

The

iCOSTES MANUAL

**for Cost Estimation of Performance Based
Road Maintenance Contract**

**Volume 1:
Manual for iCOSTES System Administrators**

**Edition 1
August 2019**



JAPAN INTERNATIONAL COOPERATION AGENCY
Strengthening of Capacity on Road Maintenance Management through Contracting (Phase 3)



iCOSTES MANUAL
for Cost Estimation of Performance Based
Road Maintenance Contract
Volume I — Manual for iCOSTES System Administrators

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Edition 1
Year of publication 2019 Nairobi

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TABLE OF CONTENTS

Acknowledgements	1
Preface	2
1 GENERAL INFORMATION	3
1.1 General Project Overview	3
1.2 System Development History	4
1.3 Manual Structure	4
1.4 iCOSTES System Ownership and Operation, User Permission	5
1.5 Project references	5
1.6 Points of Contact	6
1.7 Organisation of the Manual Document	6
1.8 Acronyms and Abbreviations	6
2 SYSTEM SUMMARIES	7
2.1 System Requirement	7
2.2 System Security and Waiver	7
2.3 Types of Users and Access Levels	7
3 MAKING COST ESTIMATION	8
3.1 Logging	8
3.1.1 Logging in	8
3.1.1 Logging Out	8
3.2 Making Cost Estimation	9
3.2.1 Overview	9
3.2.2 Contract Condition	9
3.2.3 Road Patrol and Haulage Cost Window	12
3.2.4 Unit Price Confirmation	13
3.2.5 Other PBC Works	14
3.2.6 Instructed Woks	15
3.2.7 Machinery Works Editor	16
3.2.8 Create Output	21
3.2.9 View Estimation	21
3.2.10 Instructed Works Only	22
4 DETAIL SYSTEMS STRUCTURE OF iCOSTES	23
4.1 ADMIN DASHBOARD	23
4.2 USER MANAGEMENT	23
4.2.1 Adding new user	24
4.2.2 View User Accounts	24
4.2.3 Add New Role	25
4.2.4 System Roles	25
4.2.5 User Statistics	26
4.3 MANAGE AGENCIES	26
4.3.1 Add New Agencies	26
4.3.2 List of Agencies	27
4.3.3 List of Counties	27
4.3.4 Agencies Configurations	28
4.3.5 Create New Agency Configurations	28
4.3.6 Authorities Branches	29

4.4	MANAGE CONTRACTORS	30
4.4.1	Add New Contractor	30
4.4.2	Contractors List	30
5	iCOSTES SYSTEM AND DATA ADMINISTRATION	32
5.1	SYSTEM CONFIGURATION	32
5.1.1	Application Settings	32
5.2	DEFAULT ADMIN SETTINGS	33
5.2.1	Unit Price	33
5.2.2	PBC Works Items	34
5.2.3	Manage SRUQ	34
5.2.4	Machinery based Items	35
5.2.5	Road types	35
5.3	MANAGE REGIONS	36
5.4	DATABASE USAGE	36
APPENDIX		37
1.	Road Agency Account Setup	37
	Contents of the table 1/2	38
	Data Update 1/2	38
	Contents of the table 2/2	39
	Data update 2/2	40
2.	SRUQ (Standard Resource Usage per Quality)	41
	Contents of the table	41
	Data Update	43
3.	Unit Rates Information (Database Table: UnitPrice1)	43
	Contents of the table	44
	Data Update	44
4.	Other PBC Works	45
	Contents of the table	45
	Data Update	46
5.	Instructed Works List (Table: Instructed Works List)	47
	Contents of the table	47
	Data Update	48
6.	Program Configuration (Table: Configuration)	48
7.	Difference between agency users and contractor users	49

Acknowledgements

The Government of Kenya, through the Ministry of Transport, Infrastructure, Housing and Urban Development, State Department of Infrastructure, would like to express its most sincere gratitude to the Japan International Cooperation Agency (JICA) for its financial contributions to allow for the issue of this iCOTES Manual for Cost Estimation of Performance Based Road Maintenance Contract, Volume 1: Manual for iCOSTES System Administrators.

MoTIHUD would like to extend special thanks to all of the state departments (Road Agencies) and organizations that composed the Cost Estimation Sub-Working Group (SWG):

JICA Road Maintenance Project Team
 Kenya Roads Board – KRB
 National Construction Authority – NCA
 Public Procurement Regulatory Authority – PPRA
 Kenya Wildlife Services – KWS
 Kenya National Highways Authority – KeNHA
 Kenya Rural Roads Authority – KeRRA
 Kenya Urban Roads Authority – KURA
 Kenya Institute of Highways and Building Technology – KIHBT
 Materials Testing and Research Department

The Manual would not have come to fruition without the dedication of the Cost Estimation (COSTES) Sub-Working Group Committee members, mandated by the National Working Group and the Joint Coordinating Committee to carry out this task. Therefore, we would like to recognize the individual contributions of: Eng. Tom Omai, Eng. Edwin Odwesso, Eng. Nicholas Chelugo, Eng. Walter Ochieng, Eng. Livingstone Karanja, Juliette Murugi, Qs. David Mathu, Ms. Rose Ndirangu, Eng. Ephraim Opuge, Eng. Mildred Olang’o, Phires Ogoti, Caroline Kamunya, Julius Kaliti, Motohiko Nishibayashi, Hiroshi Tsujino, Nobuya Okamoto, Kunihiro Hayashi, Takashi Nakajima, Yoshihisa Noda, Hiroshi Mita, James Nyaga and Caleb Mathuva.

In addition, the development of this sophisticated iCOSTES system would not have been achieved without substantial effort of skillful engineering staff of Sufuri Group Limited. Hereby sincerely express special thanks to Mr. Patrick Omari, Mr. Hillary Isanya.

August 2019
 JICA and KRB

Preface

Welcome to iCOSTES!

iCOSTES guides you for easy and quick cost estimation of Performance Based Contract of Road Maintenance Work in Kenya. This is a part of the Japan International Cooperation Agency (JICA) 's project "The Project for Strengthening of Capacity on Road Maintenance Management Through Contracting"

The initial idea originates in 2011 as a standalone small program to calculate the cost of instructed works this was named as COSTES. From 2015 to 2018, COSTES has dramatically improved for total estimation tool of hybrid cost estimation tool of Labour based maintenance works, Machinery Based Maintenance works and Instructed works. A lot of retreats workshops and seminars have held in Kenya and Japan. As a result, hundreds of feedbacks are raised and contributed the quality improvement. However, these COSTES software were standalone program sets therefore system requirement was strict and the scene of use had been limited.

From 2018 to 2019, JICA and a Kenyan IT company organized a joint project to develop an internet-based cost estimation based on the stand alone COSTES program. Thanks to the effort of skilful staff from Japan and Kenya, internet-based cost estimation website has been constructed. This system is dramatically improved in terms of user-friendly and data security and continuously data management. We named this website system as "iCOSTES". This website is a total estimation system of road maintenance contract and there are rich features including cost estimation, user management and data management.

This system was handed over and currently belongs to the Kenya Roads Board (KRB).

The iCOSTES development team hopes the iCOSTES contributes the better and sustainable maintenance of roads in Kenya by providing appropriate cost estimation.

August 30, 2019

iCOSTES Development Team

1 GENERAL INFORMATION

1.1 General Project Overview

The purpose of the Cost Estimation System (COSTES) is to facilitate the compilation of engineering estimate for road maintenance works. This is a part of the JICA (Japan International Cooperation Agency) called “The Project for Strengthening of Capacity on Road Maintenance Management Through Contracting”

As shown in Figure 1, PBC has more benefits than Non-PBC Contracts. Also, as show in Figure 2, the length of roads under PBC is increasing. Also, the share of PBC for highway maintenance is increasing (Figure 1.3).

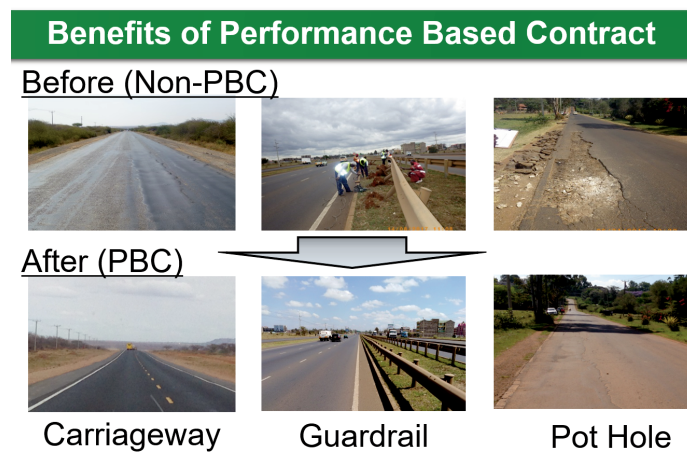


Figure 1.1 - Benefits of Performance Based Contract (PBC)

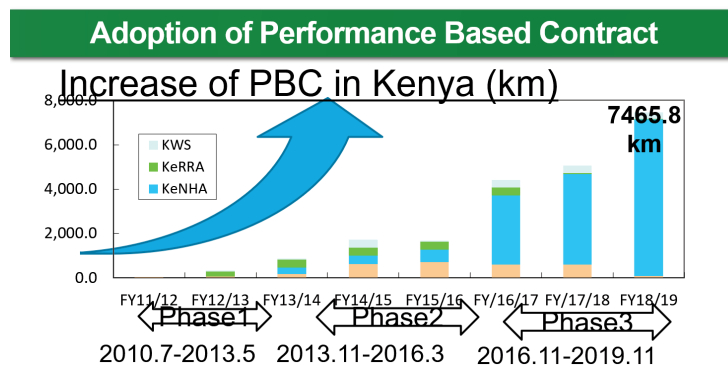


Figure 1.2 - Adoption of PBC

Share of PBC for Highway Maintenance

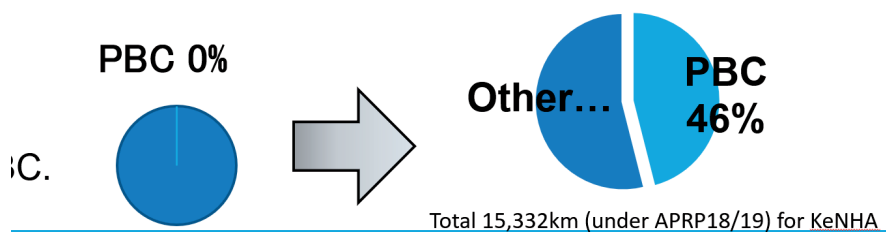


Figure 1.3 - Share of PBC for Highway Maintenance

Road Maintenance through Performance Based Road Maintenance Contract (PBC), in which road is contracted and kept at required service levels at all times; instead of conventional contracts whereby road agency identifies damages to fix.

1.2 System Development History

The history of the development of COSTES is shown in Figure 1.4. It generates cost estimates when necessary work items are selected, and their corresponding quantities inserted. Versions 2011, 2015 and 2017 can be run on any Windows-based computers, while the iCOSTES is web based and compatible with any web-based browser. In all versions a PDF reader is required to view the cost estimate output. In addition, MSExcel is needed when using COSTES 2015.

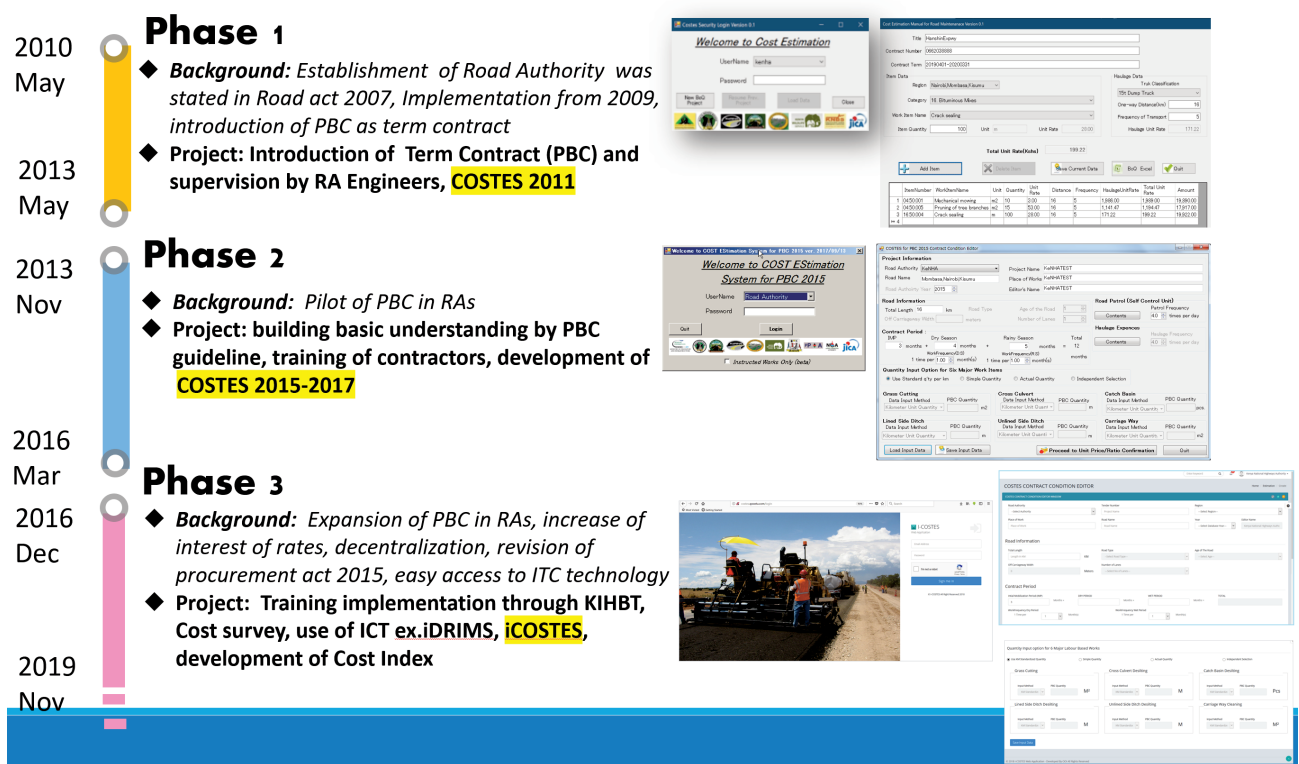


Figure 1.4 - System Development History of COSTES and iCOSTES



1.3 Manual Structure

Overall structure and relationship of PBC, CEM and CSG this manual is as shown in Figure 1.5 and Table 1.1 on the next page.



Figure 1.5 - Related Manuals

Table 1.1- Overall Structure of PBC, CEM and iCOSTES

Step	Manuals/References
Performance Based Contract for Road Maintenance in Kenya  - Provide adequate cost estimation of PBC -	<i>PBC Guideline Edition 2.0</i> <i>PBC Handbook</i> <i>Standard Tender Document for PBC</i> <i>iDRIMS (smart phone based), local agent</i>
Cost Estimation for PBC  - Provide appropriate estimation for PBC -	<i>Cost Estimation Manual for Performance Based Road Maintenance Contract (Vol.1.2.3) Edition 2.0</i> <i>Cost Survey Guidenote</i>
iCOSTES (web based) - Provide Cost Estimation Quickly and Accurately-	<i>iCOSTES Manual</i> <i>Cost</i>

1.4 iCOSTES System Ownership and Operation, User Permission

iCOSTES is owned and operated by Kenya Roads Board (KRB) and all rights are reserved.

KRB provides you with access to a variety of resources and functions, including documentation and other product information (collectively the “Documentation”), downloadable, communication and reporting modules, and other services (collectively "Services"), software, including developer tools and sample code (collectively “Software”), and Application Program Interface information (“APIs”).

The Documentation, Services, Software, and APIs (including any updates, enhancements, new features, and/or the addition of any new Web properties to the iCOSTES System), are subject to the following Terms of Use ("TOU"), unless we have provided those items to you under more specific terms, in which case, those more specific terms will apply to the relevant item. KRB reserves the right to update the TOU at any time without notice to you. The most current version of the TOU can be reviewed and are annexed to this document in the appendix.

1.5 Project references

1. Admin Manual
2. Contractor manual
3. Agencies & counties manual

1.6 Points of Contact

The Points of Organisational Contact (support and troubleshooting, coordinating, list of partner organisation, Help Desk requirements and capacity) are as follows;

Operation hours of the Contact Center are Monday to Friday (Except Holidays) from XXam to YYpm .

iCOSTES Contact Center;

Email:

Tel:

1.7 Organisation of the Manual Document

This manual is organised in sections and has separate information for different user levels.

