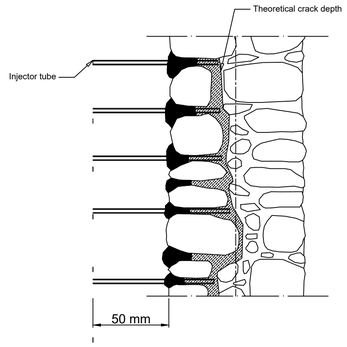
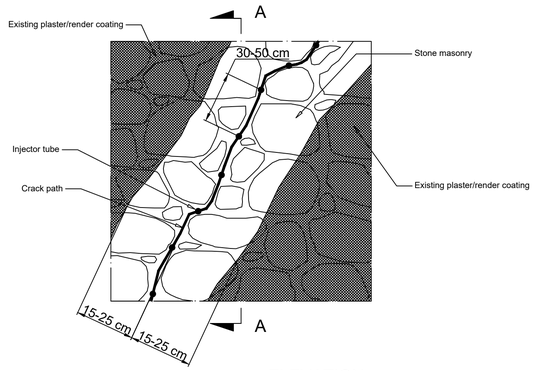
Grout injection for crack repairs



SECTION AA

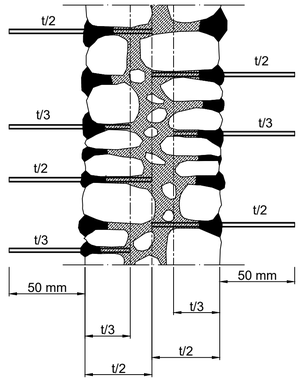


ELEVATION

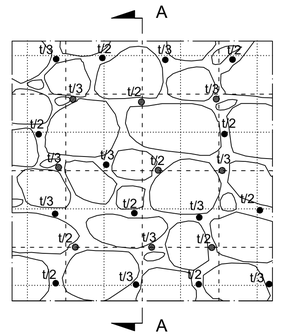
Application method

1. Identify and mark crack to be treated
2. Remove plaster/render coating on either side of crack at a width of 25 cm
3. Prepare substrate by cutting out deteriorated jointing mortar and by thorough cleaning
4. Drill 20-40 mm diameter holes extending to a depth of at least 1/3 of the thickness of the masonry regularly spaced at distances 30-50 cm
5. At the drilled holes Install injection tubes protruding 50 cm from the face of the wall
6. Seal the perimeter of the tubes and the crack path with lime mortar
7. Inject water the day before injecting the grout
8. Inject grout using low pressure pump and keeping pressure ≤ 0.10 MPa. Always start from the bottom working upwards. Continue injection in each position until slurry seeps out of a nearby tube and/or pressure reaches 0.1 MPa.
9. After completion of the procedure, remove tubes and fill holes/joints with lime mortar.

Grout injection for homogenization of mass



SECTION AA



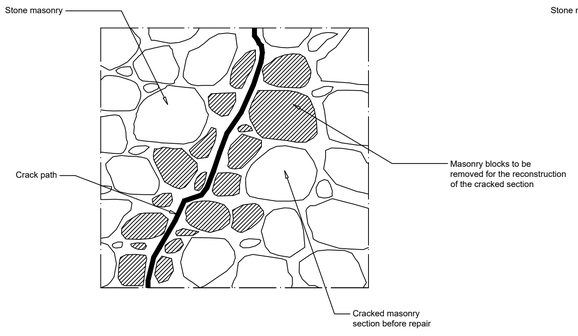
ELEVATION

- Injector tubes at the exterior face of the masonry
- Injector tubes at the interior face of the masonry
- Grid for placing injector tubes at the interior face of the masonry
- Grid for placing injector tubes at the exterior face of the masonry
- Grout material

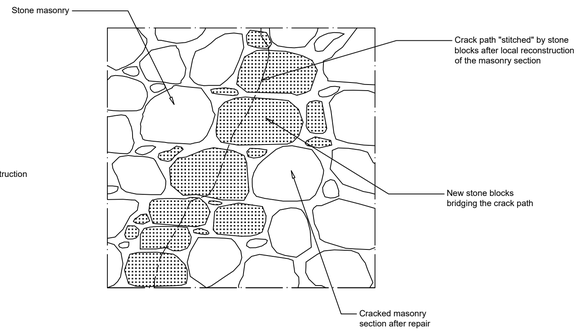
Application method

1. Identify and mark areas to be treated
2. Prepare substrate by cutting out deteriorated jointing mortar and by thorough cleaning
3. Drill 20-40 mm diameter holes extending to a depth of 1/2 - 2/3 of the thickness of the masonry at 50 x 50 cm pitch
4. At the drilled holes Install injection tubes protruding 50 cm from the face of the wall
5. Seal the perimeter of the tubes and the joints with lime mortar
6. Inject water the day before injecting the grout
7. Inject grout using low pressure pump and keeping pressure ≤ 0.10 MPa. Always start from the bottom working upwards. Continue injection in each position until slurry seeps out of a nearby tube and/or pressure reaches 0.1 MPa.
8. After completion of the procedure, remove tubes and fill holes/joints with lime mortar.

