SIMM CENTER / ABSOILS CONFERENCE 11.-12.9.2014

VISIONS FOR THE FUTURE:
NEW RESIDENTIAL AREA IN HELSINKI – HONKASUO (PINE TREE SWAMP)

LIFE09 ENV/FI/575 ABSOILS

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NEW RESIDENTIAL AREA IN HELSINKI – HONKASUO (PINE TREE SWAMP)

1. CITY DEVELOPING AND HONKASUO AREA
2. ECO-CITY OF HONKASUO
3. GEOLOGY OF HONKASUO
4. SOIL IMPROVEMENT AT HONKASUO
5. SECONDARY MATERIALS AS CONSTRUCTION MATERIALS
6. “LANDSCAPE HILL”

=> IDEAS?

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1. HOME TOWN HELSINKI - THE GOALS AND OBJECTIVES OF HOUSING AND LAND USE PLANNING

The Focal Objectives of the Programme Period

- In 2013–2016 a new general plan will be prepared, aiming at a more compact community structure and a vital, polycentric city.

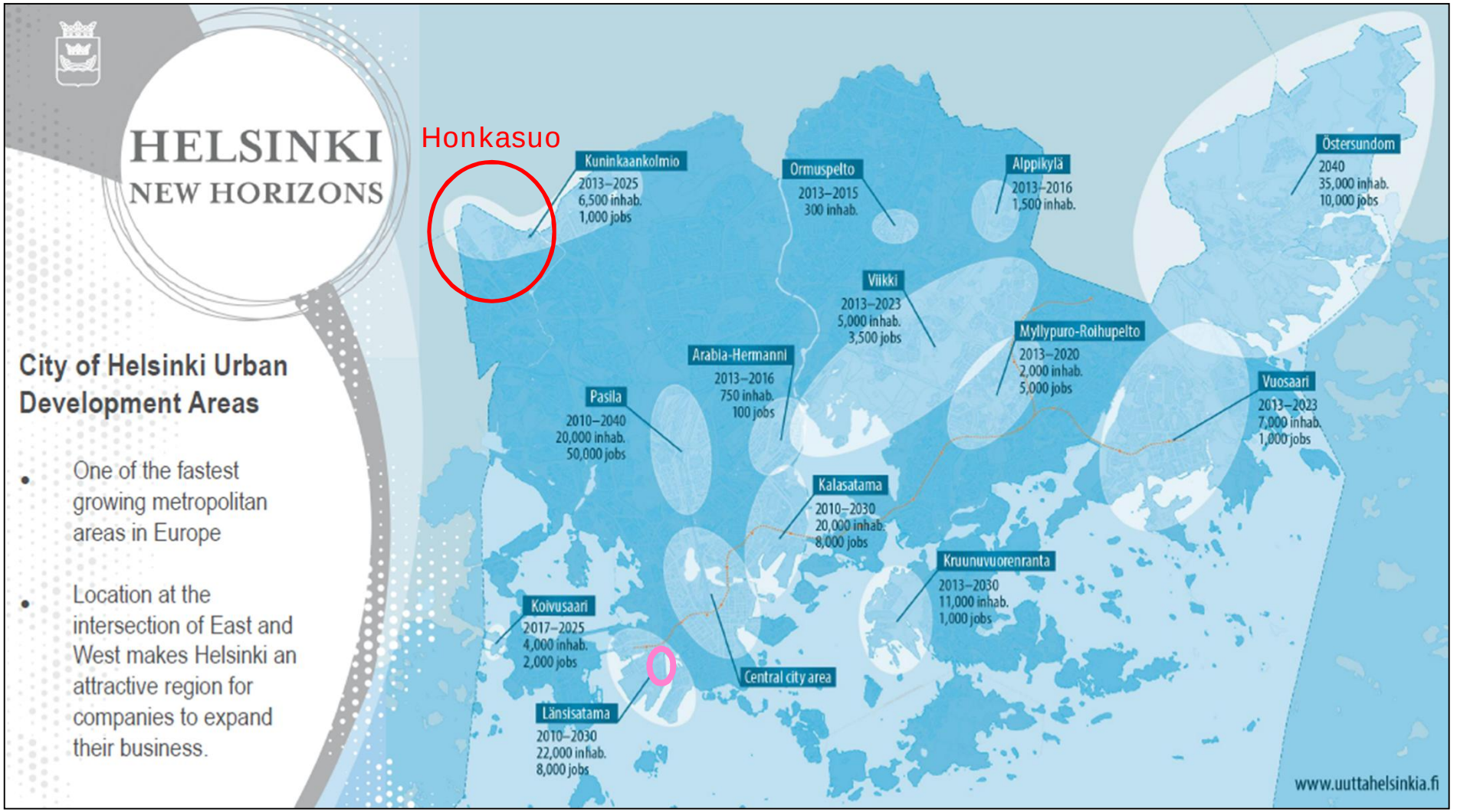
- City-owned land for at least 325 000 floor square metres is assigned annually for housing purposes.
- The reservation intake of plots for housing purposes shall correspond to the housing production of four years.

- Town plans for housing production shall be prepared for at least 450 000 floor sqm per year.
- The plan reservation intake shall allow the housing production of at least five years.

- At least 5 000 housing units will be built each year, both as new construction and through altering the purpose of use of existing buildings. 30 per cent of the housing production shall be realized as infill building.

$A_{Helsinki}$ = 187 km^2, City of Helsinki is the owner of 2/3 of the area.

