

Seismic Retrofitting Project: Assessment of Prototype Buildings

Volume 2

Research Report

Claudia Cancino and Sara Lardinois

In collaboration with Dina D'Ayala,
Carina Fonseca Ferreira, Daniel Torrealva Dávila,
Erika Vicente Meléndez, and
Luis Villacorta Santamato

Los Angeles 2012



The Getty Conservation Institute

Seismic Retrofitting Project:
Assessment of
Prototype Buildings
Volume 2

By Claudia Cancino and Sara Lardinois
In collaboration with Dina D'Áyala, Carina Fonseca Ferreira,
Daniel Torrealva Dávila, Erika Vicente Meléndez,
and Luis Villacorta Santamato

Los Angeles 2012

© 2013 J. Paul Getty Trust

The Getty Conservation Institute
1200 Getty Center Drive, Suite 700
Los Angeles, CA 90049-1684
United States
Telephone 310 440-7325
Fax 310 440-7702
E-mail gciweb@getty.edu
www.getty.edu/conservation

The Getty Conservation Institute works internationally to advance conservation practice in the visual arts—broadly interpreted to include objects, collections, architecture, and sites. The GCI serves the conservation community through scientific research, education and training, model field projects, and the dissemination of the results of both its own work and the work of others in the field. In all its endeavors, the GCI focuses on the creation and delivery of knowledge that will benefit the professionals and organizations responsible for the conservation of the world's cultural heritage.

Contents

Volume 1

Project Participants v

CHAPTER 1

Background

1.1 Introduction 1
1.2 Institutional Background and Project Partners 1
1.3 Seismic Retrofitting Project 2
1.4 Introduction to Assessment Report 5

CHAPTER 2

Methodology

2.1 Previous Assessments 7
2.2 Selection of Prototype Buildings 8
2.3 Assessment Methodology 12

CHAPTER 3

Hotel El Comercio

3.1 Summary 29
3.2 Historical Background, Context, and Significance 30
3.3 Architectural Description 33
3.4 Geological and Environmental Description 38
3.4 Structural Description 38
3.6 Irregularities, Alterations, Damages, and Decay 49
3.7 Preliminary Findings 53

CHAPTER 4

Cathedral of Ica

4.1 Summary 55
4.2 Historical Background, Context, and Significance 56
4.3 Architectural Description 59
4.4 Geological and Environmental Description 63
4.5 Structural Description 64

4.6 Irregularities, Alterations, Damages, and Decay	78
4.7 Preliminary Findings	86

CHAPTER 5

Church of Kuño Tambo

5.1 Summary	89
5.2 Historical Background, Context, and Significance	90
5.3 Architectural Description	92
5.4 Geological and Environmental Description	96
5.5 Structural Description	96
5.6 Irregularities, Alterations, Damages, and Decay	106
5.7 Preliminary Findings	111

CHAPTER 6

Casa Arones

6.1 Summary	115
6.2 Historical Background, Context, and Significance	116
6.3 Architectural Description	121
6.4 Geological and Environmental Description	125
6.5 Structural Description	125
6.6 Irregularities, Alterations, Damages, and Decay	137
6.7 Preliminary Findings	142

CHAPTER 7

Conclusions

7.1 Conclusions After the Assessment	147
--------------------------------------	-----

Bibliography	153
--------------	-----

Glossary of Architectural Terms	157
---------------------------------	-----

Volume 2

Appendix A: Survey Form Example

Appendix B: Architectural Drawings

Appendix C: Prospection Drawings

APPENDIX A

Survey Form Example

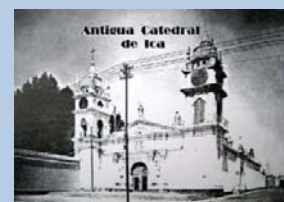
Earthen Architecture Initiative
Structural Assessment Survey Form – Seismic Retrofitting Project (SRP)



The Getty Conservation Institute

Building: Cathedral of Ica

Address: Calle Cajamarca (Libertad) esquina con Calle Bolívar, Ica
Original construction date: _____ Period: _____ NA
Date of survey: / /
Surveyor: AF / SL / CC / LV / DT / EV / DDA / VN / CF



General data

Building type :

Please consider the primary material only. Later sections will require you describing additional materials.

- Casona:
 - Adobe one story
 - Adobe two stories
 - Adobe and quincha, two or more stories
- Church:
 - Adobe walls, quincha vault/dome roofing system
 - Adobe walls, wooden truss roofing system

Context:

- Within:
 - Historic district/center
 - Urban environment
 - Country side
- Adjacent to other buildings (wall to wall):
 - i. If yes, indicated in the floor plan
 - ii. Define building location within the block:
 - End of the block
 - Corner
 - Middle
- Close to other buildings: Distance: _____
- Isolated

Setting:

- Flat
- Slope

Occupancy:

- Unoccupied
- Occupied: # @ day: _____
@ night: _____

Shape in plan:

- Rectangular Square
- "C" "L"
- Other/Mixed

Wall density:

Wall density for whole building = wall volume in the x or y-direction/total wall volume/plan volume

X-direction; Corresponding street: _____

< 0.5% 0.5-1.0% 1.0-1.5% 1.5-2.0% 2.0-2.5% 2.5-3.0% 3.0-3.5% 3.5-5.0% 5.0%

Y-direction; Corresponding street: _____

< 0.5% 0.5-1.0% 1.0-1.5% 1.5-2.0% 2.0-2.5% 2.5-3.0% 3.0-3.5% 3.5-5.0% 5.0%

Use:

- Housing/Residence:
 - 1st floor 2nd floor _____%
 - One housing unit (HU)
 - Several housing units (HUs):
of HUs: _____
of rooms per HU: _____
of bathrooms HU: _____
 - Commerce: 1st floor 2nd floor _____%
 - Museum: 1st floor 2nd floor _____%
 - Religious: 1st floor 2nd floor _____%
 - Office: 1st floor 2nd floor _____%
 - Other: _____
 1st floor 2nd floor _____%

Social-economic characteristics:

Economic level of inhabitants:

- Very poor
- Poor
- Middle class
- Wealthy
- NA

Ownership:

- Rent:
 - Short term
 - Long term
- Own by institution:
 - State Church
 - Community Own by individual

Earthen Architecture Initiative
Structural Assessment Survey Form – Seismic Retrofitting Project (SRP)



The Getty Conservation Institute

Description:

General description:

History of alterations: Please listed attached documents to the current survey for:

1. _____
2. _____
3. _____
4. _____
5. _____

Soil configuration/type: _____

If data is provided of soil analysis and identification, indicate as reference:

Maintenance:

a. Existence of maintenance plan, if yes, by who and how regular:

b. Reports of previous earthquake damage:

Yes

Describe:

No/ Non existent

NA / Not found

Earthen Architecture Initiative
Structural Assessment Survey Form – Seismic Retrofitting Project (SRP)



The Getty Conservation Institute

Quality of original workmanship:

Base on visual inspection, the quality of original workmanship in the following elements is considered:

Roof:

Where the arches or roof structure properly constructed?

- Yes
 No, describe:

NA / Non existent

Ceiling:

Where the beams and joists properly constructed?

- Yes
 No, describe:

NA / Non existent

Masonry:

Where the fabric of the original masonry walls (adobe, quincha, tapial, etc.) properly laid out?

- Yes (when the staggering in half the length of the adobe)
 No, describe:

NA / Non existent

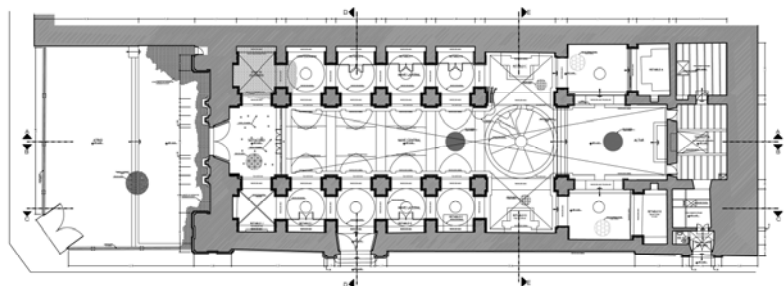
Foundations:

Where the fabric of the foundations (*Cimentación, Sobrecimiento*) properly laid out?

- Yes (when the stone are regular and regularly staggered)
 No, describe:

NA / Non existent

Satellite image and/or footprint:

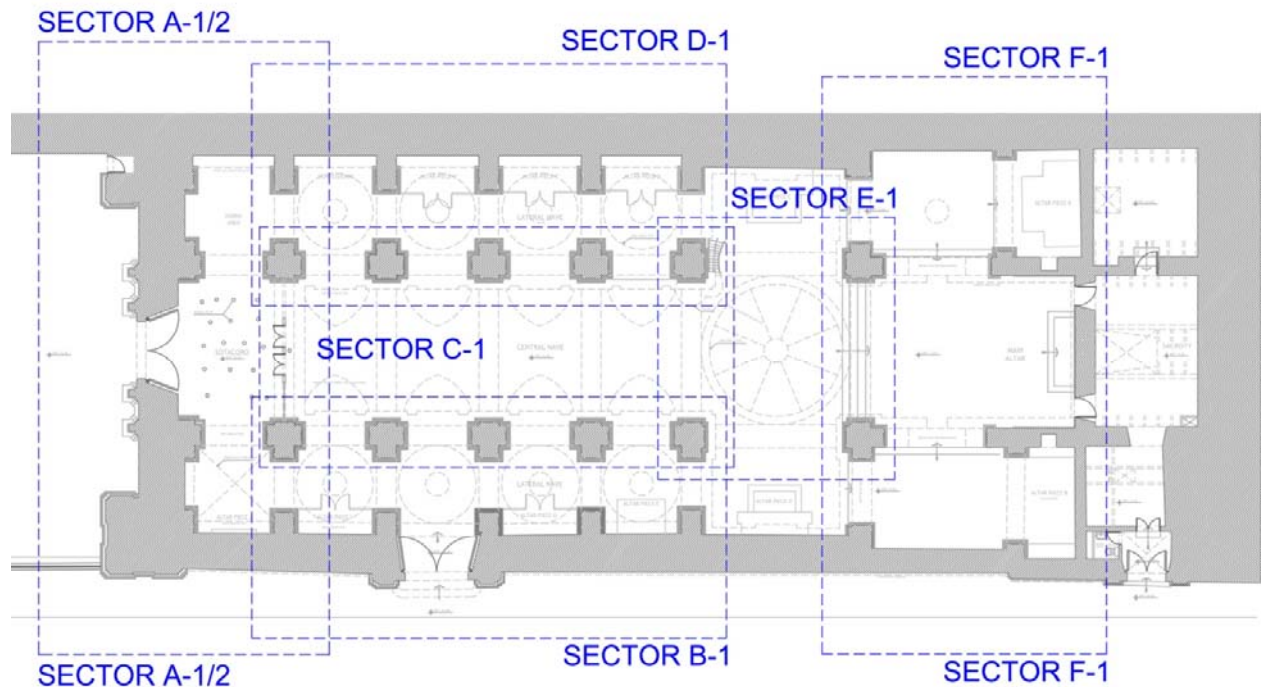


Earthen Architecture Initiative
Structural Assessment Survey Form – Seismic Retrofitting Project (SRP)



The Getty Conservation Institute

Sectors:



Criteria for sectors selection:

The survey team pre-divided the building in 6 different sectors, 6 sectors (A, B, C, D, E & F) on the first floor and 1 sector (A-2) over the "Sotocoro", plus the final roof. The sectors were divided according to the following criteria:

1. Potential structural behavior during an earthquake.
2. Structural and architectural composition.
3. Construction materials and techniques.
4. Time of construction.
5. Additions and/or interventions.

