Ontwikkelingsmaatschappij Fortuinlijk Wonen BV (OFW)

Donaustraat 176 8226 LC Lelystad Nederland

Tender Document	Timber frame construction
Project	School building, 2 storey, for 160 students
Client	MFI International, Holland Station 24, 6063 NP Vlodrop, The Netherlands
Project Management	OFW, Station 24, 6063 NP Vlodrop, The Netherlands Christian Schweizer, independent architect and city planner Station 24, 6063 NP Vlodrop, Nederland Tel. +31 475538539
Architect	Alberto Castaño, freischaffender Architekt MERU, Station 24, 6063 NP Vlodrop, Nederland sthapatyaveda@web.de Tel. +31 475538541
Building sites	Austria, Belgium, Bosnia-Herzegovina, Bulgaria, Denmark, Greece, Hungary, Latvia, Portugal, Serbia and Sweden
Date	May 29, 2007

Deadline for offers	
Likely date start of work	June 2007
Proposed finishing date	December 2007

Ontwikkelingsmaatschappij Fortuinlijk Wonen BV (OFW)
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Content

1. Tender Document and building description
2. Architectural drawings scale 1/100
3. Detail drawings scale 1//20 and 1/10
4. Preliminary structural calculation
5. Preliminary heat protection and energy balance calculation

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Project data and design description

Private school with 8 classrooms in first and second floor, 20 students each, total 160 students
Recreation and gymnastic halls in the ground floor (entrance floor)
The main building material will be insulated wooden timber frame cassettes
Rectangular footprint of a 3 storey building L/W = 33,18 / 12,78 m, H = 11,82 m
Façade modular system 1,70 m
1° Inclined roof with bitumen covering
Arched windows, 0,90 / 1,80 m
Load capacity of the existing soil: 200 KN/m^2 (assumed)

Fire protection

The central exhibition hall and the stair cases are supposed to be the main "fire compartment" and should be built in the quality F90B (German fire protection standards), including surrounding walls, ceilings, doors, glass panels and stairs, inclusive of all fittings, handles, smog window / smoke detector etc.

Requirements and basis for price calculations

Turn key offer for buildings ready for immediate use
The offer should be cost-free
Basis for calculations are the attached drawings and calculations and the present building description
The construction must certificate the basic approval of the building type and the used materials in the corresponding export country

Turn key concept components

Take over of the project, work planning and engineering
Production of the building in the local factory
Transport to the corresponding country
Erection of the elements on the locally prepared foundation
Functionality proof and hand over of the project

Contents of the tender

Description and / or pricing for the used tender components:

1. Building elements as complete work, rough and finishing's:
   walls, ceilings, roof trusses, covering and plumbing work, dome with 2 windows, stairs, railings, windows, doors
2. Technical installations:
   electricity, heating, ventilation, sanitary installations
3. Engineering:
   structural calculation, energy balance certificate (European energy conservation directive), heating / ventilation power calculations and dimensioning, heat, fire and acoustical insulation proof standards, building site security plan
4. Certificate standards, like:
   ISO 9001, RAL, etc.
5. Capacity:
   maximal production capacity of the company in terms of "number of houses production per day", or similar, should be mentioned in the offer
6. Export, VAT and further custom regulations:
   information of the current situation, VAT rates etc. should be explicitly mentioned in the offer

Ontwikkelingsmaatschappij Fortuinlijk Wonen BV (OFW)

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Material building description - premises

NATURAL MATERIALS FOR HEALTH PROMOTING BUILDINGS
In our building projects we are favoring the following materials:

WALLS
Recommended: timber, clay, bricks, porotone, liapore (or leca), natural stone
Acceptable: cellular concrete (Ytong or Siporex)
Not acceptable: steel, plastic, reinforced concrete

WALL AND ROOF INSULATION
Recommended: flax, paper wool, timber wool, wood fibber board, sheep wool,
Acceptable: mineral wool (rock wool), cellular concrete
Not acceptable: styrofoam or polystyrol

DOORS AND WINDOWS
Recommended: solid wood
Acceptable: PVC window frames, aluminium frames
Not acceptable: steel (except for fire regulations)

SURFACE MATERIALS
Recommended: marble and other natural stone, wooden pannels, plywood, gypsum board, plaster, stucco, ceramic tiles, clay, wall paper
Acceptable: artificial marble
Not acceptable: steel, plastic, pure cement plaster

ROOF SURFACE
Recommended: ceramic tiles, wooden shingles, stone slate or antracit, tar paper,
Acceptable: cement tiles, zinc and copper plate in small amount
Not acceptable: steel sheet

PAINTS IMPREGNATORS AND GLUES
Recommended: natural oil paint, caseine, wax, varnish, white cement glue
Acceptable: borax salt
Not recommended: all synthetic paints and glues

ELECTRICITY
Recommended: shielded cables and soccets, grounded installation
Not acceptable: non-shielded cables and nongrounded intallations

WATER PIPES
Recommended: copper pipes, composite (PE + aluminium) and PP-pipes
Acceptable: other non-toxic and cecyclable plastic pipes

BEARING STRUCTURE AND REINFORCEMENT
Recommended: mixed glass or carbon fibber cement, glassfibber rod reinforcement.
Steel structures and steel reinforcement should be avoided wherever possible.
Acceptable only in exceptional situations.

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Material building description – rough work

Plinth

Build out of the concrete foundation (plastered) and the outer door base with wooden wool panels to build the designed profiles acc. to elevation and section drawings

Outer Walls

Timber frame cassettes containing: inner gypsum board on OSB board, incl. inner installation space, 140 mm studs (i.e. German KVH-wood), mineral wool insulation, outer wooden wool panels (i.e. Heraklith) as bearing panel for plastering work, installed upon bituminous isolation strips on concrete slab. Outer plaster in two layers total thickness 2,5 cm.

Entablature profiles and facia boards

With wooden wool panels to build the designed profiles acc. to elevation and section drawings incl. sealing and coating to exterior walls

Inner Walls

Both sides gypsum board on OSB board on 65 or 80 mm studs, acc. to wall thickness (i.e. German KVH-wood), mineral wool insulation acc. to fire protection regulations, incl. installation pipes and bituminous isolation strips on concrete slab

Roof

Roof trusses in drayed, untreated composite wooden trusses (i.e. German KVH-wood) resting on outer walls and inner wooden laminated beams, incl. inner wind protection foil as vapor barrier (Tyvek foil, bitumen layer o.s.), mineral wool insulation with inclined upper side, etc. Plumbing in zinc work incl. all gutters, vertical pipes and overflows. Dome in wooden construction and zinc work and pedestal for crowning element (ornament will be supplied by client)

Stairs

In wood construction (or acc. To local regulations), with wooden handrail (F90B) construction, bottom side in exposed quality, top side prepared for laying of linoleum floor coverings, handrail in corresponding construction, all acc. to fire protection regulations.

Ceilings

Timber frame cassettes containing: downsides double gypsum board on acoustical metal profile, wood construction of 240 mm beams (or acc. to static) + mineral wool insulation, acc. to fire protection regulations, upper OSB board for the flooring work.

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Material building description - Finishing's

Windows

Wooden windows, white painted, single opening wings or double openings (arch windows), double glazing, minimum U-value 1.1 W/m2K, glass panes: design according to elevation and detail BD3, inclusive of all fittings, handles in brass, to be chosen by client. Roller shutter casing elements for sun protection incorporated in the wall.

Outer anti-fall guardrails for windows

Handrail in 90 cm height over floor level, in galvanized steel, like in detail drawing BD2.

Window sills

External aluminum window sills
Internal coated wood window sills

Doors

Wooden doors, painted white, one opening wing, double glazing, inclusive of all fittings, handles in brass, to be chosen by client

Flooring ground floor

Horizontal bituminous isolation on existing concrete slab, 10 cm mineral floor insulation plates, Pe-Foil 0,5mm, 70mm floating screed,

Flooring other floors

50mm floating floor out of gypsum board on wooden fiber board on OSB board, mineral wool insulation between the beams.

Natural Linoleum floor

On all floors except rest rooms, incl. all extra work and connections, skirting boards, incl. all necessary grouting

Painting

Plastering and painting of inner and outer side of exterior walls and of inner wall, as complete work, incl. all necessary pre-treatments, all connections and expansion joints,
Natural color on water basis, pigment to be chosen by the client.

Dividing walls for bathrooms

Height 2300 mm, incl. 150 mm air space at foot level, pass line height 2000 mm, incl. all doors, ceramic plates and tiles with a coated surface incl. cup board.

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Description technical Installations

Sanitary

Complete sanitary installation

For 5 WC units, 2 pissoirs, 5 sinks, incl. all pressure pipes, supplier's service installation (water meter). Quality of the chosen materials to be of medium standard, incl. 3 mirrors 100x50cm

Heating

Complete heating system

Central gas-fired law temp. heating system ca. 30 KW, incl. all pressure pipes, supplier's service installation (gas meter). Quality of radiators and other chosen materials to be of medium standard.

Central hot processed water production storage boiler with heat protection device, heating pipe circuits, supplier's service installation (gas meter) according to calculation

Radiator with flat valve and pipe connections, white colour

Electrical

Complete electrical installation

Equipment with shielded cables, including grounding and lightening conductors, electric installation and supplier's service installation (electricity meter).

Quality of the chosen materials to be of medium standard.

Lighting

32 ceiling lamps for classrooms
6 ceiling lamps for exhibition halls
1 candelabra hanging down in the center (dome)
16 ceiling lamps for exercise halls
4 ceiling lamps for teachers room
6 ceiling lamps for WC
4 ceiling lamp for the entrance hall
4 ceiling lamps for library room
6 ceiling lamps for computer rooms

Switches

55 combinations switch and socket, 13 single sockets, including covering plates,
Lighting: one outdoor lamp in each window arch, 6 spots under porch roof. Quality of the chosen lamps medium standard and

Ventilation

Consumed-air-extracting ventilation system, with heat exchanger (heat devolution for energy savings), no airconditioning, but just gradual air extracting system.

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Tender Document Timber frame construction
Project School building 2-storey for 200 students

Name of the company……..

Address of the company…….

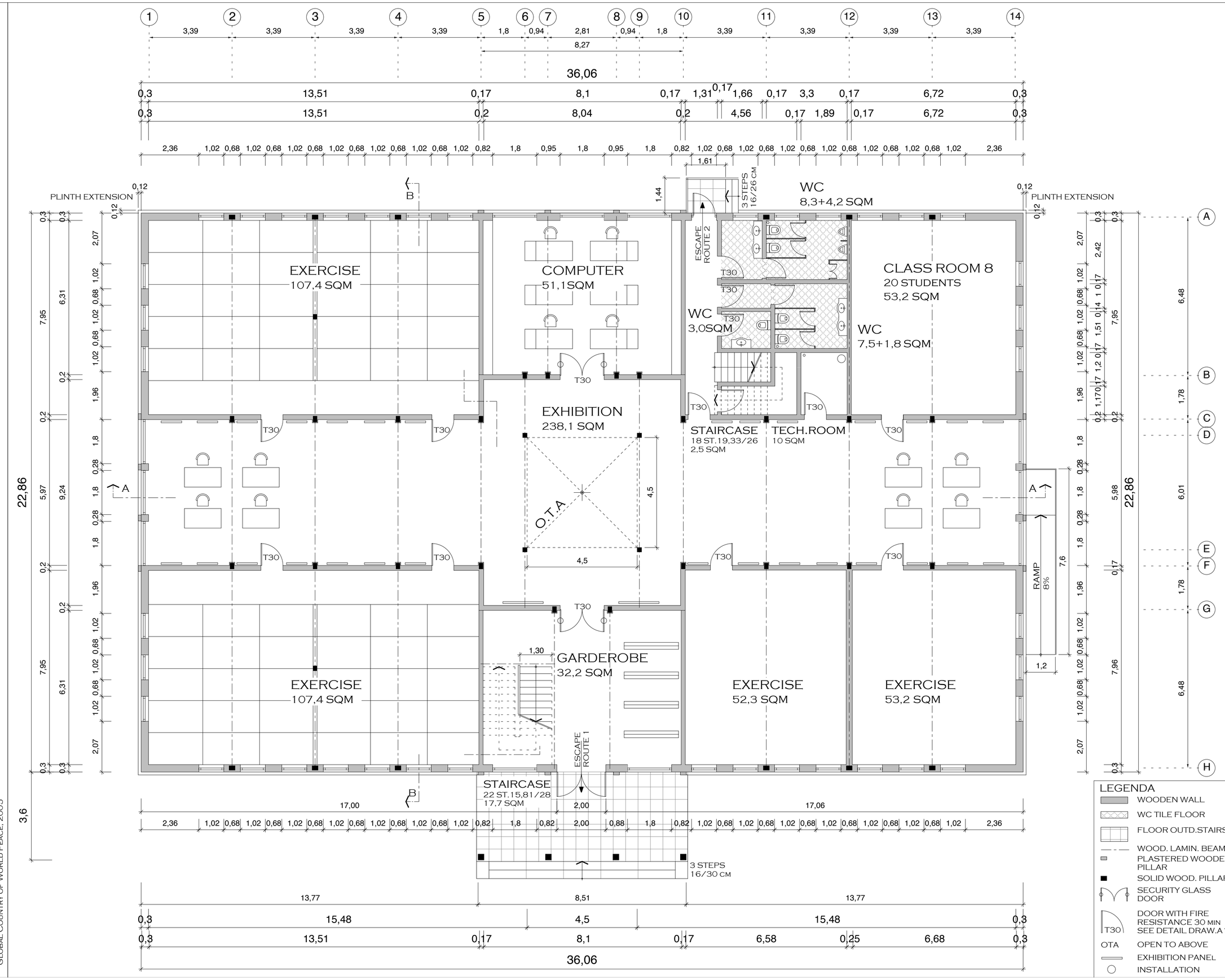
Total net price for 1 school building…… Euro

Total gross price for 1 school building…… Euro

Included VAT……% (if applicable)…… Euro

Location…… **Date** ……..…..

Signature……



MAHARISHI INVINCIBILITY SCHOOLS

LOCATION

CLIENT
Ontwikkelingsmaatschappij
Fortuinlijk Wonen BV. (OFW)
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BUILDING COMPANY
Tel.

BUILDING SITE MANAGER
Tel.

STRUCTURAL ENGINEERING
Tel.

OFFICIAL SURVEYOR
Tel.

HOUSE TECHN. ENGINEERING
Tel.

PARAMETERS

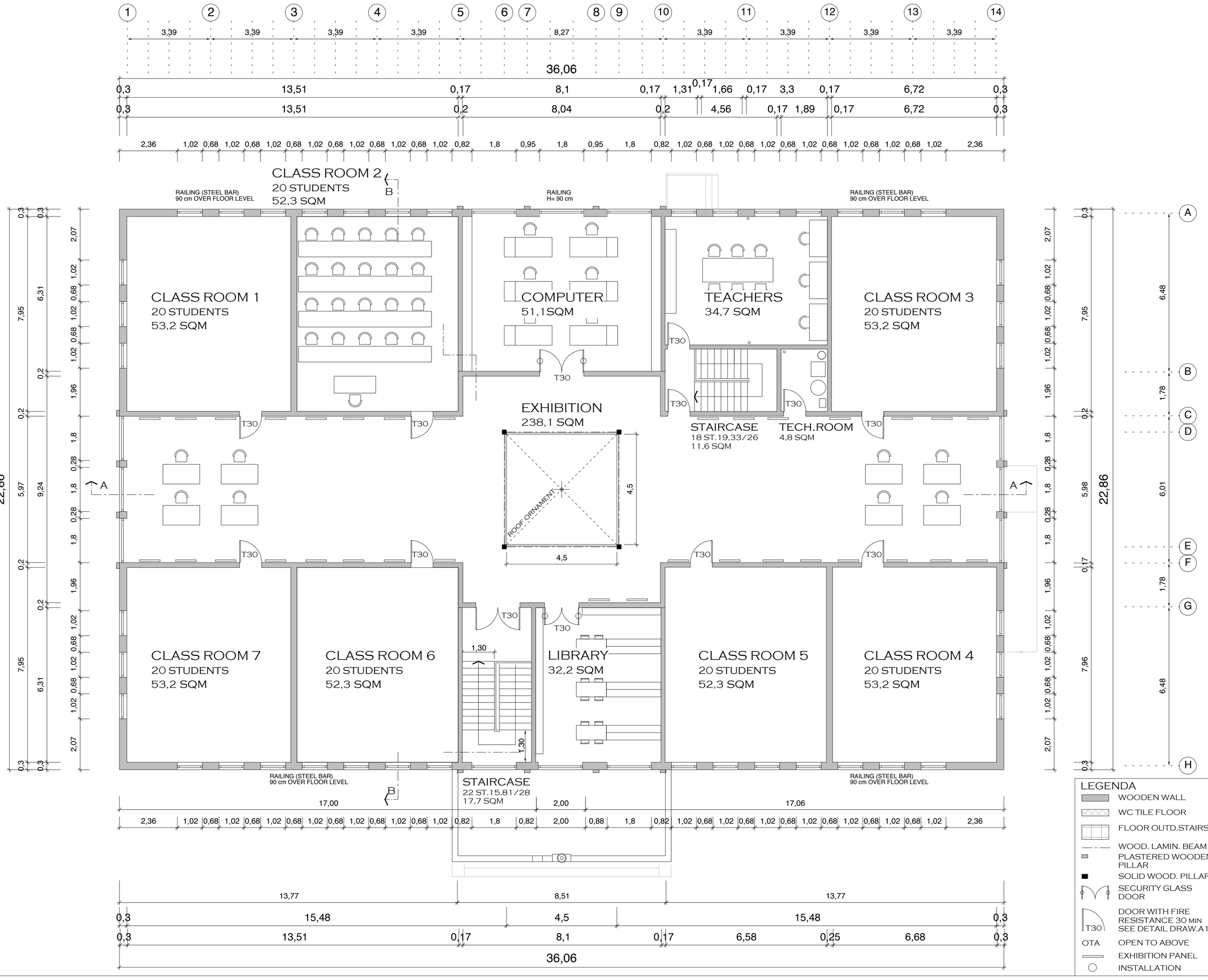
FFL-GF	0,00 m
-Finish Floor Level Ground Floor-	
FFL-FF	+3,48 m
-Finish Floor Level First Floor-	
Terrain	-0,48 m
-Finish Floor Level Soil-	
FFL-W	+4,38 m
-Finish Floor Level Window-	
Flat Roof Slope	ca.1°
MODULE	m
Outer Wall Thickness	0,30 m
Class Room Wall Th.	0,25 m
Ceiling Thickness	0,42 m

