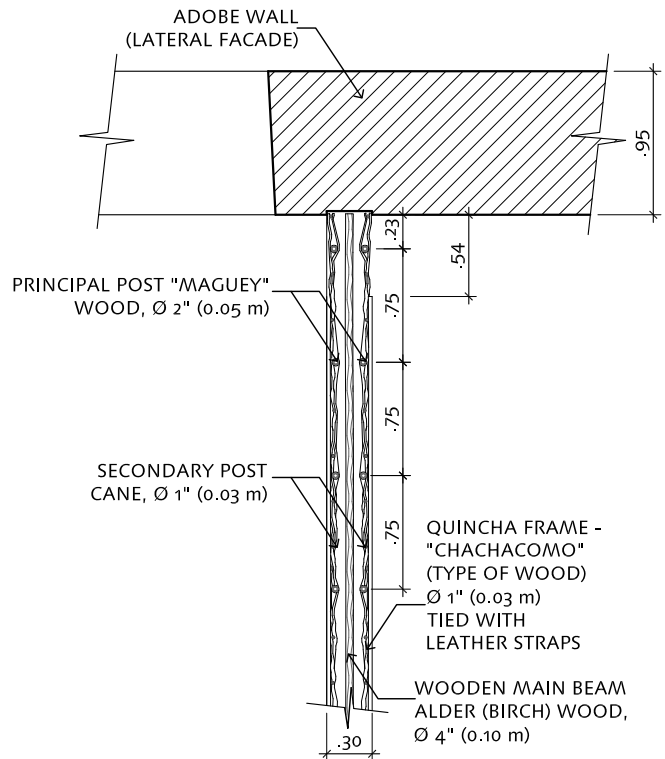


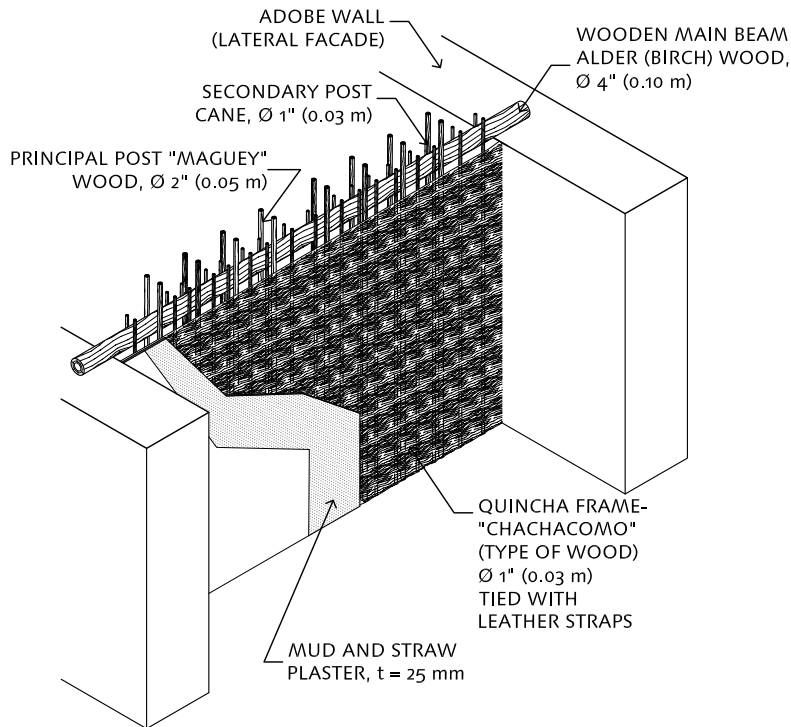
SECOND FLOOR REFERENCE PLAN

NO SCALE



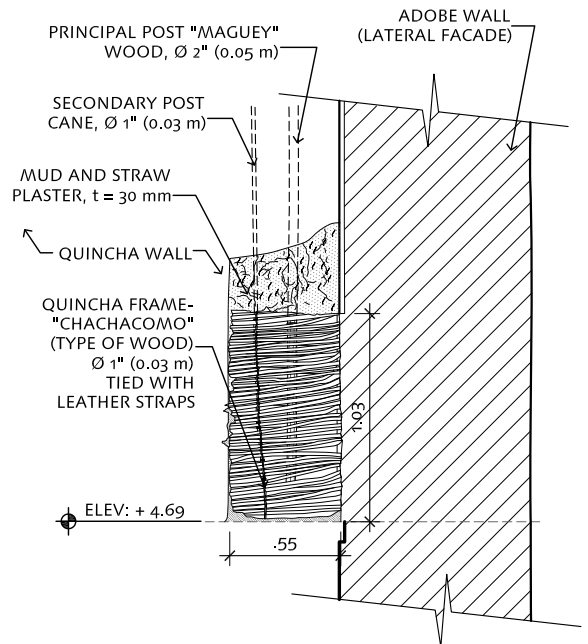
FLOOR PLAN "QUINCHA" WALL

SCALE 1: 50



ISOMETRIC OF "QUINCHA" WALL

SCALE 1: 100



ELEVATION OF "QUINCHA" WALL

SCALE 1:75

True scale when printed on 8-1/2" x 11" sheet.

SEISMIC RETROFITTING PROJECT
The Earthen Architecture Initiative



The Getty Conservation Institute



Building:
CASA ARONES
Cusco, Perú

Sheet Title:
Structural Prospection
IIW-3

Drafted By:
Percy Iparraguirre

Supervisor:
Arch. Mirna Soto

Facilitator:
Universidad Católica Sedes Sapientiae

Edited and Translated By:
Jabdiel Zapata

Date:
October 2011

Scale:
As noted

Sheet No.:

CA-P-1



IIW-3 (TOP)



IIW-3 (BOTTOM)

IIW-3

THIS OPENING SHOWS US THE STRUCTURE OF THE QUINCHA PARTITIONS USED ON THE SECOND FLOOR. THE DOUBLE QUINCHA FRAME PARTITION IS HOLLOW IN THE MIDDLE AND IS CONSTRUCTED OF ROUND PRINCIPAL POSTS MADE OF "MAGUEY" WOOD AND SPACED AT APPROXIMATELY 0.75 m ON CENTER. THESE PRINCIPAL POSTS ARE FASTENED TO ROUND WOOD FRAMING PLACED HORIZONTALLY AND SPACED AT APPROXIMATELY 1.50 m. BETWEEN THE PRINCIPAL POSTS ARE VERTICAL "CAÑA BRAVA" (CANES THAT ARE ROUNDED, NOT FLATTENED, AND NOT HOLLOW), AND 1" (0.03 m) DIAMETER "CHACHACOMO" WOOD TRUNKS ARE TIED TO THE CANES WITH LEATHER STRAPS. THE "CHACHACOMO" TRUNKS ARE COVERED WITH A 30 mm THICK MUD AND STRAW PLASTER, A GYPSUM FINISH COAT, AND WALLPAPER. THE OVERALL THICKNESS OF THE "QUINCHA" PARTITIONS IS 0.30 m, OWING TO THE FACT THAT THE PRINCIPAL AND SECONDARY POSTS, "CHACHACOMO" TRUNKS, MUD AND STRAW PLASTER, AND GYPSUM FINISH COAT ARE REPEATED AT THE OTHER SIDE.

THE QUINCHA FRAMES ARE NOT STRUCTURALLY CONNECTED TO THE ADOBE WALL; THEY ARE SIMPLY ADJACENT NEXT TO ONE ANOTHER.

True scale when printed on 8-1/2" x 11" sheet.

SEISMIC RETROFITTING PROJECT
The Earthen Architecture Initiative



The Getty Conservation Institute



Building:
CASA ARONES
Cusco, Perú

Sheet Title:
Structural Prospection
IIW-3

Drafted By:
Percy Iparraguirre

Supervisor:
Arch. Mirna Soto

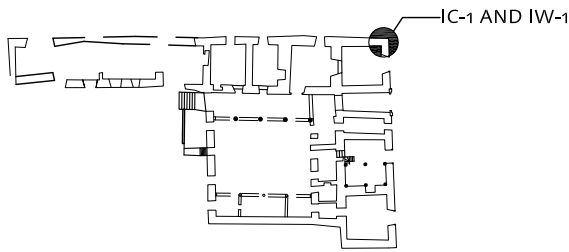
Facilitator:
Universidad Católica Sedes Sapientiae

Edited and Translated By:
Jabdiel Zapata

Date:
October 2011

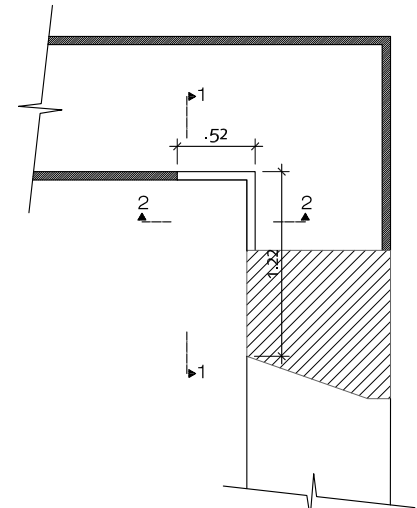
Scale:
As noted

Sheet No.:
CA-P-2



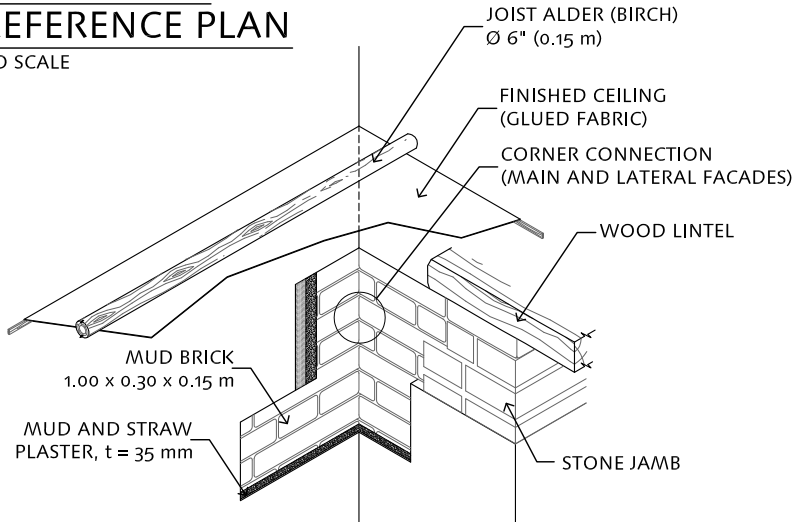
**FIRST FLOOR
REFERENCE PLAN**

NO SCALE



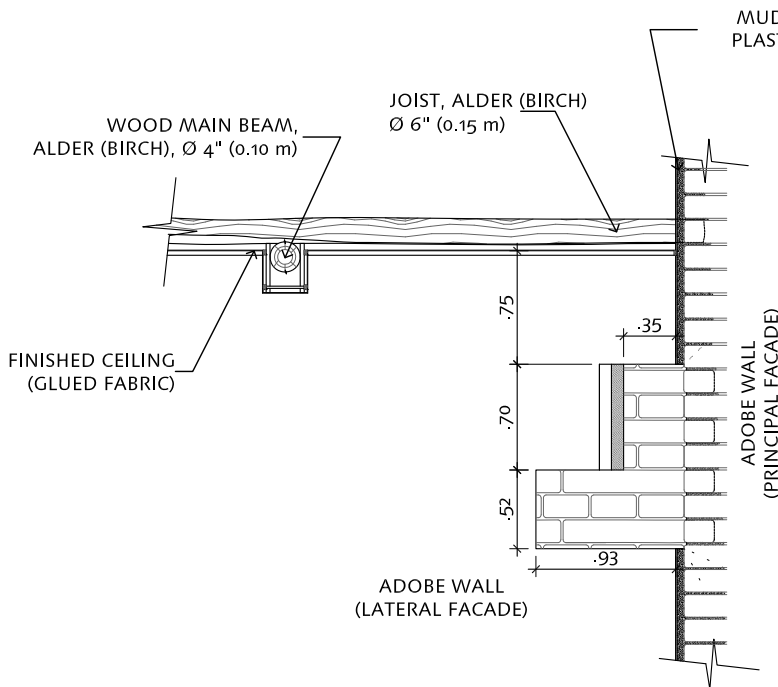
FLOOR PLAN

SCALE 1: 50



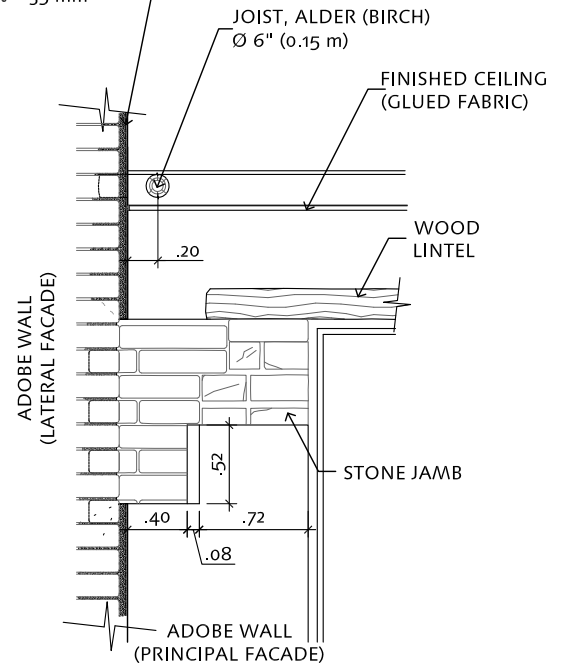
ISOMETRIC IW-1

SCALE 1: 50



SECTION CUT 1-1

SCALE 1: 50



SECTION CUT 2-2

SCALE 1: 50

True scale when printed on 8-1/2" x 11" sheet.

