

User's Manual

KYTC Pavement Design Web Application

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1. INTRODUCTION

The Kentucky Transportation Cabinet's (KYTC) Pavement Design web application¹ is intended to supplement the Cabinet's Pavement Design Guide. The Guide presents in detail specific processes for pavement design. Once in the design module, the web application automatically fills in many details based on user input, and is intended to be used from the **Title & Info.** tab on the page settings (see Figure 9). This carries information entered by users onto subsequent tabs.

It is anticipated that there will be three (3) primary users of the web application — consultant engineers, KYTC Engineers and Officers engaged in developing pavement designs. Non-registered users can use the application as well, however, these users can only view approved designs. They cannot add or edit designs. Primary users can submit designs online, approve designs online, and retrieve communications circulated among designers and approvers when they submit or approve designs.

To assist users of the web application, the following sections highlight many of its features and provide guidance on their use. The web application's various graphical user interfaces are illustrated and described.

¹ Referred to hereafter in this guide as *web application*.

2. OVERALL WEB PAGE SETTING

All functioning web pages on the web application are divided into three sections — **Header**, **Main Content**, and **Footer** (Figures 1).



Figure 1. Overall web page setting

2.1 Header

The **Header** is fixed at the top of each page and has two different settings for before and after login. The content present before *and* after login include web title, date and time, and links to **HOME**, **EXISTING DESIGN**, and **INSTRUCTIONS**. Before login, there are also links to **LOGIN** (upper right corner of the page), **REGISTER**, **FAQ**, and **CONTACT US**. After login, the user's first name appears on the top line and the **LOGIN** link is replaced with **LOGOUT** in the top right corner. Links for **NEW DESIGN** and **MY ACCOUNT** appear for users who are registered as Designers, Project Managers, District TEBMs for Project Development, Database Administrators, and Central Office TEBM Pavement. Additional links, including **USER ADMIN** and **DB MAINT**, appear for users registered as District TEBM for Project Development, Database Administrator, and Central Office TEBM Pavement.

2.2 Main Content

The **Main Content** section of each page hosts the different functioning pages, which are illustrated in detail later.

2.3 Footer

The **Footer** contains links to related web sites such as **KYTC Pavement Design**, **Kentucky Transportation Cabinet**, and **Kentucky Transportation Center**.

3. USER AS A NON-REGISTERED USER

Non-registered user can only view approved pavement designs. They can register as **Designers** and receive instant approval from the web application’s management system. The functions described below are available to non-registered users in the **Header** section.

3.1 HOME – Default Page of KYTC Pavement Design Web Application

The **HOME** link is the first link in the **Header**’s last line (Figure 1). Clicking this link loads the web application’s home page (Figure 1). This is the web application’s default page and briefly introduces the application.

3.2 EXISTING DESIGN → Approved Design -- View Approved Design List

The **EXISTING DESIGN** link is the second link in the **Header**’s last line (Figure 1). When a user mouse over the link, a sub-link to **Approved Design** appears. Clicking the sub-link brings up a list of all approved pavement designs currently housed in the web application (Figure 2). All titles of columns function like “**sort by**” key when any title is clicked. The list in Figure 2 is sorted by column of **County**, which is default sort order.

Monday, November 12, 2018 | LOGIN



KYTC Pavement Design

[HOME](#) | [EXISTING DESIGN](#) | [REGISTER](#) | [FAQ](#) | [CONTACT US](#) | [INSTRUCTIONS](#)

[Approved Design](#)

List of Existing Design

String Included: Search Design

Item No.	Project Description	County	Route No.	AADTT	Design CBR	Initiated by	Initiated Date	Submit Date	PM Approve Date	DM Approve Date	Final Appr. Date
06-3019.10	KY 338 North Jefferson @ Temperate St	Boone	KY 338	477	2	Joseph Tucker	2018-2-2	2018-2-5	2018-2-5	2018-2-6	
6-423	KY 3060 Frogtown Road	Boone	KY 3060	697	3	Emily Pooner	2018-1-3	2018-9-24	2018-9-24	2018-9-25	
3-2042.30	US 231 & Natcher Parkway Interchange Ramps	Butler	Ramps	116	2	Aaron Detjen	2018-6-8	2018-6-13	2018-6-13	2018-6-13	2018-8-14
3-2042.30	US 231 & Natcher Parkway Interchange Ramps	Butler	Ramps	54	2	Aaron Detjen	2018-7-3	2018-7-3	2018-7-5	2018-7-5	
2-8703.00	Widen KY 107 from Gateway Lane to KY 380	Christian	KY 107	1120	2	David Heil	2018-3-19	2018-3-30	2018-4-2	2018-4-9	2018-4-17
9-1092.00	Bridge Replacement- CR 1240 over Fleming Creek	Fleming	CR 1240	12	3	Joseph Hodskins	2018-9-14	2018-10-30	2018-10-31	2018-11-2	
06-8716.00	Bridge on North Delaney Road	Grant	CR-1142	981	3	Scott Gabbard	2018-7-3	2018-7-5	2018-7-5	2018-7-5	2018-7-6
06-8716	Bridge on Delaney Road	Grant	CR-1142	118	3	Scott Gabbard	2018-7-2	2018-7-2	2018-7-3	2018-7-31	
1-181.50	KY 80	Graves	KY 80	276	2	Joseph Tucker	2018-1-18	2018-1-18	2018-1-22	2018-1-22	2018-3-6
4-8502.00	US 62 Widening	Grayson	US 62	864	3	James Napier	2018-9-27	2018-10-12	2018-10-15	2018-10-15	2018-10-18
4-7020	KY 361 Widening	Hardin	361	231	3	Ashley McLain	2017-10-5	2017-10-5	2017-10-5	2017-10-9	2017-10-9
4-170	KY313 4 Lane Widening	Hardin	KY313	2193	2	Jon Miles	2018-6-26	2018-10-16	2018-10-16	2018-10-16	
4-8801	Widen KY1357 between US31WB and KY3005	Hardin	KY1357	558	2	Bradley Bottoms	2017-11-13	2017-11-13	2017-11-13	2017-11-14	
5-1077.00	Bridge Replacement	Jefferson	CR 1001G	1243	3	Timothy Shown	2018-1-5	2018-1-8	2018-1-8	2018-1-9	2018-1-9
5-1067.00	Bridge Replacement	Jefferson	US 150	1300	3	Timothy Shown	2018-5-29	2018-5-31	2018-5-31	2018-6-1	2018-6-20
5-481.00	Beulah Church Road	Jefferson	KY 864	768	3	Timothy Robinson	2018-5-30	2018-6-14	2018-6-15	2018-6-20	

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Figure 2. List of the approved pavement designs sorted by County

3.3 REGISTER – Get Approval Instantly from KYTC Pavement Design Web Application Management System

The **REGISTER** link is the third link in the **Header**'s last line (Figure 1). After clicking this link, users are asked to supply personal information to create their account (Figure 3). If a red asterisk appears next to a field, the user must provide the requested information to complete their registration. Required information includes **First Name**, **Last Name**, **Email** (which is used as the **Login ID** by the user and for all correspondence email sent by administrators), **Password** (created by the user), **Phone Number**, **Street Address**, **City**, **State**, **Zip Code**, **Country**, and **Organization**. *Designer* is the only option for user **Designation** for now. If registrant's email domain contains "gmail" or "yahoo", or does not exist in current user database, they will be assigned as a **Viewer** temporarily and wait further verification by administrator from KYTC Pavement Design web application. The **Viewer** can view all the designs in different stages, such as **Design Initiated**, **Submitted**, **Project Manager Approved**, **District Manager Approved**, **Approved Design**, and **All Existing Designs**. Some information (e.g., **Fax Number**, **Web Site**, and **Description**) is optional. Information supplied by the user is confidential and maintained in the web application management system. Passwords are encrypted and stored in the web application management system as well.