1. MAJOR URBAN DEVELOPMENT PROJECTS



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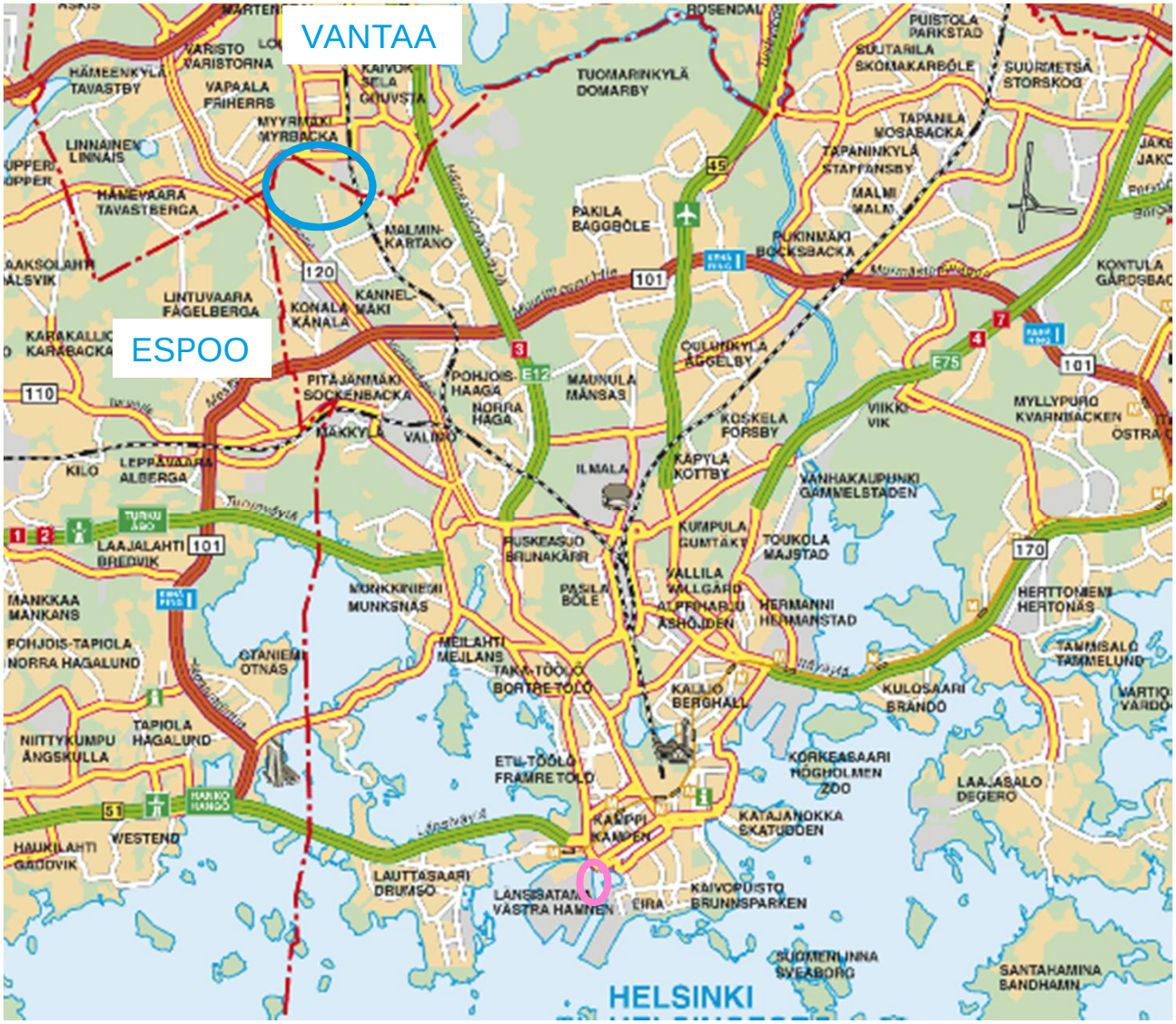
1. MAJOR URBAN DEVELOPMENT PROJECTS

Honkasuo
Honkasuo



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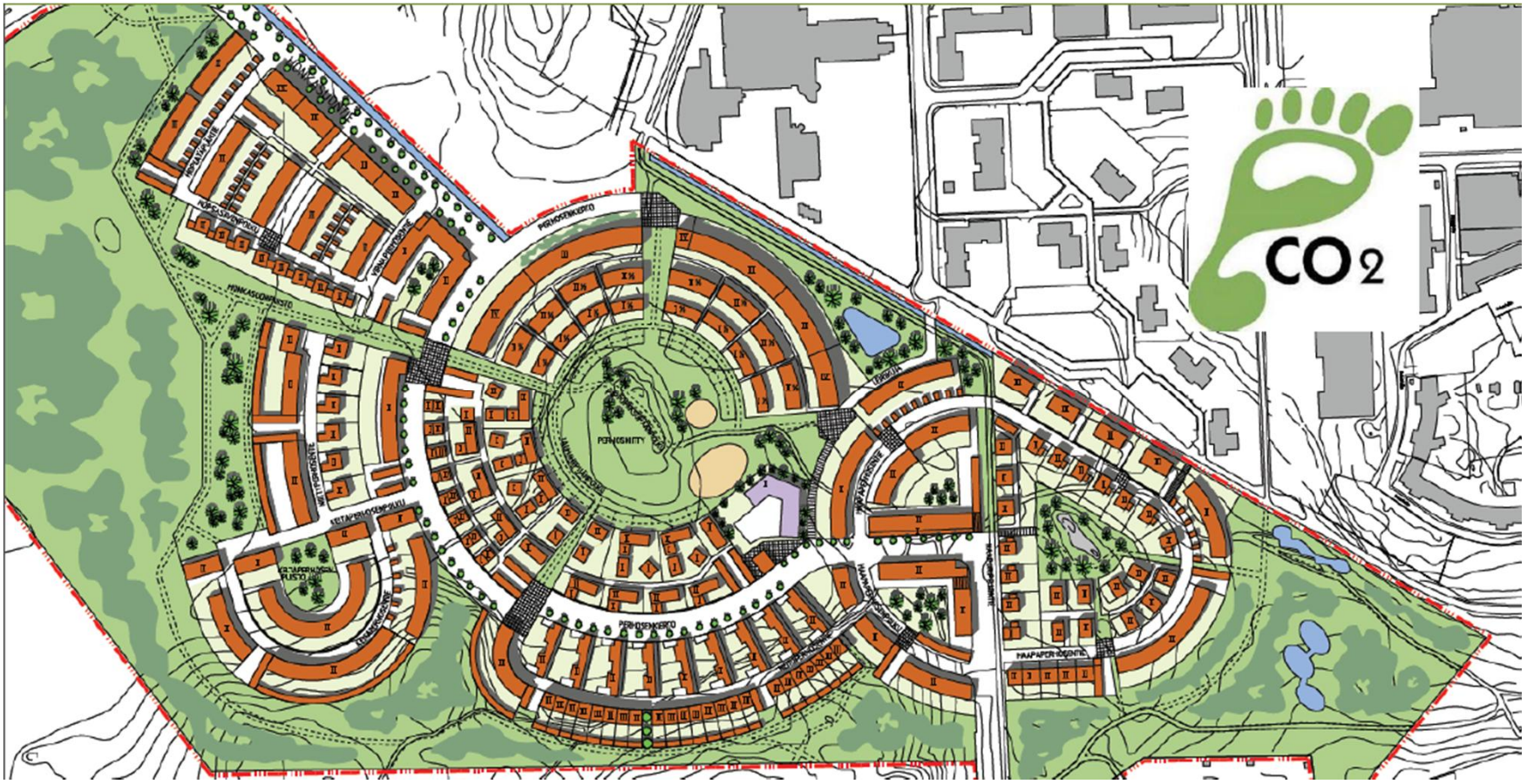
2. HONKASUO: “ECO-EFFECTIVE CITY VILLAGE”



- WOODEN BUILDINGS
- LOW ENERGY HOUSES
- LOW TEMPERATURE DISTRICT HEATING
- “CLIMATE STREET”

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2. HONKASUO: “ECO-EFFECTIVE CITY VILLAGE”

- LOCAL WATER HANDLING
- “URBAN GARDENING”
- TERRACED “TOWN HOUSES”
- ...

