

BENEFICIARY GUIDE AND CONSTRUCTION HANDBOOK

Housing Reconstruction Project
Northern Cebu, Philippines

Doing the right thing



CARITAS Schwe
Suisse
Svizzera
Svizra



In Collaboration with
University of San Carlos - Cebu, Philippines
School of Architecture, Fine Arts and Design
Institute for Planning and Design



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The handbook is used for the construction of houses only. Should there be any conflicting statements, illustrations between this handbook and the construction plans and specifications, the plans and specification shall prevail.

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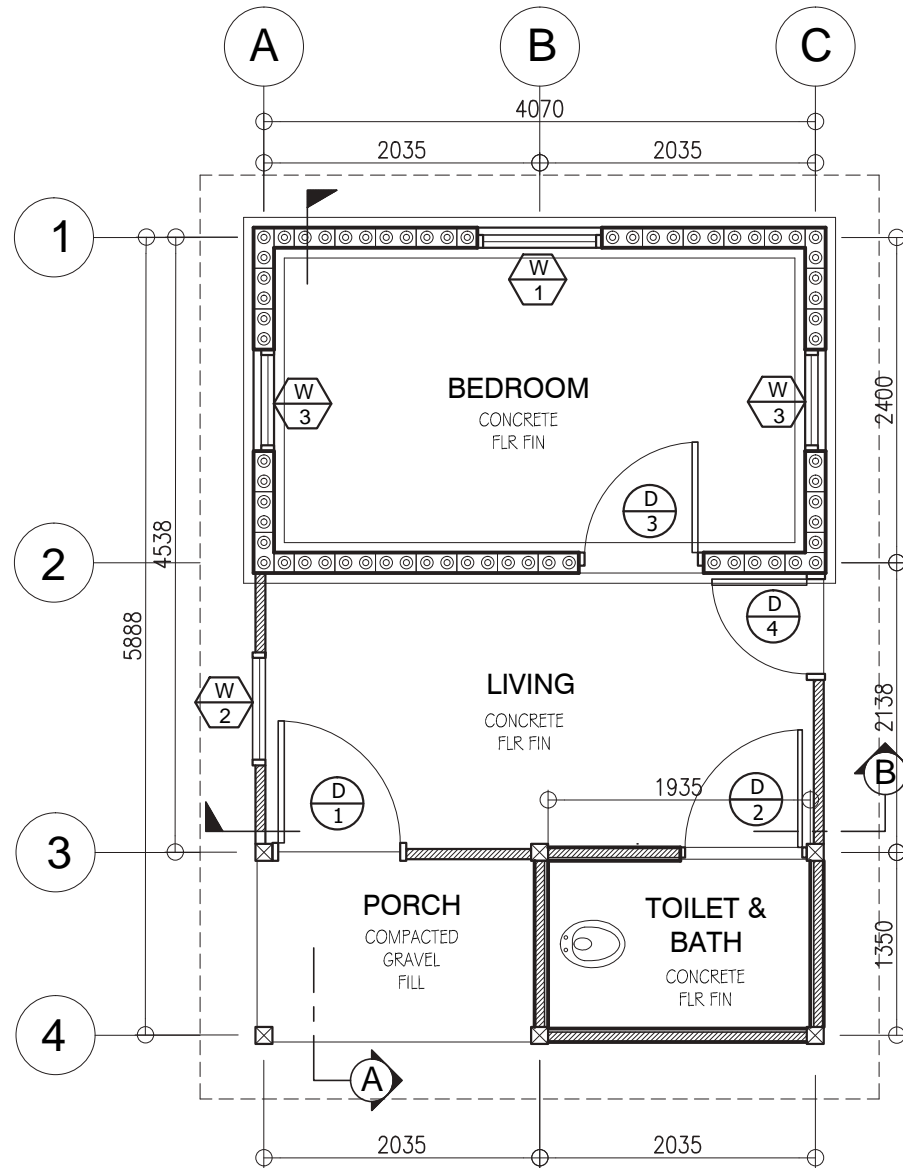
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I. WORKING DRAWINGS

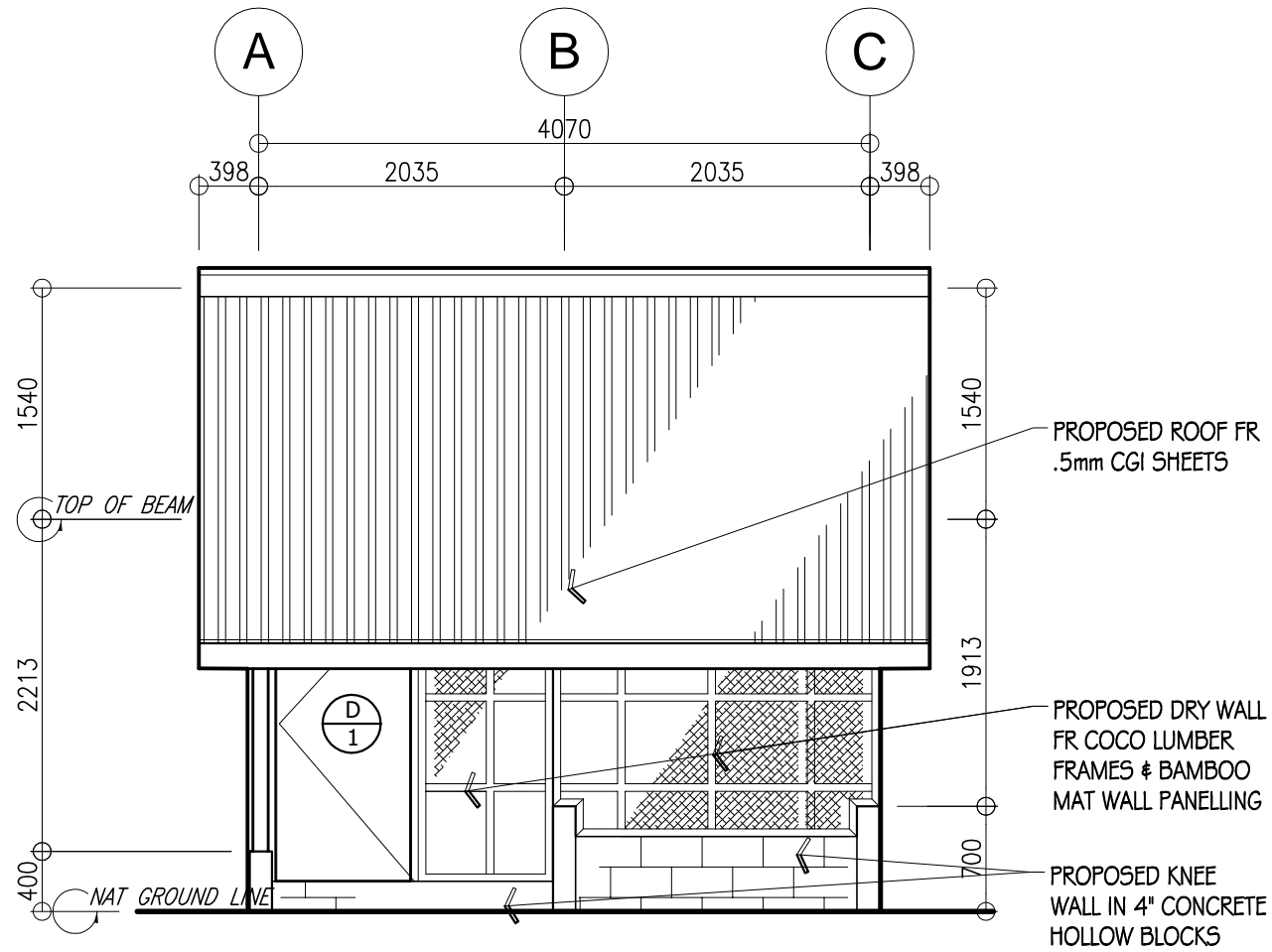
HOUSE MODEL 01



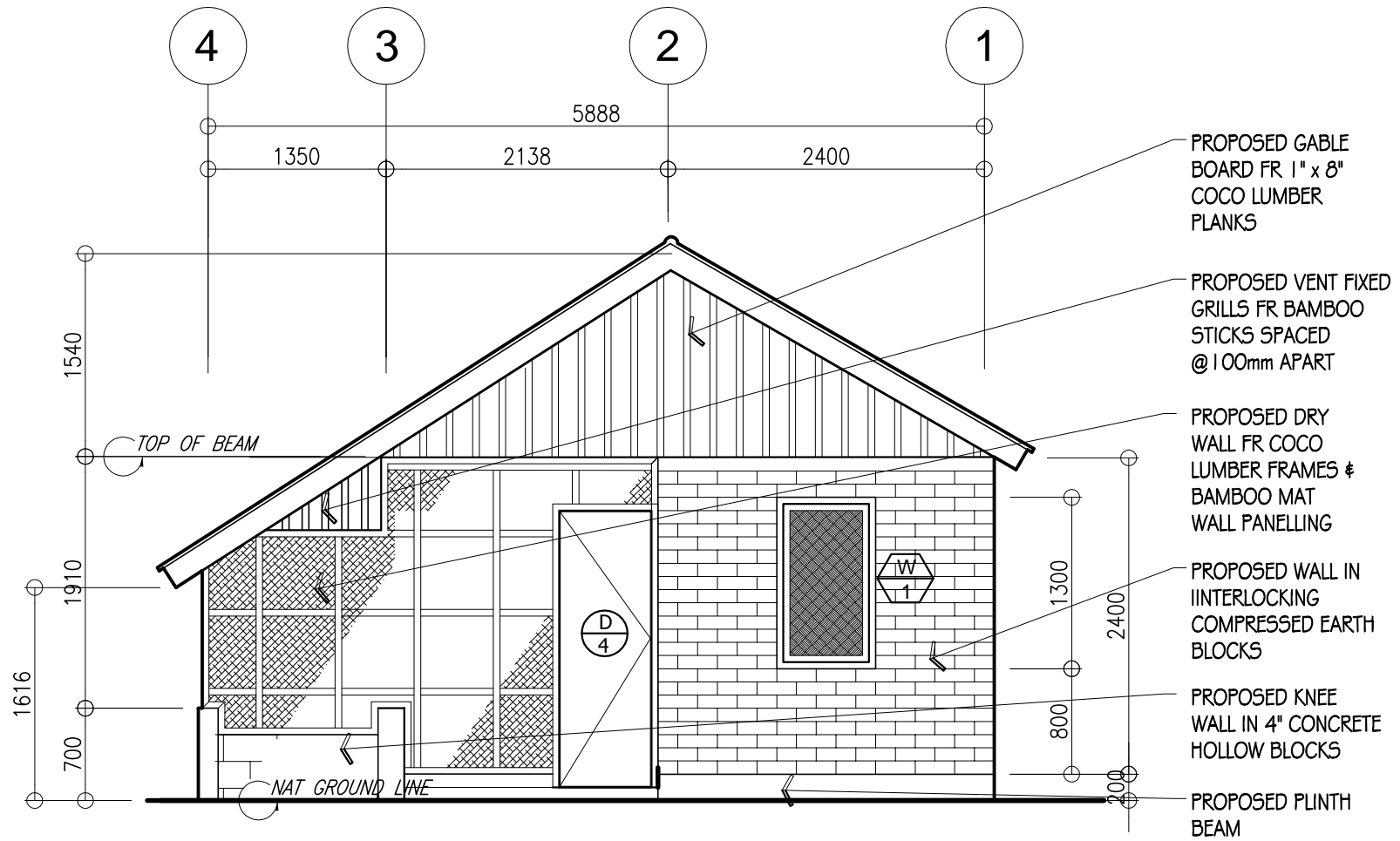
Hybrid house made of ICEB core and a timber component



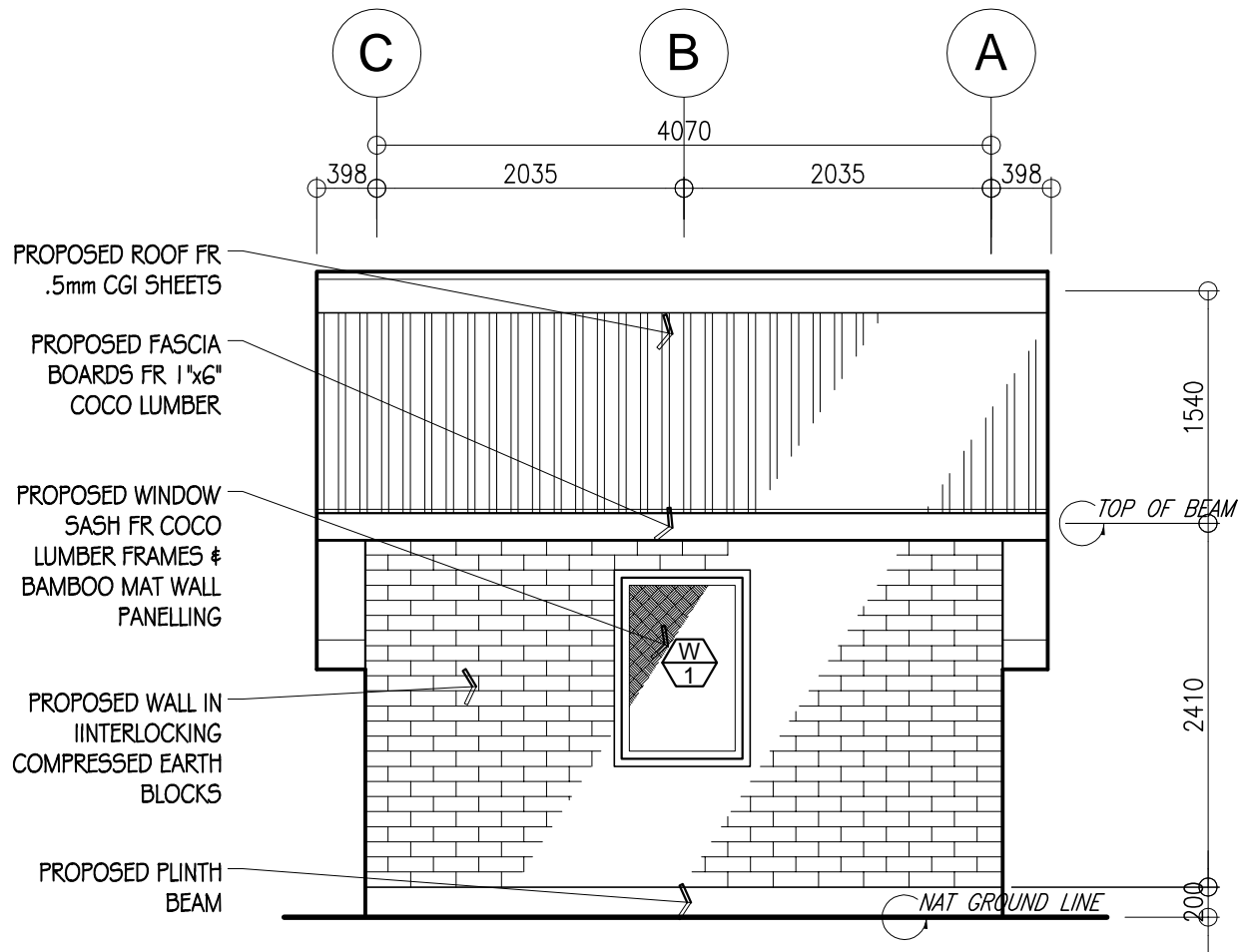
1 FLOOR PLAN
A-2 SCALE : 1 : 50 mtrs.



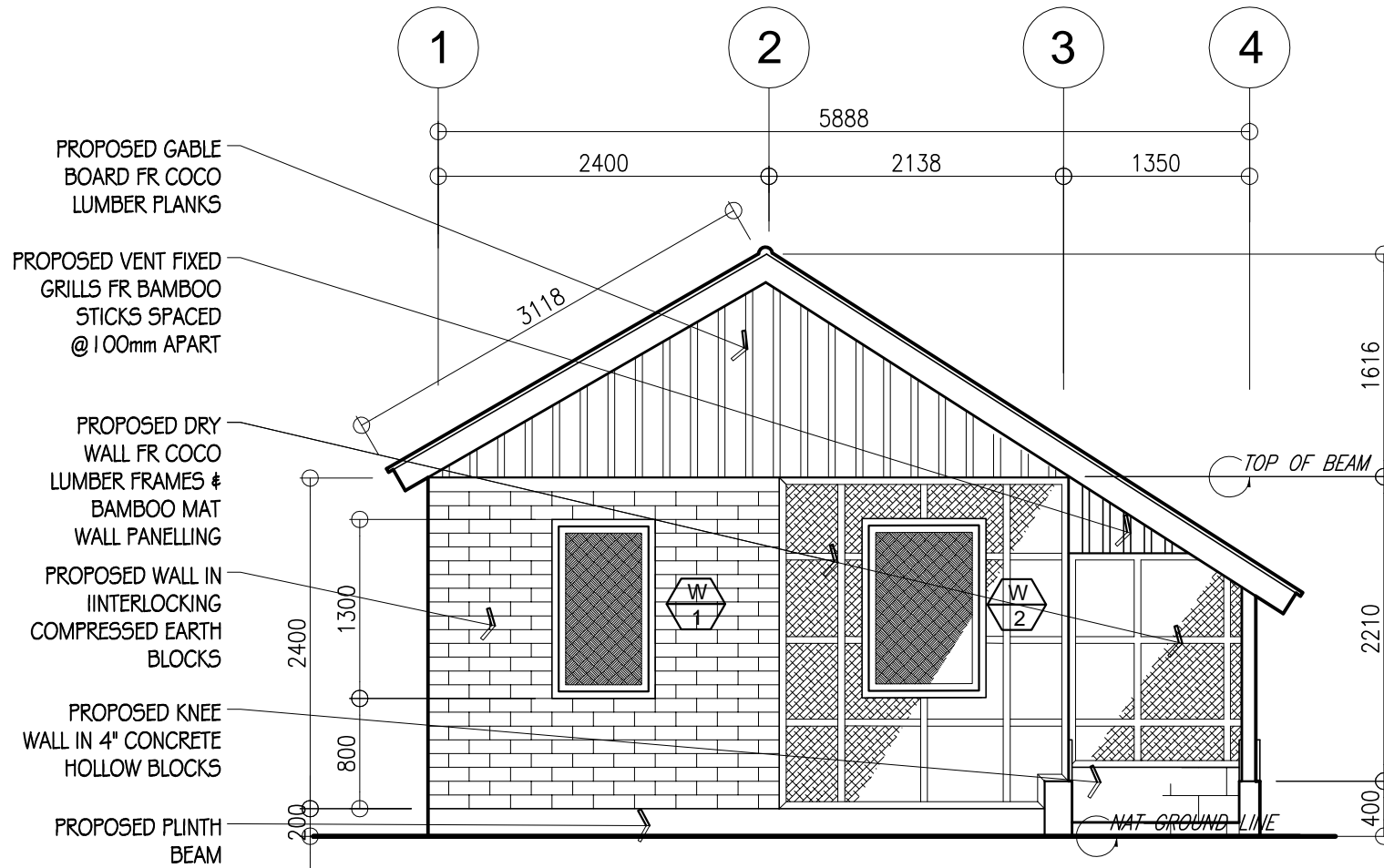
1 FRONT ELEVATION
SCALE : 1 : 50 mtrs.