After the user enters all the required information and clicks the **Register** button, the page shown in Figure 4 appears. This page informs the user: "An activation link has been sent to your email address. Please follow the instructions in the email to activate your account."

Monday, November 12, 2018 | LOGIN

KYTC Pavement Design

HOME EXISTING DESIGN REGISTER FAQ CONTACT US INSTRUCTIONS

Registration

Please provide following information to create your account

First Name *

Last Name *

Email * [Check Availability](#)

This will be your Log In ID
An account activation Email will be sent to this address
Also, in case you forget your password, this address will be used for reset

Password * Minimum 6 characters

Retype Password *

Phone Number xxx-xxx-xxxx

Fax Number [optional]

Web Site [optional]

Address 1 Street Number Street Name *

Address 2 [optional]

City *

State *

Zip Code *

Country *

Organization *

Designation

Description

* Required

[Register](#) [Reset](#)

Figure 3. REGISTRATION screen



Figure 4. Information after **Register** button is clicked

Figure 5 is an image of the email sent to the user.

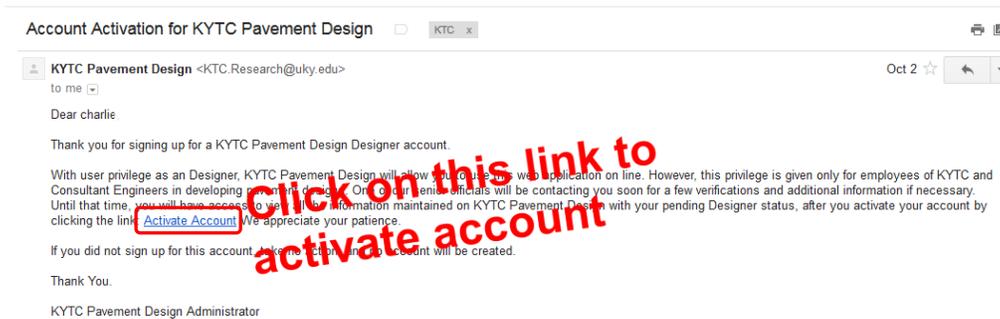


Figure 5. Email provides a link to activate user's account

A user can automatically activate their account by clicking on the link provided in the email. The **Activation** page (Figure 6) informs the new user of their account activation status. If activation is successful, the registered user may click on the **LOGIN** link, which is located on the upper right corner of the page, to log into the system by using **LOGIN** page (Figure 18).

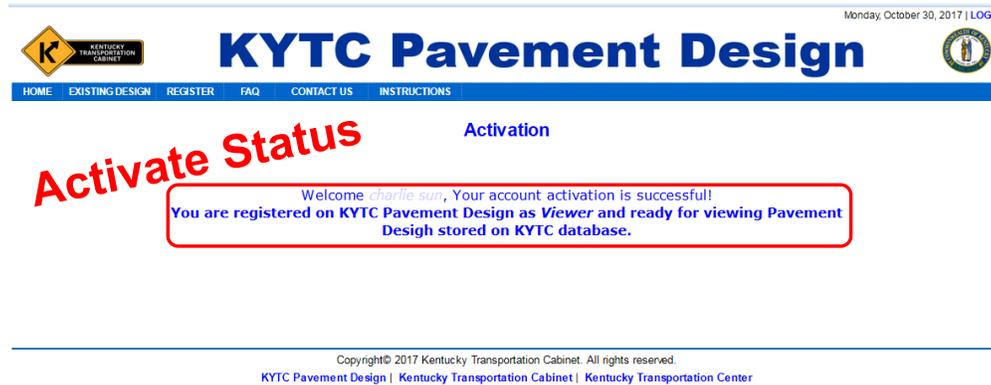


Figure 6. Screen after activating user's account

3.4 FAQ – Frequently Asked Questions

FAQ link is the fourth link in the **Header**'s last line (Figure 1). This link provides straightforward answers to frequently asked questions about the web application. KYTC's Pavement Design Approval Flowchart and its Pavement Design Users, Functions, and Relationships are posted for now (Figure 7).

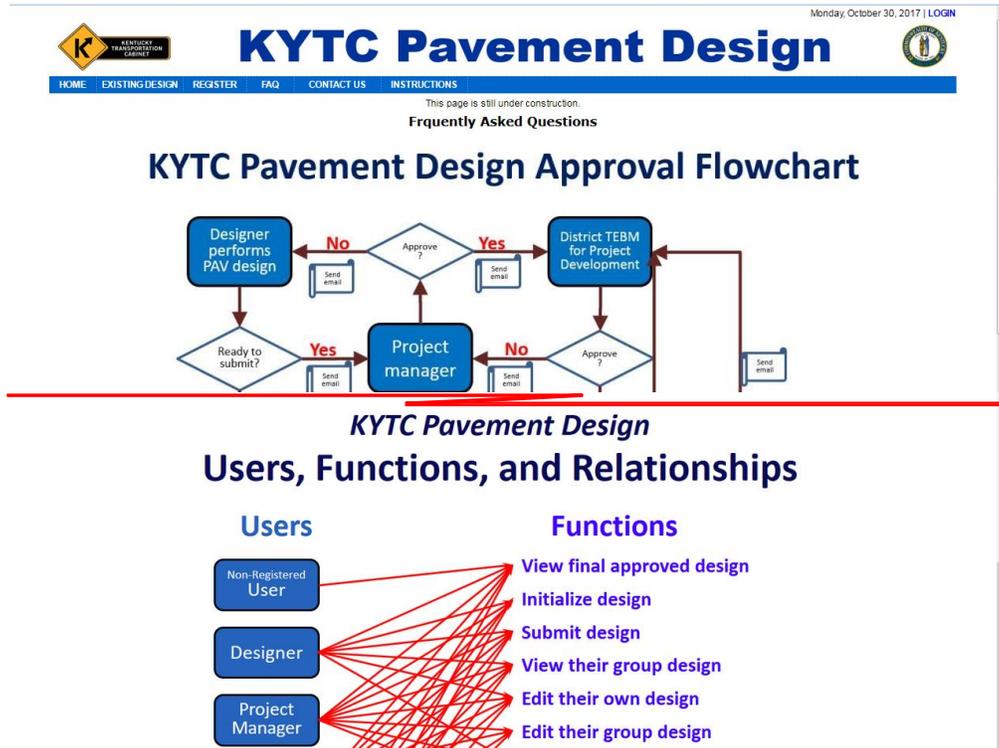


Figure 7. FAQ page with KYTC Pavement Design Approval Flowchart, and, Users, Functions, and Relationships

3.5 CONTACT US – Communicating with KYTC Pavement Design Web Application Administrator

The **CONTACT US** link is fifth link in the **Header's** last line (Figure 1). The **CONTACT US** page offers a portal for users to communicate with a system administrator (Figure 8). The users may either use their regular email application by clicking on the administrator's name; or, they may supply the required information and click the **Send** button. Clicking the **Send** button generates an email that is sent by the system to both the sender and the web application administrator.