Earthen Architecture Initiative
Structural Assessment Survey Form – Seismic Retrofitting Project in Peru (SRP)



The Getty Conservation Institute

Building: Cathedral of Ica

Address: _____

Sector: _____

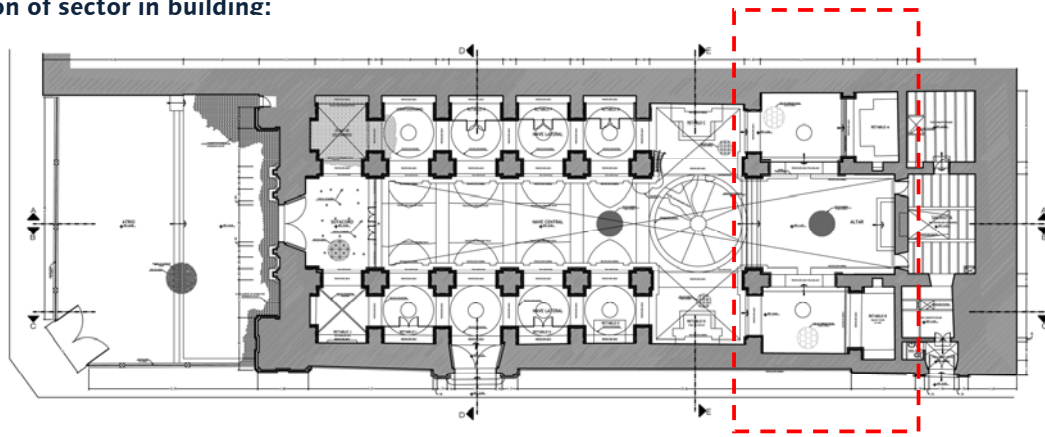
Sector type :

- Courtyard / Tower / Group of rooms / Individual Room / Roof

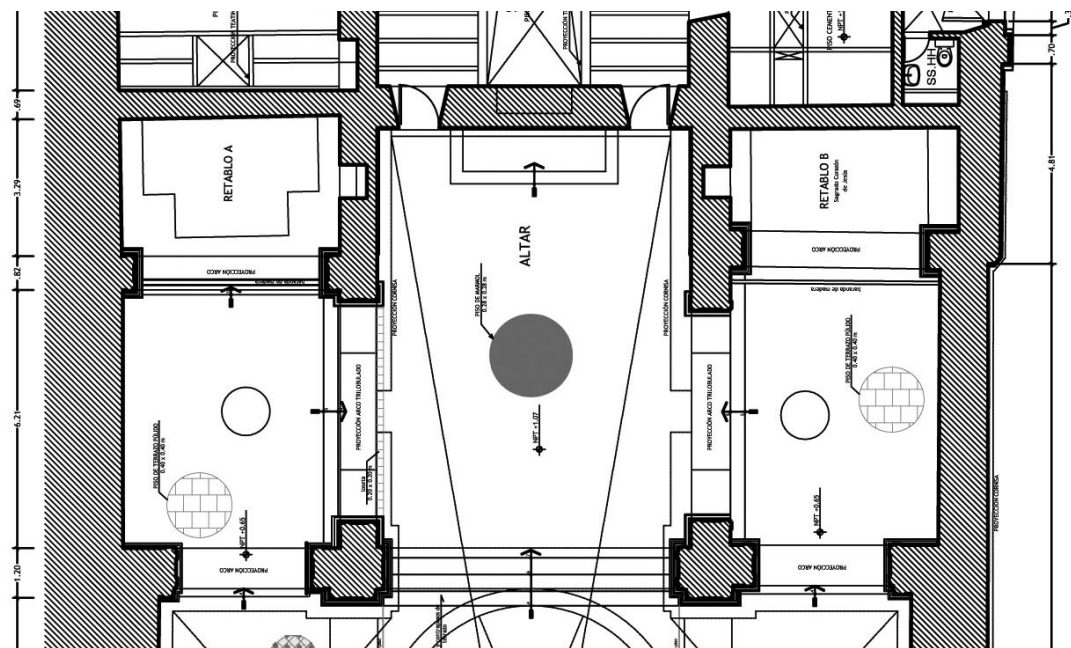
Level: First floor / Second floor / Third floor



I. Location of sector in building:



II. Floor plan of sector:



Earthen Architecture Initiative
Structural Assessment Survey Form – Seismic Retrofitting Project in Peru (SRP)



The Getty Conservation Institute

III. Sector cross sections, elevations or photos:

Earthen Architecture Initiative
Structural Assessment Survey Form – Seismic Retrofitting Project in Peru (SRP)



The Getty Conservation Institute

IV. General seismic performance and vulnerability

Shape of the building sector:

- Rectangular,
- Square,
- "C",
- "L",
- Other/Mixed

Average span between walls: _____

X-Direction: _____

Y-Direction: _____

Wall density:

Wall density per sector = wall area in the x or y-direction/total area of the sector

X-direction

Corresponding street: _____

- < 0.5% 0.5-1.0%
- 1.0-1.5% 1.5-2.0%
- 2.0-2.5% 2.5-3.0%
- 3.0-3.5% 3.5-5.0%
- >5.0%

Y-direction

Corresponding street: _____

- < 0.5% 0.5-1.0%
- 1.0-1.5% 1.5-2.0%
- 2.0-2.5% 2.5-3.0%
- 3.0-3.5% 3.5-5.0%
- >5.0%

Vertical load-bearing walls seem to be attached to the foundation (first floor only):

- Yes
- No
- NA

Vertical load-bearing walls seem to be attached to the floors/roof structures (others and last floor):

- Yes
- No
- NA

1. Maintenance:

a. General condition of building sector materials is considered to be adequate:

- Yes
- No
- NA
- Describe:

b. Lack of repair of sector building elements damaged by previous earthquakes:

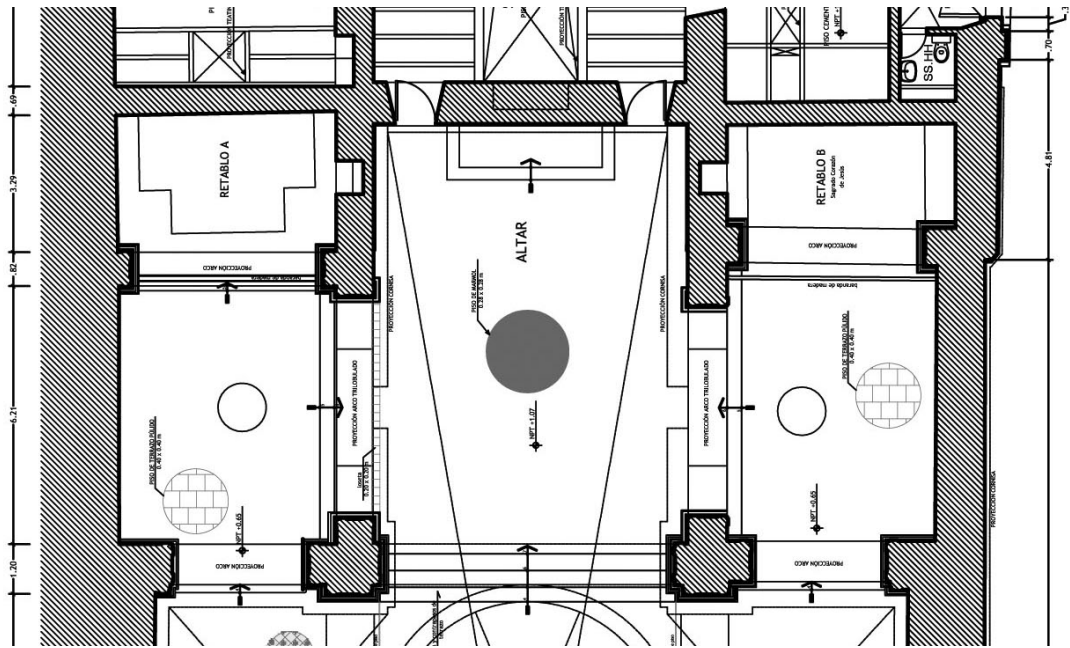
- Yes
- No
- NA
- Describe:

Earthen Architecture Initiative
 Structural Assessment Survey Form – Seismic Retrofitting Project in Peru (SRP)



The Getty Conservation Institute

V. Indicate location of photographs of conditions taken (Section VII):



Earthen Architecture Initiative
Structural Assessment Survey Form – Seismic Retrofitting Project in Peru (SRP)



