



BELGIAN BUILDING RESEARCH INSTITUTE

ESTABLISHMENT RECOGNISED BY APPLICATION OF THE DECREE LAW OF 30 JANUARY 1947

- Test centre : B-1342 Linielette, avenue P. Holoffe, 21
- Offices : B-1932 Sint-Stevens-Woluwa, Lozenberg 1, 7
- Head office : B-1000 Bruxelles, rue de la Violette, 21-23

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VAT n° BE 407.695.057

Page : 1/7

LABORATORY : Acoustics (AC)

TEST REPORT

N° DE, DAT, RE

DE 631X857

N° Laboratory

AC 3208-E

N° Sample

16/46/6

REQUESTED BY : JOINT VENTURE PRODUCTION S.r.l.,
Via dell'Industria, 19
I- 35028 - Piove di Sacco- Italy

Contact persons:

- Requested by -

- BBRI -

M. F. Tilkin, Technical Manager

Ir. I. Pissens

Tests performed : Measurement of the normalized level difference between two rooms equipped with a continuous technical floor, reference JVP type 4x4 - CATTJO.

References :

ISO 717-1: 1996 - *Rating of sound insulation in buildings and of building elements*
- Part 1 : Airborne sound insulation.

NBN EN 20140-9: 1995 - *Laboratory measurement of room to room airborne sound insulation of a suspended ceiling with a plenum above it*

NBN S01-400 : 1977 - *Acoustical insulation criteria*

Date and reference of the request : 2 march 2000, reference FT/SL-L00.123

Date of receipt of the sample(s) : 20 march 2000

Test date : 22 march 2000

Drafting date of the report : 17 april 2000

This report contains 7 pages, numbered from 1 to 7. It may only be reproduced in its entirety.

It contains also 5 figures in annex.

Each page of the original report has been stamped in red by the laboratory and initialed by the head of laboratory.

The results and findings are only valid for the tested samples.

☐ No sample

☐ Sample(s) submitted to a destructive test

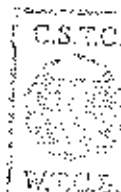
☒ Sample(s) to be removed from our laboratories 10 calendar days after sending of the report, unless a written request is received by the demander of the test

In charge of the test

Ph. Wattiez

Technical assistance : /

The head of Laboratory



Ir. B. Ingelaere



1. MEASUREMENT METHOD

The measurements are performed on the basis of the international standard ISO 140 :

"Measurement of sound insulation in buildings and of building elements - Part 9: Laboratory measurement of room to room airborne sound insulation of a suspended ceiling with a plenum above it" - corresponding to the European reference standard cited earlier, NBN EN ISO 20140-9 : 1995.

The focus here is on transmission from room to room with a continuous raised floor (plenum of 10 cm). A 6 cm joint separates the external walls of the two transmission chambers.

1.1. Test setup

The dimensions of the rooms, the heights of the partition and the plenum are given in figure 5.

Partition :

The partition, designed to ensure the maximum possible insulation, is built on the technical floor - to a height of at least 3.4 m - and thus divides the test installation into two rooms of 47 and 49 m³. The surface area of the partition corresponds to 12.6m².

The partition (interior height of 3.41 m) has a total thickness of 31 cm and is constituted of a light wall composed as follows:

- two structures of metal profiles (of the Metal Stud type, 75 mm wide) positioned with 200 mm of exterior clearance;
- on either side of this structure, an assembly of two sheets of 12.5 mm gypsumboard was applied and repointed;
- inside the metal structure, sheets of rock wool of the Rockwool 433 type - 50 and 100 mm thick and weighing 45 kg/m³ - were installed, there thus remains a space of 50 mm;
- on an external face (side C2), an acoustical lining of the type CALIBEL 50 + 10 mm was adhesively bonded.

Technical floor :

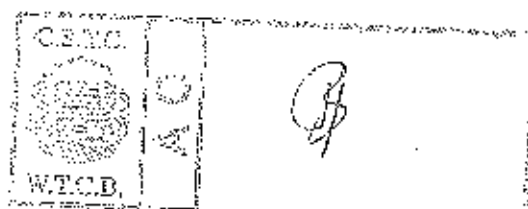
The technical floor to be tested rests on adjustable jackscrews ; it does not occupy the entire ground surface of each of the rooms (broadcast-reception) : it remains possible for a person to pass through the inner door (half-open) - (see figure 5).

The upper level of the floor is 14 cm from the level of the ground. The air space is around 10 cm. No absorbent is inserted into the space.

In the case of the test with "acoustical barrier", mattresses of mineral wool are installed below the partition under the floor, over a width of 50 cm.

The floor slabs supporting the partition remained the same for all the tests (floor slabs of the type 4x4 - C4TTJO).

A more complete description of the installation is given in §3.





1.2. Procedure

The sound source is constituted by a loudspeaker, so as to produce a field as diffuse as possible and is placed at a distance from the floor such that the direct emission on the later is not predominant. There are no diffusing elements.

The acoustical field is sampled, in each room, using a microphone attached to a rotating arm. One complete rotation takes 64 seconds and corresponds to the integration time of the measurement. The measurement is repeated in another plane.

This procedure is then repeated by reversing the emission and reception rooms, the value indicated for the normalized level difference of the technical floor $D_{n,f}$ is the arithmetic average of the two results.

This quantity, called the technical floor normalized level difference and having the symbol $D_{n,f}$ (the index f indicates the floor) is determined from normalized level difference, measured in each direction, by the relation:

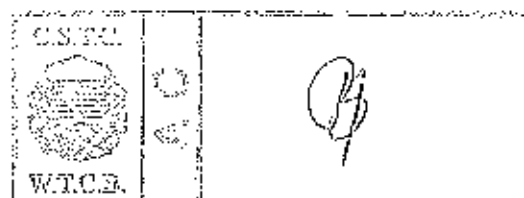
$$D_n = L_1 - L_2 - 10 \log_{10} \frac{A}{A_0} \quad \text{en dB}$$

where :

- L_1 : is the level of the average quadratic acoustical pressure in the emission room, expressed in dB;
- L_2 : is the level of the average quadratic acoustical pressure in the reception room, expressed in dB;
- A : is the equivalent absorption in the reception room. It will be calculated as of reverberation time T (in seconds) in the reception room (of volume V in m^3), using the Sabine formula : $A = 0.16 V/T$
- A_0 : is the reference absorption area taken, equal to $10 m^2$.

2. MEASUREMENT EQUIPMENT

- A noise generator -- Bruël and Kjaer - type 1405;
- An equaliser Klark Teknik DN 27;
- A power amplifier STUDER A 68;
- A loudspeaker - BOSE 802;
- Two microphones - Bruël and Kjaer - type 4165 with preamplifier BK 2639 and power supply BK 2804;
- Two rotating arms - Bruël and Kjaer - type 3923;
- A piston phone - Bruël and Kjaer - type 4220;
- A digital frequency analyser - Bruël and Kjaer - type 2131;
- A BMX computer, IBM compatible with HP plotter.





3. DESCRIPTION OF THE TEST INSTALLATION

The entire test installation (floor and partition) was created by DYNABAT, rue des Champs, 50 B- 1301 - Bierges Wavre.

The JVP brand floor slabs are installed on a finished height of 14 cm and on a surface of $\pm 22 \text{ m}^2$ (see sketch in figure 5). The installation includes the slabs and jackscrews described in detail below. The barrier and the carpet used are also described. These descriptions were provided by DYNABAT.

The partition described in § 1.1 is placed on this floor upon the separation of the two transmission chambers.

3.1 Description of the slabs

3.1.1. JVP brand type 4x4 - C4ITJO

The panels have a dimension of 600/600 mm and are 29 mm thick. A total jacketing in 0.5 mm galvanised steel was performed. The 4 sides of the slabs include a peripheral reinforcement integrated by a quadruple fold of galvanised sheet.

N.B. : The slabs have a mass of $10.0 \pm 0.1 \text{ kg}$ per slab.

3.2 Description of the jackscrews with a height of 100 mm.

The jackscrews are made of a BACO metal material of type 70/56 NB/2.

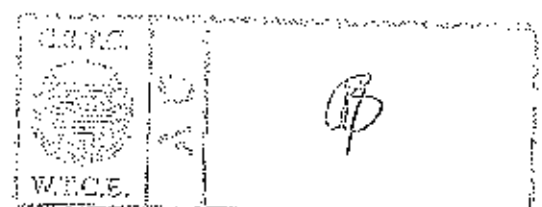
They are attached to the concrete support by a two-component epoxy adhesive.

3.3 Description of the acoustical barrier

The acoustical barrier - 500 mm wide and 80 mm thick, at the base of the partition - was created with the aid of rock wool mattresses of the Rockwool-Rockfon Soundstop RH-95 type weighing 70 kg/m^3 and installed between the concrete floor and the slabs of technical floor.

3.4 Description of the carpet

Brand:	Louis De Poortere
Type:	Missouri II Conn.
Dimensions:	50 cm x 50 cm
Weight of the pile:	735 g/m^2
Back:	Bitumen



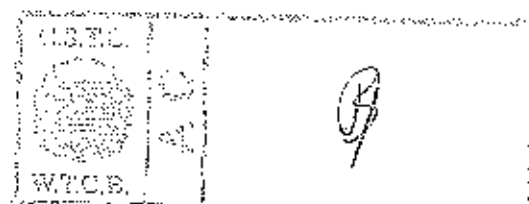


4. DESCRIPTION OF THE TESTS PERFORMED

Four different test conditions formed the object of measurements of the technical floor normalized level difference.

