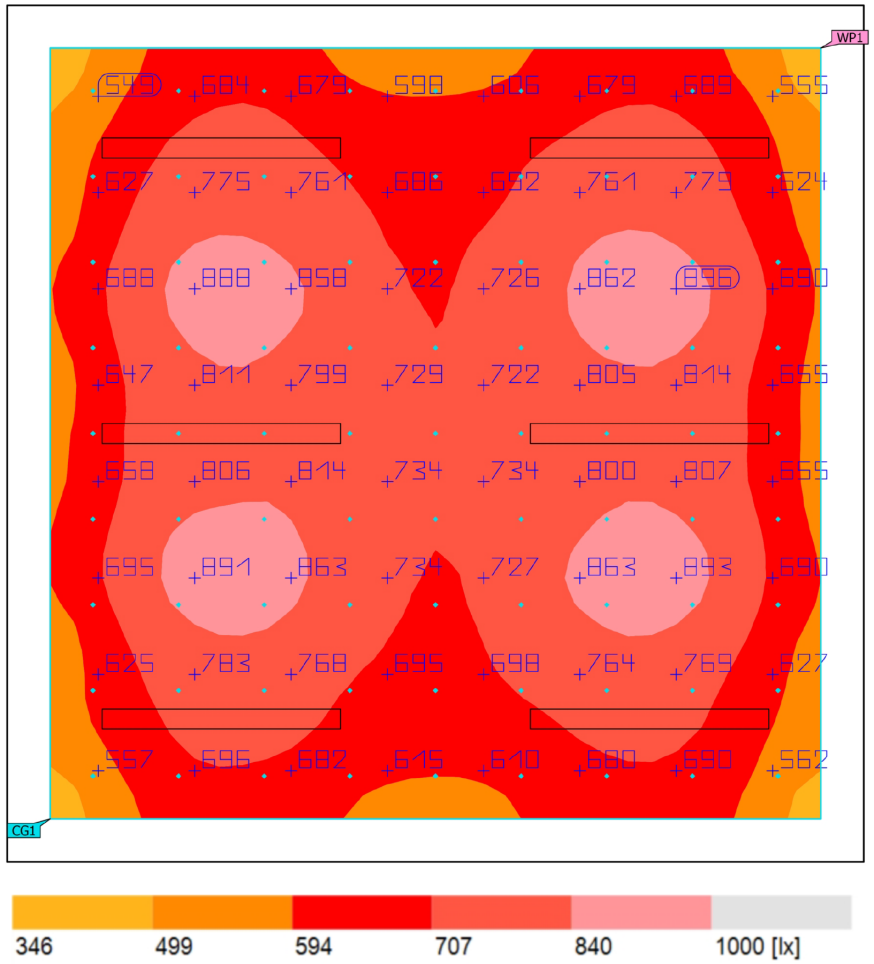
CDL polare

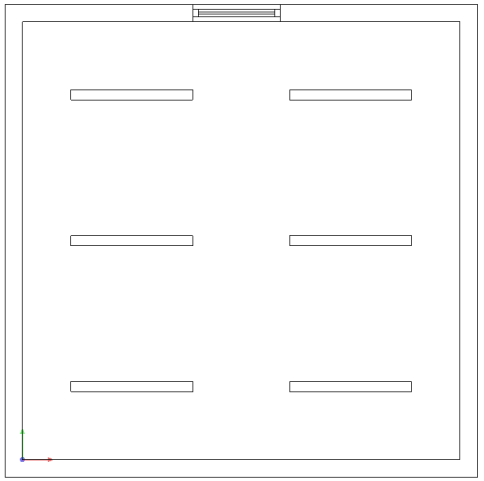


OPTIMIZATION

Illuminazione nel sistema WELL®

L03.1 Meet Lighting for Day-Active People





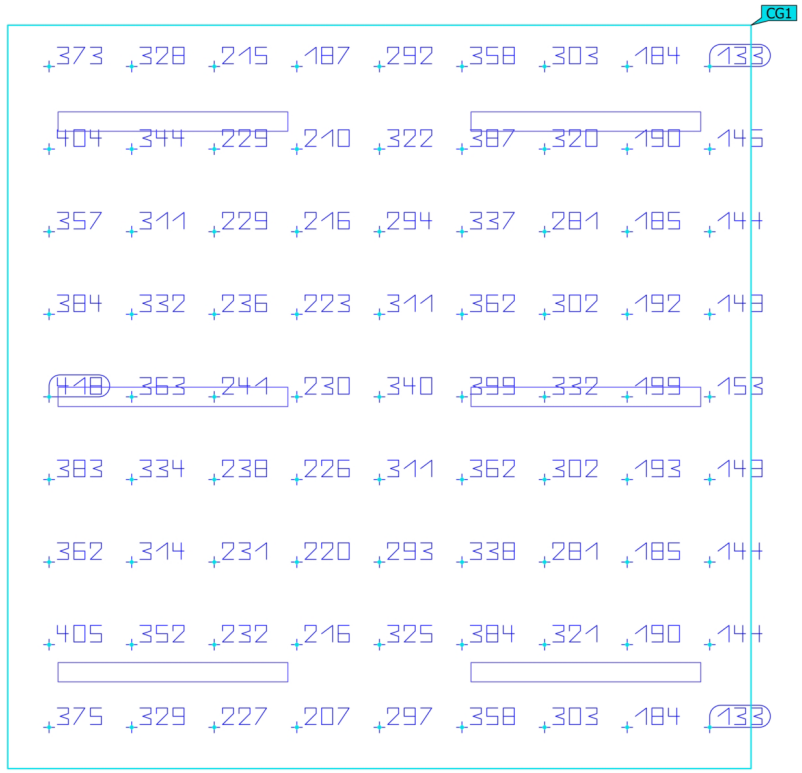
Em [lx]: 720
Emin [lx]: 459
Emax [lx]: 910
Emin / Em: 0,64

