Carbon Calculator
User Manual

Version 1.0.2

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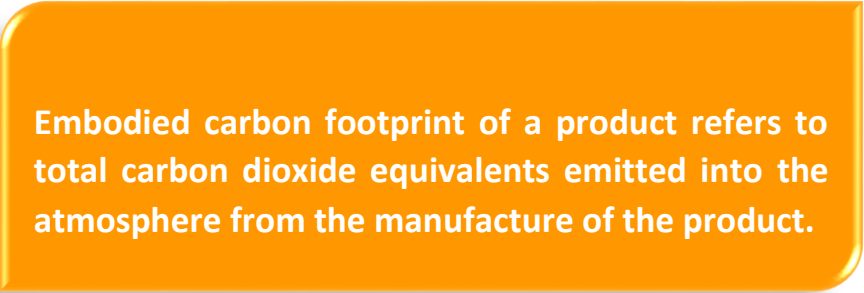Email: support@cutechgrop.com

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1 Introduction

Building and Construction Authority (BCA) develops a new embodied carbon calculator website to compute embodied carbon footprints of a building development through the declaration of the quantity used for each construction material. Based on users' input, a report will be generated with breakdown of computed embodied carbon footprint contributed by each construction material. Users are allowed to submit automatically the report to Green Mark (GM) e-portal to score for GM points in section 3.02b under version 'Green Mark 2015'. The embodied carbon calculator website system stores and tracks the carbon footprints calculation of various users for various projects and helps embodied carbon calculator website administrators to analyse the collected data.

Embodied Carbon Footprints?

Embodied carbon footprint of a product refers to total carbon dioxide equivalents emitted into the atmosphere from the manufacture of the product.

1.1 Audience

This user manual is intended for building and construction sector industry stakeholders like Carbon Consultants, Developers, Professional Engineers, Quantity Surveyors, Industry Partners, Researchers and Architects, to compute embodied carbon footprints for their building developments.

1.2 Typo Information

NOTE indicates important information that helps you to make better use of embodied Carbon Calculator website.

WARNING indicates an action you have to make sure in embodied Carbon Calculator website.

CAUTION indicates a cause of action or error in embodied Carbon Calculator website.

Bold: The word in **Bold** style indicates User Elements (Menus, Sub sessions, Buttons, and Icons/Symbols) in User Interface of embodied Carbon Calculator website, which you have to use.

2 System Requirements

Carbon Calculator website works on IE 7 and above, Google Chrome, Mozilla Firefox, Safari and Opera web browsers.

3 Login into Carbon Calculator

To login into the embodied carbon calculator website, you have to enter your user credentials. If you are a new user to the embodied carbon calculator website, you should create a new account. The embodied carbon calculator website allows Green Mark (GM) account holders to login using their Green Mark ID, so the Green Mark users do not create a new account in the website.

3.1 Create Account

If you are a new user to the embodied carbon calculator website, go to **Create New Account** option.

NOTE:

1. Registered users can only access the embodied carbon calculator website.
2. Registered users does not require any approval while login with the website.
3. Users with Green Mark ID do not need to create a new account.

GENERAL NOTE: In this embodied carbon calculator website, the fields with star (*) marked symbols are mandatory.

To create a new account,

1. Type the provided URL in the address bar of your web browser.
2. Click **Create New Account** in the web page.
3. Type your **Email ID**, which will be the "User Name" of your embodied Carbon Calculator website account.
4. Select **Title** of your name.
5. Type your **Full Name**.
6. Enter your **NRIC/FIN No**.

What is NRIC Number?

NRIC abbreviates National Registration Identity Card identifying document in Singapore, which is provided to Singaporean Citizens and Permanent residents of Singapore.

What is FIN Number?

FIN abbreviates Foreign Identification Number as a unique identification number assigned to foreigners who are issued with immigration & work passes in Singapore, for example, Student pass holders.

7. Type your **Designation**.
8. Select your **Country**.
9. Enter your **UEN No**.

What is UEN Number?

UEN abbreviates Unique Entity Number, which is the standard identification number of Entities such as Businesses, Local Companies, LLPs, Societies and Representative Offices.

