

A.2 Be LEAN Systems

A.2.1 LEAN VRF system

Name: (LEAN) VRF

UK NCM type: Variable refrigerant flow

UK NCM wizard

Is proxy for ApacheHVAC system?* ☐

HeatingCoolingHot waterSolar heatingAux energyAir supplyCost

Generator:

Meter

Electricity: Meter 1

...

Is it a heat pump*?☒

Seasonal efficiency

3.0877

Delivery efficiency

0.9000

SCoP kW/kW

2.7789

Heat recovery:

Vent. heat recovery effectiveness

0.8500

Vent. heat recovery return air temp °C

21.00

CH(C)P:

Is this heat source used in conjunction with CHP?☐

What ranking does this heat source have after the CH(C)P plant?

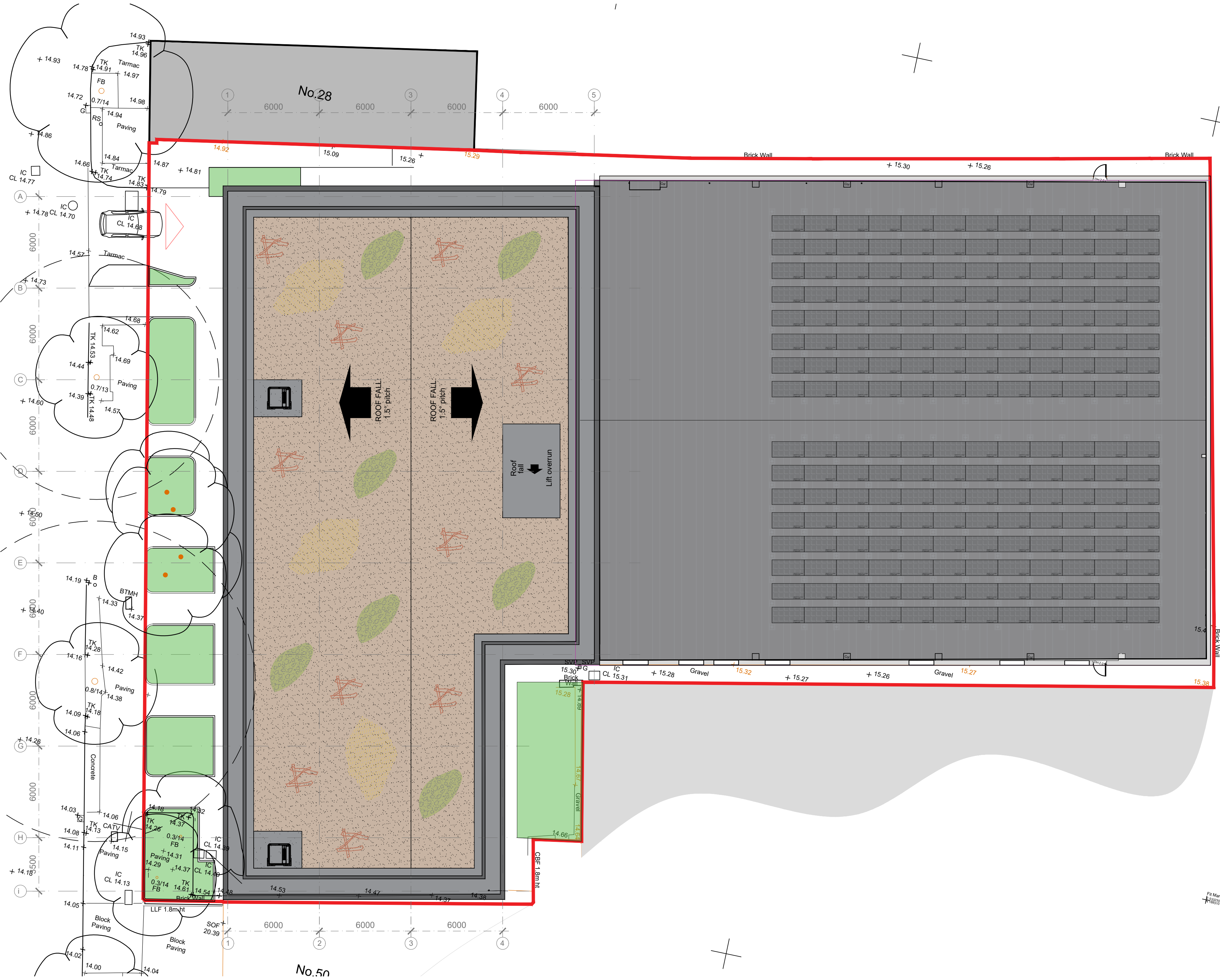
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* - Applies to UK NCM only