Valore allacciamento: 8,7 W/m²

OPTIMIZATION

Illuminazione nel sistema WELL®

L03.1 Meet Lighting for Day-Active People



Illuminamento verticale Fotopico

373	328	215	187	292	358	303	184	133
404	344	229	210	322	387	320	190	145
357	311	229	216	294	337	281	185	144
384	332	236	223	311	362	302	192	143
418	363	241	230	340	399	332	199	153
383	334	238	226	311	362	302	193	143
362	314	231	220	293	338	281	185	144
405	352	232	216	325	384	321	190	133
375	329	227	207	297	358	303	184	112

EML a 3000K
0.6

Illuminamento verticale Melanopico

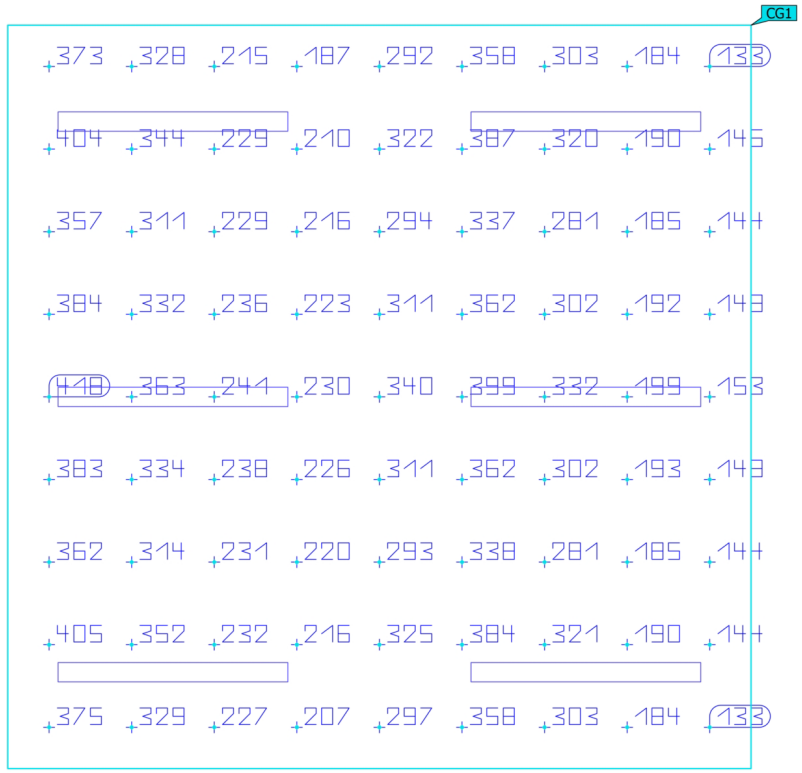
224	197	129	112	175	215	182	110	80
242	206	137	126	193	232	192	114	87
214	187	137	130	176	202	169	111	86
230	199	142	134	187	217	181	115	86
251	218	145	138	204	239	199	119	92
230	200	143	136	187	217	181	116	86
217	188	139	132	176	203	169	111	86
243	211	139	130	195	230	193	114	80
225	197	136	124	178	215	182	110	67

OPTIMIZATION

Vertical Photopic Lux X 0,6 (3000K) = Equivalent Melanopic Lux

Illuminazione nel sistema WELL®

L03.1 Meet Lighting for Day-Active People



Illuminamento verticale Fotopico

373	328	215	187	292	358	303	184	133
404	344	229	210	322	387	320	190	145
357	311	229	216	294	337	281	185	144
384	332	236	223	311	362	302	192	143
418	363	241	230	340	399	332	199	153
383	334	238	226	311	362	302	193	143
362	314	231	220	293	338	281	185	144
405	352	232	216	325	384	321	190	133
375	329	227	207	297	358	303	184	112

