RES

REsilient System for the Recognition of Energy Skills



BUONE PRATICHE PER IL RISPARMIO ENERGETICO

COMPETENZE PER LO SMART BUILDING

Roadmap verso l'agenda 2030

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Grant Agreement
n°101120907

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INTERVENTI SULL'INVOLUCRO

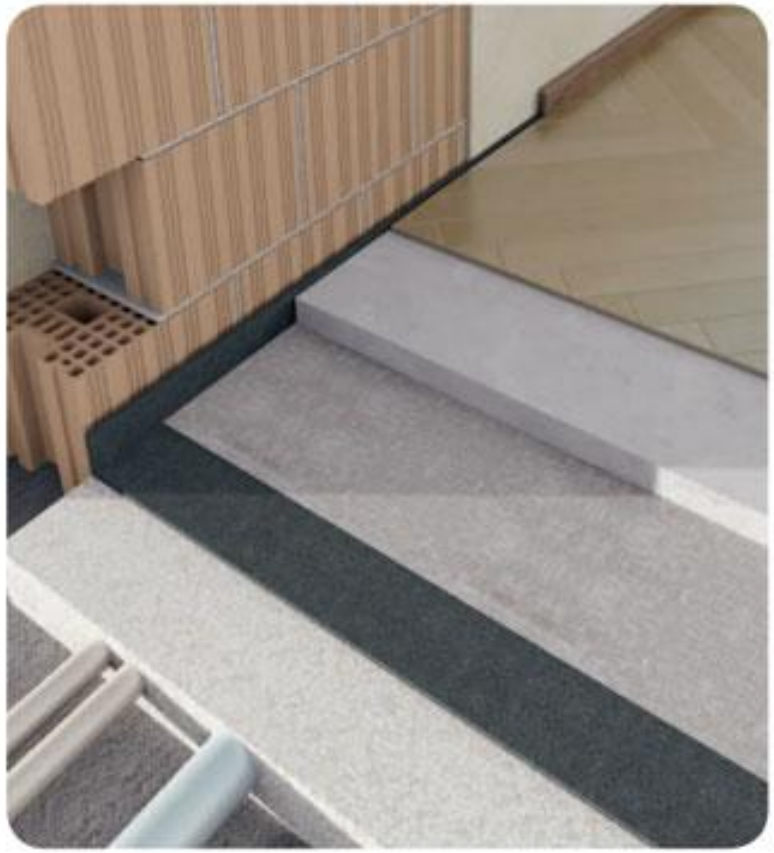
Isolamento termico dei solai



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Fattori da Considerare per l'Isolamento del Solaio



- **La scelta dell'isolamento dipende dalla destinazione d’uso dei locali.**
- **Nei sottotetti non abitabili, si possono adottare tecniche semplici ed economiche.**
- **Importante: garantire continuità dell'involucro per evitare ponti termici.**

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Tecniche di isolamento dei solai

- **All'estradosso sottopavimento**
- **Sopra la struttura portante o tra i travetti**
- **All’intradosso della struttura portante.**

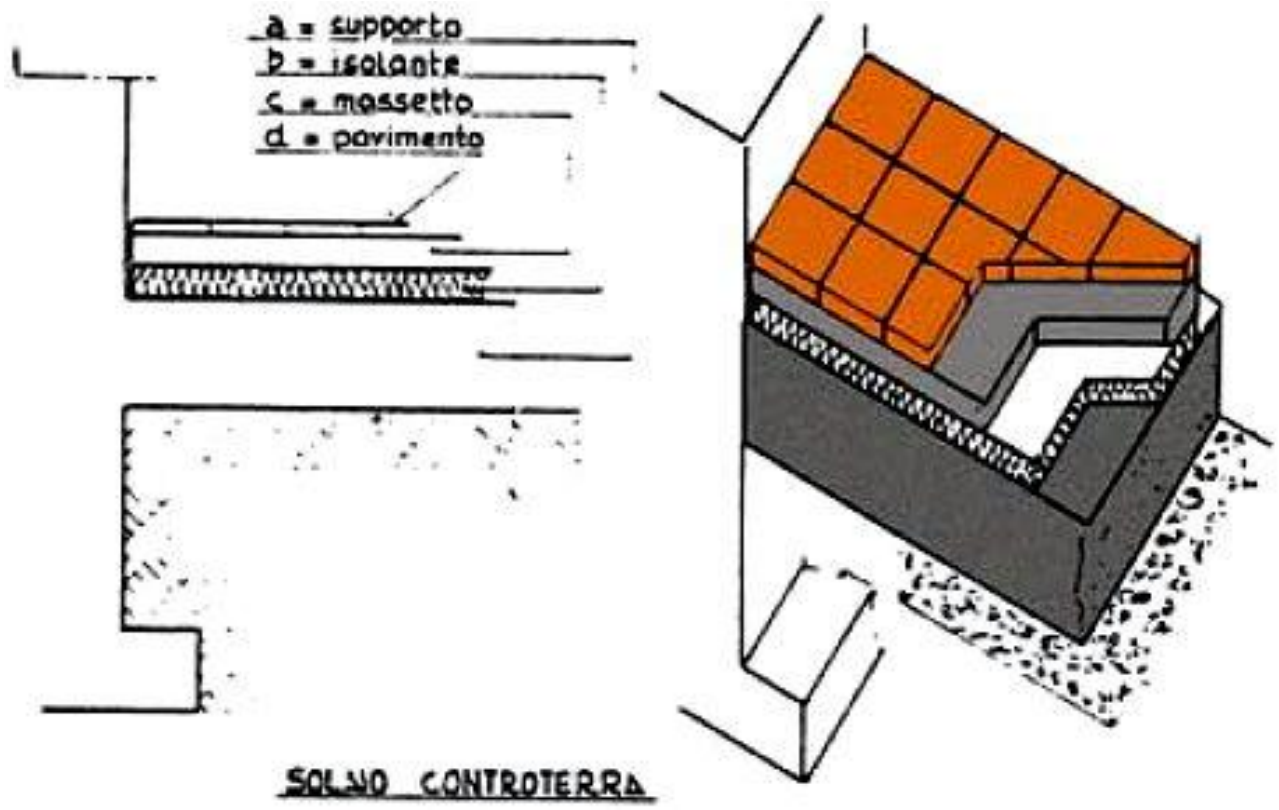


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Isolamento all'Estradosso Sottopavimento

