Masonry

Level II

Learning Guide #44

Unit of Competence: Set-out Masonry Structures

Module Title: Setting-out Masonry Structures

LG Code: EIS MAS2 M10 LO1 LG-44

TTLM Code: EIS MAS2 TTLM 0919 v1

LO 1: Plan And Prepare

Instruction Sheet-1	Learning Guide # 44

This learning guide is developed to provide you the necessary information regarding the following content coverage and topics –

- Obtaining, Confirming and Applying work instructions
- Following ***Safety*** (***OHS***) Recording instructions/information
- Identifying Signage and barricade requirements implemented Seeking clarification
- checking and selecting ***Tools and equipment*** to carry out tasks requirement
- Calculating Material quantity and quality requirements
- Identifying ,obtaining and Preparing Materials
- Identifying environmental requirements

This guide will also assist you to attain the learning outcome stated in the cover page. Specifically, upon completion of this Learning Guide, you will be able to –

- Obtain, Confirmed and Applied work instructions
- Follow ***Safety*** (***OHS***) Recording instructions/information
- Identify Signage and barricade requirements implemented Seeking clarification
- check and selected ***Tools and equipment*** to carry out tasks requirement
- Calculate Material quantity and quality requirements
- Identify ,obtained and Prepared Materials
- Identify environmental requirements

Learning Instructions:

1. Read the specific objectives of this Learning Guide.
2. Follow the instructions described in number 3 to 7
3. Read the information written in the “Information Sheets 1”. Try to understand what are being discussed. Ask you teacher for assistance if you have hard time understanding them.
4. Accomplish the “Self-check 1” in page __.
5. Ask from your teacher the key to correction (key answers) or you can request your teacher to correct your work. (You are to get the key answer only after you finished answering the Self-check 1).
6. If you earned a satisfactory evaluation proceed to “Information Sheet 2”. However, if your rating is unsatisfactory, see your teacher for further instructions or go back to Learning Activity #2.
7. Submit your accomplished Self-check. This will form part of your training portfolio.

Information Sheet-1	Obtaining, Confirming and Applying work instructions

1.1. Introduction

Work Instructions

Work instructions are the plan that includes requirements and operational details of relevant information to prepare for setting -out activities. it may include plans, specifications, quality, working procedures legislation including equal gender employment opportunity and disability inclusive.

Setting out is a very precise process that determines the exact position of the building on the property and the base measurements that all other workers will follow. Any errors made when setting out a building will affect the outcome of the entire project. It's extremely important to get accurate information and instructions about how to complete a setting out task effectively and safely before you start.

1.2. Specification

Specifications describe the nature and the class of the work; materials to be used in the work, workmanship etc. It is very important for the execution of the work

1.3 Quality : As with all construction tasks there are quality requirements related to carrying out setting out operations. These are generally covered in Standards. If you're unsure about quality requirements – whether in relation to the work you're doing, the materials you're using, or some other area.

Because setting out involves transferring information from plans to the actual worksite, it's a good idea to complete an initial inspection of the site before you begin.

The work environment itself will determine the conditions that you have to prepare for and will affect the way you complete the task.

1.4 Organization work specifications and requirements.

It includes functional requirements, performance requirements, interface requirements, design requirements, and development standards. So the requirements specification is simply the requirements written down on paper

1.5 Purpose of Obtaining, confirming and applying work instructions

Every step of the work instructions process must be carefully documented. The documents and records kept serve several purposes. They;

- Provide evidence that the process was completed.
- Enable decisions or processes to be monitored and reviewed.
- Demonstrate accountability.
- Enable accurate and consistent sharing of information

1.6 Methods of Obtaining, confirming and applying work instructions

- Obtaining work instructions is the process collection of information for dealing with the setting-out activities. More information Obtained the minds of those who will use the information to easily confirm and apply for activities. New and additional ideas come more easily if there are lots of facts Obtained as bases. Gathering additional information means an event and activities that collects different data, facts, figures, and information through employing different methods which intended to the setting-out activities intended objectives. There is a document required when we performing setting-out. like
    - Setting-out book
    - No of equipment required
    - No of tools required
    - Safety equipment
    - Instruments etc

Self-Check 1	Written Test

Directions: Answer all the questions listed below. Use the Answer sheet provided in the next page:

- What is the specification?(5 points)
- Write the purpose of specification? (5 points)
- What is the difference between plan and drawing? (5 points)

Note: **Satisfactory rating - 15 points** **Unsatisfactory - below 15abpoints**

Answer Sheet

Score = _____

Rating: _____

Name: _____ Date: _____

Short Answer Questions

1. _____

   _____

2. _____

   _____

3. _____

   _____

Information Sheet-2	Following *Safety* (*OHS*) Recording instructions/information

2.1 Introduction

Safety is the first essential requirement and every personnel must learn the safety measures even before he/she starts working on a machine or on equipment's. Safety is an attitude, a form of mind of worker. If the attitude of worker towards safety is good and he/she is safety conscious, then he/she him/herself will develop the safe working habits. Before you can use equipment and tools or attempt practical work in a workshop you must understand basic safety rules. These rules will help keep you and others safe in the workshop.

- **Safety** is a precaution to avoid accident, right way of doing to avoid accident , follows direction to prevent wastage of time, energy & money
- **Care** is a technique of properly handling tools, equipments& materials.

To protect ourselves from the accidents of hand tools & machines in the workshop it's better to consider the following safety care and know safety sign.

2.2 classification of safety

safety can be classified as; personal safety(PPE & HSE), safety hand tools &equipment, safety working area, safety rules & regulation of in the construction site and first aid.(plaster, destinficant, bandage , ointment).

2.2.1 Personal safety (PPE & HSE).

The primary important to protect the work man from accidents is to identify possible hazards and take the necessary safety measures to eliminate the hazardous. Before you go to work on any job, make sure

Your entire body is properly protected and provided other personal protective equipment and Healthy safety equipment.

2.2.2 Personal Protective Equipment

- **Helmet ;**Protects the carrier from down falling items.t should be a must for everybody who works or moves on a building site
- **Ear protection;** Protects the carrier from damages of the ears.
- **Safety shoes;** Protects the workers feet from colds, chemical, and mud in the working area.
- **Safety glass ;**protects eye against chips and dust parking around from the work piece
- **ask(respiratory equipment):** Protects the worker from other endangering object and dust during construction.
- **love:-**Protects the workers from oils, chemicals, and dust And other dangerous material that affect the skin**.**

2.2.2 safety hand tools &equipment

- **Do not force the tool.** Use the correct tool for your application. The correct tool will do the job better and safer at the rate for which it is designed.
- **Do not use the power tool if the Power Switch does not turn it on or off.** Any tool that cannot be controlled with the Power Switch is dangerous and must be replaced.
- **Disconnect the Power Cord Plug from the power source before making any adjustments, changing accessories, or storing the tool.** Such preventive safety measures reduce the risk of starting the tool accidentally.
- **Store idle tools out of reach of children and other untrained persons.** Tools are dangerous in the hands of untrained users.
- **Maintain tools with care.** Keep cutting tools sharp and clean. Properly maintained tools with a sharp cutting edge are less likely to bind and are easier to control. Do not use a damaged tool. Tag damaged tools “Do not use” until repaired.
- **Check for misalignment or binding of moving parts, breakage of parts, and any other condition that may affect the tool’s operation.** If damaged, have the tool serviced before using. Many accidents are caused by poorly maintained tools.

- **Use only accessories that are recommended by the manufacturer for your model.** Accessories that may be suitable for one tool may become hazardous when used on another tool.

Accidents may take place due to human causes, environmental causes and mechanical causes. These causes are discussed as under**.**

- **Human Causes**

1. Accidents may occur while working on unsafe or dangerous equipments or machineries possessing rotating, reciprocating and moving parts.
2. Accidents occur while operating machines without knowledge, without safety precautions, without authority, without safety devices.
3. Accidents generally occur while operating or working at unsafe speed.
4. Accidents may occur while working for long duration of work, shift duty etc.
5. Accidents commonly occur during use of improper tools.
6. Accidents may occur while working with mental worries, ignorance, carelessness, nervousness, dreaming etc.
7. Accidents occur because of not using personal protective devices.

- **Environmental Causes**

1. Accidents may occur during working at improper temperature and humidity causes fatigue to the workers so chances of accidents increases with workers having fatigue.
2. The presence of dust fumes and smoke in the working area may causes accidents.
3. Poor housekeeping, congestion, blocked exits; bad plant layout etc. may cause accidents.
4. Accidents occur due to inadequate illumination.

- **Mechanical Causes**

1. Continued use of old, poor maintained or unsafe equipment may result in accidents.
2. Accidents commonly occur due to use of unguarded or improper guarded machines or equipments.
3. Unsafe processes, unsafe design and unsafe construction of building structure may lead to accidents in the plant.
4. Accidents occur due to improper material handling system and improper plant layout
5. Accidents may occur due to not using of safety devices such as helmets, goggles, gloves, masks etc.

What does an accident mean?

Personally: Worries for the family

Consequences of the Accident may:-

- For short times OR - Permanently injured

- Permanent pain OR - Handicap

- **Loss of salary so that financial deficiency for**

Figure 2-2: accident result.

2.2.4 safety working area

Working place or area is whole building/construction/ site including tools, equipment, machines, storerooms, etc. Within the general working place there is a personal working area /space/, where someone is building up a wall or other related activities. Working space is essentially required for all construction workers, to accommodate materials and equipment for the process; therefore, it is a crucial and necessary to keep them all in proper manner.

A neat and tidy site safes time, eases the work and avoids accidents. If things like tools, battens, boards, stones, cables, steel bars etc. are not used or kept improperly they are obstacles for the construction process and can be the cause for accident.

2.2.5 safety Rules and regulations.

- **General Safety Rule**

General safety rule is very important to reduce the accident while you working in workshop. Some of them are listed below,

- ***Follow directions*:-**understanding the procedures ofusing by hand tools & machines.
- **Stay alert.** Watch what you are doing, and use common sense when operating a power tool. Do not use a power tool while tired or under the influence of drugs, alcohol, or medication. A moment of inattention while operating power tools may result in serious personal injury.
- **Use safety equipment.** Always wear eye protection. Dust mask, non-skid safety shoes, hard hat, or hearing protection must be used for appropriate conditions.

- ***Always dress properly***: - Dress properly for your work. While you must wear your aprons are provided so that you can work on the machines. Remove any jeweler, neckties, chains, bracelets, and rings. Roll up your sleeves and tie any hair back in a ponytail before beginning any work
- ***Keep the shop clean: -*** Put your tools back where they belong when you finished.
- **Keep the floor clear of debris and sawdust:-** the floor should be clear of scrap blocks, excessive material, and sawdust. Keep projects, sawhorses, and other equipment and materials you are using out of travel lanes. Wipe up any spilled liquids immediately.
- ***Learn to use the tools correctly***
  - -Understanding using of hand tools in proper ways.
- ***Avoid house play***
- ***Report all accidents***
- ***Practice lending a cheerful helping hand when requested by someone.***

Be thoughtful and helpful toward other students in the class. Caution them if they are violating a safety rule. This is one of the most important rules in that allof you have responsibility for each other's safety and well-being in the class.

- House Keeping/kaizen

Keeping of work shop clean & store the tools in proper place is to ensure our body & tools from the accidents of machine while working & breakage of tools respectively. The workshop is kept in different ways .Some of themes are:

- Work benches should be free &clean of clutter.
- Tools &equipment should be safely stored.
- Keep the floor clean &clear.
- Immediately wipe of spilled liquids which can create a slippery surface.
- Apply 5'ssort, standardiz, shine, stabilize& sustain.
- Make the environment very conducive.

2.2.6 First aid

A building site should have a first aid box which as minimum contents: -

Plasters;

Bandages;

Ointments;

Disinfectant.

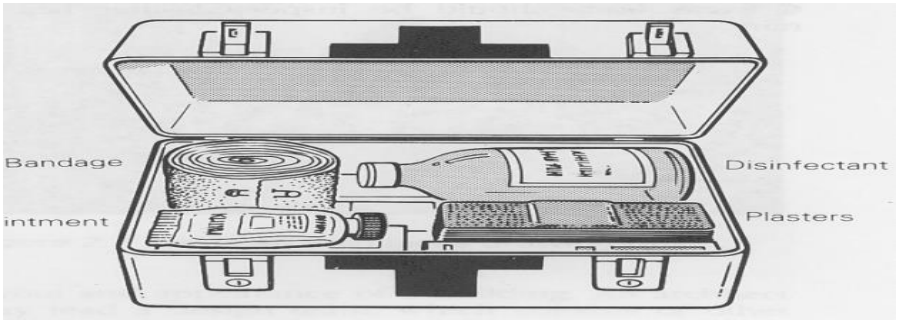


Fig 2-3: First aid tool

Summary:-

- Following proper working procedures & rules of safety and proper order of materials, tools, equipment, etc, in site, avoids accidents and eases the work.
- secure health for workers on site.
- The human body is a good conductor. Hence, be careful current from more than 0.05 A can cause death

Self-Check 2	Written Test

Directions: Answer all the questions listed below. Use the Answer sheet provided in the next page.

Choose the best answer

1. A building site should have a first aid box which as minimum contents
A) Helmets B) Plasters C) Goggles D) glove

2_____is to protect the leg of the worker from nails & sharp objects..(2points)

A) Helmets B) safety shoes C) Goggles D) glove

3,_____is to Protects the workers feet from colds, chemical, and mud in the working area. **A) Helmets B) glove C) Goggles D) safety shoes**

4,____is to Protects the workers from oils, chemicals, and dust And other dangerous material that affect the skin**. A) Helmets B) glove C) Goggles D) safety shoes**

Note: **Satisfactory rating - 10 points Unsatisfactory - below 10 points**

Answer Sheet

Score = _____

Rating: _____

Name: _____ Date: _____

Answer Questions

1,_____

2,_____

3,_____

4,_____

Information Sheet-3	**Identifying and implementing signage/barricade requirements**

3.1 Introduction to signage/barricade requirements

The Work Procedure may also include a code of conduct for the workers.

It should be stressed that the Work Procedure described is the minimum requirement. Many work Procedures may cover greater detail and cover more items relevant to the site location

3.2 Safety Signage

This section provides information on the signs that you can encounter on the work site. Most signs are self-explanatory, but if you encounter a sign where the meaning is not clear, seek advice before you commence work in the area covered by the sign.

3.2.1 Why Do We Need Safety Signage?

Safety signs draw your attention to objects and situations affecting your health and safety. Safety signs are placed in strategic locations as close as possible to hazardous areas.

If they become damaged or unreadable, please report this to your supervisor so that the sign/s can be replaced. If a sign displays a distinct safety message, it will carry the same authority as a direct instruction from your Supervisor.

3.2.2 What are the different types of signs?

We all see many signs everyday but how many signs do we take notice of? The answer is most likely many, however we do not admit to this. Signs are put in place to assist people. It is not the intention of this note to attempt to teach all about all signs and the category they fit under. However some knowledge of signs and how to use them is essential.

3.3 **Identify signs and respond as necessary and appropriately**

Signs may be:

- **Picture (symbol)**
- **Written (words)**

❖ **Picture**
- Picture signs are universal in language

❖ **Written**
- Written signs may have a language barrier
- Picture and written where the writing has the ability to clarify the picture.

3.3.1 **classification for these signs are:**
- Prohibition signs (don't do)
- Mandatory signs (must do)
- Restriction signs (limiting)
- Hazard signs (warning signs)
- Emergency signs (medical, exit)
- Fire signs (fire fighting)

▪ **Must do Signs**

Are WHITE with a BLUE circle

▪ **Restriction Signs**

Are RED circle with BLACK writing

What is important is that you appreciate and know how to respond to signs. It is just as Important that you follow the meaning of the signs. People who do not respond to signs are a risk to themselves and others

▪ **Hazard Warning Signs**

Are Triangular YELLOW with BLACK writing

- **Emergency Signs**

At the site entry to give safety and entry conditions for the site.
Wherever 'lifesaving' equipment exists, it is critical to ensure that it is ready to perform in the event of an emergency.
For those responsible for workplaces, there are strict requirements for the maintenance of essential services such as fire safety equipment.
Responsibilities can include maintaining equipment to specific standards, keeping maintenance records and completing necessary compliance reports.

- **Fire Fighting Signs**

3.3.2 Your First Line of Defense

A potential fire can often be controlled before it really takes hold, if the right fire equipment is close at hand. Companies including those in construction should have a range of portable fire extinguishers to suit all types and classes of fires.

Signs should be placed where they will be effective and at a height that is readily visible. This usually means that they need to be close, but before, to where the danger is and it should be fixed to a stable object. Consider the effectiveness of placing a number of signs at the entrance of a large commercial job.

The following sign is typical of a cluster of signs that may be found on large commercial building sites.

There are all types of signs and placing them effectively is always a concern. Consider where would you place a First Aid Sign that is going to be effective. Yes you place it at the location of the first aid room. It is expected that you will remember this later when you are working well away from the first aid room. In this instance the sign is where the object is and it relies on your memory when in need of it.

3.3.3 Signs and barricades to control access to a site

Control of access and egress to and from the worksite is imperative for the operational actives and for of all safety concerned. Signage and barriers are available in numerous, types, sizes and color.

To select the most appropriate signage and barriers for the task consultation should be carried out with the supervisor. In addition, there will be various acts, regulations, and code of practice that will need to be adhered to. Furthermore, there may be various permits and or licenses required to perform at the site.

Self-Check 3	Written Test

- ***Directions:*** Answer all the questions listed below. Use the Answer sheet provided in the next page:

1, Write classification for these signs(5point)

Note: **Satisfactory rating - 10 points** **Unsatisfactory - below 1points**

Answer Sheet

Score = _____
Rating: _____

Name: _____ Date: _____

Short Answer Questions

1,_____

, _____

_____

_____

_____

Information Sheet-4	checking and selecting *Tools and equipment* to carry out tasks requirement

1.1 *Tools and equipment* to carry out tasks

There are several type tools used by a setting out . Hand tools, in general, ease the work and accelerates the process, improves quality of work significantly and they are very important for everybody who wants to do decent work so that keep tools in perfect order. In addition tools and equipment also represents highly valued assets. For this reasons it is crucial necessary to handle tools and equipment with extra care. That means cleaning after use, storing neatly, slightly greasing if necessary and regular maintenance.

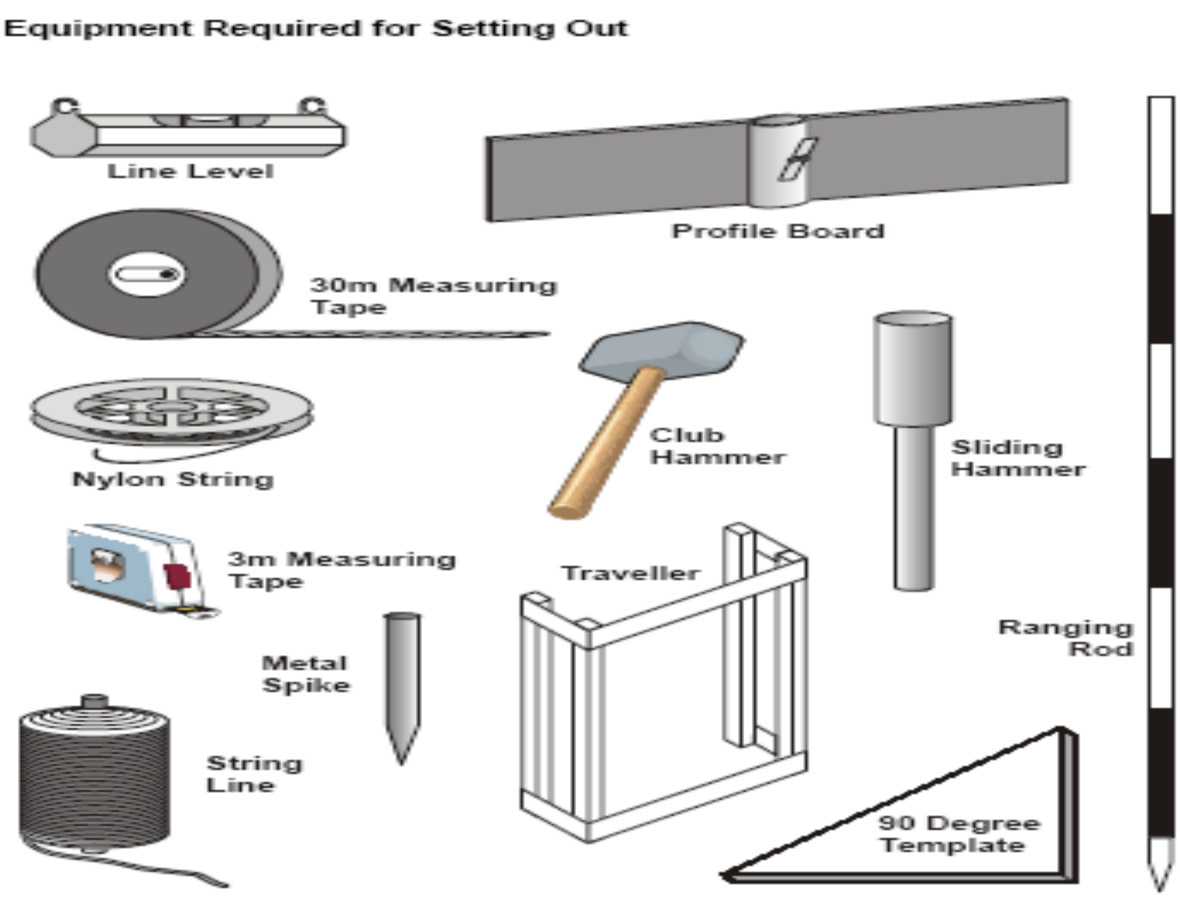


Fig 4.1 tools

1.2 Types and there use Tools and Equipment

Line Level:

A line level is a small spirit level of about 80 -120 mm length. It has a hook on each end of the level which is used for hooking the level onto a smooth line. The level is used together with a line, ranging rods (or profile boards) and a tape measure. The line level requires two people to operate.

