



Carpentry NTQF Level II

Learning Guide #65

Unit of Competence: Install and Replace Windows and Doors

Module Title: Installing and Replacing Windows and Doors

LG Code: EIS CRP2 M14 LO2-LG-65

TTLM Code: EIS CRP2 M14 TTLM 0919v1

LO2: Install window units to frame

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Instruction Sheet	Learning Guide #65
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This learning guide is developed to provide you the necessary information regarding the following content coverage and topics.

- Checking Window opening size
- Joining and fixing Reveals.
- Locating Window unit
- Positioning Window unit in place
- Packing and fixing Window to wall

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 Window opening size
- Join and fixing Reveals.
- Locate Window unit
- Position Window unit in place
- Pack and fixing Window to wall

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Learning instruction

- ✓ Read the specific objectives of this Learning Guide.
 - ✓ Read the information written in the “Information Sheets 1”. Try to understand and familiarize what are being shown and discussed. Ask your teacher for assistance if you have hard time understanding them.
 - ✓ Accomplished and submit “Self-checks 1” for evaluation.
 - ✓ If you earned a satisfactory evaluation for "self-check 1" then proceed to “Operation Sheet 1”. However, if your rating is unsatisfactory, see your teacher for further instructions or go back to Information Sheet 1.
 - ✓ Read the “Operation Sheet 1” and try to understand the procedures discussed.
 - ✓ Accomplish and submit “Operation Sheet 1” for evaluation.
 - ✓ If you earned a satisfactory evaluation for one "Operation Sheet 1" then proceed to the next “Information Sheet”. However, if your rating is unsatisfactory, see your teacher for further instructions or go back to Operation Sheet where you get unsatisfactory evaluation.
 - ✓ Continue to the next “Information Sheet” and follow instruction for learning activities in “2-7”.
 - ✓ After all “Self Check” and “Operation Sheet” is accomplished and evaluated proceed to “LAP Test”.
- Your teacher will evaluate your output either satisfactory or unsatisfactory. If unsatisfactory, your teacher shall advice you on additional work. But if satisfactory you can proceed to the next topic.

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Information Sheet 8	Checking Window opening size
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8.1 Window opening size is checked to be greater than overall window frame.

A rough opening refers to the framed opening of a window. A window frame, however, has a header across the top, a sill plate across the bottom, and vertical trimmers on either side. Because these elements take up space, a window that measures, for example, 3 feet wide and 4 feet tall is listed as 3/0 – 4/0, but the actual window measurements will be slightly less than this to accommodate the installation system. The difference between rough opening and actual window size will vary by manufacturer.

✓ How to Measure for Windows for Your Rough Opening

When measuring for windows that will fit in your rough opening, follow these simple steps:

- Measure the width across the window top of your opening between the inside faces of the framing on each side.
- Measure the width across the bottom of your window opening between the inside faces of the framing on each side.
- Measure the height of the opening between the bottom of the header and the top of the sill on the left, right, and center of the opening.
- Measure the thickness of the flashing needed.

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✓ window Sizes:

This catalogue contains all Segar's standard sizes for windows and doors. These are the ones that we make every day. They are performance rated and will be delivered in an advised lead time. They are sized to fit standard brick openings. Should you require one of our standard windows in a special size, it's not a problem. We'll work with you to ensure that the size you want maintains its rating performance, and can be delivered when you need it.

✓ Door frames and entry units are sized to fit a standard

2040mm highx820mm wide door opening and May not always suit standard brick openings. Aluminum frames and doors which cannot be trimmed should be fitted to the finished floor.

An asterisk indicates that the frame will fit an industry standard 400mm wide sidelight.

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✓ How to Measure Home Windows

Step 1. Take 3 horizontal measurements of the window frame for the rough opening width.

- Measure the distance horizontally across your frame at the top, at the middle and at the bottom from each side jamb.
- Circle the smallest measurement of the three figures.
- The smallest measurement is your rough opening width, the main measurement to reference when purchasing a replacement window.

* Tip: Always list window measurements with width before height.

Step 2. Take 3 vertical measurements of the window frame for the rough opening height.

- Measure the distance vertically across your frame from top to bottom on the left, middle, and right side of the window from head jamb to the window sill.
- Circle the smallest measurement of the three figures, this is your rough opening height.

