

**DESIGN AND CONSTRUCTION
GUIDELINES FOR CONFINED
MASONRY HOUSING**

**Build Change Post-Earthquake
Housing Reconstruction
Technical Assistance Program,
Haiti**

Prepared for

Build Change
Denver CO



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TABLE OF CONTENTS

	Page
1.0 DESIGN AND CONSTRUCTION GUIDELINES	1
1.1 Material and Construction Quality	1
1.2 Siting	4
1.3 Configuration	5
1.4 Windows and Doors	6
1.5 Foundation	7
1.6 Plinth Beam	7
1.7 Ring Beam	8
1.8 Tie Columns	8
1.9 Masonry Wall	9
1.10 Roof System	10
1.11 Stairs	11
1.12 Future Expansion	11
2.0 PROPOSED HOUSE DESIGNS	13
2.1 Single-Story House with Timber Roof	13
2.2 Single-Story House with Concrete Roof / Two-Story House	13

APPENDICES

- A.0 APPENDIX A – SINGLE-STORY HOUSE WITH TIMBER ROOF
- B.0 APPENDIX B – TWO-STORY HOUSE (OR SINGLE-STORY WITH CONCRETE ROOF)

1.0 DESIGN AND CONSTRUCTION GUIDELINES

The following rules should be followed when designing and building a one- or two-story confined masonry house.

1.1 Material and Construction Quality

1.1.1 Concrete Block

The seismic resistance of the confined masonry house designs depends upon the strength and quality of concrete block used. Therefore, the following table should be used to identify the concrete block strength required to achieve the desired level of seismic resistance, and a testing program (with a sufficient sample size) should be implemented to ensure that the blocks achieve the required compression strength.

Single Story House with Lightweight Roof

CONCRETE BLOCK STRENGTH	SEISMIC DESIGN CRITERIA
4.8 MPa (700 psi) min	Permitted in all zones ($S_d = 1.05g$ to $1.67g$)

Single Story House with Concrete Roof

CONCRETE BLOCK STRENGTH	SEISMIC DESIGN CRITERIA
4.8 MPa (700 psi)	Not permitted
6.9 MPa (1,000 psi) min	Permitted in orange and yellow zones only ($S_d = 1.05g$)
11.7 MPa (1,700 psi) min	Permitted in all zones ($S_d = 1.67g$)

Two Story House with Concrete or Lightweight Roof

CONCRETE BLOCK STRENGTH	SEISMIC DESIGN CRITERIA
4.8 MPa (700 psi)	Not permitted
6.9 MPa (1,000 psi) min	Permitted in orange and yellow zones only ($S_d = 1.05g$)
11.7 MPa (1,700 psi) min	Permitted in all zones ($S_d = 1.67g$)

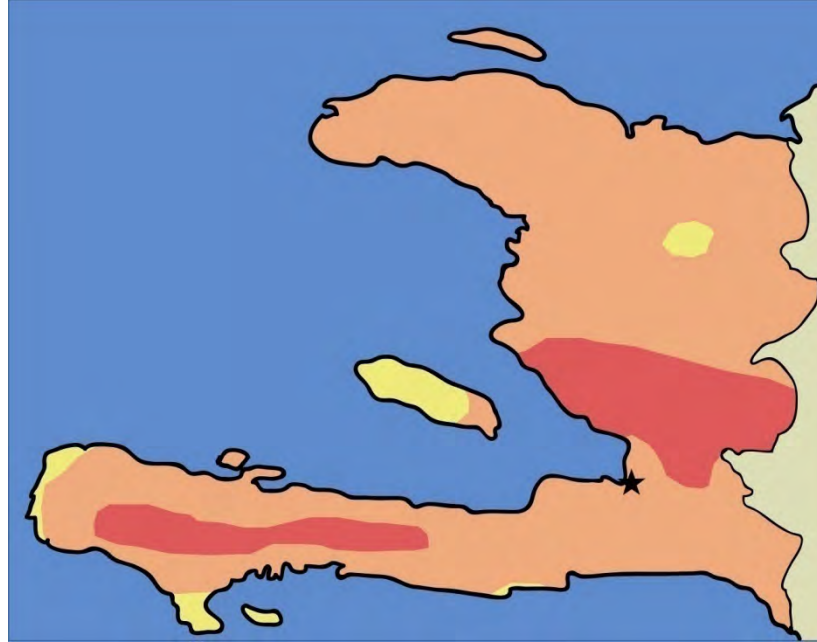


Figure 1.1 Map of Haiti showing severity of seismic demands by region based upon 2010 USGS data (Sds = 0.5g for yellow zones, Sds = 1.05g for orange zones, Sds = 1.67g for red zones)

In addition, the following quality control guidelines are recommended for the fabrication of sound concrete blocks with adequate compressive strength:

- Use a materials, mix proportions, and curing procedures consistent with tested blocks with required compressive strength
- Cement should be Type 1 Portland Cement
- Weigh the cement bags to ensure they contain correct amount of cement
- Only use clean river sand (or a combination of clean river sand and white quarry sand – the required proportion of each to be confirmed through testing)
- Do not use aggregate greater than 1 cm (3/8") in dimension
- Use clean water and only enough water to wet the mix (typically 7-8% max)
- Ram or vibrate block forms to consolidate
- Let blocks cure for at least 7 days prior to use in construction
- Do not allow blocks to cure in the sun. Cover blocks with a tarp and wet them with clean water while curing
- Do not re-use old concrete blocks
- Do not use irregular, chipped or cracked concrete blocks

1.1.2 Mortar

- Use a 1:3 mix ratio (cement: sand) for concrete block wall mortar (add 0.5 parts lime if available) to achieve 17 MPa (2500 psi) minimum compressive strength
- Use a 1:3:3 mix ratio (cement:sand:gravel) for mortar for foundation walls
- Cement should be Type 1 Portland Cement
- Weigh the cement bags to ensure they contain correct amount of cement
- Use only clean river sand in the mortar mix
- Never use white quarry sand or beach sand
- Mix dry components until color is uniform prior to adding water
- Use clean water in mortar mix
- Add only enough water for workability
- Mix mortar for 3 minutes
- Use mortar within 1 hour
- Do not remix mortar

1.1.3 Grout

- For filled grouted cores, use a 1:2:2 mix ratio (cement:sand:pea gravel) to achieve 13.8 MPa (2000 psi) minimum compressive strength
- Cement should be Type I Portland Cement
- Weigh the cement bags to ensure they contain correct amount of cement
- Only use clean river sand and pea gravel in the grout mix
- Pea gravel should be maximum 0.6 cm (1/4") in dimension
- Never use white quarry sand or beach sand
- Use clean water in the grout mix and do not use too much water
- Use a rod to compact the grout within the filled block cavities

1.1.4 Cast-in-Place Concrete

- For beams, columns and roof slabs, use a 1:3:3 mix ratio (cement:sand:gravel) to achieve 21 MPa (3000 psi) minimum compressive strength
- For foundations and slab on grade, use a 1:3:6 mix ratio (cement: sand:gravel) to achieve 15 MPa (2200 psi) minimum compressive strength
- Cement should be Type I Portland Cement
- Weigh the cement bags to ensure they contain correct amount of cement
- Only use clean river sand in the concrete mix
- Never use white quarry sand or beach sand
- Use clean water in the concrete mix and do not use too much water
- Use crushed gravel rather than rounded river stones as the coarse aggregate
- Do not use gravel greater than 2 cm (3/4") in dimension
- Ensure that the concrete mix is consolidated and distributed around reinforcement with no voids (ram with rod or tap formwork with hammer)

1.1.5 Steel Reinforcement

- Verify grade of steel by checking marking on bars (Grade 40 or Grade 60)
- Use ribbed (ie deformed) reinforcement for all reinforcing steel
- Smooth steel is not permitted
- Do not use rusty or corroded reinforcement
- Do not reuse old or bent reinforcement

1.1.6 Timber

- Verify species and grade of timber by checking markings on pieces
- Verify type of plywood by checking markings on sheets
- Do not use lumber with large or frequent knots, holes, splits or checks
- Do not use green lumber or lumber with a high moisture content
- Do not use CCA pressure treated lumber. Use naturally decay- and termite-resistant wood or an alternative natural treatment. Paint all wood in addition for weather protection and do not allow wood to come in contact with the ground

1.1.7 Roofing

- Verify panel type (strength and gauge) by checking markings on panels

1.1.8 Connections

- Do not use unprotected mild steel reinforcement to connect timber structure to concrete as it will corrode
- Verify type (grade and gauge) of stainless steel straps for timber-to-concrete and timber-to-timber connections
- Do not reuse old, rusty or bent nails, screws, straps or other connections

1.2 Siting

- Build on flat terrain with strong, stable ground
- Do not build on steep hillsides or next to a steep drop-off
- Do not build below areas that are vulnerable to landslides
- Do not build over riverbeds or in other areas prone to flooding
- Ensure that the concrete block strength used is sufficient to provide a design which provides adequate resistance to the expected ground motion at the site

1.3 Configuration

1.3.1 All House Types

- Limit length of layout to 3 times the width of the layout for single-story houses with lightweight roofs
- For single-story houses with lightweight roofs, strive for a layout that is symmetrical about both axes; the maximum asymmetry permitted is 3.5m in one direction
- A minimum wall area of 5% of the ground floor area is required in each direction on each floor (wall area equals wall thickness x wall length without windows or doors)
- A minimum of two separate lines of walls is required in each direction; an additional line of walls is required for each additional 3.5m of building dimension over 3.5m meters
- The maximum distance permitted between adjacent parallel walls (ie the spacing of orthogonal walls) is 3.5m
- Do not use walls that are angled or rounded in plan; all walls must be parallel or perpendicular to each other
- The maximum story height permitted for the first story is 2.7m from the ground floor slab
- Place tie columns at each corner and wall intersection and on either side of each door opening (and window openings where required)
- Use a continuous plinth beam below the masonry wall
- Use a continuous ring beam above the masonry wall

1.3.2 Additional Single-Story House with Concrete Roof / Two-Story Provisions

- Limit length of layout to approximately 2.5 times the width of the layout for single-story houses with concrete roofs and/or two-story houses
- Single-story houses with concrete roofs and all two-story houses should be square or rectangular with wall layouts that are symmetrical about both axes with walls and openings uniformly distributed
- Limit roof height of two-story houses to approximately 1.7 times the narrowest dimension of the layout
- The maximum story height permitted for the second story is 2.5m
- Vertically align all walls of first and second stories
- Do not build second story walls on eaves of first story concrete roof or over first story porch
- Construct the front porch and porch roofs using only timber
- Only support the concrete slab on masonry walls, not on concrete or timber posts

1.4 Windows and Doors

1.4.1 Window Openings

- Windows without confining elements are permitted only when centered on a wall panel AND when one of the following is satisfied: 1) the window opening is the only window opening located on that side of the building, 2) all openings adjacent to the window opening are surrounded by confining elements
- For windows in series on one side (or wall) of a building, every other window must have confinement
- For single-story houses with lightweight roofs, window openings should be centered on wall panels
- Confined windows do not need to be centered on wall panels if a concrete roof is used
- The top of window openings shall be aligned with the underside of the ring beam
- The maximum window opening height for unconfined windows shall be the minimum of 85cm or 33% of the wall height including the confining elements
- The maximum window opening width shall be the minimum of 1m or 1/3 of the wall width

1.4.2 Door Openings

- Door openings shall be a maximum of 1m wide
- Door openings shall extend the entire height of the masonry wall (the zone above the door may be filled with a perforated plywood panel for ventilation)
- Tie columns shall be located on either side of all door openings
- For single-story houses with lightweight roofs, door openings should be centered on wall panels
- It is not permitted to locate door openings adjacent to orthogonal walls or wall corners for single-story houses with lightweight roofs
- Full-height wall piers created by door openings shall be a minimum of 1m wide

1.4.3 Additional Two-Story Provisions

- Window and door openings shall be vertically aligned with identical widths on first and second stories of a two-story house
- The first story of a two-story house shall have at least as much solid wall area as the second story to prevent a soft story failure

1.5 Foundation

1.5.1 Strip Footings

- Footings shall be continuous below all walls
- The bottom of footings should be at least 75cm below grade (or as deep as necessary to bear on sound, undisturbed soil)
- Slope the sides of foundations trenches approximately 2:1 (rise to run) to maintain stability
- Width of concrete strip footing below all walls shall be at least 50cm for single story houses with lightweight roofs and 100cm for single story houses with concrete roofs or two story houses for soil of intermediate quality
- Width of concrete strip footing below porches and terraces (not supporting walls) shall be approximately 50cm
- Use 20cm wide concrete blocks for masonry foundation wall
- Extend reinforced concrete tie column to concrete footing. Build masonry foundation wall prior to casting concrete tie column extensions
- Use wire chairs or small concrete blocks to lift reinforcement off soil to achieve required 75mm concrete cover where tie column reinforcement is anchored into footing
- Space closed steel ties in tie column extensions at 10cm spacing between plinth beam and concrete footing
- Compact the backfill around foundation wall and footing

1.5.2 Ground Floor Slab

- The ground floor slab shall be raised a minimum of 30cm above grade (80cm in areas prone to flooding, although it is recommended not to build in these areas)
- Do not build ground floor higher than 80cm above grade
- Use 10cm compacted sand fill below concrete ground floor slab (consider use of crushed concrete debris as fill below ground floor slab)
- Use a 5cm unreinforced concrete ground floor slab
- Align top of plinth beam with top of concrete ground floor slab

1.6 Plinth Beam

- Use a continuous reinforced concrete plinth beam above the concrete block masonry foundation wall
- The plinth beam shall be 20cm wide and 15cm deep
- For a single story house with lightweight roof, reinforce the plinth beam with 4 #3 Grade 40 longitudinal steel bars and #2 Grade 40 closed stirrups spaced at 15cm near tie columns and 20cm otherwise

- For a single story house with concrete roof or two story house, reinforce the plinth beam with 4 #3 Grade 60 minimum longitudinal steel bars and #2 Grade 60 closed stirrups
- Maintain a minimum cover of 25mm on all sides, although greater cover will result in order for the longitudinal bars to pass through between the tie column reinforcement
- Provide adequate connection between reinforcement in intersecting and orthogonal plinth beams

1.7 Ring Beam

- Use a continuous reinforced concrete ring beam above the concrete block masonry walls
- The ring beam shall be 15cm wide and 15cm deep except when a concrete roof or floor slab is used. In this case, it shall be 15cm wide by 20cm deep
- For a single story house with lightweight roof, reinforce the ring beam with 4 #3 Grade 40 longitudinal steel bars and #2 Grade 40 closed stirrups spaced at 10cm near tie columns and 20cm otherwise
- For a single story house with concrete roof or two story house, reinforce the ring beam with 4 #3 Grade 60 longitudinal steel bars and #2 Grade 60 closed stirrups spaced at 10cm near tie columns and 20cm otherwise
- Maintain a minimum cover of 25mm on all sides, although greater cover will result in order for the longitudinal bars to pass through between the tie column reinforcement
- Provide adequate connection between reinforcement in intersecting and orthogonal ring beams
- If a concrete roof is used, provide adequate anchorage for the roof slab reinforcement in the ring beam
- If a timber frame roof is used, secure all embedded stainless steel straps for connections to timber structure to ring beam reinforcement prior to casting concrete

1.8 Tie Columns

- Cast reinforced tie columns after the concrete block masonry wall is built
- Place tie columns at each corner and wall intersection and on either side of each door opening and each window opening that requires confinement
- Tie columns shall be 15cm x 15cm in cross section with additional width due to toothing into concrete block masonry wall
- Ensure that concrete has completely filled toothed areas (it is not required for concrete to fill the concrete block cells)

- For a single story house with lightweight roof, reinforce tie columns with 4 #4 Grade 40 longitudinal steel bars and #2 Grade 40 closed ties spaced at 10cm near top and bottom joints and 20cm otherwise
- For a single story house with concrete roof or two story house, reinforce tie columns with 4 #4 Grade 60 longitudinal steel bars and #2 Grade 60 closed ties spaced at 10cm near top and bottom joints and 20cm otherwise
- Maintain a minimum cover of 25mm on all sides
- Anchor tie column longitudinal reinforcement into foundation at bottom and ring beam at top
- Splice longitudinal reinforcement extended from foundation above plinth beam if necessary using detail provided
- If it is expected that a second story will be added to a single-story house with a concrete roof, instead of anchoring the tie column's longitudinal reinforcement into the ring beam, extend it above the ring beam by at least 70-90cm and cover it completely with lean concrete (which can be removed to create a splice when the additional floor is added)

1.9 Masonry Wall

1.9.1 Masonry Wall Detailing

- Build concrete block masonry walls prior to reinforced concrete tie columns and ring beams
- Wet concrete blocks prior to placement
- Use 15cm-wide concrete blocks for all walls above the plinth beam
- Use 1.25cm-thick mortar joints between blocks
- Stagger joints on each course by 1/3 block
- Maintain a staggered edge (by 1/3 block) adjacent to all tie column locations
- Do not use 1/3 blocks to create staggered edge. Use either whole blocks or 2/3 blocks
- Do not use partial blocks unless they have intact cells
- A 1cm plaster finish on both the interior and exterior of masonry walls is recommended

1.9.2 Detailing of Unconfined Window Openings

- Use 1/3 or 2/3 blocks to create vertical edges at unconfined window openings
- Grout the vertical cell on each side of a window opening and reinforce it with one Grade 40 or 60 #4 bar anchored into the plinth beam and ring beam
- Use horizontal bed joint reinforcement in the course below each window opening, anchored into the nearest tie column on each side. Horizontal bed joint

reinforcement should be either two Grade 40 #4 bars sufficiently embedded in a 2.5cm bed joint or a prefabricated truss-type system

1.9.3 Detailing of Confined Window and Door Openings

- Cast 15cm x15cm reinforced concrete tie columns on either side of window (see Section 1.8 for reinforcement and detailing)
- Cast 15cm wide reinforced concrete sill beam directly below window opening and extend beam to nearest non-window tie column on either side
- Reinforce sill beam with the same reinforcement as the ring beam

1.10 Roof System

1.10.1 Timber Frame Roof

- Use a gable or hipped timber frame roof (hipped is preferable)
- Use a minimum roof slope of 25 degrees
- Make porch roof independent of primary roof
- Use a maximum eave projection of 30cm
- Use a lightweight plywood gable wall (do not use a masonry gable wall)
- Use 2x4 dimensional lumber to fabricate roof trusses
- For gable roofs, trusses which span 3-3.5m between two supports without an intermediate support shall be spaced at a maximum of 0.5m on center
- For gable roofs, trusses which span over an intermediate support with 3-3.5m on each side may be spaced at up to 1m on center
- Avoid positioning roof trusses over window or door openings in walls
- Truss configuration shall be at least 1 central vertical member and 2 diagonals for spans up to 3.5m
- Purlins to be spaced at a maximum of 50cm orthogonal to gable trusses
- Connect bottom of truss chords with orthogonal 2x4 members on either side of center vertical
- Connect 2x4 truss members using 0.75" thick plywood gusset plates nailed on both sides
- Corrugated metal sheets shall be oriented with ribs perpendicular to purlins
- Connect roof trusses to concrete ring beams using stainless steel straps anchored to ring beam reinforcement
- Provide connections as shown in the drawings to allow for sufficient tie-down due to hurricane-level wind forces

1.10.2 Flat Concrete Roof

- A house designed with a concrete roof must follow the guidelines and block strengths required for two-story houses

- Use 10cm-wide blocks (on their sides) as slab void forms to create a two-way concrete beam system
- Group void forms into approximately 80cm x 80cm zones with approximately 22.5cm to 30cm continuous clear spacing between them to create continuous 22.5cm to 30cm wide roof beams in two directions
- Leave a small amount of space between the concrete blocks within each group to allow bond between concrete and blocks
- Wet blocks prior to placement to increase bond between concrete and blocks
- Use 10cm continuous cast-in-place concrete slab on top of void forms with #3 Grade 40 or 60 bars spaced at 20cm on center in both directions positioned at the center of the continuous slab
- Reinforce the concrete roof beams with 4 #4 longitudinal bars and #2 Grade 40 closed stirrups spaced at 10cm within 1.2m of walls and 20cm otherwise
- Maintain at least 25mm concrete cover over all steel using wire chairs or small concrete blocks
- Anchor all reinforcing steel in the roof slab into the ring beams on all sides
- Provide for adequate drainage of roof to prevent ponding
- Avoid eave projections which may invite discontinuous second story walls

1.11 Stairs

- Use exterior stairs for two-story houses
- Use either reinforced concrete stairs, wooden stairs or prefabricated steel spiral stairs
- Do not connect stairs to confined masonry wall panels
- Support stairs on independent spread footing foundation
- Provide cold joint between bottom of the stair and the footing with no steel reinforcement through the joint
- Reinforced concrete stairs should be a maximum of 1m wide
- See drawings for reinforcement and detailing required for a specific stair configuration

1.12 Future Expansion

- If it is expected that a second story will be added to a single-story house with a concrete roof, instead of anchoring the tie column's longitudinal reinforcement into the ring beam, extend it above the ring beam by at least 70-90cm and cover it completely with lean concrete (which can be removed to create a splice when the additional floor is added)
- If it is expected that a house may grow in footprint, provisions should be made to allow for adequate connection between existing and new confined masonry walls

and to maintain a symmetrical layout with well-distributed walls and openings.
See suggested details provided for horizontal expansion in drawings.

- The best solution for horizontal expansion is for new structures to be completely separated from existing structures by 3cm (for a single story structure) to 6cm (for a two-story structure)

2.0 PROPOSED HOUSE DESIGNS

In addition to the design and construction guidelines provided in Section 1.0, this report provides two drawing sets showing the complete design and construction details of a single-story house with a timber roof and a two-story house (which is identical to a single-story house with a concrete roof), as well as proposed alternate layouts for each.

2.1 Single-Story House with Timber Roof

The single-story house with a timber roof shown in Appendix A has a floor area of 27m² and a covered porch area of 6m². Alternate layouts are provided for total floor areas ranging from 21m² to 63m². These alternate floor layouts also demonstrate configurations for horizontal expansion. In addition to the gable roof configuration shown in the drawings, a hipped roof or a shed roof is also permitted.

The single-story house with a timber frame roof is designed for the following cases:

CONCRETE BLOCK STRENGTH	SEISMIC DESIGN CRITERIA
4.8 MPa (700 psi) min	Permitted in all zones (Sds = 1.05g to 1.67g)

2.2 Single-Story House with Concrete Roof / Two-Story House

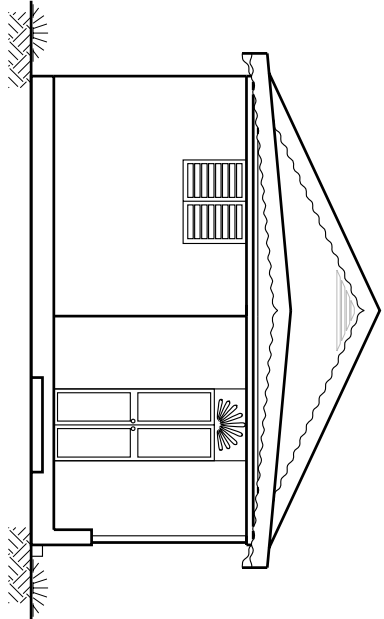
The guidelines developed for single-story houses with concrete roofs also apply to two-story houses with either concrete or timber frame roofs because it is expected that a second story will be added at some point above the single-story concrete roof slab. Therefore, the two-story house shown in Appendix B and its alternate configurations also apply to the single-story house with a concrete roof. The two-story house shown in Appendix B has a floor area of 31.5m² on each floor and a covered porch area of 7m² one each floor. In addition to the gable timber frame roof configuration shown in the drawings, a hipped timber frame roof or a flat concrete roof is also possible.

The single-story house with concrete roof / two-story house is designed for the following cases (refer to map in Section 1.1 for zone designations):

CONCRETE BLOCK STRENGTH	SEISMIC DESIGN CRITERIA
4.8 MPa (700 psi)	Not permitted
6.9 MPa (1,000 psi) min	Permitted in orange and yellow zones only (Sds = 1.05g)
11.7 MPa (1,700 psi) min	Permitted in all zones (Sds = 1.67g)

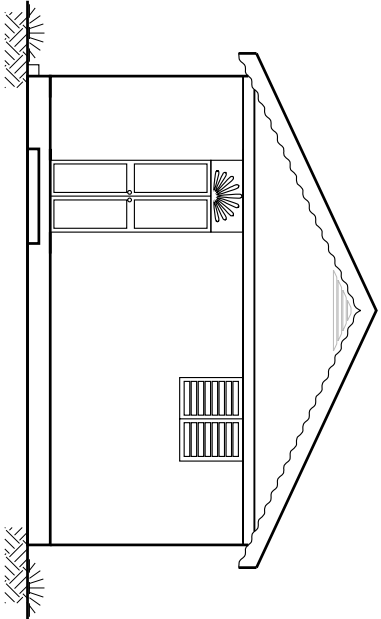
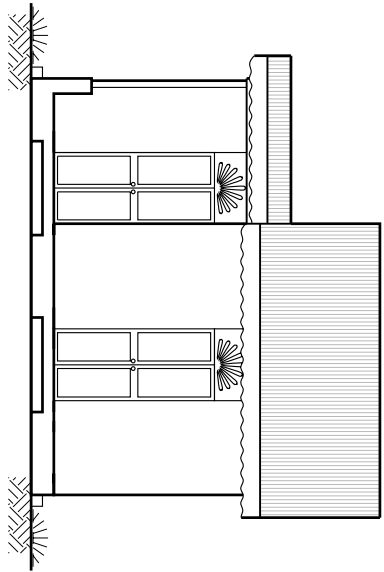
APPENDIX A

SINGLE-STORY HOUSE WITH
TIMBER ROOF

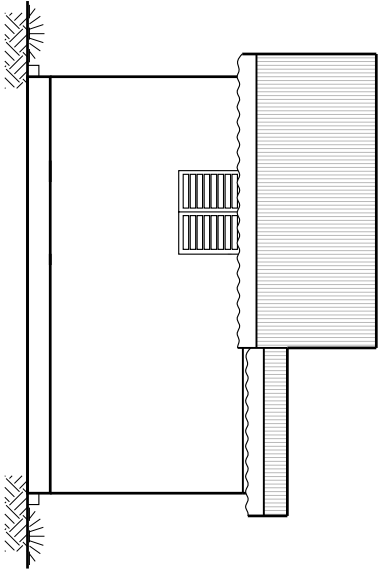


CONSTRUCTION DRAWINGS
DESSINS D'EXÉCUTION

33 M² SINGLE-STORY CONFINED
MASONRY HOUSE WITH
TIMBER ROOF
MAISON DE PLAIN-PIED (33 M²)
EN MAÇONNERIE CHÂÎNÉE
AVEC TOITURE EN BOIS



BUILD CHANGE HOUSING
RECONSTRUCTION PROGRAM
BUILD CHANGE - PROGRAMME DE
RECONSTRUCTION DE LOGEMENTS



1 THE DESIGN REFERENCES BUT DOES NOT NECESSARILY COMPLY WITH ALL REQUIREMENTS OF THE FOLLOWING STANDARDS AND GUIDELINES:
LE DIMENSIONNEMENT S'APPUÏE SUR LES NORMES ET STANDARDS SUIVANTS MAIS N'EN RESPECTE PAS NECESSAIREMENT TOUS LES CRITÈRES :

- PAN AMERICAN HEALTH ORGANIZATION (PAHO) WIND SPEED MAPS FOR THE CARIBBEAN FOR APPLICATION WITH THE WIND LOAD PROVISIONS OF ASCE 7, 2008
- UNITED STATES GEOLOGICAL SURVEY (USGS) DOCUMENTATION FOR INITIAL SEISMIC HAZARD MAPS FOR HAITI, 2010
- UNITED STATES GEOLOGICAL SURVEY (USGS) WORLDWIDE SEISMIC "DESIGN MAPS" WEB APPLICATION, BETA VERSION, 2010
- AMERICAN SOCIETY OF CIVIL ENGINEERS' MINIMUM DESIGN LOADS FOR BUILDINGS AND OTHER STRUCTURES, SEIASC 7-05, 2005
- INTERNATIONAL CODE COUNCIL'S INTERNATIONAL BUILDING CODE (IBC), 2009
- AMERICAN CONCRETE INSTITUTE'S BUILDING CODE REQUIREMENTS FOR MASONRY STRUCTURES (ACI 530-05)
- THE MASONRY SOCIETY'S BUILDING CODE REQUIREMENTS FOR MASONRY STRUCTURES (TMS 602-08), 2008
- ASCE/SEI 41-06 SEISMIC REHABILITATION OF BUILDINGS, WHICH INCLUDES STRUT-AND-TIE PROVISIONS FOR INFILL WALLS
- "OUT OF PLANE RESISTANCE OF CONCRETE MASONRY INFILLED PANELS" BY DAVE AND SEAH, 1988
- "ARCHING OF MASONRY INFILLED FRAMES: COMPARISON OF ANALYTICAL METHODS" BY FLANAGAN AND BENNETT, 1999
- "BEHAVIOR OF CONFINED MASONRY SHEAR WALLS WITH LARGE OPENINGS" BY YANEZ ET AL, 2004
- "VERIFICATION OF SEISMIC RESISTANCE OF CONFINED MASONRY BUILDINGS" BY TOMAZEVIC AND KLEMENC, 1997
- "SEISMIC DESIGN GUIDE FOR MASONRY BUILDINGS" BY ANDERSON AND BRZEZ, CANADIAN CONCRETE MASONRY PRODUCERS ASSOCIATION, 2009
- MEXICAN BUILDING CODES "COMPLEMENTARY TECHNICAL NORMS FOR DESIGN AND CONSTRUCTION OF MASONRY STRUCTURES"
- AMERICAN CONCRETE INSTITUTE'S BUILDING CODE REQUIREMENTS FOR STRUCTURAL CONCRETE (ACI 318)
- AMERICAN FOREST AND PAPER ASSOCIATION WOOD FRAME CONSTRUCTION MANUAL FOR ONE AND TWO-FAMILY DWELLINGS (WFCM-01), 2001
- AMERICAN FOREST AND PAPER ASSOCIATION NATIONAL DESIGN SPECIFICATION FOR WOOD CONSTRUCTION WITH 2005 SUPPLEMENT (NDS-05), 2005
- AMERICAN FOREST AND PAPER ASSOCIATION SPECIAL DESIGN PROVISIONS FOR WIND AND SEISMIC (ANSI&F&PA SDPWS-08), 2008

2 THE MATERIALS USED FOR CONSTRUCTION SHALL BE IN ACCORDANCE WITH THE FOLLOWING:
LES MATÉRIEAUX UTILISÉS POUR LA CONSTRUCTION DOIVENT RESPECTER LES CRITÈRES SUIVANTS:

- CONCRETE BLOCKS: 4.8 MPa (700 PSI)
- BLOCS DE BÉTON : 4.8 MPa (700 PSI)
- CAST-IN-PLACE CONCRETE (CONFINING ELEMENTS AND ROOF): 21 MPa (3000 PSI) MINIMUM COMPRESSIVE STRENGTH
- BÉTON COULÉ SUR PLACE (ÉLÉMENTS DE CHÂNAGE ET TOIT) : RÉSISTANCE À LA COMPRESSION 21MPa (3000 PSI) MINIMUM
- CAST-IN-PLACE CONCRETE (FOUNDATION AND GROUND SLAB): 15 MPa (2200 PSI) MINIMUM COMPRESSIVE STRENGTH
- BÉTON COULÉ SUR PLACE (FONDATION ET DALLE DE SOL) : RÉSISTANCE À LA COMPRESSION 21MPa (3000 PSI) MINIMUM
- MORTAR: 17.2 MPa (2500 PSI) MINIMUM COMPRESSIVE STRENGTH
- MORTIER : 17.2 MPa (2500 PSI) MINIMUM COMPRESSIVE STRENGTH
- GROUT : 13.8 MPa (2000 PSI) MINIMUM COMPRESSIVE STRENGTH
- COULIS : RÉSISTANCE À LA COMPRESSION 13.8 MPa (2000 PSI) MINIMUM
- PLASTER: 17.2 MPa (2500 PSI) MINIMUM COMPRESSIVE STRENGTH
- PLÂTRE : RÉSISTANCE À LA COMPRESSION 17.2 MPa (2500 PSI) MINIMUM
- STEEL REINFORCEMENT: GRADE 40 RIBBED BARS
- ARMATURES EN ACIER : BARRES À HAUTE ADHÉRENCE (NON LISSES) NUANCE 40KSI
- TIMBER: VISUALLY GRADED SOUTHERN PINE NO. 2
- BOIS : PIN DU SUD CLASSÉ VISUELLEMENT EN CATÉGORIE 2
- CORRUGATED GALVANIZED IRON (CGI) ROOFING PANELS
- PANNEAUX DE TÔLE ONDULÉE EN ACIER GALVANISÉ
- STAINLESS STEEL CONNECTION STRAPS: 227 MPa (33 KSI) MINIMUM YIELD STRENGTH
- SANGLES EN ACIER INOXYDABLE : LIMITE DÉLASTICITÉ 227 MPa (33KSI) MINIMUM

3 THE DESIGN IS IN ACCORDANCE WITH THE FOLLOWING LOAD CRITERIA:
LE DIMENSIONNEMENT PERMET DE RÉSISTER AUX CHARGEMENTS SUIVANTS :

- LIVE LOAD: 1.0 kN/m² (20 PSF) ON THE ROOF
- CHARGE D'EXPLOITATION : 1.0 kN/m² (20 PSF) SUR LE TOIT
- WIND: EXPOSURE CATEGORY C
- IMPORTANCE FACTOR: 1.0
- BASIC WIND SPEED: 119 MPH
- CHARGES DE VENT : CATÉGORIE D'EXPOSITION C
- FACTEUR D'IMPORTANCE : 1.0
- VITESSE DE VENT DE BASE : 119 MPH
- SEISMIC: SHORT PERIOD DESIGN SPECTRAL RESPONSE ACCELERATION (SDS): 1.67G
- SITE CLASS D
- IMPORTANCE FACTOR: 1.0
- R FACTOR: 2.5
- CHARGEMENT SISMIQUE : ACCELERATION DE DIMENSIONNEMENT (RÉPONSE SPECTRALE AUX COURTES PÉRIODES) : SDS = 1.67G
- SITE DE CLASSE D
- FACTEUR D'IMPORTANCE : 1.0
- FACTEUR R : 2.5

STRUCTURAL ENGINEER / INGÉNIEUR STRUCTURE
Guy Nordenson and Associates
225 Varick Street 6th Flr
New York NY 10014
Tel 212 766 9119
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DRAWING TITLE / TITRE DU DESSIN

GENERAL NOTES

NOTES GÉNÉRALES

DRAWN BY / ÉTABLI PAR	J.B	SHEET / PLANCHE
CHECKED BY / CONTRÔLE PAR	RL / EO	1 / 24
SCALE / ÉCHELLE	1:100	DATE / DATE 2011/10/31



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U.S. Agency for International Development
A Partnership of Leaders for a Safer, Stronger, and Better World



build change

Build Change
USA Headquarters
1416 Larimer Street Suite 301
Denver CO 80202
Tel 303 953 2563

WORK / TRAVAIL

SINGLE STORY CONFINED
MASONRY HOUSE WITH
TIMBER ROOF

MAISON DE PLAIN-PIED EN
MAÇONNERIE CHÂÎNÉE
AVEC TOITURE EN BOIS

PROJECT / PROJET

POST-EARTHQUAKE RECONSTRUCTION
TECHNICAL ASSISTANCE PROGRAM
PROGRAMME D'ASSISTANCE TECHNIQUE À LA
RECONSTRUCTION SUITE AU SÉISME

LOCATION / EMPLACEMENT

HAITI
HAÏTI



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USA Headquarters
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Denver CO 80202
Tel 303 953 2563

WORK / TRAVAIL

SINGLE STORY CONFINED
MASONRY HOUSE WITH
TIMBER ROOF

MAISON DE PLAIN-PIED EN
MAÇONNERIE CHÂÎNÉE
AVEC TOITURE EN BOIS

PROJECT / PROJET

POST-EARTHQUAKE RECONSTRUCTION
TECHNICAL ASSISTANCE PROGRAM
PROGRAMME D'ASSISTANCE TECHNIQUE A LA
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LOCATION / EMPLACEMENT

HAITI
HAITI

STRUCTURAL ENGINEER / INGÉNIEUR STRUCTURE

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Fax 212 766 9016

DRAWING TITLE / TITRE DU DESSIN

HOUSE ELEVATIONS

ÉLÉVATIONS

DRAWN BY / ÉTABLI PAR

JB

SHEET / PLANCHE

CHECKED BY / CONTRÔLÉ PAR

RL / EO

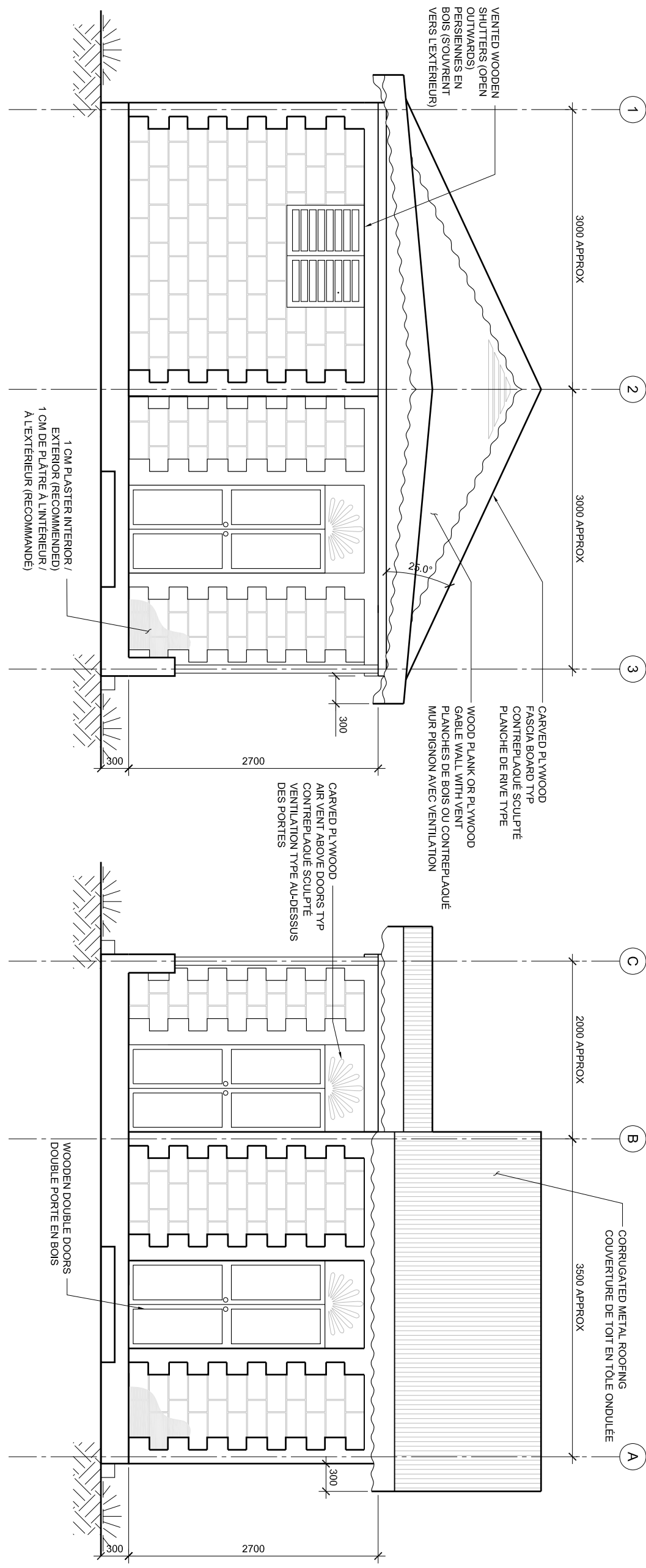
2 / 24

SCALE / ÉCHELLE

1:50

DATE / DATE

2011/01/31



C FRONT ELEVATION
FAÇADE AVANT

3 RIGHT ELEVATION
VUE DE DROITE



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SINGLE STORY CONFINED
MASONRY HOUSE WITH
TIMBER ROOF

POST-EARTHQUAKE RECONSTRUCTION
TECHNICAL ASSISTANCE PROGRAM
PROGRAMME D'ASSISTANCE TECHNIQUE À LA
RECONSTRUCTION SUITE AU SÉISME

HAIT
HAÏT

STRUCTURAL ENGINEER / INGÉNIEUR STRUCTURE

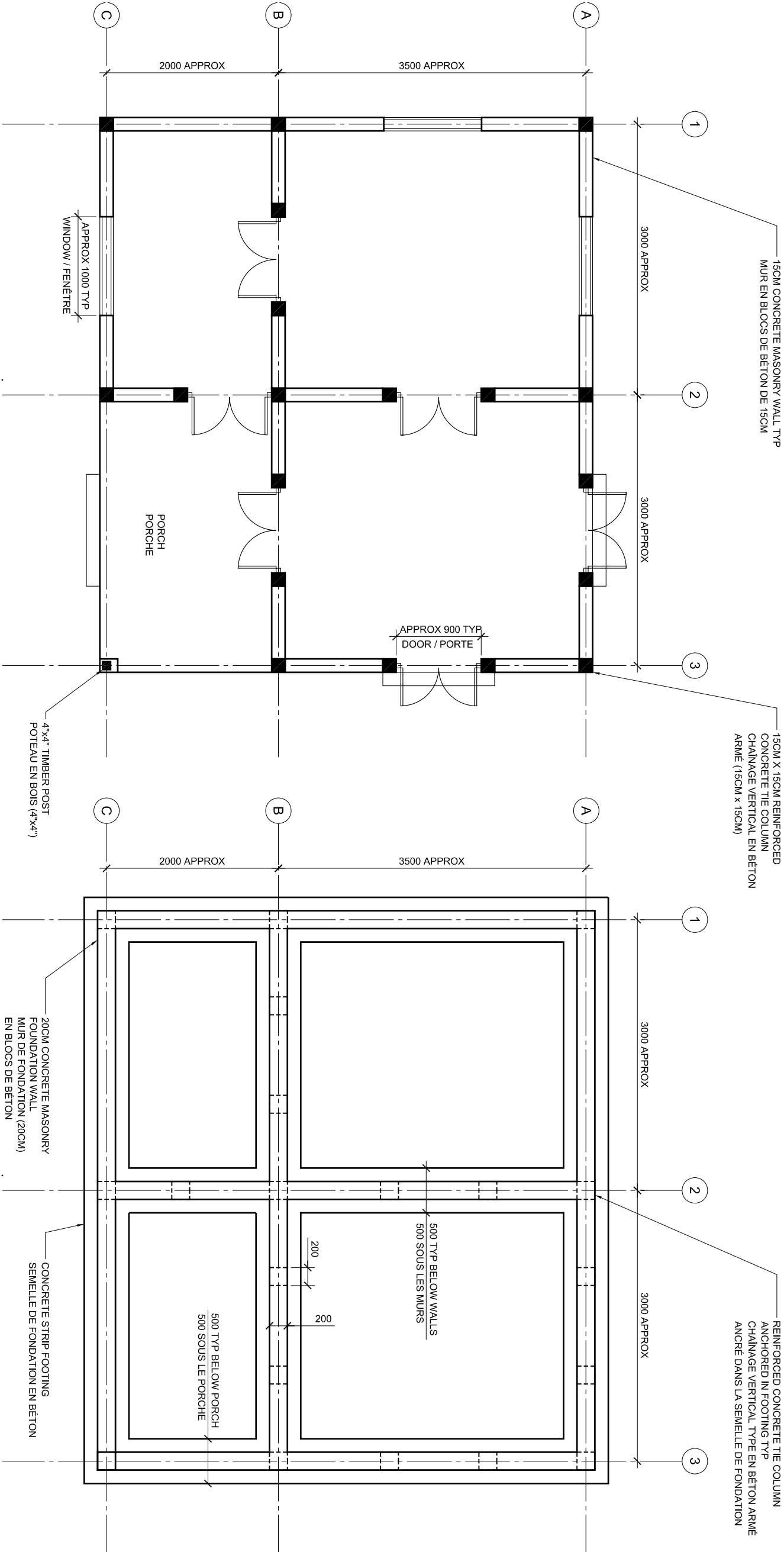
Guy Nordenson and Associates
225 Varick Street 6th Flr
New York NY 10014
Tel 212 766 9119
Fax 212 766 9016