The Getty Conservation Institute

VI. Description of structural system sector: _____

Type				
Foundations				
<i>Cimentación</i>	Sub-type	Details	% of sub-type per sector	Condition
<input type="checkbox"/> Mark here if system is assumed only	<input type="checkbox"/> Natural	<input type="checkbox"/> Solid Rock <input type="checkbox"/> Stiff soil <input type="checkbox"/> Structure rock	<input type="checkbox"/> <25% <input type="checkbox"/> 25-50% <input type="checkbox"/> 50-75% <input type="checkbox"/> 75-100% <input type="checkbox"/> 100%	<input type="checkbox"/> Cohesive <input type="checkbox"/> Non-cohesive
		<input type="checkbox"/> Rubble stone High: <input type="checkbox"/> Stone masonry High:	<input type="checkbox"/> <25% <input type="checkbox"/> 25-50% <input type="checkbox"/> 50-75% <input type="checkbox"/> 75-100% <input type="checkbox"/> 100% <input type="checkbox"/> <25% <input type="checkbox"/> 25-50% <input type="checkbox"/> 50-75% <input type="checkbox"/> 75-100% <input type="checkbox"/> 100%	<input type="checkbox"/> Cohesive <input type="checkbox"/> Non-cohesive <input type="checkbox"/> Cohesive <input type="checkbox"/> Non-cohesive
Sobrecimiento				
<input type="checkbox"/> Mark here if system is assumed only	<input type="checkbox"/> "Sobrecimiento" with mud/lime mortar	<input type="checkbox"/> Rubble stone High:	<input type="checkbox"/> <25% <input type="checkbox"/> 25-50% <input type="checkbox"/> 50-75% <input type="checkbox"/> 75-100% <input type="checkbox"/> 100%	<input type="checkbox"/> Cohesive <input type="checkbox"/> Non-cohesive
		<input type="checkbox"/> Stone masonry High:	<input type="checkbox"/> <25% <input type="checkbox"/> 25-50% <input type="checkbox"/> 50-75% <input type="checkbox"/> 75-100% <input type="checkbox"/> 100%	<input type="checkbox"/> Cohesive <input type="checkbox"/> Non-cohesive
Others				
	Sub-type		% of sub-type per facade	Condition
	Walls sitting on natural unmodified ground		<input type="checkbox"/> <25% <input type="checkbox"/> 25-50% <input type="checkbox"/> 50-75% <input type="checkbox"/> 75-100% <input type="checkbox"/> 100%	
Load bearing masonry/quincha walls (Skip if roof sector) Identify locations of wall materials on plan				
	Sub-type	Details	Approx. # of walls of sub-type/total # of walls	Graphic at plan
<input type="checkbox"/> Mark here if system is assumed only	<input type="checkbox"/> Adobe masonry walls: Dimensions: Mortar:	<input type="checkbox"/> With mud mortar (probably original)	<input type="checkbox"/> 1 = All walls <input type="checkbox"/> 1/2 of walls <input type="checkbox"/> 3/4 of walls <input type="checkbox"/> 1/4 of walls	
		<input type="checkbox"/> With mud mortar and insertions of bricks with cement mortar	<input type="checkbox"/> 1 = All walls <input type="checkbox"/> 1/2 of walls <input type="checkbox"/> 3/4 of walls <input type="checkbox"/> 1/4 of walls	
	<input type="checkbox"/> Rammed earth walls		<input type="checkbox"/> 1 = All walls <input type="checkbox"/> 1/2 of walls <input type="checkbox"/> 3/4 of walls <input type="checkbox"/> 1/4 of walls	
	<input type="checkbox"/> Brick masonry walls	<input type="checkbox"/> With cement mortar <input type="checkbox"/> With lime mortar	<input type="checkbox"/> 1 = All walls <input type="checkbox"/> 1/2 of walls <input type="checkbox"/> 3/4 of walls <input type="checkbox"/> 1/4 of walls	
	<input type="checkbox"/> Stone masonry walls	<input type="checkbox"/> With mud mortar <input type="checkbox"/> With lime/cement mortar	<input type="checkbox"/> 1 = All walls <input type="checkbox"/> 1/2 of walls <input type="checkbox"/> 3/4 of walls <input type="checkbox"/> 1/4 of walls <input type="checkbox"/> 1 = All walls <input type="checkbox"/> 1/2 of walls <input type="checkbox"/> 3/4 of walls <input type="checkbox"/> 1/4 of walls	

Earthen Architecture Initiative
Structural Assessment Survey Form – Seismic Retrofitting Project in Peru (SRP)



The Getty Conservation Institute

<input type="checkbox"/> Quincha walls with wooden frames	<input type="checkbox"/> With cane reed (part of original construction)	<input type="checkbox"/> 1 = All walls <input type="checkbox"/> 3/4 of walls	<input type="checkbox"/> 1/2 of walls <input type="checkbox"/> 1/4 of walls	
	<input type="checkbox"/> With adobe blocks infill	<input type="checkbox"/> 1 = All walls <input type="checkbox"/> 3/4 of walls	<input type="checkbox"/> 1/2 of walls <input type="checkbox"/> 1/4 of walls	
	<input type="checkbox"/> With brick infill	<input type="checkbox"/> 1 = All walls <input type="checkbox"/> 3/4 of walls	<input type="checkbox"/> 1/2 of walls <input type="checkbox"/> 1/4 of walls	

Previous structural reinforcements
Identify locations of wall materials on plan

Sub-type	Details	Approx. # of walls of sub-type/total # of walls		Graphic at plan
<input type="checkbox"/> Reinforced masonry walls	<input type="checkbox"/> Brick with embedded concrete columns	<input type="checkbox"/> 1 = All walls <input type="checkbox"/> 3/4 of walls	<input type="checkbox"/> 1/2 of walls <input type="checkbox"/> 1/4 of walls	
	<input type="checkbox"/> Adobe blocks with embedded concrete columns	<input type="checkbox"/> 1 = All walls <input type="checkbox"/> 3/4 of walls	<input type="checkbox"/> 1/2 of walls <input type="checkbox"/> 1/4 of walls	
<input type="checkbox"/> Concrete frame with unreinforced masonry walls	<input type="checkbox"/> Brick	<input type="checkbox"/> 1 = All walls <input type="checkbox"/> 3/4 of walls	<input type="checkbox"/> 1/2 of walls <input type="checkbox"/> 1/4 of walls	
	<input type="checkbox"/> Adobe	<input type="checkbox"/> 1 = All walls <input type="checkbox"/> 3/4 of walls	<input type="checkbox"/> 1/2 of walls <input type="checkbox"/> 1/4 of walls	
<input type="checkbox"/> Reinforcements		Location		Graphic at plan
	<input type="checkbox"/> Iron/Steel bars	<input type="checkbox"/> Across walls <input type="checkbox"/> Inside walls		
	<input type="checkbox"/> Anchors	<input type="checkbox"/> Top to roof <input type="checkbox"/> Wall to wall		
	<input type="checkbox"/> Wooden keys			
	<input type="checkbox"/> Isolated concrete beams	<input type="checkbox"/> Longer walls <input type="checkbox"/> Shorter walls <input type="checkbox"/> Across the room <input type="checkbox"/> Around the room		
	<input type="checkbox"/> Wooden beams	<input type="checkbox"/> Longer walls <input type="checkbox"/> Shorter walls <input type="checkbox"/> Across the room <input type="checkbox"/> Around the room		

Plaster
(Could be applicable also for roof sector) Identify locations of plaster types on plan.

Sub-type	Details	% of sub-type on all walls per sector		Graphic at plan
On walls <input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Mud/Lime plaster	<input type="checkbox"/> Painted	<input type="checkbox"/> <25% <input type="checkbox"/> 25-50% <input type="checkbox"/> 50-75% <input type="checkbox"/> 75-100% <input type="checkbox"/> 100%	
		<input type="checkbox"/> Not-painted	<input type="checkbox"/> <25% <input type="checkbox"/> 25-50% <input type="checkbox"/> 50-75% <input type="checkbox"/> 75-100% <input type="checkbox"/> 100%	
	<input type="checkbox"/> Cement plaster	<input type="checkbox"/> <25% <input type="checkbox"/> 25-50% <input type="checkbox"/> 50-75% <input type="checkbox"/> 75-100% <input type="checkbox"/> 100%		
	<input type="checkbox"/> Painted surface only	<input type="checkbox"/> <25% <input type="checkbox"/> 25-50% <input type="checkbox"/> 50-75% <input type="checkbox"/> 75-100% <input type="checkbox"/> 100%		
Roof <input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Mud/Lime plaster	<input type="checkbox"/> Painted	<input type="checkbox"/> <25% <input type="checkbox"/> 25-50% <input type="checkbox"/> 50-75% <input type="checkbox"/> 75-100% <input type="checkbox"/> 100%	
		<input type="checkbox"/> Not-painted	<input type="checkbox"/> <25% <input type="checkbox"/> 25-50% <input type="checkbox"/> 50-75% <input type="checkbox"/> 75-100% <input type="checkbox"/> 100%	
	<input type="checkbox"/> Cement plaster	<input type="checkbox"/> <25% <input type="checkbox"/> 25-50% <input type="checkbox"/> 50-75% <input type="checkbox"/> 75-100% <input type="checkbox"/> 100%		
	<input type="checkbox"/> Painted surface only	<input type="checkbox"/> <25% <input type="checkbox"/> 25-50% <input type="checkbox"/> 50-75% <input type="checkbox"/> 75-100% <input type="checkbox"/> 100%		

Earthen Architecture Initiative
Structural Assessment Survey Form – Seismic Retrofitting Project in Peru (SRP)



The Getty Conservation Institute

Flooring

(Skip if roof sector or last floor)

Direction @ longer wall. # and dimensions

Sub-type

Details

Parallel; #: _____

Indicate in plan:

.....
.....

Dimensions:

Structural elements: _____ m.

Space between them: _____ m.

With wooden beams and rafters

Mud plaster or not + wooden structure + mud cover + wooden floors

Mud plaster or not + wooden structure + cement cover + other type of floor

Perpendicular, #: _____

Indicate in plan:

.....
.....

Dimensions:

Structural elements: _____ m.

Space between them: _____ m.

With concrete beams and rafters

Mud plaster or not + wooden structure + mud cover + wooden floors

Mud plaster or not + wooden structure + cement cover + other type of floor

Roofing

Sub-type

Details

Parallel; #: _____

Indicate in plan:

.....
.....

Dimensions:

Structural elements: _____ m.

Space between them: _____ m.

Par y Nudillo

Wood rafters, tie beam, collar beam, wall plate, mud plaster, cane, mud cover and straw.

