

GREENING THE CONSTRUCTION INDUSTRY



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Living Hoarding for Site Perimeters



Problems we can address

- Dust and air pollution
- Noise
- Waste (by re-use)



Dust (PM_{2.5} & PM₁₀)

- Particulate Matter (harmful dust particles)
 - < 75 µm = 0.075mm = any suspended or deposited dust (BS6069)
 - < 10 µm = 0.01mm = PM₁₀
 - < 2.5 µm = 0.0025mm = PM_{2.5}
- Damages human respiratory and cardiovascular systems (EA, 1010)
- Over 4,000 deaths/year in London; 50,000 across UK (Miller, 2010)
- Children at most risk: 17% reduction in lung capacity (RLH, 2012)
- Sources included traffic dust (PM₁₀), combustion, e.g. vehicle engines, large plant, generators (PM_{2.5})
- 80% emissions in London from road traffic (Mayor's Air Quality Strategy, 2010)
- Construction industry contributes around 4% of PM total in the UK
- Air quality indoors also affected (no worker PPE requirements) (DoH)

Air Pollution

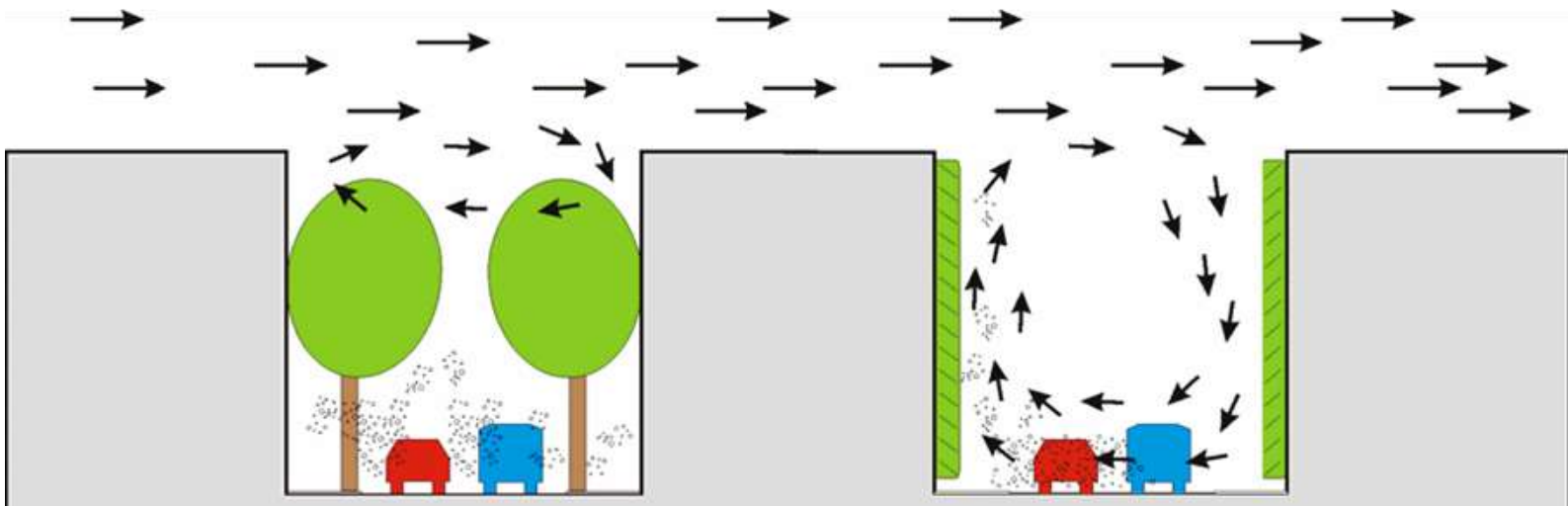
- Nitrogen dioxide (NO₂) and sulphur dioxide (SO₂) associated with respiratory and cardiovascular illness (Environmental Agency, 2010)
- Poor air quality reduces life expectancy of everyone in the UK by an average of 7-8 months (Defra, 2007)
- Air pollution is second-biggest public health threat after smoking
- UK incurs an estimated £20bn/year in related health costs
- Major sources: (Environmental Agency, 2010)
 - NO₂ – road transport (30%), energy & manufacturing sectors(46%)
 - SO₂ – power & energy sectors (68%)
- Forty of 43 UK air quality zones exceeded NO₂ legal limits in 2010
- EU fined UK government €300M in June 2012 for missing targets