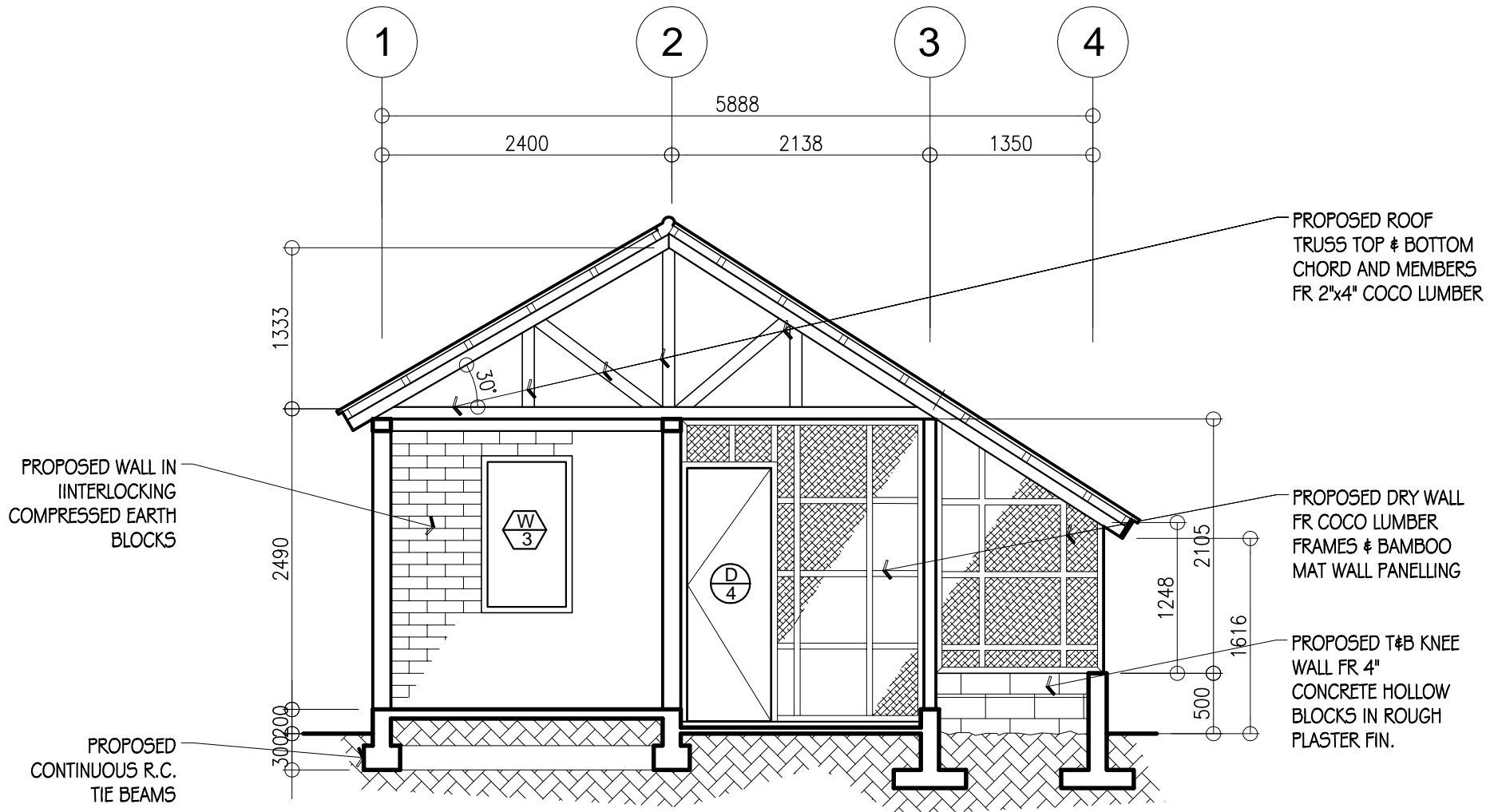
1 LEFT SIDE ELEVATION
A-4 SCALE : 1 : 50 mtrs.



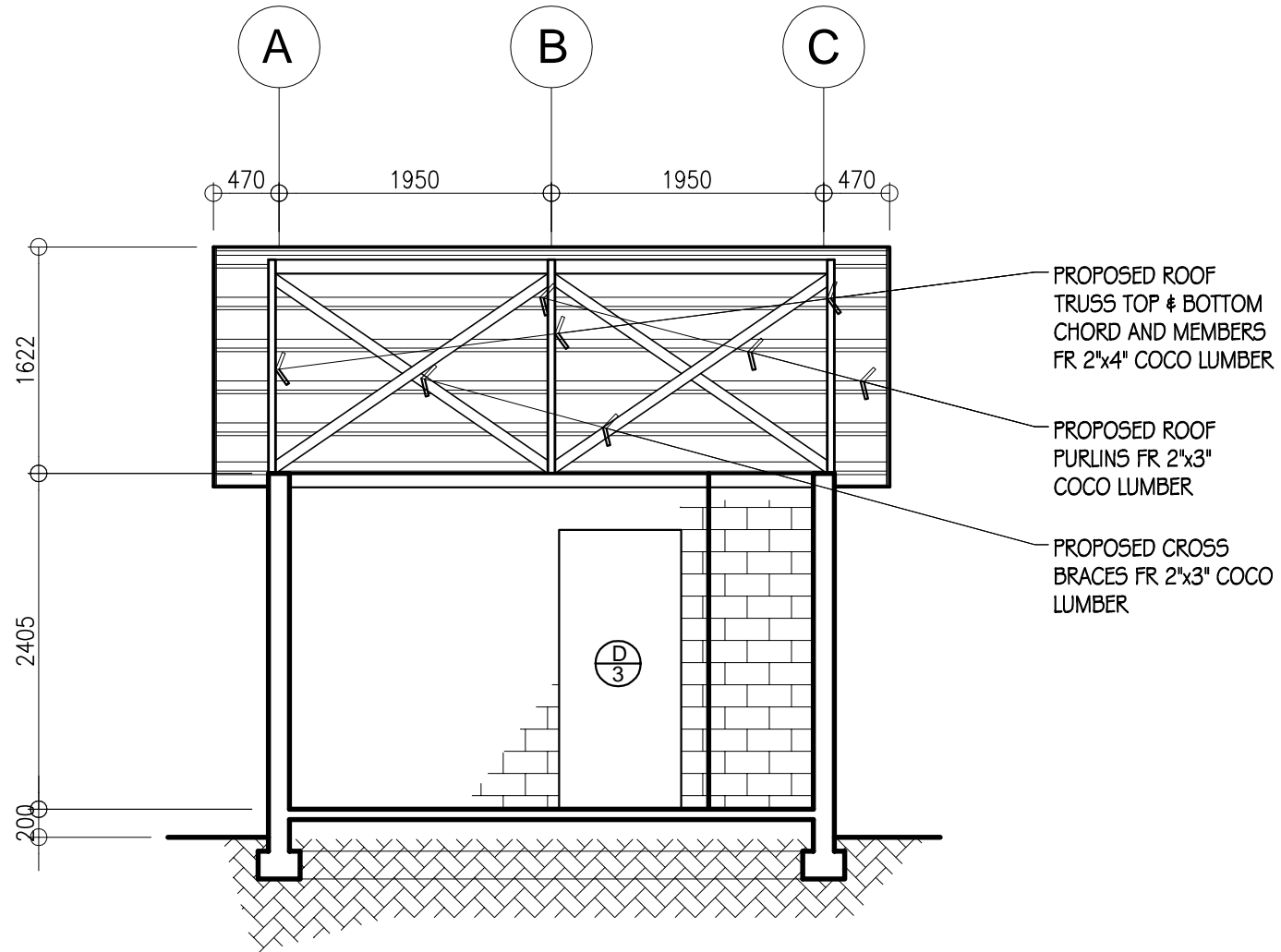
1 REAR ELEVATION
A-5 SCALE : 1 : 50 mtrs.



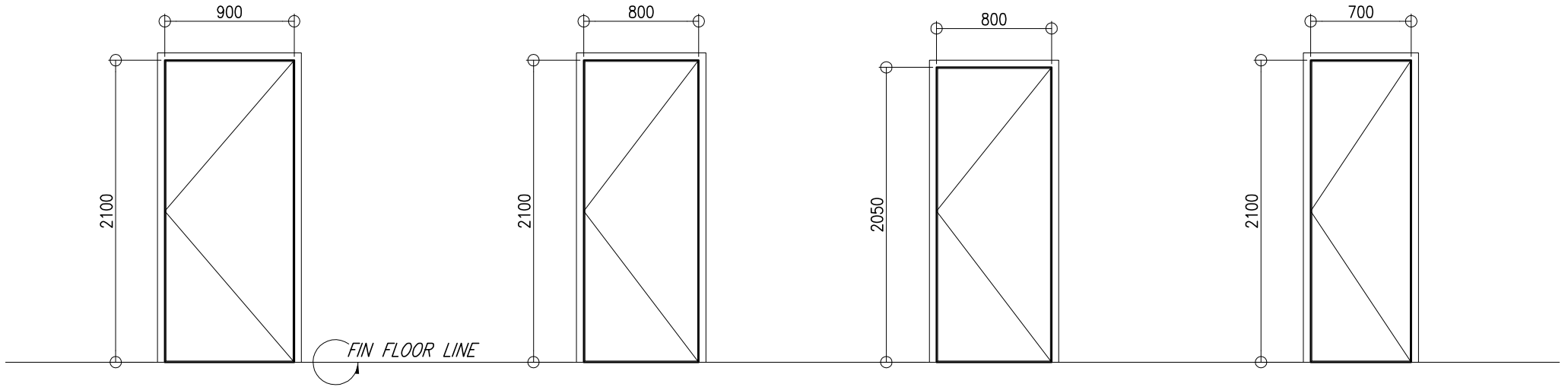
1 RIGHT SIDE ELEVATION
 A-6 SCALE : 1 : 50 mtrs.



1 SECTION THBA
A-7 SCALE : 1 : 50 mtrs.



1 SECTION THREE
A-8 SCALE : 1:50 mtrs.

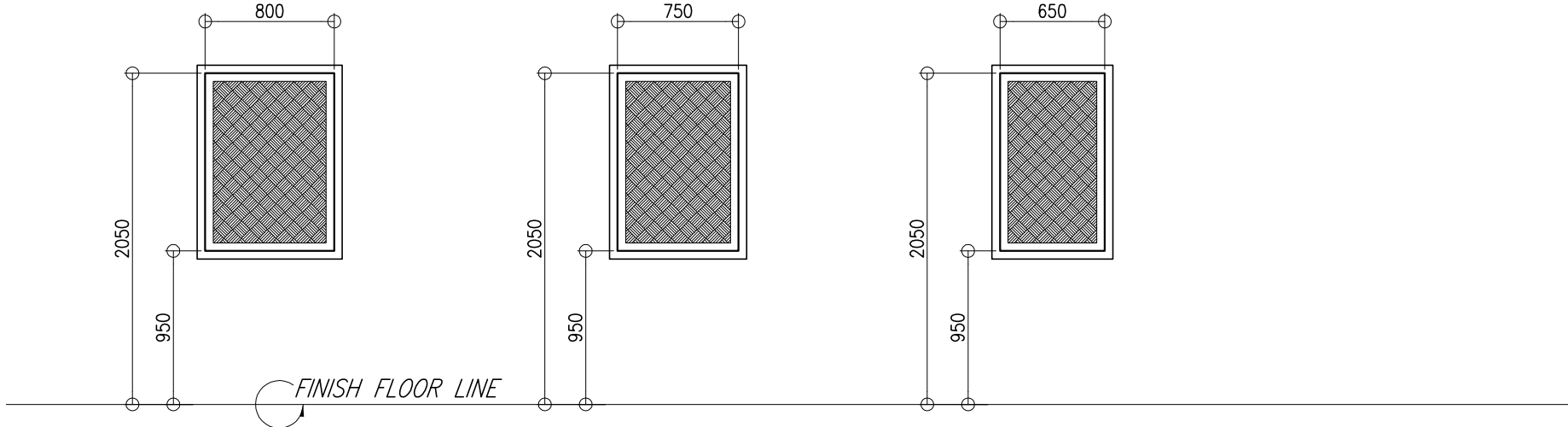


(D)
1 Hollow Core Flush Type
Main Entrance 1 sđ

(D)
2 Hollow Core Flush Type
Toilet & Bath 1 sđ

(D)
3 Hollow Core Flush Type
Bedroom 1 sđ

(D)
4 Hollow Core Flush Type
Back Exit 1 sđ

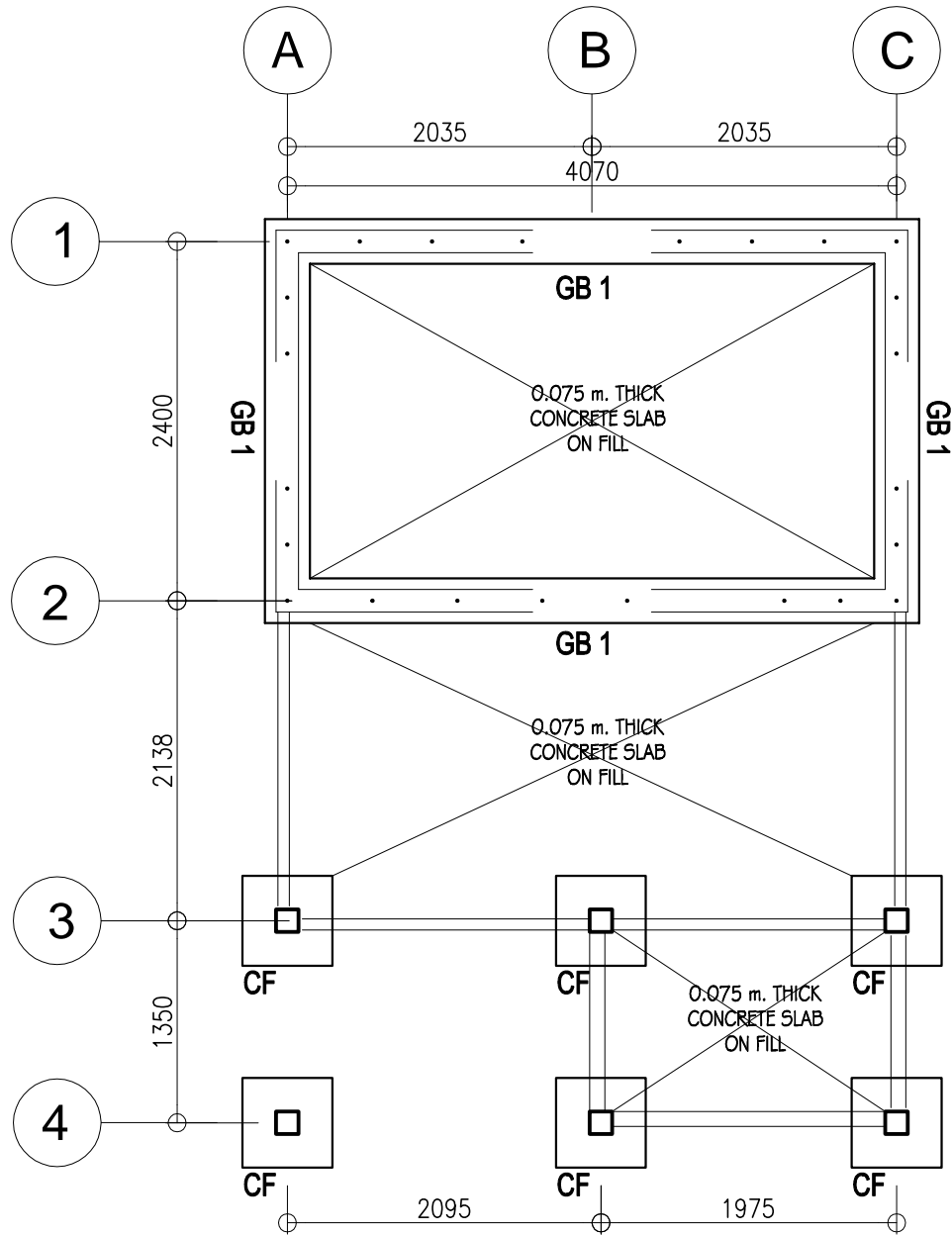


(W)
1 Amakan w/ Coco Lumber
Frames
Bedroom 1 sđ s

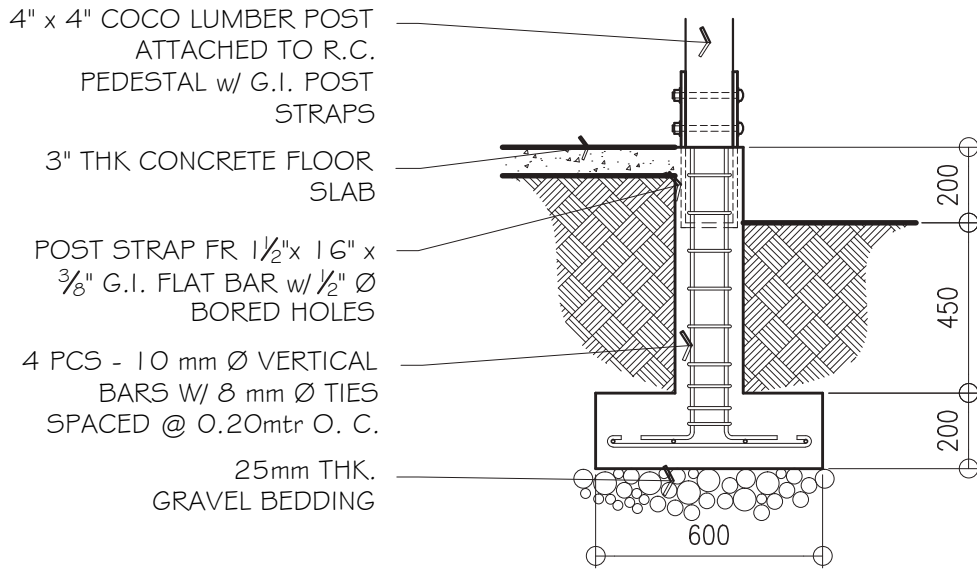
(W)
2 Amakan w/ Coco Lumber
Frames
Living 1 sđ

(W)
3 Amakan w/ Coco Lumber
Frames
Living, Bedroom 3 sđ s

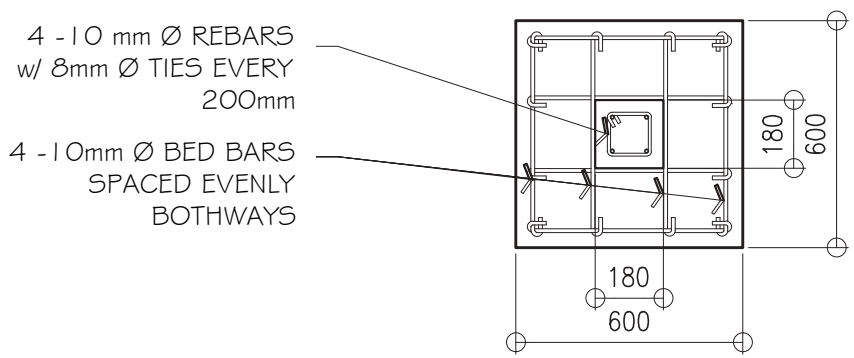
(1) SCHEDULE DOORS & WINDOWS
(A-9) SCALE : 1 : 40 mtrs.



