

Practice exercise – Answer Key

Measure quantities in Takeoff

The following steps were completed on the videos of **Module 2: Perform quantity takeoffs in Forma Takeoff**. If you followed along the videos, you are ready to start the exercise. If you have not already performed these steps when following the videos for this module, make sure these steps are completed:

1. In the Setting menu of Takeoff, you specified a measurement system and uploaded the **Project Level Classification.xlsx** into the Classification system 1.

Takeoff / Settings

General Output definitions

Measurement system *

The measurement setting display for Preconstruction.

☐ Imperial
☐ Metric

Classifications

Classifications cannot be changed once assigned to a line item with takeoff in the project.

Classification system 1

[Project Level Classification](#)

Classification system 2

[Set classification system](#)

2. In the Setting menu of Takeoff, you specified the correct currency and time frame conversions.

Currency

Note: Changing the currency display setting does not perform currency conversion.

Currency

USD

Time frame conversions *

Set the definitions of a standard work day, week, and a month. This enables converting rates to different time frames.

Hours/Day: 8
 Days/Week: 5
 Days/Month: 20

3. In the Setting menu of Takeoff, you created at least one output definition, for example, an output definition for Window Type A.

Edit Window Type A
×

Name *

Window Type A

Unit of measure *

Count (EA) ▼

Cost

100.00

Classification 1

... > 08 50 00 - Windows ▼

Classification 2

Classifications not defined ▼

ⓘ Classification 2 is not set for the project. Go to [Settings](#) to import a classification.

4. In the Sheets & Models tool:

- a. You uploaded the **Architectural Model.rvt** file from the Version 1 folder in the dataset folder to the 3D Models tab.

Sheets & Models

2D Sheets
3D Models

⬆️ Upload models

☐ Model

☐ Architectural Model.rvt (3D)

- b. You uploaded the **Architectural Sheets.pdf** and **Structural Sheets.pdf** files from the Version 1 folder in the dataset folder to 2D Sheets tab and extracted the correct sheet names and numbers.

📁 Learn Forma Preconstruction ▼

Sheets & Models

2D Sheets
3D Models

⬆️ Upload files

☐	Number	Version set
☐	S000 Cover Page	① Version 1
☐	S100 Notes	① Version 1
☐	S101 Grid Updates	① Version 1
☐	S102 00 TO Wall Footing	① Version 1

- To start this exercise, create a new takeoff package named Practice Exercise 2.

Takeoff

[Settings](#)

Work in progress
Jul 18, 2026

+ Create takeoff package

Save snapshot

Export all

Q Search

☐	Name	Updated by	Last updated	
☐	Practice Exercise 2	Student Ralph T.	Jul 18, 2026	↑

Once these steps are completed, you will be ready to start the exercise. You will apply the skills learned in this module to perform quantity takeoff from 2D drawings and 3D models in Takeoff. You will create takeoff types, capture quantities, organize outputs, and use BIM workflows to prepare quantity data for estimating while answering the questions provided.

Learning objectives:

By the end of this exercise, you should be able to:

- Perform quantity takeoff from 2D drawings using count, area, and line tools.
- Create and organize takeoff types and outputs.
- Extract quantities from 3D models using BIM-based takeoff tools.
- Create calculated outputs and manage takeoff inventory.

Success criteria:

- 2D drawing quantities are successfully captured using count, area, and line takeoff tools.
- Takeoff types, packages, and outputs are created and configured correctly.
- Quantities are successfully extracted from 3D models using BIM-based workflows.
- Calculated outputs are created using formulas, and the inventory is updated.
- Exercise questions are completed and answers are submitted for review.

Answer the following questions based on the structural and architectural sheets and the architectural model. Make sure you are working with Version 1. Create a takeoff package named Practice Exercise 2 to put all the quantities in.

1. Create a new BIM-based takeoff type for Single Flush Doors. Add an output definition to Primary line item and use the correct classification for wood doors.

Create takeoff type

Name *

Single Flush Doors

Tool *

Appearance

Fill

Description

Primary line item *

Single Flush Doors

08 14 00 - Wood Do...

EA

Additional line items

Model mappings ⓘ

Map Count to:

1

Line item details

×

Line item name

Single Flush Doors

Unit of measure *

Count (EA)

Classification 1

... > 08 14 00 - Wood Doors

Quantity Formula

Count

Emb. carbon Beta

203

KGC02E/EA

Typically between 60-203 KGC02E/EA for [Wood Doors](#)

Then using the model tree, find the wooden single flush doors and add them to the takeoff type. How many of these doors are there?

Answer Key

There are 15 doors.

Inventory			
		Group by Takeoff type	
Name	↑	Quantity	Unit
Single Flush Doors		15	EA
Single Flush Doors - Single...		15	EA

- Using the same takeoff type, add an additional line item for the frames of these doors. The frames are metal and fall under the 08 12 00 classification. Group the inventory by Classification 1 and submit a screenshot as an answer to this question.