ALL DIMENSIONS TO BE VERIFIED BY THE STRUCT. CALCULATIONS

LEGENDA
- WOODEN WALL
- WC TILE FLOOR
- FLOOR OUTD.STAIRS
- WOOD. LAMIN. BEAM
- PLASTERED WOODEN PILLAR
- SOLID WOOD. PILLAR
- SECURITY GLASS DOOR
- T30 DOOR WITH FIRE RESISTANCE 30 min SEE DETAIL DRAW.A10
- OTA OPEN TO ABOVE
- EXHIBITION PANEL
- INSTALLATION

PRELIMINARY PROJECT
GROUND FLOOR

Scale 1/100	Design CA.
Date 31.05.2007	Change
Drwg. Nr. A1	N



MAHARISHI INVINCIBILITY SCHOOLS

LOCATION

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PARAMETERS

FFL-GF	0,00 m
-Finish Floor Level Ground Floor-	
FFL-FF	+3,48 m
-Finish Floor Level First Floor-	
Terrain	-0,48 m
-Finish Floor Level Soil-	
FFL-W	+4,38 m
-Finish Floor Level Window-	
Flat Roof Slope	ca.1°
MODULE	m
Outer Wall Thickness	0,30 m
Class Room Wall Th.	0,25 m
Ceiling Thickness	0,42 m

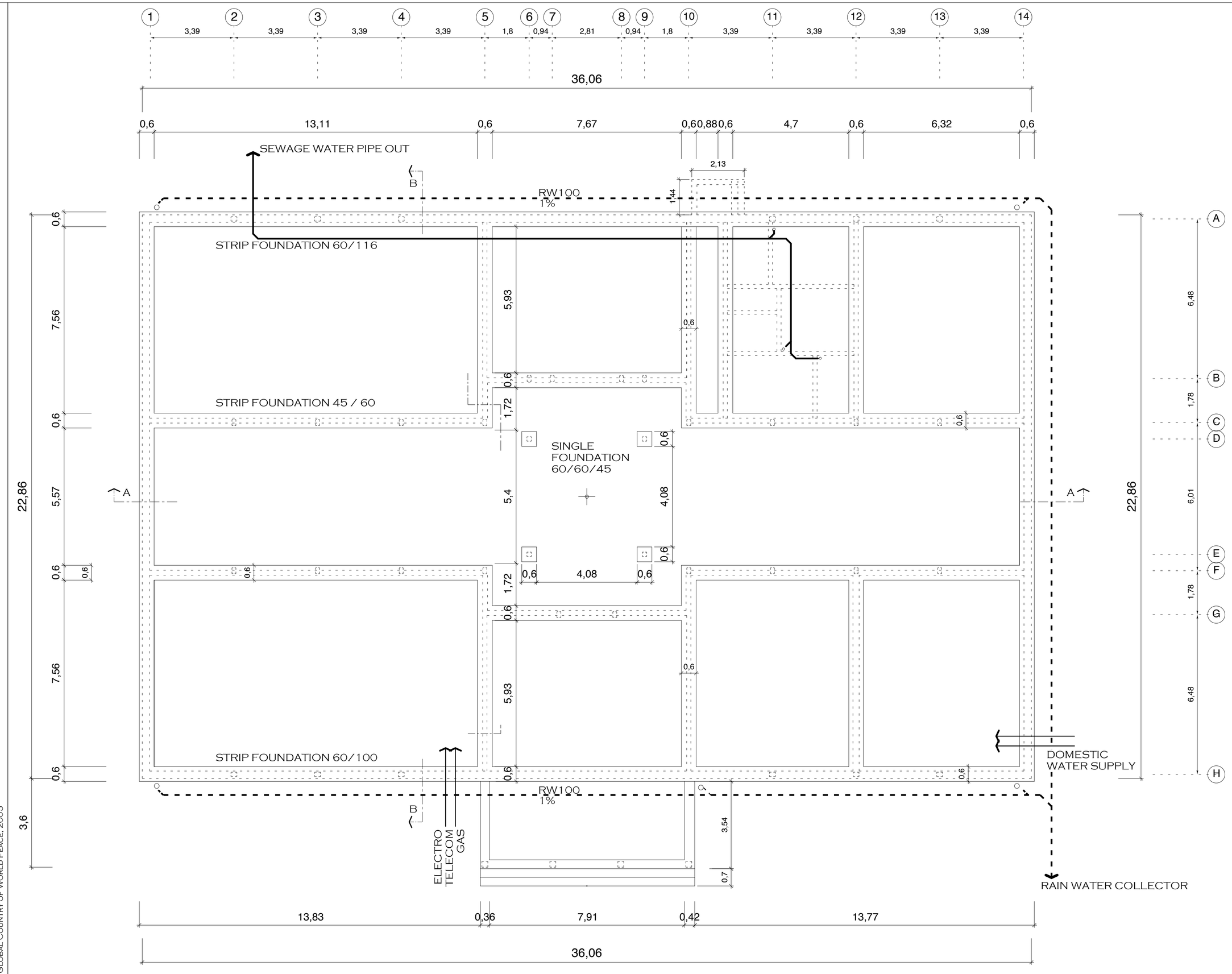
ALL DIMENSIONS TO BE VERIFIED BY THE STRUCT. CALCULATIONS

LEGENDA

- WOODEN WALL
- WC TILE FLOOR
- FLOOR OUTD.STAIRS
- WOOD. LAMIN. BEAM
- PLASTERED WOODEN PILLAR
- SOLID WOOD. PILLAR
- SECURITY GLASS DOOR
- T30 — DOOR WITH FIRE RESISTANCE 30 MIN SEE DETAIL DRAW.A10
- OTA — OPEN TO ABOVE
- EXHIBITION PANEL
- INSTALLATION

PRELIMINARY PROJECT
FIRST FLOOR

Scale 1/100	Design CA.
Date 31.05.2007	Change
Drwg. Nr. A2	N



MAHARISHI INVINCIBILITY SCHOOLS

LOCATION

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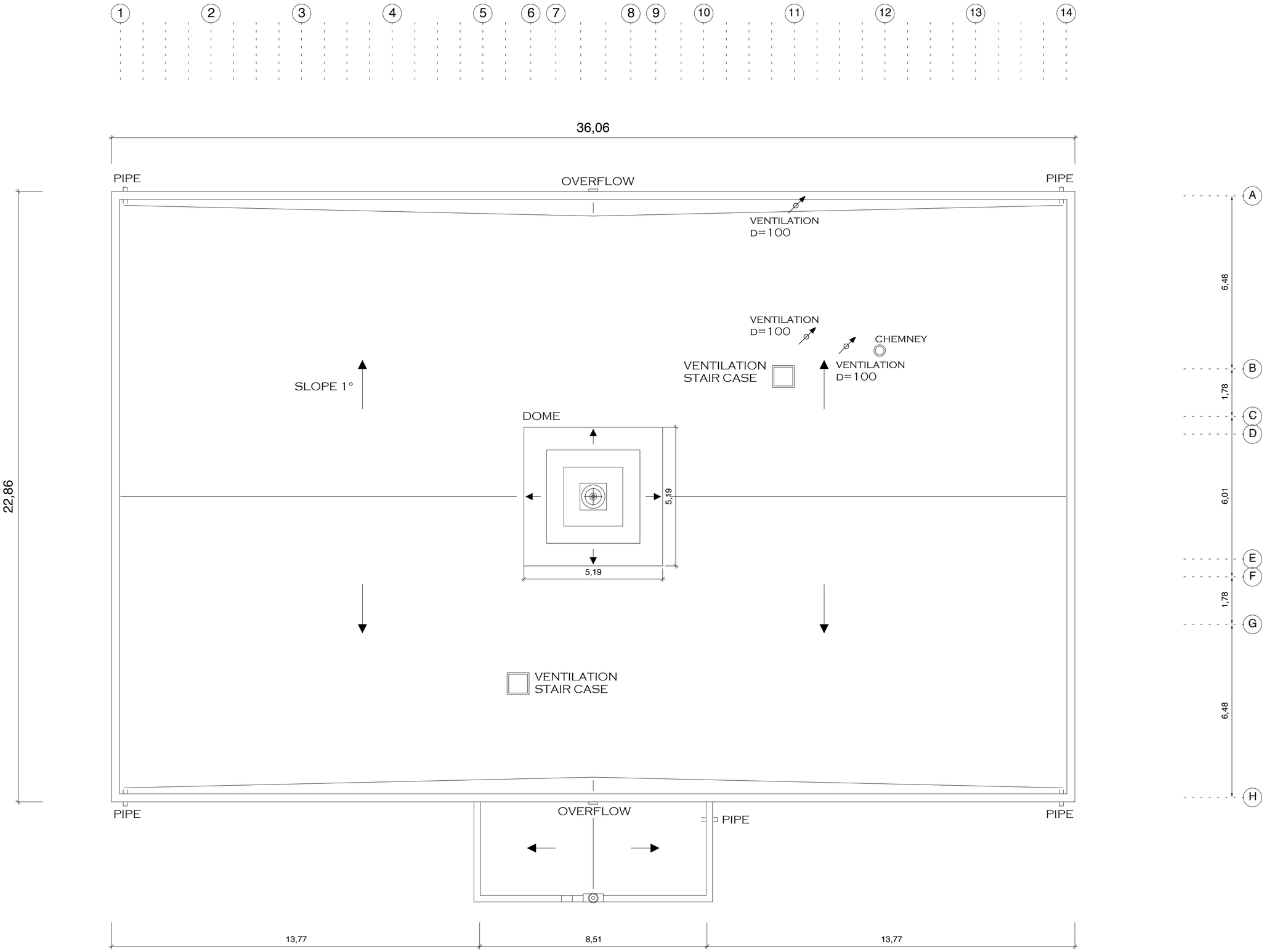
LEGENDA

FFL-GF	0,00 m
-Finish Floor Level Ground Floor-	
FFL-FF	+3,48 m
-Finish Floor Level First Floor-	
Terrain	-0,48 m
-Finish Floor Level Soil-	
FFL-W	+4,38 m
-Finish Floor Level Window-	
Flat Roof Slope	ca.1°
MODULE	m
Outer Wall Thicknes	0,30 m
Class Room Wall Th.	0,25 m
Ceiling Hight	0,42 m

ALL DIMENSIONS TO BE VERIFIED BY THE STRUCT. CALCULATIONS

PRELIMINARY PROJECT
FOUNDATION

Scale 1/100	Design CA.
Date 31.05.2007	Change
Drwg. Nr. A12	N



MAHARISHI INVINCIBILITY SCHOOLS

LOCATION

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LEGENDA

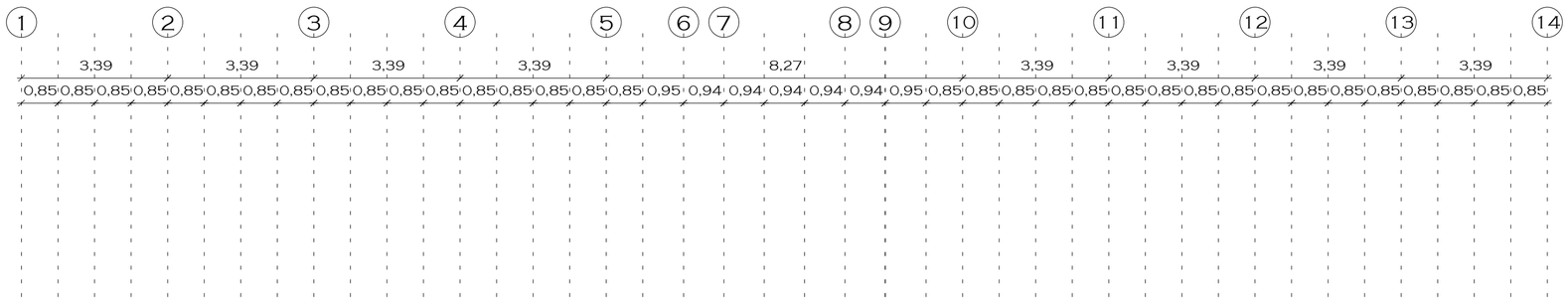
FFL-GF	0,00 m
-Finish Floor Level Ground Floor-	
FFL-FF	+3,48 m
-Finish Floor Level First Floor-	
Terrain	-0,48 m
-Finish Floor Level Soil-	
FFL-W	+4,38 m
-Finish Floor Level Window-	
Flat Roof Slope	ca. 1°
MODULE	m
Outer Wall Thicknes	0,30 m
Class Room Wall Th.	0,25 m
Ceiling Hight	0,42 m

ALL DIMENSIONS TO BE VERIFIED BY THE STRUCT. CALCULATIONS

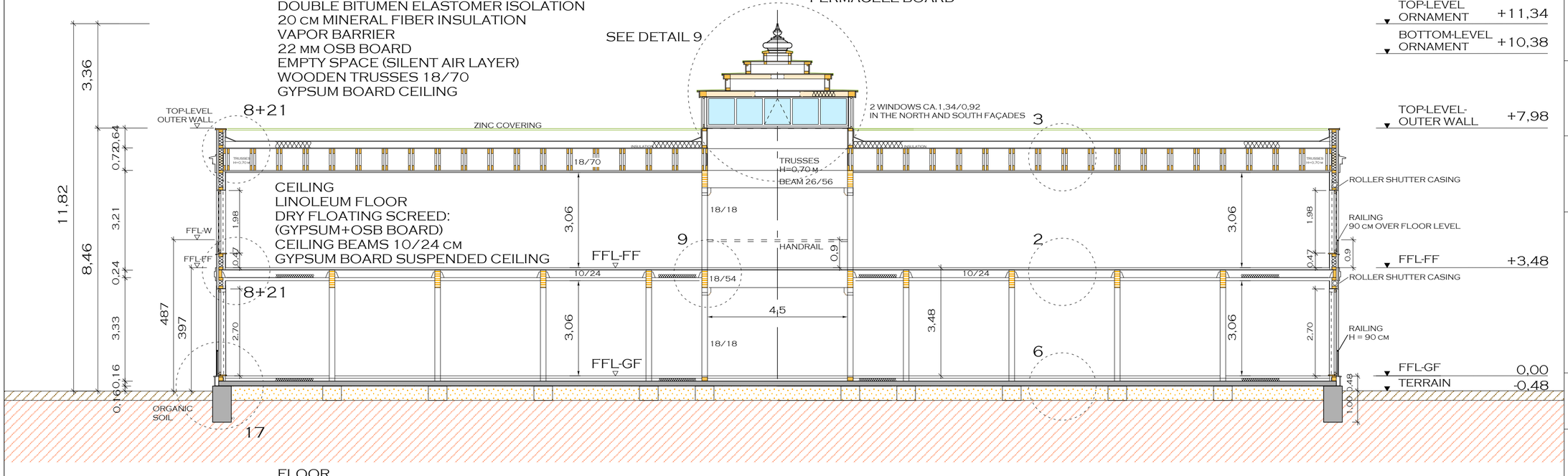
PRELIMINARY PROJECT

ROOF VIEW

Scale 1/100	Design CA.
Date 31.05.2007	Change
Drwg. Nr. A11	N



SECTION A



TOP-LEVEL ORNAMENT +11,34
BOTTOM-LEVEL ORNAMENT +10,38
TOP-LEVEL- OUTER WALL +7,98
FFL-FF +3,48
FFL-GF 0,00
TERRAIN -0,48

LEGENDA

- CONCRETE ELEMENT
- COMPACTED SAND
- NATURAL SOIL
- BEARING SOIL
- WOOD. LAMIN. BEAM
- BEAM LMW 18/58 — LAMINATED WOODEN BEAM 18/58 CM
- WOODEN TRUSS
- FFL-FF — FINISH FLOOR LEVEL FIRST FLOOR
- FFL-GF — FINISH FLOOR LEVEL GROUND FLOOR
- FFL-GF — FINISH FLOOR LEVEL WINDOW SILL
- ROLLER SHUTTER CASING

MAHARISHI INVINCIBILITY SCHOOLS

LOCATION

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LEGENDA

FFL-GF	0,00 M
-Finish Floor Level Ground Floor-	
FFL-FF	+3,48 M
-Finish Floor Level First Floor-	
Terrain	-0,48 M
-Finish Floor Level Soil-	
FFL-W	+4,38 M
-Finish Floor Level Window-	
Flat Roof Slope	ca.1°
Module	M
Outer Wall Thickness	0,30 M
Class Room Wall Th.	0,25 M
Ceiling Hight	0,42 M

