



STRUCTURAL
ENGINEERING
INSTITUTE



SE 2050 Beta Database User Guide

Version 1.1
December 11, 2023

Table of Contents

Table of Contents	1
Introduction	3
1.0 - Using the SE 2050 Database	4
1.1 - Accessing the Database	4
1.2 - Dashboard	5
1.3 - Projects	6
2.0 - Project Information	10
2.1 - Project Name	10
2.2 - Address	10
2.3 - City	10
2.4 - State	10
2.5 - Country	11
2.6 - Zip Code	11
2.7 - Primary Building Use Type	11
2.8 - Construction Type	12
2.9 - Construction Year Completed (or Anticipated)	13
2.10 - Project Phase at LCA	14
2.11 - Expected Building Life (years)	15
2.12 - Gross Square Footage (ft2)	15
2.13 - Mean Roof Height (feet)	15
2.14 - Number of Stories, Above Grade	16
2.15 - Number of Stories, Below Grade	16
3.0 - Structural System Information	17
3.1 - Typical Column Grid, Long Direction (feet)	17
3.2 - Typical Column Grid, Short Direction (feet)	17
3.3 - Risk Category	17
3.4 - Typical Floor Live Load (psf)	17
3.5 - Ground Snow Load (psf)	17
3.6 - Ultimate Wind Speed (mph)	18
3.7 - Seismic Site Class	18
3.8 - Seismic Design Category	18
3.9 - Primary Horizontal Gravity System	18
3.10 - Primary Vertical Gravity System	20
3.11 - Primary Lateral System	21
3.12 - Podium	22
3.13 - Allowable Soil Bearing Pressure (psf)	23
3.14 - Foundation Type	24

4.0 - Global Warming Potential Data	25
4.1 - LCA Tool	25
4.2 - Year LCA was Performed	26
4.3 - Global Warming Potential (kg-CO2e)	26
4.4 - Building Substructure Components (check all that apply)	28
4.5 - Building Superstructure Components (check all that apply)	29
4.6 - Show Project GWP Intensity on dashboard for all signatory firms	30
5.0 - Structural Material Quantities (Optional)	31
5.1 - Material	31
5.2 - Type	31
5.3 - Quantity	33
5.4 - Portland Cement Content - pcy (Optional)	33
Appendix A - Glossary	34
AHJ	34
Embodied Carbon	34
Embodied Carbon Intensity	34
EPD	34
Expected Building Life	34
GWP	34
LCA	34
Appendix B - Finding GWP Using LCA Tools - Excluding Biogenic Carbon and Including Biogenic Carbon	36
Tally	36
SE 2050 ECOM Tool	37
One Click LCA	38
Athena Impact Estimator	39
Appendix C - Primary Building Use Classification	39
Appendix D - Enabling Project Import Spreadsheet	42

Introduction

The goal of this User Guide is to assist structural engineers and project team members in submitting project data to the SE 2050 Database as part of their SE 2050 Commitment. The Database is populated by users with inputs for Project Information and Global Warming Potential ([GWP](#)) Data. This Guide provides a definition for each Database entry field accompanied by notes to the User.

Due to the complexity of project-specific data, it is acknowledged that not all projects will have the ability to follow this User Guide exactly. Users are encouraged to fill out the Database fields to the best of their ability while maintaining the “spirit” of the intended definition.

More detailed information about performing Life Cycle Assessments ([LCA](#)) will be provided in the forthcoming *SE 2050 Database LCA Methodology Guide*, intended for publication in 2022. However, users are encouraged to begin performing Life Cycle Assessments and submit projects to the database as soon as possible using available resources, including the SE 2050 Embodied Carbon Order of Magnitude tool and other tools mentioned in this User Guide. The SE 2050 Beta Database allows users to easily update any project at any time when the design progresses or the LCA is refined.



SE 2050 Beta Database User Guide
This document

- General information about the use of the SE 2050 Beta Database
- Basic guidance on SE 2050 Beta Database project input parameters

Prestandard for Assessing the Embodied Carbon of Structural Systems for Buildings
Anticipated publication: Q2 2024

- Guidance on how materials should be quantified during building design and construction
- Guidance on how embodied carbon should be calculated and reported
- Define rules of comparison for structural systems based on embodied carbon

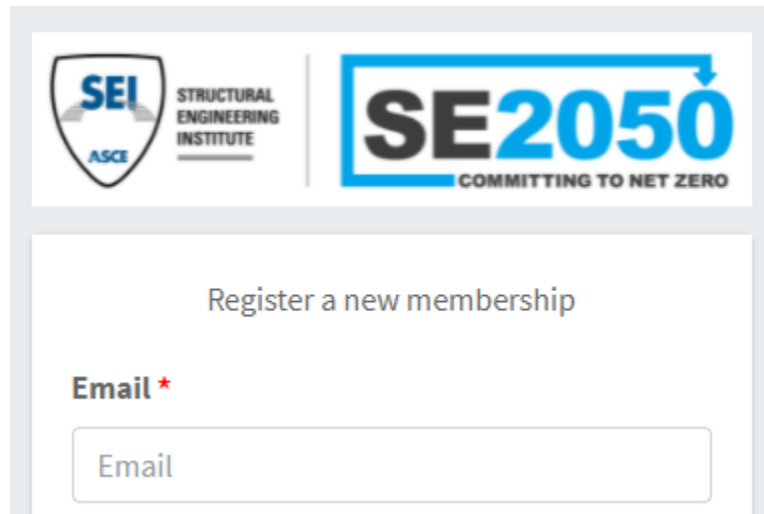
The User Guide has been written under the assumption that the project is located within the United States, and several database field descriptions are based on the most recent versions of International Building Code (IBC) and ASCE 7. While it is still encouraged that non-U.S. projects are added to the Database, this may require Users to determine appropriate equivalency to the Database entry fields.

This database would not exist without the participation and support of SE 2050 Signatory Firms. Your comments, questions, and suggestions are always welcome at database@se2050.org.

1.0 - Using the SE 2050 Database

1.1 - Accessing the Database

After a firm joins the SE 2050 Commitment Program, firm members may register for an SE 2050 Database user account here: <https://database.se2050.org>.



Upon registration, you will be assigned one of two user types:

User Type	Who	Privileges
Firm Admin	<ul style="list-style-type: none">- The designated Embodied Carbon Champion for each firm is a Firm Admin by default- Additional users as designated by an existing Firm Admin	<ul style="list-style-type: none">- Add new projects- <u>View</u> or <u>edit</u> data for any project submitted by the firm- Add new Firm Users- Upgrade a Firm User account to Firm Admin- Toggle Firm Users between Active/Inactive. This may be used, for example, if a Firm User leaves the firm. Projects created by a Firm User that becomes Inactive will still be associated with that Firm User, but the Inactive Firm User will not be able to access the SE 2050 Database. The Firm Admin can still edit or delete the Project.
Firm User	<ul style="list-style-type: none">- Any user with a company email may request a Firm User account and must be approved by a Firm Admin	<ul style="list-style-type: none">- Add new projects- <u>View</u> data for any project submitted by the user's firm- <u>Edit</u> data only for projects submitted by the user

1.2 - Dashboard

Once a registered account has been activated, Users may log in to the Database and access the SE 2050 Database Dashboard.



From the Dashboard, Users can see their User Type, how many projects they've added to the Database, how many projects their firm has added, and the Embodied Carbon Intensity Scatter Plot.

Navigation Pane

The Navigation Pane includes the following options:

- **Dashboard:** returns User to the Dashboard from any module
- **Firm Admin** (Available for Firm Admin user type only): List of all all Firm Admins in the Firm, *excluding the current user*
- **Firm Users** (Available for Firm Admin user type only): List of all Firm Users, *excluding Firm Admins*, with options to add new Firm Users, activate/deactivate Firm Users, or upgrade a Firm User to Firm Admin
- **Projects:** See [Projects](#)
- **Edit Profile:** User can edit their own name and email address
- **Change Password:** User will need to enter the current password and

Embodied Carbon Intensity Scatter Plot

This plot shows the Embodied Carbon Intensity for:

- Buildings submitted by the User's firm
- Buildings submitted by other firms that have been made public (see [Show Project GWP Intensity on dashboard for all signatory firms](#))

- CLF 2017 Benchmark Median Values, where available

Users can sort the data in three ways:

- By Primary Building Use Type
- By Number of Stories Above Grade
- By Gross Square Footage

The data can also be filtered by the "Date Range of Project Submission." As noted in the field, this date refers to the date the project was added to the Database, not the date of construction. The intent is to assist firms in verifying compliance with database submission requirements. This may also be accomplished using sorting tools on the [Projects](#) page.

1.3 - Projects

Navigate to the Projects page by clicking on "Projects" in the navigation pane. Here, Users can add a project, edit existing project data (subject to the limitations of the User Type), and view existing firm data.