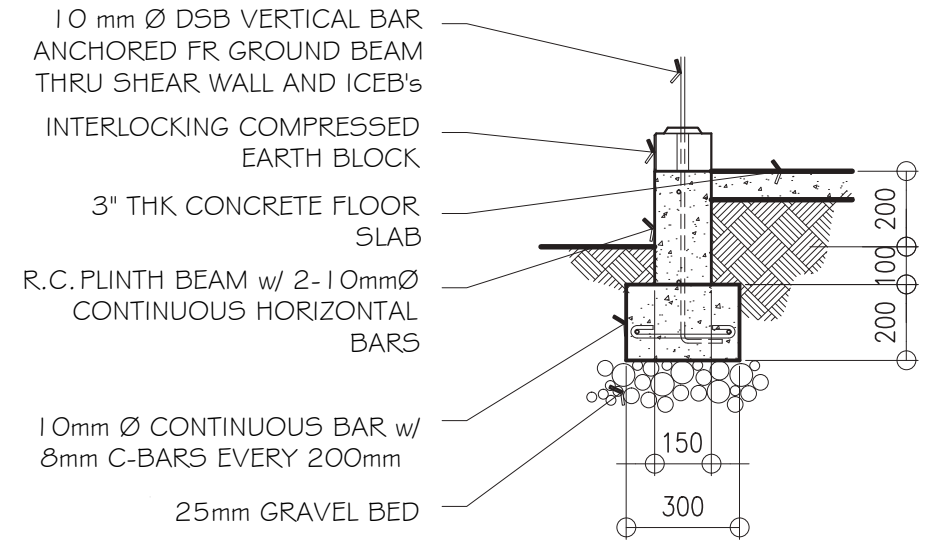
1 FOUNDATION PLAN
S-1 SCALE : 1 : 50 mtrs.



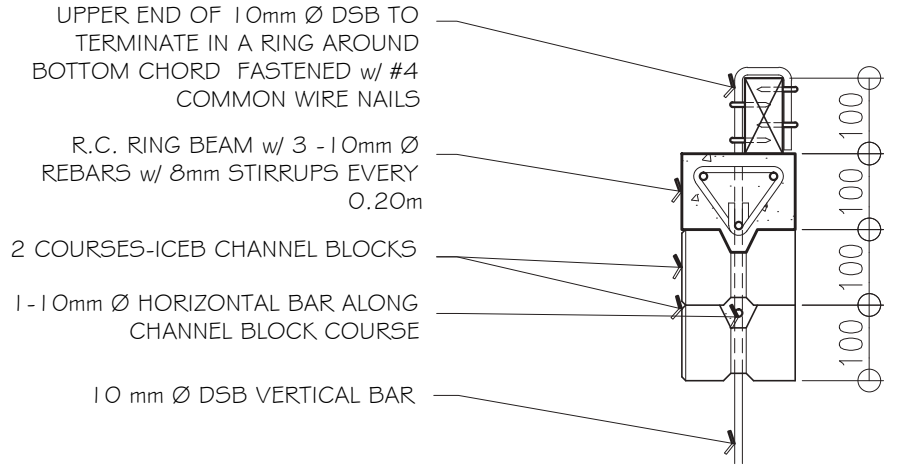
2 COLUMN FOOTING SECTION
S-2 SCALE : 1 : 20 mtrs.



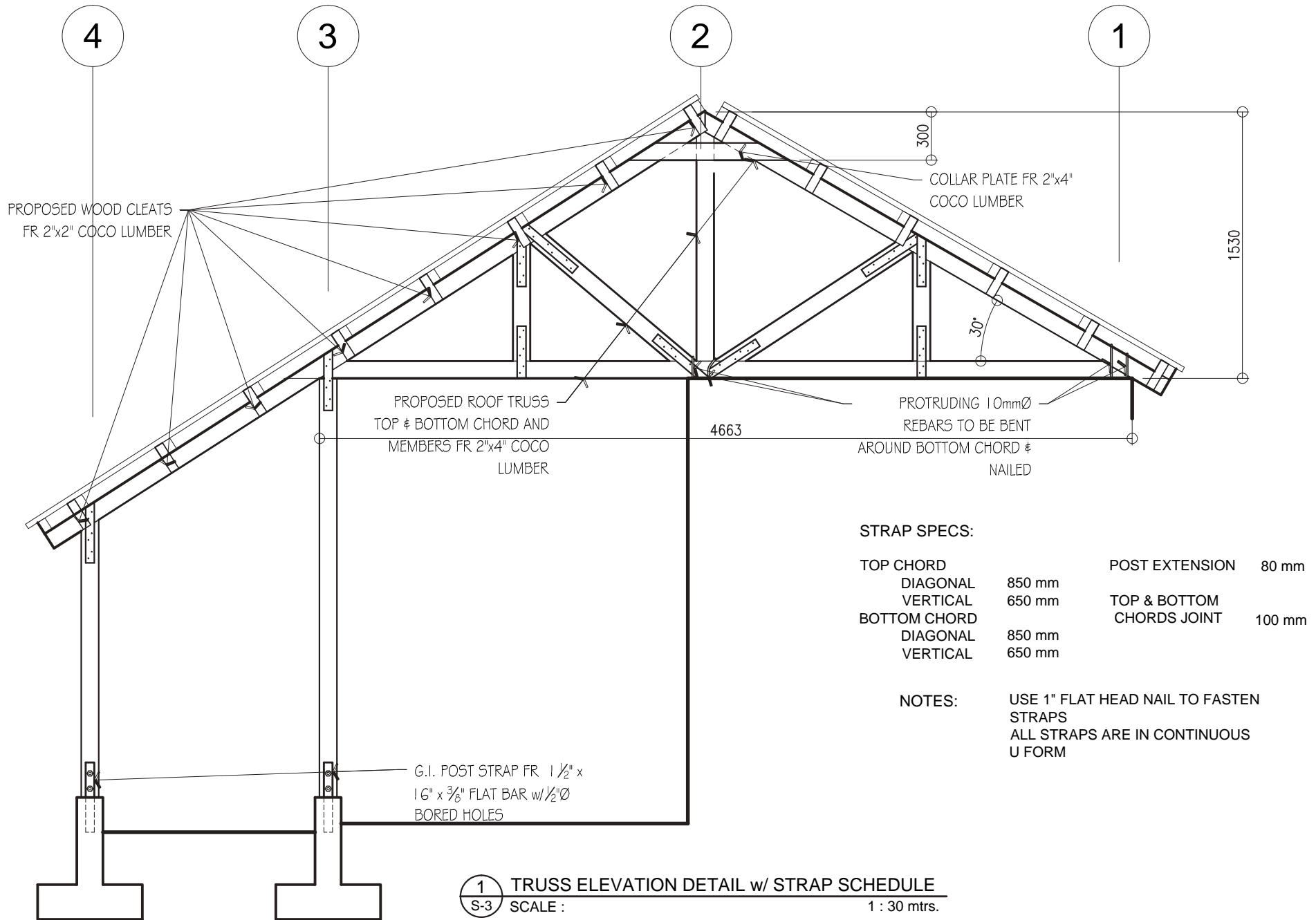
1 COLUMN FOOTING PLAN
S-2 SCALE : 1 : 20 mtrs.

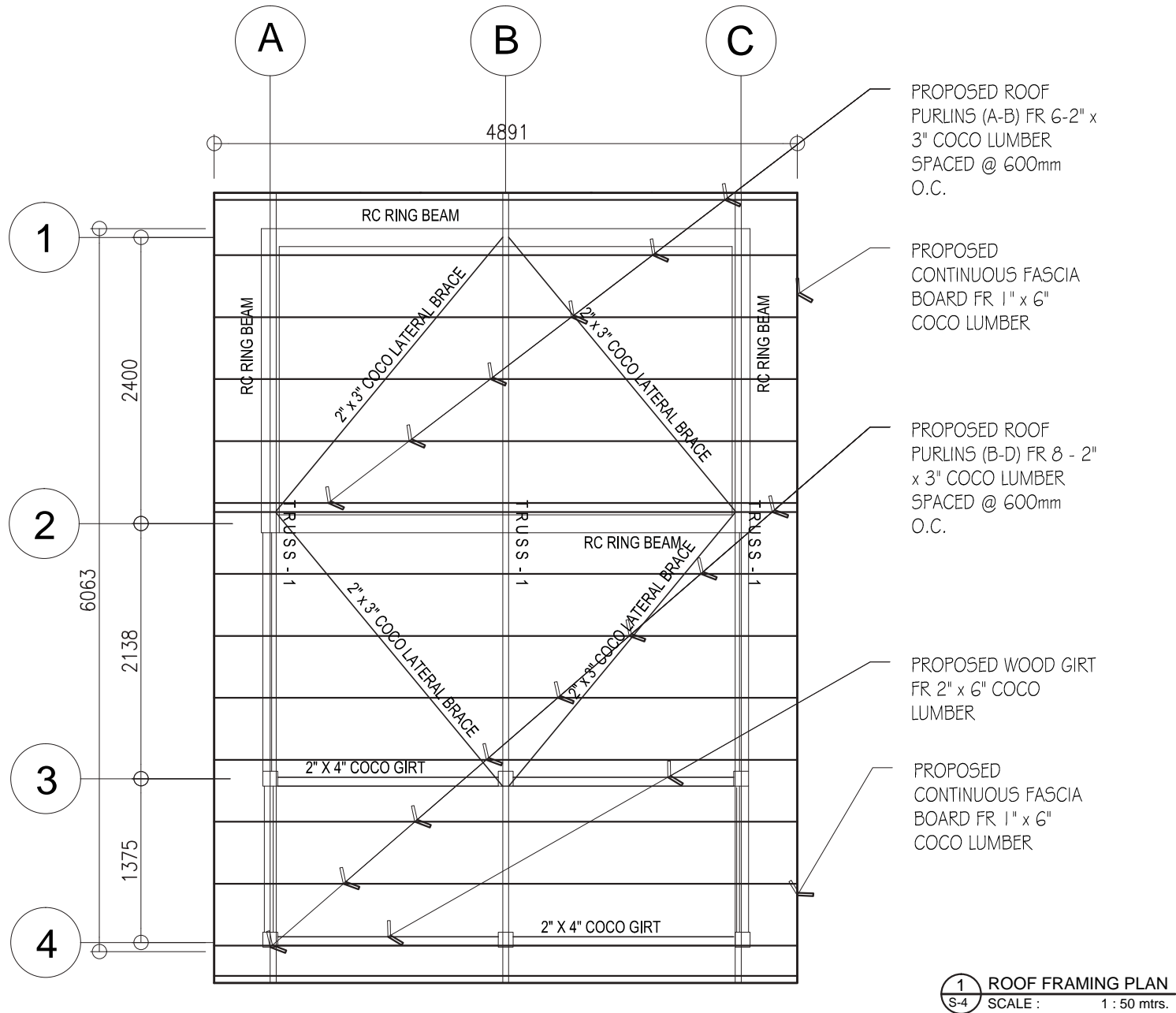


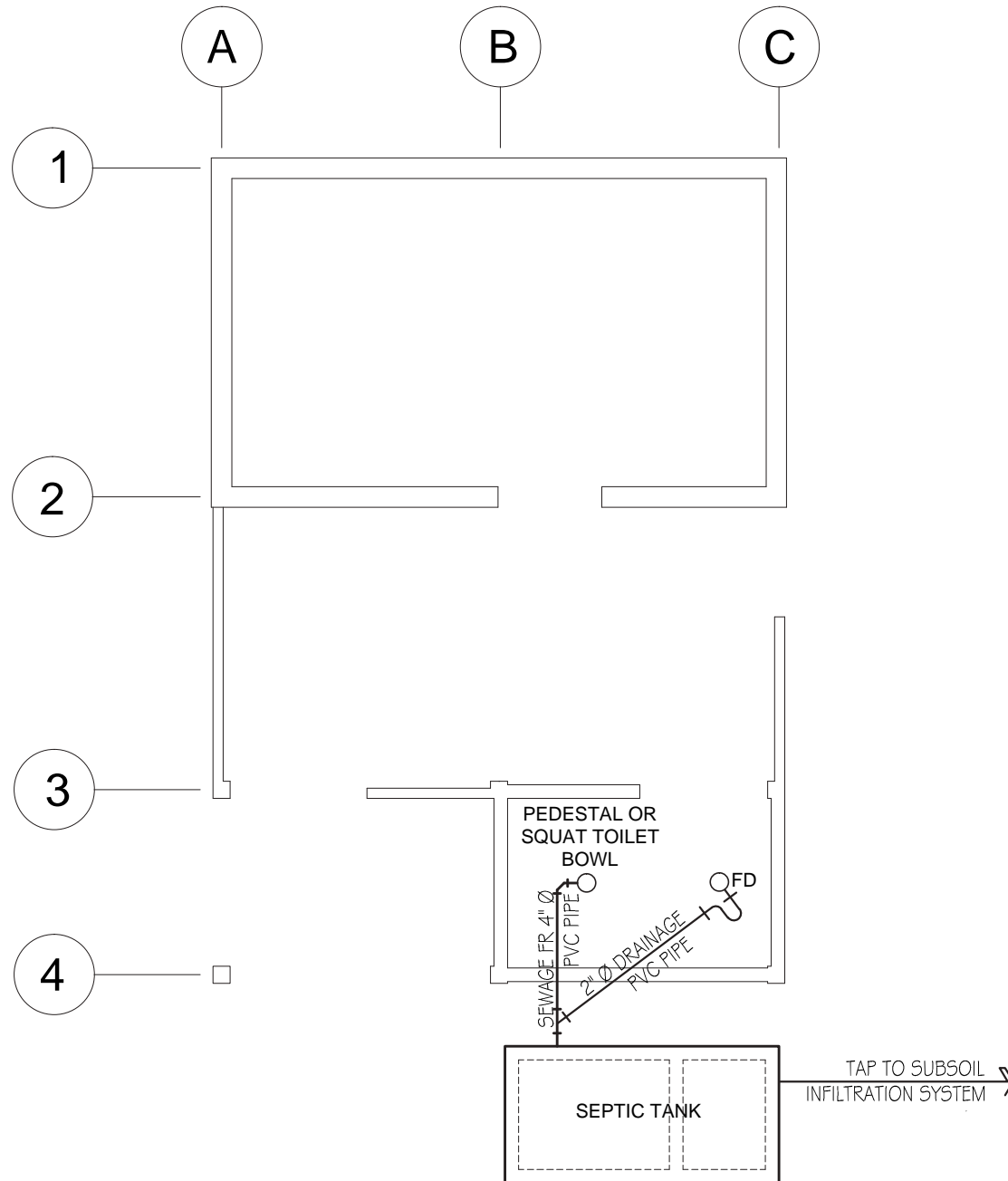
3 GROUND BEAM SECTION
S-2 SCALE : 1 : 20 mtrs.