EML a 4000K
0.76

Illuminamento verticale Melanopico

283	249	163	142	222	272	230	140	101
307	261	174	160	245	294	243	144	110
271	236	174	164	223	256	214	141	109
292	252	179	169	236	275	230	146	109
318	276	183	175	258	303	252	151	116
291	254	181	172	236	275	230	147	109
275	239	176	167	223	257	214	141	109
308	268	176	164	247	292	244	144	101
285	250	173	157	226	272	230	140	85

Vertical Photopic Lux X 0,76 (4000K) = Equivalent Melanopic Lux

OPTIMIZATION

Illuminazione nel sistema WELL®

L03.1 Meet Lighting for Day-Active People

Attenzione: Bisogna tenere sempre presente che per rispettare i limiti di EML è necessario adottare soluzione con una componente indiretta in modo da incrementare il valore di illuminamento verticale ma questo comporta un incremento di Indice di potenza allacciata (Lighting Power Density) che potrebbe ridurre il risparmio energetico per LEED

Nota integrativa #194 - I progetti possono raggiungere la soglia EML attraverso una combinazione di illuminazione d'ambiente e lampade da tavolo.
Se tutte le postazioni di lavoro non saranno automaticamente dotate di lampade da tavolo, il progetto deve presentare una Policy firmata dalla proprietà per confermare che i dipendenti saranno dotati di lampade da tavolo su richiesta.
Almeno una di queste lampade da tavolo deve essere presente durante la verifica delle prestazioni, e il team del progettazione è responsabile del corretto posizionamento e movimento tra le postazioni di lavoro durante la verifica.

OPTIMIZATION

Illuminazione nel sistema WELL®

WELL v2 - Q1 2021

Manens-Tifs INGEGNERIA

LIGHT

Precond.	Precond.	Optimiz.	Optimiz.	Optimiz.	Optimiz.	Optimiz.	Optimiz.	Optimiz.	Optimiz.	Optimiz.	Optimiz.
L01 Light Exposure	L02 Visual Lighting Design	L03 Circadian Lighting Design	L04 Electric Light Glare Control	L05 Daylight Design Strategies	L05 Daylight Design Strategies	L06 Daylight Simulation	L07 Visual Balance	L08 Electric Light Quality	L08 Electric Light Quality	L09 Occupant Lighting Control	L09 Occupant Lighting Control
Part 1 Provide Indoor Light	Part 1 Provide Visual Acuity	Part 1 Meet Lighting for Day-Active People	Part 1 Manage Glare for Electric Lighting	Part 1 Implement Daylight Plan	Part 2 Integrate Solar Shading	Part 1 Conduct Daylight Simulation	Part 1 Balance Visual Lighting	Part 1 Enhance Color Rendering Quality	Part 2 Manage Flicker	Part 1 Enhance Occupant Controllability	Part 2 Provide Supplemental Lighting

Illuminazione nel sistema WELL®

Manens-Tifs INGEGNERIA

L04.1 Manage Glare for Electric Lighting

For All Spaces except Industrial | For Industrial

Choose between the following:

Option 1: Luminaire considerations

Each luminaire meets one of the following requirements for regularly occupied spaces at light output representative of regular use conditions. Wall wash fixtures and concealed fixtures, installed as specified by manufacturer's data, as well as decorative fixtures may be excluded from meeting these requirements:

a. 100% of light is emitted above the horizontal plane.

b. Classified with Unified Glare Rating (UGR) of 16 or lower.

c. Luminance that does not exceed 6,000 cd/m^2 at any angle between 45 and 90 degrees from nadir.

Verified by Technical Document

OR

Option 2: Space considerations

The following requirement is met in all regularly occupied spaces:

a. Unified Glare Rating (UGR) of 16 or lower.

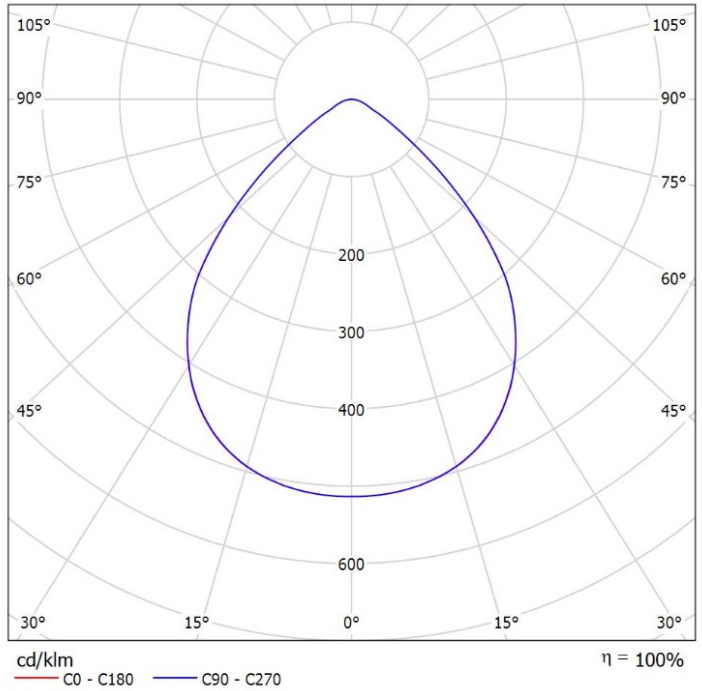
Verified by Technical Document

OPTIMIZATION

Illuminazione nel sistema WELL®

Option 1.c: Luminance that does not exceed 6,000 cd/m^2 at any angle between 45 and 90 degrees from nadir.