The following table includes the four configurations tested on 22 March 2000, and gives the ambient conditions of the measurements:

Test $D_{n,f}$ and figure	characteristic	temperature (°C)	Atmosph. pressure (hPa)	relative humidity (%)
N°1	with barrier, with carpet	20	1013	57
N°2	with barrier, without carpet	20	1013	57
N°3	without barrier, with carpet	21	1006	54
N°4	without barrier or carpet	21	1006	54



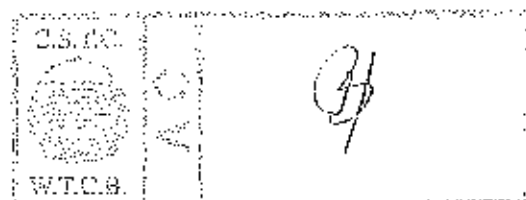


5. RESULTS OF THE MEASUREMENTS

The figures 1 to 4 include the results of measurements performed i.e. the spectrum of the technical floor normalized level difference as a function of the frequency by thirds of an octave from 100 to 5000 Hz. Each third is represented by its rated frequency (in Hz).

The following table gives the spectrum of the normalized level difference measured between the two rooms provided with the technical floor with plenum, equipped or not with barrier, with or without carpet, as indicated.

Rated frequency 1/3 octave (Hz)	Normalized level difference between rooms with technical floor (dB)			
	D_{nf}			
	Test N°1	Test N°2	Test N°3	Test N°4
100	30.0	33.2	23.7	25.9
125	34.8	32.3	27.4	24.8
160	45.2	41.7	35.8	30.9
200	46.2	47.0	40.0	33.7
250	47.8	46.4	41.4	35.4
315	49.9	48.5	44.0	40.8
400	50.9	51.3	45.3	42.5
500	52.2	50.5	46.0	42.5
630	54.6	53.5	47.3	43.7
800	52.0	52.2	48.5	45.6
1000	52.5	50.0	50.4	47.7
1250	57.5	52.4	57.7	51.2
1600	63.5	55.5	63.8	54.9
2000	67.9	58.5	68.2	56.0
2500	72.0	61.2	71.2	56.8
3150	70.9	62.8	69.9	56.8
4000	66.6	64.9	66.8	57.6
5000	66.9	66.7	66.8	59.3





6. INTERPRETATION OF THE RESULTS

The following table summarises the situations measured and gives the criteria obtained :

- the category obtained for D_n according to the standard NBN S01-400;
- the weighted technical floor normalized level difference $D_{n,f,w}$ obtained according to the international standard ISO717-Part 1;
- the sound reduction index against pink noise in dB(A) according to the French standard NF S31-051.

Reference standard	Category and insulation indices	Test Nber 1	Test Nber 2	Test Nber 3	Test Nber 4
NBN S01-400	category (D_n)	I_b	II_a	II_b	III_a
ISO 717-1	$D_{n,f,w}$ (C ; Ctr) in dB	55 (-2 ; -8)	53 (-1 ; -6)	49 (-2 ; -8)	46 (-2 ; -6)
NF S31-051	R pink dB(A)	54	52.5	48.1	45.2

12/4/2000 1799/-



NORMALIZED LEVEL DIFFERENCE

D_n

Laboratory measurement following:

EN 20140-9 (1995)

Rating following:

ISO 717-1 (1996)

Requested by:

-Joint Venture Production S.r.l.
I-33028 - Piove di Sacco - Italy

Date:

12-04-2003

File:

AC 3203-E
DE 031x037

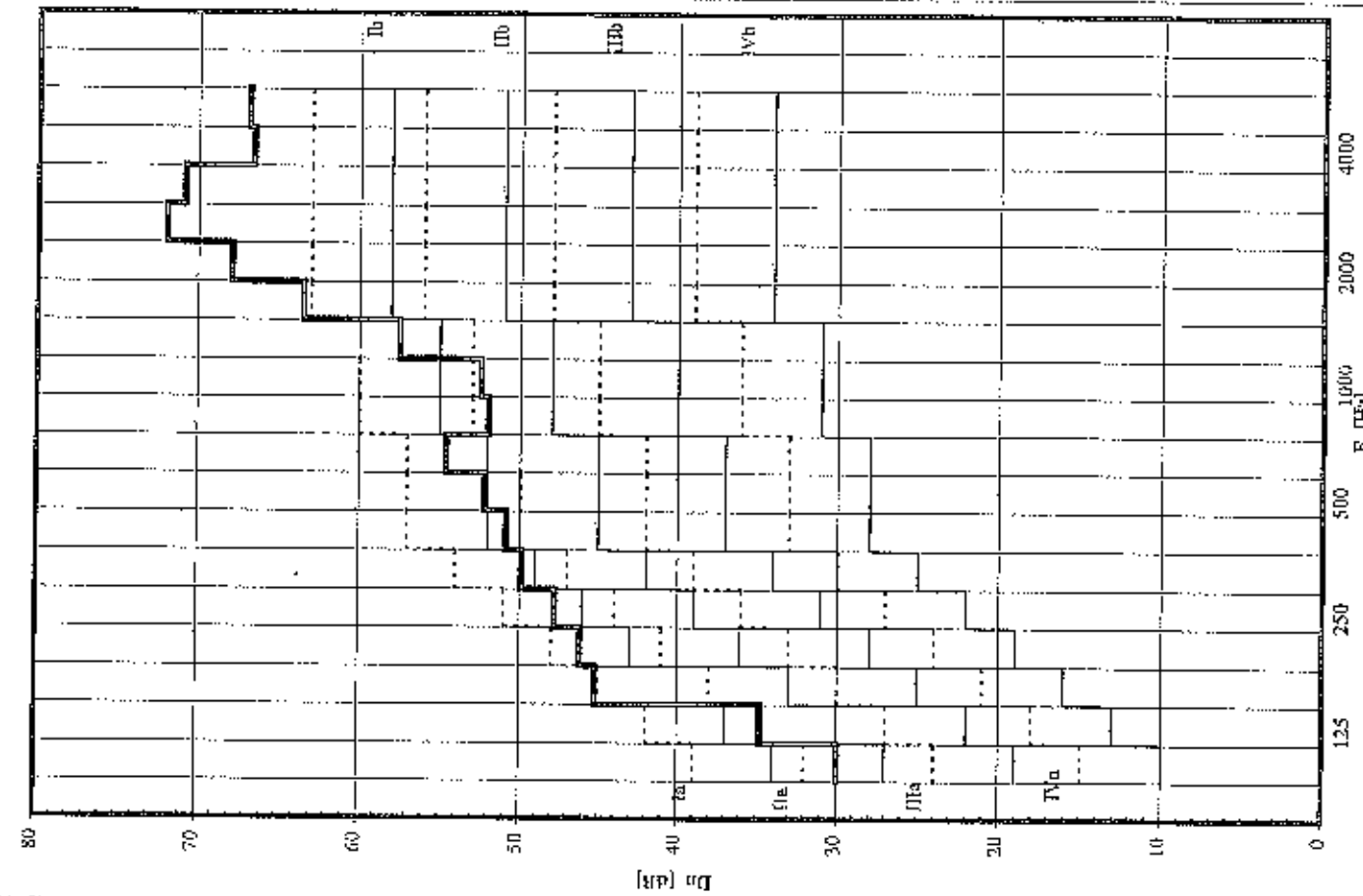
Test description:

Hall K - Cells C1 & C2 - 1342 LIMELLETTA
Arithmetic average of floor D_n measures with barrier and carpet
Test Number 1



D_n (dB)

F (Hz)



EN ISO 717-1

D_{n,w} = 55 dB

C = -2 dB

C_{tr} = -8 dB

BELGIAN BUILDING
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Acoustics Laboratory

Rue de la Violette 21-23
B-1000 BRUXELLES



CENTRE SCIENTIFIQUE
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Laboratoire Acoustique
Rue de la Violette 21-23
B-1000 BRUXELLES

NORMALIZED LEVEL DIFFERENCE

D_n

Laboratory measurement following:

NBN EN 20147-9 (1995)

Rating following:

ISO 717-1 (1996)

Requested by:

-Joint Venture Production S.r.l. -
I-35024 - Piove di Sacco - Italy

Datum:

12-04-2000

Date:

PV:

AC 3208-E

File:

DE 631x857

Test description:

Hall K - Cells C1 & C2 - 1342 LIMELLETT

Aridmetic average of floor Dn measures with barrier, without carpet

Test Number 2



D_n

ILz

Dn

dB

1000

125

160

200

250

315

400

500

630

800

1000

1250

1600

2000

2500

3150

4000

5000

33,2

32,3

41,7

4,7

46,4

48,5

51,3

50,5

53,5

52,2

50,0

52,4

55,5

58,5

61,2

62,8

64,9

56,7

NBN 801-400

cat. IIa

EN-ISO 717-1

D_nW = 53

C = -1

Clr = -6

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RESEARCH INSTITUTE

Acoustics Laboratory

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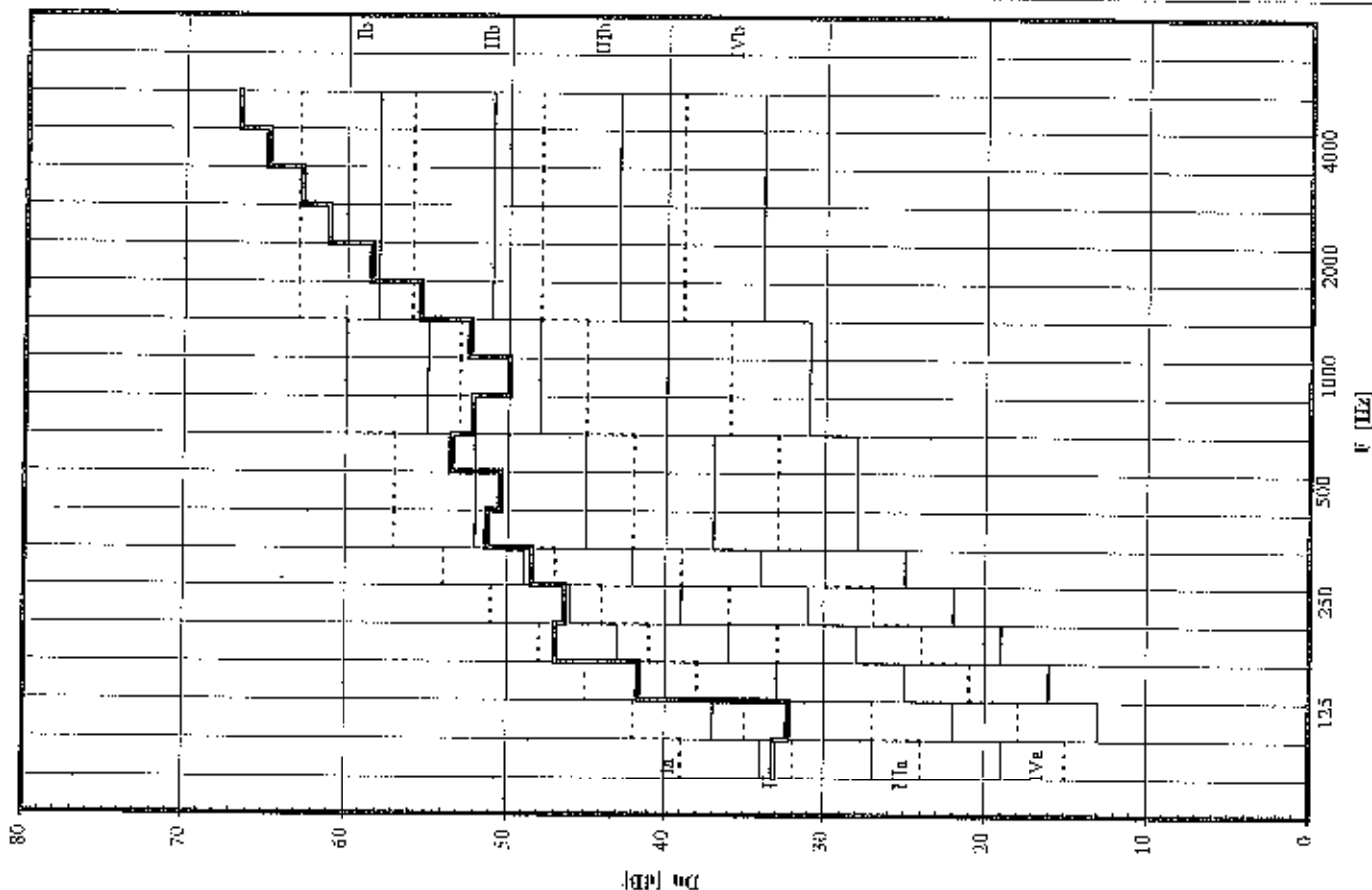


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ET TECHNIQUE DE LA
CONSTRUCTION

Laboratoire Acoustique

Rue de la Violette 21-23

B-1000 BRUXELLES



NORMALIZED LEVEL DIFFERENCE

D_n

Laboratory measurement following:

NBN EN 20140-2 (1995)

Referring following:

ISO 717-1 (1995)

Requested by:

-Joint Venture Production S.r.l.
I-35028 - Piove di Sacco - Italy

Date:

12-11-2001

File:

AC 3208
DE 631X857

D_n
dB

f
Hz

Test description:

Hall K - Cells C1 & C2 - 1343 LIMELITE
Arithmetic average of floor D_n measures without barrier, with carpet
Test Number 3



12-11-2001

[Signature]

NBN S01-400

cat. IIb

EN-ISO 717/1

D_{n,w} - 49 dB

C = -2 dB

Ctr = -8 dB

BELGIAN BUILDING
RESEARCH INSTITUTE

Acoustics Laboratory

Rue de la Violette 21-23

B - 1000 BRUXELLES

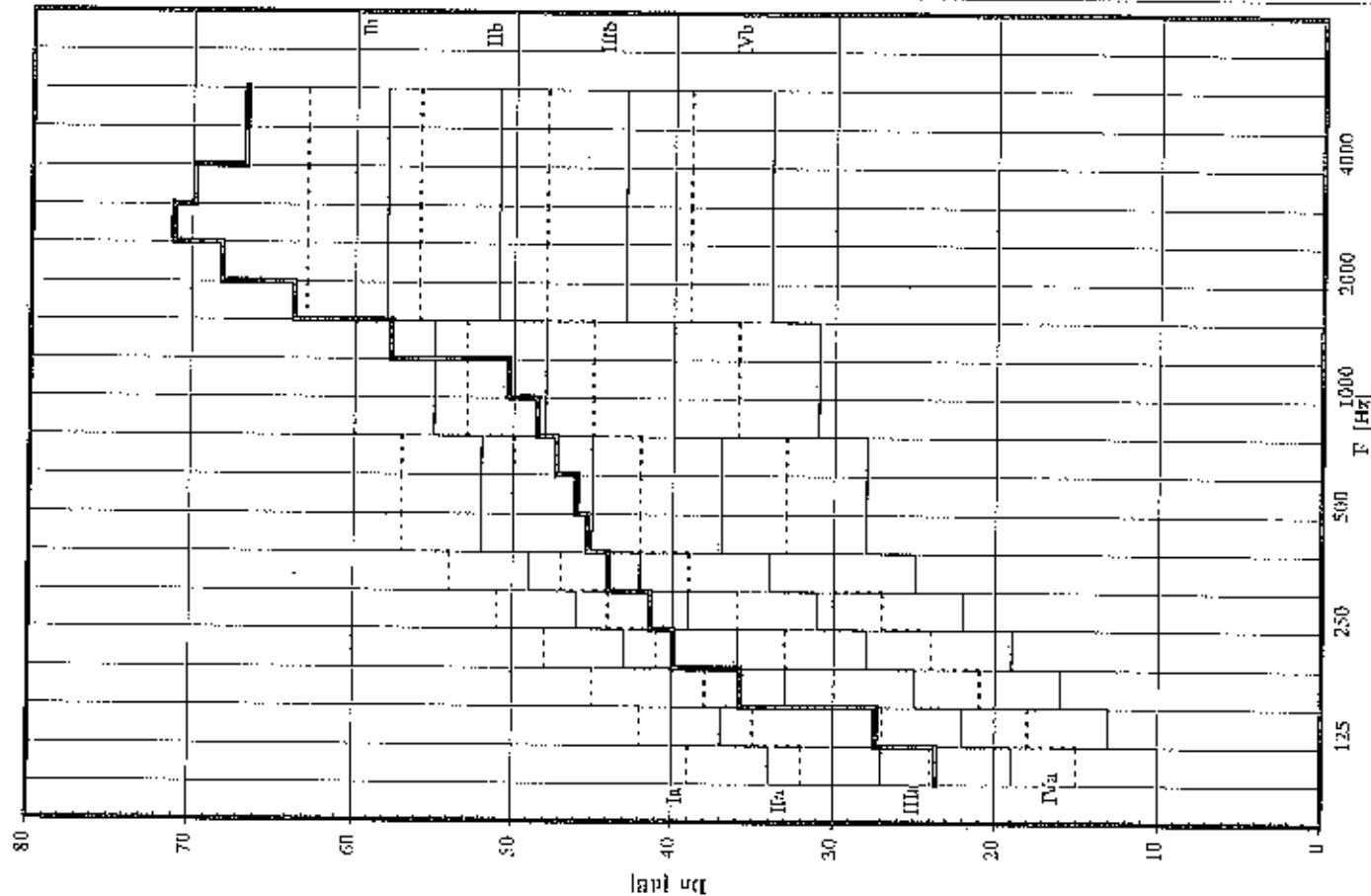


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ET TECHNIQUE DE LA
CONSTRUCTION

Laboratoire Acoustique

Rue de la Violette 21-23

B - 1000 BRUXELLES



NORMALIZED LEVEL DIFFERENCE

Dn

Laboratory measurement following:

NBN EN 20140-3 (1995)

Rating following:

ISO 717-1 (1996)

Requested by:

- Joint Venture Production S.r.l.
I-35028 - Pieve di Sacca - Italy

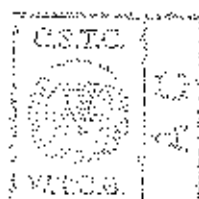
Date:
Dated:

12-04-2000

PR: ACC 320R
Title: DB 631x857

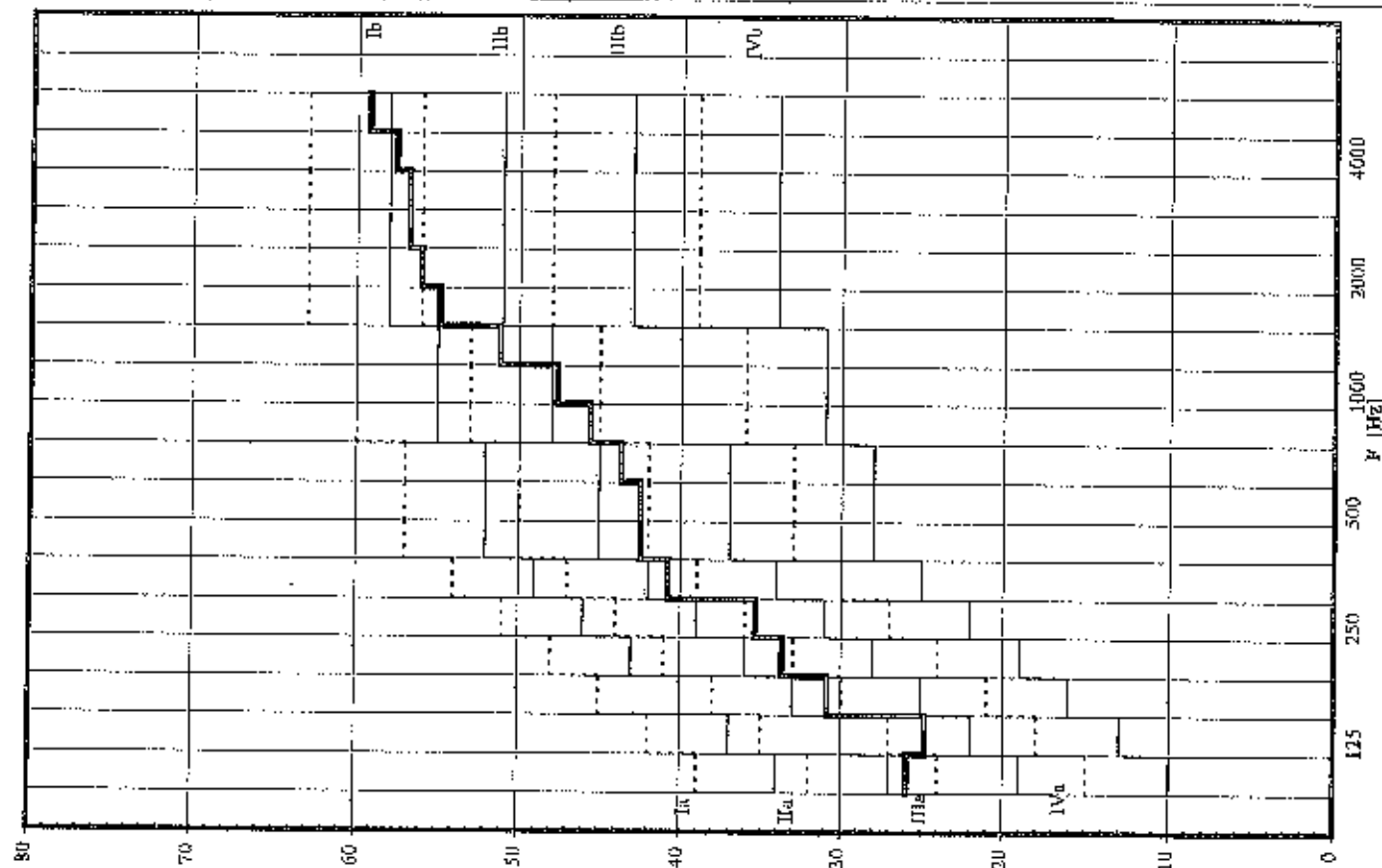
Test description:

Hall K - Cells C1 & C2 - 1342 LIMELITE
Artificial average at floor Dn measures without barrier, nor carpet
Test Number 4



Dn [dB]

f [Hz]



NBN 801-400

cat. IIIa

EN-ISO 717/1

Dn,w = 46 dB

C = -2 dB

Ctr = -6 dB

BELGIAN BUILDING
RESEARCH INSTITUTE

Acoustics Laboratory

Rue de la Violette 24-25

B-1000 BRUXELLES



CENTRE SCIENTIFIQUE
ET TECHNIQUE DE LA
CONSTRUCTION

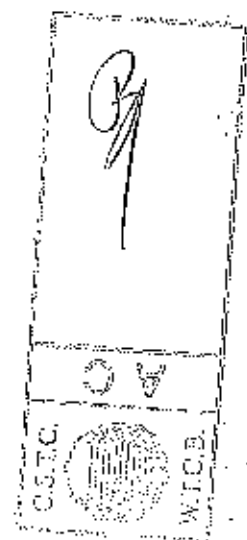
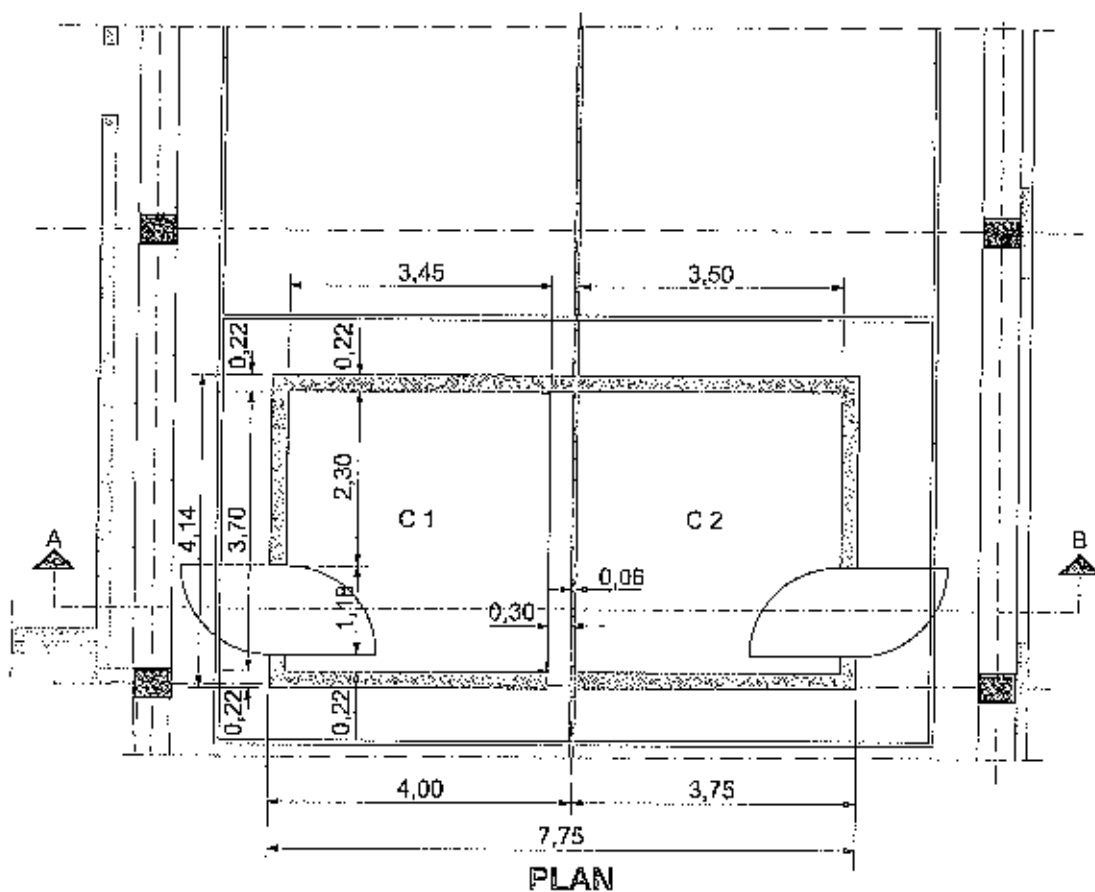
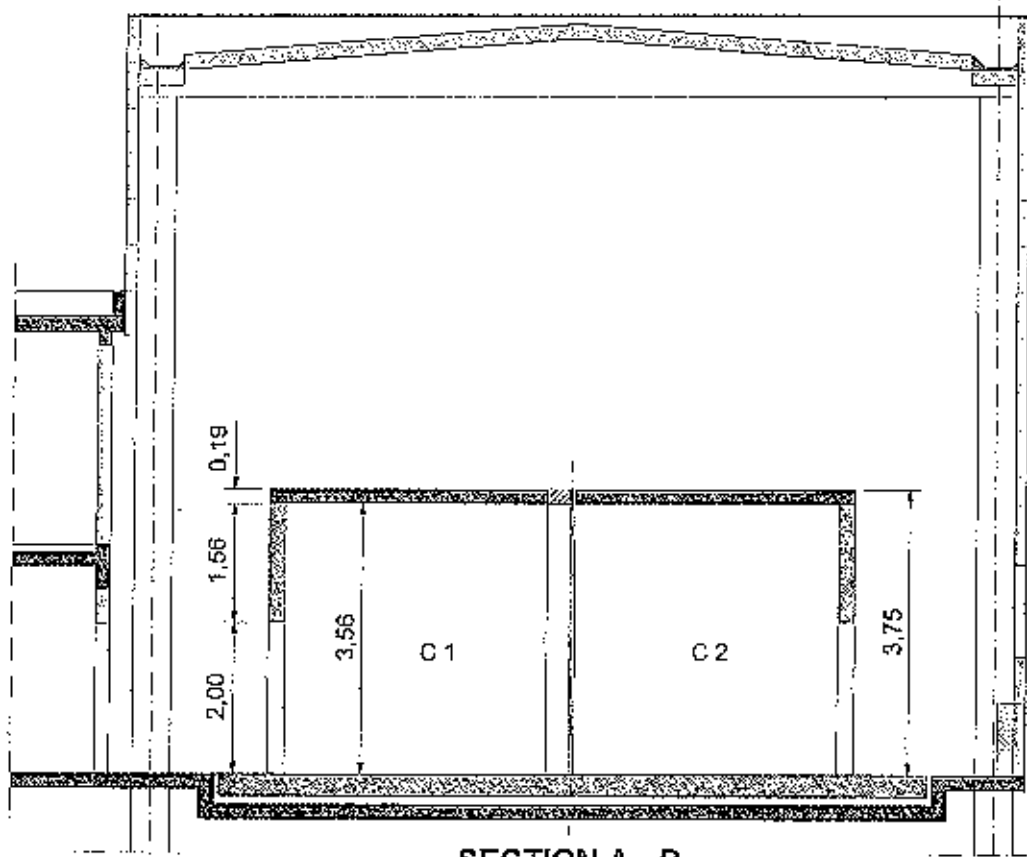
Laboratoire Acoustique