1.8 Acronyms and Abbreviations

CEM – Cost Estimation Manual Volume 1 is for the System Administrators, Volume 2 is for the Government Cost Estimators and Volume 3 is for the Contractors

CSG – Cost Survey Guidenotes

JICA – Japan International Cooperation Agency

KURA – Kenya Urban Road Authority

KRB- Kenya Roads Board

KENHA – Kenya National Highways Authority

KENHA (2+Lanes) – Kenya National Highways Authority (2+Lanes)

KWS – Kenya Wildlife Service

PBC – Performance Based Contract

SRUQ – Standard Resource Usage per Quantity

2 SYSTEM SUMMARIES

This section shows basic flow of cost estimation, other functions of iCOSTES, system requirement and security assurance of iCOSTES.

2.1 System Requirement

- ✓ iCOSTES is available by using PC and Tablet. Using PC is strongly recommended.
- ✓ Internet Browser is essential. Microsoft Edge, Google Chrome, Firefox and Safari are recommended.
Internet Explorer is not suitable for iCOSTES.
- ✓ Internet connection is also essential. When proceeding window of the internet browser, entire data is saved in the server. Therefore, users can resume data input without big time-loss.
- ✓ For viewing output, PDF Viewer is essential.

2.2 System Security and Waiver

The security of iCOSTES is ensured by placing appropriate secured server in Kenya. However, users must ensure security of users' hardware and software. KRB has no responsibility to any users for any problems and issues caused using iCOSTES.

2.3 Types of Users and Access Levels

Table 2.1 shows the types of users for handling iCOSTES. User authorization is given by KRB iCOSTES Administrator.

The Primary user and contractor and authorized user may be able to add and modify data and information related to their function only

Table 2.1 - Types of Users

Type	Description
Administrator	This is account for System Super User and has all permissions
Agency Admin	This is a person who manages road agency account...he or she can manage road agency user
Contractors	This account belongs to contractor, can edit/view own estimations
County Government	This is a county among the 47 counties in Kenya. The data related to the estimations of each county government are managed.
KRB Admin	Alternate administrator of KRB
User	Users from ministry, counties and road agencies to create estimations

3 MAKING COST ESTIMATION

This section provides a general walkthrough of the system from initiation through to the exit for making a Cost Estimation. It is believed that the logical arrangement of the information shall enable the user personnel to understand the sequence and flow of the system.

3.1 Logging

3.1.1 Logging in



Figure 3.1- Logging in Page

On the above Welcome screen, program users have to enter their registered email address and passwords in order to use iCOSTES.

The email address in iCOSTES is the unique primary user identifier thus unique for every user in the system while the password is the secret passcode which is comprised of words, numerals and/or symbols.

These login credentials authenticate the system user before granting access rights to him/her. It is advised that Passwords should be changed frequently.

Table 3.1- Elements to log-in

Item	Valid value range	Description
E-mail Address	Authorized and notified from iCOSTES Administrator	Words are recognized directly
Password	Authorized and notified from iCOSTES Administrator	Main menu recognizes password

3.1.1 Logging Out

Click “Log Out” to exit the user interface.

3.2 Making Cost Estimation

3.2.1 Overview

A main function of iCOSTES is to create the cost estimation of PBC. Figure 3.2 indicates a general flow of creating a cost estimation. Entire input is automatically saved in iCOSTES.

Basic theory and idea are summarized in Cost Estimation Manuals.

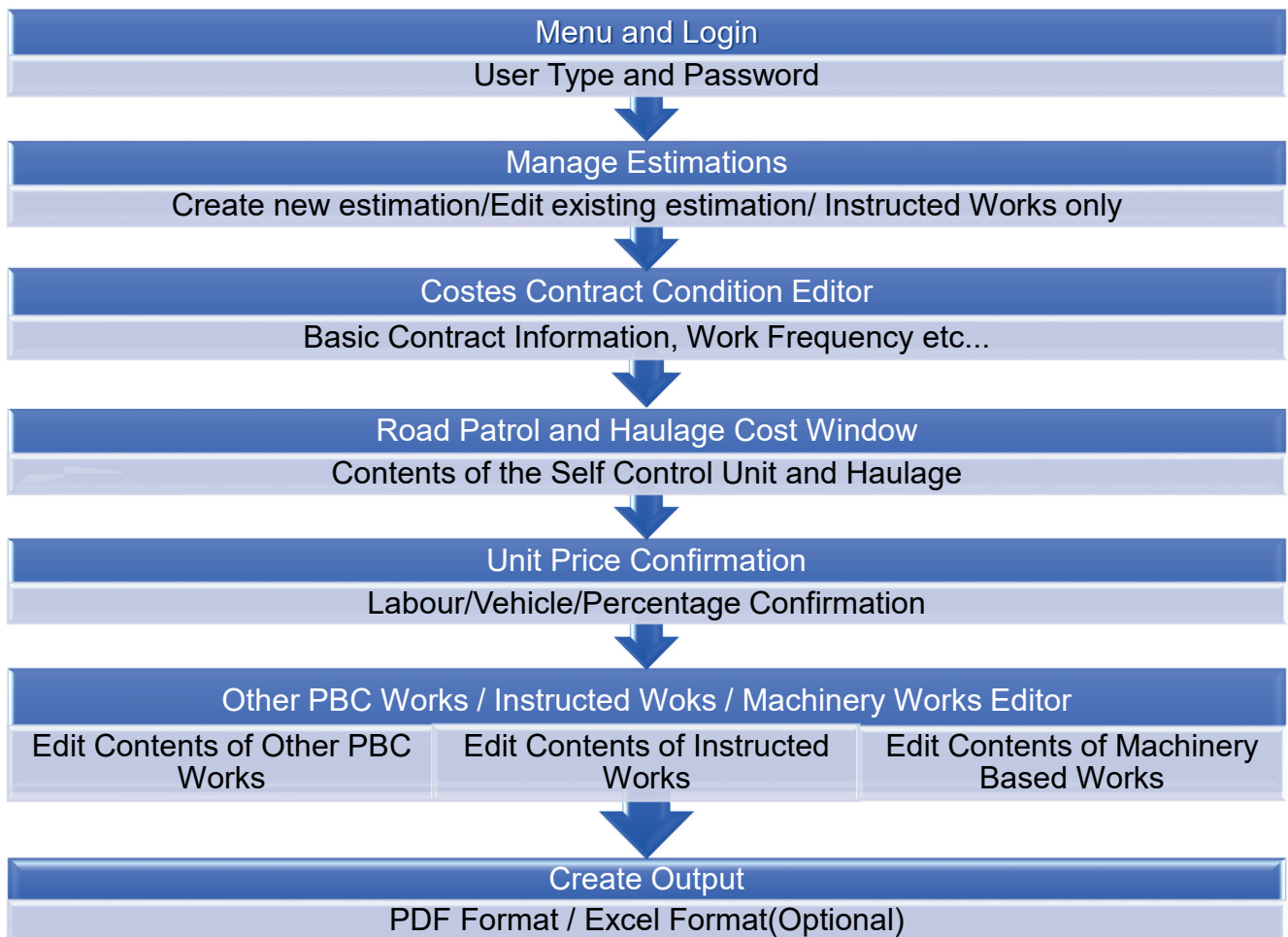


Figure 3.2- Making *Flow of Cost Estimation*

3.2.2 Contract Condition

Here the system user can create new estimations, view already created estimations and also view the instructed works only as shown in the figures on the next page.

Here the system admin can add new estimations to the system by inputting all the required estimation requirements. These requirements are to be fed into the iCOSTES contract condition editor. The requirements are as illustrated in the figure on the next page.

The screenshot displays the 'COSTES CONTRACT CONDITION EDITOR' interface. At the top, there is a search bar and a user profile for 'System Admin'. The main form is divided into two sections: 'COSTES CONTRACT CONDITION EDITOR WINDOW' and 'Road Information'.

COSTES CONTRACT CONDITION EDITOR WINDOW:

- Road Agency:** A dropdown menu with the option '--Select Agency--'.
- Tender Number:** A text input field labeled 'Project Name'.
- Region:** A dropdown menu with the option '--Select Region--'.
- Place of Work:** A text input field.
- Road Name:** A text input field.
- Year:** A dropdown menu with the option '--Select Database Y--'.
- Editor Name:** A text input field containing 'System Admin'.

Road Information:

- Total Length:** A text input field labeled 'Length In KM' followed by a 'KM' unit selector.
- Road Type:** A dropdown menu with the option '--Select Road Type--'.
- Age of The Road:** A text input field.
- Off Carriageway Width:** A text input field containing '0' followed by a 'Meters' unit selector.
- Number of Lanes:** A dropdown menu with the option '--Select No of Lanes--'.

Figure 0-1 Manage Estimations – COSTES CONTRACT CONDITION EDITOR

User selects road agency, inputs the tender number, select the region as provided by the drop down menu, mention the place of work, the road name, select the database year and then ensure the editor name is correct i.e “system Admin” for the administrator.

After completing the above personal details, then users are required to fill the Road information details. These are the Total length of the road in kilometres, select the road type either paved or unpaved, age of the road, off carriage width in metres and the number of lanes it’s made of.

Then the admin should go ahead and provide the contract period details: Initial Mobilization Period in months, provide the dry period and the wet period in months, the IMP Method(either choose IMP has both IMP and WET period work or choose if it is only IMP Works) and then input the work frequency for dry period and also for the wet period in months.

The admin then is required to choose the quantity input option for 6 major labour based works from the following four options: use KM standardized quantity, simple quantity, actual quantity or the independent selection option.

The detail of each parameter is explained in **section 3.2 of the CEM II / CEM III**.

Figure 0-2 Manage Estimations – COSTES CONTRACT CONDITION EDITOR(Cont'd)

The user chooses the PBC Quantity in Square metres for grass cutting, PBC Quantity in metres for cross culvert desilting, PBC quantity in Pieces for catch basin desilting, PBC Quantity in metres for lined side ditch desilting, PBC Quantity in metres for unlined side ditch desilting, PBC Quantity in square metres for carriage way cleaning.

The detail of each parameter is explained in **section 3.2 of the CEM II / CEM III**.

After making sure all the above details are in order the admin can now successfully save the input data.

[IMP Method]

As for the IMP Method, there are two options. The difference is;

Only IMP Periods: During IMP Periods, labour based work in IMP once.

IMP has Both IMP and WET Period Work: During IMP Periods, not only labour based works as IMP but also works as WET periods are considered. The volume of works as WET season depends on the length of IMP.

Table 3.2-1 Consideration of Additional works during Initial Mobilization Period

Duration of IMP (Month)	Considered Times of Works	
	IMP (time)	WET (time)
1	1	0
2	1	0.5
3	1	1.25
4	1	2

5	1	2.75
6	1	3.5

3.2.3 Road Patrol and Haulage Cost Window

After filling out contract condition, users can modify the road patrol (Self Control Unit) and haulage inputs by editing tables shown in the figure below. The detail of each parameter is explained in **section 3.3 of the CEM II / CEM III.**

Road Patrol (Self Control Unit)

Patrol Frequency (Times Per Day)
1

Yes/No	Item Name	Number	WorkingDays
<input checked="" type="checkbox"/>	SCU Foreman	1	30
<input type="checkbox"/>	SCU Inspector	0	30
<input checked="" type="checkbox"/>	SCU Driver(Pick Up)	1	30
<input checked="" type="checkbox"/>	SCU Pick Up	1	30

Haulage Cost

Haulage Frequency (times per day)
1

Yes/No	Item	Number	Working Days
<input type="checkbox"/>	Haulage Truck(2 ton)	1	25
<input checked="" type="checkbox"/>	Haulage Pick Up	1	25
<input checked="" type="checkbox"/>	Driver (Pick Up)	1	25
<input type="checkbox"/>	Driver (Truck)	0	25

Figure 0-3 Manage Estimations – Road Patrol and Haulage Cost Window

If the box of each item is checked, this content is the member of SC/Haulage Unit. Default value (e.g. 30days) assumes that SCU patrols the roads every day. 25days for example means that the haulage works are carried out on all days of the week except on Sunday. Numbers and working days can be changed based on the condition.

3.2.4 Unit Price Confirmation

Users can modify and check unit price and ratio by “Unit Price/Ratio Confirmation” window shown in the figure below. Firstly, users have to select the area of “Unit Price Set”. Then default unit prices and ratios will be displayed. Users can modify each value.

If logging in as a Contractor, default unit price is not shown, and all fields are blank. Contractor must fill out all unit prices from their own experience and information from the site visits and surveys. Contractor also can choose from “percentage input” or “input by cash amount” for Indirect Cost and Overhead Profit calculation.

The detail of each parameter is explained in **section 3.4 of the CEM II / CEM III**.

The screenshot displays the 'Unit Price Confirmation' interface in the I-COSTES system. At the top, there are navigation links for Home, Road Types, and Index. The main header shows 'Unit Price Confirmation' with a search icon and a refresh icon. Below the header, there are three dropdown menus: 'Road Authority' set to 'KeRRA', 'Year' set to '2015', and 'Unit Price Set' set to 'All other area'. The interface is divided into three main sections:

- Labour Unit Price Confirmation:** This section contains seven input fields for different roles:
 - Supervisor: 10000 Ksh/Month
 - Foreman: 5000 Ksh/Month
 - Labour: 1000 Ksh/Day
 - SCU Leader: 10000 Ksh/Month
 - SCU Inspector: 5000 Ksh/Month
 - Driver(Pickup): 1000 Ksh/Month
 - Driver(Truck): 1000 Ksh/Month
- Vehicle Unit Price:** This section contains six input fields for vehicle-related costs:
 - Vehicle(2ton Truck): 200000 Ksh/Month
 - Fuel(Diesel): 100 Ksh/Liter
 - Diesel Consumption: 4 Km/Liter
 - Vehicle(PickUp): 10000 Ksh/Month
 - Fuel(Gasoline/Petrol): 100 Ksh/Liter
 - Petrol Consumption: 10 KM/Liter
- Percentage Confirmation:** This section contains four input fields for percentages:
 - Miscellaneous(%): 7.00
 - Indirect Cost (%): 25.00
 - Overhead and Profit (%): 12.0
 - VAT(%): 16.00

At the bottom of the form, there are three buttons: 'Recall Default Value' (grey), 'Proceed to Other PBC Work' (blue), and 'Back to Contract Condition Editor' (orange).

• *Figure 0-4 Manage Estimations – Unit Price Confirmation*

3.2.5 Other PBC Works

There are various kinds of maintenance work except for six major labour based works. Therefore, iCOSTES has prepared other PBC work item list based on the “Other PBC Works” section of the Cost Estimation Manual. Users can select necessary work item(s) and specify price. If other PBC works are not necessary, users can skip this editing process. If logging in as a Contractor, COSTES does not present default unit price. The detail of each parameter is explained in **section 3.4 of the CEM II / CEM III.**

Contract Information

Road Agency: KURA Project Term: 12 Month

Project Name: Test1

Price Input Region: Nairobi, Mombasa, Kisumu Items in Year: 2017 Items in Any Year: []

Pavement Condition: Paved

Category: Road User Comfort

Service Scope: B) Pavement, Shoulders and ROW for Paved Roads

WorkItem: Height of shoulders vs. height of pavement

Price Input: Quotation Based Method-“Use Own Unit Price and Quantity”

Item Quantity: 35 Unit: (Unit) Unit Price: 12222

[+ Save/Refresh] [x Delete This WorkItem]

Action	Area	Paved/UnPaved	Category	ServiceScope	WorkItem	Unit	Quantity	Unit Price	Total Price	
[edit] [trash]	Nairobi, Mombasa, Kisumu	UnPaved	Road Usability	A) Road Usability	Passability	(Unit)	500	1000	500000	[trash]
[edit] [trash]	Nairobi, Mombasa, Kisumu	UnPaved	Road User Comfort	B) Pavement, Shoulders and ROW for Paved Roads	Cleanliness of the road				224418.15	[trash]
[edit] [trash]	Nairobi, Mombasa, Kisumu	Paved	Road Durability	C) Drainage	Side Drains, Mitre Drains and cut off drains (lined)				789000	[trash]
[edit] [trash]	Nairobi, Mombasa, Kisumu	Paved	Road Durability	E) Structures	Expansion joints				224418.15	[trash]
[edit] [trash]	Nairobi, Mombasa, Kisumu	Paved	Road Durability	F) Road Furniture	Traffic Signals	(Unit)	68000	100	6800000	[trash]
[edit] [trash]	Nairobi, Mombasa, Kisumu	Paved	Road User Comfort	B) Pavement, Shoulders and ROW for Paved Roads	Height of shoulders vs. height of pavement	(Unit)	35	12222	427770	[trash]

[Create Output] [Back to Gateway] [Instructed Works] [Machinery Based Work Editor] [Quit]

Figure 0-5 Manage Estimations – Other PBC Works Editor

3.2.6 Instructed Woks

In addition to PBC Other Works, roads require various kinds of special works. iCOSTES refers to them as “Instructed works” and users can select necessary work items and input quantities and prices. Editor image is shown in Figure and the detail of each parameter is explained in **section 3.4 of the CEM II / CEM III**. If logging in as a Contractor, iCOSTES does not present default unit price. Therefore, users have to input unit price and quantities, or one set of lump-sum price.