10. Type your **Company Name** you have currently working.
11. Type your **Company Address**.
12. Enter **Postal Code**.
13. Enter **Contact No**.
14. In Terms of Use, click the hyperlink and read all the conditions given below, and make sure to select the check box of "**Yes, I have read and agree to abide by the Terms of Use**".
15. Click **Create Account**. See Figure 1.

Figure 1: Create New Account

16. When you have successfully created a new account, the following message appears,
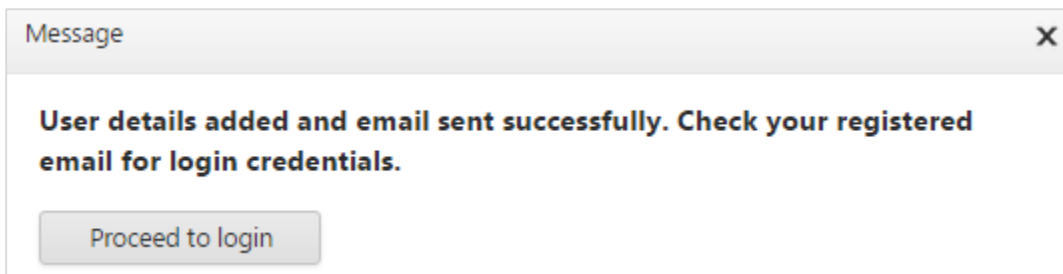
17. The website will send the User Name and Password to your registered email id automatically under account name: **bcacarboncalculator**. Now, click **"Proceed to login"** to login into the embodied Carbon Calculator website.

18. If you logged into the website, you can see your name next to Welcome tag.

➤ If you login at the first time, then the sytem will prompt you to the change the password. System will not allow you to access into the website untill you chnaged the password.

➤ Additionally, you have an option to change your Display Name and Contact Number under **"My Profile"**.

Back to Main Page: This Back to Main Page provided at the left side of the Create Account, which lets you to go to the login page.
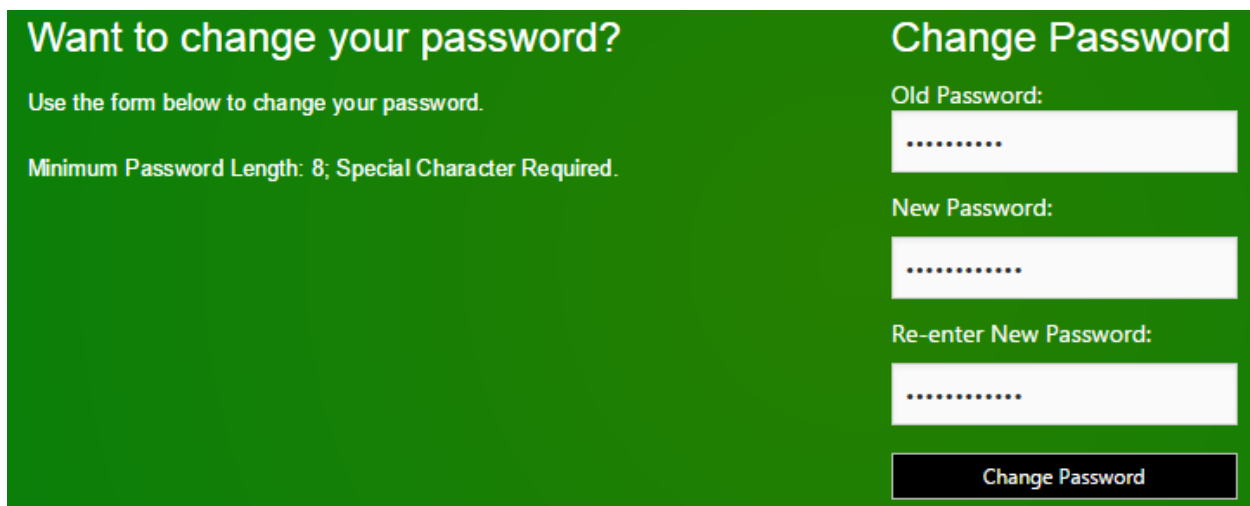
3.1.1   CHANGE PASSWORD

If you wish to change your password you can do at any time using Change Password option. Change Password criteria as follows,

➤ Minimum Password length is eight. Special character required.
➤ Once you have changed your system generated password, you can change the current password after 24 hours only.
➤ System will maintain up to three previous password history.
➤ Your password will be highly secured, and it will stored in an encrypted manner.