Lampada: PHILIPS RC461B PSD W30L120 PSD W60L60 VPC PIP LED34S/- NO
Lampadine: 1 x LED34S/930/-



Lampada: PHILIPS RC461B PSD W30L120 PSD W60L60 VPC PIP LED34S/- NO
Lampadine: 1 x LED34S/930/-

Gamma	C 0°	C 15°	C 30°	C 45°	C 60°	C 75°	C 90°
0.0°	6780	6780	6780	6780	6780	6780	6780
5.0°	6790	6784	6786	6778	6787	6782	6787
10.0°	6796	6791	6796	6781	6796	6787	6796
15.0°	6785	6784	6805	6791	6804	6775	6779
20.0°	6731	6736	6792	6792	6784	6726	6721
25.0°	6596	6616	6726	6756	6718	6603	6582
30.0°	6348	6393	6570	6620	6563	6378	6337
35.0°	5968	6047	6292	6359	6284	6035	5958
40.0°	5442	5567	5876	5971	5871	5555	5433
45.0°	4479	4695	5282	5445	5276	4664	4451
50.0°	3259	3495	4278	4724	4256	3480	3248
55.0°	2085	2267	2976	3414	2977	2269	2086
60.0°	1359	1441	1780	1991	1785	1428	1346
65.0°	863	891	1077	1139	1074	871	854
70.0°	774	776	801	794	802	772	772
75.0°	708	705	724	704	722	702	705
80.0°	651	643	655	633	652	636	645
85.0°	594	564	590	552	590	561	585

Verifica: ✓

OPTIMIZATION

Illuminazione nel sistema WELL®

L04.1 Manage Glare for Electric Lighting

For All Spaces except Industrial | For Industrial

Choose between the following:

Option 1: Luminaire considerations

Each luminaire meets one of the following requirements for regularly occupied spaces (wall wash fixtures and concealed fixtures, installed as specified by manufacturer's data, as well as decorative fixtures may be excluded from meeting these requirements):

a. Meets requirements in *All Spaces except Industrial Spaces*.

b. Unified Glare Rating (UGR) of 19 or lower.

Verified by Technical Document

OR

Option 2: Space considerations

The following requirement is met in all regularly occupied spaces:

a. Unified Glare Rating (UGR) of 19 or lower.

Verified by Technical Document

OPTIMIZATION

Illuminazione nel sistema WELL®

WELL v2 - Q1 2021

Manens-Tifs INGEGNERIA

LIGHT

Precond.	Precond.	Optimiz.	Optimiz.	Optimiz.	Optimiz.	Optimiz.	Optimiz.	Optimiz.	Optimiz.	Optimiz.	Optimiz.
L01 Light Exposure	L02 Visual Lighting Design	L03 Circadian Lighting Design	L04 Electric Light Glare Control	L05 Daylight Design Strategies	L05 Daylight Design Strategies	L06 Daylight Simulation	L07 Visual Balance	L08 Electric Light Quality	L08 Electric Light Quality	L09 Occupant Lighting Control	L09 Occupant Lighting Control
Part 1 Provide Indoor Light	Part 1 Provide Visual Acuity	Part 1 Meet Lighting for Day-Active People	Part 1 Manage Glare for Electric Lighting	Part 1 Implement Daylight Plan	Part 2 Integrate Solar Shading	Part 1 Conduct Daylight Simulation	Part 1 Balance Visual Lighting	Part 1 Enhance Color Rendering Quality	Part 2 Manage Flicker	Part 1 Enhance Occupant Controllability	Part 2 Provide Supplemental Lighting

Illuminazione nel sistema WELL®

L05.1 Implement Daylight Plan

For All Spaces except Dwelling Units | For Dwelling Units

The following requirement is met:

a. The project demonstrates, through computer simulations, that the following conditions are achieved in each floor:

Interior Layout		Façade Design	Points
70% of all workstations are within 25 ft of transparent envelope glazing. Visible light transmittance (VLT) is greater than 40%.	OR	Envelope glazing is no less than 15% of the regularly occupied floor area or individual unit. Visible light transmittance (VLT) of windows is greater than 40%.	1
70% of all workstations are within 16 ft of transparent envelope glazing. Visible light transmittance (VLT) is greater than 40%.	OR	Envelope glazing is no less than 25% of the regularly occupied floor area or individual unit. Visible light transmittance (VLT) of windows is greater than 40%.	2