Rue de la Violette 24-25

B-1000 BRUXELLES



BUILDING K : Measuring cells C



BUILDING K
GROUND FLOOR



21.04.2000



BELGIAN BUILDING RESEARCH INSTITUTE

ESTABLISHMENT RECOGNISED BY APPLICATION OF THE DECREE LAW OF 30 JANUARY 1947

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VAT n° BE 407.695.057

Page : 1/7

LABORATORY : Acoustics (AC)

TEST REPORT

N° DE, DAT, RE : DE 631X857

N° Laboratory : AC 3207-E

N° Sample : 16/46/6

REQUESTED BY : JOINT VENTURE PRODUCTION S.r.l.,

Via dell'Industria, 19

I- 35028 - Piove di Sacco- Italy

Contact persons:

- Requested by -

- BBRI -

M. F. Tilkin, Technical Manager

Ir. I. Pissens

Tests performed : Measurement of the normalized impact sound pressure level between two rooms equipped with a continuous technical floor, reference JVP type 4x4 - C4TTJO.

References :

ISO 717-2: 1996 - *Rating of sound insulation in buildings and of building elements*
Part 2 : Impact sound insulation

EN ISO 140-6: 1998 - *Laboratory measurements of impact sound insulation of floors*

NBN S01-400: 1977 - *Acoustical insulation criteria*

Date and reference of the request : 2 march 2000, reference FT/SI-L00.123

Date of receipt of the sample(s) : 20 march 2000

Test date : 22 march 2000

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The results and findings are only valid for the tested samples.

☐ No sample

☐ Sample(s) submitted to a destructive test

☒ Sample(s) to be removed from our laboratories 10 calendar days after sending of the report, unless a written request is received by the demander of the test

In charge of the test

Ph. Wattiez

Technical assistance : /

The head of Laboratory

Ir. B. Ingelaere



1. MEASUREMENT METHOD

The method of measurement is used to determine the acoustical transmission of impact noises from room to room equipped with a continuous raised floor (plenum ± 10 cm).

The measures are performed in accordance with the European standard EN ISO 140 : "Measurement of sound insulation in buildings and of building elements - Part 6 : Laboratory measurements of impact sound insulation of floors " - edition of August 1998.

1.1. Test setup

The rooms dimensions, the partition and plenum heights are given in figure 5.

Partition :

The partition, designed to ensure the maximum possible insulation, is built on the technical floor - to a height of at least 3.4 m - and thus divides the test installation into two rooms of 47 and 49 m³. The surface area of the partition corresponds to 12.6m².

The partition (interior height of 3.41 m) has a total thickness of 31 cm and is constituted of a light wall composed as follows:

- two structures of metal profiles (of the Metal Stud type, 75 mm wide) positioned with 200 mm of exterior clearance;
- on either side of this structure, an assembly of two sheets of 12.5 mm gypsumboard was applied and repointed;
- inside the metal structure, sheets of rock wool of the Rockwool 433 type - 50 and 100 mm thick and weighing 45 kg/m³ - were installed, there thus remains a space of 50 mm;
- on an external face (side C2), an acoustical lining of the type CALIBEL 50 + 10 mm was adhesively bonded.

Technical floor :

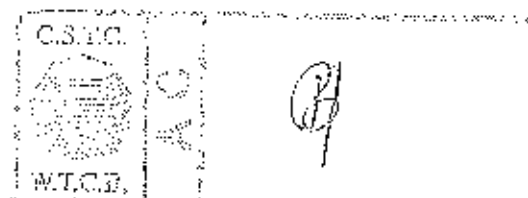
The technical floor to be tested rests on adjustable jackscrews ; it does not occupy the entire ground surface of each of the rooms (broadcast-reception) : it remains possible for a person to pass through the inner door (half-open) - (see figure 5).

The upper level of the floor is 14 cm from the level of the ground. The air space is around 10 cm. No absorbent is inserted into the space.

In the case of the test with "acoustical barrier", mattresses of mineral wool are installed below the partition under the floor, over a width of 50 cm.

The floor slabs supporting the partition remained the same for all the tests (floor slabs of the type 4x4 - C4TTJO).

A more complete description of the installation is given in §3.





1.2. Procedure

The sound source is constituted by the standardised tapping machine with steel-headed hammers; it is positioned in five different spots chosen at random in the "emission room" at a distance of at least 80 cm from the walls and such that the axis of the machine is positioned differently vis-à-vis the floor from one location to the next. There are no diffusing elements.

The acoustical field is sampled, in the reception (i.e. adjacent) room, with the aid of a microphone attached to a rotating arm. One complete rotation takes 64 seconds and corresponds to the integration time of the measurement. The measurement is repeated in another plane.

This procedure is then repeated by reversing the emission and reception rooms. The value indicated for the technical floor normalized impact sound pressure level between rooms equipped with the technical floor is noted as $L_{n,f}$ (the index f indicates the floor). This is the arithmetic average of the two results of normalized impact sound pressure level L_n .

It is given by the relationship :

$$L_n = L_{pm} + 10 \log_{10} \frac{A}{A_0} \quad \text{en dB}$$

where :

L_{pm} : is the level of the average quadratic acoustical pressure in the reception room, expressed in dB;

A : is the equivalent absorption in the reception room. It will be calculated as of reverberation time T (in seconds) in the reception room (of volume V in m^3), using the Sabine formula : $A = 0.16 V/T$

A_0 : is the reference absorption area taken, equal to $10 m^2$.

2. MEASUREMENT EQUIPMENT

- A noise generator - Bruël and Kjær - type 1405;
- An equaliser Klark Teknik DN 27;
- A power amplifier STUDER A 68;
- A loudspeaker - BOSE 802;
- Two microphones - Bruël and Kjær - type 4165 with preamplifier BK 2639 and power supply BK 2804;
- Two rotating arms - Bruël and Kjær - type 3923;
- A piston phone - Bruël and Kjær - type 4220;
- A digital frequency analyser - Bruël and Kjær - type 2131;
- A BMX computer, IBM compatible with IIP plotter.





3. DESCRIPTION OF THE TEST INSTALLATION

The entire test installation (floor and partition) was created by DYNABAT, rue des Champles, 50 B- 1301 - Biorges Wavre.

The JVP brand floor slabs are installed on a finished height of 14 cm and on a surface of $\pm 22 \text{ m}^2$ (see sketch in figure 5). The installation includes the slabs and jackscrews described in detail below. The barrier and the carpet used are also described. These descriptions were provided by DYNABAT.

The partition described in § 1.1 is placed on this floor upon the separation of the two transmission chambers.

3.1 Description of the slabs

3.1.1. JVP brand type 4x4 - CATTJO

The panels have a dimension of 600/600 mm and are 29 mm thick. A total jacketing in 0.5 mm galvanised steel was performed. The 4 sides of the slabs include a peripheral reinforcement integrated by a quadruple fold of galvanised sheet.

N.B. : The slabs have a mass of $10.0 \pm 0.1 \text{ kg}$ per slab.

3.2 Description of the jackscrews with a height of 100 mm.

The jackscrews are made of a BACO metal material of type 70/56 NB/2.

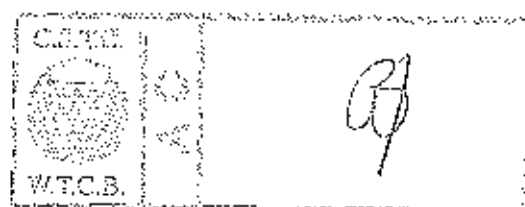
They are attached to the concrete support by a two-component epoxy adhesive.

3.3 Description of the acoustical barrier

The acoustical barrier - 500 mm wide and 80 mm thick, at the base of the partition - was created with the aid of mattresses of rock wool of the Rockwool-Rockfon Soundstop RH-95 type weighing 70 kg/m^3 and installed between the concrete floor and the slabs of technical floor.

3.4 Description of the carpet

Brand:	Louis De Poortere
Type:	Missouri II Com.
Dimensions:	50 cm x 50 cm
Weight of the pile:	735 g/m^2
Back:	Bitumen





4. DESCRIPTION OF THE TESTS PERFORMED

Four different test conditions formed the object of measurements of the normalized impact sound pressure level of the technical floor.

The following table includes the four configurations tested on 22 March 2000, and gives the ambient conditions of the measurements:

test $D_{n,f}$ and figure	Characteristic	temperature (°C)	Atmosph. pressure (hPa)	relative humidity (%)
N°1	with barrier, with carpet	20	1013	57
N°2	with barrier, without carpet	20	1013	57
N°3	without barrier, with carpet	21	1006	54
N°4	without barrier or carpet	21	1006	54





5. RESULTS OF THE MEASUREMENTS

The figures 1 to 4 include the results of measurements performed i.e. the spectrum of the normalized impact sound pressure level of the technical floor as a function of the frequency by thirds of an octave from 100 to 5000 Hz. Each third is represented by its rated frequency (in Hz).

