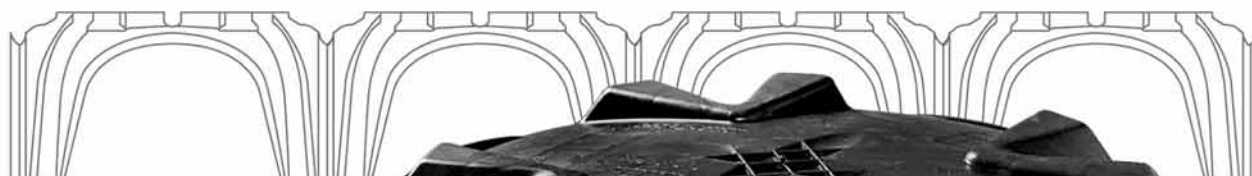


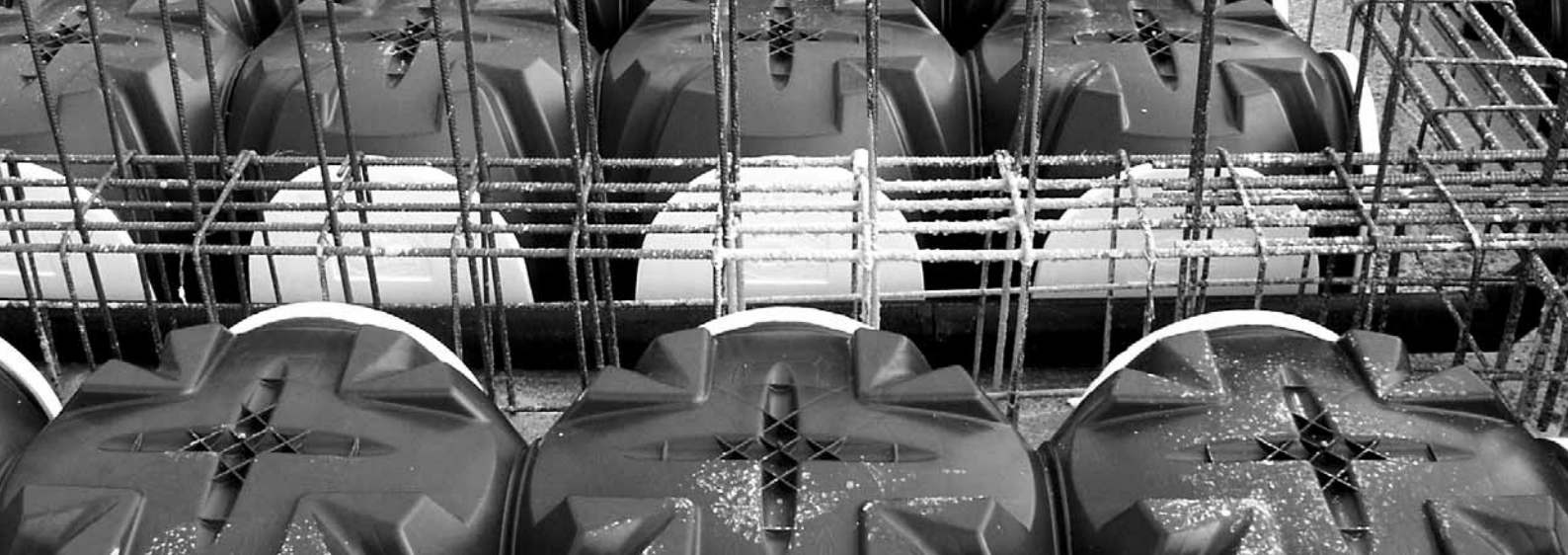
MODULO

www.geoplast.it

MODULO Contract specifications / Technical data Price List / Type of work executed / Price analysis

MODULO has been projected with a structure which makes it resistant and distributes stress all over the surface so that it can be trodden even before casting thus offering a good load capacity. MODULO is made of a mixture of non-toxic, recycled plastic materials, highly resistant and remaining unaltered in the long run.







WHAT IS A VENTILATED CRAWL SPACE ?

- The ventilated crawl space in house building is an air space built under the ground floor with insulating function, specifically aimed at preventing water infiltrations and upward dampness spreading.
- Not long ago, the traditional ventilated crawl space was made of loose dry stones and provided with ventilation grooves or better with hollow tiles laid on low walls placed at a short distance one from the other.
- The high cost of the traditional crawl space did not allow extensive use (actually it was used for particular spaces or where the building costs made it possible).



NOWADAYS with the **MODULO** system the **CRAWL SPACE** is no longer a few builders' privilege, but a requirement for a fast developing sector.