COSTES Instructed Works Editor Home / Instructed Works / Index

Instructed Works Editor

Contract Information

Road Agency: KURA Project Term: 12 Month

Project Name: Test1 Month

Region: Nairobi,Mombasa,Kisumu Items in Year: Any Year

Work Category:

WorkItem: Mechanical Mowing

Price Input: Use Registered Unit Price

Item Quantity: Unit: Unit Price: Total Price:

[+ Save/Refresh](#)

Show entries Search:

Action	Area	Category	Work Item	Unit	Quantity	Unit Price	Total Price		
	Nairobi,Mombasa,Kisumu	20. Road Furniture Repair And Maintenance	Electric Cable	m	1000	249	249000		
	Nairobi,Mombasa,Kisumu	09. Passage Of Traffic	Watchman	No	1	80000	80000		
	Nairobi,Mombasa,Kisumu	05. Earth Works	Cut To Spoil In Soft	m3	67890	150	10183500		
	Nairobi,Mombasa,Kisumu	04. Site Clearance And Topsoil Stripping	Mechanical Mowing	m2	700	3	2100		
							Total	10,587,412	

Showing 1 to 8 of 8 entries Previous Next

[Create Output](#)
[Other PBC Work Editor](#)
[Machinery Based Work Editor](#)
[Back to Gateway](#)
[Quit](#)

Figure 0-6 Manage Estimations – COSTES Instructed Works Editor

iCOSTES prepared editing window of Machinery based work items described **section 3.7 of the CEM II / CEM III and Part II of CSG.**

User's inputs for each work items are as follows

- Use This Item : Include selected item to for the calculation (Check Box)
- Simple or Actual: Simple Quantity Input (Unit quantity(generally per km, when the user belongs to the Road Agency) or Actual Quantity Input (selection and input)
- Actual Quantity : Numerical input (in case of Actual Quantity Input)
- Road Classification : Selection based on the maintenance grade (if alternatives have prepared)
- PBC Works Ratio: Default value is ready based on Road Classification, manual adjustment is possible
- Decision Ratio: Default value is ready based on Road Classification, manual adjustment is possible
- If logging in as a Contractor, user has to specify Unit Prices by themselves

Basic editing flow is based on the above input.

- "Facility Quantity", "Quantity", "Price Ksh", "Total Price" and
- Monthly unit price or "Per Month"

Are instantly and automatically calculated. Hence User can check how much the money is needed for the Machinery Based Items.

"PBCWorksRatio" and "DecisionRatio" are given based on the road condition but always adjustable.

Table is entire candidate work items is already given . Users select necessary items by **selecting subject row** as shown above and checking "Use it" checkbox. Users cannot edit table directly.

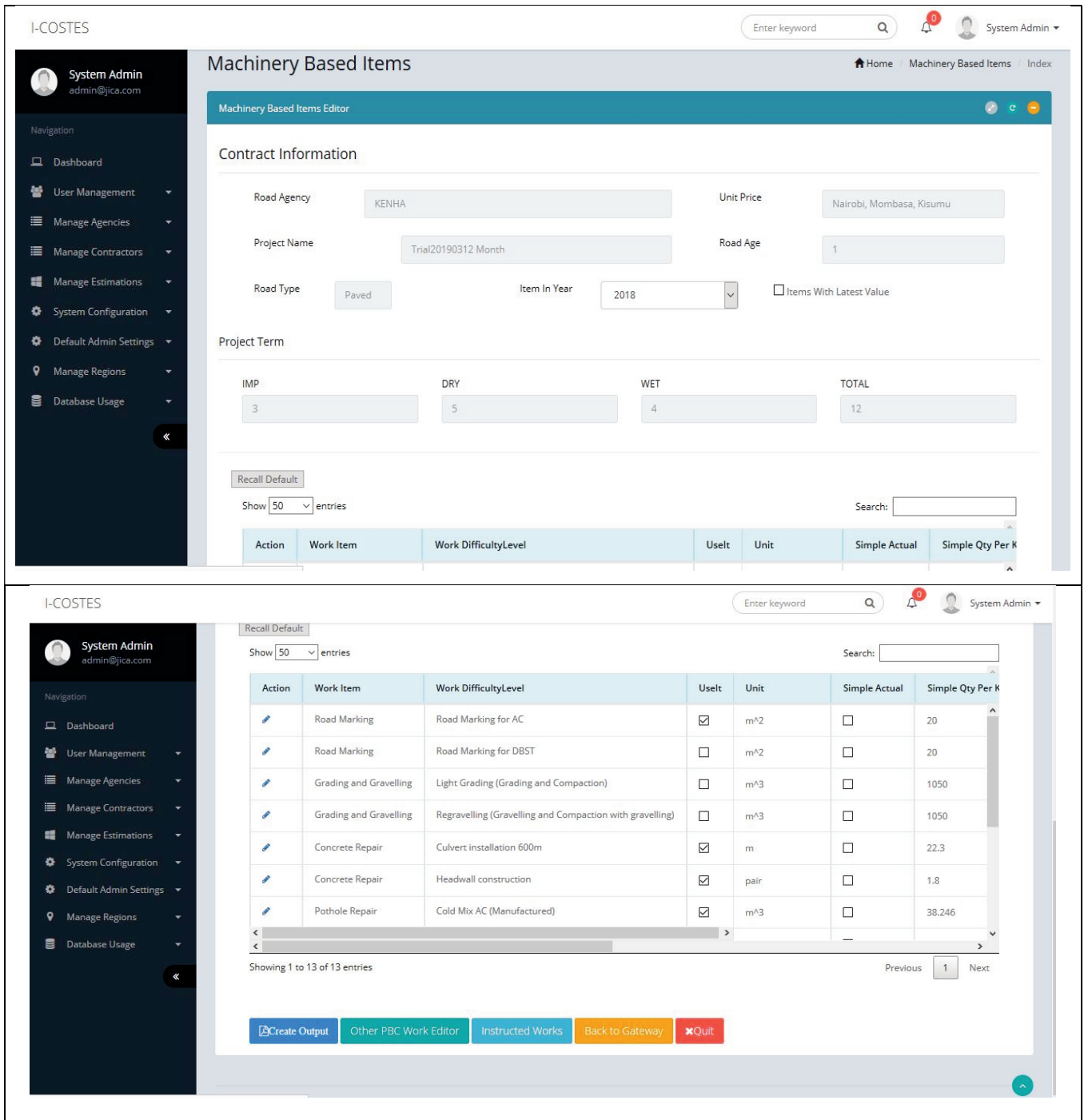


Figure 0-7 Manage Estimations –Machinery Based Items Editor

Road Marking

- **Cost Survey Guidenotes 2.4.3**
- Simple Quantity is given when the user belongs to the Road Agency
- Actual quantity: direct input is possible
- Road Classification : Grade (A or B) default value is given and adjustable

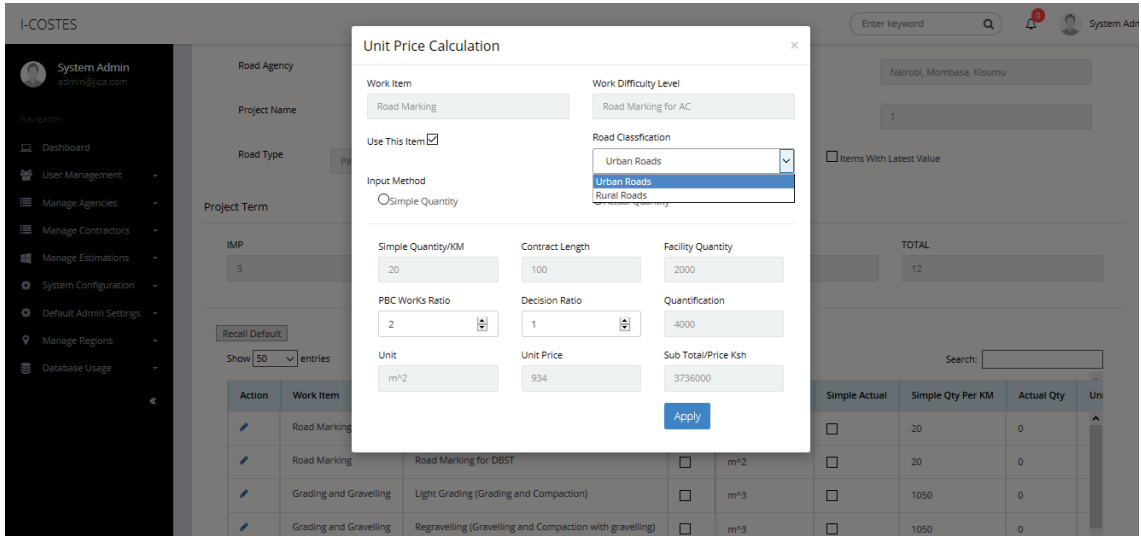


Figure 0-8 Manage Estimations –Machinery Based Items Editor - Road Marking

Grading and Graveling:

- **Cost Survey Guidenotes 2.2**
- Simple Quantity is given when the user belongs to the Road Agency
- Actual quantity: direct input is possible
- Road Classification : 2.0 is a default value for PBCWorksRatio, 0.0 is given for Decision Ratio.

Each Item is editable

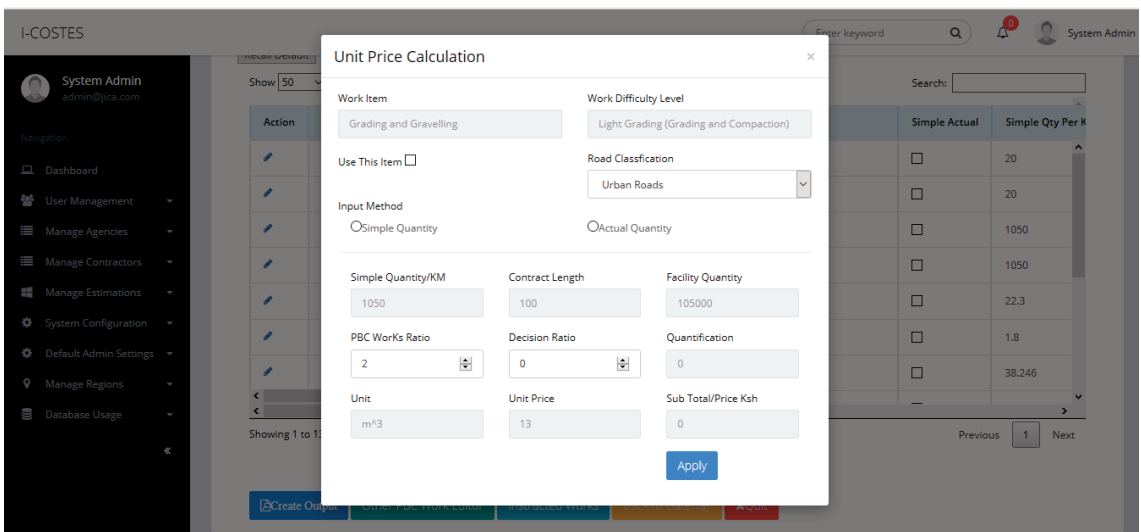


Figure 0-9: Manage Estimations –Machinery Based Items Editor - Grading and Graveling

Concrete Repair:

- **Cost Survey Guidenotes 2.1**
- Simple Quantity is given when the user belongs to the Road Agency
- Actual quantity direct input is possible
- Road Classification : default value is 0.01 for PBCWorksRatio, 1.0 for Decision Ratio respectively.

Figure 0-10 : Manage Estimations –Machinery Based Items Editor - Concrete Structure Repair

Pothole Patching:

- **Cost Survey Guidenotes 2.4.1**
- Simple Quantity is given when the user belongs to the Road Agency
- Actual quantity : direct input is possible
- Road Classification : automatically calculated based on road age. The result is presented in PBCRatio but adjustable. Contract terms have to be modified in the “Data Input” window.

Figure 0-11 Manage Estimations –Machinery Based Items Editor - Pothole Repair

GuardRail:

- **Cost Survey Guidenotes 2.3.1**
- Simple Quantity is already given when the user belongs to the Road Agency
- Actual quantity is editable by input
- Road Classification: Road Grade (S,A,B or C) gives us each default value but editable.

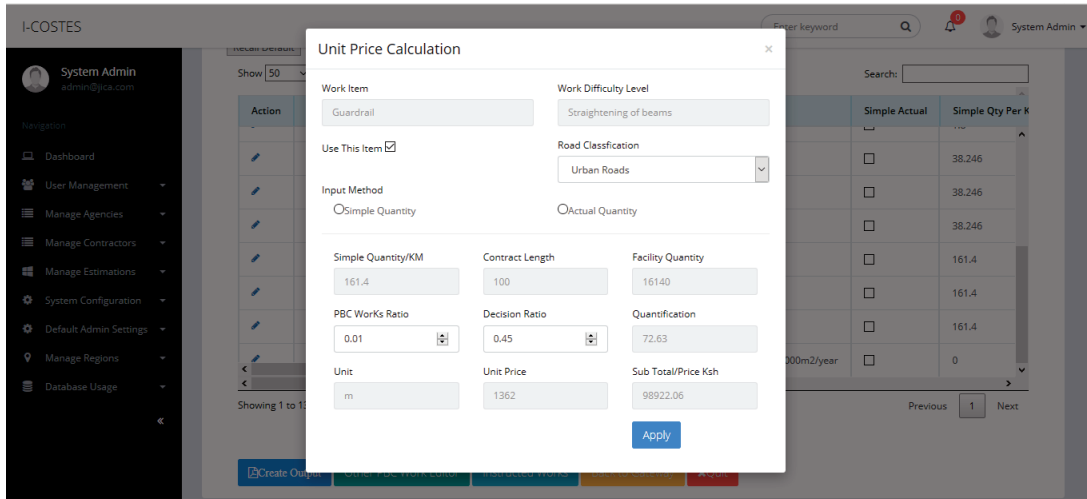


Figure 0-12 Manage Estimations –Machinery Based Items Editor - Guardrail Repair

CrackSealing:

- **Cost Survey Guidenotes 2.4.2**
- There is no Simple Quantity data. Users have to prepare Actual quantity if included in the calculation
- PBCRatio and Decision Ratio is zero therefore users have to prepare these coefficients

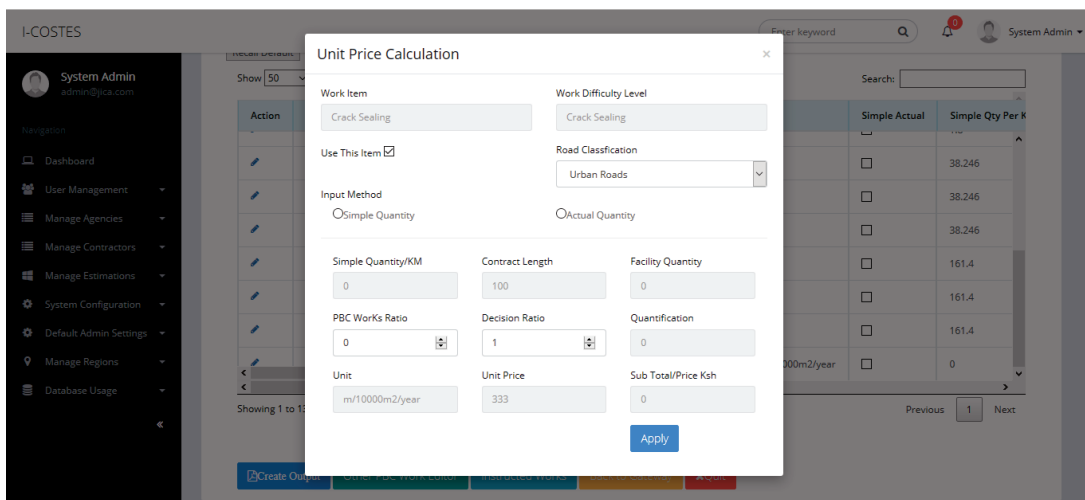


Figure 0-13 Manage Estimations –Machinery Based Items Editor - Crack Sealing

3.2.8 Create Output

By Clicking “Create Output”, Estimation book is generated automatically. Excel File will be provided via separate attached file via email (future option).

The detail of each parameter is explained in **chapter 4 of the CEM II / CEM III**.

3.2.9 View Estimation

This option provides a full list display of the already created estimations project name and provides the option to edit them. The list of the estimations that the user can view and edit depends on each user’s access level.