The following table gives the spectrum of the normalized impact sound pressure level acoustical insulation measured between the two rooms provided with the technical floor with plenum, equipped or not with barrier, with or without carpet, as indicated.

Rated frequency 1/3 octave (Hz)	Normalized impact sound pressure level between rooms with technical floor (dB)			
	D_{nT}			
	Test Nber 1	Test Nber 2	Test Nber 3	Test Nber 4
100	60.0	60.6	67.2	69.5
125	56.3	61.7	64.3	73.2
160	55.6	63.9	63.1	75.6
200	49.8	60.8	57.2	72.7
250	48.1	62.3	52.6	71.2
315	43.2	60.2	47.8	69.1
400	38.1	57.6	46.2	71.6
500	35.6	60.0	43.5	71.7
630	29.2	57.5	37.2	72.9
800	24.7	57.0	30.8	71.8
1000	21.2	57.0	25.0	68.9
1250	17.0	53.9	21.1	62.7
1600	11.9	46.8	18.8	55.7
2000	09.5	41.8	17.1	52.7
2500	09.0	37.5	16.1	52.5
3150	08.4	30.6	15.1	46.0
4000	09.1	21.4	14.4	41.0
5000	09.3	19.0	14.8	39.0





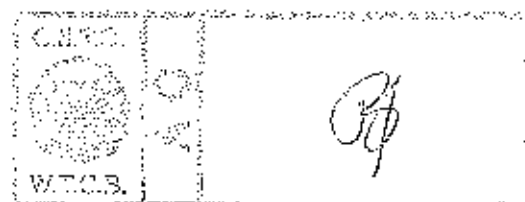
6. INTERPRETATION OF THE RESULTS

The following table summarises the situations measured and gives the criteria obtained :

- the category obtained (for L_{n0}) following the standard NBN S01-400;
- the weighted pressure level of the weighted/normalized impact sound pressure level $L_{n,f,w}$ obtained according to the international standard ISO 717-Part 2;
- the normalized impact sound pressure level in dB(A) according to the French standard NF S31-052.

Reference standard	Category and insulation indices	Test N°1	Test N°2	Test N°3	Test N°4
NBN S01-400	category (L_n)	I_a	II_a	III_a	III_a
ISO 717-2	$L_{n,f,w}$ (C) in dB	46 (2)	57 (-1)	53 (2)	69 (-1)
NF S31-052	L_n pink dB(A)	48.2	64.8	55.2	77.4

17/4/2000 1799/-



Normalized impact sound pressure levels according to ISO 140-6
Laboratory measurements of impact sound insulation of floors

L_n

Laboratory measurement following:

EN ISO 140-6 (1998)

Rating following:

ISO 717-2 (1986)

Requested by:

-Joint Venture Production S.r.l. -
 I- 33028 - Piove di Sacco - Italy

R.: L300 WAVRE

Drawing:

PV: AC 3107-E
 File: DE 631x857

Date:

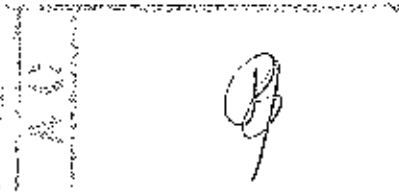
4/17/2000

L_n
dB

f
Hz

Test description:

Hall K - Cells C1 & C2 - 1342 LIMBLETT
 Arithmetic average of floor L_n measures with barrier and carpet
 Test number: 1



NRN S01-400
 cat. Ia

EN-ISO 717/2

$L_{n,w} = 46$ dB

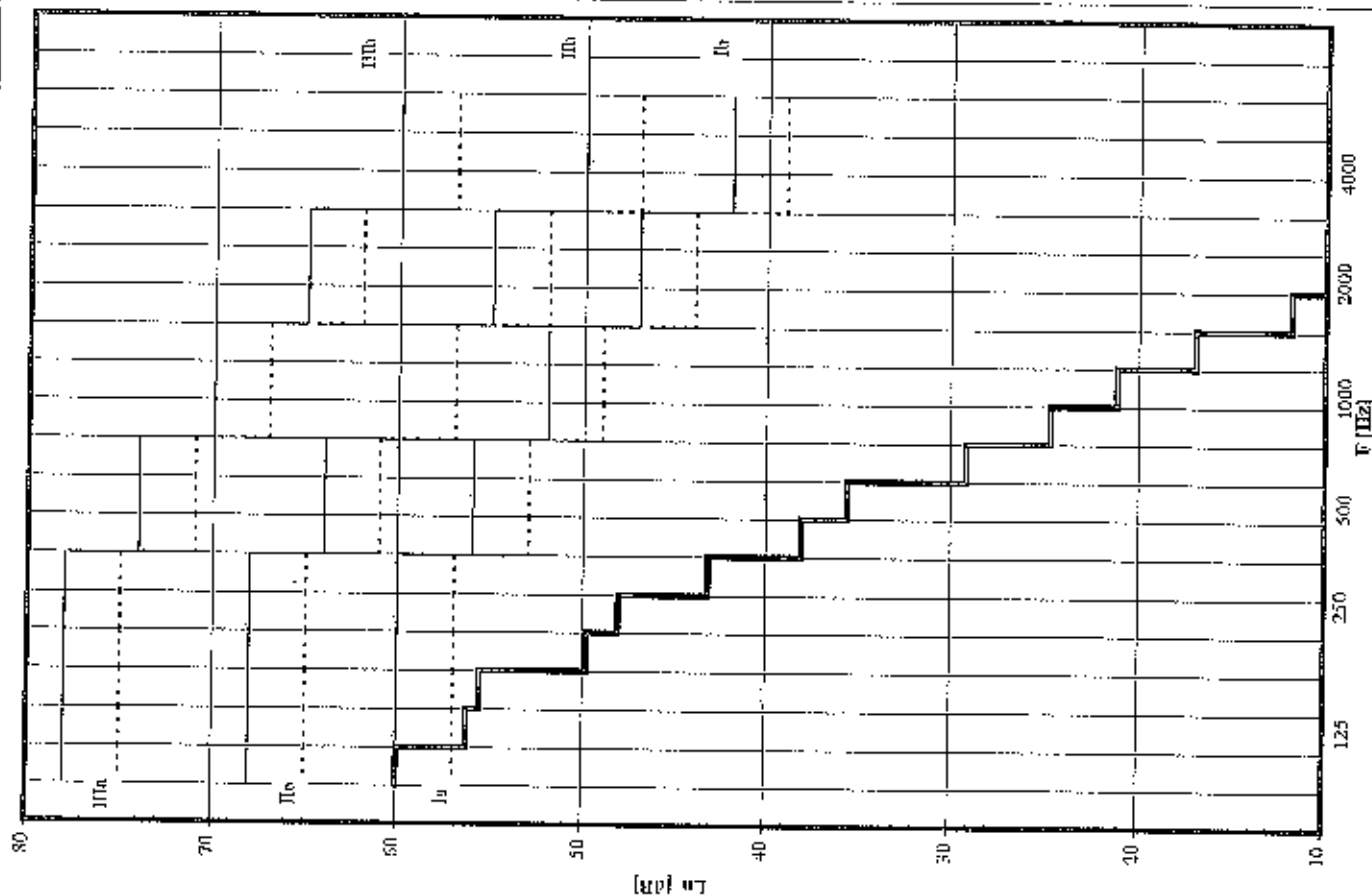
$C_1 = 2$ dB

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Normalized impact sound pressure levels according to ISO 140-6
Laboratory measurements of impact sound insulation of floors

L_n

Laboratory measurement following:

EN ISO 140-6 (1998)

Rating following:

ISO 717-2 (1996)

Requested by:

-Joint Venture Production S.r.l.
 I- 35028 - Piove di Sacco - Italy

U_n - 1300 WAVRE

Date:

4/17/2000

By:

AC 3207-E

File:

DE 6318657

Test description:

Hall K - Cells C1 & C2 - 1342 LIMELLETTA

Arithmetic average of floor L_n measures with barrier, without carpet

Test number 2



AC

BA

L_n

dB

F

Hz

100

60,6

125

61,7

160

63,9

200

66,8

250

62,3

315

60,2

400

57,6

500

60,0

630

57,5

800

57,0

1000

57,0

1250

53,9

1600

46,8

2000

41,8

2500

37,5

3150

30,6

4000

21,4

5000

19,0

NBN 501-400

cat. IIa

EN-ISO 717/2

L_{n,ref} = 57 dB

C₁ = -1 dB

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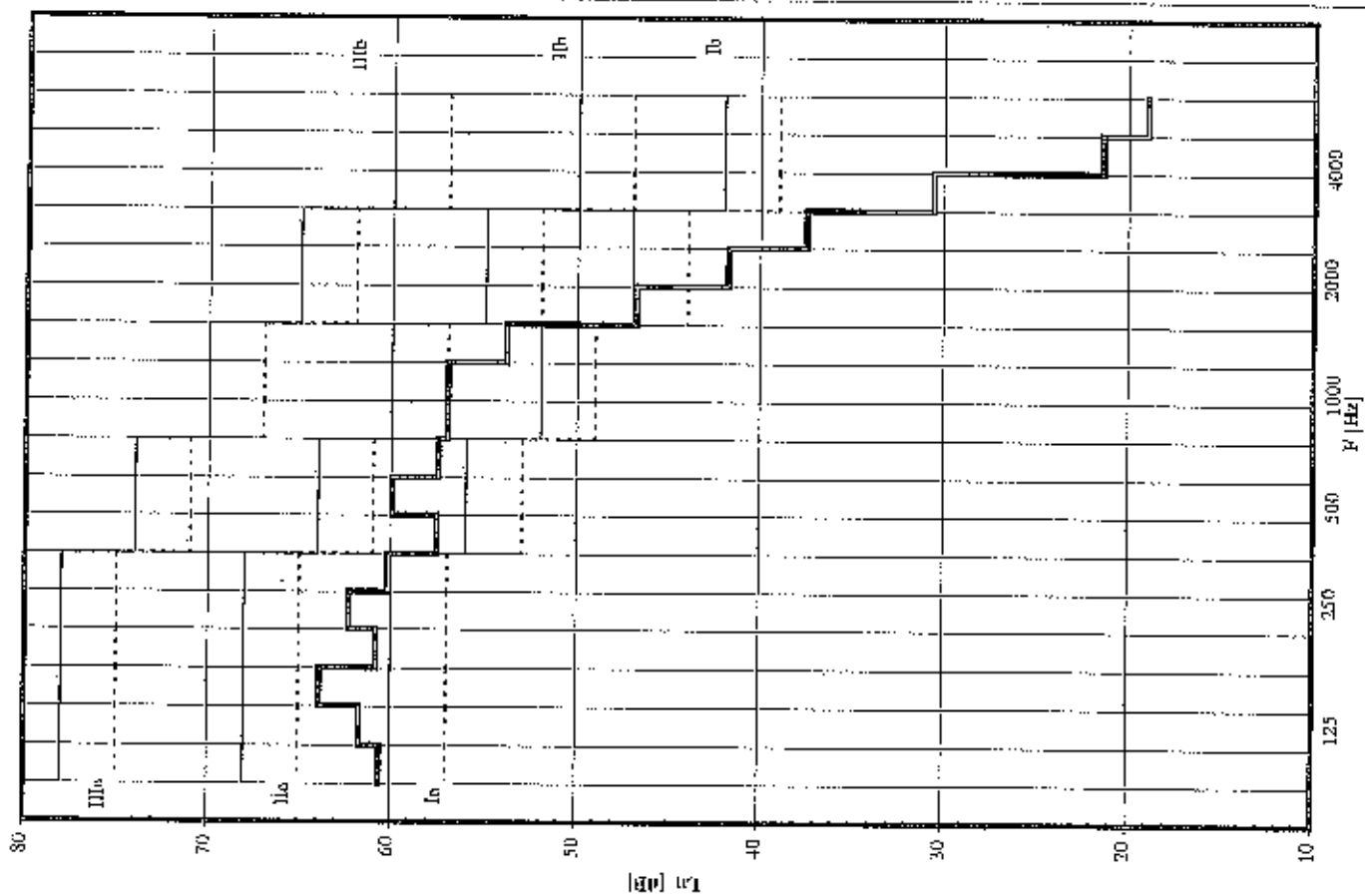
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Normalized impact sound pressure levels according to ISO 140-6
Laboratory measurements of impact sound insulation of floors

L_n

Laboratory measurement following:

EN ISO 140-6 (1998)

Rating following:

ISO 717-2 (1996)

Requested by:

-Joins Venture Production S.r.l. -
I-35028 - Fieve di Sesto - Italy

B-1300 WARE

Date:
Date:

4/17/2000

CV:
File:

AC 5207-E
LSE 631x857

L_n
dB

F
Hz

Test description:

Hall K - Cells C1 & C3 - 1342 LIMELETTE

Arithmetic average of floor L_n measures without barrier, with carpet

Test number 3



Signature

NBN S01-400
cat. IIa

EN-ISO 717/2

$L_{n,T} = 53$ dB

$C_T = 2$ dB

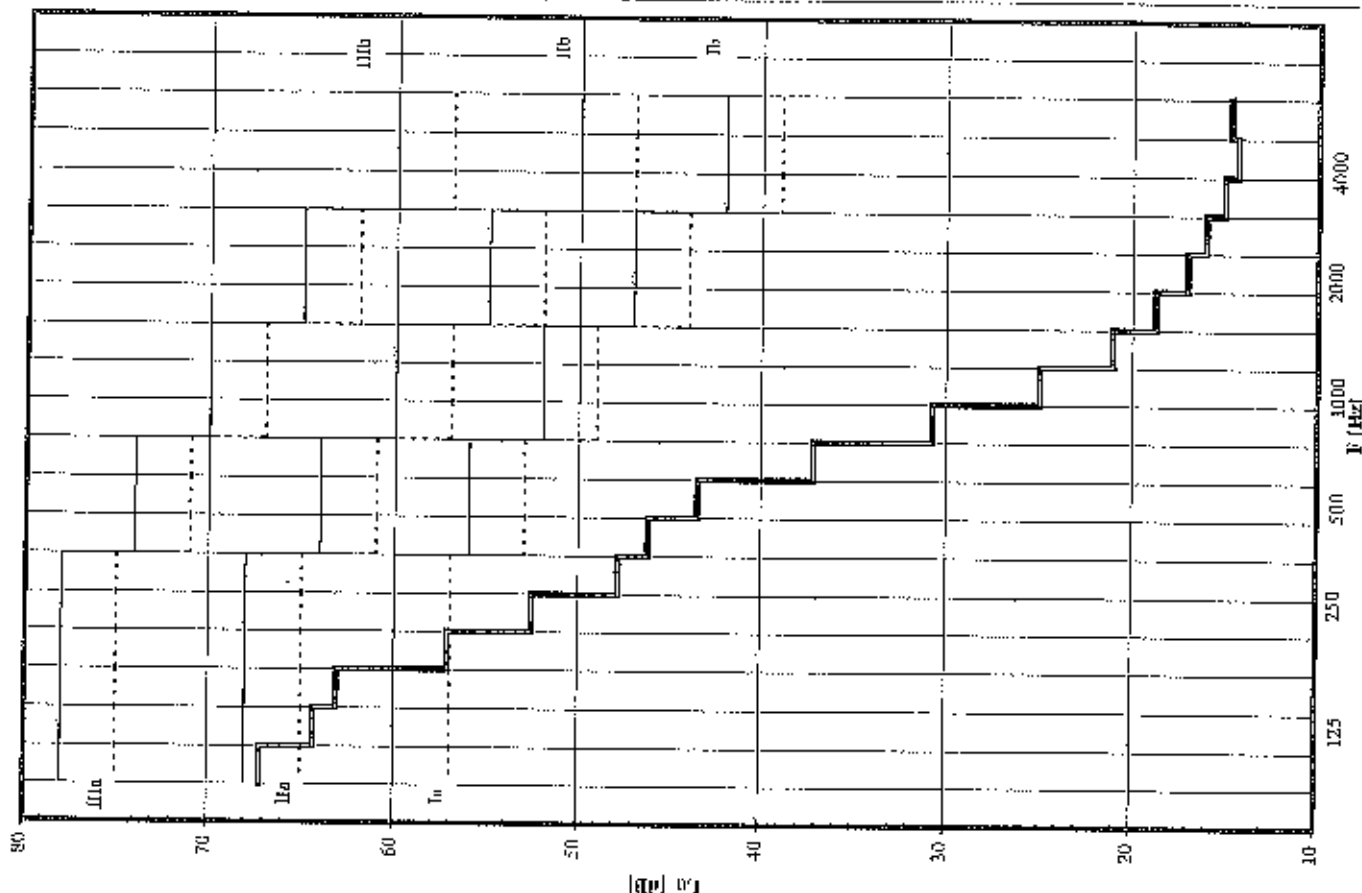
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Normalized impact sound pressure levels according to ISO 140-6
Laboratory measurements of impact sound insulation of floors

L_n

Laboratory measurement following:

EN ISO 140-6 (1998)

Rating following:

ISO 717-2 (1995)

Requested by:

- Joint Venture Production S.r.l.
I-35024 - Piove di Sacco - Italy

B-1300 WAVRE

Building
Date:

4/11/2000

PV:

AC 3207-DE
DR 631x857

L_n
dB

F
Hz

Test description:

H&O K - Cells C1 & C2 - 1342 LIMELETTE

Arithmetic average of floor L_n measures without barrier, nor carpet

Test number 4



B

NBN S01-100
cat. 111a

EN-ISO 717/2

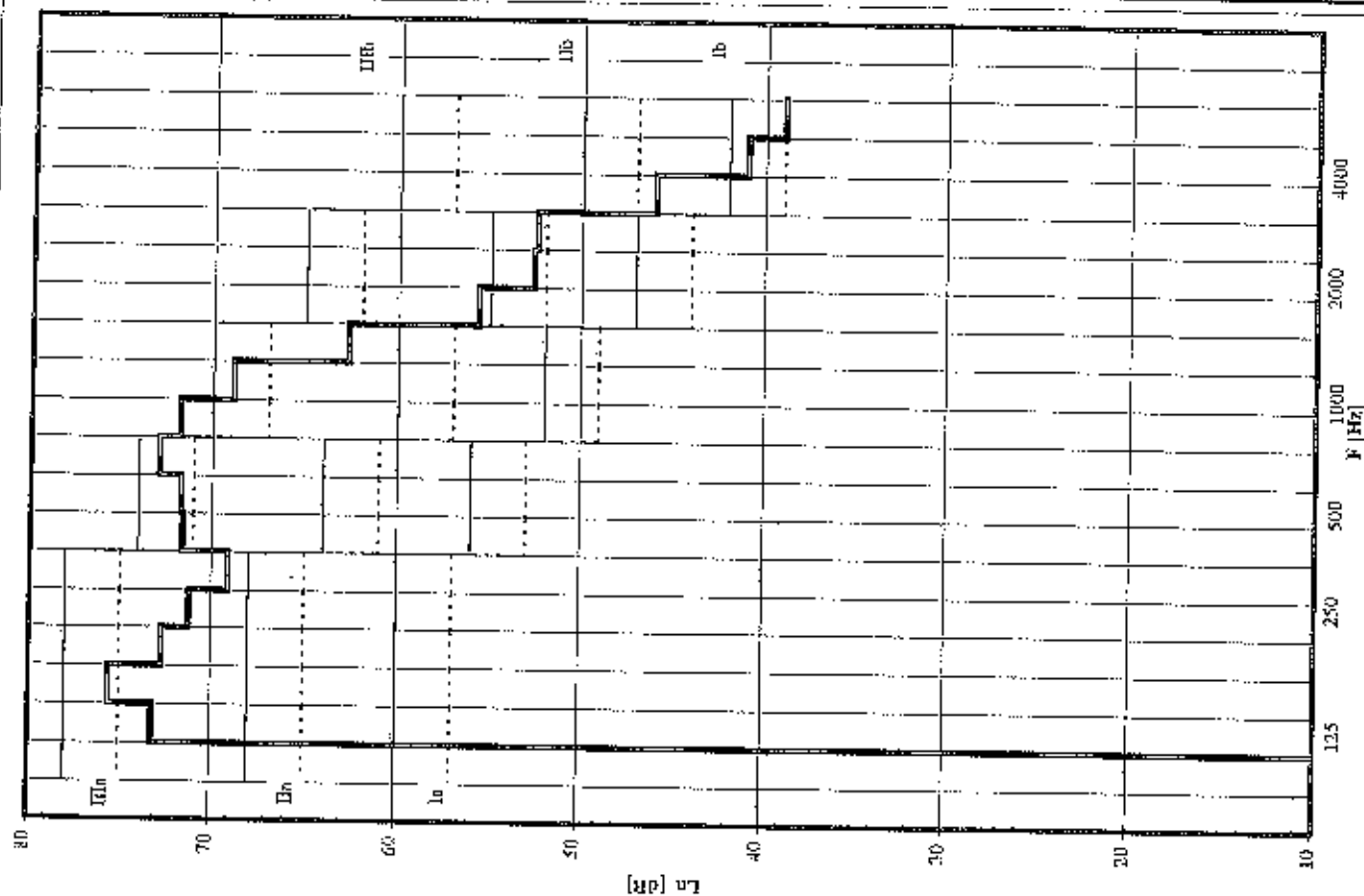
$L_{n,pn} = 49$ dB
 $C_t = -1$ dB

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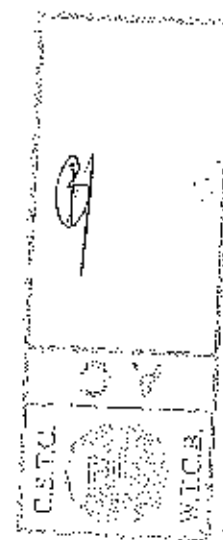
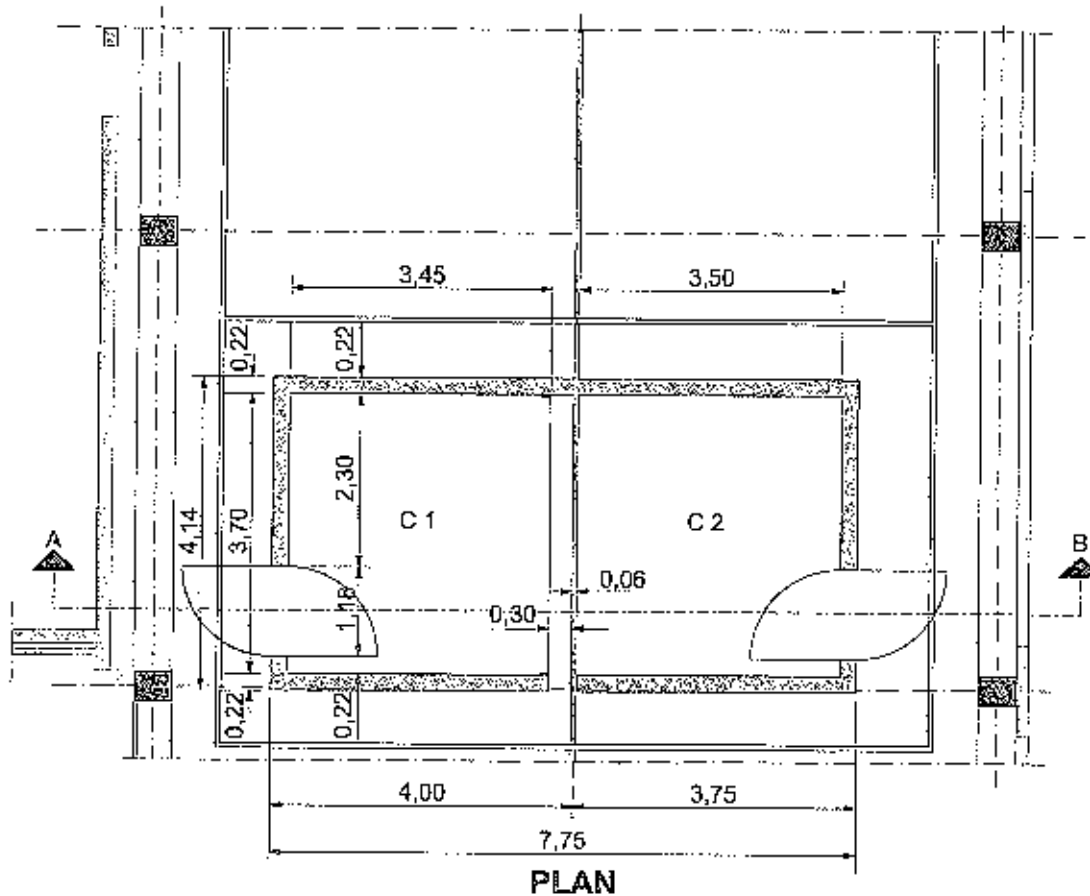
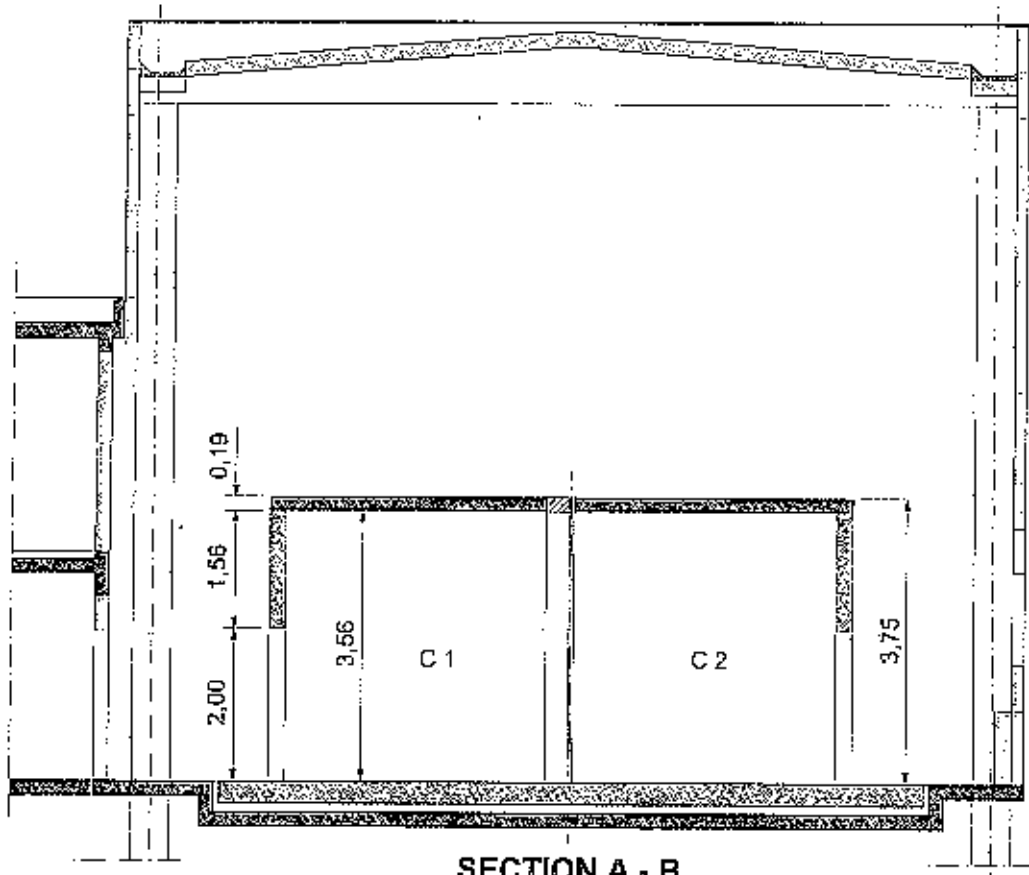


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BUILDING K : Measuring cells C



BUILDING K
GROUND FLOOR