* Tip: If your window sill is sloped, measure from the highest point of the window sill, which is usually right against your window.

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Step 3. Measure the depth of the window's opening.

- Finding the correct depth is important because some windows will be too deep to fit into a replacement window opening.
- Run a tape measure from the outside of the frame to the inside and take the measurement from edge to edge of the window frame.
- Do this in several locations around the window frame and rely on the smallest measurement once again as your final dimension.

* Tip: If you can't open your window, measure the depth on each side of the glass and add them together. Then add the thickness of your window glass pane. A single window glass pane is usually 1/8" or 3mm in thickness.

The Size of the Window Opening Determines the Size Of The Risk



Figure 1 window opening

✓ Rough Opening Size

Once the window products have been decided on and construction has begun, one critical area that must be dealt with is the rough opening size. Each manufacturer will have different rough opening size requirements for their windows depending on how they measure their product. For example, a 2×4 stud does not measure 2 inches by 4 inches, instead it is approximately 1-½ inches by 3-½ inches. The 2×4 name is referred to as its nominal dimension. Window manufacturer's use similar conventions when

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referring to their window sizes. This means that the framer needs to know the rough opening size required for the windows that will be installed on each project. For many manufacturer's, the size represented for the window is a ½ inch larger than the frame, however, this is not necessarily true for all manufacturers or custom-built windows.

Graphic Representing a Rough Opening in a Wood Framed Wall:

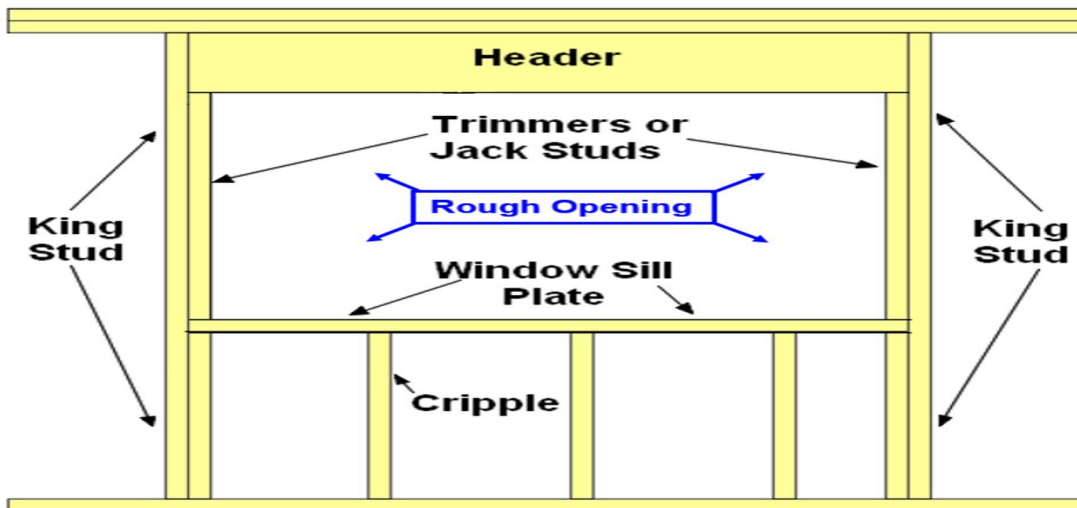


Figure 2 opening window frame

Take for example, this chart from one manufacturer which indicates that a 5'0"x6'8" window requires a rough opening the same dimensions as the normal size of the window, while the actual window frame will be a ½ inch smaller in both height and width:

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Operating Style	Size	Rough Opening		Net Size	
		Width	Height	Width	Height
Two Panel	5' 0" x 6' 8"	60	80	59 1/2"	79 1/2"
	5' 0" x 6' 10"	60	82	59 1/2"	81 1/2"
	5' 0" x 8' 0"	60	96	59 1/2"	95 1/2"
	6' 0" x 6' 8"	72	80	71 1/2"	79 1/2"
	6' 0" x 6' 10"	72	82	71 1/2"	81 1/2"
	6' 0" x 8' 0"	72	96	71 1/2"	95 1/2"

For another manufacturer, they provide the window frame dimension on a chart; however, the dimension is under a heading that does not make it clear. If you are not familiar with their product you would not know what the actual frame dimensions are. This is important because their chart does not provide rough opening size information; instead, they provide the statement seen below in their installation guidelines.