DRAWING TITLE / TITRE DU DESSIN

HOUSE ELEVATIONS

ÉLÉVATIONS

DRAWN BY / ÉTABI PAR	JB	SHEET / PLANCHÉ 3 / 21
CHECKED BY / CONTRÔLÉ PAR	RL / EO	
SCALE / ÉCHELLE	1:50	
DATE / DATE		
		2011/01/7



LAYOUT
PLAN

FOUNDATION PLAN
PLAN DE FONDATION

STRUCTURAL ENGINEER / INGÉNIEUR STRUCTURE
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New York NY 10014
Tel 212 766 9119
Fax 212 766 9016

DRAWING TITLE / TITRE DU DESSIN
LAYOUT AND FOUNDATION
PLAN
PLAN ET PLAN DES
FOUNDATIONS

DRAWN BY / ÉTABLI PAR

JB

SHEET / PLANCHE

CHECKED BY / CONTRÔLÉ PAR

RL / EO

4 / 24

SCALE / ÉCHELLE

1:50

DATE / DATE

2011/01/31

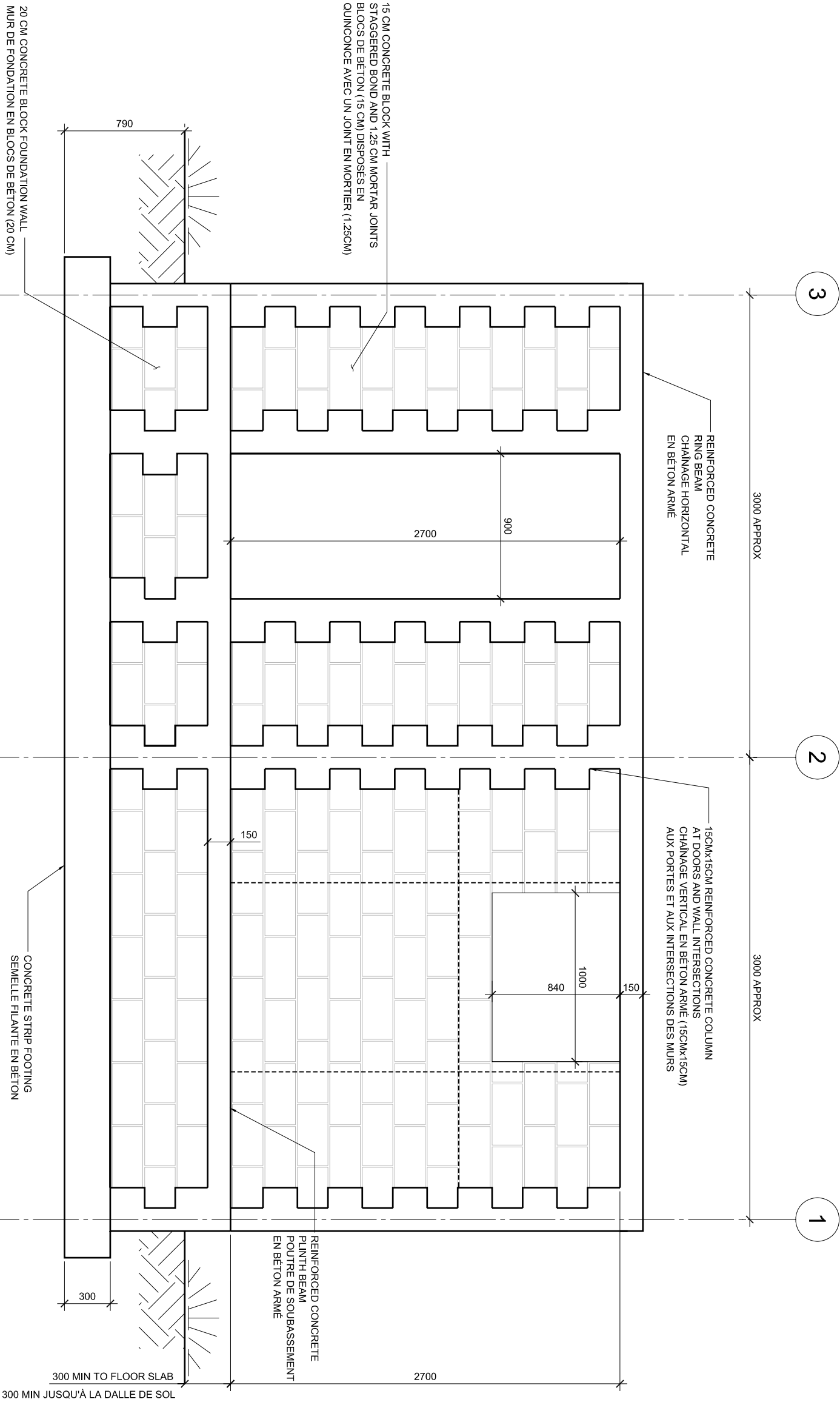


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SINGLE STORY CONFINED
MASONRY HOUSE WITH
TIMBER ROOF
MAISON DE PLAIN-PIED EN
MAÇONNERIE CHÂÎNÉE
AVEC TOITURE EN BOIS

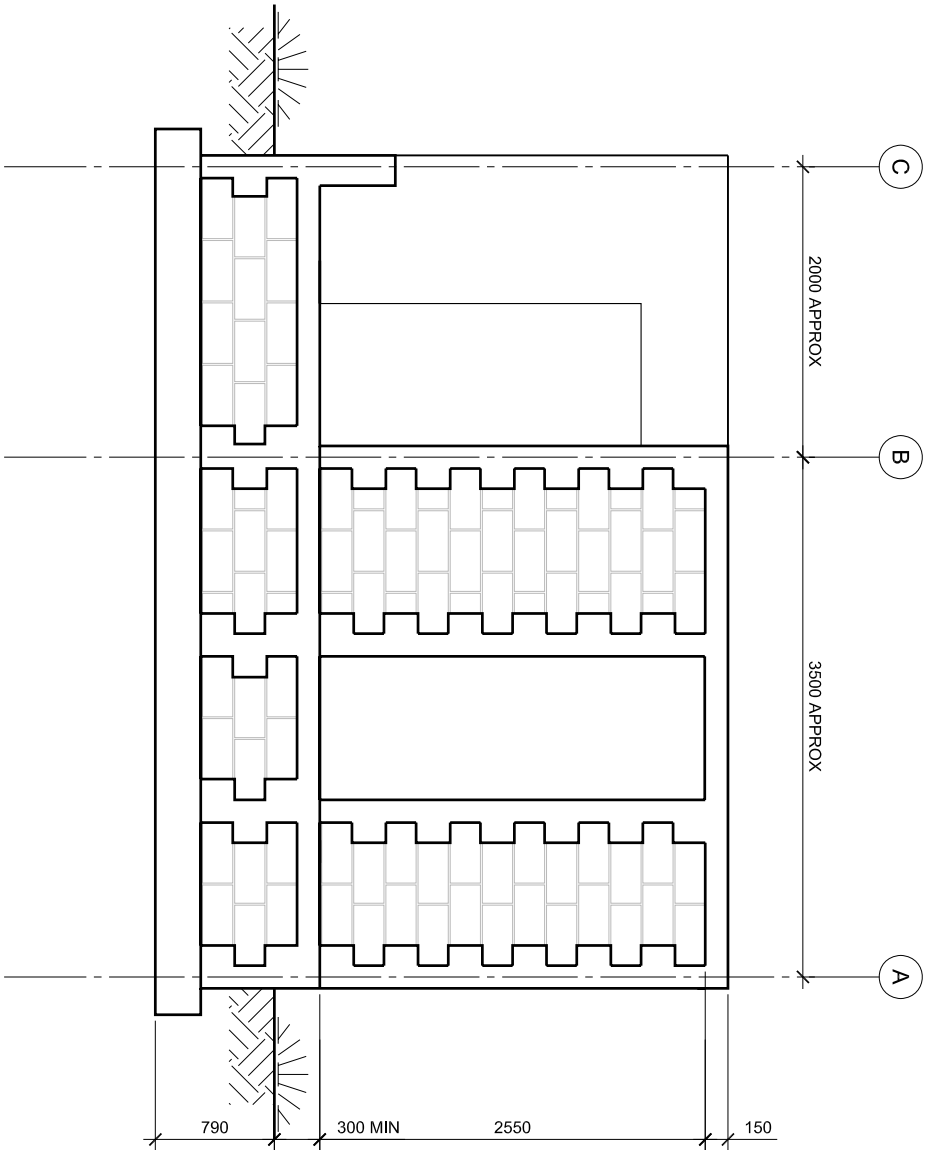
PROJECT / PROJET
POST-EARTHQUAKE RECONSTRUCTION
TECHNICAL ASSISTANCE PROGRAM
PROGRAMME D'ASSISTANCE TECHNIQUE A LA
RECONSTRUCTION SUITE AU SÉISME

LOCATION / EMPLACEMENT
HAITI
HAITI

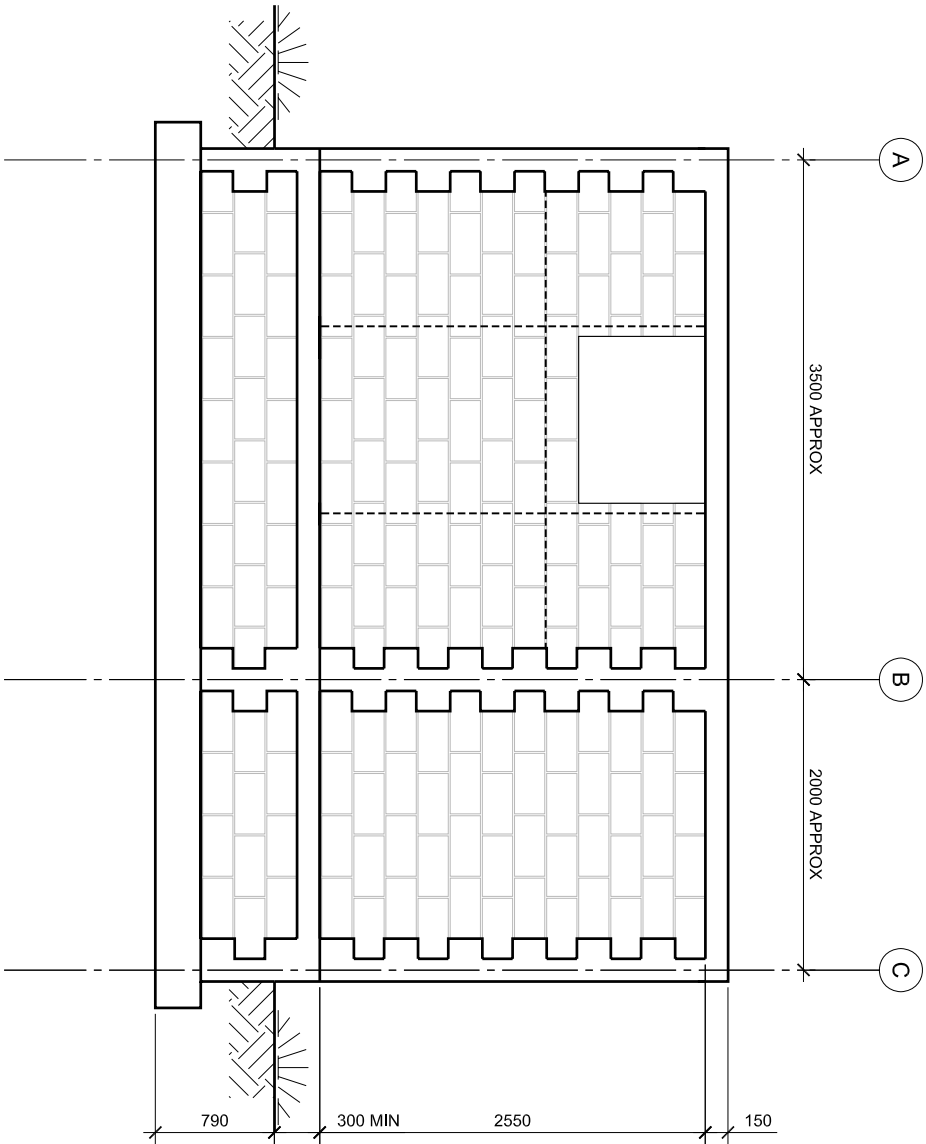


A BACK WALL ELEVATION
ÉLÉVATION - MUR AVANT



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WORK / TRAVAIL	
SINGLE STORY CONFINED MASONRY HOUSE WITH TIMBER ROOF	
MAISON DE PLAIN-PIED EN MAÇONNERIE CHÂÎNÉE AVEC TOITURE EN BOIS	
PROJECT / PROJET POST-EARTHQUAKE RECONSTRUCTION TECHNICAL ASSISTANCE PROGRAM PROGRAMME D'ASSISTANCE TECHNIQUE A LA RECONSTRUCTION SUITE AU SÉISME	
LOCATION / EMPLACEMENT HAITI HAITI	
STRUCTURAL ENGINEER / INGÉNIEUR STRUCTURE Guy Nordenson and Associates 225 Varick Street 6th Fl New York NY 10014 Tel 212 766 9119 Fax 212 766 9016	
DRAWING TITLE / TITRE DU DESSIN WALL ELEVATIONS ÉLÉVATIONS	
DRAWN BY / ÉTABLI PAR JB	SHEET / PLANCHE
CHECKED BY / CONTRÔLÉ PAR RL / EO	6 / 24
SCALE / ÉCHELLE 1:30	DATE / DATE 2011/01/31

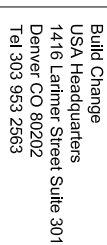


1 LEFT WALL ELEVATION
ÉLÉVATION - MUR DE GAUCHE



3 RIGHT WALL ELEVATION
ÉLÉVATION - MUR DE DROITE

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WORK / TRAVAIL		
SINGLE STORY CONFINED MASONRY HOUSE WITH TIMBER ROOF		
MAISON DE PLAIN-PIED EN MAÇONNERIE CHÂÎNÉE AVEC TOITURE EN BOIS		
PROJECT / PROJET POST-EARTHQUAKE RECONSTRUCTION TECHNICAL ASSISTANCE PROGRAM PROGRAMME D'ASSISTANCE TECHNIQUE A LA RECONSTRUCTION SUITE AU SÉISME		
LOCATION / EMPLACEMENT HAITI HAITI		
STRUCTURAL ENGINEER / INGÉNIEUR STRUCTURE Guy Nordenson and Associates 225 Varick Street 6th Flr New York NY 10014 Tel 212 766 9119 Fax 212 766 9016		
DRAWING TITLE / TITRE DU DESSIN		
WALL ELEVATIONS		
ÉLÉVATIONS		
DRAWN BY / ÉTABLI PAR JB	SHEET / PLANCHE	
CHECKED BY / CONTRÔLÉ PAR RL / EO	7 / 24	
SCALE / ÉCHELLE 1:50	DATE / DATE 2011/10/31	



Technical drawing of a wall section showing a cross-section of a wall with a window and a door. The wall is 2550 units wide and 3500 units high. The window is 2000 units high and 2550 units wide. The door is 2550 units wide and 3500 units high. The wall is 790 units thick. The window is 300 units thick. The door is 150 units thick. The drawing includes dimensions and labels A, B, and C.

**SINGLE STORY CONFINED
MASONRY HOUSE WITH
TIMBER ROOF**

PROJECT / PROJET
POST-EARTHQUAKE RECONSTRUCTION
TECHNICAL ASSISTANCE PROGRAM
PROGRAMME D'ASSISTANCE TECHNIQUE À LA
RECONSTRUCTION SUITE AU SÉISME

STRUCTURAL ENGINEER / IN
Guyn Nordenson and Associates
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New York NY 10014
Tel 212 766 9119
Fax 212 766 9016

DRAFTING TITLE / TITRE DU DESSIN

WALL ELEVATIONS

ÉLÉVATIONS

DRAWN BY / ÉTABLI PAR
SHEET / PLANCHE

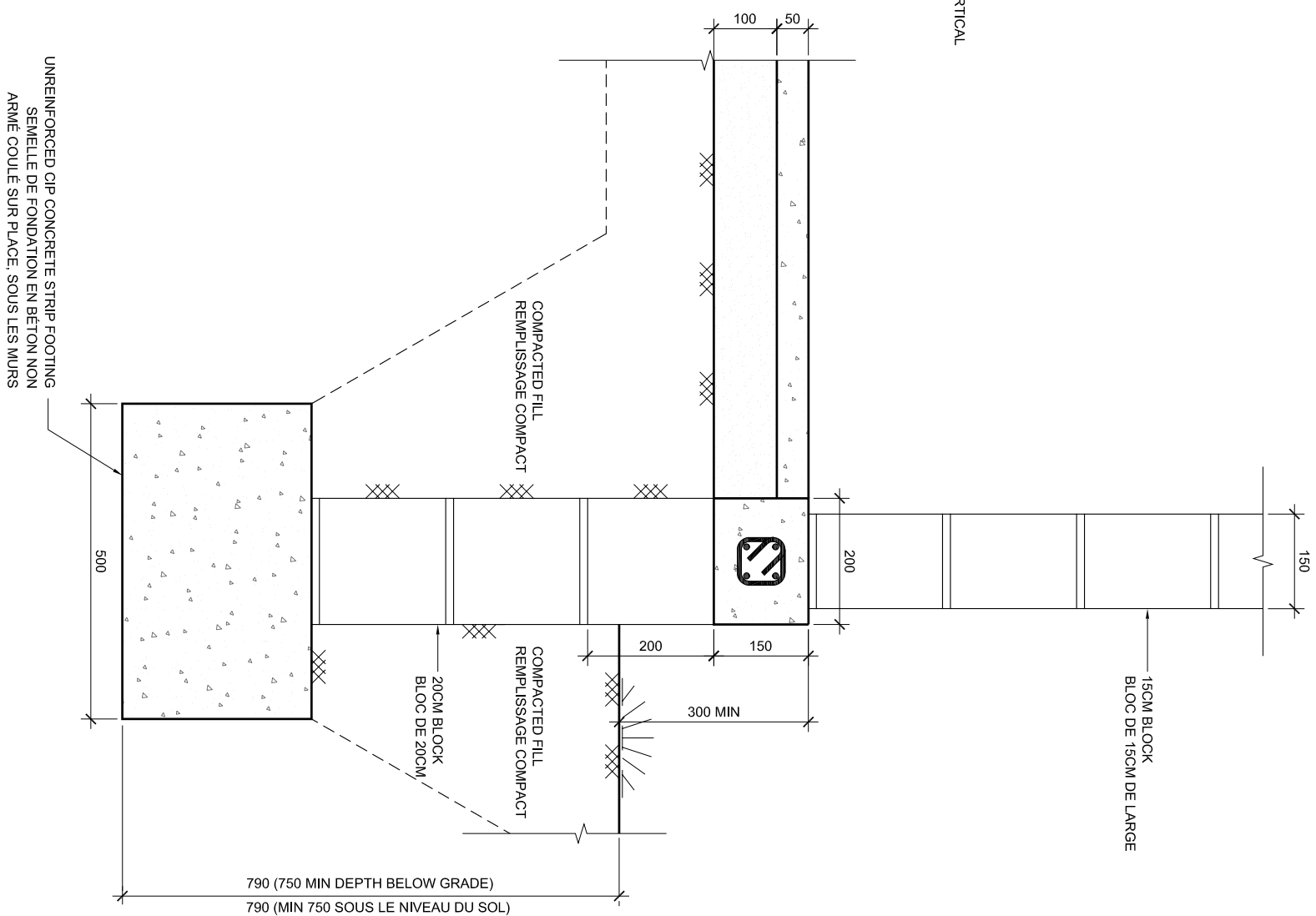
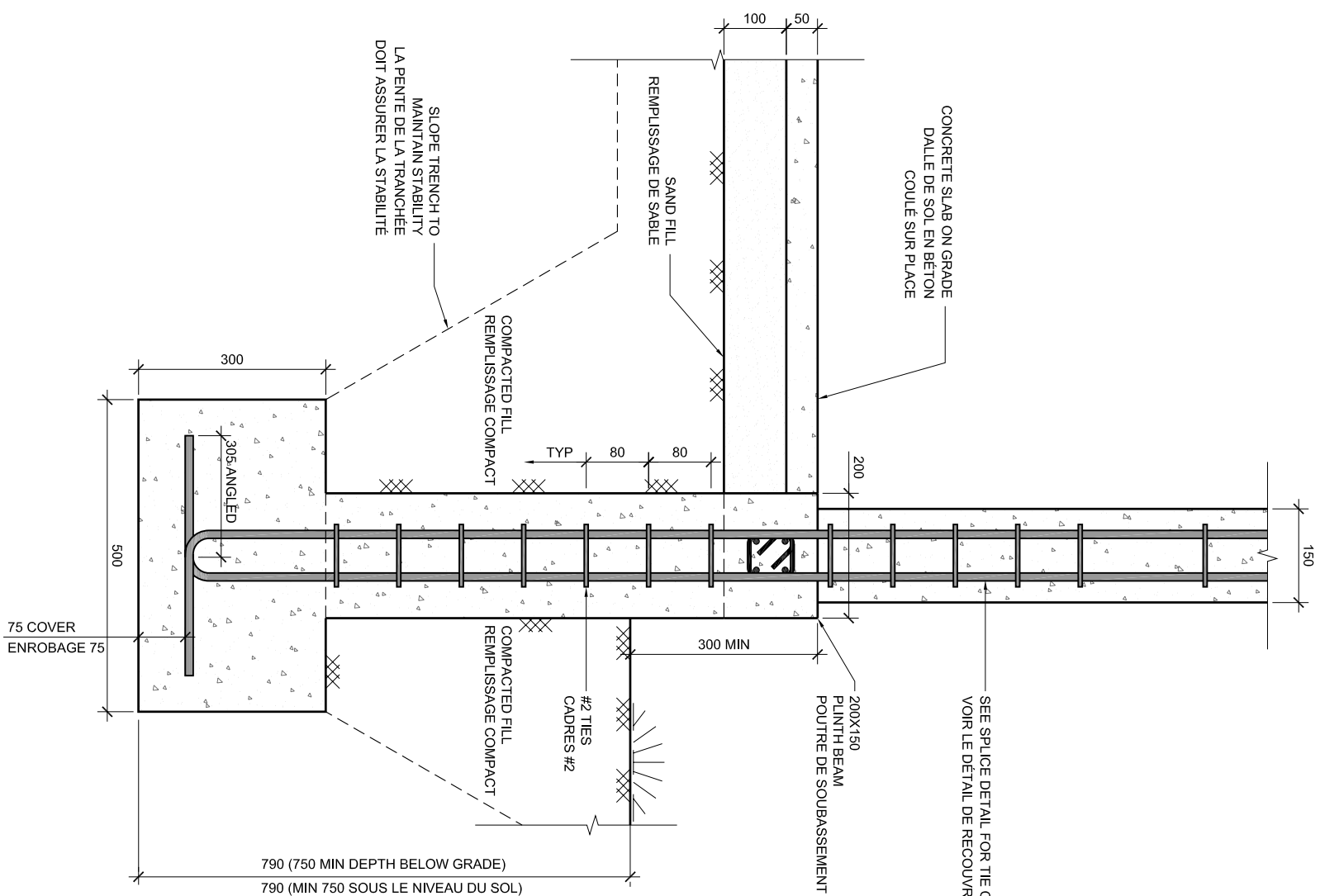
CHECKED BY / CONTRÔLÉ PAR

SCALE / ÉCHELLE	DATE / DATE
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Technical drawing of a kitchen layout. The drawing shows a 3000mm wide unit with a 2550mm wide island and a 790mm wide peninsula. The layout includes a sink, stove, and refrigerator. Dimensions are provided for the overall width (3000mm), island width (2550mm), and peninsula width (790mm). The drawing is labeled with "3000 APPROX" and "2550".

B
INTERIOR WALL ELEVATION
ÉLEVATION - MUR INTÉRIEUR

2
INTERIOR WALL ELEVATION
ÉLEVATION - MUR INTÉRIEUR





FOUNDATION SECTION AT EXTERIOR COLUMN

COUPE DES FONDATIONS (CHAÎNAGE VERTICAL EXTÉRIEUR)

FOUNDATION SECTION AT EXTERIOR WALL

COUPE DES FONDATIONS AU NIVEAU D'UN MUR EXTÉRIEUR

 <p>USAID E C A P</p> <p>FROM THE AMERICAN PEOPLE</p> <p><small>President George W. Bush and Vice President Dick Cheney A Partnership of Leaders for Humanity Development Solutions Group (DSG) and Build Change</small></p>	
 <p>Build Change USA Headquarters 1416 Larimer Street Suite 301 Denver CO 80202 Tel 303 953 2563</p>	
<p>WORK / TRAVAIL</p>	
<p>SINGLE STORY CONFINED MASONRY HOUSE WITH TIMBER ROOF</p>	
<p>MAISON DE PLAIN-PIED EN MAÇONNERIE CHAÎNÉE AVEC TOITURE EN BOIS</p>	
<p>PROJECT / PROJET</p> <p>POST-EARTHQUAKE RECONSTRUCTION TECHNICAL ASSISTANCE PROGRAM</p> <p>PROGRAMME D'ASSISTANCE TECHNIQUE A LA RECONSTRUCTION SUITE AU SEISME</p>	
<p>LOCATION / EMPLACEMENT</p> <p>HAITI HAÏTI</p>	
<p>STRUCTURAL ENGINEER / INGÉNIEUR STRUCTURE</p> <p>Guy Nordenson and Associates 225 Varick Street 6th Flr New York NY 10014 Tel 212 766 9119 Fax 212 766 9016</p>	
<p>DRAWING TITLE / TITRE DU DESSIN</p>	
<p>FOUNDATION SECTIONS</p>	
<p>COUPES DES FONDATIONS</p>	
<p>DRAWN BY / ÉTABLI PAR</p> <p>JB</p>	<p>SHEET / PLANCHE</p> <p>9 / 24</p>
<p>CHECKED BY / CONTRÔLÉ PAR</p> <p>RL / EO</p>	
<p>SCALE / ÉCHELLE</p> <p>1:10</p>	<p>DATE / DATE</p> <p>2011/01/31</p>

Build Change
USA Headquarters
1416 Larimer Street Suite 301
Denver CO 80202
Tel 303 953 2563

WORK / TRAVAIL

SINGLE STORY CONFINED
MASONRY HOUSE WITH
TIMBER ROOF

MAISON DE PLAIN-PIED EN
MAÇONNERIE CHÂÎNÉE
AVEC TOITURE EN BOIS

PROJECT / PROJET

POST-EARTHQUAKE RECONSTRUCTION
TECHNICAL ASSISTANCE PROGRAM
PROGRAMME D'ASSISTANCE TECHNIQUE A LA
RECONSTRUCTION SUITE AU SEISME

LOCATION / EMPLACEMENT

HAITI
HAITI

STRUCTURAL ENGINEER / INGÉNIEUR STRUCTURE

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New York NY 10014
Tel 212 766 9119
Fax 212 766 9016

DRAWING TITLE / TITRE DU DESSIN

FOUNDATION SECTIONS

COUPES DES FONDATIONS

DRAWN BY / ÉTABLI PAR

JB

SHEET / PLANCHE

10 / 24

CHECKED BY / CONTRÔLÉ PAR

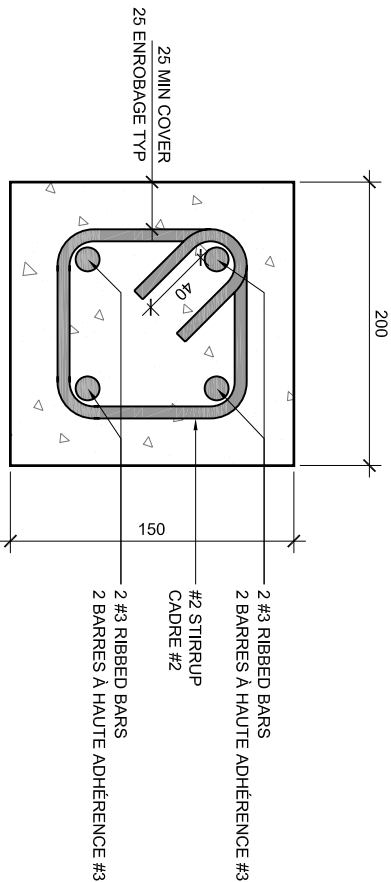
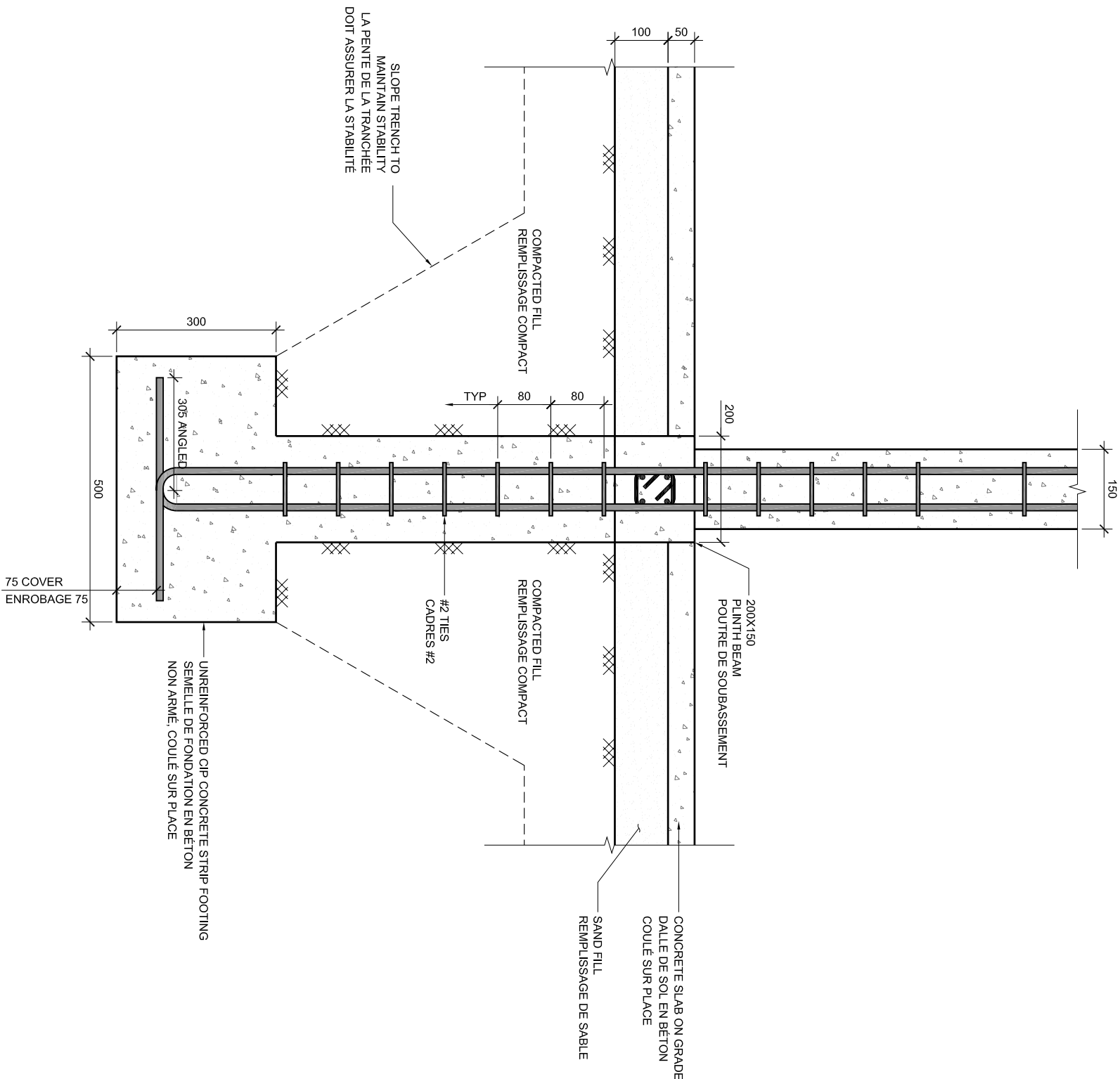
RL / EO

SCALE / ÉCHELLE

1:10



DATE / DATE

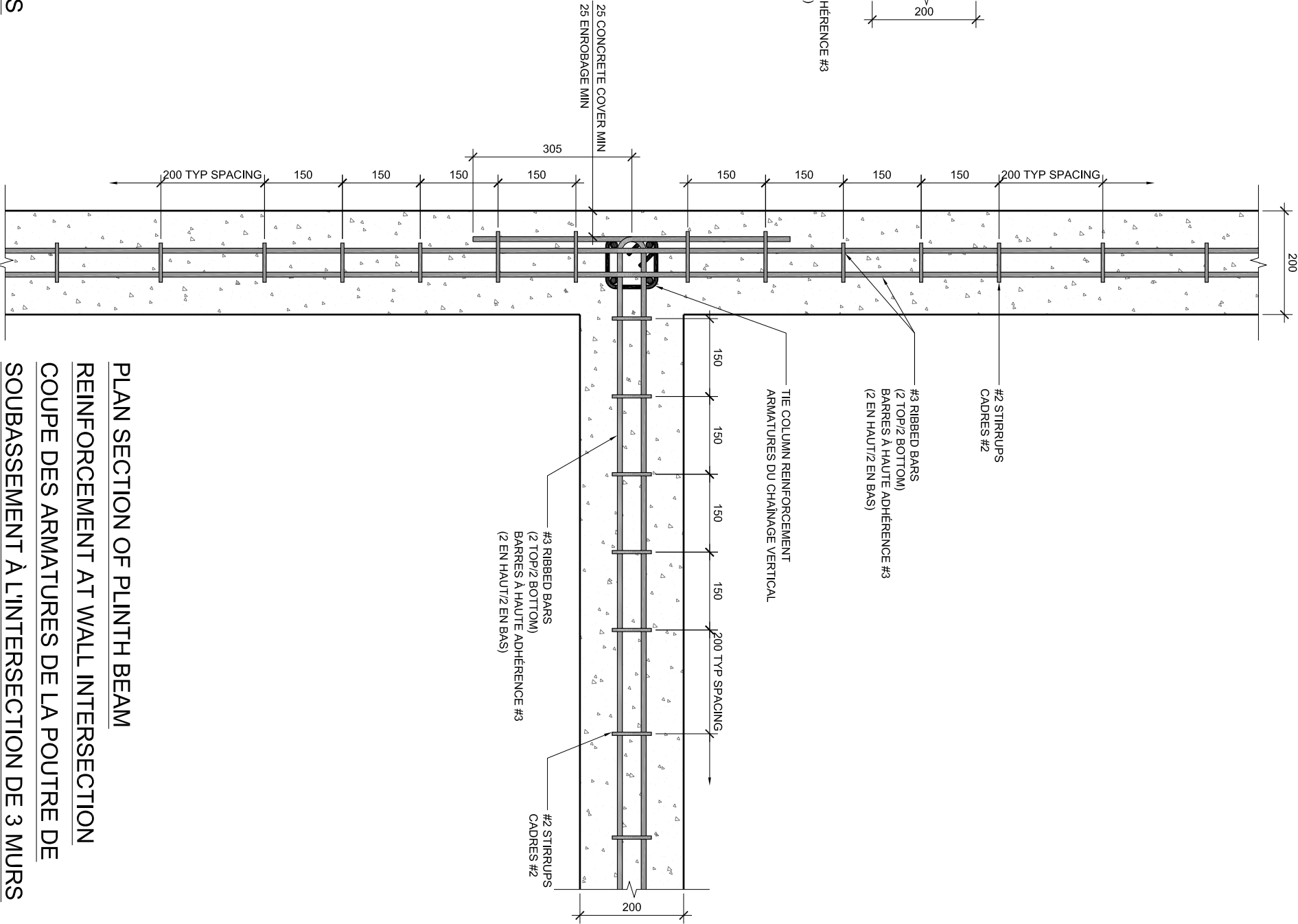
2011/01/31



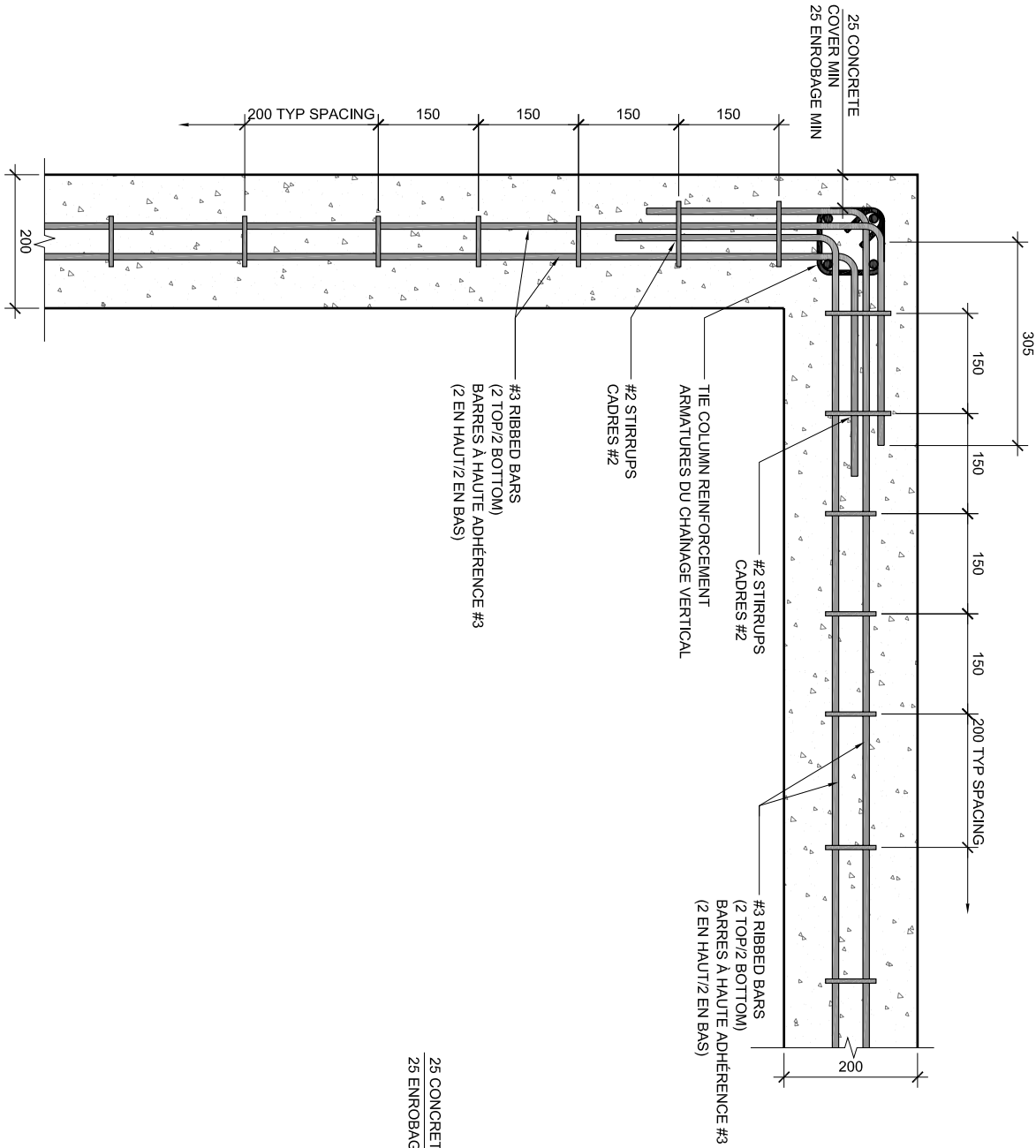
FOUNDATION SECTION AT INTERIOR COLUMN
COUPE DES FONDATIONS (CHAÎNAGE VERTICAL INTÉRIEUR)

SECTION OF PLINTH BEAM
REINFORCEMENT (SCALE 1:4)

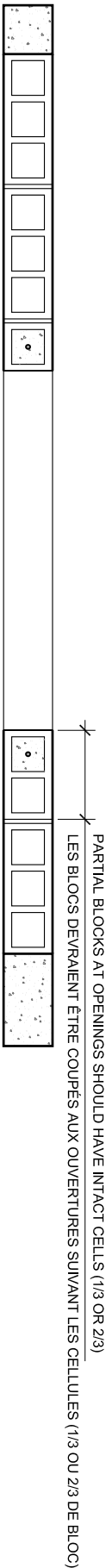
<div><div><p>FROM THE AMERICAN PEOPLE</p></div><div><p>build change</p></div></div> <div><div>Build Change USA Headquarters 1416 Larimer Street Suite 301 Denver CO 80202 Tel 303 953 2563</div><div>PROVIDING CONSTRUCTION ASSISTANCE TO SUPPORT A Partnership of Federal, State, Local, and Development Institutions Group (PDG) and Build Change</div></div>			
WORK / TRAVAIL			
SINGLE STORY CONFINED MASONRY HOUSE WITH TIMBER ROOF			
MAISON DE PLAIN-PIED EN MAÇONNERIE CHÂÎNÉE AVEC TOITURE EN BOIS			
PROJET / PROJET			
POST-EARTHQUAKE RECONSTRUCTION TECHNICAL ASSISTANCE PROGRAM PROGRAMME D'ASSISTANCE TECHNIQUE À LA RECONSTRUCTION SUITE AU SÉISME			
LOCATION / EMPLACEMENT			
HAÏTI HAÏTI			
STRUCTURAL ENGINEER / INGÉNIEUR STRUCTURE			
Guy Nordenson and Associates 225 Varick Street 6th Flr New York NY 10014 Tel 212 766 9119 Fax 212 766 9016			
DRAWING TITLE / TITRE DU DESSIN			
PLINTH BEAM PLAN SECTION COUPE HORIZONTALE DE LA POUTRE DE SOUBASSEMENT			
DRAWN BY / ÉTABLI PAR	J.B	SHEET / PLANCHE	11 / 24
CHECKED BY / CONTRÔLE PAR	RL / EO		
SCALE / ÉCHELLE	1:10	DATE / DATE	
		2011/10/31	



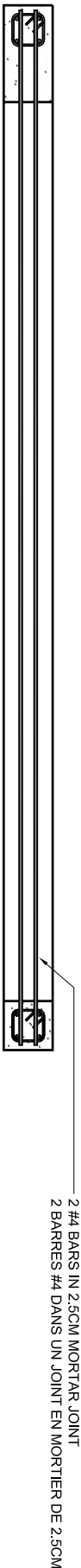
PLAN SECTION OF PLINTH BEAM
REINFORCEMENT AT CORNER
COUPE DES ARMATURES DE LA POUTRE DE
SOUBASSEMENT À L'INTERSECTION DE 2 MURS