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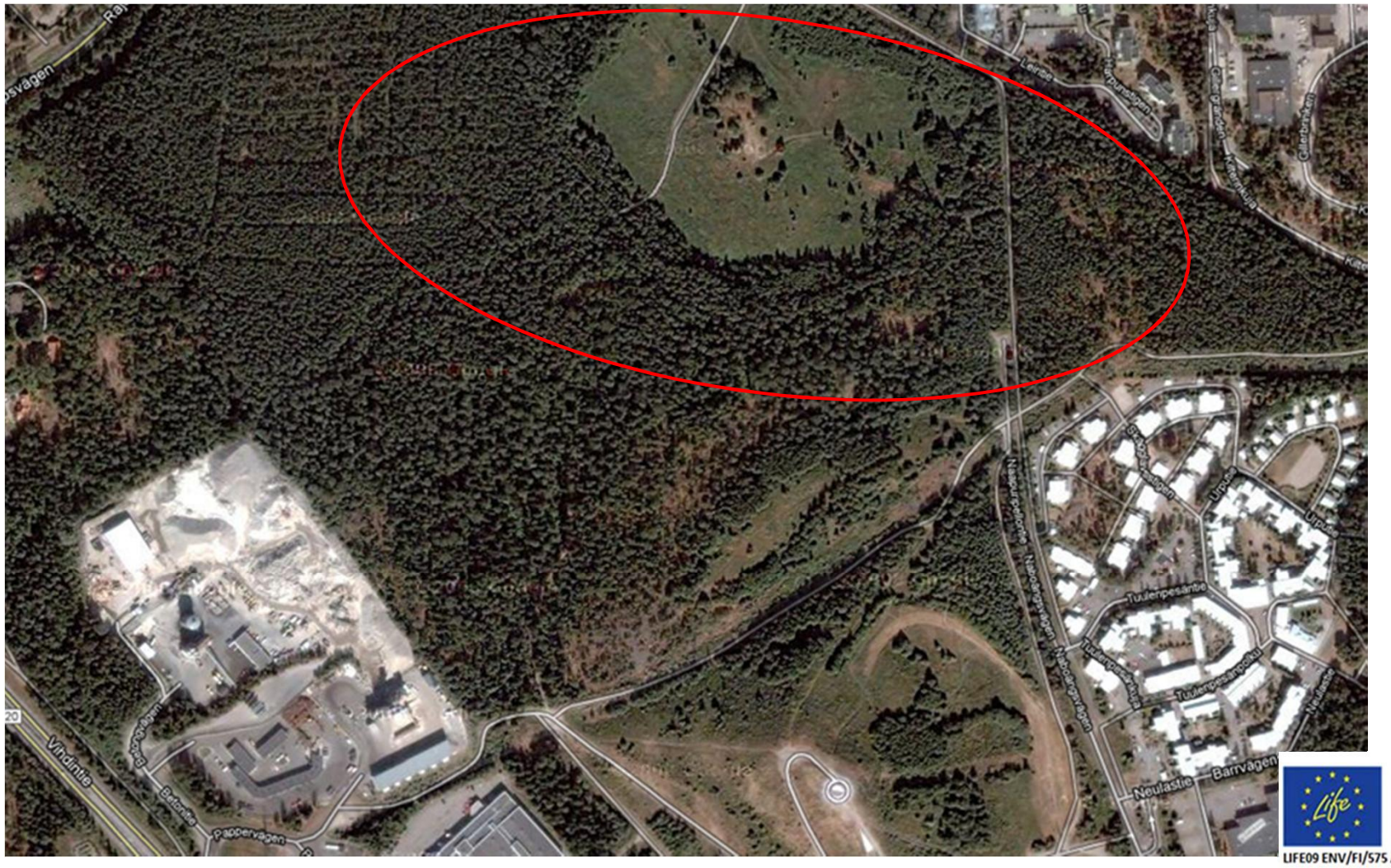
ALUEJULKISIVU ETELÄÄN 1/200

3. HONKASUO: PEAT, CLAY, GLACIAL TILL, ...:
QUESTION - WHERE ARE THE SMALLEST HOUSES AND WHERE ARE THE PARKS (AFTER THE LAND USE PLANNING)?



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3. HONKASUO: GEOLOGY AND LAND USE PLANNING

WELL BEARING AREAS => PARKS

CLAY AREAS => SMALL MULTISTOREY BUILDINGS

PEAT AREA => ONE-FAMILY HOUSES

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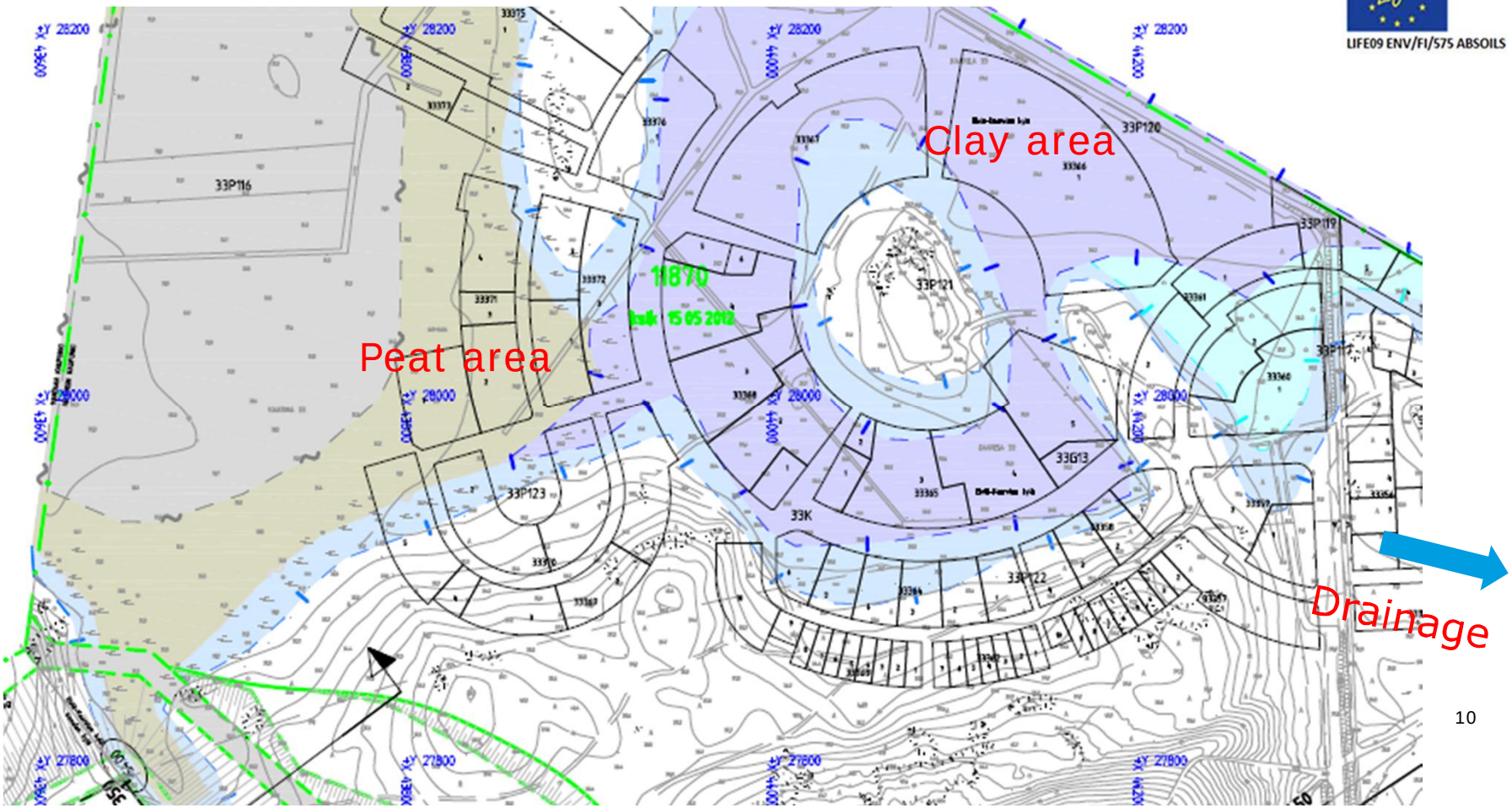

