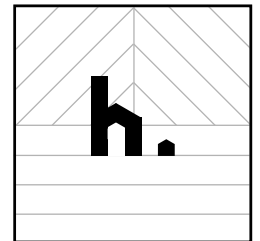


SELF-BUILDING **MANUAL**



wood-frame house

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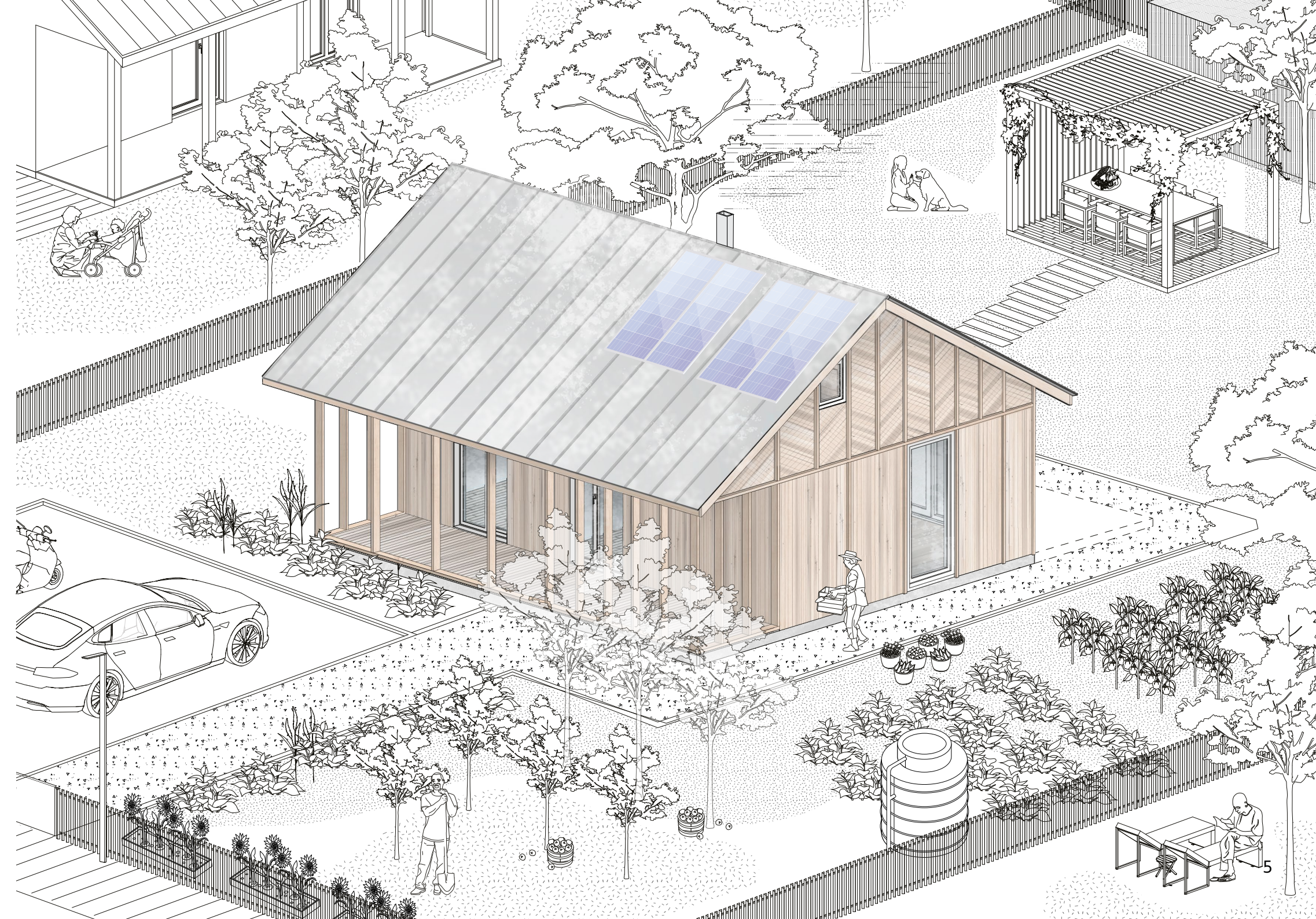
INTRODUCTION

This simplified construction guide is intended for individuals and families undertaking the construction of their own homes. We aim to provide with a better understanding of the complexities involved in building people's own house.

The project is expected to span 3-6 months, depending on the extent of work planned to be handled personally and the portions that will be delegated to subcontractors. For your construction endeavor, you will receive house plans, building materials, site services, construction supervision, inspections, and subcontracted labor for tasks beyond your capabilities. Moreover, there is going to be the support of a Construction Manager. This responsible person will oversee the work, offer guidance and assistance as well as ensure adherence to building codes and effective construction practices.

The sections in this guide have been organized in a suggested sequence to match the various stages of construction, and practical advice in the form of builder's notes has been included. Any necessary alterations to the provided details, arising from differences in local or provincial building regulations, will be communicated by a Construction Manager.

As the homeowner, the responsibility lies with you to construct your house, with the support of relatives, friends, and neighbors.



TOOLS

In order to ensure that the job is done effectively and smoothly, possessing the appropriate tools is a crucial moment to be taken into consideration.

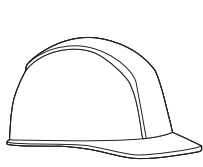
1 This guide outlines the essential tools required for constructing your house. These are the fundamental tools you might want to either buy or borrow for your home construction project.

2 After the tools have been acquired, their investment should be safeguarded by proper storage when not in use.

3 It is critical to maintain carefully the construction tools. Immediately remove any rust, ensure that power saw blades are kept sharp, keep small tools conveniently stored in a single toolbox, and maintain the sharpness of hand saws, mitre saws, chisels, knives, and axes for ease of cutting.

To guarantee the safety of both yourself and your volunteer assistants, it is essential to make sure the following safety equipment items are accessible and utilized:

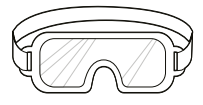
- Steel-toed/soled boots
- Hard hats
- Gloves
- Filter masks
- Safety goggles



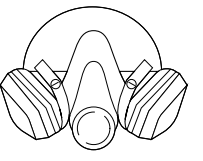
hard hat



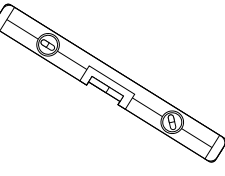
gloves



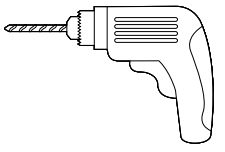
safety goggles



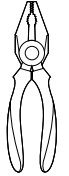
filter mask



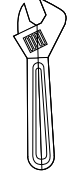
level



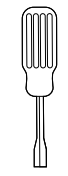
electric drill



pliers



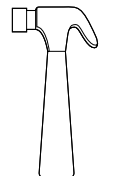
wrench



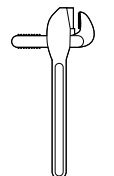
screwdrivers



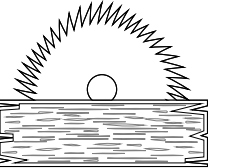
pencil



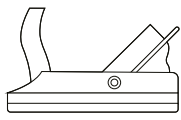
hammer



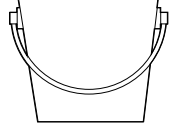
pipe wrench



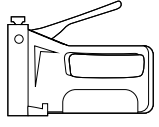
circular saw



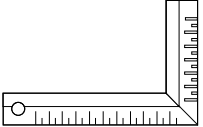
plane



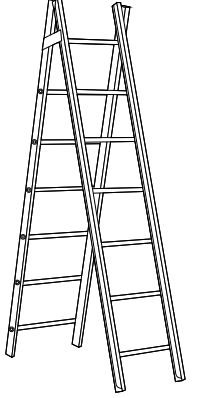
bucket



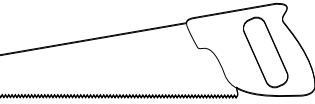
staple gun



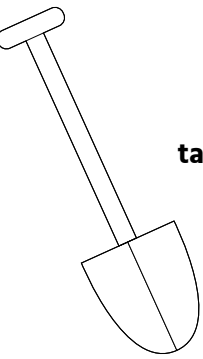
framing square



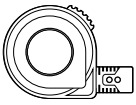
strip ladder



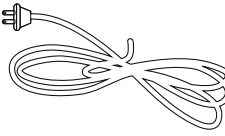
handsaw



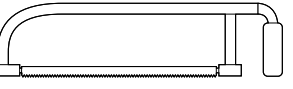
shovel



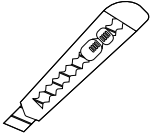
tape measure



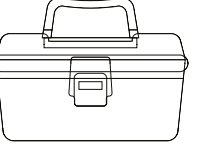
extension cord



hacksaw



utility knife



tool box

MATERIALS

At your site, it's crucial to observe specific precautions to safeguard these materials from potential damage. Items like plywood, gypsum board, insulation, windows and doors, wood siding, and electrical materials must be stored on blocking and shielded with polyethylene covers to maintain their dryness. Prevent fainting, staining, and glue from freezing, and ensure that polyethylene (vapor barrier) is shielded from direct sunlight to avoid deterioration. Additionally, it's important to stack framing lumber tightly to prevent twisting. There are some additional recommendations:

timber materials

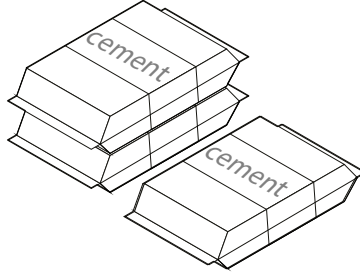
Properly store and handle wood to maintain quality. Avoid tossing timber materials carelessly on the construction site. Use a plastic pallet or wrap underneath the lumber and cover it with a plastic sheet to prevent damage. This approach preserves wood integrity and quality.

windows / doors

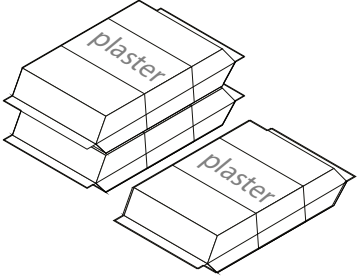
Handle windows with care upon delivery. Place them on a level, sturdy wooden pallet at a slight angle, not flat. After arranging, cover the glass with plywood and secure it with polyethylene to prevent moisture and ensure protection.

rebars

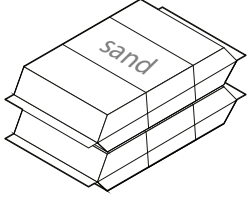
It is necessary to put the fittings on a pallet and provide a canopy made of waterproof materials or cover with a covering material