Verified by Technical Document

OPTIMIZATION

Illuminazione nel sistema WELL®

WELL v2 - Q1 2021

Manens-Tifs INGEGNERIA

LIGHT

Precond.	Precond.	Optimiz.	Optimiz.	Optimiz.	Optimiz.	Optimiz.	Optimiz.	Optimiz.	Optimiz.	Optimiz.	Optimiz.
L01 Light Exposure	L02 Visual Lighting Design	L03 Circadian Lighting Design	L04 Electric Light Glare Control	L05 Daylight Design Strategies	L05 Daylight Design Strategies	L06 Daylight Simulation	L07 Visual Balance	L08 Electric Light Quality	L08 Electric Light Quality	L09 Occupant Lighting Control	L09 Occupant Lighting Control
Part 1 Provide Indoor Light	Part 1 Provide Visual Acuity	Part 1 Meet Lighting for Day-Active People	Part 1 Manage Glare for Electric Lighting	Part 1 Implement Daylight Plan	Part 2 Integrate Solar Shading	Part 1 Conduct Daylight Simulation	Part 1 Balance Visual Lighting	Part 1 Enhance Color Rendering Quality	Part 2 Manage Flicker	Part 1 Enhance Occupant Controllability	Part 2 Provide Supplemental Lighting

Illuminazione nel sistema WELL®

L05.2 Integrate Solar Shading

Part 2

Integrate Solar Shading (Max: 2 points)

For All Spaces

The following requirements are met in regularly occupied spaces:

a. All vertical transparent envelope glazing has shading that meet one of the following:

Type of Shading	Points
Manual shading controllable by occupants at all times. Shades are regularly opened once a day for all days that the project is in use	1
Shading is automated to prevent glare	2

Verified by On-site Photographs, Policy and/or Operations Schedule

OPTIMIZATION

Illuminazione nel sistema WELL®

WELL v2 - Q1 2021

Manens-Tifs INGEGNERIA

LIGHT

Precond.	Precond.	Optimiz.	Optimiz.	Optimiz.	Optimiz.	Optimiz.	Optimiz.	Optimiz.	Optimiz.	Optimiz.	Optimiz.
L01 Light Exposure	L02 Visual Lighting Design	L03 Circadian Lighting Design	L04 Electric Light Glare Control	L05 Daylight Design Strategies	L05 Daylight Design Strategies	L06 Daylight Simulation	L07 Visual Balance	L08 Electric Light Quality	L08 Electric Light Quality	L09 Occupant Lighting Control	L09 Occupant Lighting Control
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Illuminazione nel sistema WELL®

L06.1 Conduct Daylight Simulation

For All Spaces except Dwelling Units | For Dwelling Units

The project demonstrates, through computer simulations, that the following conditions are achieved in each floor:

a. Regularly occupied spaces achieve one of the following targets:

Calculations per IES LM-83-12		Calculations per Annex A of CEN 17037:2018	Points
Average sDA300,50% is achieved for > 55% of regularly occupied floor area	OR	Target illuminance of 28 fc is achieved for >50% of individual unit area throughout 50% of daylit hours of the year	1
Average sDA300,50% is achieved for > 75% of regularly occupied floor area	OR	Target illuminance of 28 fc is achieved for >50% of individual unit area and average illuminance 9 fc is achieved for >95% of individual unit area throughout 50% of daylit hours of the year	2