The screenshot displays the 'Estimations List' interface in the I-COSTES system. The page features a navigation sidebar on the left with options like Dashboard, User Management, and Manage Agencies. The main content area shows a table of estimations with the following data:

Action	Project Name	Ref Code	Agency Name	Region	Road Name	Length	DB Year	Input Method	IMP	WET Period	Dry Peri
Action	KURA SAMPLE PROJECT	50715	KURA	KURA	All other area			TEST ROAD	32	2017	ActualQu
Action	test road	50714	KURA	KURA	All other area			Kura test road	3	2017	ActualQu
Contract Window		50713	KURA	KURA	All other area			Kura test road	8	2017	ActualQu
SelfPatrol Window		50712	KURA	KURA	Nairobi, Mombasa, Kisumu			KURA TRIAL ROAD 1	41.3	2017	SimpleQu
Unit Price	E PROJECT	50712	KURA	KURA	Nairobi, Mombasa, Kisumu			KURA TRIAL ROAD 1	41.3	2017	SimpleQu
Other PBC Work Window		50711	KURA	KURA	Nairobi, Mombasa, Kisumu			WESTERN LINK ROAD	25	2017	Standardi
Instructed Work Window	INK ROAD	50711	KURA	KURA	Nairobi, Mombasa, Kisumu			WESTERN LINK ROAD	25	2017	Standardi
Machinery Based Items											
Generate PDF Reports	OAD										

Figure 0-14 Manage Estimations – Estimation List

3.2.10 Instructed Works Only

iCOSTES optionally provides the calculation system of only instructed works. This window is used to add instructed works only without PBC works. The user selects road agency, inputs the tender number, select the region as provided by the drop-down menu, mention the place of work, the road name, and select the database year. The user is then required to fill the Road information details. These are the Total length of the road in km, select the road type either paved or unpaved, age of the road, off carriage width in metres and the number of lanes it's made of.

Then the user provide the contract period details: Initial Mobilization Period in months, provide the dry period and the wet period in months, the IMP Method (either choose IMP has both IMP and WET period work or choose if it is only IMP Works) and then input the work frequency for dry period and also for the wet period in month(s) then save this input data by clicking the “save Input Data” button as illustrated below.

The detail of the input is explained in section “Instructed Works Editor”.

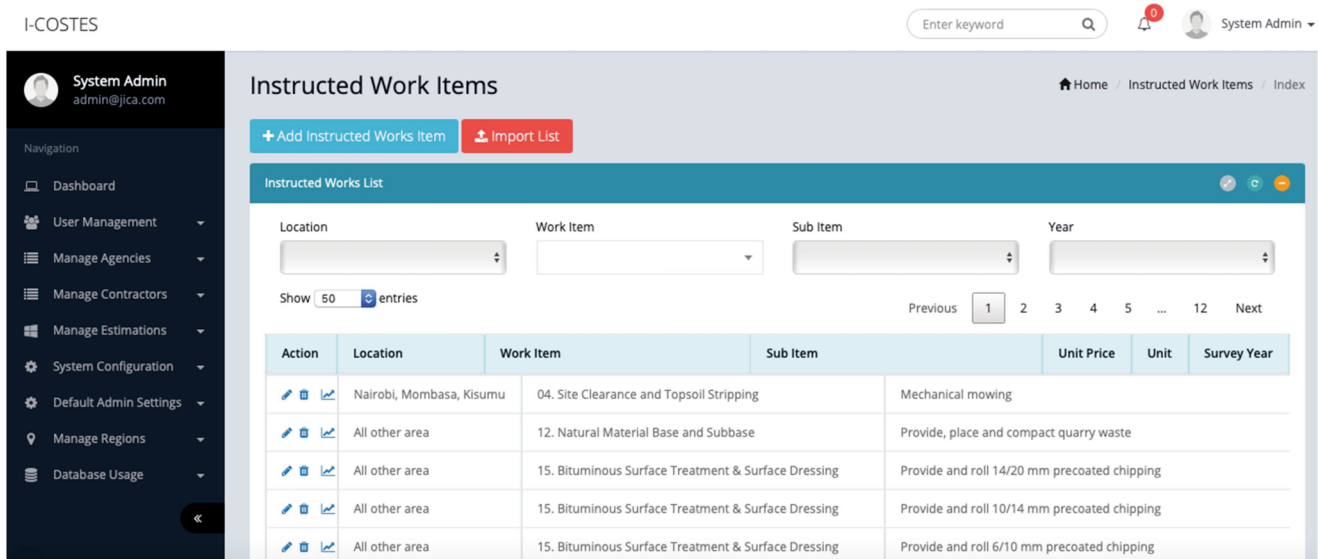


Figure 0-15 Manage Estimations – Instructed Works Only

4 DETAIL SYSTEMS STRUCTURE OF iCOSTES

4.1 ADMIN DASHBOARD

This involves defining and managing users, their roles and their access levels in the system. In iCOSTES our dashboard console provides the system administrators with high-level view of the system's user sessions, their login statuses, the privileges of each user, and their particular activity in the system.

In iCOSTES, the system admin dashboard has modules to manage the system users, manage agencies, manage the contractors, manage estimations, configure the system settings, default admin settings, manage regions and view the system database usage.

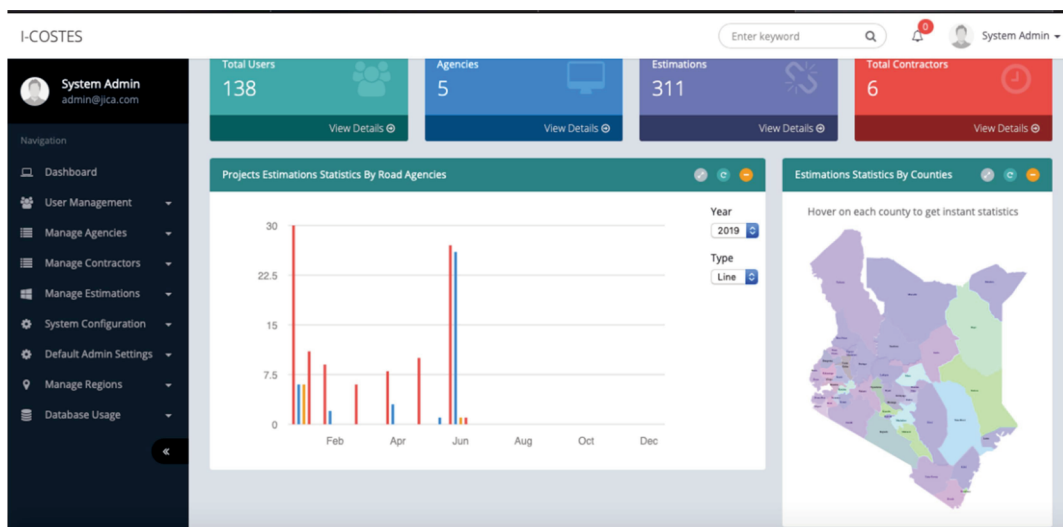


Figure 4.1- Administrator's Dashboard

4.2 USER MANAGEMENT

In this module, the system admin can add new user, view existing user accounts, add new role to the user accounts, view system roles and also the user statistics as shown below. The territory where each user can manage depends on the type of user.

Action	Name	Email Address	Access Level	Mobile	City	Country	Postal Address	ID Number	Date	Status	Block
Action	Kenya Rural Road Authority			kenrra@gmail.com			Agency Admin	+254708236804			
Action	Kenya Urban Road Authority			admin@kura.com			Agency Admin	+254708236804			
Action	Kenya Wildlife Service			kws@jicamail.com			Agency Admin	+254708236804			
Action	Kenya National Highways Authority(2+Lanes)			kenha2plus@mail.com			Agency Admin	+254708236804			
Action	JICA Survey Team			costsurveyteam@gmail.com			Administrator	+254712376153	Nairobi	Kenya	259

Figure 4.2- User Management

4.2.1 Adding new user

The admin feeds in the personal details of the new user as required; that is the name of the user, email address, telephone number, role of the new user and his password before clicking on create user button to create his account. This option is editable when logging in as a administrator or agency admin.

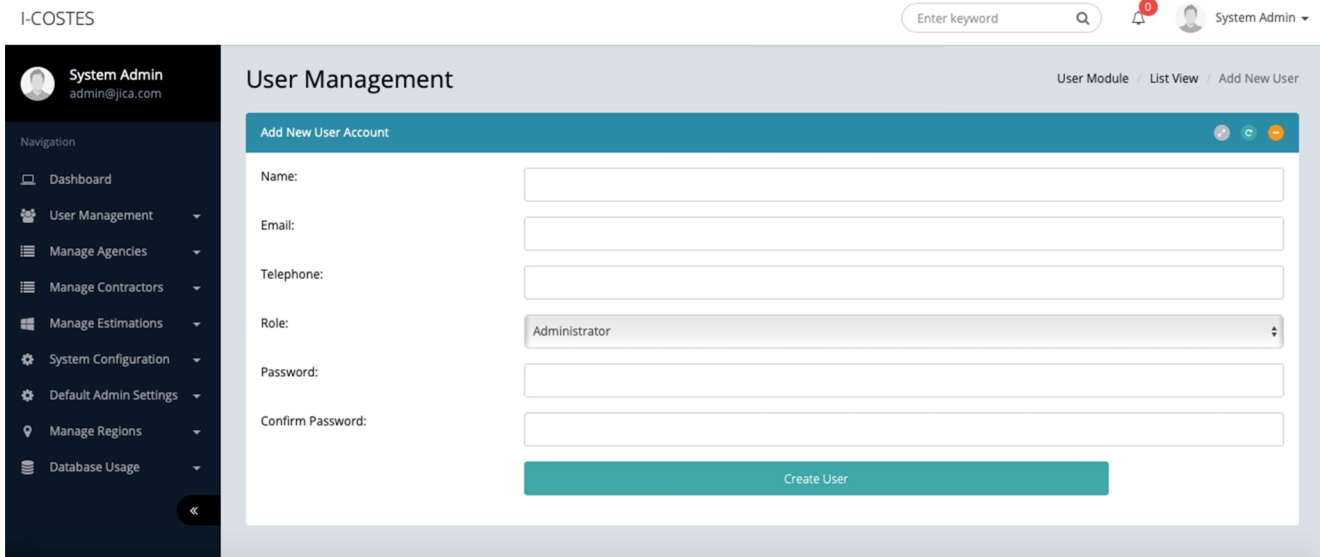


Figure 4-1 - User Management – Add New User Account

4.2.2 View User Accounts

Here the system admin is able to see a comprehensive list of the existing list of registered users, their personal details, their role and status. This option is editable when logging in as a administrator or agency admin.

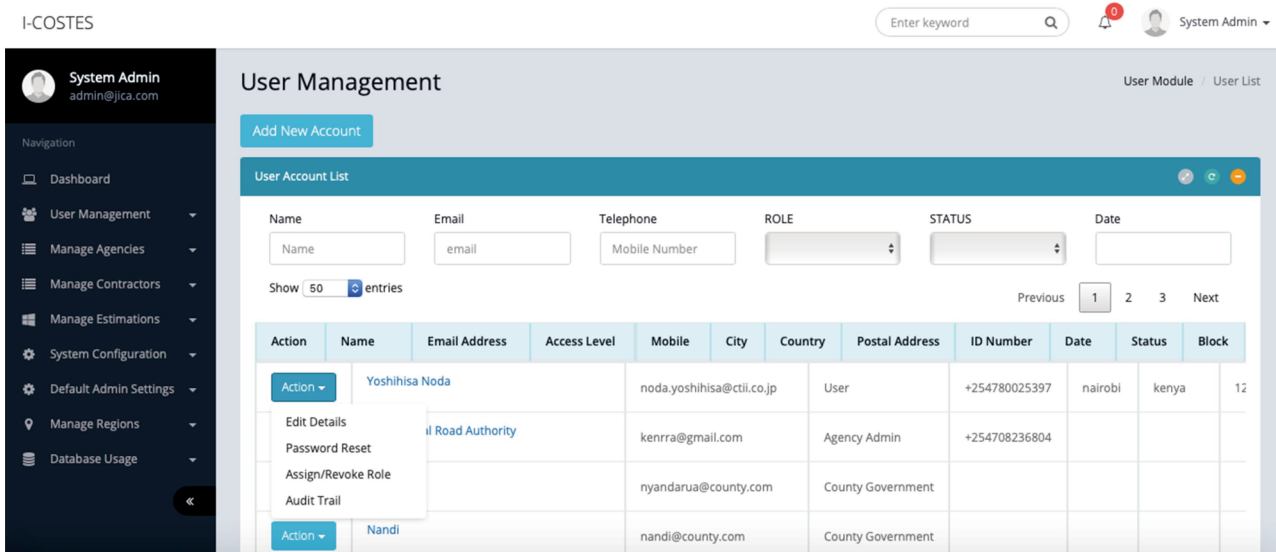


Figure 4-2 User Management – View User Account

4.2.3 Add New Role

Here you can add extra roles in the system by feeding in the Role's Name, its Display name, description and permissions then saving it by clicking the "save" button.

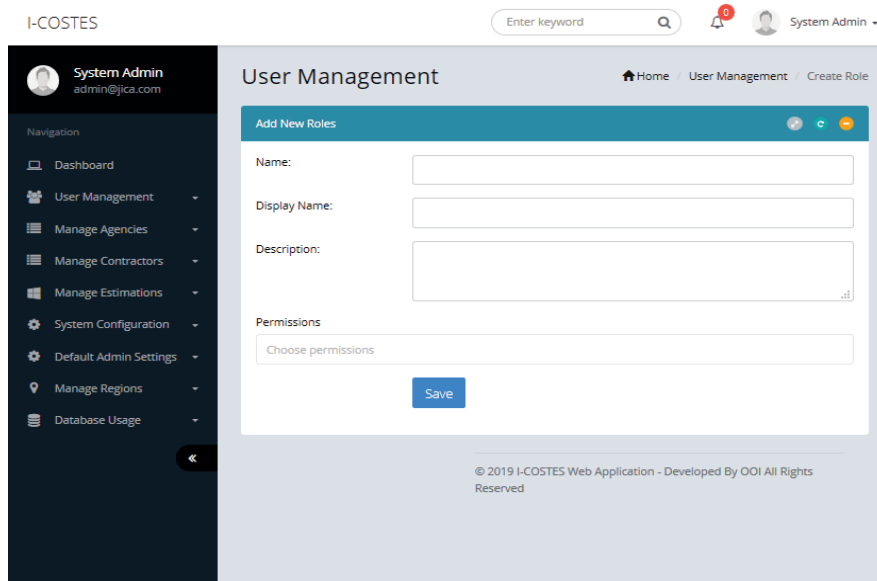


Figure 4-3 User Management – Add New Roles

4.2.4 System Roles

This feature shows all the saved system roles ranging from the Administrator role, agency admin role, contractors, county government, KRB Admin, Ministry admin, user roles and any other roles added by the system administrators. The search option at the top can be used to find in any role the user wants to see by using the roles keywords to search through the saved system roles then lists the search results.

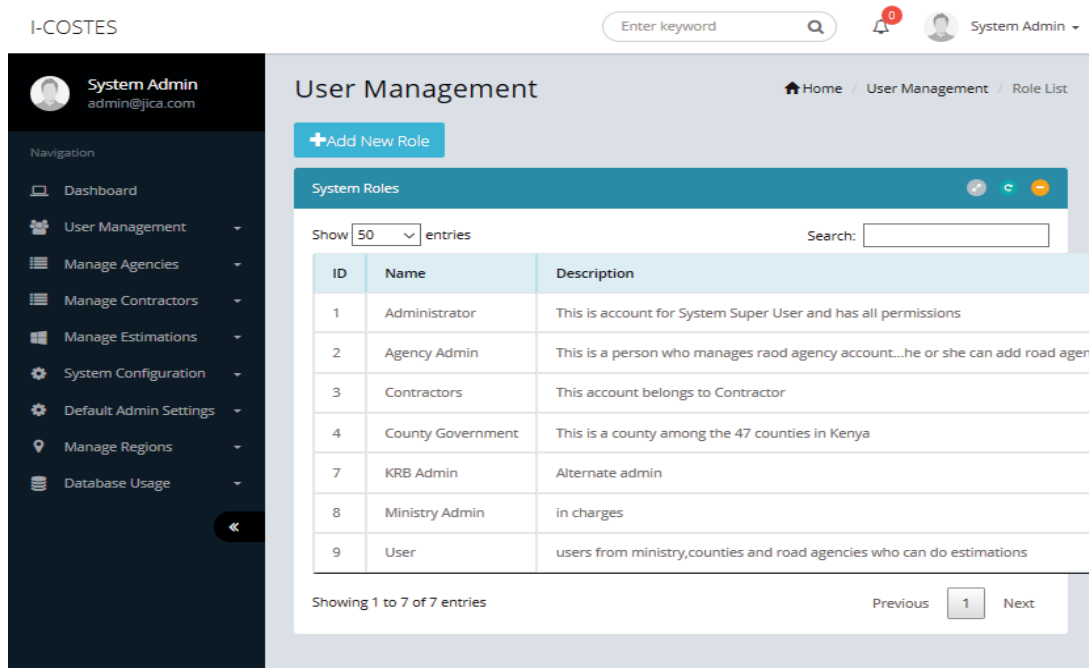


Figure 4-4 User Management – System Roles

iCOSTES MANUAL
4.2.5 User Statistics

This shows the system users' registration statistics over a given duration of time; annually and/or monthly.

