

Horsens

Building part	Material	Description	Quality	Quantity (tonnes)
Filling and bottom protection	Crushed concrete	Used for bottom protection, capillary-breaking layers and filling around foundations.	The materials had to meet the same requirements as traditional stone materials. The materials were examined for possible use. Contaminants were removed and other building materials were sorted out.	28,7
Foundation and terrain deck	Crushed concrete aggregate	<i>In-situ</i> casting of foundations and ground decks finished concrete in passive environmental control with aggregate of crushed concrete with a grain size of 8-16 mm. Strength class 15 Mpa.	Aggregate: density, absorption and sieve analysis Concrete: DS 411 Danish Concrete Association's instruction for recycled materials in concrete with passive environmental control, publication no. 34. 1989	45
Concrete hollow deck	Crushed concrete aggregate	Floor separations of concrete hollow decks are passive environmental controlled with aggregates of crushed concrete with a grain size of 8-16 mm and free of impurities. Prescription 'Recycling', strength class 30 Mpa, passive environmental control, PC cement, pulverized fuel ash and silica fume, d,max 16 mm.	Aggregates: density, absorption and sieve curve Concrete: DS 411 Danish Concrete Association's instruction for recycled materials in concrete in passive environmental class, publication no. 34. 1989	
Exterior and interior wall tiles	Hand-cleaned bricks	The outer walls are fully bricked with insulation. Not all inner walls are bricked with recycled stone, as it was not possible to find enough stones. Masonry with new lime mortar. The bricks come from demolished buildings in the surrounding area and from " Socialdemokraten" in Horsens and "Kanniketryk" in Aarhus. The bricks from the different demolitions have different appearances. Comprehensive quality assurance, including designation, procurement, sorting, labeling and reprocessing has been conducted. The masonry center found that the bricks could not meet today's requirements for avoiding frost damage. This problem was solved by treating the exteriors. For the sake of the appearance of the house, the newest stones are built into the exteriors and the oldest inside the house. It was necessary to select from front and back bricks, as front bricks have proven to be weather resistant for many years. Moreover, it has been proven that the bricks in the lower floors of old houses are stronger than in the upper ones.	Fungal control before demolition. Strength control at the Masonry Centre (6-stone strength test, 3 times higher than new stones. Determination of stone class The Danish Society of Engineers' standard for brick structures, 4. July 1991 edition, DS 414	110,5

Construction wood, roof	Cut wood	Roof construction incl. dormer, battens, ceiling formwork and walkway of recycled timber. Selective harvesting, sorting, and marking of wood. Sorted by "can be used" and "cannot be used", as the designation only concerned wood for roof construction. Marking the upper side of the wood due to the curvature of the timber after years of load. In terms of strength, the wood is on a par with new wood, but harder, which places greater demands on the performing work in the workshop or construction site. Recycled wood does not crack after many years of drying out.	Visual control Control for fungus, rot and insect infestation	1,5
Floorboards and joists		Floorboards are partly recycled pitch pine and pine floorboards. Reprocessing included removal of nails, planing, plastering and sanding. Floor joists are recycled floor joists that could be built in after light cleaning.	Visual control Control for fungus, rot and insect infestation	1,9
Roof covering	Cleaned recycled wing tiles	The wing bricks come from a disused drying barn at Bygholm Teglværk. The backstones are new in that suitable recycled backstones could not be produced. Cleaning off fungus by washing and brushing before laying.	Visual check Check for fungus	4,3
Outdoor pavement	Cobblestones	Reused granite cobblestones for Horsens municipality.		40,5
Steel profiles	Steel profiles	Reused HEB steel profiles from the demolition of another building, where they were encased in the structures. Thus, they were not corroded after many years of life. Location unknown.		0,3
Windows		3 windows were produced from recycled carpentry wood, but the product was too poor and production too difficult. Unknown if the 3 windows are built in. Therefore, 19 windows of new wood have been manufactured for the construction.		0,75
				<b>232,7</b>

Odense				
Building part	Material	Description	Quality	Quantity (tonnes)
Filling under basement	Crushed concrete	Capillary-breaking layer under floor. The material comes from selective demolition of concrete buildings. The material must not contain harmful amounts of organic substances, clay and silt.	Capillary determination Incandescent Grain size analyses: d,max = 32 mm Max 3% ≤ 0,075 mm Max 20 % 2 mm	128
Concrete aggregates, foundation, basement walls and concrete deck	Aggregates of crushed concrete and brick	<i>In-situ</i> casting of foundations, basement, ground deck and floor deck Basement walls: 30 cm <i>in-situ</i> cast concrete. Concrete deck: 20 cm <i>in-situ</i> cast concrete. The external staircase and stairwell as the external non-grounded walls, as the only concrete structures in the construction, are not made of reused concrete. 15-20 Mpa compressive strength, passive environmental control. The material comes from selective demolition of normal brick buildings. Free of technically and environmentally harmful substances. Smaller quantities of glass, metal, wood, tar/bitumen can be accepted according to instruction.	The Danish Concrete Association's instructions make recycled materials in concrete Aggregate class GP 2 (crushed brick) Maximum grain size 32 mm	365