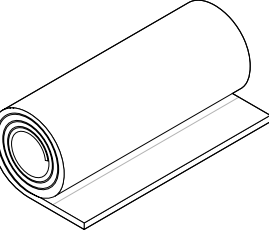
cement



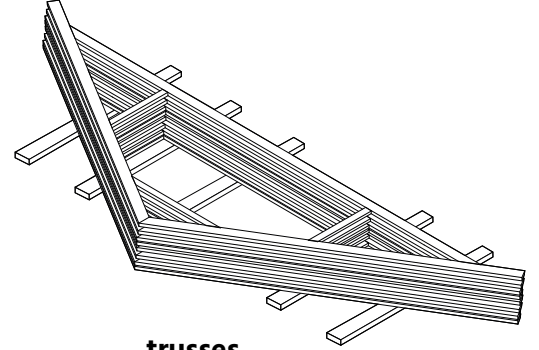
plaster



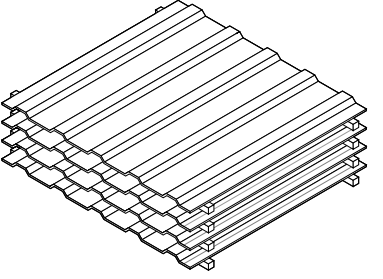
sand



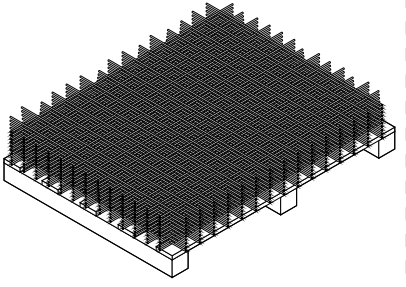
insulation



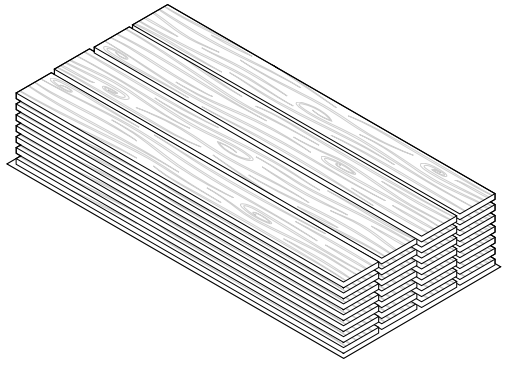
trusses



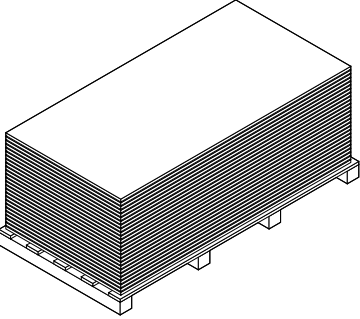
roof sheathing



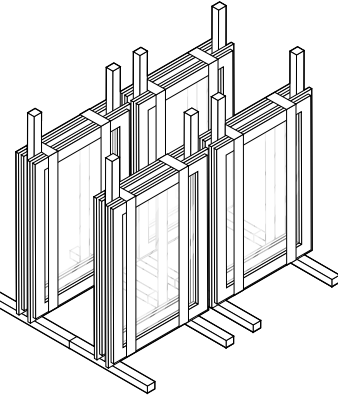
rebar



stack wood



plywood

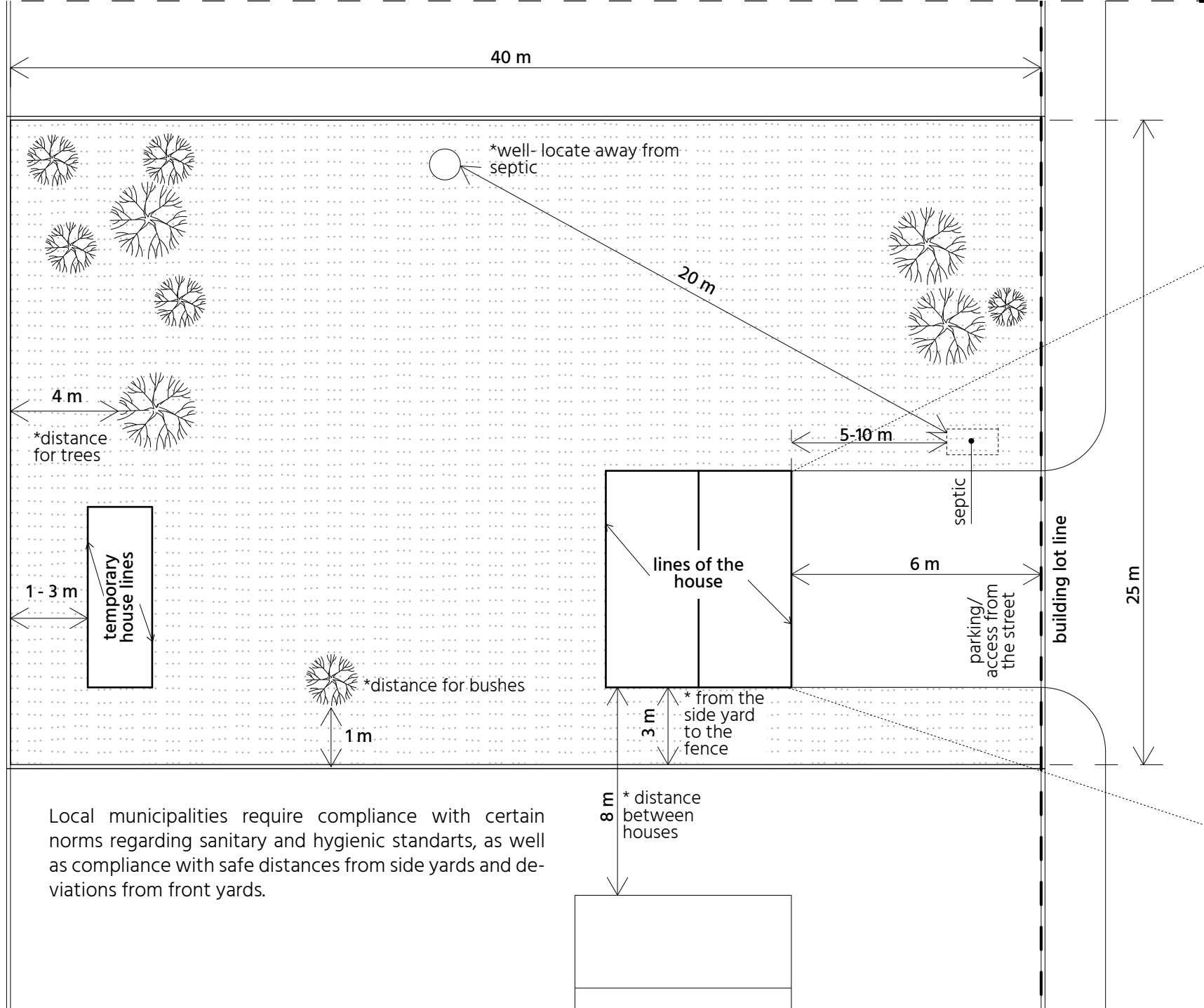


stack windows

SITE PLAN



* it should be noted that the location of house depends on the location of the plot according to the cardinal directions



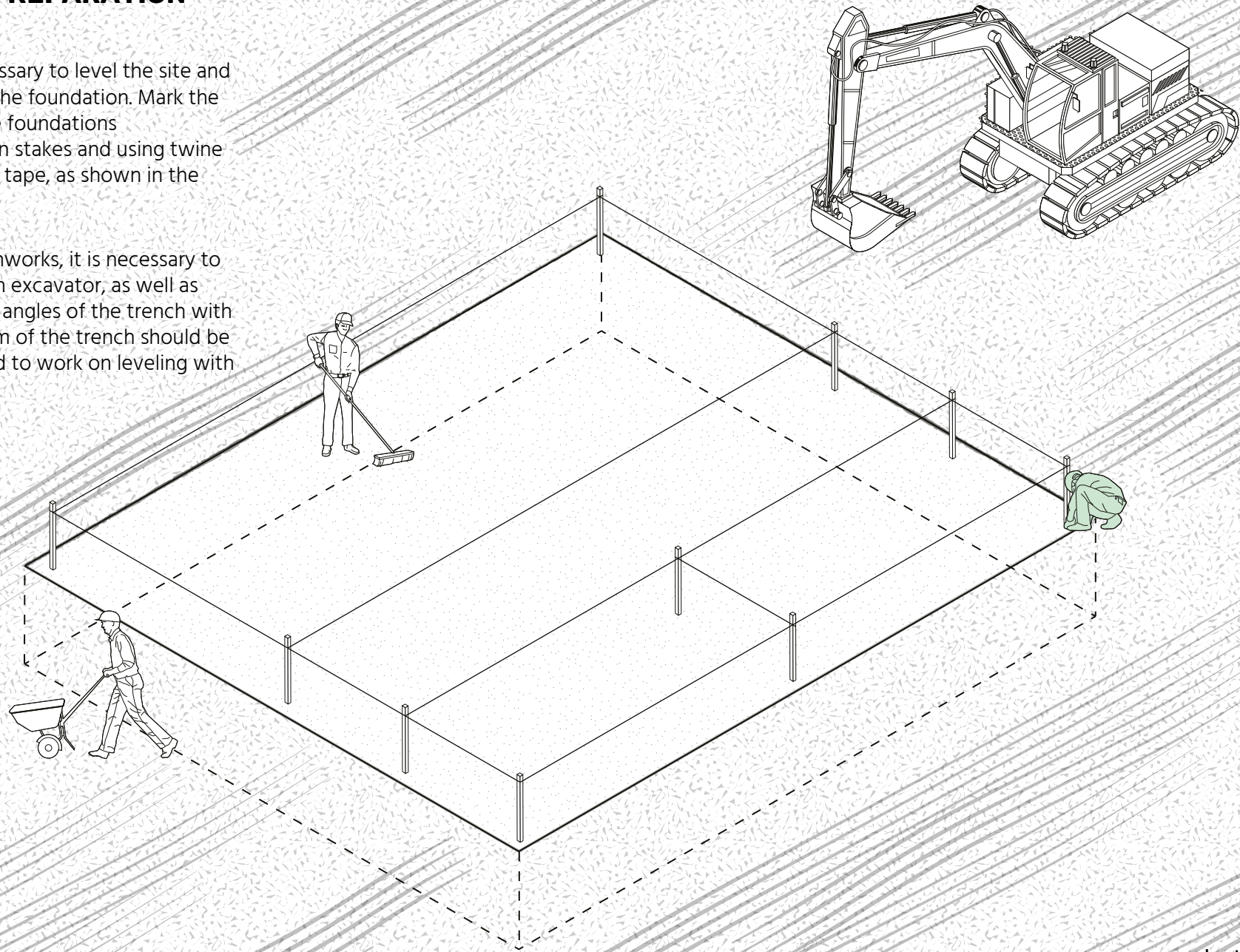
HOUSE PLAN

Scale 1:50



BUILDING SITE PREPARATION

- 1 First of all, it is necessary to level the site and make a marking of the foundation. Mark the outer corners of the foundations by installing wooden stakes and using twine lines and measuring tape, as shown in the figure.
- 2 Then there are earthworks, it is necessary to dig trenches with an excavator, as well as manually adjust the angles of the trench with a shovel. The bottom of the trench should be flat, so you will need to work on leveling with a level.