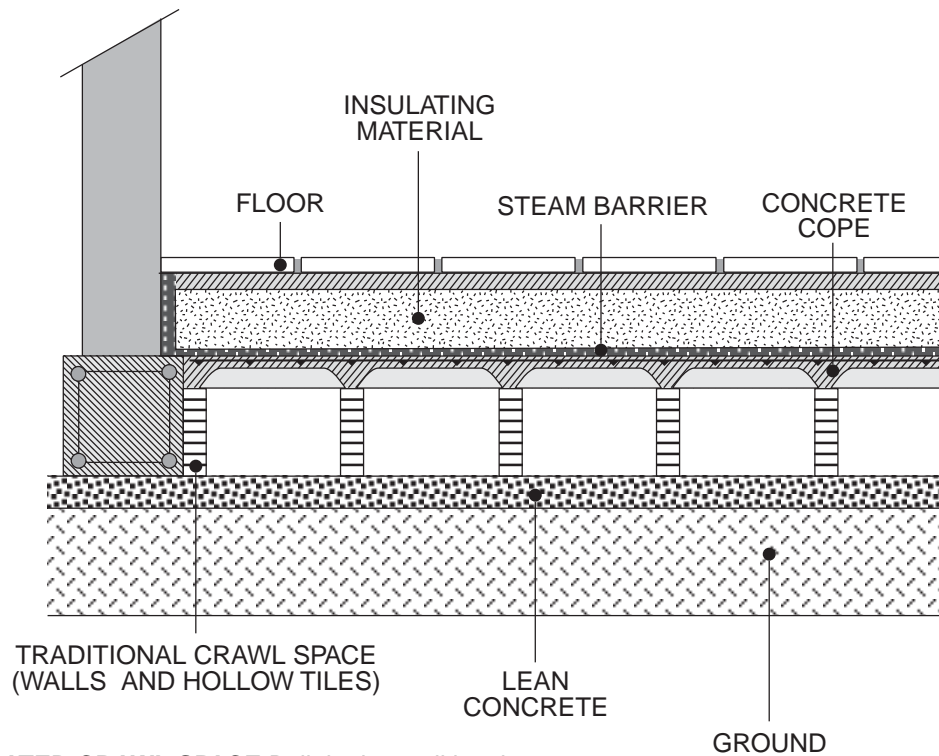
The **MODULO** is a disposable formwork making the construction of crawl spaces and interspaces possible in a quick and safe way. Thanks to its U shaped fitting joint it enables a worker to lay about 100 square metres of it per hour, consequently reducing labour costs by at least 80%.

Moreover, the resulting surface is dry and can be walked on, thus ensuring greater safety in the building yard during laying and concrete casting phases.

The low cost of laying work and of the modular formwork itself has made this product a valid substitute for materials such as gravel, which have a lower price, but definitely higher labour costs.

*The shape of the **MODULO** formwork has been projected to obtain very good ventilation and the minimum resistance to the air in the element intrados, provided the interspace is connected through pipes with the outside of the building. The in-coming pipes are to be preferably placed north and at ground level, the out-going ones south and driven up to the roof. This arrangement eliminates dampness and possible concentration of **RADON** gas.*

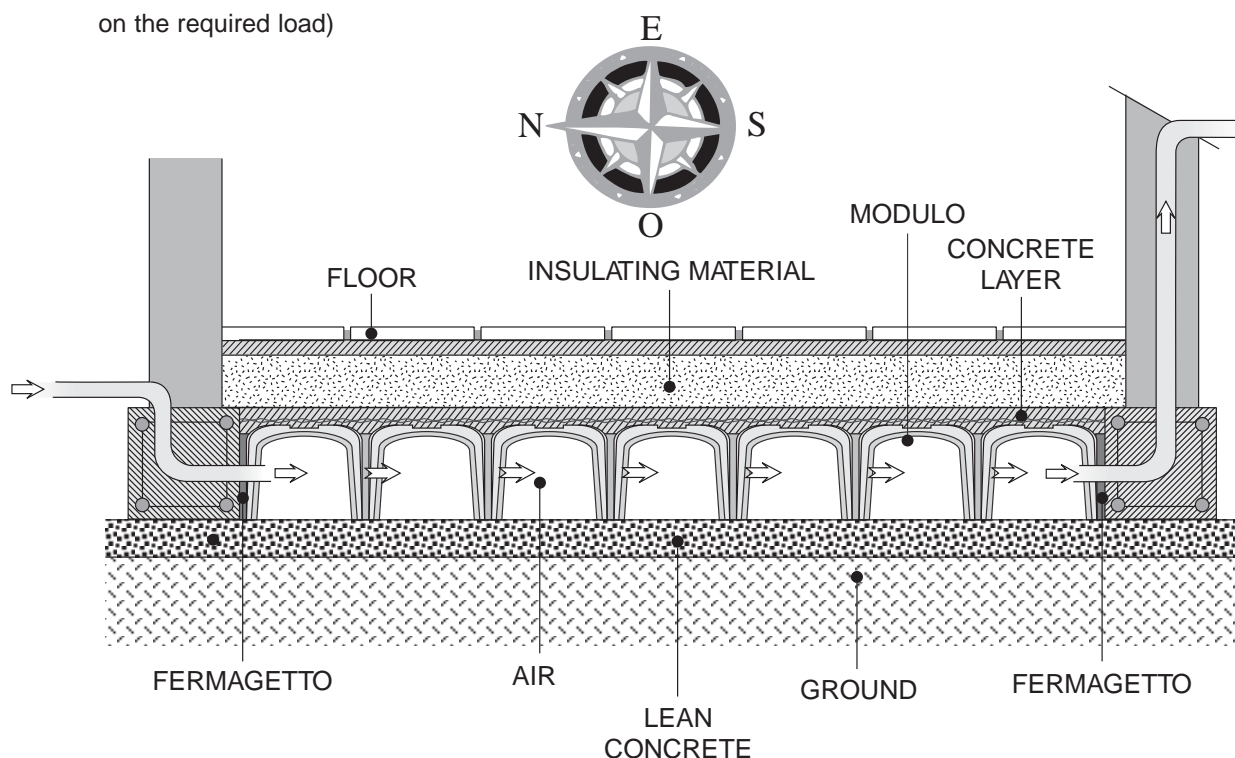
If compared to the traditional CRAWL SPACE, the **MODULO** creates a reinforced concrete structure that makes its use possible in industrial building yards where loads are higher than in private building and where having an aired interspace for placing pipes and installations has proved really advantageous.



VENTILATED CRAWL SPACE Built in the traditional way

WORK STAGES FOR PRIVATE USE OVERLOADS

- 1/ Ground digging and surface flattening
- 2/ Concrete casting for underground foundation (lean concrete) R'CK 150, thickness depending on required overload (see chart)
- 3/ Placing of **MODULO** workforms and fitting **FERMAGETTO**
- 4/ Laying of electro-soldered net $\varnothing 6 - 20 \times 20$ over the **MODULO**
- 5/ Filling up of the Modulo workforms with R'CK 300 concrete (slab thickness depending on the required load)



The new **CRAWL SPACE**

CONTRACT SPECIFICATIONS

A perfectly ventilated crawl space, insulated from the underlying ground, made of concrete and modular disposable plastic formworks, type **MODULO** Geoplast Srl.