To change the password,

1. Click **Change Password** at the top left side of the screen. Change password page appears.
2. Type your **Old Password**.
3. Type your **New Password**.
4. Confirm your new password again in **Re-enter New Password**.
5. Click **Change Password**. See Figure 2.


Figure 2: Change Passoword

3.1.2   MY PROFILE

My Profile is used to keep your updated display name and contact number. To update your changes,

1. Click **My Profile** at the top left side of the screen. My Profile page appears.
2. In User Information, three following fields are available, Email ID, Display Name, and Contact Number. You could see your registered email id in default.
3. Change your **Display Name** as you want.
4. Enter your **Contact Number**.
5. Click **Submit**. See Figure 3.

Figure 3: My Profile

6. When you have successfully updated your profile, the following message appears.
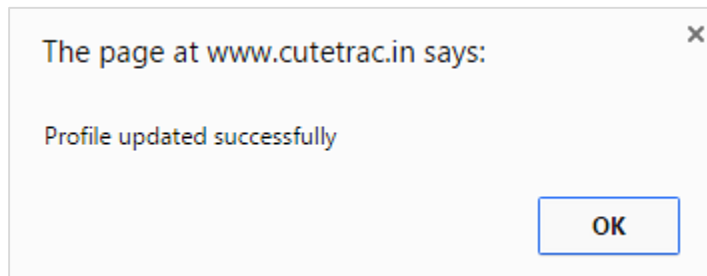
7. The recently changed profile name will appear on the top of the embodied Carbon Calculator website.

NOTE: To view the changed profile name, you have to re-login into the embodied Carbon Calculator website.

8. Recently changed Display Name shown here,
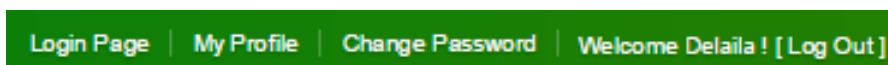
3.1.3 Reset Password

Carbon Calculator website provides an option to reset your password, when you have forgot your current password. To reset your password,

1. In the login page, click **"Click here".**
2. In the new window, enter **Carbon ID**.
3. Click **Reset Password**. System will send the newly generated password to your registered email id. See Figure 4.
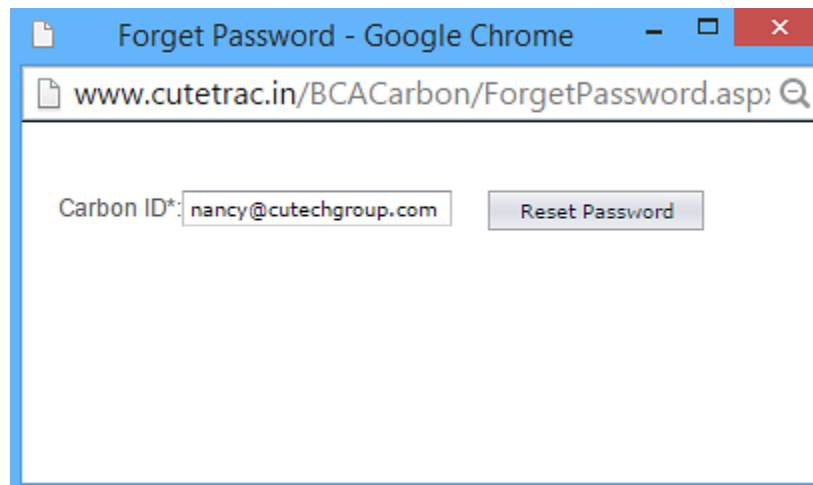
Figure 4: Reset Password

3.2 Green Mark ID

Carbon Calculator website allows Green Mark users to login using their Green Mark ID.

To login using the Green Mark ID,

1. Type the provided URL in the address bar of your Web Browser.
2. Click **Login (Carbon/Green Mark ID)**.
3. Enter **Green Mark ID**.
4. Enter Green Mark ID **Password**.
5. Click **Login**. See Figure 5.

Figure 5: Reset Password

To distinguish between Carbon User and Green Mark User, system will display **[GM]** along with your Display Name.