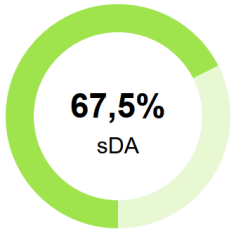
Verified by Technical Document

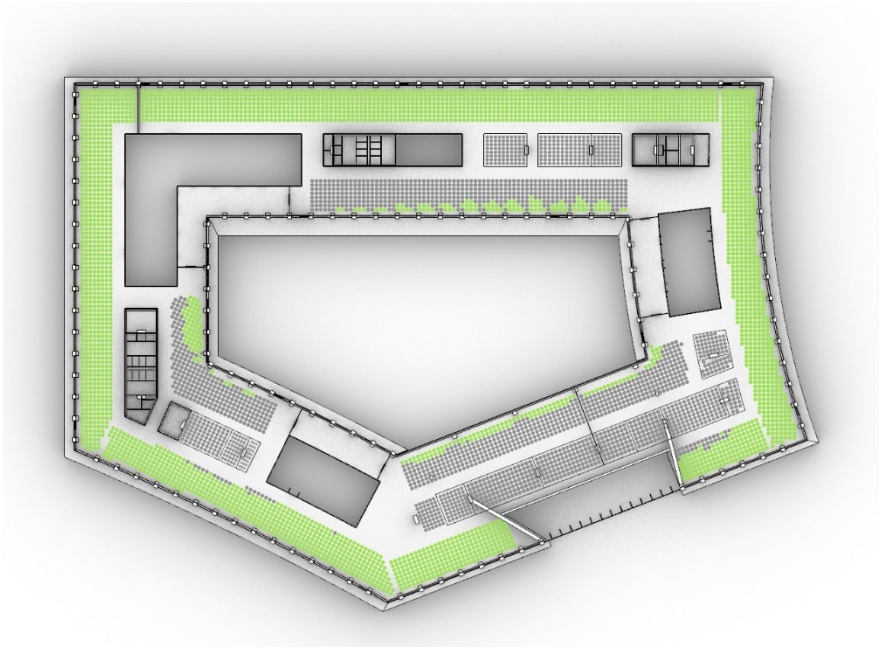
OPTIMIZATION

Illuminazione nel sistema WELL®

L06.1 Conduct Daylight Simulation

SPATIAL DAYLIGHT AUTONOMY (SDA)
è una metrica che descrive la sufficienza annuale dei livelli di luce diurna negli ambienti interni. È definita come la percentuale di un'area di analisi (l'area in cui vengono eseguiti i calcoli, in genere in un intero spazio) che soddisfa un livello minimo di illuminamento di luce diurna per una frazione specifica delle ore di funzionamento all'anno (i.e., the Daylight Autonomy value following Reinhart & Walkenhorst, 2001).
Il livello di illuminamento e la frazione di tempo sono inclusi come pedici, come in sDA 300,50%.
sDA300/50% è la percentuale di punti di analisi in tutta la superficie di analisi che soddisfano o superano il valore di 300 lux per almeno il 50% del periodo di analisi (Illuminating Engineering Society)





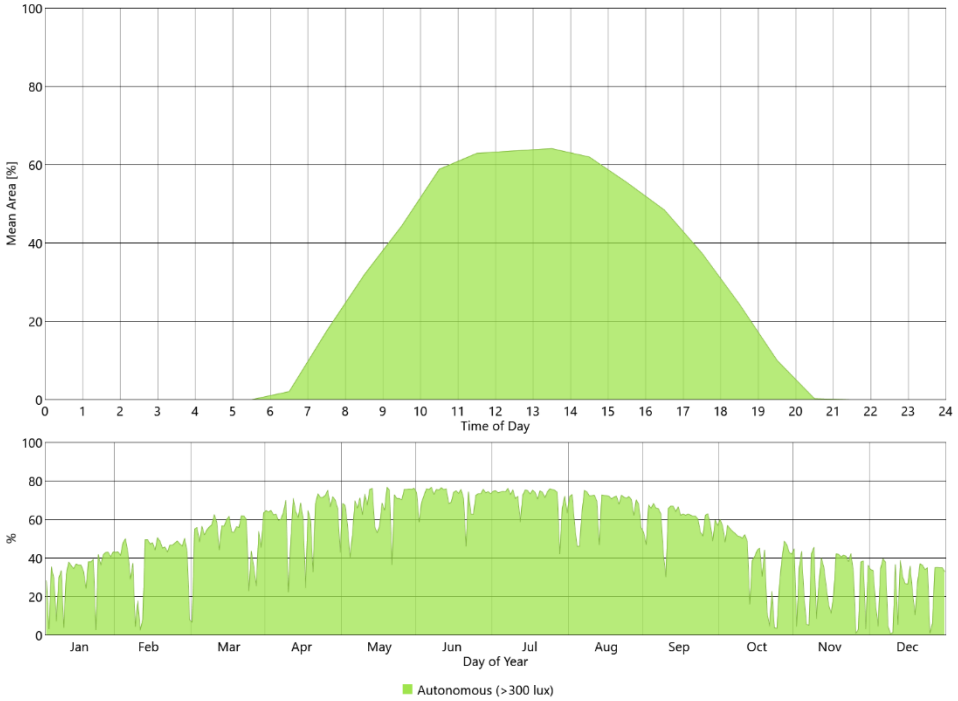


Immagine: Cortesia di Manens-Tifs

OPTIMIZATION

Illuminazione nel sistema WELL®

WELL v2 - Q1 2021

Manens-Tifs INGEGNERIA

LIGHT

Precond.	Precond.	Optimiz.	Optimiz.	Optimiz.	Optimiz.	Optimiz.	Optimiz.	Optimiz.	Optimiz.	Optimiz.
L01 Light Exposure	L02 Visual Lighting Design	L03 Circadian Lighting Design	L04 Electric Light Glare Control	L05 Daylight Design Strategies	L05 Daylight Design Strategies	L06 Daylight Simulation	L07 Visual Balance	L08 Electric Light Quality	L08 Electric Light Quality	L09 Occupant Lighting Control	L09 Occupant Lighting Control
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Illuminazione nel sistema WELL®

L07.1 Balance Visual Lighting

Choose between the following:

Option 1: Parameters for visual balance

Ambient lighting in all regularly occupied spaces meets at least three of the following requirements:

a. Horizontal and vertical luminance contrast ratios for an ambient light system is no more than 10 between adjacent independently controlled zones.

b. Illuminance uniformity ratio of at least 0.4 or 1:2.5 (minimum light level: average light level) is achieved on any horizontal task plane within a space.

c. Automatic changes in lighting characteristics, such as light levels, changes in color and distribution take place over a period of 10 minutes.

d. The Correlated Color Temperature (CCT) in each room for similar fixtures is consistent (±200 K) at any point of time.