worker type:
● professional
○ do-it-yourselfer

FOUNDATIONS

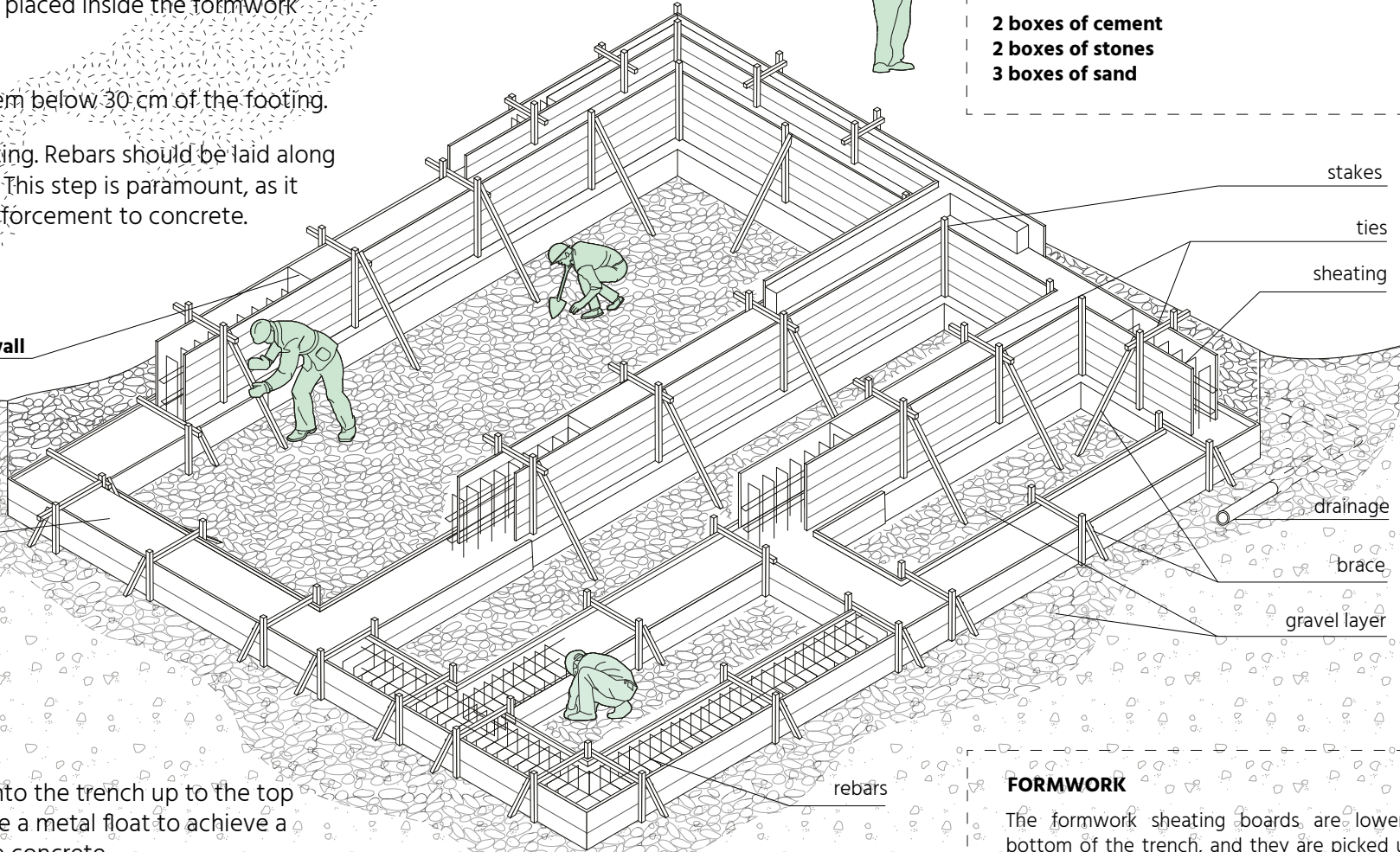
- 3 Next, you should proceed to the construction of the formwork, this will require bars and a thin board, the height of the formwork should be 10-20 cm above the depth of the trench. To avoid cement leakage, a layer of polyethylene film is placed inside the formwork structure.
- 4 Install a drainage system below 30 cm of the footing.
- 5 Set rebars for the footing. Rebars should be laid along and across the trench. This step is paramount, as it provides essential reinforcement to concrete.

foundation wall

footing

worker type:
● professional
○ do-it-yourselfer

- 6 Shovel the concrete into the trench up to the top of the stakes. Then, use a metal float to achieve a smooth surface on the concrete.
- 7 Allow the concrete to cure for a period of 3 days. Then proceed to the construction of foundation walls according to the same scheme.



stakes

ties

sheathing

drainage

brace

gravel layer

rebars

CONCRETE MIX

In situations where ready-mix concrete is unavailable and on-site mixing is necessary, it is crucial to meticulously measure the right proportions of cement, sand, stone, and water for the mix. Utilize the 1 cubic foot box displayed below to achieve accurate measurements:

- 2 boxes of cement
- 2 boxes of stones
- 3 boxes of sand

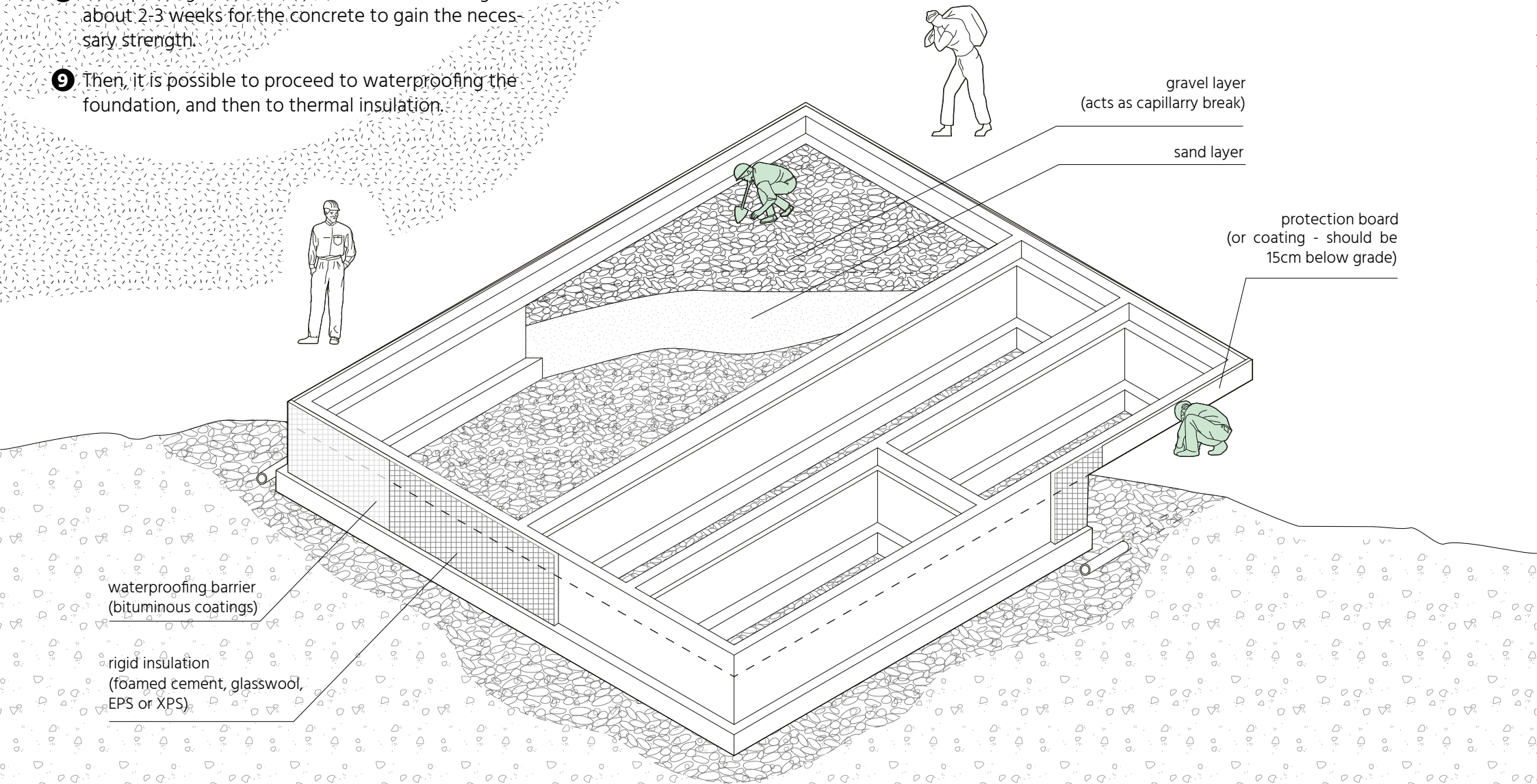


FORMWORK

The formwork sheathing boards are lowered to the bottom of the trench, and they are picked up from the outside by stakes. From the inside they are fastened with ties after 2-3 m.