ALL DIMENSIONS TO BE VERIFIED BY THE STRUCT. CALCULATIONS

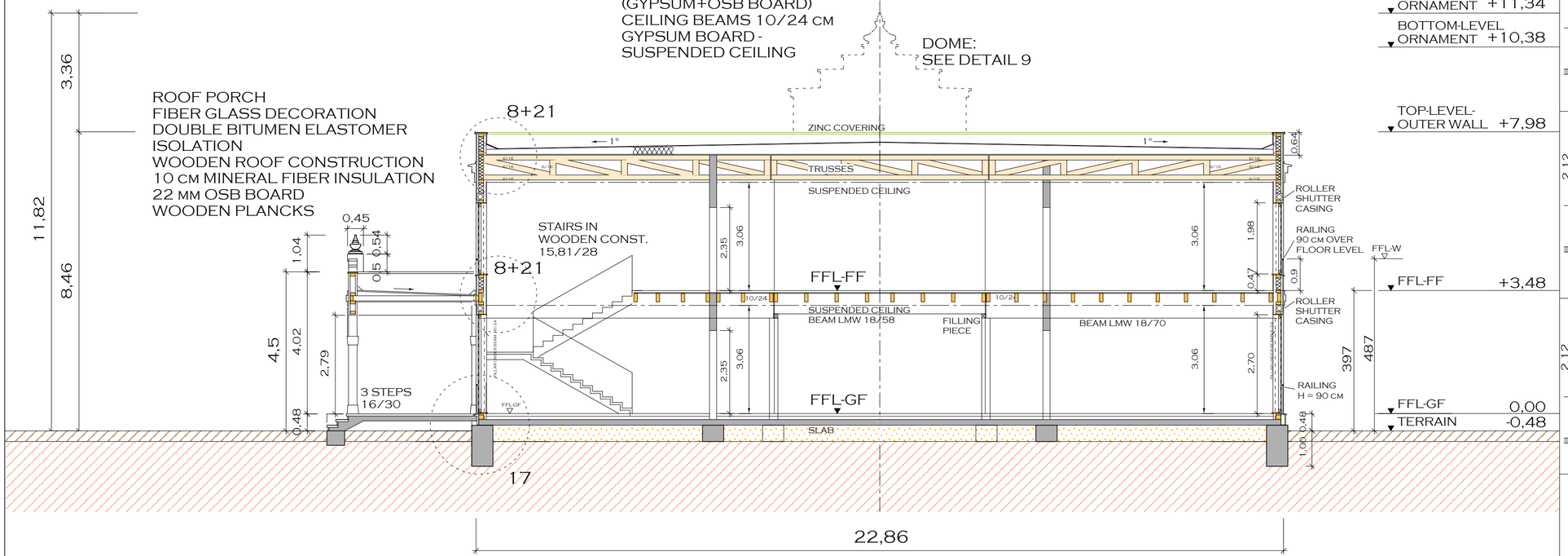
PRELIMINARY PROJECT
SECTION A-A

Scale	Design
1/100	CA.
Date	Change
31.05.2007	

Drwg. Nr.
A9

H G F E D C B A

SECTION B

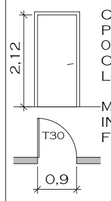


FLOOR
LINOLEUM FLOOR
FLOATING SCREED (INSULATION+FIBER REINF.CEMENT SLAB)
SINGLE BITUMEN ELASTOMER ISOLATION
CONCRETE SLAB D= 16 CM
COMPACTED SAND CA. 46 CM
BEARING SOIL

LEGENDA

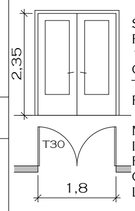
- CONCRETE ELEMENT
- COMPACTED SAND
- NATURAL SOIL
- BEARING SOIL
- WOOD. LAMIN. BEAM
- BEAM LMW 18/58 — LAMINATED WOODEN BEAM 18/58 CM
- WOODEN TRUSS
- FFL-FF — FINISH FLOOR LEVEL FIRST FLOOR
- FFL-GF — FINISH FLOOR LEVEL GROUND FLOOR
- FFL-GF — FINISH FLOOR LEVEL WINDOW SILL
- ROLLER SHUTTER CASING

INNER DOORS



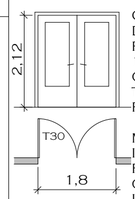
CLASS ROOM DOOR:
PROPOSED DIMS.
0,90/2,12 M
OR ACCORDING TO
LOCAL REGULATIONS

MATERIAL: WOOD
INCL. WOODEN
FRAME



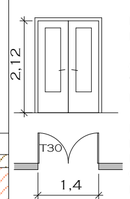
STAIRCASE DOOR:
PROPOSED DIMS.
1,80/2,12 M
OR ACCORDING
TO LOCAL
REGULATIONS

MATERIAL: WOOD
INCL. WOODEN
FRAME
GLASS FIELDS
LIKE IN THE DRAW.



COMPUTER RO.
DOOR:
PROPOSED DIMS.
1,80/2,12 M
OR ACCORDING
TO LOCAL
REGULATIONS

MATERIAL: WOOD
INCL. WOODEN
FRAME
GLASS FIELDS
LIKE IN THE DRAW.



LIBRARY DOOR:
PROPOSED DIMS.
1,40/2,12 M
OR ACCORDING
TO LOCAL
REGULATIONS

MATERIAL: WOOD
INCL. WOODEN
FRAME
GLASS FIELDS
LIKE IN THE DRAW.

MAHARISHI INVINCIBILITY SCHOOLS

LOCATION

CLIENT
ONTWIKKELINGSMAATSCHAPPIJ
FORTUINLIJK WONEN BV. (OFW)
DONAUSTRAAT 176
8226 LC LELYSTAD
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STRUCTURAL ENGINEERING
TEL.

OFFICIAL SURVEYOR
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HOUSE TECHN. ENGINEERING
TEL.

LEGENDA

FFL-GF	0,00 M
-FINISH FLOOR LEVEL GROUND FLOOR-	
FFL-FF	+3,48 M
-FINISH FLOOR LEVEL FIRST FLOOR-	
TERRAIN	-0,48 M
-FINISH FLOOR LEVEL SOIL-	
FFL-W	+4,38 M
-FINISH FLOOR LEVEL WINDOW-	
FLAT ROOF SLOPE	CA.1°
MODULE	M
OUTER WALL THICKNES	0,30 M
CLASS ROOM WALL TH.	0,25 M
CEILING HIGHT	0,42 M

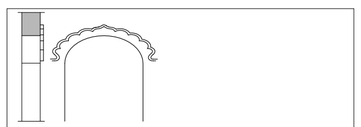
ALL DIMENSIONS TO BE VERIFIED BY THE STRUCT. CALCULATIONS

PRELIMINARY PROJECT
SECTION B-B

SCALE 1/100	DESIGN CA.
DATE 31.05.2007	CHANGE
DRWG. NR. A10	

14 13 12 11 10 9 8 7 6 5 4 3 2 1

WEST



DECORATION ARCH PROFILE ON PLASTER FAÇADE

36,06

MAHARISHI INVINCIBILITY SCHOOLS

LOCATION

CLIENT
Ontwikkelingsmaatschappij
Fortuinlijk Wonen BV. (OFW)
Donaustraat 176
8226 LC Lelystad
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PROJECT MANAGER
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BUILDING COMPANY

Tel.

BUILDING SITE MANAGER

Tel.

STRUCTURAL ENGINEERING

Tel.

OFFICIAL SURVEYOR

Tel.

HOUSE TECHN. ENGINEERING

Tel.

LEGENDA

FFL-GF	0,00 m
-Finish Floor Level Ground Floor-	
FFL-FF	+3,48 m
-Finish Floor Level First Floor-	
Terrain	-0,48 m
-Finish Floor Level Soil-	
FFL-W	+4,38 m
-Finish Floor Level Window-	
Flat Roof Slope	ca. 1°
MODULE	m
Outer Wall Thicknes	0,30 m
Class Room Wall Th.	0,25 m
Ceiling Hight	0,42 m

ALL DIMENSIONS TO BE VERIFIED BY THE STRUCT. CALCULATIONS

PRELIMINARY PROJECT
WEST ELEVATION

Scale 1/100	Design CA.
Date 31.05.2007	Change
Drwg. Nr. A6	

A B C D E F G H

SOUTH

MAHARISHI INVINCIBILITY SCHOOLS

LOCATION

CLIENT
Ontwikkelingsmaatschappij
Fortuinlijk Wonen BV. (OFW)
Donaustraat 176
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STRUCTURAL ENGINEERING

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OFFICIAL SURVEYOR

Tel.

HOUSE TECHN. ENGINEERING

Tel.

LEGENDA

FFL-GF	0,00 m
-Finish Floor Level Ground Floor-	
FFL-FF	+3,48 m
-Finish Floor Level First Floor-	
Terrain	-0,48 m
-Finish Floor Level Soil-	
FFL-W	+4,38 m
-Finish Floor Level Window-	
Flat Roof Slope	ca. 1°
MODULE	m
Outer Wall Thicknes	0,30 m
Class Room Wall Th.	0,25 m
Ceiling Hight	0,42 m

ALL DIMENSIONS TO BE VERIFIED BY THE STRUCT. CALCULATIONS

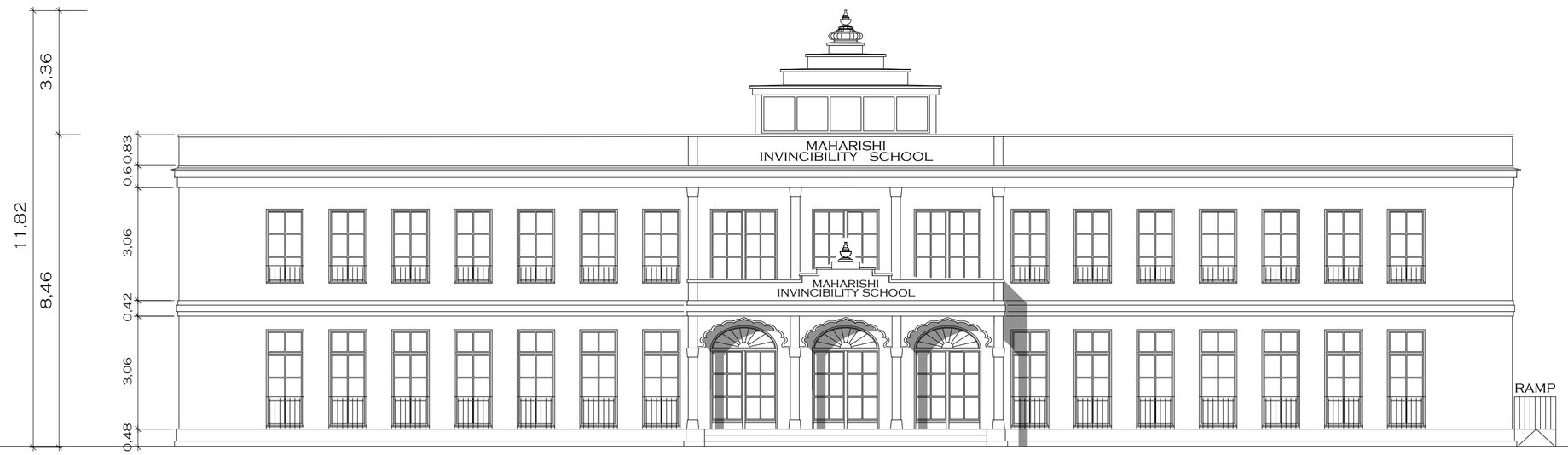
PRELIMINARY PROJECT

SOUTH ELEVATION

Scale 1/100	Design CA.
Date 31.05.2007	Change
Drwg. Nr. A8	

1 2 3 4 5 6 7 8 9 10 11 12 13 14

EAST



MAHARISHI
INVINCIBILITY
SCHOOLS

LOCATION

CLIENT
Ontwikkelingsmaatschappij
Fortuinlijk Wonen BV. (OFW)
Donaustraat 176
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HOUSE TECHN. ENGINEERING

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LEGENDA

FFL-GF	0,00 m
-Finish Floor Level Ground Floor-	
FFL-FF	+3,48 m
-Finish Floor Level First Floor-	
Terrain	-0,48 m
-Finish Floor Level Soil-	
FFL-W	+4,38 m
-Finish Floor Level Window-	
Flat Roof Slope	ca. 1°
MODULE	m
Outer Wall Thicknes	0,30 m
Class Room Wall Th.	0,25 m
Ceiling Hight	0,42 m

ALL DIMENSIONS TO BE VERIFIED BY THE STRUCT. CALCULATIONS

PRELIMINARY PROJECT
EAST ELEVATION

Scale 1/100	Design CA.
Date 31.05.2007	Change
Drwg. Nr. A5	

H G F E D C B A

NORTH

MAHARISHI INVINCIBILITY SCHOOLS

LOCATION

CLIENT
Ontwikkelingsmaatschappij
Fortuinlijk Wonen BV. (OFW)
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BUILDING COMPANY

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BUILDING SITE MANAGER

Tel.

STRUCTURAL ENGINEERING

Tel.

OFFICIAL SURVEYOR

Tel.

HOUSE TECHN. ENGINEERING

Tel.

LEGENDA

FFL-GF	0,00 m
-Finish Floor Level Ground Floor-	
FFL-FF	+3,48 m
-Finish Floor Level First Floor-	
Terrain	-0,48 m
-Finish Floor Level Soil-	
FFL-W	+4,38 m
-Finish Floor Level Window-	
Flat Roof Slope	ca. 1°
MODULE	m
Outer Wall Thicknes	0,30 m
Class Room Wall Th.	0,25 m
Ceiling Hight	0,42 m

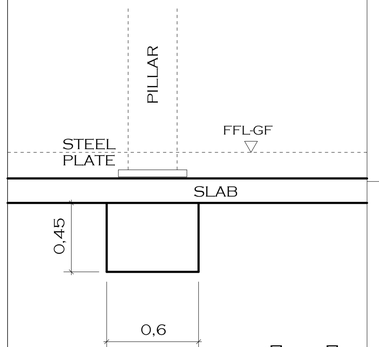
ALL DIMENSIONS TO BE VERIFIED BY THE STRUCT. CALCULATIONS

PRELIMINARY PROJECT

NORTH ELEVATION

Scale 1/100	Design CA.
Date 31.05.2007	Change
Drwg. Nr. A7	

SINGLE FOUNDATION 1/20



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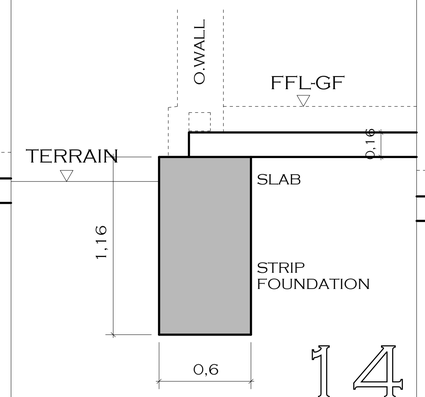
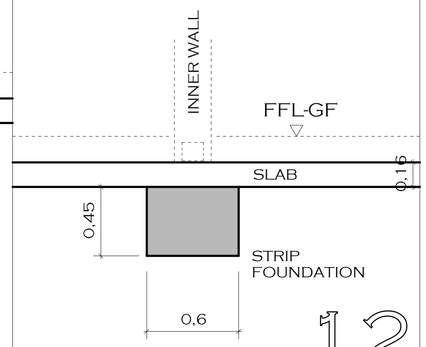
PERIMETER FOUNDATION 1/20