4. HONKASUO: SOIL IMPROVEMENT

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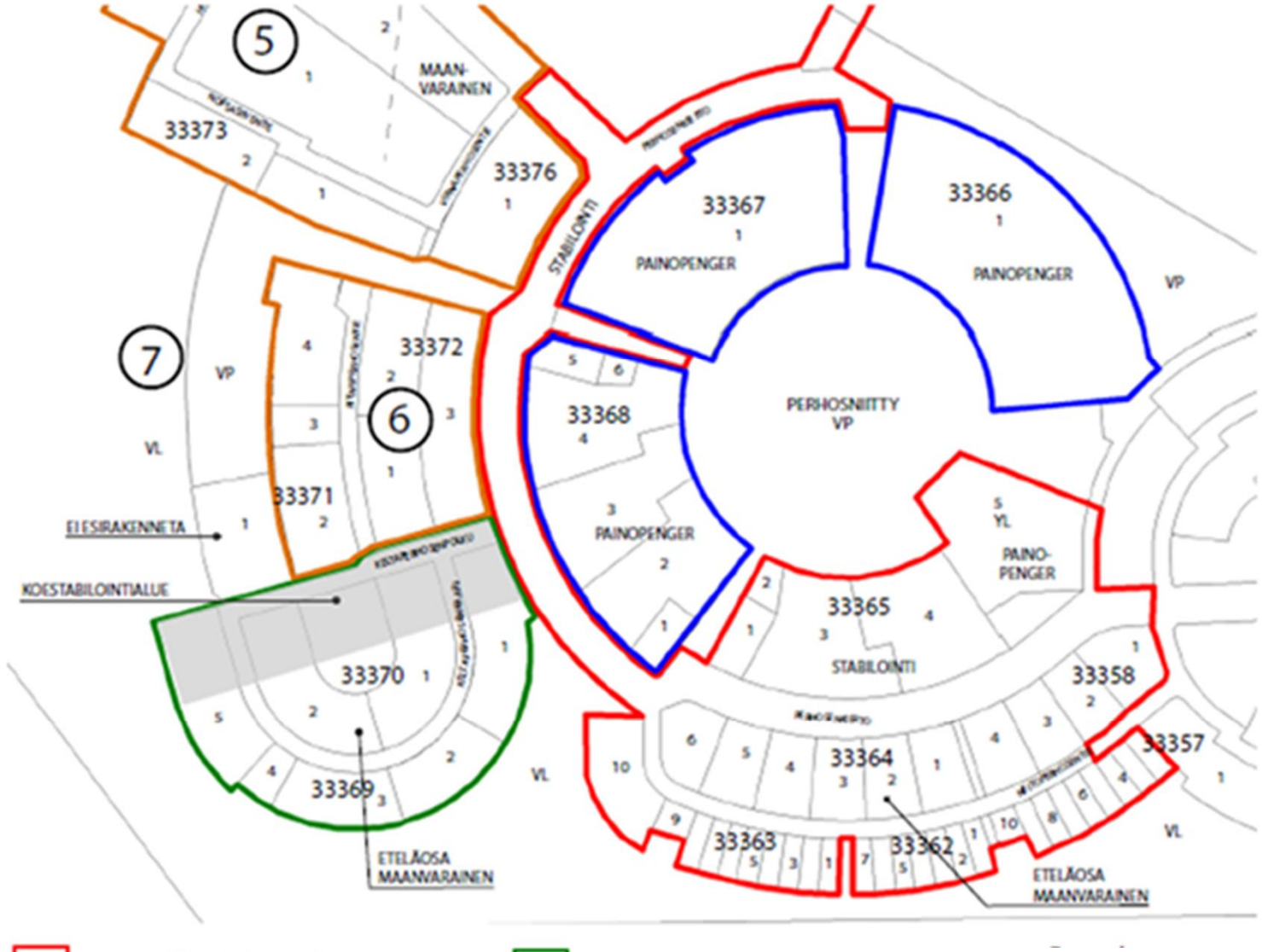

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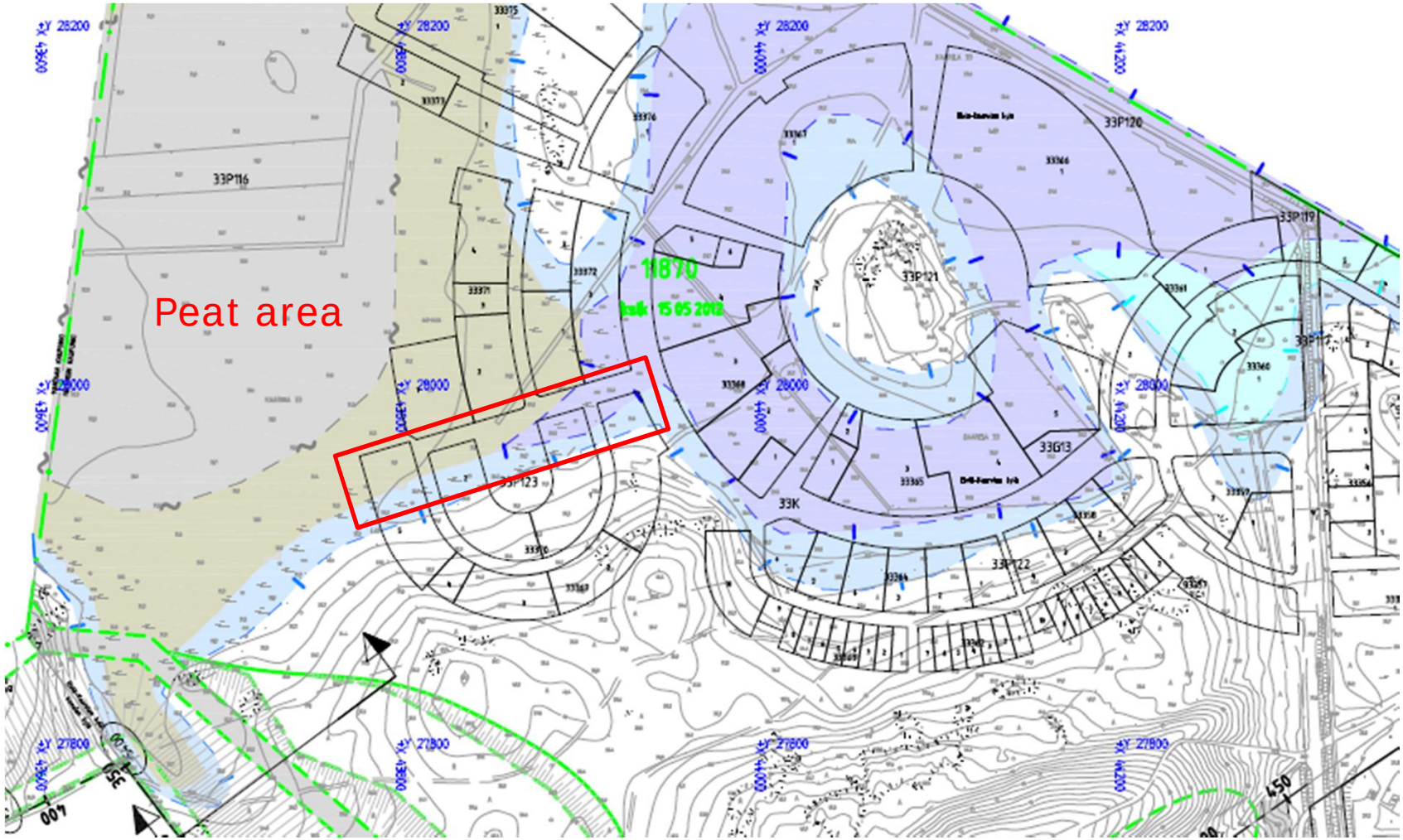
Column stabilization