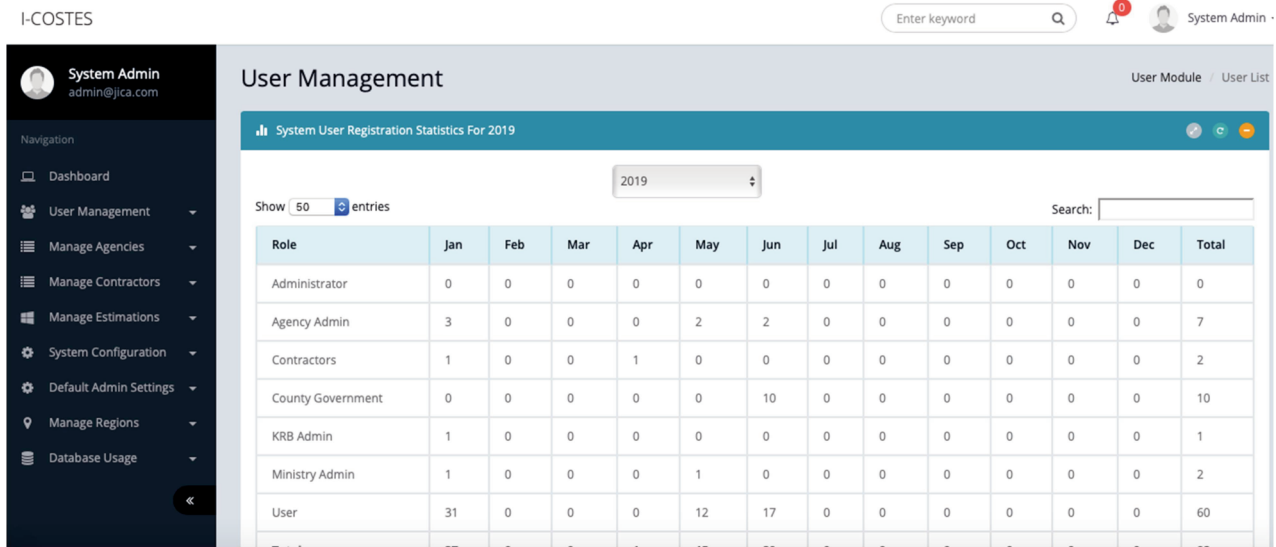


Figure 4-5 User Management – User Statistics

4.3 MANAGE AGENCIES

Here the system admin and agency admin can add new agencies, view existing list of road agencies, list of the available counties, agencies configuration and authorities' branches.

4.3.1 Add New Agencies

Here the user is required to enter the agency's details ranging from the agency full name, its abbreviation, email address, physical address, and telephone address etc. then go ahead and provide the agency settings before actualizing the account creation. As for the detail of each parameters, please refer **pp. 53 of the CEM Vol.1**.

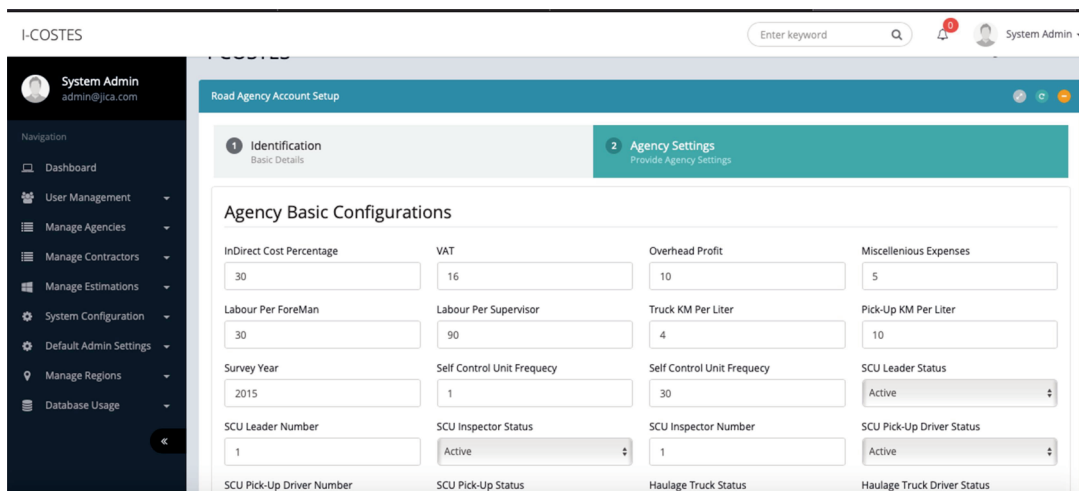
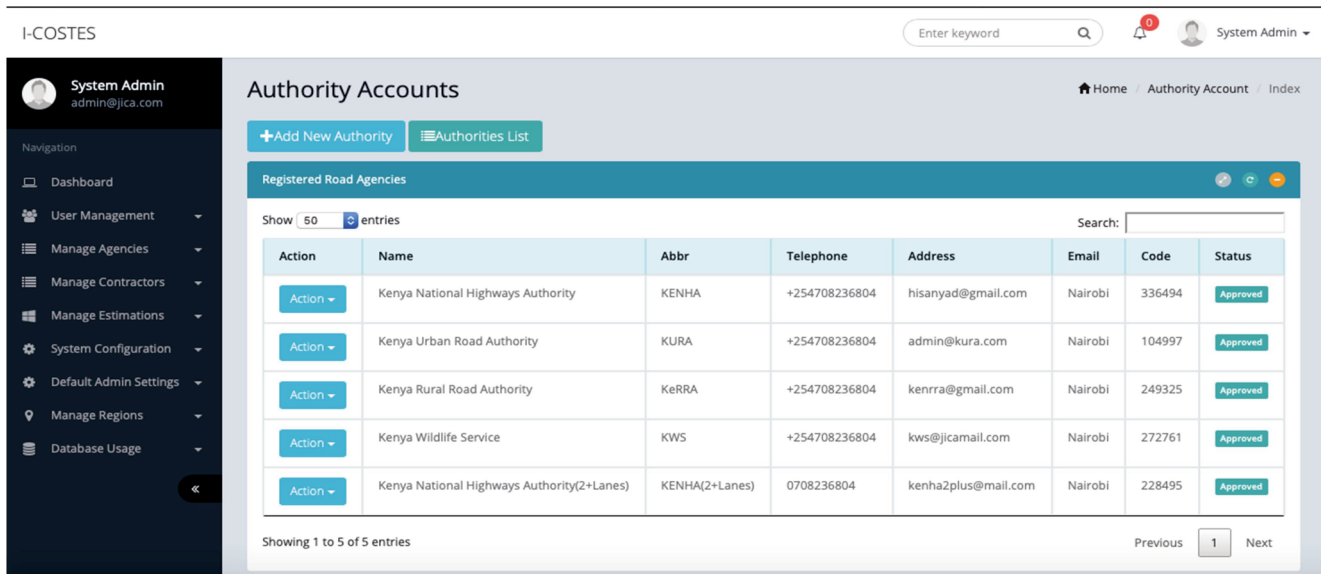


Figure 4-6 Manage Agencies – Add New Agencies

4.3.2 List of Agencies

Here the user is able to see the full list of all the already registered road agencies in the system and their basic details. The admin is also able to search the list by providing their keywords for instance the name of the authority body or its Abbreviation or the telephone number or any basic details the admin has about the road agency. The admin can also edit these registered road agencies by clicking the action drop down button to edit that particular road authority account.



The screenshot shows the 'Authority Accounts' page in the iCOSTES system. The page title is 'Authority Accounts' and it includes a search bar and a 'System Admin' user profile. The main content area is titled 'Registered Road Agencies' and displays a table with the following data:

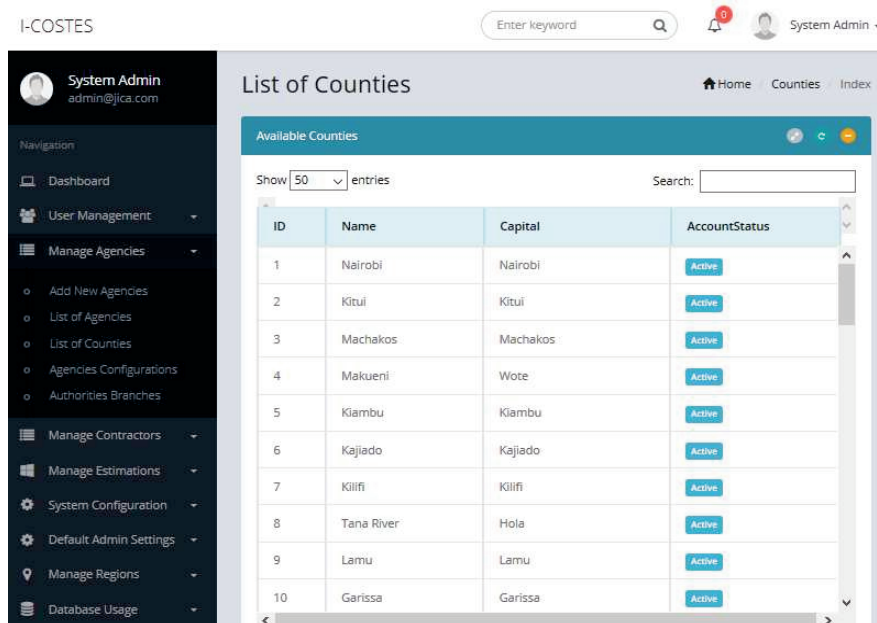
Action	Name	Abbr	Telephone	Address	Email	Code	Status
Action ▾	Kenya National Highways Authority	KENHA	+254708236804	hisanyad@gmail.com	Nairobi	336494	Approved
Action ▾	Kenya Urban Road Authority	KURA	+254708236804	admin@kura.com	Nairobi	104997	Approved
Action ▾	Kenya Rural Road Authority	KeRRA	+254708236804	kenrra@gmail.com	Nairobi	249325	Approved
Action ▾	Kenya Wildlife Service	KWS	+254708236804	kws@jicmail.com	Nairobi	272761	Approved
Action ▾	Kenya National Highways Authority(2+Lanes)	KENHA(2+Lanes)	0708236804	kenha2plus@mail.com	Nairobi	228495	Approved

The table shows 5 entries, with pagination controls for 'Showing 1 to 5 of 5 entries' and 'Previous 1 Next'.

Figure 4-7 Manage Agencies – List of Agencies

4.3.3 List of Counties

This shows list of all the available counties in the country, their capital towns and their account statuses.



The screenshot shows the 'List of Counties' page in the iCOSTES system. The page title is 'List of Counties' and it includes a search bar and a 'System Admin' user profile. The main content area is titled 'Available Counties' and displays a table with the following data:

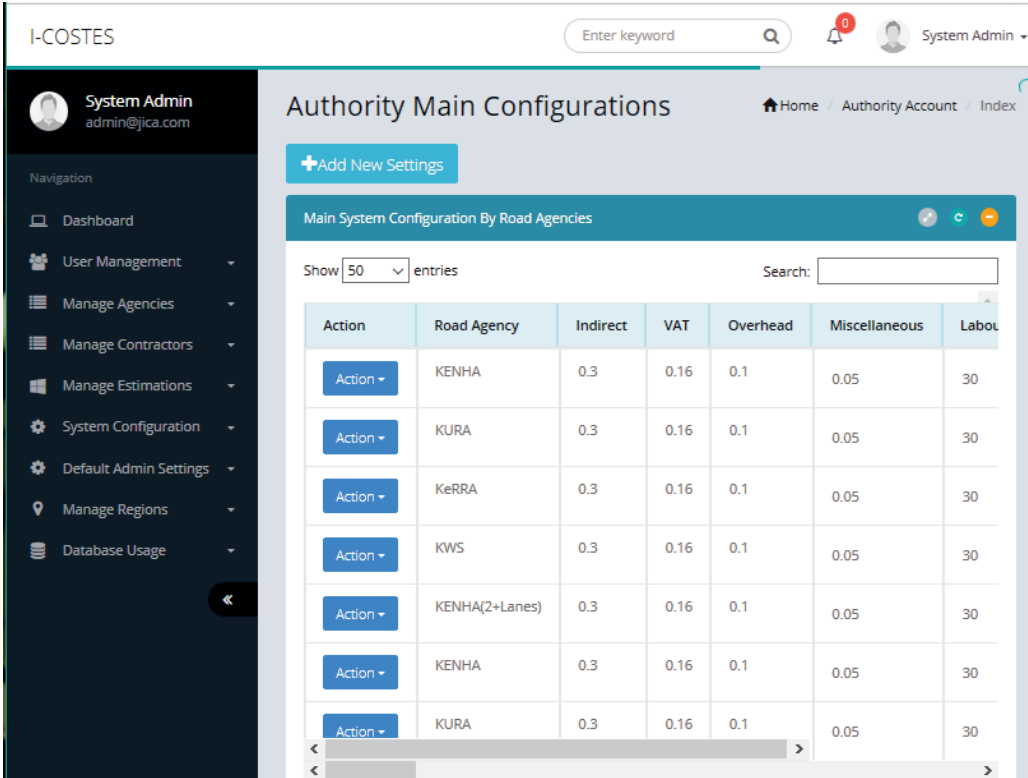
ID	Name	Capital	AccountStatus
1	Nairobi	Nairobi	Active
2	Kitui	Kitui	Active
3	Machakos	Machakos	Active
4	Makueni	Wote	Active
5	Kiambu	Kiambu	Active
6	Kajiado	Kajiado	Active
7	Kilifi	Kilifi	Active
8	Tana River	Hola	Active
9	Lamu	Lamu	Active
10	Garissa	Garissa	Active

The table shows 10 entries, with pagination controls for 'Showing 1 to 10 of 10 entries' and 'Previous 1 Next'.

Figure 4-8 Manage Agencies – List of Counties

4.3.4 Agencies Configurations

This feature shows main system configuration by individual road agencies and new agency settings can be added by choosing the “Add New Settings” button at the top. As for the detail of each parameters, please refer **pp. 53 of the CEM Vol.1**.



The screenshot shows the 'Authority Main Configurations' page in the iCOSTES system. The page title is 'Authority Main Configurations' and it includes a search bar and a user profile for 'System Admin'. A navigation sidebar on the left lists various system management options. The main content area features a table titled 'Main System Configuration By Road Agencies' with the following data:

Action	Road Agency	Indirect	VAT	Overhead	Miscellaneous	Labour
Action ▾	KENHA	0.3	0.16	0.1	0.05	30
Action ▾	KURA	0.3	0.16	0.1	0.05	30
Action ▾	KeRRA	0.3	0.16	0.1	0.05	30
Action ▾	KWS	0.3	0.16	0.1	0.05	30
Action ▾	KENHA(2+Lanes)	0.3	0.16	0.1	0.05	30
Action ▾	KENHA	0.3	0.16	0.1	0.05	30
Action ▾	KURA	0.3	0.16	0.1	0.05	30

Figure 4-9 Manage Agencies – Agency Configurations

4.3.5 Create New Agency Configurations

Here the system user is allowed to enter new agency configurations by feeding in its details and saving them into the system using “save details” button.

In this phase the admin is allowed to select the road agency then feed in the corresponding rates(indirect cost percentage, VAT, Overhead profit, miscellaneous expenses, labour per foreman, labour per supervisor, truck KM per litre, Pick-up KM per litre, the survey year, set the control unit frequency, SCU Leader status, SCU Leader number, SCU Inspector status, SCU Inspector number, SCU Pick-up driver status and number, SCU Pick up status, Haulage truck status and number, haulage pick-up status, haulage pick-up driver status and number and lastly haulage working days per month) the admin can then choose where to generate an excel output or not and also whether they generate PDF Output or not then they save the details.

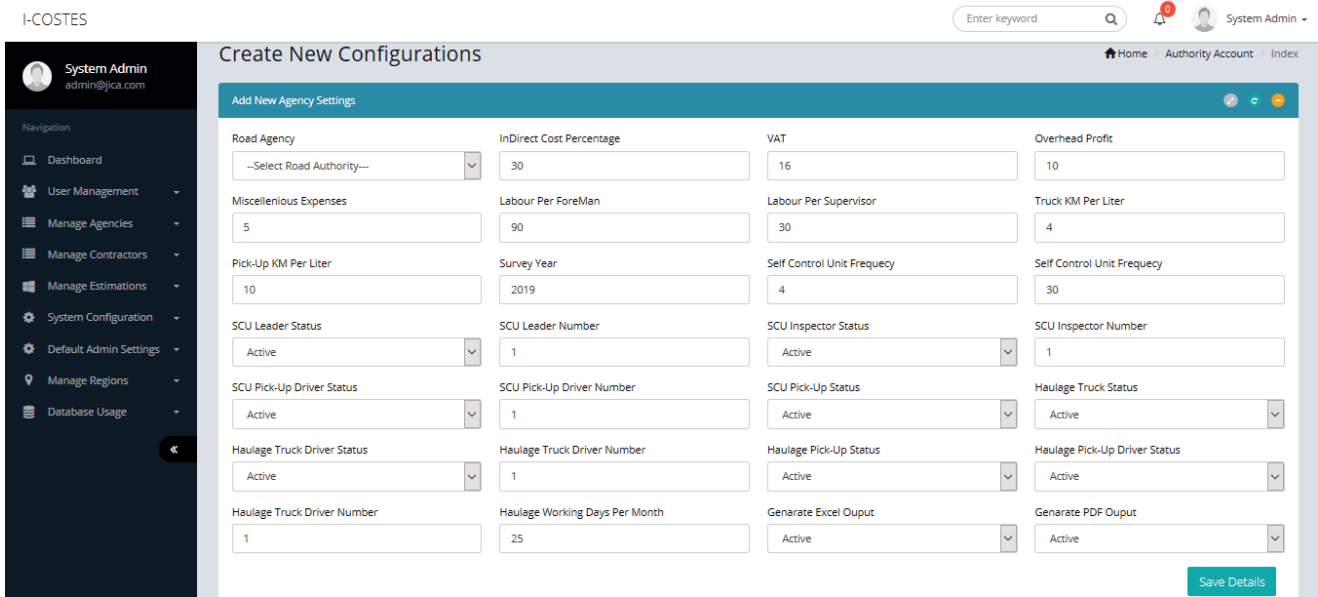


Figure 4-10 Manage Agencies – Create New Agency Configurations

4.3.6 Authorities Branches

This displays a list of all the authority’s branches registered and their locations as shown below.