The line level can be used to:

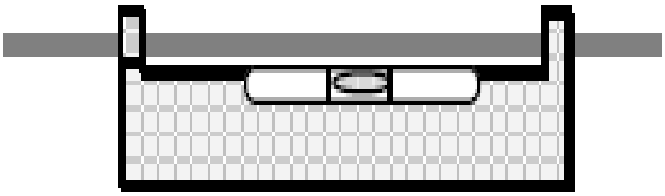
- **to transfer levels**

- **to check existing gradients**
- **to set out gradients**

Always check:

- **that the line is smooth or of nylon**
- **keep the line tight,**
- **level is in the middle between the two ranging rods,**

Check the accuracy of the level regularly

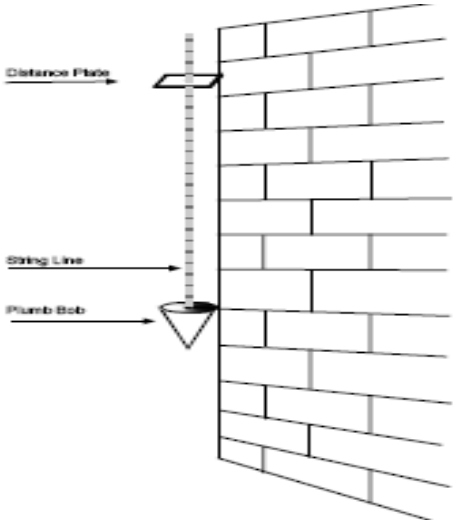


- **Profile Board :**

  A profile board is designed in such a way that it can be attached to a ranging rod. It has a screw mechanism that enables the profile board to slide up and down on the ranging rod and be fixed at any desired point simply by tightening the screw. A long lasting profile board is the one made from thin steel plate (40 cm x 10 cm) welded to a short length of metal tubing that can slide up and down and can be clamped to the metal rod. Alternatively wooden profile boards can be attached to a hard wood rod and fixed with a

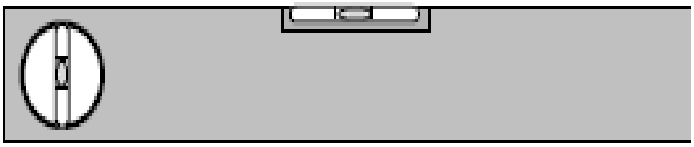
- **Plumb Bob:**

The plumb bob is usually used by masons to check the vertical alignment of walls. On road sites this is the case for structure work. The distance plate is slightly wider than the plumb bob itself and can be freely moved along the string line. In this way the plate can be heldagainst the top of the wall while the plumb bob hangs on the lower end If the plumb bob nearly touches the wall, then the top and bottom point of the wall are in a vertical line.



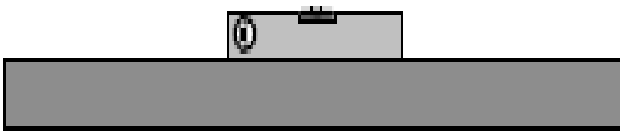
- **Spirit Level:**

Spirit levels are available in all different sizes.For construction work robust and long spirit levels are ideal. The longer the spirit level the more exact the measurement will be. Always ensure that the spirit level is properly adjusted before you buy it.



❖ **Straight-Edge with Spirit Level:**

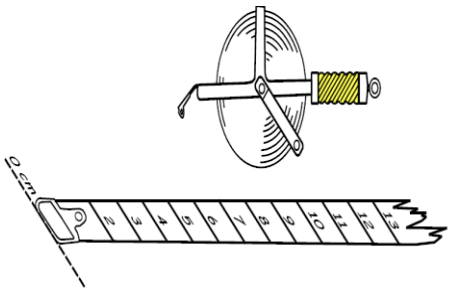
If the spirit level is not long enough, then a Straight edge of 2.50 m to 3.50 m, usually out of wood, can be used. Always ensure that your straightedges on site are actually straight on both sides.

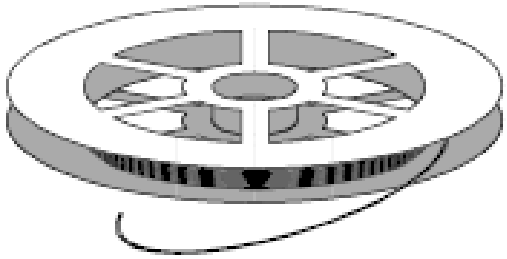


❖ **Tape Measure:**

A great variety of tape measures exist. The most common length of tape measure used for setting out is 30 meters. The tapes are made of steel or linen. Although the former is stronger, the numbers/ marking on the tape become unreadable after a period of use.

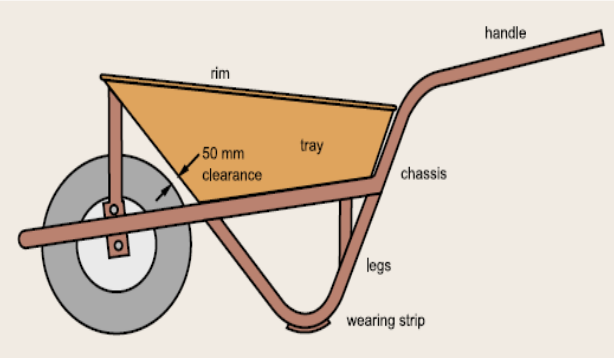
Note: The location of the 'zero point' may differ from tape measure to tape measure





❖ **Wheelbarrows**

The wheelbarrow is a useful piece of transport equipment for short distances (up to 200 meters). Wheelbarrows are used for earth and concrete works, transporting construction materials such as soil, gravel, sand, aggregate, stone, concrete, etc. Wheelbarrows are made in many different types and qualities. A good wheelbarrow should be able to take a big load (struck capacity approximately 60 to 70 litres) and be easy to balance and tip. A wheelbarrow consists of a body or tray that rests on a chassis with attached handles, a wheel and legs. The chassis is normally made from tubular steel, although



When a right angle is to be set out, the corner of the angle and one side of the corner are always known. One has only to find the second side. The square solves the problem in a very simple, quick and reliable way.

1. Setting out of the front or building line in the usual manner, with pegs or marks at the required distances. 2. Set up the tripod at peg 2 so that the datum rod is directly over the peg or mark, which represents the corner point. Mark sure that the pegs are firm on the ground.

3. Release the spike screw and extend the spike so that it sits firmly on the nail or mark. Tighten the screw.

4. Before mounting the instrument in to the tripod head, ensure that the locoing screw is tightened. Screw on the site square. Release the locking screw. By

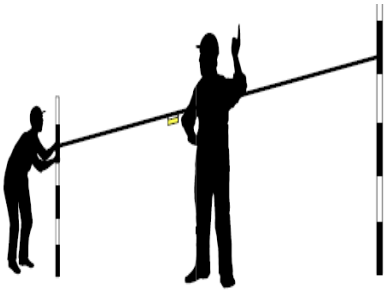
rotating the site square, point the lower telescope along the front or building line. Tight the locking screws.

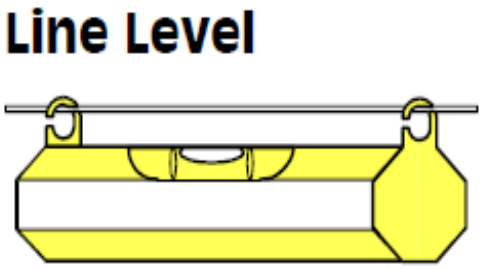
1. **Check the circular bubble over the top of the instrument. This will probably be found to be "off-centre". To correct this release the tripod leg screws and adjust the instrument until the bubble comes in to the centre of the circle. When this is achieved, tighten the tripod leg secure. The instrument is now ready to use.**
2. **When this position is obtained, measure the distance required to peg 3. Now by sighting through the top telescope, taking care note to rotate the instrument to the right or left, signal and assistant to move the peg side ways until it is "dead on" peg 3 is now positioned at an angle of 90^0.**
3. **By removing the site square to peg 3 and living up on peg 2, the removing corner peg, peg 4 can be set out using the procedures already given.**
4. **Profiles can be marked easily by lifting the telescope upwards, having sighted on to the peg, and having a nail in the ' dead on" position on the profile board.**

- **Line level**

The level of each of the profile boards can be controlled by using a *line level*. The line level is a short spirit level (about 100 mm long) with a hook at each end to hang it from a nylon string.

This instrument needs two persons to operate - one at the end of the line, and the second to watch the spirit level. The line operator moves the string up or down until the bubble is centre in the middle between the range poles or profile boards.





Self-Check 4	Written Test

Directions: Answer all the questions listed below. Use the Answer sheet provided in the next page:

I Choose the best answer

1. Which one of the following helps to measure distance or length?(2 points)
   A. String
   B. Peg
   C. Tape
   D. Sprite level
2. ----------tools are used for scooping up material and loading it on to a truck or wheel barrow.(2points)
   A. Shovel
   B. Trowel
   C. Hand rammer
   D. Pick Axe

3. _____is to protect the leg of the worker from nails & sharp objects..(2points)

A) Helmets B) safety shoes C) Goggles D) glove

4. _____ is used to check only that the surface of vertical levelness..(2points)

A) plumb bob B) Sprit Level C) try- squire D) meter

5, ---------- are useful piece of transport equipment for short distance(up to 200 m)..(2points)

A. safety shoes B. Goggles C. Wheel barrow D. mixer

Note: **Satisfactory rating - 15 points** **Unsatisfactory - below 15 points**

Answer Sheet

Score = _____
Rating: _____

Name: _____ Date: _____

Short Answer Questions:

1,_____

2,_____

3,_____

4,_____

5_____

Information Sheet-5	Calculating Material quantity and quality requirements

5.1 Material quantity requirements are calculated in accordance with plans and specifications .materials appropriate to the work application are identified.

The work man site preparation begins before you starting any work,

- Building has been designed
- Constriction documents have been approved
- Main contractor has been appointed by the client to construct the building.

When you're calculating material quantities, always double-check the plan and/or instructions you're working from, and also your calculations. This will help you to avoid situations where you can't complete a task because you have either too much or not enough of a material you need.

Once the profile boards are fixed, they should not be disturbed until the completion of basement level (plinth) of the building.

Calculate the quantity of each type of material required to complete the task. a verify of tools &equipments is needed to do digging, lifting, fixing and measuring jobs that are part of the work. the basic list should include:-

no	Supplies and Materials	Tools and Instruments	Equipment
1	String	Hammer ,meter, bow saw,	Excavator, girder
2	Nail	Spade, pickaxe	Loader , dozer
3	Pegs	Rick ,Plumb bob	
4	water tube level	claw hammer	
5	Sprit level	bow saw, pick axe	
6	Wooden pegs	try square	
7	timber		

Complete this materials list by referring to the previous plan for example setting out an

L-shaped building.

Self-Check 5	Written Test

Choose the best answer

1_____ **is used to check only that the surface of vertical levelness.**.(2points)

A) plumb bob B) Sprit Level C) try- squire D) meter

2 . Setting out an L-shaped building.

A) peg B) Sprit Level C) try- squire D) meter E, profile F,All

Note: **Satisfactory rating - 15 points** **Unsatisfactory - below 15 points**

Answer Sheet

Score = _____

Rating: _____

Name: _____ Date: _____

Short Answer Questions:

1,_____

2,_____

Information Sheet-6	Identifying ,obtaining and Preparing Materials

6.1 Introduction of Preparing Materials

When you're planning any task on a construction project, you must make sure that you have the right tools, equipment and materials, and that everything is in safe working Condition.

When using any tools, equipment or materials on a construction site, remember to:

- check the condition of all tools before work begins; never use faulty equipment and report any that you find
- read the manufacturers' instructions for any tools, equipment and materials you're not familiar with
- be aware of materials that may be hazardous and check for warning labels or a safety data sheet (SDS)
- only use tools for their designed purpose.

Self-Check 1	Written Test

I Choose the best answer

1. _____ is to protect the leg of the worker from nails & sharp objects.

A) Helmets B) safety shoes C) Goggles D) glove

2. _____ is used to check only that the surface of vertical levelness.

A) plumb bob B) Sprit Level C) try- squire D) meter

3, ---------- are useful piece of transport equipment for short distance(up to 200 m)

A. safety shoes B. Goggles C. Wheel barrow D. mixe

Answer Sheet

Score = _____

Rating: _____

Name: _____ Date: _____

Short Answer Questions:

1,_____

2,_____

Operation Sheet-1	Identifying ,obtaining and Preparing Materials

Topic:- the technique of Identify ,obtain and Prepare Materials for leveling;

1st. check the condition of all tools before work begins; never use faulty equipment and report any that you find

2nd. Read the manufacturers' instructions for any tools, equipment and materials you're not familiar with

3rd. Be aware of materials that may be hazardous and check for warning labels or a safety data sheet (SDS)

4Th. Only use tools for their designed purpose.

Information Sheet -7	Identifying environmental requirements

7.1 Introduction of environmental requirements

All construction projects have the potential to affect the environment negatively. Although setting out tasks are generally considered to have very little environmental impact as they don't use resources heavily, create a lot of waste or require much clean-up, environmental issues still need to be considered. Most construction companies or worksites will have an environmental management plan (EMP) or policies and procedures for ensuring that projects have as little impacts possible. It's everyone's responsibility to work in a way that has as low an impact on the environment as possible .As part of your planning and preparation, make sure you:

- check if there's an existing EMPfor the company, worksite and project
- comply with waste management and clean-up procedures as required.

All construction projects have the potential to affect the environment negatively. Over a third of the waste that goes into landfill comes from the construction industry and much of what's discarded could be recycled.

Even though setting out tasks has a relatively low impact on the environment, you'll still need to:

- remove general waste
- discard, reuse or recycle any materials you use
- use dust suppression techniques if the ground is significantly disturbed
- make sure your clean-up procedures and products do not damage the environment.

You must be aware of your responsibilities with regard to the requirements of your state or territory Regulations and any existing site environmental management plan (EMP).

The work environment itself will determine the conditions that you have to prepare for and will affect the way you complete the task.

Environmental issue	Strategies to address the issue
Excessive noise	Limit work to specified hours, use sound-dampening devices, redesign the work procedures to avoid high-noise equipment or tools, regularly check noisy equipment, limit vehicle traffic and site access.
Excessive dust	Keep the traffic area dampened, ensure loads to/from the site are fully covered, erect screens around high-dust areas, use dust collection devices.
Vibration	Place portable equipment or plant on pads, use alternative low-vibration equipment (including hand tools if necessary).
Waste management	Use filter traps for waste water, segregate and store waste, regularly collect and dispose of waste including off-site disposal or re-use and recycle.
Hazardous goods	Identify and segregate hazardous goods, provide secure storage areas, use MSDS to ensure correct handling/storage, limit quantities on-site, provide PPE and specific training.
Spills	Provide on-site spills kits, use bunding, have designated wash-down areas.
Soils	Store or remove contaminated or waste topsoil, use erosion management methods.

Self-Check 7	Written Test

Instructions: Answer all the questions listed below. Illustrations may be necessary to aid some explanations/answers. Write your answers in the sheet provided in the next page.

1.what is the of Environmental Protections? (10 points)

Source	Reference
Legislation	□ Queensland Work Health and Safety Regulation 2011, s68, s305A, s308, s353, s469 □ AS/NZS 4994.1:2009 Temporary edge protection – General requirements. . □ Queensland Electrical Safety Regulation 2013 Australian Standard □ AS 1319:1994 Safety signs for the occupational environment □ AS/NZS 4994.3:2010 Temporary edge protection Part 3: Installation and dismantling for edges other than roof edges □ AS 4687:2007 Temporary fencing and hoardings

Masonry

Level II

Learning Guide#45

Unit of Competence: Set-out Masonry Structures

Module Title: Setting-out Masonry Structures

LG Code: EIS MAS2 M10 LO2 LG-45

TTLM Code: EIS MAS2 TTLM 0919 v1

LO 2: Identify And Indicate Site Boundaries

Instruction Sheet	Learning Guide #45

This learning guide is developed to provide you the necessary information regarding the following content coverage and topics –

- Locating and identifying Survey pegs at corners
- Setting String lines

This guide will also assist you to attain the learning outcome stated in the cover page. Specifically, upon completion of this Learning Guide, you will be able to –

- locate and Identified Survey corners pegs
- Set String lines

Learning Instructions:

1. Read the specific objectives of this Learning Guide.
2. Follow the instructions described below 3 to 6.
3. Read the information written in the information “Sheet 1, Sheet 2, Sheet 3, Sheet 4 and Sheet 5”.
4. Accomplish the “Self-check 1, Self-check t 2, Self-check 3 and Self-check 4” **in page -55, 57, 60 and 62** respectively.
5. If you earned a satisfactory evaluation from the “Self-check” proceed to “Operation Sheet 1” **in page -63.**
6. Do the “LAP test” **in page – 64** (if you are ready).

Information Sheet 1	Locating and identifying Survey pegs at corners

1.1 Identifying and marking the boundary

The first task in the process of setting out a building is identifying the exact size and shape of the lot. Boundaries are used as reference lines from which measurements are made to determine the position of the building.

1.2 Locating the boundary markers

The size and shape of building lots are determined by a licensed surveyor from the registered plan of the area. The surveyor identifies the site features by driving survey

pegs into the ground at appropriate points eg boundary corners and easement

Positions, and issues a survey certificate showing where the site boundaries ar and how they can be identified.

The survey certificate is used by the architect whendesigning the building and creating a site plan.

1.2.1 Reading the site plans

A site plan shows the entire lot or at least the part of the lot where the building will be.

It provides most of the important information for setting out a building and includes the:

- size and shape of the lot
- position of boundary lines
- position and distance between the boundary pegs

- direction the building is facing
- contour lines showing the topography of the lot
- proposed building outline in relation to the boundaries.

1.3 Locating and reading boundary pegs

Boundary pegs are short, wooden pegs driven into the ground by the surveyor to mark the beginning and end of the site boundaries.

There are two types – corner and truncated corner pegs.

Fig-2 corner peg

1.3.1 Corner peg

As the name suggests, **corner pegs** are used to mark the main corners of the lot. They have a metal or plastic plate fixed to the top with one or more numbers corresponding to the lot number of the lots it separates. Corner pegs are approximately 50 mm × 50 mm and have a clout nail in the top which marks the exact point the boundary lines intersect. They're usually painted white for easy identification.

The number of pegs will depend on the shape of the lot. In the diagram below, Lot 2

would be identified by four survey pegs.

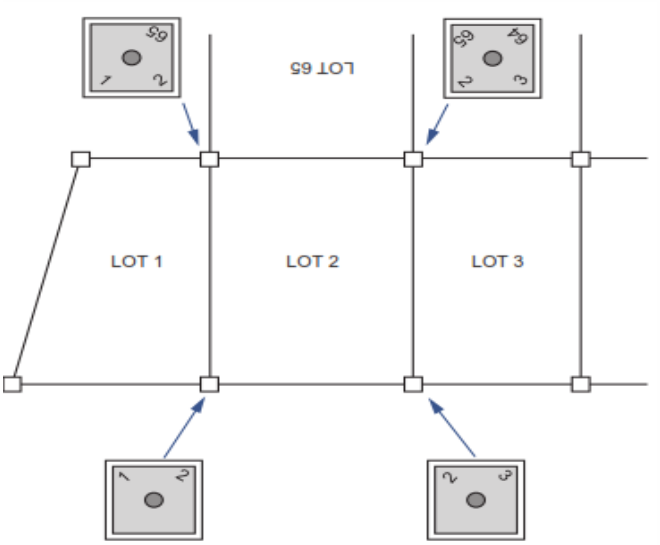


Fig-3 Sloping

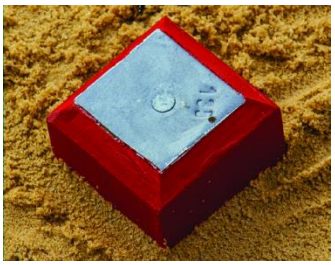


Fig-4 Truncated corner peg

1.3.2 Truncated corner peg

A **truncated corner** is where the corner of the lot has been cut off and is not square (90°). Truncated corners are marked with 75 × 75 mm pegs which are painted red to identify that there is a change of direction to the boundary line.

It's always a good idea to confirm the position of boundary pegs by taking site Measurements. Irregular shaped lots should be double-checked and care must be taken not to confuse boundary pegs with survey pegs belonging to an adjoining block of different dimensions.

Dimensions shown on plans always represent the distance across a level, horizontal

plane. If a measurement is taken with a tape along the ground on a sloping block, the distance will be shorter than it should be. All distances between survey pegs on flat, Sloping or steep sites must be measured horizontally to eliminate any accumulated error; that is, many small errors building up to become a large error.