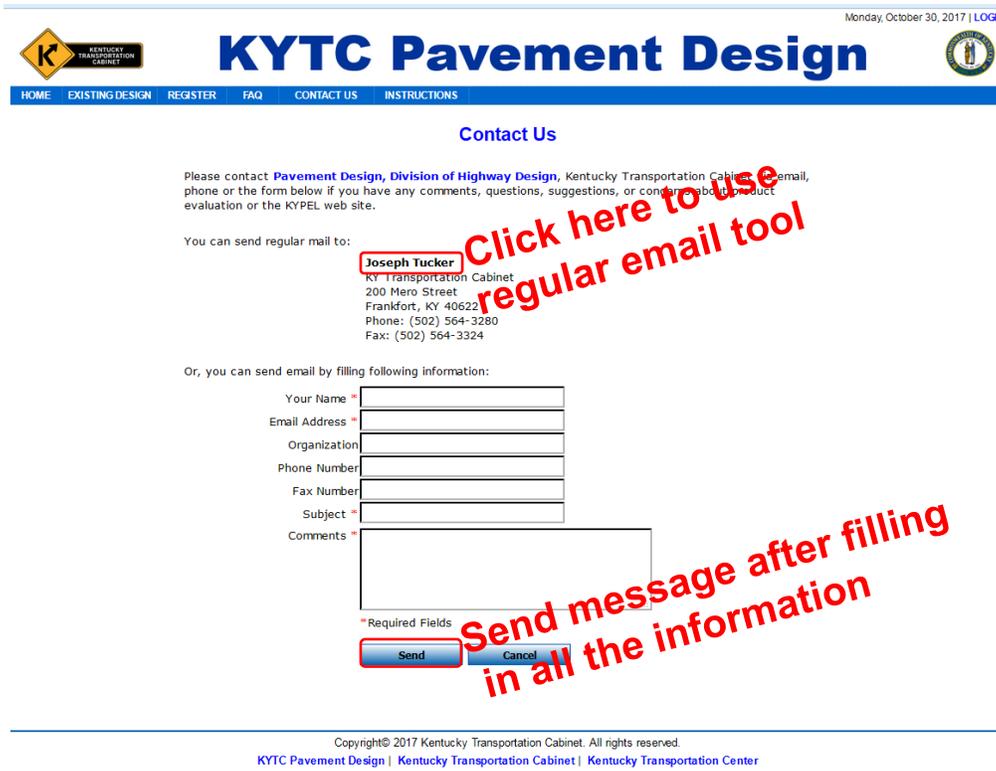


Figure 8. **CONTACT US** screen

3.6 INSTRUCTIONS

The **INSTRUCTIONS** link is the **Header**'s final link (Figure 1). Under this link, users find a *Quick Start Guide*, a *User's Manual*, and a brief introduction for this web application. The *Quick Start Guide* presents a brief instruction for using this web application; the *Manual* provides more detailed instructions. Users can view it online or download a copy for printing.

3.7 Pavement Design Details from *Approved Design* Retrieved in 3.2

Non-registered users can view pavement design detail information by clicking on an item in any column, such as **Item No.**, **Route Description**, **County**, or **Route No.**, from the list retrieved in Section 3.2. Eight (8) tabs are visible to non-registered users on the **View Design** page — **Title & Info**, **Subgrade**, **AC**, **PCC**, **Cost Analysis**, **Attachments**, **Design Selection & Notes**, and **Approval** (Figure 9).

The screenshot shows the 'View Design' page for a pavement design project. At the top, there is a navigation bar with links: HOME, EXISTING DESIGN, REGISTER, FAQ, CONTACT US, INSTRUCTIONS. The page title is 'KYTC Pavement Design'. Below the navigation bar, there are tabs for 'Title & Info', 'Subgrade', 'AC', 'PCC', 'Cost Analysis', 'Attachments', 'Design Selection & Notes', and 'Approval'. The 'Title & Info' tab is selected and contains two main sections: 'PROJECT INFO' and 'Pavement Design Section # 1'. The 'PROJECT INFO' section includes fields for Item No., Project Mainline Length (0.2 miles), Mainline Max. # of Lanes (2), Highest Section AADTT (477), Highest Design Speed (35 M.P.H.), Project Description (KY 338/ North Jefferson @ Temperate St), Designer (Joe Tucker), Project Manager (Ellen Gregory), PMS E-mail (ellen.gregory@ky.gov), and Construction Year (2018). The 'Pavement Design Section # 1' section includes fields for Lane Width (12 ft.), Total # of Lane, One Direction (1), Number of Direction (2), Inside Paved Shoulder Width (3 ft.), Outside Paved Shoulder Width (3 ft.), Construction Year ADT (5300), Construction Year Truck % (3%), Section AADTT (477), Facility Category (Other Road), County (Boone), District (6), Route No. (KY 338), Station from (26.661 to 26.861), Section Length (0.2 miles), Design Speed (55 M.P.H.), Existing Type (Asphalt), and Existing Thickness (7 in.). A note at the bottom states: 'Note: asphalt depths changed due to Curb & Gutter Section.'

Figure 9. Pavement design Title & Info. for non-registered users

3.7.1 Title & Info – Shows Pavement Design Project and Section Info

Figure 9 displays the first tab, **Title & Info**. This tab contains detailed information, including two portions of Project and Section for the pavement design chosen by the user.

3.7.2 Subgrade -- Showing Subgrade Condition and Stabilization Method

The **Subgrade** tab has information on subgrade condition, stabilization recommendation, and chosen stabilization method (Figure 10).

Monday, October 30, 2017 | LOGIN

KYTC Pavement Design

HOME EXISTING DESIGN REGISTER FAQ CONTACT US INSTRUCTIONS

View Design

Title & Info. **Subgrade** PCC Cost Analysis Attachments Design Selection & Notes Approval

The stabilized subgrade soil layer provides additional strength and a rigid layer serving as a stable paving platform as well as a structural layer resulting in substantial savings in pavement costs. The majority of soils in Kentucky have strengths that seeps into them, requiring some method to boost strength and durability. Chemical stabilization is preferred as it provides a water barrier, provides increased strength for constructing the pavement, and continues to increase in strength for several years. Some form of Subgrade Stabilization is recommended for any CBRs less than 6. See the project's Geotechnical Report for specific stabilization information.

Design CBR # Preferably from Geotechnical Report, but may be estimated based on previous reports or local knowledge. Use 3 if small project and no other known soil information.

Design Ms # Preferably from Geotechnical Report, but may be estimated as 1500 X CBR.

Geotechnical Report stabilization recommendation:

Chosen Stabilization Method:

Chemical Stabilization Note: May be cement or lime stabilized as determined by the Geotechnical Branch. Typically provides the most economical pavement design.

Geogrid, Fabric, & 6 additional inches of DGA/CSB

15" Rock & Fabric Note: Do not use with JPC Pavements

Other: Note: May not be accurately accounted for structurally in the pavement design.

None Note: Not recommended in most instances.

Either one is a required Field

Note: CBR is based on assumption there is enough rock available for Rock Roadbed.
(for this pavement design section)

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Figure 10. Subgrade information for non-registered users

3.7.3 AC (Asphalt Pavement Design) -- Showing Asphalt Design Results

The AC (Asphalt Pavement Design) tab provides detailed results for an Asphalt Design (Figure 11). Design results include the thicknesses, item codes, and unit prices for the stabilized roadbed, stabilization material (if any), aggregate base, drainage blanket, asphalt base and subbase layers, and, asphalt surface. The screen also presents the design's initial cost.