SEISMIC RETROFITTING PROJECT
The Earthen Architecture Initiative



The Getty Conservation Institute



Building: **CASA ARONES**
Cusco, Perú

Sheet Title: **Structural Prospections**
IC-1 and IW-1

Drafted By: **Percy Iparraguirre**
Supervisor: **Arch. Mirna Soto**

Facilitator: **Universidad Católica Sedes Sapientiae**
Edited and Translated By: **Jabdiel Zapata**

Date: **October 2011**
Scale: **As noted**

Sheet No.: **CA-P-3**



IW-1



IW-1

IW-1

THIS OPENING IS LOCATED IN THE CORNER, AT THE CONNECTION OF THE MAIN AND LATERAL FAÇADES. THESE TWO WALLS ARE CONNECTED BY OVERLAPPING ADOBE BRICKS. THE ADOBE BRICKS ARE 0.90-1.00 m LONG AND ARE LAID IN A MUD MORTAR. AT THE DOOR OPENING LOCATED ON THE MAIN FAÇADE, THERE ARE CUT STONE BLOCKS AT THE JAMBS AND A WOODEN LINTEL, WITH ENDS THAT ARE EMBEDDED IN THE ADOBE WALL. THE ADOBE BRICKS, STONE JAMBS, AND WOOD LINTEL ARE ALL COVERED BY A 35 mm THICK MUD AND STRAW PLASTER.

True scale when printed on 8-1/2" x 11" sheet.

SEISMIC RETROFITTING PROJECT
The Earthen Architecture Initiative



The Getty Conservation Institute



Building:
CASA ARONES
Cusco, Perú

Sheet Title:
Structural Prospection
IW-1

Drafted By:
Percy Iparraguirre

Supervisor:
Arch. Mirna Soto

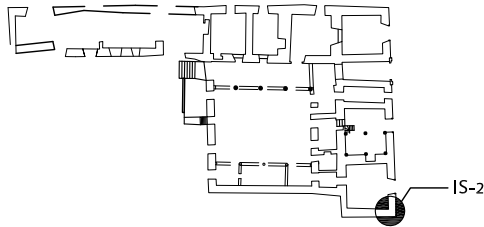
Facilitator:
Universidad Católica Sedes Sapientiae

Edited and Translated By:
Jabdiel Zapata

Date:
October 2011

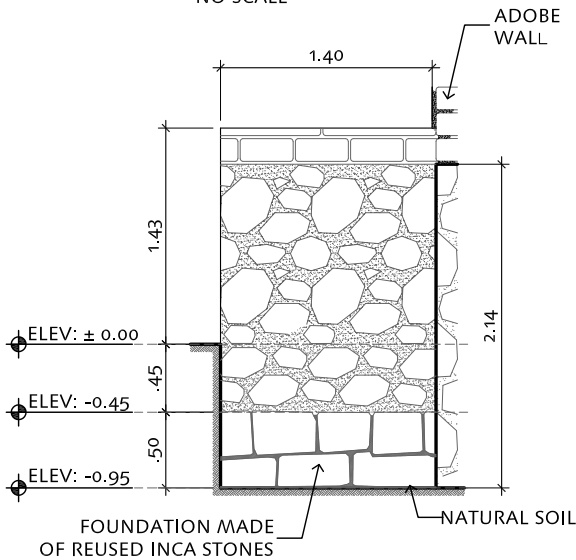
Scale:
As noted

Sheet No.:
CA-P-4



**FIRST FLOOR
REFERENCE PLAN**

NO SCALE

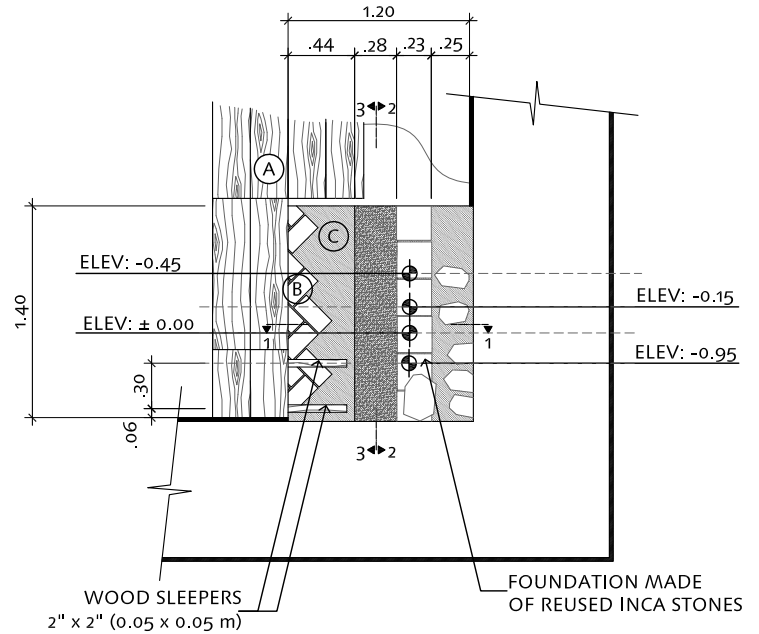


SECTION CUT 2-2

SCALE 1: 50

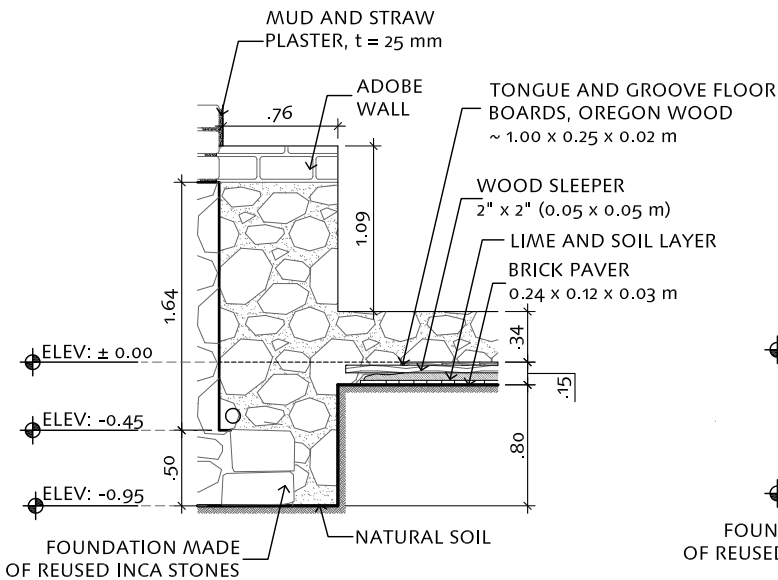
LEGEND:

- A. TONGUE-AND-GROOVE FLOOR BOARDS, OREGON WOOD ~ 1.00 x 0.25 x 0.02 m
- B. BRICK PAVER, 0.24 x 0.12 x 0.03 m (HERRINGBONE PATTERN SET IN EARTH)
- C. NATURAL SOIL



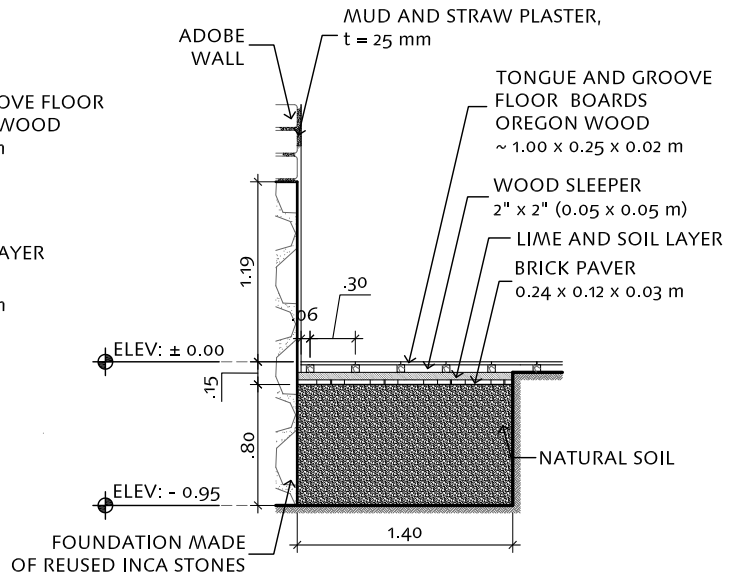
FLOOR PLAN

SCALE 1: 50



SECTION CUT 1-1

SCALE 1: 50



SECTION CUT 3-3

SCALE 1: 50

True scale when printed on 8-1/2" x 11" sheet.

SEISMIC RETROFITTING PROJECT
The Earthen Architecture Initiative



Building: **CASA ARONES**
Cusco, Perú

Sheet Title: **Structural Prospection**
IS-2

Drafted By: Percy Iparraguirre
Supervisor: Arch. Mirna Soto
Facilitator: Universidad Católica Sedes Sapientiae
Edited and Translated By: Jabdriel Zapata

Date: October 2011
Scale: As noted
Sheet No.: **CA-P-5**



IS-2



IS-2

IS-2

THIS OPENING IS LOCATED IN THE CORNER, AT THE INTERSECTION OF THE MAIN FAÇADE AND THE WALL ALONG THE ADJACENT PROPERTY, IN A ROOM DESIGNED AS A SHOP AND HAVING A DOOR OPENING ONTO THE STREET.

THE OPENING IN THE FLOOR ALLOWED US TO OBSERVE THE FOLLOWING:
 TONGUE-AND-GROOVE WOOD FLOOR BOARDS, NAILED TO WOOD SLEEPERS RUNNING PERPENDICULAR TO THE FLOOR BOARDS AND SPACED AT 0.30 m. THE SPACE BETWEEN THE SLEEPERS IS FILLED WITH LIME AND SOIL.
 BENEATH THE SLEEPERS, THERE IS ANOTHER FLOOR CONSISTING OF BRICK PAVERS SET IN A HERRINGBONE PATTERN.
 APPROXIMATELY 0.30 m BELOW THE FINISH FLOOR LEVEL THERE IS A STRUCTURE MADE OF INCA STONES, CUT OR QUARRIED IN A "PARALELEPÍPEDAS" SHAPE (A HEXAHEDRON WITH THREE PAIRS OF PARALLEL SIDES) FROM LIMESTONE. THIS STRUCTURE PROJECTS 0.50 m BEYOND THE WALL PLANE ABOVE AND IS 0.50 m DEEP. INCA STONES WERE OFTEN REUSED IN OLD COLONIAL AND REPUBLICAN BUILDINGS.
 BY EXTENDING THE OPENING TOWARDS THE WALL, WE WERE ABLE TO SEE THE FOLLOWING: A HIGH "SOBRECIMIENTO" OR BASE COURSE MADE OF IRREGULAR STONES LAID IN MUD MORTAR, AND ABOVE THIS SITS THE ADOBE WALL.
 IT IS ALSO POSSIBLE TO SEE THAT THESE TWO WALLS ARE CONNECTED AT THEIR CORNERS; HOWEVER, THERE IS A DEEP CRACK, POSSIBLY RESULTING FROM AN EARTHQUAKE.

THE FLOOR / CEILING BEAMS ABOVE ARE DAMAGED - THAT IS THE REASON SHORING HAS BEEN INSTALLED IN THIS ROOM.

True scale when printed on 8-1/2" x 11" sheet.

SEISMIC RETROFITTING PROJECT
 The Earthen Architecture Initiative



The Getty Conservation Institute



Building:
CASA ARONES
 Cusco, Perú

Sheet Title:
Structural Prospection
 IW-1

Drafted By:
 Percy Iparraguirre

Supervisor:
 Arch. Mirna Soto

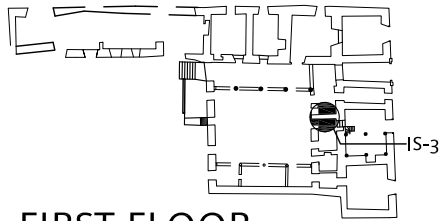
Facilitator:
 Universidad Católica Sedes Sapientiae