Local reconstruction of cracked masonry sections



ELEVATION



ELEVATION

Masonry blocks to be removed

New masonry blocks

Application method

1. Identify and mark crack to be treated
2. Remove plaster/render coating on either side of crack at a width of 50 cm
3. Install suitable temporary supports to ensure stability and safety.
4. Remove any deteriorated, cracked, particularly loose and/or poorly bonded material from treated section
5. Thoroughly clean all support and jointing surfaces.
6. Clean stone blocks used for construction from dirt/dust and pre-wet at the time of placement
7. Create an “installation bed” of mortar and then lay the stone blocks. Set stone into position by a rubber or wooden mallet and firmly bed into mortar ensuring that sufficient grip is achieved with the existing masonry units.
8. Place new stone blocks in a way that “stitching” of the crack is achieved; i.e. the stone blocks installed bridge the cracks. Arrange stones suitably to stagger the vertical joints and avoid long vertical joints .
9. Use chips and spalls of stone to fill of interstices between the adjacent blocks and .to avoid thick mortar beds
10. In case of complete reconstruction of the masonry section, use through stones or overlapping blocks to ensure bonding among the two leafs of the stonework.
11. Construct a maximum of 80 cm of masonry per day on each wall section.

0 1 2 2.5

SCALE BAR 1:20
All measurements on this drawing sheet are in meters.

A/A	Specified Works	Relevant Technical Specification
AS8. CS10. DS3. ES3. FS4.	Repair of cracks by means of repointing, grout injection and or localized masonry reconstruction	S11. Consolidation and repair of masonry by means of grout injections
FS5.	Consolidation of masonry arched section by means of grout injection	S11. Consolidation and repair of masonry by means of grout injections

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Project Title:
Sourp Magar Monastery - Rehabilitation Plan and Conservation Designs

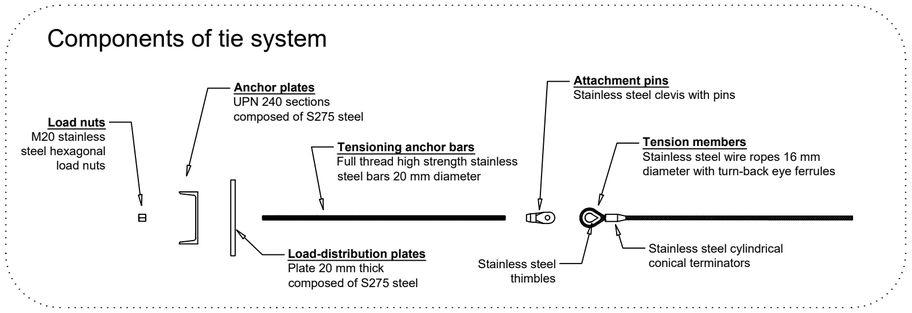
Design:	Name:	Surname:	Licence no.:
Architect:	Zoe	Lordos	10907
Civil Engineer:	Andreas	Antoniou	71696

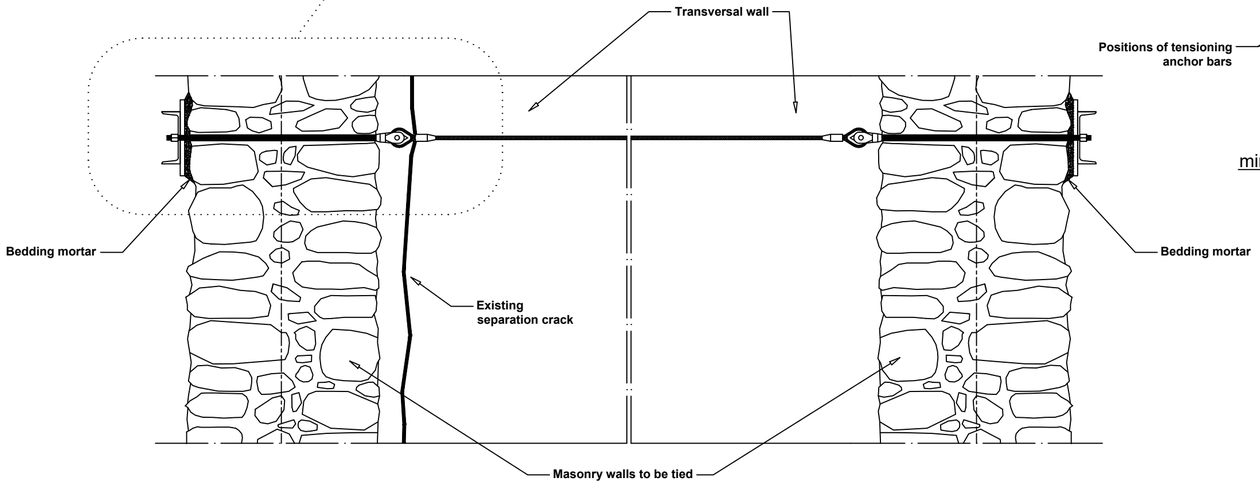
Designer Team: Senior Architect: Andreas Lordos
Architects: Ioanna Anastasiadou, Enver Eronen, Christina Kleanthous Papademetriou, Constantina Hadjicosta
Civil Engineer: Rogiros Illampas
Archaeologist: Anna Marangou