Pre-loading embankments

Mass stabilization / -

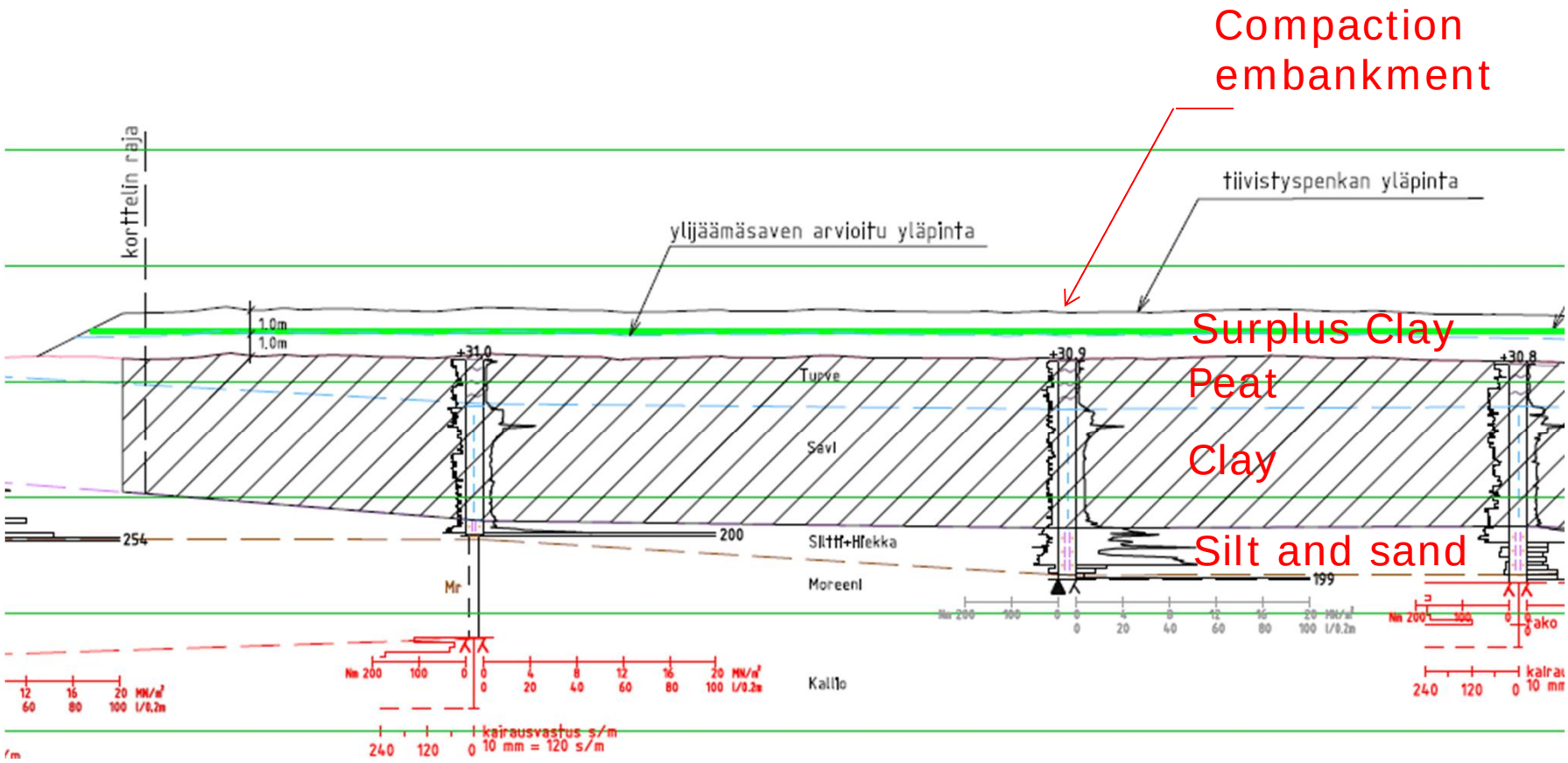
Mass stabilization? (6 + 7)

4. HONKASUO, MASS STABILISATION TEST AREA (2015)



= Test mass stabilization area

4. HONKASUO: TEST MASS STABILIZATION



Cross section: Geology and the mass stabilisation

Mass stabilization of peat layer with clay addition and binder

4. HONKASUO: TEST MASS STABILIZATION

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Absoils, Honkasuo
Massastabilointi - stabiloituvuustestaus

VÄLIRAPORTOINTI: Tutkimukset 1-vaihene tulokset

Sideainekustannusten laskennassa käytetyt yksikköhinnat		
PlusSe	100	€/tn
SRSe	115	"
LT	10	"
PKT	35	"

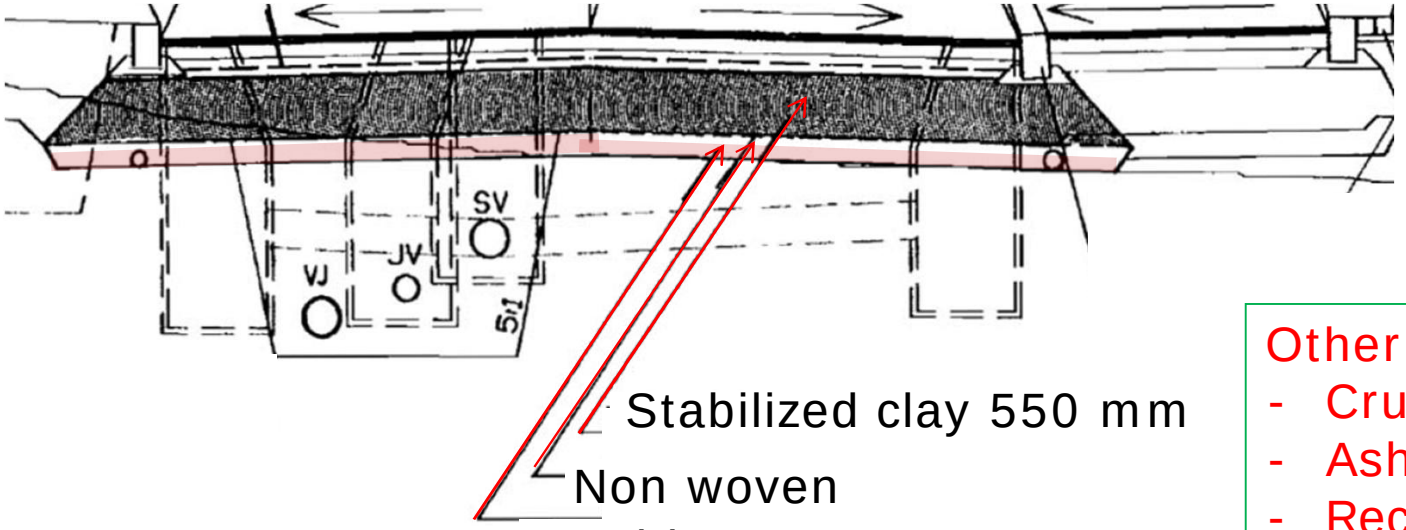
Runkomateriaali	Sideaine laatu	Sideaine määrä [kg/m3]	Puristuslujuus [kPa] 28 vrk	Puristuslujuus [kPa] 90 vrk	Suuntaa-antava sideainekustannus €/m3	€/100 kPa$_{28d}$/m3	€/100 kPa$_{90d}$/m3	
Tv-seos 1:1	PlusSe	80	109	147	8	7.3	5.4	
		110	185	194	11	5.9	5.7	
		140	230		14	6.1		
	SRSe	80	176		9.2	5.2		
		110	194		12.65	6.5		⇦
	Plus + LT	70+100	123	122	8	6.5	6.6	
		70+200	100	102	9	9.0	8.8	
		90+100	134	139	10	7.5	7.2	
		90+200	112		11	9.8		
		110+100	122		12	7.0		
	SRSe + LT	90+100	169	173	11.35	6.7	6.6	
	PlusSe + PKT	70+100	84	94	10.5	12.5	11.2	
		70+200	154		14	9.1		
		90+100	113	122	12.5	11.1	10.2	
Tv1 (Pt 127 / 0.5-1.5 m)	PlusSe	110	238	257	11	4.6	4.3	
	SRSe	110	282		12.65	4.5		⇦
	PlusSe + LT	90+150	213	220	10.5	4.9	4.8	
Tv2 (Pt 127 / 1.5-2.5 m)	PlusSe	110	119	125	11	9.2	8.8	⇦
	SRSe	110	127	133	12.65	10.0	9.5	
	PlusSe + LT	90+150	81	90	10.5	13.0	11.7	
Tv 2 (Pt 127/1.5-2.5 m) + Lj (Pt 127 / 4-5 m) 2:1	PlusSe	80	78	88	8	10.3	9.1	
		100	119	134	10	8.4	7.5	
		120	163		12	7.4		
	SRSe	100	136		11.5	8.5		
	Plus + LT	70+100	69	75	8	11.6	10.7	
		70+200	77		9	11.7		
		90+100	104	109	10	9.6		
	PlusSe + PKT	70+100	139	151	10.5	7.6	7.0	⇦
Tv 1 (Pt 127 / 0.5-1.5 m) + "Savi2" 2:1	PlusSe	80	131	138	8	6.1	5.8	
		100	155	184	10	6.5	5.4	
	Plus + LT	70+150	113	135	8.5	7.5	6.3	
		90+100	148	200	10	6.8	5.0	
	PlusSe + PKT	70+100	256		10.5	4.1		⇦
ljSa (Pt 127 / 4-5 m)	PlusSe	60	112	138	6	5.4	4.3	
		80	223		8	3.6		
		100	326		10	3.1		
	SRSe	60	164		6.9	4.2		
	Plus + LT	40+100	53	66	5	9.4	7.6	
		40+200	42	52	6	14.3	11.5	
		60+100	127	155	7	5.5	4.5	
	PlusSe + PKT	40+100	148	202	7.5	5.1	3.7	⇦