OKCancel

A.3 PV Array

Solar analysis has indicated that the west portion of the warehouse roof is overshadowed by the upper levels of the self-storage element. Therefore, the east portion of the warehouse is where the PV will be located. The upper levels of the self-storage have been taken up by plant and green roof; therefore, no PV is allocated in this area. The total array is comprised of 192 panels totalling 426.6 m², with a total rated capacity of 96.4 kWp.



Biodiverse roof example with mixed wildflower seeding / plug plants/ Sedum planting mix with gravel finish. Log piles and rock piles to be formed in areas on the biodiverse roof.



Solitary bee and insect hotels to be installed in areas across the Biodiverse roof.



Insect hotel example



NBS Specification : Q37

BIODIVERSE ROOF SPECIFICATION

Contractor Design Element; subject to equal & approved specification Products

Drainage Layer

- Material:** Thermoformed recycled polypropylene TBC by specialist contractor design / consultant civil engineer
- Depth:
 - Retention Volume:
 - Horizontal Flow Rate:
 - Vertical Flow Rate:
 - Compressive Strength: 150kPa

Filter Membrane

- Material:** Thermally strengthened non-woven polypropylene
- Mass: 0.120 kg/m2
 - Thickness: 2mm

Extensive Biodiverse Substrate

- Material:** Lightweight crushed brick & expanded clay substrate. Inorganic and organic growing medium consisting of crushed brick, expanded clay and organic matter of composted bark fines
- **Depth: 80-150mm**
 - Porosity: 63%
 - Water Holding Capacity: 25-30%
 - Bulk Density DIN EN 1097-3: 1 T/m3
 - Density at Max Water Holding Capacity: 1.25 T/m3

- PH Value: 7.0 8.0Vegetation
Planting Mix: Various wildflower species in plug plant trays and seed form
Root Ball Size (plugs): 50mm
Coverage Rate (seeds): Varies: up to 5g/m2
Coverage Rate (Plugs): 10 per m2
Vegetation Coverage: 5% minimum

Habitat Creation / Biodiversity Enhancements

- Log / Sand Piles

Edge Retaining/Separating Profile

- Material:** Aluminium
- Description/Profile: Slotted; 3m length
 - Height: 100mm (subject to system build-up/depth)
- Inspection/Access Chambers**
- Material:** Plastic coated steel
- Dimensions: 250x250mm
 - Height: 80mm
 - Colour: Black
 - Access Covers: Black, plastic coated steel with handle
 - Features: 300x 300mm flange attached for stability and to lap filter sheet

Vegetation Barrier

- Material:** Rounded washed pebbles (20-40mm)
- Depth: 70mm (subject to system build-up/depth)
- Width: 300mm minimumExecution

Installation Generally

- Preparation: Clear all surfaces of debris
- Timing: After certification of waterproof membrane integrity
- Surface condition: Visually inspect waterproof membrane, report any damage
- Faults in waterproof membrane: Report prior to commencement of works
- Contamination: Do not use materials detrimental to healthy growth of plants
- Storage: Do not overload - point loads avoided
- Outlets: Do not block
- Outlet grilles: Installed

Adverse Weather

- Unfinished work: Secure for damage and wind uplift
- Conditions: Do not install or work with frozen materials

Drainage Layer Installation

- Extent: Loose lay continuously over entire roof area
- Fitting: Close butt-joint boards or rolls; staggering joints if applicable
- Upstands: Cut to fit 300mm from penetrations and outlets, using a heavy duty knife or smooth-toothed saw