- **Posizionamento del materiale isolante tra solaio e massetto**

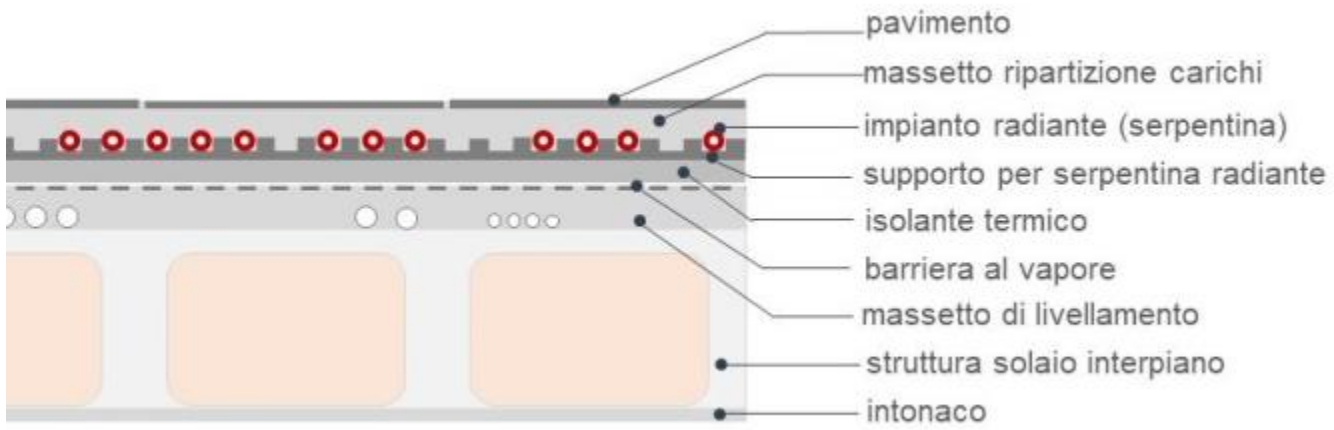


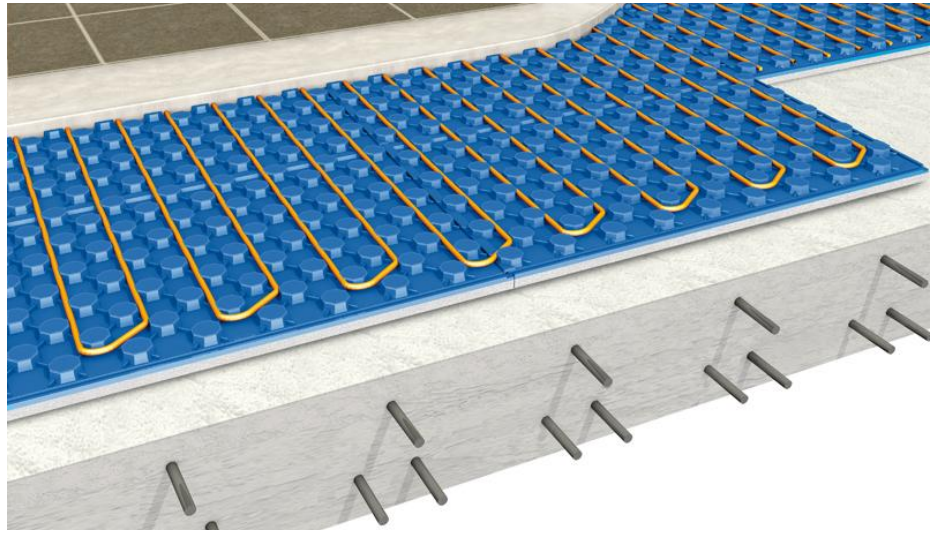
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Isolamento all'Estradosso Sottopavimento

- **Adatto per locali non riscaldati o con riscaldamento radiante a pavimento.**
- **Richiede resistenza alla compressione del materiale isolante**



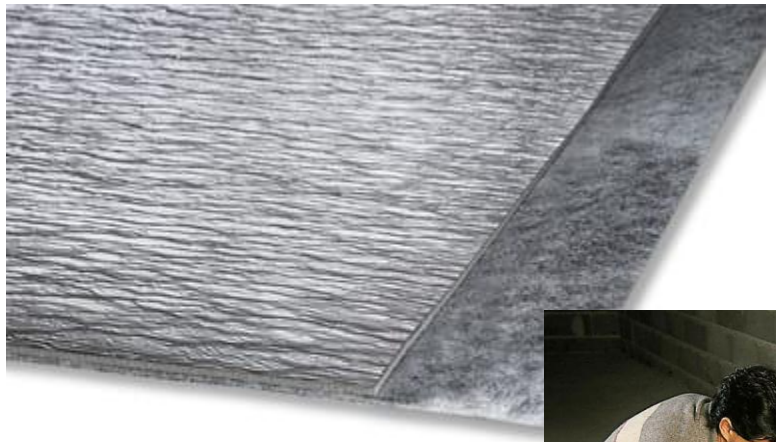


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Isolamento all'Estradosso Sottopavimento

- **Materiali utilizzabili:**
- **Materiali sfusi (minerali espansi, granulati vegetali)**
- **Pannelli**





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Isolamento sopra la struttura portante o fra i travetti

Applicazione all'estradosso del solaio o tra travetti

- **Ideale per sottotetti non abitabili, creando un "tetto freddo«**
- **Materiale isolante non richiede elevate caratteristiche di resistenza**
- **Possibilità di utilizzo come spazio di deposito, se calpestabile**

Materiali:

- **Materiali sfusi (cellulosa, granulati)**
- **Feltri/pannelli semi rigidi o rigidi**



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Isolamento sopra la struttura portante o fra i travetti

Materiali sfusi (cellulosa, granulati)



Feltri/pannelli semi rigidi o rigidi



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Isolamento sopra la struttura portante o fra i travetti

Pannelli-cassero autoportanti in polistirene espanso





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Isolamento sopra la struttura portante o fra i travetti

Pannelli in truciolare o OSB



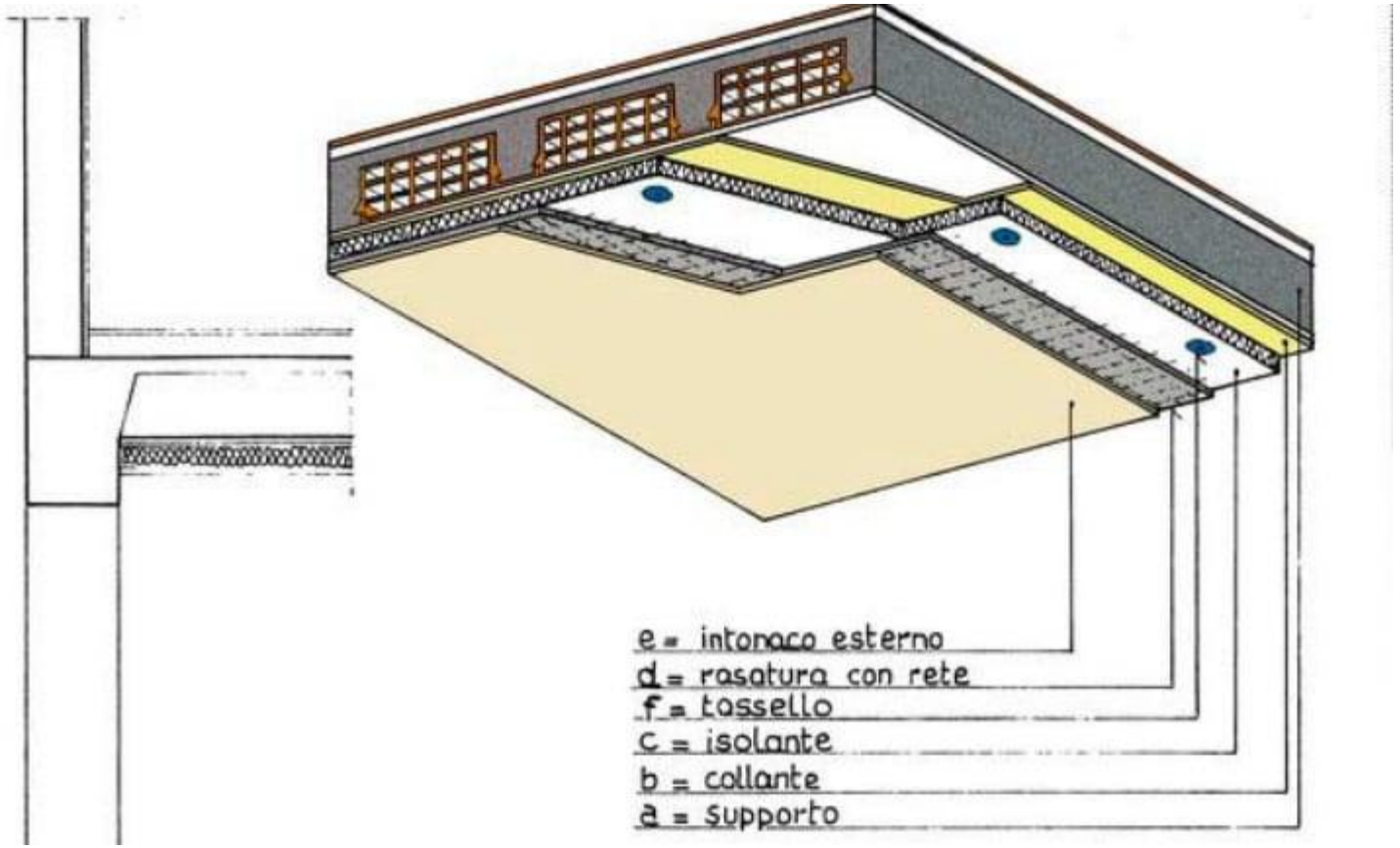
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Isolamento all'intradosso della struttura portante

- **Realizzazione dello strato isolante sotto il solaio**
- **Può fungere da controsoffitto con spazio per impianti**
- **Non è richiesta resistenza meccanica specifica.**