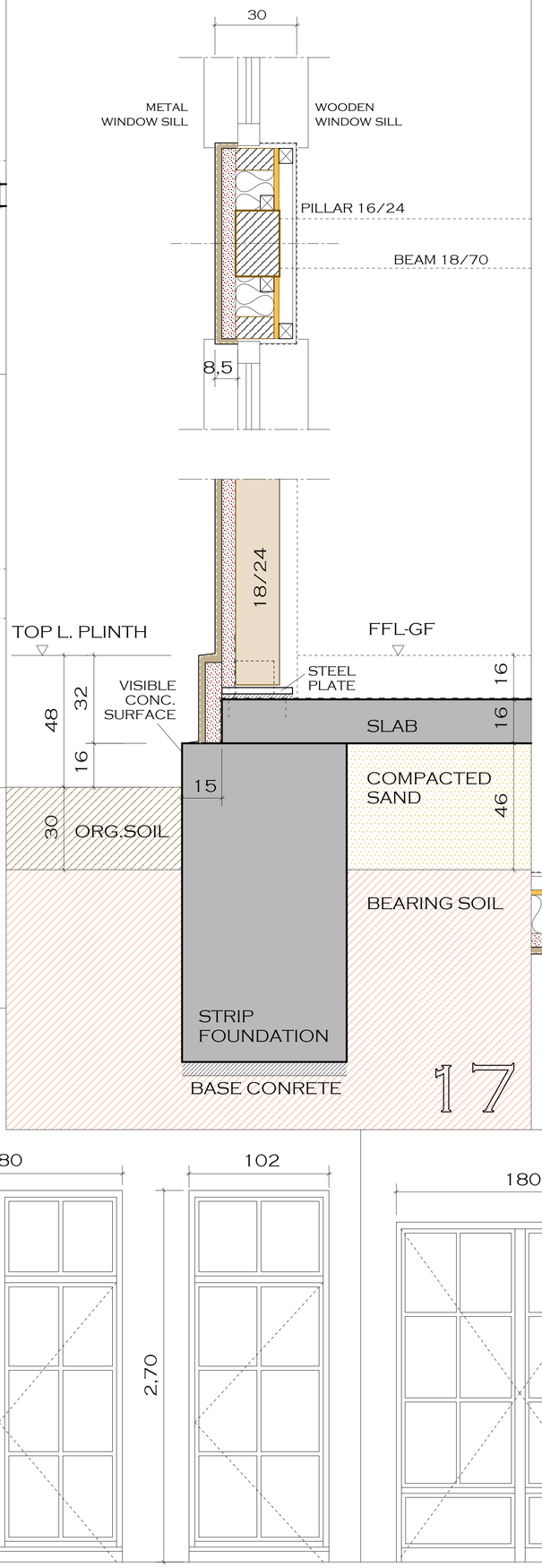
14

INNER WALL FOUNDATION 1/20



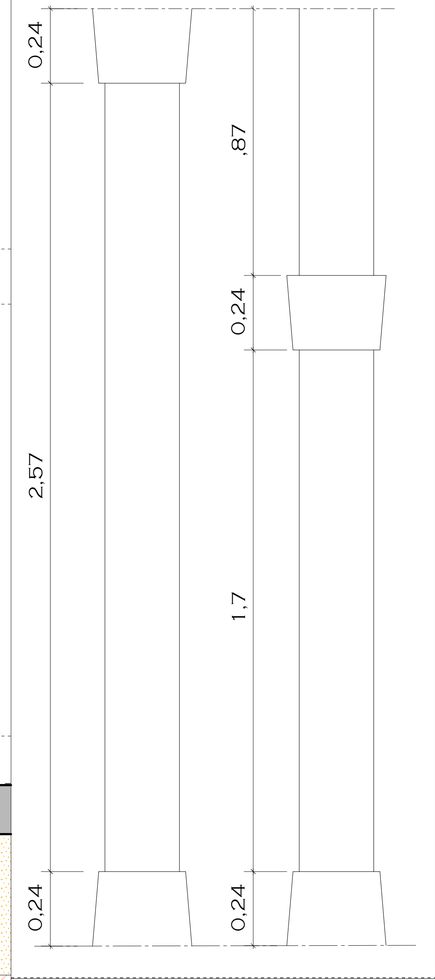
12

PILLAR POSITION IN PERIMETER WALL 1/10



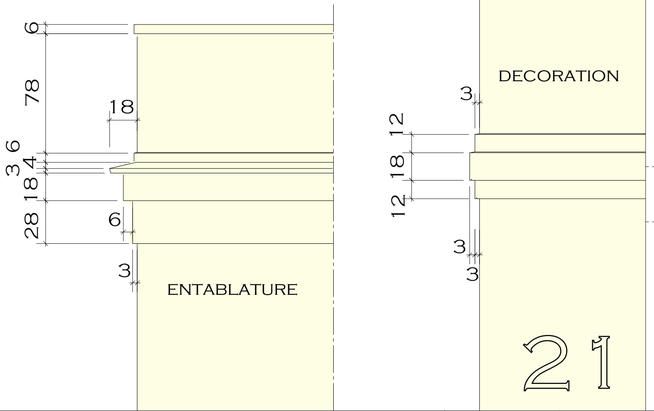
17

PILLAR DECOR IN PERIM. WALL 1/10



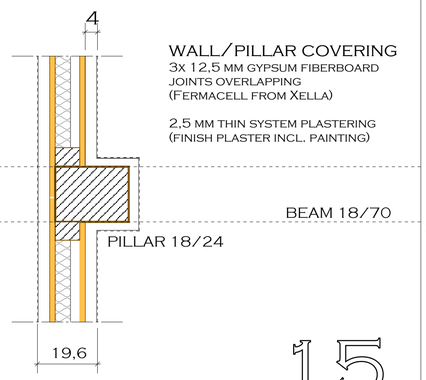
19

FAÇADE DECORATION 1/20



21

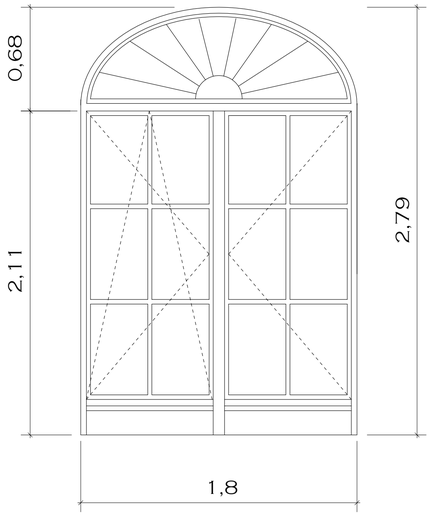
PILLAR POSITION IN INNER WALL 1/10



15

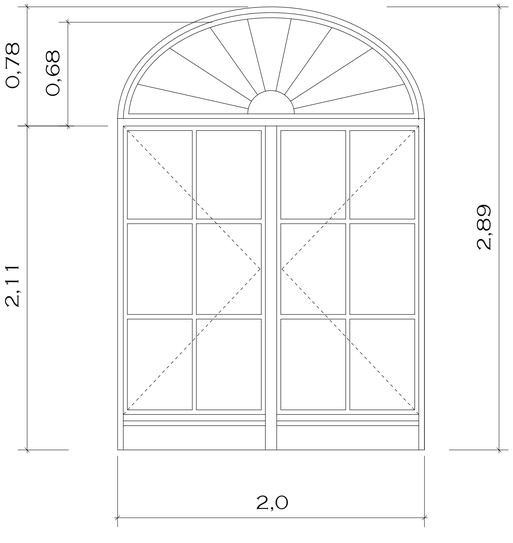
WINDOW 1/20

13



ENTRANCE DOOR 1/20

16

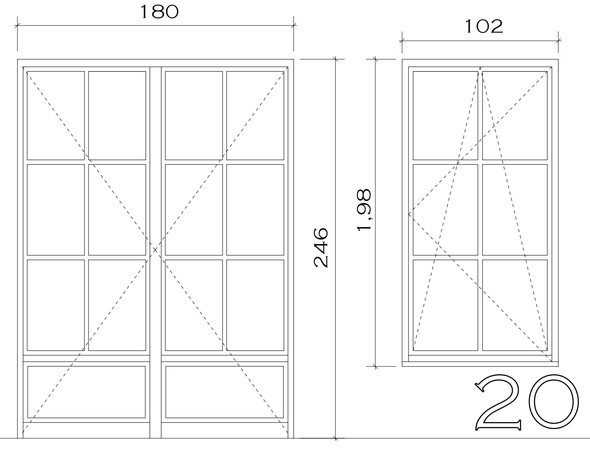


ALL WINDOW DIMENSIONS TO VERIFY BY WORKING DRAWINGS

WINDOWS 1/20

18

WINDOWS 1/20



20

MAHARISHI INVINCIBILITY SCHOOLS

LOCATION

CLIENT
ONTWIKKELINGSMAATSCHAPPIJ
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OFFICIAL SURVEYOR
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HOUSE TECHN. ENGINEERING
TEL.

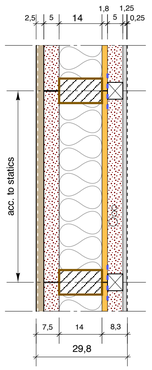
LEGENDA
FFL-GF 0,00 M
-FINISH FLOOR LEVEL GROUND FLOOR-
FFL-FF +3,48 M
-FINISH FLOOR LEVEL FIRST FLOOR-
TERRAIN -0,48 M
-FINISH FLOOR LEVEL SOIL-
FFL-W +4,38 M
-FINISH FLOOR LEVEL WINDOW-
FLAT ROOF SLOPE CA.1°
MODULE M
OUTER WALL THICKNES 0,30 M
CLASS ROOM WALL TH. 0,25 M
CEILING HIGHT 0,42 M

ALL DIMENSIONS TO BE VERIFIED BY THE STRUCT. CALCULATIONS

PRELIMINARY PROJECT
BASIC DETAILS 3

SCALE	DESIGN
1/20	CA.
DATE	CHANGE
31.05.2007	
DRWG. NR.	
BD3	

PROPOSAL FOR A OUTER WALL CONSTRUCTION



Thikness 300 mm U ≤ 0,21 W/m2K*

0,25 cm 2-layer lime-cement plaster
(included 3 mm textile glass fiber net)

5,0 cm magnesit glued wooden fiber plate
(f.e. Heraklith BM 50 or similar)

14,0 cm (minimum) wooden studs
(acc. to structural calculations)

14,0 cm mineral wool mat wall insulation
(f.e. Heralan 040 or similar)

1,8 cm OSB-board (minimum)
(joints sealed with OSB system tape - - - -)

3,5 cm installation space, insulated
(f.e. Heraklith BM 35 or similar)

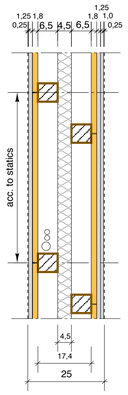
1,25 cm gypsum fiberboard
(Fermacell from Xella)

0,25 cm thin system plastering
(finish plaster incl. painting)

* U value (to be confirmed before contracting)

1

PROPOSAL FOR BEARING AND ACOUSTICAL INNER WALL CONSTRUCTION



Thickness 240 mm R´w ≥ 55 dB F90-B / F30-B

0,25 cm thin system plastering
(finish plaster incl. painting)

1,25 cm gypsum fiberboard
(Fermacell from Xella)

1,8 cm OSB-board

6,5 cm wooden studs
(acc. to structural calculations)

4,5 cm mineral wool mat wall insulation
(f.e. Heralan 040 or similar)

6,5 mm wooden studs
(acc. to structural calculations)

1,8 cm OSB-board

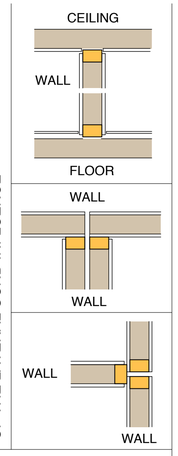
1,25 cm gypsum fiberboard
(Fermacell from Xella)

1,0 cm gypsum fiberboard
(Fermacell from Xella)

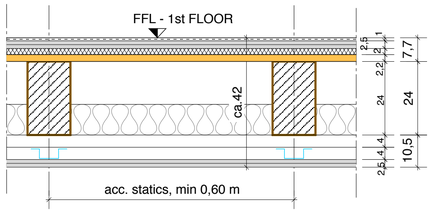
0,25 cm thin system plastering
(finish plaster incl. painting)

4

ACOUSTICAL VALUE: INCLUDING PROTECTION OF THE LATERAL OUND INFLUENCE



PROPOSAL FOR THE CEILING CONSTRUCTION



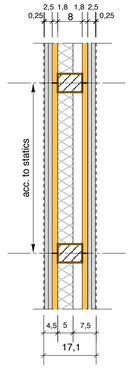
Thickness 42 cm / R´w ≥ 54 dB L´nw ≥ 53 dB F90-B

0,5 cm Linoleum flooring, water based glue, on 5 mm levelling layer
2,5 cm double fermacell gypsum board on
2,0 cm wooden fiber board (pavatex o.s.)
2,2 cm OSB board
ca. 24,0 cm ceiling beam, acc. to structural calculations
10,0 cm mineral wool mat insulation
4,0 cm wooden strip
ca. 4,0 cm acoustical metall profile
2,5 cm double fermacell gypsum board

* german protection values R´wR and TSM and F
(to be confirmed before contracting)

2

PROPOSAL FOR THE BEARING CORRIDOR WALL CONSTRUCTION (NO FIRE WALL ACC. TO DIN 4102)



Thickness 170 mm R´w ≥ 49 dB F90-B

0,25 cm thin system plastering
(finish plaster incl. painting)

1,25 cm double gypsum fiberboard
(Fermacell from Xella)

1,8 cm OSB-board

8,0 cm wooden studs
(acc. to structural calculations)

5,0 cm mineral wool mat wall insulation
(f.e. Heralan 040 or similar)

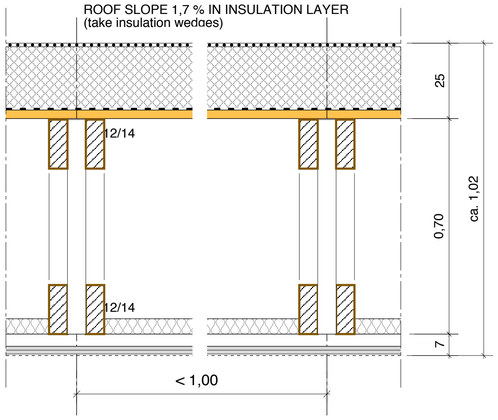
1,8 cm OSB-board

1,25 cm double gypsum fiberboard
(Fermacell from Xella)

0,25 cm thin system plastering
(finish plaster incl. painting)

5

PROPOSAL FOR THE ROOF CONSTRUCTION



ROOF COMPONENTS U ≤ 0,15 W/m2K F90-AB

Sealing with double bituminen OR single elastomer isolation

20,0 cm mineral fiber insulation

Vapor barrier as single bitum. layer

2,2 cm OSB board

Empty space (silent air layer)

Wooden trusses acc. to statics

4,0 cm wooden strip

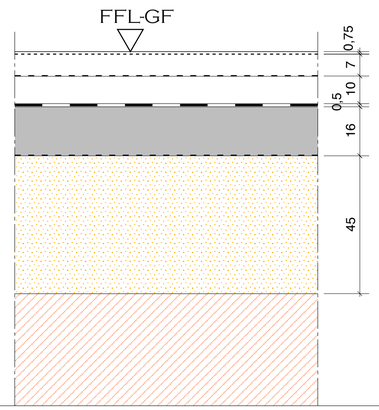
2,5 cm double fermacell gypsum board

0,25 cm thin system plaster
(finish plaster incl. painting)

* U value (to be confirmed before contracting)

3

PROPOSAL FOR THE FOUNDATION



U ≤ 0,50 W/m2K

0,25 cmLinoleum flooring, water based glue,

on 0,5 cm levelling layer

7,0 cm floating screed reinf. w. PE

PE plastic layer

10,0 cm rigid mineral fiber mat floor insulation
(f.e. Heralan DF100 or similar)

0,5 cm cold solded isolation layer

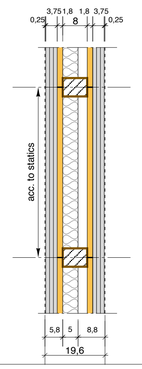
16,0 cm concrete slab
(acc. to structural calculations)

45,0 cm compacted sand filter

natural growed soil

6

PROPOSAL FOR THE "WODEN" FIRE WALL CONSTRUCTION (F90-B)



Thickness 200 mm R´w ≥ 49 dB F90-B

0,25 cm thin system plastering
(finish plaster incl. painting)

3x 1,25 cm gypsum fiberboard (joints overlapping)
(Fermacell from Xella)

1,8 cm OSB-board

8,0 cm wooden studs
(acc. to structural calculations)

5,0 cm mineral fiber mat wall insulation
(f.e. Heralan 040 or similar)

1,8 cm OSB-board

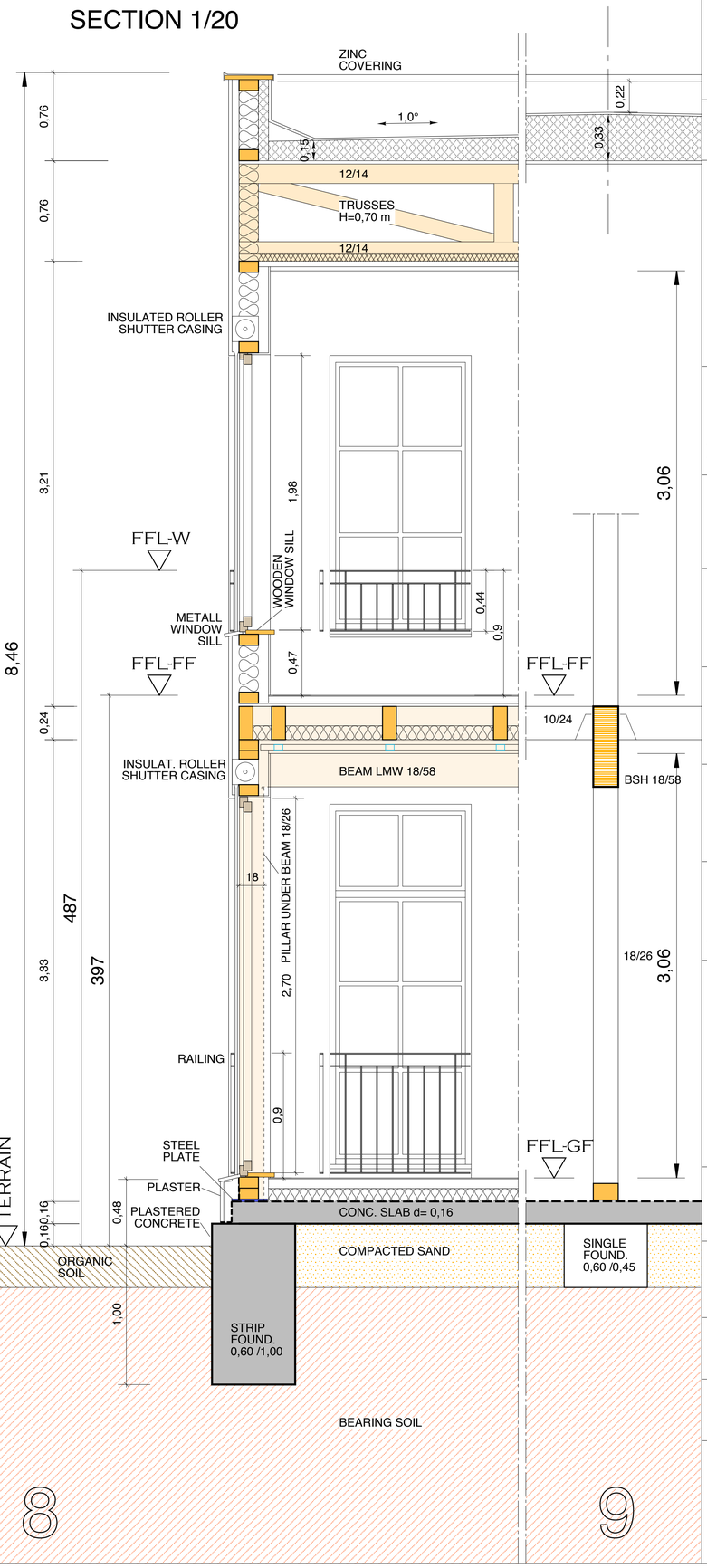
3x 1,25 cm gypsum fiberboard (joints overlapping)
(Fermacell from Xella)

0,25 cm thin system plastering
(finish plaster incl. painting)

7

8

SECTION 1/20



9

MAHARISHI INVINCIBILITY SCHOOLS

LOCATION

CLIENT
Ontwikkelingsmaatschappij
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STRUCTURAL ENGINEERING

Tel.

OFFICIAL SURVEYOR

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HOUSE TECHN. ENGINEERING

Tel.