LT = Hanasaaren kuiva LT, PKT = Palavan kiven tuhka OSA8

5. SUBSTITUTING ROCK MATERIAL IN ROAD CONSTRUCTION (CASE VIIKKI 1997)

Stabilized clay was used at the lower part of the bearing layer of the street instead of crushed aggregate

=> *“use for the surplus clay excavated during the building works, and at the same time to spare non-renewable gravel resource”*



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Other materials:
- Crushed concrete
- Ashes
- Recycled asphalt
- ....

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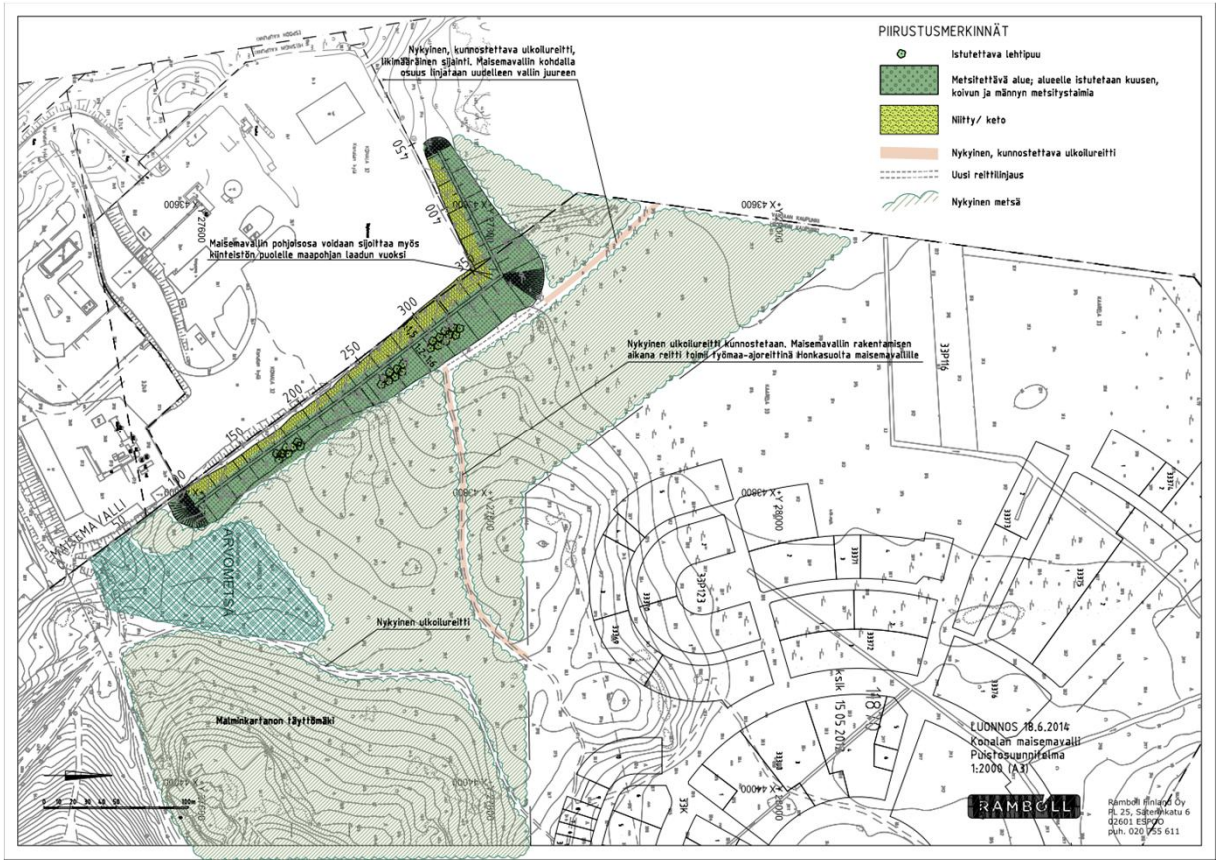
6. LANDSCAPE HILL = NOISE BARRIER

Waste concrete recycling centre is located west from Honkasuo => a barrier between houses and the centre is needed