A Green Solution (Pugh et al., 2012)

- Majority of existing solutions focused on reducing emissions or increasing dispersion over larger areas
- Green Infrastructure can actually ‘clean-up’ or reduce pollution
- Effect of planting vegetation in urban street canyons
 - Reduction of up to **40%** in NO₂
 - Reduction of up to **60%** in Particulate Matter (PM)
- Benefits can be realised on a street-by-street basis
- Immediate and sustained improvements in dense urban areas
- Works alongside other measures
- Street-level vegetation offers many additional benefits

Living Hoarding Façades

- Dust absorption comparisons (Dunnett & Kingsbury, 2004)
 - adult tree = 465 g/year, average city tree = 140 g/year
 - hederia helix ivy = 6 g/year/m²
 - 13 linear metres of living hoarding ≈ 1 average city tree
- Green façades allow enhanced air circulation and improved removal of street-level pollutants (compared with trees)



Noise Reduction

- Increased noise from construction sites
 - construction traffic, heavy plant and machinery, shouting, loud radios
- Excess noise problems
 - can cause high blood pressure, sleep disturbance and extreme stress
- Planted surfaces provide
 - low ambient noise reflectivity
 - high ambient noise absorption properties
- Living Hoarding provides
 - a vegetated barrier around the outside of the construction site
 - increased noise absorption from construction noise
 - reduction in ambient noise experienced in the local area
 - improved noise conditions for local residents and pedestrians
 - minimal noise impact during installation, no digging required

Waste Reduction

- Increasing government regulatory and policy drivers
 - Waste Framework Directive & Landfill Directive
 - Environmental, Planning & Waste Management Acts
 - Environmental protection, Hazardous Waste & Landfill Regulations
 - Good practice guidance and Codes of Practice (Defra, WRAP, CIRIA)
 - Mandatory Site Waste Management Plans (SWMPs)
- Increasing taxes, new levies & larger fines
 - Landfill tax, aggregates levy, Environmental Agency fines
- Living Hoarding is no-dig and fully reusable
 - on-ground system requires no digging, so no related waste
 - support structure and pre-grown ivy panels can be used on other sites
 - no materials wasted (or sent to landfill) when hoarding moved
 - no obsolete components if site perimeter changes
 - nothing is left on-site or in the ground when hoarding removed

Additional Benefits

- Improved aesthetics
- Increased biodiversity (Brenneisen, 2003)
- Prevention of vandalism & graffiti
- Improved public health and well-being (Ulrich, 2002)
- Improve employee productivity (Ulrich, 2002)
- Enhanced company image
- Urban heat reduction (Handley & Carter, 2006)

No-dig Living Hoarding

- pre-grown green ivy panels in multiple sizes
- totally reusable 'on-ground' site perimeter hoarding system
- quick to install, reposition or dismantle
- flexible enough to fit the majority of applications
- low-cost fencing, anti-climb mesh and living tile options



Retrofit Living Hoarding

- installation on existing traditional wooden hoarding
- uses pre-grown ivy screens or tiles that attach to hoarding
- enables existing construction sites to be 'greened-up'
- screens can be removed and recycled when hoarding is dismantled



Services & Maintenance

- All installations include an automated irrigation solution
- No on-site power required
- Standalone irrigation option requires no on-site water supply
- Flexible maintenance options to include trimming, feeding, pest control and irrigation management.



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Landscapes

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