Edited and Translated By:
 Jabdiel Zapata

Date:
 October 2011

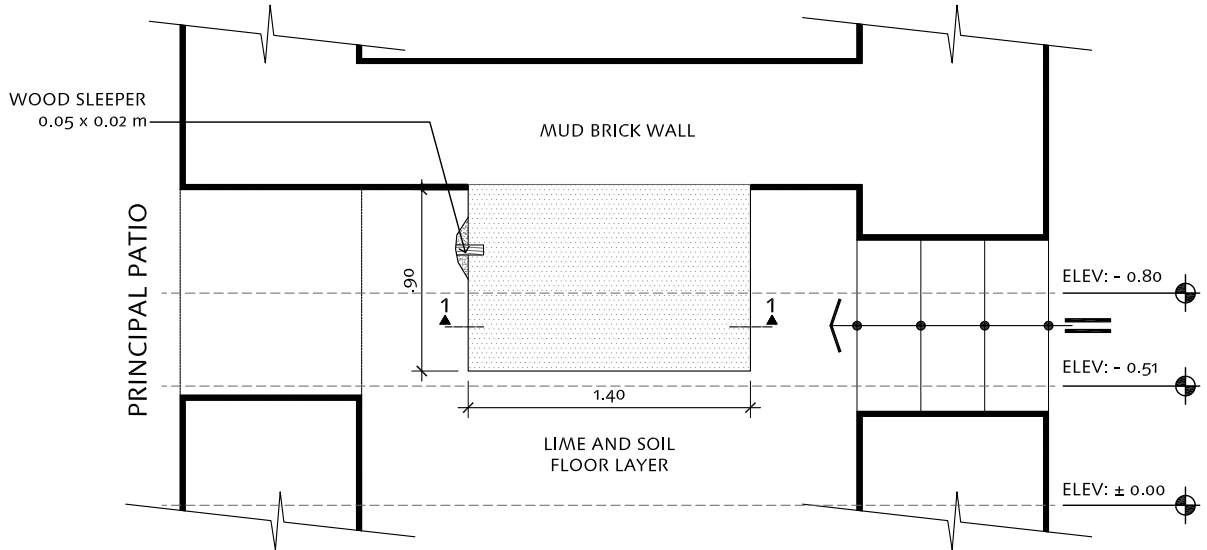
Scale:
 As noted

Sheet No.:
CA-P-6



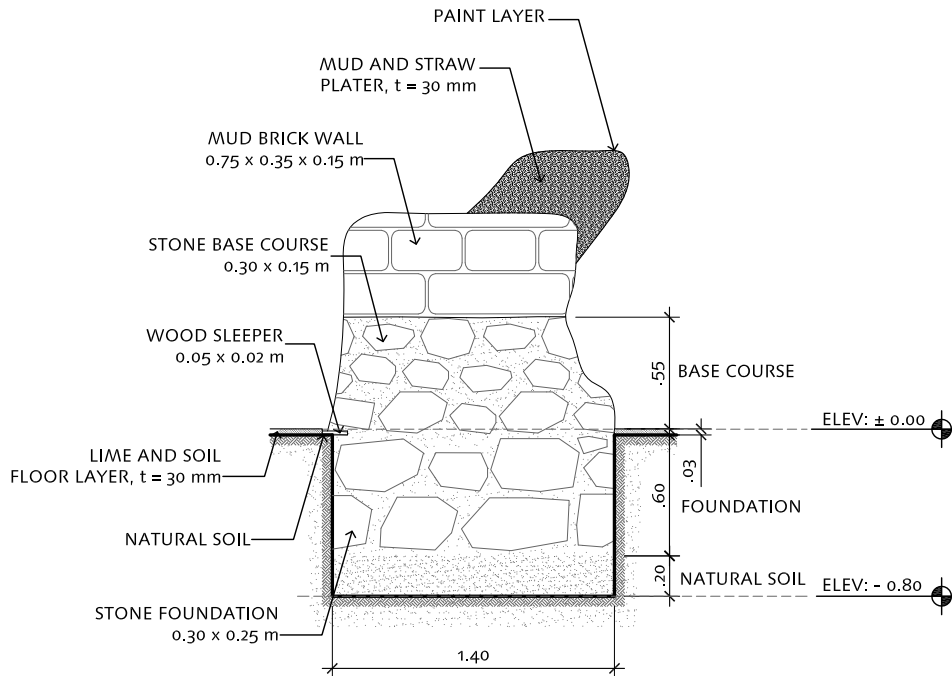
FIRST FLOOR REFERENCE PLAN

NO SCALE



FLOOR PLAN

SCALE 1: 25



SECTION CUT 1-1

SCALE 1: 25

True scale when printed on 8-1/2" x 11" sheet.

SEISMIC RETROFITTING PROJECT
The Earthen Architecture Initiative



The Getty Conservation Institute



Building: **CASA ARONES**
Cusco, Perú

Sheet Title: **Structural Prospection**
IS-3

Drafted By:
Percy Iparraguirre

Supervisor:
Arch. Mirna Soto

Facilitator:
Universidad Católica Sedes Sapientiae

Edited and Translated By:
Jabdiel Zapata

Date:
October 2011

Scale:
As noted

Sheet No.:

CA-P-7



IS-3

IS-3

THIS OPENING IS IN ONE OF THE ROOMS SURROUNDING THE PRINCIPAL PATIO. TAKING ADVANTAGE OF A PREVIOUS ARCHEOLOGICAL OPENING WE OBSERVED THE FOLLOWING:

A 0.60 m DEEP STONE FOUNDATION WITH A MUD AND LIME MORTAR.

A 0.50 m HIGH "SOBRECIMIENTO," OR BASE COURSE, WITH THE ADOBE WALL ABOVE IT.

THE FLOOR LEVEL IN THIS ROOM IS 0.50 m HIGHER THAN THE ADJOINING ROOMS ALONG THE STREET FAÇADE. THIS IS BECAUSE OF THE STEEP TERRAIN AND THE PRESENCE OF MAN-MADE PLATFORMS OR TERRACES FROM ANTIQUITY.

True scale when printed on 8-1/2" x 11" sheet.

SEISMIC RETROFITTING PROJECT
The Earthen Architecture Initiative



The Getty Conservation Institute



Building:
CASA ARONES
Cusco, Perú

Sheet Title:
Structural Prospection
IS-3

Drafted By:
Percy Iparraguirre

Supervisor:
Arch. Mirna Soto

Facilitator:
Universidad Católica Sedes Sapientiae

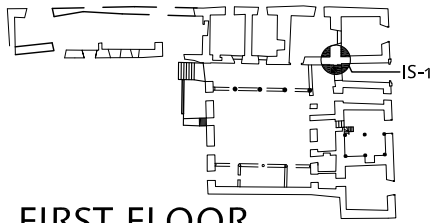
Edited and Translated By:
Jabdiel Zapata

Date:
October 2011

Scale:
As noted

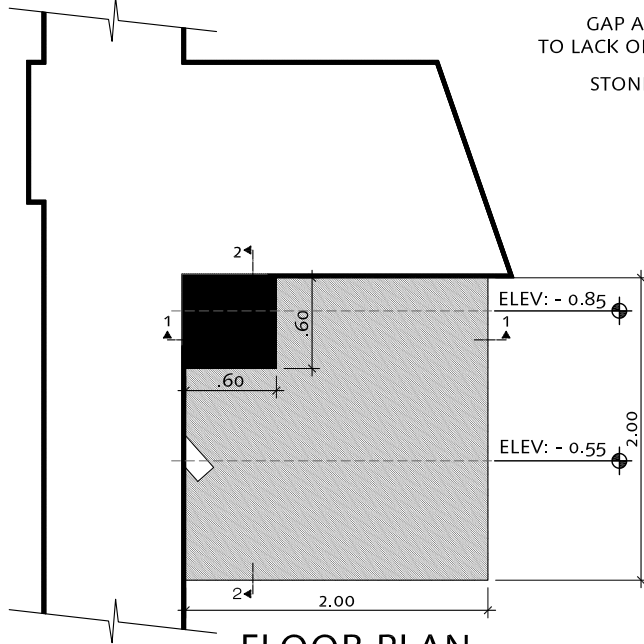
Sheet No.:

CA-P-8



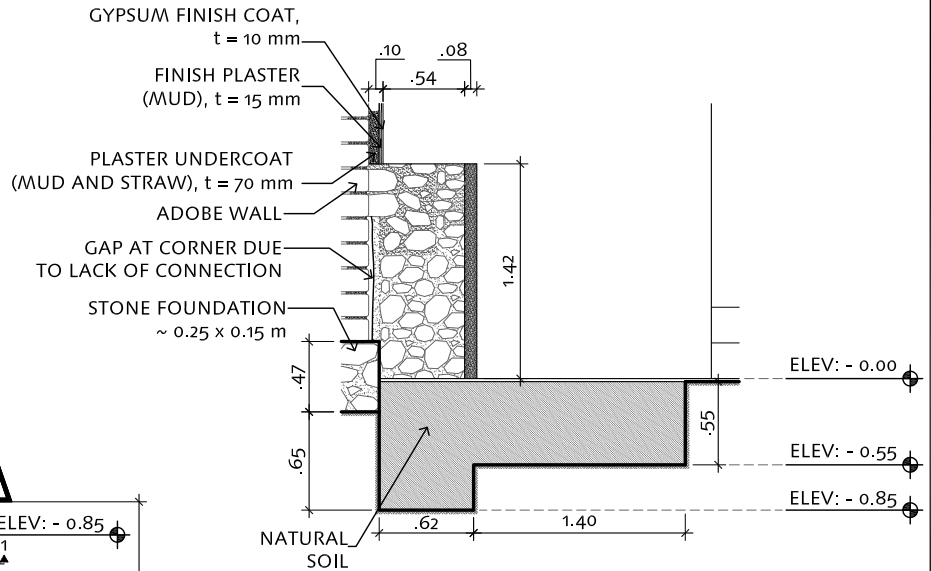
**FIRST FLOOR
REFERENCE PLAN**

NO SCALE



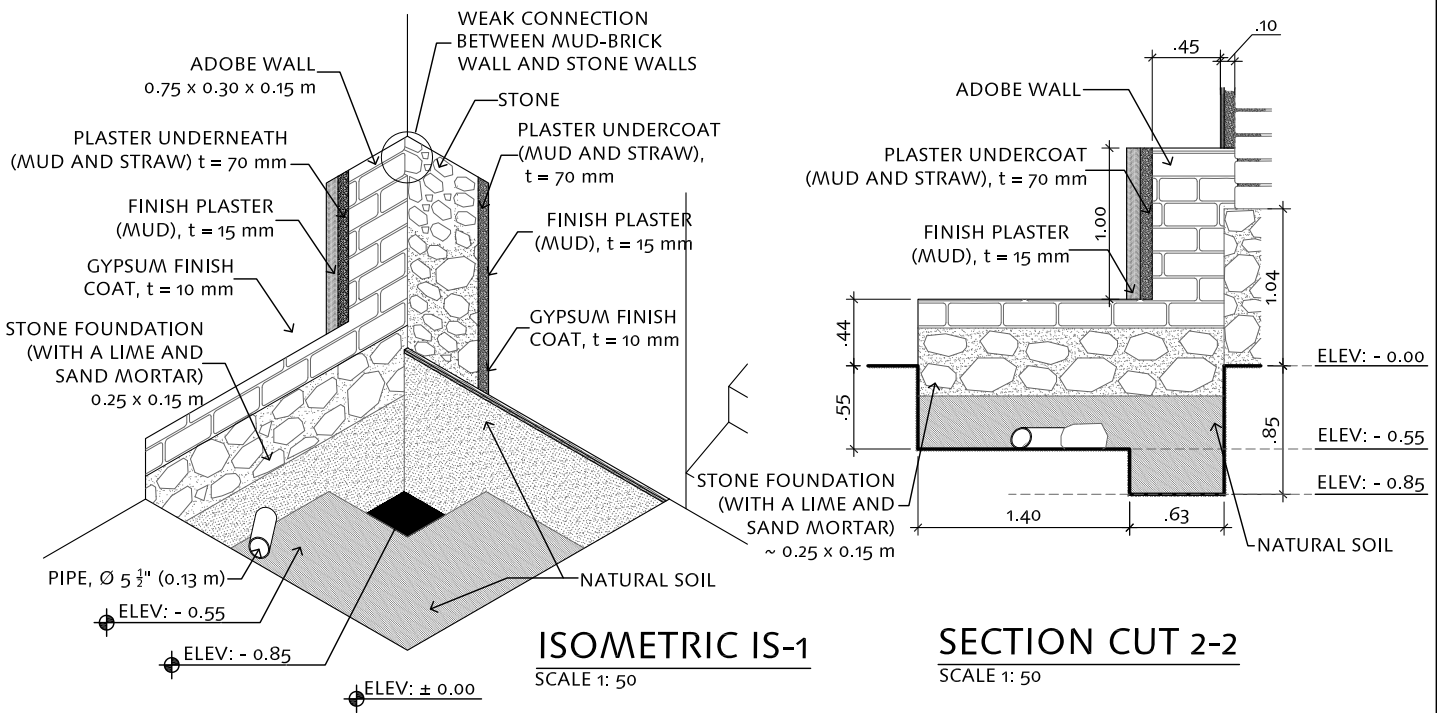
FLOOR PLAN

SCALE 1: 50



SECTION CUT 1-1

SCALE 1: 50



ISOMETRIC IS-1

SCALE 1: 50

SECTION CUT 2-2

SCALE 1: 50

True scale when printed on 8-1/2" x 11" sheet.

SEISMIC RETROFITTING PROJECT
The Earthen Architecture Initiative



Building: **CASA ARONES**
Cusco, Perú

Sheet Title: **Structural Prospection**
IS-1

Drafted By: Percy Iparraguirre
Supervisor: Arch. Mirna Soto

Facilitator: Universidad Católica Sedes Sapientiae
Edited and Translated By: Jabdriel Zapata

Date: October 2011
Scale: As noted

Sheet No.: **CA-P-9**



IS-1

IS-1

TAKING ADVANTAGE OF A PREVIOUS ARCHEOLOGICAL OPENING, THIS PROSPECTION IS LOCATED AT THE INTERSECTION OF THE WALL SEPARATING ROOM A-110 FROM THE ENTRY HALL (ROOM A-100) AND THE PERPENDICULAR WALL SEPARATING ROOMS A-110 AND C-109. WE WERE ABLE TO SEE THE FOLLOWING:

THE ENTRY HALL WALL (BETWEEN ROOMS A-110 AND A-100) IS MADE OF ADOBE WITH A 0.50 m DEEP STONE FOUNDATION WITH A MUD AND LIME MORTAR. UNDERNEATH THIS FOUNDATION THERE IS A FILL OF LOOSE SOIL AND STONES. IN THE MIDDLE OF THIS FILL IS THE END OF A CERAMIC PIPE. ACCORDING TO THE ARCHEOLOGICAL DATA, THIS PORTION OF THE FOUNDATION WAS REMOVED AT SOME POINT TO INSTALL THE PIPE.

THE PERPENDICULAR WALL DIVIDES ONE ROOM FROM ANOTHER. IT HAS VIRTUALLY NO FOUNDATION, RATHER IT RESTS DIRECTLY ON THE GROUND; HOWEVER, IT HAS A VERY HIGH "SOBRECIMIENTO," OR BASE COURSE, - 2.00 m TALL - AND IS CONSTRUCTED OF STONES BONDED WITH A MUD AND LIME MORTAR. THE CONNECTION BETWEEN THE TWO WALLS IS VERY WEAK, APPARENTLY BECAUSE THE ADOBE WALL ALONG THE ENTRY HALL WAS BUILT FIRST AND WAS LATER FOLLOWED THE PERPENDICULAR STONE WALL. AT APPROXIMATELY EVERY SECOND COURSE OF STONE, A STONE IS EMBEDDED INTO THE ADJACENT ADOBE WALL.