Filter Membrane Installation

- Extent: Loose lay continuously over entire roof area
- Fitting: Loose laid (bonded to drainage board)
- Joints: Minimize
- Overlaps (minimum): 150mm overlap excess on drainage roll

Growing Medium Installation

- Handling: Minimize handling. Deliver to roof in small sacks, bulk bag or pump.spreading the specified depth on to filter sheet, allowing the settlement factor of 20%

- Conditions: Handle in the driest condition possible. Do not handle or install when wet or frozen

Layers:

- Depth: 80-150 mm settled
- Sequence: Gently firm each layer before spreading the next.Vegetation Installation

Handling Seeds:

- Extent: Continuous and even across area to be planted
- Timing: Not to be installed if temperature is below 0C
- Storage: Must be stored in a cool and shaded area; not to be stacked excessively

Application

- Wildflower seeds to be installed within 48 hours of delivery. Irrigate to saturation.
- Watering: Thoroughly, after laying and account for climatic variation and seasonality.

Edge Retaining Profile Installation

- Cutting: Neat, accurate and without spalling
- Junctions: vertical, secured using proprietary connectors
 - Position: True to line and level. Smooth continuous lines
 - Fixing: Loose laid onto fleece, ballasted by weight on foot plate, or secured to waterproof membrane using proprietary fixing system
 - Suitable for pitched roofs of 5 degrees or less

Inspection Chamber Installation

- Location: Install centrally over rainwater outlet
- Orientation: Align parallel with adjacent features
 - Bedding: Position flanges on to crowns of drainage layer
 - Backfill: Ballast flanges with pebbles
 - Surround: 300mm diameter circle/square of 20-40 rounded pebbles

COMPLETION

Inspection

- Timing: Prior to handover
Notice period (minimum): 3 working days
Completion
General: Leave the works in a clean and tidy condition
Surfaces: Clean immediately prior to handover
Outlets: Clean and clear of any obstructions
Completed green roofs: Protect from adjacent or high level working as best as possible.

Documentation

- Timing: Submit at handover
Contents:
- Growing Medium declaration of analysis
 - Manufacturers guarantees and warranties
 - Maintenance Procedures
 - Record Drawings showing the location of planting and associated features
 - Number of copies: 1

Green Roofs Maintenance Procedure

- This set of procedures is a guide outlining the minimum maintenance measures required to keep a green roof in its designed state.

- The plant selection includes a species mix which will provide a balanced plant community on the roof. This will require basic maintenance to ensure a sustainable system for the long term.

- Living roof maintenance is best carried out twice to four times annually, during springtime and in late autumn, or as required. Monitoring/controlling the effect of leaf litter to the vegetation is important; this can be deemed to be beneficial to biodiversity, but may need to be removed if this begins to affect plant life.

EGR SPECIES MIX

- [subject to specialist contractor design]

- Wildflower Species Flower
Birdsfoot Trefoil - Lotus corniculatus
Black Medick - Medicago lupulina
Common Knapweed - Centaurea nigra
Corn Chamomile - Anthemis arvensis
Corn Cockle - Agrostemma githago
Corn Marigold - Chrysanthemum segetum
Cornflower - Centaurea cyanus
Cowslip - Primula veris
Field Forget-Me-Not - Myosotis arvensis
Field Poppy - Papaver rhoeas
Foxglove - Digitalis purpurea
Goatshead - Tragopogon
Greater Knapweed - Centaurea scabiosa
Hoary Plantain- Plantago media
Ladys Bedstraw- Galium verum
Meadow Buttercup- Ranunculus acris
Musk Mallow - Malva moschata
Night-flowering Catchfly Silene noctiflora
Ox-eye Daisy - Leucanthemum vulgare
Red Campion- Silene dioica
Ribwort Plantain- Plantago lanceolata
White/pink
Salad Burnet- Sanguisorba minor ssp minor
Self Heal Prunella- vulgaris
Sorrel- Rumex acetosa
White Campion- Silene alba
Wild Carrot- Daucus carota
Wild Clary- Agrimonia
Yarrow- Achillea millefolium