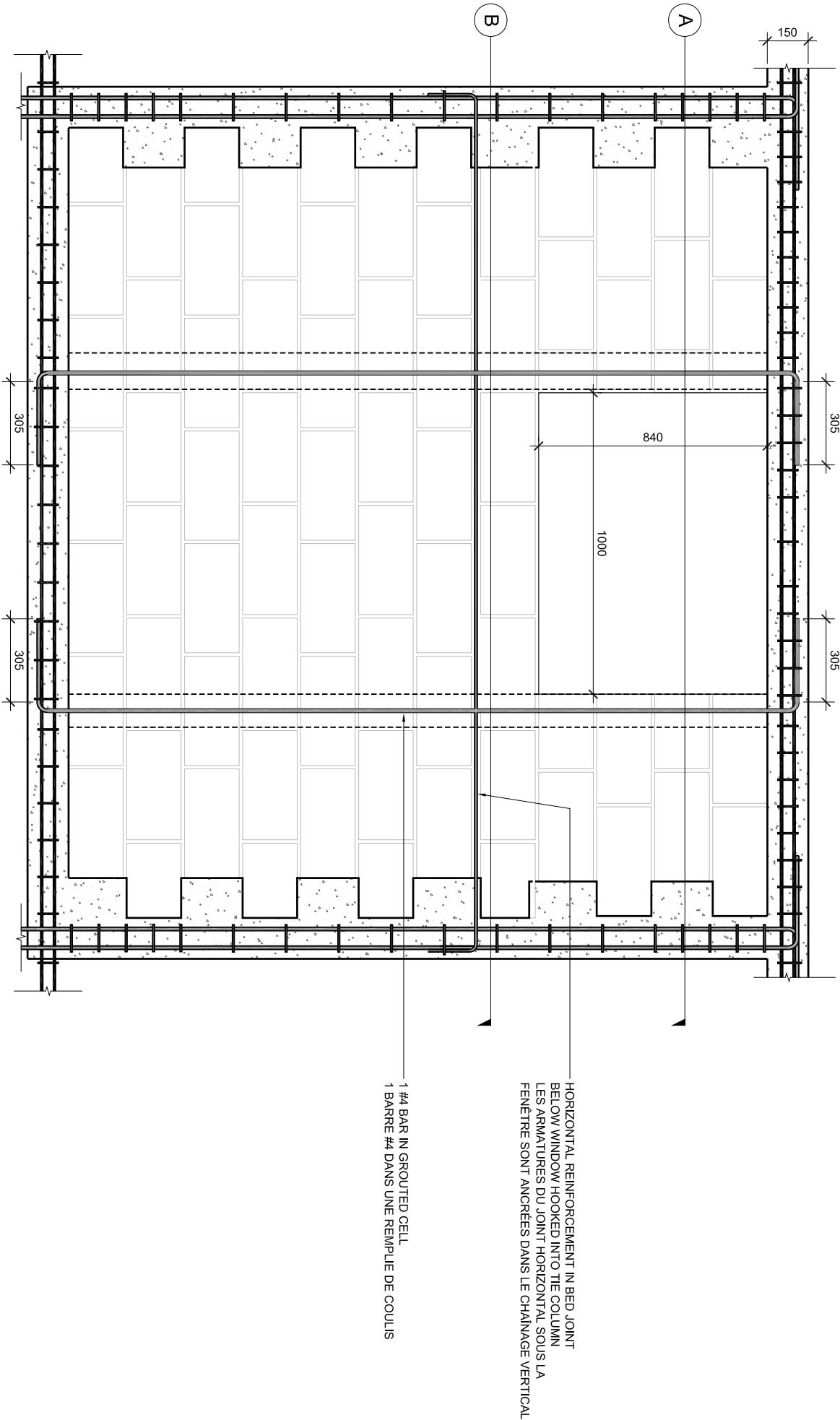
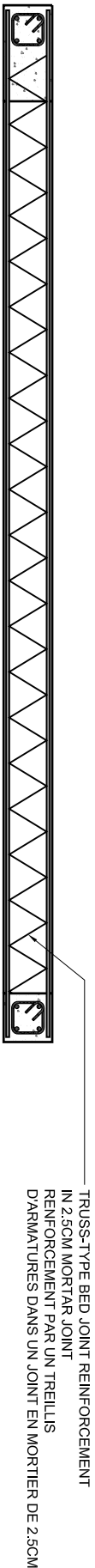
PLAN SECTION A
COUPE A



PLAN SECTION B (OPTION 1)
COUPE B (OPTION 1)



PLAN SECTION B (OPTION 2)
COUPE B (OPTION 2)



REINFORCEMENT AROUND WINDOWS
RENFORCEMENT DES FENÊTRES

FROM THE AMERICAN PEOPLE

USAID E C A P

U.S. Agency for International Development
A Partnership of Federal, State, and Local Governments
Development Resources Group (DRG)
and Build Change

Build Change
USA Headquarters
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Denver CO 80202
Tel 303 953 2563

WORK / TRAVAIL

SINGLE STORY CONFINED MASONRY HOUSE WITH TIMBER ROOF

MAISON DE PLAIN-PIED EN MAÇONNERIE CHÂÎNÉE AVEC TOITURE EN BOIS

PROJECT / PROJET

POST-EARTHQUAKE RECONSTRUCTION TECHNICAL ASSISTANCE PROGRAM

PROGRAMME D'ASSISTANCE TECHNIQUE À LA RECONSTRUCTION SUITE AU SÉISME

LOCATION / EMPLACEMENT

HAITI
HAITI

STRUCTURAL ENGINEER / INGÉNIEUR STRUCTURE

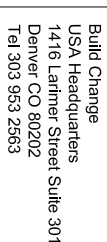
Guy Nordenson and Associates
225 Varick Street 6th Flr
New York NY 10014
Tel 212 766 9119
Fax 212 766 9016

DRAWING TITLE / TITRE DU DESSIN

OPENING DETAILS

DÉTAIL DES OUVERTURES

DRAWN BY / ÉTABLI PAR	JB	SHEET / PLANCHE
CHECKED BY / CONTRÔLÉ PAR	RL / EO	13 / 24
SCALE / ÉCHELLE	1:20	DATE / DATE
		2011/10/31



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USA Headquarters
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Denver CO 80202
Tel 303 953 2563

Structural drawing of a roof truss system. The drawing shows a grid of 2x4 trusses and purlins. The trusses are labeled "ROOF TRUSS TYP" and "FERME DU TOIT TYPE". The purlins are labeled "2'X4' ROOF PURLIN TYP" and "PANNÉE TYPE (2'X4'")". The drawing includes dimensions: 1000 MAX TYP, 3500 APPROX, and 2000 APPROX. The drawing also includes labels for "CGI SHEET" and "Panneau de toiture en tôle ondulée".

Labels and dimensions:

- ROOF TRUSS TYP / FERME DU TOIT TYPE
- 1000 MAX TYP
- 3500 APPROX
- 2000 APPROX
- 2'X4' ROOF PURLIN TYP / PANNÉE TYPE (2'X4'')
- 3000 APPROX
- CGI SHEET / PANNEAU DE TOITURE EN TÔLE ONDULÉE
- 2'X4' ROOF TRUSS TYP / FERME DU TOIT TYPE (2'X4'')
- 2'X4' BRACING / CONTREVENTEMENT (2'X4'')

**SINGLE STORY CONFINED
MASONRY HOUSE WITH
TIMBER ROOF**

PROJECT / PROJET

POST-EARTHQUAKE RECONSTRUCTION
TECHNICAL ASSISTANCE PROGRAM

PROGRAMME D'ASSISTANCE TECHNIQUE A
RECONSTRUCTION SUITE AU SEISME

LOCATION / EMPLACEMENT

HAIT
HAÏT

STRUCTURAL ENGINEER / INGÉNIEUR STRUCTURE

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DRAFTING TITLE / TITRE DU DESSIN

ROOF FRAMING PLAN

PLAN DE CHARPENTE

ROOF FRAMING PLAN / PLAN DE CHARPENTE



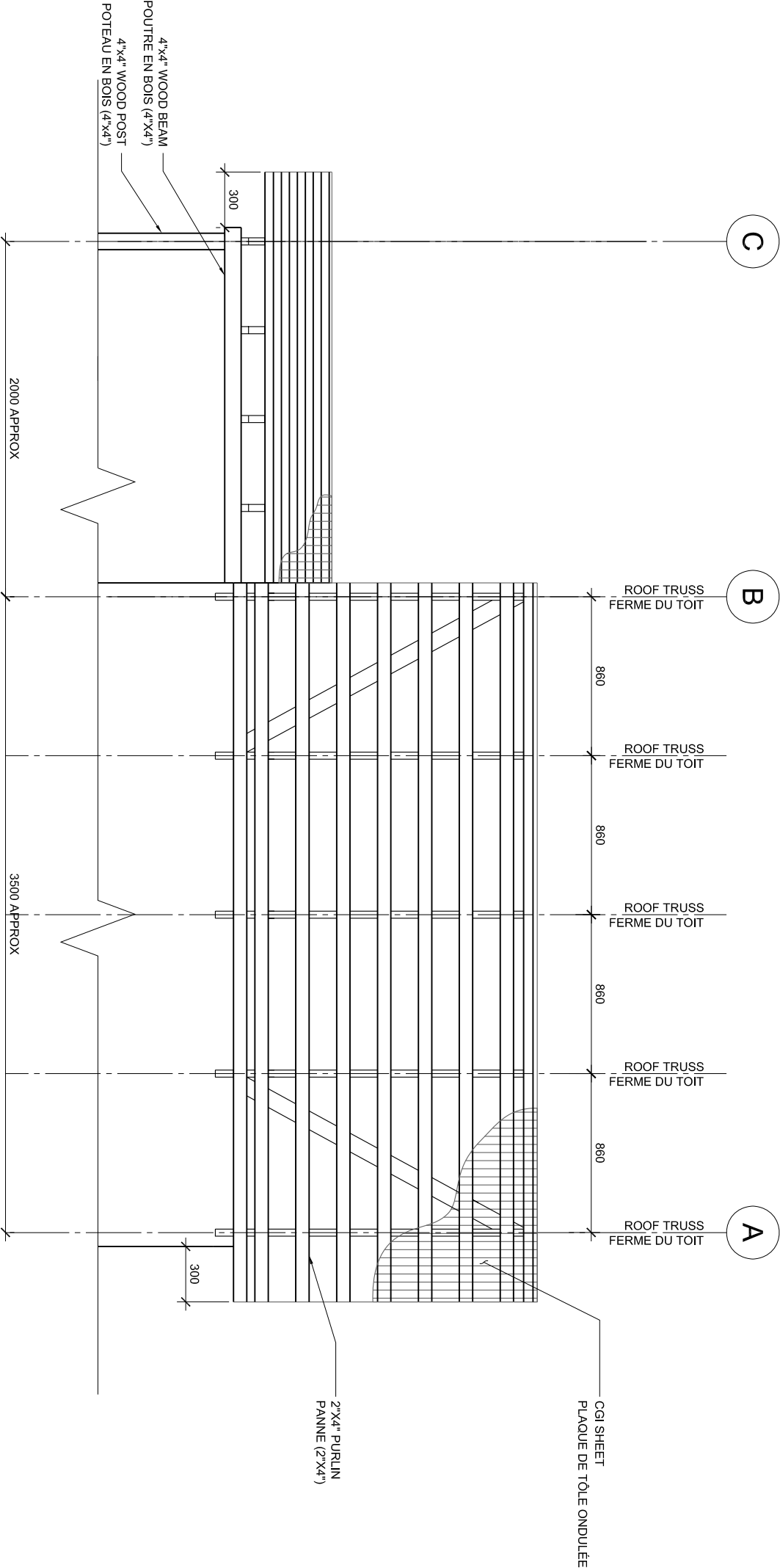
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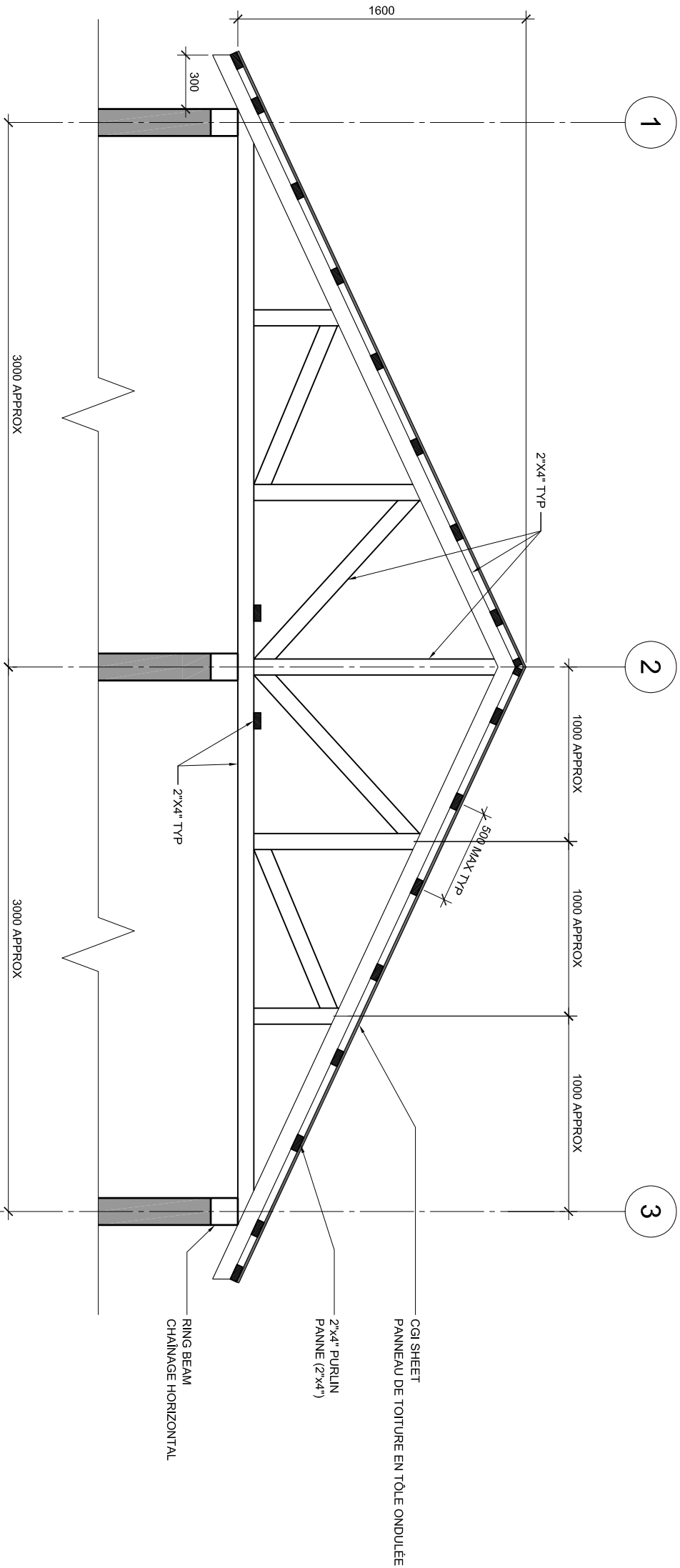
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RL/EO

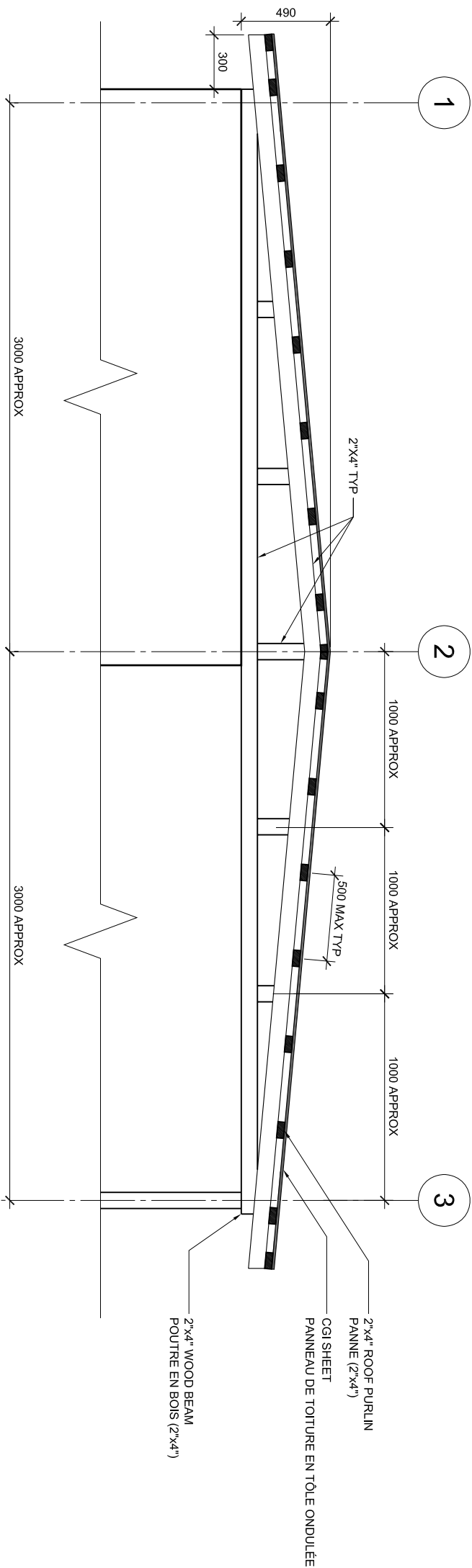
SCALE / ÉCHELLE	DATE / DATE
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1:50	2011/01/3
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<div>ROOF TRUSS ELEVATION CHARPENTE : ÉLÉVATION</div>					
<div>ROOF ELEVATION ÉLÉVATION DU TOIT</div>		<div>DRAWN BY / ÉTABLI PAR JB</div> <div>CHECKED BY / CONTRÔLÉ PAR RL / EO</div> <div>SCALE / ÉCHELLE 1:30</div>		<div>SHEET / PLANCHE 16 / 24</div> <div>DATE / DATE 2011/01/31</div>	



B ROOF TRUSS ELEVATION
CHARPENTE : ÉLEVATION



C ROOF TRUSS ELEVATION
CHARPENTE : ÉLEVATION



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WORK / TRAVAIL

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MASONRY HOUSE WITH
TIMBER ROOF

MAISON DE PLAIN-PIED EN
MAÇONNERIE CHÂÎNÉE
AVEC TOITURE EN BOIS

PROJECT / PROJET

POST-EARTHQUAKE RECONSTRUCTION
TECHNICAL ASSISTANCE PROGRAM
PROGRAMME D'ASSISTANCE TECHNIQUE À LA
RECONSTRUCTION SUITE AU SÉISME

LOCATION / EMPLACEMENT

HAITI
HAITI

STRUCTURAL ENGINEER / INGÉNIEUR STRUCTURE

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Tel 212 766 9119
Fax 212 766 9016

DRAWING TITLE / TITRE DU DESSIN

ROOF ELEVATIONS

ÉLEVATIONS DU TOIT

DRAWN BY / ÉTABLI PAR

SHEET / PLANCHE

17 / 24

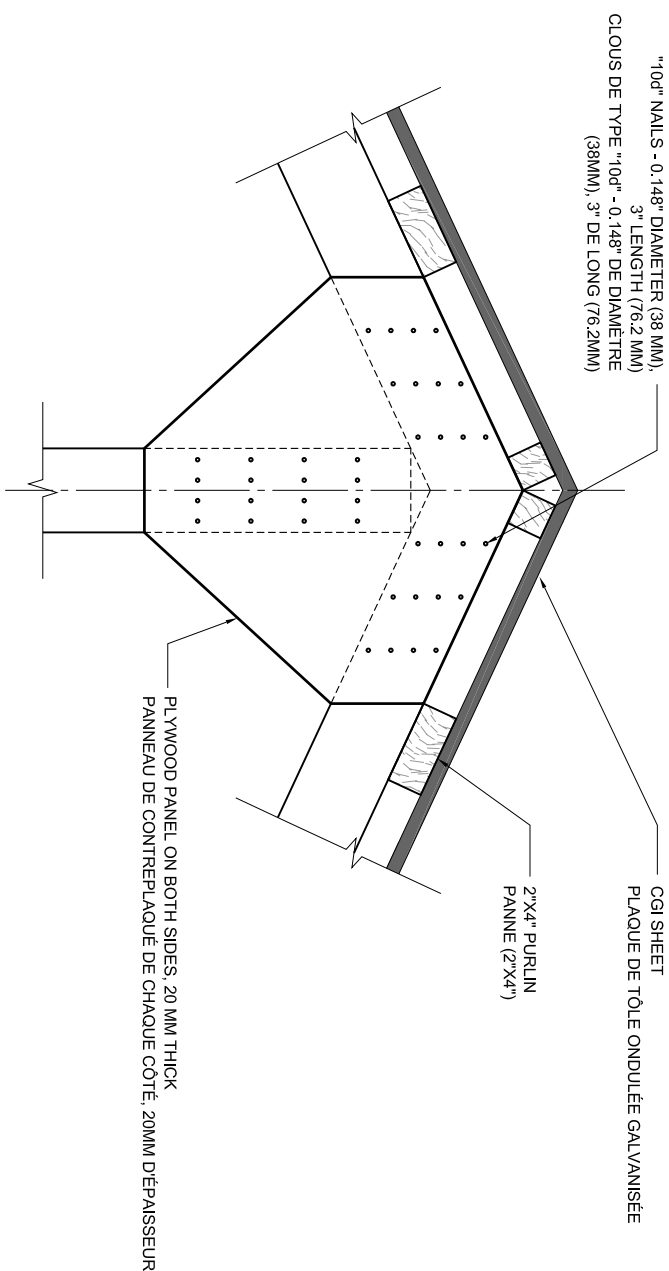
CHECKED BY / CONTRÔLÉ PAR

RL / EO

SCALE / ÉCHELLE

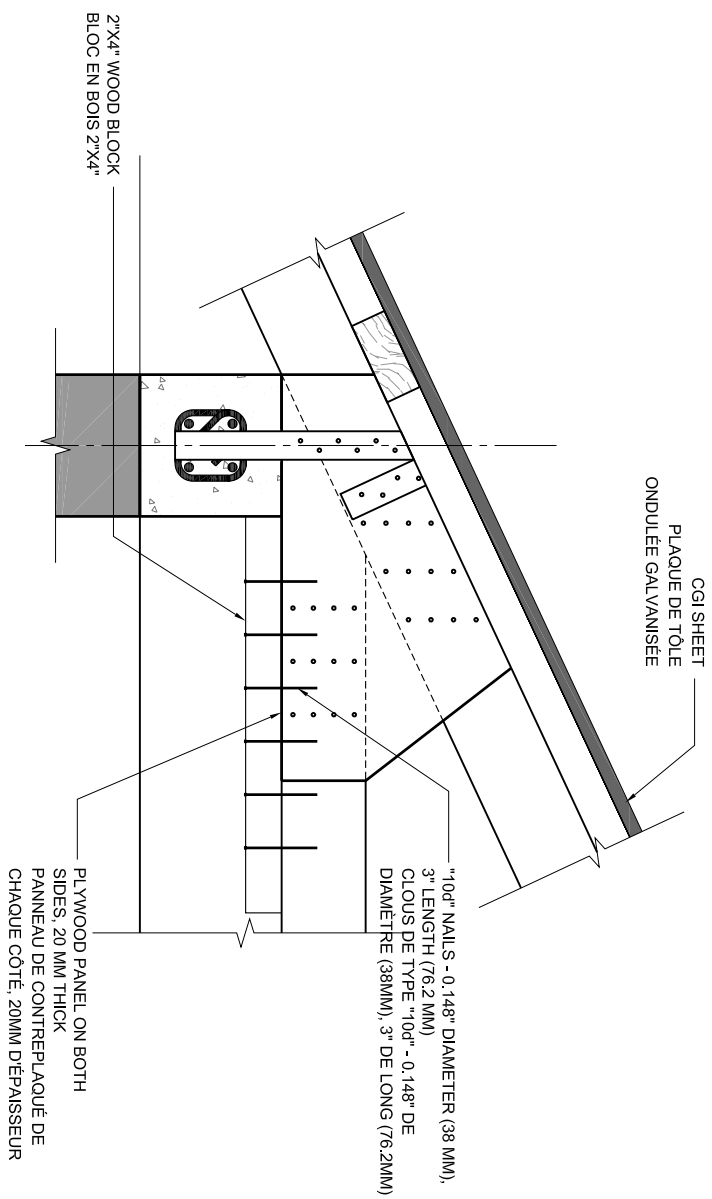
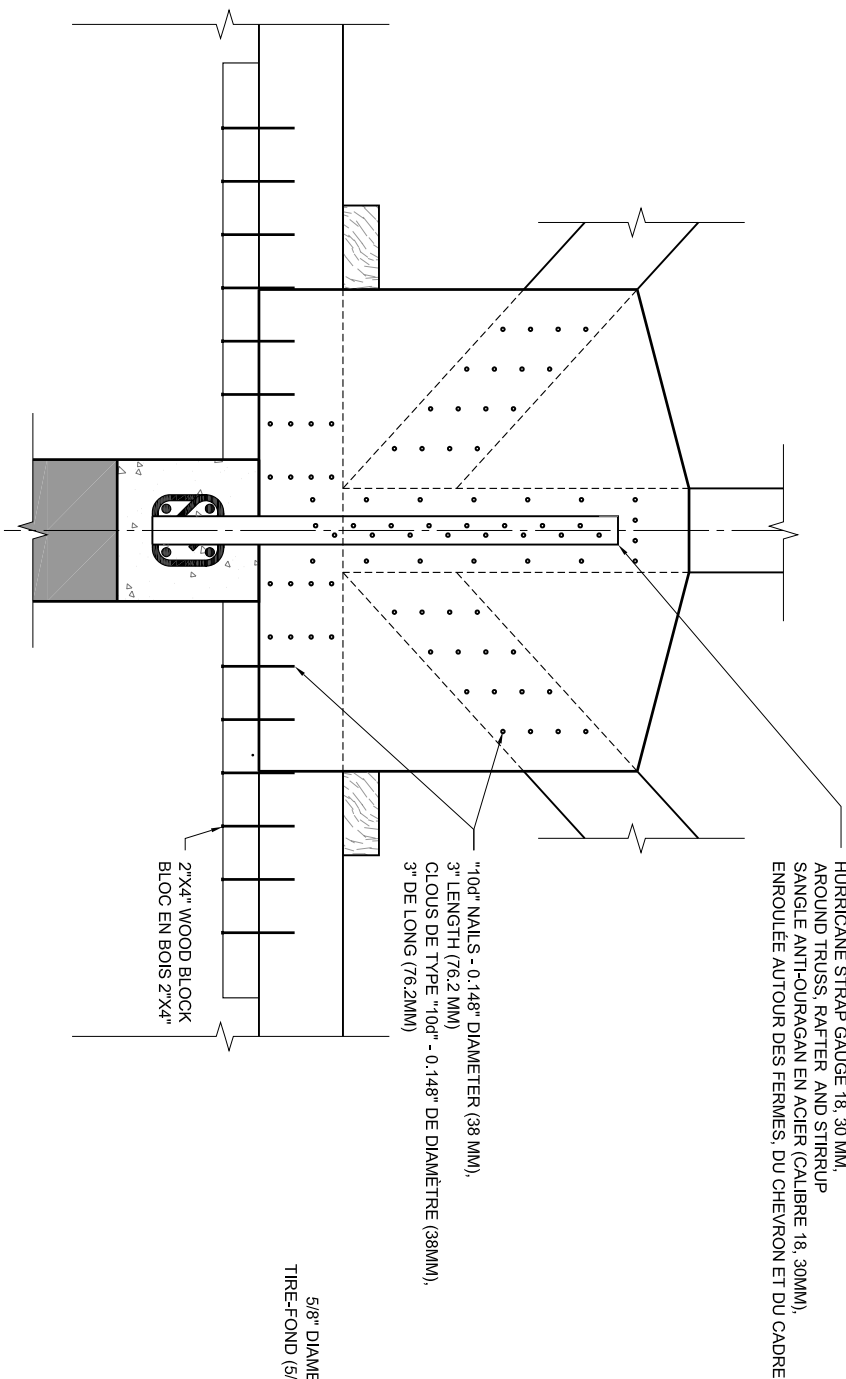
DATE / DATE

2011/01/31



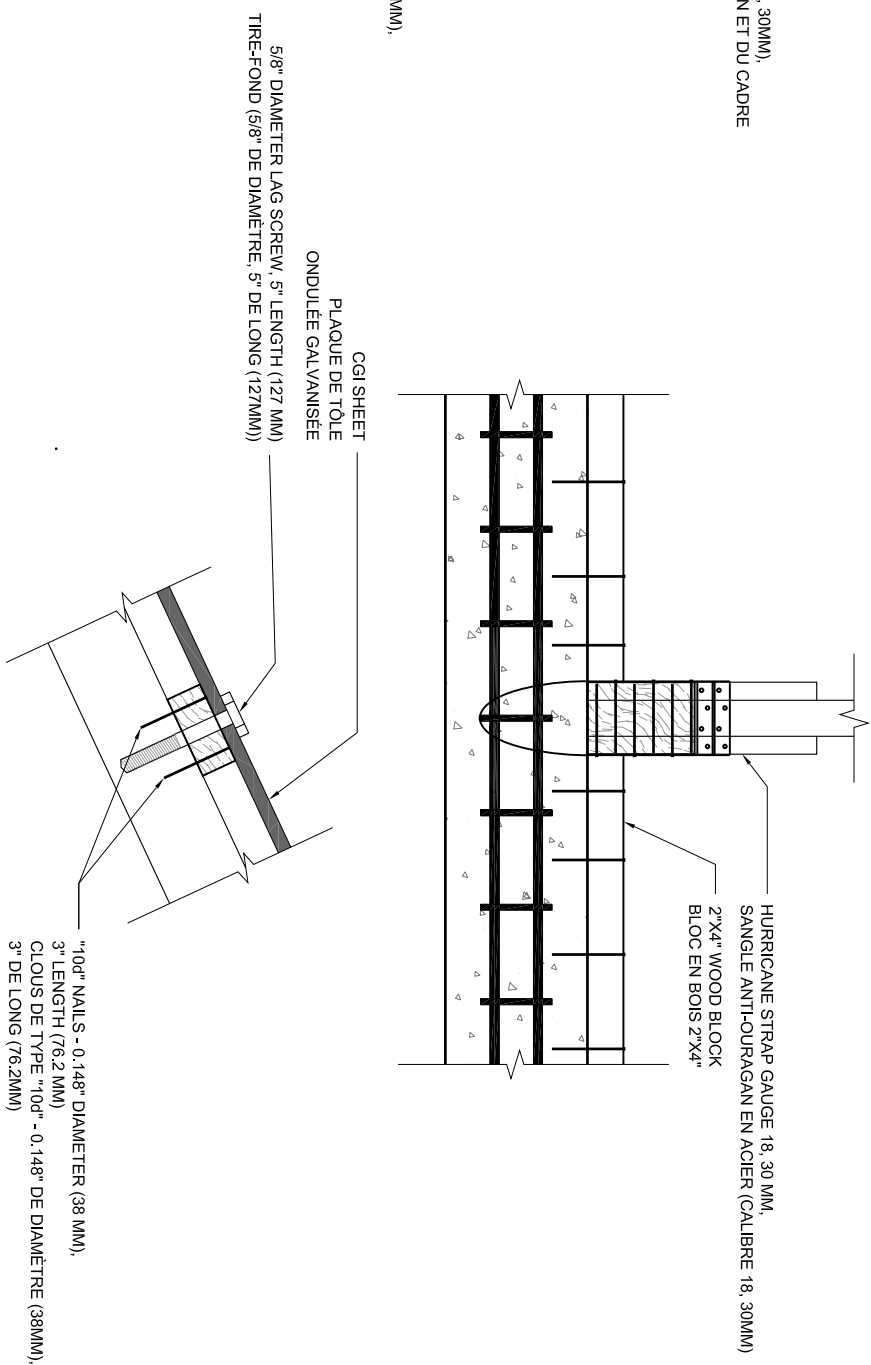
TOP CENTER ROOF TRUSS DETAIL

DÉTAIL DES FERMES DU TOIT (AU CENTRE, EN HAUT)



SIDE ROOF TRUSS DETAIL

DÉTAIL DES FERMES DU TOIT (SUR LE CÔTÉ)



Build Change
USA Headquarters
1416 Larimer Street Suite 301
Denver CO 80202
Tel 303 953 2563

WORK / TRAVAIL

SINGLE STORY CONFINED MASONRY HOUSE WITH TIMBER ROOF

MAISON DE PLAIN-PIED EN
MAÇONNERIE CHAÎNÉE
AVEC TOITURE EN BOIS

PROJECT / PROJET

POST-EARTHQUAKE RECONSTRUCTION TECHNICAL ASSISTANCE PROGRAM

PROGRAMME D'ASSISTANCE TECHNIQUE À LA
RECONSTRUCTION SUITE AU SÉISME

LOCATION / EMPLACEMENT

HAITI
HAÏTÌ

STRUCTURAL ENGINEER / INGÉNIEUR STRUCTURE

Guy Nordenson and Associates
225 Varick Street 6th Flr
New York NY 10014
Tel 212 766 9119
Fax 212 766 9016

DRAWING TITLE / TITRE DU DESSIN

ROOF DETAILS

DÉTAILS DU TOIT

DRAWN BY / ÉTABLI PAR

SHEET / PLANCHE

CHECKED BY / CONTRÔLÉ PAR

18 / 24

SCALE / ÉCHELLE

DATE / DATE



WORK / TRAVAIL

MAISON DE PLAIN-PIED EN
MAÇONNERIE CHAÎNÉE
AVEC TOITURE EN BOIS

**PROGRAMME D'ASSISTANCE TECHNIQUE À LA
RECONSTRUCTION SUITE AU SÉISME**

HAÏTIAN

Tel 212 766 9119
Fax 212 766 9016

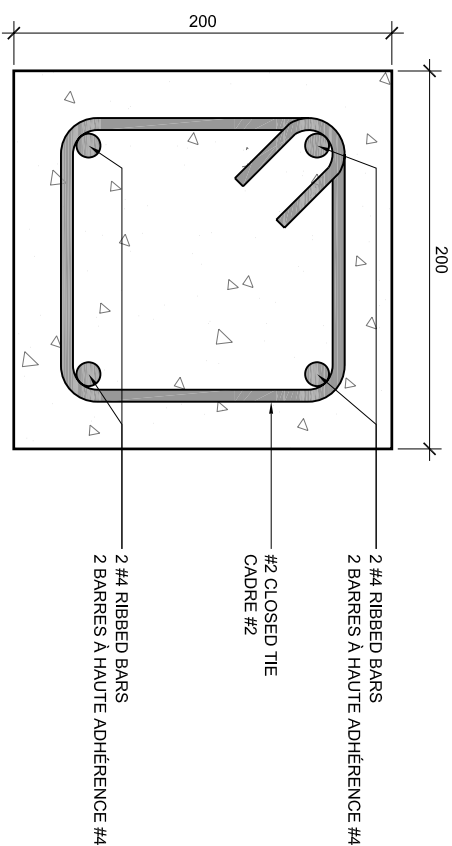
PORCH DETAILS

DÉTAILS DU PORCHE

JB

CHECKED BY / CONTRÔLÉ PAR 19 / 24

SCALE / ÉCHELLE	DATE / DATE
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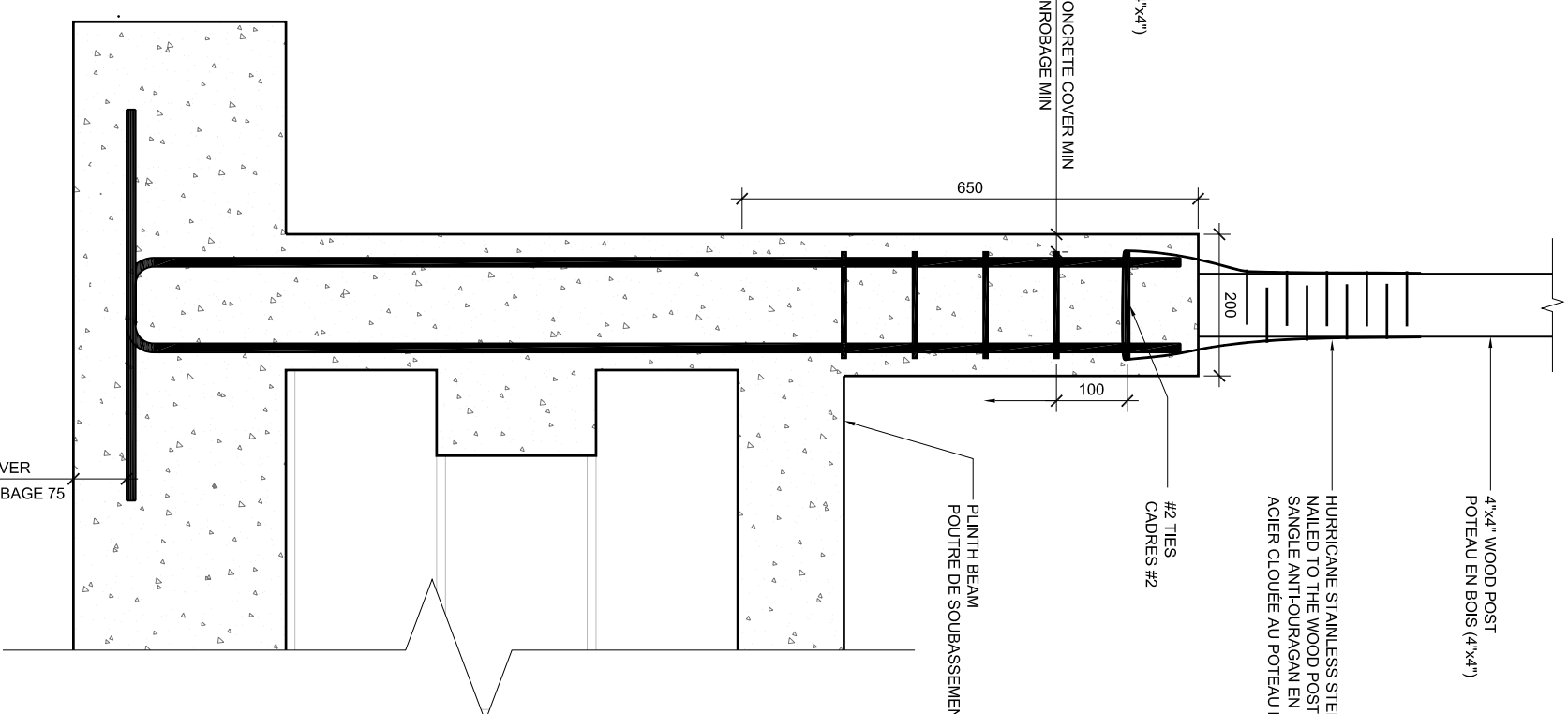


PLAN DETAIL OF CONCRETE POST

REINFORCEMENT (SCALE 1:4)

COUPE DE DÉTAIL : ARMATURES

DU POTEAU EN BÉTON (ÉCHELLE 1:4)

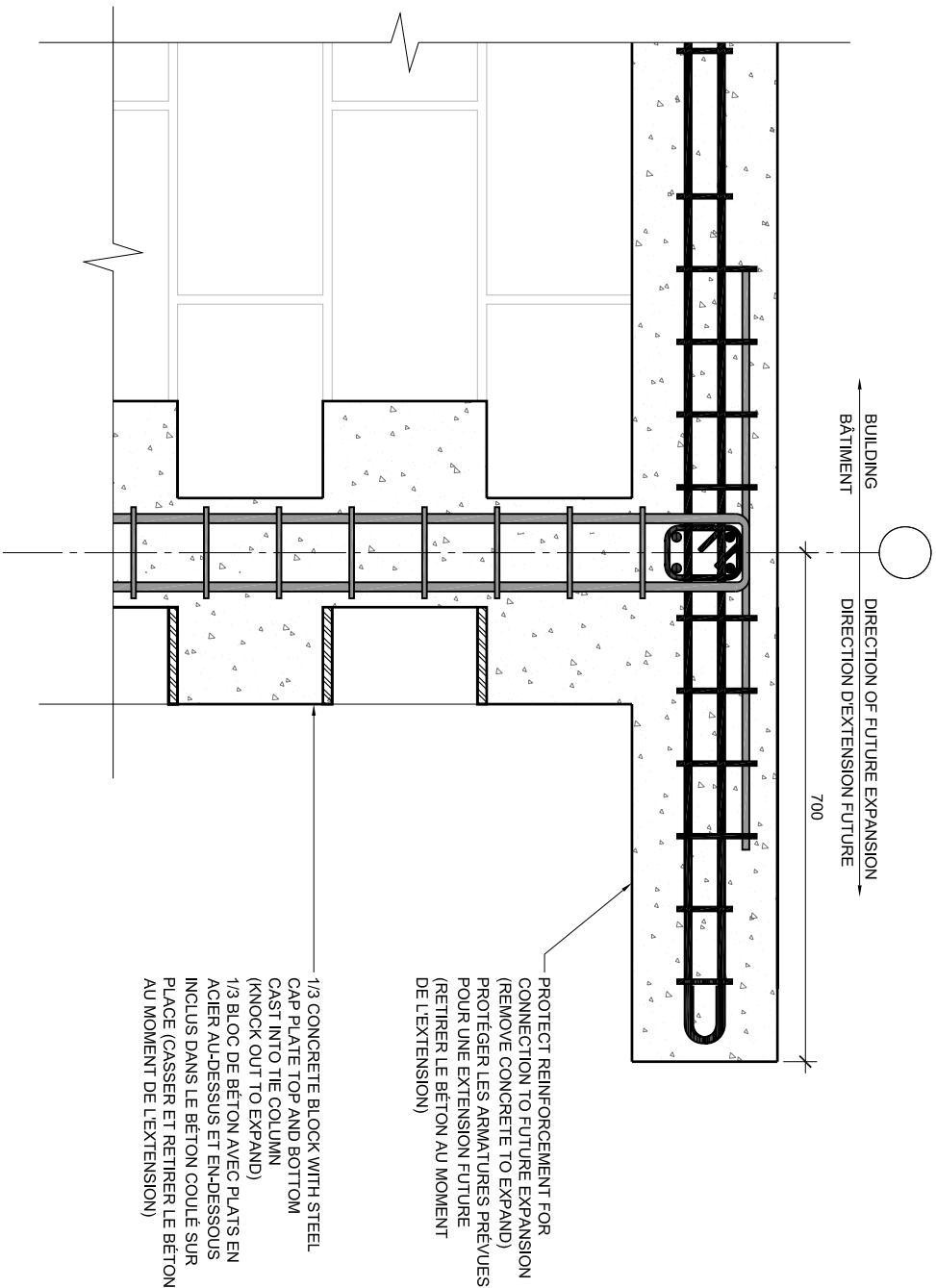


DETAIL OF WOOD POST

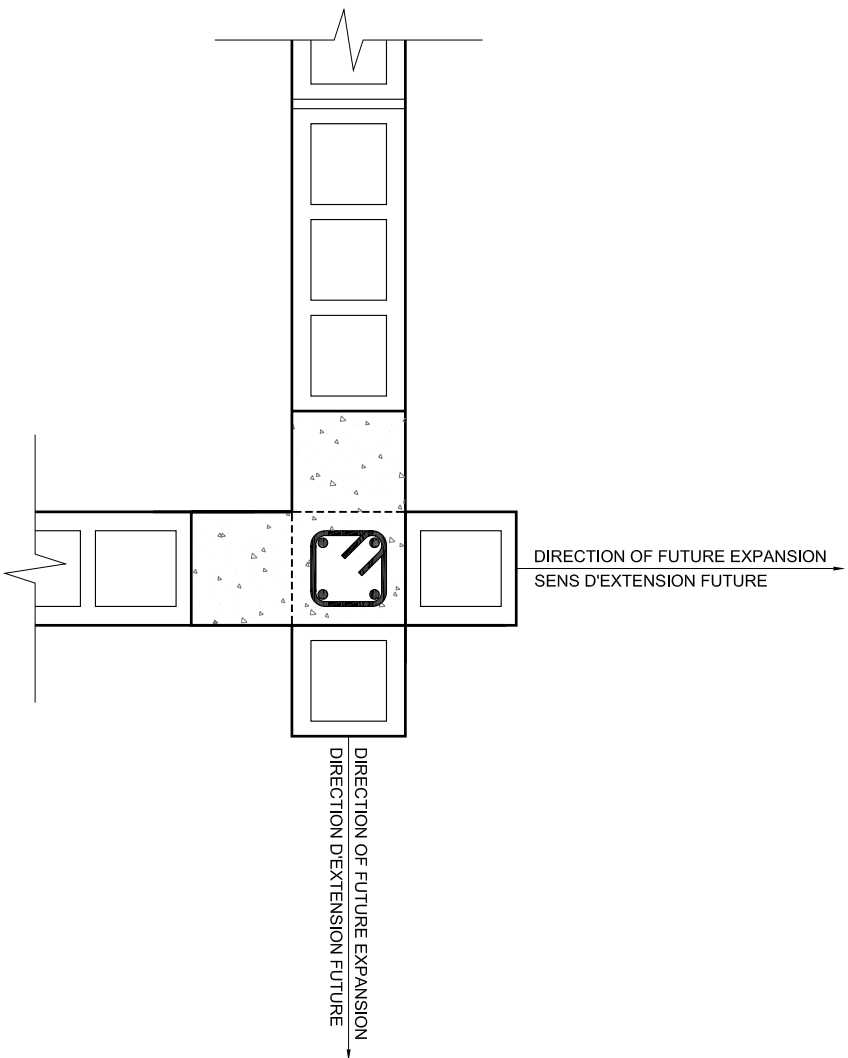
ANCHORAGE (SCALE: 1:10)