BOTH WALLS ARE COVERED WITH A 0.040 m THICK MUD AND STRAW PLASTER UNDERCOAT, OVER WHICH A PLASTER FINISH COAT IS APPLIED.

True scale when printed on 8-1/2" x 11" sheet.

SEISMIC RETROFITTING PROJECT
The Earthen Architecture Initiative



The Getty Conservation Institute



Building:
CASA ARONES
Cusco, Perú

Sheet Title:
Structural Prospection
IS-1

Drafted By:
Percy Iparraguirre

Supervisor:
Arch. Mirna Soto

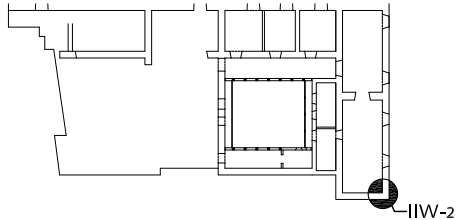
Facilitator:
Universidad Católica Sedes Sapientiae

Edited and Translated By:
Jabdiel Zapata

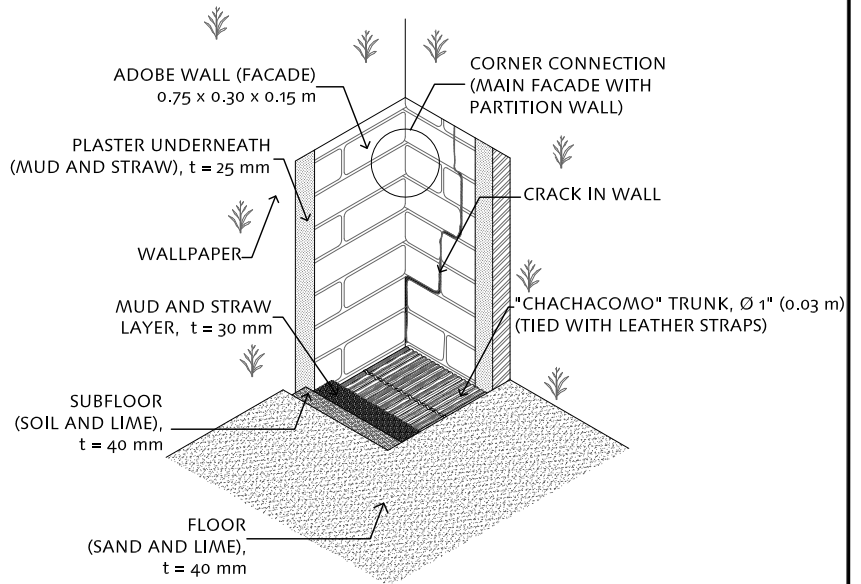
Date:
October 2011

Scale:
As noted

Sheet No.:
CA-P-10

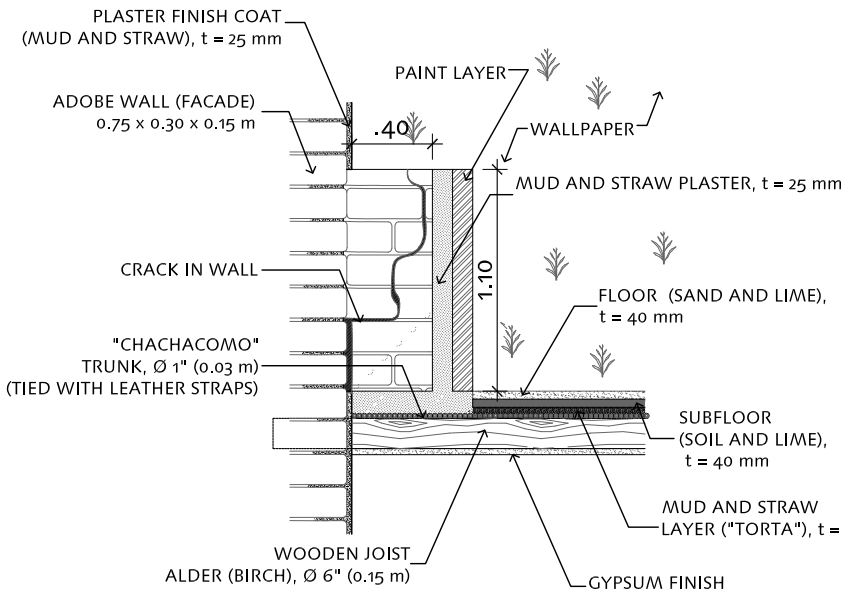


**SECOND FLOOR
REFERENCE PLAN**



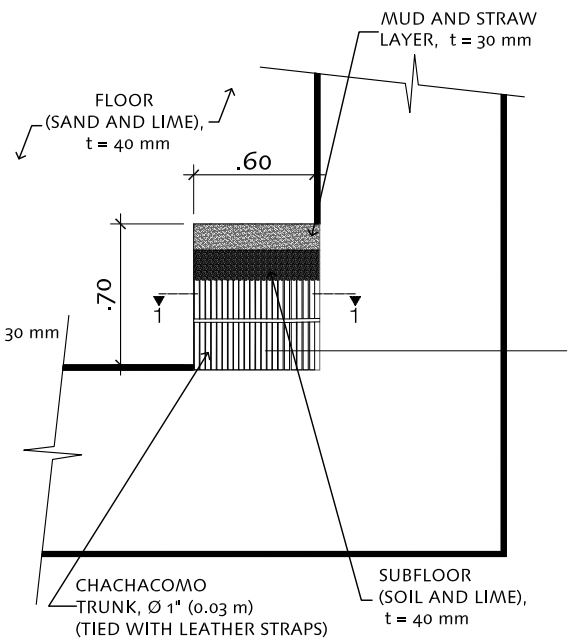
ISOMETRIC IIW-2

SCALE 1: 25



SECTION CUT 1-1

SCALE 1: 25



FLOOR PLAN

SCALE 1: 25

True scale when printed on 8-1/2" x 11" sheet.

SEISMIC RETROFITTING PROJECT
The Earthen Architecture Initiative



The Getty Conservation Institute



Building:
CASA ARONES
Cusco, Perú

Sheet Title:
Structural Prospection
IIW-2

Drafted By:
Percy Iparraguirre

Supervisor:
Arch. Mirna Soto

Facilitator:
Universidad Católica Sedes Sapientiae

Edited and Translated By:
Jabdiel Zapata

Date:
October 2011

Scale:
As noted

Sheet No.:

CA-P-11



IIW-2



IIW-2



IIW-2

THIS OPENING IS LOCATED ON THE SECOND FLOOR, AT THE INTERSECTION OF THE MAIN FAÇADE AND THE WALL ALONG THE ADJACENT PROPERTY AFTER REMOVING THE WALLPAPER AND 0.04 m OF MUD PLASTER WITH AN ABUNDANT AMOUNT OF STRAW IN IT, WE WERE ABLE TO SEE THE CONNECTION BETWEEN THESE TWO WALLS. THERE IS A CRACK AT THIS CORNER, PROBABLY RESULTING FROM A PAST EARTHQUAKE. THIS OPENING IS LOCATED AT THE END OF THE PRINCIPAL ROOM ON THE SECOND FLOOR, ABOVE A SHOP ON THE FIRST FLOOR. THE FLOOR IN THIS ROOM IS SEVERELY SETTLED OR WARPED, RESULTING FROM DAMAGE TO THE SUPPORTING BEAMS BELOW. SHORING HAS BEEN INSTALLED AT THE FIRST FLOOR TO SUPPORT THE BEAMS AND FLOOR.

THIS OPENING ALSO ALLOWED US TO OBSERVE THE FLOOR / CEILING STRUCTURE BETWEEN THE FIRST AND SECOND LEVELS: THE FLOOR SURFACE IS MADE OF A LIME, SAND AND GYPSUM MORTAR, FOLLOWED BY A LAYER OF STRAW WITH SOME MUD IN IT. UNDERNEATH THESE LAYERS THERE ARE NEATLY-ARRANGED SMALL TRUNKS OR BRANCHES OF "CHACHACOMO" WOOD, TIED WITH LEATHER STRAPS TO ONE ANOTHER AND ALSO ATTACHED TO THE ALDER (BIRCH) WOOD JOISTS. THE BOTTOM PART OF THE STRUCTURE CORRESPONDS TO THAT OF THE FIRST FLOOR CEILING, AND IT IS FINISHED WITH GYPSUM PLASTER.

True scale when printed on 8-1/2" x 11" sheet.

SEISMIC RETROFITTING PROJECT
The Earthen Architecture Initiative



Building: **CASA ARONES**
Cusco, Perú

Sheet Title: **Structural Prospection**
IIW-2

Drafted By:
Percy Iparraguirre

Supervisor:
Arch. Mirna Soto

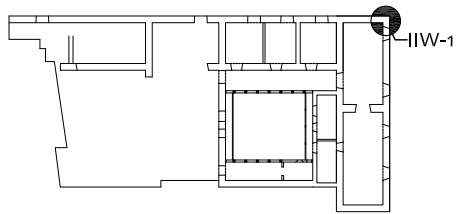
Facilitator:
Universidad Católica Sedes Sapientiae

Edited and Translated By:
Jabdiel Zapata

Date: October 2011

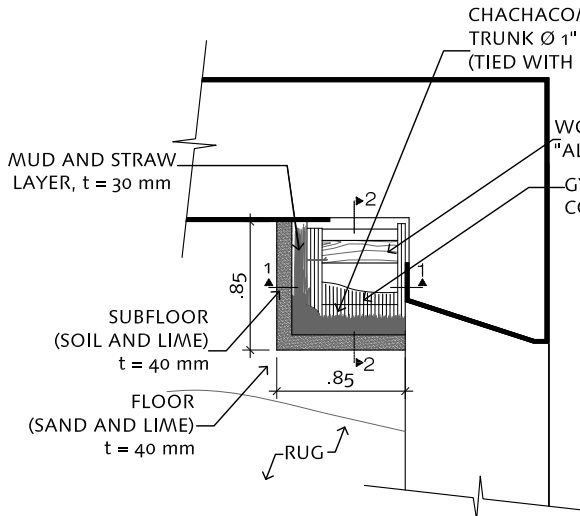
Scale: As noted

Sheet No.: **CA-P-12**



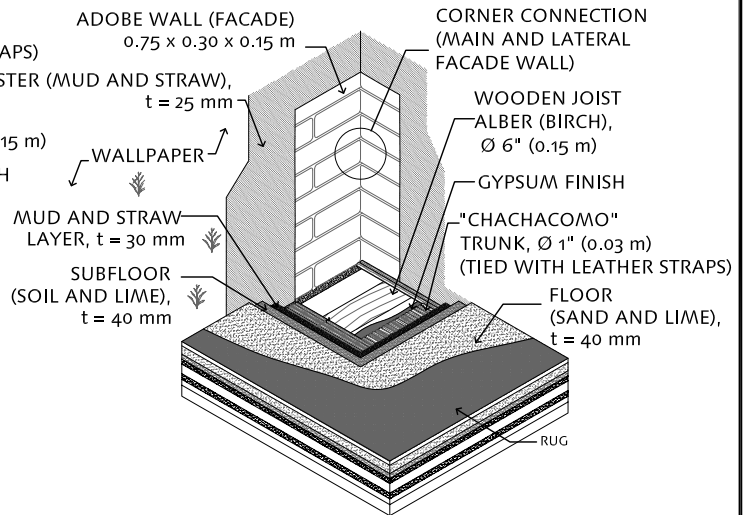
SECOND FLOOR REFERENCE PLAN

NO SCALE



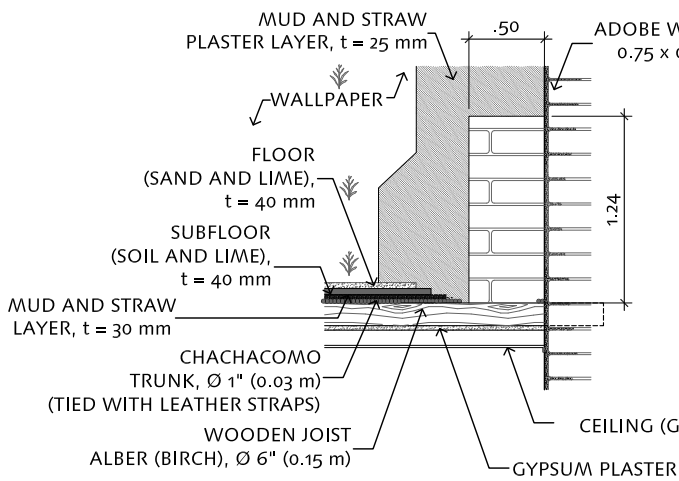
FLOOR PLAN

SCALE 1: 50



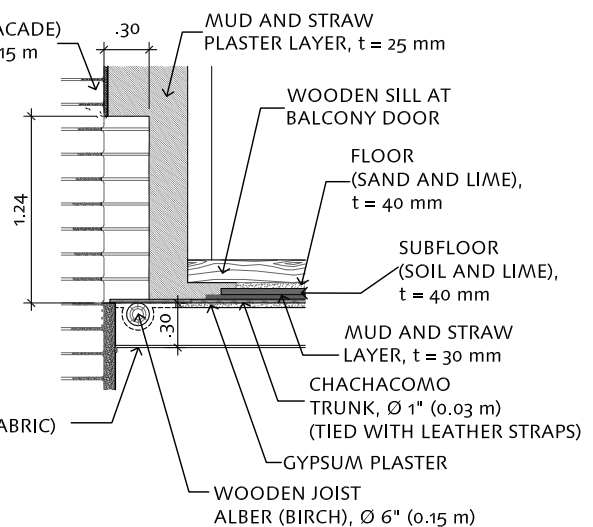
ISOMETRIC IIW-2

SCALE 1: 50



SECTION CUT 1-1

SCALE 1: 50



SECTION CUT 2-2

SCALE 1: 50

True scale when printed on 8-1/2" x 11" sheet.