Wood rafters, tie beam, collar beam, wall plate, mud plaster, cane, mud cover and tiles.

Wood rafters, tie beam, collar beam, wall plate, cane, mud cover and tiles.

Wood rafters, tie beam, collar beam, wall plate, cane and tiles.

Wood rafters, tie beam, collar beam, wall plate, cane, cement cover and tiles.

Concrete structure

Flat

Two eaves

Perpendicular, #: _____

Indicate in plan:

.....
.....

Dimensions:

Structural elements: _____ m.

Space between them: _____ m.

Quincha vault/dome: Wooden frame, ribs and arches

With cane planks laid across wooden arches and mud mortar

With cane planks laid across wooden arches and cement mortar

With mud plaster, wooden beams and joists, and mud cover.

With wooden beams and joists, and mud cover

With mud plaster, wooden beams and joists, and cement cover.

Flat

Other

Describe:

Earthen Architecture Initiative
Structural Assessment Survey Form – Seismic Retrofitting Project in Peru (SRP)



The Getty Conservation Institute

VII. Conditions impacting seismic performance of sector: _____

General impression:

Stable Instable

Adobe/Quincha walls			
Conditions:	In relation to the longer wall	Location	Graphic at plan
Total wall collapse	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> All walls <input type="checkbox"/> ½ of walls <input type="checkbox"/> 3/4 of walls <input type="checkbox"/> 1/4 of walls	
Partial wall collapse (no consider plaster)	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> At the center <input type="checkbox"/> At the corners <input type="checkbox"/> Upper section	
Settlement of walls:	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Center <input type="checkbox"/> Edges	
Corner damage: (The "V" thing, incipient corner collapse)	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> All height <input type="checkbox"/> Upper	
Out of plane displacement: <input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Inward <input type="checkbox"/> Outward <input type="checkbox"/> Bowing	<input type="checkbox"/> Lower <input type="checkbox"/> Upper <input type="checkbox"/> Middle	
Structural cracking: <input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Horizontal	<input type="checkbox"/> Lower <input type="checkbox"/> Upper <input type="checkbox"/> Center	
	<input type="checkbox"/> Vertical	<input type="checkbox"/> Lower <input type="checkbox"/> Upper <input type="checkbox"/> Center <input type="checkbox"/> Coming out of openings <input type="checkbox"/> At corners	
	<input type="checkbox"/> Flexural	<input type="checkbox"/> Wall to wall <input type="checkbox"/> Wall to mid-wall	
	<input type="checkbox"/> Diagonal	<input type="checkbox"/> Top to bottom <input type="checkbox"/> Top to mid-height <input type="checkbox"/> Bottom to mid-height	
	<input type="checkbox"/> X-Shaped	<input type="checkbox"/> Top to bottom <input type="checkbox"/> Top to mid-height <input type="checkbox"/> Bottom to mid-height	

Earthen Architecture Initiative
Structural Assessment Survey Form – Seismic Retrofitting Project in Peru (SRP)



The Getty Conservation Institute

Conditions:	Details	Graphic at plan	% of sub-type on all walls per sector
Plaster loss: <input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Center <input type="checkbox"/> Corners <input type="checkbox"/> Lower <input type="checkbox"/> Upper		<input type="checkbox"/> <25% <input type="checkbox"/> 25-50% <input type="checkbox"/> 50-75% <input type="checkbox"/> 75-100% <input type="checkbox"/> 100% of walls show plaster detachment
Detachment of plasters: <input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Center <input type="checkbox"/> Corners <input type="checkbox"/> Lower <input type="checkbox"/> Upper		<input type="checkbox"/> <25% <input type="checkbox"/> 25-50% <input type="checkbox"/> 50-75% <input type="checkbox"/> 75-100% <input type="checkbox"/> 100% of walls show plaster loss
Beetle damage (Round isolated holes): <input type="checkbox"/> No <input type="checkbox"/> Yes With: <input type="checkbox"/> Disaggregation	<input type="checkbox"/> Center <input type="checkbox"/> Corners <input type="checkbox"/> Lower <input type="checkbox"/> Upper		<input type="checkbox"/> <25% <input type="checkbox"/> 25-50% <input type="checkbox"/> 50-75% <input type="checkbox"/> 75-100% <input type="checkbox"/> 100% of walls show beetle damage
Erosion: <input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Upper <input type="checkbox"/> Center <input type="checkbox"/> Lower <input type="checkbox"/> At corners Average depth of loss: <input type="checkbox"/> <0.01 <input type="checkbox"/> 0.01-0.05 <input type="checkbox"/> > 0.05		<input type="checkbox"/> <25% <input type="checkbox"/> 25-50% <input type="checkbox"/> 50-75% <input type="checkbox"/> 75-100% <input type="checkbox"/> 100% of the facade show erosion
Moisture damage: <input type="checkbox"/> No <input type="checkbox"/> Yes With: <input type="checkbox"/> Detachment <input type="checkbox"/> Blistering <input type="checkbox"/> Disaggregation <input type="checkbox"/> Erosion <input type="checkbox"/> Discoloration <input type="checkbox"/> Rising damp <input type="checkbox"/> Mold <input type="checkbox"/> Vegetation	<input type="checkbox"/> Center <input type="checkbox"/> Corners <input type="checkbox"/> Top <input type="checkbox"/> Bottom		<input type="checkbox"/> <25% <input type="checkbox"/> 25-50% <input type="checkbox"/> 50-75% <input type="checkbox"/> 75-100% <input type="checkbox"/> 100% of walls show moisture damage
Presence of vegetation: <input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Center <input type="checkbox"/> Corners <input type="checkbox"/> Top <input type="checkbox"/> Bottom		<input type="checkbox"/> <25% <input type="checkbox"/> 25-50% <input type="checkbox"/> 50-75% <input type="checkbox"/> 75-100% <input type="checkbox"/> 100% of walls has vegetation

Earthen Architecture Initiative
Structural Assessment Survey Form – Seismic Retrofitting Project in Peru (SRP)

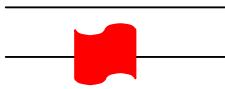


The Getty Conservation Institute

Wooden beams, rafters, quincha frames:

Deformation:

- No
 Yes



Floors

- Joists ("*viguetas*") Center
 At intersection <25% 25-50%
 50-75% 75-100%
 100% show deformation

- Beams ("*vigas*") Center
 At connections <25% 25-50%
 50-75% 75-100%
 100% show deformation

Roof

- Rafters ("*pares*") Center
 At the edges <25% 25-50%
 50-75% 75-100%
 100% show deformation

- Purlins Center
 At the edges <25% 25-50%
 50-75% 75-100%
 100% show deformation

- Ridge purlins ("*Cumbrera*") Center
 At the edges <25% 25-50%
 50-75% 75-100%
 100% show deformation

- Collar beam ("*Nudillos*") Center
 At the edges <25% 25-50%
 50-75% 75-100%
 100% show deformation

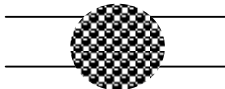
- Arches/Ribs Center
 At the edges <25% 25-50%
 50-75% 75-100%
 100% show deformation

Quincha frames

- Vertical posts Center
 Diagonal posts At the edges <25% 25-50%
 50-75% 75-100%
 100% show deformation

Rotting:

- No
 Yes



Floors

- Joists ("*viguetas*") Center
 At intersection <25% 25-50%
 50-75% 75-100%
 100% show rotting

- Beams ("*vigas*") Center
 At connections <25% 25-50%
 50-75% 75-100%
 100% show rotting

Roof

- Rafters ("*pares*") Center
 At the edges <25% 25-50%
 50-75% 75-100%
 100% show rotting

- Purlins Center
 At the edges <25% 25-50%
 50-75% 75-100%
 100% show rotting

- Ridge purlins ("*Cumbrera*") Center
 At the edges <25% 25-50%
 50-75% 75-100%
 100% show rotting

Earthen Architecture Initiative
Structural Assessment Survey Form – Seismic Retrofitting Project in Peru (SRP)



The Getty Conservation Institute

<input type="checkbox"/> Collar beam ("Nudillos")	<input type="checkbox"/> Center <input type="checkbox"/> At the edges	<input type="checkbox"/> <25% <input type="checkbox"/> 25-50% <input type="checkbox"/> 50-75% <input type="checkbox"/> 75-100% <input type="checkbox"/> 100% show rotting
--	--	---

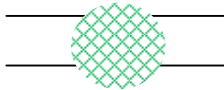
<input type="checkbox"/> Arches/Ribs	<input type="checkbox"/> Center <input type="checkbox"/> At the edges	<input type="checkbox"/> <25% <input type="checkbox"/> 25-50% <input type="checkbox"/> 50-75% <input type="checkbox"/> 75-100% <input type="checkbox"/> 100% show rotting
--------------------------------------	--	---

Quincha frames

<input type="checkbox"/> Vertical posts <input type="checkbox"/> Diagonal posts	<input type="checkbox"/> Center <input type="checkbox"/> At the edges	<input type="checkbox"/> <25% <input type="checkbox"/> 25-50% <input type="checkbox"/> 50-75% <input type="checkbox"/> 75-100% <input type="checkbox"/> 100% show rotting
--	--	---

Termite damage:

- No
 Yes



Floors

<input type="checkbox"/> Joists ("viguetas")	<input type="checkbox"/> Center <input type="checkbox"/> At intersection	<input type="checkbox"/> <25% <input type="checkbox"/> 25-50% <input type="checkbox"/> 50-75% <input type="checkbox"/> 75-100% <input type="checkbox"/> 100% show termite damage
--	---	--

<input type="checkbox"/> Beams ("vigas")	<input type="checkbox"/> Center <input type="checkbox"/> At connections	<input type="checkbox"/> <25% <input type="checkbox"/> 25-50% <input type="checkbox"/> 50-75% <input type="checkbox"/> 75-100% <input type="checkbox"/> 100% show termite damage
--	--	--

Roof

<input type="checkbox"/> Rafters ("pares")	<input type="checkbox"/> Center <input type="checkbox"/> At the edges	<input type="checkbox"/> <25% <input type="checkbox"/> 25-50% <input type="checkbox"/> 50-75% <input type="checkbox"/> 75-100% <input type="checkbox"/> 100% show termite damage
--	--	--