Verified by Professional Narrative

OR

OPTIMIZATION

Illuminazione nel sistema WELL®

L07.1 Balance Visual Lighting

Option 2: Design for visual balance

Lighting is designed by a lighting professional and takes into account the following considerations:

a. Luminance ratios on vertical and horizontal adjacent zones.

b. Illuminance uniformity on horizontal task planes.

c. Changes in lighting characteristics, such as light levels, changes in color and distribution.

d. Color temperature of lights used.

Verified by Professional Narrative

OPTIMIZATION

Illuminazione nel sistema WELL®

WELL v2 - Q1 2021

Manens-Tifs INGEGNERIA

LIGHT

Precond.	Precond.	Optimiz.	Optimiz.	Optimiz.	Optimiz.	Optimiz.	Optimiz.	Optimiz.	Optimiz.	Optimiz.	Optimiz.
L01 Light Exposure	L02 Visual Lighting Design	L03 Circadian Lighting Design	L04 Electric Light Glare Control	L05 Daylight Design Strategies	L05 Daylight Design Strategies	L06 Daylight Simulation	L07 Visual Balance	L08 Electric Light Quality	L08 Electric Light Quality	L09 Occupant Lighting Control	L09 Occupant Lighting Control
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Illuminazione nel sistema WELL®

L08.1 Enhance Color Rendering Quality

For All Spaces except Circulation Areas | For Circulation Areas

All luminaires (except decorative fixtures, emergency lights and other special-purpose lighting) meet at least one of the following color rendering requirements. If tunable white lighting is used, the requirements are met at 1,000K intervals from the lower end (with a minimum of 2,700K) to the higher end (with a maximum of 5,000k):

a. CRI ≥90.

b. CRI ≥ 80 with R9 ≥ 50.

c. IES $R_f \geq 78$, IES $R_g \geq 100$, $-1\% \leq$ IES $R_{cs,h1} \leq 15\%$.

Verified by Technical Document

For All Spaces except Circulation Areas | For Circulation Areas

All luminaires (except decorative fixtures, emergency lights and other special-purpose lighting) meet at least one of the following color rendering requirements:

a. CRI ≥ 80.

b. IES $R_f \geq 75$, IES $R_g \geq 95$, $-7\% \leq$ IES $R_{cs,h1} \leq 15\%$.

Verified by Technical Document

OPTIMIZATION

Illuminazione nel sistema WELL®

WELL v2 - Q1 2021

Manens-Tifs INGEGNERIA

LIGHT

Precond.	Precond.	Optimiz.	Optimiz.	Optimiz.	Optimiz.	Optimiz.	Optimiz.	Optimiz.	Optimiz.	Optimiz.	Optimiz.
L01 Light Exposure	L02 Visual Lighting Design	L03 Circadian Lighting Design	L04 Electric Light Glare Control	L05 Daylight Design Strategies	L05 Daylight Design Strategies	L06 Daylight Simulation	L07 Visual Balance	L08 Electric Light Quality	L08 Electric Light Quality	L09 Occupant Lighting Control	L09 Occupant Lighting Control
Part 1 Provide Indoor Light	Part 1 Provide Visual Acuity	Part 1 Meet Lighting for Day-Active People	Part 1 Manage Glare for Electric Lighting	Part 1 Implement Daylight Plan	Part 2 Integrate Solar Shading	Part 1 Conduct Daylight Simulation	Part 1 Balance Visual Lighting	Part 1 Enhance Color Rendering Quality	Part 2 Manage Flicker	Part 1 Enhance Occupant Controllability	Part 2 Provide Supplemental Lighting

Illuminazione nel sistema WELL®

L08.2 Manage Flicker

For All Spaces

All luminaires, in combination with the appropriate controls (except decorative lights, emergency lights and other special-purpose lighting), used in regularly occupied spaces meet at least one of the following flicker requirements:

a. Classified as "reduced flicker operation" per California Title 24, when tested according to the requirements in Joint Appendix JA-10.[8]

b. Recommended practices 1, 2 or 3 as defined by IEEE standard 1789-2015 LED.[9]

c. Pst LM ≤ 1.0 and SVM ≤ 0.6 for indoor applications per NEMA 77-2017.[10,11]

Verified by Technical Document

OPTIMIZATION

Illuminazione nel sistema WELL®

WELL v2 - Q1 2021

Manens-Tifs INGEGNERIA

LIGHT

Precond.	Precond.	Optimiz.	Optimiz.	Optimiz.	Optimiz.	Optimiz.	Optimiz.	Optimiz.	Optimiz.	Optimiz.	Optimiz.
L01 Light Exposure	L02 Visual Lighting Design	L03 Circadian Lighting Design	L04 Electric Light Glare Control	L05 Daylight Design Strategies	L05 Daylight Design Strategies	L06 Daylight Simulation	L07 Visual Balance	L08 Electric Light Quality	L08 Electric Light Quality	L09 Occupant Lighting Control	L09 Occupant Lighting Control
Part 1 Provide Indoor Light	Part 1 Provide Visual Acuity	Part 1 Meet Lighting for Day-Active People	Part 1 Manage Glare for Electric Lighting	Part 1 Implement Daylight Plan	Part 2 Integrate Solar Shading	Part 1 Conduct Daylight Simulation	Part 1 Balance Visual Lighting	Part 1 Enhance Color Rendering Quality	Part 2 Manage Flicker	Part 1 Enhance Occupant Controllability	Part 2 Provide Supplemental Lighting