- A) Floor rough made of rolled scree with variable thickness as per chart
- B) Layer of lean concrete with variable thickness as per chart
- C) At the builder's discretion, before placing the formworks, holes and/or chases can be made for the passage of pipes or of all sorts of installations.
- D) The floor will be ventilated by making 80/120 mm diameter holes on the outside walls, one every 3.50/4.00 metres and possibly provided with connecting PVC pipes and external stainless steel grates equipped with anti-insect plastic nets. For a better ventilation the holes will have to be made at a higher level on the south, warmer side of the building rather than the north, colder side. In case there are parts of crawl space inside the foundation beams these will have to be connected with the outside or perimeter portions.
- E) The Modulo will be laid over a lean concrete slab, previously prepared and with a suitable thickness (see specific charts). The formworks must be arranged in rows from right to left and from up to down always keeping the printed arrow upwards.
- F) Placing of **Fermagetto EXTENSION** and **FERMAGETTO** made of polystyrene, preventing concrete from penetrating into the crawl space and facilitating the construction of external kerbs and foundation beams during the casting phase.
- G) Laying of weight distributing reinforcement with a 6 mm minimum diameter and with a 20 x 20 mesh, necessary to stand stress.
- H) Filling up of the formworks and casting of the top layer with concrete (Resistance class R'CK 250 Kg/cm² and with 3 cm minimum thickness (see chart)). Work executed with or without the help of pumps.
- I) Vibration phase



LOAD CHART **FOR MODULO H 3/6**

TYPE OF LOAD	Overload Kg/sq.m.	Cap thickness cm	Pressure on the floor Kg/cm ²	Bar diameter mm	Net mesh cm x cm
Terraces	250	1,5	0,43	3	10 x 10
Houses	400	2	0,69	3	10 x 10
Offices	700	3	1,22	6	20 x 20
Garages	1.500	4	2,60	6	20 x 20
Ind.bdgs	3.000	6	5,21	6	20 x 20

CONTRACT SPECIFICATIONS

LOAD CHART FOR MODULO H 9

TYPE OF LOAD	Overload Kg/sq.m.	Cap thickness cm	Lean concrete thickness cm	Pressure on the coarse gravel Kg/cm ²	Coarse gravel thickness cm	Pressure on the ground Kg/cm ²	Bar diameter mm	Net mesh cm x cm
CIVIL	1.000	4	0		0	2,27	6	20 x 20
			5		0	1,04		
			10		0	0,59		
			5	1,04	10	0,38		
	3.000	5	0		0	6,80	6	20 x 20
			5		0	3,12		
			10		0	1,78		
			5	3,12	10	1,15		
	10.000	7	10	5,95	25	1,21	6	20 x 20
INDUSTRIAL	20.000	10	15	7,69	30	1,62	8	20 x 20
	30.000	15	15	11,54	35	2,05	8	20 x 20

LOAD CHART FOR MODULO H 13/15/17/20/27/30/35/40

TYPE OF LOAD	Overload Kg/sq.m.	Cap thickness cm	Lean concrete thickness cm	Pressure on the coarse gravel Kg/cm ²	Coarse gravel thickness cm	Pressure on the ground Kg/cm ²	Bar diameter mm	Net mesh cm x cm
CIVIL	1.000	3	0		0	2,06	6	20 x 20
			5		0	0,56		
			10		0	0,26		
			5	0,56	10	0,15		
	3.000	4	0		0	6,19	6	20 x 20
			5		0	1,70		
			10		0	0,78		
			5	1,70	10	0,45		
	10.000	5	10	5,66	25	0,49	6	20 x 20
INDUSTRIAL	20.000	10	15	2,97	25	0,60	6	20 x 20
	30.000	15	15	4,46	25	0,90	8	20 x 20

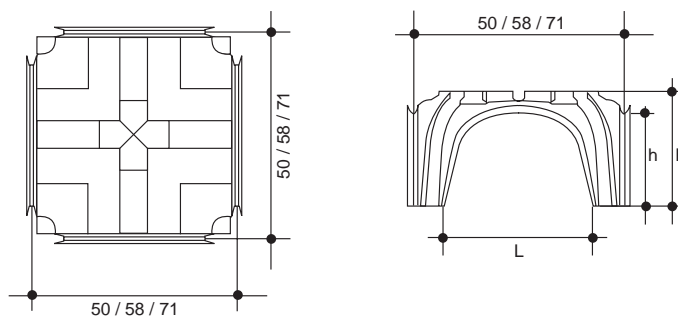
LOAD CHART FOR MODULO H 45/50/55/60/65/70

TYPE OF LOAD	Overload Kg/sq.m.	Cap thickness cm	Lean concrete thickness cm	Pressure on the coarse gravel Kg/cm ²	Coarse gravel thickness cm	Pressure on the ground Kg/cm ²	Bar diameter mm	Net mesh cm x cm
CIVIL	1.500	5	0		0	3,40	6	20 x 20
			5		0	1,56		
			10		0	0,89		
			5	1,56	10	0,58		
	3.000	8	0		0	6,80	6	20 x 20
			5		0	3,12		
			10		0	1,78		
			5	3,12	10	1,15		
INDUSTRIAL	20.000	10	15	7,69	30	1,62	8	20 x 20
	30.000	15	15	11,54	35	2,05	8	20 x 20