DÉTAIL D'ANCRAGE DU POTEAU



EN BOIS (ÉCHELLE 1:10)



HORIZONTAL EXPANSION DETAIL
DÉTAIL D'EXTENSION HORIZONTALE



HORIZONTAL EXPANSION PLAN DETAIL
DÉTAIL D'EXTENSION HORIZONTALE

<div><div><p>FROM THE AMERICAN PEOPLE</p><p>USAID E C A P</p><p><small>USAID E C A P is a proud partner of the U.S. Agency for International Development (USAID) and the U.S. Department of State. A Partnership of Leaders for a Safer, Stronger, and More Resilient World.</small></p></div><div><p>Build Change USA Headquarters 1416 Larimer Street Suite 301 Denver CO 80202 Tel 303 953 2563</p></div></div>		WORK / TRAVAIL	
SINGLE STORY CONFINED MASONRY HOUSE WITH TIMBER ROOF		PROJECT / PROJET	
MAISON DE PLAIN-PIED EN MAÇONNERIE CHÂÎNÉE AVEC TOITURE EN BOIS		POST-EARTHQUAKE RECONSTRUCTION TECHNICAL ASSISTANCE PROGRAM PROGRAMME D'ASSISTANCE TECHNIQUE À LA RECONSTRUCTION SUITE AU SÉISME	
LOCATION / EMPLACEMENT		HAITI HAÏTI	
STRUCTURAL ENGINEER / INGÉNIEUR STRUCTURE		Guy Nordenson and Associates 225 Varick Street 6th Flr New York NY 10014 Tel 212 766 9119 Fax 212 766 9016	
DRAWING TITLE / TITRE DU DESSIN		EXPANSION DETAILS DÉTAILS POUR LES EXTENSIONS FUTURES	
DRAWN BY / ÉTABLI PAR		SHEET / PLANCHE	
CHECKED BY / CONTRÔLÉ PAR		20 / 24	
SCALE / ÉCHELLE		DATE / DATE	
VARIES		2011/10/31	



USAID E C A P
FROM THE AMERICAN PEOPLE
USAID E C A P is pleased to announce a Partnership of Nations for Housing Development Initiatives Group (PDG) and Build Change



Build Change
USA Headquarters
1416 Larimer Street Suite 301
Denver CO 80202
Tel 303 953 2563

WORK / TRAVAIL

SINGLE STORY CONFINED
MASONRY HOUSE WITH
TIMBER ROOF

MAISON DE PLAIN-PIED EN
MAÇONNERIE CHÂÎNÉE
AVEC TOITURE EN BOIS

PROJECT / PROJET

POST-EARTHQUAKE RECONSTRUCTION
TECHNICAL ASSISTANCE PROGRAM
PROGRAMME D'ASSISTANCE TECHNIQUE A LA
RECONSTRUCTION SUITE AU SEISME

LOCATION / EMPLACEMENT

HAITI
HAÏTI

STRUCTURAL ENGINEER / INGÉNIEUR STRUCTURE

Guy Nordenson and Associates
225 Varick Street 6th Flr
New York NY 10014
Tel 212 766 9119
Fax 212 766 9016

DRAWING TITLE / TITRE DU DESSIN

ALTERNATE PLANS

ALTERNATIVES

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SHEET / PLANCHE

CHECKED BY / CONTRÔLÉ PAR

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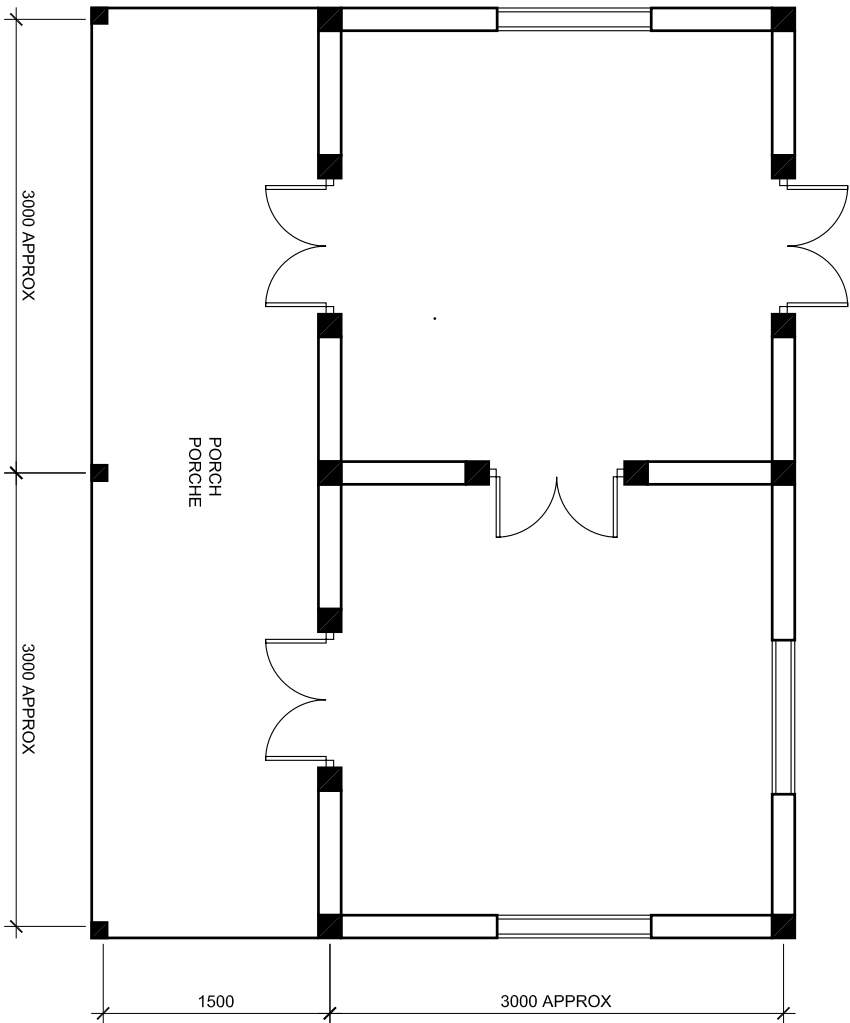
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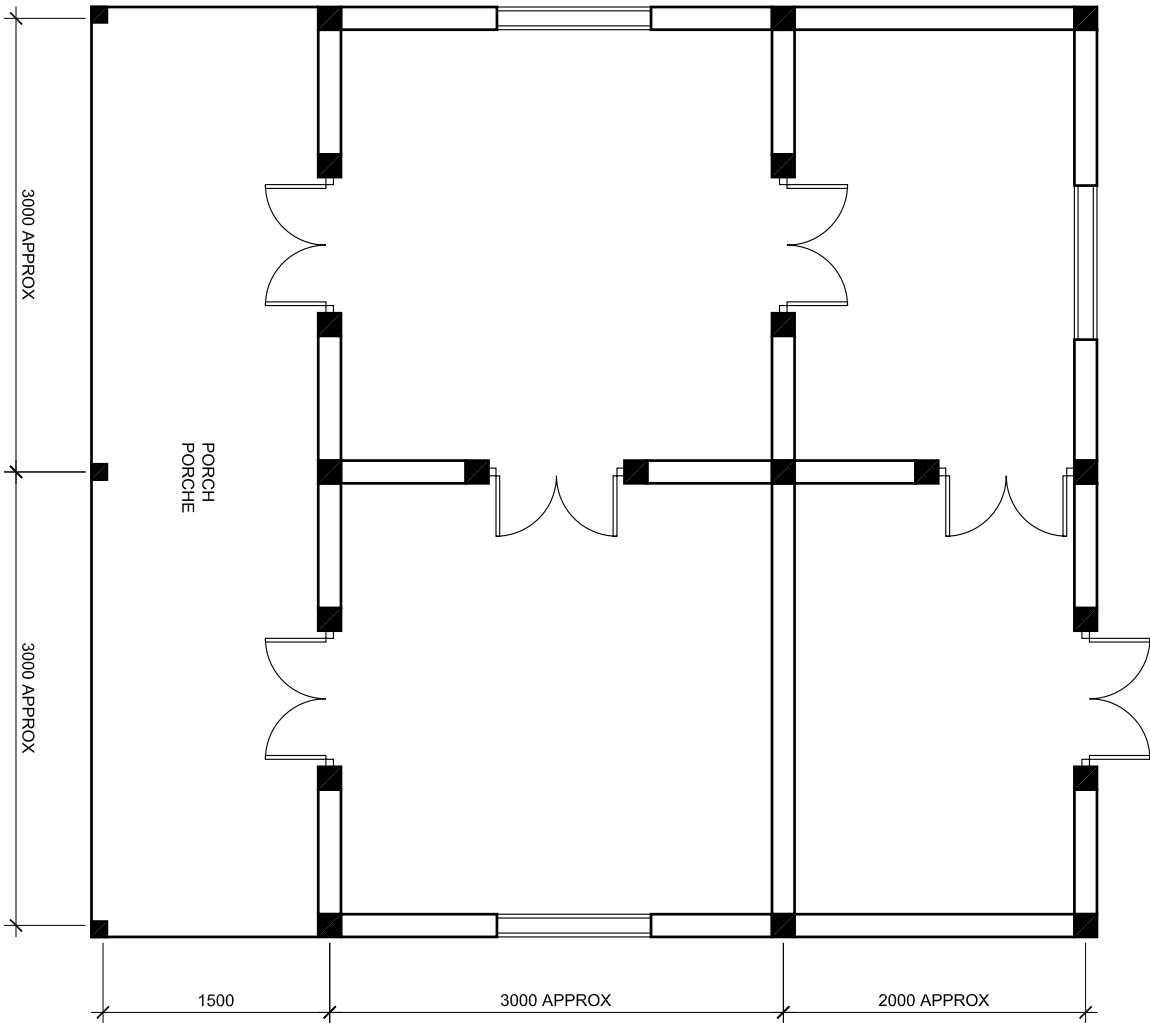
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DATE / DATE

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ALTERNATE LAYOUT A / VARIANTE A



ALTERNATE LAYOUT B / VARIANTE B



USAID E C A P
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USAID E C A P is a U.S. government agency that is authorized to provide U.S. government funds to support development projects in Haiti.
A Partnership of Leaders for Humanity
Development Resources Group (DRG)
and Build Change



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WORK / TRAVAIL

SINGLE STORY CONFINED
MASONRY HOUSE WITH
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MAISON DE PLAIN-PIED EN
MAÇONNERIE CHÂÎNÉE
AVEC TOITURE EN BOIS

PROJECT / PROJET

POST-EARTHQUAKE RECONSTRUCTION
TECHNICAL ASSISTANCE PROGRAM
PROGRAMME D'ASSISTANCE TECHNIQUE A LA
RECONSTRUCTION SUITE AU SEISME

LOCATION / EMPLACEMENT

HAITI
HAITI

STRUCTURAL ENGINEER / INGÉNIEUR STRUCTURE

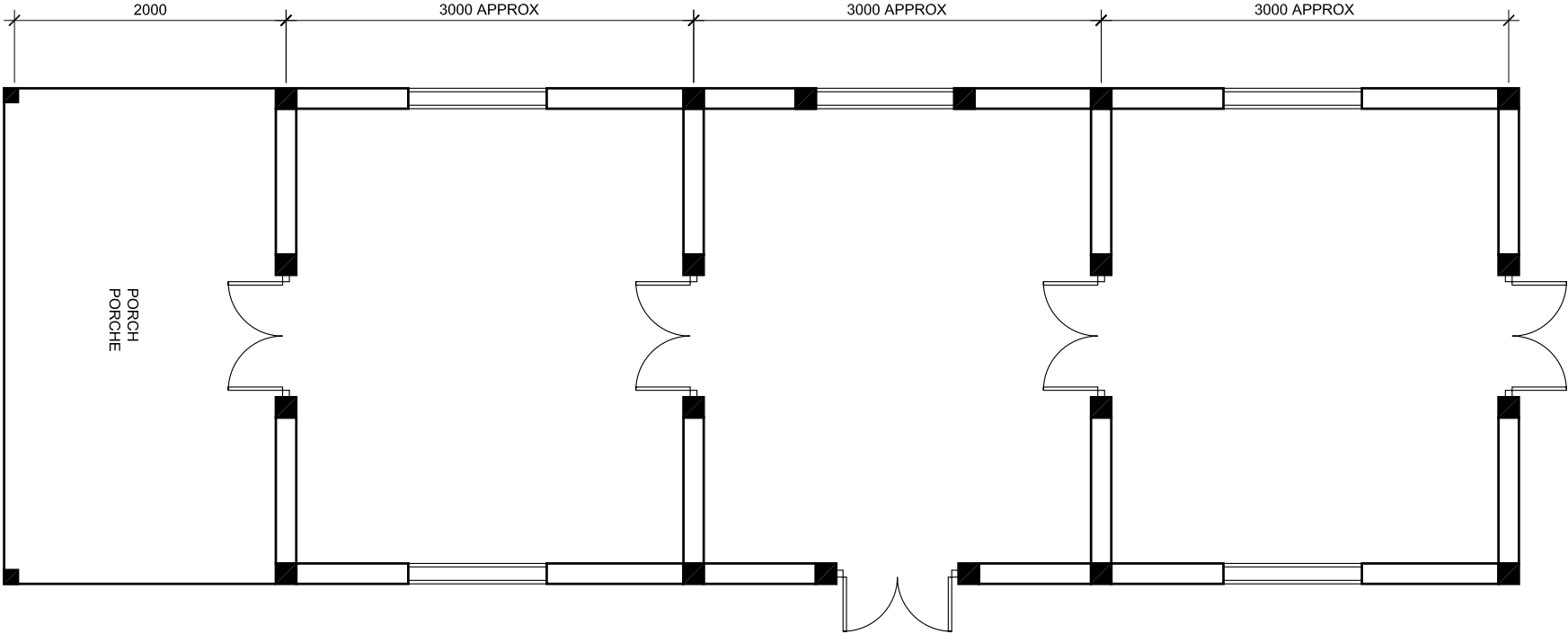
Guy Nordenson and Associates
225 Varick Street 6th Flr
New York NY 10014
Tel 212 766 9119
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DRAWING TITLE / TITRE DU DESSIN

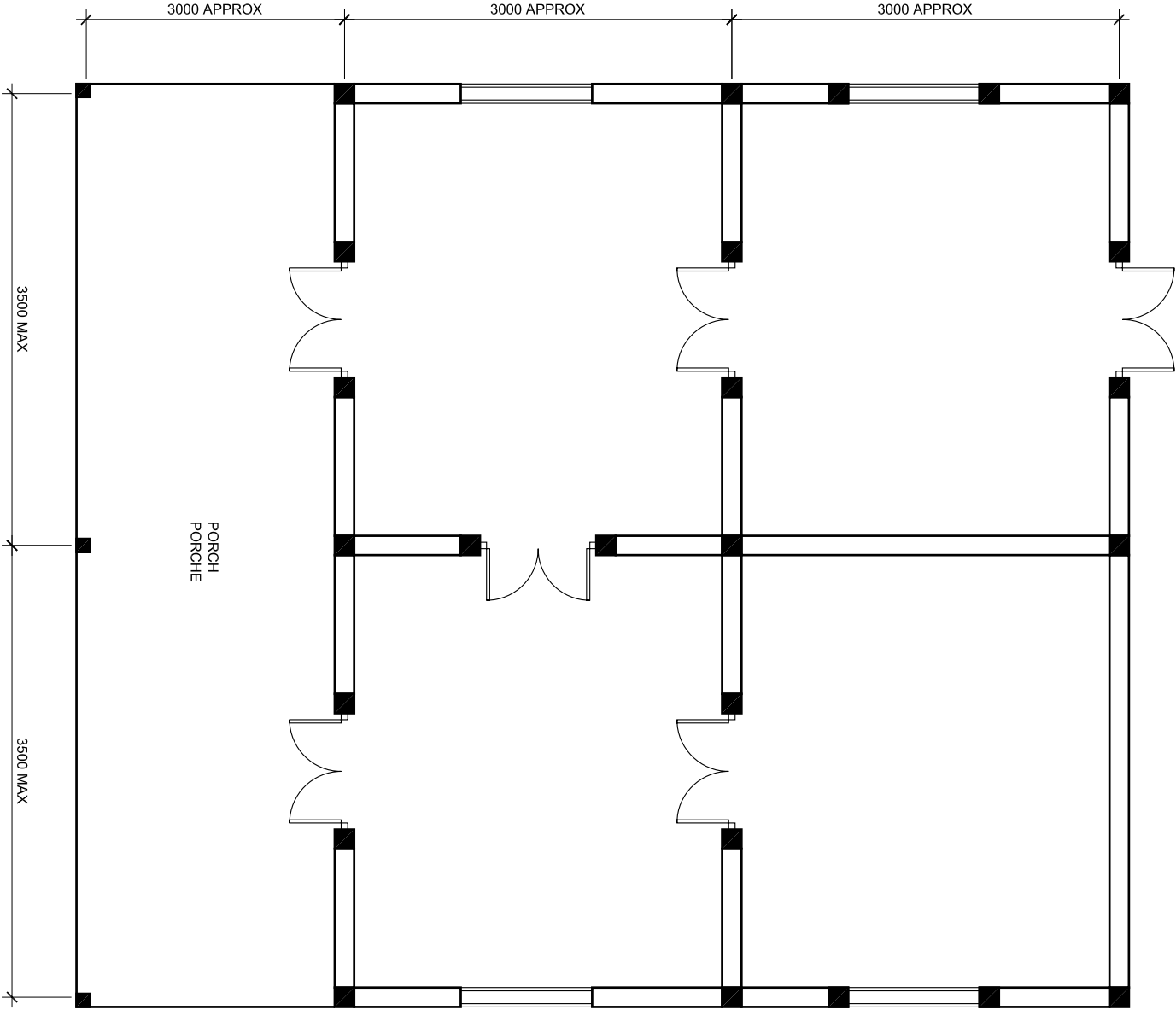
ALTERNATE PLANS

ALTERNATIVES

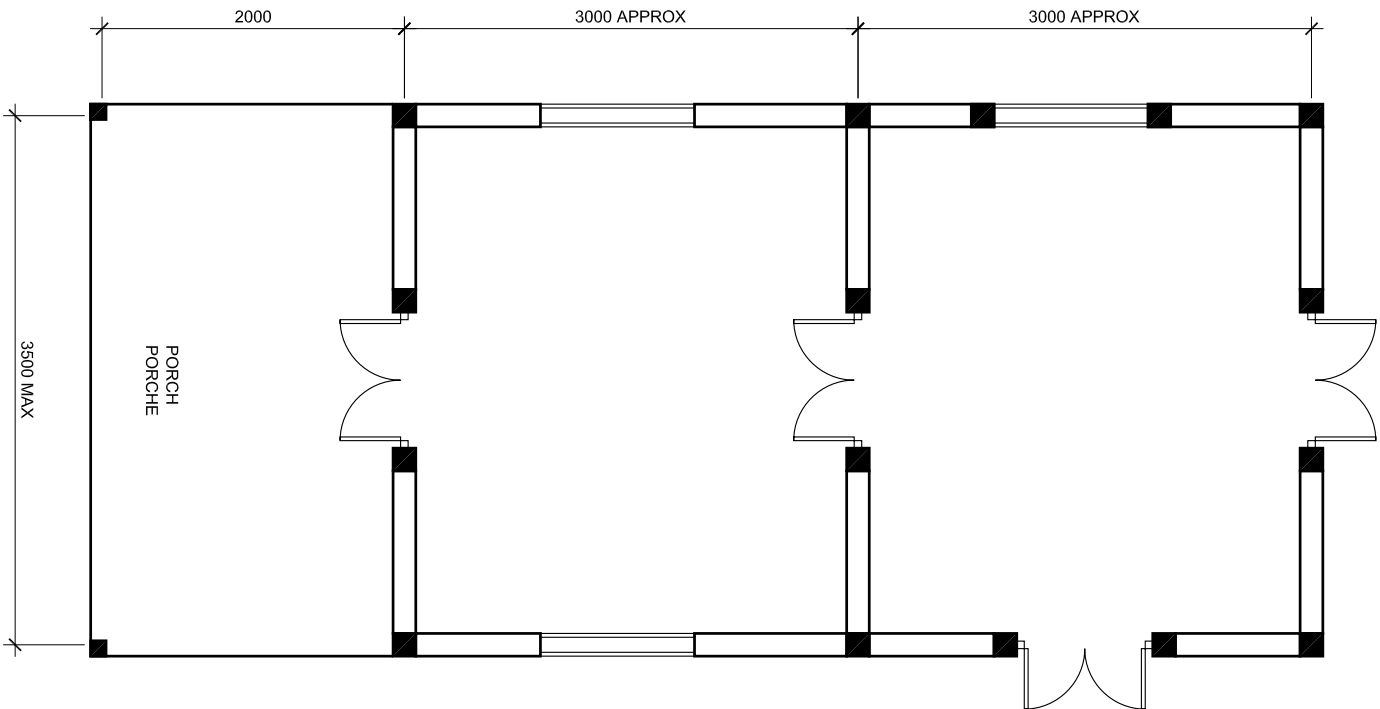
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SCALE / ÉCHELLE	1:50	DATE / DATE
		2011/01/31



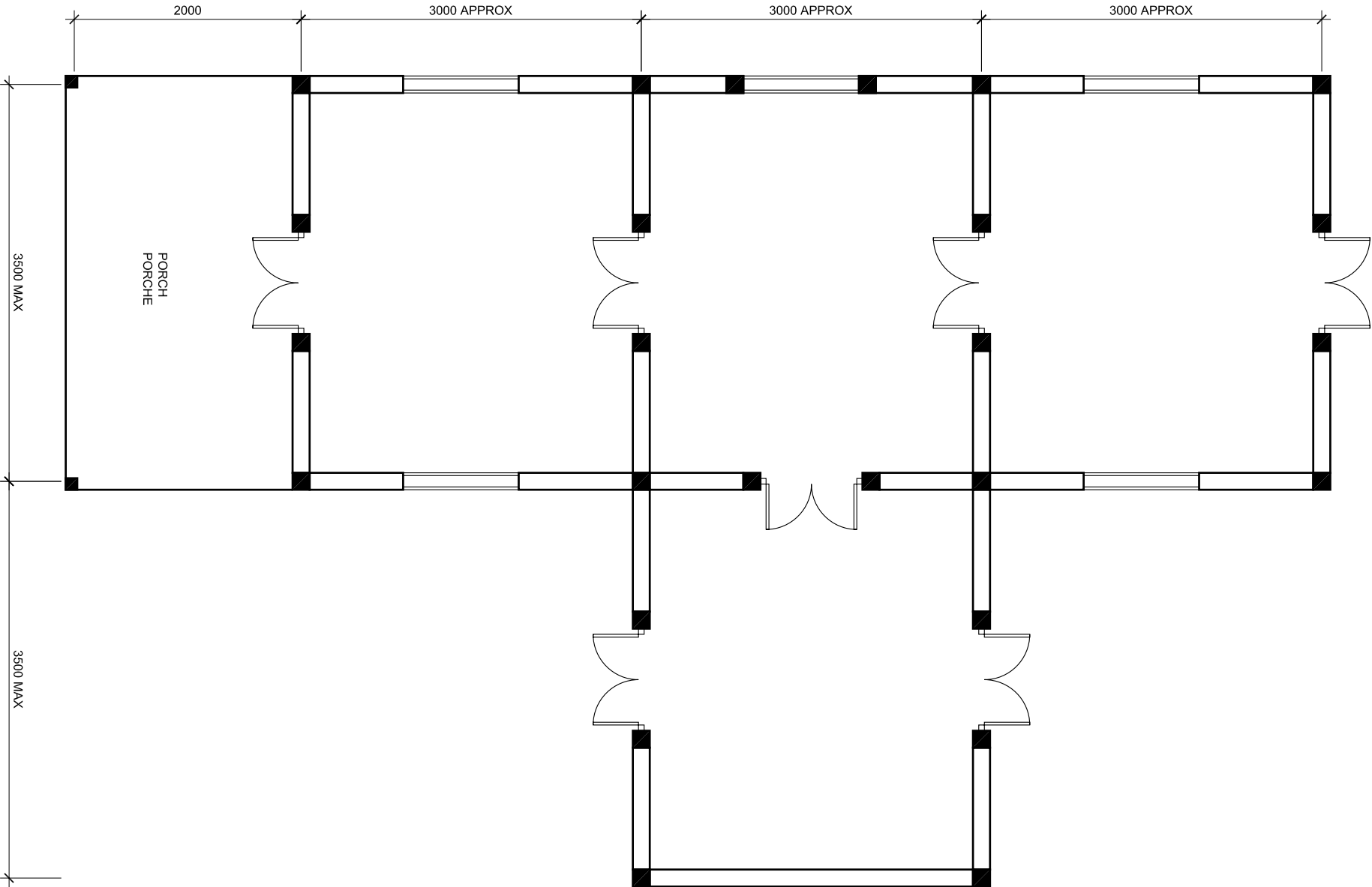
ALTERNATE LAYOUT C / VARIANTE C



ALTERNATE LAYOUT D / VARIANTE D

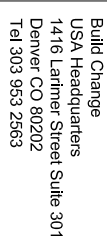


ALTERNATE LAYOUT E / VARIANTE E



ALTERNATE LAYOUT F / VARIANTE F

<div><div><div><div>FROM THE AMERICAN PEOPLE</div><div>USAID E C A P</div><div><small>U.S. Agency for International Development A Partnership of Nations for Humanity Development Resources Group (DRG) and Build Change</small></div></div></div><div><div></div><div><div>Build Change</div><div>USA Headquarters 1416 Larimer Street Suite 301 Denver CO 80202 Tel 303 953 2563</div></div></div></div>	
WORK / TRAVAIL	
<div>SINGLE STORY CONFINED MASONRY HOUSE WITH TIMBER ROOF</div> <div>MAISON DE PLAIN-PIED EN MAÇONNERIE CHAÎNÉE AVEC TOITURE EN BOIS</div>	
PROJECT / PROJET	
<div>POST-EARTHQUAKE RECONSTRUCTION TECHNICAL ASSISTANCE PROGRAM</div> <div>PROGRAMME D'ASSISTANCE TECHNIQUE A LA RECONSTRUCTION SUITE AU SÉISME</div>	
LOCATION / EMPLACEMENT	
<div>HAITI</div> <div>HAÏTI</div>	
STRUCTURAL ENGINEER / INGÉNIEUR STRUCTURE	
<div>Guy Nordenson and Associates 225 Varick Street 6th Flr New York NY 10014 Tel 212 766 9119 Fax 212 766 9016</div>	
DRAWING TITLE / TITRE DU DESSIN	
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SINGLE STORY CONFINED
MASONRY HOUSE WITH
TIMBER ROOF

POST-EARTHQUAKE RECONSTRUCTION
TECHNICAL ASSISTANCE PROGRAM

PROGRAMME D'ASSISTANCE TECHNIQUE À LA
RECONSTRUCTION SUITE AU SÉISME

HAITI
HAÏTI

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New York NY 10014
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Fax 212 766 9016

ALTERNATE PLANS ALTERNATIVES

JB

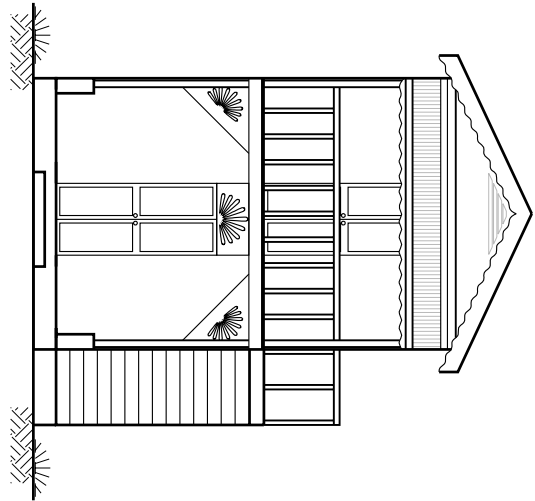
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APPENDIX B

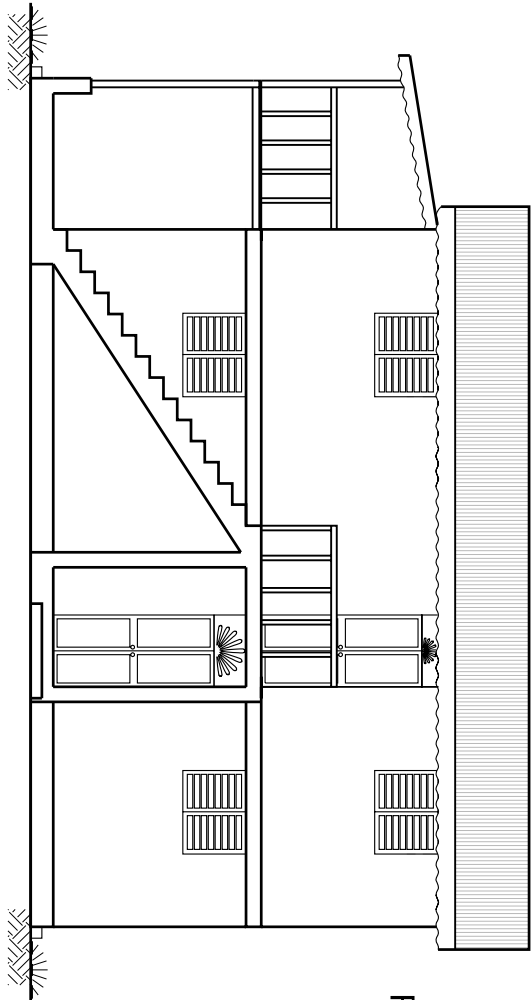
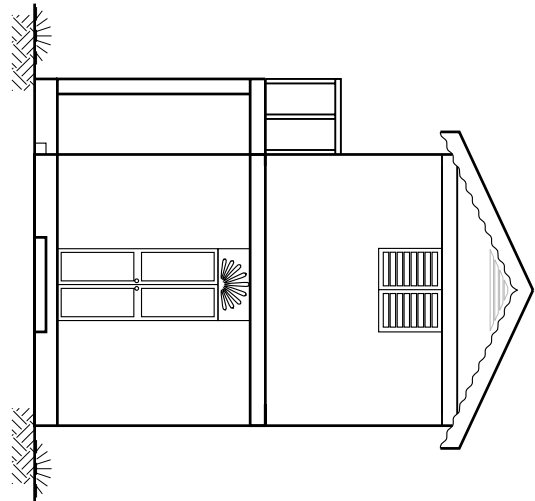
TWO-STORY HOUSE
(OR SINGLE-STORY HOUSE WITH
CONCRETE ROOF)



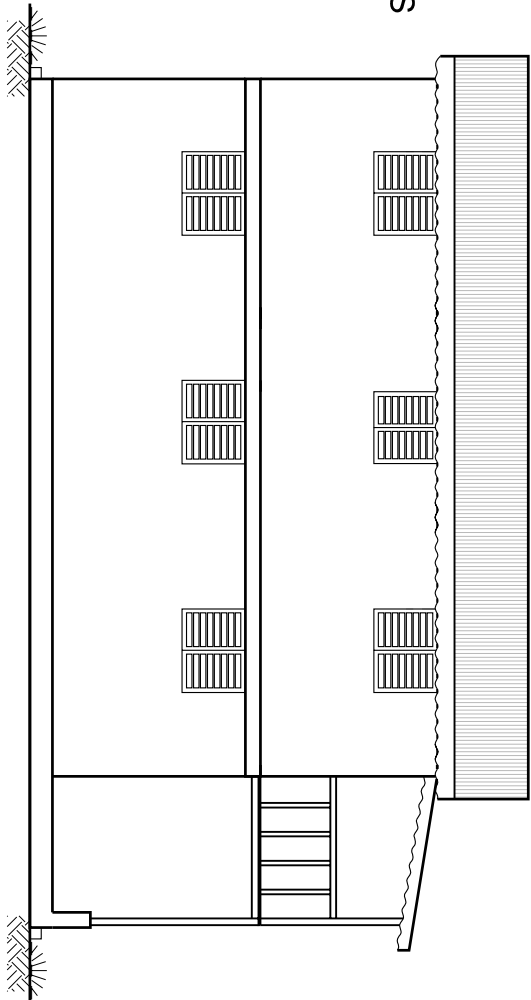
CONSTRUCTION DRAWINGS
DESSINS D'EXÉCUTION

77 M² TWO STORY CONFINED
MASONRY HOUSE
(38.5 M² SINGLE STORY HOUSE
WITH CONCRETE ROOF)

MAISON À UN ÉTAGE EN
(77 M²) MAÇONNERIE CHÂÎNÉE
(MAISON DE PLAIN-PIED AVEC
TOITURE EN BÉTON 38.5 M²)



BUILD CHANGE HOUSING
RECONSTRUCTION PROGRAM
BUILD CHANGE - PROGRAMME DE
RECONSTRUCTION DE LOGEMENTS



1 THE DESIGN REFERENCES BUT DOES NOT NECESSARILY COMPLY WITH ALL REQUIREMENTS OF THE FOLLOWING STANDARDS AND GUIDELINES:
LE DIMENSIONNEMENT S'APPLIQUE SUR LES NORMES ET STANDARDS SUIVANTS MAIS NIEN RESPECTE PAS NECESSAIREMENT TOUTS LES CRITERES :

- PAN AMERICAN HEALTH ORGANIZATION (PAHO) WIND SPEED MAPS FOR THE CARIBBEAN FOR APPLICATION WITH THE WIND LOAD PROVISIONS OF ASCE 7, 2008
- UNITED STATES GEOLOGICAL SURVEY (USGS) DOCUMENTATION FOR INITIAL SEISMIC HAZARD MAPS FOR HAITI, 2010
- UNITED STATES GEOLOGICAL SURVEY (USGS) WORLDWIDE SEISMIC "DESIGN MAPS" WEB APPLICATION, BETA VERSION, 2010
- AMERICAN SOCIETY OF CIVIL ENGINEERS' MINIMUM DESIGN LOADS FOR BUILDINGS AND OTHER STRUCTURES, SEI/ASCE 7-05, 2005
- INTERNATIONAL CODE COUNCIL'S INTERNATIONAL BUILDING CODE (IBC), 2009
- AMERICAN CONCRETE INSTITUTE'S BUILDING CODE REQUIREMENTS FOR MASONRY STRUCTURES (ACI 530-05)
- THE MASONRY SOCIETY'S BUILDING CODE REQUIREMENTS FOR MASONRY STRUCTURES (TMS 602-06), 2008
- ASCE/SEI 41-06 SEISMIC REHABILITATION OF BUILDINGS, WHICH INCLUDES STRUT-AND-TIE PROVISIONS FOR INFILL WALLS
- "OUT OF PLANE RESISTANCE OF CONCRETE MASONRY INFILLED PANELS" BY DAVE AND SEAH, 1988
- "ARCHING OF MASONRY INFILLED FRAMES: COMPARISON OF ANALYTICAL METHODS" BY FLANAGAN AND BENNETT, 1999
- "BEHAVIOR OF CONFINED MASONRY SHEAR WALLS WITH LARGE OPENINGS" BY YANEZ ET AL, 2004
- "SEISMIC DESIGN GUIDE FOR MASONRY BUILDINGS" BY ANDERSON AND BRZEY, CANADIAN CONCRETE MASONRY PRODUCERS ASSOCIATION, 2009
- MEXCAN BUILDING CODES' "COMPLEMENTARY TECHNICAL NORMS FOR DESIGN AND CONSTRUCTION OF MASONRY STRUCTURES"
- AMERICAN CONCRETE INSTITUTE'S BUILDING CODE REQUIREMENTS FOR STRUCTURAL CONCRETE (ACI 318)
- AMERICAN FOREST AND PAPER ASSOCIATION WOOD FRAME CONSTRUCTION MANUAL FOR ONE AND TWO-FAMILY DWELLINGS (WFCM-01), 2001
- AMERICAN FOREST AND PAPER ASSOCIATION NATIONAL DESIGN SPECIFICATION FOR WOOD CONSTRUCTION WITH 2005 SUPPLEMENT (NDS-05), 2005
- AMERICAN FOREST AND PAPER ASSOCIATION SPECIAL DESIGN PROVISIONS FOR WIND AND SEISMIC (ANSI/AF&PA SDPWS-08), 2008

2 THE MATERIALS USED FOR CONSTRUCTION SHALL BE IN ACCORDANCE WITH THE FOLLOWING:
LES MATERIAUX UTILISES POUR LA CONSTRUCTION DOIVENT VERIFIER LES CRITERES SUIVANTS:



- CONCRETE BLOCKS: 6.9 MPA (1000 PSI) OR 11.7 MPA (1700 PSI) (SEE NOTE 4 FOR MORE INFORMATION)
- BLOCS DE BÉTON : 6.9 MPA (1000 PSI) OU 11.7 MPA (1700 PSI) (VOIR INFORMATIONS SUPPLÉMENTAIRES CI-DESSOUS)
- CAST-IN-PLACE CONCRETE (CONFINING ELEMENTS AND ROOF): 21 MPA (3000 PSI) MINIMUM COMPRESSIVE STRENGTH
- BÉTON COULÉ SUR PLACE (ÉLÉMENTS DE CHÂÎNAGE ET TOIT) : RÉSISTANCE À LA COMPRESSION 21MPA (3000 PSI) MINIMUM
- CAST-IN-PLACE CONCRETE (FOUNDATION AND GROUND SLAB): 15 MPA (2200 PSI) MINIMUM COMPRESSIVE STRENGTH
- BÉTON COULÉ EN PLACE (FONDATION ET DALLE DE SOL) : RÉSISTANCE À LA COMPRESSION 21MPA (3000 PSI) MINIMUM
- MORTAR: 17.2 MPA (2500 PSI) MINIMUM COMPRESSIVE STRENGTH
- MORTIER : RÉSISTANCE À LA COMPRESSION 17.2 MPA (2500 PSI) MINIMUM
- GROUT : 13.8 MPA (2000 PSI) MINIMUM COMPRESSIVE STRENGTH
- COULIS : RÉSISTANCE À LA COMPRESSION 13.8 MPA (2000 PSI) MINIMUM
- PLASTER: 17.2 MPA (2500 PSI) MINIMUM COMPRESSIVE STRENGTH
- PLÂTRE : RÉSISTANCE À LA COMPRESSION 17.2 MPA (2500 PSI) MINIMUM
- STEEL REINFORCEMENT: GRADE 60 RIBBED BARS
- ARMATURES EN ACIER : BARRES À HAUTE ADHÉRENCE (NON LISSES) NUANCE 60KSI
- TIMBER: VISUALLY GRADED SOUTHERN PINE NO. 2
- BOIS : PIN DU SUD CLASSÉ VISUELLEMENT EN CATÉGORIE 2
- CORRUGATED GALVANIZED IRON (CGI) ROOFING PANELS
- PANNEAUX DE TÔLE ONDULÉE EN ACIER GALVANISÉ
- STAINLESS STEEL CONNECTION STRAPS: 227 MPA (33 KSI) MINIMUM YIELD STRENGTH
- SANGLES EN ACIER INOXYDABLE : LIMITE D'ÉLASTICITÉ 227 MPA (33KSI) MINIMUM

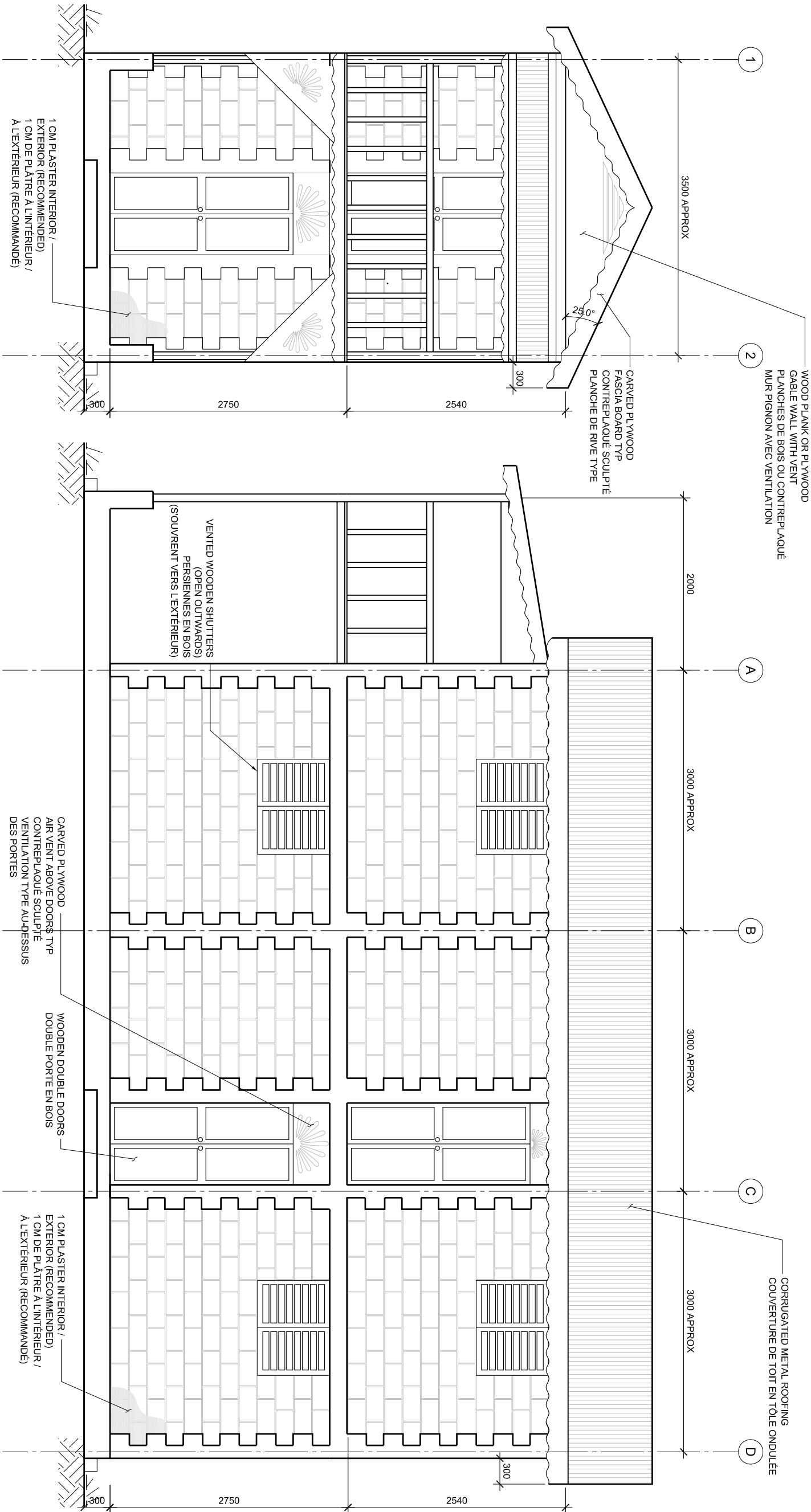
3 THE DESIGN IS IN ACCORDANCE WITH THE FOLLOWING LOAD CRITERIA:
LE DIMENSIONNEMENT PERMET DE RÉSISTER AUX CHARGEMENTS SUIVANTS :

- LIVE LOAD: 2.4 KN/M² (50 PSF) ON THE FLOOR
1.0 KN/M² (20 PSF) ON THE ROOF
CHARGE D'EXPLOITATION : 2.4 KN/M² (50 PSF) AU SOL
1.0 KN/M² (20 PSF) SUR LE TOIT
- WIND: EXPOSURE CATEGORY C
IMPORTANCE FACTOR: 1.0
BASIC WIND SPEED: 119 MPH
CHARGES DE VENT : CATÉGORIE D'EXPOSITION C
FACTEUR D'IMPORTANCE : 1.0
VITESSE DE VENT DE BASE : 119 MPH
- SEISMIC:
SHORT PERIOD DESIGN SPECTRAL RESPONSE ACCELERATION (SDS): 1.05G (SEE NOTE 4)
1.67G (SEE NOTE 4)

4 THE SEISMIC RESISTANCE OF THE DESIGN IS DEPENDANT UPON THE STRENGTH OF CONCRETE BLOCK USED. TO ACHIEVE A RESISTANCE OF SDS = 1.67G, 11.7 MPA (1700 PSI) BLOCK IS REQUIRED. TO ACHIEVE A RESISTANCE OF SDS = 1.05G, 6.9MPA (1000 PSI) BLOCK IS REQUIRED.