FOUNDATION INSULATION

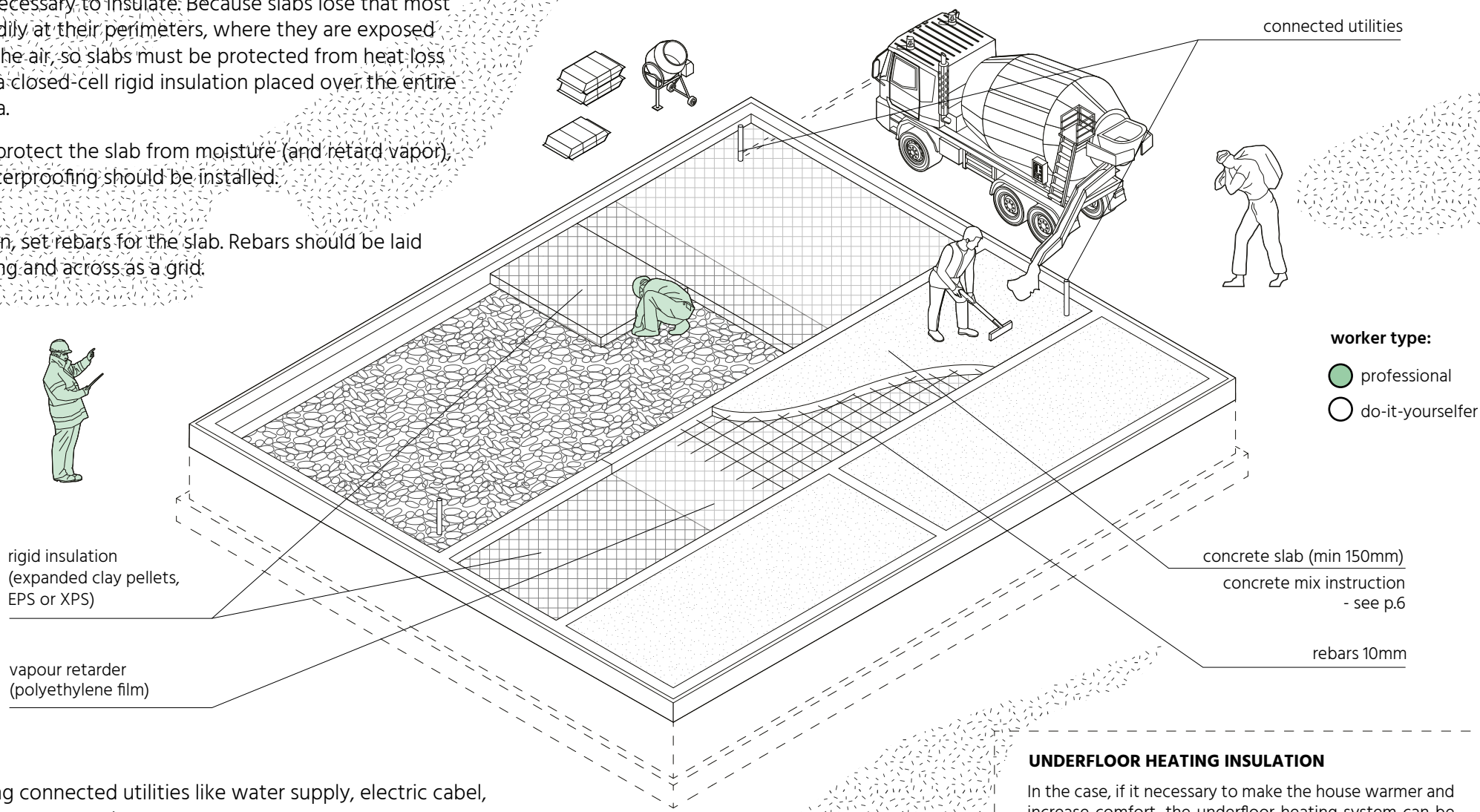
- 8 After pouring the foundation, it is worth waiting about 2-3 weeks for the concrete to gain the necessary strength.
- 9 Then, it is possible to proceed to waterproofing the foundation, and then to thermal insulation.



worker type:
● professional
○ do-it-yourselfer

GROUND FLOOR SLAB

- 10 Further, before filling the slab, it should be insulated. Because slabs lose that most readily at their perimeters, where they are exposed to the air, so slabs must be protected from heat loss by a closed-cell rigid insulation placed over the entire area.
- 11 To protect the slab from moisture (and retard vapor), waterproofing should be installed.
- 12 Then, set rebars for the slab. Rebars should be laid along and across as a grid.



worker type:
● professional
○ do-it-yourselfer

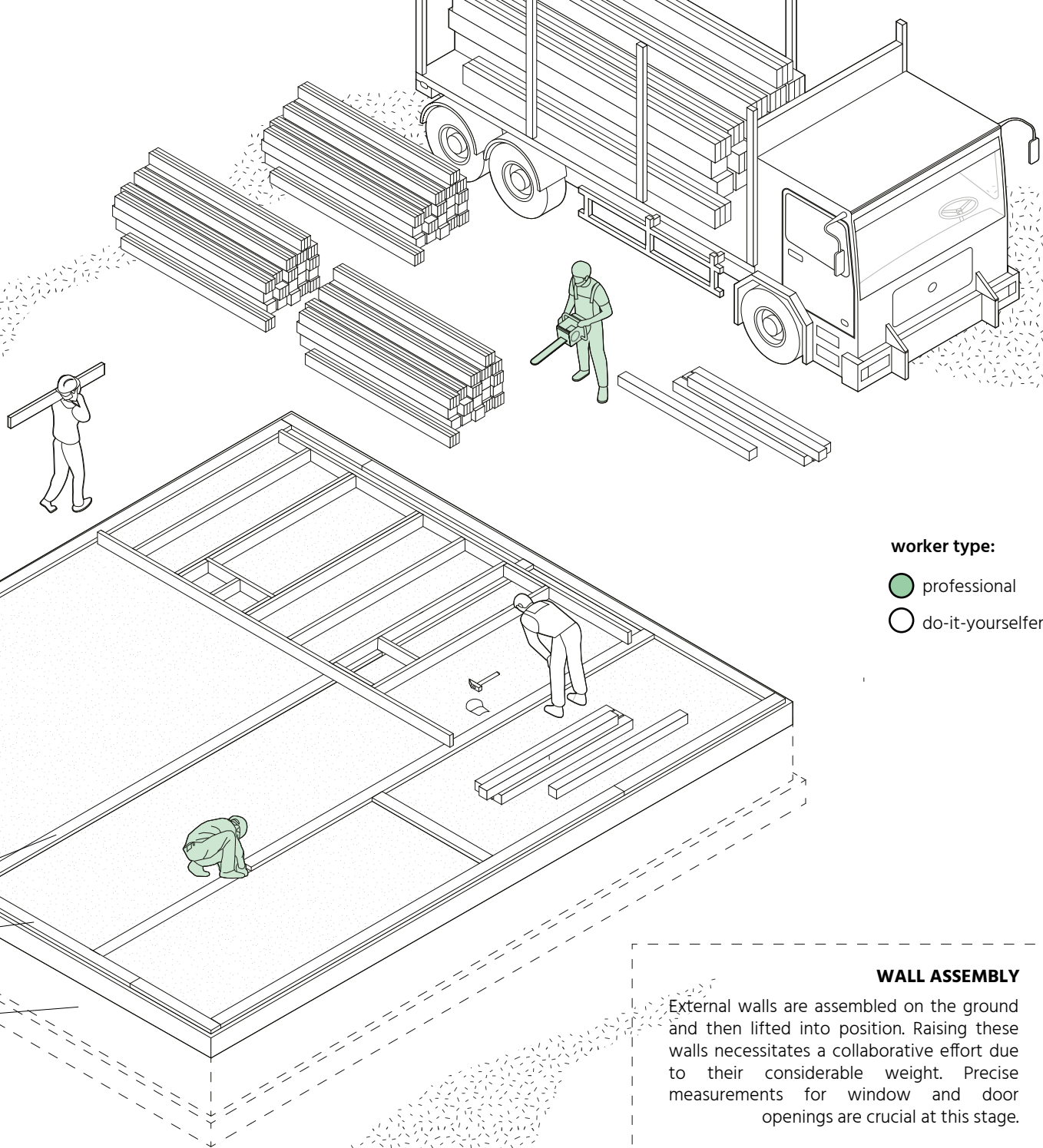
- 13 Bring connected utilities like water supply, electric cable, and sewage system.
- 14 Pour the concrete up to the top of the foundation. After 14 days it can be possible to move to the wall construction.

UNDERFLOOR HEATING INSULATION

In the case, if it necessary to make the house warmer and increase comfort, the underfloor heating system can be installed, which is often more energy-efficient than traditional heating systems because it operates at lower temperatures. It can be installed at the stage of rebars setting or in the future already at the stage of floor cladding

EXTERNAL WALL FRAMING

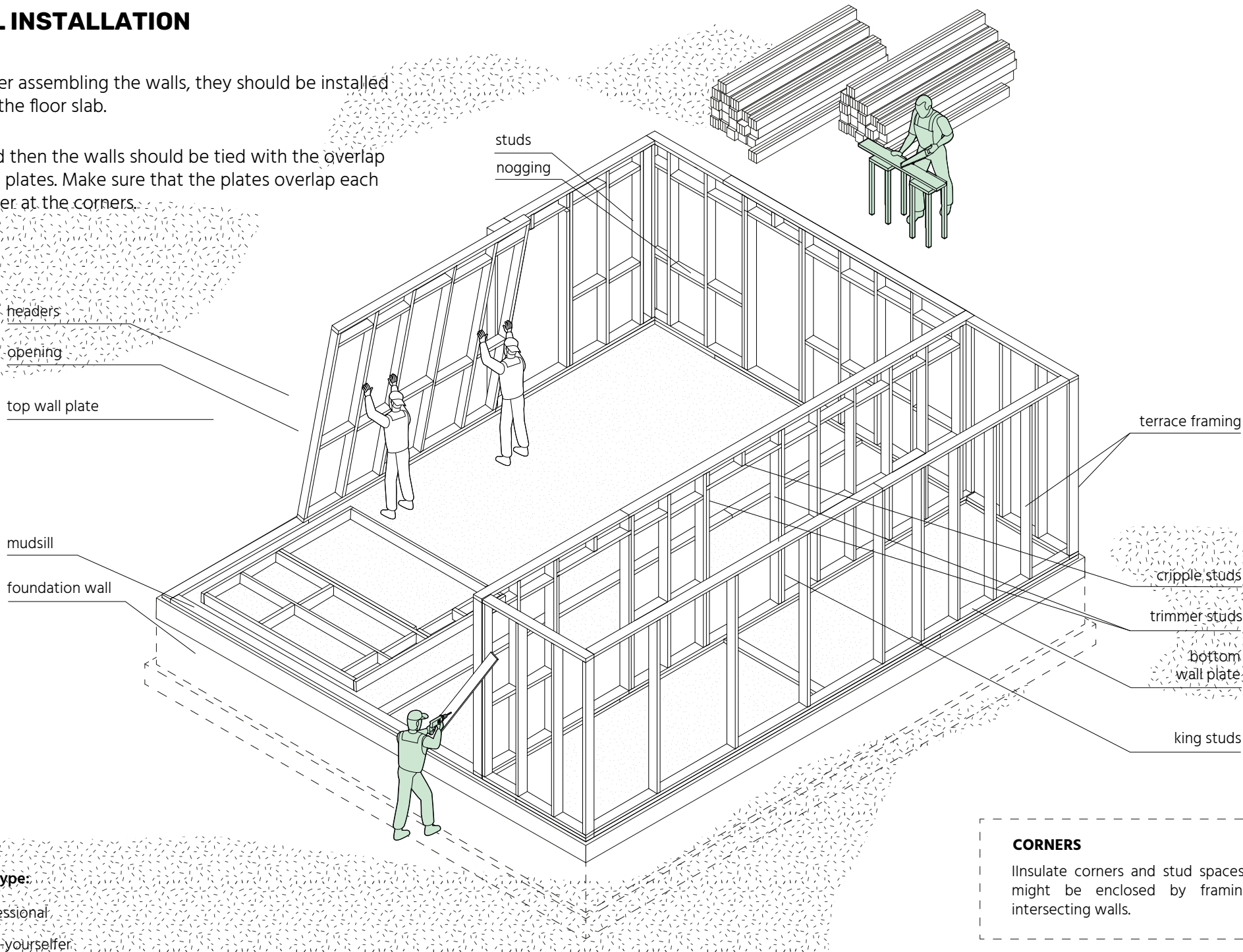
- 15 After finishing the slab construction, the focus shifts to the exterior walls. Firstly, mark the positions of the exterior walls on the slab, ensuring their alignment (employ a chalk line to mark the inside of the walls).
- 16 Install the mudsills and make waterproof under it. The first layer of wood should be installed on top of the foundation wall.
- 17 Start assembling the walls: choose high-quality, straight lumber for the top and bottom plates. Mark both plates for wall studs and door/window openings while they are assembled together. Separate the top and bottom plates and nail in the pre-cut wall studs and door/window jackstuck.