Date:	19/02/2019	Scale:	1:20 @ A1
Revision Date:	27/03/2019 08/04/2019 24/06/2019		

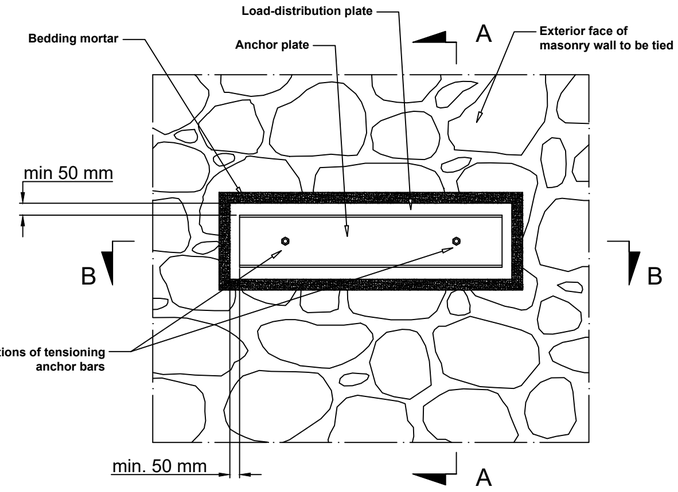
Drawing Name:
Consolidation and repair of masonry by means of grout injection - Final

Drawing no.:
S-Pr 01

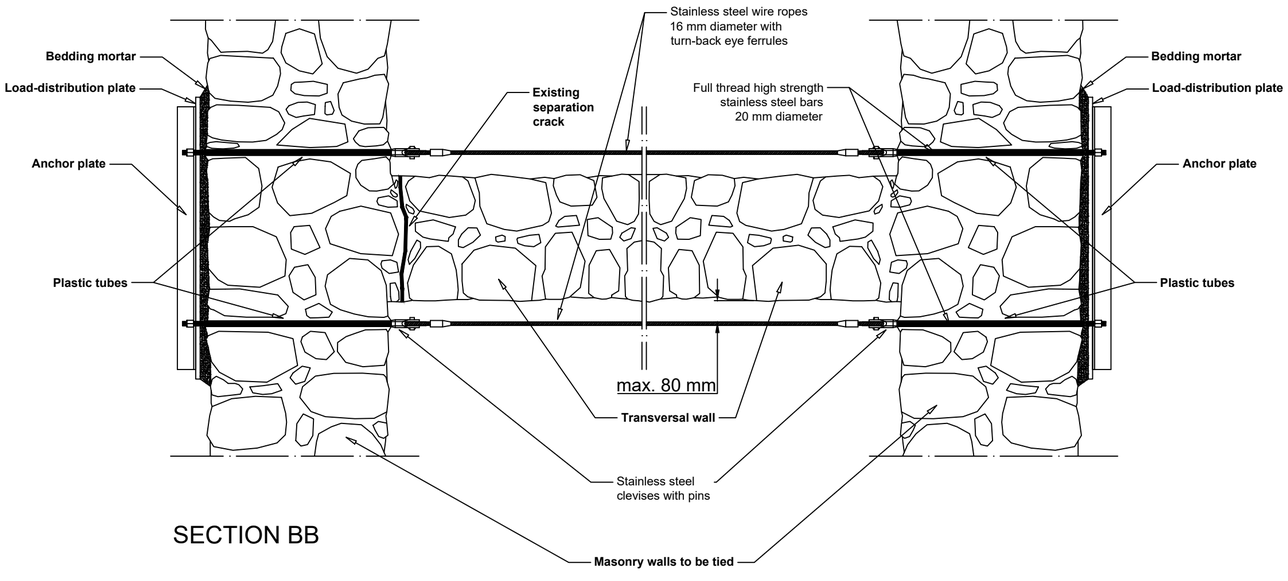




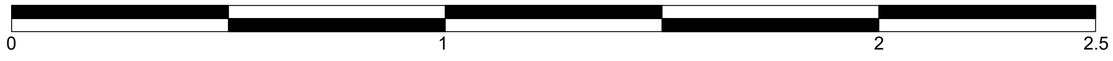
SECTION AA



ELEVATION



SECTION BB



SCALE BAR 1:20
All measurements on this drawing sheet are in meters.