Illuminazione nel sistema WELL®

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L09.1 Enhance Occupant Controllability

OPTIMIZATION

Meet the following:

1: Lighting zones

Ambient lighting systems meet the following requirement:

a. All regularly occupied spaces contain lighting zones as shown in the table below (note: individual rooms smaller than the areas below and/or that have occupancies less than those listed in the table are considered separate zones):

Number of Zones		Number of Zones	Points
One per 60 m^2	OR	One per 10 occupants	1
One per 30 m^2	OR	One per 5 occupants	2

Verified by Technical Document

AND

Illuminazione nel sistema WELL®

L09.1 Enhance Occupant Controllability

2: Lighting control system

Each lighting zone meets the following requirements:

a. Lighting systems have at least three lighting levels or scenes that allow for changes in light levels and have the ability to change at least one of the following:

   1. Color.
   2. Color temperature.
   3. Distribution of light by controlling different groups of lights or through preset scenes.

b. All regular occupants have control over their immediate lighting environment through at least one of the following:

   1. Manual controls (e.g. switches or control panels) located in the same space as each lighting zone.
   2. Digital interface available on a computer or phone.

c. Lighting for presentation or projection walls are separately controlled.

Verified by Professional Narrative

OPTIMIZATION

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WELL v2 - Q1 2021

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LIGHT

Precond.	Precond.	Optimiz.	Optimiz.	Optimiz.	Optimiz.	Optimiz.	Optimiz.	Optimiz.	Optimiz.	Optimiz.	Optimiz.
L01 Light Exposure	L02 Visual Lighting Design	L03 Circadian Lighting Design	L04 Electric Light Glare Control	L05 Daylight Design Strategies	L05 Daylight Design Strategies	L06 Daylight Simulation	L07 Visual Balance	L08 Electric Light Quality	L08 Electric Light Quality	L09 Occupant Lighting Control	L09 Occupant Lighting Control
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Illuminazione nel sistema WELL®

L09.2 Provide Supplemental Lighting

For All Spaces except Dwelling Units

Meet the following:

1: Supplemental lighting requirements

The following requirements are met:

a. Occupants are provided supplemental lighting, the light fixtures provided increase the light level on the task surface to at least twice the recommended light levels based on the reference used to meet Feature L02: Visual Lighting Design, Part 1.

b. The supplemental light fixture is positioned to create minimal visual discomfort for the occupant or per manufacturer recommendations for installation.

c. The supplemental light fixture is installed at least 23 cm from the front edge of the workstation or other work surface (horizontal distance) or per manufacturer's instructions.

Verified by Performance Test

AND

OPTIMIZATION

Illuminazione nel sistema WELL®

L09.2 Provide Supplemental Lighting

2: Supplemental lighting availability

The following requirements are met:

a. Supplemental light fixtures are provided to occupants upon request at no cost. Requests are fulfilled within eight weeks.

b. At least one supplemental light fixture is available to occupants for trial purposes.

Verified by Policy and/or Operations Schedule

OPTIMIZATION

LEED® e WELL® Compatibilità tra i due protocolli

I due protocolli di sostenibilità possono lavorare insieme?

SI

sono stati sviluppati per ottimizzare le prestazioni dell'edificio in relazione alla salute umana e all'ambiente

LEED® e WELL® Compatibilità tra i due protocolli

Manens-Tifs INGEGNERIA

Armonia tra i due protocolli

- ✓ L'IWBI (International WELL Building Institute) gestisce la formazione e la certificazione del protocollo
- ✓ La WELL Certification e la WELL Compliance , che includono l'esame della documentazione di progetto e le verifiche prestazionali in sito, sono verificate dall'ente terzo GBCI (Green Business Certification Inc.), la stessa organizzazione che certifica gli edifici LEED®

IWBI

INTERNATIONAL WELL BUILDING INSTITUTE™

GBCI

GREEN BUSINESS® CERTIFICATION INC.

LEED® e WELL® Compatibilità tra i due protocolli

Armonia tra i due protocolli

IWBI, USGBC and GBCI hanno sviluppato la seguente guida per mostrare come LEED può aiutare nell'ottenimento delle feature WELL e viceversa.

https://standard.wellcertified.com/well-crosswalks

https://resources.wellcertified.com/tools/applying-leed-and-the-well-building-standard/

INTERNATIONAL WELL BUILDING INSTITUTE

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Domande o Commenti?

END

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