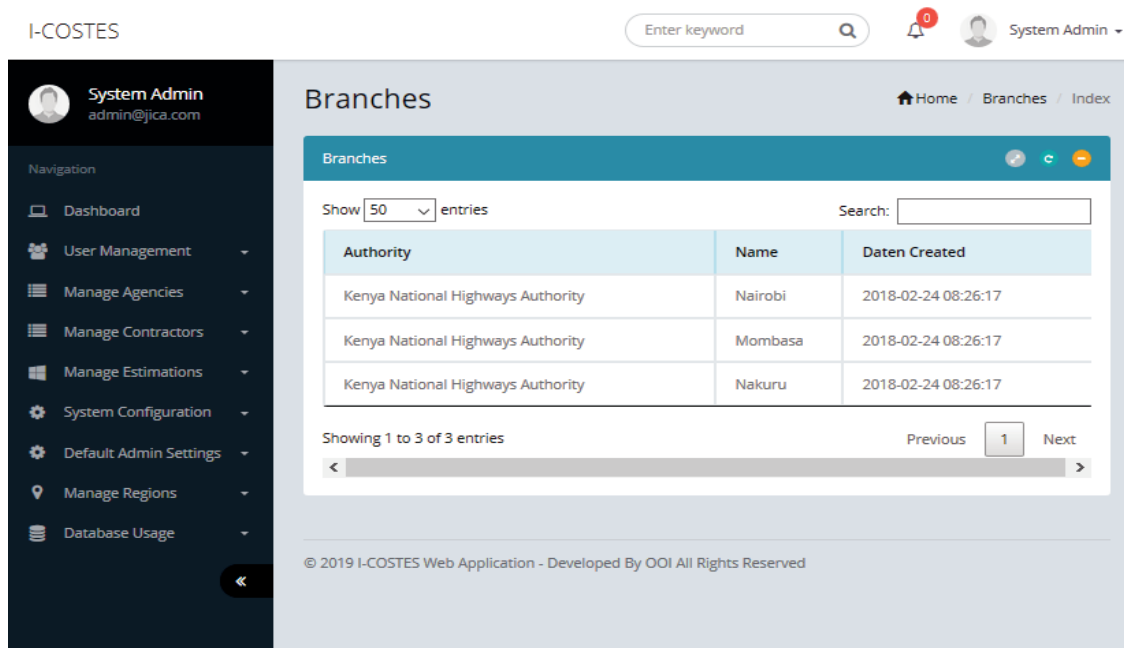


Figure 4-11 Manage Agencies – Authority Branches

4.4 MANAGE CONTRACTORS

This module allows the admin to create a new contractor account and/or view a list of all the existing contractors.

4.4.1 Add New Contractor

Here the admin first has to feed in the contractors basic details which are the License number, telephone number and their email address for identification purposes before proceeding to next to add their contact information on how they can be contacted, then save to create the contractor’s account.

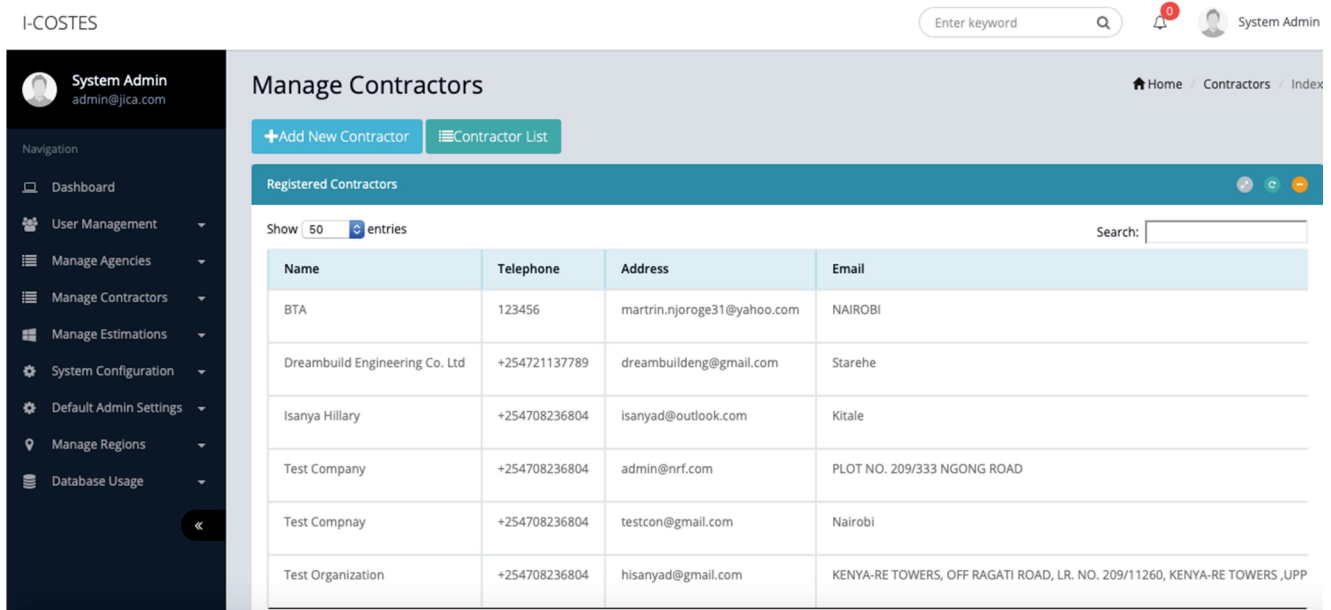


Figure 4-12 Manage Contractors – Add New Contractor

4.4.2 Contractors List

Clicking on contractor list shows display of all the already existing contractors that have already been registered with the ICOSTES system.

The administrator can also search through the list of the registered contractors list using their details as the keywords to get the related display of the desired contractors list. For instance searching “Nairobi” will display all the contractors located in Nairobi.

I-COSTES Enter keyword System Admin

System Admin
admin@jica.com

Navigation

- Dashboard
- User Management
- Manage Agencies
- Manage Contractors
- Manage Estimations
- System Configuration
- Default Admin Settings
- Manage Regions
- Database Usage

Manage Contractors

Home / Contractors / Index

Registered Contractors

Show entries Search:

Name	Telephone	Address	Email
BTA	123456	martrin.njoroge31@yahoo.com	NAIROBI
Dreambuild Engineering Co. Ltd	+254721137789	dreambuildeng@gmail.com	Starehe
Isanya Hillary	+254708236804	isanyad@outlook.com	Kitale
Test Company	+254708236804	admin@nrf.com	PLOT NO.
Test Compnay	+254708236804	testcon@gmail.com	Nairobi
Test Organization	+254708236804	hisanyad@gmail.com	KENYA-RE

Showing 1 to 6 of 6 entries Previous Next

Figure 4-13 Contractors List

5 iCOSTES SYSTEM AND DATA ADMINISTRATION

5.1 SYSTEM CONFIGURATION

5.1.1 Application Settings

These system configurations; application settings refer to the system defined settings made by the designers of the system or the system administrator which control how the system works.

The screenshot displays the 'Application Settings' page in the iCOSTES web application. The page features a dark navigation sidebar on the left with options like 'Dashboard', 'User Management', and 'System Configuration'. The main content area shows a table of settings with columns for 'Id', 'Name', 'Value', and 'Description'. There are 7 entries listed, each with a pencil icon for editing. The table is paginated to show 1 to 7 of 7 entries.

Id	Name	Value	Description	Actions
1	PBC Optional Work Input	No	This Option Allow/does not allow the input of independent PBC works other than six major labour based works	
2	Instructed Work Input	No	This option allow/does not allow the input of Instructed works	
3	Select Input Method of major labour based works one by No	Yes	if Yes,users can select input method per work item	
4	Generate PDF	Yes	Allow the system to generate both PDF and Excel Reports	
5	Operation Mode	Advanced	Select wether to allow the authority to input their own default settings(Advanced) or (Normal) they can be set by admin.	
6	Simple Quantity(sruq) decimal places	7	Number of Decimal Places to be used for calculation of 6 major PBC work items using simple method	
7	Round To Decimal Place	3	Number of Decimal Places to be rounded to when carrying out any decimal calculation	

Showing 1 to 7 of 7 entries

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Figure 5-1 System Configuration – Application Settings

5.2 DEFAULT ADMIN SETTINGS

This part provides basic default parameters of unit price, list of PBC work items, instructed work items, SRUQs, Characteristics of Machinery Based work items and Road types. The parameters that the user can edit depends on the access level.

5.2.1 Unit Price

Here the system user can add new unit price or import list for new unit price per location. They can also edit the existing unit price lists. The detail of each parameter is explained in **pp. 49 of the CEM I**.

Action	Location	Code	Item	Name	Unit	Unit Price	Source	Source Type	Year
	Nairobi, Mombasa, Kisumu	21.00.001	Labour	Supervisor	month	37079.25	Oct2015	a	2015
	Nairobi, Mombasa, Kisumu	21.00.002	Labour	Foreman	month	30126	Oct2015	a	2015
	Nairobi, Mombasa, Kisumu	21.00.003	Labour	Labour	day	527.1	Oct2015	a	2015
	Nairobi, Mombasa, Kisumu	21.00.004	Labour	SCU Leader	month	37079.25	Oct2015	a	2015
	Nairobi, Mombasa, Kisumu	21.00.005	Labour	SCU Inspector	month	30126	Oct2015	a	2015
	Nairobi, Mombasa, Kisumu	21.00.006	Labour	Driver(Truck)	month	24719.5	Oct2015	a	2015
	Nairobi, Mombasa, Kisumu	21.00.010	Machinery	Vehicle(2ton Truck)	number	191800	Oct2015	a	2015
	Nairobi, Mombasa, Kisumu	21.00.011	Machinery	Vehicle(Pick up)	number	88200	Oct2015	a	2015
	Nairobi, Mombasa, Kisumu	21.00.012	Material	Fuel(Diesel)	Lit	79.99	Oct2015	a	2015
	Nairobi, Mombasa, Kisumu				Lit	102.65	Oct2015	a	2015

Figure 5-2 Default Admin Settings – Unit Price

Field	Value
Location	Nairobi, Mombasa, Kisumu
Item	Labour
Name	Supervisor
Survey Year	2015
Code	21.00.001
Unit	month
Unit Price	37079.25
Source	Oct2015
Source Type	a

Save

Figure 5-3 Default Admin Settings – Unit Price (details)

5.2.2 PBC Works Items

Here the system admin can view other existing PBC Work Items and/or add other PBC Work Item. To add new other PBC Work items the admin selects its location, the work item, condition of the road (paved or unpaved), choose its category (Road user comfort, road usability or road durability), then selects its service scope and finally the year.

The detail of each parameter is explained in pp. 51 of the CEM I.

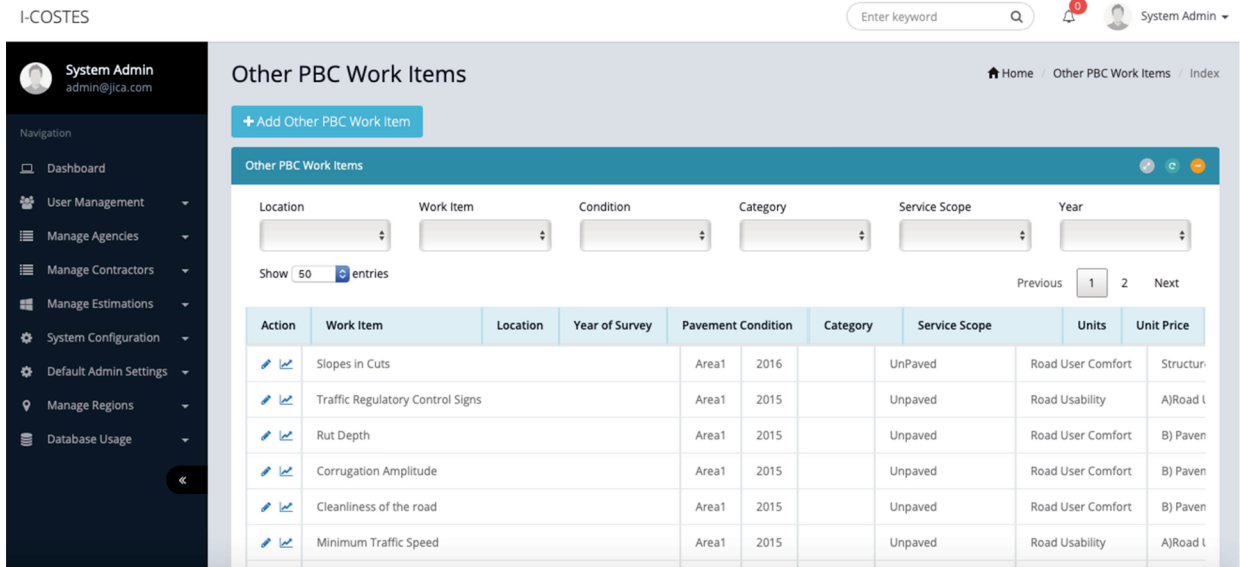


Figure 5-4 Default Admin Settings – Other PBC Works

5.2.3 Manage SRUQ

Here the admin can add SRUQ (Standard Resource Usage per Quantity) or import list. To create new SRUQ he clicks on the add SRUQ button then fills the form by providing the following details: Road authority, work item, type(IMP or RMP), period(wet or dry), work difficult level, year, SRUQ,SRUQ2 then quantity per kilometer then clicking on create.

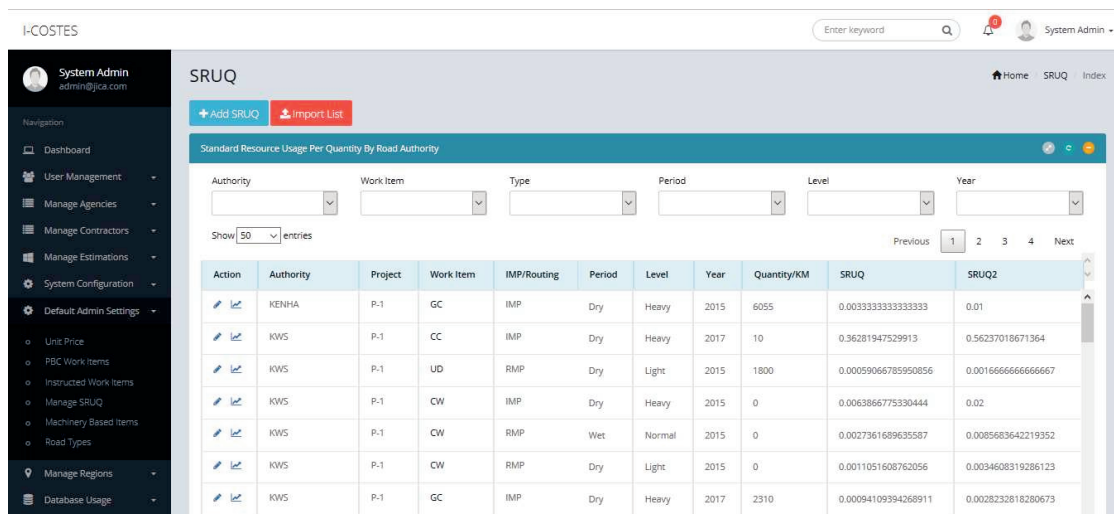


Figure 5-5 Default Admin Settings – Manage SRUQs

5.2.4 Machinery based Items

This module provides a list of machinery based item list and also allows the admin to import new list of machinery based items into the system.