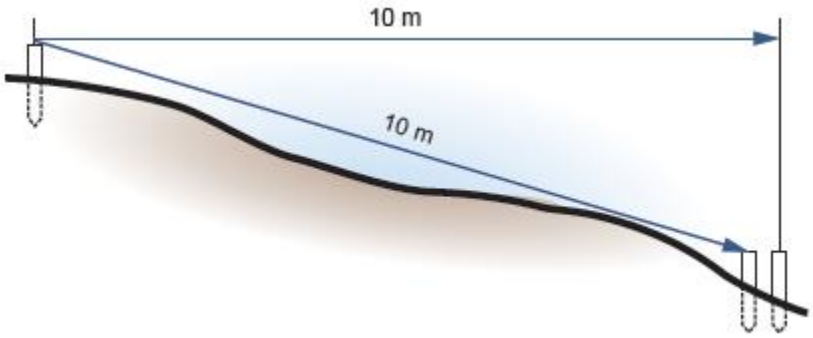


Fig-5 Sloping

If the boundary pegs are missing, a licensed surveyor should be employed by the builder to replace them. It's very risky to set out a building without knowing the correct Positions of boundary corners.

This also applies in established suburbs where an old house has been demolished to make way for a new one. The position of boundary lines can shift from their legally Recognized position over time as buildings and fences are constructed and demolished

1.4 Marking the boundary

Once survey pegs have been located and identified, string lines can be set up to mark the boundary and provide a guide for finding the position of the proposed building.

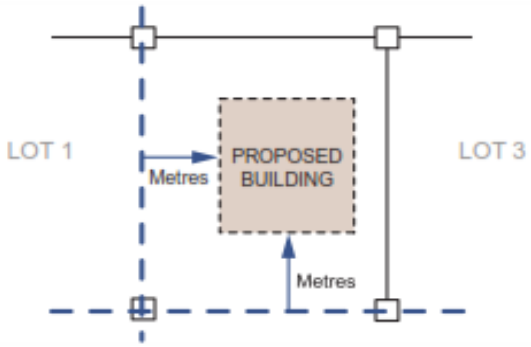


Fig-5 marking lines

Self-Check-1 ***Written Test***

Directions: Answer all the questions listed below. Use the Answer sheet provided in the next page:\

SAY TRUE OR FALSE

1. Any worker man first job is lay out the site boundaries.

2, A worker man is constructed a permanent building in the building site.

3. A site office with secure storage and workshops are a well managed site.

Note: **Satisfactory rating - 15 points** **Unsatisfactory - below 15 points**

Answer Sheet

Score = _____
Rating: _____

Name: _____ Date: _____

Short Answer Questions

1._____

2,_____

3,_____

Operation Sheet 1	**Locating and identifying Survey pegs at corners**

Topic. Techniques to Locating and identifying Survey pegs at corners

1St. **Locating and reading boundary pegs**

2nd. **Identifying and marking the boundary**

3rd. Locating the boundary markers

4th. Reading the site plans

5th. Corner peg

Information Sheet 2	String lines

2.1 String lines

String lines are some of the oldest and most basic hand tools used in building and construction. They're usually made from nylon or fine cotton string about 2–3 mm in diameter and used to create a straight line between two points.

A string line is set up by attaching one end of the string to a nail fixed into the top of

a timber peg that's been driven into the ground. The string is then pulled taut (tight)and securely fastened to another peg.

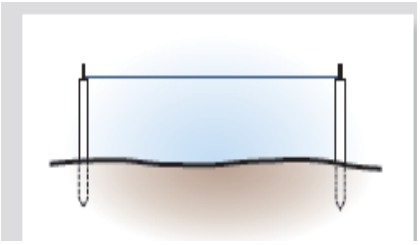


Fig-5 String lines

The site should be cleared of all unwanted obstacles before string lines are set out and care should be taken to avoid any distortion to the line caused by wind, uneven ground, plants and grass, or debris.

Where you set the string lines to identify the site boundaries will depend on different factors, including:

- the shape of the lot
- the position of the proposed building
- obstacles such as trees or existing structures
- buildings built on the existing boundary line on adjacent lots
- fences on the boundary line of adjacent lots.

Lots with level ground and boundary lines at 90° to one another are the easiest environment on which to set out a building. In this situation, you only need to set string lines on two sides of the lot, as all building measurements can be taken from these two reference lines.

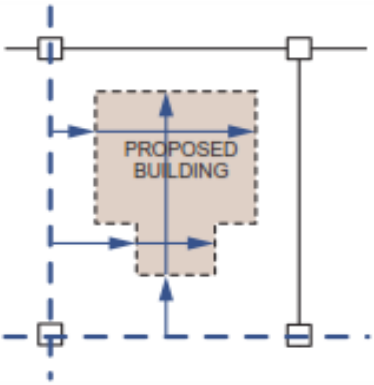


Fig-3 level 90°

Step1

Locate the two boundary pegs that identify the **front** boundary and set a taut string line between these two points.

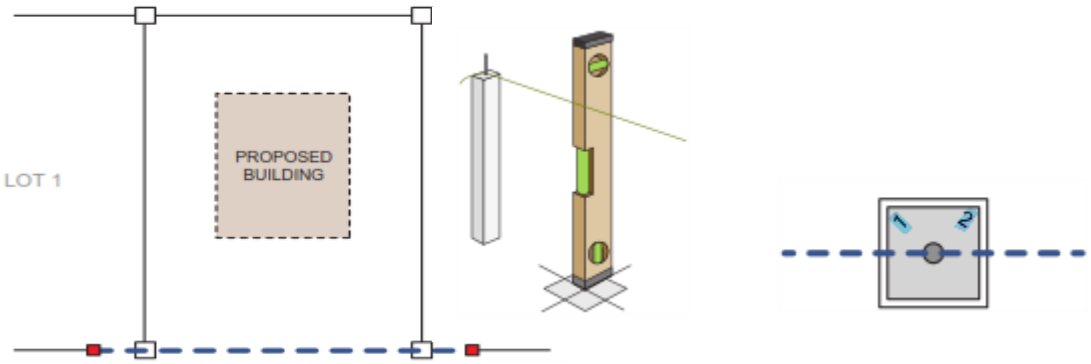
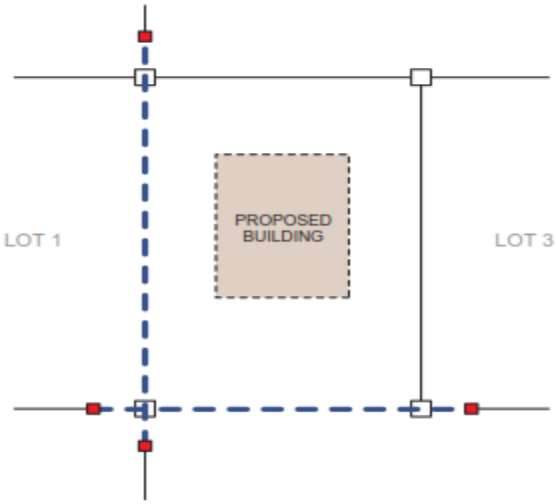


Fig-3 string line

Don't attach string directly to the boundary pegs as this may disturb their position. Use temporary timber pegs with the string running above the exact centre of the boundary pegs (over the clout nail).
The position of the string can be checked by using a spirit level to plumb down (check vertically) from the string line to the centre of the boundary peg.

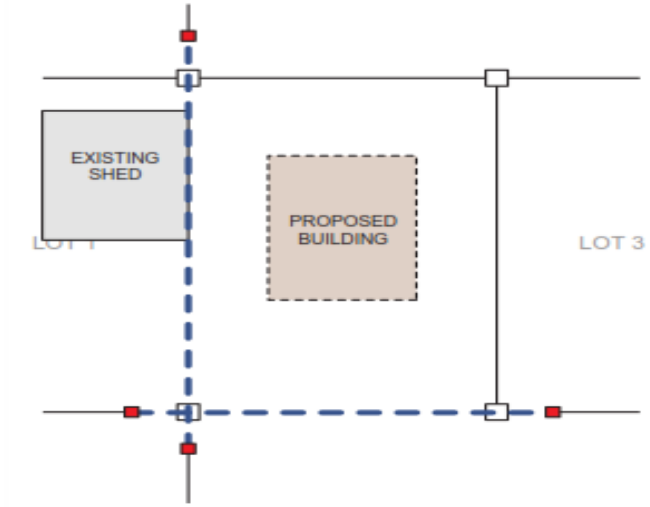
Step2

Locate the two survey pegs that identify the **side** boundary and set a taut string line between these two points. Use temporary timber pegs running over the centre point of the boundary pegs.



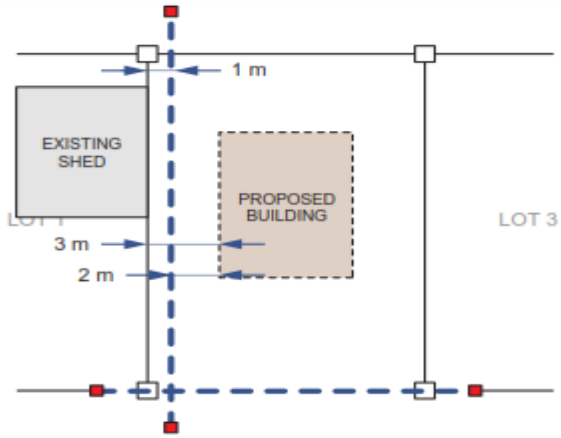
Example1

The string line can be positioned against the side of the existing building; however, you must avoid bending or distorting the string line where it touches the existing building.



Example2

The string line is positioned at a set distance from the boundary pegs and away from
the existing building. When you're using this method, you must adjust measurements
taken from site drawings accurately to ensure that the proposed building remains in its
desired position on the lot.



Self-Check-2 *Written Test*

Directions: Answer all the questions listed below. Use the Answer sheet provided in the next page:

SAY TRUE OR FALSE

1, Locate the two boundary pegs that identify the **front** boundary and set a taut string line between these points.?

2, Lots with level ground and boundary lines at 80° to one another are the easiest environment on which to set out a building.?

3, The position of the string can be checked by using a mater (check vertically) from the string line to the centre of the boundary peg.?

Note: **Satisfactory rating - 15 points** **Unsatisfactory - below 15 points**

Answer Sheet

Score = _____
Rating: _____

Name: _____ Date: _____

Answer Questions

1,_____-

2,_____

3,_____

operation Sheet -2	**String lines**

Topic. Techniques to set out the string lines for a simple rectangular building. Complete the following tasks.

1st. Identify and install string lines to mark the boundary.

2nd.Set up temporary pegs to mark the approximate position and overall size of the building.

3rd.Set out the building lines and check the right angle for accuracy using the 3:4:5 method.

4th. Measure the diagonals to check that the final set-out is ‘square’.

Masonry

Level II

Learning Guide #46

Unit of Competence: Set-out Masonry Structures

Module Title: Setting-out Masonry Structures

LG Code: EIS MAS2 M10 LO3 LG-46

TTLM Code: EIS MAS2 TTLM 0919 v1

LO 3: Set out first line for building alignment

Instruction Sheet	Learning Guide #46

This learning guide is developed to provide you the necessary information regarding the following content coverage and topics –

- Determining Measurements of building line
- Determining Approximate position and length of line
- Installing approximately Pegs and profiles
- Marking accurately Location for line

This guide will also assist you to attain the learning outcome stated in the cover page. Specifically, upon completion of this Learning Guide, you will be able to –

- Determine Measurements of building line
- Determine Approximate position and length of line
- Install approximately Pegs and profiles
- Marker accurately Location for line

Learning Instructions:

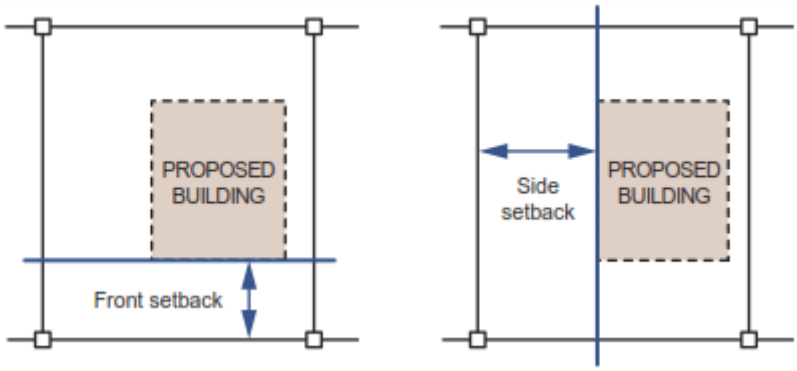
7. Read the specific objectives of this Learning Guide.
8. Follow the instructions described below 3 to 6.
9. Read the information written in the information “Sheet 1, Sheet 2, Sheet 3, Sheet 4 and Sheet 5”.
10. Accomplish the “Self-check 1, Self-check t 2, Self-check 3 and Self-check 4” **in page -55, 57, 60 and 62** respectively.
11. If you earned a satisfactory evaluation from the “Self-check” proceed to “Operation Sheet 1” **in page -63.**
12. Do the “LAP test” **in page – 64** (if you are ready).

Information Sheet-1	Determining Measurements of building line

1.1 Concept of Measurements of building line

Starting the set-out in the correct place is essential to the success of the task and the overall project and the relative terms to be used for measurements are applied .i.e.

setbacks the distances between the boundaries and the outer walls of the building and these measurements must be identified before the building can be set out. The position of a building on a lot is identified by its relationship to the boundary lines.



There is a minimum distance for setbacks in most areas which is determined by state or territory Regulations. It usually depends on the area zoning and the size of the lot and proposed building. The architect includes this information in the design of the building and provides the exact measurements on the project site plan.

The front setback is always measured perpendicular (at 90°) from the front boundary to the nearest part of the building.

If the building is not parallel to the boundary, the architect may give more than one measurement for the side setback, eg the distances between the front corner and rear corners of the building and the side boundary.

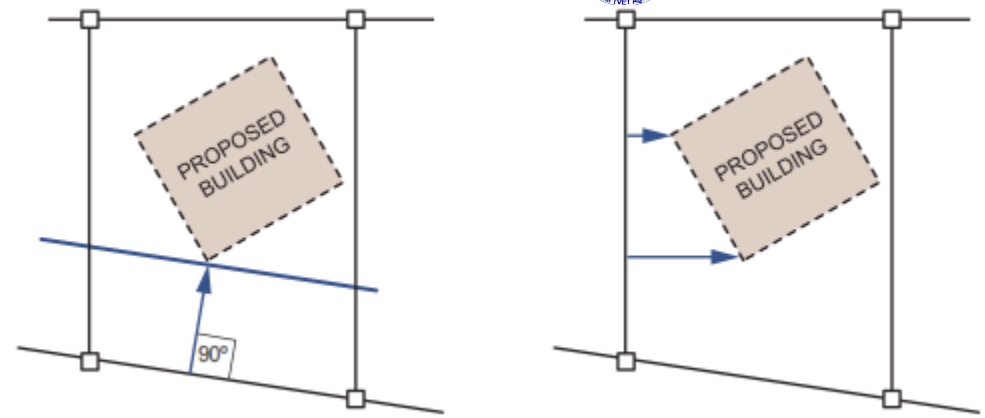


Figure-front setback

Minimum setback distances can apply to other features on a lot including other buildings, fences, landscaping, swimming pools and drains. Setback distances are a legal requirement so the measurements shown on the site plan must be set out precisely.

Self-Check-1 *Written Test*

Directions: Answer all the questions listed below. Use the Answer sheet provided in **the next page:**

I Say true or false

1, Measure the front setback from the front boundary to the profiles.

2, Minimum setback distances can apply to other features on a lot including other buildings,

3 The position of a building on a lot is identified by its relationship to the boundary lines.

Note: **Satisfactory rating - 15 points** **Unsatisfactory - below 15 points**

Answer Sheet

Score = _____

Rating: _____

Name: _____ Date: _____

Short Answer Questions

1_____
2_____
3._____

Information Sheet-2	Determining Approximate position and length of line

2.1 Determining approximate position and length of line

Once the front and side setbacks have been determined, the approximate position and Overall sizes of the building are temporarily marked to guide the setting out process.

Measure the setback distances from the front and side boundaries and place a temporary peg at the first corner.

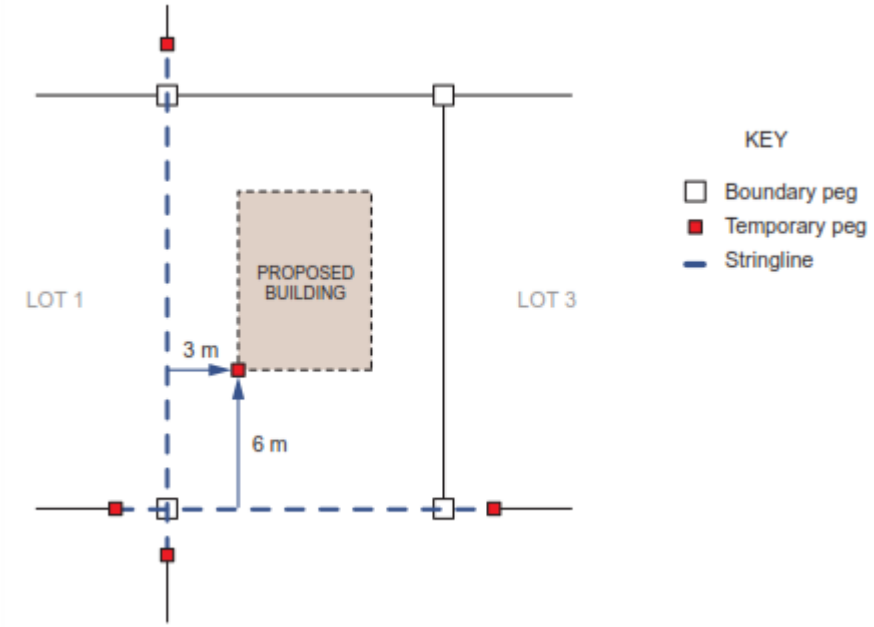


Figure-1 front,

Identify the **width** of the building from the site plans and place a temporary peg at corner 2 by measuring the distances from corner 1 (width) and the front boundary (setback).

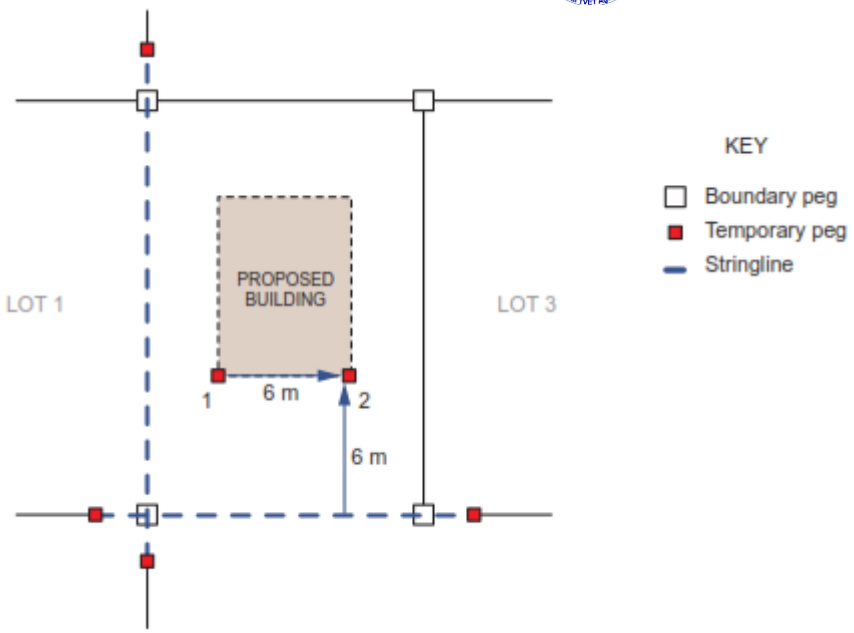


Figure-2 **width**

Identify the **depth** of the house from the site plans and place a temporary peg at corner 3 by measuring the distances from corner 1 (depth) and the side boundary (setback).

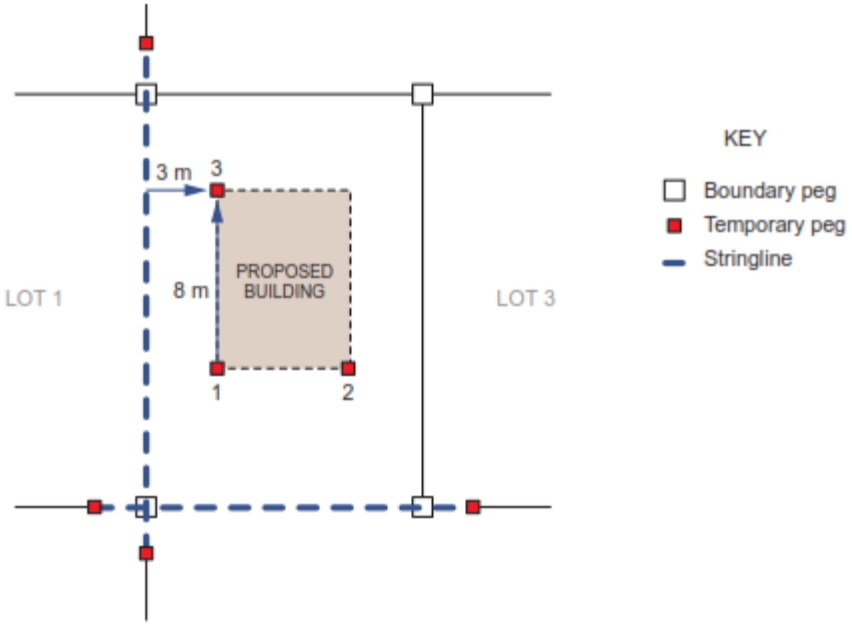


Figure-3 **depth**

Place a temporary peg at corner 4 by measuring the distances from corner 3 (width) and corner 2 (depth).