SEISMIC RETROFITTING PROJECT
The Earthen Architecture Initiative



The Getty Conservation Institute



Building:
CASA ARONES
Cusco, Perú

Sheet Title:
Structural Prospection
IIW-1

Drafted By:
Percy Iparraguirre
Supervisor:
Arch. Mirna Soto

Facilitator:
Universidad Católica Sedes Sapientiae
Edited and Translated By:
Jabdiel Zapata

Date:
October 2011
Scale:
As noted

Sheet No.:
CA-P-13



IIW-1

IIW-1

ON THE CORNER BETWEEN THE PRINCIPAL FAÇADE WALL AND LATERAL FAÇADE WALL OF THE SECOND FLOOR IT'S LOCATED THIS OPENING. THERE IS EVIDENCE OF STRUCTURAL CONNECTION BETWEEN THESE TWO WALLS. ALSO THERE IS STRAW AND MUD PLASTER OF 1" (25 mm) THICK, GYPSUM AS A FINISH COAT AND WALLPAPER.

THERE IS OTHER OPENING AT THE BOTTOM OF THIS ONE, WHICH ALLOWS US TO SEE THE FLOOR STRUCTURE OF THE SECOND LEVEL. UNDERNEATH THE CARPET THERE IS A SMOOTH FINISH COMPOSED WITH A LIME, SAND AND PLASTER MORTAR, FOLLOWING BY A THICK LAYER OF MUD AND STRAW, UNDERNEATH THIS THEY ARE SMALL TRUNKS OF "CHACHACOMO" TIED WITH LEATHER STRAPS NEXT TO EACH OTHER AND ATTACHED TO THE BIRCH/ALDER WOODEN JOIST, THESE JOISTS ARE EMBEDDED INTO THE WALL AND IN OTHER CASES ARE SUPPORTED BY A 8" (0.20 m) WOODEN BEAM. THIS WOODEN BEAM IT'S ALSO A BIRCH/ALDER ROUNDED WOOD BEAM, THE GIRDER HAS BEEN MODIFIED WITH OTHER PIECES OF WOOD TO GIVE IT A RECTANGULAR APPEARANCE AND ITS BEEN PAINTED. FURTHERMORE ALL THE CEILING OF THE FIRST FLOOR HAS BEEN COVERED WITH A GLUED FABRIC, THAT IT'S BEEN STRETCHED TO COVER ALL THE ROOM AND ITS BEEN NAILED TO THE WALLS WITH SOME WOODEN STRIPS.

True scale when printed on 8-1/2" x 11" sheet.

SEISMIC RETROFITTING PROJECT
The Earthen Architecture Initiative



The Getty Conservation Institute



Building:
CASA ARONES
Cusco, Perú

Sheet Title:
Structural Prospection
IIW-1

Drafted By:
Percy Iparraguirre

Supervisor:
Arch. Mirna Soto

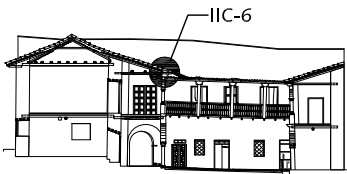
Facilitator:
Universidad Católica Sedes Sapientiae

Edited and Translated By:
Jabdiel Zapata

Date:
October 2011

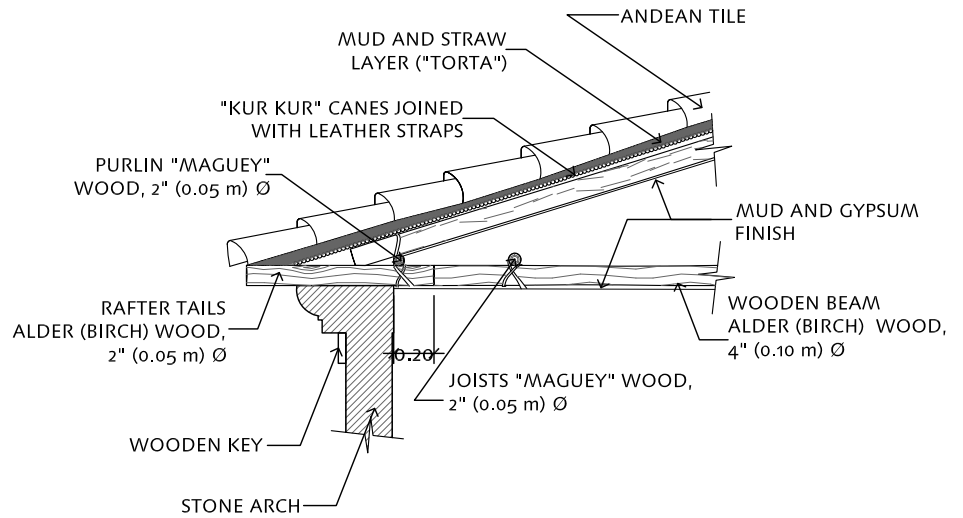
Scale:
As noted

Sheet No.:
CA-P-14



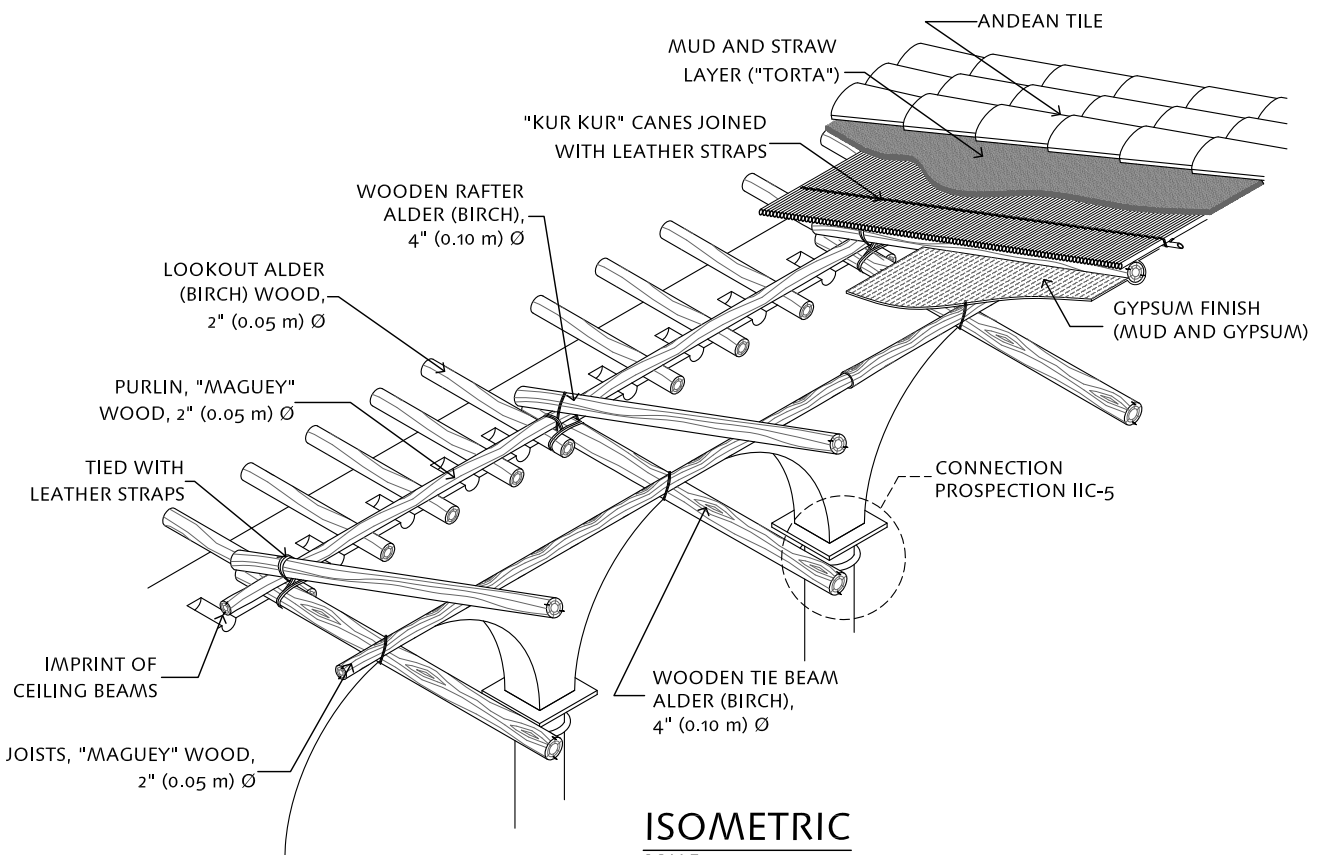
REFERENCE ELEVATION

NO SCALE



TRANSVERSAL SECTION

SCALE 1: 75



ISOMETRIC

SCALE 1: 75

True scale when printed on 8-1/2" x 11" sheet.

SEISMIC RETROFITTING PROJECT
The Earthen Architecture Initiative



Building: **CASA ARONES**
Cusco, Perú

Sheet Title: **Structural Prospection**
IIC-6

Drafted By: Percy Iparraguirre
Supervisor: Arch. Mirna Soto
Facilitator: Universidad Católica Sedes Sapientiae
Edited and Translated By: Jabdiel Zapata

Date: October 2011
Scale: As noted

Sheet No.: **CA-P-15**



IIC-6

IIC-6

THIS OPENING IS LOCATED AT THE SECOND FLOOR GALLERY (ROOM 210). THE GALLERY ARCADE AT THE SOUTH SIDE OF THE ROOM IS CONSTRUCTED WITH CUT STONE LAID IN A LIME AND SAND MORTAR. THE ARCADE SUPPORTS THE ROOF STRUCTURE ABOVE. HORIZONTAL BEAMS OR TIE BEAMS CROSS THE GALLERY. THE SOUTH ENDS OF THE TIE BEAMS REST ON TOP OF THE STONE ARCADE, AND THE NORTH ENDS ARE EMBEDDED IN THE ADOBE WALL OPPOSITE THE ARCADE. ABOVE THE ARCADE, A LOOKOUT (A SHORT JOIST THAT PROJECTS BEYOND THE WALL OF A BUILDING AND SUPPORTS THE EAVES) IS TIED TO THE END OF THE TIE BEAM; AND THIS LOOKOUT CROSSES THE WALL AND PROJECTS APPROXIMATELY 0.40 m BEYOND ITS EXTERIOR FACE TO CREATE AN EAVE OVER THE PATIO BELOW. ADDITIONAL LOOKOUTS ARE PROVIDED IN THE SPACE BETWEEN EACH TIE BEAM. A PURLIN, RUNNING PARALLEL TO THE ARCADE, SITS ON TOP OF THE NORTH ENDS OF LOOKOUTS AND IS TIED TO THEM WITH LEATHER STRAPS. TWO OTHER ROUND BEAMS, LOCATED ABOVE THE TIE BEAMS, PROVIDE LONGITUDINAL BRACING. IN THE AREA WHERE THE TIE BEAM, LOOKOUT, AND PURLIN MEET, THERE IS A FOURTH ELEMENT - AN INCLINED RAFTER - WHICH RESTS ON AND IS TIED TO THE OTHER THREE ELEMENTS. OTHER RAFTERS ARE LOCATED IN THE SPACE BETWEEN THE TIE BEAMS. OVER THE RAFTERS ARE WOVEN "KUR KUR" CANES, WHICH ARE ATTACHED TO SMALL CANES RUNNING IN THE TRANSVERSE DIRECTION THAT PROVIDE SOME REINFORCEMENT AND PREVENT COLLAPSE. OVER THE "KUR KUR" CANES IS A THICK LAYER OF MUD AND STRAW THAT SUPPORTS THE ROOF TILE. THE UNDERSIDE OF THE STRUCTURAL ELEMENTS AND CANES IS COVERED WITH MUD PLASTER AND A GYPSUM FINISH COAT, WHICH FORMS THE GALLERY CEILING.

IT APPEARS THAT THERE WAS ONCE A DROPPED FLAT CEILING IN THE GALLERY. BELOW THE LEVEL OF THE EXISTING TIE BEAMS, THE CUT ENDS OF ROUND JOISTS AND JOIST POCKETS ARE VISIBLE. THE JOIST ENDS AND POCKETS SUGGEST THAT JOISTS ONCE SPANNED BETWEEN THE ADOBE WALLS AND ARCADE, AND THAT THEY PROVIDED A FRAMEWORK FOR A FABRIC CEILING.

True scale when printed on 8-1/2" x 11" sheet.