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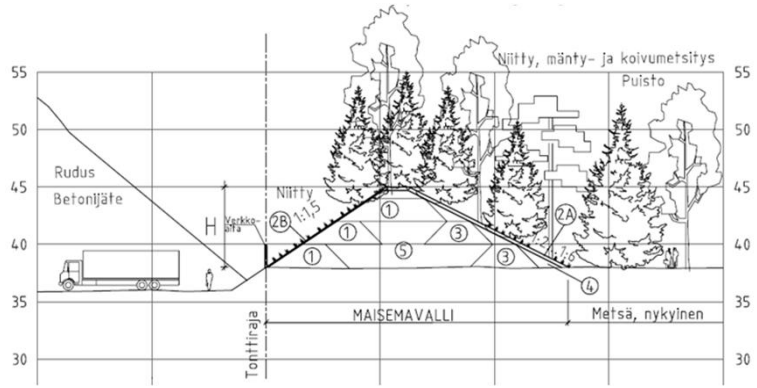
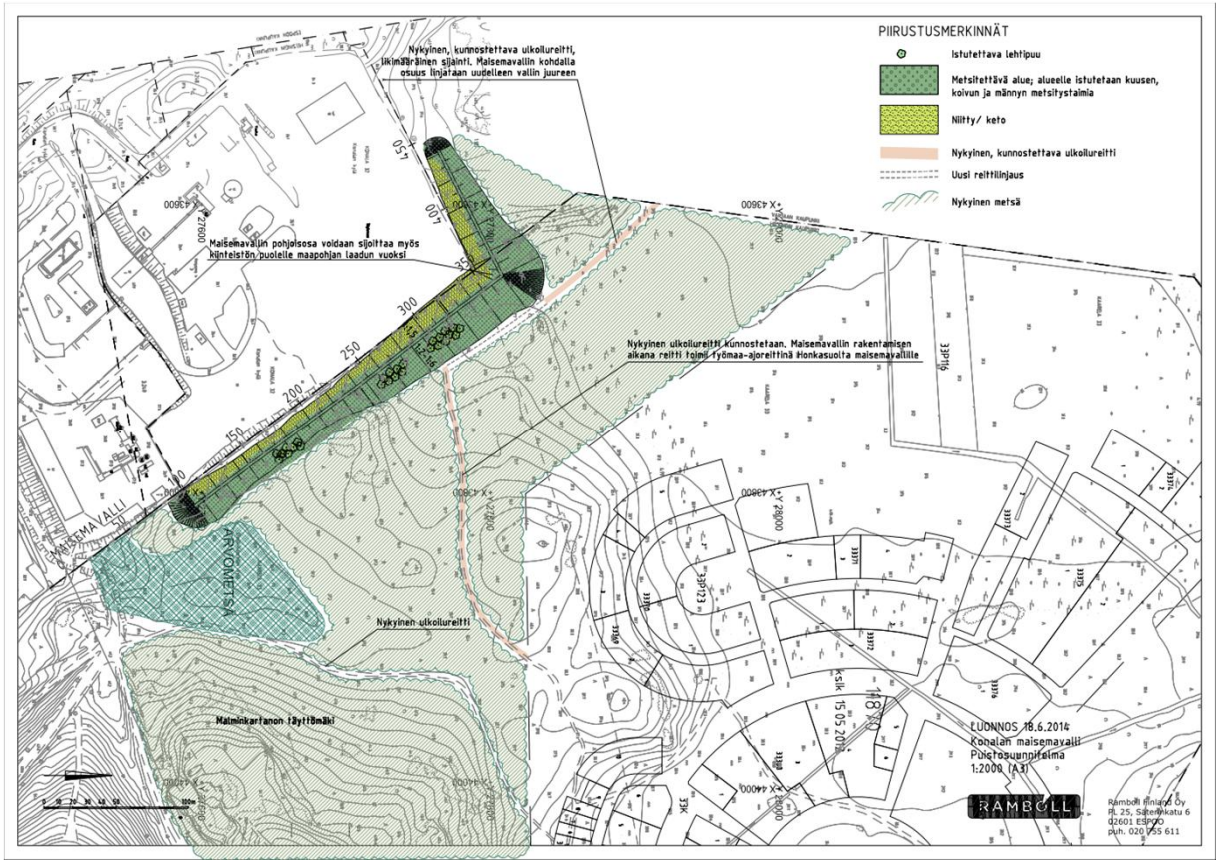
LANDSCAPE HILL = NOISE BARRIER



West from Honkasuo is located waste concrete recycling centtre => a barrier between houses and centtre is needed



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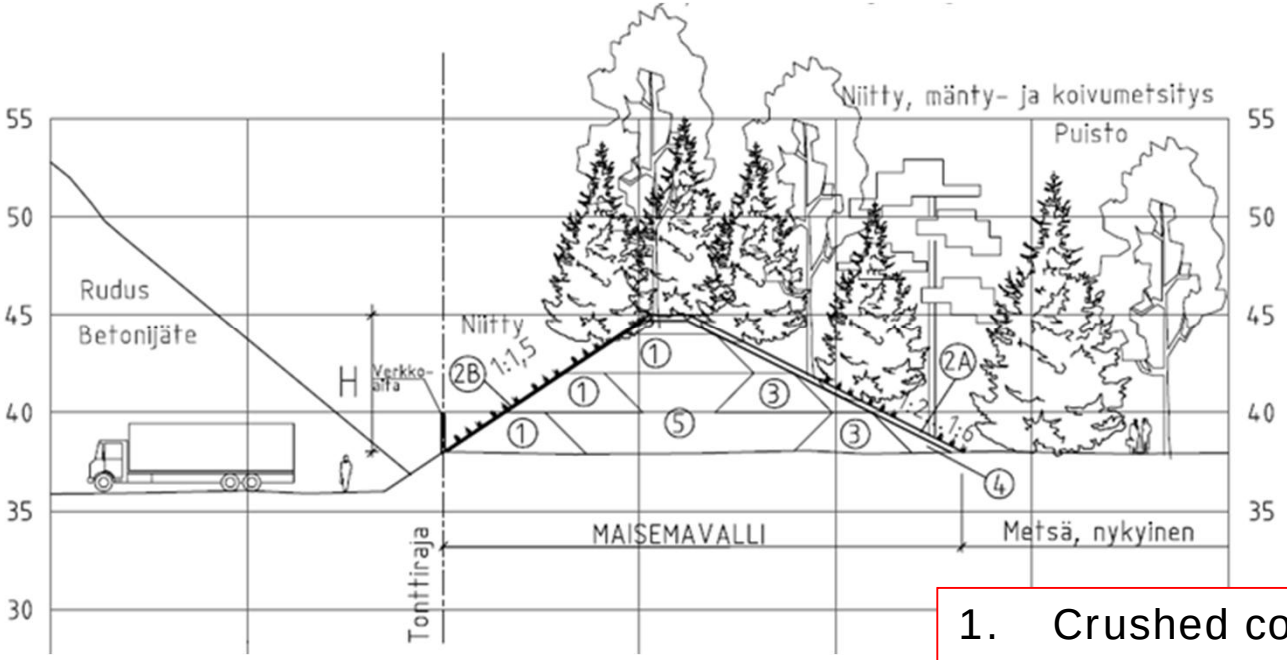

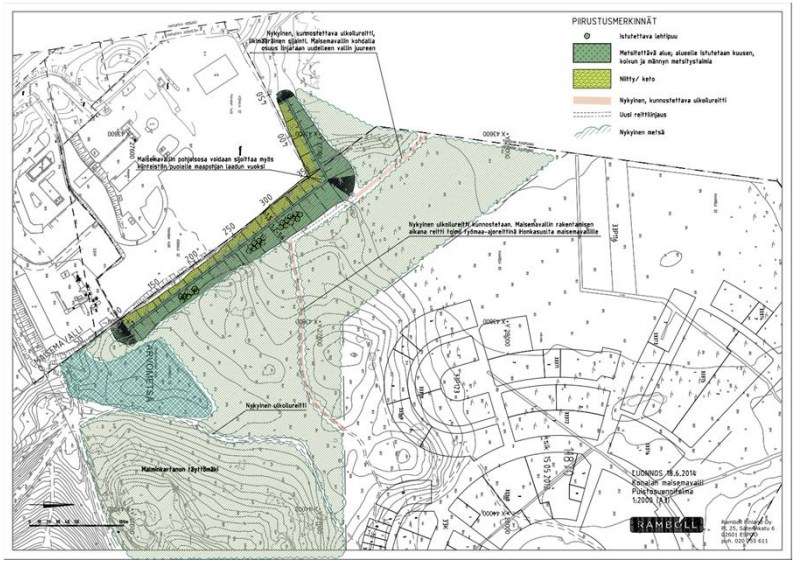

1. Crushed concrete
2. Crushed concrete, friction soil
3. Surplus soil
4. Soft surplus soil, Helsinki moraine, …
5. Substrate