LA RÉSISTANCE AU SÉISME DU DIMENSIONNEMENT DÉPEND DE LA RÉSISTANCE À LA COMPRESSION DES BLOCS UTILISÉS. POUR RÉSISTER AUX ACCÉLÉRATIONS SDS = 1.67G, IL EST NÉCESSAIRE D'UTILISER DES BLOCS DE 11.7 MPA (1700 PSI) DE RÉSISTANCE. POUR RÉSISTER AUX ACCÉLÉRATIONS SDS = 1.05G, IL EST NÉCESSAIRE D'UTILISER DES BLOCS DE 6.9 MPA (1000 PSI) DE RÉSISTANCE.

<div><div><p>FROM THE AMERICAN PEOPLE</p></div><div><p>Build Change USA Headquarters 1416 Larimer Street Suite 301 Denver CO 80202 Tel 303 953 2563</p></div><div></div></div>		<p>WORK / TRAVAIL</p> <p>TWO STORY CONFINED MASONRY HOUSE (SINGLE STORY HOUSE WITH CONCRETE ROOF)</p> <p>MAISON À UN ÉTAGE EN MAÇONNERIE CHÂÎNÉE (MAISON DE PLAIN-PIED AVEC TOITURE EN BÉTON)</p>	
<p>PROJECT / PROJET</p> <p>POST-EARTHQUAKE RECONSTRUCTION TECHNICAL ASSISTANCE PROGRAM</p> <p>PROGRAMME D'ASSISTANCE TECHNIQUE À LA RECONSTRUCTION SUITE AU SÉISME</p>		<p>LOCATION / EMPLACEMENT</p> <p>HAITI HAÏTI</p>	
<p>STRUCTURAL ENGINEER / INGÉNIEUR STRUCTURE</p> <p>Guy Nordenson and Associates 225 Varick Street 6th Flr New York NY 10014 Tel 212 766 9119 Fax 212 766 9016</p>		<p>DRAWING TITLE / TITRE DU DESSIN</p> <p>GENERAL NOTES</p> <p>NOTES GÉNÉRALES</p>	
<p>DRAWN BY / ÉTABLI PAR</p> <p>JB</p>		<p>SHEET / PLANCHE</p> <p>1 / 31</p>	
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<p>SCALE / ÉCHELLE</p> <p>1:100</p>			






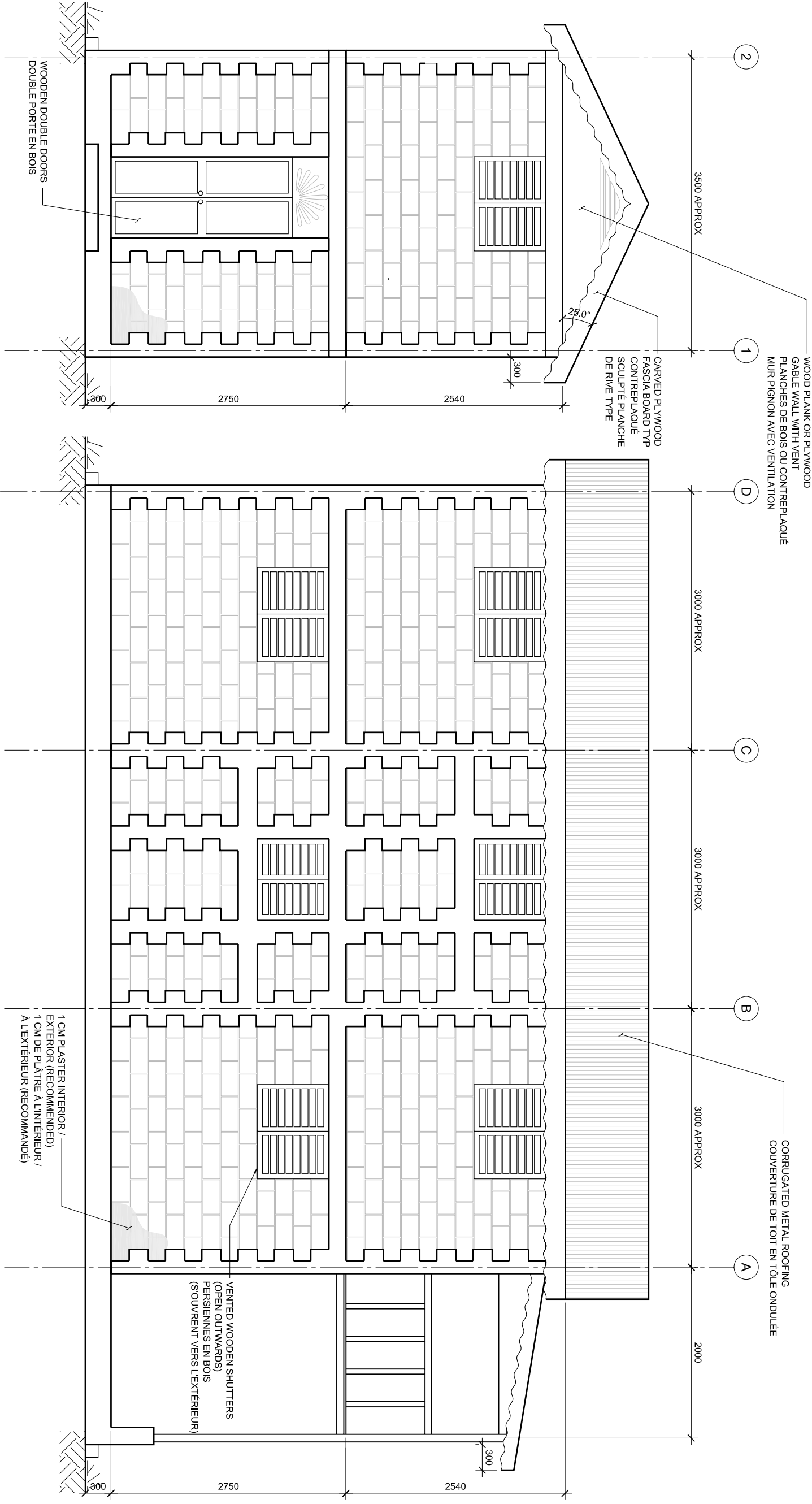
FRONT ELEVATION
FAÇADE AVANT

NOTE: STAIRS NOT SHOWN (REFER TO SHEETS 25-26)
NOTE : LES ESCALIERS NE SONT PAS REPRÉSENTÉS (VOIR PLANCHES 25-26)

RIGHT ELEVATION
VUE DE DROITE

NOTE: STAIRS NOT SHOWN (REFER TO SHEETS 25-26)
NOTE : LES ESCALIERS NE SONT PAS REPRÉSENTÉS (VOIR PLANCHES 25-26)

<div><div><div>FROM THE AMERICAN PEOPLE</div></div><div><div><div>USAID E C A P</div></div><div><div>USAID E C A P</div><div>U.S. Agency for International Development</div></div></div></div>		<div><div><div>build change</div></div><div><div>Build Change</div><div>USA Headquarters</div><div>1416 Larimer Street Suite 301</div><div>Denver CO 80202</div><div>Tel 303 953 2563</div></div></div>		<div>WORK / TRAVAIL</div> <div><div>TWO STORY CONFINED MASONRY HOUSE (SINGLE STORY HOUSE WITH CONCRETE ROOF)</div><div>MAISON À UN ÉTAGE EN MAÇONNERIE CHÂÎNÉE (MAISON DE PLAIN-PIED AVEC TOITURE EN BÉTON)</div></div>
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D
BACK ELEVATION
FAÇADE ARRIÈRE

NOTE: STAIRS NOT SHOWN (REFER TO SHEETS 25-26)
NOTE : LES ESCALIERS NE SONT PAS REPRÉSENTÉS (VOIR PLANCHES 25-26)

1
LEFT ELEVATION
VUE DE GAUCHE

NOTE: STAIRS NOT SHOWN (REFER TO SHEETS 25-26)
NOTE : LES ESCALIERS NE SONT PAS REPRÉSENTÉS (VOIR PLANCHES 25-26)

STRUCTURAL ENGINEER / INGÉNIEUR STRUCTURE

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225 Varck Street 6th Flr
New York NY 10014
Tel 212 766 9119
Fax 212 766 9016

DRAWING TITLE / TITRE DU DESSIN

HOUSE ELEVATIONS
ÉLÉVATIONS

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FROM THE AMERICAN PEOPLE

USAID E C A P

USAID E C A P is a partnership between the U.S. Agency for International Development and the American People. It is a partnership of resources for housing, development, education, and health change.

Build Change
USA Headquarters
1416 Larimer Street Suite 301
Denver CO 80202
Tel 303 953 2563

**TWO STORY CONFINED
MASONRY HOUSE
(SINGLE STORY HOUSE
WITH CONCRETE ROOF)**



**MAISON À UN ÉTAGE EN
MAÇONNERIE CHÂÎNÉE
(MAISON DE PLAIN-PIED
AVEC TOITURE EN BÉTON)**

PROJECT / PROJET

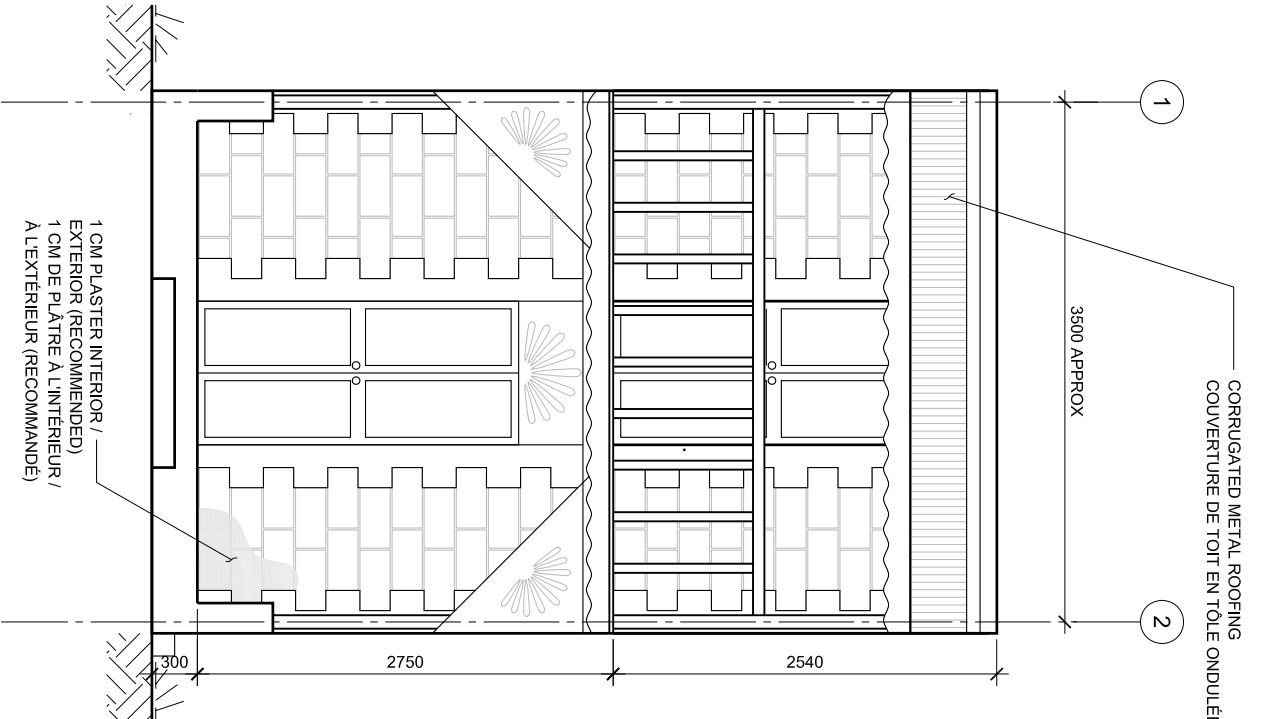
POST-EARTHQUAKE RECONSTRUCTION
TECHNICAL ASSISTANCE PROGRAM
PROGRAMME D'ASSISTANCE TECHNIQUE À LA
RECONSTRUCTION SUITE AU SÉISME

LOCATION / EMPLACEMENT

HAITI
HAITI

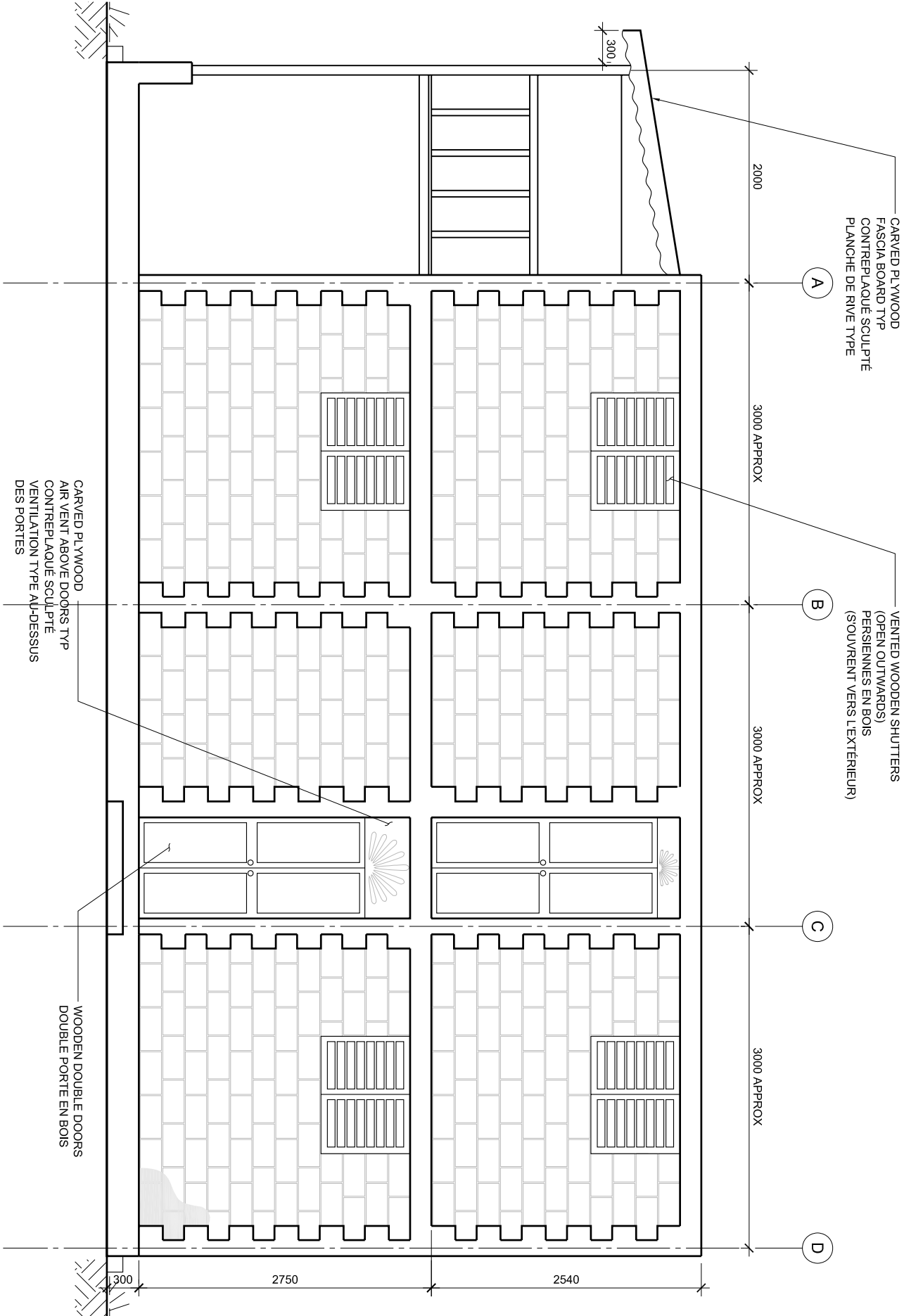
<div><div><div><div>FROM THE AMERICAN PEOPLE</div><div>USAID E C A P</div><div><small>USAID E C A P assistance is made possible by the American people through the U.S. Agency for International Development. USAID E C A P is a partnership of USAID and the U.S. Agency for International Development. USAID E C A P is a partnership of USAID and the U.S. Agency for International Development.</small></div></div></div><div></div><div><div>Build Change</div><div>USA Headquarters 1416 Larimer Street Suite 301 Denver CO 80202 Tel 303 953 2563</div></div></div>			<div>WORK / TRAVAIL</div> <div>TWO STORY CONFINED MASONRY HOUSE (SINGLE STORY HOUSE WITH CONCRETE ROOF)</div> <div>MAISON À UN ÉTAGE EN MAÇONNERIE CHÂÎNÉE (MAISON DE PLAIN-PIED AVEC TOITURE EN BÉTON)</div>	
<div>PROJECT / PROJET</div> <div>POST-EARTHQUAKE RECONSTRUCTION TECHNICAL ASSISTANCE PROGRAM</div> <div>PROGRAMME D'ASSISTANCE TECHNIQUE À LA RECONSTRUCTION SUITE AU SÉISME</div>			<div>LOCATION / EMPLACEMENT</div> <div>HAÏTI</div> <div>HAÏTI</div>	
<div>STRUCTURAL ENGINEER / INGÉNIEUR STRUCTURE</div> <div>Guy Nordenson and Associates 225 Varick Street 6th Fl New York NY 10014 Tel 212 766 9119 Fax 212 766 9016</div>			<div>FRONT ELEVATION</div> <div>FAÇADE AVANT</div>	
<div>DRAWING TITLE / TITRE DU DESSIN</div> <div>ALTERNATE HOUSE ELEVATIONS</div> <div>AUTRES ÉLÉVATIONS</div>			<div>RIGHT ELEVATION</div> <div>VUE DE DROITE</div>	
<div>DRAWN BY / ÉTABLI PAR</div> <div>JB</div> <div>CHECKED BY / CONTRÔLÉ PAR</div> <div>RL / EO</div> <div>SCALE / ÉCHELLE</div> <div>1:50</div>			<div>SHEET / PLANCHE</div> <div>4 / 31</div> <div>DATE / DATE</div> <div>2011/01/31</div>	

 || FRONT ELEVATION FAÇADE AVANT | RIGHT ELEVATION VUE DE DROITE |
| SINGLE-STORY HOUSE WITH CONCRETE ROOF MAISON DE PLAIN-PIED AVEC TOITURE EN BÉTON | | | | |---------------------------------|-----------------| | DRAWING TITLE / TITRE DU DESSIN | | | ALTERNATE HOUSE ELEVATIONS | | | AUTRES ÉLÉVATIONS | | | DRAWN BY / ÉTABLI PAR | SHEET / PLANCHE | | CHECKED BY / CONTRÔLÉ PAR | 4 / 31 | | SCALE / ÉCHELLE | DATE / DATE | | 1:50 | 2011/01/31 | |



A
FRONT ELEVATION
FAÇADE AVANT



NOTE: STAIRS NOT SHOWN (REFER TO SHEETS 25-26)
NOTE : LES ESCALIERS NE SONT PAS REPRÉSENTÉS (VOIR PLANCHES 25-26)

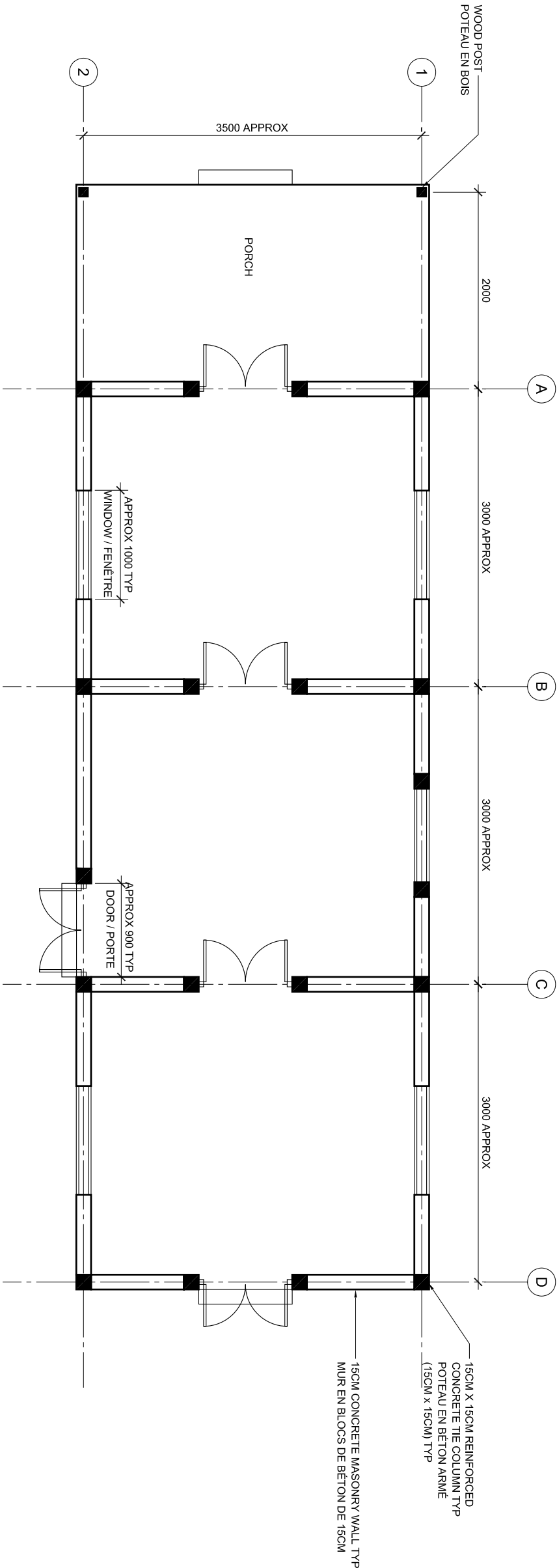


2
RIGHT ELEVATION
VUE DE DROITE

NOTE: STAIRS NOT SHOWN (REFER TO SHEETS 25-26)
NOTE : LES ESCALIERS NE SONT PAS REPRÉSENTÉS (VOIR PLANCHES 25-26)

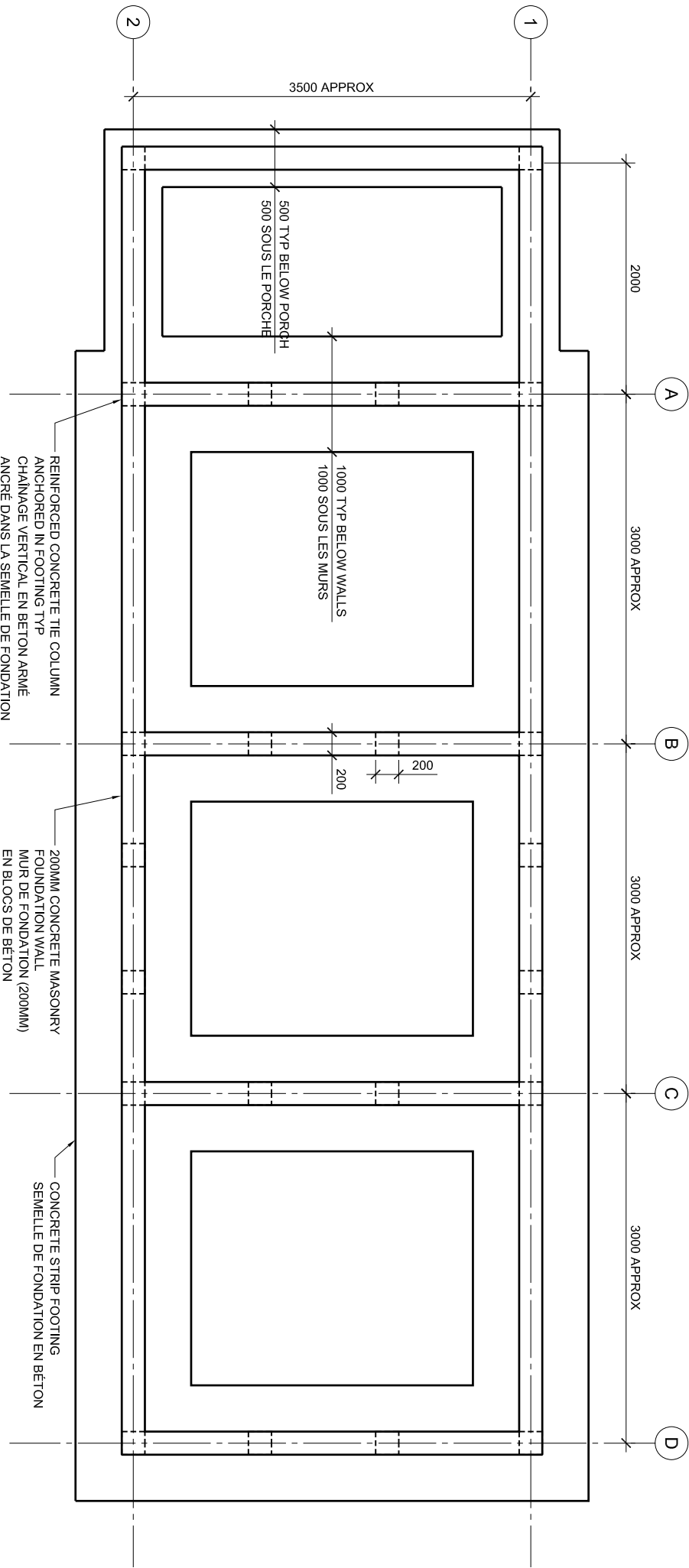
TWO-STORY HOUSE WITH CONCRETE ROOF
MAISON À UN ÉTAGE AVEC TOITURE EN BÉTON

<div><div><div><div>FROM THE AMERICAN PEOPLE</div><div>USAID E C A P</div><div><small>USAID E C A P is a registered trademark of the U.S. Agency for International Development. A Partnership of Nations for a Safer, Stronger, and Better World.</small></div></div></div></div>		<div><div></div><div><div>Build Change</div><div>USA Headquarters</div><div>1416 Larimer Street Suite 301</div><div>Denver CO 80202</div><div>Tel 303 953 2563</div></div></div>	
<div><div>WORK / TRAVAIL</div><div><div>TWO STORY CONFINED MASONRY HOUSE (SINGLE STORY HOUSE WITH CONCRETE ROOF)</div><div>MAISON À UN ÉTAGE EN MAÇONNERIE CHÂÎNÉE (MAISON DE PLAIN-PIED AVEC TOITURE EN BÉTON)</div></div></div>		<div><div>PROJECT / PROJET</div><div><div>POST-EARTHQUAKE RECONSTRUCTION TECHNICAL ASSISTANCE PROGRAM</div><div>PROGRAMME D'ASSISTANCE TECHNIQUE À LA RECONSTRUCTION SUITE AU SÉISME</div></div></div>	
<div><div>LOCATION / EMPLACEMENT</div><div><div>HAITI</div><div>HAÏTI</div></div></div>		<div><div>STRUCTURAL ENGINEER / INGÉNIEUR STRUCTURE</div><div><div>Guy Nordenson and Associates</div><div>225 Varick Street 6th Fl</div><div>New York NY 10014</div><div>Tel 212 766 9119</div><div>Fax 212 766 9016</div></div></div>	
<div><div>DRAWING TITLE / TITRE DU DESSIN</div><div><div>ALTERNATE HOUSE ELEVATIONS</div><div>AUTRES ÉLÉVATIONS</div></div></div>		<div><div>DRAWN BY / ÉTABLI PAR</div><div><div>JB</div><div>SHEET / PLANCHE</div></div></div>	
<div><div>CHECKED BY / CONTRÔLÉ PAR</div><div><div>RL / EO</div><div>5 / 31</div></div></div>		<div><div>SCALE / ÉCHELLE</div><div><div>1:50</div><div>DATE / DATE</div></div></div>	
		<div><div>2011/10/31</div></div>	



LAYOUT / PLAN

NOTE: STAIRS NOT SHOWN (REFER TO SHEETS 25-26)
NOTE : LES ESCALIERS NE SONT PAS REPRÉSENTÉS (VOIR PLANCHES 25-26)



FOUNDATION PLAN / PLAN DES FONDATIONS

NOTE: FOUNDATIONS FOR STAIRS NOT SHOWN
NOTE : LES FONDATIONS DES ESCALIERS NE SONT PAS REPRÉSENTÉES



Build Change
USA Headquarters
1416 Larimer Street Suite 301
Denver CO 80202
Tel 303 953 2563

WORK / TRAVAIL

TWO STORY CONFINED
MASONRY HOUSE
(SINGLE STORY HOUSE
WITH CONCRETE ROOF)

MAISON À UN ÉTAGE EN
MAÇONNERIE CHÂÎNÉE
(MAISON DE PLAIN-PIED
AVEC TOITURE EN BÉTON)

PROJECT / PROJET

POST-EARTHQUAKE RECONSTRUCTION
TECHNICAL ASSISTANCE PROGRAM
PROGRAMME D'ASSISTANCE TECHNIQUE À LA
RECONSTRUCTION SUITE AU SÉISME

LOCATION / EMPLACEMENT

HAITI
HAÏTI

STRUCTURAL ENGINEER / INGÉNIEUR STRUCTURE

Guy Nordenson and Associates
225 Varick Street 6th Flr
New York NY 10014
Tel 212 766 9119
Fax 212 766 9016

DRAWING TITLE / TITRE DU DESSIN

LAYOUT AND FOUNDATION
PLAN
PLAN ET PLAN DES
FONDATIONS

DRAWN BY / ÉTABLI PAR

SHEET / PLANCHE

CHECKED BY / CONTRÔLÉ PAR

RL / EO

6 / 31

SCALE / ÉCHELLE

1:50

DATE / DATE

2011/01/31



USAID E C A P
FROM THE AMERICAN PEOPLE
USAID E C A P is pleased to announce a Partnership of Nations for Housing Development, Resilience Group (PDG) and Build Change



Build Change
USA Headquarters
1416 Larimer Street Suite 301
Denver CO 80202
Tel 303 953 2563

WORK / TRAVAIL

TWO STORY CONFINED
MASONRY HOUSE
(SINGLE STORY HOUSE
WITH CONCRETE ROOF)

MAISON À UN ÉTAGE EN
MAÇONNERIE CHÂÎNÉE
(MAISON DE PLAIN-PIED
AVEC TOITURE EN BÉTON)

PROJECT / PROJET

POST-EARTHQUAKE RECONSTRUCTION
TECHNICAL ASSISTANCE PROGRAM
PROGRAMME D'ASSISTANCE TECHNIQUE À LA
RECONSTRUCTION SUITE AU SÉISME

LOCATION / EMPLACEMENT

HAITI
HAÏTI

STRUCTURAL ENGINEER / INGÉNIEUR STRUCTURE

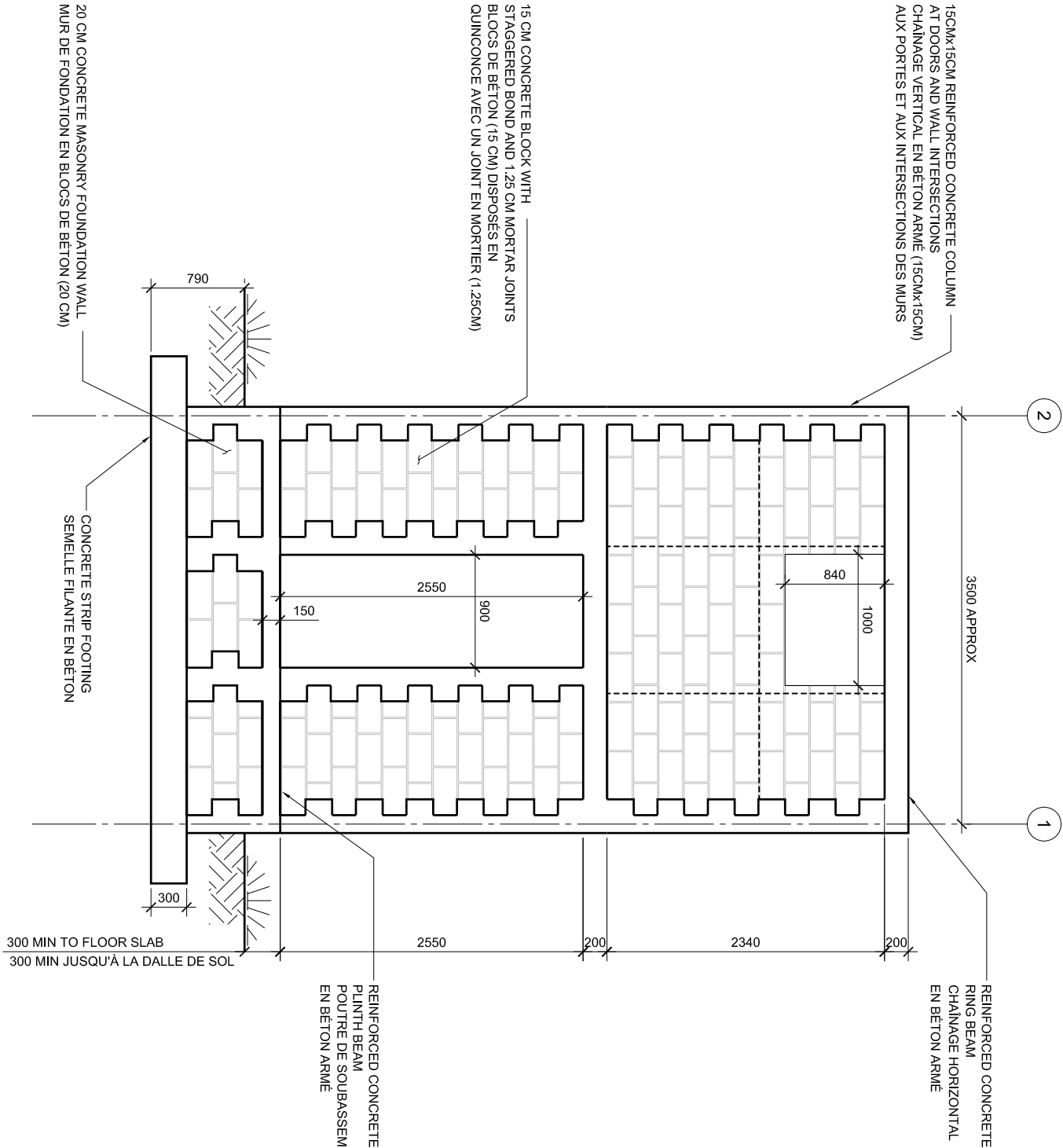
Guy Nordenson and Associates
225 Varick Street 6th Flr
New York NY 10014
Tel 212 766 9119
Fax 212 766 9016

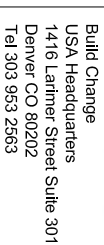
DRAWING TITLE / TITRE DU DESSIN

WALL ELEVATIONS

ÉLEVATIONS

DRAWN BY / ÉTABLI PAR		SHEET / PLANCHE	
JB		7 / 31	
CHECKED BY / CONTRÔLÉ PAR		RL / EO	
SCALE / ÉCHELLE		DATE / DATE	
1:50		2011/01/31	





Build Change
USA Headquarters
1416 Larimer Street Suite 301
Denver CO 80202
Tel 303 953 2563

TWO STORY CONFINED
MASONRY HOUSE
(SINGLE STORY HOUSE
WITH CONCRETE ROOF)

POST-EARTHQUAKE RECONSTRUCTION
TECHNICAL ASSISTANCE PROGRAM
PROGRAMME D'ASSISTANCE TECHNIQUE À LA
RECONSTRUCTION SUITE AU SÉISME

HAÏTIAN

STRUCTURAL ENGINEER / INGÉNIEUR STRUCTURE

Guy Nordenson and Associates
225 Varick Street 6th Flr
New York NY 10014
Tel 212 766 9119
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DRAWING TITLE / TITRE DU DESSIN