Block C		
A/A	**Specified Works**	**Relevant Technical Specification**
CS6..	Installation of steel tie rods along the length of the transversal walls to connect the longitudinal walls of the structure	S17. Installation of steel tie rods

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Civil Engineer:	Andreas	Antoniou	71696

Designer Team: Senior Architect: Andreas Lordos
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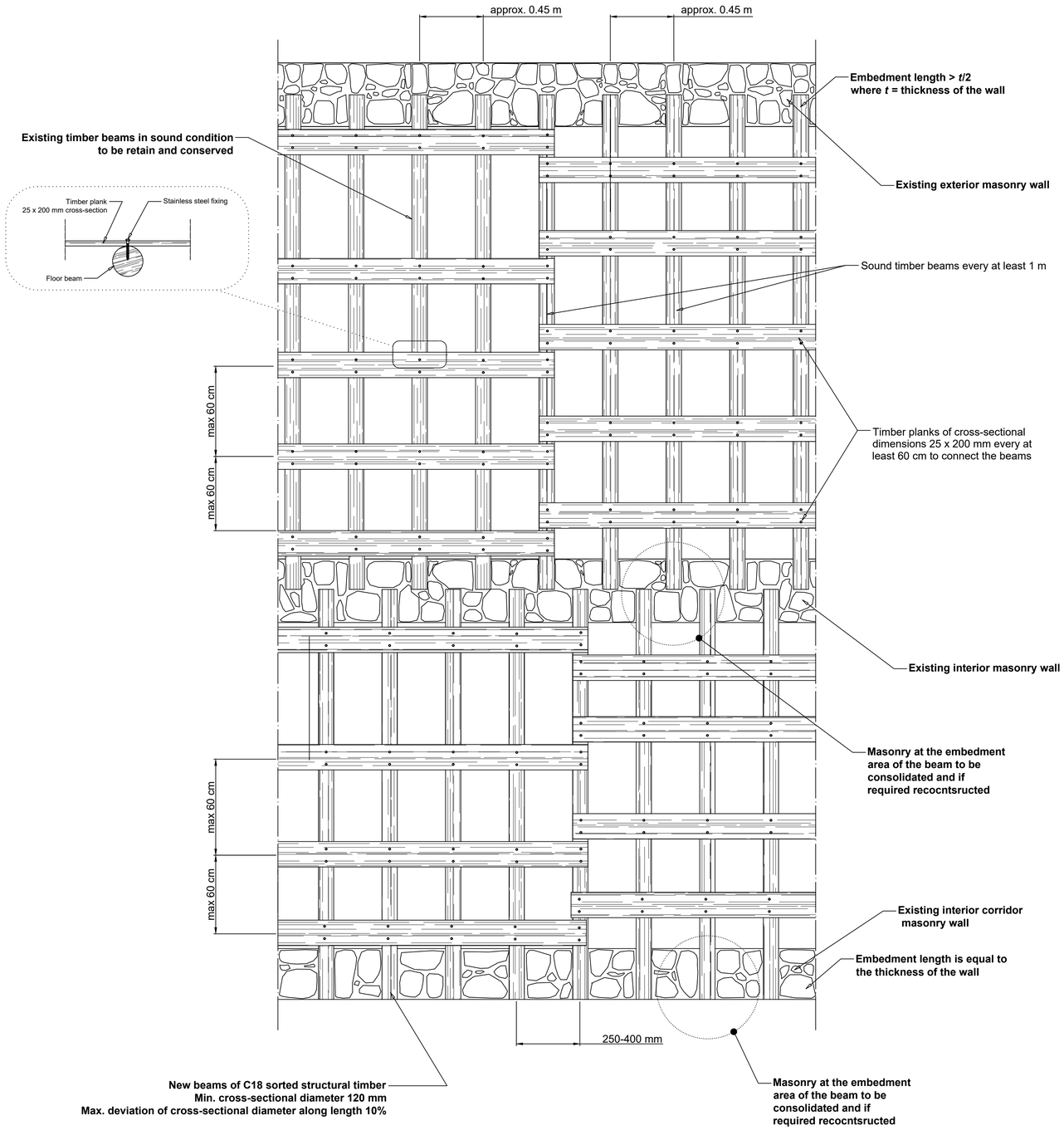
Civil Engineer: Rogiros Illampas
Archaeologist: Anna Marangou

Date:	19/02/2019	Scale:	1:20 @ A2
Revision Date:	08/04/2019 24/06/2019		

Drawing Name:
Installation of steel tie rods
Final

Drawing no.:
S-Pr 02

[S14] Replacement of damaged timber beams



0 1 2 2.5

SCALE BAR 1:20
All measurements on this drawing sheet are in meters.

Application method

1. Identify and mark all timber beams to be replaced.
2. Install suitable supports to make working area safe (method statement required).
3. Cut and remove damaged beams progressively in sections.
4. Thoroughly clean embedment areas of beams.
5. Set new beams in place and provide support by means of mechanical props.
6. While beams are supported construct a bedding course of masonry
7. After the mortar of the bedding course is matured fill all voids between the beam and masonry with mortar and pieces of stone.*
8. Remove propping when the mortar of the reconstructed part is matured.
9. Install timber planks of 25 x 200 mm cross-section every 60 cm using stainless steel fixings to interconnect the beams.