WALL ASSEMBLY
External walls are assembled on the ground and then lifted into position. Raising these walls necessitates a collaborative effort due to their considerable weight. Precise measurements for window and door openings are crucial at this stage.

WALL INSTALLATION

- 18 After assembling the walls, they should be installed on the floor slab.
- 19 And then the walls should be tied with the overlap top plates. Make sure that the plates overlap each other at the corners.



CORNERS
Insulate corners and stud spaces that might be enclosed by framing or intersecting walls.

ROOF FRAMING & TRUSSES INSTALLATION

20 After erecting the exterior walls the subsequent task is to construct the roof frame. Frame the gables trusses and install temporary bracing across the house.

21 Then install a single gable truss and secure it to the end wall by fastening it with nails to both the wall and the gable truss.

22 Mark the location of the wooden trusses on the top plate of the outer wall.

worker type:
● professional
○ do-it-yourselfer

23 Place the trusses on the exterior walls so that the roof visor is pointing down. Then slide one truss at a time to the opposite end of the house and set it in place. Using the lifting rods, turn the truss vertically.

TEMPORARY BRACING

Install temporary bracing across the trusses. This temporary bracing will remain in place until the roof sheathing is installed.

temporary bracing

gable truss

24 It also requires two people on ladders or scaffolding to secure the trusses when they are lifted.

25 Install the remaining trusses in the design position one by one and check the verticality of each truss.

gable truss

prefabricated attic trusses

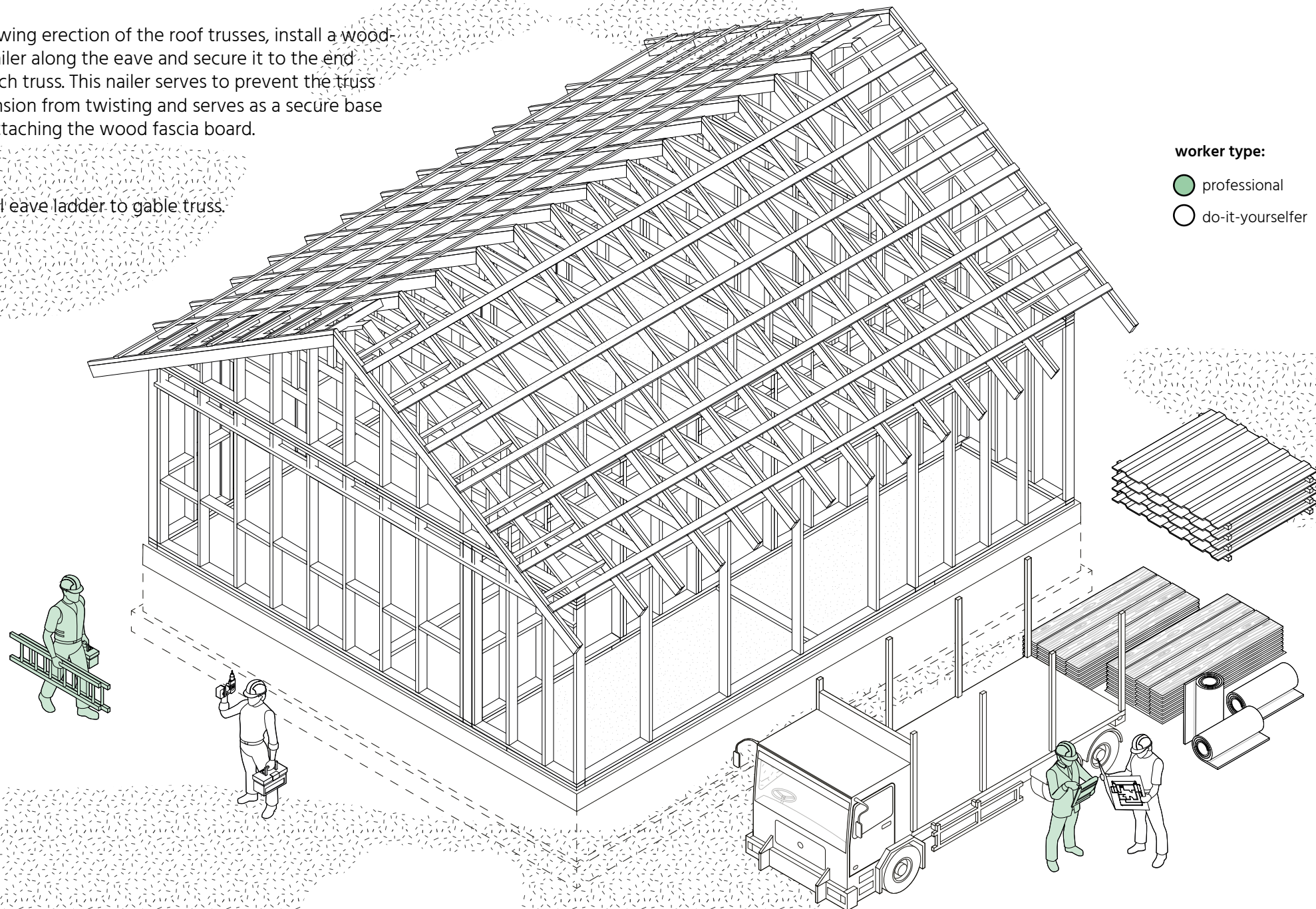
top plates

worker type:
● professional
○ do-it-yourselfer

ROOF FINISHING

26 Following erection of the roof trusses, install a wooden nailer along the eave and secure it to the end of each truss. This nailer serves to prevent the truss extension from twisting and serves as a secure base for attaching the wood fascia board.

27 Install eave ladder to gable truss.



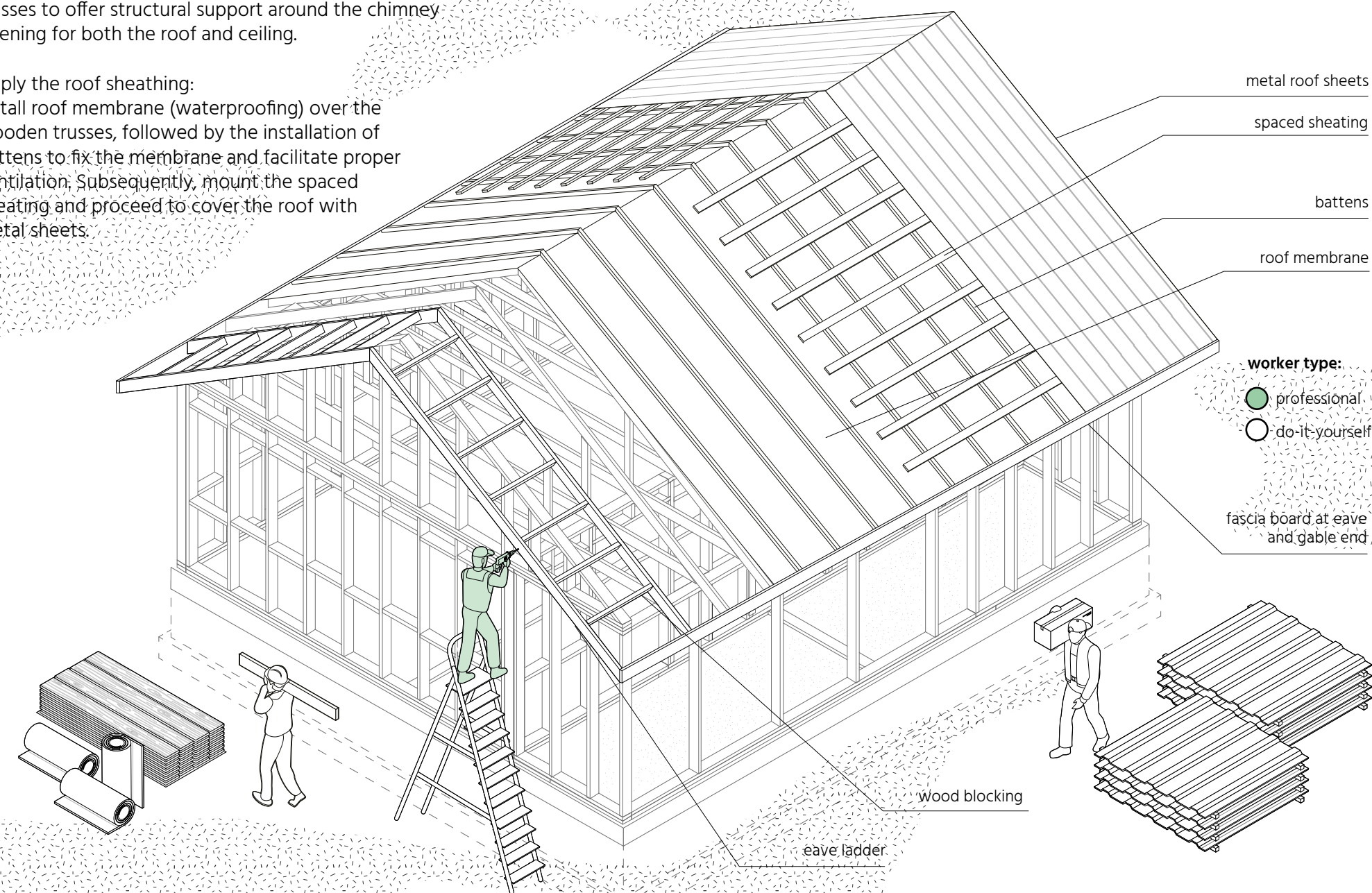
worker type:

● professional

○ do-it-yourselfer

28 Consider siting the prefabricated chimney between two roof trusses if feasible. Construct a frame between the trusses to offer structural support around the chimney opening for both the roof and ceiling.

29 Apply the roof sheathing: install roof membrane (waterproofing) over the wooden trusses, followed by the installation of battens to fix the membrane and facilitate proper ventilation. Subsequently, mount the spaced sheathing and proceed to cover the roof with metal sheets.



metal roof sheets

spaced sheathing

battens

roof membrane

worker type:

● professional

○ do-it-yourselfer

fascia board at eave and gable end

wood blocking

eave ladder

EXTERIOR FINISHES, WINDOWS & DOORS

30 With the roof in place, it is advisable to proceed with exterior work to ensure the house is weatherproof. Begin by applying the exterior wall finishes:

install OSB sheets on top of the wall frame (or add extra rigid thermal insulation if required), followed by the application of waterproofing. Then proceed with wall strapping, finish the process by laying wooden siding.