Concrete aggregate. Concrete elements	Aggregates of crushed concrete and brick	Precast concrete elements for indoor elements. In the execution phase, there was water on a small area, which suffered frost peeling The material comes from selective demolition of brick or concrete buildings. Free from technical and environmental harmful substances. Smaller quantities of glass, metal, wood, tar/bitumen can be accepted according to instruction.	The Danish Concrete Association's instructions make recycled materials in concrete Aggregate class GP 1 and 2 (crushed concrete and brick) Maximum grain size 16 mm	
Exterior	Cleaned bricks	The exterior is bricked in, cross-linked with whole stone in cup shifts. Wet bricks caused, among other things, damage as a result of salt efflorescence (remedied by additional drying in the apartments). Some bricks, on one side, were discoloured by a dark material (presumably calcium sulfate, gypsum), and discoloured the paster on the brick wall. It was attempted to remedy it with sanding, a special binder and new surface treatment but this was unsuccessful. The dark layer on the masonry's viewing surface was removed. In other places, the exterior of former bricks faced outwards, which meant that the stones were "pushed through" by painting and it was necessary to use extra binding primers in these areas. Approximately 10 pcs. unburned stones, which had to be replaced. Different brick quality led to the use of different thickness sealants in the same window as well as the need for screed of individual crooked bricks in false. Outer wall construction: 35 cm cavity wall insulated recycled masonry, plaster finish. The bricks originate from selectively demolished exterior masonry in normal brick construction.	Whole bricks without damage Compressive strength, stone class: Rear wall in facades, living room: 25 Back wall in facades, 1. saL: 20 Apartment boundaries: 10 Internal partitions: no requirements	128
Inner wall tiles	Cleaned bricks	Bricking of non-load-bearing wall against neighboring fire wall Interior walls: 11 cm recycled exterior brick, plaster finish The stones originate from selectively demolished usually older brick buildings	Whole bricks without damage Compressed strength, stone grade 15	134
Construction wood	Cut wood in dimensions: Rafter wood: 60 x 170 mm 60 x 130 mm 50 x 100 mm 100 x 100 mm Other construction wood: 150 x 150 mm	Roof construction: Recycled slate on battens with underlayment. A-rafters with 20 cm insulation (new) and internal cladding of 13 mm plasterboard (new). Attic construction: Insulated (new) wooden boundary, flunker and roof covered with zinc (new) on boards, interior cladding of 13 mm plasterboard (new). Construction wood also used for glass-covered construction in the stairwell. The wood comes from selective demolition of traditional residential construction. Wood was used for the entire roof construction except roof battens.	Strength K18 according to DS 413 The tree must be reviewed for rot and fungus	9
Floor joists and battens	Cut wood in dimensions: 50 x 50 mm (floor joists) 38 x 56 (roof battens)	Bedding construction under wooden plank floors. Battens in connection with roof construction. The wood comes from selective demolition.	Strength K18 according to DS 413 The tree must be reviewed for rot, fungus and wood boring beetles	4
Floorboards		Floors in all rooms except bathrooms. Planed on previous back and made with new tongue and groove before laying. Surface treated. The boards come from selective demolitions.	Reviewed for fungus and wood boring beetles	1

Carpentry wood	Cut wood in the dimensions: 19 x 100 mm (Skirting boards and girder truss)	Cabinet doors in kitchens are recycled wood. Skirting boards and girder trusses in all homes.	Reviewed for fungus and wood boring beetles	1
Formwork	Cut wood in dimensions: 25 x 100 mm 25 x 125 mm	Scattered formwork on 2nd floor as a substrate for drywall. Formwork for board separators at depots in the basement and for walkways in roof spaces. Formwork on dormers as a substrate for zinc cladding. The boards come from selective demolitions.	Inspected for rot and fungus	3
Internal doors		All interior doors including sills. Direct recycling of wood. New bracket lock boxes and grips. Doors and frames are cleaned, puttied, primed, sanded, primed and painted before installation. The doors came from selective demolitions.	Inspected for rot and fungus	6
Windows and exterior doors		Windows (horizontal): Custom-made windows made of cut and cleaned recycled wood (frames, middle post, sprods). Installed front windows Skylights, dormer: Velux (new). Exterior doors: Made of recycled wood.	Inspected for rot and fungus	11
Natural slate	12" and 14 "	Roofing throughout the building, exclusive stairwell. 12" slate slabs facing courtyard. 14" slate slabs facing yard side. Generally poor and fluctuating quality of slate slabs with large spills before and during construction. However, the roofer estimated that the quality of the obvious old slate to be higher than contemporary slate.	Whole pieces without visible cracks or fractures	11
				<b>801</b>