CONTRACT SPECIFICATIONS

SPECIFICATIONS OF MODULO PILLARS

ARTICLE	Pillar side cm	Pillar surface cm ²	Number of MODULO pillars	Number of MODULOS for sq.m.	Number of pillars for sq.m.
Modulo H 3	2	4	36	4	144
Modulo H 6	3	9	25	4	100
Modulo H 9	6	36	4	3	12
Modulo H 13	14	196	1	4	4
Modulo H 15	15	225	1	4	4
Modulo H 17	13	169	1	4	4
Modulo H 20	14	196	1	4	4
Modulo H 27	12	144	1	4	4
Modulo H 30	12	144	1	4	4
Modulo H 35	12	144	1	4	4
Modulo H 40	12	144	1	4	4
Modulo H 45	16	256	1	2	2
Modulo H 50	16	256	1	2	2
Modulo H 55	15	225	1	2	2
Modulo H 60	15	225	1	2	2
Modulo H 65	14	196	1	2	2
Modulo H 70	14	196	1	2	2



MODULO'S CONCRETE CONSUMPTION AND PACKING SIZES

ARTICLE dim. cm	Concrete consumption for the top layer	h cm clean span	L cm	Package cm	no. pieces per pallet	sq.m. per pallet
Modulo 50x50 H 3	m ³ 0,004xsq.m.	2,1	5,5	110x110x230	720	180
Modulo 50x50 H 6	m ³ 0,009xsq.m.	4,5	5,4	110x110x230	720	180
Modulo 58x58 H 9	m ³ 0,010xsq.m.	7,5	20,5	120x120x230	360	120
Modulo 50x50 H 13	m ³ 0,028xsq.m.	7	28	110x110x230	300	75
Modulo 50x50 H 15	m ³ 0,030xsq.m.	9,5	26,4	110x110x230	300	75
Modulo 50x50 H 17	m ³ 0,035xsq.m.	11,5	30	110x110x230	300	75
Modulo 50x50 H 20	m ³ 0,037xsq.m.	14,5	28	110x110x230	300	75
Modulo 50x50 H 27	m ³ 0,040xsq.m.	21	34	110x110x230	300	75
Modulo 50x50 H 30	m ³ 0,045xsq.m.	24,5	31,7	110x110x230	300	75
Modulo 50x50 H 35	m ³ 0,052xsq.m.	30	35	110x110x230	300	75
Modulo 50x50 H 40	m ³ 0,056xsq.m.	34	36	110x110x230	300	75
Modulo 71x71 H 45	m ³ 0,064xsq.m.	36	48	145x145x230	200	100
Modulo 71x71 H 50	m ³ 0,080xsq.m.	41	48	145x145x230	200	100
Modulo 71x71 H 55	m ³ 0,073xsq.m.	46	50	145x145x230	200	100
Modulo 71x71 H 60	m ³ 0,085xsq.m.	51	50,9	145x145x230	200	100
Modulo 71x71 H 65	m ³ 0,077xsq.m.	56	53	145x145x230	200	100
Modulo 71x71 H 70	m ³ 0,090xsq.m.	61	53	145x145x230	200	100

PRICE LIST

A) Disposable formworks, type Modulo by Geoplast srl, made of atoxic,highly resistant, recycled and fully recyclable polypropylene. These modular pieces, if correctly coupled, can form load bearing pillars with a minimum support base of 135 cm². Each of them is ... X ... cm on the plan and ... cm in height and has a concave cap with stiffeners, specifically made to increase load capacity. The cap has flat reliefs among which the slab reinforcement can be laid and concrete can be poured. (Actually the flat reliefs mark the maximum height the cast can reach). The MODULO is dry laid and used for making ventilated floors; it is certified by an authorized Institute and delivered directly to the building yard.

PRICE LIST FOR MODULO

ARTICLE	PRICE
Modulo H 3cm	€/sq.m.
Modulo H 6cm	€/sq.m.
Modulo H 9cm	€/sq.m.
Modulo H 13cm	€/sq.m.
Modulo H 15cm	€/sq.m.
Modulo H 17cm	€/sq.m.
Modulo H 20cm	€/sq.m.
Modulo H 27cm	€/sq.m.
Modulo H 30cm	€/sq.m.
Modulo H 35cm	€/sq.m.
Modulo H 40cm	€/sq.m.
Modulo H 45cm	€/sq.m.
Modulo H 50cm	€/sq.m.
Modulo H 55cm	€/sq.m.
Modulo H 60cm	€/sq.m.
Modulo H 65cm	€/sq.m.
Modulo H 70cm	€/sq.m.

B) Plastic panels with fitting joint, type **FERMAGETTO**, close up the MODULO thus preventing concrete from penetrating inside the crawl space and making the construction of outside kerbs and foundation beams possible while casting.

PRICE LIST FOR FERMAGETTO MODULO

ARTICLE	PRICE
Fermagetto Modulo H 13cm	€/each
Fermagetto Modulo H 15cm	€/each
Fermagetto Modulo H 17cm	€/each
Fermagetto Modulo H 20cm	€/each
Fermagetto Modulo H 27cm	€/each
Fermagetto Modulo H 30cm	€/each
Fermagetto Modulo H 35cm	€/each
Fermagetto Modulo H 40cm	€/each
Fermagetto Modulo H 45cm	€/each
Fermagetto Modulo H 50cm	€/each
Fermagetto Modulo H 55cm	€/each
Fermagetto Modulo H 60cm	€/each
Fermagetto Modulo H 65cm	€/each
Fermagetto Modulo H 70cm	€/each