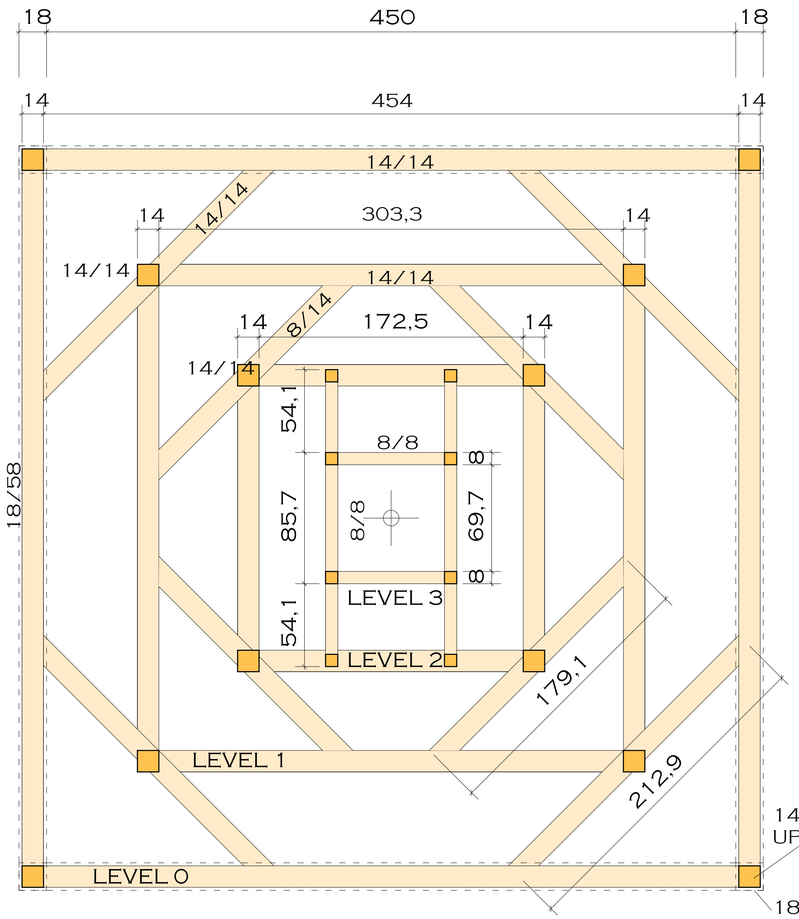
LEGENDA
FFL-GF 0,00 m
-Finish Floor Level Ground Floor-
FFL-FF +3,48 m
-Finish Floor Level First Floor-
Terrain -0,48 m
-Finish Floor Level Soil-
FFL-W +4,38 m
-Finish Floor Level Window-
Flat Roof Slope ca.1°
MODULE M
Outer Wall Thicknes 0,30 m
Class Room Wall Th. 0,25 m
Ceiling Hight 0,42 m

ALL DIMENSIONS TO BE VERIFIED BY THE STRUCT. CALCULATIONS

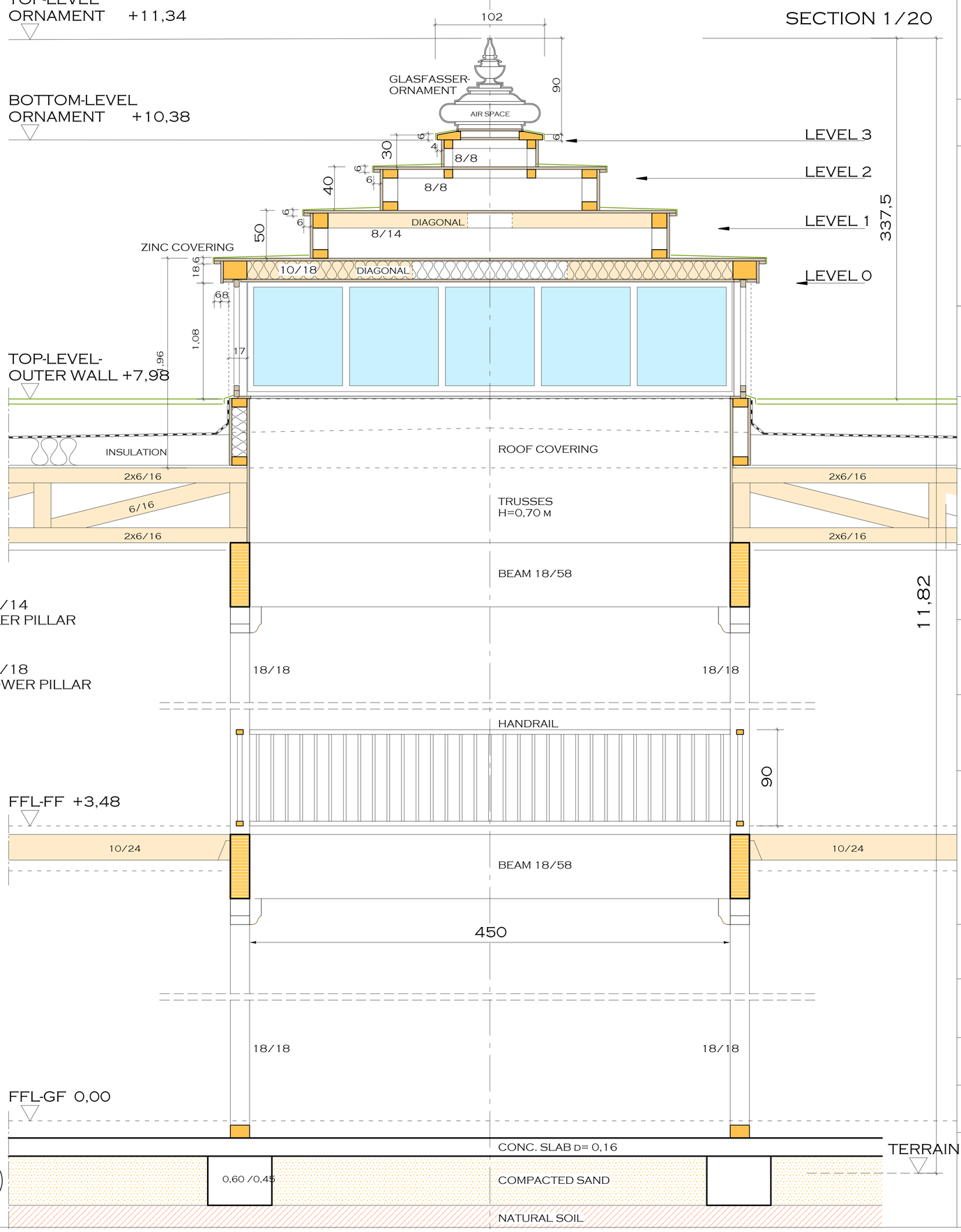
PRELIMINARY PROJECT
BASIC DETAILS 2

Scale	Design
1/20	CA.
Date	Change
31.05.2007	
Drwg. Nr.	
BD2	

FLOOR PLAN 1/20



SECTION 1/20



LEGENDA DOME

ROOF

ZINC COVERING SHEET
22 MM OSB BOARD
WOOD CONSTRUCTION
10 CM INSULATION ON LEVEL 0
22 MM OSB BOARD

DOUBLE GLAZED WINDOWS

WALLS

WOOD CONSTRUCTION
WATERPROOFED WOODEN BOARDS
(I.E. WERZALITH OR SIML.)

MAHARISHI
INVINCIBILITY
SCHOOLS

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LEGENDA

FFL-GF	0,00 M
-FINISH FLOOR LEVEL GROUND FLOOR-	
FFL-FF	+3,48 M
-FINISH FLOOR LEVEL FIRST FLOOR-	
TERRAIN	-0,48 M
-FINISH FLOOR LEVEL SOIL-	
FFL-W	+4,38 M
-FINISH FLOOR LEVEL WINDOW-	
FLAT ROOF SLOPE	CA.1°
MODULE	M
OUTER WALL THICKNES	0,30 M
CLASS ROOM WALL TH.	0,25 M
CEILING HIGHT	0,42 M

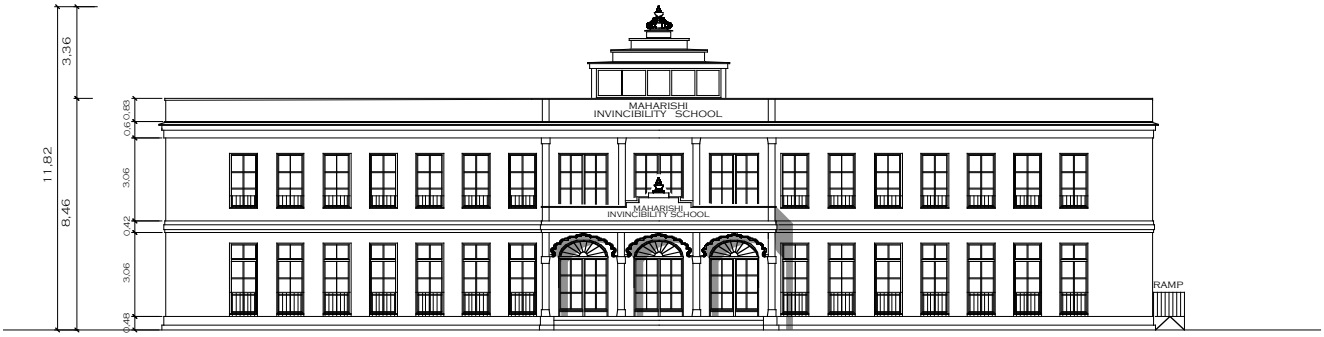
ALL DIMENSIONS TO BE VERIFIED BY THE STRUCT. CALCULATIONS

PRELIMINARY PROJECT
BASIC DETAILS 1

SCALE 1/20	DESIGN CA.
DATE 31.05.2007	CHANGE
DRWG. NR. BD 1	

Statische Berechnung

!Vorstatik zur Ermittlung Maßgebender Querschnitte!



Bauherr : MFI International, Holland

Rechtsträger : MFI International, Holland, Station 24, 6063 NP Vlodrop, The Netherlands

Bauort : noch nicht bekannt / Annahme Deutschland Schneelastzone III > 400m über NN

Bauvorhaben : Seminargebäude / Schule

Architekt : Dipl.-Ing. Alberto Castaño, Waldstr. 20c, D-23911 Mustin

Bearbeitet : Dipl.-Ing. (FH) Sven Schütrumpf

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Berechnungsgrundlagen

DIN 1055 Lastannahmen für Bauten

DIN V ENV 1991 Grundlagen der Tragwerksplanung und Einwirkungen auf Tragwerke

DIN 1045 Tragwerke aus Beton, Stahlbeton und Spannbeton

DIN 1052 Holzbauwerke, Berechnung und Ausführung

DIN 1053 Berechnungsgrundlagen für Bauteile aus künstlichen und natürlichen Steinen

DIN 1054 Zulässige Belastung des Baugrundes

Literatur: Schneider Bautabellen für Ingenieure; Wendehorst Bautechnische Zahlentafeln

Grundlegende Baustoffe

Mindestanforderungen:

Beton:	C 16/20 X0
Stahlbeton	C 20/25 XC2 Gründungsbauteile
Betonstahl:	BSt 500 S + M (A)
Profilstahl:	S 235
Mauerwerk:	siehe statische Berechnungen
Holz:	NH Sortierklasse S 10 / BSH 11

Baugrund

Eine Geotechnische Untersuchung bzw. ein Geotechnischer Bericht zur Baugrunduntersuchung nach DIN 4020 zur Feststellung:

- Zum Baugrundaufbau mit Schichten, Verwerfungen, Störungen und Einschlüssen;
- Zu den Grundwasserverhältnissen;
- Zu den boden- und felsmechanischen Eigenschaften und Kenngrößen;
- Zu den Rändern der untersuchten Baugrundbereiche und Randbedingungen an diesen;

!Ist nicht vorhanden!

Annahmen siehe statische Berechnungen.

Baubeschreibung

Angaben zum Standort:

- Umgebungssituation: noch nicht bekannt
- NN – Höhenlage: noch nicht bekannt
- Schneelastzone: noch nicht bekannt
- Geografische Sonderlage: noch nicht bekannt

Angaben zur Nutzung des Bauwerks

- Nutzung: Seminar- und Tagungsgebäude
- Gebäudeklasse: **je nach Landesbauordnung**
- Brandschutz: **je nach Landesbauordnung bzw. Gebäudeklasse**

(Aufgrund der Nutzung wird es besondere Anforderungen an den Brandschutz geben, beachte Landesvorschriften.)

Abmessungen des Gebäudes

- Länge: 36,06m
- Breite: 22,86m
- Höhe: 11,82m ü. OKG
- Abtreppungen: nicht vorhanden

Erläuterung der statischen Grundkonzeption

- Grundprinzip: Holzständerbauweise
- Fundament: Streifenfundament
- Decken: Holzbalkendecken
- Dach: Fachwerkbinder
- Wände: Holzständerkonstruktion

Einwirkungen

Dach:

- Verkehrslasten: 2,0 kN/m², der Windsog ist zu berücksichtigen

Decken:

- Verkehrslasten: 3,5 kN/m², „Klassenzimmer“ bzw. Seminarräumen
- Verkehrslasten: 5,0 kN/m² Flure zu „Klassenzimmern“ bzw. Seminarräumen

Treppen:

- Verkehrslasten: 5,0 kN/m², kein Wohngebäude

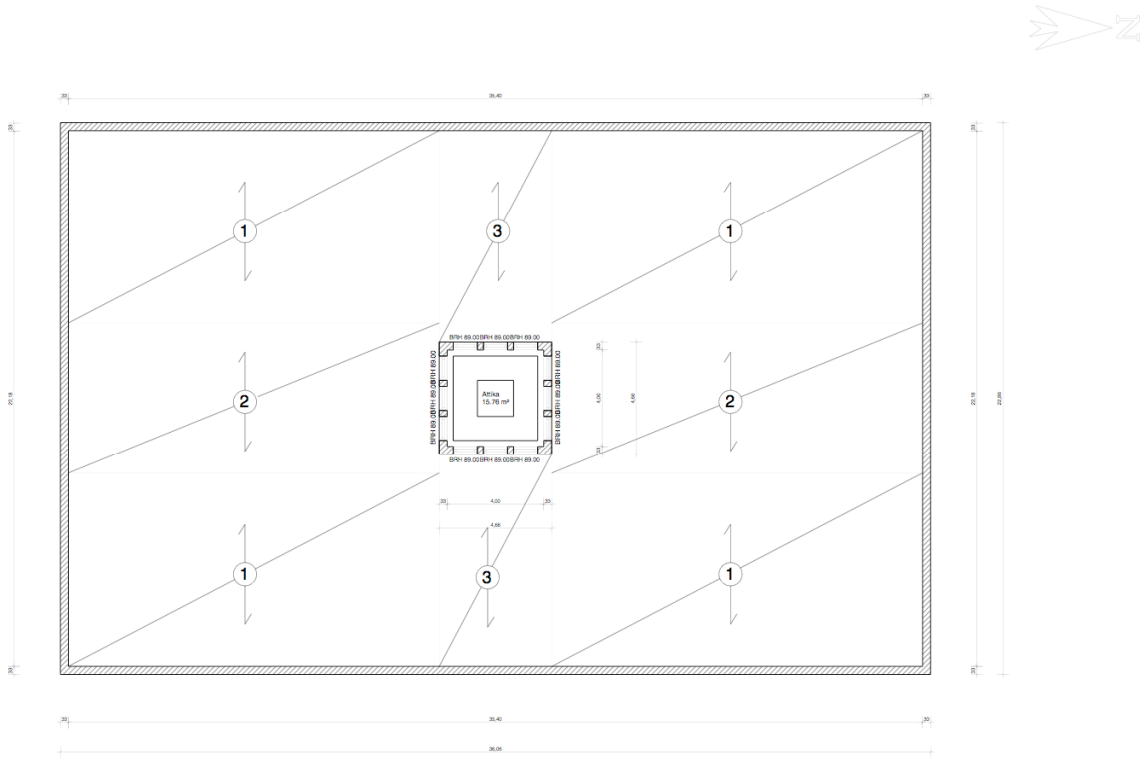
Balkone:

- Verkehrslasten: =>10m² 3,5 kN/m²; =< 10m² 5,0 kN/m²

Trennwandzuschlag für Decken:

- 0,75kN/m² (g = 100 kg/m²)
- 1,25kN/m² (g= 150 kg/m²)

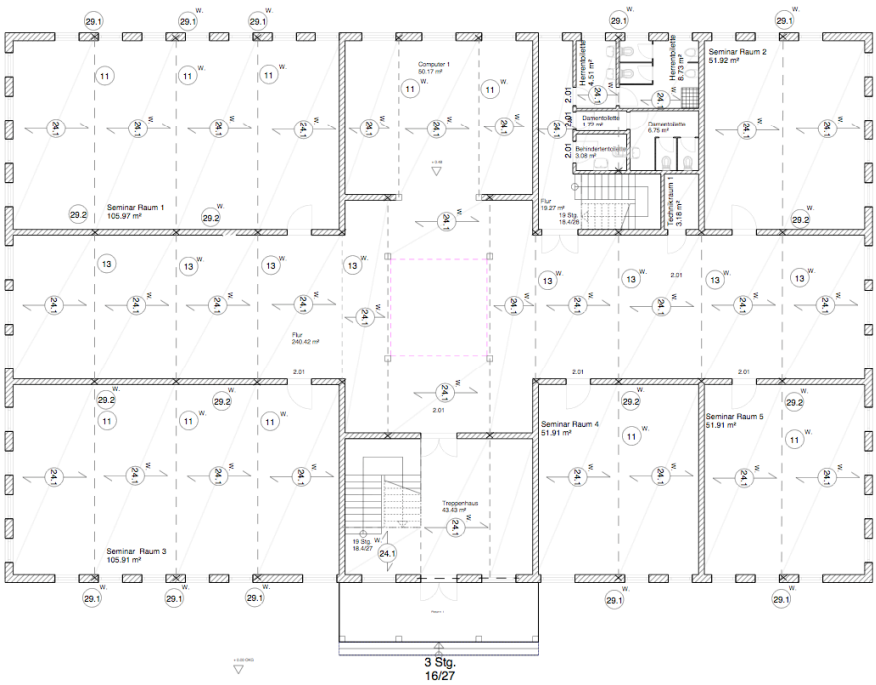
Grundriss Dachgeschoß



Positionsplan, Fachwerkträger

Projekt:	Seminarzentrum
Bauherr:	Maharishi Weltfriedens-Stiftung Rewchtträger: Maharishi Veda GmbH
Architekt:	Herr Alberto Castano Bearbeiter: Dipl. Ing. (FH) Sven Schütrumpf
Dateiname:	Invincibility School
Maßstab: 1 : 100	Datum: 26.04.2007 | 1. Dachgeschoß