Copenhagen				
Building part	Material	Description	Quality	Quantity (tonnes)
Filling around basement	Crushed concrete and brick	The material comes from selective demolition of brick or concrete buildings. The material must not contain harmful amounts of organic substances, clay and silt.	Analyses for grain size: d,max = 32 mm Max 3 % ≤ 0,075 mm Max 20 % 2 mm	102
Filling under basement	Crushed concrete and brick	Capillary-breaking layer under floor The material comes from selective demolition of brick or concrete buildings The material must not contain harmful amounts of organic substances, clay and silt.	Capillary determination Incandescent Grain size analyses: d,max = 32 mm Max 3% ≤ 0,075 mm Max 20 % 2 mm	
Concrete aggregate, foundation and basement	Broken brick aggregate	<i>In-situ</i> casting of foundation and basement. 20 Mpa compressive strength passive environmental class. The material comes from selective demolition of normal brick buildings Free of technically and environmentally harmful substances. Smaller quantities of glass, metal, wood, tar/bitumen can be accepted according to instructions.	The Danish Concrete Association's instructions make recycled materials in concrete Aggregate class GP 2 (crushed brick) Maximum grain size 32 mm	190

Concrete aggregate. Concrete elements	Aggregates of crushed concrete and brick	Precast concrete elements for wall and deck structures. Concrete for gallery corridors and stair towers is not recycled concrete. The material comes from selective demolition of brick or concrete buildings Free from technically and environmentally harmful substances Smaller quantities of glass, metal, wood, tar/bitumen can be accepted according to instructions.	The Danish Concrete Association's instructions make recycled materials in concrete Aggregate class GP 1 and 2 (crushed concrete and glass) Maximum grain size 16 mm	372
Facade tiles	Cleaned bricks	Bricklaying of shell wall on outer walls of street and courtyard façade. The stones come from selectively demolished façade masonry in normal brick construction.	Whole stones without damage Compressive strength, stone grade 22	130
Inner wall tiles	Cleaned bricks	Masonry of non-load-bearing wall against neighboring fire wall. The stones originate from selectively demolished usually older brick buildings.	Whole stones without damage Compressive strength, stone grade 15	54
Roof tiles	Recycled roof tiles	Roof tiles originate from demolitions in Copenhagen. Cleaning of mortar was done manually from larger mortar residues and then by means of high-pressure washing. In terms of materials, it has been shown that the recycled roof tiles' density and water absorption are in the normal range of newer Danish roof tiles and that they are frost resistant. Roof tiles are fastened with ties rather than originally with steel wire and nails.	Condition, visual check after cleaning	12
Construction wood	Cut wood in dimensions: 125 x 125 mm 56 x 38 mm 56 x 22 mm (inner covering)	The wood comes from selective demolition of traditional roof construction Wood was used for the entire roof structure except roof battens.	Strength K18 according to DS 413 The wood must be free from rot and fungus	5
Floor joists	Cut wood in dimensions: 50 x 50 mm	Bedding construction under wooden plank floors. The wood comes from selective demolition.	Strength K18 according to DS 413 Inspected for rot and fungus	3
Wooden frame for interior walls	Cut wood in dimensions: 45 x 70 mm	The wood originates from selectively demolished usually older brick buildings.	Strength K18 according to DS 413 Inspected for rot and fungus	2
Add-on panels	Cut wood in dimensions: 25 x 100 mm	Add-on panels between frame and back wall. The wood originates from selectively demolished usually older brick buildings.	Strength K18 according to DS 413 Annex A Inspected for rot and fungus	2
Storage room boards	Cut wood in dimensions: 25 x 100 mm	Construction of storage room in basement. The wood originates from selectively demolished usually older brick buildings.	Strength K18 according to DS 413 Annex A Inspected for rot and fungus	1
New windows		Inserted in the "old-fashioned" way by mounting in a mortar joint instead of plastic grout.		
				<b>873</b>