4 RING BEAM SECTION
S-2 SCALE : 1 : 10 mtrs.





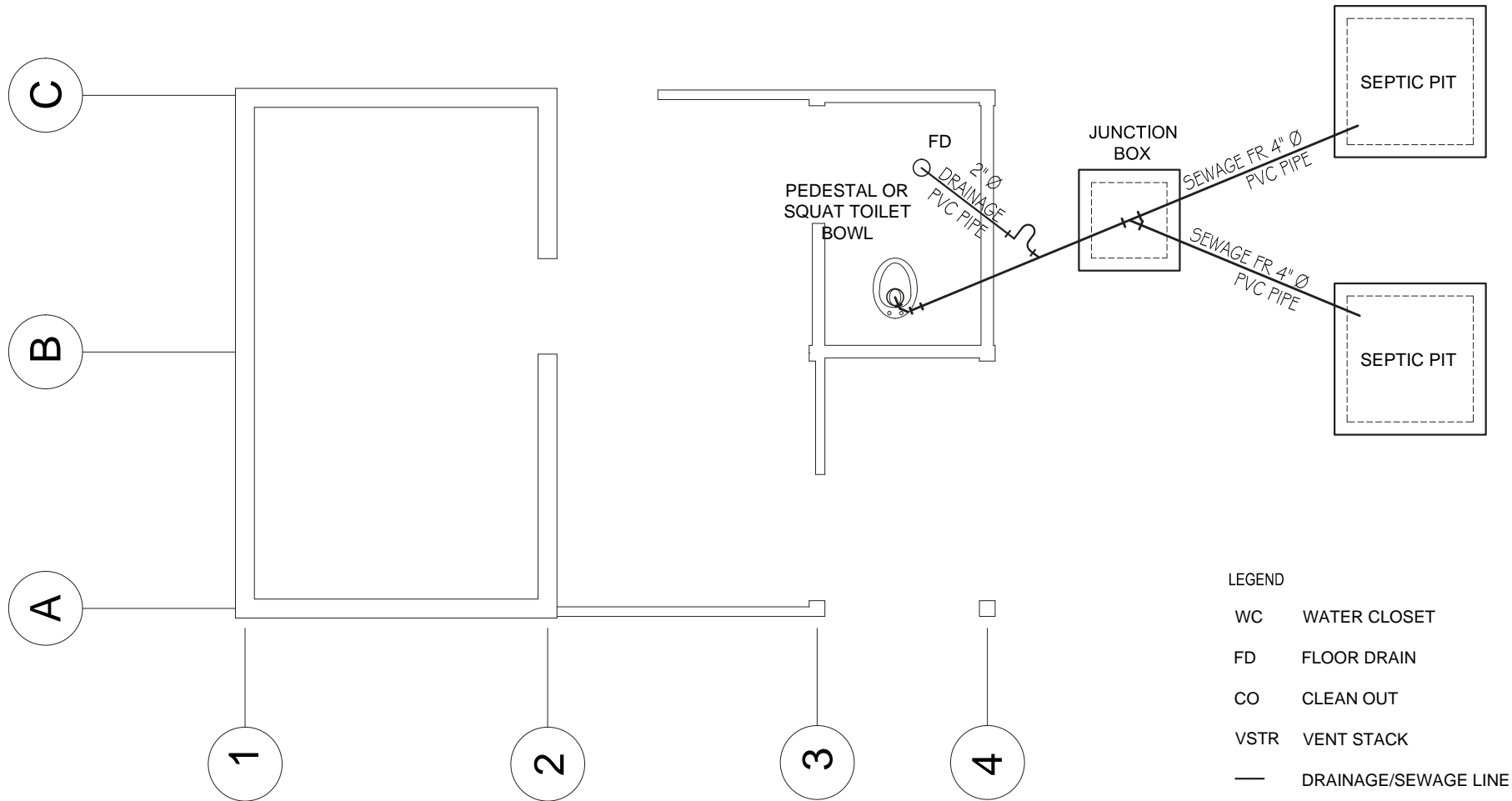


LEGEND

- WC WATER CLOSET
- FD FLOOR DRAIN
- CO CLEAN OUT
- VSTR VENT STACK
- DRAINAGE/SEWAGE LINE

2 PLUMBING LEGEND
P-1

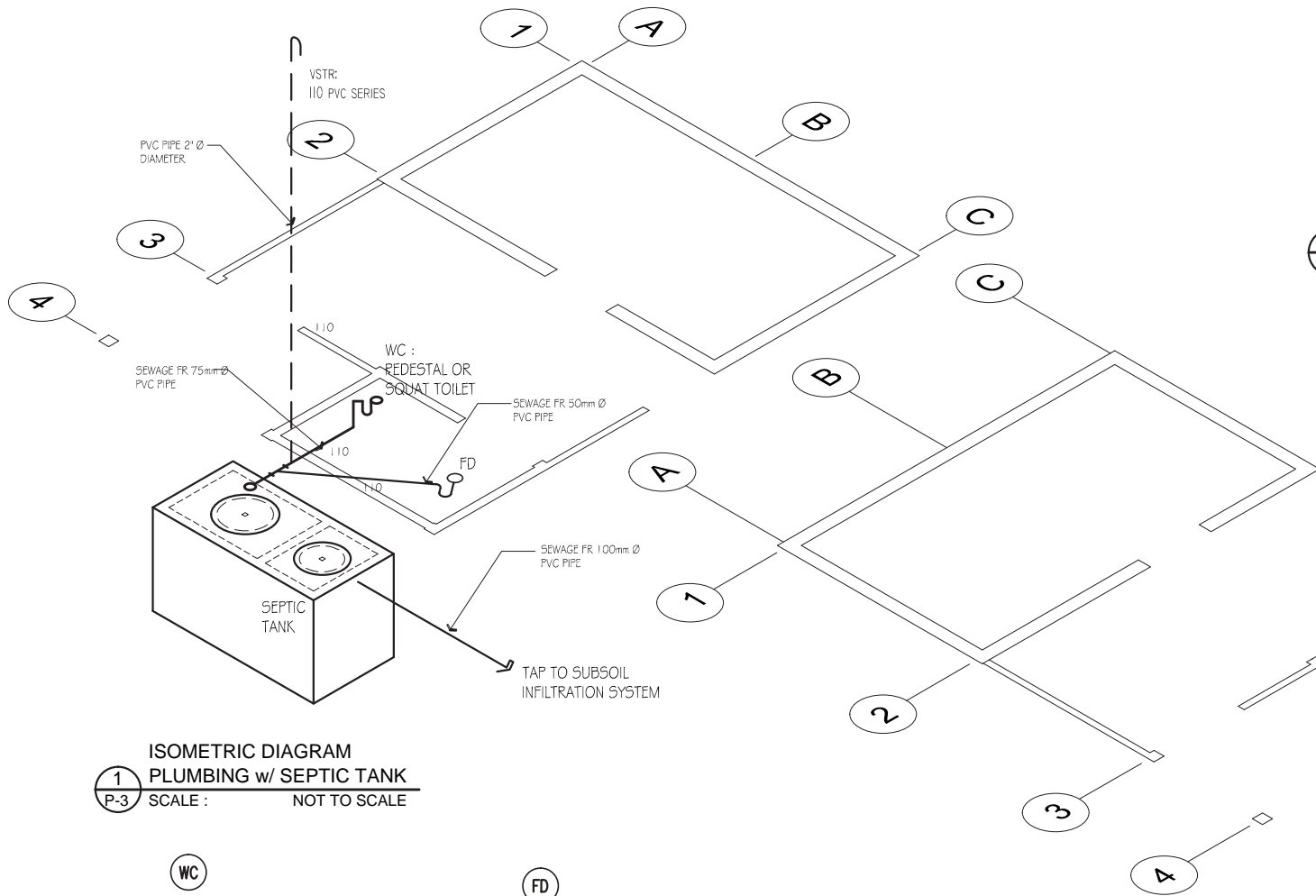
1 PLUMBING LAYOUT
P-1 SCALE : 1 : 50 mtrs.



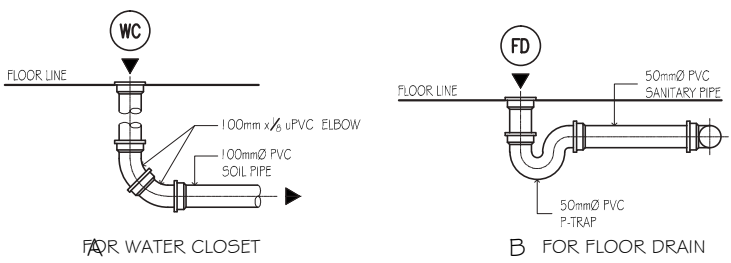
- LEGEND
- WC WATER CLOSET
 - FD FLOOR DRAIN
 - CO CLEAN OUT
 - VSTR VENT STACK
 - DRAINAGE/SEWAGE LINE

1 PLUMBING LAYOUT
P-2 SCALE : 1 : 50 mtrs.

2 PLUMBING LEGEND
P-2



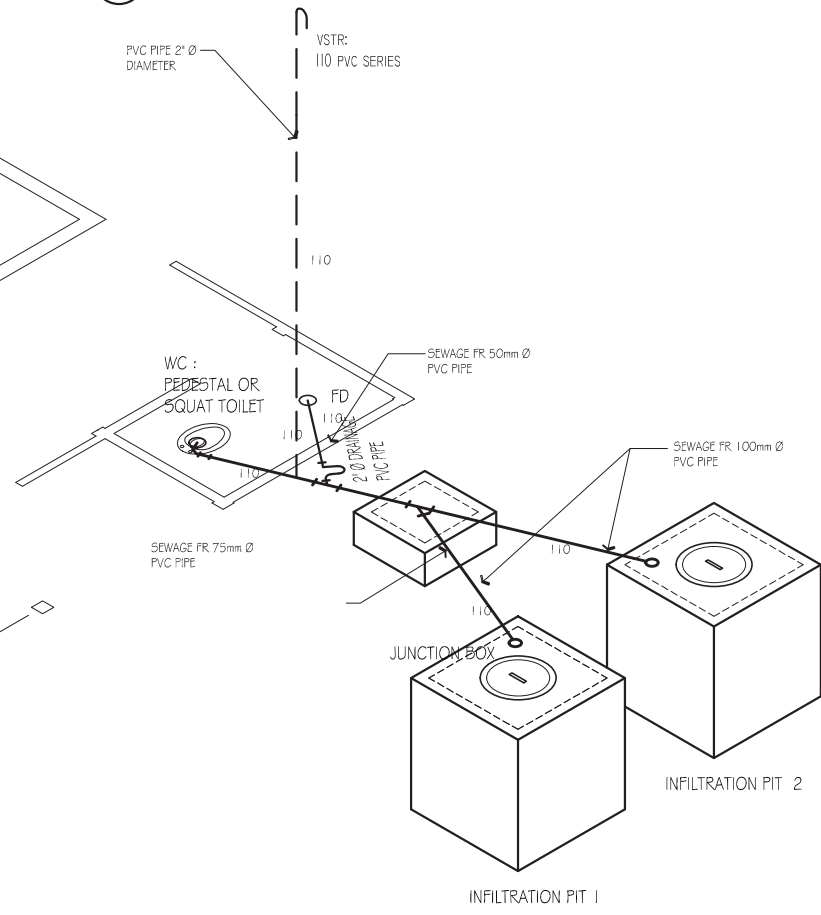
1 ISOMETRIC DIAGRAM
PLUMBING w/ SEPTIC TANK
SCALE : NOT TO SCALE



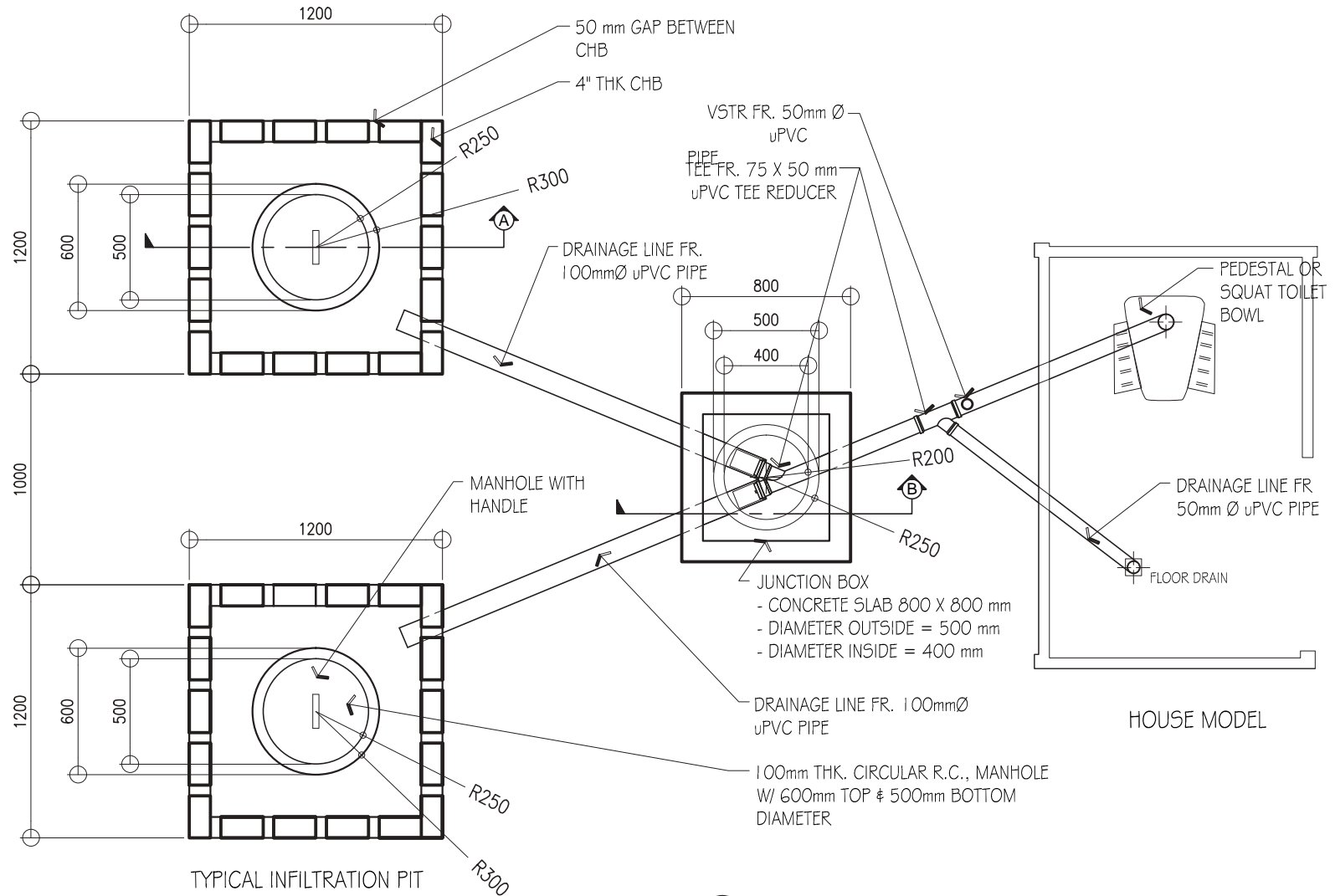
4 STANDARD PIPE FITTING DETAILS
SCALE : NOT TO SCALE