Grundriss Erdgeschoß



Vorabzug Positionsplan

Projekt:	Seminarzentrum
Bauherr:	Maharishi Weltfriedens-Stiftung Rewchträger: Maharishi Veda GmbH
Architekt:	Bearbeiter: Dipl. Ing. (FH) Sven Schürtrumpf
Dateiname: Invincibility School	
Maßstab: 1 : 100	Datum: 22.05.2007 Erdgeschoß

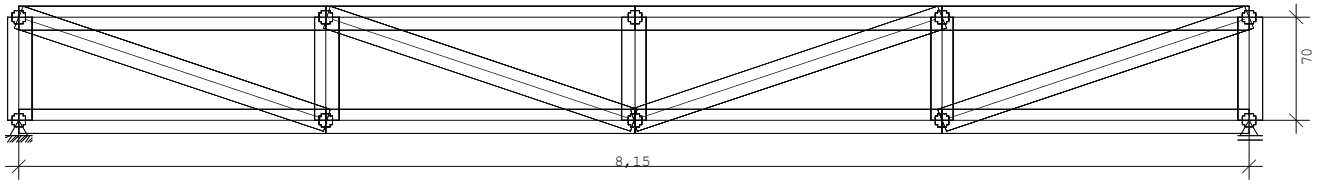
Dachgeschoß

Lastannahmen

	kN/m²
Dachabdichtungsbahn 1,54kg/m²	0,02
EPS 040 DAA d =18cm – d= 28cm	0,24
Trennlage aus PE-Folie, 0,2mm dick	0,02
Holzschalung (Nut und Feder) 28mm	0,23
Fachwerkträger a = 70cm	*0,23*
Dampfsperre	0,01
Gipskartonplatte d=2,5cm	0,28
Ständige Lasten g	**1,12**
Verkehrslasten q	**2,00**

Pos 1 Fachwerkbinder

```
Berechnungsgrundlagen: DIN 1052 , DIN 1055

Baustoffe  : Nadelholz  S 10  Gamma = 6.00 kN/m3
             Stahl St 37, Holzschutz nach DIN 68800

Maßstab   1 : 50
```




```
SYSTEM:      Parallelgurtiger Fachwerkbinder Art 1 mit  4 Feldern
-----------------------------------------------------------------------
Spannweite            L  =  8.15 m
Feldlänge             L1 =  2.04 m
Binderhöhe            H  =  0.70 m
Binderabstand         a  =  1.00 m
Queraussteifung OG   sB  =  1.00 m

BELASTUNG und Lastfälle:     [kN/m2]       [kN/m]
-----------------------------------------------------------------------
Auflast OG            go =  0.55 Dfl         0.55
Unterkonstruktion UG  gu =  0.40 Gfl         0.40
Verkehr auf OG        p  =  1.00 Dfl         1.00
Schnee                s0 =  1.00 Gfl    s =  1.00    ks =  1.00
Wind                  q  =  0.50       wd =  0.00    ws =  0.30 kN/m

Bindergewicht          G =  1.87 kN          0.23 kN/m

LF H : Eigengewicht + go + gu + p + s
LF HZ: Eigengewicht + go + gu + p + s + wd + ws
```

AUFLAGERKRÄFTE:	V li	H li	V re	H re [kN]
g	4.81	0.00	4.81	0.00
Ständig OG	2.24	0.00	2.24	0.00
Schnee voll	4.07	0.00	4.07	0.00
LF H	12.96	0.00	12.96	0.00
LF HZ	12.96	0.00	12.96	0.00

DURCHBIEGUNG : zul f = 1.36 cm = L/600 Kriechfaktor = 1.00

Untergurt max f = 0.94 cm < L/600

Überhöhung des Binders nach DIN 1052 8.5.5

STABKRÄFTE: LF H [kN]

Nr.	Untergurt	Obergurt	Vertikalstäbe	Diagonalen
1	0.00	-28.24	-12.48	29.84
2	28.24	-37.66	-8.68	9.93
3			-5.38	

SPANNUNGSNACHWEISE

Obergurt **7,5 / 16** l = 2.04 m A = 120 cm2

N = -37.66 kN MF = 1.36 kNm Omega = 1.35 kB = 1.00
Sigma / zul Sigma = 3.14 / 8.50 + 4.25 / 10.00 = 0.79 < 1.0
Sigma / zul Sigma = 3.14 / 6.30 + 4.25 / 11.00 = 0.88 < 1.0

Untergurt **7,5 / 16** l = 2.04 m A = 120 cm2 Delta A = 15 %

N = 28.24 kN MF = 0.24 kNm
Sigma / zul Sigma = 2.35 / 7.00 + 0.77 / 10.00 = 0.41 < 1.0
N = 28.24 kN MS = 0.00 kNm (Nettowerte)
Sigma / zul Sigma = 2.77 / 7.00 = 0.41 < 1.0

Pfosten **6 / 16** l = 0.70 m A = 96 cm2

N = -12.48 kN Omega = 1.27 Lambda = 40.41
Sigma / zul Sigma = 1.30 / 6.70 = 0.19 < 1.0

Diagonale **6 / 16** l = 2.15 m A = 96 cm2 Delta A = 15 %

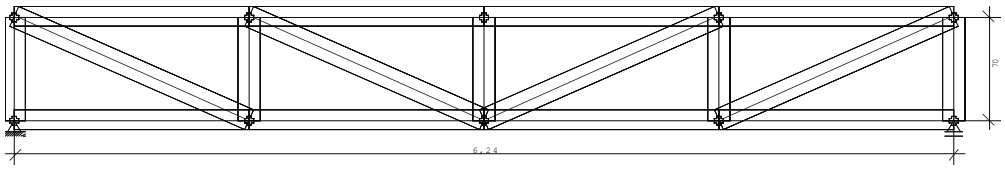
N = 29.84 kN (Nettowerte)
Sigma / zul Sigma = 3.66 / 7.00 = 0.52 < 1.0

Pos 2 Fachwerkbinder

Berechnungsgrundlagen: DIN 1052 , DIN 1055

Baustoffe : Nadelholz S 10 Gamma = 6.00 kN/m3
Stahl St 37, Holzschutz nach DIN 68800

Maßstab 1 : 50



SYSTEM: Parallelgurtiger Fachwerkbinder Art 1 mit 4 Feldern

Spannweite	L	=	6.24	m			
Feldlänge	L1	=	1.56	m			
Binderhöhe	H	=	0.70	m			
Binderabstand	a	=	1.00	m			
Queraussteifung OG	sB	=	1.00	m			

BELASTUNG und Lastfälle:		[kN/m2]		[kN/m]			
Auflast OG	go =	0.55	Dfl	0.55			
Unterkonstruktion UG	gu =	0.40	Gfl	0.40			
Verkehr auf OG	p =	1.00	Dfl	1.00			
Schnee	s0 =	1.00	Gfl	s = 1.00		ks = 1.00	
Wind	q =	0.50		wd = 0.00		ws = 0.30	kN/m
Bindergewicht	G =	1.31	kN	0.21	kN/m		

LF H : Eigengewicht + go + gu + p + s
LF HZ: Eigengewicht + go + gu + p + s + wd + ws

AUFLAGERKRÄFTE:	V li	H li	V re	H re [kN]
g	3.62	0.00	3.62	0.00
Ständig OG	1.72	0.00	1.72	0.00
Schnee voll	3.12	0.00	3.12	0.00
LF H	9.86	0.00	9.86	0.00
LF HZ	9.86	0.00	9.86	0.00

DURCHBIEGUNG : zul f = **1.04** cm = L/600 Kriechfaktor = 1.00

Untergurt	max f =	**0.39** cm < L/600

Überhöhung des Binders nach DIN 1052 8.5.5

STABKRÄFTE: LF H [kN]

Nr.	Untergurt	Obergurt	Vertikalstäbe	Diagonalen
1	0.00	-16.45	-9.50	18.01
2	16.45	-21.93	-6.62	5.99
3			-4.11	

SPANNUNGSNACHWEISE

Obergurt **6 / 16** l = 1.56 m A = 96 cm2

N = -21.93 kN MF = 0.79 kNm Omega = 1.57 kB = 1.00
Sigma / zul Sigma = 2.28 / 8.50 + 3.10 / 10.00 = **0.58 < 1.0**
Sigma / zul Sigma = 2.28 / 5.42 + 3.10 / 11.00 = **0.70 < 1.0**

Untergurt **6 / 16** l = 1.56 m A = 96 cm2 Delta A = 15 %

N = 16.45 kN MF = 0.14 kNm
Sigma / zul Sigma = 1.71 / 7.00 + 0.54 / 10.00 = 0.**30 < 1.0**
N = 16.45 kN MS = 0.00 kNm (Nettowerte)
Sigma / zul Sigma = 2.02 / 7.00 = **0.30 < 1.0**

Pfosten **6 / 16** l = 0.70 m A = 96 cm2

N = -9.50 kN Omega = 1.27 Lambda = 40.41
Sigma / zul Sigma = 0.99 / 6.70 = **0.15 < 1.0**

Diagonale **6 / 16** l = 1.71 m A = 96 cm2 Delta A = 15 %

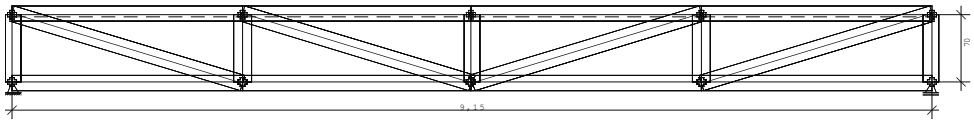
N = 18.01 kN (Nettowerte)
Sigma / zul Sigma = 2.21 / 7.00 = 0.32 < 1.0

Pos 3 Fachwerkbinder

Berechnungsgrundlagen: DIN 1052 , DIN 1055

Baustoffe : Nadelholz S 10 Gamma = 6.00 kN/m3
Stahl St 37, Holzschutz nach DIN 68800

Maßstab 1 : 75



SYSTEM: Parallelgurtiger Fachwerkbinder Art 1 mit 4 Feldern

Spannweite	L	=	9.15 m				
Feldlänge	L1	=	2.29 m				
Binderhöhe	H	=	0.70 m				
Binderabstand	a	=	1.00 m				
Queraussteifung OG	sB	=	1.00 m				

BELASTUNG und Lastfälle:		[kN/m2]		[kN/m]			
Auflast OG	go	= 0.55	Dfl	0.55			
Unterkonstruktion UG	gu	= 0.40	Gfl	0.40			
Verkehr auf OG	p	= 1.00	Dfl	1.00			
Schnee	s0	= 1.00	Gfl	s = 1.00	ks =	1.00	
Wind	q	= 0.50		wd = 0.00	ws =	0.30	kN/m
Bindergewicht	G	= 2.07	kN	0.23	kN/m		

LF H : Eigengewicht + go + gu + p + s
LF HZ: Eigengewicht + go + gu + p + s + wd + ws

AUFLAGERKRÄFTE:	V li	H li	V re	H re [kN]
g	5.38	0.00	5.38	0.00
Ständig OG	2.52	0.00	2.52	0.00
Schnee voll	4.57	0.00	4.57	0.00
LF H	14.53	0.00	14.53	0.00
LF HZ	14.53	0.00	14.53	0.00

DURCHBIEGUNG : zul f = 1.53 cm = L/600 Kriechfaktor = 1.00

Untergurt	max f = 1.51 cm	< L/600

Überhöhung des Binders nach DIN 1052 8.5.5

STABKRÄFTE: LF H [kN]

Nr.	Untergurt	Obergurt	Vertikalstäbe	Diagonalen
1	0.00	-37.07	-13.99	38.75
2	37.07	-48.27	-10.20	11.69
3			-5.63	

SPANNUNGSNACHWEISE

Obergurt **8 / 16** l = 2.29 m A = 120 cm2

N = -48.27 kN MF = -1.06 kNm Omega = 1.41 kB = 1.00
Sigma / zul Sigma = 4.02 / 8.50 + 3.30 / 10.00 = 0.80 < 1.0
Sigma / zul Sigma = 4.02 / 6.05 + 3.30 / 11.00 = **0.97 < 1.0**

Untergurt **8 / 16** l = 2.29 m A = 120 cm2 Delta A = 15 %

N = 37.07 kN MF = 0.31 kNm
Sigma / zul Sigma = 3.09 / 7.00 + 0.96 / 10.00 = 0.54 < 1.0
N = 37.07 kN MS = 0.00 kNm (Nettowerte)
Sigma / zul Sigma = 3.63 / 7.00 = 0.54 < 1.0

Pfosten **6 / 16** l = 0.70 m A = 96 cm2

N = -13.99 kN Omega = 1.27 Lambda = 40.41
Sigma / zul Sigma = 1.46 / 6.70 = 0.22 < 1.0

Diagonale **6 / 16** l = 2.39 m A = 96 cm2 Delta A = 15 %

N = 38.75 kN (Nettowerte)
Sigma / zul Sigma = 4.75 / 7.00 = 0.68 < 1.0

Pos 24.1 Deckenbalken

(Seminarraum)

Decke Spannweite 3,54m

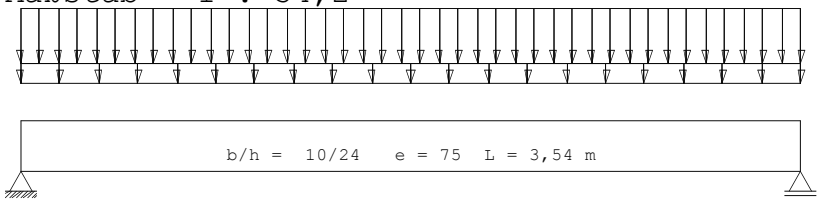
		kN/m²
Fliesen, d=1,0cm		0,22
Fermacell Estrich-Elemente d= 2,5cm		0,30
Trittschalldämmung, d = 2cm		0,02
OSB - Platte d= 2,2cm		0,24
Deckenbalken 10/24cm a = 0,45cm		
mineralischer Faserdämmstoff d= 10cm		0,10
Lattung d/b 3/5cm		0,02
Federschienen		0,01
Fermacell Platten - Elemente d = 2,5cm		0,30
	g	**1,21**

Verkehrslast

	q	**3,50**

```
BAUSTOFF:  Nadelholz  S 10
           Holzfeuchte <= 18 %  ke = 1.000 ks = 1.000
```

Maßstab 1 : 34,2



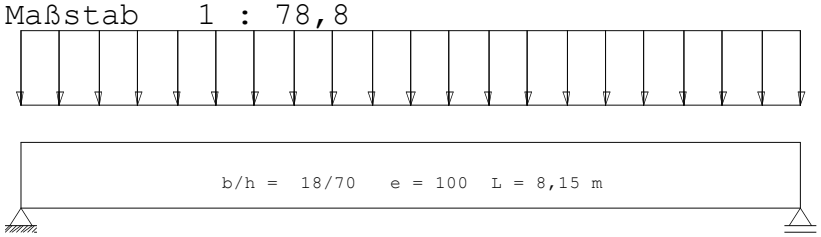

```
BELASTUNG  Flächenlast  g1 =   1.25  kN/m2   p1 =   3.50  kN/m2

BALKEN:    10 / 24    e = 0.75 m    LF H
-------------------------------------------------------------------
max Mf =   5.58 kNm    Eta_Sigma =  5.81 /10.00 = 0.58 < 1.0
max Ms =   0.00 kNm    Eta_Sigma =  0.00 /10.00 = 0.00 < 1.0
max  Q =  -6.31 kN     Eta_Tau   =  0.39 / 0.90 = 0.44 < 1.0
max f  =   0.63 cm  <  L/300     =  1.18  Eta_f = 0.54 < 1.0

AUFLAGERKRÄFTE  (kN/m)
-------------------------------------------------------------------
Stütze     aus g    aus p   Vollast    max     min
  1         2.21     6.20     8.41     8.41     2.21
  2         2.21     6.20     8.41     8.41     2.21
Summe:      4.43    12.39    16.82    16.82     4.43
```

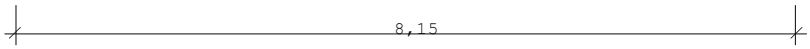
Unterzüge

Pos 11 Unterzug

Belastung aus Pos. 24.1 und W. 24.1
8,45+8,45= ~ 16,90 kN/m + Eigenlast

```
BAUSTOFF:  Brettschichtholz BS 11
           Holzfeuchte <= 18 %  ke = 1.000 ks = 1.000

Maßstab   1 : 78,8
```



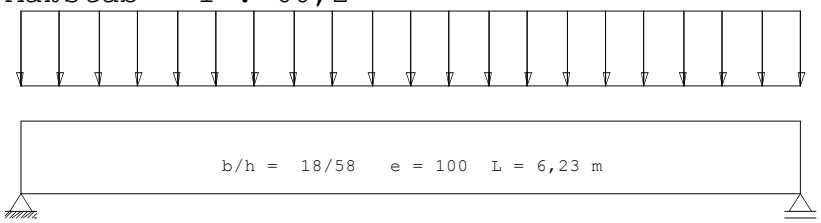


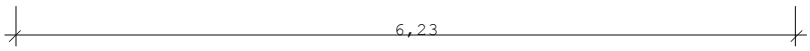

```
BELASTUNG  Flächenlast  g1 =  17.55  kN/m2   p1 =   0.00  kN/m2

BALKEN:    18 / 70    e = 1.00 m    LF H
-----------------------------------------------------------------------
max Mf = 145.71 kNm    Eta_Sigma =  9.91 /11.00 = 0.90 < 1.0
max Ms =   0.00 kNm    Eta_Sigma =  0.00 /11.00 = 0.00 < 1.0
max  Q =  71.52 kN     Eta_Tau   =  0.85 / 1.20 = 0.71 < 1.0
max f  =   1.78 cm  <  L/300     =  2.72  Eta_f = 0.66 < 1.0

AUFLAGERKRÄFTE  (kN/m)
-----------------------------------------------------------------------
Stütze     aus g    aus p   Vollast    max     min
  1        71.52     0.00    71.52    71.52    71.52
  2        71.52     0.00    71.52    71.52    71.52
Summe:    143.03     0.00   143.03   143.03   143.03
```

Pos 13 Unterzug

Belastung aus Pos. 24.1.1 und W. 24.1.1
11+11= ~ 22,00 kN/m + Eigenlast

```
BAUSTOFF:  Brettschichtholz BS 11
           Holzfeuchte <= 18 %  ke = 1.000 ks = 1.000

Maßstab   1 : 60,2
```






```
BELASTUNG  Flächenlast  g1 =  22.00  kN/m2   p1 =   0.00  kN/m2

BALKEN:    18 / 58    e = 1.00 m    LF H
-----------------------------------------------------------------
max Mf = 106.74 kNm    Eta_Sigma = 10.58 /11.00 = 0.96 < 1.0
max Ms =   0.00 kNm    Eta_Sigma =  0.00 /11.00 = 0.00 < 1.0
max  Q =  68.53 kN     Eta_Tau   =  0.98 / 1.20 = 0.82 < 1.0
max f  =   1.34 cm  <  L/300     =  2.08  Eta_f = 0.65 < 1.0

AUFLAGERKRÄFTE  (kN/m)
-----------------------------------------------------------------
Stütze     aus g    aus p   Vollast    max     min
  1        68.53     0.00    68.53    68.53    68.53
  2        68.53     0.00    68.53    68.53    68.53
Summe:    137.06     0.00   137.06   137.06   137.06
```

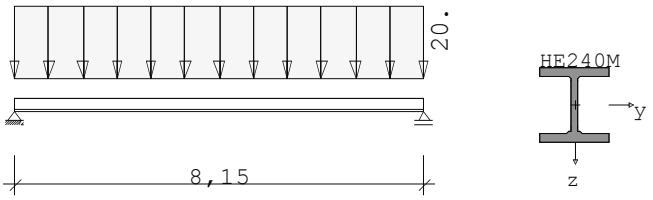
Alternativ zu Pos 11 und Pos 13

(Pos 11)

Bemerkung: Deckenbalken Pos 24.1 können als Zweifeldträger ausgebildet werden. Auflager beachten!