SEISMIC RETROFITTING PROJECT
The Earthen Architecture Initiative



The Getty Conservation Institute



UNIVERSITY OF BATH



PONTIFICIA UNIVERSIDAD CATÓLICA DEL PERÚ

Building: **CASA ARONES**
Cusco, Perú

Sheet Title: **Structural Prospection**
IIC-6

Drafted By:
Percy Iparraguirre

Supervisor:
Arch. Mirna Soto

Facilitator:
Universidad Católica Sedes Sapientiae

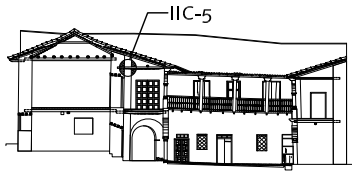
Edited and Translated By:
Jabdiel Zapata

Date:
October 2011

Scale:
As noted

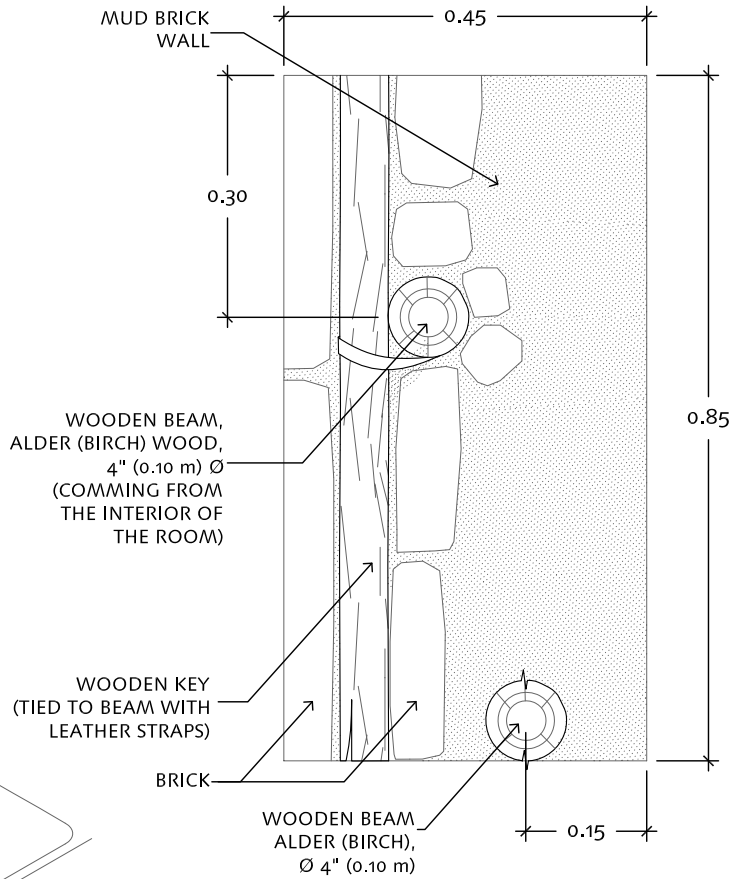
Sheet No.:

CA-P-16



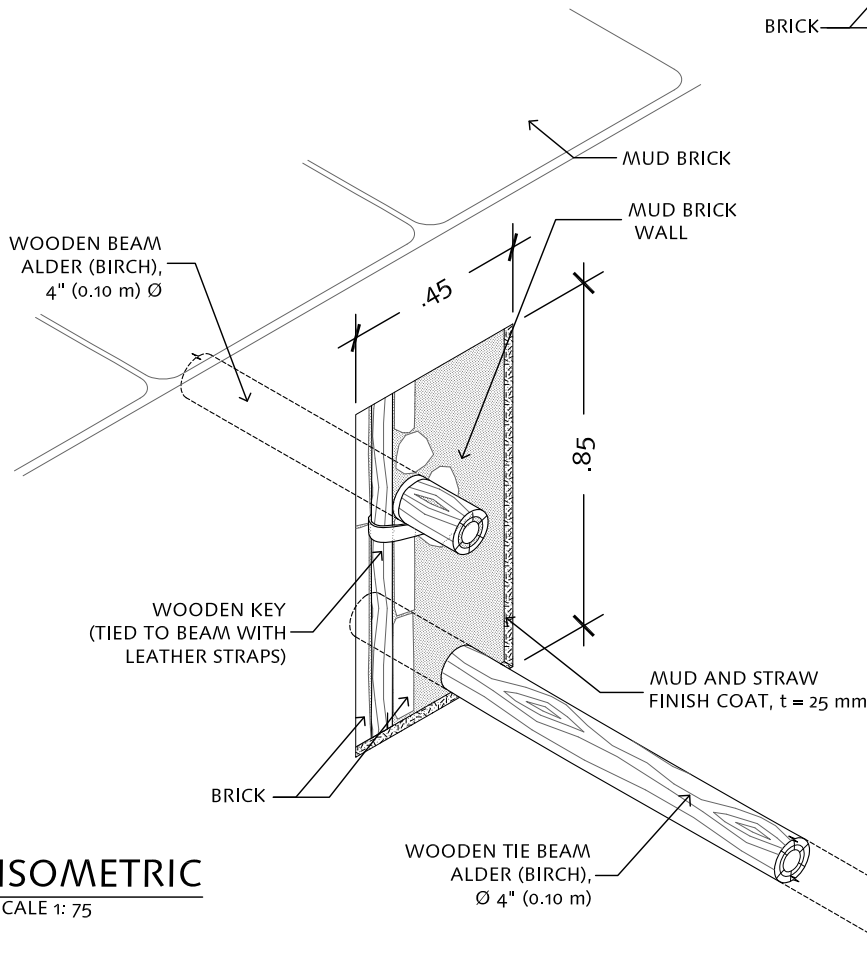
REFERENCE SECTION

NO SCALE



FRONT VIEW

SCALE 1: 75



ISOMETRIC

SCALE 1: 75

True scale when printed on 8-1/2" x 11" sheet.

SEISMIC RETROFITTING PROJECT
The Earthen Architecture Initiative



The Getty Conservation Institute



UNIVERSITY OF BATH



PONTIFICIA UNIVERSIDAD CATÓLICA DEL PERÚ

Building: **CASA ARONES**
Cusco, Perú

Sheet Title: **Structural Prospection**
IIC-5

Drafted By: Percy Iparraguirre
Supervisor: Arch. Mirna Soto

Facilitator: Universidad Católica Sedes Sapientiae
Edited and Translated By: Jabdriel Zapata

Date: October 2011

Scale: As noted

Sheet No.:

CA-P-17



IIC-5



IIC-5

IIC-5

THIS OPENING IS A CONTINUATION OF IIC-6. IT IS LOCATED AT THE NORTH END OF THE TIE BEAM, WHERE IT IS EMBEDDED IN THE ADOBE WALL. ONE CAN SEE THE ENDING OF A BEAM COMING FROM THE ADJACENT ROOM. ITS END IS ALSO EMBEDDED IN THE ADOBE WALL AND IS TIED WITH LEATHER STRAPS TO A VERTICAL WOODEN KEY THAT IS WITHIN IN THE WALL.

True scale when printed on 8-1/2" x 11" sheet.

SEISMIC RETROFITTING PROJECT
The Earthen Architecture Initiative



The Getty Conservation Institute



UNIVERSITY OF
BATH



PONTIFICIA
UNIVERSIDAD
CATÓLICA
DEL PERÚ

Building:

CASA ARONES
Cusco, Perú

Drafted By:

Percy Iparraguirre

Date:

October 2011

Supervisor:

Arch. Mirna Soto

Scale:

As noted

Sheet Title:

Structural Prospection
IIC-5

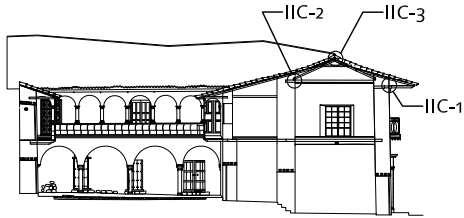
Facilitator:

Universidad Católica Sedes Sapientiae

Sheet No.:

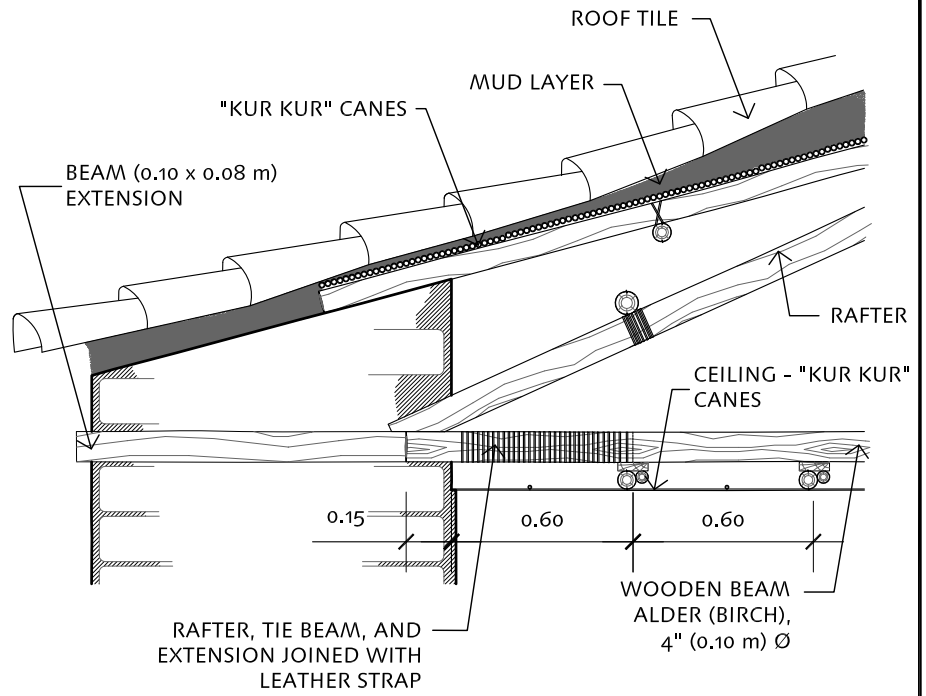
Edited and Translated By:
Jabdiel Zapata

CA-P-18



REFERENCE SECTION

NO SCALE

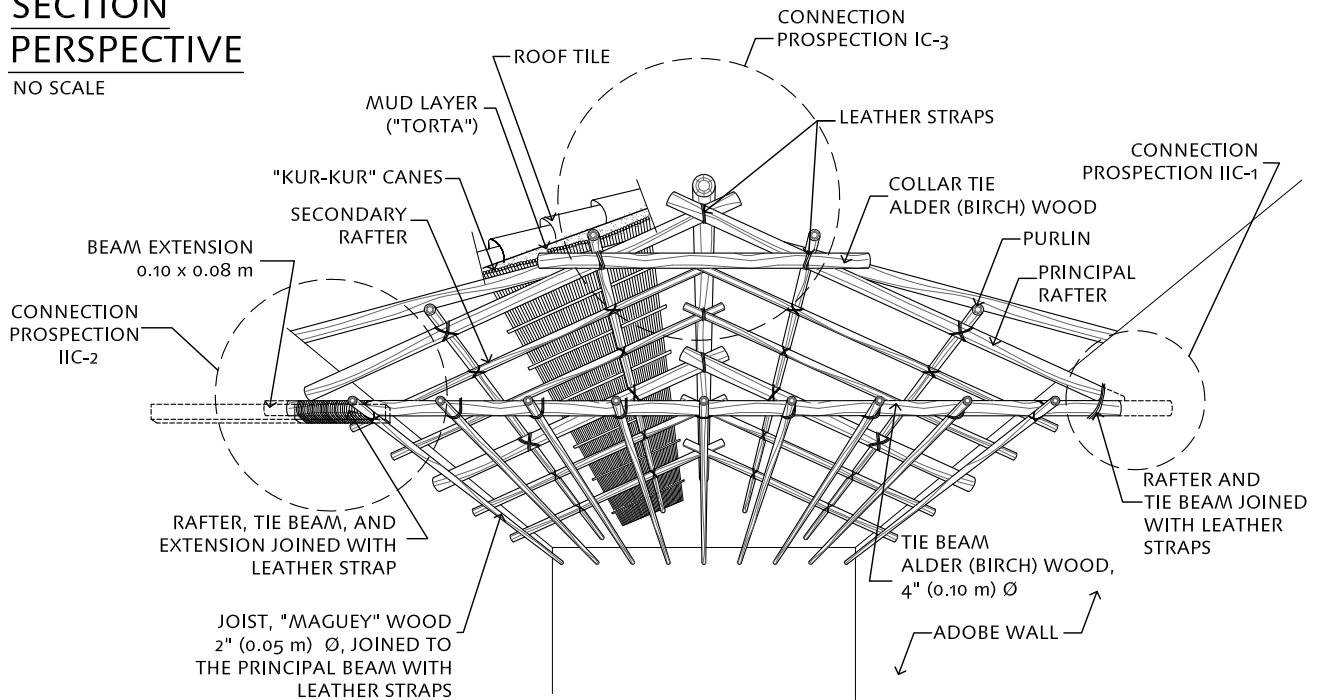


**CONNECTION PROSPECTION IIC-2
TRANSVERSAL SECTION CUT**

SCALE 1: 25

**SECTION
PERSPECTIVE**

NO SCALE



True scale when printed on 8-1/2" x 11" sheet.

SEISMIC RETROFITTING PROJECT
The Earthen Architecture Initiative



The Getty Conservation Institute



Building: **CASA ARONES**
Cusco, Perú

Sheet Title: **Structural Prospections
IIC-1, IIC-2, and IIC-3**

Drafted By:
Percy Iparraguirre

Supervisor:
Arch. Mirna Soto

Facilitator:
Universidad Católica Sedes Sapientiae

Edited and Translated By:
Jabdiel Zapata

Date:
October 2011

Scale:
As noted

Sheet No.:
CA-P-19



IIC-1 and IIC-3



IIC-1



IIC-3



IIC-3



IIC-2

IIC-3

THIS OPENING SHOWS THE STRUCTURE OF THE ROOF RIDGE, WHICH HAS THE SAME CHARACTERISTICS AS THE RIDGE OVER THE ADJACENT ROOM A-203 AND THE ROOMS ALONG THE LATERAL FAÇADE.