*Grouting at the abutments of the beams may additionally be requested by the supervising Civil Engineer

Block C

A/A	Specified Works	Relevant Technical Specification
CS4.	Replacement of damaged timber beams of the floor (including removal of all floor overlays)	S14. Replacement of damaged timber beams

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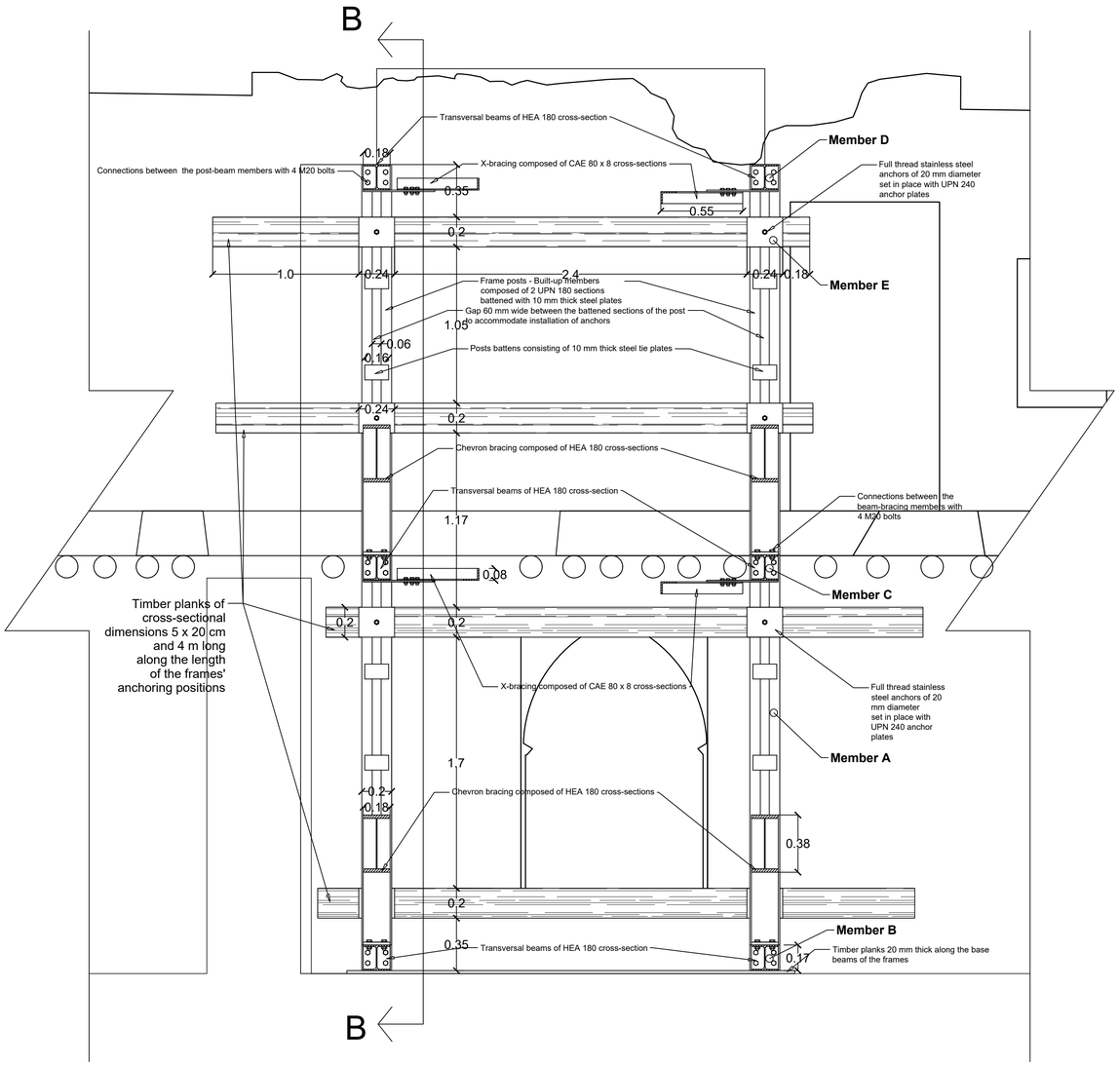
Civil Engineer: Rogiros Illampas
Archaeologist: Anna Marangou