EINFELDTRÄGER HE 240 M L = 8.15 m S235

Maßstab 1 : 150



Teilsicherheitsbeiwert GammaM = 1.10 Eigengewicht g = 1.570 kN/m

EINFACHE LASTEN (q-Anteile : GammaF = 1.50 ; zp : Oberseite)

Streckenlast 1 : gz = 20.60 kN/m2 bz = 1.00 m

AUFLAGERKRÄFTE Grundkomb. (ohne GammaF) * = Maximum

Lager	Ew	V (kN)	Hx (kN)	Hy (kN)	aus Lasten **)
links	G	**90.34**	0.00	0.00	
rechts	G	**90.34**	0.00	0.00	

SPANNUNGEN Grundkomb. nach Th.1.O. , x0= 4.08 m GammaF-fach

vorh.SigmaX / fyd = 138.11 / 218.2 = 0.63 < 1
vorh.Tau / TauRd = 0.00 / 126.0 = 0.00 < 1
vorh.SigmaV / fyd = 138.11 / 218.2 = 0.63 < 1

NACHWEIS BIEGEKNICKEN DIN 18800 T2

Grundkomb. : Nachweis Biegeknicken nicht erforderlich.

NACHWEIS BIEGEDRILLKNICKEN DIN 18800 T2 (Ersatzstab nach BTII)

Grundkomb. Nd = 0.00 kN Myd = 248.50 Mzd = 0.00 kNm
Nkiz = 0.00 kN Mkiy= 1176.63 kNm
Gleichung 16 : Eta = 0.56 < 1

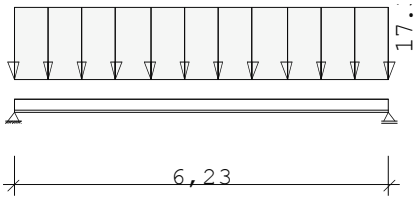
DURCHBIEGUNGEN für 1-fache Lasten , x0= 4.08 m zul w = L / 300

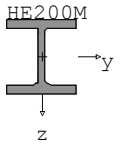
vorh. w / zul w = 2.50 / 2.72 = 0.92 < 1

(Pos 13)

EINFELDTRÄGER HE 200 M L = 6.23 m S235

Maßstab 1 : 125





Teilsicherheitsbeiwert GammaM = 1.10 Eigengewicht g = 1.030 kN/m

EINFACHE LASTEN (q-Anteile : GammaF = 1.50 ; zp : Oberseite)

Streckenlast 1 : gz = 17.30 kN/m2 bz = 1.00 m

AUFLAGERKRÄFTE Grundkomb. (ohne GammaF) * = Maximum

Lager	Ew	V (kN)	Hx (kN)	Hy (kN)	aus Lasten **)
links	G	57.10	0.00	0.00	
rechts	G	57.10	0.00	0.00	

SPANNUNGEN Grundkomb. nach Th.1.O. , x0= 3.12 m GammaF-fach

vorh.SigmaX / fyd = 124.12 / 218.2 = 0.57 < 1
vorh.Tau / TauRd = 0.00 / 126.0 = 0.00 < 1
vorh.SigmaV / fyd = 124.12 / 218.2 = 0.57 < 1

NACHWEIS BIEGEKNICKEN DIN 18800 T2

Grundkomb. : Nachweis Biegeknicken nicht erforderlich.

NACHWEIS BIEGEDRILLKNICKEN DIN 18800 T2 (Ersatzstab nach BTII)

Grundkomb. Nd = 0.00 kN Myd = 120.06 Mzd = 0.00 kNm
Nkiz = 0.00 kN Mkiy= 657.62 kNm
Gleichung 16 : Eta = 0.51 < 1

DURCHBIEGUNGEN für 1-fache Lasten , x0= 3.12 m zul w = L / 300

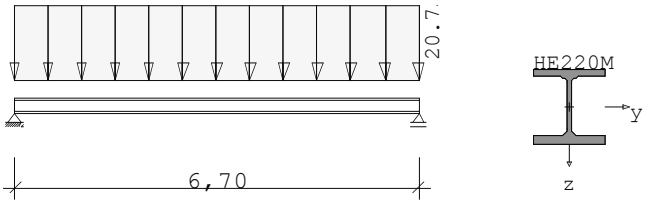
vorh. w / zul w = 1.61 / 2.08 = 0.77 < 1

(Pos 16)

Deckenposition dann als Durchlaufträger.

EINFELDTRÄGER HE 220 M L = 6.70 m S235

Maßstab 1 : 125



Teilsicherheitsbeiwert GammaM = 1.10 Eigengewicht g = 1.170 kN/m

EINFACHE LASTEN (q-Anteile : GammaF = 1.50 ; zp : Oberseite)

Streckenlast 1 : gz = 20.75 kN/m2 bz = 1.00 m

AUFLAGERKRÄFTE Grundkomb. (ohne GammaF) * = Maximum

Lager	Ew	V (kN)	Hx (kN)	Hy (kN)	aus Lasten **)
links	G	73.43	0.00	0.00	
rechts	G	73.43	0.00	0.00	

SPANNUNGEN Grundkomb. nach Th.1.O. , x0= 3.35 m GammaF-fach

vorh.SigmaX / fyd = 136.48 / 218.2 = 0.63 < 1
vorh.Tau / TauRd = 0.00 / 126.0 = 0.00 < 1
vorh.SigmaV / fyd = 136.48 / 218.2 = 0.63 < 1

NACHWEIS BIEGEKNICKEN DIN 18800 T2

Grundkomb. : Nachweis Biegeknicken nicht erforderlich.

NACHWEIS BIEGEDRILLKNICKEN DIN 18800 T2 (Ersatzstab nach BTII)

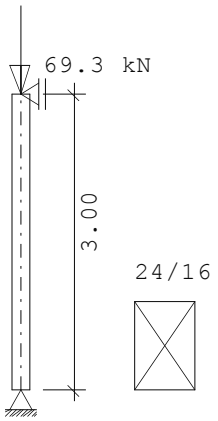
Grundkomb. Nd = 0.00 kN Myd = 166.01 Mzd = 0.00 kNm
Nkiz = 0.00 kN Mkiy= 787.35 kNm
Gleichung 16 : Eta = 0.56 < 1

DURCHBIEGUNGEN für 1-fache Lasten , x0= 3.35 m zul w = L / 300

vorh. w / zul w = 1.88 / 2.23 = 0.84 < 1

Pos 24.1 Stütze

PENDELSTÜTZE: H = 3.00 m 24/16 cm Nadelholz S 10



MASSGEBENDE SYSTEMGRÖSSEN für die Nachweise:

sky =	300 cm		skz =	300 cm	
Lambda =	65.0		Omega =	1.74	

BELASTUNG: V = 69.30 kN LF (H)

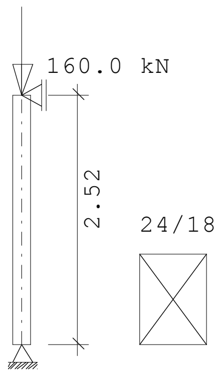
SPANNUNGSNACHWEISE: für Max.-Werte

Zugseite	SigmaZ =	-1.80 MN/m2	<	7.00 MN/m2	(-0.26)
Druck	SigmaD =	1.80 MN/m2	<	8.50 MN/m2	(0.21)
Knicknachweis	SigmaD =	3.15 MN/m2	<	8.50 MN/m2	(0.37)

Schwellendicke	Überstand	Aufstandslänge	Pressung [MN/m2]
20.0 cm	20.0 cm	20.0 cm	1.80 < 2.00(0.90)

Pos 24.2 Stütze

```
PENDELSTÜTZE: H = 2.52 m  24/18 cm                  Nadelholz  S 10
--------------------------------------------------------------------
```



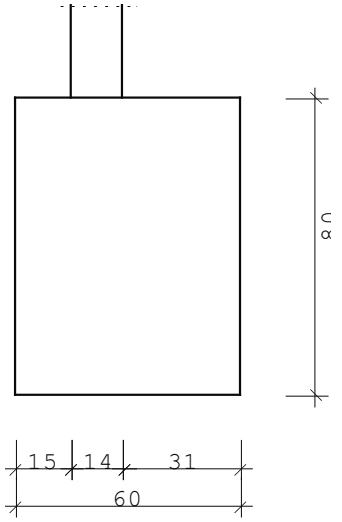

```
MASSGEBENDE SYSTEMGRÖSSEN für die Nachweise:
--------------------------------------------------------------------
                  sky  =     252 cm        skz  =     252 cm
               Lambda =    48.5          Omega  =    1.39

BELASTUNG:         V  =  160.00 kN                            LF (H)
--------------------------------------------------------------------

SPANNUNGSNACHWEISE:    für Max.-Werte
--------------------------------------------------------------------
Zugseite       SigmaZ =   -3.70 MN/m2  <    7.00 MN/m2 (-0.53)
Druck          SigmaD =    3.70 MN/m2  <    8.50 MN/m2 ( 0.44)
Knicknachweis  SigmaD =    5.14 MN/m2  <    8.50 MN/m2 ( 0.60)

Schwellendicke   Überstand    Aufstandslänge     Pressung [MN/m2]
--------------------------------------------------------------------
   14.0 cm        20.0 cm        20.0 cm       3.70 >   2.00( 1.85)
```

Schwellenlagerung nicht möglich!
Gewählt Stahlschuh 180/240mm mit 2 Bolzen M 12 zur Lagesicherung. Verankerung in Bodenplatte bzw. Streifenfundamente.

Fundament

Pos 30 Streifenfundament

Maßstab 1 : 20



Streifenfundament 60 / 80 C 20/25 BSt 500 S(B)

Abmessungen

Wand	d =	0.14 m	L =	1.00 m	Mauerwerk	
Streifenfundament	b =	0.60 m	L =	1.00 m	d =	0.80 m
Bewehrungslage	d1 =	5.0 cm				
Überstand	links =	0.15 m	re =	0.31 m		
vorgeg.Überstand	links =	0.15 m	re =	beliebig		

Belastung

Vertikalkräfte	G =	100.00 kN	g =	100.00 kN/m		
	P =	0.00 kN	p =	0.00 kN/m		
Fundament	G1 =	16.20 kN	g1 =	16.20 kN/m		
	Q =	116.20 kN	q =	116.20 kN/m		

BODENPRESSUNGEN : ohne klaffende Fuge

Bodenpressung nach DIN 1054	Sigma =	245.00	kN/m2
Kantenpressungen : max	Sigma Li =	320.00	kN/m2
max	Sigma Re =	53.33	kN/m2

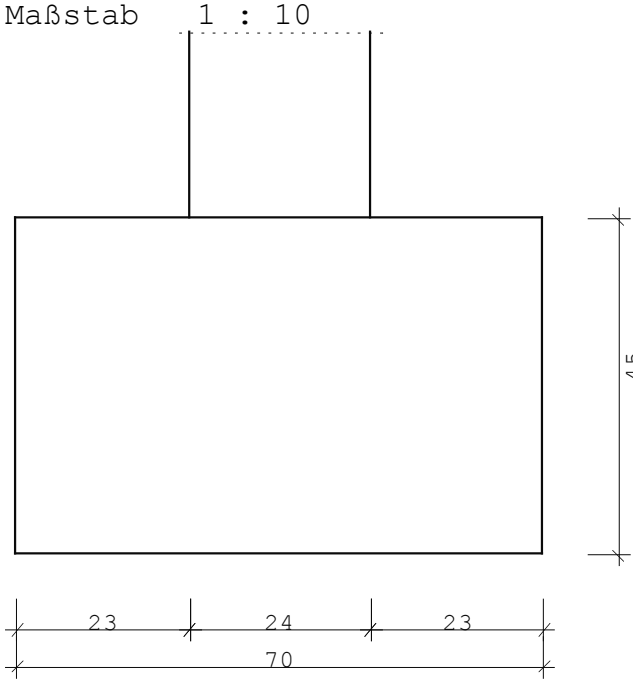
Bemessung für 1.35-fache g- und 1.5-fache p-Lasten :

nach Heft 240 Punkt 2.5
keine Biegebewehrung erforderlich

```
Schubbemessung       C 20/25 BSt 500 S(B) nach DIN 1045-1
------------------------------------------------------------------------
links:  VEd =-355.20 kN/m < VRd,ct =  41.92 kN/m
aswQ* =  7.07 cm2/m je lfd. m
* Mindestschubbewehrung
rechts: VEd =  35.20 kN/m < VRd,ct =  41.92 kN/m
aswQ* =  7.07 cm2/m je lfd. m
* Mindestschubbewehrung
```

Pos 30.1 Streifenfundament

Maßstab 1 : 10



Streifenfundament 70 / 45 C 20/25 BSt 500 S(B)

Abmessungen

Wand	d =	0.24 m	L =	1.00 m	Mauerwerk
Streifenfundament	b =	0.70 m	L =	1.00 m	d = 0.45 m
Bewehrungslage	d1 =	5.0 cm			

Belastung

Vertikalkräfte	G =	150.00 kN	g =	150.00 kN/m
	P =	0.00 kN	p =	0.00 kN/m
Fundament	G1 =	10.63 kN	g1 =	10.63 kN/m
	Q =	160.63 kN	q =	160.63 kN/m

zentrische Pressung p = 225.54 kN/m2

Bemessung für 1.35-fache g- und 1.5-fache p-Lasten :

nach Heft 240 Punkt 2.5
keine Biegebewehrung erforderlich

Schubbemessung C 20/25 BSt 500 S(B) nach DIN 1045-1

links: VEd = -49.85 kN/m < VRd,ct = 46.87 kN/m
aswQ* = 7.07 cm2/m je lfd. m
* Mindestschubbewehrung

rechts: VEd = -49.85 kN/m < VRd,ct = 46.87 kN/m
aswQ* = 7.07 cm2/m je lfd. m
* Mindestschubbewehrung

Technische Abteilung der Maharishi Veda GmbH

Hannover

Objektdaten

Bauherr:	Maharishi Weltfriedens Stiftung
Bauvorhaben:	Seminargebäude
Bauort:	Deutschland
Straße:	
Gemarkung / Flur / Objekt-Nr.	