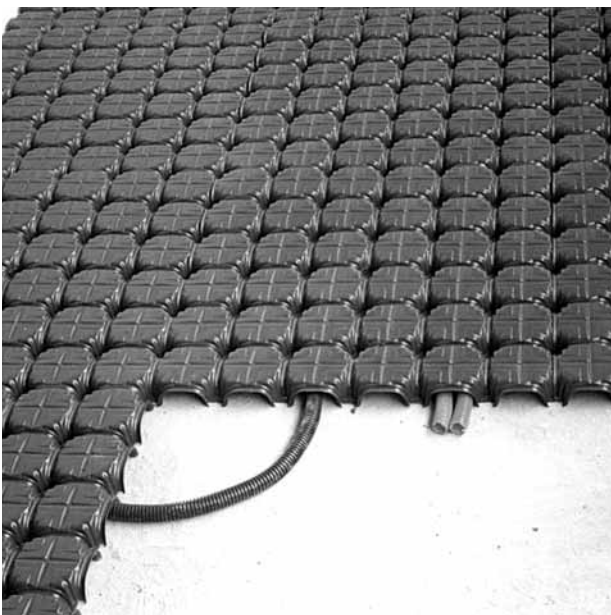
TYPES OF WORK EXECUTED

Ventilated floor

- Supply of disposable formworks, type **MODULO** by Geoplast srl, made of highly resistant atoxic, recycled plastic materials - height as per project specifications - inclusive of scrap.
- Dry laying of modular elements over pre-arranged foundation, as per project specifications
- Supply and laying of resistance electro-soldered net (minimum dimension - 6 mm, with 20x20 cm mesh, or as per project specifications), inclusive of scrap all over the MODULO.
- Supply and casting of concrete RCK' 250 kg/cm² for the filling up of the formworks and for the upper slab thickness s ... cm. Work executed with or without the help of pumps.
- Vibration puddling

PRICE LIST FOR VENTILATED FLOOR

ARTICLE	PRICE
Modulo H 3cm with slab thickness s=	€/sq.m.
Modulo H 6cm with slab thickness s=	€/sq.m.
Modulo H 9cm with slab thickness s=	€/sq.m.
Modulo H 13cm with slab thickness s=	€/sq.m.
Modulo H 15cm with slab thickness s=	€/sq.m.
Modulo H 17cm with slab thickness s=	€/sq.m.
Modulo H 20cm with slab thickness s=	€/sq.m.
Modulo H 27cm with slab thickness s=	€/sq.m.
Modulo H 30cm with slab thickness s=	€/sq.m.
Modulo H 35cm with slab thickness s=	€/sq.m.
Modulo H 40cm with slab thickness s=	€/sq.m.
Modulo H 45cm with slab thickness s=	€/sq.m.
Modulo H 50cm with slab thickness s=	€/sq.m.
Modulo H 55cm with slab thickness s=	€/sq.m.
Modulo H 60cm with slab thickness s=	€/sq.m.
Modulo H 65cm with slab thickness s=	€/sq.m.
Modulo H 70cm with slab thickness s=	€/sq.m.



Reinforcement of foundation pillars.

- Supplying of fitting plastic panels, type **FERMAGETTO MODULO**, for closing up the MODULO - height as per project specifications.
- Placing of fitting panels, inclusive of scrap due to cuts for making holes for air ducts.

PRICE LIST FOR FERMAGETTO MODULO

ARTICLE	PRICE
Fermagetto Modulo H 13cm	€/each
Fermagetto Modulo H 15cm	€/each
Fermagetto Modulo H 17cm	€/each
Fermagetto Modulo H 20cm	€/each
Fermagetto Modulo H 27cm	€/each
Fermagetto Modulo H 30cm	€/each
Fermagetto Modulo H 35cm	€/each
Fermagetto Modulo H 40cm	€/each
Fermagetto Modulo H 45cm	€/each
Fermagetto Modulo H 50cm	€/each
Fermagetto Modulo H 55cm	€/each
Fermagetto Modulo H 60cm	€/each
Fermagetto Modulo H 65cm	€/each
Fermagetto Modulo H 70cm	€/each



Ventilation ducts

- Making of 80/120 mm diameter holes on the outside walls, each at a distance of 3.50/4.00 metres from the other. For a better ventilation these will have to be made at a higher level on the south, warmer side of the building rather than the north, colder side. In case there are portions of crawl space inside the foundation beams, they will have to be connected with the external ones.
- Supply and installation of PVC pipes Ø 80/120 mm as per project specifications possibly provided with external stainless steel grates with anti-insect plastic nets:

PRICE LIST VENTILATION DUCTS

ARTICLE	PRICE
PVC pipes Ø 80/120 mm	€/m.

PRICE ANALYSIS MODULO H 27

ART. NUMBER	ARTICLE CODE	DESCRIPTION				UNIT OF MEASURE
	...1-a	Ventilated crawl space type Modulo * 1) with modulo h cm 27 a) with cope superior to cm 5				sq.m.
CAT.	ART.	MU	QUANTITY	UNIT COST	SUBTOTAL	TOTAL AMOUNT
A	LABOUR			€	€	€
1	unskilled worker for laying Modulo and electro-soldered net mesh	hour	0,020	20	0,40	
2	skilled worker for concrete casting	hour	0,100	22	2,20	2,60
B	MATERIALS AND SUPPLIES					
1	supply of MODULO and scrap	sq.m.	1,010	9,50	9,60	
2	concrete R'bk250 for filling up the MODULO	c.m.	0,040	62,00	2,48	
3	concrete R'bk250 for slab	c.m.	0,050	62,00	3,10	
4	electro-soldered net 6mm 20X20cm	sq.m.	1,000	1,10	1,10	16,28
C	FREIGHT AND CARRIAGE					
1	Carriage from Grantorto (PD) to building yard	corpus	1,000	0,65	0,65	
2	sundries	corpus	1,000	0,20	0,20	0,85
	COSTS TOTAL					19,73
	GENERAL CHARGES					3,02
	COSTS AMOUNT + GENERAL CHARGES					22,75
	BUILDER'S PROFITS					2,32
	APPLICATION PRICE					25,07
	ROUNDING OFF					
	ROUNDED OFF PRICE					25,07