WALL ELEVATIONS

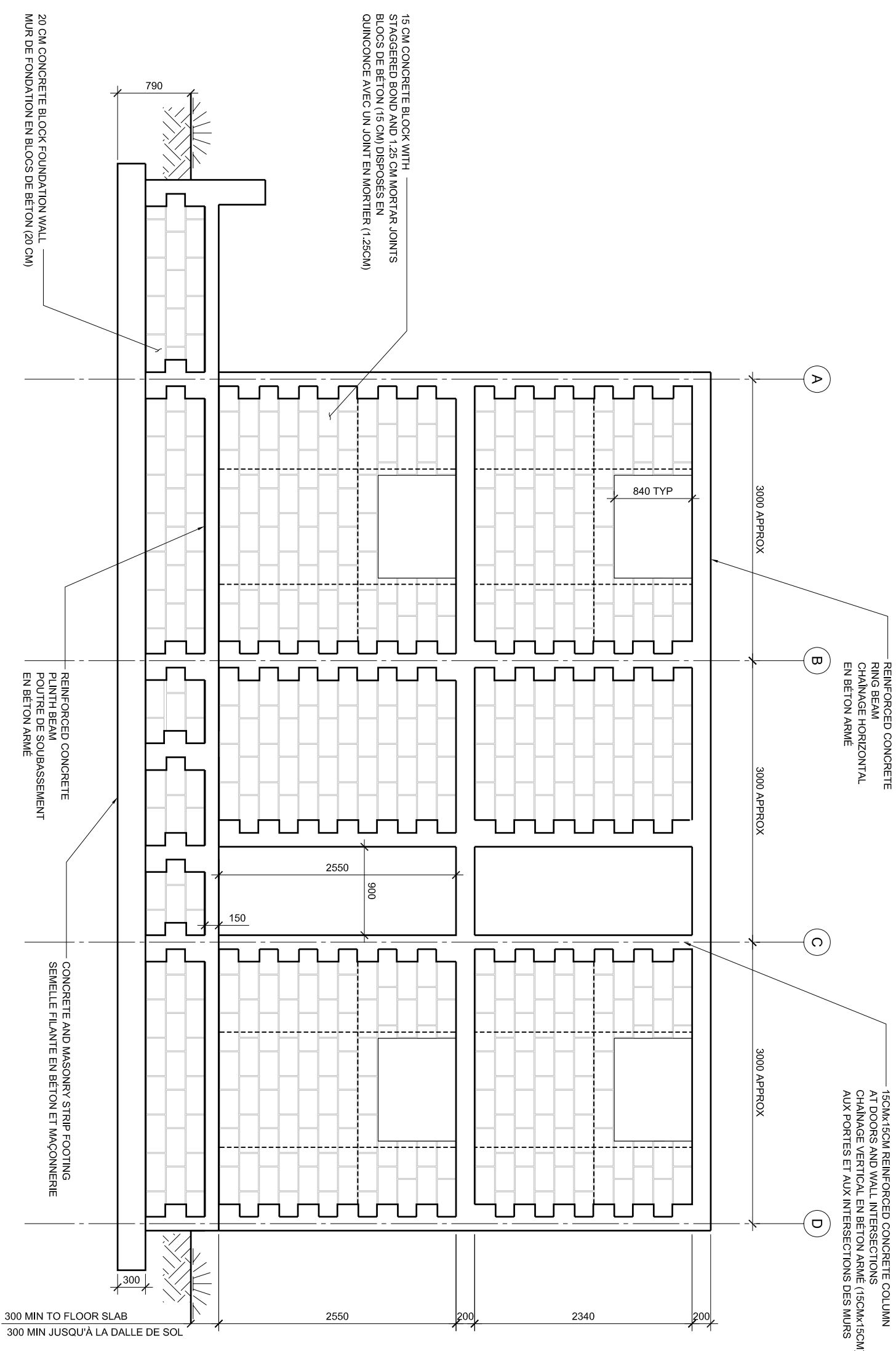
ÉLÉVATIONS

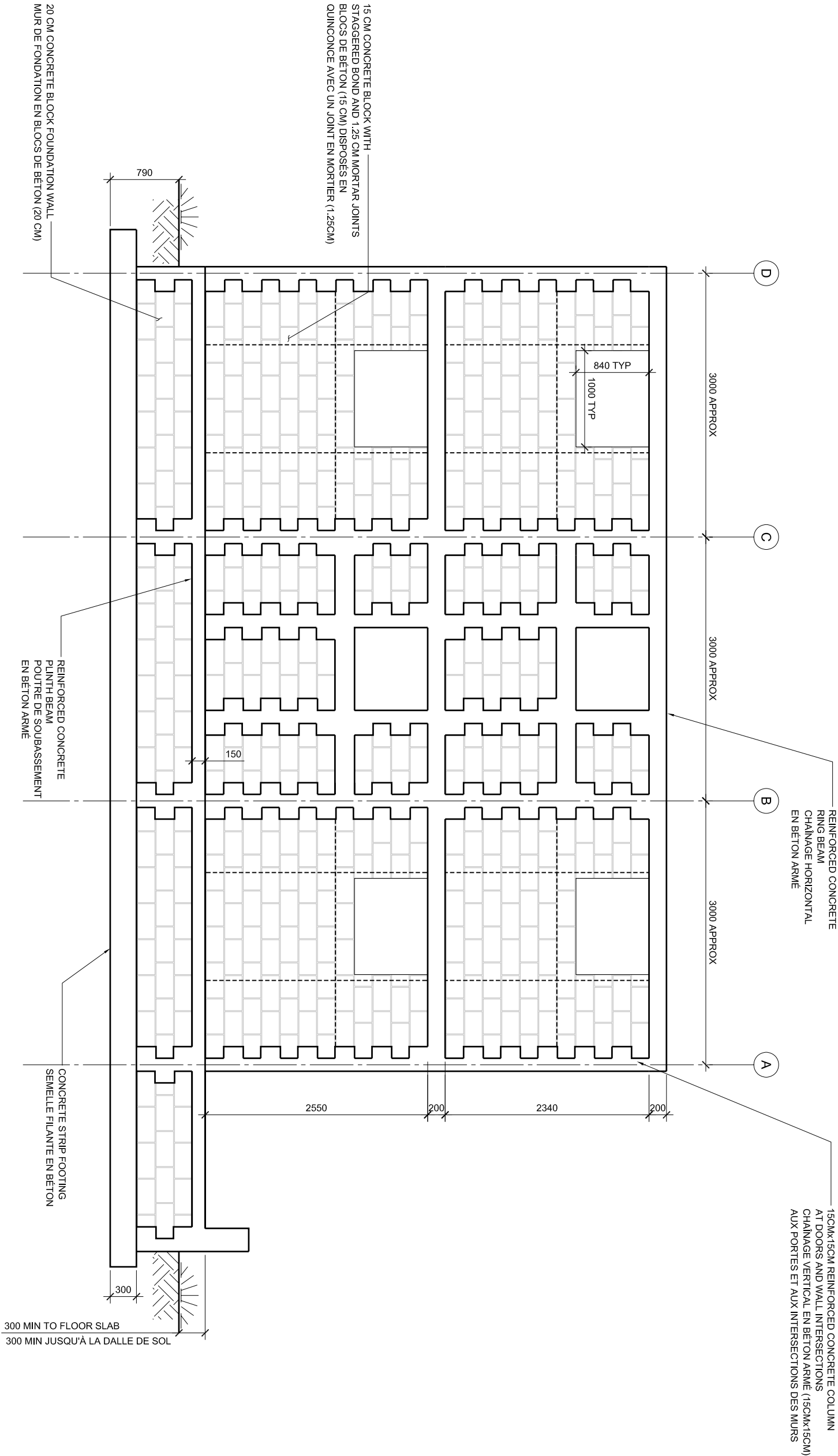
SHEET / PLANCHE

8 / 31



EO	
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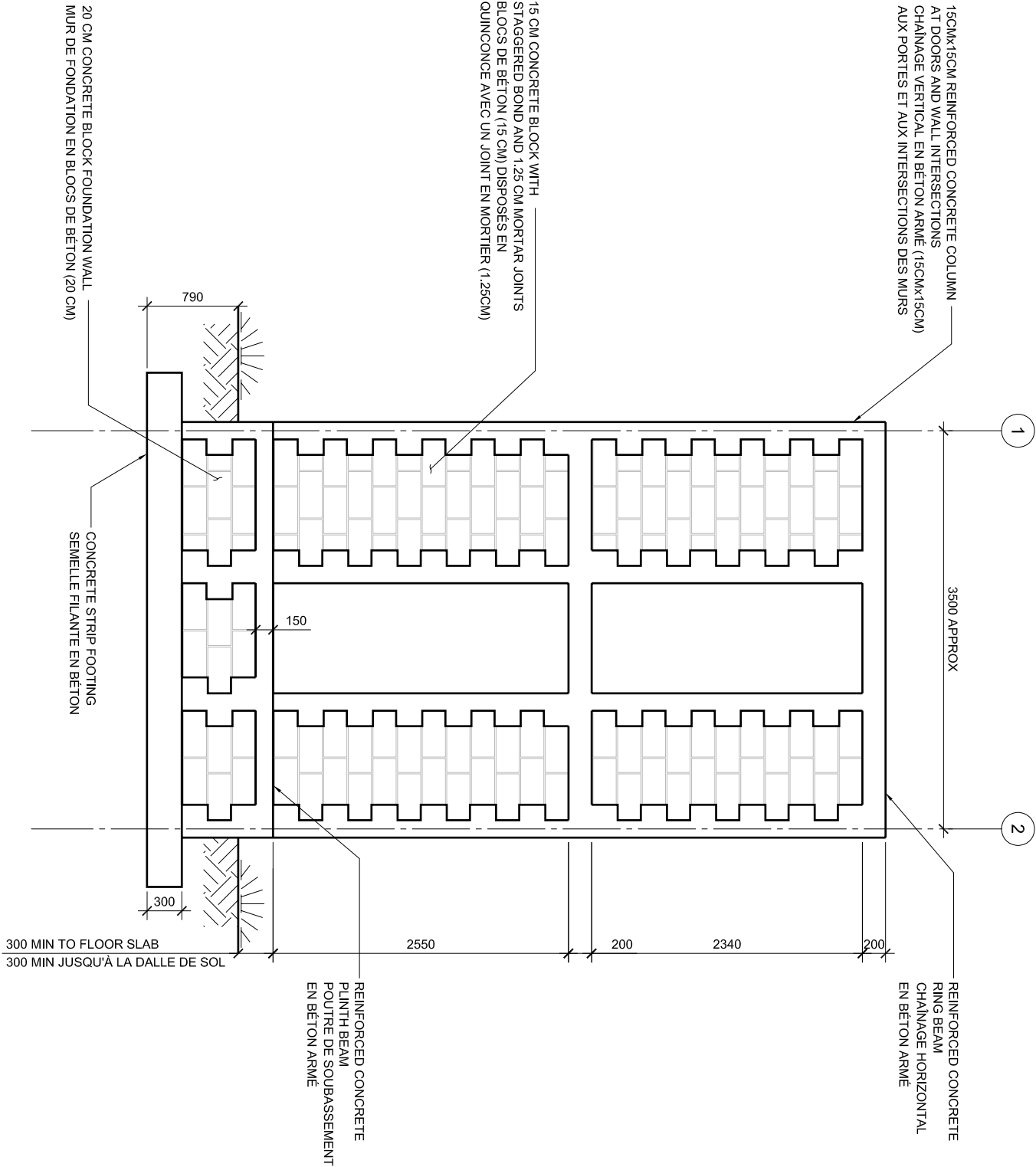
1:50	2011/01/31
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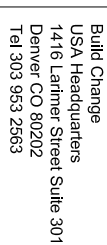
1 LEFT WALL ELEVATION
ÉLEVATION - MUR DE GAUCHE

<div><div><p>USAID E C A P</p><p>FROM THE AMERICAN PEOPLE</p><p>USAID E C A P is a proud partner of the American people in the fight against poverty and hunger. A Partnership of Nations for a Safer, Stronger, and More Prosperous World.</p></div><div><p>build change</p></div></div>			
<p>Build Change USA Headquarters 1416 Larimer Street Suite 301 Denver CO 80202 Tel 303 953 2563</p>			
WORK / TRAVAIL			
<p>TWO STORY CONFINED MASONRY HOUSE (SINGLE STORY HOUSE WITH CONCRETE ROOF)</p> <p>MAISON À UN ÉTAGE EN MAÇONNERIE CHÂÎNÉE (MAISON DE PLAIN-PIED AVEC TOITURE EN BÉTON)</p>			
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<p>POST-EARTHQUAKE RECONSTRUCTION TECHNICAL ASSISTANCE PROGRAM</p> <p>PROGRAMME D'ASSISTANCE TECHNIQUE À LA RECONSTRUCTION SUITE AU SÉISME</p>			
LOCATION / EMPLACEMENT			
<p>HAITI HAÏTI</p>			
STRUCTURAL ENGINEER / INGÉNIEUR STRUCTURE			
<p>Guy Nordenson and Associates 225 Varick Street 6th Flr New York NY 10014 Tel 212 766 9119 Fax 212 766 9016</p>			
DRAWING TITLE / TITRE DU DESSIN			
WALL ELEVATIONS			
ÉLEVATIONS			
DRAWN BY / ÉTABLI PAR	J.B.	SHEET / PLANCHE	
CHECKED BY / CONTRÔLÉ PAR	RL / EO		9 / 31
SCALE / ÉCHELLE	1:50	DATE / DATE	2011/10/31



A
INTERIOR WALL ELEVATION
ÉLÉVATION - MUR INTÉRIEUR

<div><div><div><div>FROM THE AMERICAN PEOPLE</div><div><div>USAID</div><div>E C A P</div></div><div><div>International Cooperation and Development</div><div>A Partnership of Nations for a Safer, Prosperous, and Sustainable World</div></div></div></div><div><div></div><div><div>Build Change</div><div>USA Headquarters</div><div>1416 Larimer Street Suite 301</div><div>Denver CO 80202</div><div>Tel 303 953 2563</div></div></div></div>	
WORK / TRAVAIL	
TWO STORY CONFINED MASONRY HOUSE (SINGLE STORY HOUSE WITH CONCRETE ROOF)	
MAISON À UN ÉTAGE EN MAÇONNERIE CHÂÎNÉE (MAISON DE PLAIN-PIED AVEC TOITURE EN BÉTON)	
PROJECT / PROJET	
POST-EARTHQUAKE RECONSTRUCTION TECHNICAL ASSISTANCE PROGRAM PROGRAMME D'ASSISTANCE TECHNIQUE À LA RECONSTRUCTION SUITE AU SÉISME	
LOCATION / EMPLACEMENT	
HAITI HAÏTI	
STRUCTURAL ENGINEER / INGÉNIEUR STRUCTURE	
Guy Nordenson and Associates 225 Varick Street 6th Flr New York NY 10014 Tel 212 766 9119 Fax 212 766 9016	
DRAWING TITLE / TITRE DU DESSIN	
WALL ELEVATIONS	
ÉLÉVATIONS	
DRAWN BY / ÉTABLI PAR	SHEET / PLANCHE
JB	10 / 31
CHECKED BY / CONTRÔLÉ PAR	
RL / EO	
SCALE / ÉCHELLE	DATE / DATE
1:50	2011/01/31



TWO STORY CONFINED
MASONRY HOUSE
(SINGLE STORY HOUSE
WITH CONCRETE ROOF)

LOCATION / EMPLOYMENT
HAÏT
HAÏT

Fax 212 766 9016

FOUNDATION SECTIONS

SCALE / ÉCHELLE	DATE / DATE
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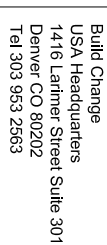


FOUNDATION SECTION AT EXTERIOR COLUMN

COUPE DES FONDATIONS (CHAÎNAGE VERTICAL EXTÉRIEUR)

FOUNDATION SECTION AT EXTERIOR WALL

COUPE DES FONDATIONS AU NIVEAU D'UN MUR EXTÉRIEUR



TWO STORY CONFINED
MASONRY HOUSE
(SINGLE STORY HOUSE
WITH CONCRETE ROOF)

POST-EARTHQUAKE RECONSTRUCTION
TECHNICAL ASSISTANCE PROGRAM
PROGRAMME D'ASSISTANCE TECHNIQUE À
RECONSTRUCTION SUITE AU SÉISME



STRUCTURAL ENGINEER / INGÉNIEUR STRUCTURE

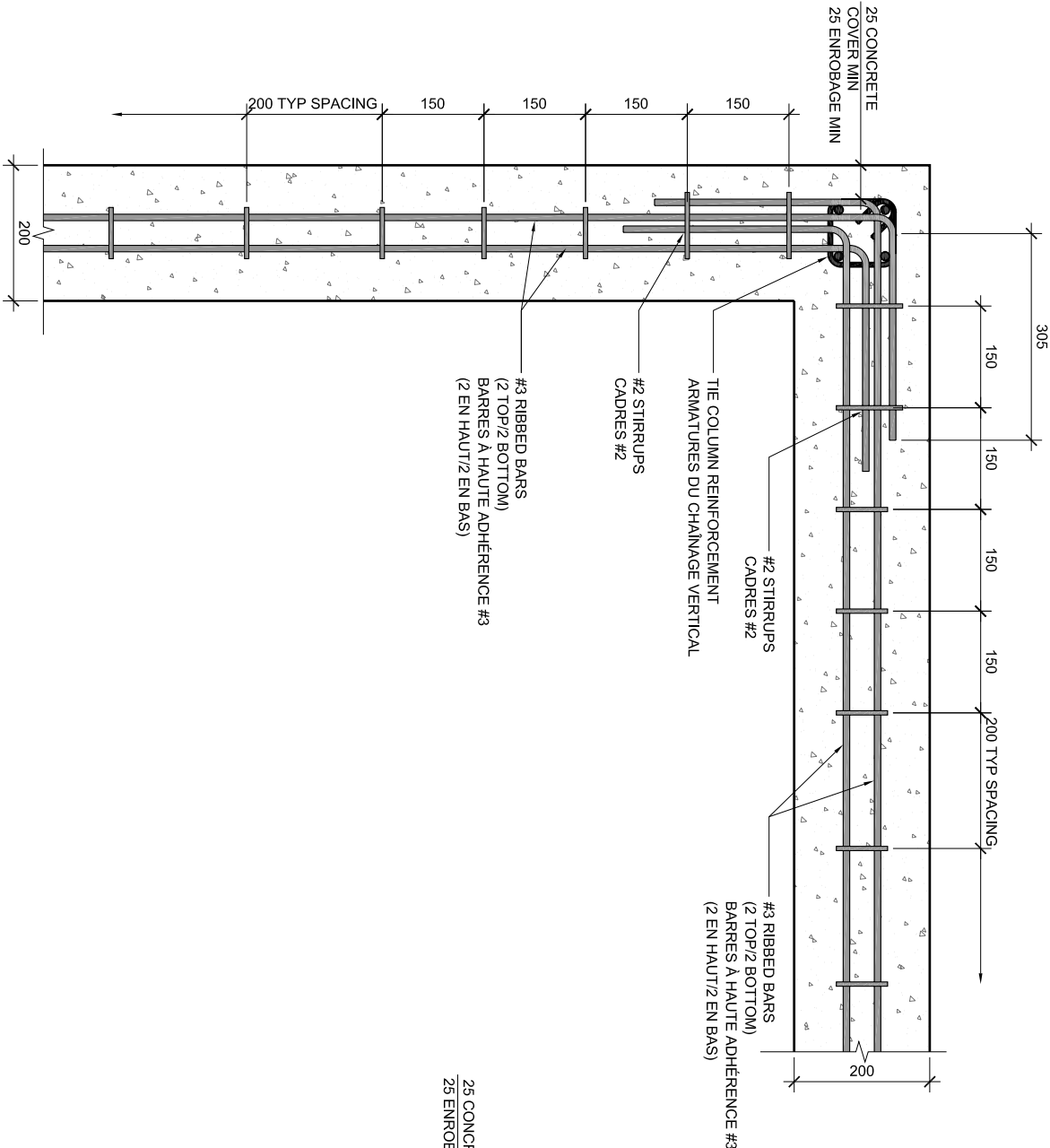
Guy Nordenson and Associates
225 Varick Street 6th Flr
New York NY 10014
Tel 212 766 9119
Fax 212 766 9016

FOUNDATION SECTIONS
COUPES DES FONDATIONS

CHECKED BY / CONTRÔLÉ PAR 12 / 31

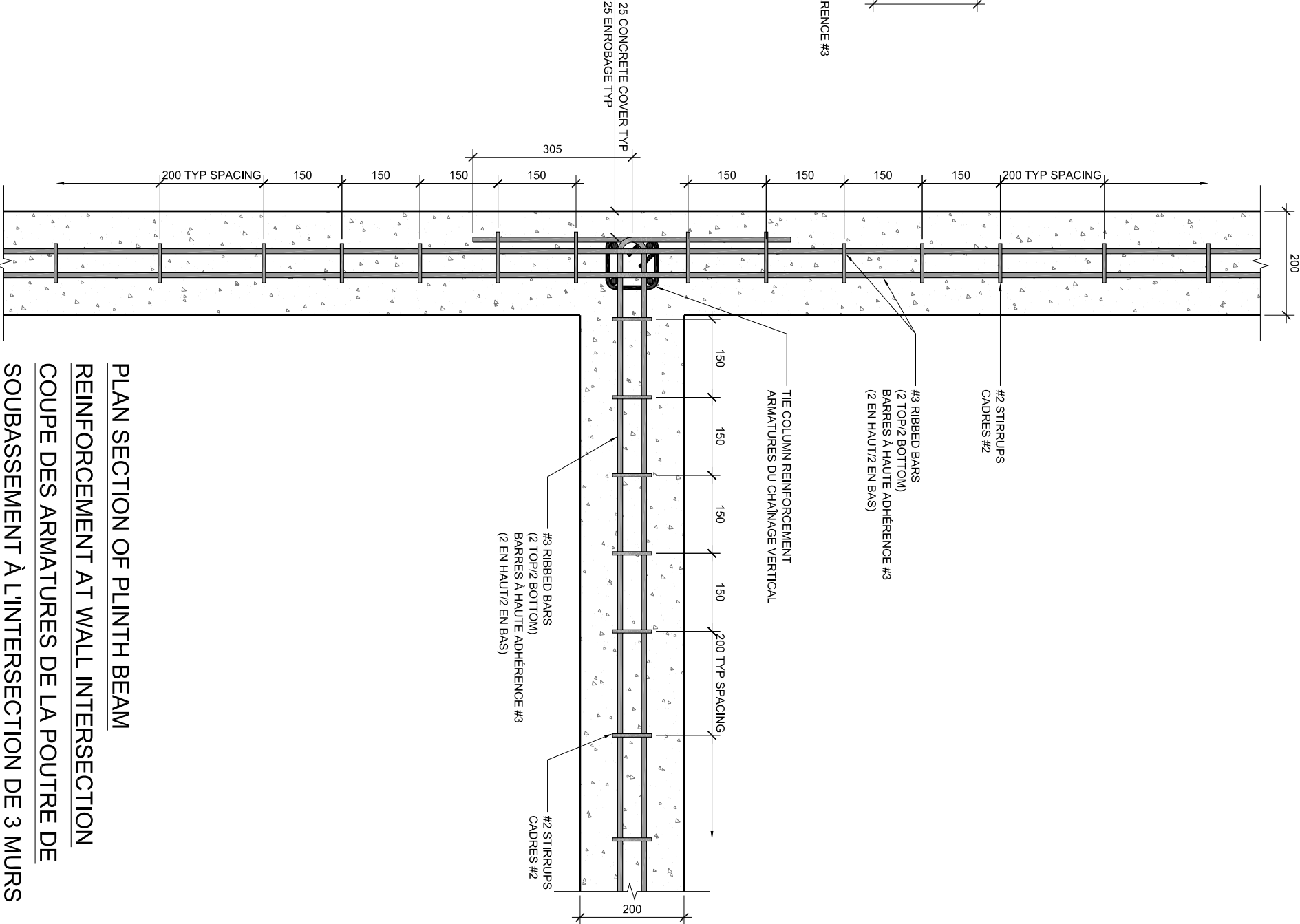
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<div><div><div><div>FROM THE AMERICAN PEOPLE</div><div>USAID E C A P</div><div><small>U.S. Agency for International Development A Partnership of Leaders for Humanity Development Resources Group (DRG) and Build Change</small></div></div></div><div><div></div><div><div>Build Change</div><div>USA Headquarters 1416 Larimer Street Suite 301 Denver CO 80202 Tel 303 953 2563</div></div></div></div> <div><div>WORK / TRAVAIL</div><div><div>TWO STORY CONFINED MASONRY HOUSE (SINGLE STORY HOUSE WITH CONCRETE ROOF)</div><div>MAISON À UN ÉTAGE EN MAÇONNERIE CHÂÎNÉE (MAISON DE PLAIN-PIED AVEC TOITURE EN BÉTON)</div></div></div> <div><div>PROJECT / PROJET</div><div><div>POST-EARTHQUAKE RECONSTRUCTION TECHNICAL ASSISTANCE PROGRAM PROGRAMME D'ASSISTANCE TECHNIQUE À LA RECONSTRUCTION SUITE AU SÉISME</div></div></div> <div><div>LOCATION / EMPLACEMENT</div><div><div>HAITI HAÏti</div></div></div> <div><div>STRUCTURAL ENGINEER / INGÉNIEUR STRUCTURE</div><div><div>Guy Nordenson and Associates 225 Varick Street 6th Flr New York NY 10014 Tel 212 766 9119 Fax 212 766 9016</div></div></div> <tr><td colspan="2"><div><div>DRAWING TITLE / TITRE DU DESSIN</div><div>PLINTH BEAM PLAN SECTION COUPE HORIZONTALE DE LA POUTRE DE SOUBASSEMENT</div></div></td><td colspan="2"><div><div>DRAWN BY / ÉTABLI PAR</div><div>JB</div></div><div><div>CHECKED BY / CONTRÔLÉ PAR</div><div>RL / EO</div></div><div><div>SCALE / ÉCHELLE</div><div>1:10</div></div></td><td colspan="2"><div><div>SHEET / PLANCHE</div><div>13 / 31</div></div><div><div>DATE / DATE</div><div>2011/01/31</div></div></td></tr>		<div><div>DRAWING TITLE / TITRE DU DESSIN</div><div>PLINTH BEAM PLAN SECTION COUPE HORIZONTALE DE LA POUTRE DE SOUBASSEMENT</div></div>		<div><div>DRAWN BY / ÉTABLI PAR</div><div>JB</div></div> <div><div>CHECKED BY / CONTRÔLÉ PAR</div><div>RL / EO</div></div> <div><div>SCALE / ÉCHELLE</div><div>1:10</div></div>		<div><div>SHEET / PLANCHE</div><div>13 / 31</div></div> <div><div>DATE / DATE</div><div>2011/01/31</div></div>	
<div><div>DRAWING TITLE / TITRE DU DESSIN</div><div>PLINTH BEAM PLAN SECTION COUPE HORIZONTALE DE LA POUTRE DE SOUBASSEMENT</div></div>		<div><div>DRAWN BY / ÉTABLI PAR</div><div>JB</div></div> <div><div>CHECKED BY / CONTRÔLÉ PAR</div><div>RL / EO</div></div> <div><div>SCALE / ÉCHELLE</div><div>1:10</div></div>		<div><div>SHEET / PLANCHE</div><div>13 / 31</div></div> <div><div>DATE / DATE</div><div>2011/01/31</div></div>			



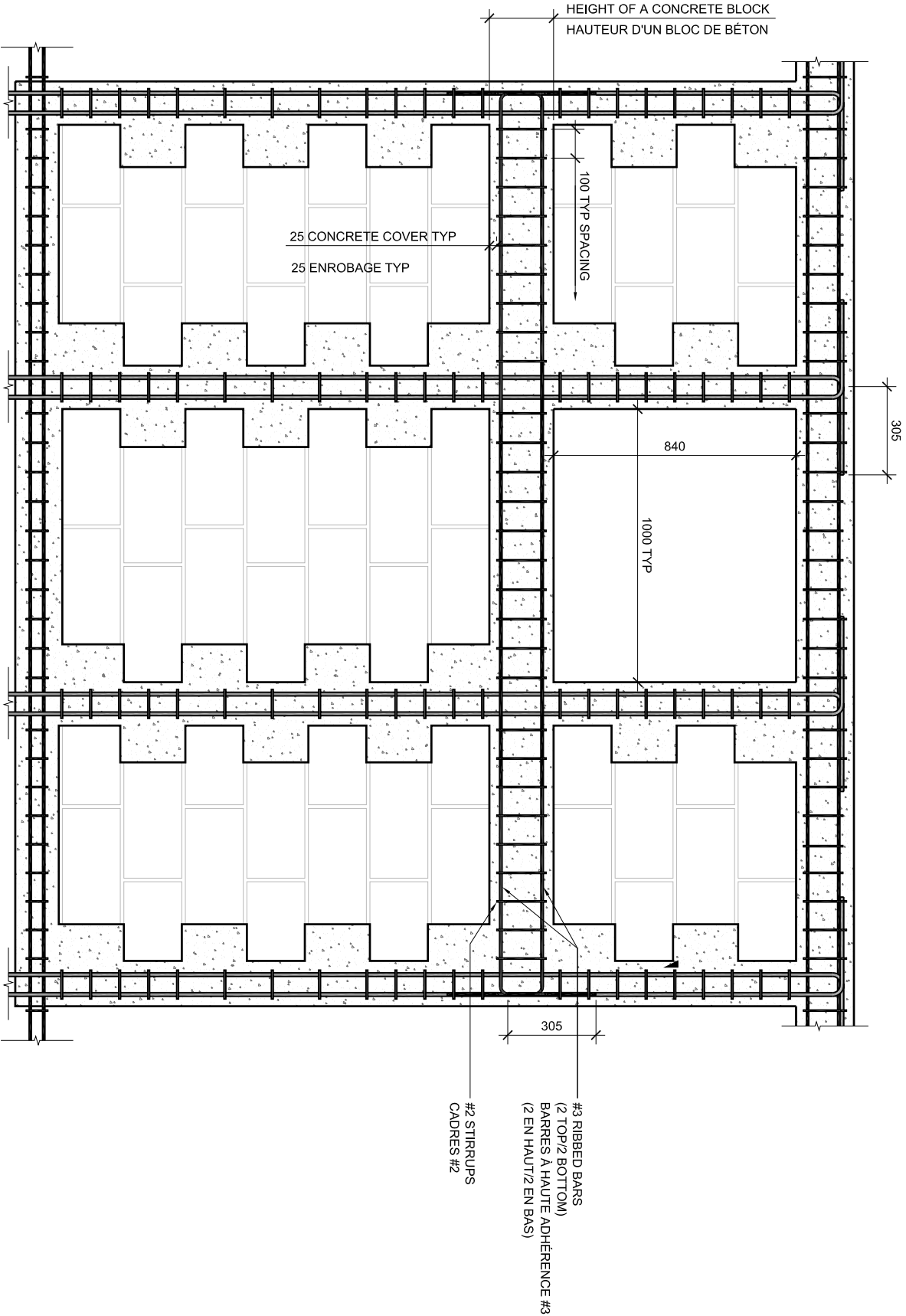
PLAN SECTION OF PLINTH BEAM
REINFORCEMENT AT CORNER

COUPE DES ARMATURES DE LA POUTRE DE
SOUBASSEMENT À L'INTERSECTION DE 2 MURS



PLAN SECTION OF PLINTH BEAM
REINFORCEMENT AT WALL INTERSECTION

COUPE DES ARMATURES DE LA POUTRE DE
SOUBASSEMENT À L'INTERSECTION DE 3 MURS





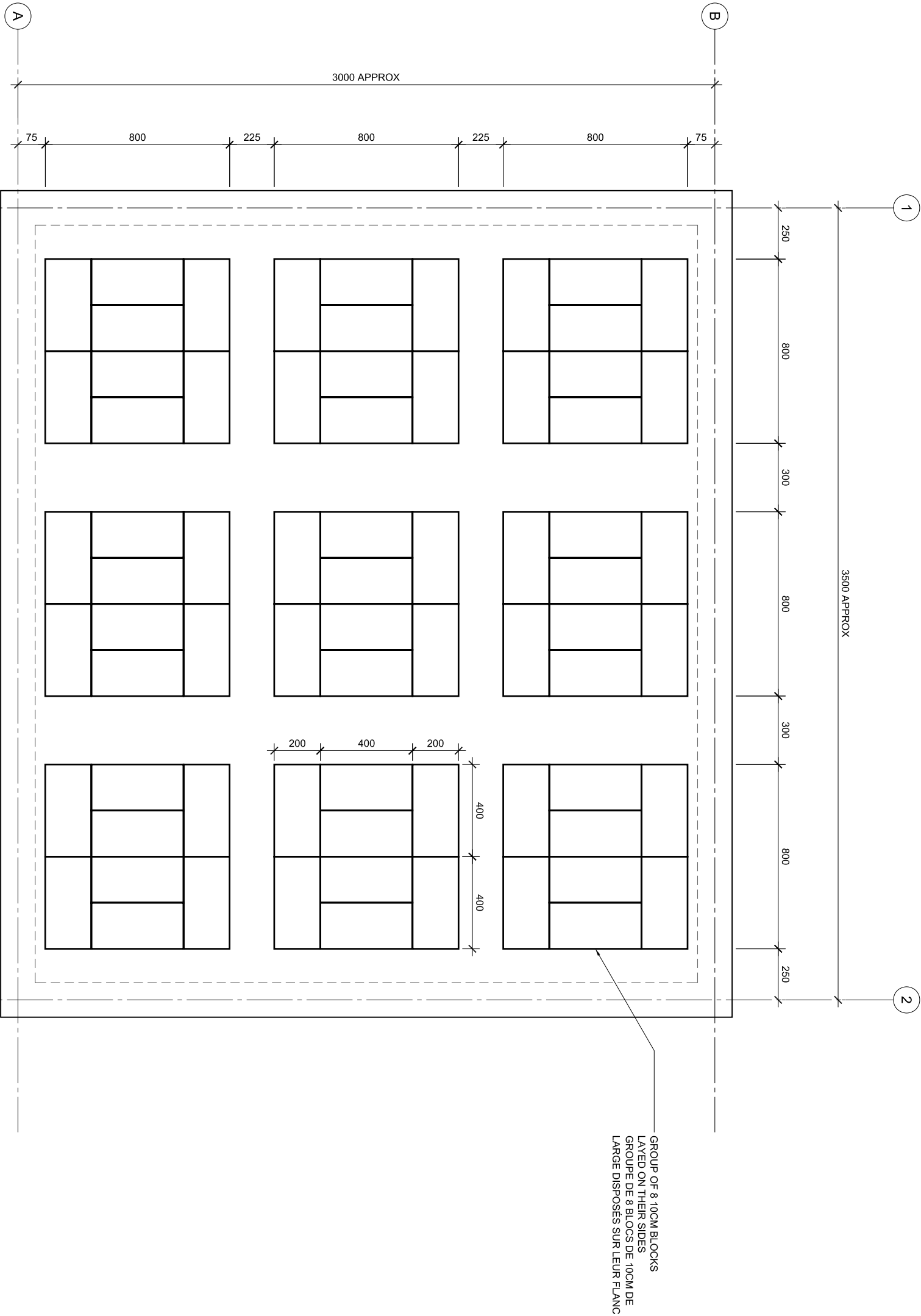
REINFORCEMENT AROUND WINDOWS (WITH TIE COLUMNS)

RENFORCEMENT DES FENÊTRES (AVEC CHÂNAGE VERTICAL)

NOTE: SEE SHEETS 12-15 FOR ADDITIONAL INFORMATION ON REINFORCEMENT

NOTE : VOIR LES PLANCHES 12-15 POUR DES INFORMATIONS SUPPLÉMENTAIRES SUR LES ARMATURES

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WORK / TRAVAIL	
<div><div>TWO STORY CONFINED MASONRY HOUSE</div><div>(SINGLE STORY HOUSE WITH CONCRETE ROOF)</div><div>MAISON À UN ÉTAGE EN MAÇONNERIE CHÂÎNÉE (MAISON DE PLAIN-PIED AVEC TOITURE EN BÉTON)</div></div>	
PROJECT / PROJET <div>POST-EARTHQUAKE RECONSTRUCTION TECHNICAL ASSISTANCE PROGRAM</div> <div>PROGRAMME D'ASSISTANCE TECHNIQUE À LA RECONSTRUCTION SUITE AU SÉISME</div>	
LOCATION / EMPLACEMENT <div>HAITI</div> <div>HAÏTI</div>	
STRUCTURAL ENGINEER / INGÉNIEUR STRUCTURE <div>Guy Nordenson and Associates</div> <div>225 Varck Street 6th Flr</div> <div>New York NY 10014</div> <div>Tel 212 766 9119</div> <div>Fax 212 766 9016</div>	
DRAWING TITLE / TITRE DU DESSIN	
OPENING DETAILS	
DÉTAIL DES OUVERTURES	
DRAWN BY / ÉTABLI PAR <div>JB</div>	SHEET / PLANCHE
CHECKED BY / CONTRÔLÉ PAR <div>RL / EO</div>	16 / 31
SCALE / ÉCHELLE <div>1:20</div>	DATE / DATE <div>2011/01/31</div>




TYPICAL CONCRETE BLOCK LAYOUT

DISPOSITION TYPE DES BLOCS DE BÉTON

NOTE : GAP BETWEEN BLOCKS REQUIRED TO BOND BLOCK TO CONCRETE SLAB


NOTE : IL EST NÉCESSAIRE DE LAISSER UN ESPACE ENTRE LES BLOCS POUR QU'ILS ADHÉRENT À LA DALLE DE BÉTON



FROM THE AMERICAN PEOPLE

USAID E C A P

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USA Headquarters
1416 Larimer Street Suite 301
Denver CO 80202
Tel 303 953 2563

WORK / TRAVAIL

TWO STORY CONFINED MASONRY HOUSE (SINGLE STORY HOUSE WITH CONCRETE ROOF)

MAISON À UN ÉTAGE EN MAÇONNERIE CHÂÎNÉE (MAISON DE PLAIN-PIED AVEC TOITURE EN BÉTON)

PROJECT / PROJET

POST-EARTHQUAKE RECONSTRUCTION TECHNICAL ASSISTANCE PROGRAM

PROGRAMME D'ASSISTANCE TECHNIQUE À LA RECONSTRUCTION SUITE AU SÉISME

LOCATION / EMPLACEMENT

HAITI
HAÏTI

STRUCTURAL ENGINEER / INGÉNIEUR STRUCTURE

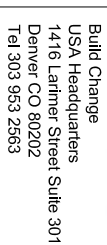
Guy Nordenson and Associates
225 Varick Street 6th Flr
New York NY 10014
Tel 212 766 9119
Fax 212 766 9016

DRAWING TITLE / TITRE DU DESSIN

ROOF SLAB LAYOUT

PLAN DE LA DALLE DE TOIT

DRAWN BY / ÉTABLI PAR	J.B	SHEET / PLANCHE
CHECKED BY / CONTRÔLÉ PAR	RL / EO	18 / 31
SCALE / ÉCHELLE	1 / 20	DATE / DATE
		2011/01/31



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USA Headquarters
 1416 Larimer Street Suite 301
 Denver CO 80202
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TWO STORY CONFINED
MASONRY HOUSE
(SINGLE STORY HOUSE
WITH CONCRETE ROOF)

PROJECT / PROJET

POST-EARTHQUAKE RECONSTRUCTION
TECHNICAL ASSISTANCE PROGRAM
PROGRAMME D'ASSISTANCE TECHNIQUE À LA
RECONSTRUCTION SUITE AU SÉISME

LOCATION / EMPLACEMENT

HAIT
HÄIT

STRUCTURAL ENGINEER / INGÉNIEUR STRUCTURE

Guy Nordenson and Associates
225 Varick Street 6th Flr
New York NY 10014
Tel 212 766 9119
Fax 212 766 9016

DRAWING TITLE / TITRE DU DESSIN
RING BEAM CONNECTION

DETAILS

DÉTAILS DE CONNEXION DU CHÂINAGE HORIZONTAL

DRAWN BY / ÉTABLI PAR SHEET / PLANCHE

JB	20 / 31
CHECKED BY / CONTRÔLÉ PAR	

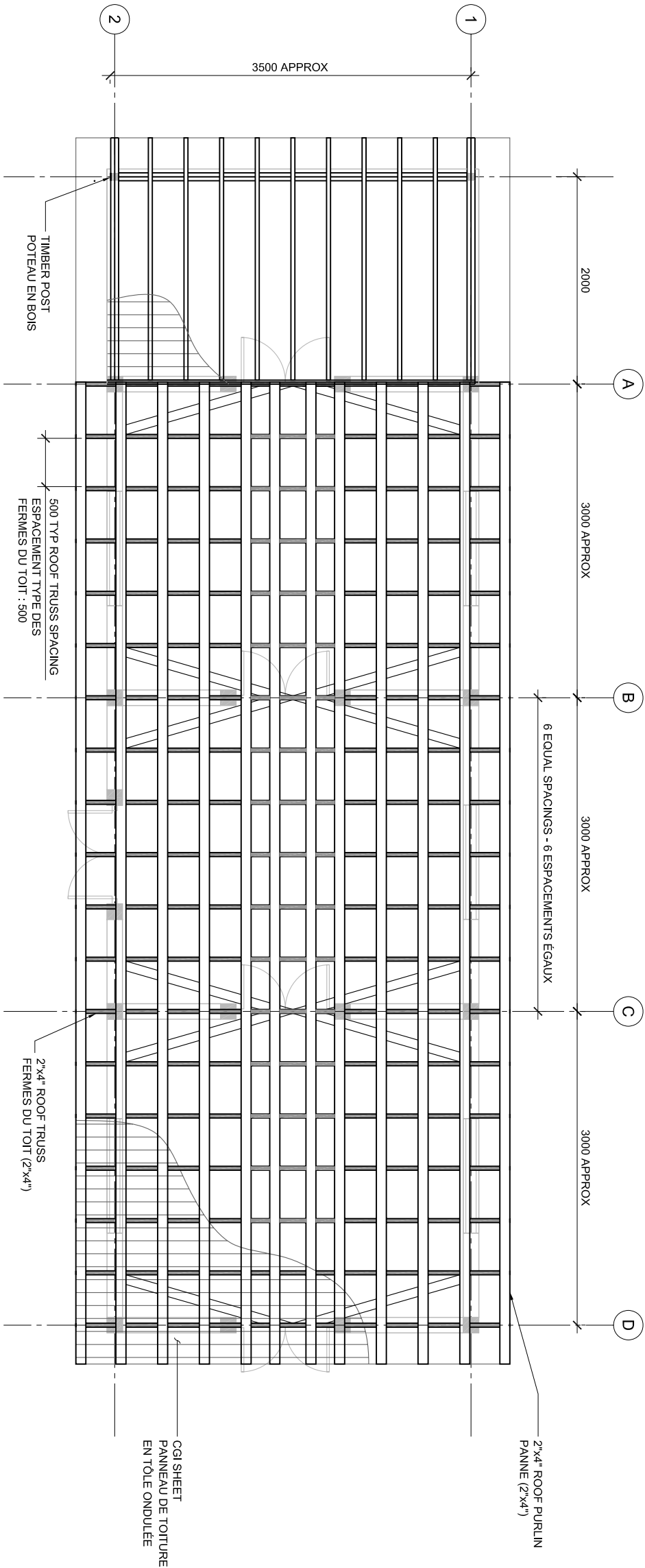
SCALE / ÉCHELLE

SCALE / ÉCHELLE	DATE / DATE
1 / 10	2011/01/31

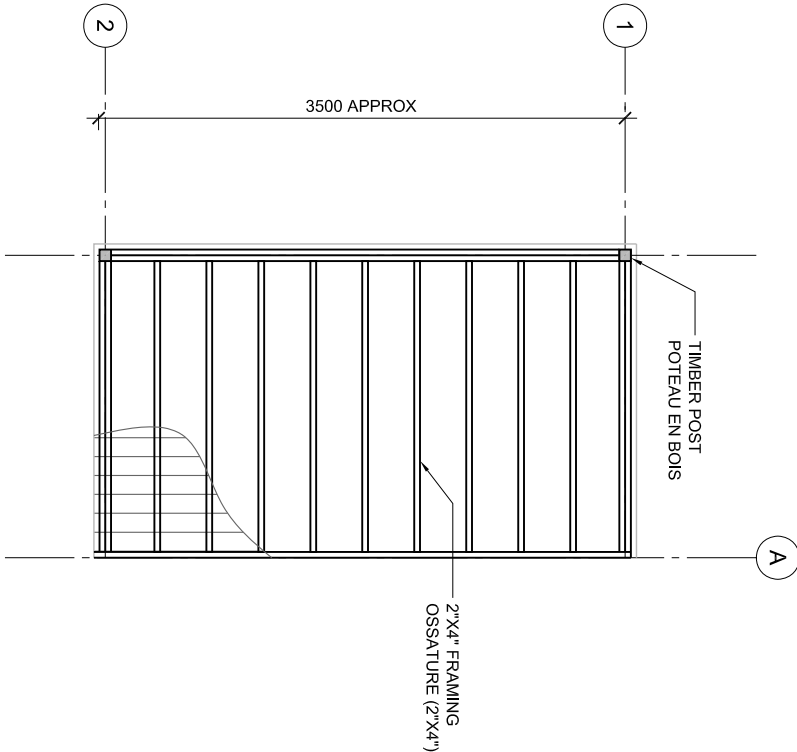


DETAILS AT SLAB TO RING BEAM CONNECTION



DÉTAILS DE CONNEXION ENTRE LA DALLE ET LE CHÂÎNAGE HORIZONTAL

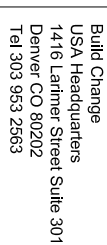


ROOF FRAMING PLAN
PLAN DE CHARPENTE



PORCH FRAMING PLAN
PLAN DE LA CHARPENTE DU PORCHE

<div><div> FROM THE AMERICAN PEOPLE</div><div> build change</div><div><div>USAID E C A P</div><div><small>USAID E C A P is a partnership between USAID and the American People's Foundation for Leadership Development, Inc. (APFLD) to support the development of the private sector in Haiti.</small></div></div></div>				<p>Build Change USA Headquarters 1416 Larimer Street Suite 301 Denver CO 80202 Tel 303 953 2563</p>	
WORK / TRAVAIL		TWO STORY CONFINED MASONRY HOUSE (SINGLE STORY HOUSE WITH CONCRETE ROOF)			
PROJECT / PROJET		MAISON À UN ÉTAGE EN MAÇONNERIE CHÂÎNÉE (MAISON DE PLAIN-PIED AVEC TOITURE EN BÉTON)			
POST-EARTHQUAKE RECONSTRUCTION TECHNICAL ASSISTANCE PROGRAM PROGRAMME D'ASSISTANCE TECHNIQUE À LA RECONSTRUCTION SUITE AU SÉISME		LOCATION / EMPLACEMENT			HAITI HAITI
STRUCTURAL ENGINEER / INGÉNIEUR STRUCTURE		Guy Nordenson and Associates 225 Varick Street 6th Flr New York NY 10014 Tel 212 766 9119 Fax 212 766 9016			
DRAWING TITLE / TITRE DU DESSIN		ROOF FRAMING PLANS PLANS DE CHARPENTE			
DRAWN BY / ÉTABLI PAR		SHEET / PLANCHE		JB	
CHECKED BY / CONTRÔLÉ PAR		RL / EO		21 / 31	
SCALE / ÉCHELLE		1 / 50		DATE / DATE	
				2011/10/31	



Build Change
USA Headquarters
1416 Larimer Street Suite 301
Denver CO 80202
Tel 303 953 2563

**TWO STORY CONFINED
MASONRY HOUSE
(SINGLE STORY HOUSE
WITH CONCRETE ROOF)**

MAISON À UN ÉTAGE EN
MAÇONNERIE CHÂÎNÉE
(MAISON DE PLAIN-PIED
AVEC TOITURE EN BÉTON

POST-EARTHQUAKE RECONSTRUCTION
TECHNICAL ASSISTANCE PROGRAM
PROGRAMME D'ASSISTANCE TECHNIQUE À LA
RECONSTRUCTION SUITE AU SÉISME