Answer Key

The student should submit a screenshot of the inventory, which you can also check directly on their project on Forma.

Inventory						
		Group by	Classification 1	Package Total Emb. Carbon: 3,050 KGCO2E Beta		
Name	↑	Quantity	Unit	Cost	Total Cost	Emb. Ca
08 00 - Openings						
08 12 00 - Metal Frames						
Single Flush Doors - ...		15	EA			
08 14 00 - Wood Doors						
Single Flush Doors - ...		15	EA			60-203 KGC

- Create a new BIM-based takeoff type for ceiling tiles.

Create takeoff type

Name *

Ceiling Tiles

Tool *

Appearance

Fill

Description

Primary line item *

Ceiling Tiles 09 51 00 - Acoustic... EA

Additional line items

Model mappings

Line item details

Line item name

Ceiling Tiles

Unit of measure *

Count (EA)

Classification 1

... > 09 51 00 - Acoustical Ceilings

Quantity Formula

Count

Emb. carbon Beta Reset

1 KGCO2E/EA

Manually added value.

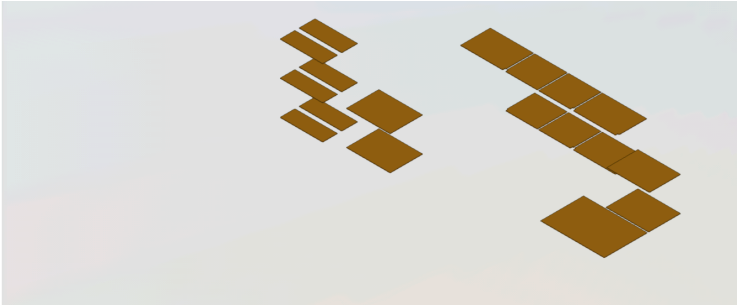
In the model, all acoustical ceilings have ACT in their type name, and all ceiling tiles are 2 feet by 2 feet (0.61 m by 0.61 m). Adjust the quantity formula in the Line item details appropriately, then use the model browser to find the ACT ceilings in the model. What is the total number of ceiling tiles required in the model?

Answer Key

There are 982 ceiling tiles in the model.

▼ 09 00 - Finishes

 Ceiling Tiles	18 EA
Ceiling Tiles	982 EA



The student should create the following line item details and model browser filters.

Create takeoff type

Name: Ceiling Tiles

Tool:    

Appearance:  Fill

Description:
 +

Primary line item:
 Ceiling Tiles 09 51 00 - Acoustic... EA

Additional line items:
 +

Model mappings:
 Map Area to:
 Area

Line item details

Line item name: Ceiling Tiles

Unit of measure: Count (EA)

Classification 1: ... > 09 51 00 - Acoustical Ceilings

Quantity Formula: Area / 4

Emb. carbon:  Beta 

1 KGCO2E/EA

 Manually added value.

Model Browser

Disciplines:
 Select disciplines...
 Show more
 Edit basic filters

Advanced filters:
 Identity Data/Type Name contains ACT

Identity Data/Type Name:
 Contains ACT

+ Add a rule

Model Tree:
 > Ceilings

- Create a new BIM-based takeoff type Gypsum wall board to find the number of boards to be purchased. The gypsum boards are 8 feet by 4 feet (2.44 m by 1.22 m).

Create takeoff type

Name: Gypsum Wall Board

Tool:    

Appearance:  Fill

Description:
 +

Primary line item:
 GWB 09 29 00 - Gypsum ... EA

Additional line items:
 +

Model mappings:
 Map Count to:
 1

Line item details

Line item name: GWB

Unit of measure: Count (EA)

Classification 1: ... > 09 29 00 - Gypsum Board

Quantity Formula: Count

Emb. carbon:  Beta 

1 KGCO2E/EA

 Manually added value.

In the model, gypsum boards are used in walls of type mark E1 and E4 and in some ceilings that have GWB in their type name. What is the total number of gypsum boards needed in the model?

Answer Key

The number of gypsum wall boards is 706.

Inventory		Group by	Classification 1	Package Total Em
Name	↑	Quantity	Unit	
08 00 - Openings				
> 08 12 00 - Metal Frames				
> 08 14 00 - Wood Doors				
09 00 - Finishes				
> 09 29 00 - Gypsum Board				
Gypsum Wall Board - GWB		706	EA	
> 09 51 00 - Acoustical Ceilings				

The student should create the following line item details and model browser filters.

Create takeoff type

Name: Gypsum Wall Board

Tool: [Icon]

Appearance: Fill

Description: [Icon]

Primary line item: GWB 09 29 00 - Gypsum ... EA

Additional line items: Unassigned

Model mappings: Map Area to: Area

Line item details

Line item name: GWB

Unit of measure: Count (EA)

Classification 1: 09 29 00 - Gypsum Board

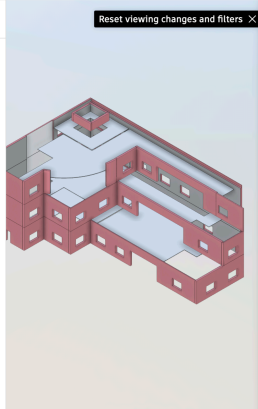
Quantity Formula: Area / 32

Emb. carbon: 1 (Beta) Reset

KGCOZE/EA

Manually added value.