*OSB board
exterior wall cladding
(hardboard siding)
strapping
air barrier

worker type:
● professional
○ do-it-yourselfer

*ADDITIONAL WALL INSULATION

If there is a need for additional thermal insulation, then in this case, rigid insulation (rigid wood fibre insulation board) is installed instead of the OSB plate. Then the air barrier, strapping and external cladding are also installed.

31 Insert the window unit into the opening, leveling it with shims or edges. Secure the window by nailing through the exterior trim into the wall framing, avoiding wedges at the top of the window frame. Fill the gap between the rough opening and the window frame with insulation or foam, ensuring caution to prevent distortion. Finally, seal the window frame and wall air/vapor barriers with sealant and staples.

32 Install and seal exterior door frames in a manner similar to window frames.

terrace
floor finishing

worker type:
● professional
○ do-it-yourselfer

*terrace
ceiling finishing
(optional)

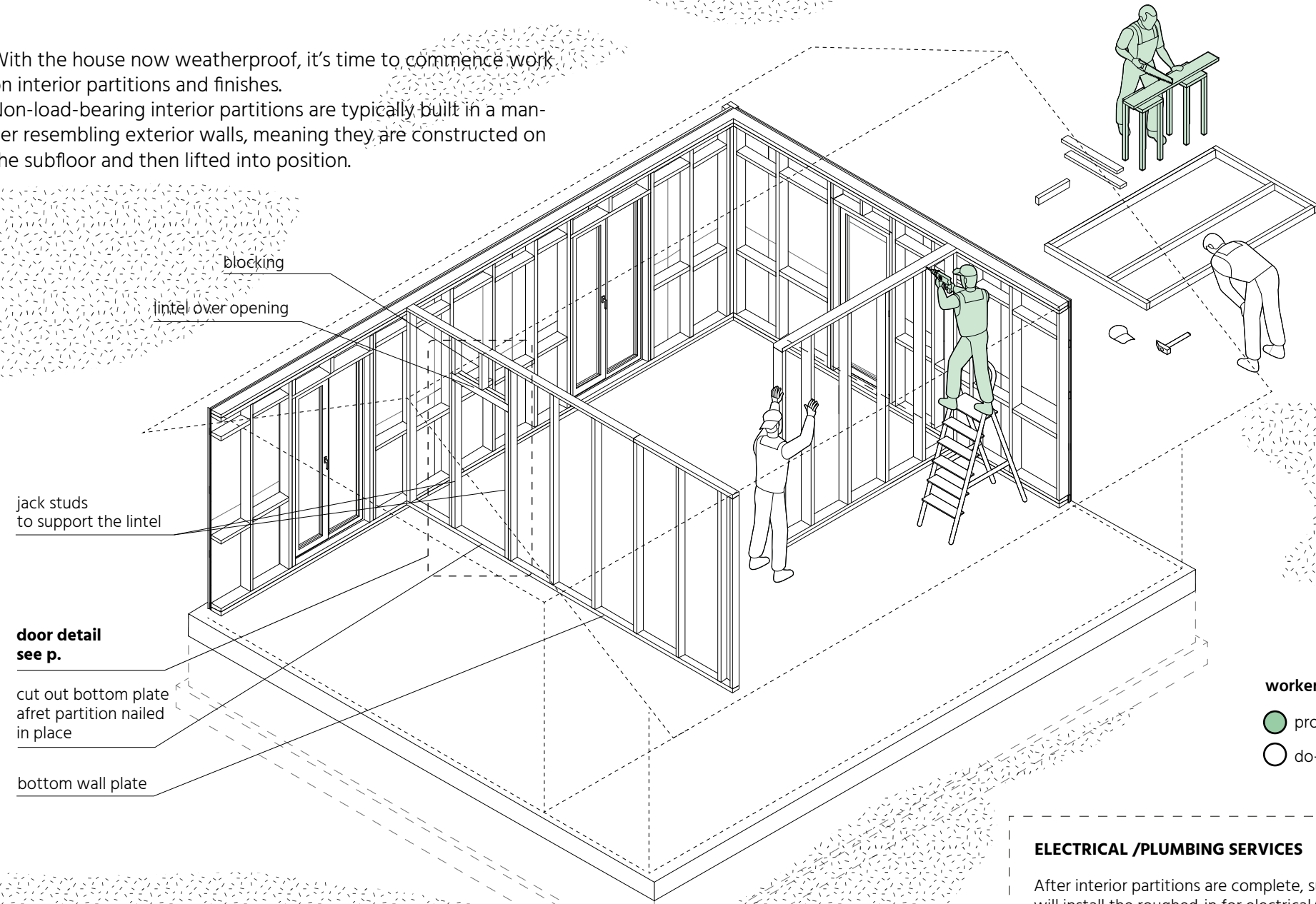
window detail
see p.

WINDOWS

The majority of manufacturers create window assemblies that include sashes, glazing, seals, and exterior trim. A significant number of these units are presently fabricated in the factory.

INTERIOR FRAMING

33 With the house now weatherproof, it's time to commence work on interior partitions and finishes. Non-load-bearing interior partitions are typically built in a manner resembling exterior walls, meaning they are constructed on the subfloor and then lifted into position.



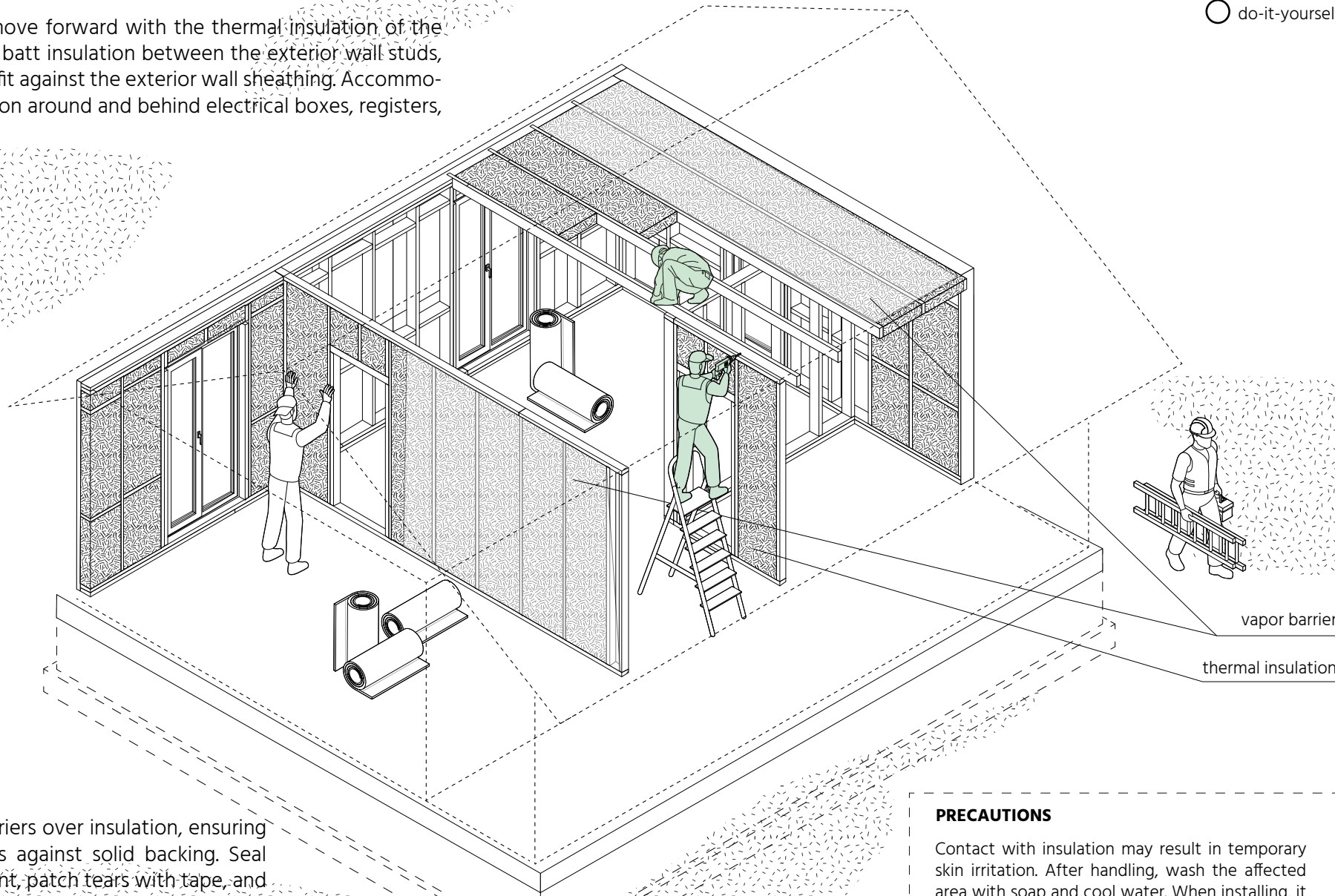
worker type:
● professional
○ do-it-yourselfer

ELECTRICAL /PLUMBING SERVICES

After interior partitions are complete, sub-trades will install the roughed-in for electrical/plumbing services.

WALL INSULATION

34 Subsequently, move forward with the thermal insulation of the walls and install batt insulation between the exterior wall studs, ensuring a snug fit against the exterior wall sheathing. Accommodate the insulation around and behind electrical boxes, registers, blocking, etc.



worker type:
● professional
○ do-it-yourselfer

35 Install vapor barriers over insulation, ensuring overlap at joints against solid backing. Seal joints with sealant, patch tears with tape, and staple to framing members. Apply sealant at top and bottom wall plates for a secure seal.