Photo of a Rough Opening to Ensure a Square Fit:



Figure 3 rough opening

Even when changes in plans are communicated to the framer, room for error can still occur. As building on the field does not typically have tight tolerances, it is not unusual

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for things to be off to some degree. This is why the standards are sure to include acceptable variations from perfection. At times, however, the installed condition exceeds acceptable tolerances per the standard. *The question is, when the installer notices that the opening is out of tolerance, will they know if it is out beyond acceptable limits and when they discover this, what will they do?* The correct answer would be to not install the window and inform the project superintendent or project manager so they can contact the framer to get the opening corrected. However, what we see too often, is the window installer proceeds to install the window to the best of their ability despite the anomaly being present. Such an action may be a decision that the window installer makes on their own, or it could even be at the direction of the project superintendent or project manager. Whatever the cause may be, when this happens it creates risk.

Self-Check -1	Written Test
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Directions: Answer all the questions listed below. Use the Answer sheet provided in the next page:

1. How to Measure Home Windows?

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Note: Satisfactory above – 4 out of 8 points Unsatisfactory - below 4 out of 8 point

Information Sheet 9	Joining and fixing Reveals.
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9.1 Joining and fixing Reveals

A Reveal is timber that is fixed perpendicular to a fin on the frame of the door or window. It is used to mount and fix the door or window into internal framework of a wall..

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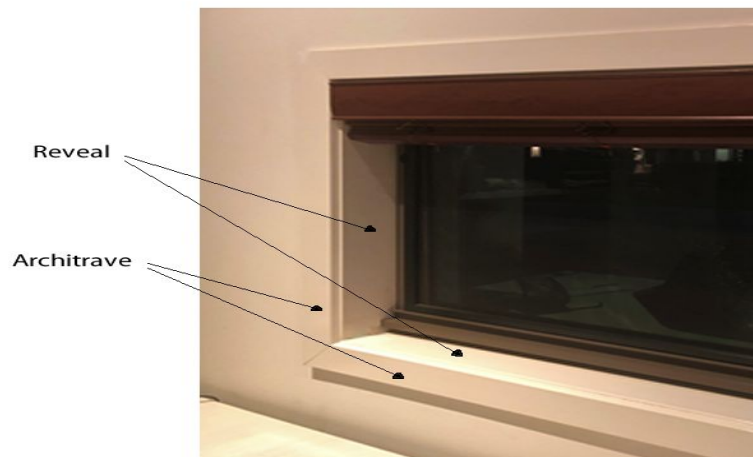


Figure 4 window reveals

- ✓ The Reveal is a timber surround fitted to the fin of the window or door and used for installing the product into timber framing. The reveal becomes the frame of your window or door covering the stud. The architrave attaches to the reveal to cover the gap between the reveal and the plasterboard (or internal lining).

A variety of reveal sizes are available depending on your construction. The size of the reveal is the combined width of the timber stud, the internal lining and cavity (for brick veneer).

The standard reveal material is primed pine. It is a finger joint pine that has been finished with a white primer.



- ✓ How to Determine the Reveal Size

Reveals for External Cladded Applications

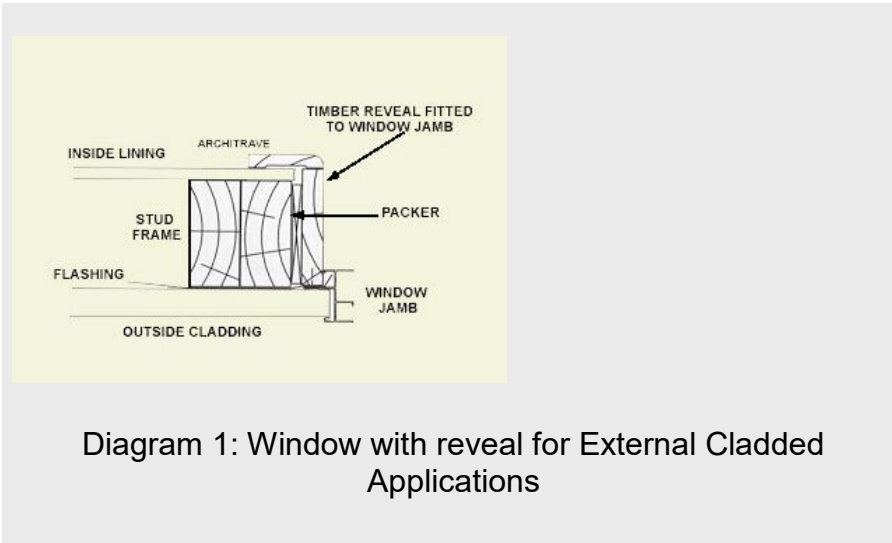
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This is relevant for timber cladding, blue board cladding or any other type of cladding up to 25mm thick.