- LEGEND**
- WC WATER CLOSET
 - FD FLOOR DRAIN
 - CO CLEAN OUT
 - VSTR VENT STACK
 - DRAINAGE/SEWAGE LINE

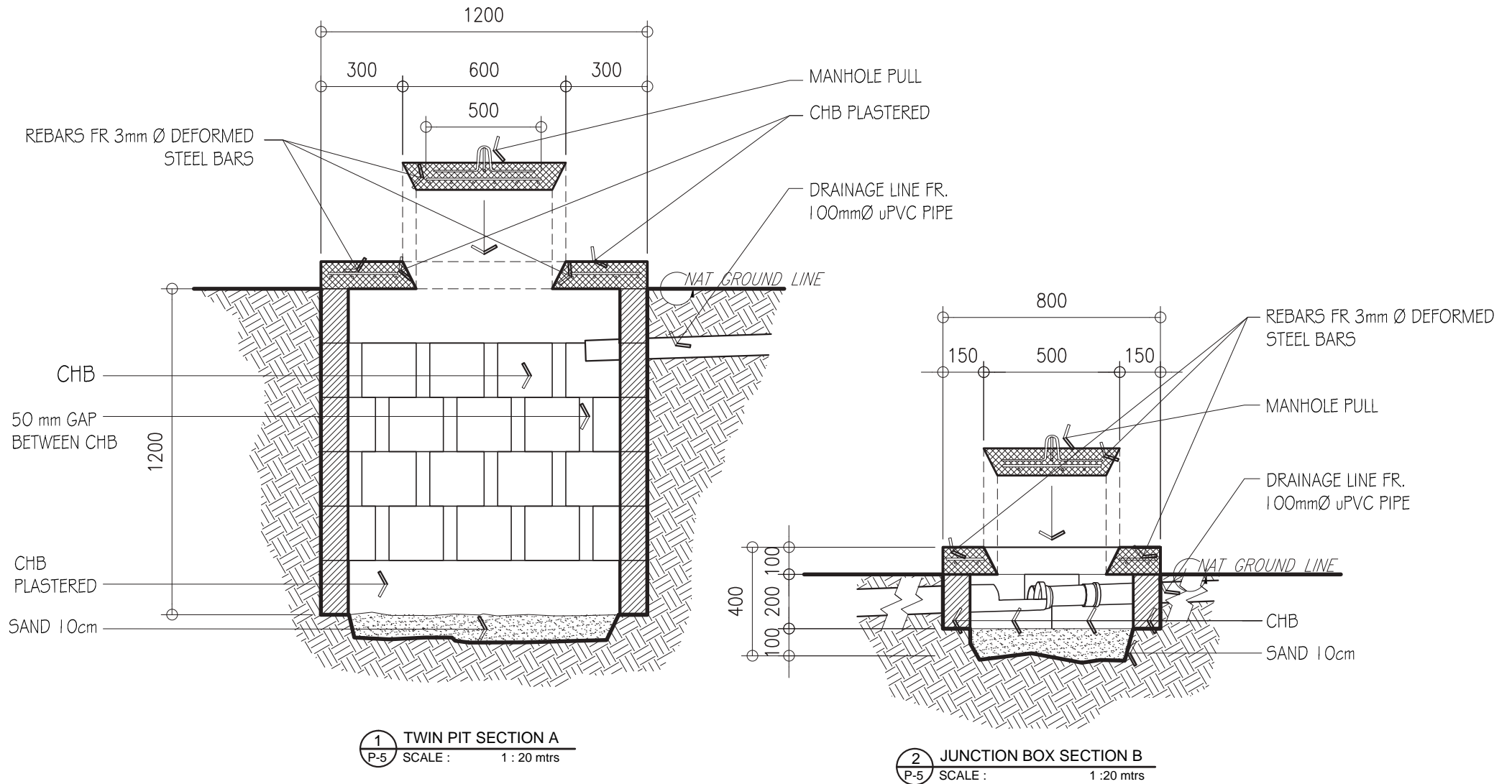
3 PLUMBING LEGEND
P-3

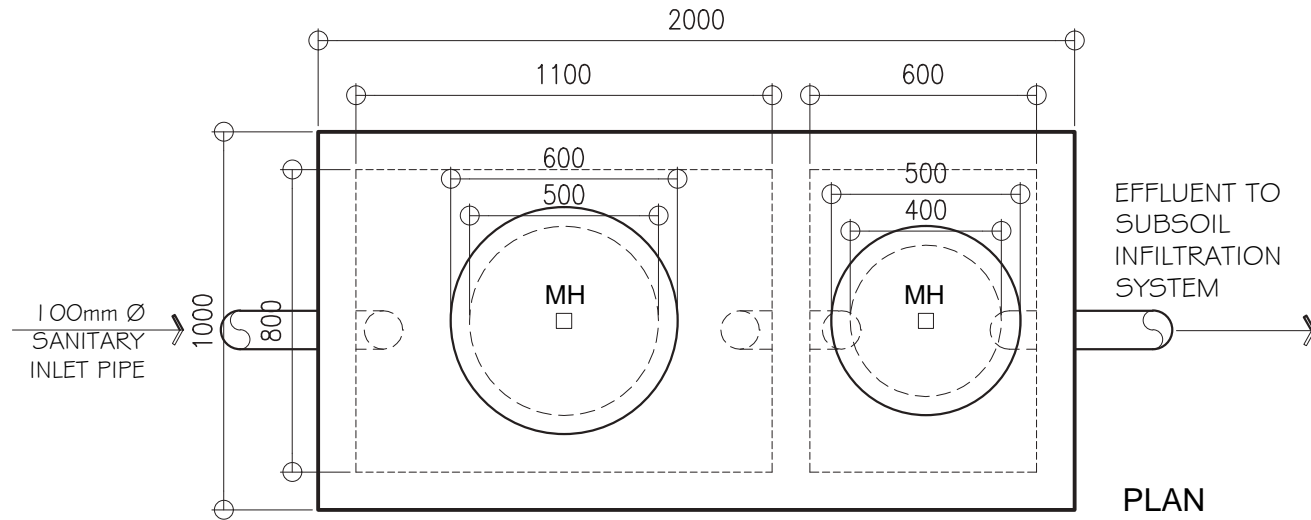


2 ISOMETRIC DIAGRAM:
PLUMBING w/ TWIN PIT SYSTEM
SCALE : NOT TO SCALE

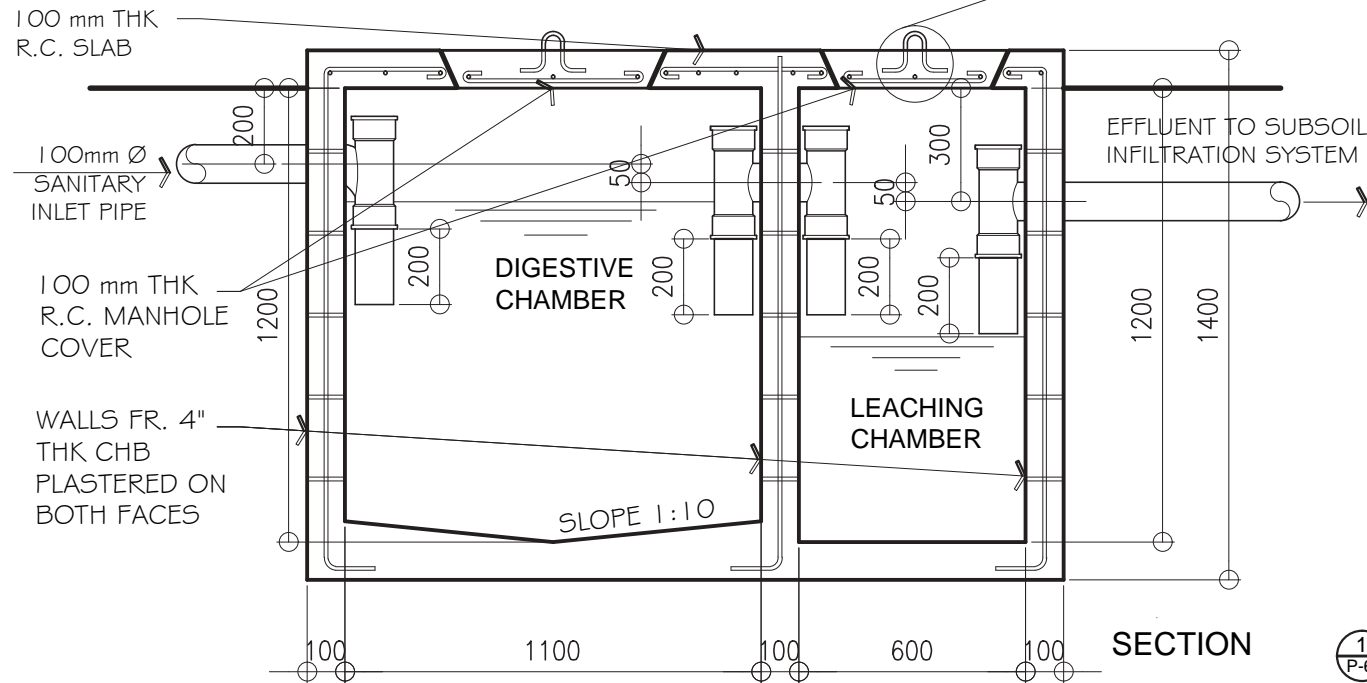


1 TWIN PIT DETAILED PLAN
P-4 SCALE : 1:30 mtrs

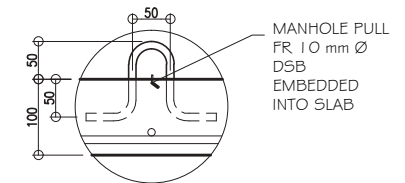




PLAN

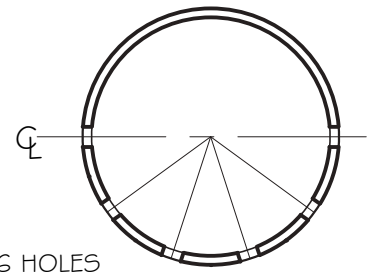
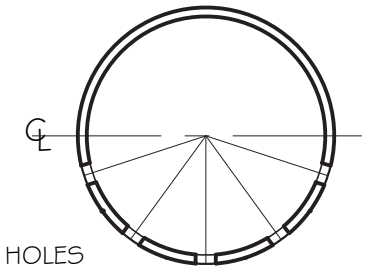
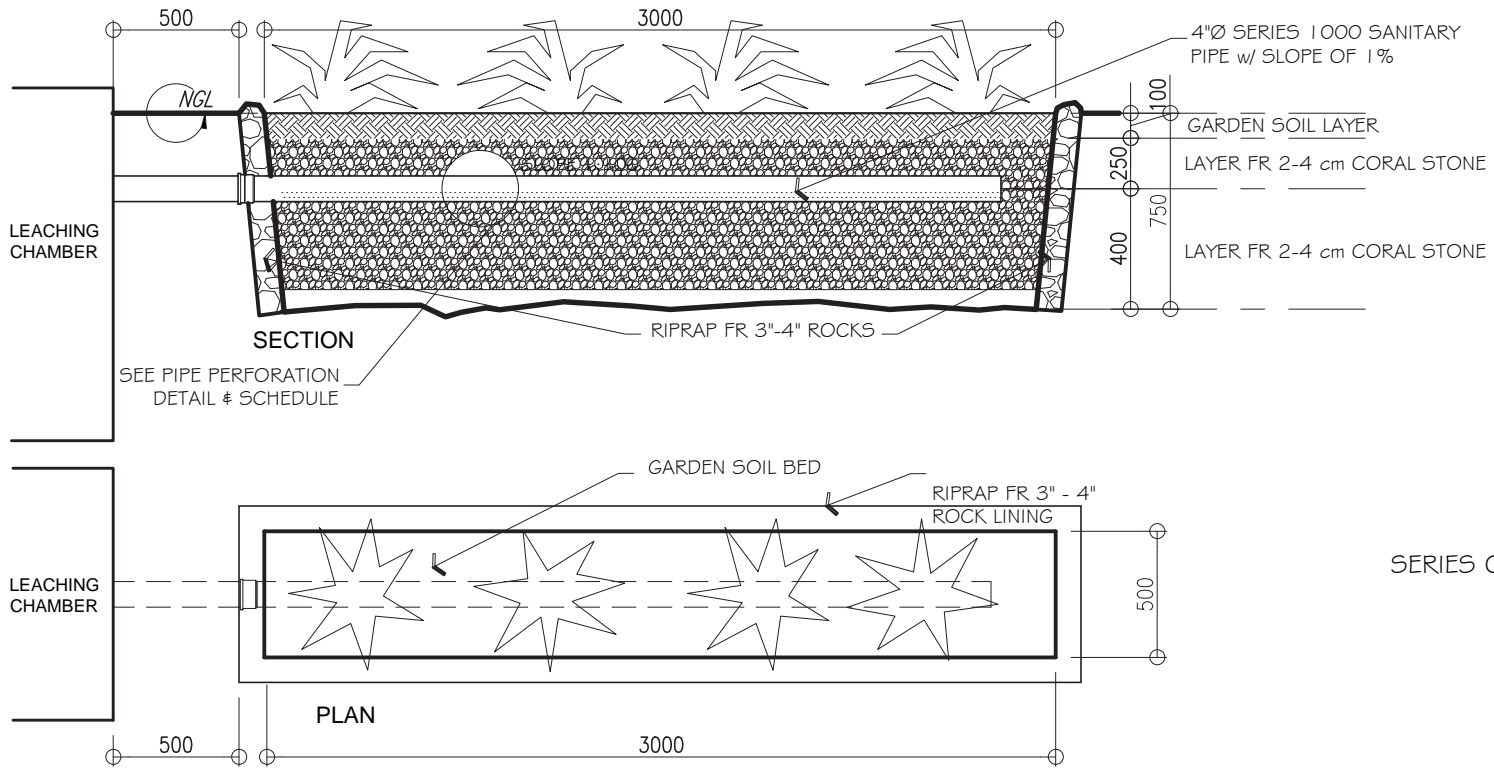


SECTION



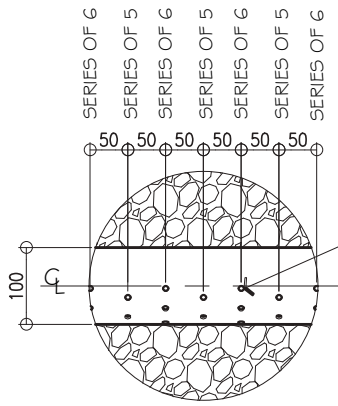
2 SPOT DETAIL
SCALE : 1 : 10 mtrs.

1 SEPTIC TANK DETAILS
SCALE : 1 : 20 mtrs.



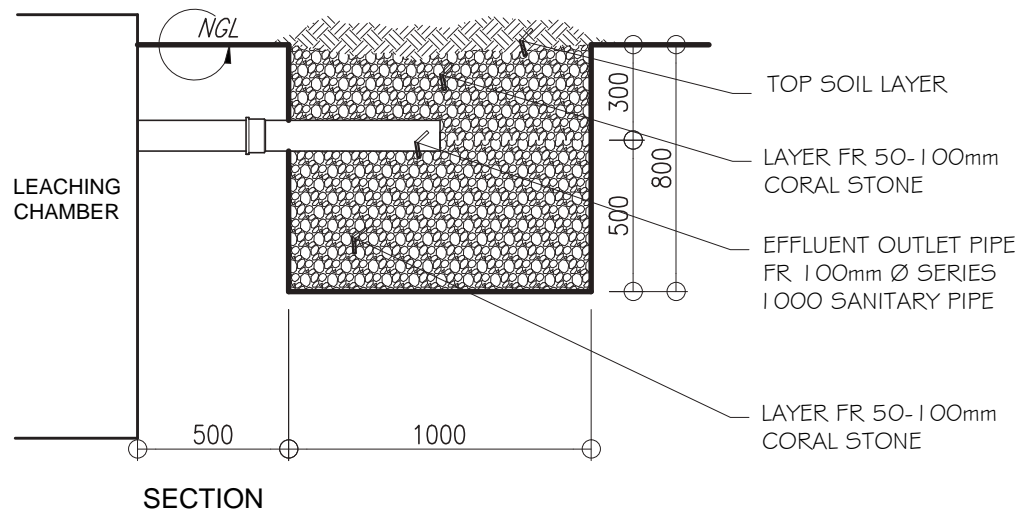
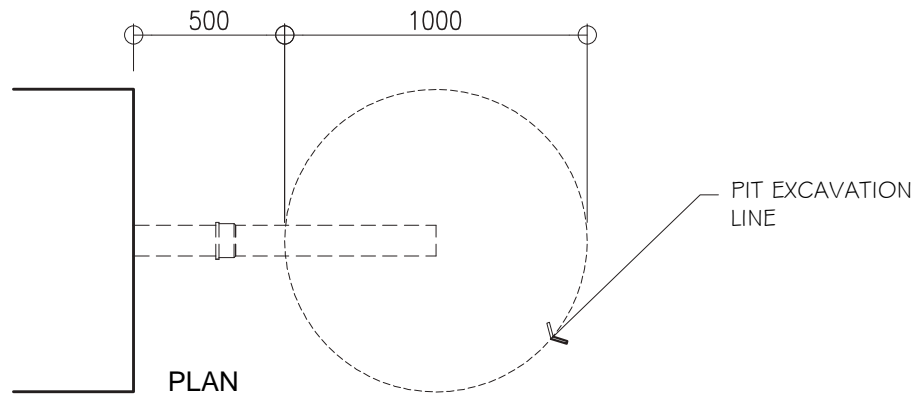
1-A LEACH PAD DETAILS
P-7 SCALE : 1 : 30 mtrs.

2-A PIPE PERFORATION DETAIL
P-7 SCALE : 1 : 3 mtrs.

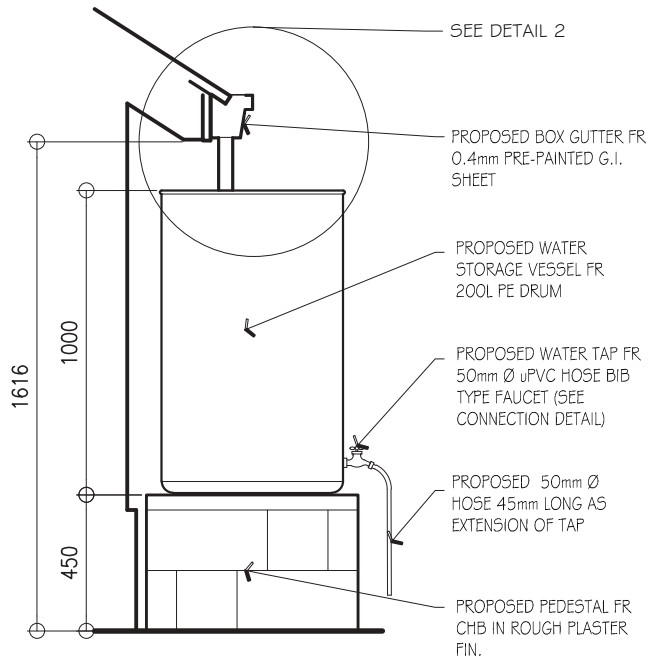


PIPE PERFORATIONS ON BOTTOM HALF OF PIPE w/ 8mm HOLES IN SERIES OF 5 & 6 ALTERNATING EVERY 2" FROM END TO END OF DRAIN PIPE

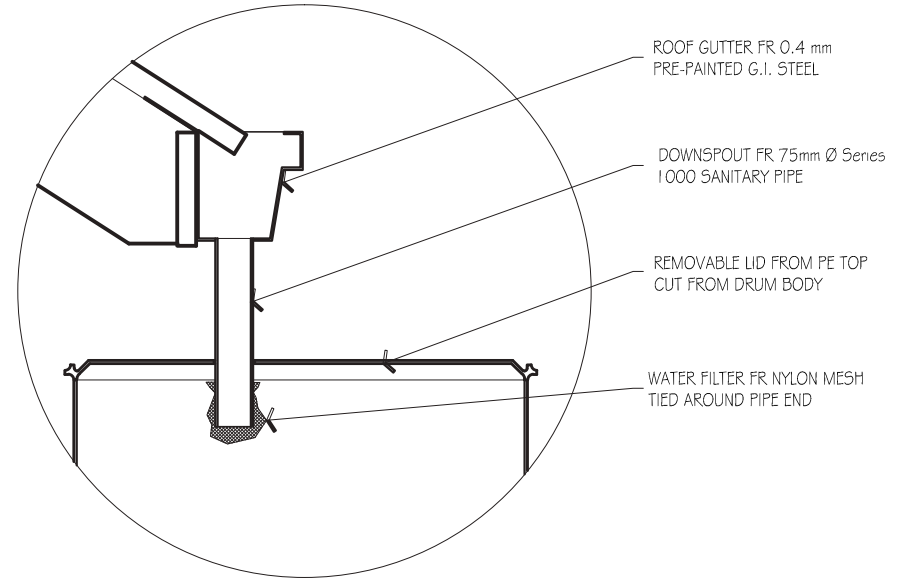
3-A PIPE PERFORATION SCHEDULE
P-7 SCALE : 1 : 10 mtrs.



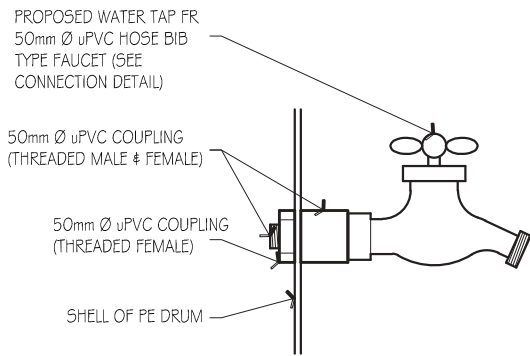
1-B SOAK PIT DETAILS
P-8 SCALE: 1 : 25 mtrs.



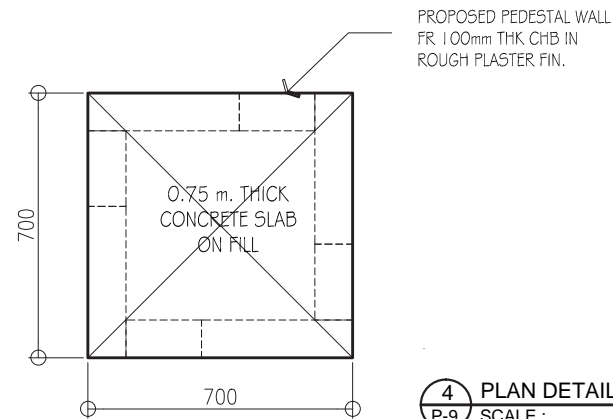
1 RAIN WATER HARVEST SYSTEM
P-9 SCALE : 1 : 25 mtrs.