The screenshot shows the SE2050 Projects page. At the top, there are five callout boxes: "Add a Project", "Import Projects", "Export Projects", "Project List", and "Edit or Delete a Project". Below these, the page layout includes a sidebar with a navigation menu (Dashboard, Projects, Edit Profile, Change Password), a header with "Logged In as: Firm User" and a "Logout" button, and a main content area. In the main content area, there are buttons for "Add Project" and "Import Projects", a "Show 10 entries" dropdown, and an "Export" button. Below these is a table with columns: Project Name, Building Use Type, Construction Type, LCA Tool, LCA Stages, Biogenic Carbon?, Gross Square Footage (ft²), GWP Intensity (kg-CO2e/m²), and Edit/Delete. The table contains one row of data. At the bottom right of the table, there are "Previous" and "Next" pagination buttons.

Project Name	Building Use Type	Construction Type	LCA Tool	LCA Stages	Biogenic Carbon?	Gross Square Footage (ft²)	GWP Intensity (kg-CO2e/m²)	Edit	Delete
CCCCOO	Education	New Construction	Athena IE	A1-A3,A4,A5,B1-B5,C1-C4	Yes	1000000	213.02		

Add Project

Click this to open the New Project page and add a new project. See User Guide section [2.0 - Project Information](#) for detailed guidance about each input parameter.

Import Projects

Click this to open the Import Project module:

Import Project

Please download the sample import file [here](#).

Select File *

Choose file



Browse

Import

Cancel

To import one or more projects using a macro-enabled spreadsheet (.xlsm), first download the sample import spreadsheet by clicking the link on the word “here.” The spreadsheet contains detailed instructions for properly filling out the spreadsheet and importing projects using either the .xlsm file. See [Appendix D - Enabling Project Import Spreadsheet](#) for information on enabling the macro-enabled spreadsheet.

All fields for a project must have an appropriate input value for the project to import successfully. The sample spreadsheet lists acceptable data types for each field, and in-cell data validation is used in most fields to limit potential import errors. The import spreadsheet also includes a macro which verifies that the input values have been entered correctly. If the macro finds invalid data, cells with invalid data are highlight red for the user to identify and correct. If all data is entered correctly, the macro will produce a note which states “NO INVALID DATA FOUND - OK TO UPLOAD”. Users are required to run the macro prior to importing the spreadsheet to the database.



SE 2050 Database Import Spreadsheet Template

General Information

- Always add project data beginning at Cell B38. Do not modify rows 1-37 or Column A; these are for information only.
- Gray cells in rows 25-37 indicate allowed inputs (bold) or allowed input types (italics) for each column. Deviating from the allowed inputs will cause an import error.
- Refer to the SE 2050 Database User Guide (se2050.org/se-2050-database/) for more information and clarification about all data fields

Entering Project Data without optional Structural Material Quantities

- Use one row per project; In each row, enter "Project" in Column B, and enter project data in columns C through BK

Entering Project Data with optional Structural Material Quantities

- Enter Project data similar to above; enter "Project" in Column B, and enter project data in columns C through BK in that row
- Following the initial Project row, use one row per material entry; enter "Material" in Column B in each row with a material, leave columns B through BK blank, and fill in columns BL through BO
- It is permissible to include projects with and without Structural Material Quantities in the same spreadsheet. Entering "Project" in Column B indicates a new project is starting

Validate data using the built-in macro

- If prompted with a security warning that macros have been disabled, click "Enable Macros." If prompted with "SECURITY RISK Microsoft has blocked macros...", right-click on the file in File Explorer, select Properties, and check the "Enable macros" box.

Importing data to the SE 2050 Database

- Save this file as .xlsm file type, close it, and log in to the SE 2050 Database (se2050.org/se-2050-database/)
- On the left navigation pane, select Projects, then click the "Import Projects" button near the top of the page
- Browse to find the saved .xlsm file, then click the "Import" button

Questions? Email: database@se2050.org

Click to Run Macro

REQUIRED: VALIDATE DATA PRIOR TO UPLOADING TO SE 2050 DATABASE

Validate Data



Data Type	Project Information							
N/A This column used for spreadsheet import only	Project Name	Address	City	State	Country	ZIP Code	Primary Building Use Type	Construction Type

After an import is attempted, a message will appear at the top of the screen indicating either that all projects were imported successfully or that certain projects were not imported successfully and which fields were not entered correctly.


Please contact database@se2050.org for any questions or to report unexpected behavior.

Project List

This list shows a select set of important project parameters for a user's projects. There are two ways to view all parameters for a project:

- Edit Project using the  (Edit) button
- Export Projects using the  button as described below


Additional Project List features:



- Sort the Project List by clicking on the up/down arrows  next to any column heading
- Filter the list by typing in the Search bar in the upper right corner of the Project List. This will search across all parameters shown on the list. To search or filter based on a specific parameter, we recommend exporting the full project list as an Excel spreadsheet and adding a filter to the header row of the spreadsheet.

Export Projects

This will export a complete list of project fields to an Excel (.xlsx) file for all of the projects that a user has access to ([see 1.1 - Accessing the Database](#) for more information about User permissions).


Edit Project

Project data may be edited at any time by any user that has the required permission ([see 1.1 - Accessing the Database](#) for more information about User permissions). To begin editing, click on the  (Edit) button in the Project List. This will take you to the Edit Project page. This page is similar to the Add Project page, but all input fields will be prefilled with the current project data.

To make changes, edit any number of inputs, then click the  button at the bottom of the page to apply changes to the project. To return to the Projects page without saving changes, click the  button.


Delete Project

A project may be deleted at any time by any User that has the required permission to edit the project ([see 1.1 - Accessing the Database](#) for more information about user permissions). To

delete a project, click on the  (Delete) button in the Project List, then click "OK" when prompted by the popup to confirm the deletion. Once a project is deleted, it cannot be recovered.

2.0 - Project Information

Project Information inputs collect project-specific data not directly related to the GWP. The goal of collecting this data is to allow for the eventual development of industry-wide benchmarks and targets specific to relevant project parameters.

In the database, users can hover over the  icon next to input fields to view tooltips with descriptions of each input. The following sections provide a description of each input related to Project Information with notes to the User as appropriate.

2.1 - Project Name

Enter the name of the project, using the official project name at completion if known.

The Project Name, Address, City, and Zip Code are only used for project identification among users in your firm. It is permissible to enter "confidential" if this information is sensitive.

2.2 - Address

Enter the project street address or closest known address in the text box.

The Project Name, Address, City, and Zip Code are only used for project identification among users in your firm. It is permissible to enter "confidential" if this information is sensitive.

2.3 - City

Enter the name of the city where the project is located.

The Project Name, Address, City, and Zip Code are only used for project identification among users in your firm. It is permissible to enter "confidential" if this information is sensitive.

2.4 - State

Enter the two-letter abbreviation for the state where the project is located. For states or provinces in other countries, enter any appropriate abbreviation.

2.5 - Country

Enter the country where the project is located. Enter "United States" for projects in the United States (not US, USA, etc).

2.6 - Zip Code

Use 5-digit ZIP code for US addresses;

The Project Name, Address, City, and Zip Code are only used for project identification among users in your firm. It is permissible to enter "confidential" if this information is sensitive.

If the project is not in the United States:

Enter the relevant postal code for the country the project is in, or enter "00000" if no postal code is used.

2.7 - Primary Building Use Type

Select one of the following options using the dropdown:

Primary Building Use Type
<i>Input Options</i>
Office
Public Assembly
Education
Industrial
Mercantile
Multi-Family Residential
Warehouse
Other
Public Order and Safety
Single-Family Residential
Parking

Lodging
Health Care

For mixed-use buildings:

Select the use with the greatest floor area devoted to it.

What is the basis of this list of options?

Various building use classification systems were considered in creating the available list of options - primarily those used by the IBC and the Commercial Buildings Energy Consumption Survey (CBECS).

[Appendix C - Primary Building Use Classification](#) provides a comparison between these classification systems and includes references to further guidance if the proper classification is not clear.

2.8 - Construction Type

Select one of the following options using the dropdown:

Construction Type	
<i>Input Options</i>	<i>Description</i>
New Construction	<ul style="list-style-type: none"> - Brand new building on a greenfield or brownfield site - New building in the place of a demolished building if no existing elements are being reused - Horizontal expansion of an existing building in which there is very little structural interaction between the old and new buildings
Major Renovation of Existing Building: Vertical Expansion	<ul style="list-style-type: none"> - Vertical expansion of an existing building (new stories added on top of existing stories)
Major Renovation of Existing Building: Structural Retrofit	<ul style="list-style-type: none"> - Renovation that involves significant modifications to structural framing such that IEBC code is triggered (5% of mass, ...)
Major Renovation of Existing Building: Other	<ul style="list-style-type: none"> - Retrofitting for seismic or other hazards

A pure horizontal expansion of an existing building is generally considered New Construction.

The database is not currently intended for the following types of projects:

- Tenant improvement (TI) projects which primarily include modification to non-structural elements
- Infrastructure projects that are not similar to buildings
 - For example, a train station is an appropriate project type for the database, whereas a concrete gravity dam or highway should be excluded.
 - Future development to the Database is planned to incorporate infrastructure projects.

2.9 - Construction Year Completed (or Anticipated)

Enter the year when the contractor has completed or anticipates completing all work specified in the construction contract in accordance with the construction documents (specifications and drawings). All punch list work and final inspections have been completed (or are anticipated to be complete) at this time.