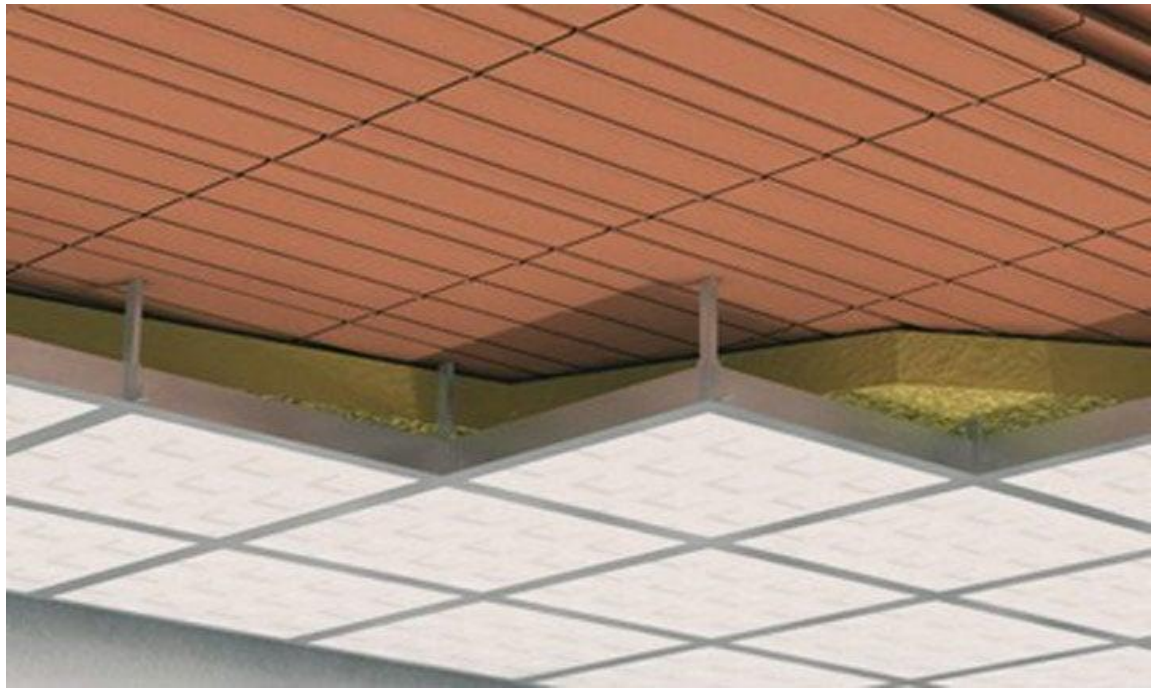


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Isolamento all’intradosso della struttura portante

Feltri per controsoffitti sospesi



Pannelli rigidi fissati direttamente

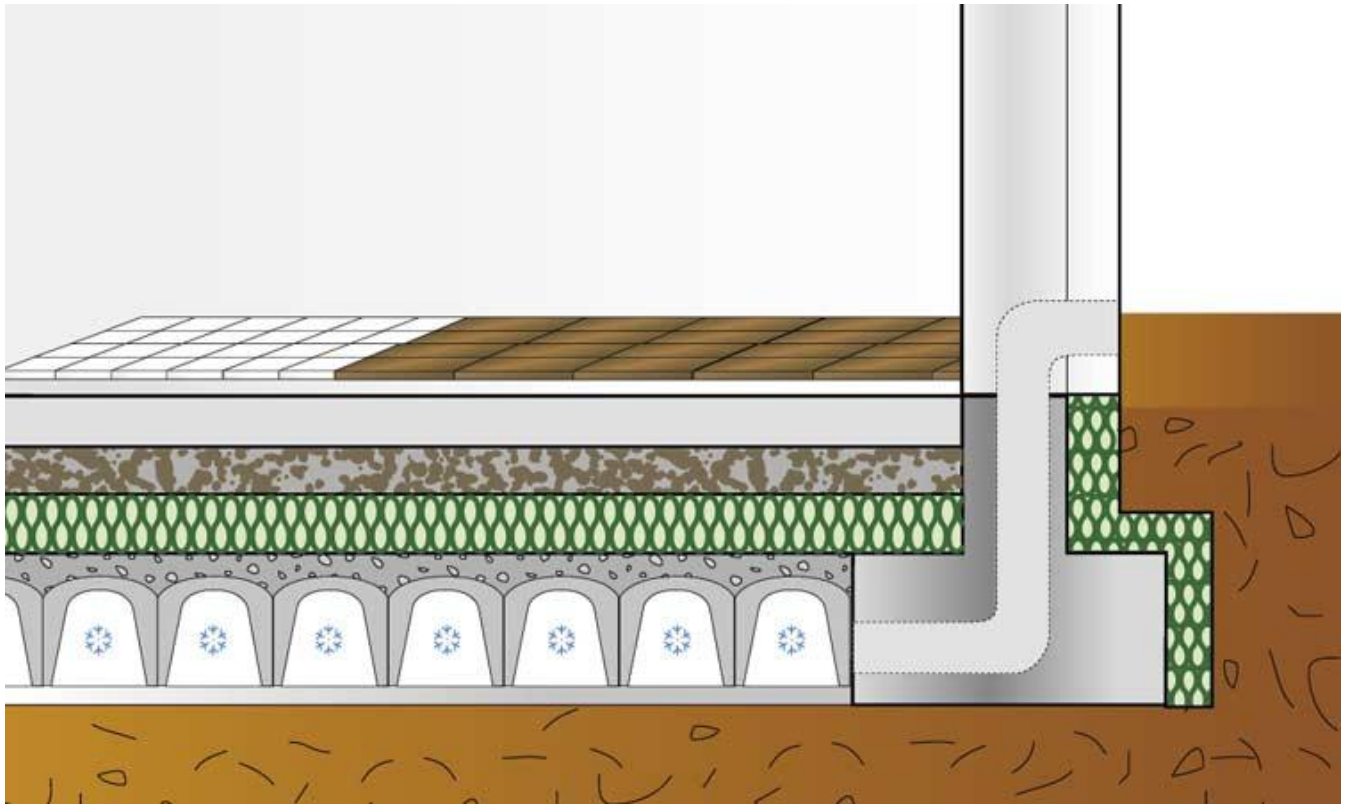


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Isolamento controterra sopra soletta di ripartizione carichi



- **Applicazione al di sopra della soletta portante con strato impermeabile.**
- **Utilizzato per ridurre dispersioni termiche verso il terreno**
- **Richiesta buona stabilità dimensionale resistenza alla compressione**

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Isolamento controterra sopra soletta di ripartizione carichi

Materiali sfusi (schiuma poliuretanica a spruzzo)