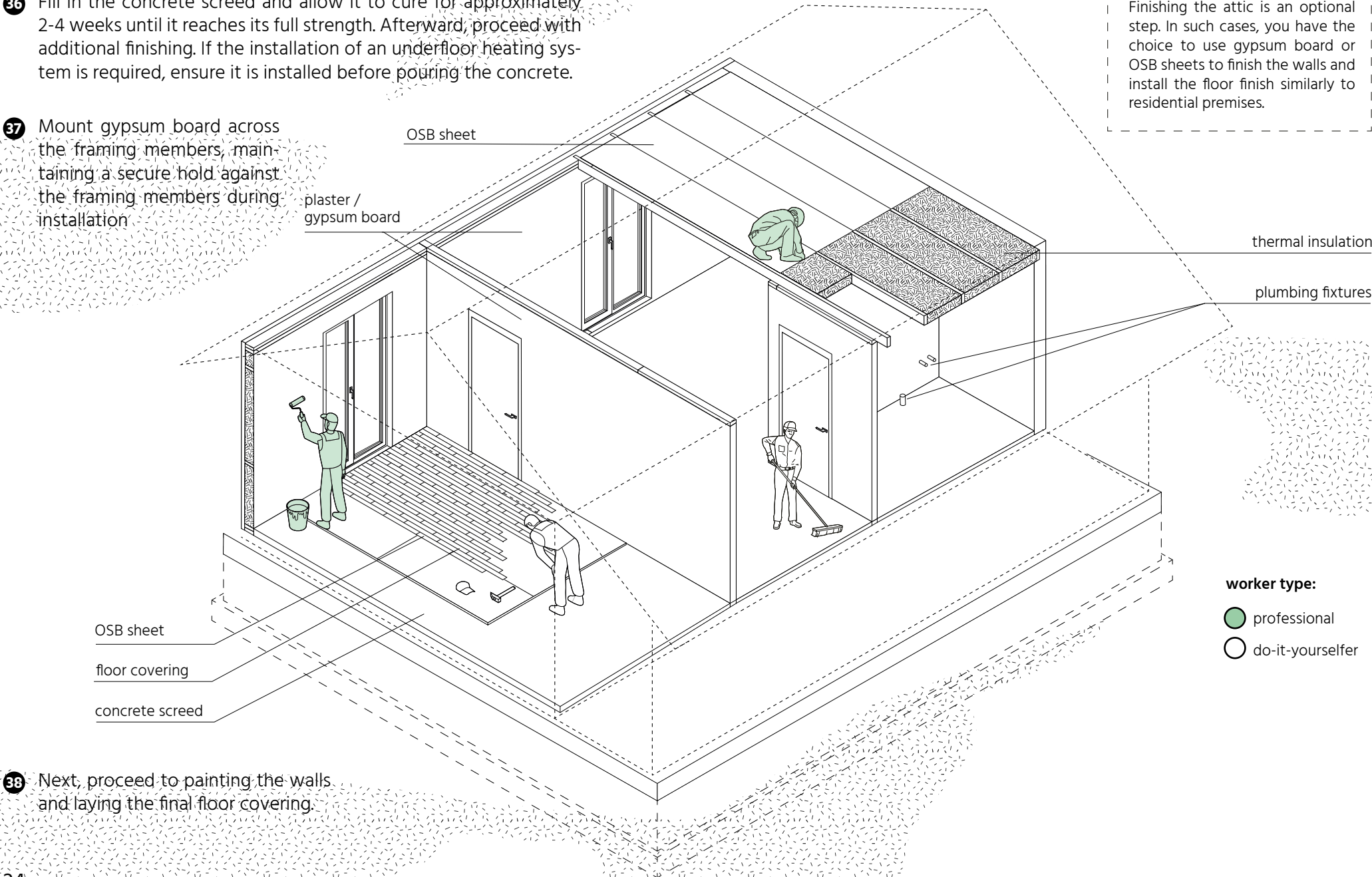
PRECAUTIONS

Contact with insulation may result in temporary skin irritation. After handling, wash the affected area with soap and cool water. When installing, it is recommended to wear loose clothing, snug work gloves, and a hat for added protection.

INTERIOR FINISHES

36 Fill in the concrete screed and allow it to cure for approximately 2-4 weeks until it reaches its full strength. Afterward, proceed with additional finishing. If the installation of an underfloor heating system is required, ensure it is installed before pouring the concrete.

37 Mount gypsum board across the framing members, maintaining a secure hold against the framing members during installation



38 Next, proceed to painting the walls and laying the final floor covering.

ATTIC FINISHING

Finishing the attic is an optional step. In such cases, you have the choice to use gypsum board or OSB sheets to finish the walls and install the floor finish similarly to residential premises.

thermal insulation

plumbing fixtures

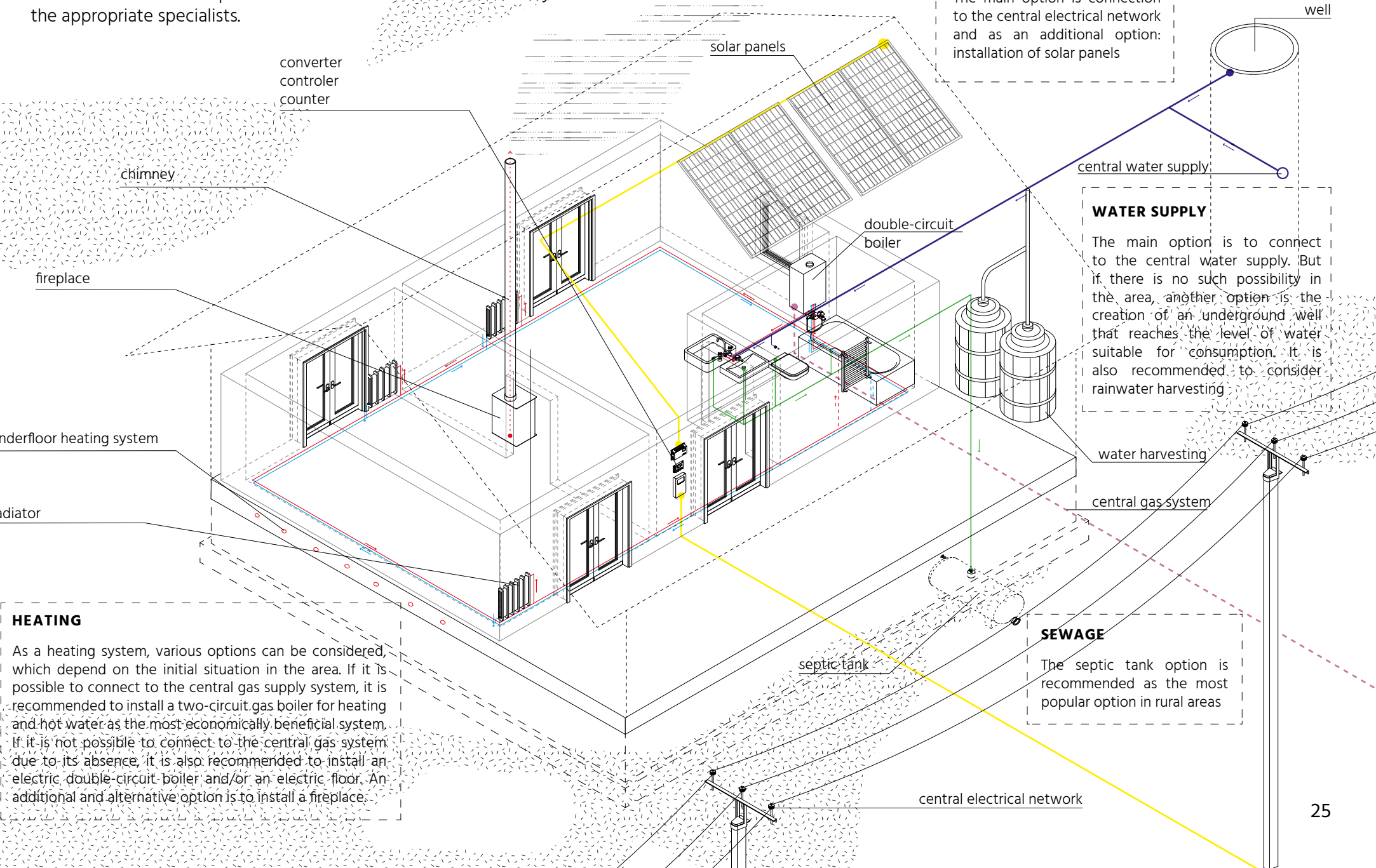
worker type:

professional

do-it-yourselfer

ELECTRICITY, HEATING, WATER SUPPLY AND SEWAGE

39 Upon finishing the premises, proceed to install all devices in the house. Ensure that this process is coordinated and carried out by the appropriate specialists.



ELECTRICITY

The main option is connection to the central electrical network and as an additional option: installation of solar panels

WATER SUPPLY

The main option is to connect to the central water supply. But if there is no such possibility in the area, another option is the creation of an underground well that reaches the level of water suitable for consumption. It is also recommended to consider rainwater harvesting

SEWAGE

The septic tank option is recommended as the most popular option in rural areas

HEATING

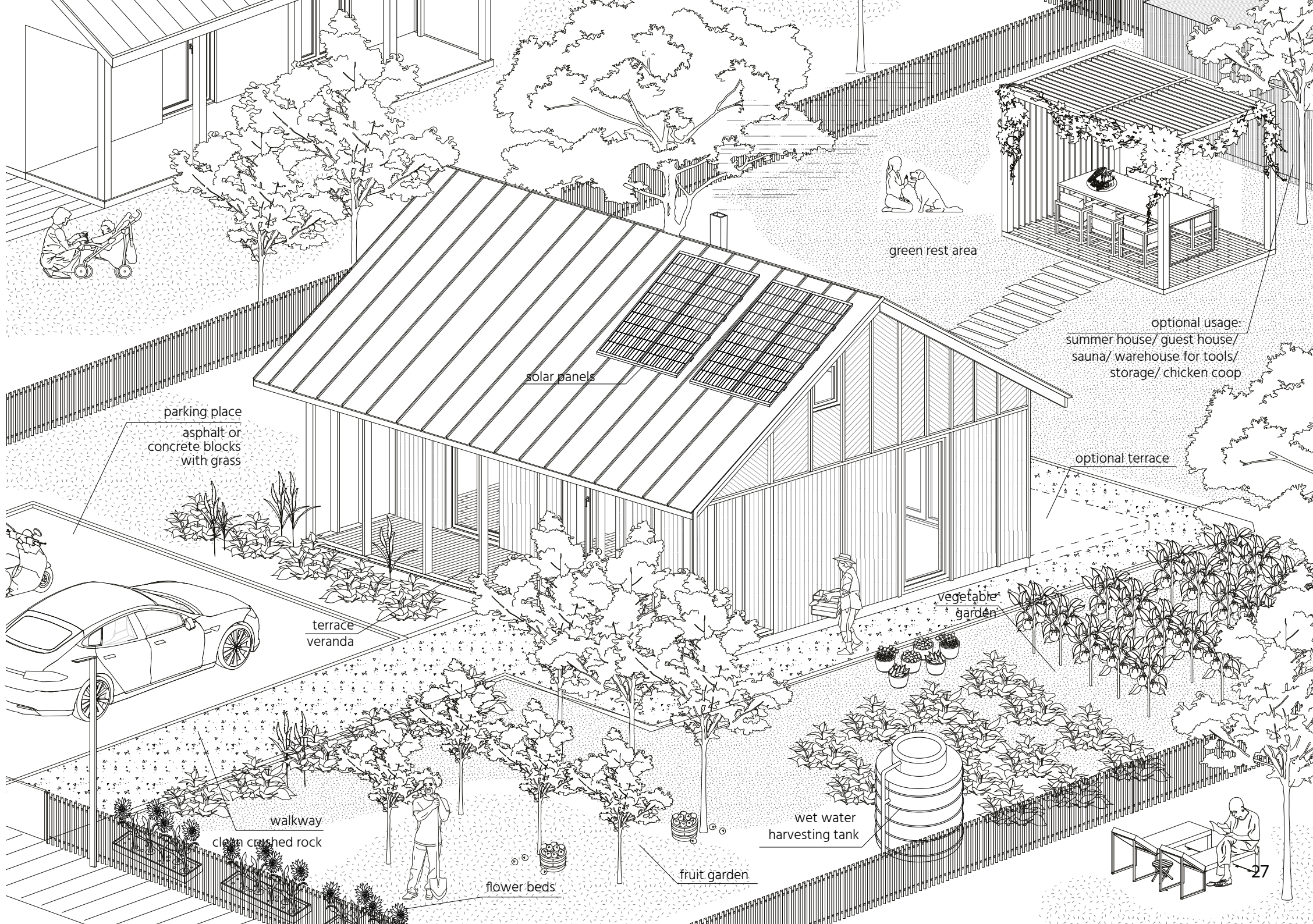
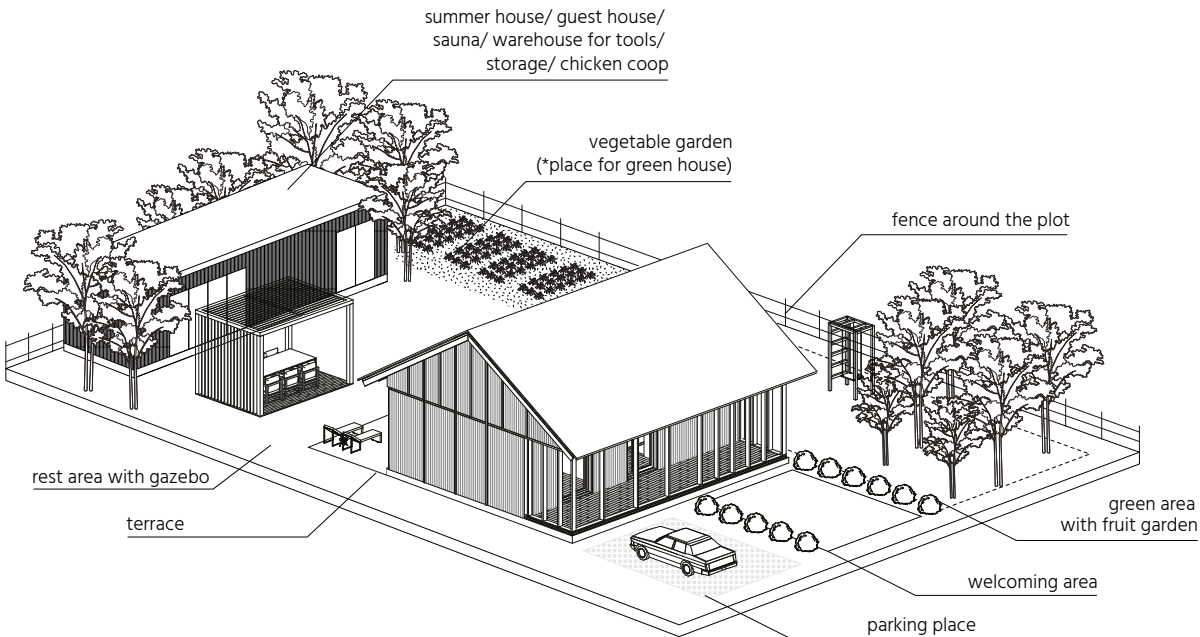
As a heating system, various options can be considered, which depend on the initial situation in the area. If it is possible to connect to the central gas supply system, it is recommended to install a two-circuit gas boiler for heating and hot water as the most economically beneficial system. If it is not possible to connect to the central gas system due to its absence, it is also recommended to install an electric double-circuit boiler and/or an electric floor. An additional and alternative option is to install a fireplace.