Reveal Size = Internal lining (say 10mm) + Stud Size (say 75mm) = 85mm (use closest standard size 86mm)

If bracing ply is used, you need to add the thickness of the bracing ply to your reveal size also.



Standard Reveal Sizes for External Cladding

External Cladding	
Stud Size (mm)	Reveal Size* (mm)
70	81
75	86
90	98
100	110

What the window will look like with reveals

The reveals are on the inside of the window. The flashing is between the fin and the reveal (as pictured). When you collect or have your window delivered the flashing will

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be tacked neatly to avoid it being damaged. The second picture shows a close up of the outside of the window jamb and sill showing the fin of the window and staples attaching the flashing and reveal to the window.



Inside view



Fin & Flashing – outside view

Self-Check -2	Written Test
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Directions: Answer all the questions listed below. Use the Answer sheet provided in the next page:

1. ----- is a timber surround fitted to the fin of the window or door and used for installing the product into timber framing.

A. Reveals

B. Window



C. Timber

D. None

Note: Satisfactory above – 4 out of 8 points Unsatisfactory - below 4 out of 8 point

Information Sheet 10	Locating Window unit
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10.1 Locating Window unit

Window unit is located to suit brickwork and eaves finish for veneer construction, whichever is applicable.

It includes

- windows of all sizes,

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- casement, double hung,
 - hopper, straight and sliding including glazed sliding doors
- ✓ Standard sliding **window** widths are 36, 48, 60, 72 and 84 inches wide; the **windows** themselves are actually 36 1/2, 47 1/2, 59 1/2, 71 1/2 and 83 1/2 inches wide to allow for installation. Standard heights are 24 inches, 36 inches, 48 and 60 inches. A 6-foot-wide by 4-foot-tall **window** is identified as "6040."
- ✓ **Casement window sizes** range 1 ft 2 inches to a 2 ft 11.5 inch width. **Casement windows** height range from 2ft 5.5 inches to a maximum of 6 ft 5.5 inches tall.
... **Casement Height:** 2'5.5" min

Double-hung **windows**, where both sashes move up and down, are one of the **most common window** types. These **windows** start at 24 inches and go up to 28, 32 and 40 inches. Their heights vary from 36 to 72, with heights of 44, 52, 54 and 62. Remember to take 1/2 inch off of each measurement for the correct **window size**.

✓ What Are Standard Window Sizes?

Face it, building a home is expensive, and there are always unexpected bills to pay so it makes sense to cut costs when you can. That's one reason many homeowners opt to use standard window sizes rather than expensive custom-made windows. But don't go cutting the window openings to the exact measurements of the window sizes before you read up on sizing. You may be surprised to learn the ways window manufacturers identify the dimensions of their standard products.

✓ Standard Window Sizes

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Home improvement and some window retailers carry windows identified by whole numbers for standard-sized rough openings. Though the actual window measurements are usually 1/2 inch less, the identifier is always a whole number for the rough opening. For example, sliding windows designed to fit into a 2-by-2-foot rough opening are identified by the number 2020, but have actual measurements of 23 1/2 by 23 1/2 inches. Windows that fit rough openings of 44 by 44 inches are identified as "3838" windows, because they are actually 3 feet, 8 inches wide by 3 feet, 8 inches long -- not including the 1/2 inch taken off for the actual window size. The "3838" also identifies the window schedule on the blueprints.

✓ A Half-Inch Less

A manufacturer identifies its windows by rough opening sizes but takes off a 1/2 inch on both window dimensions to ensure ease of installation. When you install a window, the rough opening must be fitted with flashing materials, and then the window must be centered in the space to ensure it functions properly. The 1/2-inch reduction in the size of the window on both dimensions allows the installer the room to do just that. Once the window is plumb, installers add shims to it to keep it in place while they secure the window to the rough opening. Each manufacturer may offer different sizes, but most provide windows with standard measurements.