Pannelli rigidi

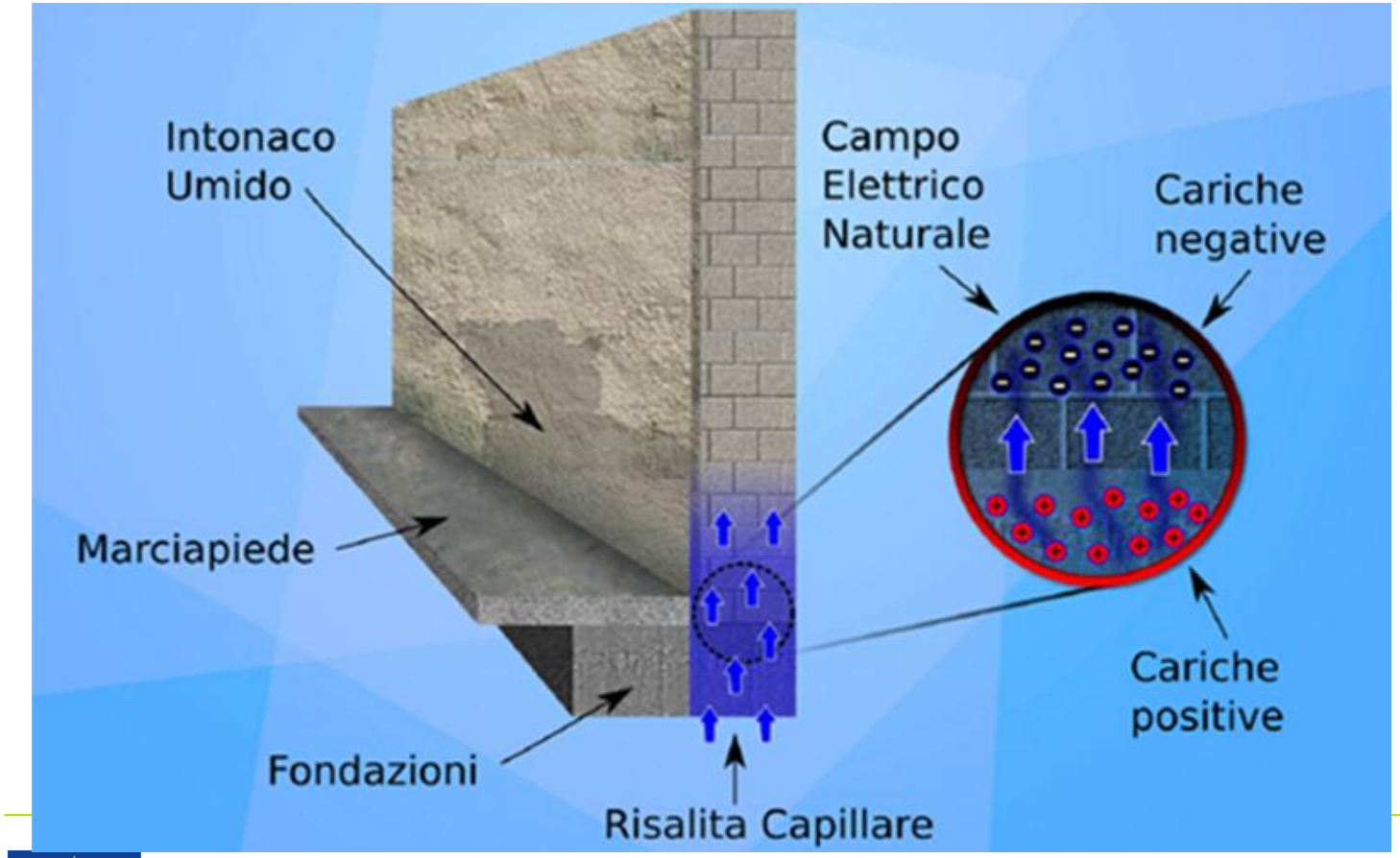


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Cos’è l’umidità di risalita

Come l’umidità risale lungo le murature



L'umidità di risalita nelle murature è un fenomeno che si verifica quando l'acqua presente nel terreno viene assorbita capillarmente dai materiali porosi delle pareti, causando danni strutturali e problemi di salubrità.

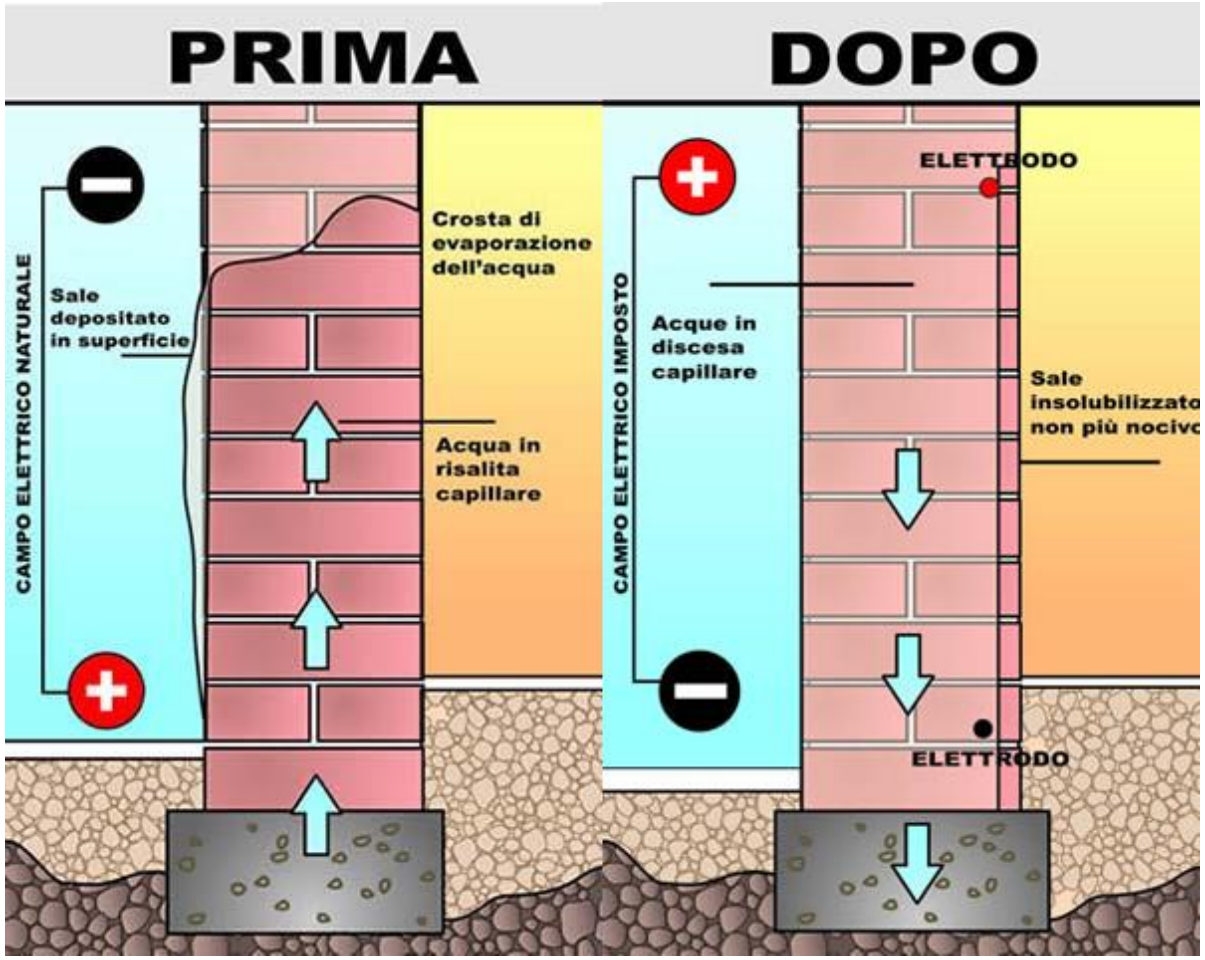


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Tecniche innovative per eliminare l’umidità di risalita: l’elettrosmosi



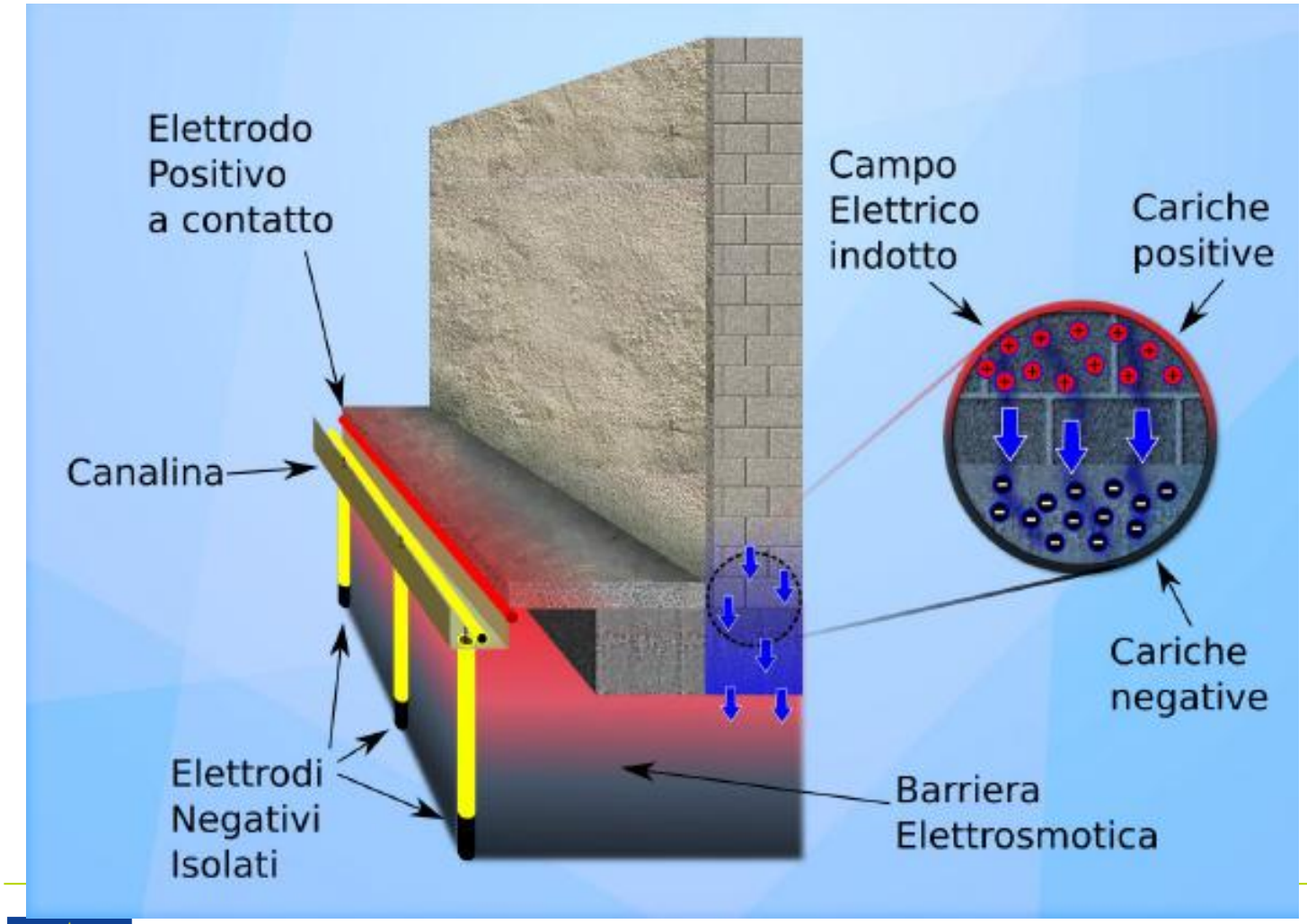
I sistemi elettrosmotici rappresentano una soluzione efficace per contrastare l'umidità di risalita nelle murature. Questo fenomeno si verifica quando l'acqua presente nel terreno viene assorbita capillarmente dai materiali porosi delle pareti, causando danni strutturali e problemi di salubrità.