KYTC Pavement Design

Monday, November 12, 2018 | LOGIN

HOME EXISTING DESIGN REGISTER FAQ CONTACT US INSTRUCTIONS

View Design

Title & Info. Subgrade **AC** **Asphalt Design Results** Cost Analysis Attachments Design Selection & Notes Approval

Section Description: Item Number: 03-853.007, Work Item County: Warren County
 Analysis Date: 2018-09-24

Structural Design Inputs:
 Design CBR: 3 Design Ms: AADTT: 1482

Pavement Structural Design from Design Catalog: User Designed Pavement Design

Total minimum Asphalt thickness are 6.75 inches (for route class 2) and 7.5 inches (for route class 3 or 4). The recommended AC thickness for CBR design section is 8 inches. The minimum aggregate thickness is 4 inches.
 Required total AC Thickness on 8 inches of aggregate base: 7.50 in. AC thickness without Credit from Aggregate Base is 8 inches. The minimum thickness for route class 3 or 4 is 7.5 inches. This may not be most economical design.

Driving Lane Material Selection				Shoulder Material Selection				
Thickness	Item Code	Description	Unit Price	Thickness	Item Code	Description	Unit Price	
Surface:	1.5	00388	CL3 ASPH SURF 0.388 PG64-22	71.33	1.5	00301	CL2 ASPH SURF 0.380 PG64-22	65.68
Base:	Polish-resistant type B is correct.							
Layer 1:	3	00214	CL3 ASPH BASE 1.00D PG64-22	63.98	3	00212	CL2 ASPH BASE 1.00D PG64-22	68.42
Layer 2:	3	00214	CL3 ASPH BASE 1.00D PG64-22	63.98	0	0	None	
Layer 3:	0	0	None	0	0	None		
Drain. Blanket:	0	0	None	0	0	None	0	
Aggr. Base:	8	00003	CRUSHED STONE BASE	24.74	11	00003	CRUSHED STONE BASE	24.74
Stab. Roadbed:	6	00003	CRUSHED STONE BASE	24.74	6	00003	CRUSHED STONE BASE	24.74
Stab. Material:	00005	GEOGRID REINFORCEMENT FOR SUBGRADE	2.12	00005	GEOGRID REINFORCEMENT FOR SUBGRADE	2.12		
	02599	FABRIC-GEOTEXTILE TYPE IV (at top)	1.45	02599	FABRIC-GEOTEXTILE TYPE IV (at top)	1.45		

Initial Cost: \$8,317,362.78

Note for Unit Price Change:

Note: Geotech recommendation of 8 additional inches of CSB with Geogrid and Fabric. 2 inches of CSB was added to the depth calculated in the agg base increasing it from 6" to 8".

Figure 11. Asphalt Pavement Design results for non-registered users

3.7.4 PCC (Concrete Pavement Design) -- Showing Concrete Design Results

The PCC (Concrete Pavement Design) tab provides detailed results for a Concrete Pavement Design (Figure 12). The design results include the thicknesses, item codes, and unit prices for the stabilized roadbed, stabilization material (if any), aggregate base, and JPC pavement design. The screen also presents the design's initial cost.

Monday, November 12, 2018 | LOGIN



KYTC Pavement Design

HOME EXISTING DESIGN REGISTER FAQ CONTACT US INSTRUCTIONS

View Design

Title & Info. Subgrade **PCC** **Concrete Design Results** Analysis Attachments Design Selection & Notes Approval

Section Description: [Item Number: 03-8853.00; ROADWAY DESIGN] [County:]

Analysis Date: 2018-09-24

Structural Design Inputs:
 Design CBR: 3 Design M_R: AADTT: 1482

Pavement Structural Design from Design Catalog:
 Required Thickness: 9.00 in. Designed Thickness: 9 in. **Shoulder Option:** JPC

Driving Lane Material Selection				Shoulder Material Selection				
Thickness	Item Code	Description	Unit Price	Thickness	Item Code	Description	Unit Price	
JPC Pavement:								
	02073	JPC PAVEMENT-9 IN	61		02078	JPC PAVEMENT-6 IN SHLD	54	
Aggr. Base:	6	00003	CRUSHED STONE BASE	24.74	9	00003	CRUSHED STONE BASE	24.74
Stab. Roadbed:	6	00003	CRUSHED STONE BASE	24.74	6	00003	CRUSHED STONE BASE	24.74
Stab. Material:		00005	GEOGRID REINFORCEMENT FOR SUBGRA	2.12		00005	GEOGRID REINFORCEMENT FOR SUBGRA	2.12
		02599	FABRIC-GEOTEXTILE TYPE IV (at top)	1.45		02599	FABRIC-GEOTEXTILE TYPE IV (at top)	1.45

Initial Cost: \$13,774,017.26

Note for Unit Price Change:

Note: Geotech recommendation of 8 additional inches of CSB with Geogrid and Fabric. 2 inches of CSB was added to the depth calculated in the egg base increasing it from 6" to 8".

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Figure 12. Concrete Pavement Design results for non-registered users

3.7.5 Cost Analysis -- Showing Cost Analysis for both Asphalt and Concrete Designs

The **Cost Analysis** tab provides cost analysis results for asphalt and concrete pavement designs (Figure 13). Results include initial construction item, initial construction, and for certain years rehabilitation costs.

Monday, November 12, 2018 | LOGIN



KYTC Pavement Design



HOME
EXISTING DESIGN
REGISTER
FAQ
CONTACT US
INSTRUCTIONS

View Design

Title & Info.
Subgrade
AC
PCC
Cost Analysis
Attachments
Design Selection & Notes
Approval

Cost Analysis

LIFE CYCLE COST ANALYSIS*

Maximum Asphalt Design

FLEXIBLE PAVEMENT

ONE OR TWO DIRECTIONS: 0 in. ASBESTOS PAVEMENT

ANALYSIS PERIOD (YEARS): 8 in. DRAINAGE BLANKET

CONSTRUCTION YEAR: 6 in. Aggregate Base

MAINT.OF TRAFFIC(\$/MILE): Init. Const. Rehabilitation

COST ON MAINT.OF TRAFFIC: \$42,580.00 Init. Const. \$21,290.00 Rehabilitation

Analysis DATE: 2018-09-24

*NOTE - These analyses compare only the pavement types and Maintenance of Traffic. They are not total project costs.

ECONOMIC ANALYSIS Maximum Asphalt Design

YEAR		INTEREST	P/F	COST	PW
0	PW OF INITIAL CONSTRUCTION	4	1.00	\$8,317,362.78	\$8,317,362.78
15	PW OF REHABILITATION	4	0.56	\$873,205.02	\$484,859.75
30	PW OF REHABILITATION	4	0.31	\$1,717,074.40	\$529,406.09
	PW OF SALVAGE		0.21	\$3,675,934.17	

* Salvage Values are considered equivalent and are currently not included in Life Cycle Cost Analysis

PW OF Maximum Asphalt Design \$9,331,628.62

INITIAL CONSTRUCTION ITEM COST

Driving Lane Item Quantity and Cost					Shoulder Item Quantity and Cost				
Code	Description	Quantity	Unit	Cost	Code	Description	Quantity	Unit	Cost
Surface:	00388 CL3 ASPH SURF 0.388 PG64-22	9892.186	TON	\$705,807.44	00301	CL2 ASPH SURF 0.38D PG64-22	4121.744	TON	\$270,716.15
Base:									
Layer 1:	00214 CL3 ASPH BASE 1.00D PG64-22	19784.371	TON	\$1,265,804.07	00212	CL2 ASPH BASE 1.00D PG64-22	8243.488	TON	\$564,019.45
Layer 2:	00214 CL3 ASPH BASE 1.00D PG64-22	19784.371	TON	\$1,265,804.07					
Layer 3:									
Aggr. Base:	00003 CRUSHED STONE BASE	35156.429	TON	\$1,364,570.05	00003	CRUSHED STONE BASE	31600.037	TON	\$781,784.92
Stab.Roadbed:	00003 CRUSHED STONE BASE	41367.322	TON	\$1,023,427.54	00003	CRUSHED STONE BASE	17236.384	TON	\$426,428.14
Stab. Material:	00005 GEOGRID REINFORCEMENT FOR SUBGRADE	119905.280	SV	\$254,199.19	00005	GEOGRID REINFORCEMENT FOR SUBGRADE	49960.533	SV	\$105,916.33
	02599 FABRIC-GEOTEXTILE TYPE IV (at top)	119905.280	SV	\$173,862.66	02599	FABRIC-GEOTEXTILE TYPE IV (at top)	49960.533	SV	\$72,442.77