4 Projects

The "Projects" tab lets you to add a new project to calculate Carbon Footprints. There are two sub divisions under Projects tab, one is Current Projects and the other is Computed Projects.

The Current Projects lets you to add a new project. For adding a new project, process can vary for the Normal User and Green Mark User. So you have proceed depend upon the ID (Carbon ID or Green Mark ID) you have logged in. Where the details for adding projects explained in detail below. Also, from Current Projects you can edit, modify and delete the added projects when you want. The Computed Projects lets you to compute, revise and synchronize the projects.

4.1 Add Project

4.1.1 Carbon User

To add a new project in Carbon Calculator,

1. Navigate to **Projects**, and click **Current Projects**.

2. In Current Projects, click [+] ADD NEW PROJECT .

Mandatory Fields
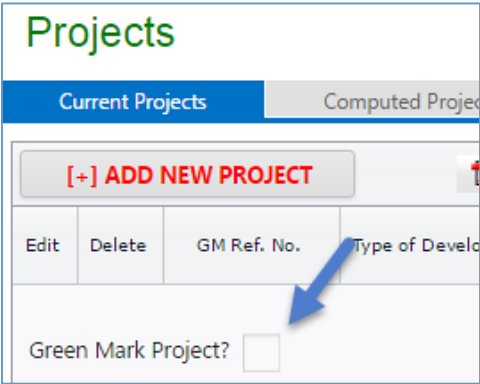
3. Select **Type of Development**.
4. Type **Project Name**.
5. Type **Project Owner**.
6. Type **Project Address**.
7. Type **Structural Consultant** name, who is going to work in the new project.
8. Type **Architect** name, who is going to work in the new project.
9. Select **Gross Floor Area (m2)** of the new project.
10. Type **Builder** name, who is going to work in the new project.
11. Click **Save**. See Figure 6.

Figure 6: Add Project

4.1.2   Green Mark (GM) User

NOTE: The embodied Carbon Calculator website shows Green Mark option to only Green Mark users, who have logged in, while adding new project.

To add a new project from the Green Mark ID,

1. Enter **GM (Green Mark) Reference Number**. System will auto populate the project details such as Type of Development, Project Name, Project Owner, Project Address, Structural Consultant and Architect from Green Mark database,.
2. Click **Save**. See Figure 7.

Figure 7: Add New Project

After the successful creation of the project, system will take you to the Calculator page, where you can provide the **"Material Input"**. In the Calculator page, you can see the following material groups,

➢ Concrete (Breakdown into components)
➢ Concrete (General)
➢ Steel
➢ Glass
➢ Others

NOTE: To add Material Input, click **Go to Calculator**.

4.2 Materials Input

> ➢ In the Material Input page, some of the materials (Concrete (Breakdown into components), Concrete (General), Steel and Glass) are predefined and listed.
>
> ➢ You can also add other materials additionally, if you want.
>
> ➢ Provide Material Emission Factor (EF) along with a Supporting Document.

To enter the input value of the materials,

1. You have to click on the particular cell of the material.
2. The Material Input consist of both Material Quantity and Emission Factor, where the "Quantity" has measured in the unit of "Kg", and the "Emission Factor" has measured in the unit of "Kg CO_2e/kg".

3. The Material Input should be given as a Numerical value.

4. See the below figure for adding inputs of **Concrete (Breakdown into components)**.

Figure 8: Enter Material Quantity and emission Factor

5. See the below figure for added material inputs in concrete (Breakdown into components).

Figure 9: Material Inputs

6. When you added your own Emission Factor, you have to provide supporting documents. If you have not updated for Emission Factor, you don't have to add any support files. When no emission factor is added, the computation will use the system emission factor embedded.

(*If you want to go back to the previous screen, click **"Back"** button provided at the top right of the screen.)

NOTE: System will show Material Quantity and Material Emission Factor in Green color until you save it.

4.2.1 ATTACHMENTS

To add a new Attachment,

Click Attachment , then a new **Supporting Documents** window appears.