- Companion grasses:
Common Bentgrass- Agrostis castellana
Crested Dogtail- Cynosurus cristatus
Sheep's Fescue- Festuca ovina
Smooth Stalked Meadow Grass- Poa pratensis
Strong Creeping Red Fescue- Festca rubra rubra

- Sedum species:
Sedum Acre Aureum
Sedum Album Althorum
Sedum Reflexum
Sedum Voodoo
Sedum Album Coral Carpet

NOTES

ORIGINAL A1

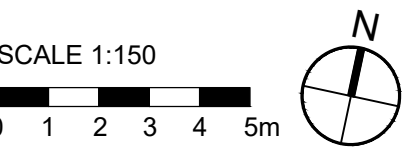
All levels and dimensions to be checked on site prior to construction / fabrication; report discrepancies immediately. Do not scale dimensions from this drawings. This drawing is copyright protected.

REVISION

A	220925	Layout of PVs amended	AF
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Material Key:

-  Biodiverse Roof with 500mm gravel strip to perimeter
-  Photovoltaics Quadcore Powerpanels on kingspan quadcore pitched roof. 192Nr panels - Area circa 422sqm.
-  Kingspan - Topdeck. Single ply membrane
-  Lift Overrun, insulated panel lined in single ply membrane
-  Smoke vent & access hatch



PLANNING

SCALE	DATE	DRAWN	CHECKED
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PROJECT