Initial Total Item Cost: **\$8,274,782.78**

JPC Pavement

RIGID PAVEMENT

ONE OR TWO DIRECTIONS: 9 in. JPC PAVEMENT

ANALYSIS PERIOD (YEARS): 0 in. DRAINAGE BLANKET

CONSTRUCTION YEAR: 6 in. Aggregate Base

COST ON MAINT.OF TRAFFIC: \$42,580.00 Init. Const. \$21,290.00 Rehabilitation

Analysis DATE: 2018-09-24

ECONOMIC ANALYSIS JPC Pavement

YEAR		INTEREST	P/F	COST	PW
0	PW OF INITIAL CONSTRUCTION	4	1.00	\$13,774,017.26	\$13,774,017.26
25	PW OF REHABILITATION	4	0.38	\$1,821,547.87	\$561,617.21
	PW OF SALVAGE		0.21	\$1,663,069.75	

* Salvage Values are considered equivalent and are currently not included in Life Cycle Cost Analysis

PW OF Maximum JPC Design \$14,335,634.47

INITIAL CONSTRUCTION ITEM COST

Driving Lane Item Quantity and Cost					Shoulder Item Quantity and Cost				
Code	Description	Quantity	Unit	Cost	Code	Description	Quantity	Unit	Cost
JPC Pavement:	02073 JPC PAVEMENT-9 IN	119905.280	SV	\$7,314,222.08	02078	JPC PAVEMENT-6 IN SHLD	49960.533	SV	\$2,697,868.80
Aggr. Base:	00003 CRUSHED STONE BASE	41367.322	TON	\$1,023,427.54	00003	CRUSHED STONE BASE	25854.576	TON	\$639,642.21
Stab.Roadbed:	00003 CRUSHED STONE BASE	41367.322	TON	\$1,023,427.54	00003	CRUSHED STONE BASE	17236.384	TON	\$426,428.14
Stab. Material:	00005 GEOGRID REINFORCEMENT FOR SUBGRADE	119905.280	SV	\$254,199.19	00005	GEOGRID REINFORCEMENT FOR SUBGRADE	49960.533	SV	\$105,916.33
	02599 FABRIC-GEOTEXTILE TYPE IV (at top)	119905.280	SV	\$173,862.66	02599	FABRIC-GEOTEXTILE TYPE IV (at top)	49960.533	SV	\$72,442.77

Initial Total Item Cost: **\$13,731,437.26**

Note: [Stretch recommendation of 8 additional inches of CSB with Geogrid and Fabric. 2 inches of CSB was added to the depth calculated in the egg base increasing it from 6" to 8".

Figure 13. Cost Analysis on AC and PCC designs for non-registered users

3.7.6 Attachments -- Showing Uploaded Attachments by Designer

On the **Attachments** tab, the user may view or download attachments uploaded by the designer (Figure 14).

Monday, November 12, 2018 | LOGIN

KYTC Pavement Design

HOME EXISTING DESIGN REGISTER FAQ CONTACT US INSTRUCTIONS

View Design

Title & Info. Subgrade AC PCC Cost Analysis **Attachments** Design Selection & Notes Approval

Select the attachment you wish to open and click on it. If a window appears asking "DO YOU WANT TO SAVE THIS FILE?" that means you must save the file to your hard drive and then open it from your hard drive. We apologize for the inconvenience.

Attached Files for This Pavement Design

File Name	Type	Size	Uploader	Organization	Date
RA-013-2016.pdf	application/pdf	6383850	Bradley Bottoms	KYTC District 4	Oct 12, 2017
Taylor County Traffic Forecast Oct 23 2014.pdf	application/pdf	4184196	Bradley Bottoms	KYTC District 4	Oct 10, 2017
Taylor County Traffic Forecast Oct 23 2014.pdf	application/pdf	4184196	Bradley Bottoms	KYTC District 4	Oct 10, 2017

Note: Mainline shoulders utilize full depth design due to possibility of future conversion of roadway to a 2+1.
(for this pavement design section)

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Figure 14. Pavement design attachments for non-registered users

3.7.7 Design Selection & Notes -- Showing Selected Design and Notes

The **Design Selection & Notes** tab presents the selected design and what notes have been selected for the pavement design project (Figure 15). Asphalt and concrete pavement adjustments will show up when *Alternate Pavement* is selected as pavement design. Design notes include the Common Plan Notes, Special Notes for ASPHALT, JPC PAVEMENT, and OTHERS.

Monday, November 12, 2018 | LOGIN

KYTC Pavement Design

HOME EXISTING DESIGN REGISTER FAQ CONTACT US INSTRUCTIONS

[View Design](#)

Title & Info. Subgrade AC PCC Cost Analysis Attachments **Design Selection & Notes** Approval

Pavement Design Selected: * Alternate Pavement
Asphalt Pavement Adjustment = \$437,938.38 Concrete Pavement Adjustment = \$1,144,443.33

Pavement Design Notes: (Select following notes for this design by checking the front check box)

Common Plan Notes

- 233 - Earthwork adjustments for alternate pavement designs
- 275 - Cement stabilized roadbed
- 276 - Lime stabilized roadbed
- 444a - Asphalt pavement ride quality (specify category A) (>0.4 mi. unbroken length, all interstate/parkways)
- 444b - Asphalt pavement ride quality (specify category B) (>0.4 mi. unbroken length, all interstate/parkways)
- 447 - Specifies Compaction option A (>1000 tons of any one mix)
- 448 - Specifies Compaction option B (<1000 tons of any one mix)
- 455 - Edge Key
- 555a - JPC ride quality (specify category A) (>0.4 miles unbroken length, all interstate/parkways)
- 555b - JPC ride quality (specify category B) (>0.4 miles unbroken length, all interstate/parkways)

Parameters for 275: Top Thickness in. Min. CBR Cement Content % Dry Density pcf

Special Notes

ASPHALT

- 11N LONGITUDINAL PAVEMENT JOINT ADHESIVE (5-30-14)
- Use a Material Transfer Vehicle (MTV) according to Section 403.03.05A of the Standard Specifications.

JPC PAVEMENT

- 11J FULL DEPTH CONCRETE PAVEMENT REPAIR (6-15-12)
- 11K PARTIAL DEPTH CONCRETE PAVEMENT REPAIR (6-15-12)
- Special Note for Dowel Bar and Tie Bar Placement in JPC Pavement

OTHERS

- Special Note for Inlaid Pavement Markers

* Required field when this design is submitted.

Note:
(for this pavement design section)

Figure 15. Pavement design selection and notes for non-registered users

3.7.8 Approval

Clicking the **Approval** tab brings up the stage of the pavement design (Figure 16). Visible information includes the pavement designer, who approved the design at different stages if applicable, and dates on which approvals were issued.