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Tecniche innovative per eliminare l’umidità di risalita: le tecnologie di sistemi elettrosmotici

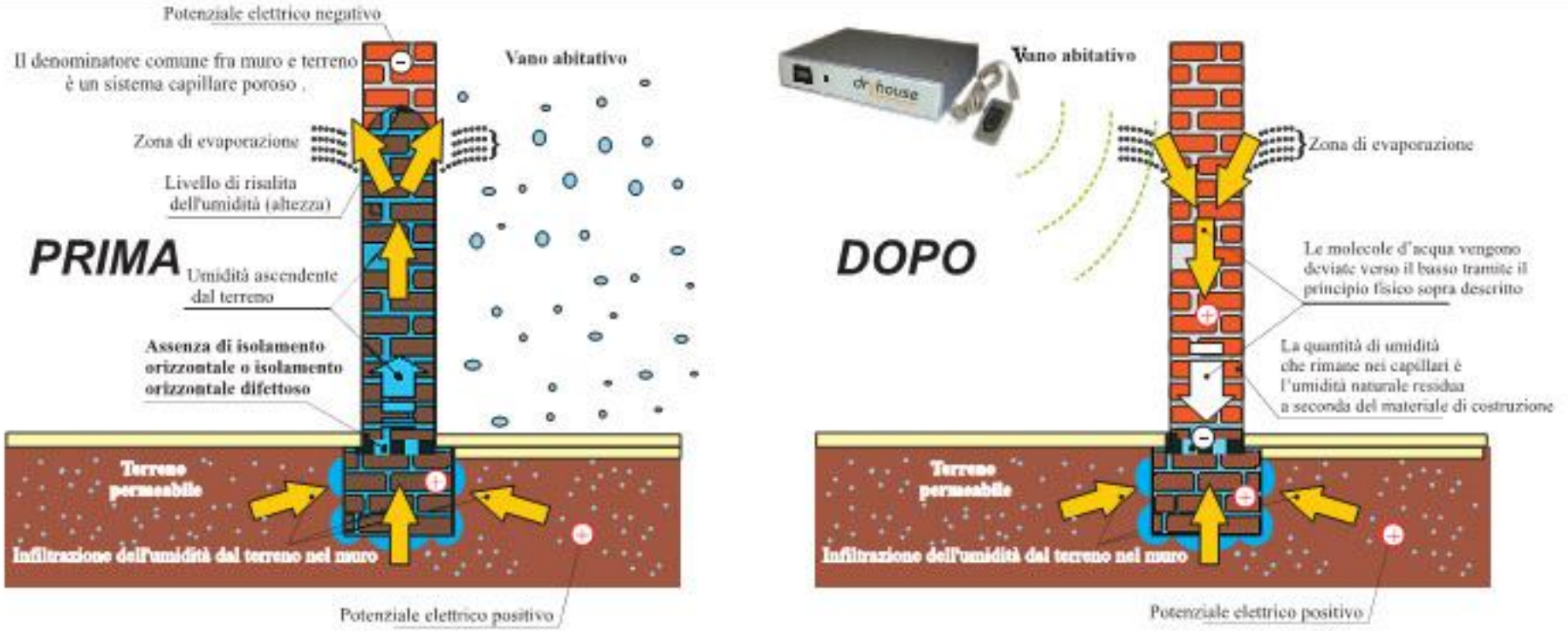


Elettrosmosi attiva:
Prevede l'installazione di elettrodi collegati a una fonte di corrente continua. Questo sistema richiede un'installazione più invasiva, ma offre risultati rapidi ed efficaci

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Tecniche innovative per eliminare l'umidità di risalita: le tecnologie di sistemi elettrosmotici



Deumidificazione elettrofisica: Utilizza dispositivi che generano campi elettromagnetici all'interno delle murature senza contatto diretto. Questi sistemi sono poco invasivi e non richiedono interventi strutturali significativi.

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Tecniche innovative per eliminare l’umidità di risalita: i vantaggi e i requisiti dei sistemi elettrosmotici

Vantaggi dei sistemi elettrosmotici

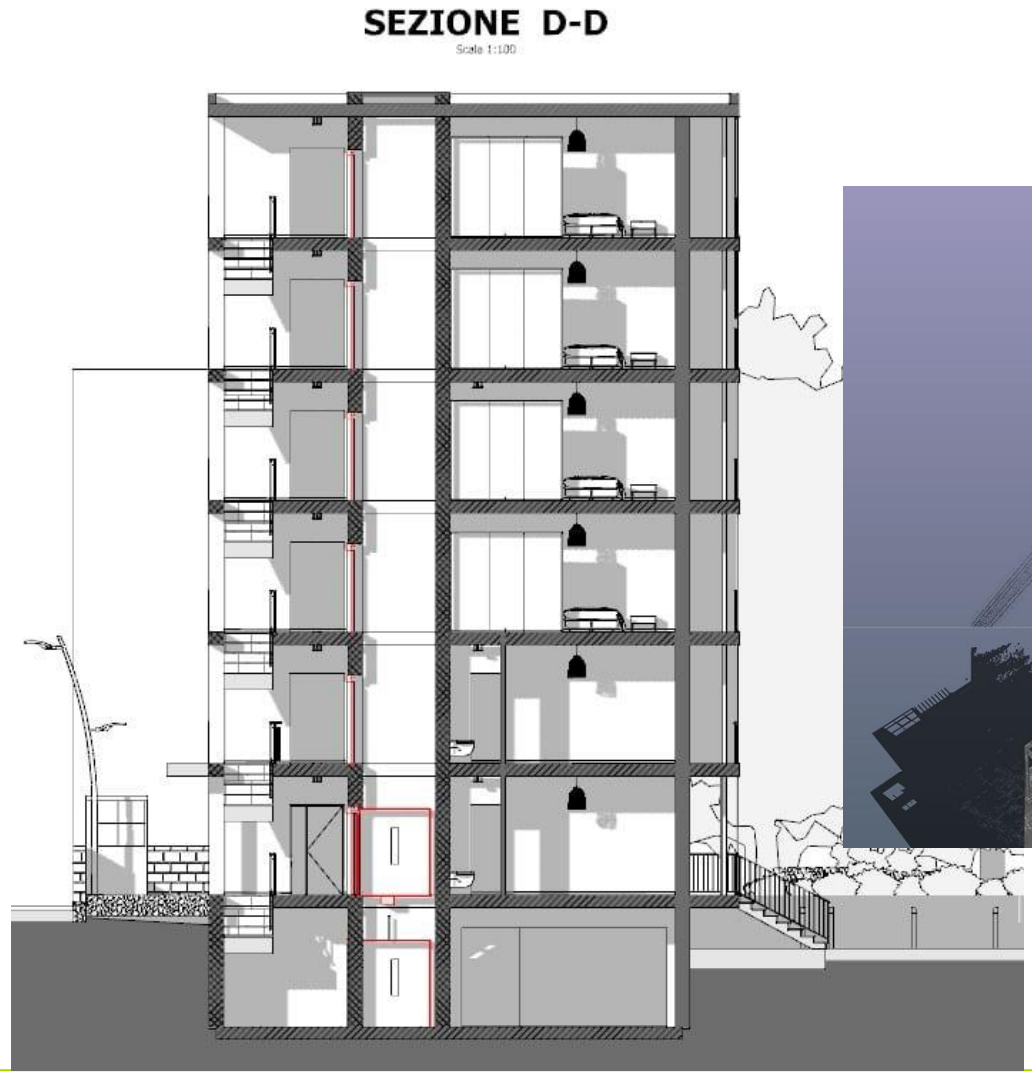
- **Efficacia comprovata:** Agiscono direttamente sulla causa dell'umidità, invertendo il flusso dell'acqua nei capillari.
- **Non invasività:** Alcuni sistemi, come la deumidificazione elettrofisica, non richiedono interventi strutturali sulle murature.
- **Versatilità:** Possono essere applicati a diverse tipologie di edifici, inclusi quelli storici o con vincoli architettonici.