<input type="checkbox"/> Purlins	<input type="checkbox"/> Center <input type="checkbox"/> At the edges	<input type="checkbox"/> <25% <input type="checkbox"/> 25-50% <input type="checkbox"/> 50-75% <input type="checkbox"/> 75-100% <input type="checkbox"/> 100% show termite damage
----------------------------------	--	--

<input type="checkbox"/> Ridge purlins ("Cumbra")	<input type="checkbox"/> Center <input type="checkbox"/> At the edges	<input type="checkbox"/> <25% <input type="checkbox"/> 25-50% <input type="checkbox"/> 50-75% <input type="checkbox"/> 75-100% <input type="checkbox"/> 100% show termite damage
--	--	--

<input type="checkbox"/> Collar beam ("Nudillos")	<input type="checkbox"/> Center <input type="checkbox"/> At the edges	<input type="checkbox"/> <25% <input type="checkbox"/> 25-50% <input type="checkbox"/> 50-75% <input type="checkbox"/> 75-100% <input type="checkbox"/> 100% show termite damage
--	--	--

<input type="checkbox"/> Arches/Ribs	<input type="checkbox"/> Center <input type="checkbox"/> At the edges	<input type="checkbox"/> <25% <input type="checkbox"/> 25-50% <input type="checkbox"/> 50-75% <input type="checkbox"/> 75-100% <input type="checkbox"/> 100% show termite damage
--------------------------------------	--	--

Quincha frames

<input type="checkbox"/> Vertical posts <input type="checkbox"/> Diagonal posts	<input type="checkbox"/> Center <input type="checkbox"/> At intersection	<input type="checkbox"/> <25% <input type="checkbox"/> 25-50% <input type="checkbox"/> 50-75% <input type="checkbox"/> 75-100% <input type="checkbox"/> 100% show termite damage
--	---	--

Adobe masonry - (Usually located at the bottom of the façade)

<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> All façade <input type="checkbox"/> Corners <input type="checkbox"/> Center	<input type="checkbox"/> <25% <input type="checkbox"/> 25-50% <input type="checkbox"/> 50-75% <input type="checkbox"/> 75-100% <input type="checkbox"/> 100% show termite damage
---	--	--

Connections

Corrosion on metal anchors/nails:

- No
 Yes



<input type="checkbox"/> Anchors	<input type="checkbox"/> Top of walls <input type="checkbox"/> Bottom
----------------------------------	--

<input type="checkbox"/> Bars	<input type="checkbox"/> Middle/Center <input type="checkbox"/> At the edges
-------------------------------	---

Earthen Architecture Initiative
Structural Assessment Survey Form – Seismic Retrofitting Project in Peru (SRP)



The Getty Conservation Institute

Failure/Disconnections:

- No
- Yes



Wall to wall:

- | | | | |
|--|-------------------------------------|--|----------------------------------|
| <input type="checkbox"/> Edge connection | <input type="checkbox"/> All height | <input type="checkbox"/> <25% | <input type="checkbox"/> 25-50% |
| <input type="checkbox"/> Internal T connection | <input type="checkbox"/> Upper | <input type="checkbox"/> 50-75% | <input type="checkbox"/> 75-100% |
| | <input type="checkbox"/> Lower | <input type="checkbox"/> 100% show failure | |

- | | | | |
|----------------------------------|---------------------------------------|--|----------------------------------|
| <input type="checkbox"/> Lintels | <input type="checkbox"/> Center | <input type="checkbox"/> <25% | <input type="checkbox"/> 25-50% |
| | <input type="checkbox"/> At the edges | <input type="checkbox"/> 50-75% | <input type="checkbox"/> 75-100% |
| | | <input type="checkbox"/> 100% show failure | |

- | | | | |
|---|---------------------------------------|--|----------------------------------|
| <input type="checkbox"/> Floor/Wall connections | <input type="checkbox"/> Center | <input type="checkbox"/> <25% | <input type="checkbox"/> 25-50% |
| | <input type="checkbox"/> At the edges | <input type="checkbox"/> 50-75% | <input type="checkbox"/> 75-100% |
| | | <input type="checkbox"/> 100% show failure | |

- | | | | |
|---|---------------------------------------|--|----------------------------------|
| <input type="checkbox"/> Roof/Top of the wall connections | <input type="checkbox"/> Center | <input type="checkbox"/> <25% | <input type="checkbox"/> 25-50% |
| | <input type="checkbox"/> At the edges | <input type="checkbox"/> 50-75% | <input type="checkbox"/> 75-100% |
| | | <input type="checkbox"/> 100% show failure | |

Earthen Architecture Initiative
Structural Assessment Survey Form – Seismic Retrofitting Project in Peru (SRP)



The Getty Conservation Institute

Building: Cathedral of Ica

Address: _____

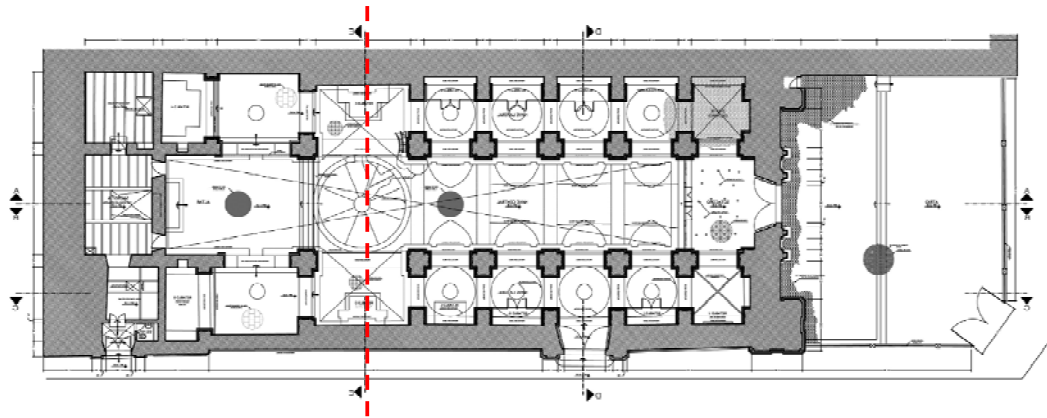
Facade: _____

Type: Exterior / Interior/Patio/Courtyard

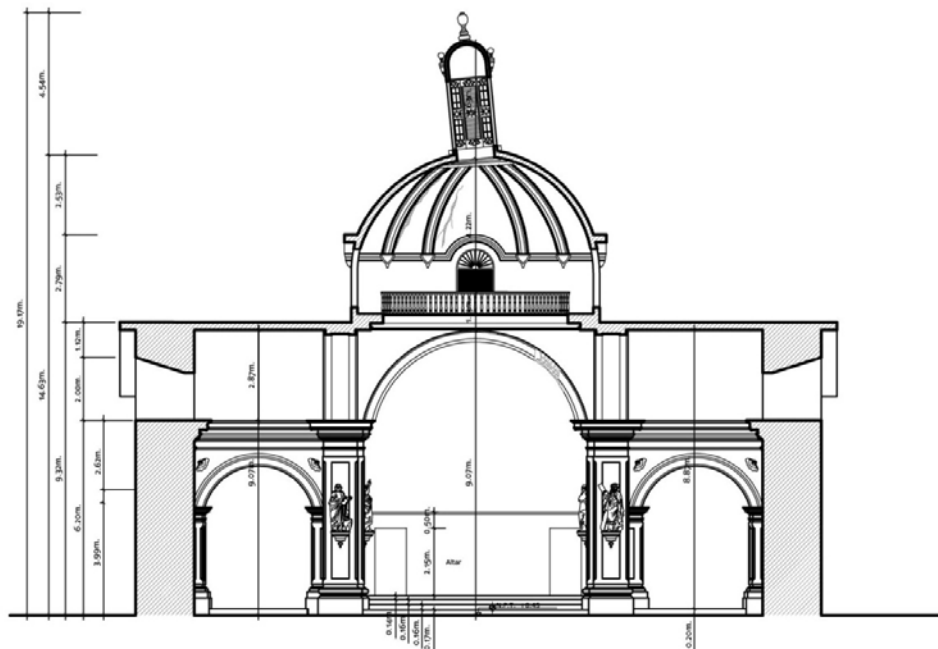
Date of survey: / / (mm/dd/yy)



I. Location of facade (square) or cross section (line) in the building:



II. Elevation of façade or cross section:



Earthen Architecture Initiative
Structural Assessment Survey Form – Seismic Retrofitting Project in Peru (SRP)



The Getty Conservation Institute

III. Facade photos or sketches:

Earthen Architecture Initiative
Structural Assessment Survey Form – Seismic Retrofitting Project in Peru (SRP)

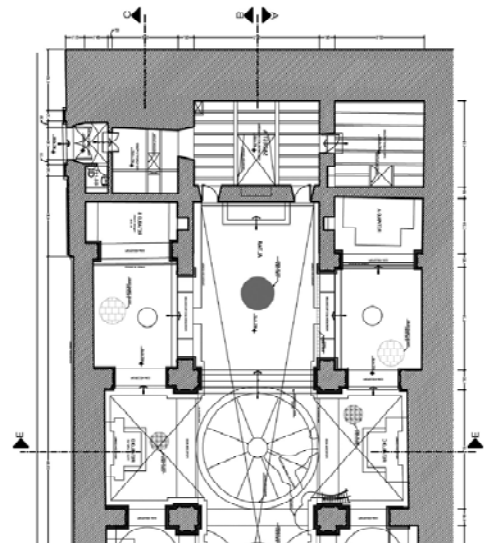
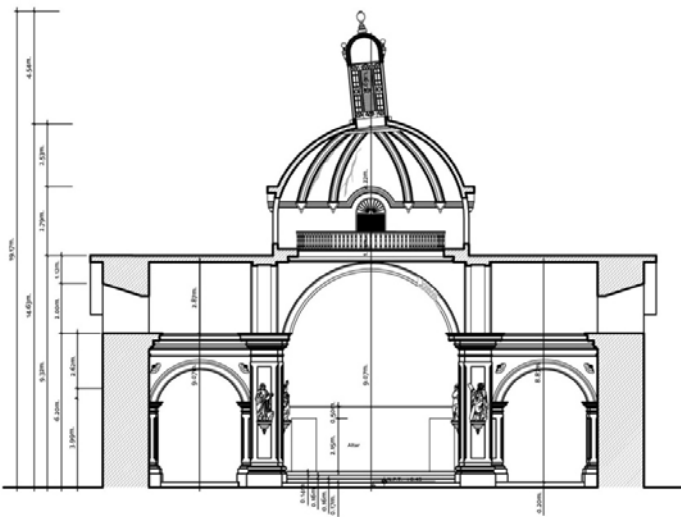