Monday, October 30, 2017 | LOGIN

KYTC Pavement Design

HOME EXISTING DESIGN REGISTER FAQ CONTACT US INSTRUCTIONS

View Design

Title & Info. Subgrade AC PCC Cost Analysis Attachments Design Selection & Notes **Approval**

Item No. # of Diff. Pavement Designs
Mainline Max. # of Lanes Project Mainline Length miles
Designed By Design Submitted Date
Project Description

This design has been approved by:

Project Manager:	<input type="text" value="Larry Krueger"/>	Approve Date:	<input type="text" value="2017-10-05"/>
District PDBM:	<input type="text" value="Brad Bottoms"/>	Approve Date:	<input type="text" value="2017-10-09"/>
CO Pav. Branch Manager:	<input type="text" value="Joe Tucker"/>	Approve Date:	<input type="text" value="2017-10-09"/>

Note:
(for this pavement design section)

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Figure 16. Design and approval information for non-registered users

4. USER AS A DESIGNER

Designer is a registered user and belongs to a major group on the web application. They can instantly activate their account after registering and following directions shown on the screen. If the **Designer** does not activate their account, the administrator can send them a notification email with the activating link or activate the account on their behalf. Personal information can be modified by clicking on the **MY ACCOUNT** link. Unlike non-registered users, a **Designer** can access approved pavement designs as well as all the designs in different stages, such as **Design Initiated**, **Submitted**, **Project Manager Approved**, **District Manager Approved**, **Approved Design**, and **All Existing Designs** (Figure 17). A **Designer** also can design their pavement or share designs with other designers who are in the same group, submit their design online, and upload attachments.

Tuesday, November 13, 2018 | Hello, Charlie | LOGOUT

KYTC Pavement Design

HOME EXISTING DESIGN NEW DESIGN MY ACCOUNT USER ADMIN DB MAINT INSTRUCTIONS

Instructions

Quick Start Guide User's Manual

This web design application is intended to be a supplement to the Kentucky Transportation Cabinet's Pavement Design Guide. The specific processes for pavement design are presented in detail in the Guide. When user is in design module, the web application is set up to automatically fill in many details based on input from the user, and is intended to be used from "Title & Info." tab at the page settings. This will allow information input by the user to be carried over to subsequent tabs.

More Designs

Flexible **Rigid**

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Figure 17. Designers can view all the designs at different stages

4.1 LOGIN

Figure 18 displays the **LOGIN** page. This page is the gateway for registered users to access the web application. A **Designer** may **Sign In** by entering their email address and password into the appropriate fields in the **Login** area.

Tuesday, November 14, 2017 | [LOGIN](#)

KYTC Pavement Design

HOME EXISTING DESIGN REGISTER FAQ CONTACT US INSTRUCTIONS

Login

Please login using your E-Mail Address and Password.

Login

E-mail Address:

Password:

[Forgotten Password](#)

Forgotten Password

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Figure 18. **LOGIN** page

4.2 FORGOTTEN PASSWORD

If user forgets their login password, they can click **Forgotten Password** link shown in Figure 18. Clicking this link takes the user to a page where they can reset their password (Figure 19). On the **Forgotten Password** page, a user enters their registered email address and clicks the **Reset Password** button. This creates a temporary, randomly generated password and emails it to the user. Once the user logs in with their temporary password, the user is prompted to immediately proceed to the **MY ACCOUNT** page and update their password.



Figure 19. **Reset Password** screen

4.3 MY ACCOUNT -- Modify Personal Information

Clicking **MY ACCOUNT** brings up the page depicted in Figure 20. A registered user can update their profile and change their password or contact information on this page (except for their email address, which serves as the user ID).

Monday, October 30, 2017 | Hello, Charlie | [LOGOUT](#)

KYTC Pavement Design

HOME EXISTING DESIGN MY ACCOUNT INSTRUCTIONS

My Account

Please provide following information to update your account

User Email: charlie.sun@uky.edu

Password: [Change Password](#) **Click to change password**

First Name * Charlie

Last Name * Sun

Phone Number: xxx-xxx-xxxx * 859-257-7330

Fax Number (optional): 859-257-1815

Web Site (optional): http://www.ktc.uky.edu

Address 1 Street Number Street Name * 277 Raymond Building

Address 2 (optional):

City * Lexington

State * KY

Zip Code * 40506

Country * USA

Organization * University of Kentucky

Description: Any description

* Required Fields

[Update](#) [Cancel](#) **Click to save changes**

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Figure 20. Update user's account from **MY ACCOUNT** link

4.4 Starting Page after LOGIN

The **INSTRUCTIONS** page (Figure 21) appears following login. The **Designer** has access to an extra link — **NEW DESIGN** to create new designs; they can edit their own and their group's existing designs which have not been submitted from the design list. The user's manual is linked at the upper right of this starting page.



Figure 21. Starting page after a Designer logs in

4.5 NEW DESIGN – Create and Submit a New Pavement Design

The **Designer** can establish a new pavement design by clicking the **NEW DESIGN** link. The page displayed in Figure 22 appears once a user clicks this link. Two tabs, **Title & Info** and **Subgrade**, are visible once the link is opened.

Figure 22. Screen for inputting new project and section information

The tabs contain five kinds of entry fields:

1. Required Fields are denoted with *
 - Ignorable Fields will be automatically filled by program when user enters section information.
2. Required Fields are denoted with **
 - Required fields must be completed to view design results, cost analysis, or save their design.
3. Field with ***
 - Information must be provided if the designer submits their design.
4. Fields with #:
 - Optional fields where one option must be selected. A designer has to enter data in at least one of these fields.
5. Fields without any mark:
 - Optional fields — information can be entered in them, or they can be left blank.

4.5.1 Title & Info – Entering Pavement Design Project and Section Info

When the **NEW DESIGN** is clicked, some fields are pre-selected or have default values. The default values for “Multiple pavement designs required?”, “ON NHS?” and “Would you like to input your own traffic growth rate?” are “No.” The default value for “# of Diff. Pavement Designs” is “1”; the default values for “Existing Type” and “Existing Thickness” are “N/A”. ON NHS is defined as “On National Highway System”. Clicking on the [KYTC Traffic Count](#) hot link under the **Title & Info.** tab opens KYTC’s Traffic Count Reporting System web page, where users can gather ADT data. The default **Traffic Growth Rate** is 2.0%. Users can input their **Traffic Growth Rate** by selecting answer “Yes” to the question, “*Would you like to input your own traffic growth rate?*” to make **Traffic Growth Rate** input area available.

PROJECT INFO and **Pavement Design Section** information are under the **Title & Info** tab. A user can ignore data entry in shaded areas in the **PROJECT INFO** section. Data in these shaded areas are automatically entered by program as the data entered in **Pavement Design Section** portion. Number of **Section AADTT** can be calculated when **Construction Year ADT** and **Construction Year Truck %** are entered. **Section AADTT** data can be overwritten by typing in data after calculation. The **District** field is automatically populated after making a **County** selection. Please note, the prices for bid items are assigned by district. **Section Length** is calculated when data are entered in the **MP from** and **MP to** fields. **Section Length** can be overwritten by typing in data after calculation as well.

4.5.2 Subgrade -- Entering Subgrade Condition and Stabilization Method

On the **Subgrade** tab (Figure 23), **Chemical Stabilization** is the default selection. This option is unchecked if the **Design CBR** entered is greater than 5 or the **Design M_R** exceeds 7,500. Either **Design CBR** or **Design M_R** is required for pavement design. The pavement design is based on **Design CBR** if both **Design CBR** and **Design M_R** are entered.

Three (3) inches of asphalt credit are allocated if any one of three stabilization methods — **Chemical Stabilization; Geogrid, Fabric, & 6 additional inches of DGA/CSB; and 12” 2s, 3s, or 23s underlain with TY V fabric and TY IV Fabric on Top** — is adopted.