STOREX SELF STORAGE

Lawrence Road, Tottenham
LONDON: N15 4EG

DRAWING

Roof Plan

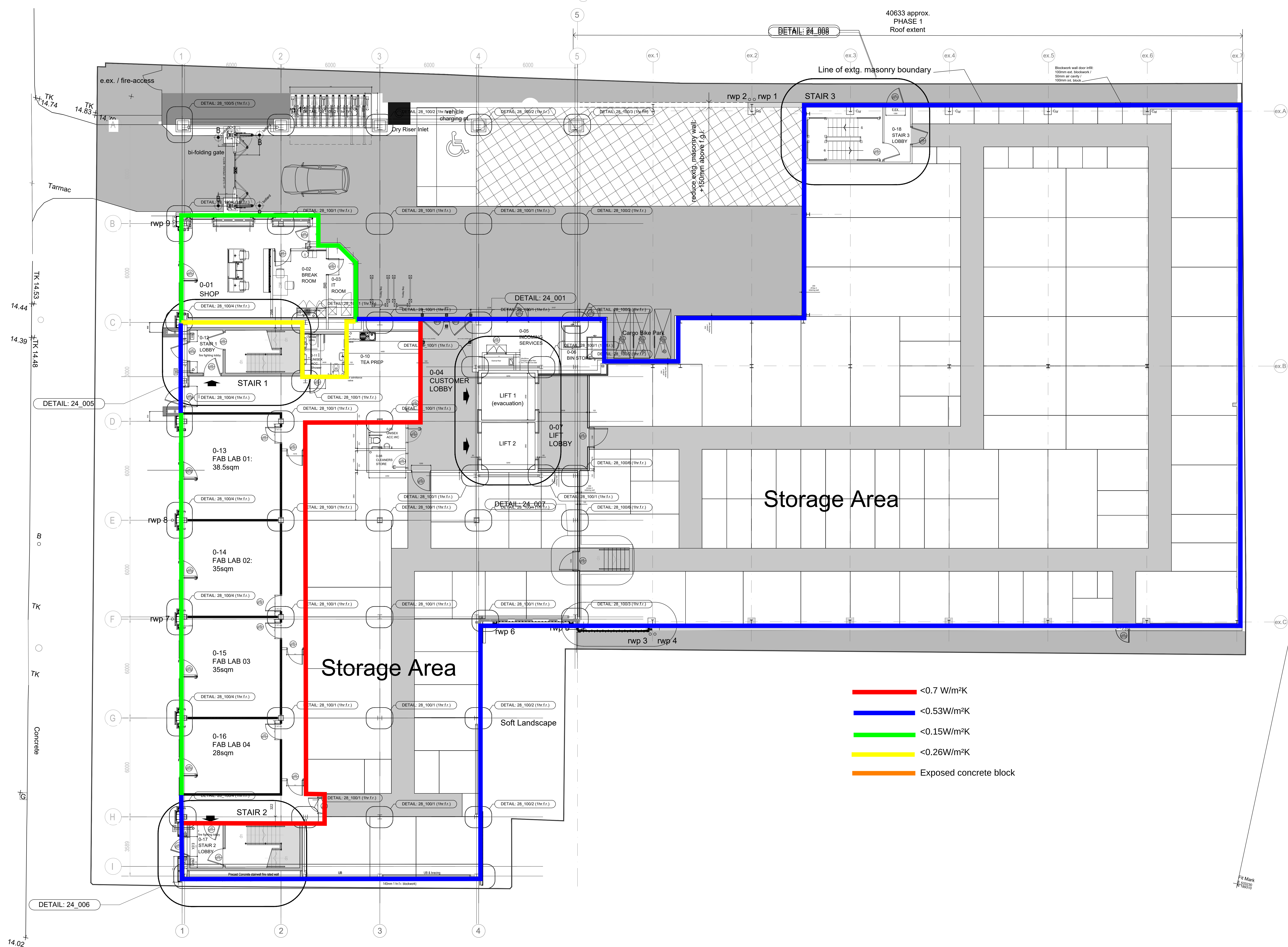
As Proposed



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DRAWING No.
25012_D_010A

A.4 Thermal line U-value markup



TENDER

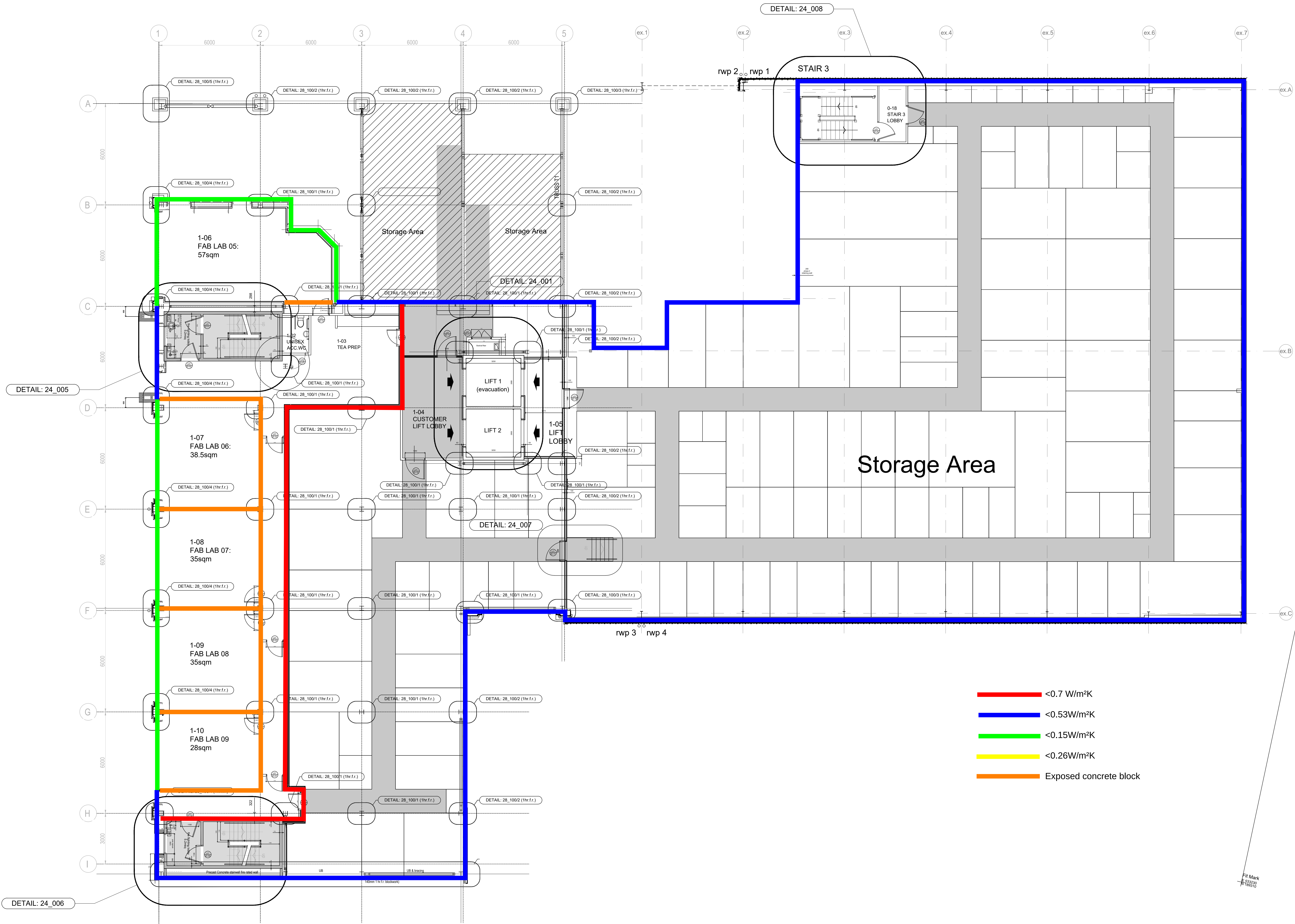
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PROJECT