1. Click **Browse** to select a supporting document you want to add.
2. Click **Upload**. See Figure 10.

NOTE: When you have adding attachments, you have to make sure for the following,

1. Each document size must not contain more than 10 MB in file size.
2. You can add multiple documents under one material.
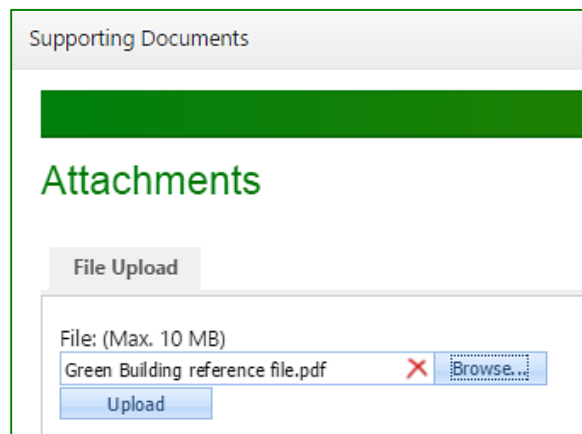
Figure 10: Add Attachments

3. When you have successfully uploaded the attachments, it will shows in the list of "File Added" under "File Upload". See Figure 11.

Figure 11: Added Files

4. The below diagram shows Material Inputs for Concrete (Breakdown into components), Concrete (General), Steel, Glass, Others, and Computation. See Figure 12.

Figure 12: Overwritten Material Input value & added Support File

5. To save all your modifications in Material Input screen, click **"Save All (All Tabs)"** at the bottom of the screen.
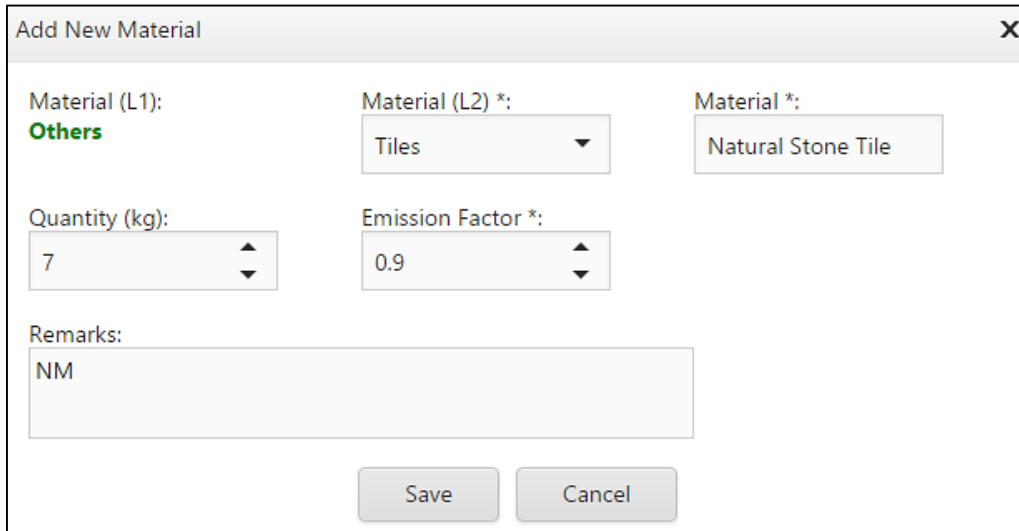
You have to follow the same for all group of materials to input the material input values.

Additionally, if you want to add more materials, you should navigate to **Add New Material** provided at left side of the Material Input page.

4.2.2 ADD NEW MATERIAL

To add a new material,

1. In Material Inputs, click **Add New Material**. A new window appears.
2. In the window, select a new material you want to add from the drop-down list of **Material (L2)**.
3. Type **Material Name**.
4. Select **Material Quantity**.
5. Select **Emission Factor**.
6. Type **Remarks** for the material you have add newly.
7. Click **Save**. See Figure 13.

Figure 13: Add New Material

4.3 COMPUTATION

After you have added material inputs, you can compute your project. While Computation, you have to maintain Carbon Reference Number and Green Mark (GM) Reference Number in Carbon Calculator Online, as like Client of Carbon Calculator will maintain a Green Mark (GM) online. So, that when the Client have opening their website, they could see both of the Carbon Reference Number and Green Mark (GM) Reference Number, which you have updated.

⚠️ **WARNING:**

1. Make sure you have added input values for added materials.
2. Make sure you have added support documents for the given Emission Factor value.