Reset viewing changes and filters



Model Browser

Search: [Icon]

Show more

Edit basic filters

Advanced filters

Identity Data/Type Name contains GWB

Identity Data/Type Name: [Dropdown]

Contains: GWB

AND OR

OR Identity Data/Type Mark is E1, E4 and E2

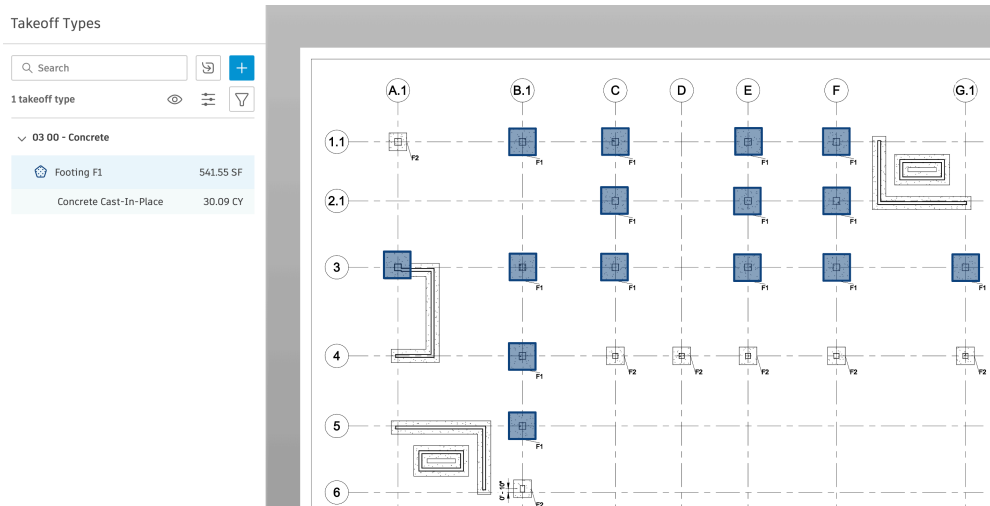
Identity Data/Type Mark: [Dropdown]

Is: 3 selected

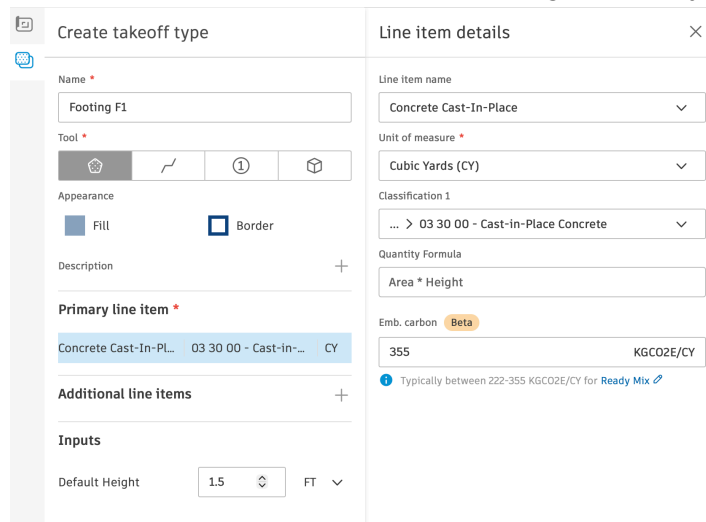
5. Using sheet S103, what is the quantity of cast in place concrete needed, in cubic yards (cubic meters), for spread footing F1 which are 1'6" deep (0.46m)? You should create a new area-based takeoff type named Footing F1 and the Concrete Cast-In-Place from the Hub Library.

Answer Key

There quantity of concrete is about 30 CY (~23 cubic meters).



The student should create the following takeoff type.



The screenshot shows the 'Create takeoff type' dialog box. The 'Name' field is set to 'Footing F1'. The 'Tool' field is set to 'Area'. The 'Appearance' section shows 'Fill' selected. The 'Description' field is empty. The 'Primary line item' section shows 'Concrete Cast-In-Place' selected. The 'Additional line items' section is empty. The 'Inputs' section shows 'Default Height' set to 1.5 FT. The 'Line item details' section on the right shows 'Line item name' set to 'Concrete Cast-In-Place', 'Unit of measure' set to 'Cubic Yards (CY)', 'Classification 1' set to '03 30 00 - Cast-in-Place Concrete', 'Quantity Formula' set to 'Area * Height', 'Emb. carbon' set to 'Beta', and 'KGCO2E/CY' set to 355. A note at the bottom states 'Typically between 222-355 KGCO2E/CY for Ready Mix'.