The Getty Conservation Institute

IV. General seismic performance and vulnerability

<p>The total width of door and window openings in a sector wall is less than 1/3 of the distance between the adjacent cross walls:</p> <p><input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> NA</p>	<p>Height-to-thickness ratio of the shear walls is:</p> <p>_____</p>
<p>Average story height:</p> <p>_____</p>	<p>Average ratio opening/walls:</p> <p>_____</p>
<p>Façade is restrained at diaphragm level by:</p> <p><input type="checkbox"/> Joists</p> <p><input type="checkbox"/> Rafters:</p> <p>Presence of:</p> <p><input type="checkbox"/> Wall plate</p> <p><input type="checkbox"/> Pins</p> <p><input type="checkbox"/> Inca external anchor</p> <p><input type="checkbox"/> External pin anchor</p> <p><input type="checkbox"/> Embedded pin anchor</p> <p><input type="checkbox"/> Others: _____</p> <p><input type="checkbox"/> NA</p>	<p>Type of openings:</p> <p><input type="checkbox"/> Floor height #: _____</p> <p><input type="checkbox"/> Less than floor height #: _____</p> <p>Location:</p> <p><input type="checkbox"/> Center:</p> <p style="padding-left: 20px;"><input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> NA</p> <p><input type="checkbox"/> Close to the corners:</p> <p style="padding-left: 20px;"><input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> NA</p> <p><input type="checkbox"/> Distributed evenly horizontally:</p> <p style="padding-left: 20px;"><input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> NA</p> <p><input type="checkbox"/> Distributed evenly vertical:</p> <p style="padding-left: 20px;"><input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> NA</p> <p><input type="checkbox"/> Other describe: _____</p>
<p>Façade connections at edges:</p> <p><input type="checkbox"/> Originally built full connection (complete woven with the wall)</p> <p style="padding-left: 20px;"><input type="checkbox"/> X connection</p> <p style="padding-left: 20px;"><input type="checkbox"/> T connection</p> <p><input type="checkbox"/> Adjacent with butt joints</p>	<p>Façade connections with interior walls:</p> <p><input type="checkbox"/> Originally built full connection (complete woven with the wall)</p> <p style="padding-left: 20px;"><input type="checkbox"/> X connection</p> <p style="padding-left: 20px;"><input type="checkbox"/> T connection</p> <p>Adjacent with butt joints</p>

V. Indicate location of photographs of conditions taken (Section VII):
(Façade and floor plan)















Earthen Architecture Initiative
Structural Assessment Survey Form – Seismic Retrofitting Project in Peru (SRP)



The Getty Conservation Institute

VI. Description of structural system facade: _____

Type				
Foundations				
Cimentación	Sub-type	Details	% of sub-type per facade	Condition
<input type="checkbox"/> Mark here if system is assumed only	<input type="checkbox"/> Natural	<input type="checkbox"/> Solid Rock <input type="checkbox"/> Stiff soil <input type="checkbox"/> Structure rock	<input type="checkbox"/> <25% <input type="checkbox"/> 25-50% <input type="checkbox"/> 50-75% <input type="checkbox"/> 75-100% <input type="checkbox"/> 100%	<input type="checkbox"/> Cohesive <input type="checkbox"/> Non-cohesive 
	<input type="checkbox"/> Man made: Stone "cimentación" with mud/lime mortar	<input type="checkbox"/> Rubble stone	<input type="checkbox"/> <25% <input type="checkbox"/> 25-50% <input type="checkbox"/> 50-75% <input type="checkbox"/> 75-100% <input type="checkbox"/> 100%	<input type="checkbox"/> Cohesive <input type="checkbox"/> Non-cohesive 
	<input type="checkbox"/> Stone masonry	<input type="checkbox"/> <25% <input type="checkbox"/> 25-50% <input type="checkbox"/> 50-75% <input type="checkbox"/> 75-100% <input type="checkbox"/> 100%	<input type="checkbox"/> Cohesive <input type="checkbox"/> Non-cohesive 	
Sobrecimiento				
Sobrecimiento	Sub-type	Details	% of sub-type per facade	Condition
<input type="checkbox"/> Mark here if system is assumed only	<input type="checkbox"/> "Sobrecimiento" with mud/lime mortar	<input type="checkbox"/> Rubble stone	<input type="checkbox"/> <25% <input type="checkbox"/> 25-50% <input type="checkbox"/> 50-75% <input type="checkbox"/> 75-100% <input type="checkbox"/> 100%	<input type="checkbox"/> Cohesive <input type="checkbox"/> Non-cohesive 
	<input type="checkbox"/> Stone masonry	<input type="checkbox"/> <25% <input type="checkbox"/> 25-50% <input type="checkbox"/> 50-75% <input type="checkbox"/> 75-100% <input type="checkbox"/> 100%	<input type="checkbox"/> Cohesive <input type="checkbox"/> Non-cohesive 	
Others				
Others	Sub-type	Details	% of sub-type per facade	Condition
	<input type="checkbox"/> Walls sitting on natural unmodified ground		<input type="checkbox"/> <25% <input type="checkbox"/> 25-50% <input type="checkbox"/> 50-75% <input type="checkbox"/> 75-100% <input type="checkbox"/> 100%	
Load bearing masonry/quincha facades				
Sub-type	Details	Location within the facade	Graphic at plan	
<input type="checkbox"/> Adobe masonry walls	<input type="checkbox"/> With mud mortar (probably original)	<input type="checkbox"/> First floor <input type="checkbox"/> Second and third floor		
	<input type="checkbox"/> With mud mortar and insertions of bricks with cement mortar	<input type="checkbox"/> First floor <input type="checkbox"/> Second and third floor		
<input type="checkbox"/> Rammed earth walls		<input type="checkbox"/> First floor <input type="checkbox"/> Second and third floor		
<input type="checkbox"/> Brick masonry walls	<input type="checkbox"/> With cement mortar	<input type="checkbox"/> First floor <input type="checkbox"/> Second and third floor		
<input type="checkbox"/> Stone masonry walls	<input type="checkbox"/> With mud mortar	<input type="checkbox"/> First floor <input type="checkbox"/> Second and third floor		
	<input type="checkbox"/> With lime/cement mortar	<input type="checkbox"/> First floor <input type="checkbox"/> Second and third floor		
<input type="checkbox"/> Quincha walls with wooden frames	<input type="checkbox"/> With cane reed and mud plaster (original)	<input type="checkbox"/> First floor <input type="checkbox"/> Second and third floor		

Earthen Architecture Initiative
Structural Assessment Survey Form – Seismic Retrofitting Project in Peru (SRP)



The Getty Conservation Institute

	<input type="checkbox"/> With cane reed and cement plaster	<input type="checkbox"/> First floor <input type="checkbox"/> Second and third floor		
	<input type="checkbox"/> With adobe blocks infill and mud plaster	<input type="checkbox"/> First floor <input type="checkbox"/> Second and third floor		
	<input type="checkbox"/> With adobe/brick infill and cement plaster	<input type="checkbox"/> First floor <input type="checkbox"/> Second and third floor		
	<input type="checkbox"/> Reinforced masonry walls	<input type="checkbox"/> Bricks with embedded concrete columns	<input type="checkbox"/> First floor <input type="checkbox"/> Second and third floor	
		<input type="checkbox"/> Adobe blocks with embedded concrete	<input type="checkbox"/> First floor <input type="checkbox"/> Second and third floor	
	<input type="checkbox"/> Concrete frame with unreinforced masonry walls	<input type="checkbox"/> Brick	<input type="checkbox"/> First floor <input type="checkbox"/> Second and third floor	
<input type="checkbox"/> Adobe		<input type="checkbox"/> First floor <input type="checkbox"/> Second and third floor		

Plaster				
	Sub-type	Details	% of sub-type on the facade	Graphic at plan
<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Mud/Lime plaster	<input type="checkbox"/> Painted	<input type="checkbox"/> <25% <input type="checkbox"/> 25-50% <input type="checkbox"/> 50-75% <input type="checkbox"/> 75-100% <input type="checkbox"/> 100%	
		<input type="checkbox"/> Not-painted	<input type="checkbox"/> <25% <input type="checkbox"/> 25-50% <input type="checkbox"/> 50-75% <input type="checkbox"/> 75-100% <input type="checkbox"/> 100%	
	<input type="checkbox"/> Cement plaster	<input type="checkbox"/> <25% <input type="checkbox"/> 25-50% <input type="checkbox"/> 50-75% <input type="checkbox"/> 75-100% <input type="checkbox"/> 100%		
	<input type="checkbox"/> Painted surface only	<input type="checkbox"/> <25% <input type="checkbox"/> 25-50% <input type="checkbox"/> 50-75% <input type="checkbox"/> 75-100% <input type="checkbox"/> 100%		

Balconies				
	Sub-type	Details	Structural description	Graphic at plan
<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Jetty (enclosed)	<input type="checkbox"/> Across entire façade <input type="checkbox"/> Part of the façade #: _____ <input type="checkbox"/> Corner	<input type="checkbox"/> Stone flooring <input type="checkbox"/> Wooden flooring	
	<input type="checkbox"/> Open	<input type="checkbox"/> Across entire façade <input type="checkbox"/> Part of the façade #: _____ <input type="checkbox"/> Corner	<input type="checkbox"/> Stone flooring <input type="checkbox"/> Wooden flooring	

Buttresses			
	Sub-type and # per sector	Condition	Graphic at plan
<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Adobe: #: _____	Masonry fabric: <input type="checkbox"/> Good <input type="checkbox"/> Fair <input type="checkbox"/> Poor	
		<input type="checkbox"/> Originally built full connection (complete woven with the wall)	
		<input type="checkbox"/> Adjacent with butt joints	
	<input type="checkbox"/> Later addition, superficial connection		
	<input type="checkbox"/> Adobe and brick/stone: #: _____	Masonry fabric: <input type="checkbox"/> Good <input type="checkbox"/> Fair <input type="checkbox"/> Poor	
		<input type="checkbox"/> Originally built full connection (complete woven with the wall)	
<input type="checkbox"/> Adjacent with butt joints			
<input type="checkbox"/> Later addition, superficial connection			