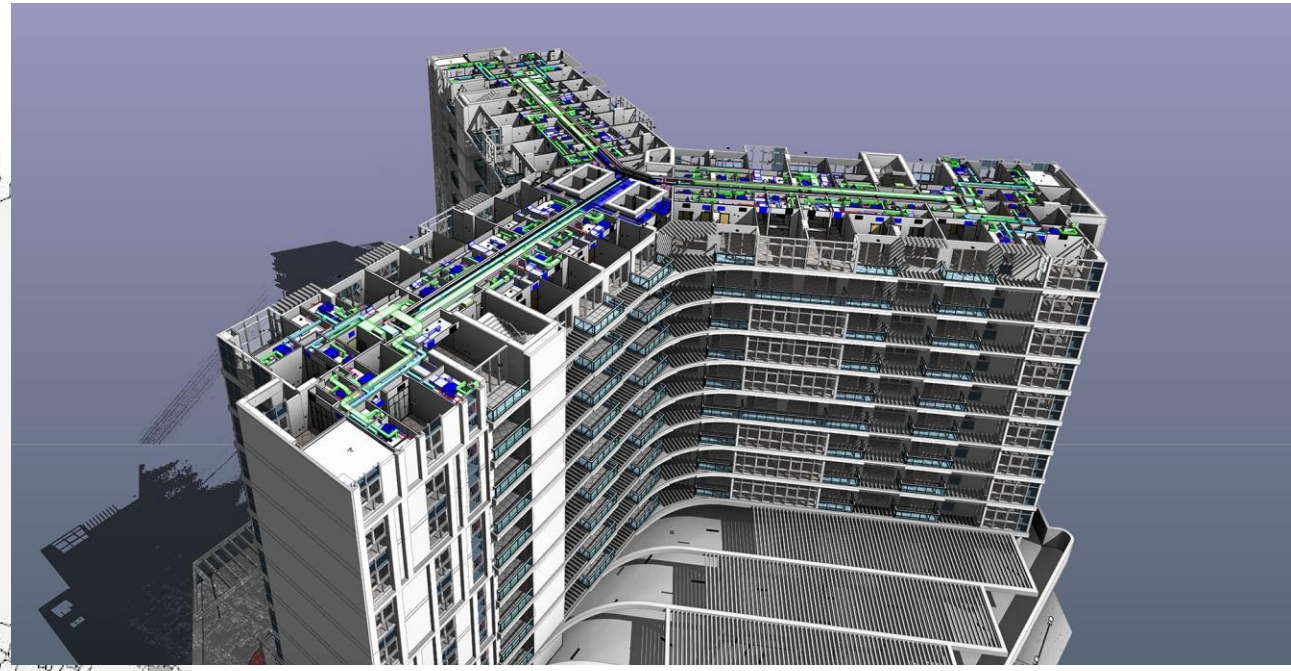


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I vantaggi del BIM per l'isolamento dei solai: la precisione delle misure



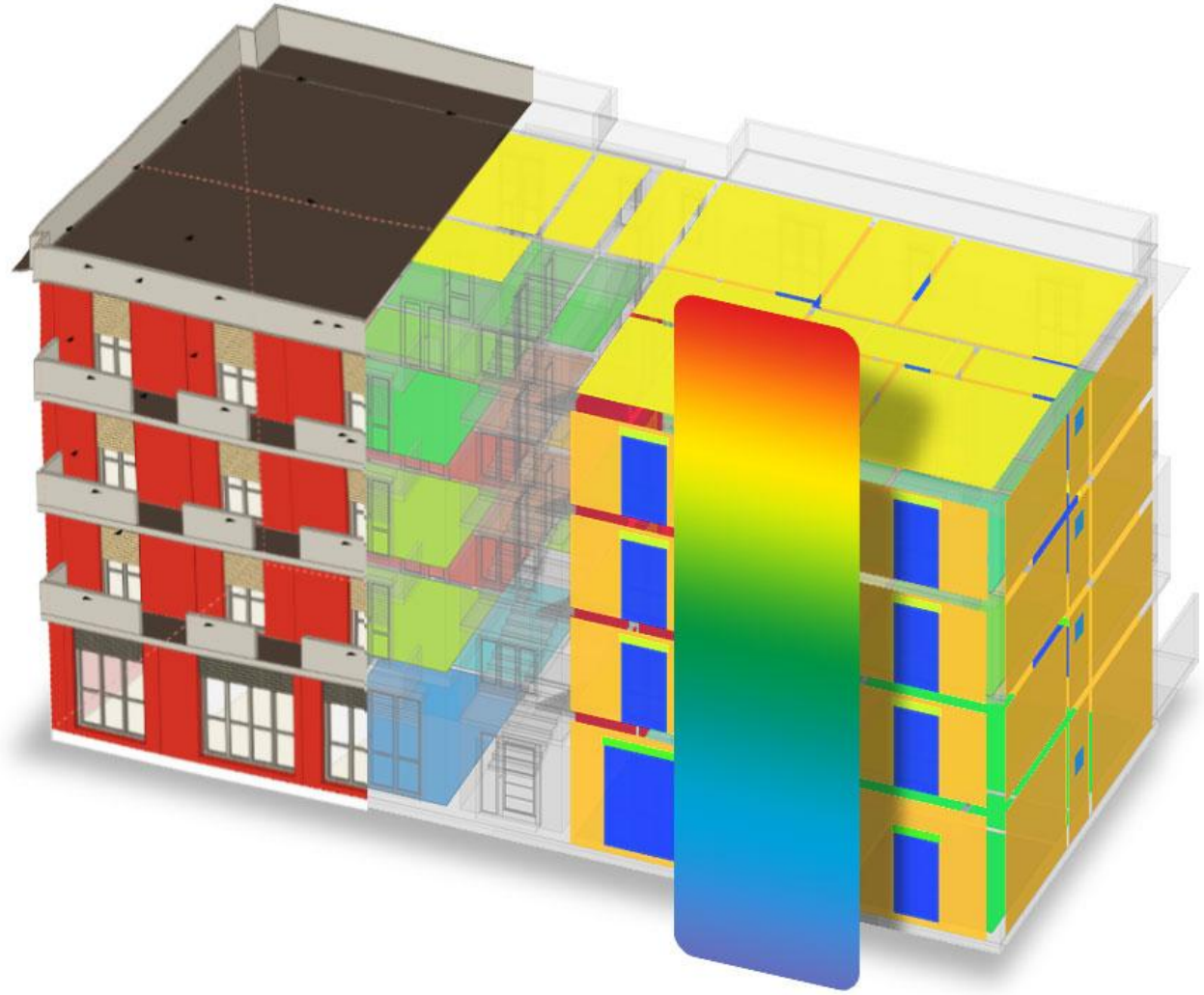


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I vantaggi del BIM per per l'isolamento dei solai : l'analisi energetica integrata