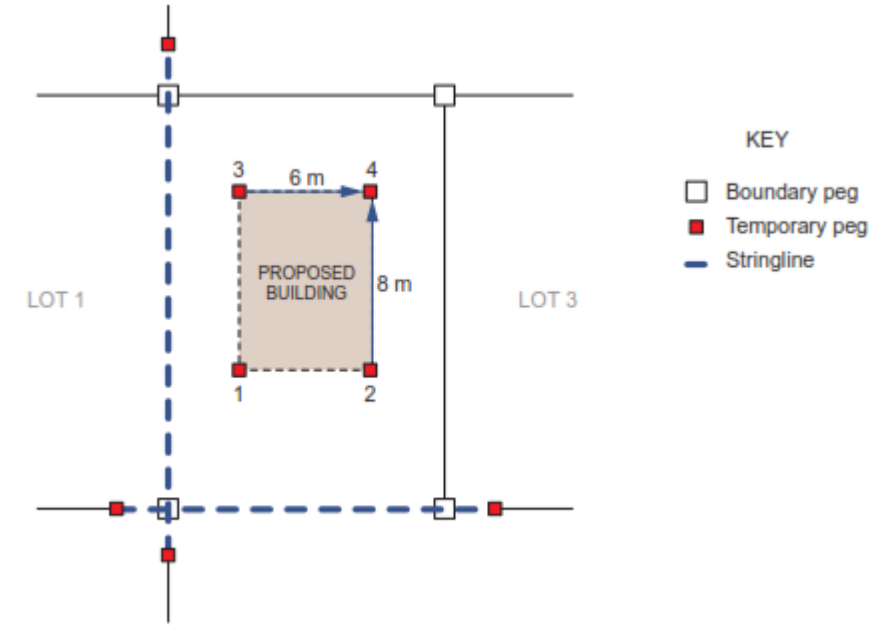


Figure-2,3

It’s not necessary to map out the exact shape of the proposed building at this stage. The temporary pegs are placed as a guide to the position and overall dimensions (width and depth) of the building.

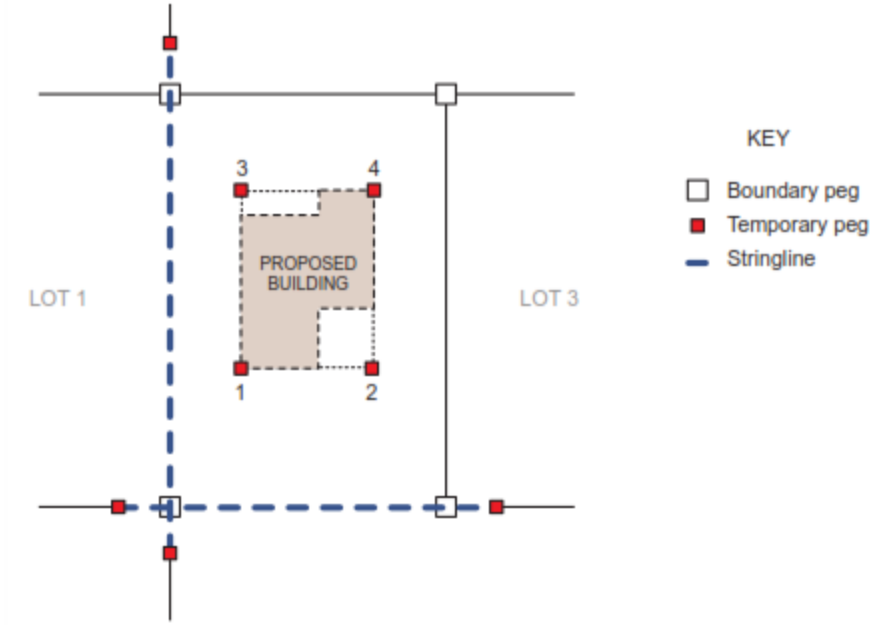


Figure: width and depth

Self-Check-2 ***Written Test***

Directions: Answer all the questions listed below. Use the Answer sheet provided in the next page:

I Say true or false

1, Measure the front setback from the front boundary to the profiles.

2, Identify the **depth** of the house from the site plans and place a temporary peg at corner

3, Use a plumb to make sure each ledger is level across the top face and an optical

Note: **Satisfactory rating - 15 points** **Unsatisfactory - below 15 points**

Answer Sheet

Score = _____

Rating: _____

Name: _____ Date: _____

Answer Questions

1,_____

2,_____

3,_____

Information Sheet-3	Installing approximately Pegs and profiles

3.1 Installing approximately Pegs and profiles

Profiles are pegs or pickets attached by timber crosspieces which provide an anchor for the string lines that mark out the shape and dimensions of a proposed building.

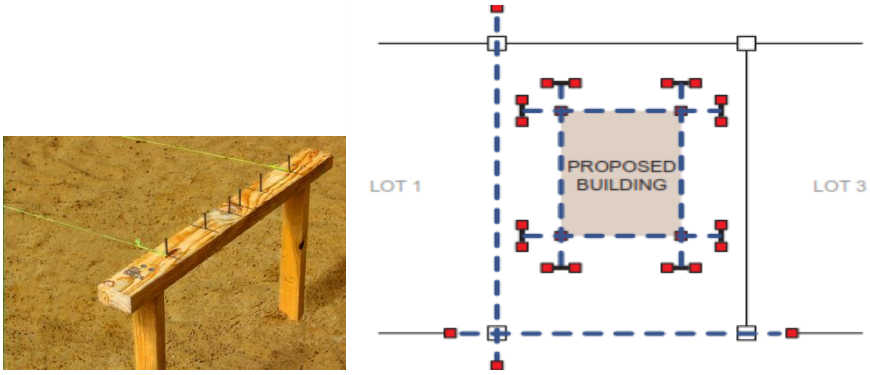


Figure-1 Profiles are pegs

- Profiles, sometimes called hurdles, vary in design but generally consist of two or more legs (timber pegs or steel pickets) that support a timber top known as a ledger. String lines are attached to nails driven into the ledger to mark the position of building lines.

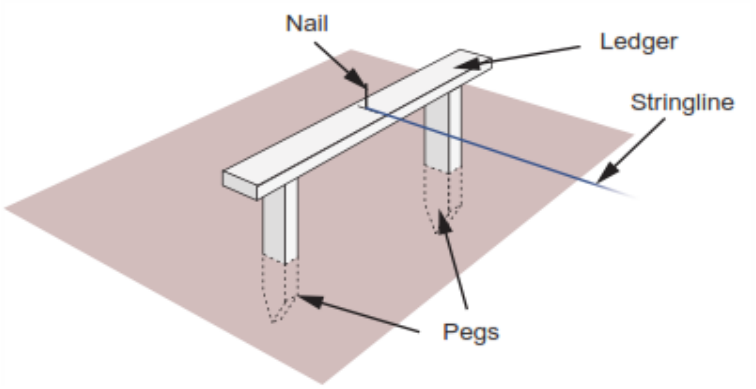


Figure-2 hurdles Profiles

3.1,1 Four types of profiles are used when a building is set out.

- **Saddle profile**

Saddle profiles are generally used for setting out buildings on flat, level sites. They have two
pegs approximately 400 mm high and a ledger 600–900 mm in length.

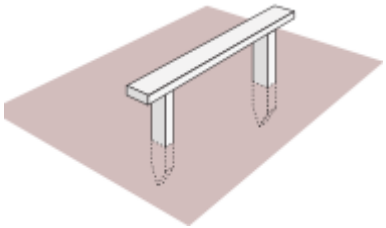


Figure- 3 Saddle profile

- **Hurdle profile**

Hurdle profiles are suitable where the site slopes. The pegs are longer to allow for variations in the height of the land with the position of the ledger adjusted to suit.

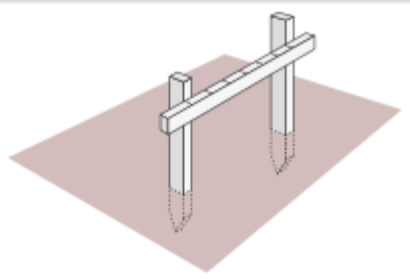


Figure- 4 Hurdle profile

- **Corner profile**

A corner profile has three pegs and two ledgers creating an L-shaped structure that can be used as an alternative to separate profiles at a 90°corner. They are much stronger than saddle or hurdle profiles as the adjacent ledgers provide support for each other.

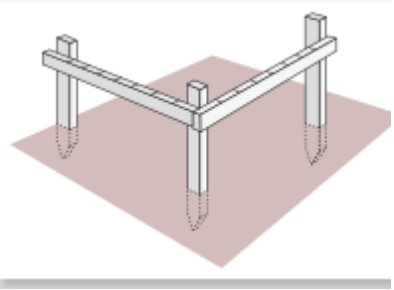


Figure- 5 Corner profile

- **Continuous profile**

Continuous profiles have ledgers around the entire perimeter of the proposed building. Although this type of profile takes longer to set up and requires more resources, it's useful where the proposed building has a complicated shape and needs numerous string lines.

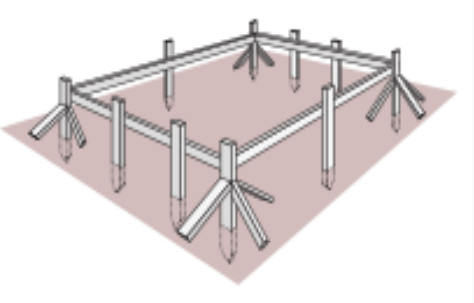


Figure- 6 Continuous profile

Self-Check-3 ***Written Test***

Directions: Answer all the questions listed below. Use the Answer sheet provided in the next page:

1, _____is the hurdles, vary in design but generally consist of two or more legs A) Hurdle profile B) Corner profile C) Saddle profile D) Profiles, sometimes

2, _____ are generally used for setting out buildings on flat, level sites. They have two A) Hurdle profile B) Corner profile C) Saddle profile D) Profiles, sometimes

3, _____have ledgers around the entire perimeter of the proposed building. A) Continuous profile B) Corner profile C) Saddle profile D) meter

Note: **Satisfactory rating - 15 points** **Unsatisfactory - below 15 points**

Answer Sheet

Score = _____

Rating: _____

Name: _____ Date: _____

Answer Questions

1,_____

2,_____

3,_____

Information Sheet-4	Marking accurately Location for line

4.1 Installing pegs and hurdles/profiles

Peg the four outside corners: -Determine the location of the building in relation to other buildings and boundaries (as usually shown on the site-plan or other relevant plan), and place pegs in the ground marking the four corners of the building.

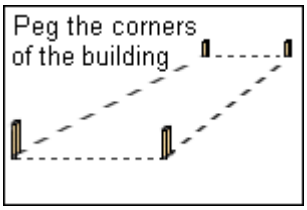


Fig- 1 peg

We need the following materials;

- *2 batter boards*
- *2' length of 1/2" rebar*
- *String*
- *Mallet*
- *4 wooden stakes*
- *2 green stakes or small wooden dowels*
- *Tape measure*
- *Knife*

This method can be used to create a square or rectangular string line of any size. For this tutorial a 4' by 12' area is being marked off. Start by pounding a piece of rebar into the ground to mark one corner of the rectangle.

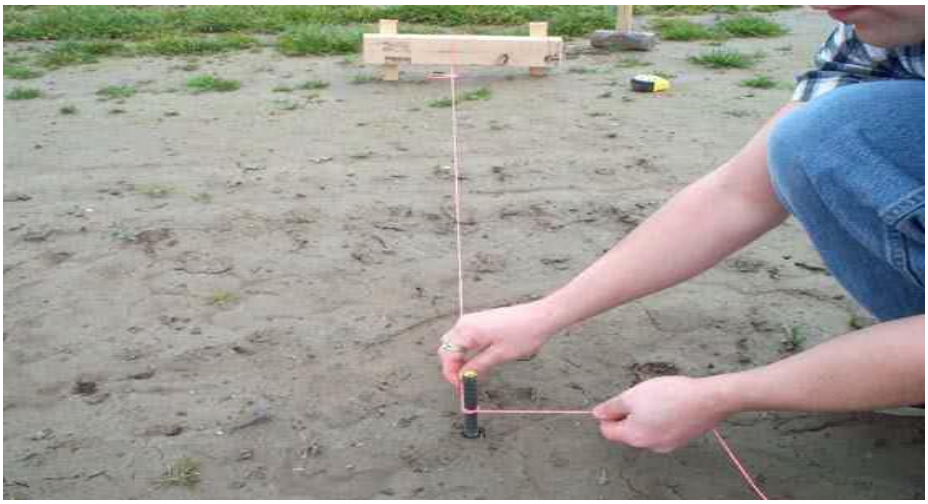


Figure-2 string line

Tie one end of the string to a batter board. Don't tighten the string down too much around the batter board because you will need to adjust it later. Pull the string taut, and loop it around the rebar a couple times. Move to the second batter board, pull the string taut, and tie it off.

Figure-3 pull the string taut

Following one leg of the string line, measure 3' away from the outside of the rebar. Use a green stake or a small dowel to mark the spot. Move to the other leg of the string line

and measure 4' away from the outside of the rebar, again marking it with a small, round stake

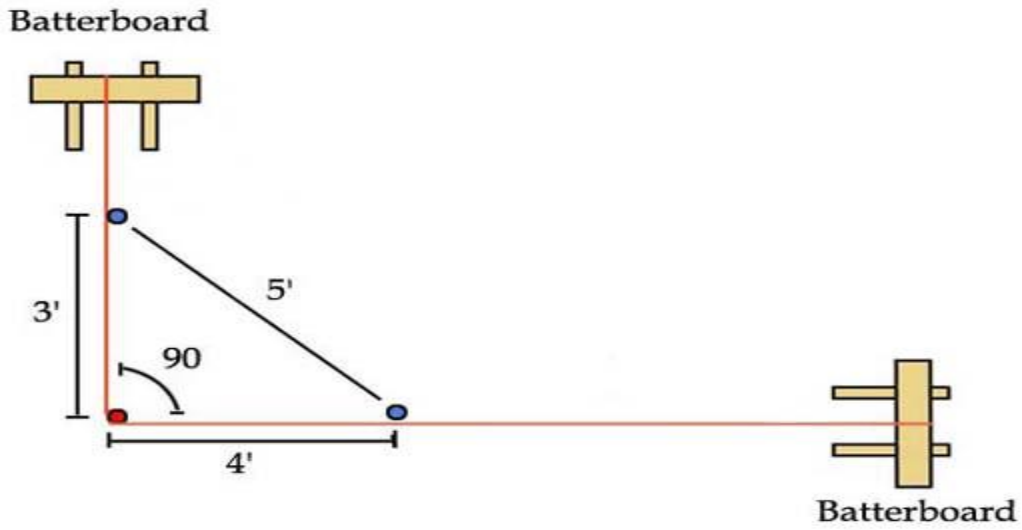


Figure- 4 check 90 degrees

The Pythagorean Theorem states that if one leg of a triangle is 3 units, one leg is 4 units, and the hypotenuse is 5 units, then the angle in between the legs is 90 degrees. Measure the distance in between the two marker stakes. The object is to get that value to be 5' by sliding the string along the batter board. Adjust the position of the string on the batter board until you have a 3' by 4' by 5' triangle.

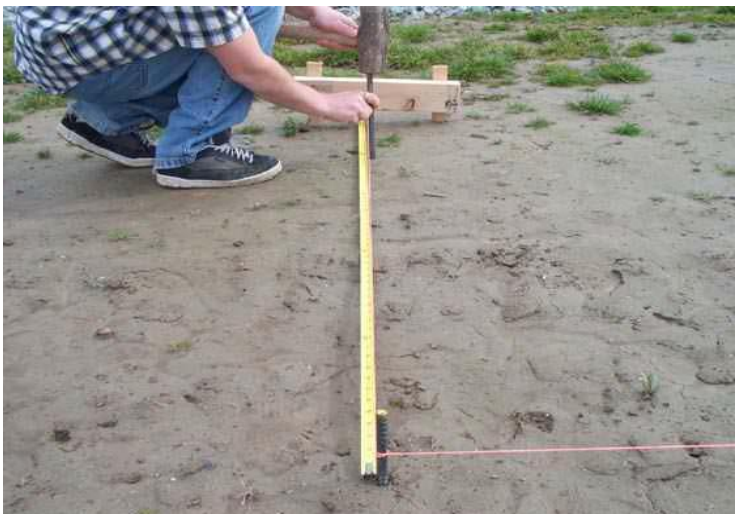


***Figure- 5* marker stakes**

our can verify this mark by measuring the distance diagonally between the two corner stakes that are already in the ground. Hook your tape measure on the first piece of rebar and measure the distance between it and the marks you made in the dirt. If the values are identical, you have right angles all the way around your rectangle. Pound in the fourth stake and run the string line the rest of the way around the rectangle. Tie off the ends

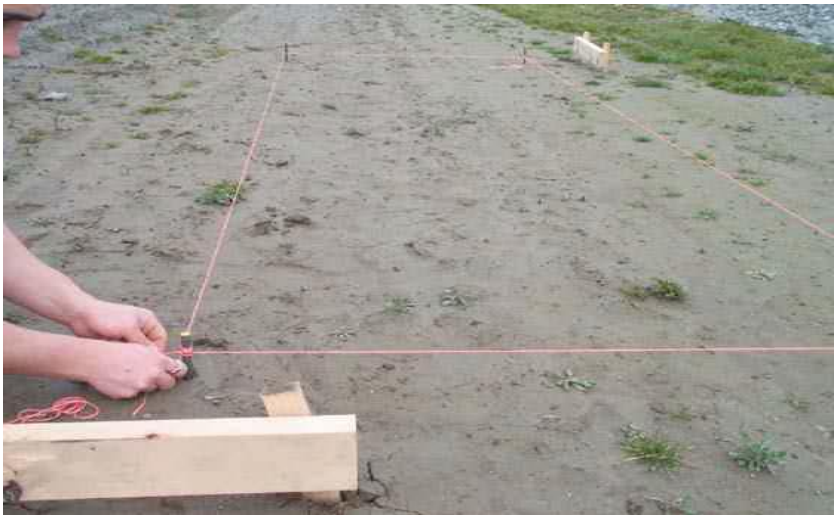


Figure-6 string line the rest

Self-Check-4 ***Written Test***

Directions: Answer all the questions listed below. Use the Answer sheet provided in the next page:

I Say true or false

1, Tie one first of the string to a batter board.

2, If the values are identical, you have right angles all the way around your rectangle

3, Adjust the position of the string on the batter board until you have a 3' by 4' by 5' triangle.

Note: **Satisfactory rating - 15 points** **Unsatisfactory - below 15 points**

Answer Sheet

Score = _____
Rating: _____

Name: _____ Date: _____

Answer Questions

1,_____

2,_____

3,_____

Masonry

Level II

Learning Guide #47

Unit of Competence: Set-out Masonry Structures

Module Title: Setting-out Masonry Structures

LG Code: EIS MAS2 M10 LO4 LG-47

TTLM Code: EIS MAS2 TTLM 0919 v1

LO 4: Set out right angled corners

Instruction Sheet	Learning Guide # 47

This learning guide is developed to provide you the necessary information regarding the following content coverage and topics –

- Determining corner of building
- Setting up right angles
- Installing Profiles

This guide will also assist you to attain the learning outcome stated in the cover page. Specifically, upon completion of this Learning Guide, you will be able to –

- Determine corner of building
- Set up right angle
- Install Profiles

Learning Instructions:

1 Read the specific objectives of this Learning Guide.

2 Follow the instructions described below 3 to 6.

3 Read the information written in the information “Sheet 1, Sheet 2, Sheet 3,

4 Accomplish the “Self-check 1, Self-check t 2, and Self-check 3 ” **in page -55, 57, 60 and 62** respectively.

5 If you earned a satisfactory evaluation from the “Self-check” proceed to “Operation Sheet 1” **in page -63.**

6 Do the “LAP test” **in page – 64** (if you are ready).

Information Sheet 1	Determining corner of building

Introduction

The process of setting out the shape and size of a building is one of the key stages of construction. Any mistakes made at this stage will have a major impact on the remainder of the construction process.

Depending on the type of construction methods used, the string lines may be used by:

• concreters, eg to set out for a strip, pad or slab-on-ground footing

• carpenters, eg to position timber stumps

• steel erectors, eg to set out the positions of the steel columns or posts

• bricklayers, eg to set out and construct walls.

In this section you'll be looking at the process for setting out the building string lines that provide the guide for all subsequent construction tasks.

Information Sheet 2	Setting up right angles

2.1 Setting out right-angled corners

If the proposed building has right-angled (90°) corners, the string lines must be checked at this point to make sure that the corner angle is accurate before any other string lines are installed.