STOREX SELF STORAGE
30-48 Lawrence Road, South
Tottenham, London N15 EG

DRAWING

Ground Floor Plan



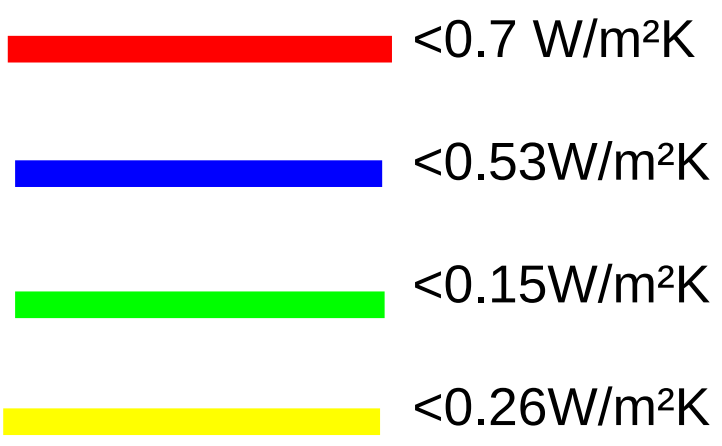
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PROJECT
STOREX SELF STORAGE
30-48 Lawrence Road, South
Tottenham, London N15 EG

DRAWING
First Floor Plan

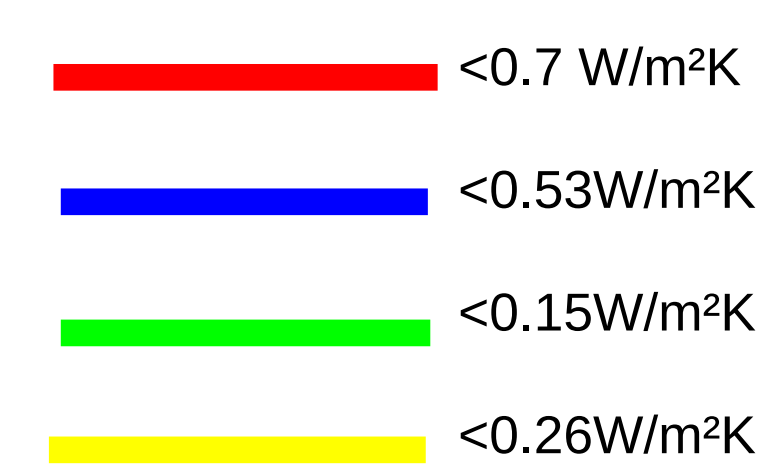




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DRAWING

Second Floor Plan



DRAWING

Third Floor Plan