✓ Sliding Windows

While you can definitely order windows made to custom sizes, when you build a home or add new windows, you can buy them "off the shelf" if you have standard-sized rough openings, which makes for cheap house windows, or at least cheaper house windows. For example, all windows are first fit by the horizontal width, then their height. Standard sliding window widths are 36, 48, 60, 72 and 84 inches wide; the windows themselves are actually 36 1/2, 47 1/2, 59 1/2, 71 1/2 and 83 1/2 inches wide to allow for

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installation. Standard heights are 24 inches, 36 inches, 48 and 60 inches. A 6-foot-wide by 4-foot-tall window is identified as "6040."

✓ Picture Windows

Picture windows have similar standard dimensions, but with more options from which to choose. These windows don't open, so they can be much wider and taller. Standard widths are 2 feet, 3 feet, 4 feet, 5 feet, 6 feet and 8 feet. Standard heights in whole numbers range from 2 feet tall all the way 8 feet tall, with additional window heights of 18 inches, 52 inches, 54 inches and 62 inches. Again, rough openings are in whole numbers, with 1/2 inch taken from each rough opening size for the actual window size. It helps to look at a single-hung window size chart.

✓ Double-Hung Windows

Rough opening widths for double-hung windows start at 24 inches, ranging all the way up to 48 inches, with additional window widths of 28 inches, 32 inches and 40 inches. Again, the actual window size is 1/2 inch less than its rough opening. Double hung window heights vary from 36 to 72 inches tall, including window heights of 44, 52, 54 and 62 inches with 1/2 inch taken off each measurement for the actual window size.

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Figure 5 window opening

Self-Check -3	Written Test
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Directions: Answer all the questions listed below. Use the Answer sheet provided in the next page:

1. Write the width of standard sliding window

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Note: Satisfactory above – 4 out of 8 points Unsatisfactory - below 4 out of 8 point

Information Sheet 11	Positioning Window unit in place
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11.1 Positioning Window unit in place

Window unit is positioned in place so that head/sill are level and stiles are plumb and in wind, ensuring reveals or frame are finished flush with face of inside Wall lining.

It includes:-

- windows of all sizes,
- casement, double hung,

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- hopper, straight and sliding including glazed sliding doors

Also include:-

Curved and bay

- ✓ Casement windows, on the other hand, tend to have a slightly tighter seal than double-hung windows when they are locked, since there isn't a track for casement windows to slide on. The tighter the seal of the window, the more energy efficient it is
- ✓ Double hung windows have two vertically sliding sashes, meaning both the top and bottom can open up and down. ... Casement windows open outward like a door on the hinges on the side of the window, using a cranking mechanism. They also allow you to clean the outside of the window from inside when you crank them open fully.
- ✓ A casement window seal is not flexible. While both replacement window options are energy efficient, casement windows are more energy efficient since they are not flexible by design

When casement windows are closed, the sash is pressed tight into the frame. ... Certain styles of casement windows are flush with the frame when closed, instead of having a lip. These are the safest casement windows because no part of the window is able to be manipulated from outside.

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Figure 6 window casement

Self-Check -4

Written Test

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

Say true or false

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1. A casement window seal is not flexible While both replacement window options are energy efficient, casement windows are more energy efficient since they are not flexible by design

Note: Satisfactory above – 4 out of 8 points Unsatisfactory - below 4 out of 8 point

Information Sheet 12	Packing and fixing Window to wall
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12.1 Packing and fixing Window to wall

Each window should take around 30 minutes to install, depending on the size of the windows. However, window installation can be a two-day job depending on several

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factors. After removal and installation, they will begin to install exterior trim on your windows to finish the job.

Will the replacement windows be installed from the inside or outside? The majority of our replacement windows are installed from the outside. In some situations it may be necessary to install from the inside.



Self-Check -5	Written Test
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Directions: Answer all the questions listed below. Use the Answer sheet provided in the next page:

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1. The majority of our replacement windows are installed from the -----

- A. Corner
- B. Out side
- C. Inside
- D. Back

Note: Satisfactory above – 4 out of 8 points Unsatisfactory - below 4 out of 8 point

LIST OF REFERENCE

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