THE PRINCIPAL RAFTERS MEET AT THE RIDGE AND ARE JOINED WITH HALF-LAP JOINTS AND ARE ALSO TIED WITH LEATHER STRAPS. THE SECONDARY RAFTERS ARE NOT JOINED WITH HALF-LAP JOINTS - THEY ARE ONLY TIED TOGETHER WITH WIRE. THE USE OF WIRE INDICATES THE SECONDARY RAFTERS ARE NOT ORIGINAL. THE RIDGE BEAM IS LOCATED ABOVE THE RAFTERS' MEETING POINT. IN THE UPPER THIRD PART OF THE PRINCIPAL RAFTERS, THERE IS A COLLAR TIE, WHICH IS TIED TO THE RAFTERS WITH LEATHER STRAPS.

IT IS ALSO POSSIBLE TO OBSERVE THAT THE ROOF IN THIS AREA HAS SUFFERED FROM RECENT INTERVENTIONS, WHICH CHANGED ITS HEIGHT BY 0.60 M.


IIC-1

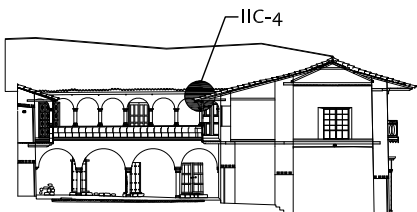
THIS OPENING IS LOCATED AT THE INTERSECTION OF THE ROOF FRAMING AND THE ADOBE WALL.

THE TIE BEAM IS EMBEDDED INTO THE ADOBE WALL. UNDERNEATH THIS TIE BEAM ARE JOISTS THAT SUPPORT THE CEILING, WHICH IS CONSTRUCTED WITH "KUR KUR" CANES TIED WITH LEATHER STRAPS AND COVERED WITH A LAYER OF MUD PLASTER AND FINISHED WITH A GYPSUM COAT. ABOVE THE TIE BEAMS, THE ENDS OF THE PRINCIPAL AND SECONDARY RAFTERS ARE EMBEDDED IN THE ADOBE WALL. AN ADDITIONAL SET OF RAFTERS ABOVE, THAT GIVE SHAPE TO THE ROOF, SIT ON TOP OF THE ADOBE WALLS; BUT THERE IS NOT A WALL PLATE.

PURLINS TRANSVERSELY SPAN ACROSS THE RAFTERS. ON TOP OF THE RAFTERS ARE "KUR KUR" CANES TIED WITH LEATHER STRAPS, FOLLOWED BY A LAYER OF STRAW AND MUD WHICH SUPPORTS THE ROOF TILES.

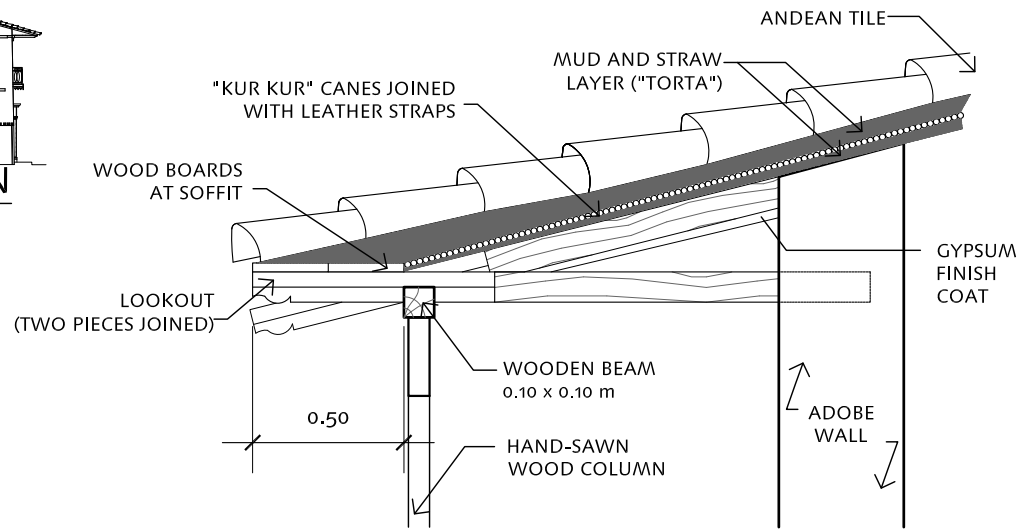
True scale when printed on 8-1/2" x 11" sheet.

SEISMIC RETROFITTING PROJECT The Earthen Architecture Initiative 	Building:	CASA ARONES Cusco, Perú	Drafted By: Percy Iparraguirre	Date: October 2011
	Sheet Title:	Structural Prospections IIC-1 and IIC-3	Supervisor: Arch. Mirna Soto	Scale: As noted
			Facilitator: Universidad Católica Sedes Sapientiae	Sheet No.:
			Edited and Translated By: Jabdiel Zapata	CA-P-20



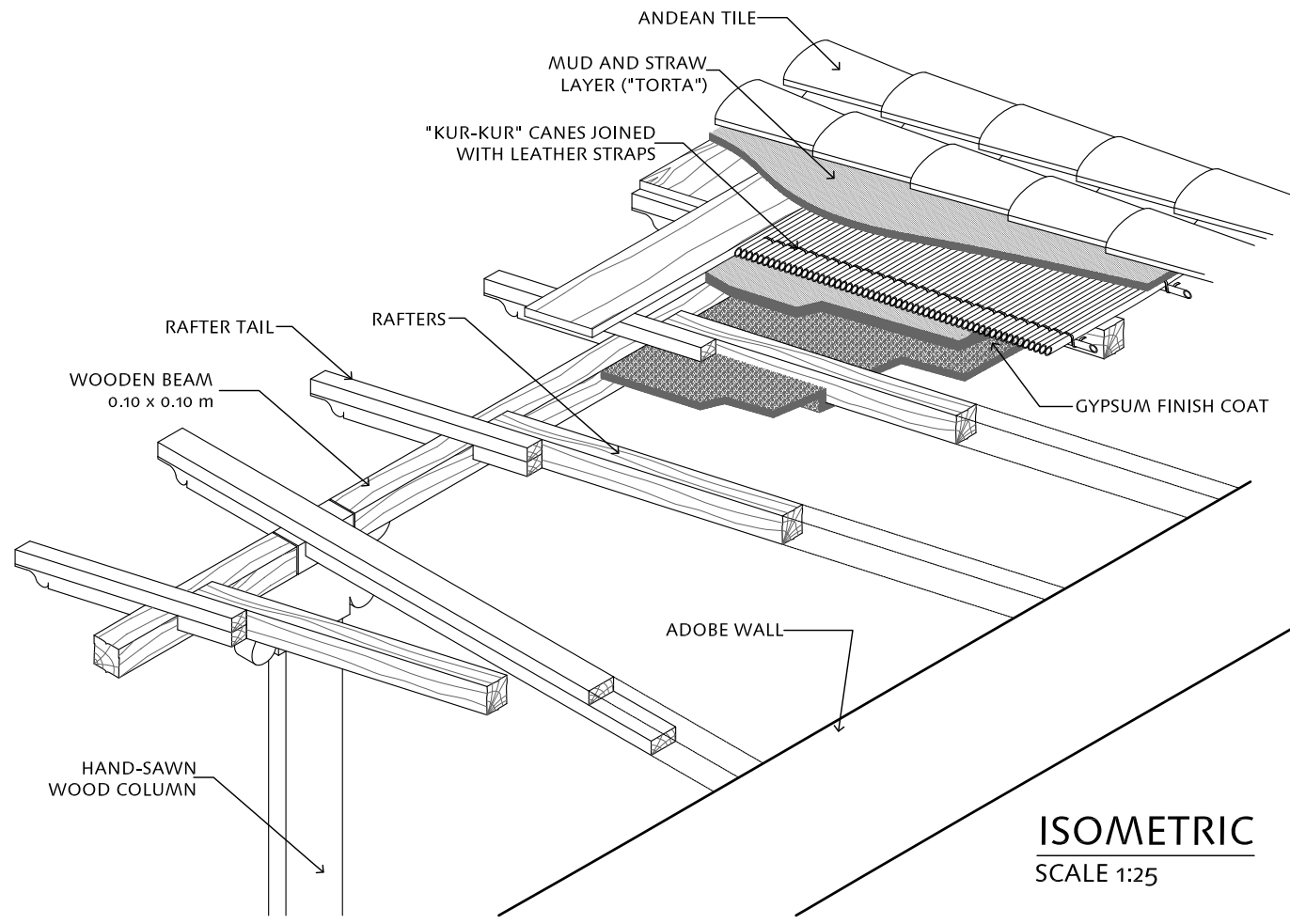
REFERENCE SECTION

NO SCALE



SECTION CUT

SCALE 1:25



ISOMETRIC

SCALE 1:25

True scale when printed on 8-1/2" x 11" sheet.

SEISMIC RETROFITTING PROJECT
The Earthen Architecture Initiative



Building: **CASA ARONES**
Cusco, Perú

Sheet Title: **Structural Prospection**
IIC-4

Drafted By: Percy Iparraguirre
Supervisor: Arch. Mirna Soto
Facilitator: Universidad Católica Sedes Sapientiae
Edited and Translated By: Jabbdiel Zapata

Date: October 2011
Scale: As noted
Sheet No.: **CA-P-21**



IIC-4

IIC-4

THIS OPENING IS LOCATED AT THE ROOF OVER THE SECOND FLOOR BALCONY AT THE EAST SIDE OF THE PATIO. THE ROOF STRUCTURE IS SUPPORTED BY WOOD COLUMNS WITH HAND-SAWN WOOD CAPITALS. THE CAPITAL SUPPORTS TWO BEAMS. THERE IS A GAP BETWEEN THE BEAM ENDS; AND THIS GAP IS CENTERED OVER THE COLUMN BELOW. IN THIS GAP THERE IS A BLOCK OF WOOD THAT SUPPORTS THE TIE BEAM. UNLIKE OTHER AREAS OF CASA ARONES, THIS TIE BEAM HAS A SQUARE PROFILE. THE CONNECTION BETWEEN THE TIE BEAM AND BLOCK IS MADE BY A HALF-LAP JOINT, ALLOWING THE TIE BEAM TO CONTINUE THROUGH TO THE EAVES. THE OTHER END OF THE TIE BEAM IS EMBEDDED INTO THE ADOBE WALL AT THE OPPOSITE SIDE OF THE BALCONY. THUS, EACH TIE BEAM ALIGNS WITH A WOOD COLUMN.

THE MEETING OF THE WOOD BLOCK AND TIE BEAM ALSO CORRESPONDS TO THE LOCATION OF THE RAFTER ENDS. THE TOPS OF THE RAFTERS ARE FLUSH WITH THE TOP OF THE ADOBE WALL AT THE OPPOSITE SIDE OF THE BALCONY. OTHER RAFTERS FILL THE SPACE BETWEEN THE TIE BEAMS; HOWEVER, THEIR ENDS REST ON THE BEAM OVER THE COLUMN CAPITALS. THE PROJECTION OF THE EAVES IS CREATED WITH RAFTER TAILS, WHICH ARE TIED TO THE RAFTERS WITH LEATHER STRAPS.

CANES, RUNNING PARALLEL TO THE RAFTERS, FILL THE SPACE BETWEEN THE RAFTERS. THESE CANES ARE WOVEN AND TIED TO "KUR KUR" CANES ABOVE. OVER THIS IS A THICK LAYER OF MUD AND STRAW ("TORTA") THAT SUPPORTS THE ROOF TILES. THE UNDERSIDE OF THE ROOF STRUCTURE IS COATED WITH A THIN LAYER OF MUD FINISHED WITH GYPSUM.

True scale when printed on 8-1/2" x 11" sheet.

SEISMIC RETROFITTING PROJECT
The Earthen Architecture Initiative



The Getty Conservation Institute



Building: **CASA ARONES**
Cusco, Perú

Sheet Title: **Structural Prospection**
IIC-4

Drafted By:
Percy Iparraguirre

Supervisor:
Arch. Mirna Soto

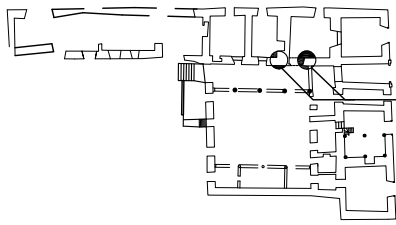
Facilitator:
Universidad Católica Sedes Sapientiae