2.10 - Project Phase at LCA

Enter the phase of the project on which the LCA is based. Select one of the following options using the dropdown:

Project Phase at LCA	
<i>Input Options</i>	<i>Description</i>
Concept	The concept phase includes developing the building concept, investigating its feasibility, and proposing the concept to stakeholders to make a decision to develop the concept further.
Schematic	The schematic phase includes rough drawings or a narrative that illustrate the basic concepts of the building design which most often include spatial relationships as well as basic scale and forms the owner might desire. At this time, initial descriptions of the structural, mechanical, HVAC, plumbing and electrical, interior and exterior finishes and building site are often included. The schematic phase also includes initial cost estimates.
Design Development	The design development phase involves finalizing the building design and specifying items such as materials, window and door locations and general structural details.
Construction Documents	The construction document phase includes the development of final architectural, structural, civil, mechanical, and electrical drawings to be used for construction. These drawings are in greater detail than drawings produced during design development and typically include specifications for construction details and materials.
Construction	The contractor constructs the building in accordance with the construction documents during the construction phase. The architect, engineers, and consultants perform quality control inspections, respond to Requests for Information (RFIs), review and approve technical submittals and generally ensure that the project is constructed by the contractor in accordance with the construction documents.
Completed	The contractor has completed the construction contract in accordance with the construction documents, and a Certificate of Occupancy has been issued.

2.11 - Expected Building Life (years)

Select one of the following options using the dropdown:

Expected Building Life (years)
<i>Input Options</i>
20
60
75
100

The expected building life is the period of time for which the building meets or exceeds its performance requirements. The expected building life is typically assumed by the designer based on the owner's project requirements. The expected building life selected should match the expected building life used within the LCA tool.

Additional guidance regarding Expected Building Life will be provided in the forthcoming SE 2050 LCA Methodology Guide. Unless specifically designed for a different building life, use 60 years as a default assumption.

2.12 - Gross Square Footage (ft²)

Gross square footage (or gross area) of a building shall represent the total horizontal area, measured in plan, taken to the outer edge of the exterior envelope. The area value reported shall be consistent with the architectural information of the project and follow a standard calculation method, such as those published by the Building Owners and Managers Association International (BOMA) for various building types. It is not recommended for structural engineers to calculate this value separately.

For renovation projects:

The gross area shall represent the total area of the existing building being renovated/retrofitted and any new area added.

2.13 - Mean Roof Height (feet)

Mean roof height shall match the quantity "h" per ASCE 7 wind loading provisions, measured from the base to the roof of the structure. For sloped roof structures, the average elevation of the roof shall be used to calculate "h". Parapets or other roof appendages shall not be included in roof height.

For renovation projects:

The roof height shall be that of the total completed building, including the existing structure and any additions.

2.14 - Number of Stories, Above Grade

Enter any non-negative number of above grade stories following ASCE 7, which defines a story above the grade plane as one in which “the floor or roof surface at the top of the story is more than 6 ft above grade plane or is more than 12 ft above the finished ground level at any point on the perimeter of the structure.” Small mezzanine areas that have floor areas of less than 10% of that of an adjacent floor shall not be counted in the total number of stories.

For renovation projects:

The number of stories shall be that of the total completed building, including the existing structure and any additions.

2.15 - Number of Stories, Below Grade

See 2.13 for definition of stories above grade. Stories below grade shall be any stories below those considered above grade.

3.0 - Structural System Information

3.1 - Typical Column Grid, Long Direction (feet)

Enter the center-to-center spacing of the project's typical column grid in the long direction. It is acknowledged that projects will have columns at some non-typical spacing. Engineers shall use judgment to establish what column grid represents a majority of the horizontal framing area of the building. The purpose of collecting this information is to understand how embodied carbon is related to span lengths due to changes in beam framing material quantities, so the users shall select a span value that is representative of the predominant framing configuration for their project. An average span may be used if the building has a very irregular column layout with no "typical" bays.

For light-frame floors (typically wood or cold-formed steel joists) supported by continuous walls:
Enter the typical joist span.

3.2 - Typical Column Grid, Short Direction (feet)

This quantity is defined as the center-to-center spacing of the project's typical column grid in the short direction. See 3.1 for additional information.

For light-frame floors (typically wood or cold-formed steel joists) supported by continuous walls:
Enter the typical joist spacing.

3.3 - Risk Category

Select the Risk Category as defined by ASCE 7.

3.4 - Typical Floor Live Load (psf)

Enter the typical design live load pressure in the occupied areas of the building in units of pounds per square foot (psf). As the building will have a variety of live load requirements, this value should represent the loading value that covers the majority of the building framing. Note that this floor live load shall represent the actual design load of the project, which may be greater than the code minimum live load values specified in ASCE 7 due to building-specific requirements.

3.5 - Ground Snow Load (psf)

Ground snow load shall match the value of p_g as defined by ASCE 7. The reported value shall represent the actual value used for the project, which may be greater than minimum values in

ASCE 7, based on specific requirements for the project or as required by the AHJ. For projects in which snow loads were not considered, a value of 0 shall be entered.

3.6 - Ultimate Wind Speed (mph)

Wind speed defined as V per ASCE 7. The reported value shall represent the actual value used for the project, which may be greater than minimum values in ASCE 7, based on specific requirements for the project as required by the AHJ.

3.7 - Seismic Site Class

Classification of site according to soils per ASCE 7.

3.8 - Seismic Design Category

Classification based on risk category and design earthquake level of the site per ASCE 7

3.9 - Primary Horizontal Gravity System

Select the option that best represents the building's primary horizontal gravity framing system based on the following system descriptions:

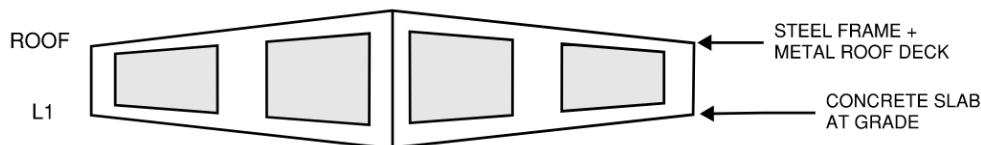
Primary Horizontal Gravity System	
<i>Input Options</i>	<i>Description</i>
Concrete: PT Framing	Concrete framing with PT tendons and mild reinforcing bars. Includes 2-way slab and 1-way with beams.
Concrete: Non-PT Framing	Cast-in-place concrete system with only mild reinforcing. Includes 2-way slab and 1-way with beams.
Concrete: Precast	System of precast elements. System may be prestressed and may include a concrete topping.
Concrete: Other	2/3 of the floor area is composed of a concrete framing system not listed above or a combination of different concrete framing systems.
Steel: Frame + Concrete on Metal Deck	Concrete or Composite slab on metal deck with steel supports, such as wide-flange beams or open web steel joists (OWSJ).
Steel: Frame + Bare Metal Deck	Steel framing members with bare metal deck. This system should be selected when a majority of the horizontal framing in the structure is metal roof deck.
Steel: Other	2/3 of the floor area is composed of a steel framing system not listed above or a combination of different steel framing systems.

Wood: Joists and Sheathing	Plywood or OSB decking supported by wood joists. Joists may be standard wood or engineered wood.
Wood: Engineered Panels	CLT, DLT, NLT, GLT or other engineered wood panels. May include concrete topping.
Wood: Other	2/3 of the floor area is composed of a wood framing system not listed above or a combination of different wood framing systems.
Other Material (not concrete, steel, or wood)	2/3 of the floor area is composed of a framing system not listed above.

For the SE 2050 database, the Primary Horizontal Gravity System is defined as the system comprising at least $\frac{2}{3}$ of the combined floor and roof area of the superstructure (excluding the slab at grade). The slab at grade is considered part of the substructure, regardless of whether the slab bears on soil or is designed as a suspended slab. See guidance examples below:

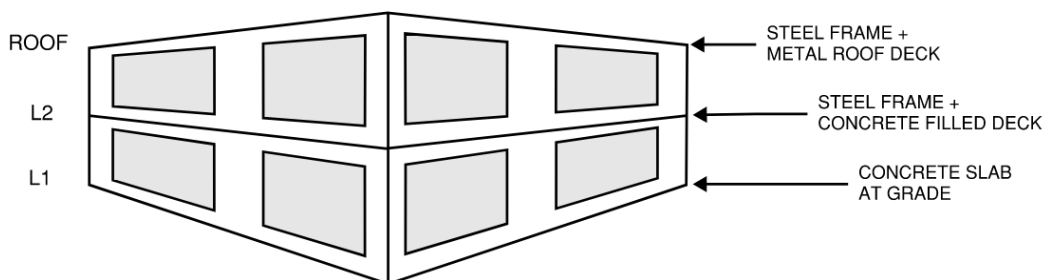
For a one story building with a concrete slab at grade and a steel frame with bare metal deck roof:

Select “Steel: Frame + Bare Metal Deck Roof” regardless of the type of slab at grade.