R&D ideas:

⇒ Open areas for butterfly
⇒ Area for limey liking plants
⇒ Environmental effects
⇒ Construction technics
⇒ Materials
⇒ …

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=> IDEAS

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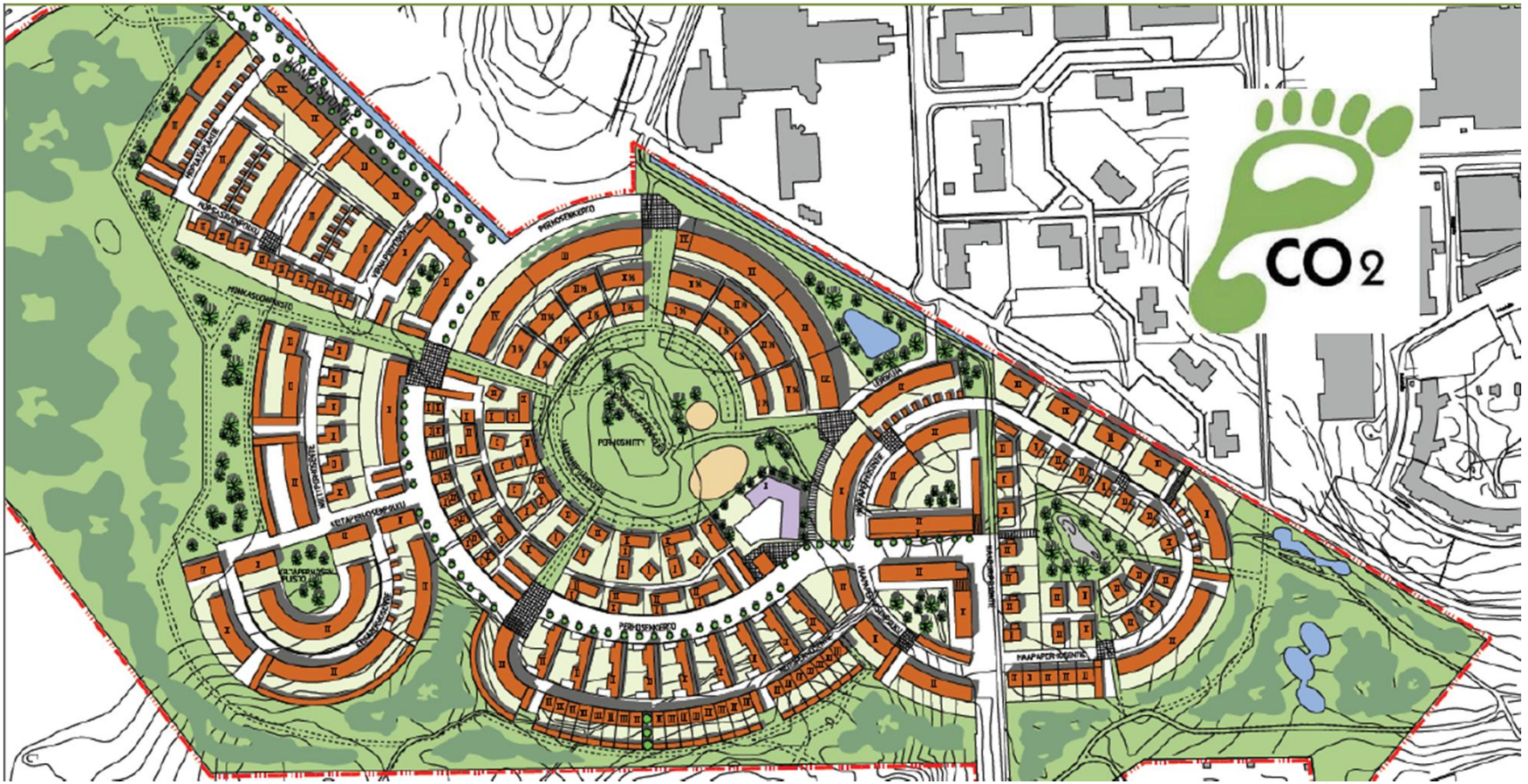

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Helsingin kaupungin ilmastotyö

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Strategia tai sitoumus	Tavoite
Kaupungin strategia 2013-2016, ympäristöpolitiikka ja Energiapoliittiset linjaukset (Kvsto 2012, 2013)	a) Hiilineutraali Helsinki 2050 b) KHK-päästöt -30 % 1990-2020 c) Helenin päästöt -20 % 1990-2020 d) Uusiutuvan energian osuus energian tuotannossa 20 % vuonna 2020
Pks ilmastostrategia 2007 (kh 2008)	KHK päästövähennys -39 % per asukas 1990-2030
Hiilineutraali energiantuotanto 2010 Kehitysohjelma 2020+	Helsingin Energian hiilineutraalisuus 2050 Helenin päästöt -20 % 1990-2020
Covenant of Mayors 2009 -Seap kestävän energian ohjelma	KHK päästövähennys 2020 -20 % (kaupungin vaikutuspiiri; ei jäte, energiantuotanto, laivaliikenne)
Green Digital Charter 2010	ICT KHK päästövähennys 2030 -30%
Kaupungin johtajien ilmastoverkosto (Helsinki, Espoo, Tampere, Vantaa, Turku and Oulu)	10 aloitetta
EUROCITIES Climate Change Declaration 2009	

4. HONKASUO: TEST MASS STABILIZATION

Index test results

Projektin nimi: Honkasuo					Projektin numero: 1510006510-005							
Näytepiste / pvm	Syvyys [m]	*Silmämääräinen arvio*		*Määritetty*		w [%]	H_h [%]	pH	Rakeisuusmääritys			Muu tutkimus
		Maalaji*	Routivuus	Maalaji**	Routivuus				Pesuseul.	Kuivaseul.	Areom.	
PL 127	0,5-1,5 m	KTv H5				1399	95.3	3.7				SO4+Cl
	1,5-2,5 m	MTv H8				1004	86.2	4.5				SO4+Cl
	4,0-5,0 m	Sa				96.4	6.1	tulossa			x	
	6,0-7,0 m	Sa				94.0	3.9				x	
PL 128	0,5-1,5 m	KTv H5				1004	97.3	3.3				SO4+Cl
	3,0-4,0 m	Sa				134	9.4				x	
	4,0-5,0 m	ljSa				109	5.9	tulossa			x	
	5,0-6,0 m	Sa				91.9	4.0				x	
PL 129	0,5-1,5 m	Kuiva KTv?				194	92.2	3.3				SO4+Cl
	1,5-2,5 m	Kuiva KTv?				187	88.7	3.1				SO4+Cl
	4,0-5,0 m	SiMr				18.7	0.7				x	
Savi 2		Sa				85.5	3.8	tulossa			x	