IN BLUE

Earthen Architecture Initiative
Structural Assessment Survey Form – Seismic Retrofitting Project in Peru (SRP)



The Getty Conservation Institute

<input type="checkbox"/> Brick: #: _____	Masonry fabric: <input type="checkbox"/> Good <input type="checkbox"/> Fair <input type="checkbox"/> Poor	IN BLACK
	<input type="checkbox"/> Originally built full connection (complete woven with the wall)	
	<input type="checkbox"/> Adjacent with butt joints	
	<input type="checkbox"/> Later addition, superficial connection	

Porticos			
	Location @ other walls	Details	Numbers
<input type="checkbox"/> None	<input type="checkbox"/> Across part of the facade	<input type="checkbox"/> Brick/Stone <input type="checkbox"/> Wood	#: _____
	<input type="checkbox"/> Across half of the facade	<input type="checkbox"/> Brick/Stone <input type="checkbox"/> Wood	#: _____
	<input type="checkbox"/> Across all facade	<input type="checkbox"/> Brick/Stone <input type="checkbox"/> Wood	#: _____

Length of portico vs. length of façade:

Earthen Architecture Initiative
Structural Assessment Survey Form – Seismic Retrofitting Project in Peru (SRP)



The Getty Conservation Institute

VII. Conditions impacting seismic performance of facade: _____

General impression: Stable Instable

Adobe/Quincha walls			
Conditions:	Details	Location	Graphic at facade
Total collapse: <input type="checkbox"/> Yes <input type="checkbox"/> No		<input type="checkbox"/> All floors <input type="checkbox"/> Third floor <input type="checkbox"/> Second floor <input type="checkbox"/> First floor	
Partial collapse (no consider plaster): <input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> All facade <input type="checkbox"/> 1/2 of facade <input type="checkbox"/> 3/4 of facade <input type="checkbox"/> 1/4 of facade	<input type="checkbox"/> Third floor <input type="checkbox"/> Second floor <input type="checkbox"/> First floor <input type="checkbox"/> At corners	
Settlement of facade:) <input type="checkbox"/> Yes <input type="checkbox"/> No		<input type="checkbox"/> Center <input type="checkbox"/> Edges	
Corner damage: (The "V" thing) <input type="checkbox"/> Yes <input type="checkbox"/> No		<input type="checkbox"/> All height <input type="checkbox"/> Upper	
Out of plane displacement: <input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Inward <input type="checkbox"/> Outward <input type="checkbox"/> Bowing	<input type="checkbox"/> Lower <input type="checkbox"/> Upper <input type="checkbox"/> Middle <input type="checkbox"/> At corners	
	<input type="checkbox"/> Horizontal Average width: _____	<input type="checkbox"/> Lower <input type="checkbox"/> Upper <input type="checkbox"/> Center	
Structural cracking: <input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Vertical: Average width: _____	<input type="checkbox"/> At the piers (between openings and end of the façade) <input type="checkbox"/> At the spandrel <input type="checkbox"/> From the openings <hr/> <input type="checkbox"/> Lower <input type="checkbox"/> Upper <input type="checkbox"/> Center	

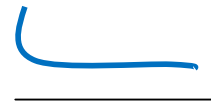
Earthen Architecture Initiative
Structural Assessment Survey Form – Seismic Retrofitting Project in Peru (SRP)



The Getty Conservation Institute

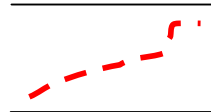
Flexural

- Wall to wall
- Wall to mid-wall



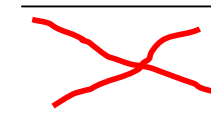
Diagonal

- Top to bottom
- Top to mid-height
- Bottom to mid-height
- At the piers (between openings and end of the façade)
- At the spandrel



X-shaped

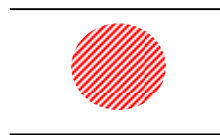
- Top to bottom
- Top to mid-height
- Bottom to mid-height
- At the piers (between openings and end of the façade)
- At the spandrel



Plaster loss:

- Yes
- No

- Center
- Corners
- Lower
- Upper
- Everywhere

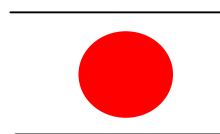


- <25%
- 25-50%
- 50-75%
- 75-100%
- 100% of facade show plaster detachment

Detachment of plasters:

- Yes
- No

- Center
- Corners
- Lower
- Upper
- Everywhere

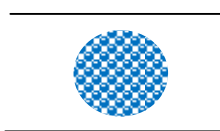


- <25%
- 25-50%
- 50-75%
- 75-100%
- 100% of facade show plaster loss

Erosion:

- Yes
- No

- Upper
 - Center
 - Lower
 - At corners
- Average depth of loss:
- <0.01
 - 0.01-0.05
 - > 0.05



- <25%
- 25-50%
- 50-75%
- 75-100%
- 100% of the facade show erosion

Earthen Architecture Initiative
Structural Assessment Survey Form – Seismic Retrofitting Project in Peru (SRP)

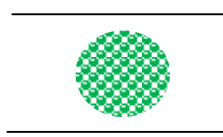


The Getty Conservation Institute

Beetle damage,
(Round isolated holes):

- No
 Yes
With:
 Disaggregation

- Center
 Corners
 Lower
 Upper



- <25% 25-50%
 50-75% 75-100%
 100% of walls show beetle damage

Moisture damage:

- No
 Yes
With:
 Detachment
 Blistering
 Disaggregation
 Erosion
 Discoloration
 Rising damp
 Mold
 Vegetation

- Center
 Corners
 Top
 Bottom

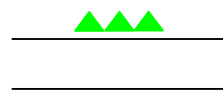


- <25% 25-50%
 50-75% 75-100%
 100% of walls show moisture damage

Presence of vegetation:

- Yes
 No

- Center
 Corners
 Top
 Bottom

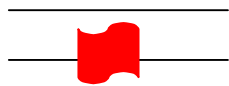


- <25% 25-50%
 50-75% 75-100%
 100% of walls has vegetation

Wooden beams, rafters, quincha frames:

Deformation:

- No
 Yes



Wall plate

- Center
 At intersection

- <25% 25-50%
 50-75% 75-100%
 100% show deformation

Wooden lintels

- Center
 At connections

- <25% 25-50%
 50-75% 75-100%
 100% show deformation

Rafters ("Pares")
Location:

- Center
 At the edges

- <25% 25-50%
 50-75% 75-100%
 100% show deformation

Joists ("viguetas")
Location:

- Center
 At the edges

- <25% 25-50%
 50-75% 75-100%
 100% show deformation

Arches/Ribs

- Center
 At the support

- <25% 25-50%
 50-75% 75-100%
 100% show deformation

Quincha

Vertical posts
 Diagonal posts

- Center
 At intersection

- <25% 25-50%
 50-75% 75-100%
 100% show deformation

Balconies

Drop of support

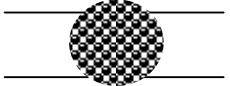
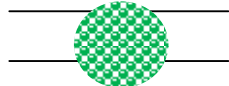
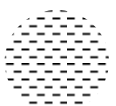
- At the edges
 At the center

- <25% 25-50%
 50-75% 75-100%
 100% show drop of support

Earthen Architecture Initiative
Structural Assessment Survey Form – Seismic Retrofitting Project in Peru (SRP)