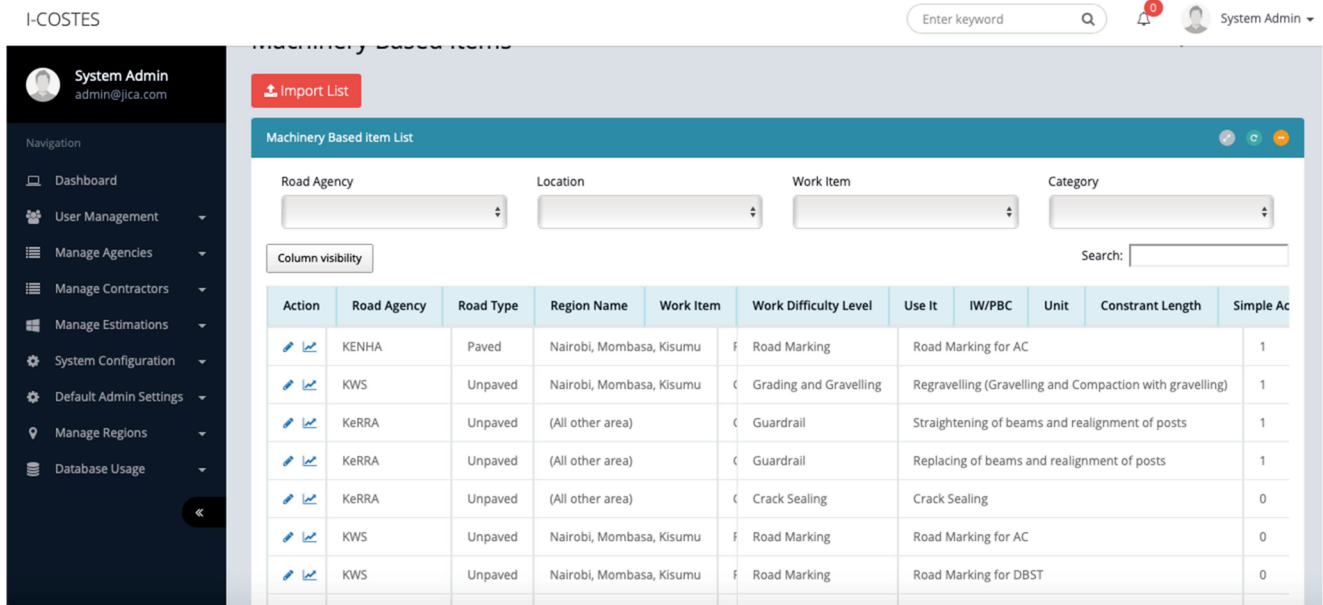


Figure 5-6 Default Admin Settings – Manage Machinery Based Items

5.2.5 Road types

Here the system admin is able to categorize the type of roads; either paved or unpaved and also, he/she is able to add new roads into the system as shown below. Currently, only “Paved” and “Unpaved “are considered in iCOSTES

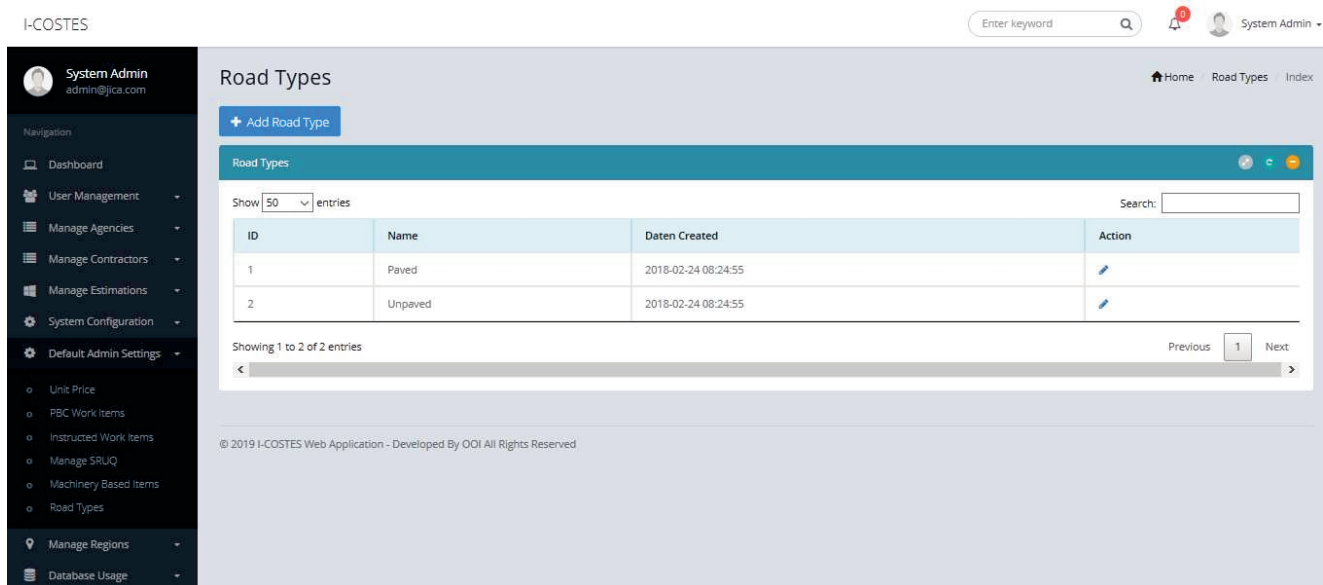


Figure 5-7 Default Admin Settings – Road Types

5.3 MANAGE REGIONS

Here the operation area of the system admins is preset for the users of the system to be able to locate or address them. The admin is able to add regions for operation areas into the systems too.

However, currently, the survey is carried out by the classification of only “Nairobi, Mombasa, Kisumu” and “All other area”. Therefore, this function is not necessary to modify until the unit of survey area will have changed.

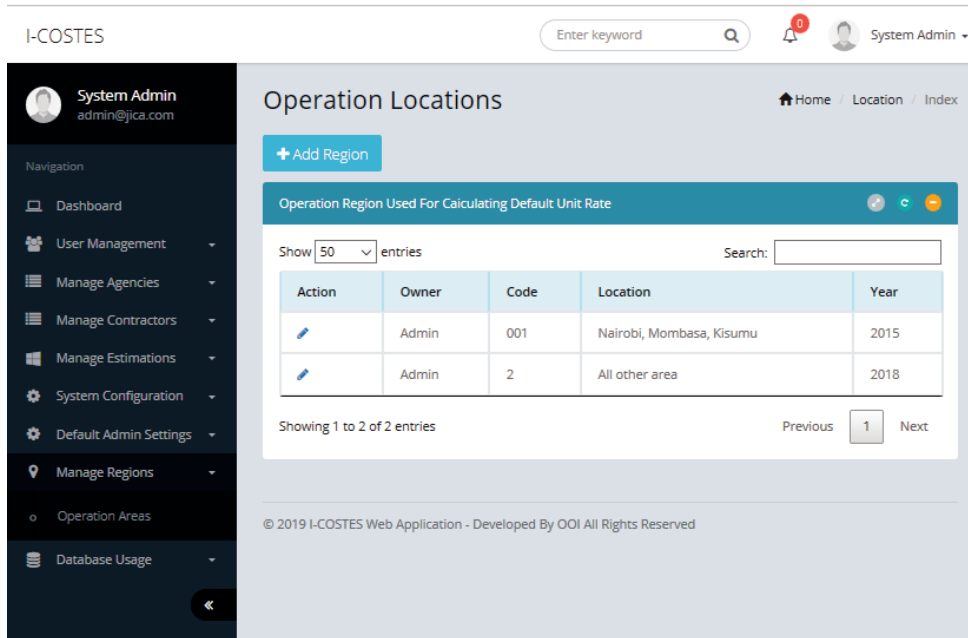


Figure 5-8 Manage Regions – Operation Locations

5.4 DATABASE USAGE

This module displays a table of statistics showing entries of how the database has been accessed and how much space in megabytes (MB) each table has utilized too with its corresponding average grow size in Kilobits (KB)

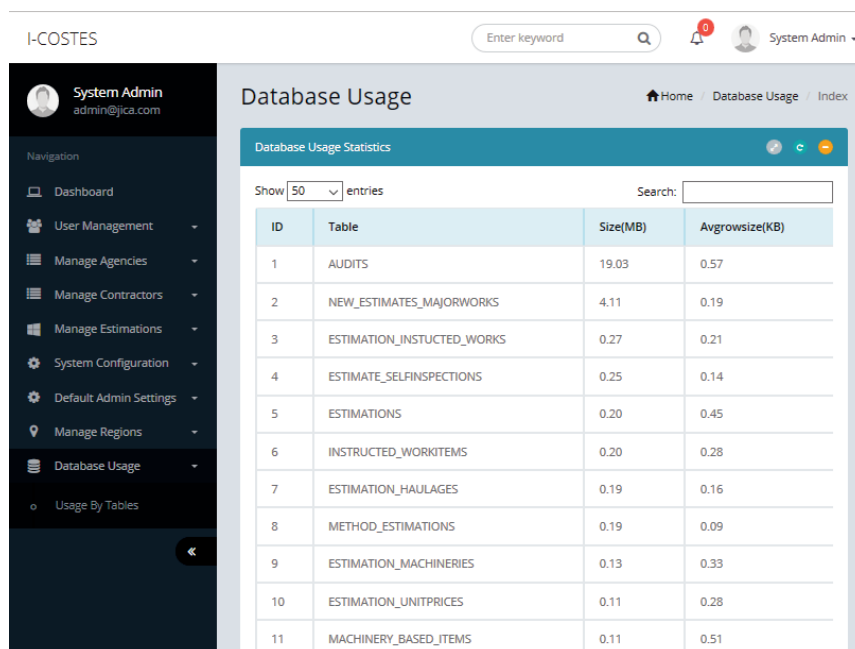


Figure 5-9 Database Usage

APPENDIX

1. Road Agency Account Setup

Road Agency Account Setup

1 Identification
Basic Details

2 Agency Settings
Provide Agency Settings

Agency Basic Configurations

Indirect Cost Percentage 30	VAT 16	Overhead Profit 10	Miscellenious Expenses 5
90	30	4	10

Q 🔔 👤 System Admin ▾

Survey Year 2015	Self Control Unit Frequecy 1	Self Control Unit Frequecy 30	SCU Leader Status Active
SCU Leader Number 1	SCU Inspector Status Active	SCU Inspector Number 1	SCU Pick-Up Driver Status Active
SCU Pick-Up Driver Number 1	SCU Pick-Up Status Active	Haulage Truck Status Active	Haulage Truck Driver Status Active
Haulage Truck Driver Number 1	Haulage Pick-Up Status Active	Haulage Pick-Up Driver Status Active	Haulage Truck Driver Number 1
Haulage Working Days Per Month 25	Genarate Excel Ouput Active	Genarate PDF Ouput Active	

Save Details

Quantity Input option for 6 Major Labour Based Works

Use KM Standardized Quantity
 Simple Quantity
 Actual Quantity
 Independent Selection

<p style="margin-top: 0; font-size: 0.8em;">Grass Cutting</p> <table style="width: 100%; border-collapse: collapse;"> <tr> <td style="font-size: 0.7em;">Input Method</td> <td style="font-size: 0.7em;">PBC Quantity</td> <td style="font-size: 0.7em;">M²</td> </tr> <tr> <td style="font-size: 0.7em;">KM Stanc</td> <td style="border: 1px solid #ccc; width: 40px;"></td> <td></td> </tr> </table>	Input Method	PBC Quantity	M ²	KM Stanc			<p style="margin-top: 0; font-size: 0.8em;">Cross Culvert Desilting</p> <table style="width: 100%; border-collapse: collapse;"> <tr> <td style="font-size: 0.7em;">Input Method</td> <td style="font-size: 0.7em;">PBC Quantity</td> <td style="font-size: 0.7em;">M</td> </tr> <tr> <td style="font-size: 0.7em;">KM Stanc</td> <td style="border: 1px solid #ccc; width: 40px;"></td> <td></td> </tr> </table>	Input Method	PBC Quantity	M	KM Stanc			<p style="margin-top: 0; font-size: 0.8em;">Catch Basin Desilting</p> <table style="width: 100%; border-collapse: collapse;"> <tr> <td style="font-size: 0.7em;">Input Method</td> <td style="font-size: 0.7em;">PBC Quantity</td> <td style="font-size: 0.7em;">Pcs</td> </tr> <tr> <td style="font-size: 0.7em;">KM Stanc</td> <td style="border: 1px solid #ccc; width: 40px;"></td> <td></td> </tr> </table>	Input Method	PBC Quantity	Pcs	KM Stanc		
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<p style="margin-top: 0; font-size: 0.8em;">Lined Side Ditch Desilting</p> <table style="width: 100%; border-collapse: collapse;"> <tr> <td style="font-size: 0.7em;">Input Method</td> <td style="font-size: 0.7em;">PBC Quantity</td> <td style="font-size: 0.7em;">M</td> </tr> <tr> <td style="font-size: 0.7em;">KM Stanc</td> <td style="border: 1px solid #ccc; width: 40px;"></td> <td></td> </tr> </table>	Input Method	PBC Quantity	M	KM Stanc			<p style="margin-top: 0; font-size: 0.8em;">Unlined Side Ditch Desilting</p> <table style="width: 100%; border-collapse: collapse;"> <tr> <td style="font-size: 0.7em;">Input Method</td> <td style="font-size: 0.7em;">PBC Quantity</td> <td style="font-size: 0.7em;">M</td> </tr> <tr> <td style="font-size: 0.7em;">KM Stanc</td> <td style="border: 1px solid #ccc; width: 40px;"></td> <td></td> </tr> </table>	Input Method	PBC Quantity	M	KM Stanc			<p style="margin-top: 0; font-size: 0.8em;">Carriage Way Cleaning</p> <table style="width: 100%; border-collapse: collapse;"> <tr> <td style="font-size: 0.7em;">Input Method</td> <td style="font-size: 0.7em;">PBC Quantity</td> <td style="font-size: 0.7em;">M²</td> </tr> <tr> <td style="font-size: 0.7em;">KM Stanc</td> <td style="border: 1px solid #ccc; width: 40px;"></td> <td></td> </tr> </table>	Input Method	PBC Quantity	M ²	KM Stanc		
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Input Method	PBC Quantity	M																		
KM Stanc																				
Input Method	PBC Quantity	M ²																		
KM Stanc																				

Save Input Data

Contents of the table 1/2

Item	Value type/ value range/ condition	Description
Road Agency	Letter String/ up to 100 characters/ At least the name includes “KeNHA”, “KURA”, “KeRRA” or “KWS”	Defines the name of the road authorities. Alternatives include: “KeNHA”, “KURA”, “KeRRA”, and “KWS”. ICOSTES recognizes these names by exact word and character.
Indirect Cost	Decimal Number / 0.000 to 1.500 (3 decimal points)	Ratio of the indirect cost. ICOSTES calculates indirect cost by multiplying total direct cost (including PBC and Instructed work) by this ratio.
VAT	Decimal Number / 0.00 to 1.00 (2 decimal points)	Ratio of Value Added Tax
Overhead Profit	Decimal Number / 0.0000 to 1.5000 (4 decimal points)	Ratio of the overhead and profit. ICOSTES calculates overhead cost and profit by multiplying this ratio with the sum of direct and indirect cost.
Miscellaneous	Decimal Number/ 0.0000 to 1.5000 (4 decimal points)	Ratio of the miscellaneous cost. ICOSTES calculates miscellaneous cost by multiplying total labour cost by this ratio. This ratio is used on the detail cost sheets of 6 Major Labour Based Works in the “Detail Contents (B)” sheets.
Labour/ Foreman	No Decimal point / 0 to 300	Defines how many labours should be allocated to ONE Site agent. This value is used in the detail cost sheets of 6 Major Labour Based Works in the “Detail Contents (B)” sheets.

Data Update 1/2

It is essential to modify parameters (2015 data), except for “Road Agency”, for each authority otherwise iCOSTES cannot find any parameters if 2016 or later data have not been registered. One parameter set can be installed for each year by the Road Agency. It is important to note that two or more parameter sets cannot be registered in the same year. If a new data set is obtained, please input them but the year should be unique. iCOSTES uses the data of the year which the user specifies on the “Contract Condition” window.

It is strongly recommended that both Road Agency and Contractor use the data of the same year.

Standard Resource Usage per Quantity (SRUQ) Table defines:

The productivity rate (P/R):

Simple/Actual quantity ratio; and, Standard quantity per km.