LANDSCAPING

Enhance the aesthetic appeal and value of your new home and property through strategic landscaping. Consider the following steps:

- 1 Optimize Green Spaces:**
Treat the areas around your house with quality topsoil, expanding them in harmony with existing varieties.
- 2 Vegetable Garden Preparation:**
If you're planning a vegetable garden, ensure proper soil preparation. During dry weather, distribute topsoil and apply commercial-grade fertilizers based on the plot's size and your preferences for seed choices.
- 3 Driveway Excellence:**
For a durable driveway, opt for pure crushed stone. Spread a 100 mm layer evenly on footpaths. For parking areas, use asphalt or concrete blocks with grass.
- 4 Floral and Structural Enhancements:**
Elevate your property's charm by planting flowers, trees, and shrubs or adding a stylish fence.

By embracing these detailed landscaping endeavors, you not only elevate the visual charm but also substantially augment the overall value of your property, creating a haven that seamlessly blends aesthetics with functionality.

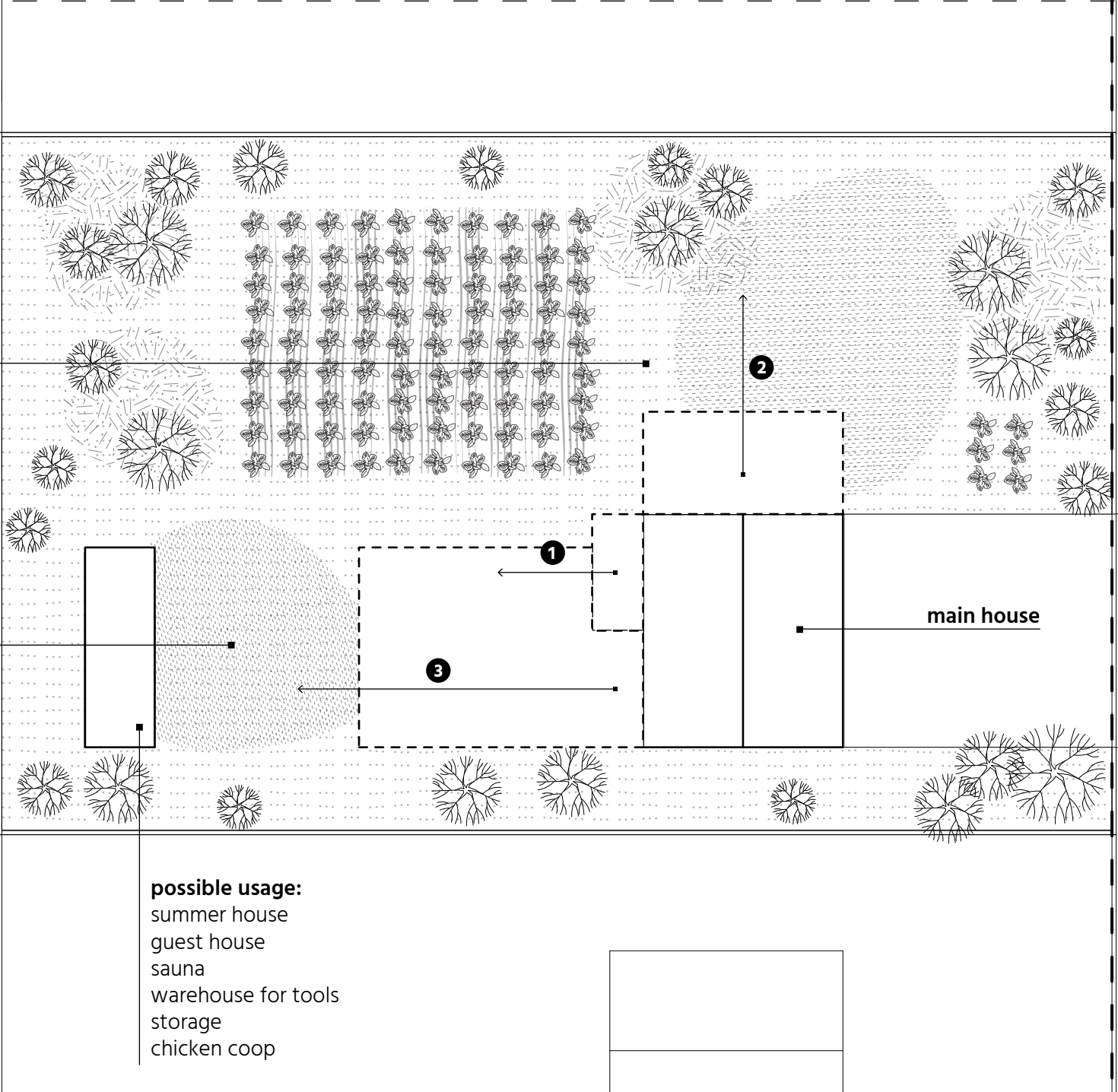


POSSIBLE
HOUSE
EVOLUTION
AND
EXTENSIONS

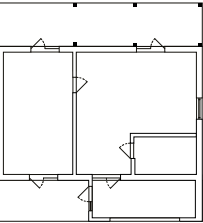
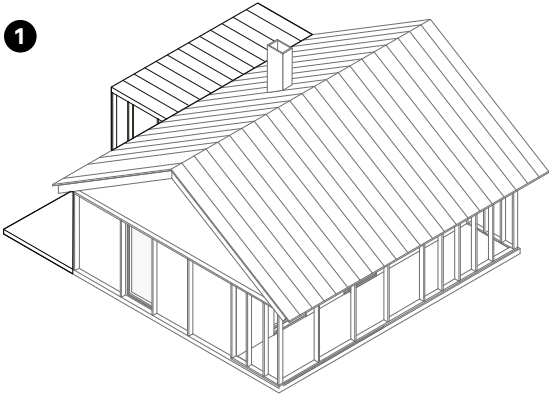
possible options
for the site:
vegetable garden
fruit garden
flower beds

backyard zone

possible usage:
summer house
guest house
sauna
warehouse for tools
storage
chicken coop

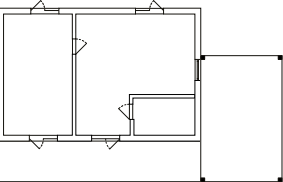
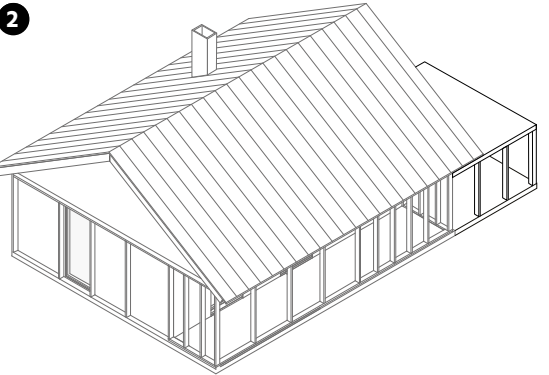


1



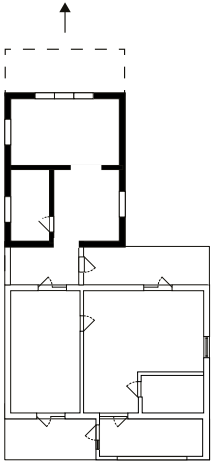
An alternative possibility includes adding a terrace that connects to the backyard, whether it's hidden or open.

2



Another potential option involves attaching a terrace connected to a veranada, whether concealed or open.

3



Afterward, there is an option to construct a complete house, linking it to the main residence through the extension of a small block. This house also offers the potential for further expansion, usually the space behind the house in the yard is much larger than the space in front of the house, which allows for much more options for construction.

CONGRATULATIONS!

You are now the proud owner of a new home. Your dedication and hard work made your dream come true. It's crucial to take proper care of your home and make the most of the time you spent in it.