After entering the required data, four additional tabs — **AC** (Asphalt design results) **PCC** (Concrete design results), **Cost Analysis**, and **Design Selection & Notes** — appear (Figure 24). The content of the four tabs is transferred over from the previous two tabs, obtained from drawn designs, pavement thickness design catalog tables, or calculated from entered data from drawn designs, pavement thickness design catalog tables, or calculated from entered data.

Tuesday, November 13, 2018 | Hello, Charlie | LOGOUT



KYTC Pavement Design



HOMEEXISTING DESIGNNEW DESIGNMY ACCOUNTUSER ADMINDB MAINTINSTRUCTIONS

New Design

Title & InfoSubgrade

The stabilized subgrade soil layer provides both an improved subgrade layer serving as a stable paving platform as well as a structural layer resulting in substantial savings in pavement costs. The majority of soils in Kentucky loose strength as water seeps into them, requiring some method to boost strength and durability. Chemical stabilization is preferred as it provides a water barrier, provides increased strength for constructing the pavement, and continues to increase in strength for several years. Some form of Subgrade Stabilization is recommended for any CBRs less than 6. See the project's Geotechnical Report for specific stabilization information.

Design CBR # Preferably from Geotechnical Report, but may be estimated based on previous reports or local knowledge. Use 3 if small project and no other known soil information.

Design M_R # Preferably from Geotechnical Report, but may be estimated as 1500 X CBR.

Geotechnical Report stabilization recommendation:

Chosen Stabilization Method:

Chemical Stabilization Note: May be cement or lime stabilized as determined by the Geotechnical Branch. Typically provides the most economical pavement design.

Geogrid, Fabric, & 6 additional inches of DGA/CSB

12” 2s, 3s, or 23s underlain with TY V fabric and TY IV Fabric on Top

Other: Note: May not be accurately accounted for structurally in the pavement design.

None Note: Not recommended in most instances.

Either one is a required Field

Note:

(for this pavement design section)

Save as New Project Reset

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Figure 23. Screen for inputting subgrade information

4.5.3 AC (Asphalt Pavement Design) -- Adjusting Asphalt Design

Under the **AC** tab (Figure 24), data like **Section Description**, **Layer Thickness**, and **Item Prices** can be modified; users can reselect **Layer Item** from each layer dropdown list. More AC items appear in each layer dropdown list if the user clicks on **More AC Item Selections**. Drainage Blanket is *not selected* by default. It reduces up to two (2) inches of asphalt thickness if Drainage Blanket is used. Six (6) inches of aggregate base is the default thickness since all the AC pavement designs incorporate this base. Four (4) inches of aggregate base is the minimum thickness and is increased to 0.7 inches thickness of asphalt if four (4) inches of aggregate base are used. If the aggregate base's thickness exceeds six (6) inches, asphalt thickness is proportionally lowered to a minimum thickness of 7.5 inches (Route Class 3 or 4) and 5.5 inches (Route Class 2) using a ratio of 0.14/0.44. **Layer of Stab. Roadbed** is automatically selected by program on the **Subgrade** tab. Users can select different items in the Stabilization Roadbed dropdown list and modify the item price if needed. **Stab. Material** is selected accordingly by program when the Stabilization Roadbed item has been selected. By default, AC design is not user defined (Figure 24). Polish-resistant check for surface layer and violated warrants check for selecting asphalt mixtures and compaction options are run programmatically when layer thickness or layer item is modified. Check result message is shown on screen after those checks. When AC design is shifted to user defined by user, (by selecting “Yes” as an answer to question “User Defined AC Design?”), both polish-resistant and violated warrants checks are not performed when layer thickness or layer item is modified. No warning message is shown on screen either.

Friday, November 16, 2018 | Hello, Charlie | LOGOUT

KYTC Pavement Design

HOME EXISTING DESIGN NEW DESIGN MY ACCOUNT USER ADMIN DB MAINT INSTRUCTIONS

New Design

Title & Info. Subgrade **AC** PCC Cost Analysis Design Selection & Notes

Section Description: Route: US 27; Campbell County;
 Analysis Date: 2018-11-16

Structural Design Inputs:
 Design CBR: 4 Design M_s: AADTT: 333

Pavement Structural Design from Design Catalog: **User Defined AC Design?** No Yes only when inputting existing approved pavement designs into the database for record keeping purposes.

Total minimum Asphalt thickness are 6.75 inches (for route class 2) and 7.5 inches (for route class 3 or 4). The recommended AC thickness for Curb & Gutter section is 8 inches. The minimum aggregate thickness is 4 inches.
 Required total AC Thickness on 6 inches of aggregate base: 6.75 in.

Driving Lane Material Selection				Shoulder Material Selection				
Thickness	Item Code	Description	Unit Price	Thickness	Item Code	Description	Unit Price	
Surface:	1.5	00301	CL2 ASPH SURF 0.38D PG64-22	65.68	1.5	00301	CL2 ASPH SURF 0.38D PG64-22	65.68
Base:								
Layer 1:	2.25	00221	CL2 ASPH BASE 0.75D PG64-22	71.53	2.25	00212	CL2 ASPH BASE 1.00D PG64-22	68.42
Layer 2:	3	00221	CL2 ASPH BASE 0.75D PG64-22	71.53	0	None	0.00	
Layer 3:	0	0	None	0.00	0	None	0.00	
Drain. Blanket:	0	0	None	0.00	0	None	0.00	
Aggr. Base:	6	00003	CRUSHED STONE BASE	24.74	9	00003	CRUSHED STONE BASE	24.74
Stab. Roadbed:	8	00008	CEMENT STABILIZED ROADBED	2.50	8	00008	CEMENT STABILIZED ROADBED	2.50
Stab. Material:		02542	CEMENT	150.00		02542	CEMENT	150.00

Initial Cost:
 Note for Unit Price Change: -- Violated warrants for selecting asphalt mixtures and compaction options

Note:
 (for this pavement design section)

Save [As New Project] Reset

Figure 24. Screen for adjusting AC (Asphalt pavement design) results

If either checkbox associated with the **Same Design as Driving Lane** for **Inside Paved Shoulder Width** or **Outside Paved Shoulder Width** in the Pavement Design Section is left unchecked, the **Shoulder Material Selection** portion appears. AC surface layer and only one AC base layer is the default shoulder design layout. The thickness of the aggregate base on the shoulder portion balances the total difference in thickness between the driving lane and shoulder. Shoulder design is adjustable as well. If both checkboxes of **Same Design as Driving Lane** for **Inside Paved Shoulder Width** and **Outside Paved Shoulder Width** on Pavement Design Section portion are checked, the **Shoulder Material Selection** portion remains blank. The message, “*Shoulder Material Selection Same as Driving Lane,*” appears in that area.

4.5.4 PCC (Concrete Pavement Design) -- Adjusting Concrete Design

On the **PCC tab** (Figure 25), JPC is the default shoulder design. Six (6) inches of JPC Pavement Shoulder is the default shoulder type when the width of shoulder is greater than six (6) feet. The thickness of the shoulder’s aggregate base balances the total difference in thickness between driving lane and shoulder. Asphalt shoulder design is an optional selection for PCC design (Figure 26). Under this scenario, the shoulder design is identical to the design in the AC shoulder design.