HAITI
HAÏTI

Guy Nordenson and Associates
225 Varick Street 6th Flr
New York NY 10014
Tel 212 766 9119
Fax 212 766 9016

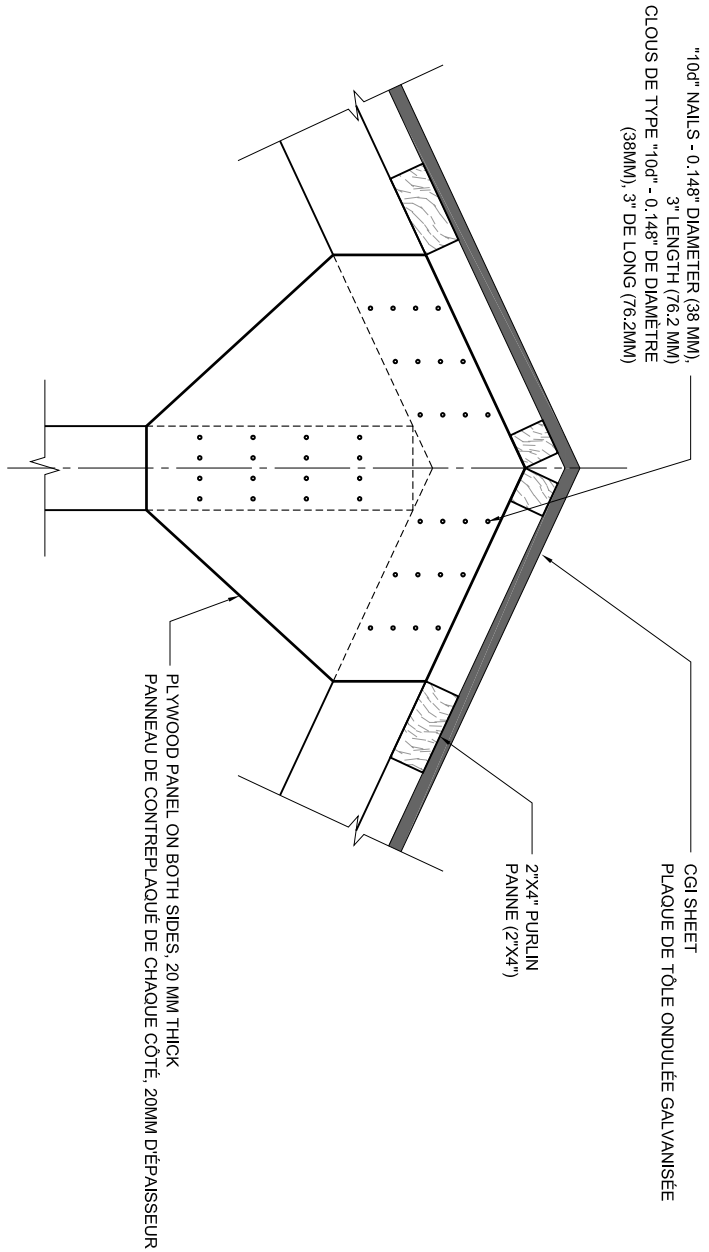
ROOF ELEVATIONS

ÉLÉVATIONS DU TOIT

JB

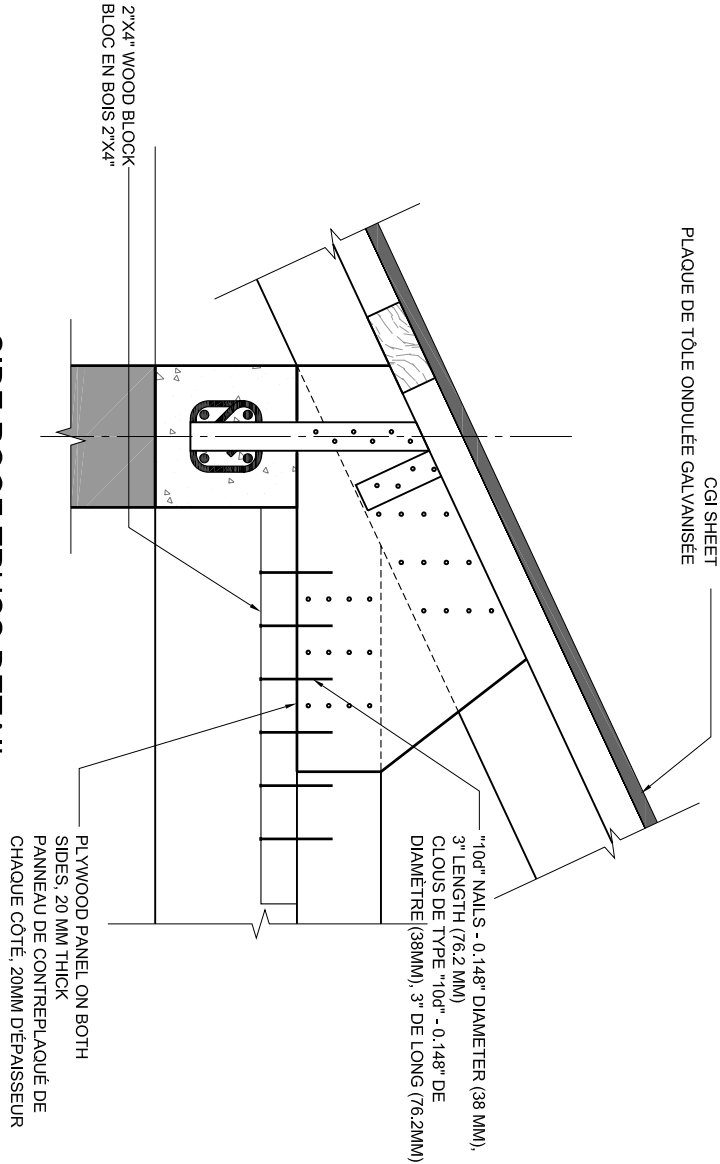
RL / EO

VARIES	2011/01/31
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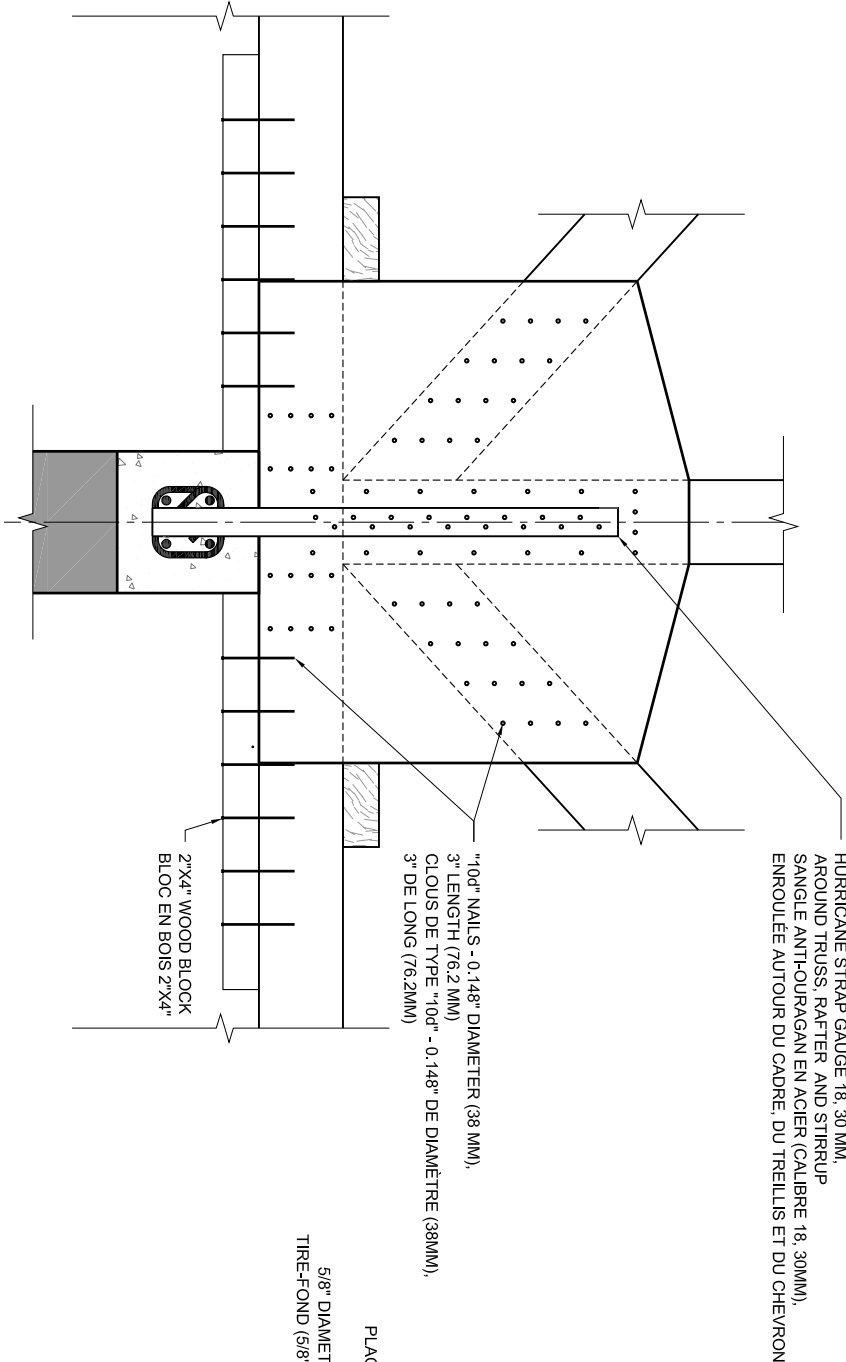
TOP CENTER ROOF TRUSS DETAIL

DÉTAIL DES FERMES DU TOIT (AU CENTRE, EN HAUT)



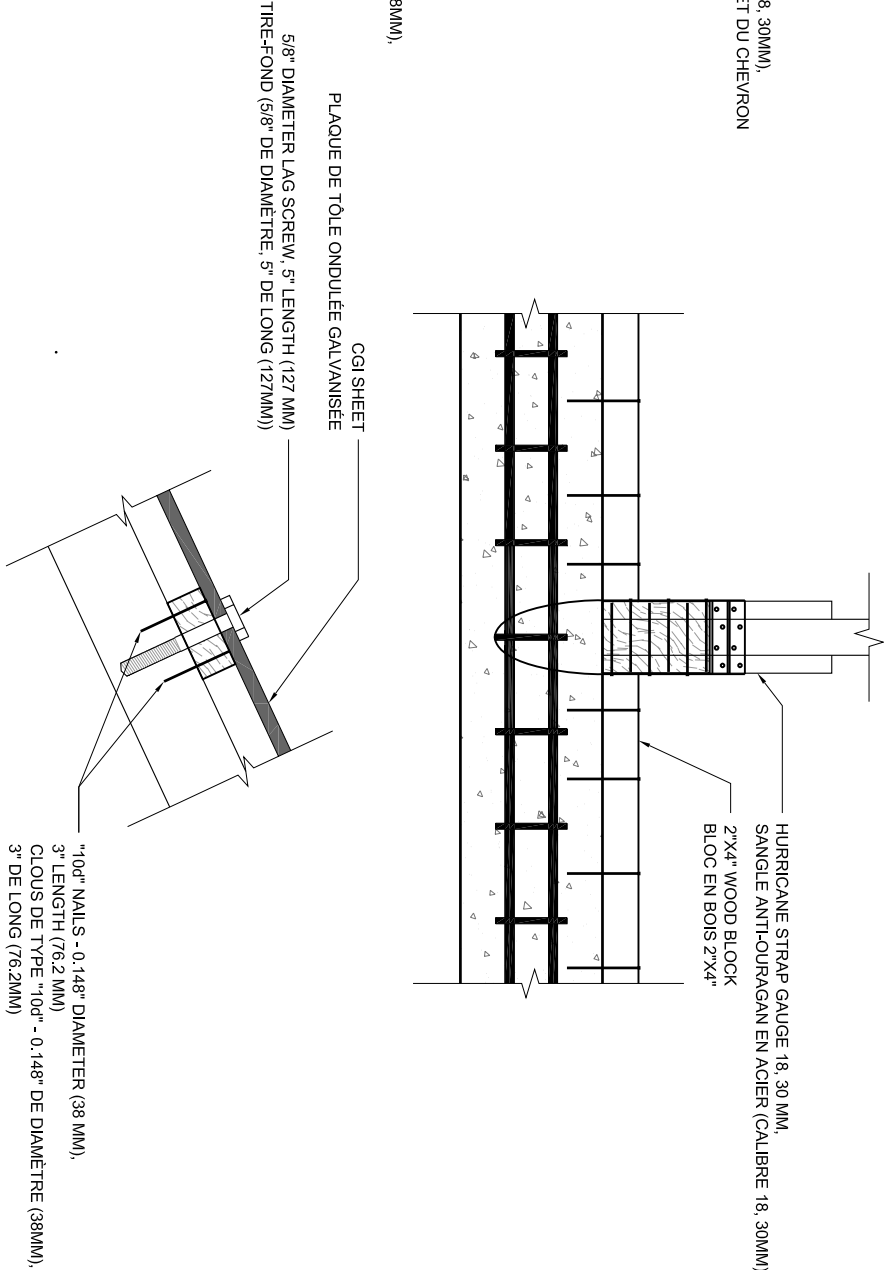
SIDE ROOF TRUSS DETAIL

DÉTAIL DES FERMES DU TOIT (SUR LE CÔTÉ)



BOTTOM CENTER ROOF TRUSS DETAIL

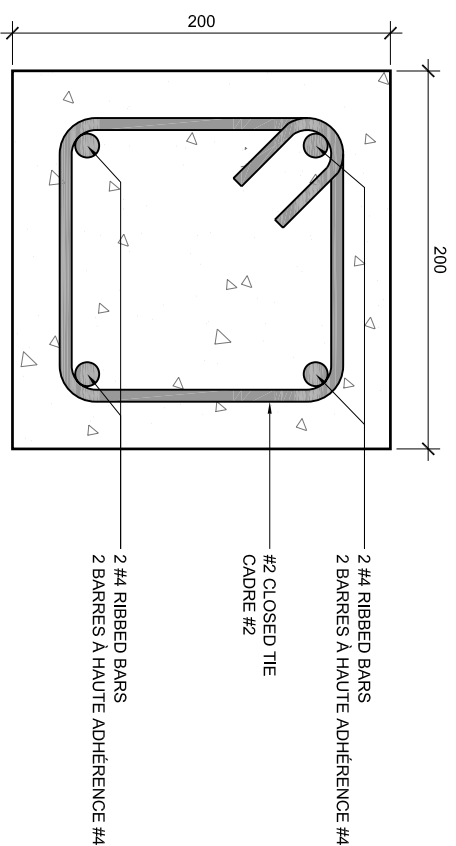
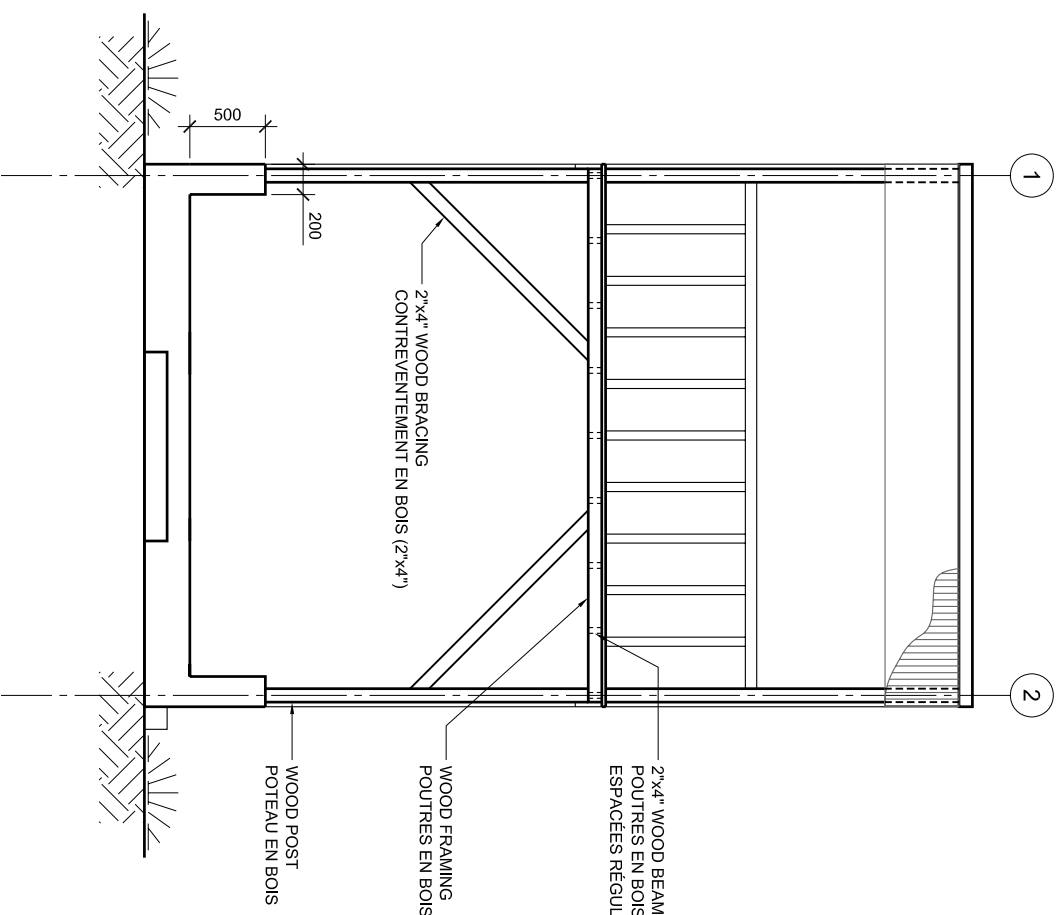
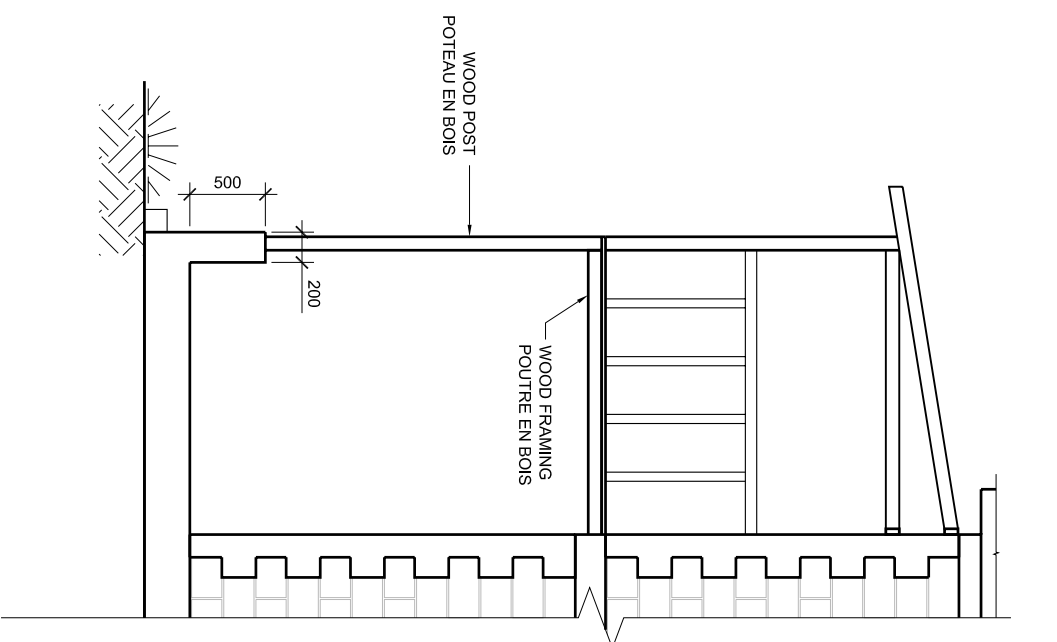
DÉTAIL DES FERMES DU TOIT (AU CENTRE, EN BAS)



ROOFING CONNECTION DETAILS

DÉTAILS DE CONNEXION DU TOIT

<div><div><div><div><div><div></div></div></div><div><div><div></div></div><div><div></div></div></div><div><div><div></div></div><div><div></div></div></div><div><div><div></div></div><div><div></div></div></div></div></div><div><div>FROM THE AMERICAN PEOPLE</div><div>USAID</div><div>E C A P</div><div><small>International Cooperative Development Administration A Partnership of Federal Agencies Development Resources Group (DRG) and Build Change</small></div></div><div><div>Build Change</div><div>USA Headquarters 1416 Larimer Street Suite 301 Denver CO 80202 Tel 303 953 2563</div></div></div>		<div>WORK / TRAVAIL</div> <div>TWO STORY CONFINED MASONRY HOUSE (SINGLE STORY HOUSE WITH CONCRETE ROOF)</div> <div>MAISON À UN ÉTAGE EN MAÇONNERIE CHÂÎNÉE (MAISON DE PLAIN-PIED AVEC TOITURE EN BÉTON)</div> <div>PROJECT / PROJET</div> <div>POST-EARTHQUAKE RECONSTRUCTION TECHNICAL ASSISTANCE PROGRAM PROGRAMME D'ASSISTANCE TECHNIQUE À LA RECONSTRUCTION SUITE AU SÉISME</div> <div>LOCATION / EMPLACEMENT</div> <div>HAITI HAÏTI</div> <div>STRUCTURAL ENGINEER / INGÉNIEUR STRUCTURE</div> <div>Guy Nordenson and Associates 225 Varick Street 6th Flr New York NY 10014 Tel 212 766 9119 Fax 212 766 9016</div> <div>DRAWING TITLE / TITRE DU DESSIN</div> <div>ROOF DETAILS</div> <div>DÉTAILS DU TOIT</div> <div>DRAWN BY / ÉTABLI PAR</div> <div>JB</div> <div>SHEET / PLANCHE</div> <div>CHECKED BY / CONTRÔLÉ PAR</div> <div>RL / EO</div> <div>23 / 31</div> <div>SCALE / ÉCHELLE</div> <div>1 / 50</div> <div>DATE / DATE</div> <div>2011/10/31</div>
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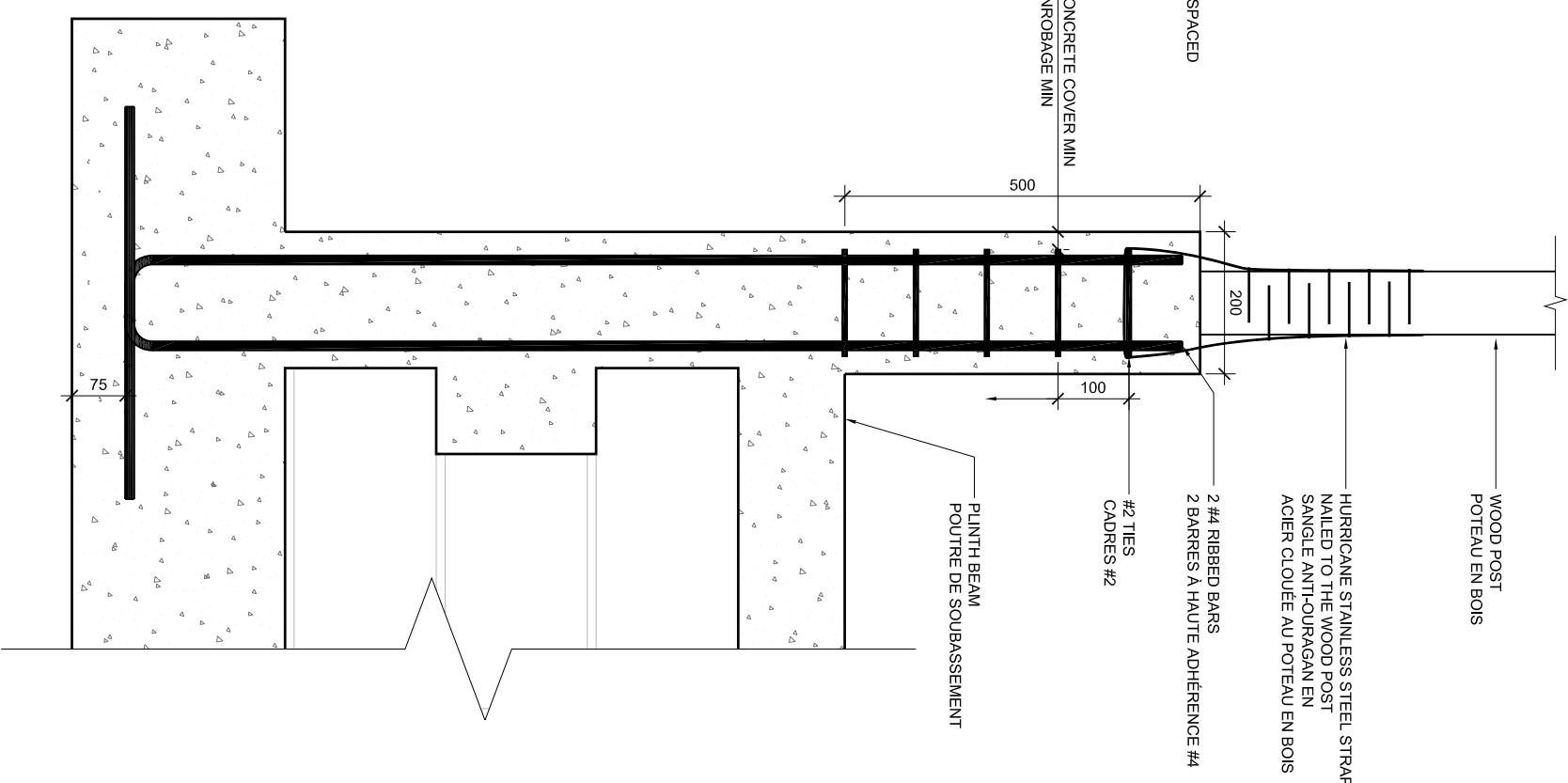


PORCH RIGHT ELEVATION (SCALE 1:50)

PORCHE : VUE DE DROITE (ÉCHELLE 1:50)

PORCH FRONT ELEVATION (SCALE 1:50)

PORCHE : VUE DE FACE (ÉCHELLE 1:50)






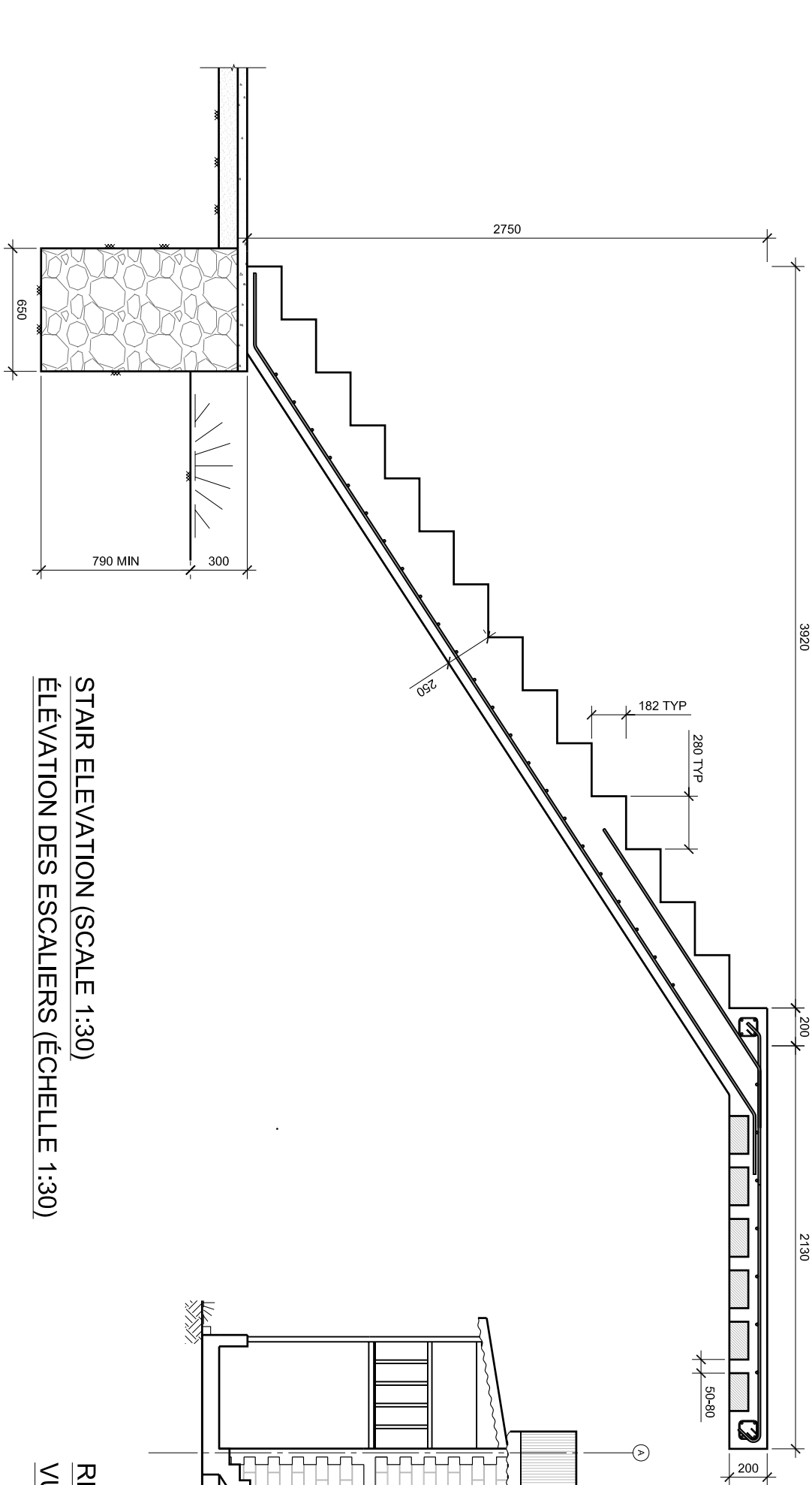
DETAIL OF WOOD POST

ANCHORAGE (SCALE: 1:10)

DÉTAIL D'ANCRAGE DU POTEAU

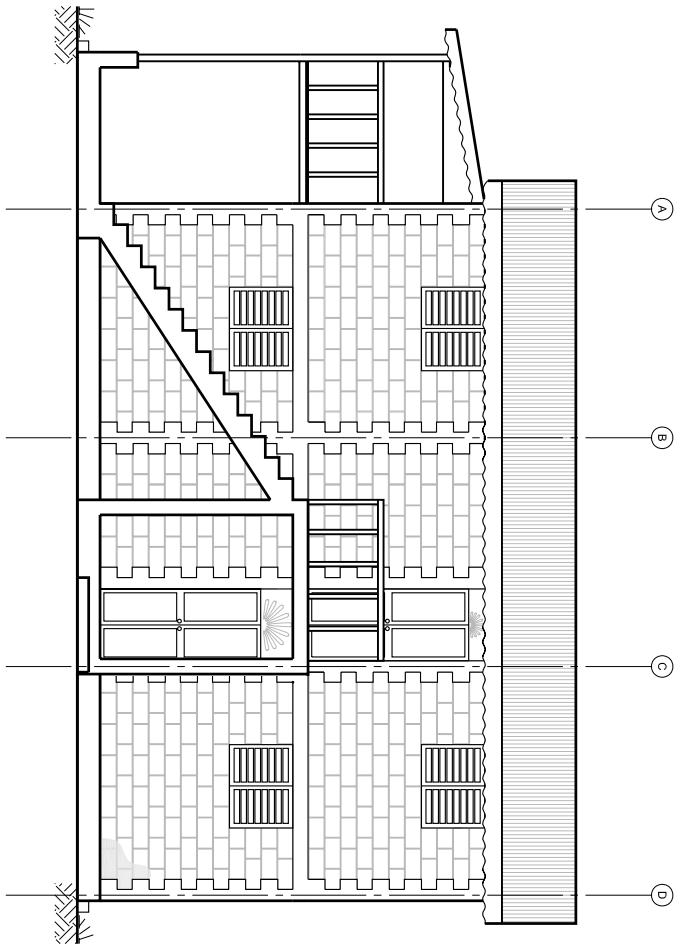
EN BOIS (ÉCHELLE 1:10)

 USAID <small>FROM THE AMERICAN PEOPLE</small>		 <small>Providing U.S. government and U.S. private sector assistance to help support A Partnership of Leaders for Humanity Development Economics Group (DEG) and Build Change</small>	
			
Build Change USA Headquarters 1416 Larimer Street Suite 301 Denver CO 80202 Tel 303 953 2563			
WORK / TRAVAIL			
TWO STORY CONFINED MASONRY HOUSE (SINGLE STORY HOUSE WITH CONCRETE ROOF)			
MAISON À UN ÉTAGE EN MAÇONNERIE CHÂÎNÉE (MAISON DE PLAIN-PIED AVEC TOITURE EN BÉTON)			
PROJECT / PROJET			
POST-EARTHQUAKE RECONSTRUCTION TECHNICAL ASSISTANCE PROGRAM PROGRAMME D'ASSISTANCE TECHNIQUE À LA RECONSTRUCTION SUITE AU SÉISME			
LOCATION / EMPLACEMENT			
HAÏTI HAÏTI			
STRUCTURAL ENGINEER / INGÉNIEUR STRUCTURE			
Guy Nordenson and Associates 225 Varick Street 6th Flr New York NY 10014 Tel 212 766 9119 Fax 212 766 9016			
DRAWING TITLE / TITRE DU DESSIN			
PORCH DETAILS			
DÉTAILS DU PORCHE			
DRAWN BY / ÉTABLI PAR		SHEET / PLANCHE	
JB		24 / 31	
CHECKED BY / CONTRÔLÉ PAR			
RL / EO			
SCALE / ÉCHELLE		DATE / DATE	
VARIES		2011/01/31	



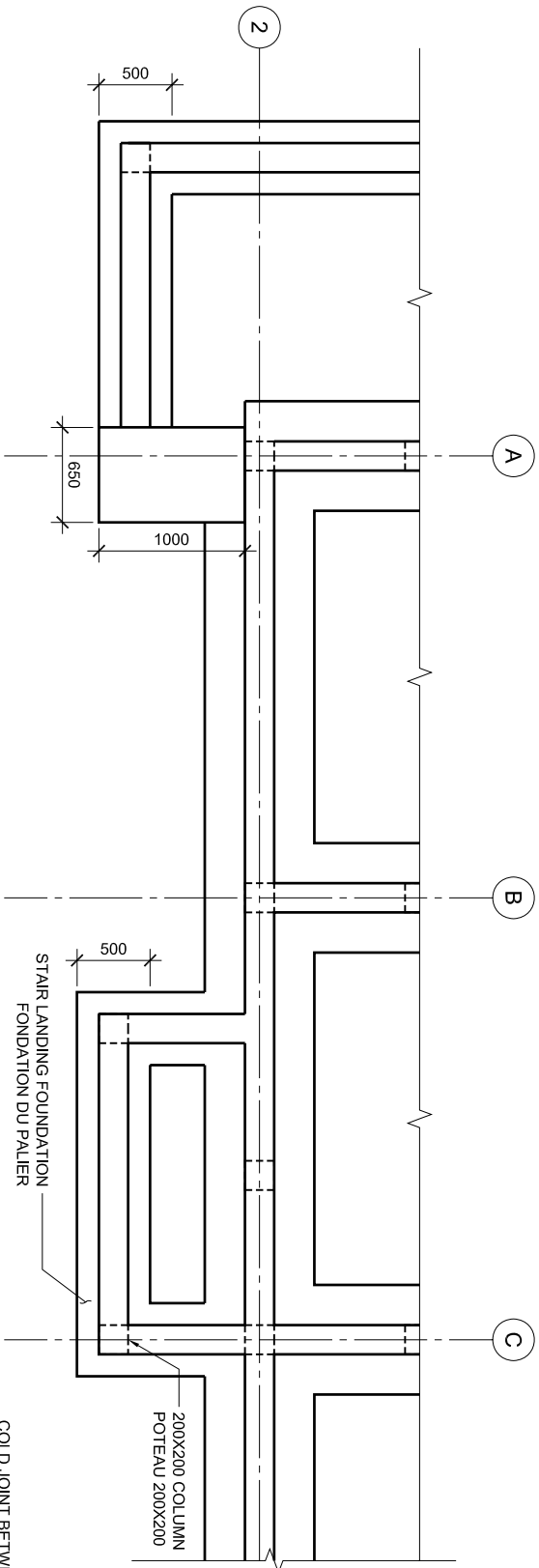
STAIR ELEVATION (SCALE 1:30)

ÉLÉVATION DES ESCALIERS (ÉCHELLE 1:30)



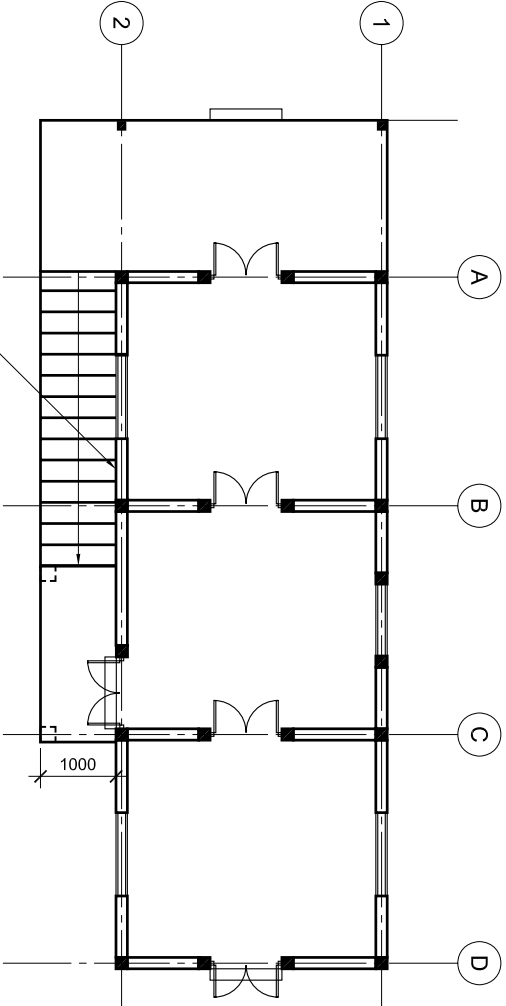
RIGHT ELEVATION (SCALE 1:100)

VUE DE DROITE (ÉCHELLE 1:100)





FOUNDATION PLAN (SCALE 1:50)

PLAN DES FONDATIONS (ÉCHELLE 1:50)



LAYOUT (SCALE 1:100)

PLAN (ÉCHELLE 1:100)

<div><div><p>FROM THE AMERICAN PEOPLE</p></div><div><p>build change</p></div></div> <div><p>Build Change USA Headquarters 1416 Larimer Street Suite 301 Denver CO 80202 Tel 303 953 2563</p></div> <div><p>PROYECTO CONSTRUYENDO PARA EL CAMBIO A Partnership of Leaders for Humanity Development Resources Group (DRG) and Build Change</p></div>			
WORK / TRAVAIL			
TWO STORY CONFINED MASONRY HOUSE (SINGLE STORY HOUSE WITH CONCRETE ROOF)			
MAISON À UN ÉTAGE EN MAÇONNERIE CHÂÎNÉE (MAISON DE PLAIN-PIED AVEC TOITURE EN BÉTON)			
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POST-EARTHQUAKE RECONSTRUCTION TECHNICAL ASSISTANCE PROGRAM			
PROGRAMME D'ASSISTANCE TECHNIQUE À LA RECONSTRUCTION SUITE AU SÉISME			
LOCATION / EMPLACEMENT			
HAITI HAÏTI			
STRUCTURAL ENGINEER / INGÉNIEUR STRUCTURE			
Guy Nordenson and Associates 225 Varick Street 6th Flr New York NY 10014 Tel 212 766 9119 Fax 212 766 9016			
DRAWING TITLE / TITRE DU DESSIN			
STAIR DETAILS			
DÉTAILS DES ESCALIERS			
DRAWN BY / ÉTABLI PAR		SHEET / PLANCHE	
JB		25 / 31	
CHECKED BY / CONTRÔLÉ PAR		RL / EO	
SCALE / ÉCHELLE		DATE / DATE	
VARIES		2011/10/31	



WORK / TRAVAIL

MAISON À UN ÉTAGE EN
MAÇONNERIE CHAÎNÉE
(MAISON DE PLAIN-PIED
AVEC TOITURE EN BÉTON)