2 DETAIL 2
P-9 SCALE : 1 : 10 mtrs.



3 WATER TAP CONNECTION DETAIL
P-9 SCALE : 1 : 4 mtrs.



4 PLAN DETAIL OF PEDESTAL
P-9 SCALE : 1 : 20 mtrs.

II. CONSTRUCTION GUIDE

1 Site Clearing

Freeing the proposed construction site from shrubs & other unwanted objects.

Ang paglimpyo sa lugar nga pagaobrahan sa byay



Remarks

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2 Layouting

Measuring & staking of the plan on the lot pad.

Pagistaka ug pagmarka sa sukod sa byay dha sa duta.



Materials :

10 lengths - 2"x2"x12' coco lumber

2 kgs - 3" common wire nails



Coco Lumber



Common Wire Nails

Remarks

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3 Excavation

Digging earth portions according to plan in preparation for structural requirements.

Ang pagkaot sa duta ingon sa plano aron sa pagandam sa kinahanglanon sa pang-istraktura.



Remarks

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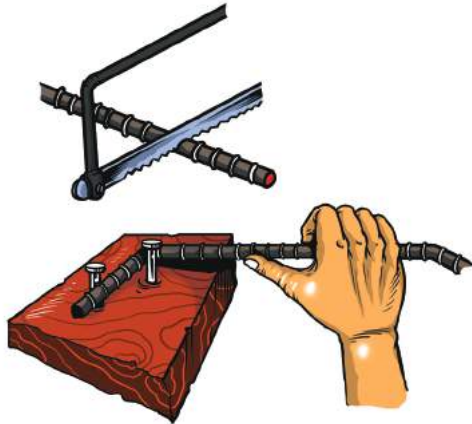
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4 Steelworks

Cutting & bending of steel bars per design

Pagputol ug pagbaog sa mga kabilya ingon sa mga plano



Fabrication of cut to size and bent reinforcing steel bars according to design.

Ang pagporma sa naputol ug nabaog nga kabilya ingon sa ispesipikasyon sa plano.



Remarks

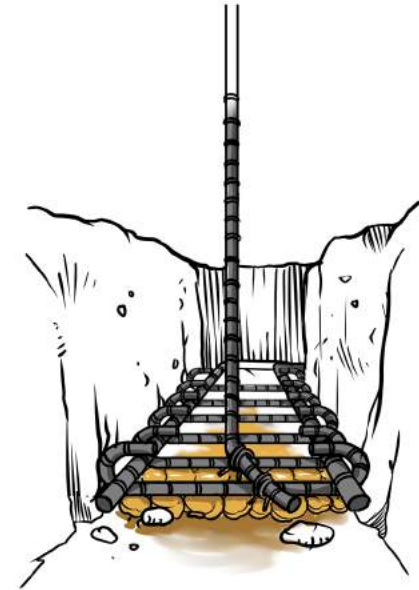
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Installation of reinforcing fabrications on specific excavations.
Fix vertical steel bars per assigned points.

*Paglugar sa mga napormang kabilya sa tigisa isa nga istasyon.
Paglugar ug paggaid sa gipabarog nga mga kabilya.*



Materials :

25 lengths - 10mmØ Gr40 Def Steel Bars

9 lengths - 8mmØ standard Def. Steel Bars

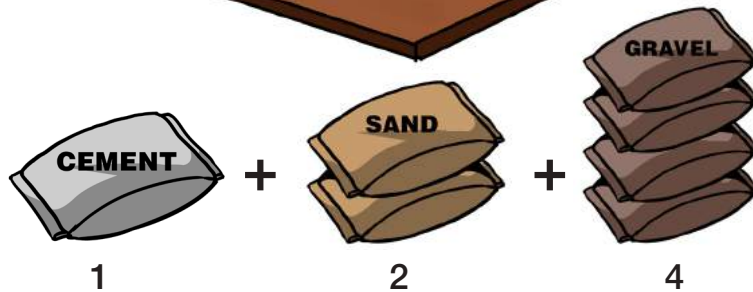
2 kgs - # 16 Tie wire

2 pcs - hacksaw blade

5 Concrete Mixing (ground beam)

Pour in cement, gravel and sand with water for a concrete mix intended for footings.

Pagkutaw sa semento, graba ug baybay, dugangan ug tubig aron sa usa ka mixture sa konkreto.



Materials :

- 14 bags - Portland cement
- 32 bags - washed sand
- 63 bags - crushed gravel



Portland Cement



Crushed Gravel



Washed Sand

Remarks

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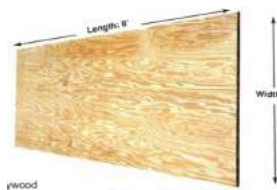
6 Concrete Pouring (ground beam)

Pouring of concrete mix over steel reinforcing mats

Pagbuhos sa konkreto .



Coco Lumber



Plywood



Common Wire Nail

Remarks

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7 Formworks Installation

Fabrication of formworks and installing them on assigned areas.

Pagkutaw sa semento, graba ug baybay, dugangan ug tubig aron sa usa ka mixture sa konkreto.



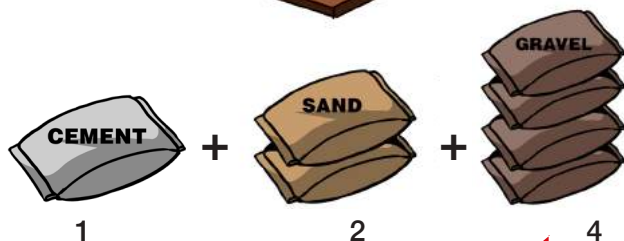
Materials :

- 15 lengths – 2"x2"x12' coco lumber
- 5 lengths – 2"x3"x12' coco lumber
- 3 sheets – 1/4" thk ordinary plywood
- ¼ kg. - 1" common wire nail
- 1 kg - 3" common wire nail
- 1 kg - 4" common wire nail

8 Concrete Mixing (pedestals & plinth beam)

Pour in cement, gravel and sand with water for a concrete mix intended for continuous plinth beam and pedestals

Pagkutaw sa semento, graba ug baybay, dugangan ug tubig aron sa usa ka mixture sa konkreto.



Materials :

- 5 bags – portland cement
- 11 bags – washed sand
- 22 bags – crushed gravel



Portland Cement



Crushed Gravel

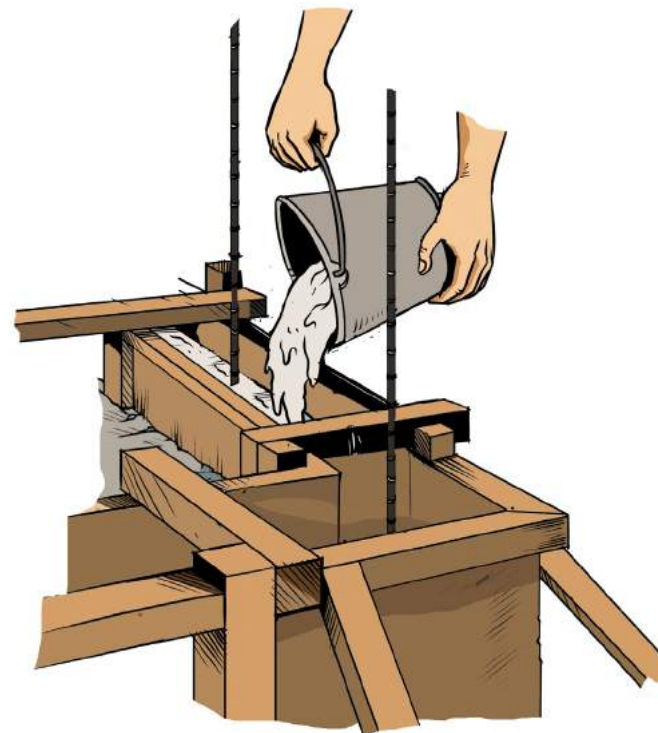


Washed Sand

9 Concrete Pouring (pedestals & plinth beam)

Pouring of concrete mix over steel reinforcing mats

Pagbuhos sa konkreto .



Remarks

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10 Removal of Formworks

Dismantling and taking off of formworks around pedestals and plinth beam

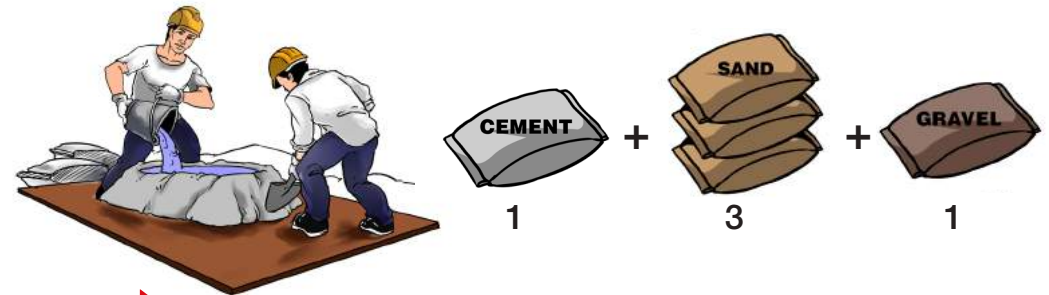
Pagbungkag ug pagtangtang sa mga porma nga nakabalot nianing mga konkretong poste ug biga.



11 Concrete Mixing (CHB mortar)

Pour in cement, gravel and sand with water for a concrete mix intended for mortar.

Pagkutaw sa semento, graba ug baybay, dugangan ug tubig aron sa usa ka mixture sa konkreto.



Materials :

- 60 pcs – 4” concrete hollow blocks
- 5 lengths – 10mm Ø Gr40 DSB
- 1 kgs – #16 Tie wire
- 6 bags – portland cement
- 16 bags – washed sand
- 17 bags – crushed gravel



Washed Sand



Portland Cement



Deformed Steel Bars



Hollow Blocks



Crushed Gravel

Remarks

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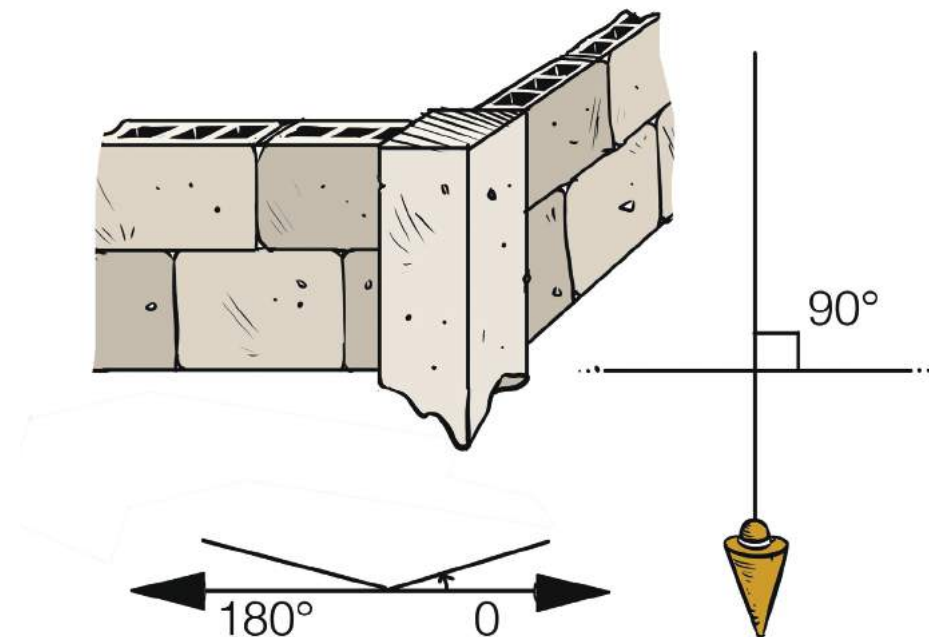
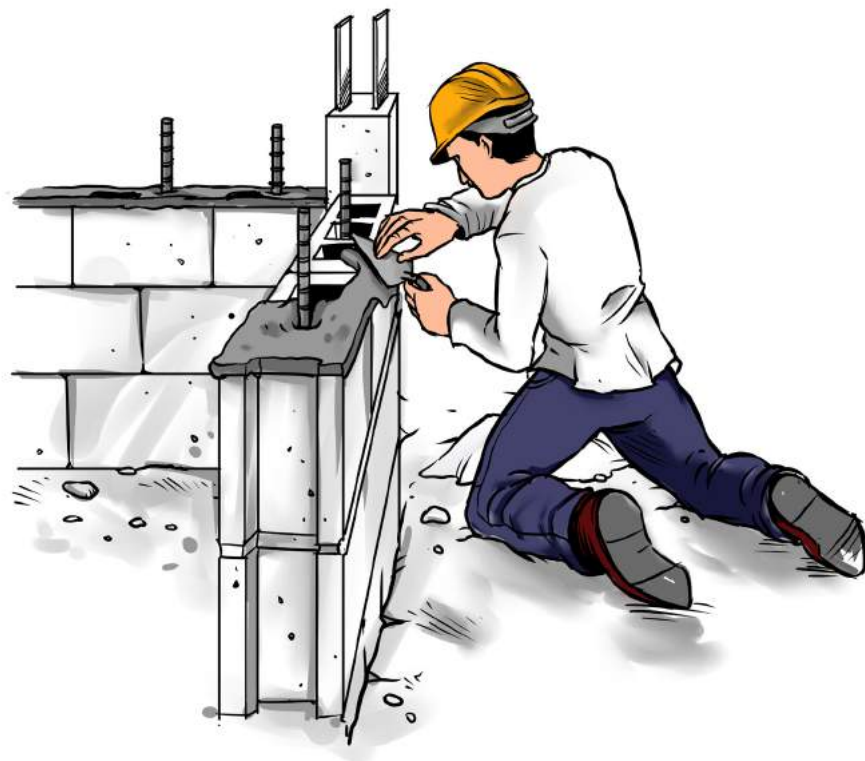
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12 Laying of CHB

Laying of CHB for Walls.

Pagpatong ug pagplatar sang haloblak aron makabarog sang bungbong.



Note:

Plumbness and level should be consistent and even.

Remarks

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13 Concrete Mixing (plaster and finishing)

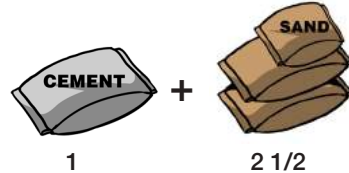
Pour in cement, gravel and sand with water for a concrete mix intended for plastering.

Pagkutaw sa semento, graba ug baybay, dugangan ug tubig aron sa usa ka mixture sa konkreto.



Materials :

- 2 bags – portland cement
- 6 bags – fine sand



14 CHB Plastering

Plastering the CHB walls with concrete mixture for finishing.

Tiwason ug pagpalitada sa bungbong nga haloblak gamit ang konkreto.



Remarks

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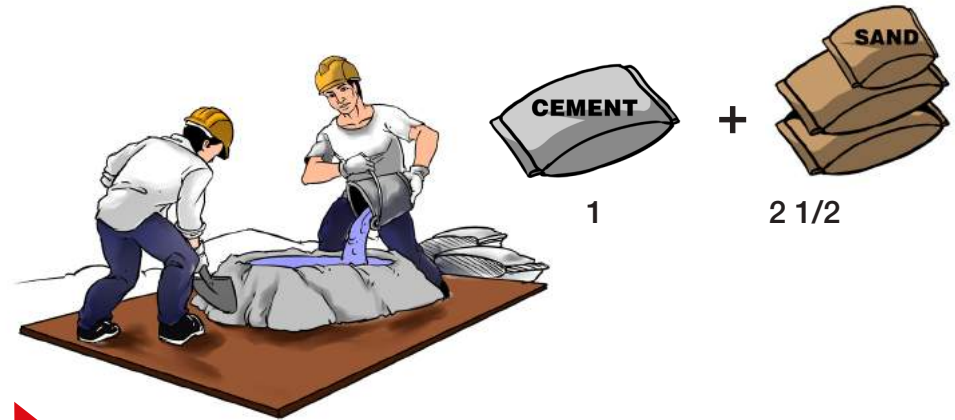
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15 Concrete Mixing (ICEB laying)

Pour in cement, gravel and sand with water for a concrete mix intended for mortar.

Pagkutaw sa semento, graba ug baybay, dugangan ug tubig aron sa usa ka mixture sa konkreto.



Materials :

- 8 bags – portland cement
- 15 bags – washed sand
- 900 pcs – various ICEBs
- 7 lengths – 10mm Ø Gr40 Def. Steel Bars



Portland Cement



Deformed Steel Bars



ICEBs

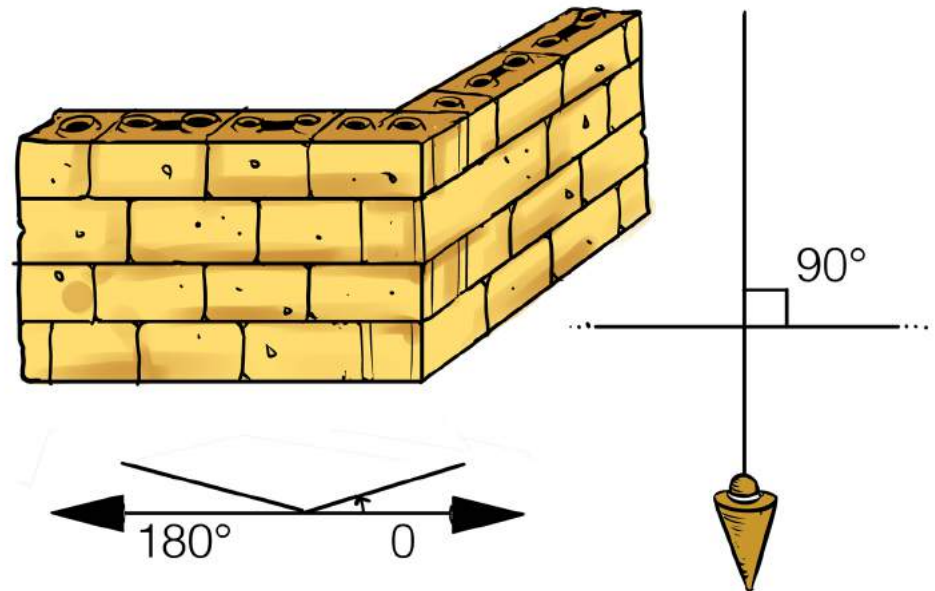


Washed Sand

16 ICEB laying

Laying of ICEB blocks

Pagpatong ug pagplastar sa mga ICEB



Note:

Plumbness and level should be consistent and even.