Verwendetes Verfahren	**EnEV - Monatsbilanzverfahren**		
Gebäudevolumen brutto V_e	6509,03 m³	Beheiztes Luftvolumen V	5207,22 m³
Gebäudenutzfläche A_N	2082,89 m²		
Luftdichtheit Gebäudehülle	nicht geprüft	Luftwechselzahl n	0,7 / h
Heizunterbrechung	10 h/d	Interne Lasten	6 W/m²
Gebäudeheizlast DIN 4108-6	82,38 kW		
Klimaregion	Mittlerer Standort		
Wärmebrücken	pauschal nach DIN 4108 Beiblatt 2		
Bauart	leicht, wirksame Speicherfähigkeit pauschal 15 Wh/(m³*K)*Ve		
Volumenermittlung V_e	22,86*36,06*7,85+(4*4*1,50)+((1,72/3)*(16+4,47+4))		

EnEV-Anforderungsprofil

Gebäudetyp	Nicht-Wohngebäude
Wärmebereitstellung	Fossil oder elektrisch konventionell

Technische Abteilung der Maharishi Veda GmbH

Hannover

Liste der verwendeten Bauteile:

Außenwand Faserdämmung

Richtung **N ↑**

Fläche **71,30** m² F_x **1,00**

Flächenberechnung

22,86*7,85+4,00*2,00-(2*8+14,54)*2-1*3,5-22,54-29,03

Schichtaufbau	λ [W/mK]	Dicke [cm]
R_{se} **0,04** m²*K/W		
Putzmörtel aus Kalk, Kalkzement, hydr. Kalk	1,000	2,50
Holzwolle-Leichtbauplatten nach DIN 1101 065	0,065	5,00
Faserdämmstoffe nach DIN 18165-1 035	0,035	14,00
OSB-Platten	0,130	1,80
Faserdämmstoffe nach DIN 18165-1 050	0,050	5,00
PA-Folie >= 0.05 mm		0,01
Wandbauplatten aus Gips 18163	0,290	1,250
R_{si} **0,13** m²*K/W		

U-Wert **0,16** W/(m²*K) α-Wert **0,40**

Außenwand Faserdämmung

Richtung **S ↓**

Fläche **71,30** m² F_x **1,00**

Flächenberechnung

22,86*7,85+4,00*2,00-(2*8+14,54)*2-1*3,5-22,54-29,03

Schichtaufbau	λ [W/mK]	Dicke [cm]
R_{se} **0,04** m²*K/W		
Putzmörtel aus Kalk, Kalkzement, hydr. Kalk	1,000	2,50
Holzwolle-Leichtbauplatten nach DIN 1101 065	0,065	5,00
Faserdämmstoffe nach DIN 18165-1 035	0,035	14,00
OSB-Platten	0,130	1,80
Faserdämmstoffe nach DIN 18165-1 050	0,050	5,00
PA-Folie >= 0.05 mm		0,01
Wandbauplatten aus Gips 18163	0,290	1,250
R_{si} **0,13** m²*K/W		

U-Wert **0,16** W/(m²*K) α-Wert **0,40**

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Außenwand Faserdämmung

Richtung **O ➔**

Fläche **127,82** m² F_x **1,00**

Flächenberechnung

36,06*7,85+4,00*2,00-(2*10+4,072*4)*2-2,5-4,072-1*3,50-35,73-44,87

Schichtaufbau	λ [W/mK]	Dicke [cm]
R_{se} **0,04** m²*K/W		
Putzmörtel aus Kalk, Kalkzement, hydr. Kalk	1,000	2,50
Holzwolle-Leichtbauplatten nach DIN 1101 065	0,065	5,00
Faserdämmstoffe nach DIN 18165-1 035	0,035	14,00
OSB-Platten	0,130	1,80
Faserdämmstoffe nach DIN 18165-1 050	0,050	5,00
PA-Folie >= 0.05 mm		0,01
Wandbauplatten aus Gips 18163	0,290	1,250
R_{si} **0,13** m²*K/W		

U-Wert **0,16** W/(m²*K) α-Wert **0,40**

Außenwand Faserdämmung

Richtung **W ➔**

Fläche **122,15** m² F_x **1,00**

Flächenberechnung

36,06*7,85+4,00*2,00-(2*14+4,072*3)*2-1*3,50-40,12-44,87

Schichtaufbau	λ [W/mK]	Dicke [cm]
R_{se} **0,04** m²*K/W		
Putzmörtel aus Kalk, Kalkzement, hydr. Kalk	1,000	2,50
Holzwolle-Leichtbauplatten nach DIN 1101 065	0,065	5,00
Faserdämmstoffe nach DIN 18165-1 035	0,035	14,00
OSB-Platten	0,130	1,80
Faserdämmstoffe nach DIN 18165-1 050	0,050	5,00
PA-Folie >= 0.05 mm		0,01
Wandbauplatten aus Gips 18163	0,290	1,250
R_{si} **0,13** m²*K/W		

U-Wert **0,16** W/(m²*K) α-Wert **0,40**

Technische Abteilung der Maharishi Veda GmbH

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Außenwand Ständer

Richtung **N ↑**

Fläche **22,54** m² F_x **1,00**

Flächenberechnung

20*(0,14*7,85)+2*(0,14*2,00)

Schichtaufbau	λ [W/mK]	Dicke [cm]
R_{se} **0,04** m²*K/W		
Putzmörtel aus Kalk, Kalkzement, hydr. Kalk	1,000	2,50
Holzwolle-Leichtbauplatten nach DIN 1101 065	0,065	5,00
Konstruktionsholz	0,180	14,00
OSB-Platten	0,130	1,80
Faserdämmstoffe nach DIN 18165-1 050	0,050	5,00
PA-Folie >= 0.05 mm		0,01
Wandbauplatten aus Gips 18163	0,290	1,250
R_{si} **0,13** m²*K/W		

U-Wert **0,34** W/(m²*K) α-Wert **0,40**

Außenwand Ständer

Richtung **S ↓**

Fläche **22,54** m² F_x **1,00**

Flächenberechnung

20*(0,14*7,85)+2*(0,14*2,00)

Schichtaufbau	λ [W/mK]	Dicke [cm]
R_{se} **0,04** m²*K/W		
Putzmörtel aus Kalk, Kalkzement, hydr. Kalk	1,000	2,50
Holzwolle-Leichtbauplatten nach DIN 1101 065	0,065	5,00
Konstruktionsholz	0,180	14,00
OSB-Platten	0,130	1,80
Faserdämmstoffe nach DIN 18165-1 050	0,050	5,00
PA-Folie >= 0.05 mm		0,01
Wandbauplatten aus Gips 18163	0,290	1,250
R_{si} **0,13** m²*K/W		

U-Wert **0,34** W/(m²*K) α-Wert **0,40**

Außenwand Ständer

Richtung **O →**

Fläche **35,73** m² F_x **1,00**

Flächenberechnung

32*(0,14*7,85)+2*(0,14*2,00)

Schichtaufbau	λ [W/mK]	Dicke [cm]
R_{se} **0,04** m²*K/W		
Putzmörtel aus Kalk, Kalkzement, hydr. Kalk	1,000	2,50
Holzwolle-Leichtbauplatten nach DIN 1101 065	0,065	5,00
Konstruktionsholz	0,180	14,00
OSB-Platten	0,130	1,80
Faserdämmstoffe nach DIN 18165-1 050	0,050	5,00
PA-Folie >= 0.05 mm		0,01
Wandbauplatten aus Gips 18163	0,290	1,250
R_{si} **0,13** m²*K/W		

U-Wert **0,34** W/(m²*K) α-Wert **0,40**

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Außenwand Ständer

Richtung **W ←**

Fläche **40,12** m² F_x **1,00**

Flächenberechnung

36*(0,14*7,85)+2*(0,14*2,00)

Schichtaufbau	λ [W/mK]	Dicke [cm]
R_{se} **0,04** m²*K/W		
Putzmörtel aus Kalk, Kalkzement, hydr. Kalk	1,000	2,50
Holzwolle-Leichtbauplatten nach DIN 1101 065	0,065	5,00
Konstruktionsholz	0,180	14,00
OSB-Platten	0,130	1,80
Faserdämmstoffe nach DIN 18165-1 050	0,050	5,00
PA-Folie >= 0.05 mm		0,01
Wandbauplatten aus Gips 18163	0,290	1,250
R_{si} **0,13** m²*K/W		

U-Wert **0,34** W/(m²*K) **α** -Wert **0,40**

Außenwand Riegel

Richtung **N ↑**

Fläche **29,03** m² F_x **1,00**

Flächenberechnung

6*(0,2*22,86)+2*(0,2*4,00)

Schichtaufbau	λ [W/mK]	Dicke [cm]
R_{se} **0,04** m²*K/W		
Putzmörtel aus Kalk, Kalkzement, hydr. Kalk	1,000	2,50
Holzwolle-Leichtbauplatten nach DIN 1101 065	0,065	5,00
Konstruktionsholz	0,180	14,00
OSB-Platten	0,130	1,80
Faserdämmstoffe nach DIN 18165-1 050	0,050	5,00
PA-Folie >= 0.05 mm		0,01
Wandbauplatten aus Gips 18163	0,290	1,250
R_{si} **0,13** m²*K/W		

U-Wert **0,34** W/(m²*K) **α** -Wert **0,40**

Außenwand Riegel

Richtung **S ↓**

Fläche **29,03** m² F_x **1,00**

Flächenberechnung

6*(0,2*22,86)+2*(0,2*4,00)

Schichtaufbau	λ [W/mK]	Dicke [cm]
R_{se} **0,04** m²*K/W		
Putzmörtel aus Kalk, Kalkzement, hydr. Kalk	1,000	2,50
Holzwolle-Leichtbauplatten nach DIN 1101 065	0,065	5,00
Konstruktionsholz	0,180	14,00
OSB-Platten	0,130	1,80
Faserdämmstoffe nach DIN 18165-1 050	0,050	5,00
PA-Folie >= 0.05 mm		0,01
Wandbauplatten aus Gips 18163	0,290	1,250
R_{si} **0,13** m²*K/W		

U-Wert **0,34** W/(m²*K) **α** -Wert **0,40**

Technische Abteilung der Maharishi Veda GmbH

Hannover

Außenwand Riegel

Richtung **O ➔**

Fläche **44,87** m² F_x **1,00**

Flächenberechnung

6*(0,2*36,06)+2*(0,2*4,00)

Schichtaufbau	λ [W/mK]	Dicke [cm]
R_{se} **0,04** m²*K/W		
Putzmörtel aus Kalk, Kalkzement, hydr. Kalk	1,000	2,50
Holzwolle-Leichtbauplatten nach DIN 1101 065	0,065	5,00
Konstruktionsholz	0,180	14,00
OSB-Platten	0,130	1,80
Faserdämmstoffe nach DIN 18165-1 050	0,050	5,00
PA-Folie >= 0.05 mm		0,01
Wandbauplatten aus Gips 18163	0,290	1,250
R_{si} **0,13** m²*K/W		

U-Wert **0,34** W/(m²*K) **α** -Wert **0,40**

Außenwand Riegel

Richtung **W ➔**

Fläche **44,87** m² F_x **1,00**

Flächenberechnung

6*(0,2*36,06)+2*(0,2*4,00)

Schichtaufbau	λ [W/mK]	Dicke [cm]
R_{se} **0,04** m²*K/W		
Putzmörtel aus Kalk, Kalkzement, hydr. Kalk	1,000	2,50
Holzwolle-Leichtbauplatten nach DIN 1101 065	0,065	5,00
Konstruktionsholz	0,180	14,00
OSB-Platten	0,130	1,80
Faserdämmstoffe nach DIN 18165-1 050	0,050	5,00
PA-Folie >= 0.05 mm		0,01
Wandbauplatten aus Gips 18163	0,290	1,250
R_{si} **0,13** m²*K/W		

U-Wert **0,34** W/(m²*K) **α** -Wert **0,40**

Dach an Außenluft

Richtung **O ➔** Neigung **0°**

Fläche **824,33** m² F_x **1,00**

Flächenberechnung

36,06*22,86

R_{se} **0,04** m²*K/W		
Kunststoff-Dachbahn DIN 16729		0,50
Polyurethan(PUR)-Hartschaum 035	0,035	24,00
PTFE-Folie >= 0.05 mm		0,01
OSB-Platten	0,130	2,20
R_{si} **0,13** m²*K/W		

U-Wert **0,14** W/(m²*K) **α** -Wert **0,80**

Bemerkungen

Dachneigung >1%

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Hannover

Bodenplatte

Fläche **824,33** m² F_x **0,35**

Flächenberechnung

36,06*22,86

Umfang der Bodenplatte: 117,8 m

Ohne Grundwasser
Ohne Randdämmung

Schichtaufbau	λ [W/mK]	Dicke [cm]
R_{se} **0,00** m²*K/W		
Beton nach DIN 206, mittlere Rohdichte	1,350	16,00
Polystyrol-Partikelschaum DIN 18164 040	0,040	10,00
Anhydrit-Estrich	1,200	6,00
Linoleum	0,170	1,00
R_{si} **0,17** m²*K/W		

U-Wert **0,35** W/(m²*K)

Fenster allgemein

Richtung **N ↑**

Fläche **64,58** m² F_x **1,00**

Flächenberechnung

(2*8+14,54)*2+3,5

F_S **0,90** F_C **1,00** F_F **0,70** g-Wert **0,60**

U-Wert **1,30** W/(m²*K)

Bemerkungen

Zweifachverglasung Ug = 1,1 Rahmen m. Prüfzeugnis

Fenster allgemein

Richtung **S ↓**

Fläche **64,58** m² F_x **1,00**

Flächenberechnung

(2*8+14,54)*2+3,5

F_S **0,90** F_C **1,00** F_F **0,70** g-Wert **0,60**

U-Wert **1,30** W/(m²*K)

Bemerkungen

Zweifachverglasung Ug = 1,1 Rahmen m. Prüfzeugnis

Fenster allgemein

Richtung **O →**

Fläche **80,15** m² F_x **1,00**

Flächenberechnung

(2*10+4,072*4)*2+4,072+3,5

F_S **0,90** F_C **1,00** F_F **0,70** g-Wert **0,60**

U-Wert **1,30** W/(m²*K)

Bemerkungen

Zweifachverglasung Ug = 1,1 Rahmen m. Prüfzeugnis

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Fenster allgemein

Richtung **W ←**

Fläche **83,93** m² F_x **1,00**

Flächenberechnung

(2*14+4,072*3)*2+3,5

F_S **0,90** F_C **1,00** F_F **0,70** g-Wert **0,60**

U-Wert **1,30** W/(m²*K)

Bemerkungen

Zweifachverglasung Ug = 1,1 Rahmen m. Prüfzeugnis

Außentür opak

Richtung **O →**

Fläche **2,50** m² F_x **1,00**

Flächenberechnung

2,5

U-Wert **1,70** W/(m²*K) α -Wert **0,40**

Bemerkungen

Vollholztür, schwere Ausführung, Dicke des Türblattes ca. 60 mm

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Ziegel - EnEV Ergebnisreport Monatsbilanz

	Jan	Feb	Mrz	Apr	Mai	Jun	Jul	Aug	Sep	Okt	Nov	Dez	
Q_t	11418	9348,1	8381,0	5171,2	3431,2	1796,3	562,5	393,7	2504,0	5568,6	7784,1	9956,0	kWh
Q_{WB}	1967,7	1610,9	1444,3	891,1	591,3	309,6	96,9	67,9	431,5	959,6	1341,4	1715,7	kWh
Q_{FH}	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	kWh
Q_{sop}	-87,0	-14,1	96,3	492,8	573,8	706,6	736,6	460,5	293,3	74,7	-64,1	-138,5	kWh
Q_V	18718	15324	13739	8476,9	5624,5	2944,6	922,1	645,4	4104,6	9128,3	12760	16320	kWh
Q_{il}	2960,3	2261,5	1810,8	972,7	610,9	317,7	99,5	69,6	442,8	1056,5	1652,5	2351,3	kWh
ΣQ_l	29231	24036	21657	13074	8462,3	4026,2	745,4	576,9	6303,9	14525	20297	25779	kWh
Q_s	2182,5	2628,1	4064,5	8203,3	8709,6	9651,0	10320	7750,9	6195,5	3981,5	2264,3	1325,8	kWh
Q_{TWD}	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	kWh
Q_{Wiga}	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	kWh
Q_i	9298,0	8398,2	9298,0	8998,1	9298,0	8998,1	9298,0	9298,0	8998,1	9298,0	8998,1	9298,0	kWh
ΣQ_g	11480	11026	13363	17201	18008	18649	19618	17049	15194	13279	11262	10624	kWh
γ	0,39	0,46	0,62	1,32	2,13	4,63	26,32	29,55	2,41	0,91	0,55	0,41	-
η_g	0,984	0,973	0,935	0,675	0,456	0,215	0,038	0,034	0,407	0,829	0,952	0,981	-
Q_h	17939	13308	9166,8	1471,3	247,4	8,4	0,0	0,0	124,2	3520,5	9578,4	15360	kWh

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Ziegel - EnEV Ergebnisreport

Hüllfläche	A	2605,70	m²
Bezugsfläche	A_N	2082,89	m²
Bruttovolumen	V_e	6509,03	m³
Hüllflächenfaktor	A/V_e	0,40	1/m
Fensterflächenanteil	f_s	0,16	-
Nutzbare interne Gewinne	Q'_i	10,44	kWh / (m³a)
Nutzbare Solargewinne Fenster	Q'_s	4,61	kWh / (m³a)
Nutzbare Solargewinne Glasvorbau	Q'_{ss}	0,00	kWh / (m³a)
Nutzbare Solargewinne TWD	Q'_{TWD}	0,00	kWh / (m³a)
Nutzbare Gesamtgewinne	Q'_g	15,05	kWh / (m³a)
Lüftungswärmeverluste	Q'_V	16,70	kWh / (m³a)
Transmissionswärmeverluste	Q'_T	9,71	kWh / (m³a)
Wärmebrückenverluste	Q'_{WB}	1,76	kWh / (m³a)
Reduzierung durch Nachtabsenkung	Q'_{il}	2,24	kWh / (m³a)
Flächenbez. Transmissionswärmeverlust vorh.	$H'_{T,vorh.}$	0,34	W / (m²K)
Flächenbez. Transmissionswärmeverlust zul.	$H'_{T,zul.}$	0,68	W / (m²K)
Heiztage	t_{HP}	201	d
Heizwärmebedarf	Q'_h	10,87	kWh / (m³a)
Trinkwasser-Wärmebedarf	Q'_{TW}	0,00	kWh / (m³a)
Gesamt-Aufwandszahl	e_P	1,52	-
Primärenergiebedarf vorh.	$Q'_{vorh.}$	16,52	kWh / (m³a)
Primärenergiebedarf zul.	$Q'_{zul.}$	19,54	kWh / (m³a)

Nachweis erbracht

Name _____ Datum _____

Funktion/ Firma _____ Unterschrift _____

Anschrift _____

_____

_____ Stempel / Firmenzeichen

Technische Abteilung der Maharishi Veda GmbH

Hannover

Nachweis über energiesparenden Wärmeschutz und energiesparende Anlagentechnik bei Gebäuden gemäß Energieeinsparverordnung 2002 / 2003

Bauherr:	Maharishi Weltfriedens Stiftung
Bauvorhaben:	Seminargebäude
Bauort:	Deutschland
Straße:	
Gemarkung / Flur / Objekt-Nr.	

Die "Verordnung über energiesparenden Wärmeschutz und energiesparende Anlagentechnik bei Gebäuden (Energieeinsparverordnung - EnEV)" vom 1.2.2002

Grundlagen :	DIN	4108-2
	DIN V	4108-6
	DIN V	4701-10 und Beiblatt 1
	DIN EN ISO	6946
	Bauaufsichtliche Zulassungen und Bescheide	

Nachweis erstellt mit Programmversion 4.10

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