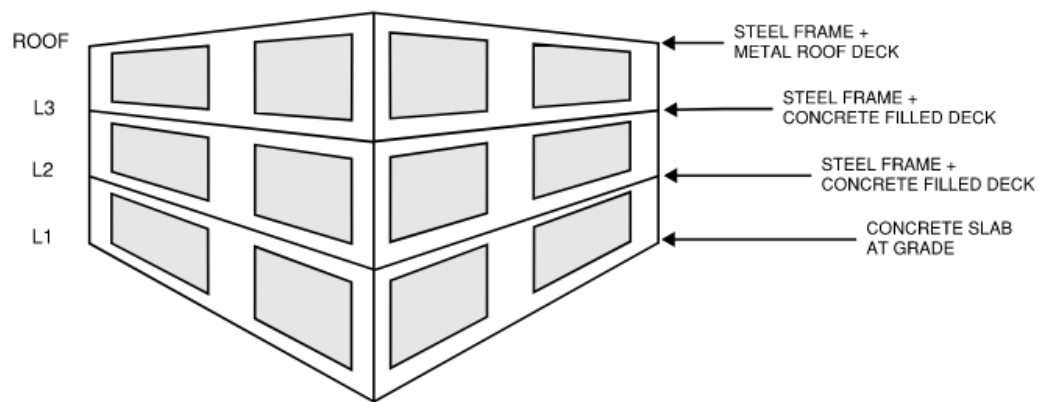
For a two-story building with a concrete slab at grade, steel frame with concrete filled metal deck floor at Level 2, and steel frame with metal deck roof:

Select “Steel: Other” because approximately 50% of the combined elevated floor and roof area is concrete filled metal deck and 50% is bare metal deck.



For a three-story building with a concrete slab at grade, steel frame with concrete filled metal deck floor at Levels 2 and 3, and steel frame with metal deck roof:

Select “Steel: Frame + Concrete on Metal Deck” because approximately $\frac{2}{3}$ of the combined elevated floor and roof area is concrete filled metal deck, and this meets the $\frac{2}{3}$ threshold.



For a structure that includes multiple materials, with no system making up more than $\frac{2}{3}$ of the superstructure floor area:

Select the “Other” category associated with the material that makes up the most superstructure floor area.

3.10 - Primary Vertical Gravity System

Select the option that best represents the building’s primary vertical gravity framing system based on the following system descriptions:

Primary Vertical Gravity System	
Input Options	Description
Concrete: CIP	Cast-in-place concrete columns and walls
Concrete: Precast	Precast concrete columns and walls
Concrete: Other	Other Concrete Vertical Gravity System
Steel: Columns	Steel wide flange or rectangular, square, or round hollow structural section columns
Steel: Cold-Formed	Cold-formed steel columns and/or Light-frame cold-formed steel bearing walls
Steel: Other	Other Steel Vertical Gravity System
Wood: Mass Timber	Mass or heavy timber columns, e.g. Glulam
Wood: Light-Frame	Light-Frame wood bearing walls
Wood: Other	Other Wood Vertical Gravity System

Masonry	Masonry columns and/or bearing walls
---------	--------------------------------------

For mixed vertical systems, the guidelines for selection of the horizontal system also apply.

3.11 - Primary Lateral System

Select the option that best represents the building's primary lateral framing system based on the following system descriptions:

Primary Lateral System	
<i>Input Options</i>	<i>Description</i>
Concrete: Shear Walls	CIP or Precast Shear Walls
Concrete: Moment Frames	CIP or Precast Concrete Moment Frames
Concrete: Other	Other, including concrete cantilevered columns, or multiple steel systems including all-steel dual systems
Steel: Braced Frames	Steel braced frame, including buckling restrained braces (BRB)
Steel: Moment Frames	Steel moment frames
Steel: Other	Other, including steel plate shear walls, steel cantilevered columns, or multiple steel systems including all-steel dual systems
Light Frame Shear Panels	Wood or cold formed walls with shear panels such as plywood or OSB
Masonry: Shear Walls	Masonry Shear Walls
Wood: Shear Panels	Engineered wood shear panels, including CLT
Wood: Other	Other, including wood cantilevered columns or light-framed walls with shear panels of non-wood materials
Other	Material not listed above, or no single material predominates (includes Dual Systems with multiple materials)

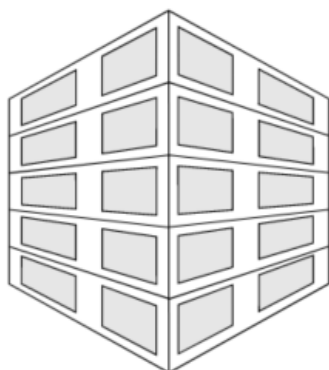
For mixed lateral systems, the guidelines for selection of the horizontal system also apply.

3.12 - Podium

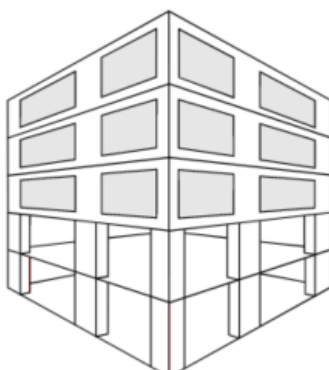
Select one of the following options using the dropdown:

Podium	
<i>Input Options</i>	<i>Description</i>
Not a Podium Building	Select this if the building does not have a podium (see definition below).
Primary System Defined Above is On a Podium	Select this when the majority of floors in the <i>superstructure</i> (excluding slab at grade - see Section 4.4) are above the podium.
Primary System Defined Above is a Podium	Select this when the majority of floors in the <i>superstructure</i> (excluding slab at grade - see Section 4.4) are a part of the podium.

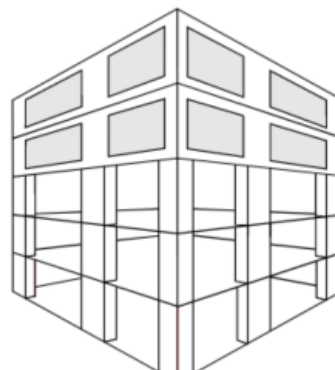
A podium building is one that is split vertically into two distinct zones with different structural systems and/or materials. One common example of this type of building is a residential structure comprising several stories of light wood framing over one or two levels of concrete framing.



Not a Podium Building



Primary System Defined Above is On a Podium



Primary System Defined Above is a Podium

Although it would be interesting and potentially beneficial for benchmarking purposes for the user to enter separate building information and GWP data for each system in a podium building, the SE 2050 Database does not have this feature currently. Furthermore, it may be more onerous on the user in many cases to split up the GWP attributed to the podium portion versus non-podium portions of the building.

Therefore, at this time, the user should select as the “primary” structural system whichever system is used for the majority of superstructure floors. By including this question in the SE 2050 Database, it will be possible to distinguish buildings that are generally one system (per the rules established in [Section 2.23](#)) from those that have multiple distinct systems.

If the number of podium and non-podium superstructure floors are equal:

Select the non-podium system as the “primary” system.

Should I enter the GWP for only the “primary” structural system?

No - always enter the GWP for the entire building structure, regardless of the structural system defined as “primary.” This is because the podium design is still affected by the structure above and the foundation carries the load of both the podium and non-podium. Entering a fictitious structure with inherent incongruencies is likely to be more misleading than entering complete building information with identifiers for it to be easily set apart in future data analysis.

3.13 - Allowable Soil Bearing Pressure (psf)

Enter the allowable soil bearing pressure in pounds per square foot (psf), selecting from one of the following:

Allowable Soil Bearing Pressure (psf)
<i>Input Options</i>
2,000
3,000
4,000
5,000
6,000
7,000
8,000
9,000
10,000
15,000
20,000
30,000
40,000

The Allowable Soil Bearing Pressure represents the load the soil is capable of supporting without failure and without intolerable settlement of the structure and should be consistent with the value used for the design of foundations, whether from a site-specific geotechnical report or presumptive values found in the IBC.

If your project's allowable bearing pressure does not appear on this list:

Choose the value closest to your bearing pressure; round up as a tiebreaker

If your project has multiple bearing pressures at different locations on the site:

Use your judgment to input an approximate "weighted average" site bearing pressure based on the total weight supported at each .

Example:

2/3 of total building weight bears on shallow foundations with 6,000 psf allowable

1/3 of total building weight bears on shallow foundations with 8,000 psf allowable

Average: $0.67 \times 6000 + 0.33 \times 8000 = 6,660$ → Input **7,000 psf**

If your building is supported primarily on deep foundations:

Enter the allowable soil bearing pressure for shallow footings on the site, if known. Enter 2000 if unknown. Do not include the allowable bearing pressure or side friction for deep foundations.

3.14 - Foundation Type

Select the building's primary foundation type from one of the following options using the dropdown:

Foundation Type	
<i>Input Options</i>	<i>Description</i>
Shallow Foundations	Spread footings, strip foundations, mat foundations, or raft foundations
Deep Foundation < 50ft/15m	Foundation systems with overall depth (e.g. piles) < 50 feet or 15m
Deep Foundation > 50ft/15m	Foundation systems with overall depth (e.g. piles) > 50 feet or 15m
Other Foundation System	Other foundations

4.0 - Global Warming Potential Data

Global Warming Potential (GWP) Input Parameters collect project-specific GWP, or embodied carbon, data. The goal of collecting this data is to promote transparency among structural engineers throughout the industry. When combined with Project Input Parameters, the GWP Input Parameters will allow future analysis and trend-spotting within the Database.