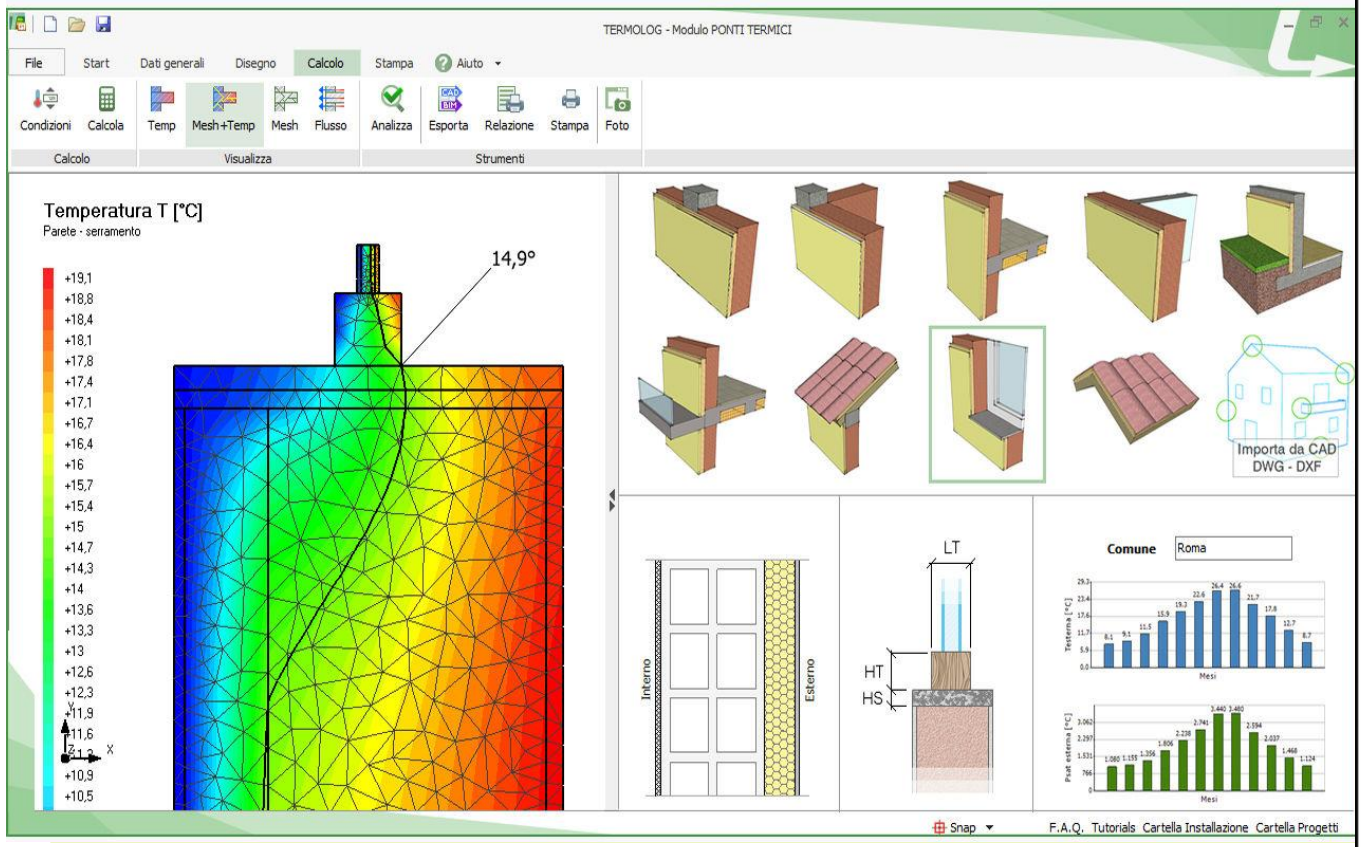
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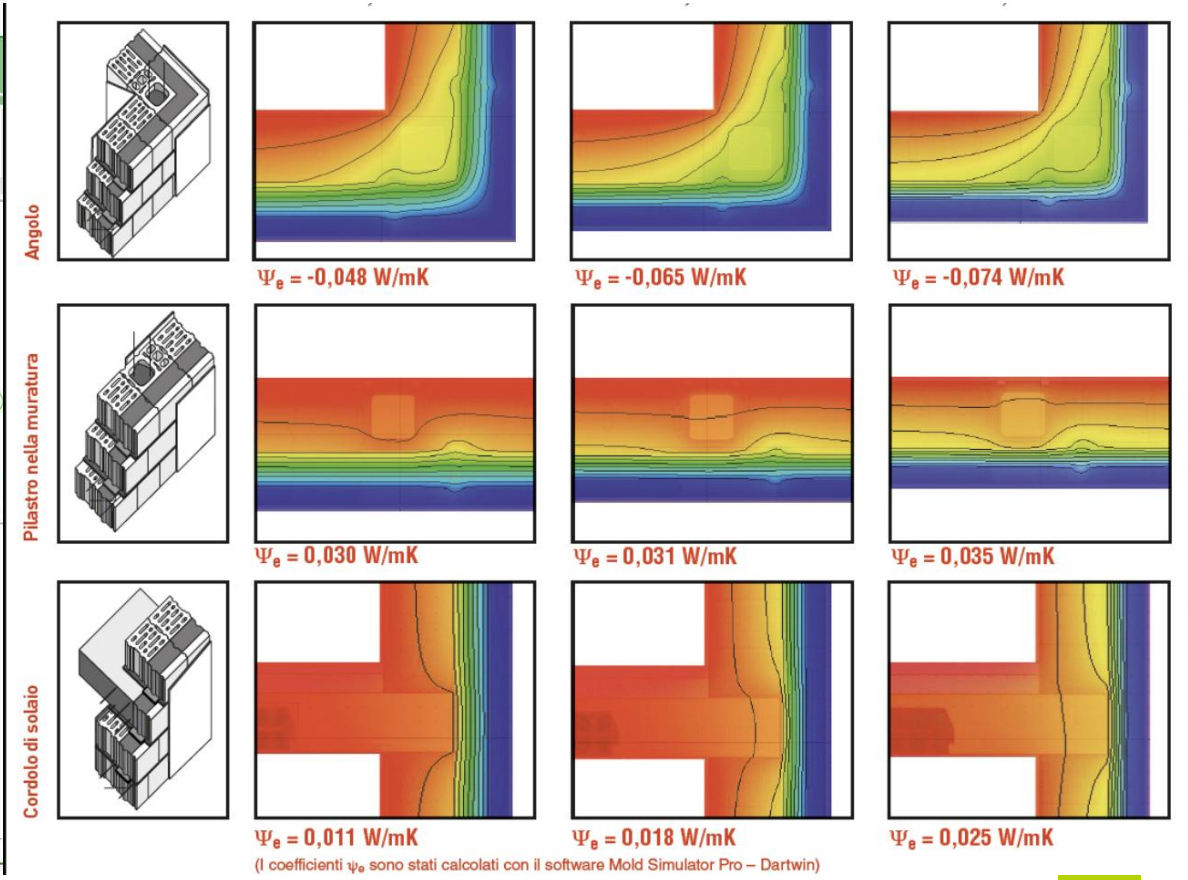
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I vantaggi del BIM per per l'isolamento dei solai : identificazione dei ponti termici

Modulo PONTI TERMICI FEM





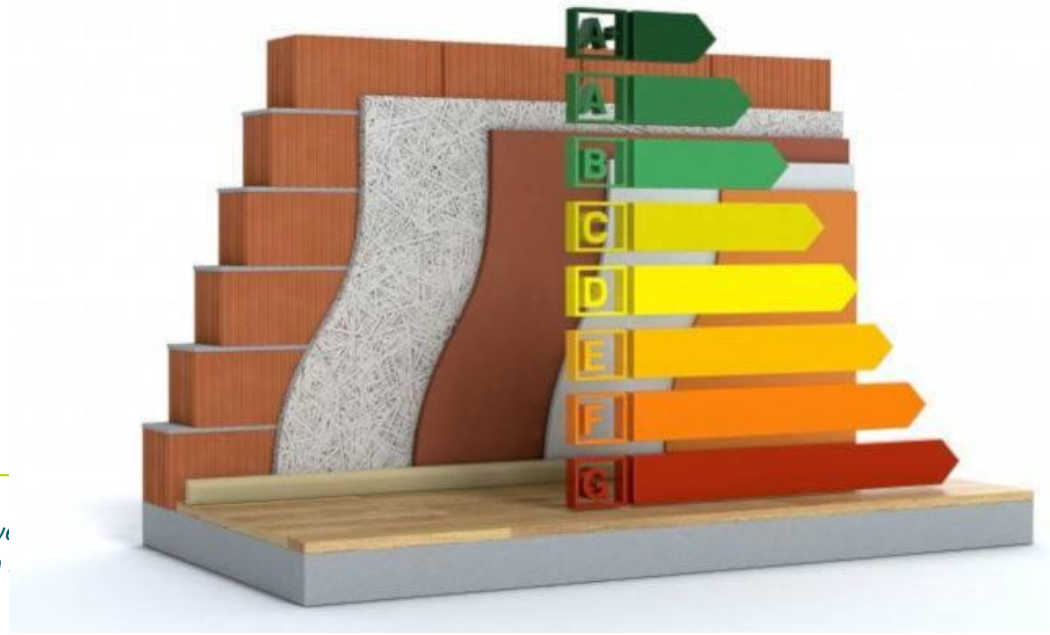
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I vantaggi del BIM per per l'isolamento dei solai : verifica della normativa