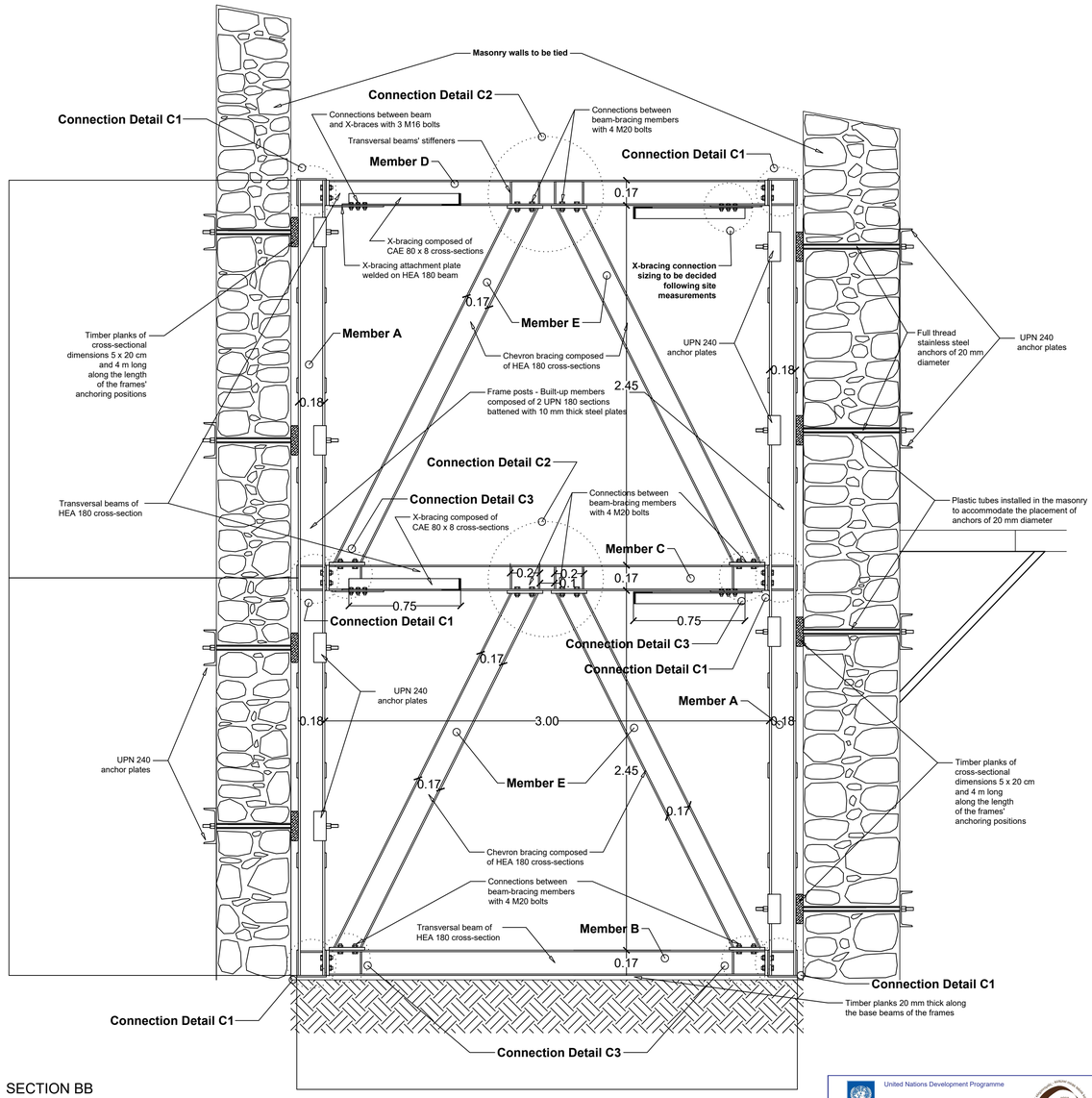
Date:	19/02/2019	Scale:	1:20 @ A1
Revision Date:	27/03/2019 08/04/2019	24/06/2019	

Drawing Name:
Replacement of damaged timber beams - Final

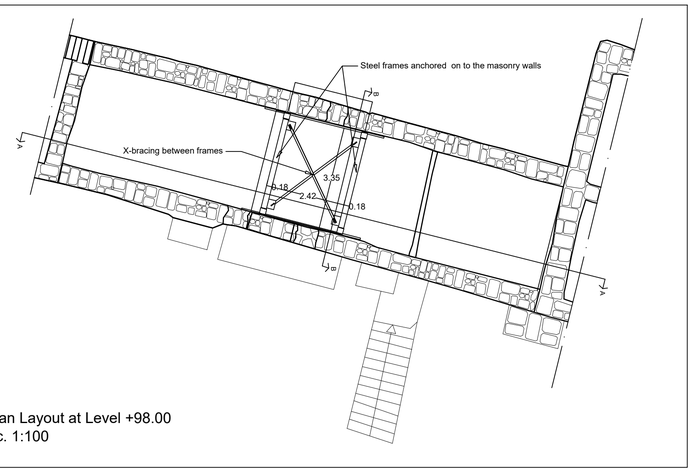
Drawing no.:
S-Pr 03



SECTION AA
Sc. 1:20



SECTION BB
Sc. 1:20



Plan Layout at Level +98.00
Sc. 1:100

Block C		
A/A	**Specified Works**	**Relevant Technical Specification**
CS8.	Addition of steel truss frame structure to retail lateral movement of unrestrained sections of the facade wall	S18. Consolidation of steel structures