The following sections provide a description of each GWP Input Parameter with notes to the User as appropriate.

4.1 - LCA Tool

Select the LCA tool that was used to calculate the GWP values reported.

LCA Tool	
<i>Input Options</i>	<i>Description</i>
Athena IE	Impact Estimator for Buildings, by the Athena Sustainable Materials Institute
Tally	Tally, by KT Innovations
One Click	One Click LCA, by Bionova Ltd
eTool	eTool, by eToolLCD
EC3	Embodied Carbon in Construction Calculator (EC3), by Building Transparency
Beacon	Beacon, by Thornton Tomasetti
Quartz	Quartz Common Products Database (note: no longer updated after January 2019)
Embodied Carbon Order of Magnitude (ECOM)	Embodied Carbon Rough Order of Magnitude, https://se2050.org/ecom-tool/
Environmental Product Declarations (EPDs)	Structural material quantities are used along with Environmental Product Declarations (EPDs) for individual materials to manually calculate a total Global Warming Potential
SimaPro	SimaPro, by PRé Sustainability
Other	If “Other” is selected, please specify the method used

Select “Other” if the tool used is not listed in the drop-down menu. Properly identifying which tool was used is critical to understand underlying assumptions, data sets, and methodologies

that led to the reported GWP value. It is recommended that engineers use one of the commercially-available LCA tools, as this will allow for some measure of consistency within a firm and allow for more rational comparisons across projects.

4.2 - Year LCA was Performed

Enter the year in which the LCA corresponding to the reported GWP values was completed. It is noted that projects may go through various iterations and LCA studies at intermediate stages, the year entered here shall represent the year that the reported GWP values are calculated.

4.3 - Global Warming Potential (kg-CO₂e)

Enter the GWP or Embodied Carbon value from the LCA software, tool, or spreadsheet for each life-cycle stage (A1-A3, A4, A5, B1-B2, C1-C6, D) included in the analysis. These values shall include the embodied GWP of the structural system, reported in units of kg of CO₂-equivalent (CO₂-e), for each life-cycle stage reported. At a minimum, the GWP value for life-cycle stage A1-A3 (also known as cradle-to-gate) must be reported, but we highly encourage reporting all applicable life-cycle stages included in the analysis. The “Total GWP (excluding D)” is automatically calculated in the database by adding the GWP values entered for life-cycle stages A1-A3, A4, A5, B1-B5, and C1-C4. Similarly, the “GWP Intensity (excluding D)” is automatically calculated in the database by dividing the value for the above-mentioned Total GWP (excluding D) by the Gross Square Footage value entered by the user.

Some LCA tools allow the user to select whether biogenic carbon is included in the calculation of the Total GWP value. The user may enter GWP results for data sets “Excluding Biogenic” carbon, “Including Biogenic” carbon, or both. Users are required to enter at least the “Excluding Biogenic” value for life-cycle stage A1-A3, but we highly encourage users to fill out the complete table for all results available, as this will help SE 2050 better understand and derive meaningful insights from the data in the database.

[Appendix B](#) provides clarification about how to obtain the LCA data required by SE 2050 from various LCA tools.

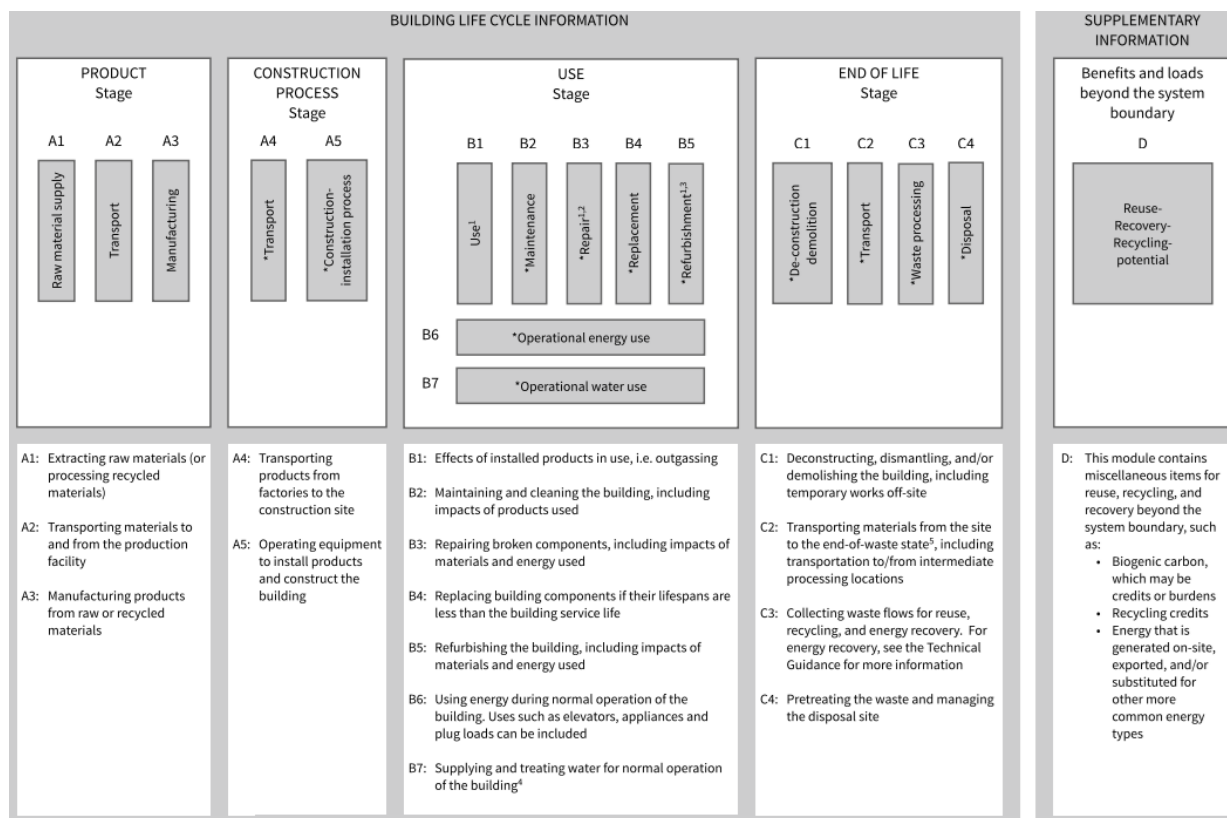
Global Warming Potential (kg CO₂e)

	Excluding Biogenic ¹	Including Biogenic ¹	
A1-A3 *	<input type="text"/>	<input type="text"/>	kgCO ₂ e
A4	<input type="text"/>	<input type="text"/>	kgCO ₂ e
A5	<input type="text"/>	<input type="text"/>	kgCO ₂ e
B1-B5	<input type="text"/>	<input type="text"/>	kgCO ₂ e
C1-C4	<input type="text"/>	<input type="text"/>	kgCO ₂ e
D	<input type="text"/>	<input type="text"/>	kgCO ₂ e
Total GWP (excluding D)	<input type="text"/>	<input type="text"/>	kgCO ₂ e
GWP Intensity(excluding D)	<input type="text"/>	<input type="text"/>	kgCO ₂ e/m ²

User entered

Calculated by database

The following figure describes the LCA stage(s) for which users can report GWP data:



Source: The Carbon Leadership Forum, "Life Cycle Assessment of Buildings: A Practice Guide," (Figure 4. Standard life cycle stages and modules, adopted from EN 15978), University of Washington, June 2018.

<https://www.carbonleadershipforum.org/wp-content/uploads/2018/06/CLF-LCA-Practice-Guide-v1.0-2018-06-28.pdf>

If your LCA Tool is Environmental Product Declarations (EPDs), EC3, or ECOM:

Enter GWP value for only the A1-A3 option (Excluding Biogenic). For other LCA Tools, refer to the tool's user documentation or detailed results for more specific guidance about the LCA stages included.

If your LCA tool includes some of the “B” stages, but not all of B1-B5:

Enter GWP value for the B1-B5 option (and other options that apply). Similarly, enter GWP for the C1-C4 option if your LCA tool includes some but not all of the “C” stages.