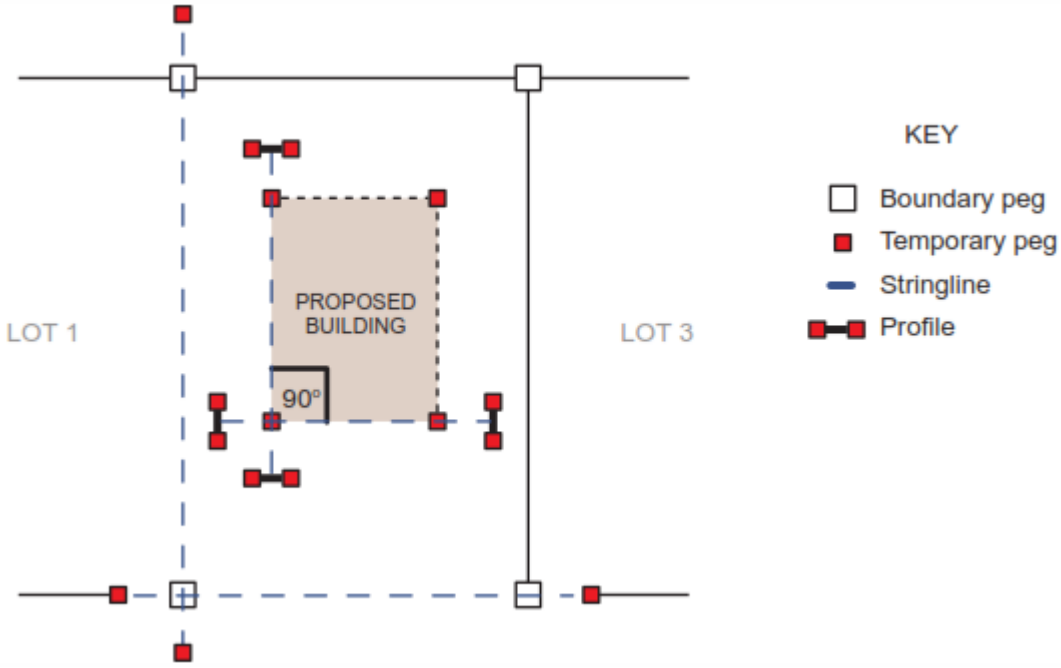
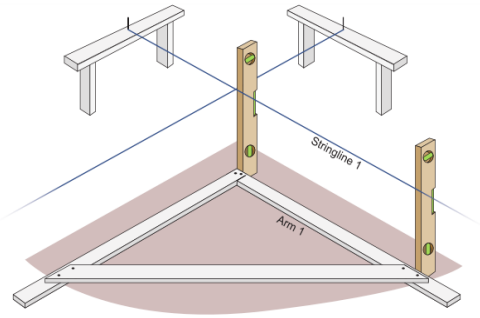


Fig-1 right-angled (90°)

2.2 Checking angles using a builder's square



The simplest way of checking that the angle is precisely 90° (also called 'checking for square') is to use a builder's square.

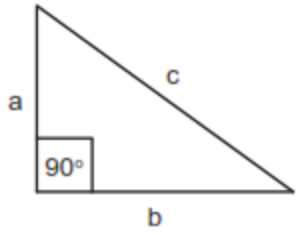
- Place the builder's square beneath the two string lines that form the corner.
- Use a spirit level to plumb down and set the outer edge of **arm 1** of the builder's square directly under **string line 1**.
- Check the position of the other string line. If it doesn't run directly over the outer edge of the other arm of the builder's square, the corner is 'out of square' and the string line must be adjusted before any other lines are installed.

2.3 Checking angles using the 3:4:5 method

The second way of checking for square is by using a calculation called Pythagoras's theorem (commonly known in the building industry as the 3:4:5 method).

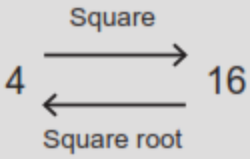
The theorem tells us that for a right-angled triangle – which is a triangle where two of the sides meet at 90° – the sum of the squares on the two shorter sides equals the square on the longest side (known as the hypotenuse).

In other words, for the triangle pictured here, $a^2 + b^2 = c^2$.

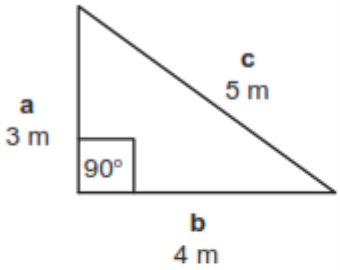


The **square** of a number is the result of the number multiplied by itself. For example, the square of four is 16; that is, 4 × 4.

A **square root** (√) is the opposite. A number, when divided by itself, gives the original number. The square root of 16 is 4 because 4 x 4 = 16.



A simple example of this is a triangle with sides of 3 m, 4 m and 5 m.



$a^2 + b^2 = c^2$

$3\ m^2 + 4\ m^2 = 5\ m^2$

because

9 m + 16 m = 25 m

√25 m = 5 m

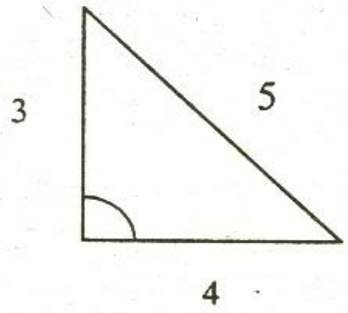
Use the 3:4:5 method to check the angle of the front corner. Follow these steps.

1. Drive a timber peg into the ground at the corner of the building (**A**).
2. From the centre of corner peg **A**, measure 3 m along the first line **A–B** and drive another peg (**B**) into the ground.
3. From the centre of corner peg **A**, measure 4 m along the second line **A–C** and drive another peg (**C**) into the ground.
4. Measure the distance between pegs **B** and **C**.

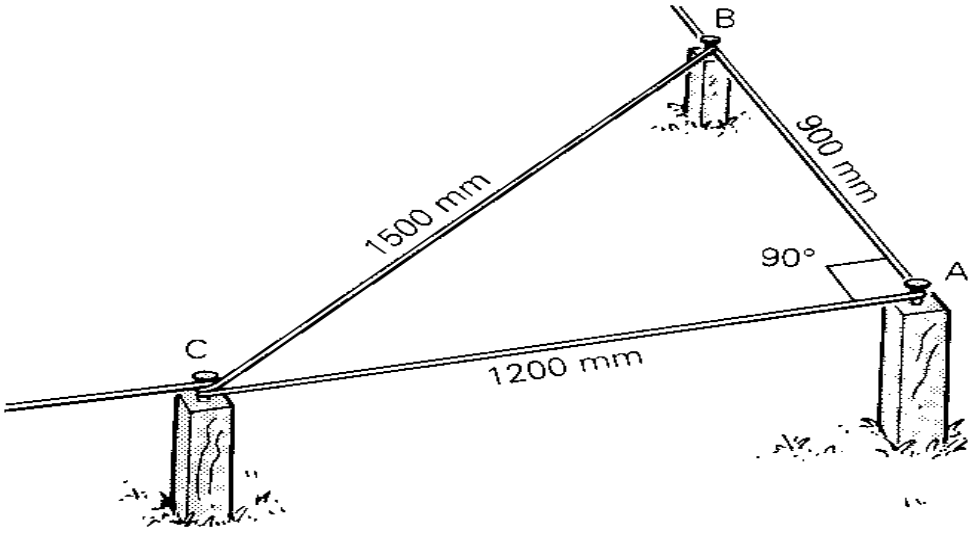
2.3.1. The 3, 4, 5 method

- Mark out the building line from the road by measuring the required distance from the centre of the road, or by stretching a line along an existing building to the proposed site. The building line is then, represented by a line knows the ranging line, which also marks the front wall of the building as shown by GG1 in Fig.
- Mark out the overall length of the building by driving pegs at A and B along the ranging line.
- Obtain two steel tape measures; mark out four equal distances on the ranging line starting from the corner peg at B. These distances may be in any unit of measurement. That is mm, cm, m etc.
- Pull a tape measure from point B to C and ask an assistant to hold it, ready with hammer and peg.
- Pull the second tape from fourth mark at D on the ranging line to point E on the first tape.
- The distance 5m if using meters on tape DE should coincide with point 3m on tape BEC. Then the angle B is 90 degree (from Pythagoras theorem). If the points do not coincide, the tape BC is either shifted out wards or in wards until 5m on the second tape coincide with the 3m marks on the first tape.
- Repeat the same procedure to obtain the right angle for BAF and mark out the overall width of the building.
- Establish corner pegs and erect profiles.
- Mark the position of partition wall on the profile with either nails or saw cut. Ranging lines are stretched through these nails and the corner pegs to mark the ground to indicate the line of excavation for the foundation trench.

By 3, 4, 5 method.



3	4	5
6	8	10
9	12	15
12	16	20



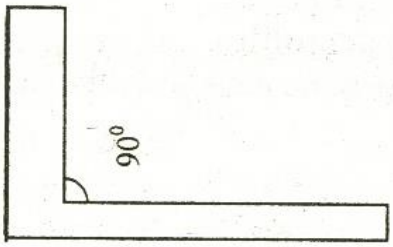
Making a 3-4-5 triangle with pegs and string.

Fig. 2. 3.4.5 method

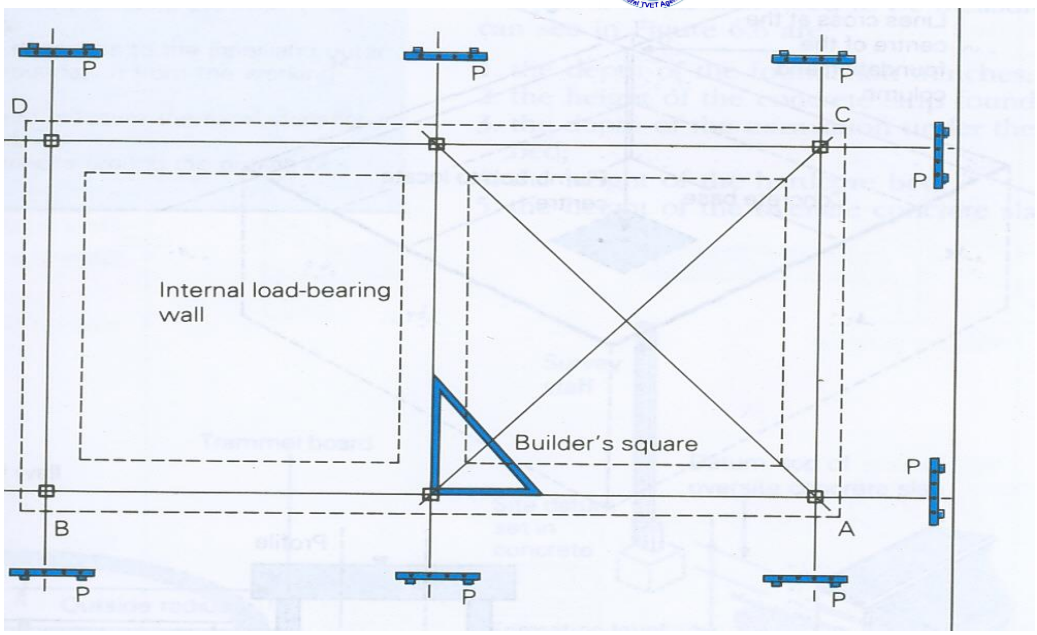
2.3.2 Builder's square method: -

- Set out the front or building line in the usual manner with pegs or marks at the required distance.
- Place the builder's square so that front line touch one side if the square right through its length.
- Stretch a line from the peg so that it is parallel to second side of the square and establish the third peg. A corner of angle 90 degree is thus obtained.
- With the aid of a tape measure mark out the length and breadth of the proposed building.
- Transferring the builder's square to the remaining corners and repeating the above operations; a simple rectangular building can be set out.
- After establishing the four corner pegs, profiles (separate or continuous) may be erected in the same way.

By using try square (squadra)



Steel or wooden a square.



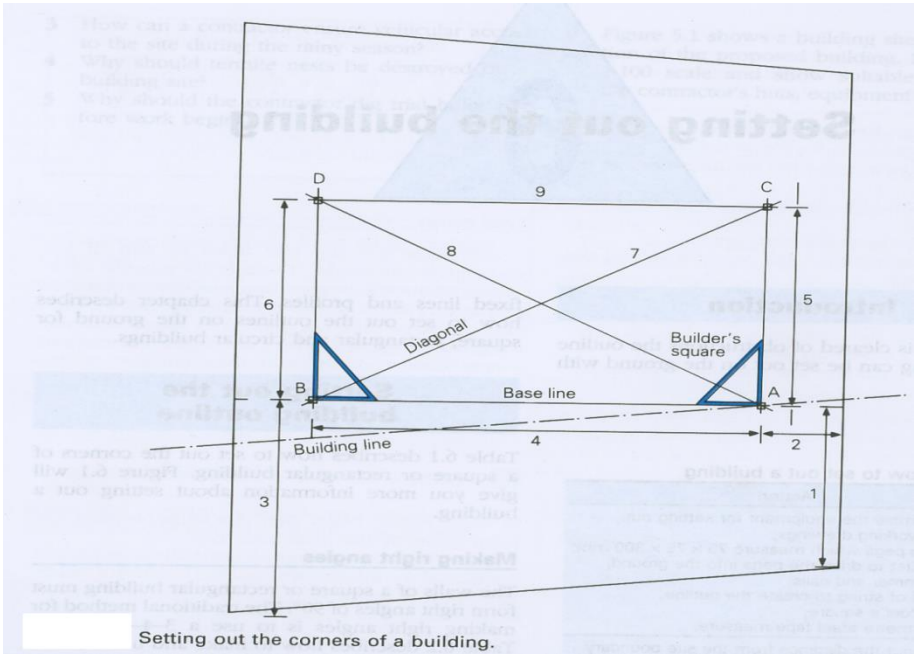


Fig 3. Builders square.

Self-Check-1 *Written Test*

Directions: Answer all the questions listed below. Use the Answer sheet provided in the next page:

1, _____ the front or building line in the usual manner with pegs or marks at the required distance.?

A) set out B) Corner profile C) Saddle profile D) Profiles, sometimes

2, _____ the position of partition wall on the profile with either nails or saw cut.?

A) Hurdle profile B) string line C) Mark D) Profiles, sometimes

3, the corner is 'out of square' and the string line must be adjusted before any other lines are_____.?

A) Continuous profile B) installed C) spirit level D) meter

Note: **Satisfactory rating - 15 points** **Unsatisfactory - below 15 points**

Answer Sheet

Score = _____
Rating: _____

Name: _____ Date: _____

Answer Questions

1,_____

2,_____

3,_____

Operation sheet-1	Setting up right angles

Topic. Techniques **of** Setting up right angles Procedures:

Step 1. Wear PPE.

Step 2. Read and understand the given drawing

Step 3. Select working site

Step 4. Select materials, tools and instruments

Step 5. Use appropriate methods of Setting up right angles

Step 6. Document your results

Information Sheet 3	Installing profiles

1.1 profiles

Profiles are placed to allow room for excavation work to be carried out without damaging or disturbing their position. It's recommended that profiles are set 2–3 m from the proposed building outline but this may have to be reduced if required by the site conditions.

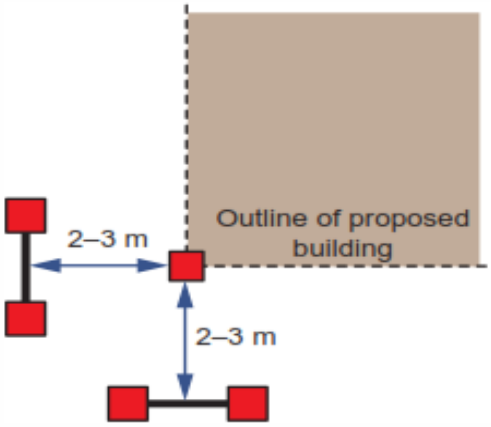


Figure- 1 profiles are set

Profiles should be placed parallel to the proposed building and in line with each other, where possible. Because string lines are used to determine the dimensions of the building, improper placement of the profiles can distort the building outline.

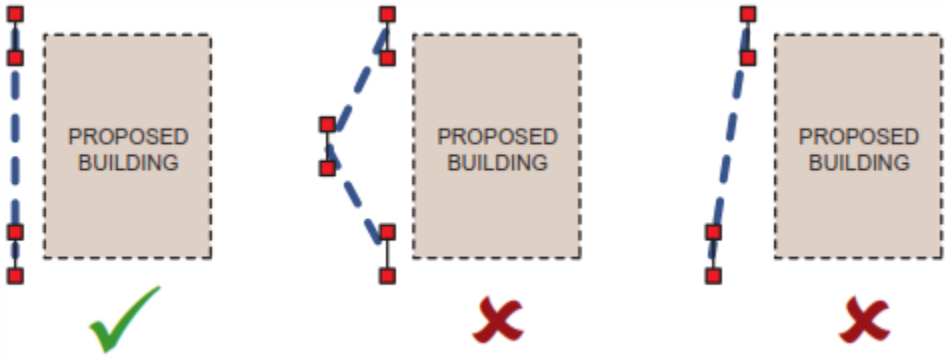


Figure-2 parallel

Install the ledger of a profile so that it's approximately level across its top. Use a spirit level to check each profile after it's been driven into the ground.

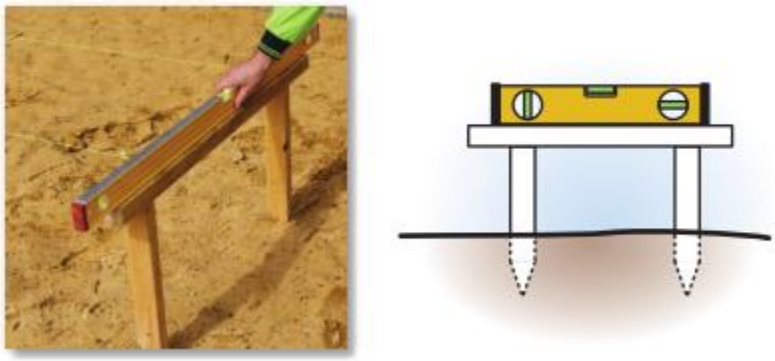


Figure-3 spirit level to check

Profiles should be set up using a suitable leveling device such as an optical or laser level where possible, to make sure the tops of the ledgers are level with one another.

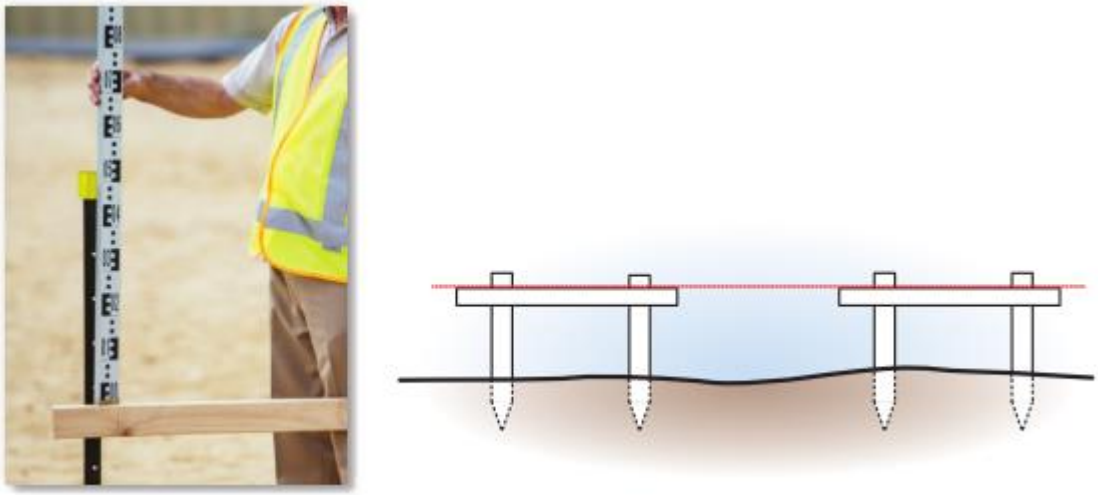


Figure- 4 check to leveling

On sloping sites where it's impractical for profile ledgers to be level, eg the slope is too steep, you may need to step the profiles down along the slope. The building dimensions should always be measured horizontally and a plumb-bob or spirit level used to transfer the exact measurement down to the top of the ledger.

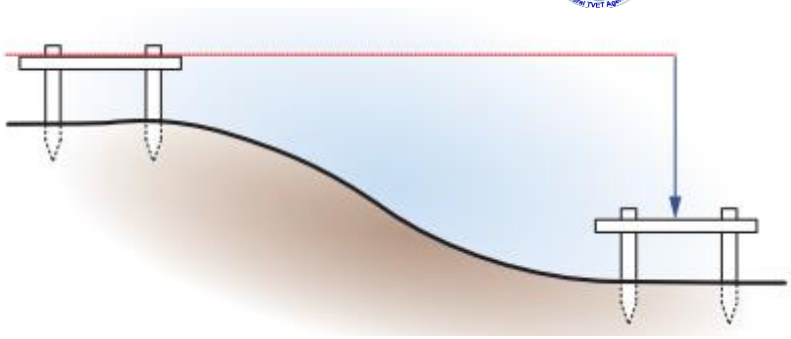


Figure- 5 sloping sites

1.2 PROFILES

When the positions of the corners of the building are known, and the distances between them, then we can mark the positions and widths of the foundations as well as of the footings and plinth course.

This marking should be carried out in a relatively permanent way, so that it is accurate for a longer period. We do this by using profiles. A profile is a simple, temporary structure which maintains the correct locations of the various marks.

The profile consists of a board nailed flat wise on top of two pegs which are set in the ground, at a height of about 60 cm (Fig. 1). This height is necessary to lift the line well above the footings, so that later the plinth course can be marked from the profile.