Remarks

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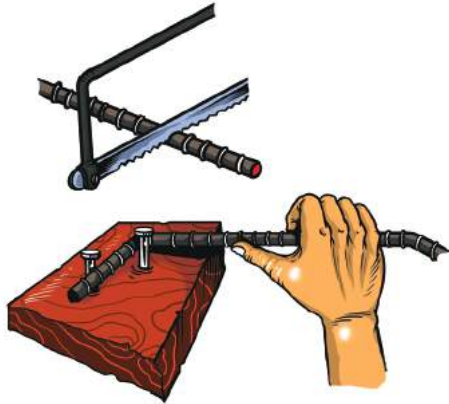
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17 Steelworks

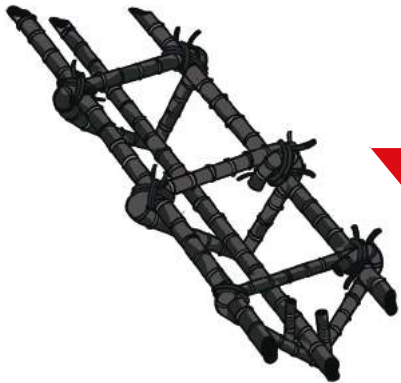
Cutting & bending of steel bars per design

Pagputol ug pagbaog sa mga kabilya ingon sa mga plano



Fabrication of beam reinforcement

Pagobra sa mga kabilya sa porma nga himuon ug beam



Materials :

9 lengths – 10mm Ø Gr 40 DSB

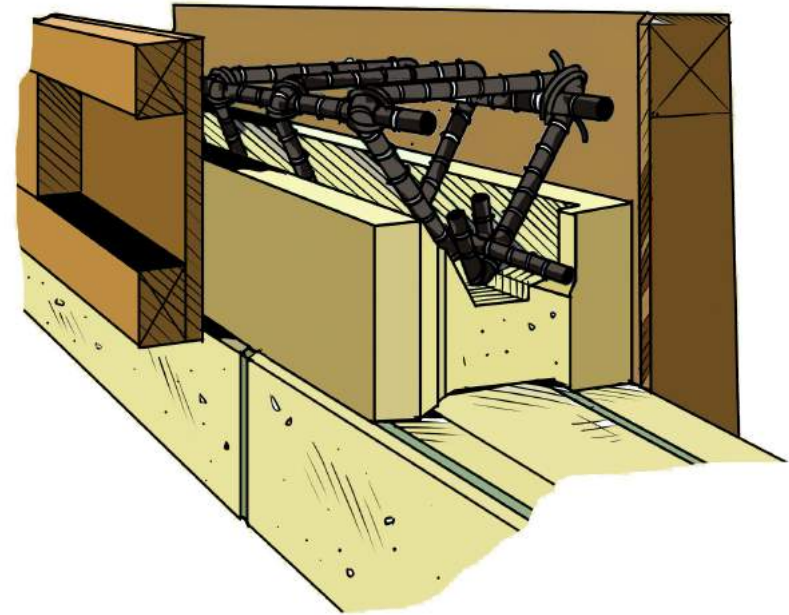
4 lengths – 8mm Ø standard DSB

2 kgs – #16 Tie wire

18 Formworks (ring beam)

Fabrication of formworks and installing them on assigned areas.

Pagkutaw sa semento, graba ug baybay, dugangan ug tubig aron sa usa ka mixture sa konkreto.



Materials :

Utilize left-over plywood sheets and coco lumber

Remarks

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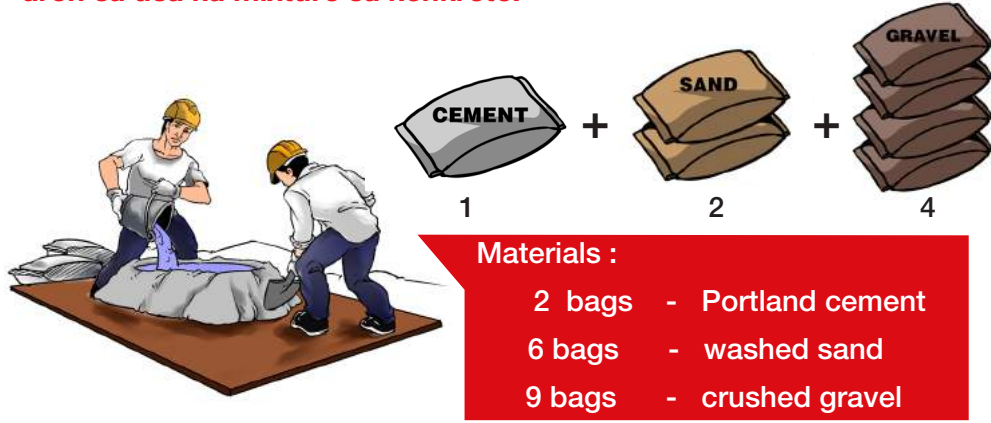
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19 Concrete Mixing (ring beam)

Pour in cement, gravel and sand with water for a concrete mix intended for ring beam

Pagkutaw sa semento, graba ug baybay, dugangan ug tubig aron sa usa ka mixture sa konkreto.



Materials :

- 2 bags - Portland cement
- 6 bags - washed sand
- 9 bags - crushed gravel



Washed Sand



Portland Cement



Crushed Gravel

21 Removal of Formworks (ring beam)

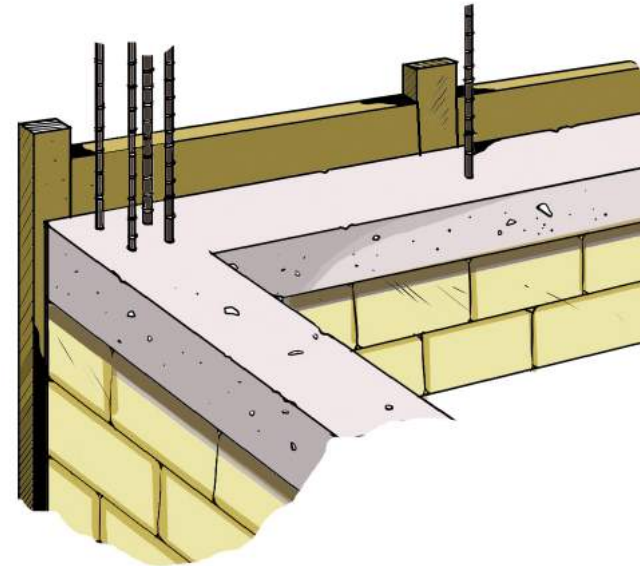
Dismantling and taking off of formworks around pedestals and plinth beam

Pagbungkag ug pagtangtang sa mga porma nga nakabalot nianing mga konkretong poste ug biga.

20 Concrete Pouring (ring beam)

Pouring of concrete mix over steel reinforcing mats

Pagbuhos sa konkreto .



Remarks

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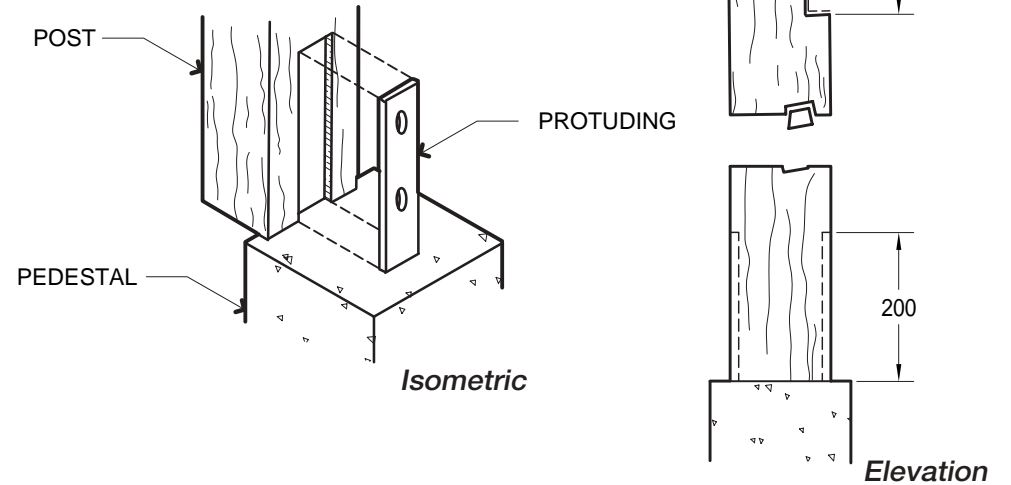
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22 Timber Post Installation

Attaching of timber post to pedestals.

Pagtaod ug plaster sa poste nga kahoy.



Note:

Observe bottom preparation to fit to post straps

Musunod sa post strap aron muuyonsa poste.

Materials :

- 2 lengths – 4”x4”x5’ coco lumber
- 1 length – 4”x4”x6’ coco lumber
- 3 lengths – 4”x4”x8’ coco lumber
- 2 lengths – 2”x4”x10’ coco lumber
- 2 lengths – 2”x4”x14’ coco lumber
- 3 sheets – 1/4” thk ordinary plywood
- 2 gals. - Wood preservative
- 1 kg - 3” common wire nail
- 1 kg - 4” common wire nail

Remarks

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23 Girt Installation

Installation of timber girt.

Pagtaod sa kahoy nga biga o sagbayan.



Coco Lumber



Flathead Nails



Common Wire Nails



Concrete Nails



Common Wire Nail

Materials :

- 4 lengths – 2"x3"x10' coco lumber
- 5 length – 2"x4"x 8' coco lumber
- 5 lengths – 2"x4"x10' coco lumber
- 6 lengths – 2"x4"x16' coco lumber
- 1 kg - flat head nails
- 3 kgs - 2" common wire nails
- 4 kgs - 3" common wire nails
- 4 kgs - 4" common wire nails
- 3 kgs - 5" common wire nails
- 1 kg - 4" concrete nails
- 1 kg - 1 1/2" finishing nails

Remarks

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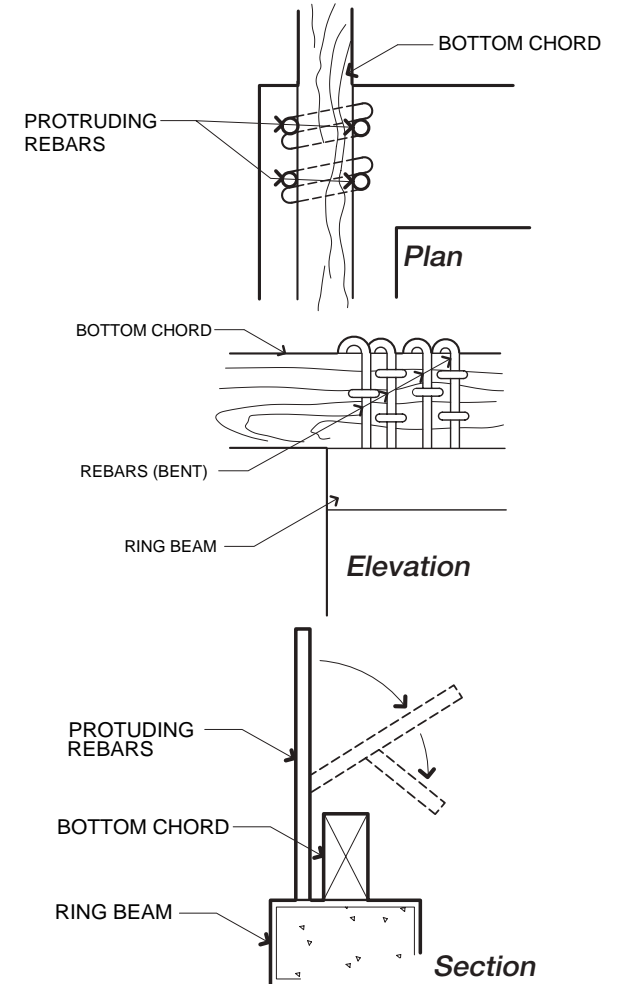
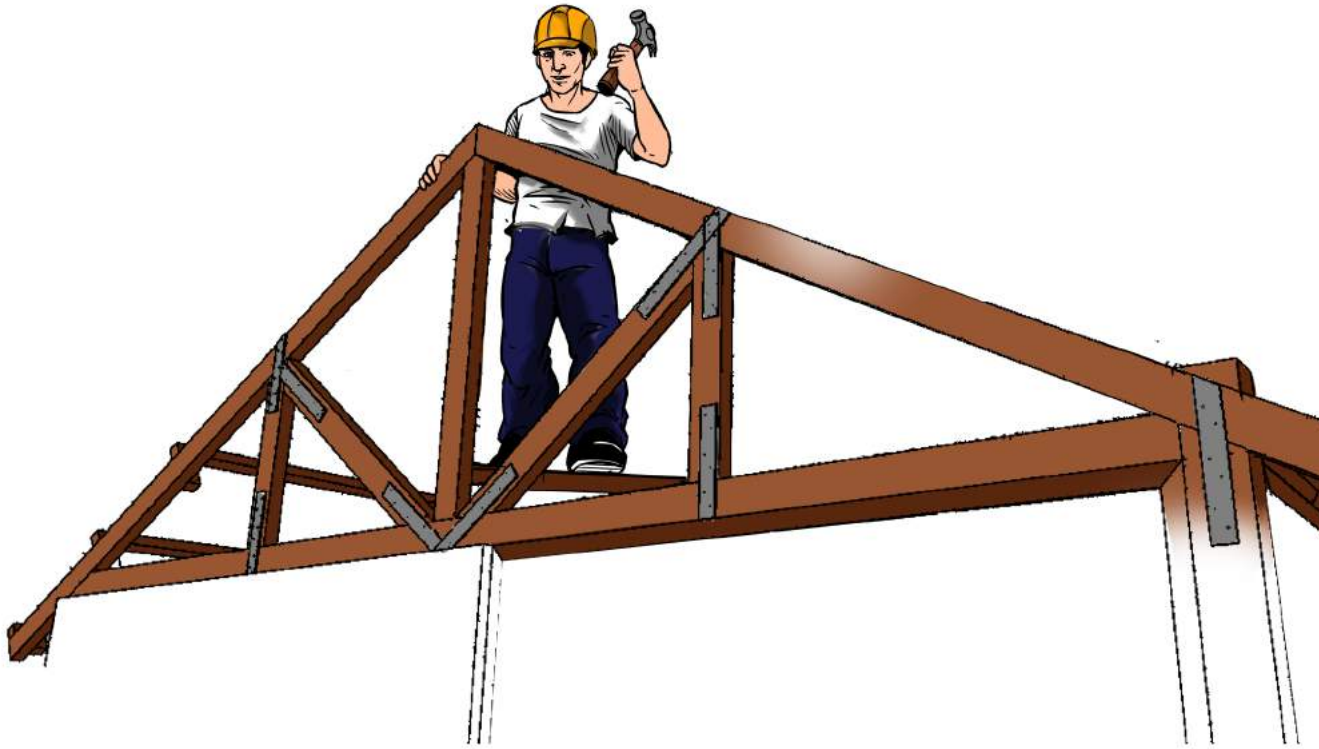
24 Truss Installation

Fabricate & install trussing

Pagobra sa tras ug pagtaod niani sa mga biga.

Fix Bottom chord with protruding rebars and secure R.C. to ring beam.

Pagsiguro nga nakabakos ang kabilya sa trass



Remarks

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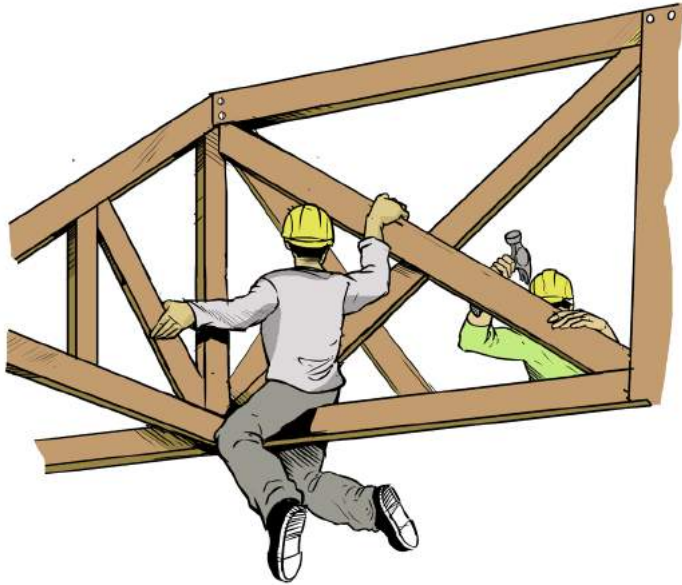
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25 Ridge Beam & Cross Bracing Installation

Install Ridge Beam and cross-bracing

Pagplastar sa ridge beam ug mga suporta.