4.4 - Building Substructure Components (check all that apply)

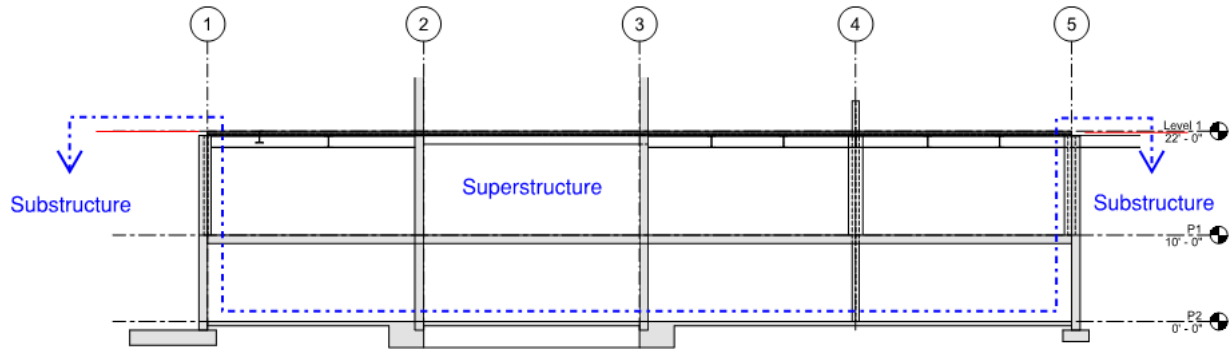
Select the building substructure component(s) included in the LCA from the following options:

Building Substructure Components	
<i>Input Options (multi-select)</i>	<i>Description</i>
Deep Foundation	Drilled pile, driven pile, caisson, auger cast pile, pressure injected footing (PIF), load bearing element (LBE)
Shallow Foundation	Spread footing, mat/raft foundation, pile cap, grade beam
Slabs [slab at grade only; see diagram below]	Framed (mild reinforcing), framed (PT), slab on grade, topping slab
Walls	Retaining wall, basement wall, frost/stem wall, permanent earth support wall
Other: Embedded Steel Elements	Embedded steel elements, temporary earth retaining wall, ground improvement, rigid/geo foam
Other: Temporary Earth Retaining	Temporary earth retaining wall
Other: Ground Improvement	Ground improvement
Other: Rigid/Geo Foam	Rigid/geo foam

Note:

A warning is triggered if either Deep Foundation or Shallow Foundation are not selected.

The component “Slab” listed above refers only to the lowest level slab, which may either bear on soil or be designed as a suspended slab. See figure below for delineation of substructure and superstructure components.



4.5 - Building Superstructure Components (check all that apply)

Select the building superstructure component(s) included in the LCA from the following options:

Building Superstructure Components	
<i>Input Options (multi-select)</i>	<i>Description</i>
Columns	Column, built-up column, composite column
Beams	Beam, built-up beam, truss, open web joist
Slab/Deck	Suspended slab (mild reinforcing), suspended slab (PT), bare metal deck, metal deck with concrete topping, plank and decking, topping
Bracing	Vertical bracing, horizontal bracing
Walls	Bearing wall, shear wall, sandwich wall
Other: Anchor Rods, Bolts, Nuts and Washers	Anchor rods, bolts, nuts and washers
Other: Nails, Screws and Connections	Nails, screws, and connectors
Other: Screen Wall and Canopy Framing	Screen wall and canopy framing
Other: Stair Framing	Stair framing
Other: Connection Steel	Shear tabs, column base plates, bearing angles/plates, gusset plates, wood hangers, knife plates, etc.
Other: Miscellaneous Steel	Pour stops, beam penetration reinforcement, web stiffeners, etc.

Note:

A warning is triggered if Slab/Deck is not selected.

A warning is triggered if either Columns or Walls are not selected.

4.6 - Show Project GWP Intensity on dashboard for all signatory firms

Select either “Yes” or “No” per the following description

Show Project GWP Intensity	
<i>Input Options</i>	<i>Description</i>
Yes	The Embodied Carbon Intensity for this building will be visible as a plot point on the Embodied Carbon Intensity Scatter Plot for all users of the SE 2050 Database. No other project data will be visible to database users outside of your firm.
No	No information about this building will be visible to other database users outside of your firm.

Regardless of project visibility, all data entered into the spreadsheet may be used in accordance with the SE 2050 Beta Database User Agreement. Please refer to se2050.org/se-2050-database/ for more information regarding the individuals and organizations that will have access to the data in the database.

5.0 - Structural Material Quantities (Optional)

After the user has entered the required project information in accordance with Sections 2 through 4 above, the user has the option to enter Structural Material Quantities corresponding to the project. The input of Structural Material Quantities will help tracking embodied carbon impacts of structural building systems as well as comparing material efficiencies.

5.1 - Material

Select the Material from the following options:

Material
<i>Input Options</i>
Concrete
Steel Reinforcement
Masonry
Steel
Timber

5.2 - Type

Enter the material Type from the following options:

Concrete	
<i>Input Options</i>	<i>Units</i>
2500 PSI	Cubic Yards
3000 PSI	Cubic Yards
4000 PSI	Cubic Yards
5000 PSI	Cubic Yards
6000 PSI	Cubic Yards
8000 PSI	Cubic Yards

3000 PSI LW	Cubic Yards
4000 PSI LW	Cubic Yards
5000 PSI LW	Cubic Yards

Note:

LW stands for lightweight concrete.

Steel Reinforcement	
<i>Input Options</i>	<i>Units</i>
Rebar	Tons
Welded Wire Reinforcement	Tons
Post Tensioning	Tons

Masonry	
<i>Input Options</i>	<i>Units</i>
Normal Weight Masonry Block	Tons
Light Weight Masonry Block	Tons
Masonry Grout	Cubic Yards
Mortar	Cubic Yards

Steel	
<i>Input Options</i>	<i>Units</i>
Rolled Steel Shapes	Tons
Plate Steel Fabrications	Tons
Tube Steel (HSS)	Tons
Open Web Steel Joists	Tons
Steel Deck	Tons

Cold Formed Metal Framing	Tons
---------------------------	------

Timber	
<i>Input Options</i>	<i>Units</i>
Softwood Lumber	Cubic Feet
Softwood Plywood	Cubic Feet
Glulam	Cubic Feet
Cross Laminated Timber	Cubic Feet
Laminated Veneer Lumber	Cubic Feet
Wood I Joists	LBS

5.3 - Quantity

Enter any non-negative number for the structural material quantity. See tables above in Section 5.2 for the units associated with each material Type.

5.4 - Portland Cement Content - pcy (Optional)

If structural material quantities are reported for concrete, enter any non-negative number for the portland cement content for each concrete Type. The Portland cement content is reported in units of pounds per cubic yard (pcy) and is an optional input.

Appendix A - Glossary

AHJ

The Authority Having Jurisdiction, or the AHJ, is an organization, office, or individual responsible for enforcing the requirements of a code or standard.

Embodied Carbon

Embodied carbon is the sum of greenhouse gas emissions released throughout the following life-cycle stages: raw material extraction, transportation, manufacturing, construction, maintenance, renovation, and end-of-life for a product or system. It is reported in terms of GWP and units of kilograms of carbon dioxide equivalent (kg-CO₂e).

Embodied Carbon Intensity

Embodied carbon intensity is the total embodied carbon of a building divided by the building floor area. In accordance with international whole building life-cycle assessment standards, it is reported in units of kilograms of carbon dioxide equivalent per square meter (kg-CO₂e/m²).

EPD

An Environmental Product Declaration, or EPD, is a document that provides information about the life-cycle environmental impact of products or materials. EPDs are based on ISO 14025 and require third party verification. While EPDs often only report A1-A3 environmental impacts, they should be used within consideration of the full life-cycle impact of products.

Expected Building Life

The expected building life is the period of time for which the building meets or exceeds its performance requirements. It may also be known as a building's service life.

GWP

Global Warming Potential, or GWP, is the aggregation of various greenhouse gas emissions based on their relative global warming potential standardized to that of carbon dioxide. It is reported in units of kilograms of carbon dioxide equivalent (kg-CO₂e).

LCA

Life-Cycle Assessment, or LCA, is a method used to determine the potential environmental impacts over the life-cycle of a given material or product. When performed at the building level,

this is referred to as a Whole-Building Life-Cycle Assessment (WBLCA). LCA is performed according to ISO 14040 and ISO 14044 using commercially available software.

Appendix B - Finding GWP Using LCA Tools - Excluding Biogenic Carbon and Including Biogenic Carbon

This section aims to help users identify, for a few common LCA tools, which numbers to report in the Global Warming Potential Input fields for each life-cycle stage.

Tally

When saving a report from Tally, it is highly recommended to check the option to save the output as a spreadsheet in addition to the pdf report. The GWP values shown alongside the various graphical outputs in the .pdf report may differ from the GWP value that should be used for input to the database, for various reasons that are outside the scope of this User Guide. Therefore, it is highly recommended that the user save the output as a spreadsheet and find the values under *Sum of Global Warming Potential Total (kgCO₂eq)* on the sheet labeled “Life Cycle Stage” in Column D as shown below:

Row Labels	Sum of Acidification Potential Total (kgSO ₂ eq)	Sum of Eutrophication Potential Total (kgNeq)	Sum of Global Warming Potential Total (kgCO ₂ eq)	Sum of Ozone Depletion Potential Total (CFC-11eq)	Sum of Smog Formation Potential Total (kgO ₃ eq)	Sum of Primary Energy Demand Total (MJ)	Sum of Renewable Energy Demand (MJ)
[A1-A3] Product	6,561.71	440.03	1,458,517.97	3.87E-02	77,233.98	23,056,163.16	
[A4] Transportation	90.86	7.40	19,609.06	6.72E-10	3,002.41	285,157.43	
[B2-B5] Maintenance and Replacement	5,356.66	546.17	1,355,457.43	3.09E-02	77,547.13	25,351,153.73	
[C2-C4] End of Life	226.90	23.78	55,249.10	2.90E-06	4,105.68	747,561.46	
[D] Module D	-1,964.57	-50.67	-540,093.87	2.08E-03	-20,030.47	-6,194,637.84	
Grand Total	10,271.56	966.71	2,348,739.69	7.17E-02	141,858.73	43,245,397.94	

On the “Life Cycle Stage” tab of the output spreadsheet, GWP values are broken down by life cycle stage.