price of E:L:	% discount	discounted price

* Example of price analysis for Mod. 27 with a 5 cm floor slab

PRICE ANALYSIS MODULO H 40

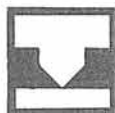
ART. NUMBER	ARTICLE CODE	DESCRIPTION				UNIT OF MEASURE
	...1-a	Ventilated crawl space type Modulo * 1) WITH Modulo h cm 40 a) with cope superior to cm 5				sq.m.
CAT.	ART.	MU	QUANTITY	UNIT COST	SUBTOTAL	TOTAL AMOUNT
A	LABOUR			€	€	€
1	unskilled worker for laying MODULO and electro-soldered net mesh	hour	0,020	20,00	0,40	
2	skilled worker for concrete casting	hour	0,100	22,00	2,20	2,60
B	MATERIALS AND SUPPLIES					
1	supply of MODULO and scrap	sq.m.	1,010	10,50	10,61	
2	concrete R'bk250 for filling up the MODULO	c.m.	0,056	62,00	3,47	
3	concrete R'bk250 for slab	c.m.	0,050	62,00	3,10	
4	electro-soldered net 6mm 20X20cm	sq.m.	1,000	1,10	1,10	18,28
C	FREIGHT AND CARRIAGE					
1	Carriage from Grantorto (PD) to building yard	corpus	1,000	0,65	0,65	
2	sundries	corpus	1,000	0,20	0,20	0,85
COSTS TOTAL						21,73
GENERAL CHARGES						3,30
COSTS AMOUNT + GENERAL CHARGES						25,03
BUILDER'S PROFITS						2,53
APPLICATION PRICE						27,56
ROUNDING OFF						
ROUNDED OFF PRICE						27,56

price of E:L:	% discount	discounted price

* Example of price analysis for Mod. 40 with a 5 cm floor slab

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DEI MATERIALI DA COSTRUZIONE
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DI CONTROLLO PER LA QUALIFICAZIONE

INDAGINI PER LO STUDIO - LA VALUTAZIONE -
GESTIONE E MANUTENZIONE PROGRAMMATA
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Vicenza, 20/01/00

Certificato n° 1019X/9/001

Richiedente: GEOPLAST S.r.l.

Via Martiri della libertà 6/8 - 35010 Grantorto (PD)

Indicazioni del Richiedente:

Campioni di "Modulo 27", "Modulo 40" e "Minimodulo" per pavimentazioni

Prova: PUNZONAMENTO CON IMPRONTA ϕ 25 cm

Norma: modalità di prova concordate con il Richiedente

Materiale: 4 campioni di moduli-cassaforma completi di getto di calcestruzzo.

Data di accettaz.: 22/12/99.

Data di prova: 14 e 17/01/00.

Attrezzatura:

- Telaio di carico con cilindro di spinta Enerpac;
- pompa manuale Enerpac P-462, pressione massima: 700 bar;
- trasduttore di pressione Wika tipo 891.23.510, campo 0 ÷ 1000 bar;
- trasduttore di spostamento potenziometrico Penny+Giles HLP 190/FS1, corsa massima: 50 mm, linearità: 0.2%;
- unità di acquisizione Teleadat.

Risultati:

Camp.	Descrizione	Dimensioni in pianta cm	H tot cm	Carico massimo daN
1	Modulo 27 soletta da 5	153x152	33	10650
2	Modulo 27 soletta da 10	153x152	37	25000
3	Modulo 40 soletta da 15	153x153	55	43700 raggiunta portata del telaio di carico senza rottura
4	Minimodulo	101x101	5	27650

Lo Sperimentatore

Ignazio Sardu

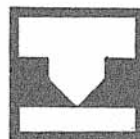
Il Direttore del Laboratorio

Dott. Ing. Alfio Vigilante

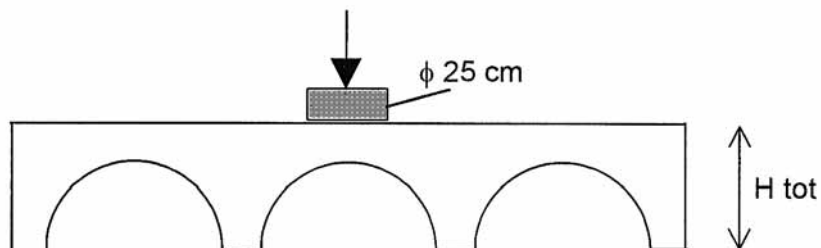
Laboratorio autorizzato all'esecuzione delle prove ai sensi e per gli effetti dell'art. 20
della Legge 05/11/1971 n. 1086 con D.M. LL. PP. n. 22989 del 18/12/1982

Riconosciuto dal **Ministero ricerca scientifica e tecnologica** con D.P.R. n. 283 del 2/12/88

Socio **UNI** e **SITEB** Associato **A.I.C.Q.** Membro **ASTM - USA**



Test draft

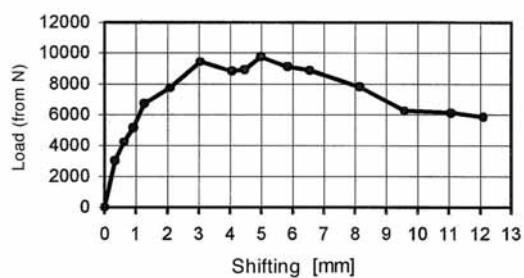


Load-shifting charts

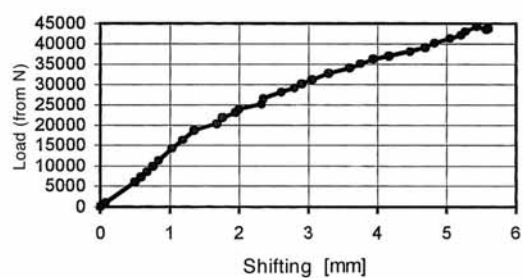
Note

The peak of the maximum load in the chart is not indicated as registered point in the load-shifting curve