Coco Lumber

Materials :

28 lengths - 2"x3"x10' coco lumber

Remarks

26 Purlins Installation

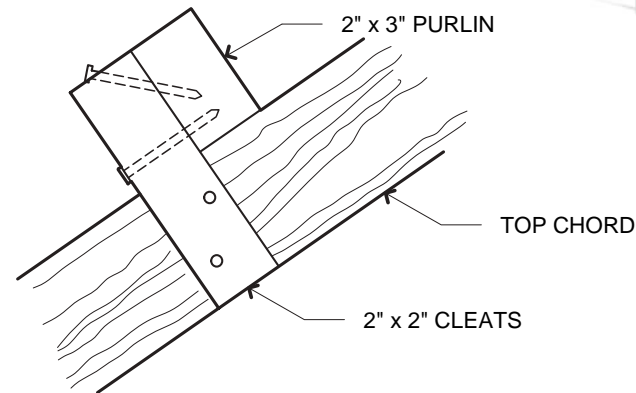
Install purlins

Pagtaod sa mga purlina



Install wood cleats

Pagsuporta sa purlina sang kahoy



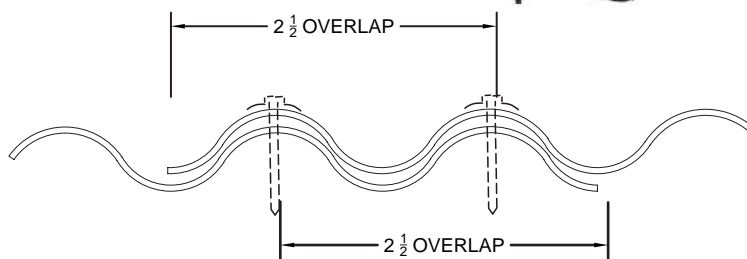
27 Roof Sheets & accessories Installation

Install & secure roof sheets over roof framing

Install accessories e.g.: ridge roll, edge flushing & gutter (optional)

Pagtaod sang atop

Pagtaod sa mga ubang materyales sakop sa atop



Remarks

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Corr. G.I. Sheets



Ridge Roll



G.I. Flushing



Umbrella Nails



Multi-purpose Sealant

Materials :

- 14 sheets – 8' 0.4mm Corr. G.I. sheets
- 7 sheets – 10' 0.4mm Corr. G.I. sheets
- 3 lengths – 8" 0.4mm ridge roll
- 7 lengths – 0.4mm G.I. flushing (3 bends)
- 2 lengths - 0.4mm G.I. box gutter
- 4 kgs - 2 1/2" twisted shank umbrella nails
- 1 Pack - multi-purpose sealant

28 Finish Carpentry

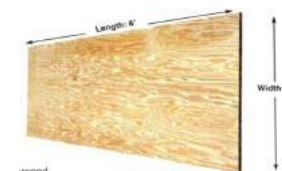
Cut, fabricate and install wooden components as indicated on plans

Pagputol, obra ug taod sa tanang kahoy nga kinahanglanon sa plano.



Materials :

- 10 lengths – 2"x2"x 8' coco lumber
- 16 lengths – 2"x2"x10' coco lumber
- 26 lengths – 2"x3"x 8' coco lumber
- 7 lengths – 2"x4"x 8' coco lumber
- 1 length - 2"x4"x10 coco lumber
- 30 lengths - 1"x6"x10 coco lumber
- 5 sheets - 1/4" thk marine plywood
- 11 sheets - Amakan mats
- 3 bundles - #8 bamboo splits
- 12 pcs - 3 1/2" x 3 1/2" ordinary door
- 1/2 kg - 1" common wire nails
- 1 kg - 2" common wire nails
- 2 kgs - 3" common wire nails
- 2 kgs - 4" common wire nails
- 1 kg - 4" concrete nails



Plywood



Amakan Mats



Coco Lumber



Common wire nails



Bamboo Splits



Concrete Nails

Remarks

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Installation of continuous fascia board.
Pagtaud sa senepa palibot sa agwas.



Fabricate & install wall frames; cover them with Amakan mats & secure
Pagobra sa mga bungbong ug pagtaptap sa amakan.



Fabricate & install doors & windows
Pagobra ug pagtaod sa mga pultahan ug bintana



Fabricate & install gable boards to cover the truss.
Pagobra ug pagtaod sa mga tabla nga mutaptap sa tras.



Remarks

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29 Sewage Line Excavation

Trace and dig trenches to run the sewage line.

Pagkaot sa agianan sa tubo nga gadala sa hugaw.



Remarks

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30 Sewage Pipe Installation

Lay & connect sanitary pipes from toilet to septic tank

Pagtaod sa tubo mukonekta sa kasilyas ug septic tank.



Materials :

- 1 length - 4"Ø Ser1000 Sanitary pipe
- 1 pc - 4"Ø Sanitary pipe 45°
- 1 can - Solvent Cement



Sanitary Pipe



Sanitary Elbow



Solvent Cement

31 Concrete Mixing (Floor slab)

Pour in cement, gravel and sand with water for a concrete mix intended for floor slabbing.

Pagkutaw sa semento, graba ug baybay, dugangan ug tubig aron sa usa ka mixture sa konkreto.




Materials :

- 9 bags – portland cement
- 15 bags – washed sand
- 22 bags – crushed gravel

32 Concreting of Floor Slab

Pour a 2" layer of concrete mix for flooring

Pagsemento sa saog ug dos



Remarks

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33 Toilet Bowl Installment

Install Toilet bowl and accessories.

Pagtaod sa bowl ug uban pang gamit.



II. CONSTRUCTION GUIDE - WASH

A. Septic Tank with Subsoil infiltration system

1. Excavation for WASH Facilities

Digging prescribed holes for sub-soil facilities to contain waste water

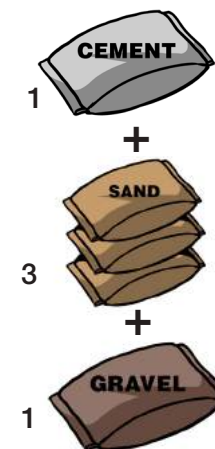
Pagkabkab sang lungag sa duta para sa mga angay obrahun nga daganan sang hugaw nga tubig



2. Concrete Mixing (CHB Mortar)

Pour in cement, gravel and sand with water for concrete mix intended for septic tank.

Pagkutaw sa semento, graba ug baybay, dugangan ug tubig aron sa usa ka mixture sa konkreto.



Materials :

Flooring

1.00 bag - Portland Cement (40 kgs)

2 bags - Washed sand

4 bags - Crushed Gravel



Washed Sand



Portland Cement



Crushed Gravel

Remarks

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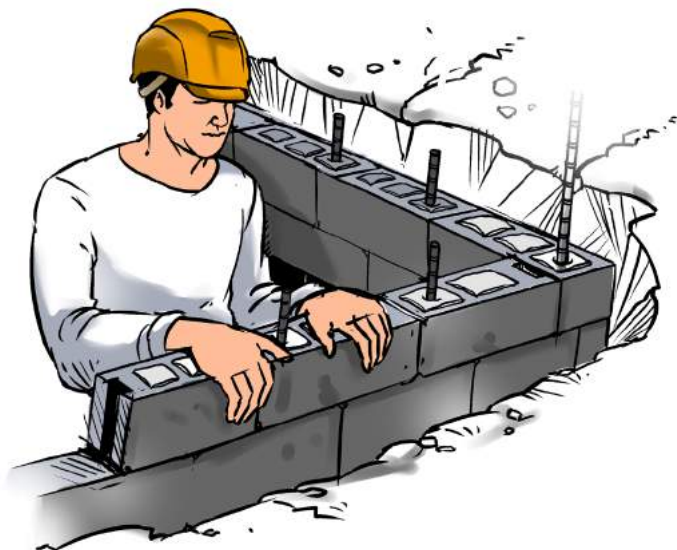
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3. CHB Laying on Septic Tank

Laying of CHB for Septic Tank.

Pagpatong ug pagplatar sang haloblak aron makabarovang sang bungbong para sa Septic Tank.



Materials :

- 1.5 kg - Tie wire, no. 16
- 90 pcs - 4" CHB
- 3 bags - Portland Cement (40 kgs)
- 12 bags - Washed sand
- 6 bags - Crushed Gravel
- 1 gal - Waterproofing Compound
- 5 pcs. - 10mm Ø Gr. 40 Def.Steel Bars (6 m. length)

Remarks

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4. Plumbing Works (Septic Tank)

Installing connecting pipes between chambers and out of the leaching chambers.

Pagtaod sa mga tubo nga mukonekta sa sulod ug gawas sa lawak sa septic tank.



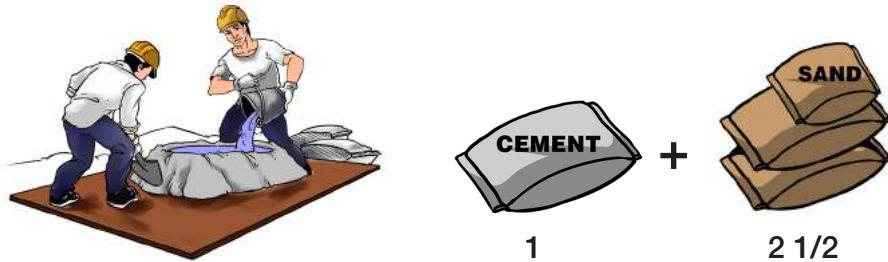
Materials :

- 1 length - 4" Ø S1000 Sanitary PVC Pipe
- 1 pc - 2" Ø S1000 P-trap
- 1 pc - 4" x 2" Ø S1000 Sanitary Wye
- 4 pcs - 4" Ø S1000 Sanitary Tee
- 1 pc - 4" x 2" Ø S1000 Sanitary Tee
- 2 lengths - 2" Ø S1000 Sanitary Pipe
- 1 pc - 2" Ø S1000 P-trap
- 5 pcs - 2" Ø S1000 Sanitary Elbow 90°
- 1 can - Solvent Cement 100cc
- 3 sachets - epoxy sealant 75 ml.

5. Concrete Mixing (Plastering for Septic Tank)

Pour in cement and sand with water for concrete mix intended for plastering with waterproofing.

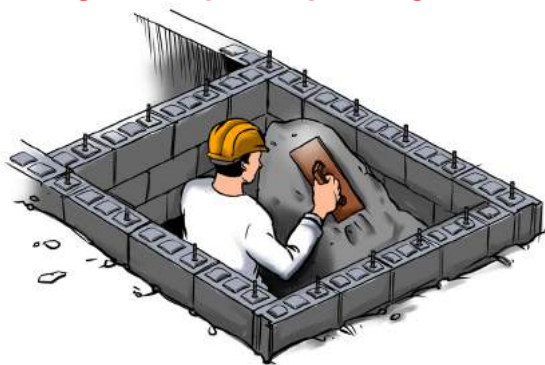
Pagkutaw sa semento ug baybay, dugangan ug tubig aron sa usa ka mixture sa konkreto nga adunay waterproofing.



6. Septic Tank chamber walls plastering

Plastering the septic tank chamber interior walls with concrete mixture with waterproofing.

Pagpalitada sa sulod sa lawak sa septic tank ug sagol sa konkreto nga adunay waterproofing.



Portland Cement



Washed Sand

Materials :

2 bags - Portland Cement

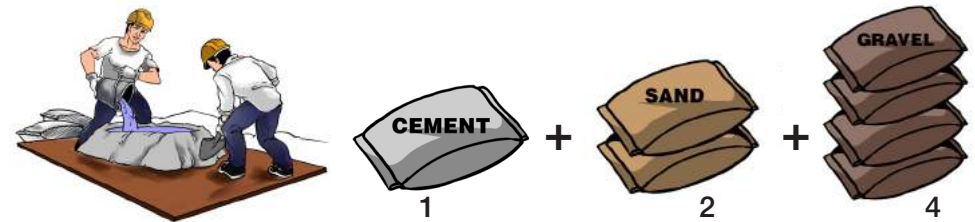
6 bags. - Washed sand

Remarks

7. Concrete Mixing (Slabbing and Manhole)

Pour in cement and sand with water for concrete mix intended for septic tank slabs and manhole.

Pagkutaw sa semento ug baybay, dugangan ug tubig aron sa usa ka mixture sa konkreto para sa slab ug manhole.



8. Slabbing & Manhole

Pour a layer of concrete mix for septic tank slab.

Pagsemento sa slab sa septic tank.



Materials :

1 sheet - 1/4" thk ordinary plywood

2 lengths - 10mm Ø Gr 40 DSB

2 bags - Portland Cement

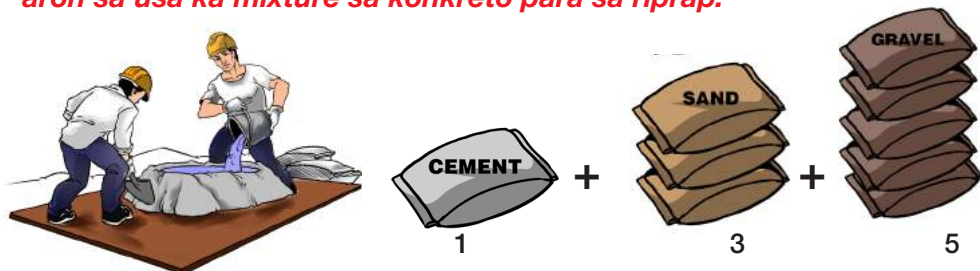
4 bags - Washed sand

8 bags - Crushed Gravel

9. Concrete Mixing (Riprap mortar)

Pour in cement, gravel and sand with water for concrete mix intended for sub-soil infiltration riprap walls.

Pagkutaw sa semento, graba ug baybay, dugangan ug tubig aron sa usa ka mixture sa konkreto para sa riprap.



10. Riprap on Sub-soil Infiltration Walls

Lay the rocks along excavation walls with riprap mortar.

Pagplastar sa mga bato sa kilid sa kinubkob nga naay palitada aron makabuhat ug riprap.



Materials :

1 bag - Portland cement (40 kgs.)

3 bags - Washed sand (river)

Remarks

11. Backfilling of Infiltration Ditch with Hard Limestone

Fill the base of the infiltration ditch with rocks as first layer for grey water infiltration.

Pagsulod ug bato sa ubos nga parte sa buho nga giriprap aron makatuhop ang tubig nga gikan sa septic tank.



Materials :

10 bags 3/8 Coral gravel pack

12. Plumbing works (Infiltration ditch)

Lay and connect perforated sanitary pipe from septic tank outlet to infiltration ditch.

Pagtaod sa gibangag-bangagan nga tubo nga mukonekta sa ulahi nga lutsanan sa septic tank padulong sa infiltration ditch.

13. Backfilling with Topsoil

Fill the remaining layer of the infiltration ditch with topsoil for planting banana or papaya.

Pagsulod ug bato sa taas nga parte sa buho nga giriprap aron makatanom ug saging o kapayas.



Note:
Observe bottom perforation.

Pagmatyag nga ang buho-buho naa sa ubos nga bahin sa tubo.

Materials :

1 length - 4" Ø S1000 sanitary pipe (perforated)



Sanitary Pipe



Remarks

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14. Planting over Infiltration ditch

Plant banana or papaya in topsoil covered infiltration ditch.

Pagtanum ug saging o kapayas sa infiltration ditch nga adunanay yutang matanumam.



Remarks

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II. CONSTRUCTION GUIDE - WASH

B. Twin Pit

1. Excavation

Digging prescribed holes for sub-soil facilities to contain waste water

Pagkabkab sang lungag sa duta para sa mga angay obrahun nga daganan sang hugaw nga tubig



3. CHB Laying on Twin Pit

Laying of CHB for Twin Pit.

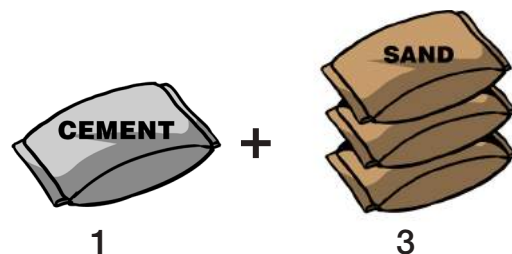
Pagpatong ug pagplastar sang haloblak aron makabarog sang bungbong para sa Twin Pit.



2. Concrete Mixing (CHB Mortar)

Pour in cement, gravel and sand with water for concrete mix intended for twin pit.

Pagkutaw sa semento, graba ug baybay, dugangan ug tubig aron sa usa ka mixture sa konkreto.



Portland Cement



Washed Sand



Tie Wire



Deformed Steel Bars



Hollow Blocks

Materials :

- 6 bags - Portland Cement
- 18 bags - Washed sand
- 4 lengths - 10mm Ø Gr 40 DSB
- 1.5 kg - Tie wire, no. 16
- 120 pcs - 4" CHB

Remarks

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4. Plumbing Works (Twin pit)

Installing connecting pipes between twin pits and out of the pits.

Pagtaod sa mga tubo nga mukonekta sa sulod ug gawas sa gawang sa mga twin pit.



Materials :

- 1 length - 4" Ø Series 1000 Sanitary Pipe
- 1 length - 3" Ø Series 1000 Sanitary Pipe
- 1 pc. - 3" Ø Series 1000 P-trap (Squat)
- 1 pc. - 3" Ø Series 1000 Sanitary Wye
- 1 pc - 3" x 2" Ø S1000 Sanitary Wye
- 1 pc - 3" x 2" Ø S1000 Sanitary Tee
- 2 lengths - 2" Ø Series 1000 Sanitary pipe
- 1 pc - 2" Ø Series 1000 P-trap
- 5 pcs - 2" Ø Series 1000 sanitary elbow 90°
- 1 can - Solvent Cement 100cc

Remarks

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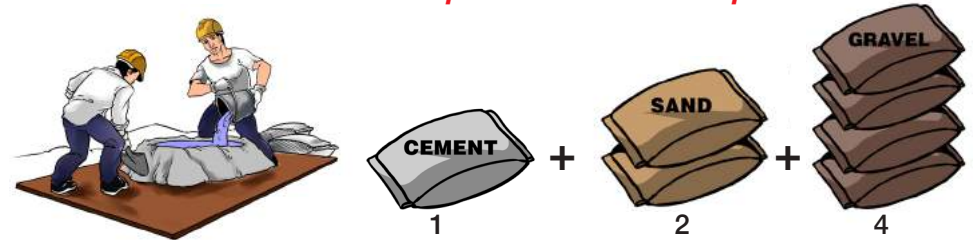
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5. Concrete Mixing (Concrete Slab)

Pour in cement, gravel and sand with water for concrete mix intended for twin pit slab.

Pagkutaw sa semento, graba ug baybay, dugangan ug tubig aron sa usa ka mixture sa konkreto para sa slab sa twin pit.



6. Slabbing & Manhole

Pour a layer of concrete mix for twin pit slab.

Pagsemento sa slab sa twin pit.



Materials :

- 1 sheet - 1/4" thk ordinary plywood
- 2 lengths - 10mm Ø Gr 40 DSB
- 2 bags - Portland Cement
- 4 bags - Washed sand
- 8 bags - Crushed Gravel