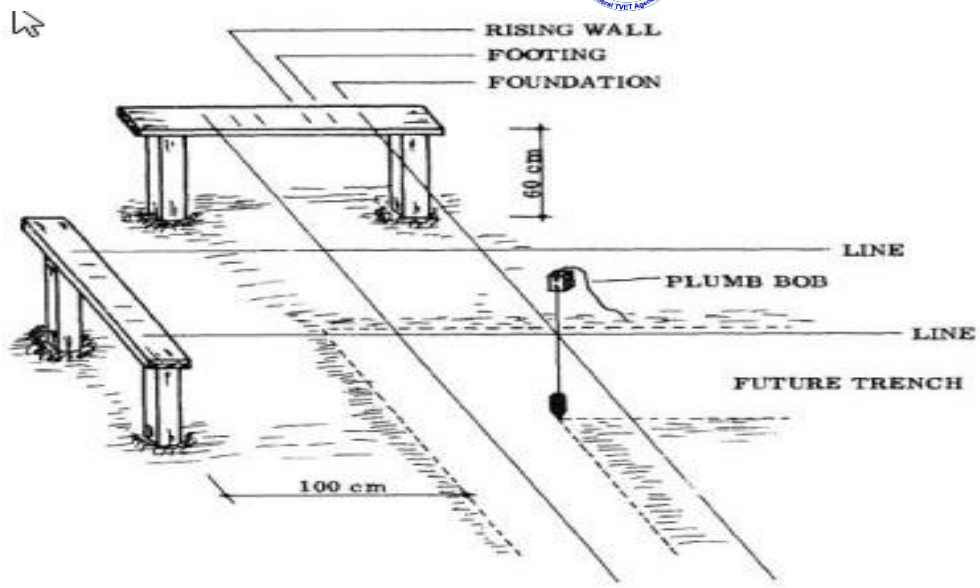


Fig. 1 MARKING THE POSITION OF THE FOUNDATION ON THE GROUND

Self-Check-3 ***Written Test***

Directions: Answer all the questions listed below. Use the Answer sheet provided in the next page:

1, _____ the front or building line in the usual manner with pegs or marks at the required distance.?

A) set out B) Corner profile C) Saddle profile D) Profiles, sometimes

2, _____ consists of a board nailed flat wise on top of two pegs which are set in the ground?

A) Hurdle profile B) string line C) Saddle profile D) the Profiles

3, _____ Use a to plumb down and set the outer edge of the builder's ?

A) Continuous profile B) Corner profile C) spirit level D) meter

Note: **Satisfactory rating - 15 points** **Unsatisfactory - below 15 points**

Answer Sheet

Score = _____
Rating: _____

Name: _____ Date: _____

Answer Questions

1,_____

2,_____

3,_____

Masonry

Level II

Learning Guide #48

Unit of Competence: Set-out Masonry Structures

Module Title: Setting-out Masonry Structures

LG Code: EIS MAS2 M10 LO5-LG48

TTLM Code: EIS MAS2 TTLM 0919 v1

LO 5: **Install Other Building Lines**

Instruction Sheet-1	Learning Guide #48

This learning guide is developed to provide you the necessary information regarding the following content coverage and topics –

- Installing profiles for remaining building lines
- Marking and nailing measurement for remaining building lines
- Setting-taut String lines into position

This guide will also assist you to attain the learning outcome stated in the cover page. Specifically, upon completion of this Learning Guide, you will be able to –

- Install Profiles for remaining building lines
- Mark and Nail measurement for remaining building lines
- Set-taut String lines into position

Learning Instructions:

5 Read the specific objectives of this Learning Guide.
6 Follow the instructions described below 3 to 6.
7 Read the information written in the information “Sheet 1, Sheet 2, and Sheet 3,
8 Accomplish the “Self-check 1, Self-check t 2, and Self-check 3 ” **in page -55, 57, 60 and 62** respectively.
9 If you earned a satisfactory evaluation from the “Self-check” proceed to “Operation Sheet 1” **in page -63.**
10 Do the “LAP test” **in page – 64** (if you are ready).

Information Sheet-1	Installing Profiles for remaining building lines

1.1 Setting out building lines

Once the front and side setbacks have been established and the temporary pegs are in place, you can begin setting out the profiles and string lines to establish the exact size, shape and position of the proposed building.

1.2 – Setting out the first lines

The first two building lines are measured from the boundary line of the lot or, if necessary, from an existing building.

Step 1

- Install the first profiles **A** and **B** approximately 2–3 m from the temporary pegs used to mark the corners of the proposed building.

Use a spirit level to make sure each ledger is level across the top face and an optical or laser level to check that both profiles are approximately level with each other.

- Measure the front setback from the front boundary to the profiles.

Use a spirit level to transfer and mark the measured position from the ground to the top of each ledger.

- Fix a nail in the top of each ledger at the mark and set the string line **A–B** taut between the nails to create the building line for the front of the proposed building.

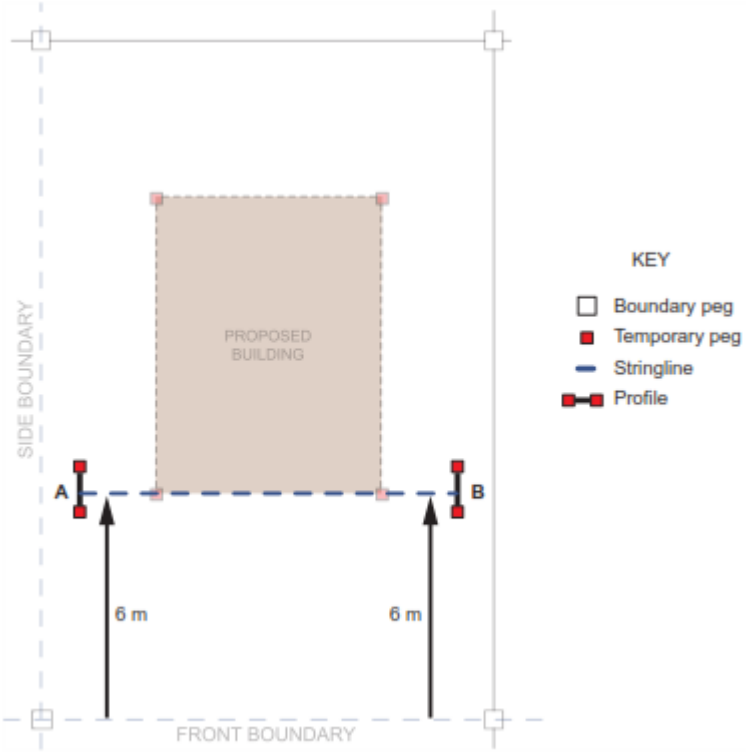


Fig-1 Install the first profiles

Step 2

a) Position the second set of profiles **C** and **D** and check that they're approximately level with each other and all other profiles in the set-out.

b) Set the string line **C–D** for the side building line of the proposed building, following the process outlined in Step 1. Measurements for the side setback are taken from the side boundary.

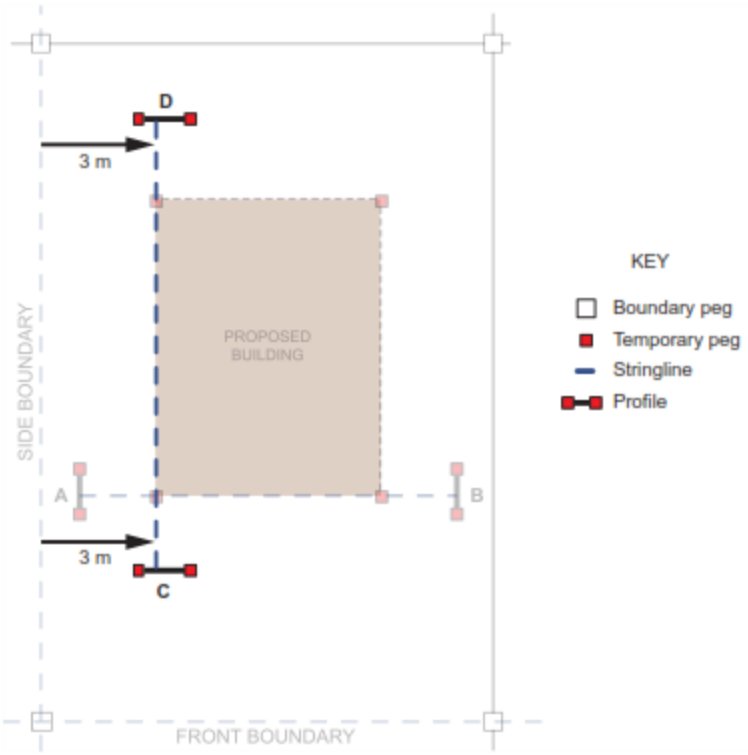


Fig- the second set of profiles

Self-Check-1	***Written Test***

Directions: Answer all the questions listed below. Use the Answer sheet provided in the next page:

I Say true or false

1, Measure the front setback from the front boundary to the profiles.

2, Set the string line not **C–D** for the side building line of the proposed building

3, Use a plumb to make sure each ledger is level across the top face and an optical

Note: **Satisfactory rating - 15 points** **Unsatisfactory - below 15 points**

Answer Sheet

Score = _____
Rating: _____

Name: _____ Date: _____

Answer Questions

1,_____

2,_____

3,_____

Operation sheet-2	**Installing Profiles for remaining building lines**

Topic. Techniques of Installing Profiles for remaining building lines practice,**:**

Step 1. set out the longest side of the building first.

Step 2. Setting out the first lines

Step 3. Install the first profiles

Step 4. Measure the front setback from the front boundary to the profiles

Step 5 Fix a nail in the top of each ledger at the mark and set the string line

Step 6. Position the second set of profiles

Step 7. Set the string line

;

Information Sheet-2	Marking and Nailing measurement for remaining building lines

2.1 Marking and nailing measurement

The first two building lines are used to determine all subsequent building lines. This means that the measurements for positioning the third and fourth string lines are taken from these lines rather than the boundaries, using the dimensions for the building found on the plans and specifications

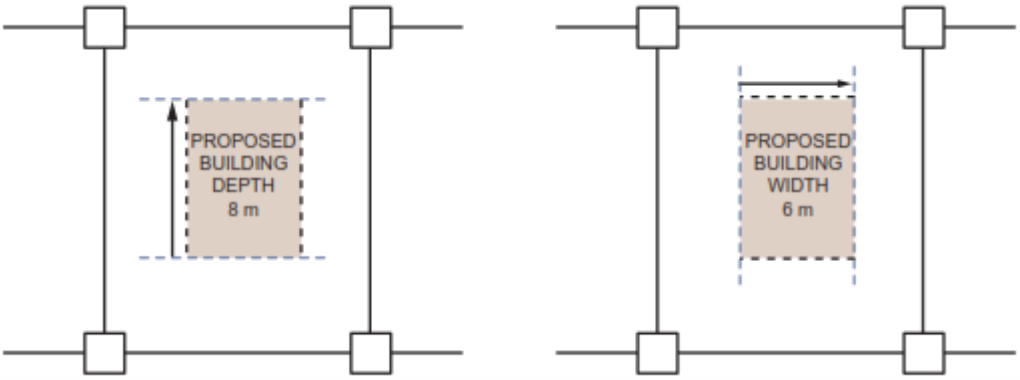


Fig 1. building lines

Step 1

- Determine the **building depth** from the site plans and specifications to measure the position of the third building line.
- Install the profiles **E** and **F** approximately 2–3 m from the temporary pegs and use a spirit level to make sure each ledger is level across the top face.
- Measure the distance identified as the structure depth from profile **A** to profile **E**, and from profile **B** to profile **F**.

Note: Measurements should not be taken from string lines as they bend easily and can make the measurement inaccurate. Always measure from the top of one profile to the top of the next.

Tape measures must be pulled tightly as a sagging tape measure will give an incorrect measurement.

- Fix a nail in the top of each new ledger at the mark, and set the string line **E–F** taut (stretched tight) between the nails to create the third building line

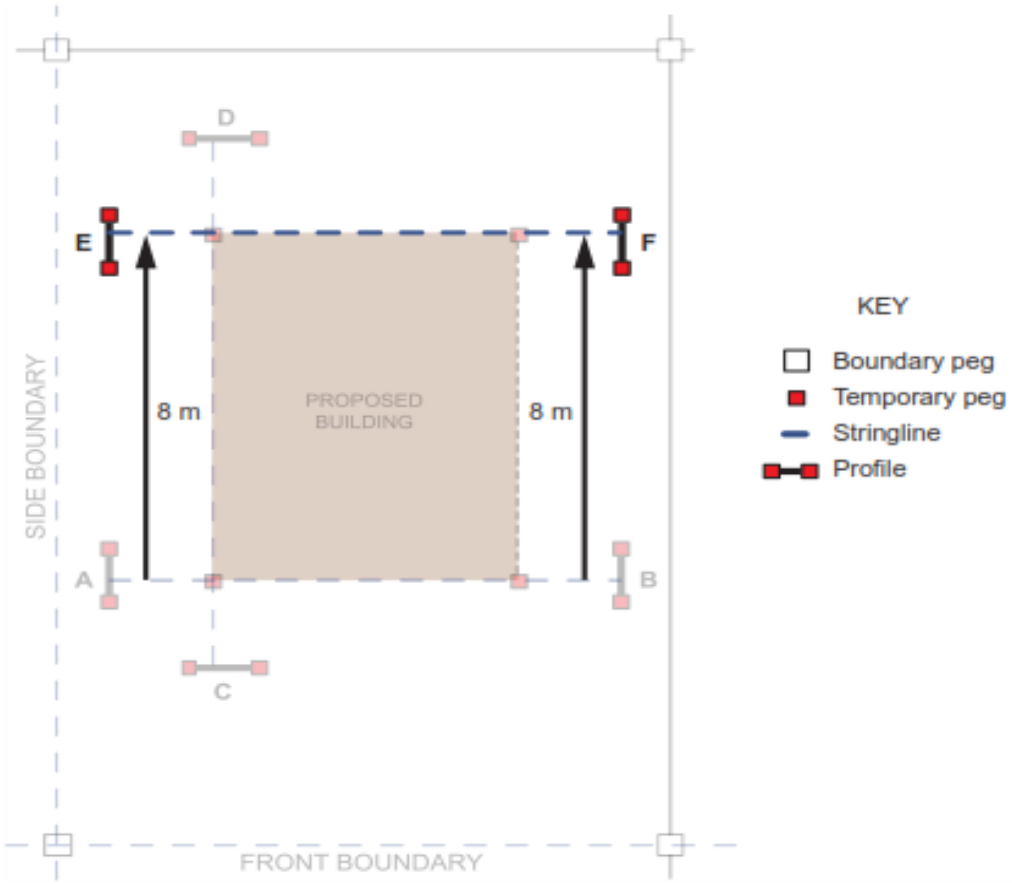


Fig 1. setting out others building lines

Step 2

a) To set out the fourth and final line, position profiles **G** and **H** and measure the distance identified as the **building width** from profile **C** to profile **G**, and from profile **D** to profile **H**.

b) Fix a nail in the top of each new ledger at the mark, and set the string line **G–H** taut between the nails to create the fourth building line.

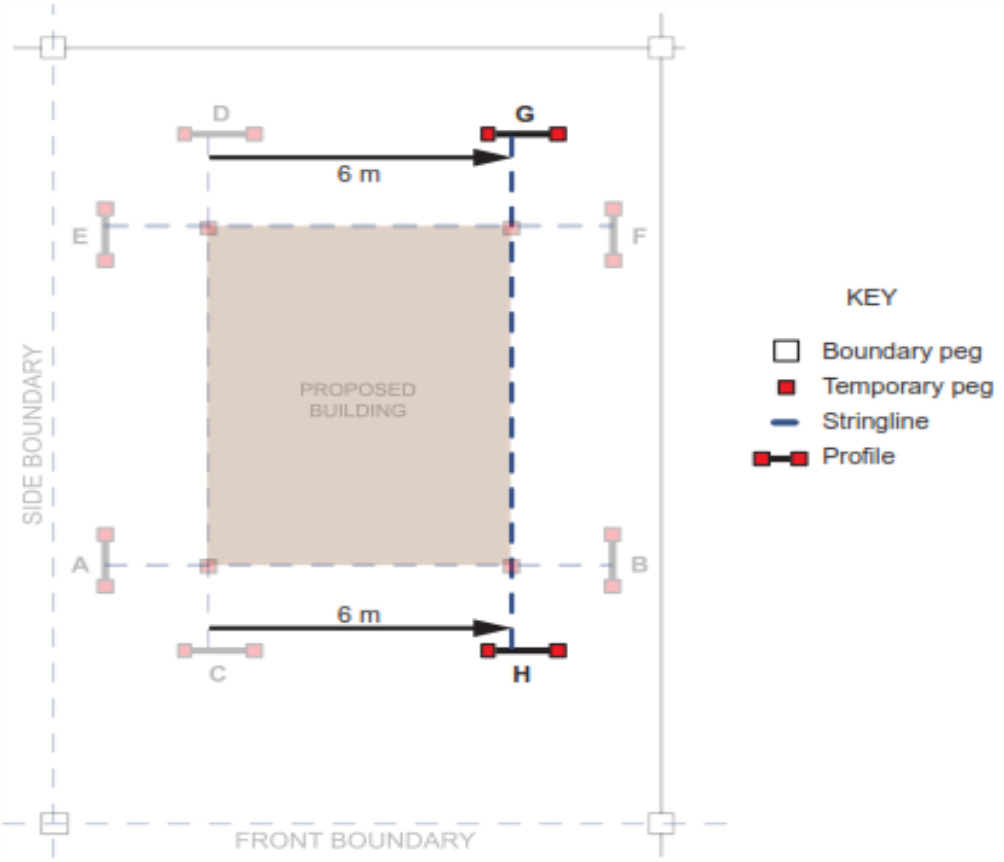


Fig -2 Fix a nail

Self-Check-2 ***Written Test***

Directions: Answer all the questions listed below. Use the Answer sheet provided in the next page:

I Say true or false

1, Determine the **building depth** from the site plans and specifications to measure the position of the third building line.

2,To set out the fourth and final line, position profiles **G** and **H** and measure the distance

3, Fix a nail in the top of each new ledger at the mark, and set the string line **G–H** taut (Stretched tight) between the nails to create the third building line

Note: **Satisfactory rating - 15 points** **Unsatisfactory - below 15 points**

Answer Sheet

Score = _____

Rating: _____

Name: _____ Date: _____

Answer Questions

1,_____

2,_____

3,_____

Information Sheet-3	Setting-out String lines into position

3.1 concepts of Setting out the profiles and string lines for an offset

The distance a building line is set back from the standard shape is known as the offset.

You won't be asked very often to set out a building that's as simple as a standard square or rectangle. Most building designs contain irregular shapes.

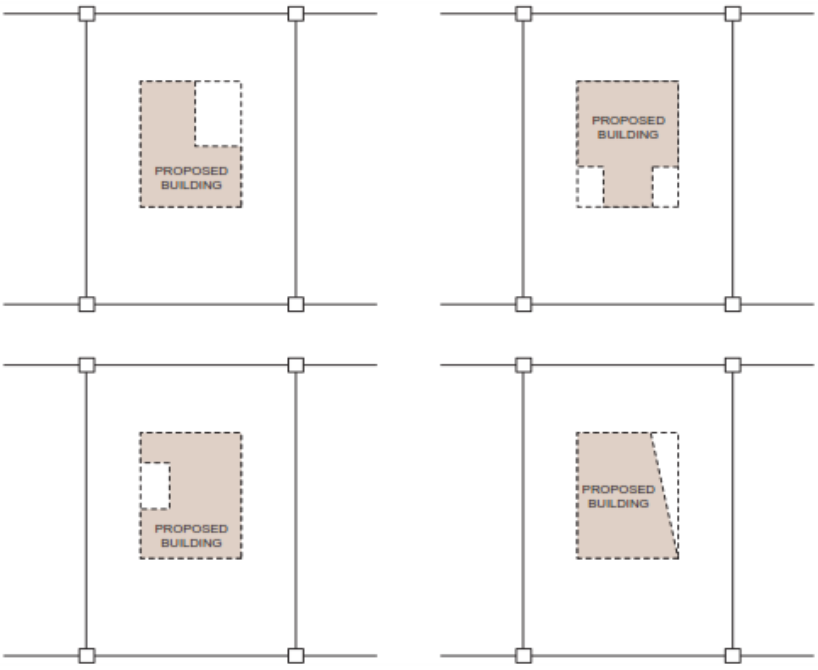


Fig-1 irregular shapes

The following example shows the process for setting out an L-shaped building with two offset measurements.

Step 1

Set out the initial rectangular shape as described earlier in this section. Starting with a regular shape rather than a single reference line allows for greater accuracy and testing of overall dimensions.

Step 2

Determine the specified offset distances from the site plans. In this example, the offsets of the building are 3 m wide and 4 m deep.

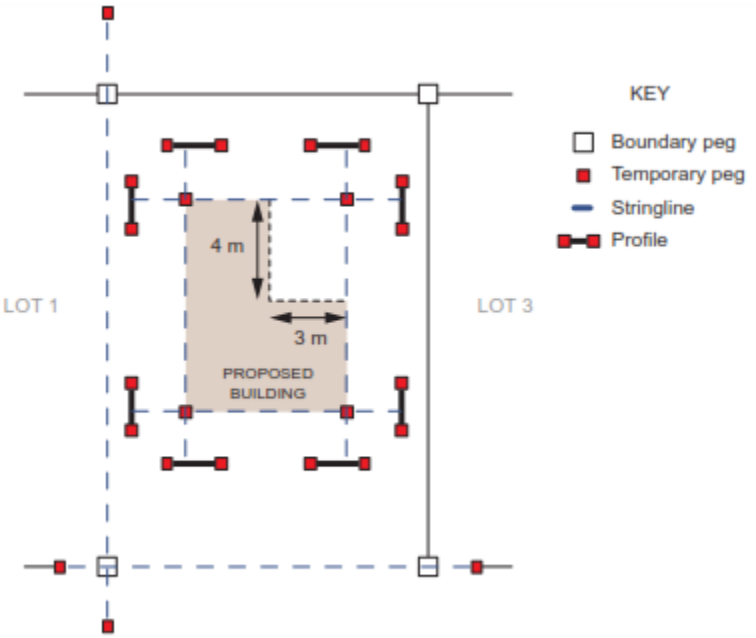


Fig-2 site plan

Step 3

- Set up profiles **I** and **J** for the first offset building line.
- Measure the distance identified as the offset width from profile **G** to profile **I**, and from profile **H** to profile **J**.
- Fix a nail in the top of each new ledger at the mark and set the string line **I–J** taut between the nails to create the building line.