Edited and Translated By:
Jabdiel Zapata

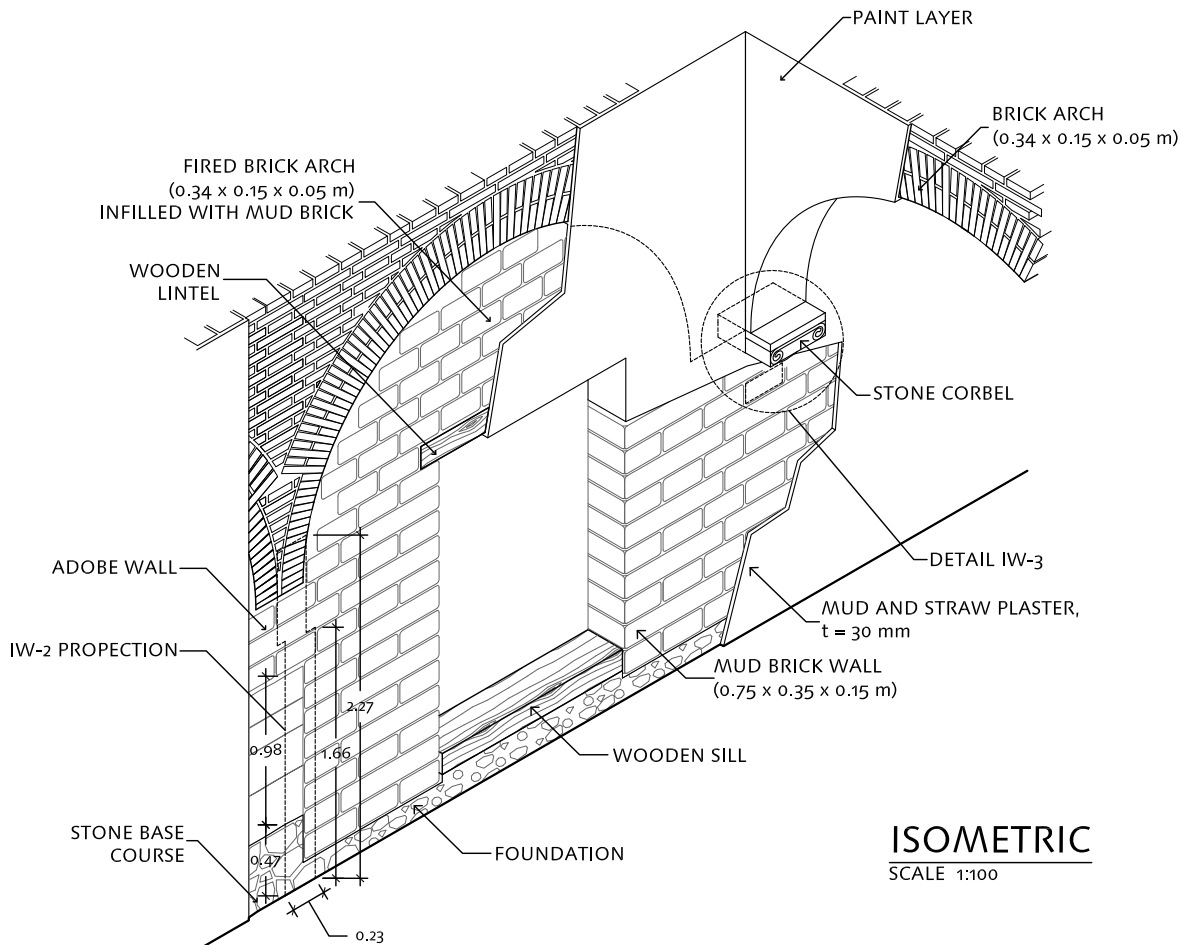
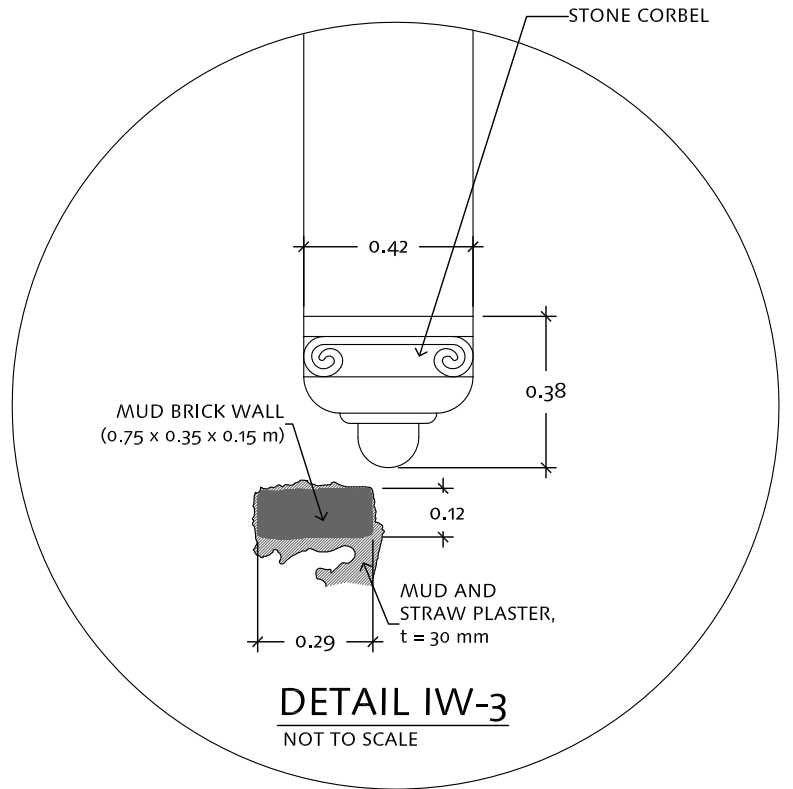
Date:
October 2011

Scale:
As noted

Sheet No.:
CA-P-22



**SECOND FLOOR
REFERENCE PLAN**



True scale when printed on 8-1/2" x 11" sheet.

SEISMIC RETROFITTING PROJECT
The Earthen Architecture Initiative



Building: **CASA ARONES**
Cusco, Perú

Sheet Title: **Structural Prospections**
IW-2 and IW-3

Drafted By: Percy Iparraguirre
Supervisor: Arch. Mirna Soto
Facilitator: Universidad Católica Sedes Sapientiae
Edited and Translated By: Jabdiel Zapata

Date: October 2011
Scale: As noted
Sheet No.:

CA-P-23



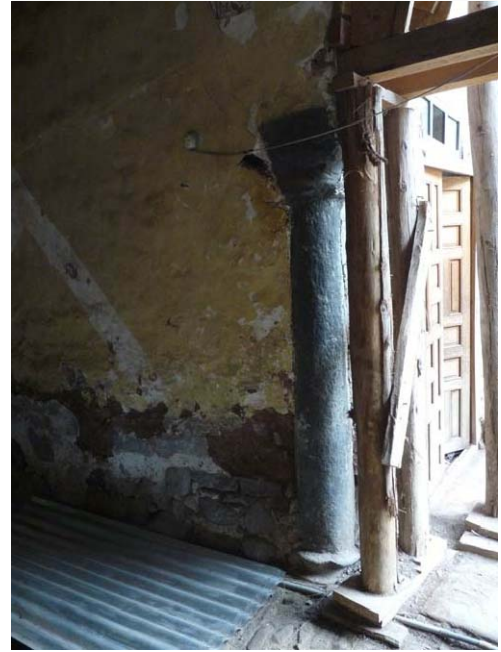
IW-2



IW-3



IW-3



IW-3

IW-2

THIS OPENING IS LOCATED AT ONE OF FIRST FLOOR WALLS THAT SEPARATES THE GALLERY FROM THE ADJACENT ROOMS. THERE IS A HIGH BASE COURSE MADE OF CUT STONES, AND ABOVE IT IS THE MUD BRICK WALL WHICH SUPPORTS THE SPRING POINT OF THE FIRED BRICK ARCH. ORIGINALLY THERE WAS A SERIES OF OPEN ARCHES ALONG THIS WALL; BUT THEY WERE LATER INFILLED WITH MUD BRICK AND DOORS WERE PLACED IN THE MIDDLE OF THE INFILL TO PROVIDE ACCESS TO ROOMS ON THE OTHER SIDE.

IW-3

THIS OPENING IS LOCATED AT THE ARCH IN THE ENTRY HALL. THE BRICK ARCH IS SUPPORTED BY A STONE COLUMN ON ONE SIDE AND A STONE CORBEL ON THE OTHER SIDE. TWO-THIRDS OF THE LENGTH OF THIS CORBEL IS RECESSED INTO THE ADOBE WALL.

True scale when printed on 8-1/2" x 11" sheet.

SEISMIC RETROFITTING PROJECT
The Earthen Architecture Initiative



The Getty Conservation Institute



Building:
CASA ARONES
Cusco, Perú

Sheet Title:
Structural Prospections
IW-2 and IW-3

Drafted By:
Percy Iparraguirre

Supervisor:
Arch. Mirna Soto

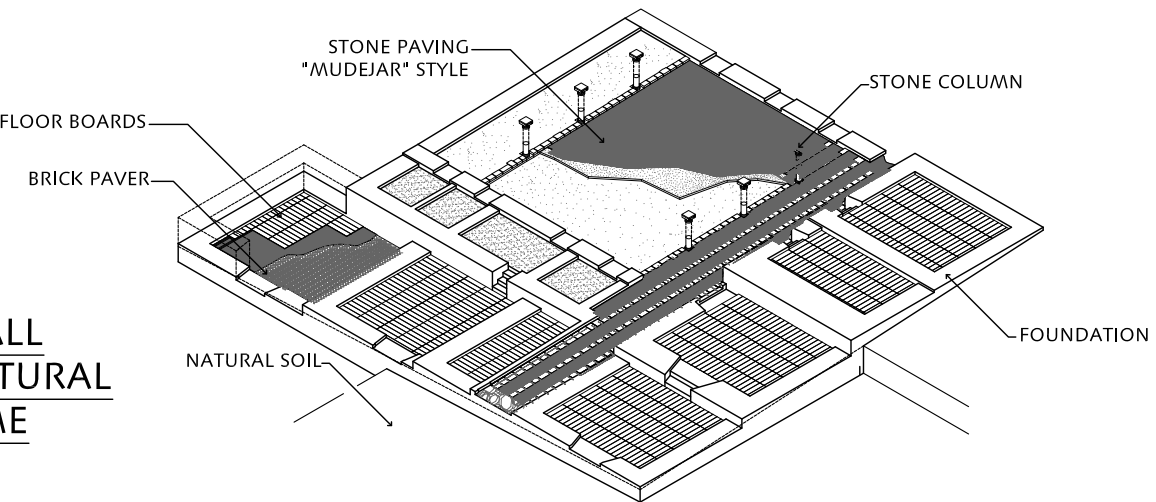
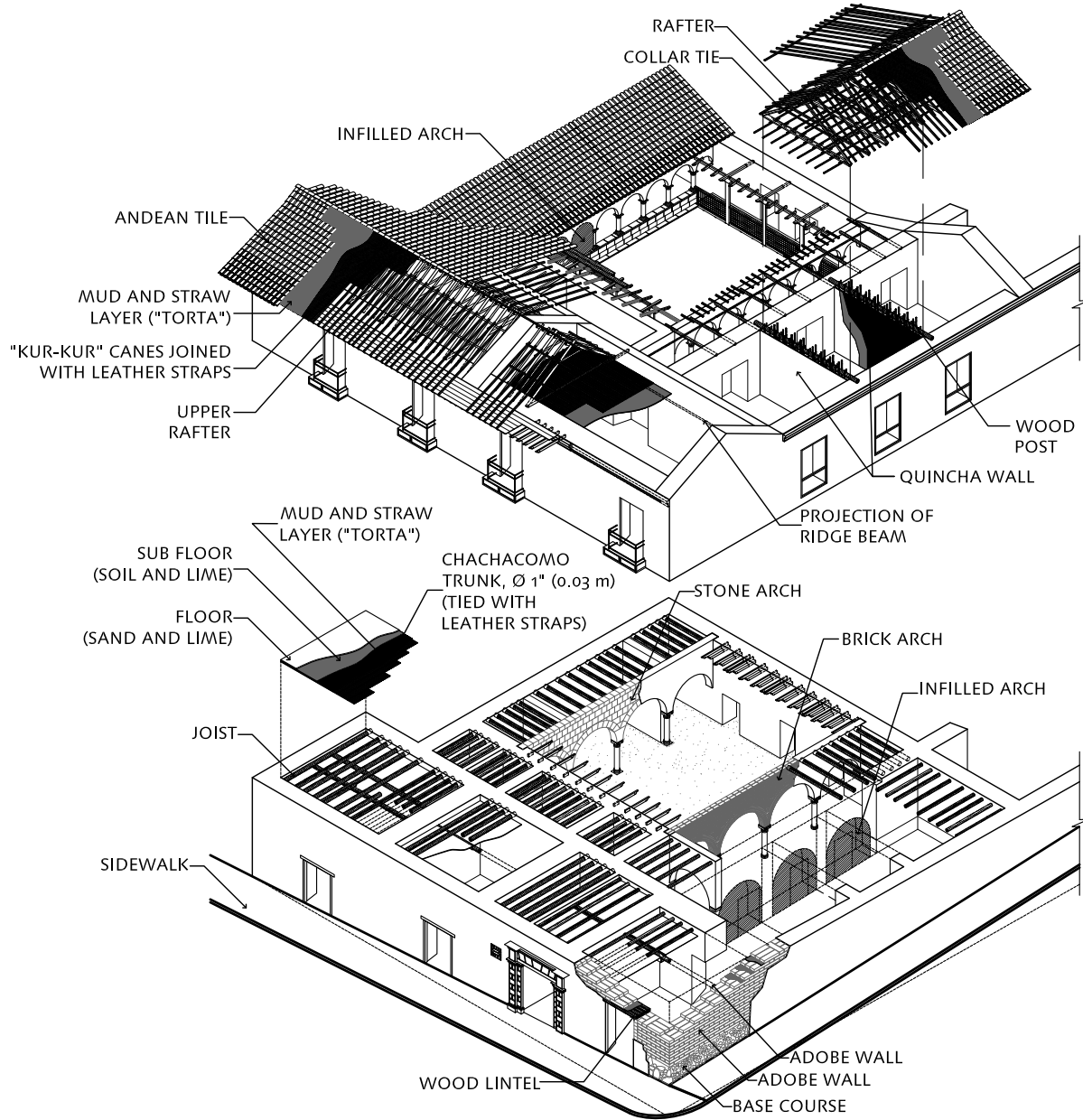
Facilitator:
Universidad Católica Sedes Sapientiae

Edited and Translated By:
Jabdiel Zapata

Date:
October 2011

Scale:
As noted

Sheet No.:
CA-P-24



OVERALL STRUCTURAL SCHEME

NO SCALE

True scale when printed on 8-1/2" x 11" sheet.

SEISMIC RETROFITTING PROJECT
The Earthen Architecture Initiative



Building: **CASA ARONES**
Cusco, Perú

Sheet Title: **Overall Structural Scheme**

Drafted By: **Percy Iparraguirre**

Supervisor: **Arch. Mirna Soto**

Facilitator: **Universidad Católica Sedes Sapientiae**

Edited and Translated By: **Jabdiel Zapata**

Date: **October 2011**

Scale: **As noted**

Sheet No.: **CA-P-25**



The Getty Conservation Institute