After completion of material inputs, you can go to **Computation** tab. You will be prompted with the validation message. The message will be, "Validated Successfully. You can submit the project now".
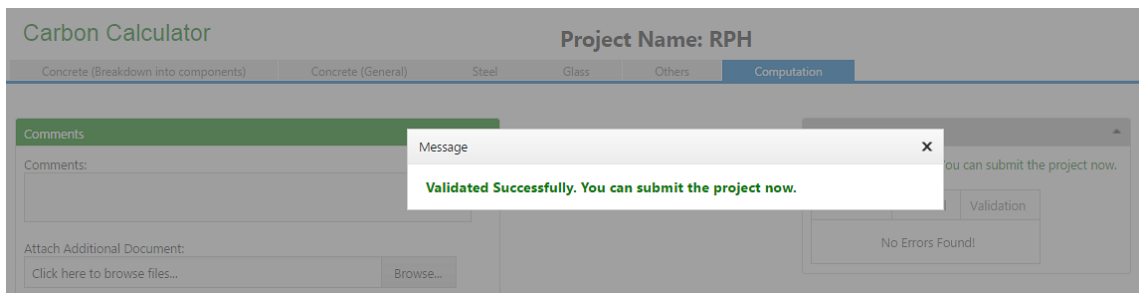

Figure 14: Validation Message

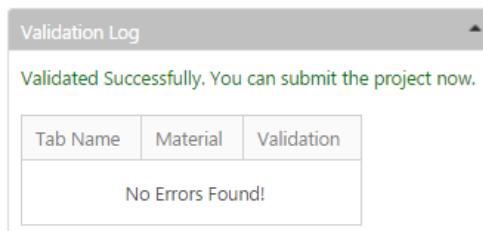Validation Log has shown that, "No Errors Found",

Figure 15: Validation Summary

After you gave successfully done for computation process without errors, you could see that the calculated "Estimated Total Embodied Carbon Footprint" value has shown in the same page at the Validation Log tab. You can view the "Embodied Carbon Footprint", before you have submitting.

Validation Log ▲

Estimated Total Embodied Carbon Footprint : 0.00 TonCO₂e

Validated Successfully. You can submit the project now.

Tab Name	Material	Validation
No Errors Found!		

CAUTION: If the material input was not provided for the mandatory materials, the following message will appear.

Message   ×

Errors found. Please review the error log.

Validation Log ▲

Errors found. Please review the error log.

Tab Name	Material	Validation
Concrete	Granite	Value Required!
Concrete	Sand	Value Required!
Concrete	Water	Value Required!
Concrete	Admixture	Value Required!
Concrete	Ordinary Portland Cement (OPC)	Value Required!

Page 1 of 2 (7 items)   ◄   1   2   ►

You have to go through the Validation Log in detail and you must clear all the errors before you go for Computation.

4.3.1   COMMENTS & ADDITIONAL DOCUMENTS

Optionally, you can provide Comments and Additional Document for the project you have computing. To add Comments and Additional Document, navigate to the left side of the computation screen. Refer the below screenshot.
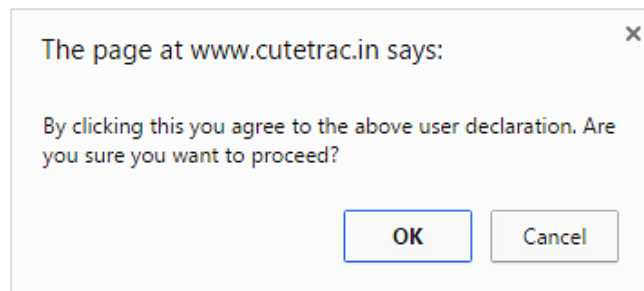

Figure 16: Add Comments and Additional Document

WARNING: Make sure you have read User Declaration information.

To complete the above action,

1. Click **Compute** at the bottom left side of the screen.
2. You can receive the following message of, **"By clicking this you agree to the above user declaration. Are you sure want to Proceed?"**.