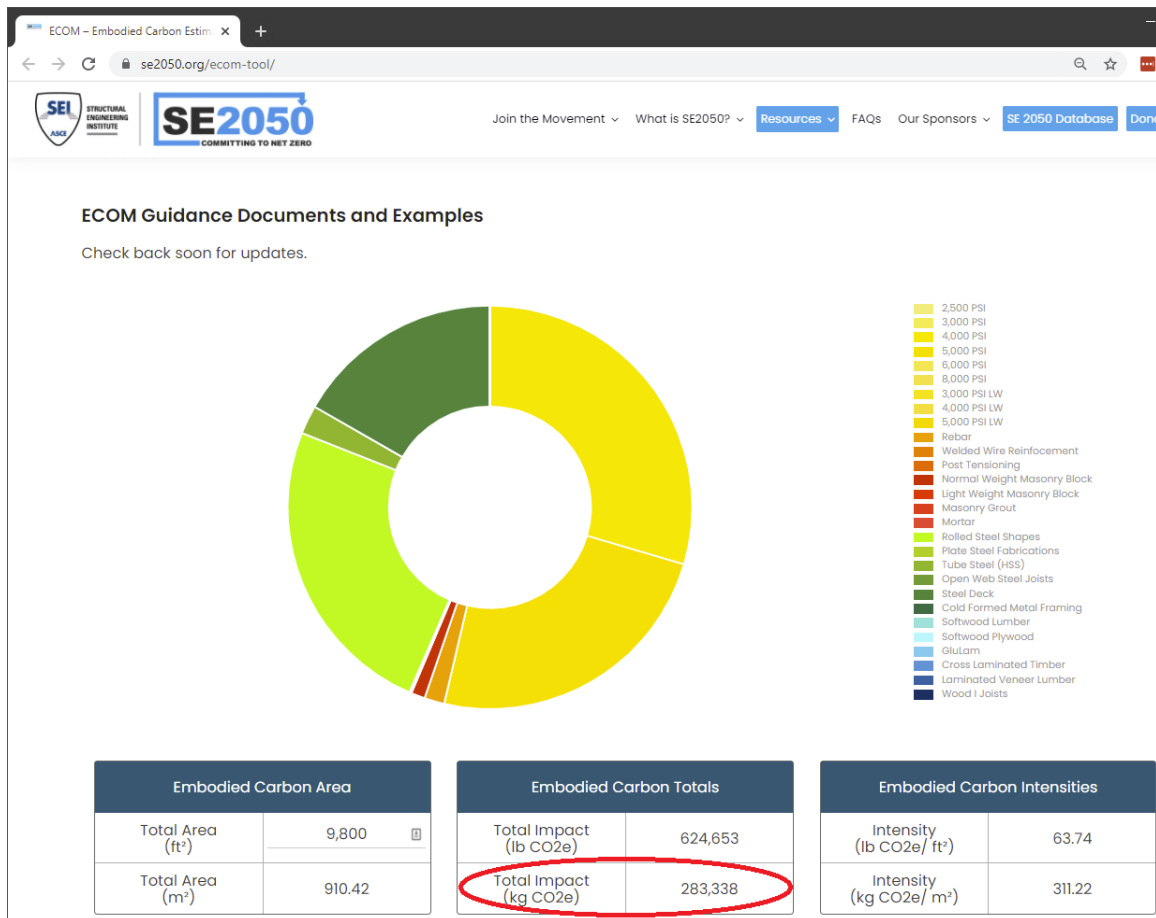
Notes:

- Enter the Tally GWP value for “[B2-B5]” into the SE 2050 database field “B1-B5”
- Enter the Tally GWP value for “[C2-C4]” into the SE 2050 database field “C1-B4”
- The Report Summary tab of the output spreadsheet indicates whether the data in the spreadsheet is from an LCA with biogenic carbon included or excluded. We encourage Tally users to run the LCA twice and to report both the “Excluding Biogenic” and “Including Biogenic” data to the SE 2050 Database.

	A	B
1	Tally Version	Trial Version 2023.09.13.01
2		
3	Author	SE 2050 User
4	Company	SE 2050 Signatory Firm
5	Date	10/17/2023
6		
7	Project	New Building
8	Location	West Branch MI
9	Gross Area	2950 ft ²
10	Building Life	60 years
11		
12	Boundaries	Cradle to grave, inclusive of biogenic carbon
13		
	Report Summary	Revit model Life Cycle Stage Stage-Division Stage-Category

SE 2050 ECOM Tool

The GWP is found where shown in the screenshot below and only includes life-cycle stages A1-A3. Only enter this value in the input field for life-cycle stage A1-A3 for data “Excluding Biogenic” carbon.



One Click LCA

When using One Click LCA, the amount of embodied carbon for each of the life-cycle stage is included in the results summary. OneClick LCA offers multiple LCA options that affect how biogenic carbon is presented in the results. Please refer to OneClick LCA product documentation for more information about the reporting of biogenic carbon.

Whole-building Life Cycle Assessment, ISO 14040 & ISO 14044 (TRACI 2.1.) [Download Results Summary](#)

Result category	Global warming kg CO2e ⓘ	Ozone Depletion kg CFC11e ⓘ	Acidification kg SO2e ⓘ	Eutrophication kg Ne ⓘ	Formation of tropospheric ozone kg O3e ⓘ	Depletion of nonrenewable energy MJ	Biogenic carbon storage kg CO2e bio ⓘ
A1-A3 ⓘ Construction Materials	743,355.38	0.01	1,803	7,933.2	58,701.99	5,958,958.88	0 Details
📦 A4 ⓘ Transport to the building site	16,961.85	0	52.46	12.4	1,217.54	337,392.68	Details
📦 B3 ⓘ Repair	0	0	0	0	0	0	Details
📦 B4-B5 ⓘ Material replacement and refurbishment	1,980.83	0	25.85	50.98	244.67	57,342.41	Details
📦 C1-C4 ⓘ End of life	12,027.74	0	28.31	7.76	234.74	53,141.59	Details
Total	774,325.77	0.02	1,909.42	8,004.34	60,398.94	6,406,835.57	0
Results per denominator							
Gross Internal Floor Area (ASHRAE) 70000.0 sq ft	11.06	0	0.03	0.11	0.86	91.53	0

Please note. The following LCA or EPD standards are all fully compliant with the requirements of ISO 14044: ISO 14025, ISO 21930, EN15804. Assessment period fixed to 80 years.

Athena Impact Estimator

After running your model, choose “detailed measure by life cycle stage” from the report tab. Here you will find the embodied carbon values for each life-cycle stage in the Global Warming Potential row.

		PRODUCT (A1 to A3)			CONSTRUCTION PROCESS (A4 & A5)			USE (B2, B4 & B6)				END OF LIFE (C1 to C4)		
LCA Measures	Unit	Manufacturing	Transport	Total	Construction-Installation Process	Transport	Total	Replacement-Manufacturing	Replacement-Transport	Operational Energy Use Total	Total	Deconstruction, Demolition, Disposal & Waste Processing	Transport	Total
Global Warming Potential	kg CO2 eq	2.79E+03	5.48E+01	2.84E+03	2.48E+02	1.18E+02	3.66E+02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.36E+02	5.70E+01	1.93E+02
Acidification Potential	kg SO2 eq	7.34E+00	6.35E-01	7.97E+00	1.92E+00	1.14E+00	3.06E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.95E+00	5.48E-01	2.49E+00
HH Particulate	kg PM2.5 eq	1.90E+00	2.77E-02	1.92E+00	1.33E-01	6.27E-02	1.95E-01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	4.77E-02	3.04E-02	7.81E-02
Eutrophication Potential	kg N eq	3.19E+00	3.93E-02	3.23E+00	2.57E-01	7.07E-02	3.27E-01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.22E-01	3.41E-02	1.56E-01
Ozone Depletion Potential	kg CFC-11 eq	7.00E-05	2.01E-09	7.00E-05	3.50E-06	4.12E-09	3.51E-06	0.00E+00	0.00E+00	0.00E+00	0.00E+00	5.94E-09	1.99E-09	7.93E-09
Smog Potential	kg O3 eq	1.34E+02	2.04E+01	1.54E+02	5.83E+01	3.59E+01	9.42E+01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	6.47E+01	1.73E+01	8.20E+01
Total Primary Energy	MJ	1.66E+04	7.83E+02	1.74E+04	2.45E+03	1.72E+03	4.16E+03	0.00E+00	0.00E+00	0.00E+00	0.00E+00	2.03E+03	8.31E+02	2.86E+03
Non-Renewable Energy	MJ	1.59E+04	7.83E+02	1.66E+04	2.41E+03	1.72E+03	4.12E+03	0.00E+00	0.00E+00	0.00E+00	0.00E+00	2.03E+03	8.31E+02	2.86E+03
Fossil Fuel Consumption	MJ	1.47E+04	7.81E+02	1.55E+04	2.35E+03	1.71E+03	4.06E+03	0.00E+00	0.00E+00	0.00E+00	0.00E+00	2.02E+03	8.29E+02	2.85E+03

Biogenic carbon for biobased products is found in Module D in Athena IE, but non-biogenic emissions that are deemed outside the building boundary can also be found in Module D. If the user wants to report biogenic carbon, it would be best to see the Athena IE User Guide to understand treatment of biogenic carbon to learn how to isolate the value for reporting to the SE 2050 database.