The Getty Conservation Institute

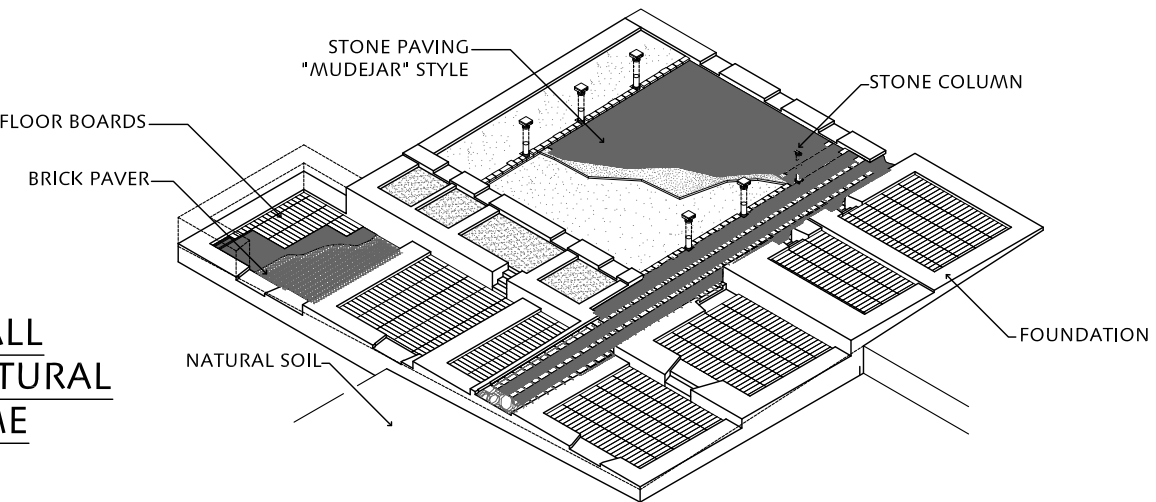
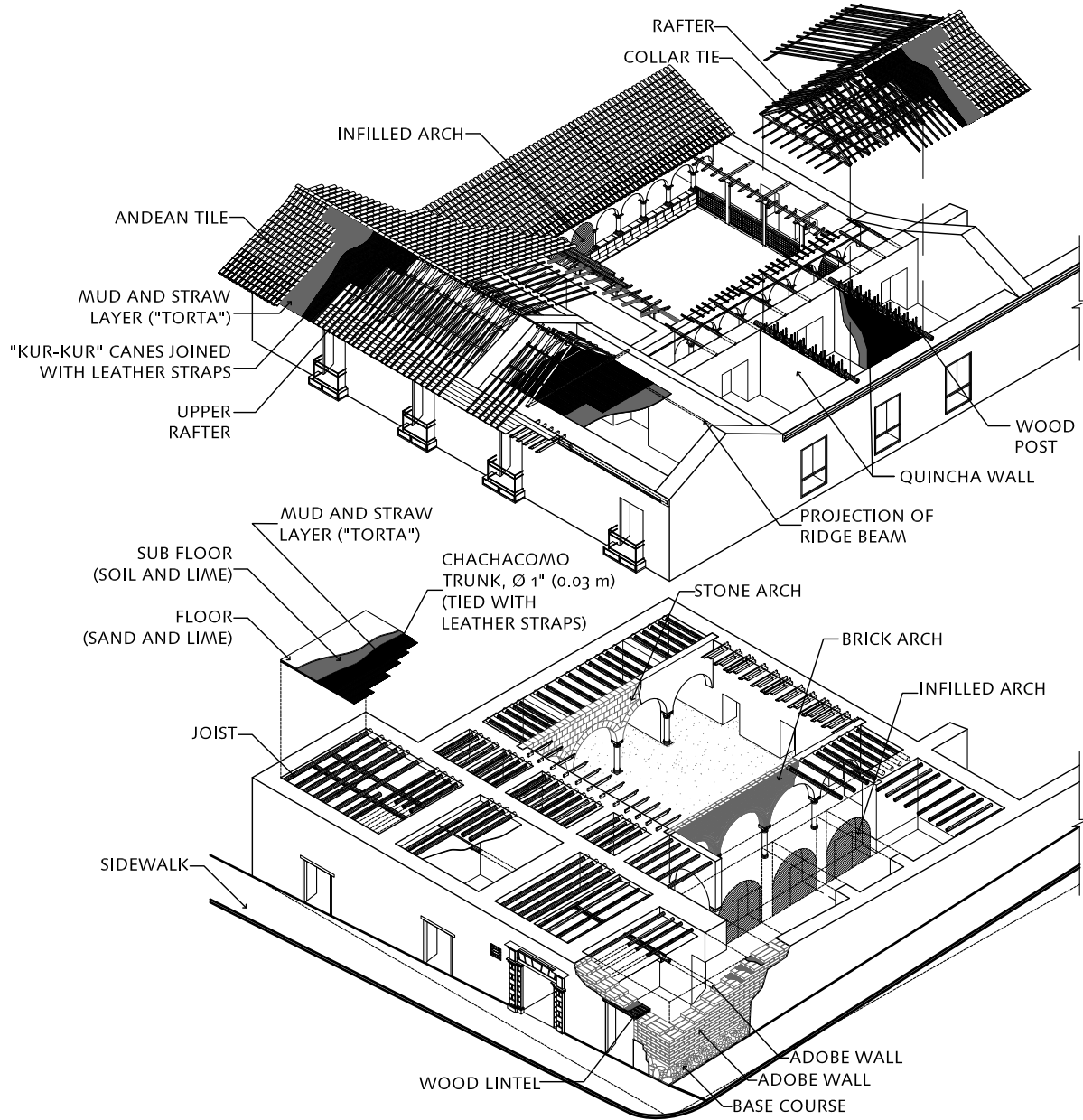
		<input type="checkbox"/> <25% <input type="checkbox"/> 25-50% <input type="checkbox"/> 50-75% <input type="checkbox"/> 75-100% 100% of balconies show floor deformation	
	Floor deformation <input type="checkbox"/> At the edges <input type="checkbox"/> At the center		
Rotting: <input type="checkbox"/> No <input type="checkbox"/> Yes		<input type="checkbox"/> Wall plate <input type="checkbox"/> Center <input type="checkbox"/> At intersection <hr/> <input type="checkbox"/> Wooden lintels <input type="checkbox"/> Center <input type="checkbox"/> At connections <hr/> <input type="checkbox"/> Rafters ("Pares") <input type="checkbox"/> Center Location: <input type="checkbox"/> At the edges <hr/> <input type="checkbox"/> Joists ("viguetas") <input type="checkbox"/> Center Location: <input type="checkbox"/> At the edges <hr/> <input type="checkbox"/> Arches/Ribs <input type="checkbox"/> Center <input type="checkbox"/> At the support	<input type="checkbox"/> <25% <input type="checkbox"/> 25-50% <input type="checkbox"/> 50-75% <input type="checkbox"/> 75-100% <input type="checkbox"/> 100% show rotting <hr/> <input type="checkbox"/> <25% <input type="checkbox"/> 25-50% <input type="checkbox"/> 50-75% <input type="checkbox"/> 75-100% <input type="checkbox"/> 100% show rotting <hr/> <input type="checkbox"/> <25% <input type="checkbox"/> 25-50% <input type="checkbox"/> 50-75% <input type="checkbox"/> 75-100% <input type="checkbox"/> 100% show rotting <hr/> <input type="checkbox"/> <25% <input type="checkbox"/> 25-50% <input type="checkbox"/> 50-75% <input type="checkbox"/> 75-100% <input type="checkbox"/> 100% show rotting <hr/> <input type="checkbox"/> <25% <input type="checkbox"/> 25-50% <input type="checkbox"/> 50-75% <input type="checkbox"/> 75-100% <input type="checkbox"/> 100% show rotting
Quincha			
	<input type="checkbox"/> Vertical posts <input type="checkbox"/> Center <input type="checkbox"/> Diagonal posts <input type="checkbox"/> At intersection	<input type="checkbox"/> <25% <input type="checkbox"/> 25-50% <input type="checkbox"/> 50-75% <input type="checkbox"/> 75-100% <input type="checkbox"/> 100% show rotting	
Termite damage (Evidence of termites wings, frass): <input type="checkbox"/> No <input type="checkbox"/> Yes		<input type="checkbox"/> Wall plate <input type="checkbox"/> Center <input type="checkbox"/> At intersection <hr/> <input type="checkbox"/> Wooden lintels <input type="checkbox"/> Center <input type="checkbox"/> At connections	<input type="checkbox"/> <25% <input type="checkbox"/> 25-50% <input type="checkbox"/> 50-75% <input type="checkbox"/> 75-100% <input type="checkbox"/> 100% show termite damage <hr/> <input type="checkbox"/> <25% <input type="checkbox"/> 25-50% <input type="checkbox"/> 50-75% <input type="checkbox"/> 75-100% <input type="checkbox"/> 100% show termite damage
Quincha frames			
	<input type="checkbox"/> Vertical posts <input type="checkbox"/> Center <input type="checkbox"/> Diagonal posts <input type="checkbox"/> At intersection	<input type="checkbox"/> <25% <input type="checkbox"/> 25-50% <input type="checkbox"/> 50-75% <input type="checkbox"/> 75-100% <input type="checkbox"/> 100% show termite damage	
Adobe masonry - (Usually located at the bottom of the façade)			
	<input type="checkbox"/> Yes <input type="checkbox"/> All façade <input type="checkbox"/> No <input type="checkbox"/> Corners <input type="checkbox"/> Center	<input type="checkbox"/> <25% <input type="checkbox"/> 25-50% <input type="checkbox"/> 50-75% <input type="checkbox"/> 75-100% <input type="checkbox"/> 100% show termite damage	
Connections			
Corrosion on metal anchors/nails: <input type="checkbox"/> No <input type="checkbox"/> Yes		<input type="checkbox"/> Anchors <input type="checkbox"/> Top of walls <input type="checkbox"/> Bottom <hr/> <input type="checkbox"/> Bars <input type="checkbox"/> Center <input type="checkbox"/> At the edges	
Failure/Disconnections: <input type="checkbox"/> No <input type="checkbox"/> Yes	<input type="checkbox"/> "Cimentacion"	<input type="checkbox"/> Center <input type="checkbox"/> At the edges	<input type="checkbox"/> <25% <input type="checkbox"/> 25-50% <input type="checkbox"/> 50-75% <input type="checkbox"/> 75-100% <input type="checkbox"/> 100% show failure

Earthen Architecture Initiative
Structural Assessment Survey Form – Seismic Retrofitting Project in Peru (SRP)



The Getty Conservation Institute

<input type="checkbox"/> "Sobrecimiento"	<input type="checkbox"/> Center <input type="checkbox"/> At the edges	<input type="checkbox"/> <25% <input type="checkbox"/> 25-50% <input type="checkbox"/> 50-75% <input type="checkbox"/> 75-100% <input type="checkbox"/> 100% show failure
Wall to wall:		
<input type="checkbox"/> Edge connection	<input type="checkbox"/> All height	<input type="checkbox"/> <25% <input type="checkbox"/> 25-50%
<input type="checkbox"/> Internal T connection	<input type="checkbox"/> Upper	<input type="checkbox"/> 50-75% <input type="checkbox"/> 75-100%
	<input type="checkbox"/> Lower	<input type="checkbox"/> 100% show failure
<input type="checkbox"/> Buttresses	<input type="checkbox"/> All height	<input type="checkbox"/> <25% <input type="checkbox"/> 25-50%
	<input type="checkbox"/> Upper	<input type="checkbox"/> 50-75% <input type="checkbox"/> 75-100%
	<input type="checkbox"/> Lower	<input type="checkbox"/> 100% show failure
<input type="checkbox"/> Wall plate	<input type="checkbox"/> Partial	<input type="checkbox"/> <25% <input type="checkbox"/> 25-50%
	<input type="checkbox"/> All length of facade	<input type="checkbox"/> 50-75% <input type="checkbox"/> 75-100%
		<input type="checkbox"/> 100% show failure
<input type="checkbox"/> Lintels	<input type="checkbox"/> Center	<input type="checkbox"/> <25% <input type="checkbox"/> 25-50%
	<input type="checkbox"/> At the edges	<input type="checkbox"/> 50-75% <input type="checkbox"/> 75-100%
		<input type="checkbox"/> 100% show failure
<input type="checkbox"/> Floor/Façade connections	<input type="checkbox"/> Center	<input type="checkbox"/> <25% <input type="checkbox"/> 25-50%
	<input type="checkbox"/> At the edges	<input type="checkbox"/> 50-75% <input type="checkbox"/> 75-100%
		<input type="checkbox"/> 100% show failure
<input type="checkbox"/> Roof/Top of the facade connections	<input type="checkbox"/> Center	<input type="checkbox"/> <25% <input type="checkbox"/> 25-50%
	<input type="checkbox"/> At the edges	<input type="checkbox"/> 50-75% <input type="checkbox"/> 75-100%
		<input type="checkbox"/> 100% show failure



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