3. Click **OK**. Project menu appears.
4. Now, you can see the project has added under **Computed Projects**.

S.No	Revise	Carbon Ref. No.	GM Ref. No.	Type of Development	Total Embodied Carbon Footprint	Project Name	Report	Project Owner	Project Address
1	↻	CC/1/201510/71.1		Residential (Public Housing)	TonCO₂e	RPH	🖶	CapitaMall	881 EAST COAST ROAD
2	↻	CC/1/201510/71		Residential (Public Housing)	0.00 TonCO₂e	RPH	🖶	CapitaMall	881 EAST COAST ROAD
3	↻	CC/5/201508/28.01		Mixed Development (Retail/Resi)		Project 3	🖶	CapitaMall	Jurong East

Figure 17 : Computed Projects

Once the project has been submitted, the project will available under Computed Projects tab. Also the system will generate a unique "**Carbon Reference Number**" for the computed projects. The computed projects can be viewed by the Administrator of this website.

CAUTION: Once the projects has been submitted, system will not allow you to edit.

4.3.2   REPORT

After you have completed the project, you can generate report under Computed Projects.

To view the Carbon Footprint Report, simply click on Report 🖶 under Computed Project.

Carbon Footprint Report

Project Details:

Carbon Ref No	CC/5/201508/28.01	Project Address	Jurong East
GM Ref No		Structural Consultant	Tri Builder
Type of Development	Mixed Development (Retail/Resi)	Architect	UK Construction Company
Project Name	Project 3	Project Owner	CapitaMall
Submitted By	Ms. Delaila	Submitted Date	25/09/2015 17:29

Material Details:

Material	Quantity (Kg)	Remarks
Concrete (Breakdown into components)		
Concrete component: Admixture		
Admixture	0	
Concrete component: Cement		
Ordinary Portland Cement (OPC)	0	
Ground-Granulated Blast-Furnace Slag (GGBS)	0	
Limestones Fines	0	
Limestones	0	
Concrete component: Coarse aggregates		
Granite	0	

Carbon Footprint Report

Marble	0	
Timber		
General Timber	0	
Glue Laminated Timber	0	
Plywood	0	
Steel		
Primary Steel		
Primary Steel	2	
Recycled Steel		
Recycled Steel	0	
Total Quantity of Declared Materials (kg):	8	

Total Embodied Carbon Footprint:	0.01	$TonCO_2$ e
Total Embodied Carbon Footprint/GFA:	-	$TonCO_2$ e

Comments

Note: To score for Green Mark (GM) points, please present the report to appointed GM Assessors.

Figure 18: Carbon Footprint Report

4.4 Revision

Revision helps you when there is a change from the existing computed project. Revision applies only for the computed projects.

When users revise the computed projects, the old values input for the computed projects should reflect in the "new" project materials input page. Which makes convenient the users to change the values wherever necessary and no need to re-key in all the values.

To revise the project,

➢ Navigate to the **Revision** column provided under Computed Projects tab.

➢ After the Revision has made, the system will copy the contents from the existing project and create as a new project.

➢ The newly created project comes under Current Project.

➢ After you have successfully computed the revised project, system will generate a new **Carbon Reference Number** for the revised project.

➢ The Carbon Reference Number will generated as a version of the parent project. For example, if you have revised the following report **"CC/0/201509/1"**, the revised reference number will be **"CC/0/201509/1.01"**. Also the revised project will changed into Red color.

To revise the parent project,

1. Click **Revise** under the Computed Projects tab.
2. Once the project has revised, the project will be available under Current Projects tab.
3. Click edit to make changes.
4. Click **Save**.
5. Go to Calculator to amend the material inputs.
6. Go to computation tab to compute the revised project.
   See Figure 19.

Figure 19: Revision

4.5 Synchronization

Synchronization is provided to update the latest changes of the Green Mark projects from the Green Mark Portal. This option is only available for the Green Mark projects.

To synchronize the Green Mark project,

1. Click **"Sync with GM"** under Sync column.
2. When you click the confirm button, the following message appears,
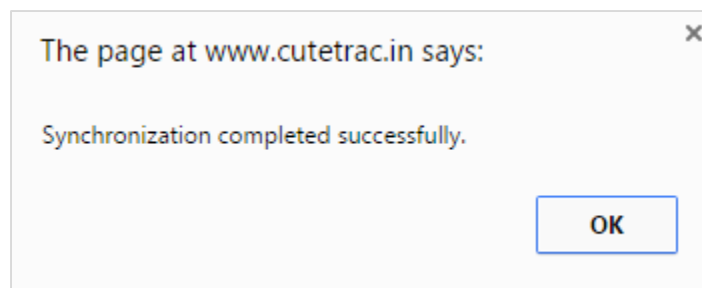
3. Click **OK**. See Figure 20.