LOCATION / EMPLACEMENT

STRUCTURAL ENGINEER / INGÉNIEUR STRUCTURE

Fax 212 766 9016

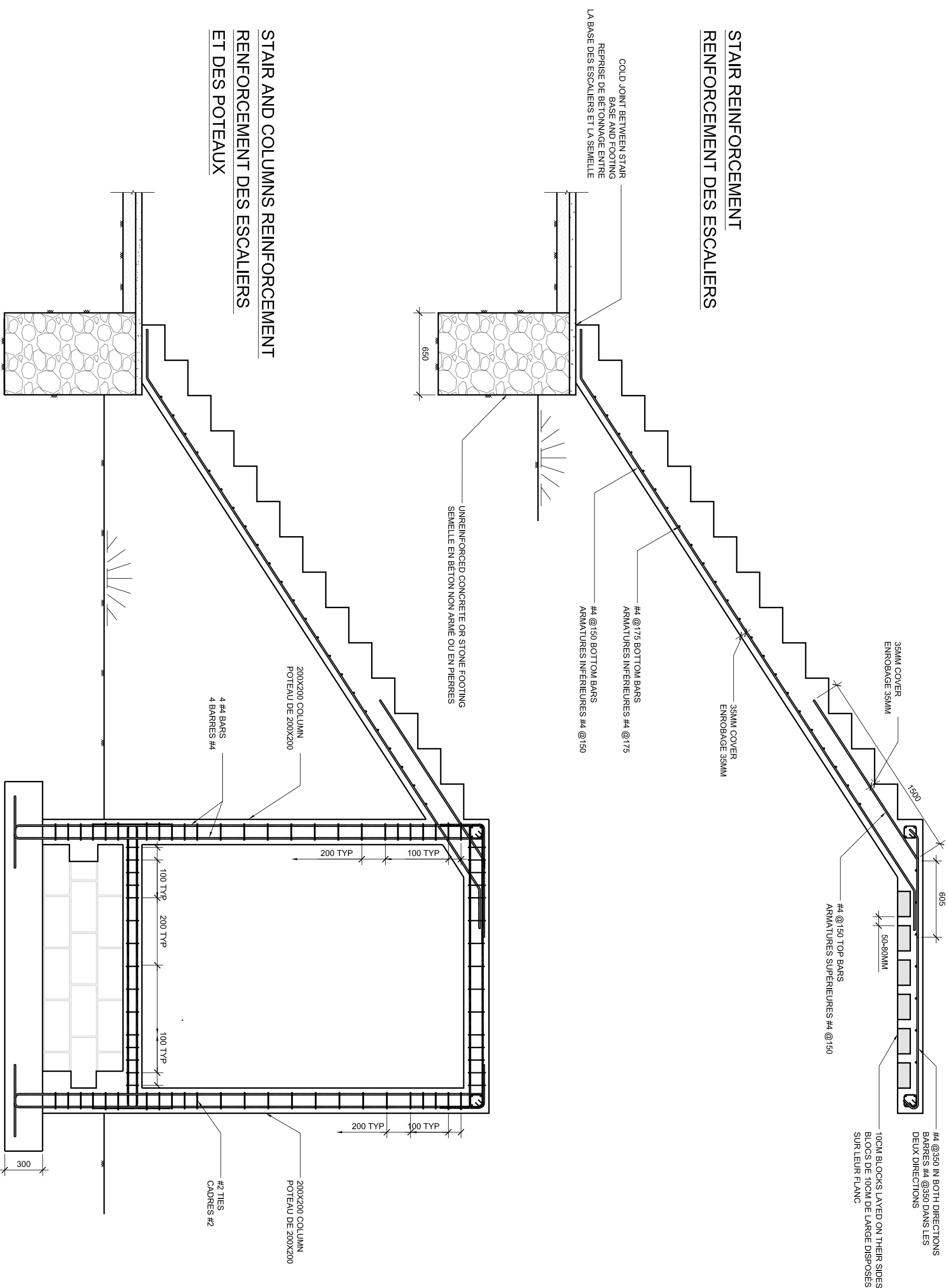
STAIR DETAILS

DÉTAILS DES ESCALIERS

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SCALE / ÉCHELLE

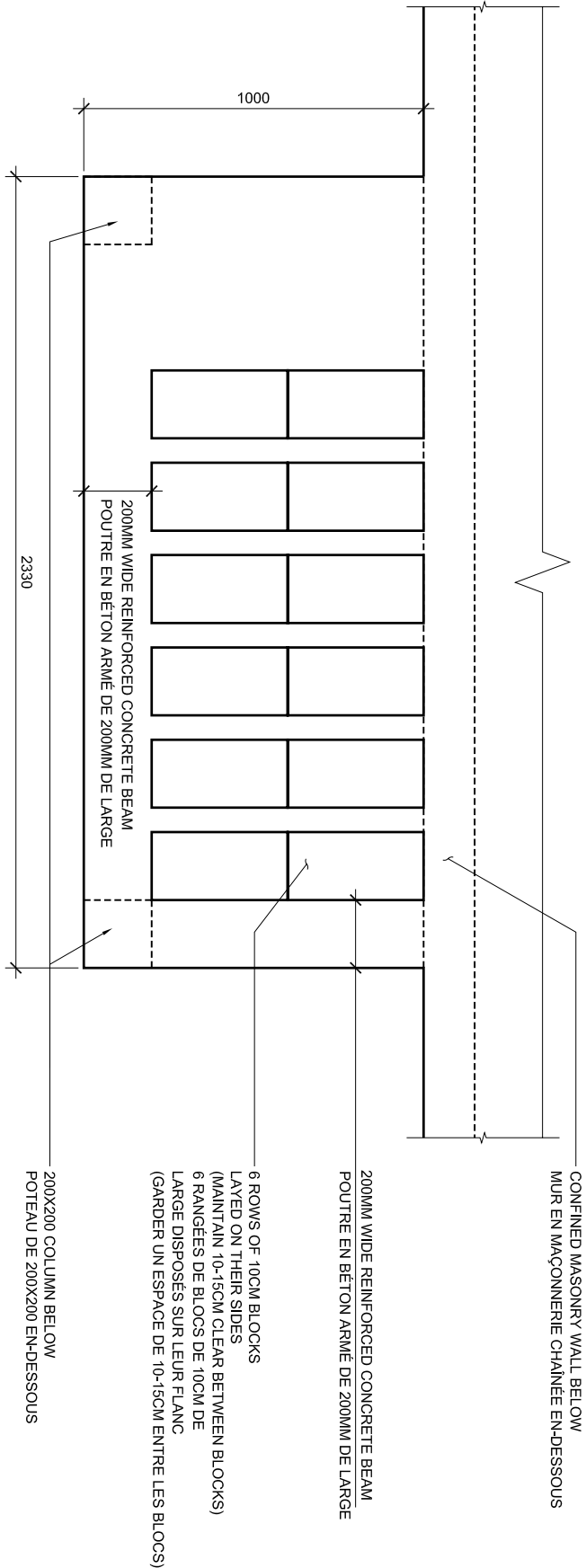
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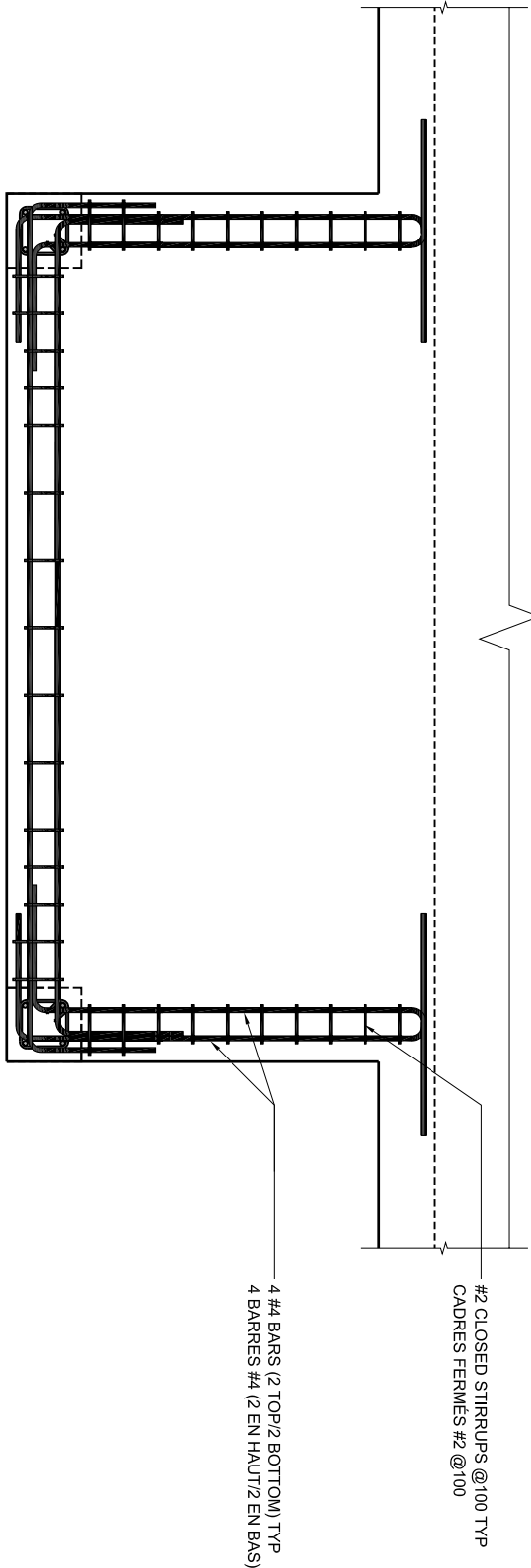
STAIR REINFORCEMENT

STAIR AND COLUMNS REINFORCEMENT RENFORCEMENT DES ESCALIERS ET DES POTEAUX

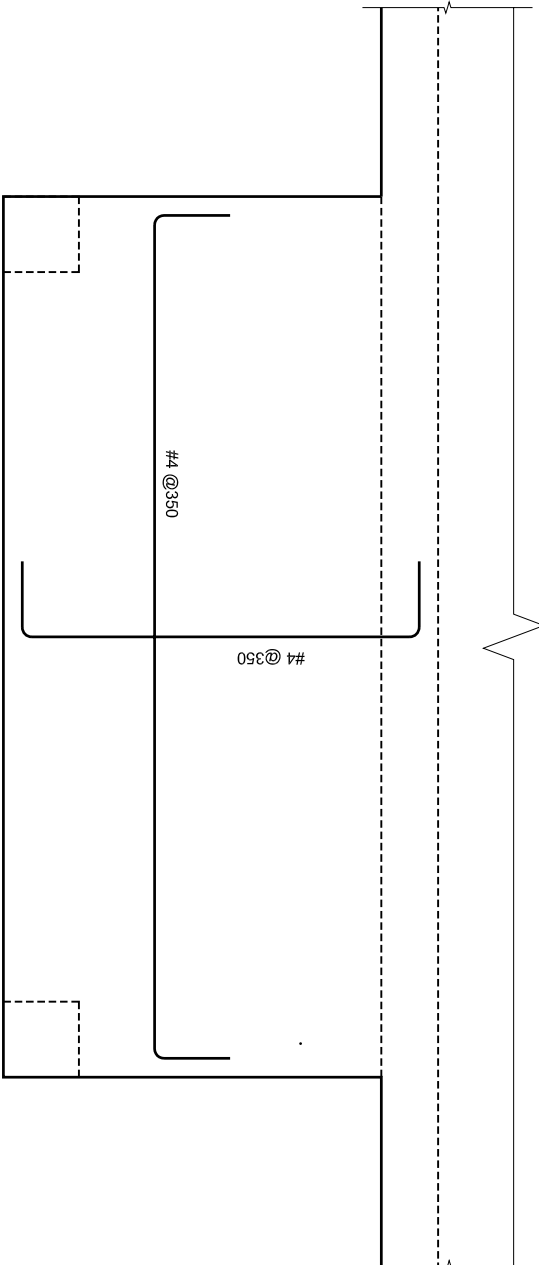
STAIR LANDING CONCRETE BLOCK LAYOUT
DISPOSITION DES BLOCS DE BÉTON DU PALIER





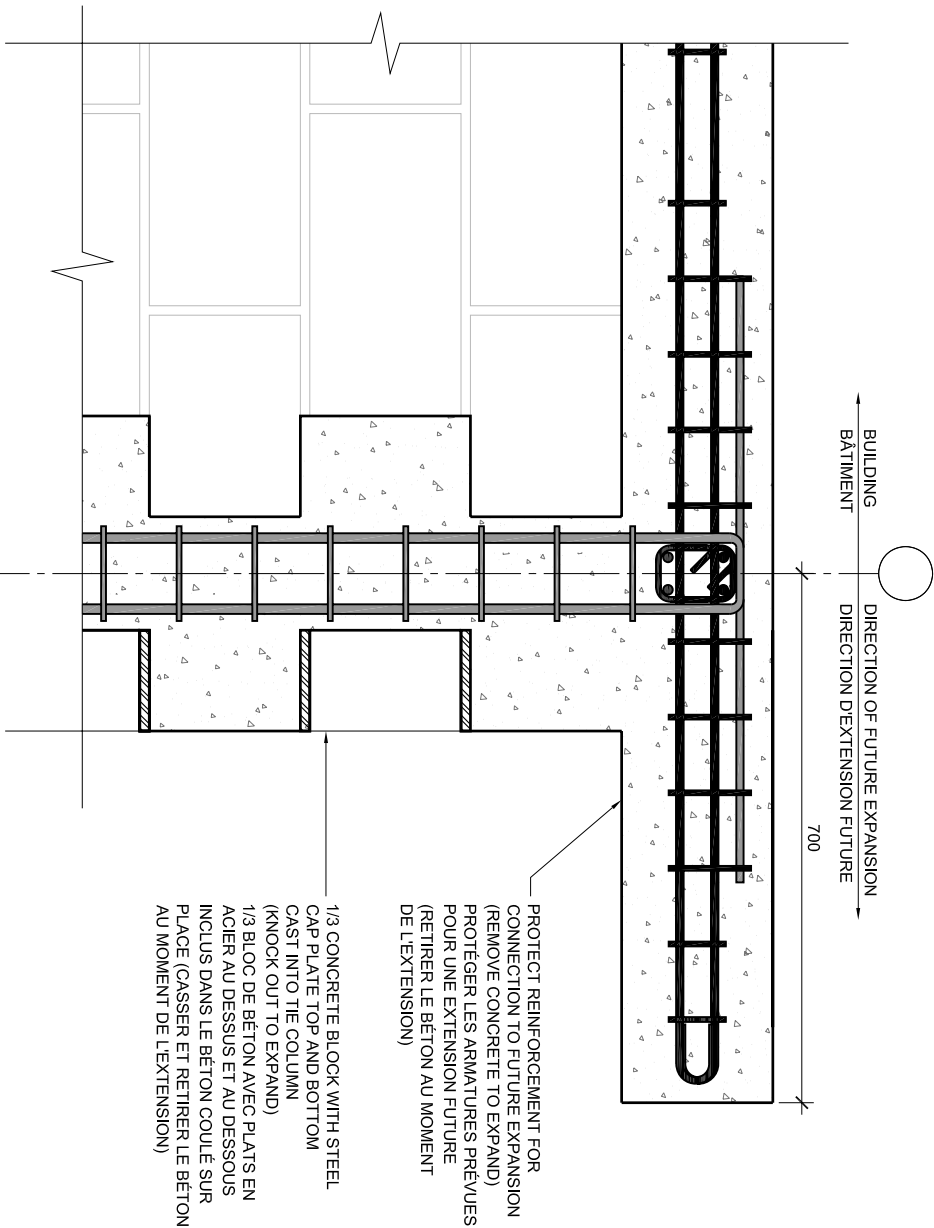
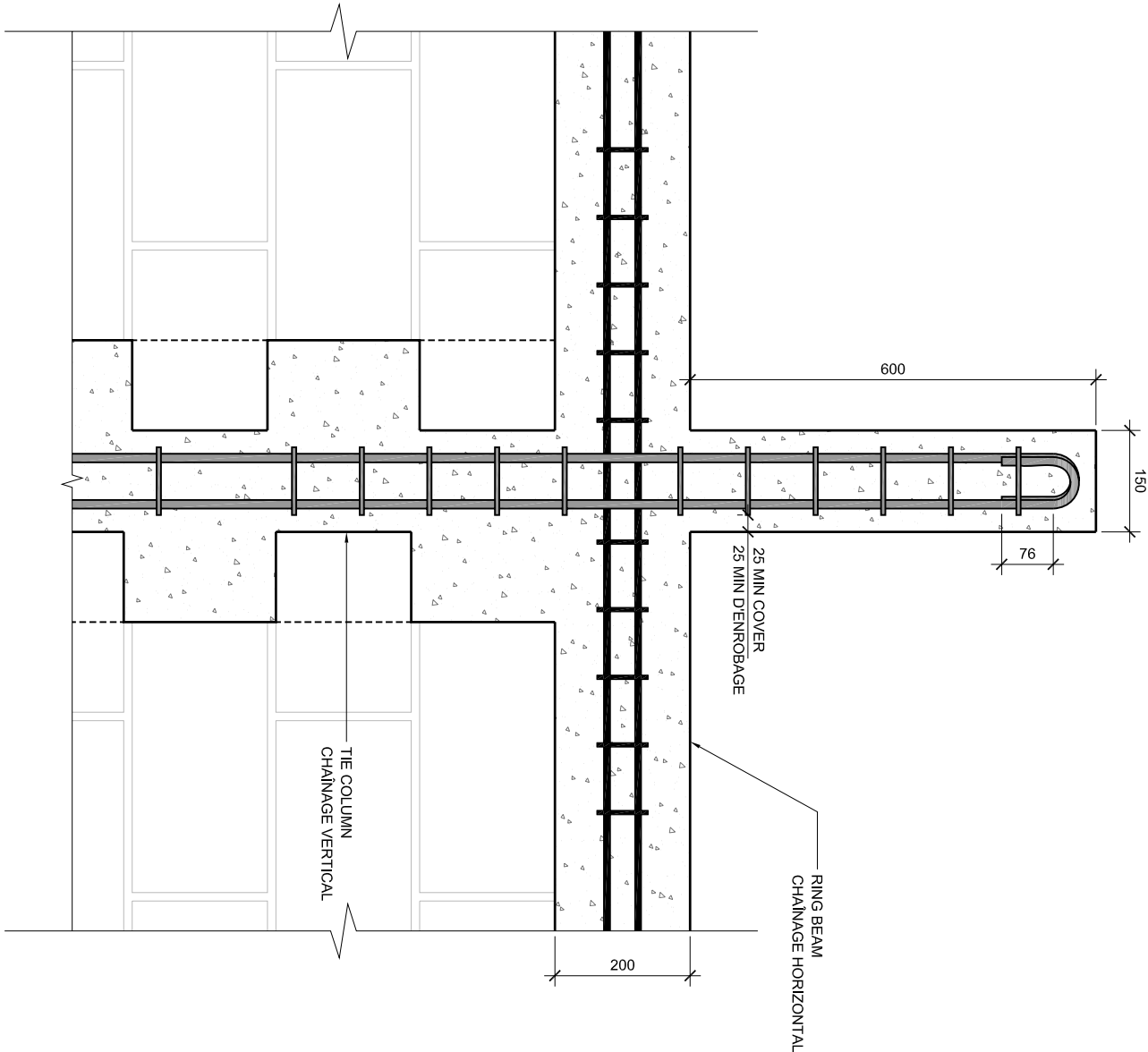
STAIR LANDING BEAM REINFORCEMENT PLAN
ARMATURES DES POUTRES DU PALIER



STAIR LANDING TOP REINFORCEMENT PLAN
ARMATURES SUPÉRIEURES DU PALIER

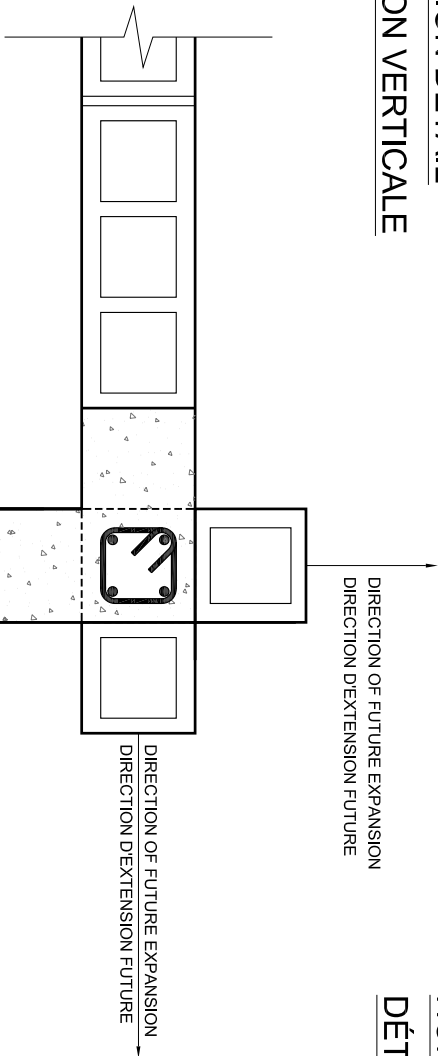


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WORK / TRAVAIL			
TWO STORY CONFINED MASONRY HOUSE (SINGLE STORY HOUSE WITH CONCRETE ROOF)			
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LOCATION / EMPLACEMENT			
HAITI HAÏTI			
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Guy Nordenson and Associates 225 Varick Street 6th Flr New York NY 10014 Tel 212 766 9119 Fax 212 766 9016			
DRAWING TITLE / TITRE DU DESSIN			
STAIR LANDING DETAILS			
DÉTAILS DU PALIER			
DRAWN BY / ÉTABLI PAR		SHEET / PLANCHE	
JB		27 / 31	
CHECKED BY / CONTRÔLÉ PAR		RL / EO	
SCALE / ÉCHELLE		DATE / DATE	
1:20		2011/10/31	



VERTICAL EXPANSION DETAIL
DÉTAIL D'EXTENSION VERTICALE

HORIZONTAL EXPANSION DETAIL
DÉTAIL D'EXTENSION HORIZONTALE



Build Change
USA Headquarters
1416 Larimer Street Suite 301
Denver CO 80202
Tel 303 953 2563

WORK / TRAVAIL

TWO STORY CONFINED
MASONRY HOUSE
(SINGLE STORY HOUSE
WITH CONCRETE ROOF)

MAISON À UN ÉTAGE EN
MAÇONNERIE CHÂÎNÉE
(MAISON DE PLAIN-PIED
AVEC TOITURE EN BÉTON)

PROJET / PROJET

POST-EARTHQUAKE RECONSTRUCTION
TECHNICAL ASSISTANCE PROGRAM
PROGRAMME D'ASSISTANCE TECHNIQUE À LA
RECONSTRUCTION SUITE AU SÉISME

LOCATION / EMPLACEMENT

HAITI
HAÏTI

STRUCTURAL ENGINEER / INGÉNIEUR STRUCTURE

Guy Nordenson and Associates
225 Varick Street 6th Flr
New York NY 10014
Tel 212 766 9119
Fax 212 766 9016

DRAWING TITLE / TITRE DU DESSIN

EXPANSION DETAILS
DÉTAILS POUR LES
EXTENSIONS FUTURES

DRAWN BY / ÉTABLI PAR

JB

SHEET / PLANCHE

HORIZONTAL EXPANSION PLAN DETAIL

DÉTAIL D'EXTENSION HORIZONTALE

28 / 31

CHECKED BY / CONTRÔLÉ PAR

RL / EO

SCALE / ÉCHELLE

1:10

DATE / DATE

2011/10/31



USAID E C A P
FROM THE AMERICAN PEOPLE
USAID E C A P is a U.S. government agency that is authorized to provide technical assistance and training to support development and economic growth in Haiti.
A Partnership of Leaders for Humanity
Development Resources Group (DRG)
and Build Change



Build Change
USA Headquarters
1416 Larimer Street Suite 301
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WORK / TRAVAIL

**TWO STORY CONFINED
MASONRY HOUSE
(SINGLE STORY HOUSE
WITH CONCRETE ROOF)**

**MAISON À UN ÉTAGE EN
MAÇONNERIE CHÂÎNÉE
(MAISON DE PLAIN-PIED
AVEC TOITURE EN BÉTON)**

PROJECT / PROJET

POST-EARTHQUAKE RECONSTRUCTION
TECHNICAL ASSISTANCE PROGRAM
PROGRAMME D'ASSISTANCE TECHNIQUE À LA
RECONSTRUCTION SUITE AU SÉISME

LOCATION / EMPLACEMENT

HAITI
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STRUCTURAL ENGINEER / INGÉNIEUR STRUCTURE

Guy Nordenson and Associates
225 Varick Street 6th Flr
New York NY 10014
Tel 212 766 9119
Fax 212 766 9016

DRAWING TITLE / TITRE DU DESSIN

ALTERNATE PLANS

ALTERNATIVES

DRAWN BY / ÉTABLI PAR

SHEET / PLANCHE

CHECKED BY / CONTRÔLÉ PAR

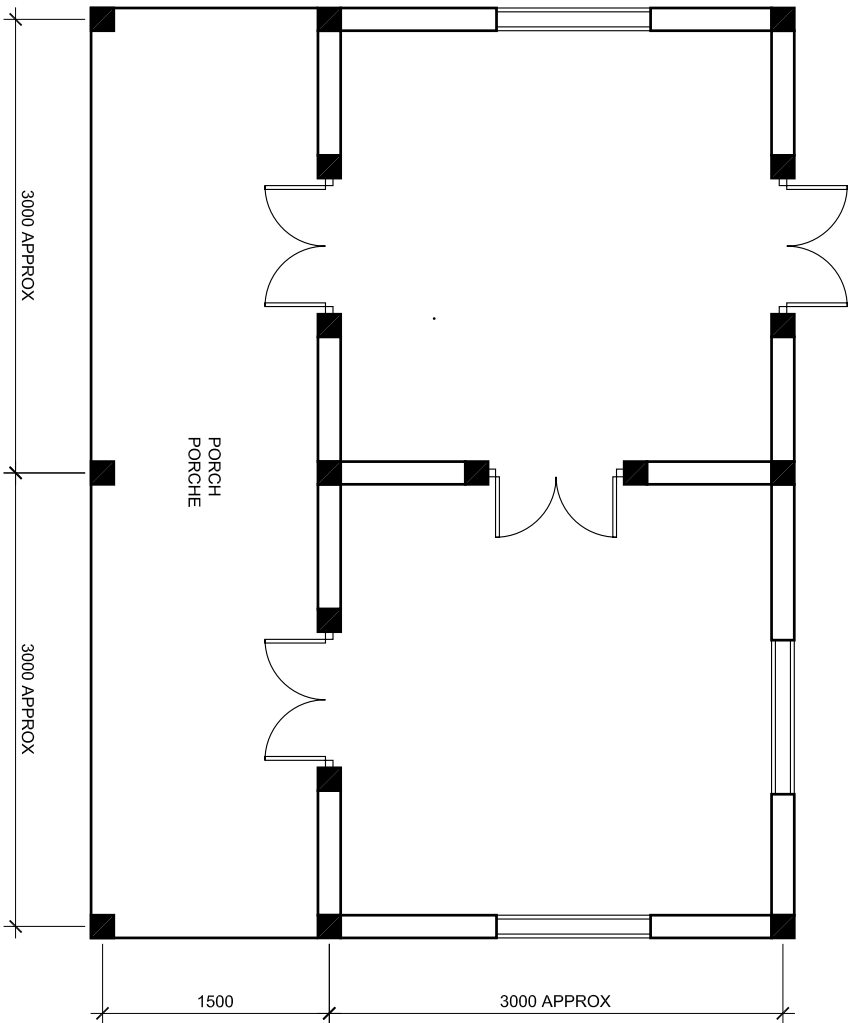
RL / EO

SCALE / ÉCHELLE

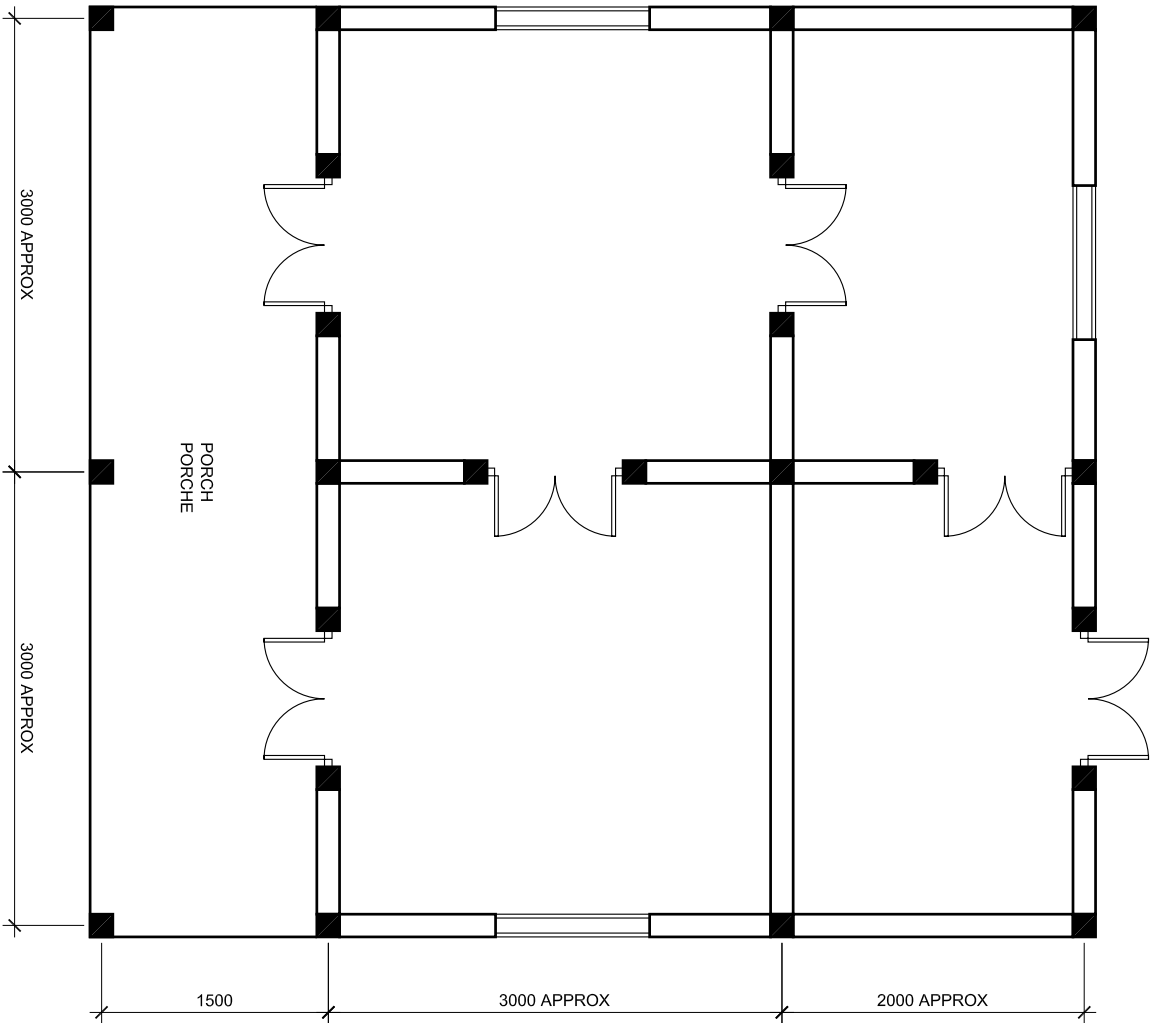
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DATE / DATE

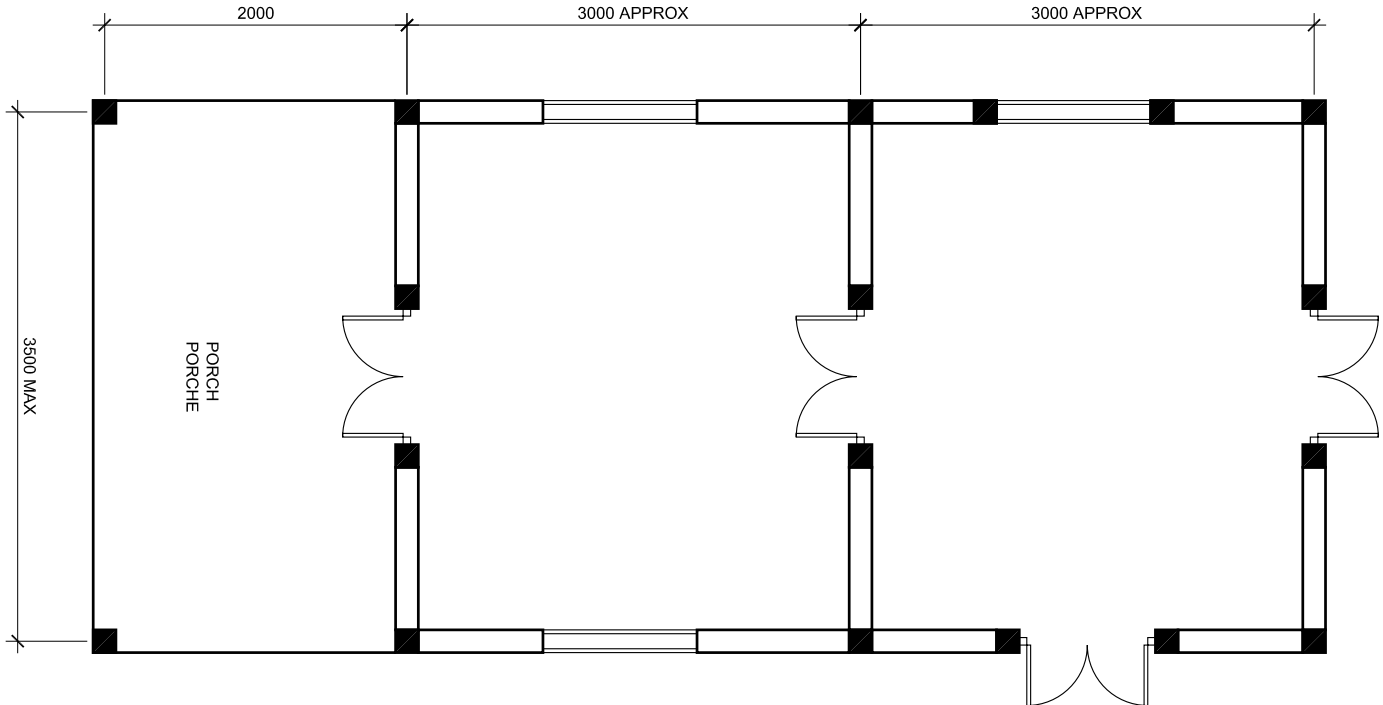
2011/10/31



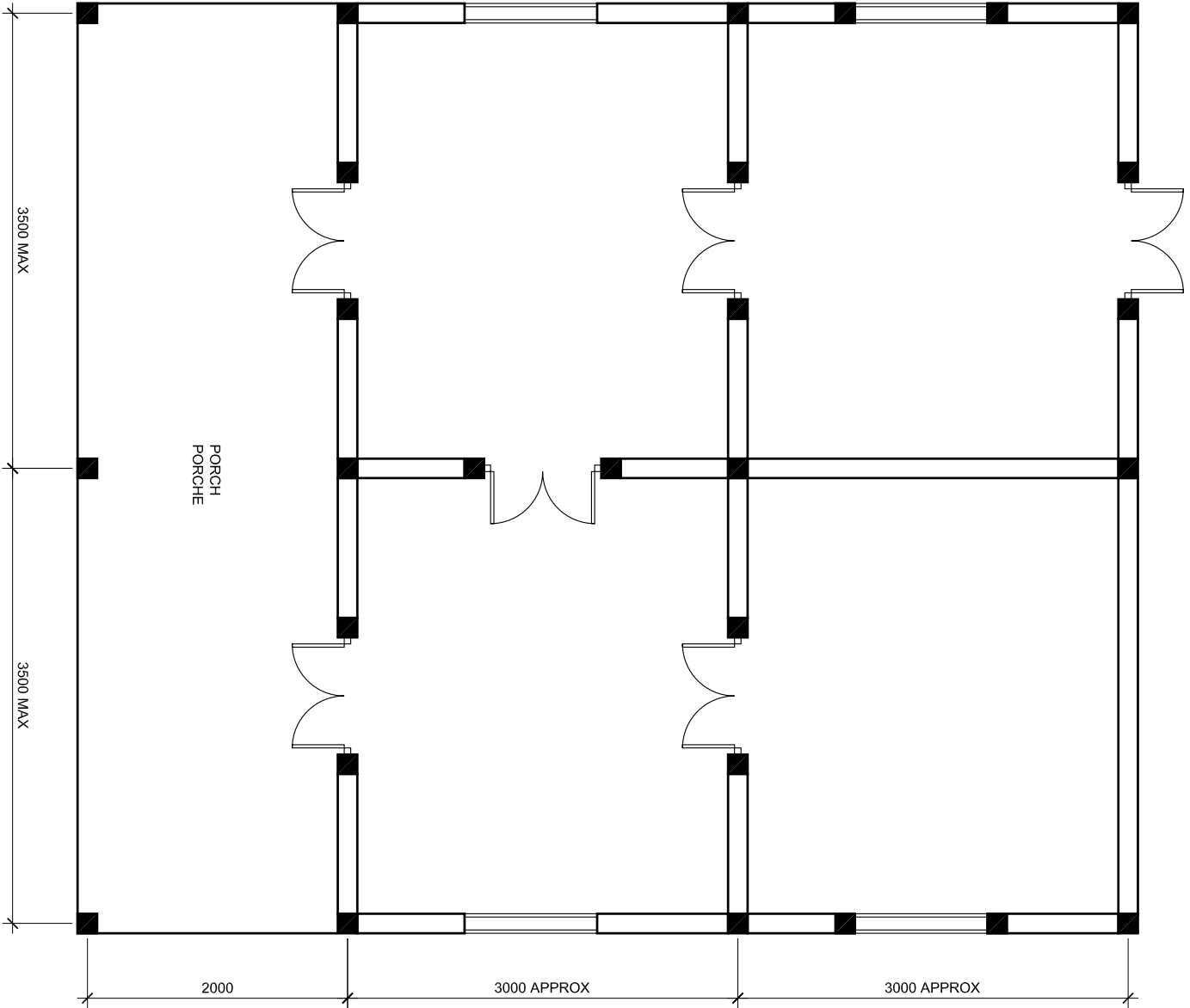
ALTERNATE LAYOUT A / VARIANTE A






ALTERNATE LAYOUT B / VARIANTE B

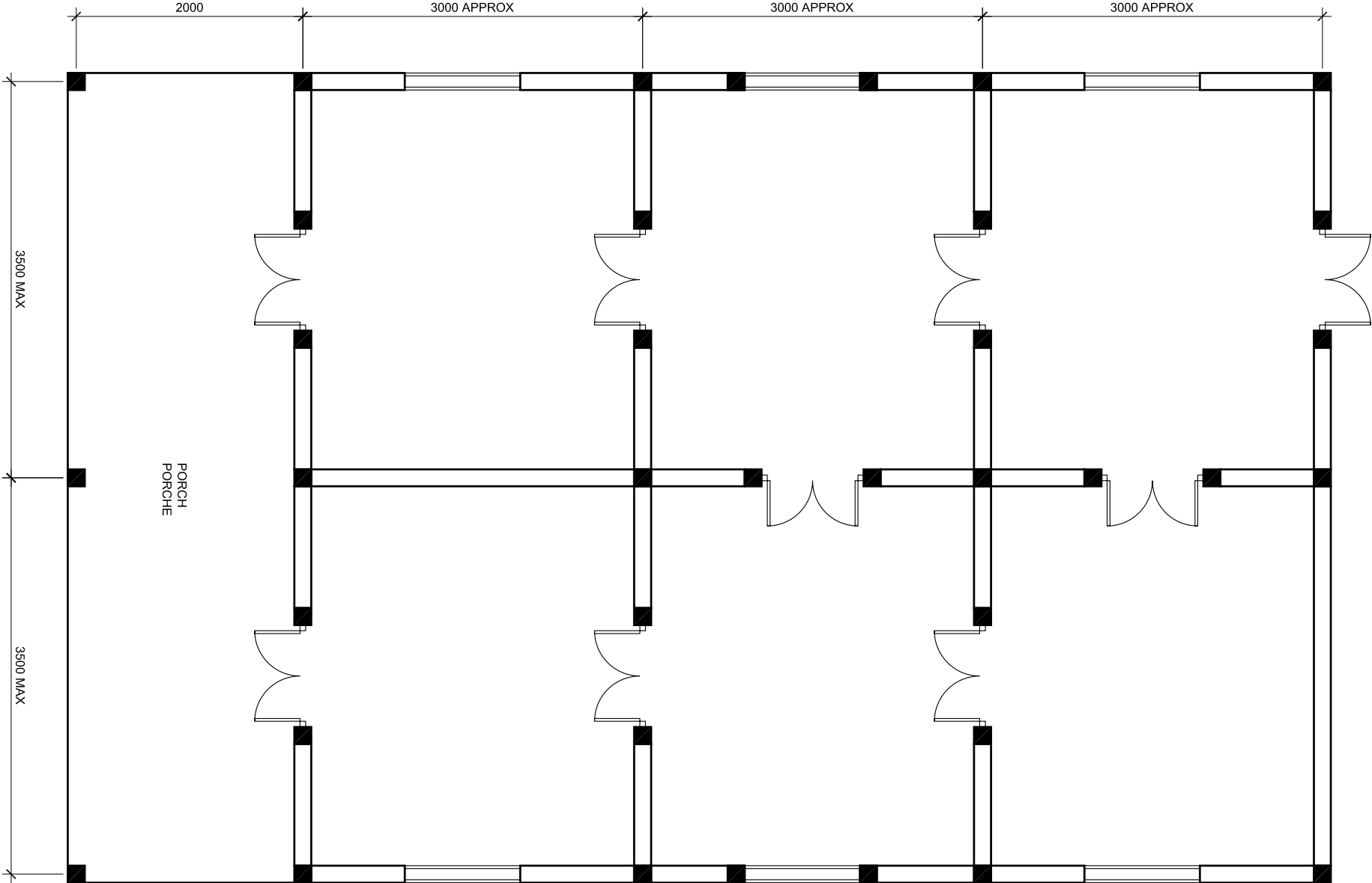


ALTERNATE LAYOUT C / VARIANTE C





ALTERNATE LAYOUT D / VARIANTE D

<div><div><div>FROM THE AMERICAN PEOPLE</div><div>USAID E C A P</div><div><small>USAID E C A P assistance is provided by the U.S. Agency for International Development (USAID) through the U.S. Department of State. A Partnership of Nations for a Safer, Stronger, and More Prosperous World.</small></div></div><div></div></div>			
<div><div>Build Change USA Headquarters 1416 Larimer Street Suite 301 Denver CO 80202 Tel 303 953 2563</div><div></div></div>			
WORK / TRAVAIL			
<div><div>TWO STORY CONFINED MASONRY HOUSE (SINGLE STORY HOUSE WITH CONCRETE ROOF)</div><div>MAISON À UN ÉTAGE EN MAÇONNERIE CHÂÎNÉE (MAISON DE PLAIN-PIED AVEC TOITURE EN BÉTON)</div></div>			
PROJECT / PROJET			
<div><div>POST-EARTHQUAKE RECONSTRUCTION TECHNICAL ASSISTANCE PROGRAM</div><div>PROGRAMME D'ASSISTANCE TECHNIQUE À LA RECONSTRUCTION SUITE AU SÉISME</div></div>			
LOCATION / EMPLACEMENT			
<div><div>HAITI</div><div>HAÏTI</div></div>			
STRUCTURAL ENGINEER / INGÉNIEUR STRUCTURE			
<div><div>Guy Nordenson and Associates 225 Varck Street 6th Fl New York NY 10014 Tel 212 766 9119 Fax 212 766 9016</div></div>			
DRAWING TITLE / TITRE DU DESSIN			
<div><div>ALTERNATE PLANS</div><div>ALTERNATIVES</div></div>			
DRAWN BY / ÉTABLI PAR		SHEET / PLANCHE	
JB		30 / 31	
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SCALE / ÉCHELLE		DATE / DATE	
1:50		2011/01/31	



ALTERNATE LAYOUT E / VARIANTE E

<div><div><div><div>FROM THE AMERICAN PEOPLE</div><div><div>USAID</div><div>E C A P</div></div><div><div>International Cooperation and Development</div><div>A Partnership of Nations for Humanity</div><div>Development Resources Group (DRG) and Build Change</div></div></div></div><div><div></div><div><div>Build Change</div><div>USA Headquarters</div><div>1416 Larimer Street Suite 301</div><div>Denver CO 80202</div><div>Tel 303 953 2563</div></div></div></div>			
WORK / TRAVAIL			
<div><div>MAISON À UN ÉTAGE EN MAÇONNERIE CHÂÎNÉE (MAISON DE PLAIN-PIED AVEC TOITURE EN BÉTON)</div><div>TWO STORY CONFINED MASONRY HOUSE (SINGLE STORY HOUSE WITH CONCRETE ROOF)</div></div>			
<div><div>PROJECT / PROJET</div><div><div>POST-EARTHQUAKE RECONSTRUCTION</div><div>TECHNICAL ASSISTANCE PROGRAM</div><div>PROGRAMME D'ASSISTANCE TECHNIQUE À LA RECONSTRUCTION SUITE AU SÉISME</div></div></div>			
<div><div>LOCATION / EMPLACEMENT</div><div><div>HAITI</div><div>HAÏTI</div></div></div>			
<div><div>STRUCTURAL ENGINEER / INGÉNIEUR STRUCTURE</div><div><div>Guy Nordenson and Associates</div><div>225 Varck Street 6th Flr</div><div>New York NY 10014</div><div>Tel 212 766 9119</div><div>Fax 212 766 9016</div></div></div>			
<div><div>DRAWING TITLE / TITRE DU DESSIN</div><div>ALTERNATE PLANS</div><div>ALTERNATIVES</div></div>			
<div><div>DRAWN BY / ÉTABLI PAR</div><div>JB</div></div>		<div><div>SHEET / PLANCHE</div><div>31 / 31</div></div>	
<div><div>CHECKED BY / CONTRÔLÉ PAR</div><div>RL / EO</div></div>		<div><div>DATE / DATE</div><div>2011/10/31</div></div>	
<div><div>SCALE / ÉCHELLE</div><div>1:50</div></div>			