[S18] Construction of steel structures - Steel shoring frames at Block C

1. **Structural drawings must be read in conjunction with the architectural drawings. In case of inconsistencies the Civil Engineer must be informed immediately.**
2. **All listed dimensions are nominal dimensions for sizing purposes. The exact dimensions must be measured on site prior to fabrication and installation**
3. **All bolts shall be of class 8.8 and zinc coated or stainless steel**
4. **All steel members shall be of steel grade S275**
5. **All welded connections shall be 7 mm fillet welds**
6. **Member drilling and welding must be made at the shop. The execution of such works on site is not permitted.**
7. **All timber members shall be of grade C18 softwood**
8. **The use of lateral stability installations other than X-bracing between the frames (e.g. beams) may be prescribed by the supervising Civil Engineer depending on site conditions at the time of the works**

SCALE BAR 1:20
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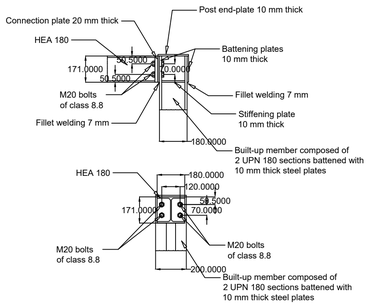
Archaeologist: Anna Marangou

Date:	19/02/2019	Scale:	1:100 & 1:20
Revision Date:	28/02/2019 27/03/2019 08/04/2019	24/06/2019	

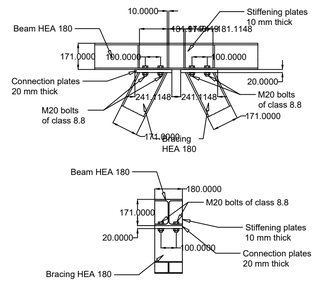
Drawing Name: **Steel Truss Frame Structure - Final**

Drawing no.: **S-Pr 04**

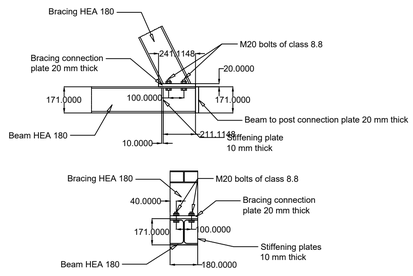
Connection Detail C1



Connection Detail C2

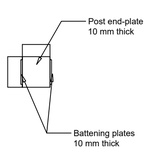


Connection Detail C3

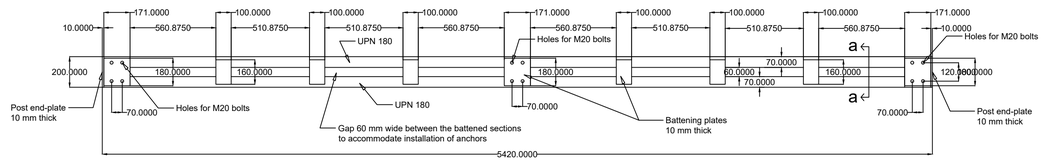


SCALE BAR 1:20
All measurements on this drawing sheet are in meters.

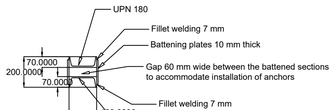
Member A - POST



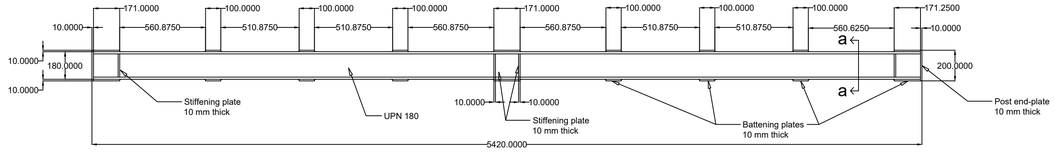
BOTTOM VIEW



FRONT VIEW



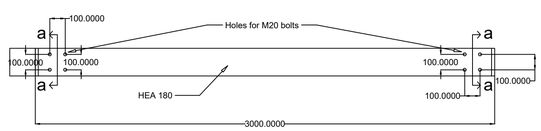
SECTION aa



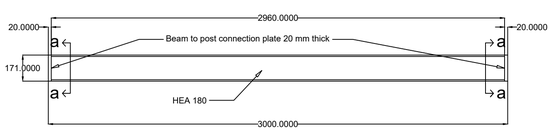
SIDE VIEW

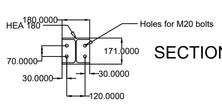
Member B - BOTTOM BEAM

TOP VIEW



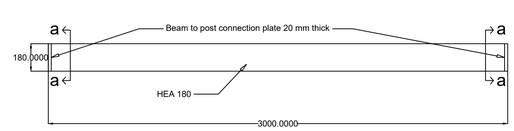
SIDE VIEW





SECTION aa

BOTTOM VIEW



Block C		
A/A	**Specified Works**	**Relevant Technical Specification**
CS8.	Addition of steel truss frame structure to retail lateral movement of unrestrained sections of the facade wall	S18. Consolidation of steel structures