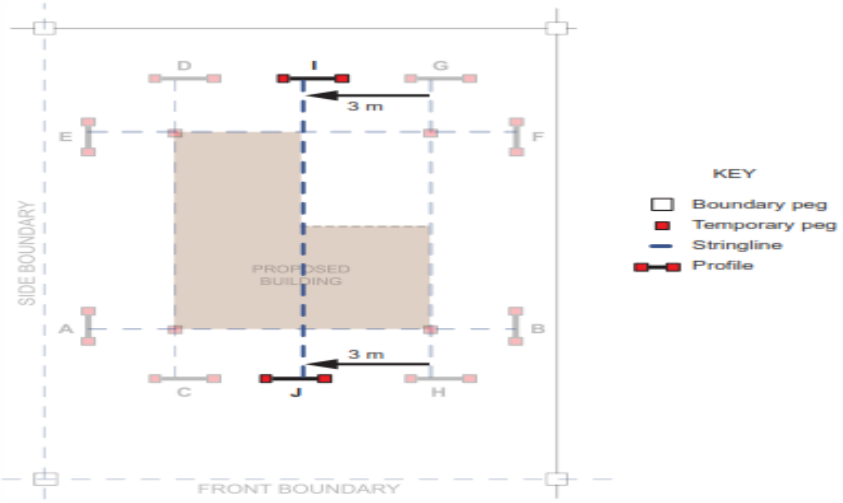


Fig-3 Set up profiles

Step 4

a) To set out the second offset building line, position profiles **K** and **L** and measure the distance identified as the **offset depth** from profile **E** to profile **K**, and from profile **F** to profile **L**.

b) Fix a nail in the top of each new ledger at the mark, and set the stringline **K–L** taut between the nails to create the final building line.

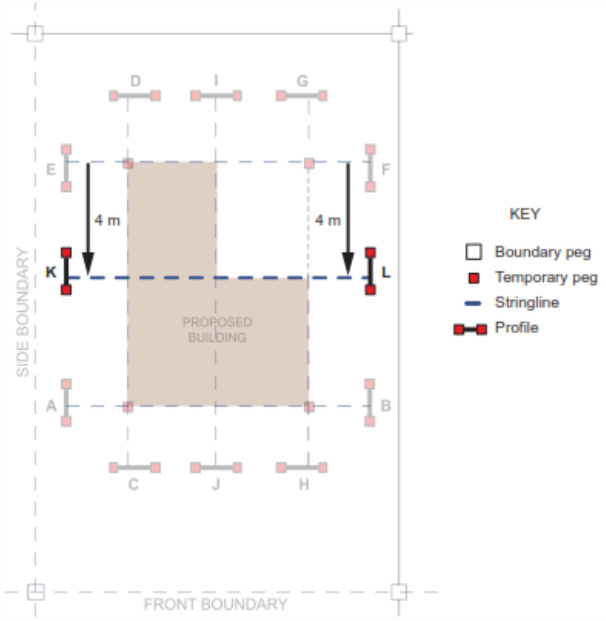
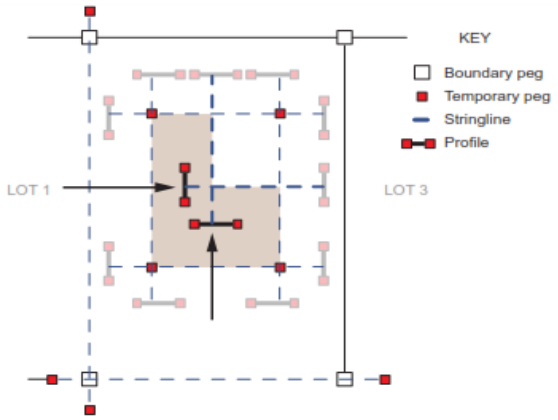


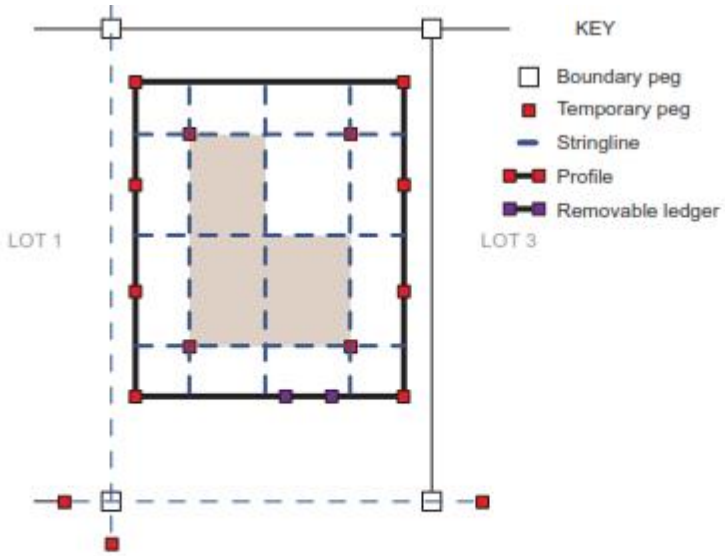
Fig-4 set out second offset

In some situations (depending on the type of footings being set out), the profiles may be set up on the inside of the proposed building.



Alternatively, setting out may be carried out using continuous profiles as shown here.

Fig-5 set out

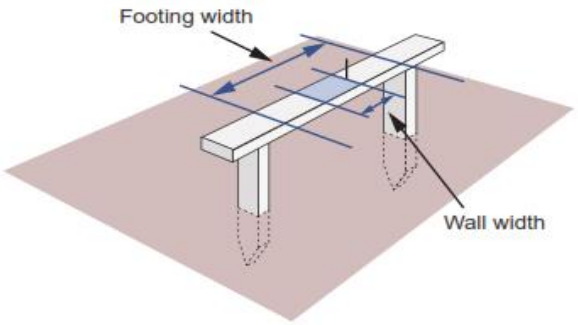


Note: A removable ledger is placed near the front of the site to provide access to and from the proposed building.

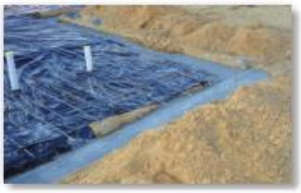
Fig-6 continuous profiles

Example-1

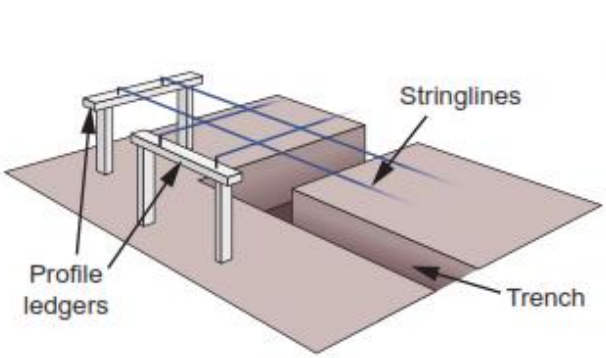
Profiles are used to set out the information required to construct the footings. The tops of the profiles are marked with the width of the footing and any other relevant information including, for example, the width of the wall, the width of the cavity or the position of the stumps or posts.

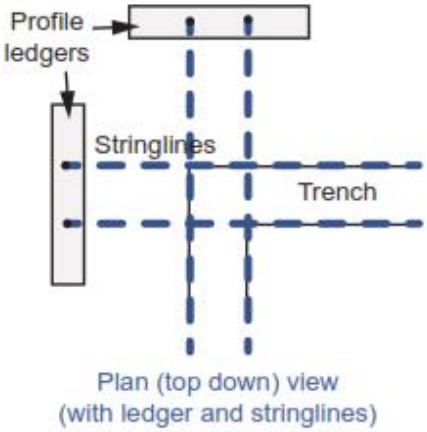


Strip footing



Strip footings are made up of concrete placed into a trench and reinforced with steel bars. The footings support the weight of the exterior walls and any load-bearing interior walls. Strip footings are one of the most common types of footing used in Australia.

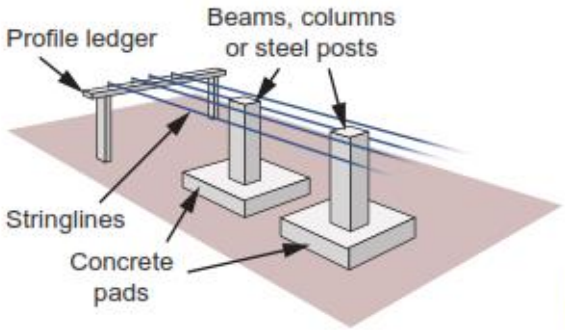




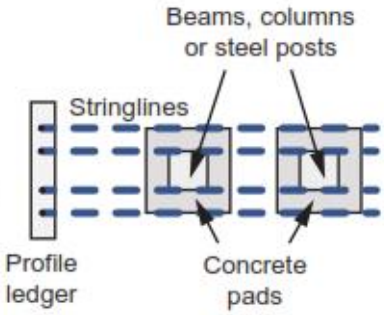
Fir- 7 pictorial view

Concrete pad footing

Concrete pads are the simplest and most cost-effective footings used for transferring the weight of a building to the ground. Holes are dug into the ground and filled with reinforced concrete to create isolated pads.



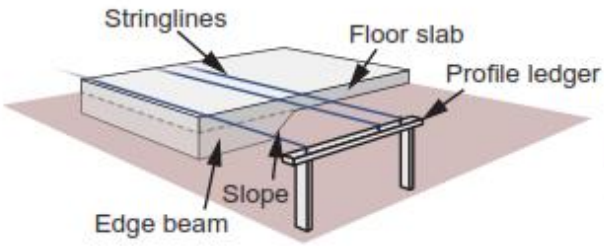
Pictorial view



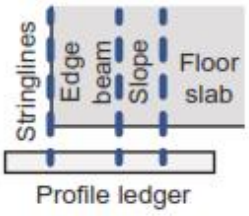
Plan view
(with ledger and stringlines)

Slab-on-ground footing

As its name suggests, a slab-on-ground footing is a single layer of concrete that sits directly on the ground. The concrete is thicker at the edges to form an integrated slab and footing, with steel reinforcing bars used to strengthen the thickened edge.

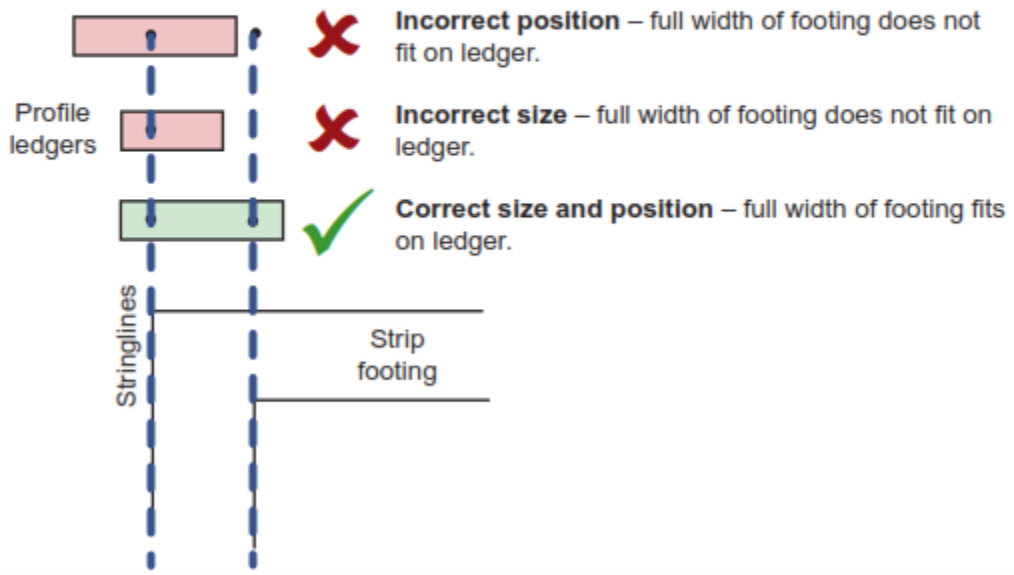


Pictorial view



Plan view
(with ledger and stringlines)

Profile ledgers need to be long enough to mark out all the required information for the proposed footing, and the profile must be placed in a position where the full width of the footing is within the building outline.



3.2 Procedures to set out a for string lines

- Collect the necessary tools, equipments & materials
  - Working drawings
  - Steel tape
  - Sharp pegs
  - Water level
  - Profiles
  - Mallets to drive pegs
  - Hammer & nails
  - A ball of string to create the out line
  - Builder's square
- determine the frontage line on the site*.* That is the line beyond which the new building must otproject. It can be positioned by referring to the layout plan of the building. Pegs are driven in atpositions which are clear off the structure and a string line is then strai ned between these two pegs (1 and 2), secured to nails in, the top of each.
- (corners) of the building. It is from these pegs that a line is strained at **90°** to the front age line.On a single rectangular building of modest size, the builder's square would b

e adequate to setthis right angle. Alternatively the 3-4-

5 formula can be applied by means of tape. By measuring3 m on the frontage line an d 4 m on the return with a ***5*** m hypotenuse a right-angle will have been formed

- Which again are kept well clear of the structure. From this point it is possible to pos tion the last

  two quoin pegs (7 and 8) at distances taken from the drawing between the frontage line and the rear line of the building.
- diagonally from peg 3 to peg 8 and then from peg 4 to peg 7 these distances should be exactly the same if the building is rectangular and all angles are right angles.

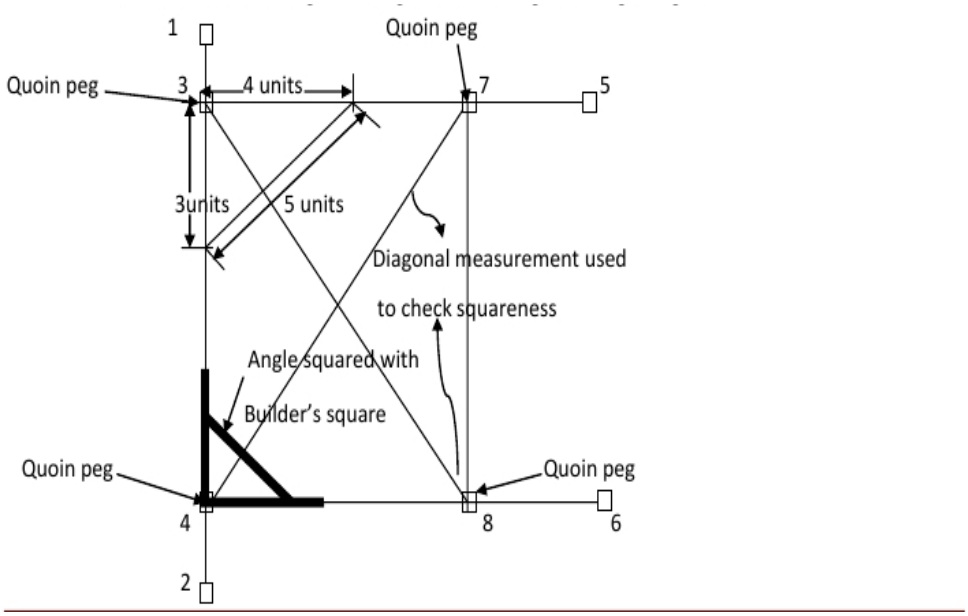


Fig-11 right angles

3.3 Fixing the corners in place

The position of the corners must stay fixed in place after the ground is excavated. Y ou will need to ildspecial boards called profiles to attach the lines that define the outlin e of the building. The profiles replaethe corner pegs.

A profile consists of two timber posts with a horizontal board across the top .The post s are sharpened liestakes so that they will stay in the ground. You should use two profi les at each corner. This means thatyuomust make eight profiles for a simple rectangul ar building.

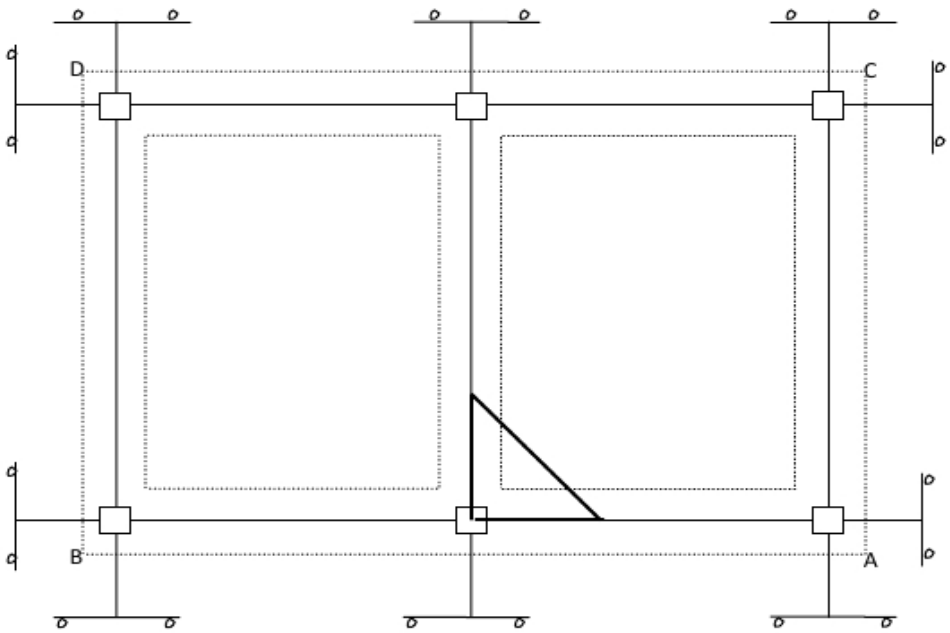


Fig- profiles to attach two timber

Procedures in making and using profiles

1. **Attach a horizontal board to two timber posts and sharpen the posts at one e nd to stick in the ground.**
2. **Mark on the top of the board with nails to show the width of the walls and fou**

ndations at corners.

3. Place a pair of profiles in the ground beside the pegs used for setting out an d check that the angles arestill 90^0.

4. Stretch lines between the profiles at the corners of the building. Use nails t o locate the position of thewalls and foundatios.

Self-Check 3	Written Test

Directions: **Answer all the questions listed below. Use the Answer sheet provided in the next page**

IANSWER THE FOLLOWING WITH WHAT ARE ASKED FOR.

1. write the necessary materials, tool, and equipments for set out the building

2 write the procedures of making and using profile

3 List the Procedures to set out a building

Masonry

Level II

Learning Guide #49

Unit of Competence:	Set-out Masonry Structures
Module Title:	Setting-out Masonry Structures
LG Code:	EIS MAS2 M10 LO6-LG49
TTLM Code:	EIS MAS2 TTLM 0919 v1

LO 6: Checking Building lines for square

Instruction Sheet	Learning Guide #49

This learning guide is developed to provide you the necessary information regarding the following content coverage and topics –

- Checking diagonal measurements
- Checking measurements are for accuracy.

This guide will also assist you to attain the learning outcome stated in the cover page. Specifically, upon completion of this Learning Guide, you will be able to –

- Check diagonal measurements
- Check measurements are for accuracy

Learning Instructions:

1 Read the specific objectives of this Learning Guide.

2 Follow the instructions described in number 3 to 6

3 Read the information written in the “Information Sheets 1”. Try to understand what are being discussed. Ask you teacher for assistance if you have hard time understanding them.

4 Accomplish the “Self-check 1” in page __.

5 Ask from your teacher the key to correction (key answers) or you can request your teacher to correct your work. (You are to get the key answer only after you finished answering the Self-check 1).

6 If you earned a satisfactory evaluation proceed to “Information Sheet 2”. However, if your rating is unsatisfactory, see your teacher for further instructions or go back to Learning Activity #2.

Information Sheet 1	Checking diagonal measurements

1.1 Checking diagonal measurements

Once the initial rectangular shape has been completed, it must be checked to ensure that the set-out is square; that is, the corners are at 90°, and the measurements are correct. You do this by comparing the diagonal distances between corners.

Example 1. Take precise measurements of the distance between **corners 1** and **3** and between

corners 2 and **4 .**If these diagonal measurements are the same, the set-out is correct.