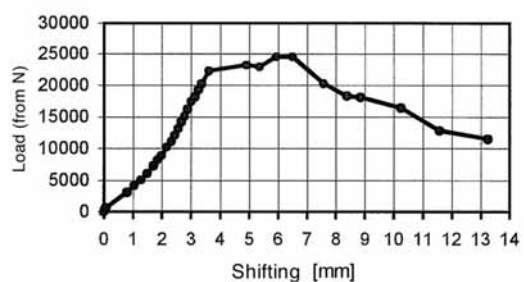
Sample 1 : H tot = 33 cm



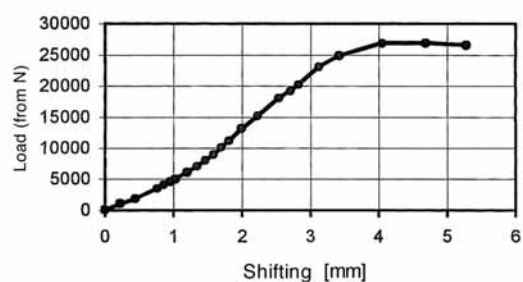
Sample 3 : H tot = 55 cm

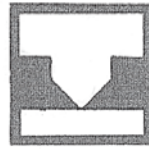


Sample 2 : H tot = 37 cm

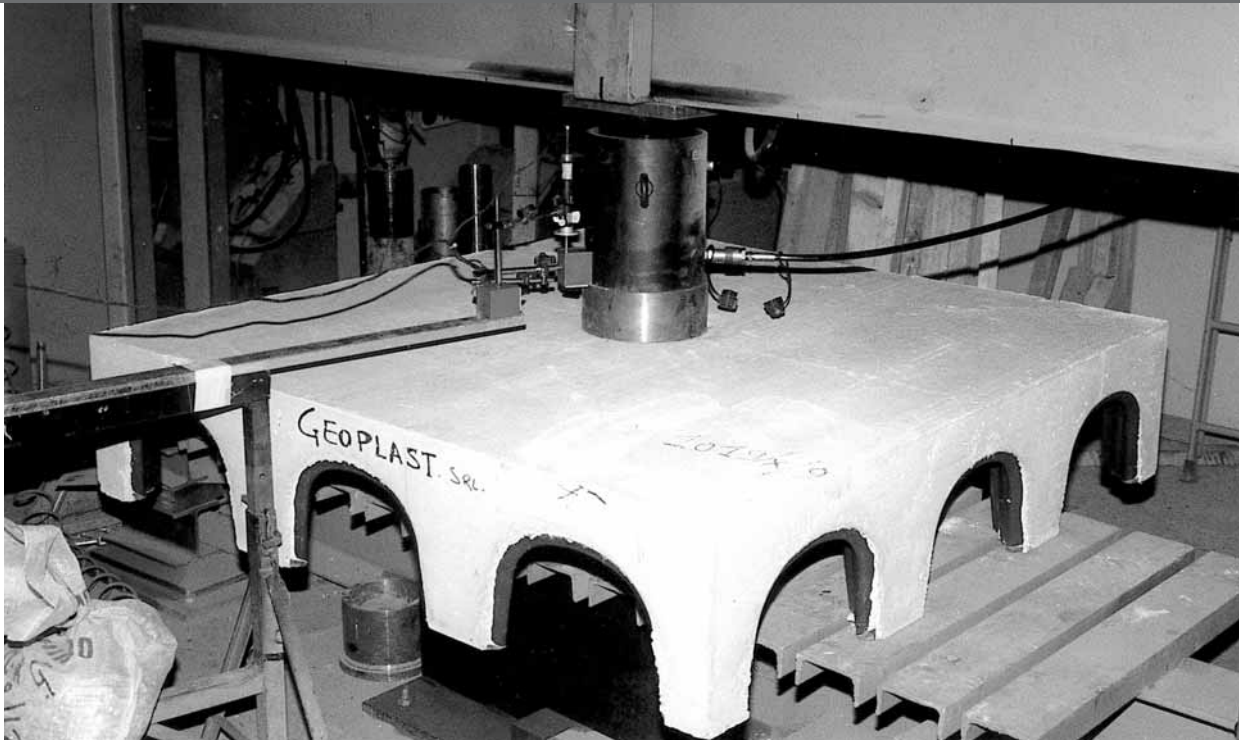