Relevant Technical Specification

S18. Construction of steel structures

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Architect:	Zoe	Lordos	10907
Civil Engineer:	Andreas	Antoniou	71696

Designer Team: Senior Architect: Andreas Lordos
Architects: Ioanna Anastasiadou, Enver Eronen, Christina Kleanthous Papademetriou, Constantina Hadjicosta
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Archaeologist: Anna Marangou

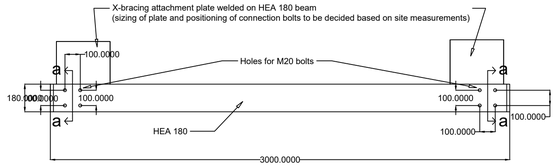
Date:	28/02/2019	Scale:	1:100 & 1:20
Revision Date:	24/06/2019		

Drawing Name:
Steel Truss Frame Structure Details- Final

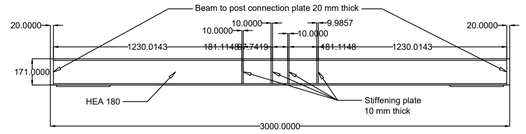
Drawing no.:
S-Pr 05

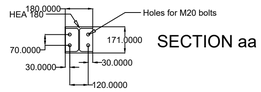
Member C - MID-HEIGHT BEAM

TOP VIEW



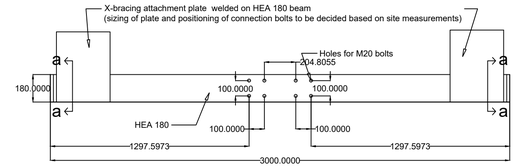
SIDE VIEW





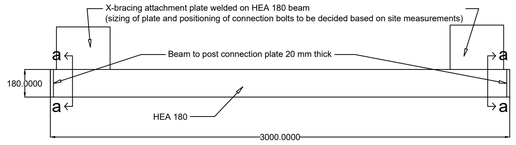
SECTION aa

BOTTOM VIEW

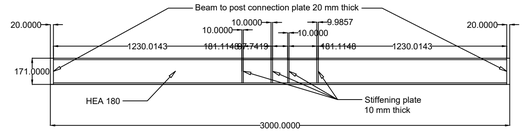


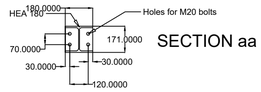
Member D - TOP BEAM

TOP VIEW



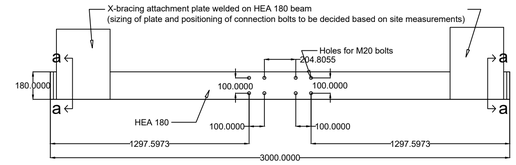
SIDE VIEW



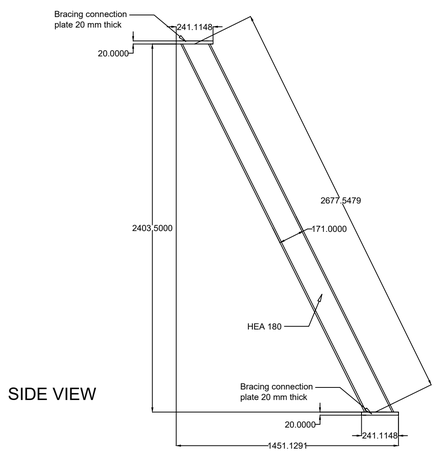


SECTION aa

BOTTOM VIEW

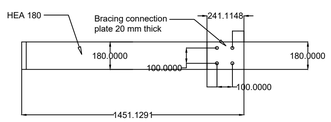


Member E - BRACING

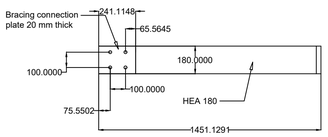


SIDE VIEW

BOTTOM VIEW



TOP VIEW



0 1 2 3 4 5

SCALE BAR 1:20
All measurements on this drawing sheet are in meters.

Block C		
A/A	**Specified Works**	**Relevant Technical Specification**
CS8.	Addition of steel truss frame structure to retail lateral movement of unrestrained sections of the facade wall	S18. Consolidation of steel structures

Relevant Technical Specification

S18. Construction of steel structures

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Archaeologist: Anna Marangou

Date:	28/02/2019	Scale:	1:100 & 1:20
Revision Date:	24/06/2019		

Drawing Name:
Steel Truss Frame Structure Details - Final

Drawing no.:
S-Pr 06