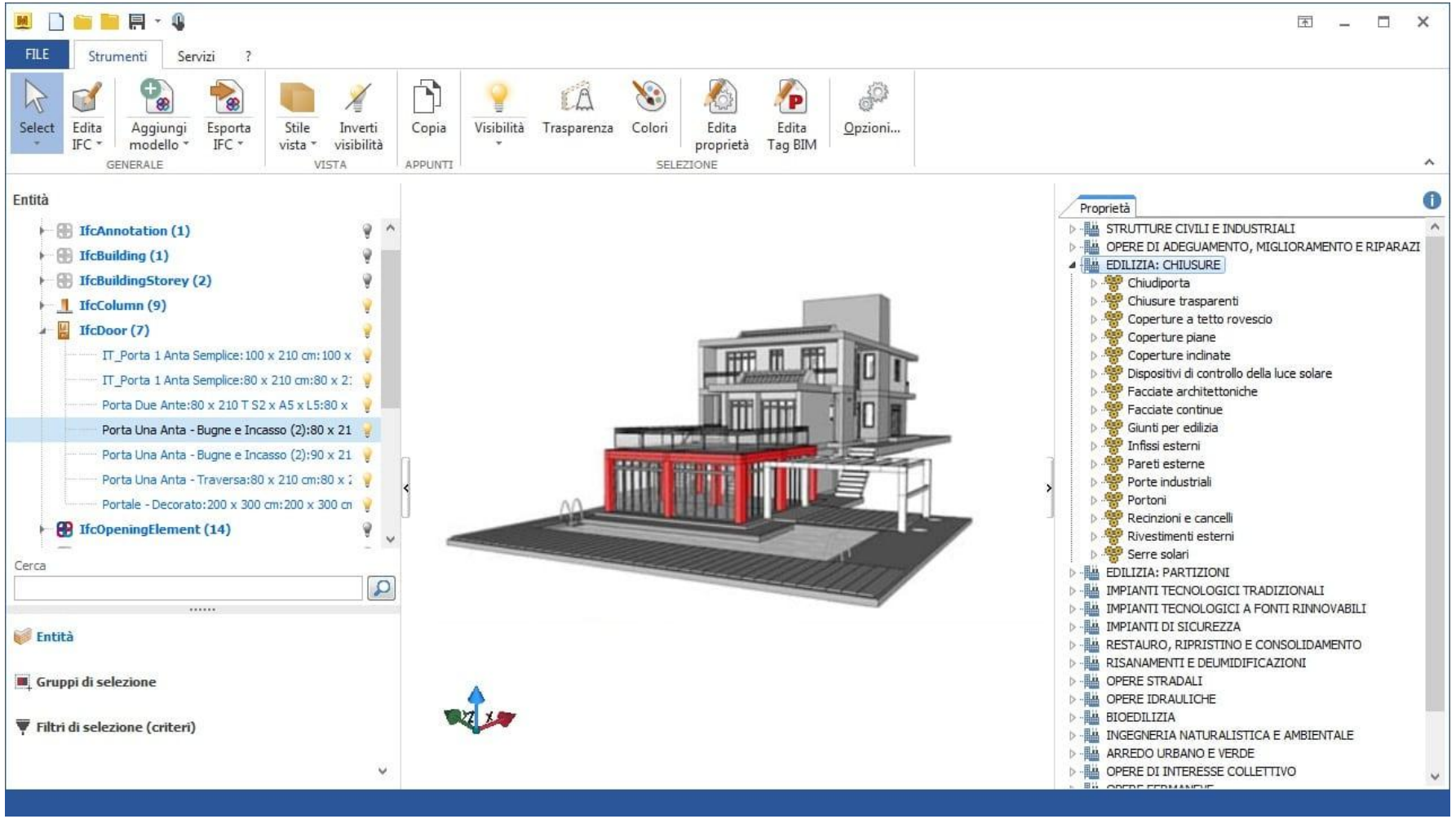
iii. Strutture opache verticali: isolamento pareti perimetrali (calcolo secondo le norme UNI EN ISO 6946)	Zona climatica A	$\leq 0{,}38$ W/m^2*K
	Zona climatica B	$\leq 0{,}38$ W/m^2*K
	Zona climatica C	$\leq 0{,}30$ W/m^2*K
	Zona climatica D	$\leq 0{,}26$ W/m^2*K
	Zona climatica E	$\leq 0{,}23$ W/m^2*K
	Zona climatica F	$\leq 0{,}22$ W/m^2*K



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I vantaggi del BIM per per l'isolamento dei solai : aggiornamento e manutenzione



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I vantaggi del BIM per per l'isolamento dei solai : l'uso dei prefabbricati

Pannelli prefabbricati integrati con tecnologia BIM

I Pannelli progettati e prodotti utilizzando il Building Information Modeling (BIM) consentono una perfetta integrazione con il progetto digitale dell'edificio con i seguenti vantaggi:

- Precisione millimetrica nella prefabbricazione.
- Riduzione degli errori in cantiere.
- Facilità di monitoraggio durante il ciclo di vita del prodotto.

- **Pannelli modulari prefabbricati**

  Questi pannelli isolanti preassemblati, ad esempio, combinano materiali come EPS o lana minerale con una finitura esterna, facilitando un'installazione rapida e di qualità



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BIM per progettare l’isolamento dei solai



Per approfondire l’argomento suggeriamo di seguire il corso BIM ed efficienza energetica realizzato da IBIMI e presente su questa stessa piattaforma

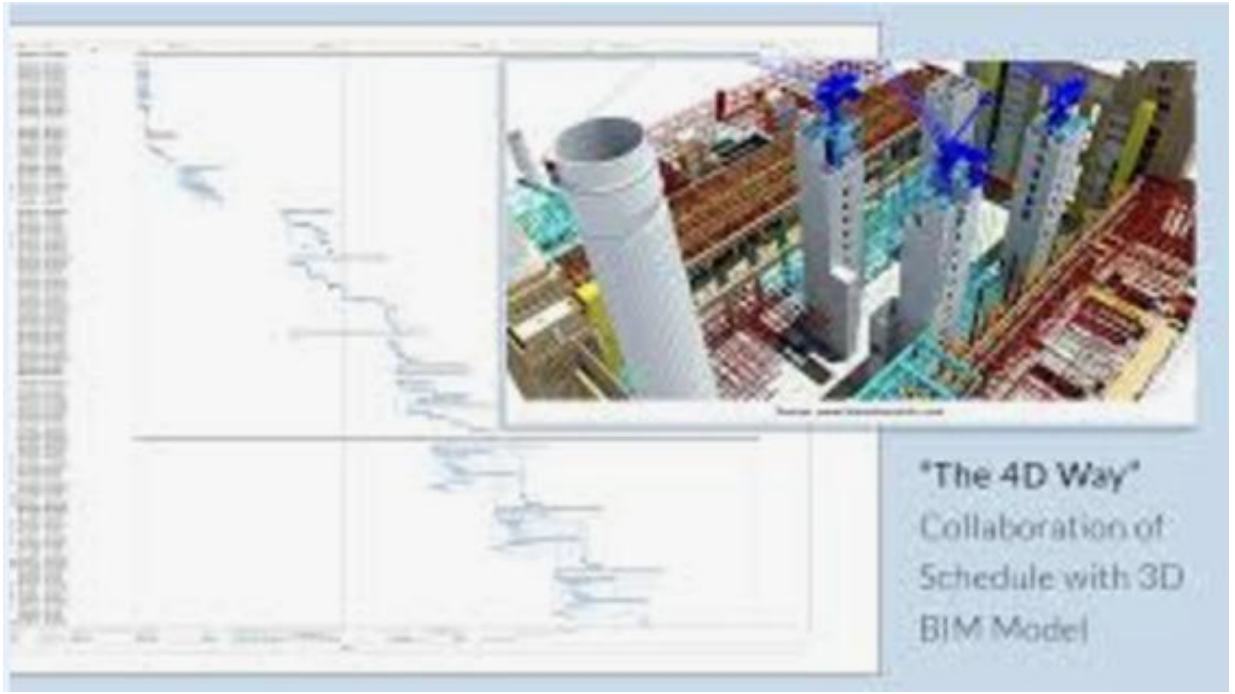
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BIM 4 D e BIM 5D per valutare tempi e costi per l'isolamento dei solai

Stima dei tempi



Stima dei costi



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La certificazione delle competenze BIM

Per approfondire



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