Carbon Ref. No.	GM Ref. No.	Type of Development	Total Embodied Carbon Footprint	Project Name	Report	Project Owner	Project Address	Structural Consultant	Architect	Attachments	Remarks	Sync
CC/5/201508/21		Mixed Development (Retail/Resi)		Apartment	🖶	Pro	tes	ABC	TFG	📎 (0)		
CC/4/201508/24		Mixed Development (Hotel/Resi)		Test	🖶	Mohammed	Jurong East	ABC Builders	Singapore Company	📎 (1)		
CC/5/201508/28		Mixed Development (Retail/Resi)		Project 3	🖶	CapitaMall	Jurong East	Tri Builder	UK Construction Company	📎 (1)		
CC/0/201509/31	GM1994/06/2015	Mixed (Resi + Commerical)		PROPOSED NEW ERECTION OF A 4-STOREY RESIDENTIAL	🖶	PO	881 EAST COAST ROAD	Beca Carter	Ong & Ong Architect	📎 (0)		Sync with GM

Figure 20: Synchronization

5 Contact US

Contact our support team to learn more about Carbon Calculator website. You can also post your feedbacks in the provided URL address.

You can contact our support team in two ways!!!

Phone   **Email**
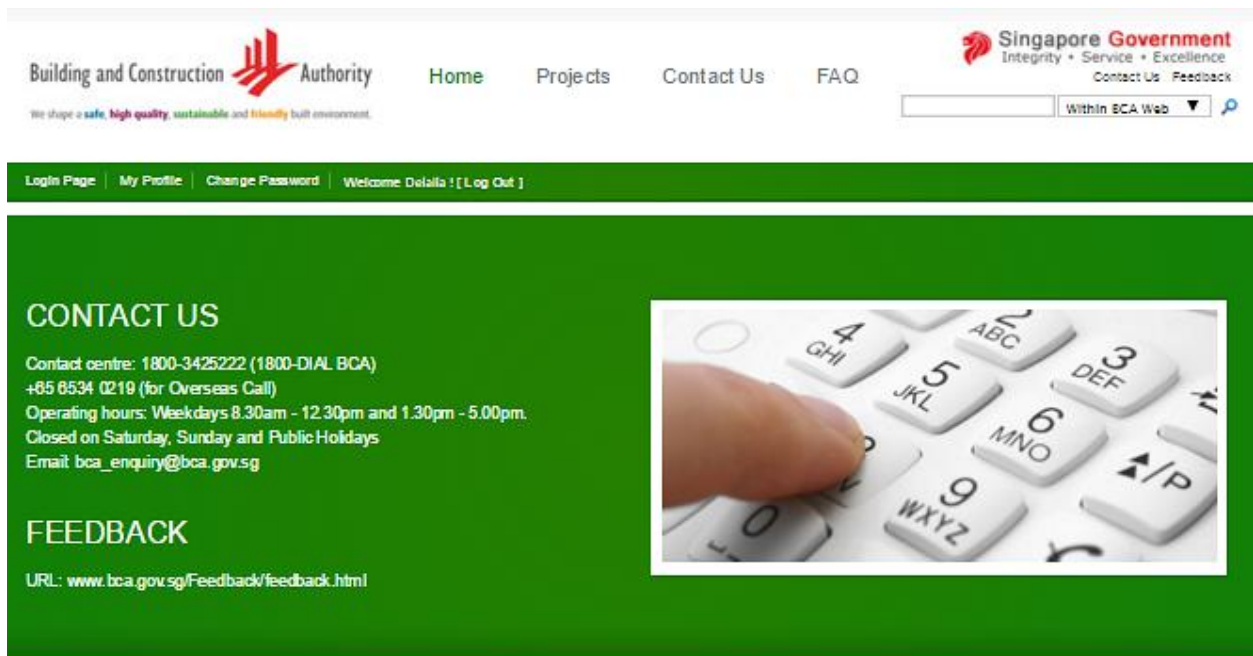
6 FAQ

Carbon Calculator website provides frequently asked questions and its answers in FAQ page.