Appendix C - Primary Building Use Classification

Various building use classification systems were considered in creating the available list of options - primarily those used by the International Building Code (IBC), and the Commercial Buildings Energy Consumption Survey (CBECS).

The table below can be used to aid in mapping SE 2050 Use Types to IBC. CBECS is also shown for reference:

Building Use: Mapping SE 2050 to Other Categorization Systems		
SE 2050	IBC	CBECS
Office	Business	Office
Public Assembly	Assembly	Public Assembly Religious Worship
Education	Educational	Education
Industrial	Factory and Industrial	N/A
Mercantile	Mercantile	Mercantile (Enclosed and Strip Malls) Mercantile (Retail Other Than Mall) Food Sales Food Service
Multi-Family Residential	Residential	N/A
Warehouse	Storage	Warehouse and Storage
Other	Utility and Miscellaneous; High Hazard	N/A
Public Order and Safety	Institutional	Public Order and Safety
Single-Family Residential	Residential	N/A
Parking	Storage	N/A
Lodging	Residential	Lodging
Health Care	Institutional	Health Care (Inpatient) Health Care (Outpatient)

The table below can be used to aid in mapping IBC Use Types to SE 2050 Use Types. CBECS is also shown for reference:

Building Use: Mapping IBC to SE 2050 to CBECS		
IBC	SE 2050	CBECS
Assembly	Public Assembly	Public Assembly Religious Worship
Business	Office	Office
Educational	Education	Education
Factory and Industrial	Industrial	N/A
High Hazard	Other	N/A
Institutional	Public Order and Safety	Public Order and Safety;
	Health Care	Health Care (Inpatient); Health Care (Outpatient)
Mercantile	Mercantile	Mercantile (Enclosed and Strip Malls); Mercantile (Retail Other Than Mall); Food Sales; Food Service;
Residential	Single-Family Residential	N/A
	Multi-Family Residential	N/A
	Lodging	Lodging
Storage	Warehouse	Warehouse and Storage
	Parking	N/A
Utility and Miscellaneous	Other	N/A

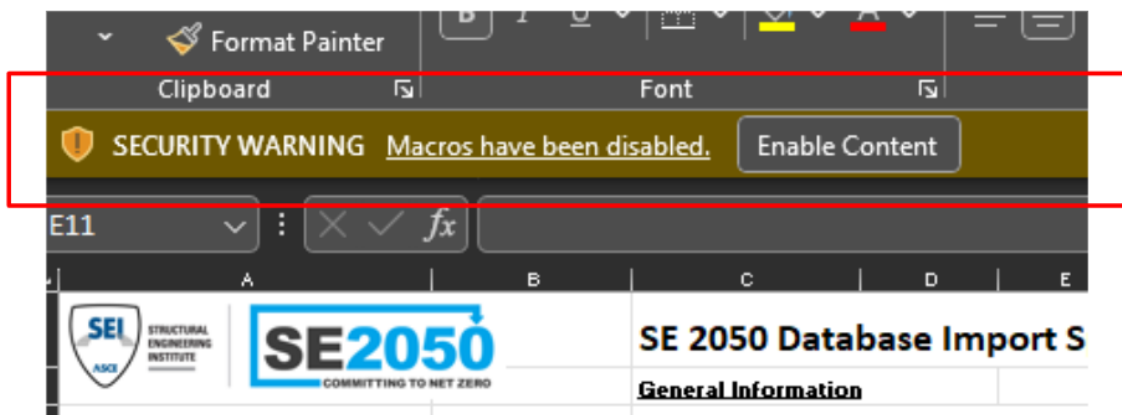
For additional background in building use types, refer to the following sources:

- International Building Code 2018 - Building Code Chapter 3: Occupancy Classification and Use
- Commercial Buildings Energy Consumption Survey (CBECS)
<https://www.eia.gov/consumption/commercial/building-type-definitions.php>

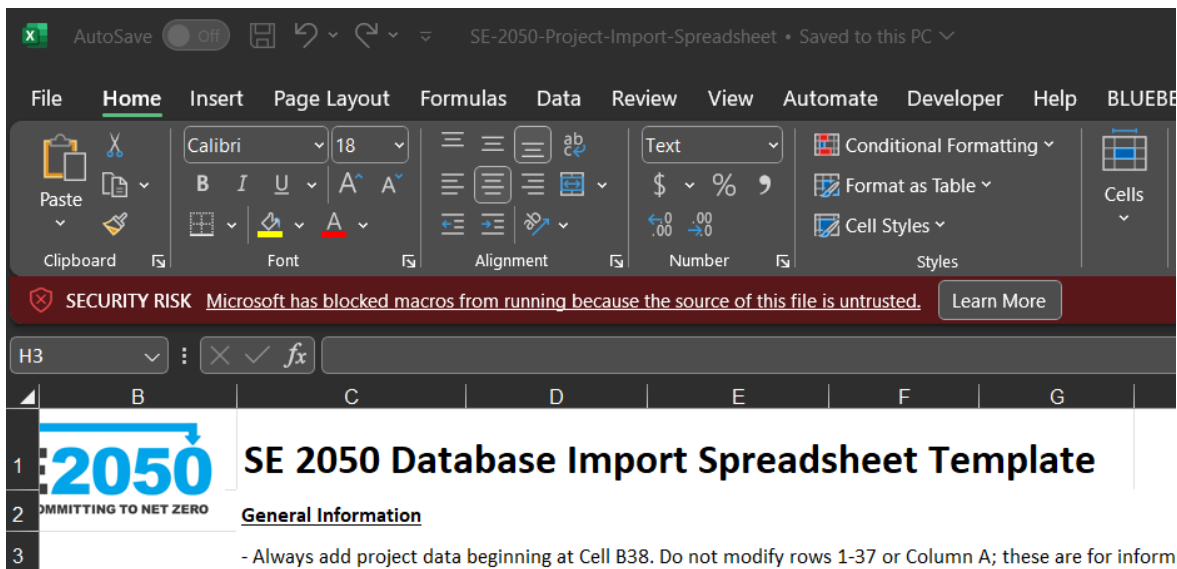
Appendix D - Enabling Project Import Spreadsheet

The Project Import Spreadsheet is a macro-enabled spreadsheet which may trigger security warnings when downloaded from the database. Some of the frequently encountered issues and solutions to grant access to the Project Import Spreadsheet are described below.

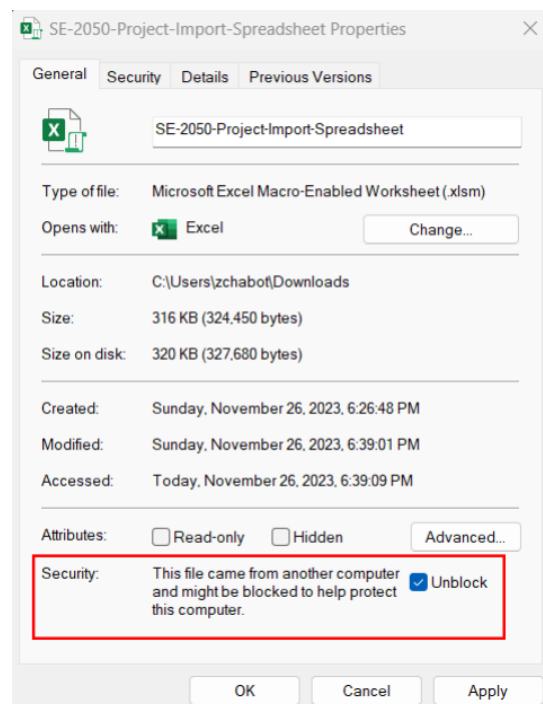
If prompted with a security warning that “Macros have been disabled”, select “Enable Macros” to permit use of the macro to verify data.



If prompted with a warning that states “SECURITY RISK Microsoft has blocked macros from running because the source of this file is untrusted”, the file has been blocked and the user needs to unblock the spreadsheet before it is opened.



The user needs to close the file and navigate to the file's location in File Explorer. Once the user has located the file, right-click on the file and select Properties from the drop-down menu. In the Security subsection of the General tab, check the box titled Unblock to permit access to the spreadsheet.



If the user cannot gain access to the Project Import Spreadsheet after following the steps above, the user may need to work with their companies and their IT representatives to grant access to the spreadsheet.