Contents of the table 2/2

Item	Value type/ value range/ condition	Description
Labour/ Supervisor	No Decimal point / 0 to 300	Defines how many labourers should be allocated to ONE Supervisor. This value is used on the detail cost sheets of 6 Major Labour Based Works6 Major Labour Based Works in the “Detail Contents (B)” sheets.
Truck_Kilo_per_Litre	No Decimal point / 0 to 30	Defines truck’s diesel fuel consumption efficiency. The Unit is “Litres per km”. This value is used for the Self inspection and Haulage expenses, and related to the truck distance travelled.
Pick-Up_Kilo_per_Litre	No Decimal point / 0 to 40	Defines Pick-up’s petrol fuel consumption efficiency. The Unit is “Litres per km”. This value is used for the Self inspection and Haulage expenses and related to the pickup distance travelled.
Truck_working_days_per_month	No Decimal point / 0 to 30	Defines the number of days when each maintenance work is carried out. It affects the calculation of the labour quantity per month in the “Detail Contents (B)”. Default value is 25 days.
PickUp_working_days_per_month:	No Decimal point / 0 to 30	Defines the number of days when each self-inspection work is carried out. It affects the calculation of the travel distance of the pickup per month in the “Detail Contents (B)” sheets. Default value is 30 days because Road Patrol is executed every day.
Password	Letter String / up to 100 characters	iCOSTES currently does not use this item
Self_Control_Unit(patrol)_Frequency	Decimal 2 decimal points/ 0.03 to 100.00	Specifies how many times the self-inspection crew patrols the road per day. This value can be changed in the “Data Input” form in iCOSTES.
Survey Year	Numeric value / 2010 to 2030	Survey Year
SCU Foreman, SCU Inspector, SCU Driver, Truck, Truck for	Checkbox / checked or non-checked	If checkbox is checked, SCU Table and Haulage Table in iCOSTES Contract Condition Editor will be checked. That is, checked items are regarded as the default member of SCU/Haulage Unit.

Haulage, Driver for Haulage, Pickup for Haulage	Number / integer/ If non-checked, the number is zero	These values become default values in the SCU/Haulage Editor if checked.
--	--	--

Data update 2/2

These parameters are defined for every 6 Major Labour Based Works and every type of contract period.

P/Rs have been surveyed, collected and classified into “Road Agency”, “Type of work”, “IMP/RMP”, and “Dry/ Wet”. The “Simple/Actual quantity ratio” and “standard quantity per km” are collected and classified into “Road Agency” and “Type of work”. These parameters are used in the calculation of labour quantity in the “Detail Contents (B)” Sheets.

2. SRUQ (Standard Resource Usage per Quality)

Create New SRUQ ✕

Road Authority:

Work Item:

Type:

Period:

Work Diffulty Level:

Year:

SRUQ:

SRUQ2:

Quantity /Km:

[Create](#)

I-COSTES Enter keyword 🔍 🔔 👤 System Admin

SRUQ 🏠 Home SRUQ / Index

+ Add SRUQ
📄 Import List

Standard Resource Usage Per Quantity By Road Authority

Authority:
 Work Item:
 Type:
 Period:
 Level:
 Year:

Show entries Previous 2 3 4 Next

Action	Authority	Project	Work Item	IMP/Routing	Period	Level	Year	Quantity/KM	SRUQ	SRUQ2
✎ 🔗	KENHA	P-1	GC	IMP	Dry	Heavy	2015	6055	0.0033333333333333	0.01
✎ 🔗	KWS	P-1	CC	IMP	Dry	Heavy	2017	10	0.36281947529913	0.562370
✎ 🔗	KWS	P-1	UD	RMP	Dry	Light	2015	1800	0.00059066785950856	0.001666
✎ 🔗	KWS	P-1	CW	IMP	Dry	Heavy	2015	0	0.0063866775330444	0.02
✎ 🔗	KWS	P-1	CW	RMP	Wet	Normal	2015	0	0.0027361689635587	0.008568
✎ 🔗	KWS	P-1	CW	RMP	Dry	Light	2015	0	0.0011051608762056	0.003460
✎ 🔗	KWS	P-1	GC	IMP	Dry	Heavy	2017	2310	0.00094109394268911	0.002823
✎ 🔗	KWS	P-1	GC	RMP	Wet	Normal	2017	2310	0.00073134463183928	0.002194

Contents of the table

Item	Value type/ value range/ condition	Description
Road Agency	Links to the list of “Road Agency” in “Others” Table	“Road Agency” in “Others” Table
Project	Letter String	Not used at present (future preparation)
SRUQ:	One of the lists consists of “GC”, “CC”, “BC”, “LD”, “UD”, “CW”	Specifies types of work. Values are for: “GC (Grass Cutting)”, “CC (Cross Culvert)”, “BC (Catch Basin Cleaning)”, “LD (Lined Ditch Cleaning)”, “UD (Unlined ditch Cleaning)”, and “CW (Carriage Way Cleaning)”.

IMP/routine_Maintenance_Period	Selection from “IMP” or “RMP”	Initial Mobilization Period (IMP) or Routine Maintenance Period (RMP)
Dry/Wet	Selection from “Dry” or “Wet”	Selection of Dry or Wet season
Work_Difficulty_Level	Automatically assigned Work_Difficulty_Level	See table below
SRUQ	Decimal Number/ 0 to100 (any number of decimal places)	Defined as how many labour-days are necessary for doing each task for pre-determined unit when carrying out maintenance to SIMPLE quantity.
SRUQ2	Decimal Number/ 0 to 100 (any number of decimal places)	Defined as how many labour-days are necessary for doing each task for pre-determined unit when carrying out maintenance to ACTUAL quantity.
Quantity/1km	Decimal Number/ 0 to 100 (any number of decimal places)	Defined as the quantity of subject maintenance work per km. This value is collected through survey.
Year	Numeric value / 2010 to 2030	The year when the Productivity Rate / SRUQ is surveyed

The Work_Difficulty_Level allocated to IMP and RMP, in accordance with the prevailing season, are as follows:

IMP/RMP	Dry/Wet	Work Difficulty Level
IMP	Dry or Rain (No concern)	Heavy
RMP	Wet	Normal
	Dry	Light

Users can calculate work quantities by choosing one of the following formulas in ICOSTES:

1. Quantity per km: $SRUQ \text{ (Standard Resource Usage per Quantity)} * (\text{Simple quantity per km}) * (\text{Project Length})$
2. Simple quantity input: $SRUQ \text{ (Standard Resource Usage per Quantity)} \text{ for SIMPLE Quantity} * (\text{Simple Quantity input})$
3. Actual quantity input: $SRUQ \text{ for ACTUAL Quantity input} * (\text{Actual Quantity input})$
4. In the case of 2 and 3 above, users have to collect the information of total quantity of the project prior to the cost estimation.

Conversion between Productivity Rate and Standard Resource Usage per Quantity is described in Clause 1.5 of the Manual.

Data Update

The Year 2017 Value sets can be changed but should not be removed. The Road Agency name should not be changed. The Year 2017 Value sets are necessary for each Road Agency specified in the “Others” table. Data Update is possible per Work Item. In this regard, Year 2018 or later have to be chosen as “Survey Year” and iCOSTES will automatically search the latest data for each work item.

If the other conditions are identical, do not allocate the same year because iCOSTES cannot recognize which one is the correct one.

3. Unit Rates Information (Database Table: UnitPrice1)

Unit rate information is currently a set of 11 core unit rates. Rates information has to be excluded in the case of the ICOSTES distribution to the contractor candidates. “Haulage” table also includes the information related to vehicle operation.

Add Unit Price x

Location

Item Name

Survey Year Code

Unit Unit Price

Source Source Type

[Create](#)

I-COSTES Enter keyword System Admin

Unit Price Home / Settings / Index

[+Add Unit Price](#) [Import List](#)

Unit Price

Show entries Search:

Action	Location	Code	Item	Name	Unit	Unit Price	Source	Source Type	Year
	Nairobi, Mombasa, Kisumu	21.00.001	Labour	Supervisor	month	37079.25	Oct2015	a	2015
	Nairobi, Mombasa, Kisumu	21.00.002	Labour	Foreman	month	30126	Oct2015	a	2015
	Nairobi, Mombasa, Kisumu	21.00.003	Labour	Labour	day	527.1	Oct2015	a	2015
	Nairobi, Mombasa, Kisumu	21.00.004	Labour	SCU Leader	month	37079.25	Oct2015	a	2015
	Nairobi, Mombasa, Kisumu	21.00.005	Labour	SCU Inspector	month	30126	Oct2015	a	2015
	Nairobi, Mombasa, Kisumu	21.00.006	Labour	Driver(Truck)	month	24719.5	Oct2015	a	2015
	Nairobi, Mombasa, Kisumu	21.00.010	Machinery	Vehicle(2ton Truck)	number	191800	Oct2015	a	2015
	Nairobi, Mombasa, Kisumu	21.00.011	Machinery	Vehicle(Pick up)	number	88200	Oct2015	a	2015
	Nairobi, Mombasa, Kisumu	21.00.012	Material	Fuel(Diesel)	Lit	79.99	Oct2015	a	2015
					Lit	102.65	Oct2015	a	2015

Showing 1 to 27 of 27 entries Previous Next

Contents of the table

Item	Value type/ value range/ condition	Description
Item	Selection from “Labour”, “Machinery”, or” Material”	Classification of each item (Category) Labour, Machinery, or Material
Location	Letter String	Tables should complete 11 sets of unit price data for each area. At present “Nairobi, Mombasa, Kisumu” and (All other area) are listed as sample.
Code	Letter String	Sample data. Allocate unique code number (not used for the current iCOSTES).
Name	Selection from specified list	DO NOT Change the name for 11 price set. “Labours”, “Supervisors” (Foreman)”, “Fuel”, “SCU Leader”, “SCU Inspector”, “Driver”, “Vehicle (Pick up)”, “Foreman”, “Fuel”, “Vehicle (2ton Truck)”
Type:	Selection from specified list	“Petrol” or “Diesel” for Fuel. “Operating Loss” for Vehicle. Blank for others
Unit	Automatic selection linked to the “Name”	Unit for each item. Current iCOSTES does not use it.
Unit Price	Numeric value / 0 to 1,000,000	Unit price If the iCOSTES file set is distributed to contractor candidates, unit price should be zero for all items in the database.
Source	Letter String	For reference purpose. Current iCOSTES does not use it.
Survey Year	Numeric value / 2010 to 2030	The year when the unit price was surveyed and collected. iCOSTES automatically selects the latest year’s unit price if unit price was surveyed for several years.

Data Update

Yearly update is possible per item. However, two or more-unit prices cannot be allocated for the same year as iCOSTES will search for the latest year’s price.

In the case of Haulage expense for instructed works, there is no classification by Road Agency nor location. (This option is future discussion)

4. Other PBC Works

The screenshot shows a web application interface titled "Other PBC Work Items". At the top, there are several filter dropdown menus for Location, Work Item, Condition, Category, Service Scope, and Year. Below these is a "Show 50 entries" option and pagination controls (Previous, 1, 2, Next). The main part of the interface is a table with the following columns: Action, Work Item, Location, Year of Survey, Pavement Condition, Category, and Service Scope. The table contains 10 rows of data, all with "Area1" as the location and "Unpaved" as the pavement condition. The work items include "Slopes in Cuts", "Traffic Regulatory Control Signs", "Rut Depth", "Corrugation Amplitude", "Cleanliness of the road", "Minimum Traffic Speed", "Average Traffic Speed or Roughness", "Road Works Advance Warning Sign", "Passability", and "Road Durability". The categories are "Road User Comfort" and "Road Usability", and the service scopes are "Structure", "A)Road Usability", "B) Pavement, Shoulders", and "C) Drainage". At the bottom, it says "Showing 1 to 50 of 72 entries" and has another set of pagination controls.

Action	Work Item	Location	Year of Survey	Pavement Condition	Category	Service Scope
	Slopes in Cuts	Area1	2016	UnPaved	Road User Comfort	Structure
	Traffic Regulatory Control Signs	Area1	2015	Unpaved	Road Usability	A)Road Usability
	Rut Depth	Area1	2015	Unpaved	Road User Comfort	B) Pavement, Shoulders
	Corrugation Amplitude	Area1	2015	Unpaved	Road User Comfort	B) Pavement, Shoulders
	Cleanliness of the road	Area1	2015	Unpaved	Road User Comfort	B) Pavement, Shoulders
	Minimum Traffic Speed	Area1	2015	Unpaved	Road Usability	A)Road Usability
	Average Traffic Speed or Roughness	Area1	2015	Unpaved	Road Usability	A)Road Usability
	Road Works Advance Warning Sign	Area1	2015	Unpaved	Road Usability	A)Road Usability
	Passability	Area1	2015	Unpaved	Road Usability	A)Road Usability
					Road Durability	C) Drainage

Contents of the table

Variables for the estimation of Other PBC Works consist of the following items.

Item	Value type/ value range/ condition	Description
ID	Letter String	Unique ID. ICOSTES does not need it
Area	Letter String	Area is necessary if the same work item has a different value
Paved/Unpaved	Selection from "Paved" or "Unpaved"	Paved or Unpaved
Category	Selection from "Road Usability", "Road User Comfort", or "Road Durability"	Category is based on Table 4-19 in the manual
Service Scope	Selection from A) through to H)	Category is based on Table 4-19 in the manual vol.2
Work Item	Letter String	Category is based on Table 4-19 in the manual but expressed as "Service Criteria"
Survey Year	Numeric value / 2010 to 2030	The year when each item was collected. ICOSTES recognizes the latest year's unit price if the same item has different value by surveyed year
Unit	Letter String	Unit will be determined
Unit Price	Numeric value / 0 to 1000000	

iCOSTES MANUAL

Data Update

If a new service criterion is added, it is possible to add them one by one. However, do not use the same service criteria in the identical year (iCOSTES cannot distinguish which item is the correct one).

5. Instructed Works List (Table: Instructed Works List)

Instructed works list for ICOSTES2015 comes from the format of ICOSTES 0_1

Add Instructed Works Item x

Work Item

Location

Unit

Description

Sub Item

Survey Year

Unit Price

✔ Create

I-COSTES

System Admin

Instructed Work Items

+ Add Instructed Works Item
↑ Import List

Instructed Works List

Location

Work Item

Sub Item

Year

Show entries Previous 2 3 4 5 ... 12 Next

Action	Location	Work Item	Sub Item
✕ 🔗	Nairobi, Mombasa, Kisumu	04. Site Clearance and Topsoil Stripping	Mechanical mowing
✕ 🔗	All other area	12. Natural Material Base and Subbase	Provide, place and compact quarry waste
✕ 🔗	All other area	15. Bituminous Surface Treatment & Surface Dressing	Provide and roll 14/20 mm pre-coated chipping
✕ 🔗	All other area	15. Bituminous Surface Treatment & Surface Dressing	Provide and roll 10/14 mm pre-coated chipping
✕ 🔗	All other area	15. Bituminous Surface Treatment & Surface Dressing	Provide and roll 6/10 mm pre-coated chipping
✕ 🔗	All other area	15. Bituminous Surface Treatment & Surface Dressing	Provide and roll 3/6 mm pre-coated chipping
✕ 🔗	All other area	15. Bituminous Surface Treatment & Surface Dressing	Tack Coat (bitumen emulsion)
✕ 🔗	All other area	15. Bituminous Surface Treatment & Surface Dressing	Tack Coat (grade bitumen cutback)

Contents of the table

Item	Value type/ value range/ condition	Description
ID	Letter String	Unique ID. ICOSTES does not need it
Code	Letter String	ICOSTES does not use the code but may be necessary for the arrangement of items
Unit Rate	Numeric value / 0 to 1,000,000	Rate for each item per specified unit If the ICOSTES file set is distributed to contractor candidates, unit rate should be zero for all items in the

		database.
Unit	Letter String	Unit for each item
Work Item	Letter String	Category for the item. Suffix as xx. Is preferred
Sub Item	Letter String	Name and specification of the item
Description	Letter String	Explanation of each item
Area	Letter String	Area is necessary if the same work items have different values
Survey Year	Numeric value / 2010 to 2030	The year when each item was collected. ICOSTES recognizes the latest year's unit price if the same item has different value by surveyed year

Data Update

Addition/Removal of items is possible, one by one. However, completion of all fields is necessary.

Yearly update is possible for the same item (e.g. there are two items and the difference is surveyed yearly).

However, two, or more, unit prices cannot be allocated within an identical year as ICOSTES searches the latest year's price by each item.

6. Program Configuration (Table: Configuration)

The Administrator can control how iCOSTES works by setting the following factors:

1: Allow PBC Optional works input (YES/NO)

This option allows/does not allow the input of independent PBC works other than six major labour based works.

2: Allow Instructed Works Input (YES/NO)

This option allows/does not allow the input of instructed works.

3: Allow to select input method of major labour based works one by one (YES/NO)

When this option is "YES", user can select input method per work item. This is advantageous if the user does not know simple/actual quantity. The user can then select each quantity and others can be calculated by using standard quantity per km in the database. However, mixture of input methods might cause complexity in the estimation.

4: Cost estimation by Excel format

When this option is “YES”, ICOSTES generates not only PDF format cost estimation sheets but also excel format raw-data.

7. Difference between agency users and contractor users

The difference of database between two user categories is whether the database has “Price” information or not. Price information is included in “UnitPrice1”, “Other PBC Works”, and “Instructed Works” tables.

Road Agencies can use the pre-surveyed unit price as standard value. Then they can check the price before performing cost estimation and modify if possible. Contractor candidates have to register all price sets by their own survey or responsibility. No price data will be given.