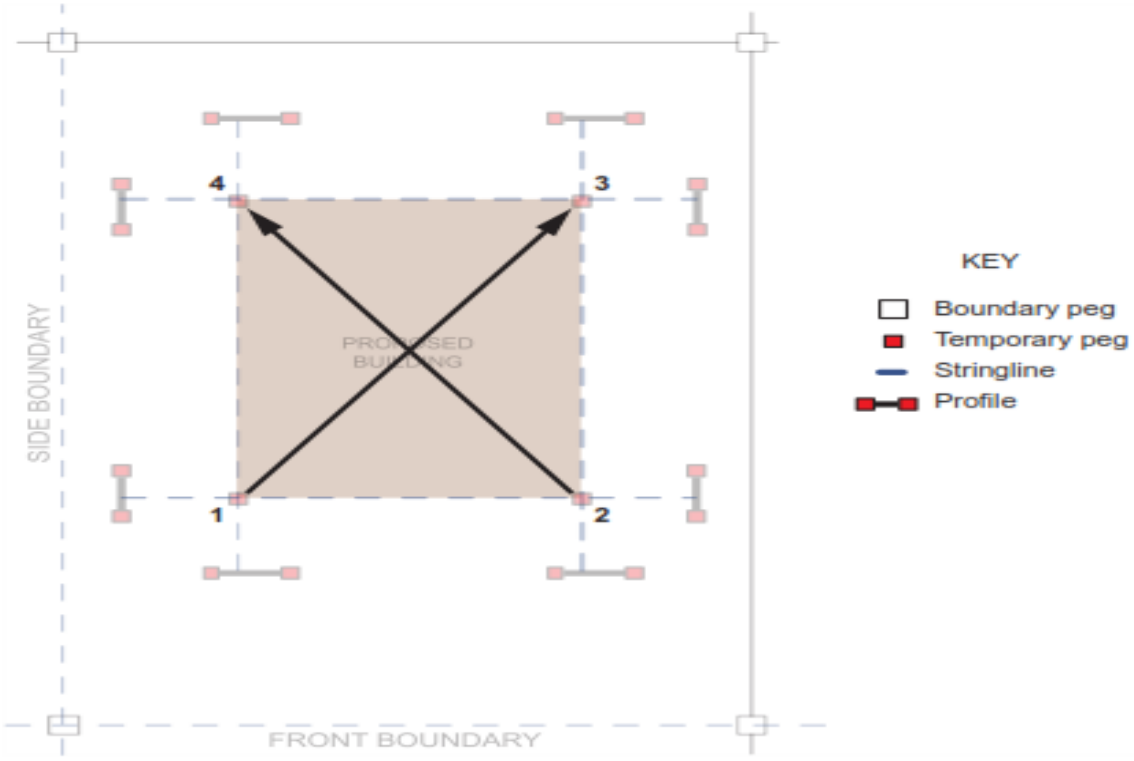
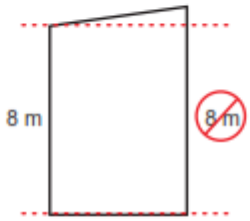


Figure:1 Checking for corners

There is an allowable variation that is considered a reasonably acceptable amount of error when setting out a building. This is known as a **tolerance** and is a Difference of 5 mm over a diagonal distance of 15 m.

If the difference between the diagonal measurements is greater than the allowable tolerance, the set-out is not correct and the stringlines must be adjusted.

There are two reasons that one diagonal line may be longer than the other.

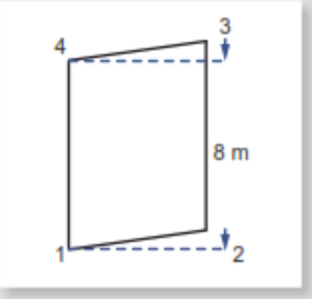
	
1. The first corner of the set-out is not square (90°).	2. The dimension measurements are not correct and the opposing lines are not parallel.

To determine the cause of the error, you must recheck the initial corner with either a builder's square or the 3:4:5 method **and** check the dimensions of each side of the set-out.

Fig-2 checking for accuracy

Adjusting stringlines – part 2

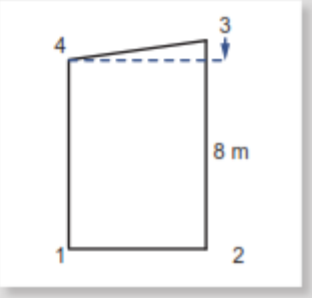
Example 1 – Angle error



1. Adjust line 1–2 at corner 2 and recheck the angle at corner 1.
2. Adjust line 3–4 at corner 3 by the same amount in the same direction. Remeasure dimension 2–3.

In this situation, the stringlines must be moved as a pair to avoid changing the dimensions of the building.

Example 2 – Measurement error



1. Remeasure dimension 2–3 and adjust stringline 3–4.

In most cases, the difference in measurement will be small and you'll probably only have to reposition the nail in the ledger to the required position.

Important note: If adjustments are made to any of the stringlines during the setting out procedure, **all** measurements should be rechecked to ensure that the dimensions of the proposed building and front and side setbacks remain in accordance with the site drawings.

Information Sheet 2	Checking measurements are for accuracy.

2.1 Checking measurements for accuracy.

Determining the location of the building in relation to other buildings and boundaries (as usually shown on the site-plan or other relevant plan), and place pegs in the ground marking the four corners of the building to establish the building line (profile, perimeter of a building) and ensure it is square and level is Suitable for accuracy. The following is some example;

- **Peg the four outside corners**:

Check to see if the pegs are square and form an exact rectangle. This can be done by making sure that:

1). Line AA-CC and line BB-DD are parallel. Line AA-BB and line CC-DD are parallel.(as shown in the drawing below)

2). the distance between peg AA and peg BB is the same as the distance between peg CC and peg DD.

3). The distance between peg AA and peg CC is the same as the distance between peg BB and peg DD.

4). the distance between peg AA and peg DD (the diagonals) is the same as the distance between peg BB and peg CC.

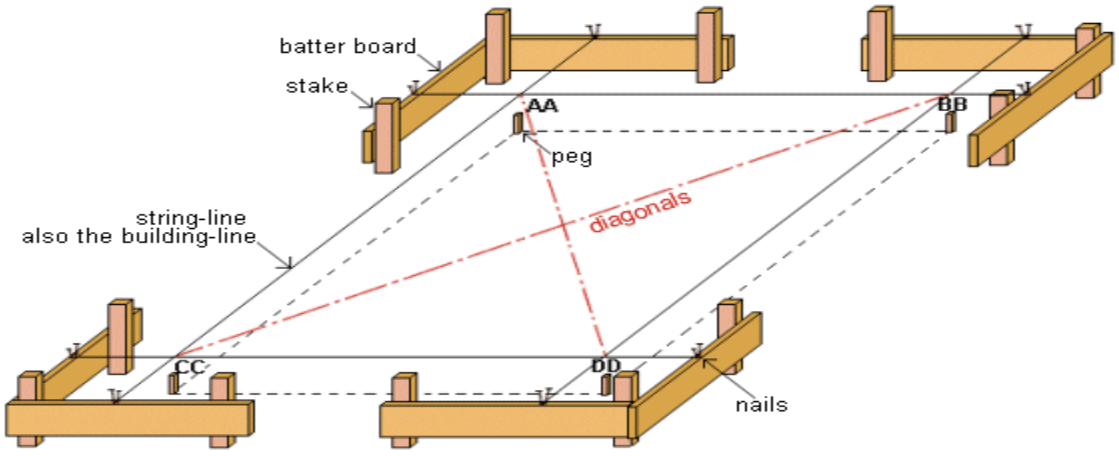


Figure:1 checking for accuracy

- **Hammer in the stakes and mark the height:**

Cut 12 stakes 600 (2ft) long, out of 50x50 (2x2) stock (or similar). Cut a point at one end of each stake so they can be easily hammered into the ground.

Position the twelve stakes as shown in the diagram (3 at each corner) and hammer them firmly into the ground.

Note: If the ground is sloping, then the stakes will need to be longer at the lower corners to compensate.

The stakes should be at least 600 (2ft) out from the building line to allow room to dig the corner footing holes. If a machine is required to dig the footings, then the stakes will need to be further out from the building line.

Make a level mark on all twelve stakes beginning approx 150 (6") above ground level, at the corner where the ground is the highest (if the ground is sloping). Keeping the batter boards close to the ground saves the need for bracing. The height is only a reference height, so it does not really matter if the marks are slightly higher or lower, as long as they are all level. The water level method is one way of finding accurate levels.

Self check 2	*Written Test*

Name---------- ***Date; ----------***

Time Started; ----------Time Finished; ----------

Directions:- **Answer all the questions listed below. Illustrations may be necessary to aid some explanations/answers.**

1. *How to establish and check building line?*
2. *What is the instrument used for diagonal check?*

Masonry

Level II

Learning Guide #50

Unit of Competence: Set-out Masonry Structures

Module Title: Setting-out Masonry Structures

LG Code: EIS MAS2 M10 LO7 LG-50

TTLM Code: EIS MAS2 TTLM 0919 v1

LO 7: Clean up

Instruction Sheet	Learning Guide #50

This learning guide is developed to provide you the necessary information regarding the following content coverage and topics –

- Clearing work area
- Cleaning, checking, maintaining and storing tools and equipment

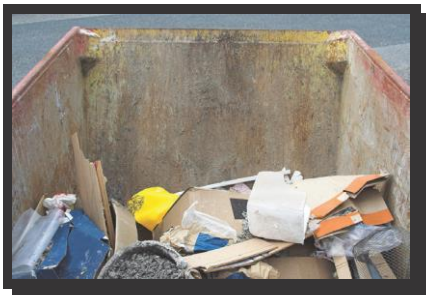
This guide will also assist you to attain the learning outcome stated in the cover page. Specifically, upon completion of this Learning Guide, you will be able to –

Learning Instructions:

11 Read the specific objectives of this Learning Guide.
12 Follow the instructions described below 3 to 6.
13 Read the information written in the information “Sheet 1, Sheet 2, Sheet 3, Sheet 4 and Sheet 5”.
14 Accomplish the “Self-check 1, Self-check t 2, Self-check 3 and Self-check 4” **in page -55, 57, 60 and 62** respectively.
15 If you earned a satisfactory evaluation from the “Self-check” proceed to “Operation Sheet 1” **in page -63.**
16 Do the “LAP test” **in page – 64** (if you are ready).

Information Sheet-1	Clearing Work area and disposing of, reusing for recycling materials

1.1 Clean work area



When you complete any task on a building site, you must clear your work area to ensure the safety and convenience of your workmates, other construction teams and the public. This process includes:

- recycling or disposing of any waste material
- cleaning, maintaining and storing equipment
- safely filing or storing plans, documents and records
- cleaning up the area.

1.2. Relevant legislation, regulations and job specifications

State and territory Regulations usually require a site to be kept and left in a clean, safe condition. The tasks involved in setting out by level don't produce a lot of clutter or rubbish but all construction workers must know and follow the site policies and procedures for maintaining a tidy, organized and safe workplace including:

- clearing potential safety hazards
- safe waste disposal
- recycling of materials
- maintenance and storage of tools and equipment.

- Inspection shall be carried out daily to ensure that sufficient workmen/women, tools and facilities are provided to maintain the standard of hygiene.

- Final cleaning of the site and removal of all temporary facilities shall be carried out to approval at completion of works

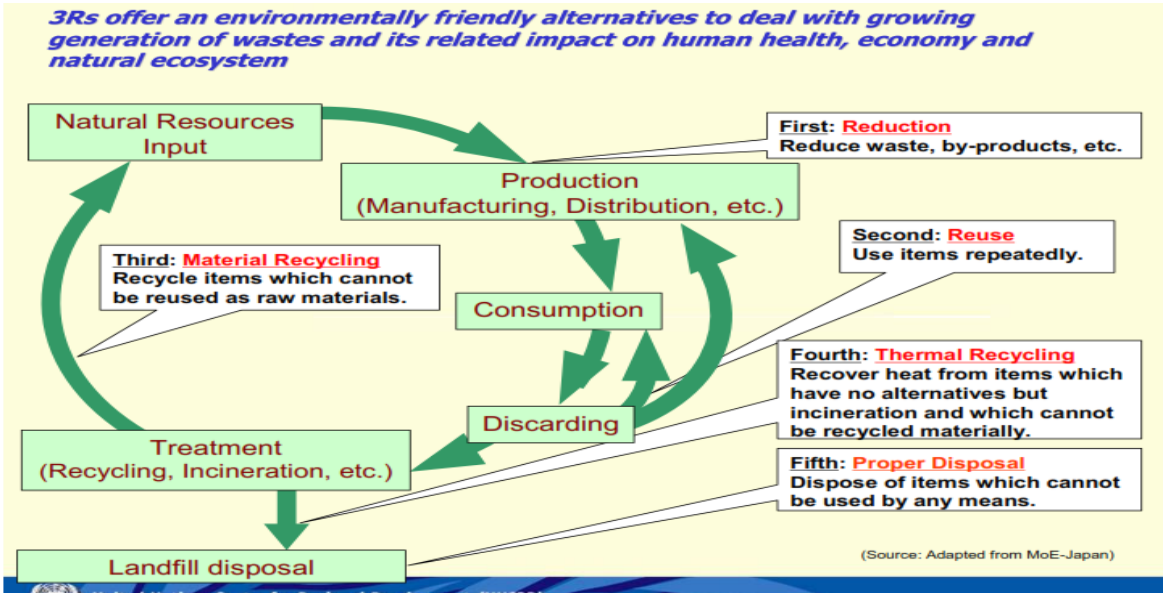
1.3 Disposing Removing and destroying or storing damaged, used or other unwanted domestic, agricultural or industrial products and *substances*

Recycling means turning an item into raw materials which can be used again, usually for a completely new product. This is an energy consuming procedure.

Reusing refers to using an object as it is without treatment. This reduces pollution and waste, thus making it a more sustainable process.

- **Purpose**

When looking into **environmental sustainability**



1.4 **Advantages of 3R'S**

Recycling is the process of collecting and processing materials that would otherwise be thrown away as trash and turning them into new products. Recycling can benefit your community and the environment.

Recycling reduces waste disposal by transforming useful materials such as plastic, glass and paper into new products

The reusing process is not just about re-purposing materials, but the object as it is. This includes buying and selling used goods and repairing items rather than discarding them. Reusing is better than recycling because it saves the energy that comes with having to dismantle and re-manufacture products. It also significantly reduces waste and pollution because it reduces the need for raw materials, saving both forests and water supplies.

- **Waste management**

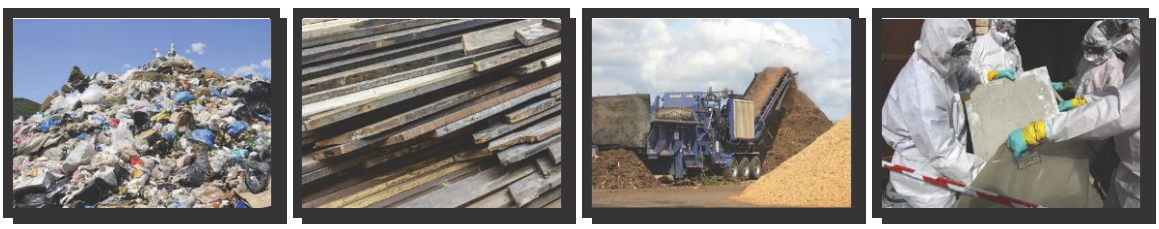
Construction projects create a lot of waste including general rubbish and used, damaged or surplus materials. All waste must be disposed of appropriately.

- No degradable substances and organic material like food and vegetation should be disposed of at a landfill site.

•Left over materials in good condition and in useable sizes or quantities can be salvaged.

- Used materials that can be repurposed or reprocessed can be recycled.

Note: Hazardous waste such as asbestos must be handled by removal specialists.



There are laws which outline how waste materials should be dealt with and large

fines can be issued if they're not followed. Companies and contractors usually develop policies and procedures to make sure that everyone on the building site complies with these requirements.

Therefore, Waste that cannot be *reused* or *recycled* in some form eventually finds its way to ***disposal***. This *disposal* includes landfills, but an increasing number of municipalities have elected to divert *waste* into resource recovery. These recovery methods use the *waste* to generate electricity or produce raw *materials* for industry.

Self-Check -1	**Written Test**

Instructions*:* Answer all the questions listed below. Illustrations may be necessary to aid some explanations/answers. Write your answers in the sheet provided in the next page.

1. What are the advantages of applying 3R's for environmental sustainability? (5 points)
2. Why you apply clean up rules to work area? (5 points)

Note: **Satisfactory rating - 5 points** **Unsatisfactory - below 5**

Answer Sheet

Score = _____
Rating: _____

Name: _____ **Date:** _____

Short Answer Questions

1. _____

_____

2._____

_____

_____

Information Sheet-2	Maintenance Of Plant, Tools And Equipment.

2.1 Maintenance of tools and equipment

Tools must be checked, maintained or, if necessary, repaired when a job is completed to ensure they:

- Remain In A Good Working Condition
- Are Safe To Use
- Are Ready For The Next Project.

Regular maintenance helps to preserve the quality of the tools, keep them safe and extend their life. Doing a little maintenance each time you complete a job or project can prevent costly and time-consuming repairs or replacement.

You should complete the following procedures as routine maintenance at the end of every task;

1. Wipe all tools to clear away dust or debris, and remove substances like grease or sap.
2. Pay particular attention to tools that have been used in wet or damp conditions.
3. They should be cleaned with an oily rag to prevent rust and, if rust exists, it should
4. be removed with steel wool or a wire brush.
5. Sharpen blades and replace damaged or worn components.
6. Lubricate moving or adjustable parts of tools to allow smooth, continuous operation. Lubrication reduces friction between moving parts, helps them to last longer and makes the machine more energy efficient.
7. Store tools and equipment properly so that they’re protected against weather and theft, easy to find when needed and not a hazard to

yourself, other workers or members of the public.

2.1 Clearing the site

Keeping the site tidy is an essential part of maintaining a safe workplace. Tools, equipment and materials are all potential hazards to site workers and the public and should always be properly organized and stored when they're not being used. The pegs, pickets, stringlines and profiles you place during a leveling task can be safety hazards and should be removed once there's been sufficient progress on the construction, and the position, size and shape of the building are well established.

2.2 Dos and don'ts of plant and equipment maintenance

Do…

- Ensure maintenance is carried out by a competent person (someone who has the necessary skills, knowledge and experience to carry out the work safely)
- Maintain plant and equipment regularly – use the manufacturer's maintenance instructions as a guide, particularly if there are safety-critical features
- Have a procedure that allows workers to report damaged or faulty equipment
- Provide the proper tools for the maintenance person
- Schedule maintenance to minimise the risk to other workers and the maintenance person wherever possible
- make sure maintenance is done safely, that machines and moving parts are isolated or locked and that flammable/explosive/toxic materials are dealt with properly

Don't…

- Ignore maintenance
- Ignore reports of damaged or unsafe equipment
- Use faulty or damaged equipment

2.3 Dos and don'ts of machinery safety for workers

Do…

- Check the machine is well maintained and fit to be used, ie appropriate for the job and working properly and that all the safety measures are in place – guards, isolators, locking mechanisms, emergency off switches etc
- Use the machine properly and in accordance with the manufacturer's instructions
- Make sure you are wearing the appropriate protective clothing and equipment required for that machine, such as safety glasses, hearing protection and safety shoes

Don't…

- Use a machine or appliance that has a danger sign or tag attached to it. Danger signs should only be removed by an authorised person who is satisfied that the machine or process is now safe
- Wear dangling chains, loose clothing, rings or have loose, long hair that could get caught up in moving parts
- Distract people who are using machines
- Remove any safeguards, even if their presence seems to make the job more difficult

Self-Check -2	Written Test

***Instructions**:* Answer all the questions listed below. Illustrations may be necessary to aid some explanations/answers. Write your answers in the sheet provided in the next page.

1. Discuss dos and don’ts of tools, equipments and machineries? (10points)

Note: **Satisfactory rating - 10points** **Unsatisfactory - below 10**

Answer Sheet

Score = _____
Rating: _____

Name: _____ **Date: _____**

Short Answer Questions

1._____

_____

REFERENCE

C. R. C. Mohanty, UNCRD ;9 May 2011,
REDUCE,REUSE AND RECYCLE(3R) AND RESOURCE EFFICIENCY AS THE BASIS FOR Sustainable Waste Management. New York.

Environment Protection Guidelines for Construction and Land Development in the ACT retrieved from https://ginninderry.com/wp-content/uploads/2017/03/EPA-Guidelines-for-Construction-and-Land-Development-ACCESS.pdf. accessed on Oct 30/2017.

Workplace Housekeeping - Basic Guide; Document confirmed current on June 6, 2014.

REFERENCE

- Https://ginninderry.com/wp-content/uploads/2017/03/EPA-Guidelines-for-Construction-and-Land-Development-ACCESS.pdf. Accessed on Oct 30/2017
- Https://en.wikipedia.org/wiki/Diagram
- Http://www.isgmax.com/Articles_Papers/Equipment%20Specs%20Paper.pdf
- Https://www.collate.co.nz › BU622-Good-plans-and-specifications
- Https://en.wikipedia.org/wiki/Signage

-CPCCCA3002A Carry out setting out

This learning guide prepared by :

No	Name of trainer	Qualification	Region	E-mail
1	Dereje Teshome	Construction technology & management(MSC)	Dire dawa	Derat8@gmail.com
2	Haymanot Kefale	Construction technology (BSc)	Benishagul gumuz	Haymanot281@gmail.com
3	Jemal Abdulahi	Construction technology (BSc)	Harari	
4	Mohammed Hassen	Construction technology (BSc)	Somali	mohammedhassen286@gmail.com
5	Muluken Solomon	Construction technology & management(MSC)	Oromia	mulecot99@gmail.com
6	Solomon Eshetu	Construction technology (BSc)	Amhara	Natansolomon10@gmail.com
7	Zelallem Taye Gedifew	ANRST tvet office curriculum expert	Amhara	tayezelalem22@gmail.com
8	Addisu wodajo	Anrst tvet office curriculum expert	Amhara	Addalvy2010@gmail.com