Sample 4 : H tot = 5 cm



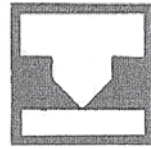


Sample 1



Sample 2

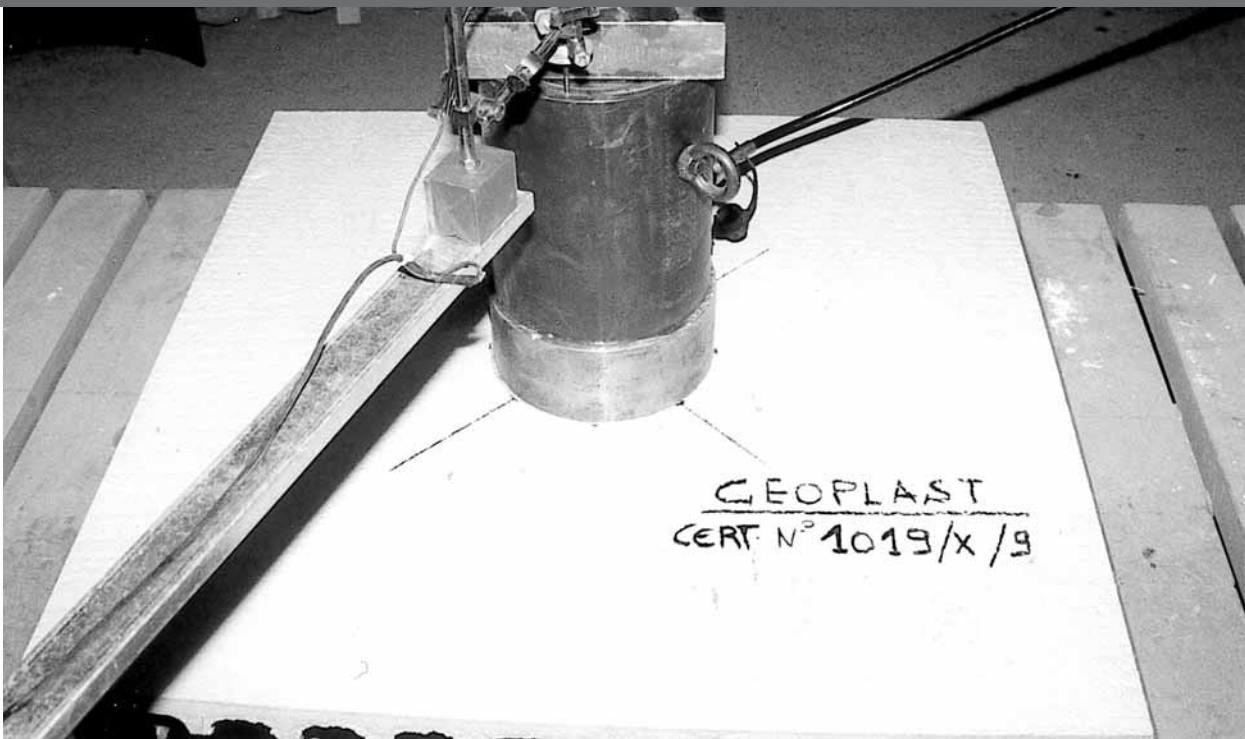




Sample 3

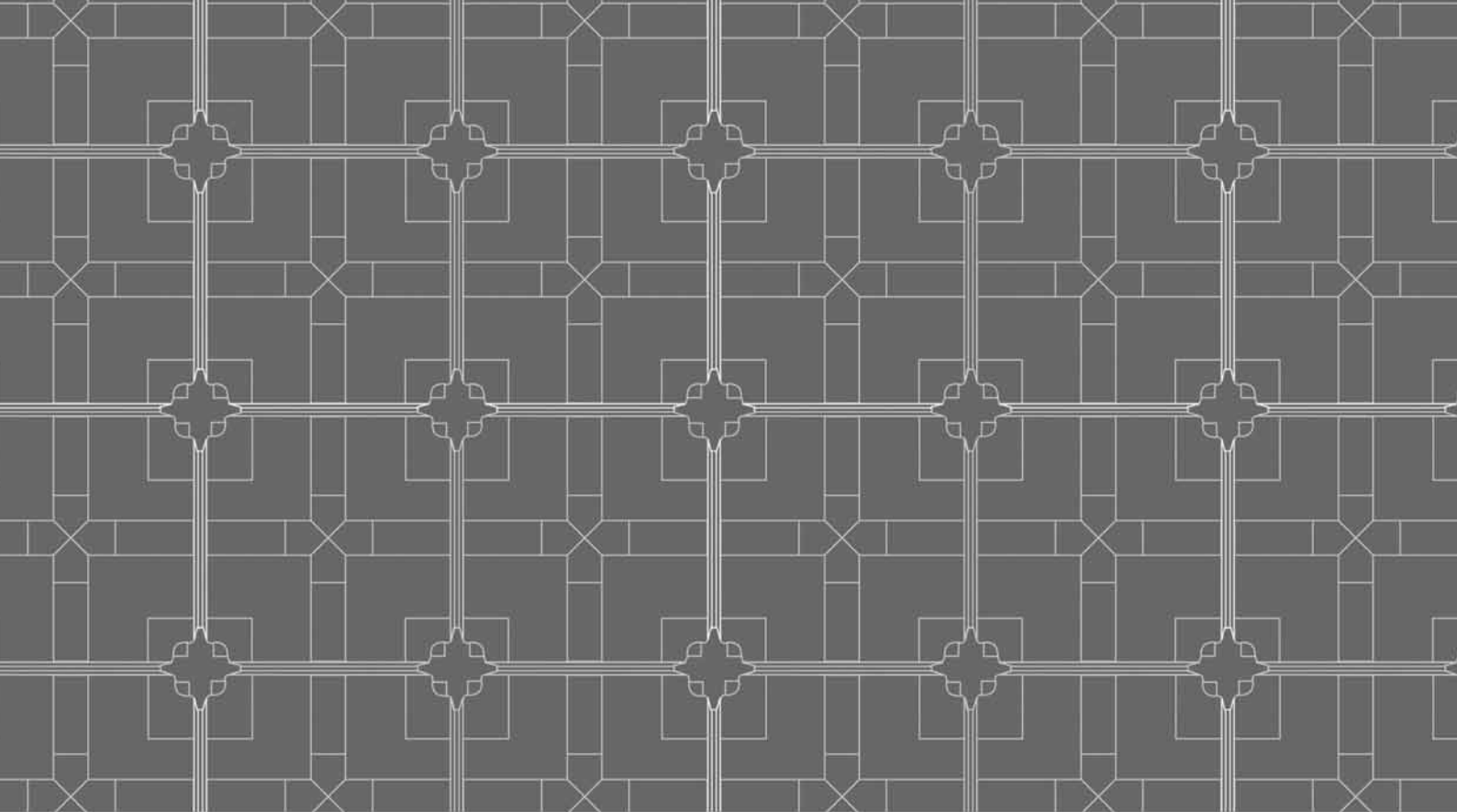


Sample 4









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