Friday, November 16, 2018 | Hello, Charlie | LOGOUT

KYTC Pavement Design

HOME EXISTING DESIGN NEW DESIGN MY ACCOUNT USER ADMIN DB MAINT INSTRUCTIONS

New Design

Title & Info. Subgrade AC **PCC** Cost Analysis Design Selection & Notes

Section Description: Route: US 27; Campbell County;
 Analysis Date: 2018-11-16

Structural Design Inputs:
 Design CBR: 4 Design M_s: AADTT: 333

Pavement Structural Design from Design Catalog:
 Required Thickness: 8.00 in. Designed Thickness: 8 in. Shoulder Option: JPC

Driving Lane Material Selection				Shoulder Material Selection				
Thickness	Item Code	Description	Unit Price	Thickness	Item Code	Description	Unit Price	
JPC Pavement:	02084	JPC PAVEMENT-8 IN	58.00	JPC Pavement:	02081	JPC PAVEMENT-8 IN SHLD	58.00	
Aggr. Base:	6	00003	CRUSHED STONE BASE	24.74	6	00003	CRUSHED STONE BASE	24.74
Stab. Roadbed:	8	00008	CEMENT STABILIZED ROADBED	2.50	8	00008	CEMENT STABILIZED ROADBED	2.50
Stab. Material:	02542	CEMENT	150.00	02542	CEMENT	150.00		

Initial Cost:
 Note for Unit Price Change:
 Note: (for this pavement design section)

Save as New Project Reset

Figure 25. Screen for adjusting PCC (Concrete pavement design) results with default JPC shoulder

Friday, November 16, 2018 | Hello, Charlie | LOGOUT



KYTC Pavement Design



HOME
EXISTING DESIGN
NEW DESIGN
MY ACCOUNT
USER ADMIN
DB MAINT
INSTRUCTIONS

New Design

Title & Info
Subgrade
AC
PCC
Cost Analysis
Design Selection & Notes

Section Description

Analysis Date

Structural Design Inputs:
 Design CBR: Design M_s: AADTT:

Pavement Structural Design from Design Catalog:

Required Thickness: in. Designed Thickness: in. **Shoulder Option:**

Driving Lane Material Selection				Shoulder Material Selection				
Thickness	Item Code	Description	Unit Price	Thickness	Item Code	Description	Unit Price	
JPC Pavement:								
	<input type="text" value="02084"/>	<input type="text" value="JPC PAVEMENT-8 IN"/>	<input type="text" value="58.00"/>					
Asphalt Surface:								
			<input type="text" value="1.5"/>	<input type="text" value="00301"/>	<input type="text" value="CL2 ASPH SURF 0.38D PG64-22"/>		<input type="text" value="65.68"/>	
Asphalt Base:								
Layer 1:			<input type="text" value="3"/>	<input type="text" value="00212"/>	<input type="text" value="CL2 ASPH BASE 1.00D PG64-22"/>		<input type="text" value="68.42"/>	
Layer 2:			<input type="text" value="0"/>	<input type="text" value="0"/>	<input type="text" value="None"/>		<input type="text" value="0.00"/>	
Layer 3:			<input type="text" value="0"/>	<input type="text" value="0"/>	<input type="text" value="None"/>		<input type="text" value="0.00"/>	
Drain. Blanket:			<input type="text" value="0"/>	<input type="text" value="0"/>	<input type="text" value="None"/>		<input type="text" value="0.00"/>	
Aggr. Base:	<input type="text" value="6"/>	<input type="text" value="00003"/>	<input type="text" value="CRUSHED STONE BASE"/>	<input type="text" value="24.74"/>	<input type="text" value="9.5"/>	<input type="text" value="00003"/>	<input type="text" value="CRUSHED STONE BASE"/>	<input type="text" value="24.74"/>
Stab. Roadbed:	<input type="text" value="8"/>	<input type="text" value="00008"/>	<input type="text" value="CEMENT STABILIZED ROADBED"/>	<input type="text" value="2.50"/>	<input type="text" value="8"/>	<input type="text" value="00008"/>	<input type="text" value="CEMENT STABILIZED ROADBED"/>	<input type="text" value="2.50"/>
Stab. Material:	<input type="text" value="02542"/>	<input type="text" value="CEMENT"/>	<input type="text" value="150.00"/>	<input type="text" value="02542"/>	<input type="text" value="CEMENT"/>	<input type="text" value="150.00"/>	<input type="text" value="150.00"/>	

[More AC Item Selections](#)

Initial Cost:

Note for Unit Price Change:

Note:

(for this pavement design section)

Figure 26. Screen for adjusting PCC (Concrete pavement design) results with Asphalt shoulder

4.5.5 Cost Analysis -- Adjusting Cost Analysis for both Asphalt and Concrete designs

On the **Cost Analysis** tab (Figure 27), users may adjust the costs for asphalt and concrete pavement designs. The **DESIGN NUMBER OF YEARS, MAINT. OF TRAFFIC (\$/MILE) - Init. Const. and Rehabilitation**, and, **INTEREST** rates are adjustable variables for cost analysis. **INITIAL CONSTRUCTION ITEM COST** and **Initial Total Item Cost** for both AC and PCC designs are available for user's quick check.



KYTC Pavement Design



HOME EXISTING DESIGN NEW DESIGN MY ACCOUNT USER ADMIN DB MAINT INSTRUCTIONS

New Design

Title & Info. Subgrade AC PCC **Cost Analysis** Design Selection & Notes

LIFE CYCLE COST ANALYSIS*
Maximum Asphalt Design Design CBR Design M_R in. ASPHALT PAVEMENT
FLEXIBLE PAVEMENT in. DRAINAGE BLANKET
 ONE OR TWO DIRECTIONS:
 ANALYSIS PERIOD (YEARS):
 CONSTRUCTION YEAR:
 MAINT.OF TRAFFIC(\$/MILE): Init. Const. Rehabilitation
 COST ON MAINT.OF TRAFFIC: Init. Const. Rehabilitation
 Analysis DATE: 2018-11-16

*NOTE - These analyses compare only the pavement types and Maintenance of Traffic. They are not total project costs.

ECONOMIC ANALYSIS Maximum Asphalt Design

YEAR	INTEREST	P/F	COST	PW
0	4.00	1.00	\$3,663,376.12	\$3,663,376.12
15	4.00	0.56	\$441,373.31	\$245,078.93
30	4.00	0.31	\$928,830.23	\$286,375.70
40	4.00	0.21	\$2,030,991.71	

* Salvage Values are considered equivalent and are currently not included in Life Cycle Cost Analysis

PW OF Maximum Asphalt Design

INITIAL CONSTRUCTION ITEM COST

Driving Lane Item Quantity and Cost					Shoulder Item Quantity and Cost				
Code	Description	Quantity	Unit	Cost	Code	Description	Quantity	Unit	Cost
00301	CL2 ASPH SURF 0.38D PG64-22	5343.360	TON	\$350,951.88	00301	CL2 ASPH SURF 0.38D PG64-22	3562.240	TON	\$233,967.92
00212	CL2 ASPH BASE 1.00D PG64-22	10686.720	TON	\$731,185.38	00212	CL2 ASPH BASE 1.00D PG64-22	7124.480	TON	\$487,456.92
00003	CRUSHED STONE BASE	22344.960	TON	\$552,814.31	00003	CRUSHED STONE BASE	22344.960	TON	\$552,814.31

Initial Total Item Cost: \$3,640,376.12

JPC Pavement Design CBR Design M_R in. JPC PAVEMENT
RIGID PAVEMENT in. DRAINAGE BLANKET
 ONE OR TWO DIRECTIONS:
 ANALYSIS PERIOD (YEARS):
 CONSTRUCTION YEAR:
 COST ON MAINT.OF TRAFFIC: Init. Const. Rehabilitation
 Analysis DATE: 2018-11-16

ECONOMIC ANALYSIS JPC Pavement

YEAR	INTEREST	P/F	COST	PW
0	4.00	1.00	\$7,155,396.81	\$7,155,396.81
25	4.00	0.38	\$983,926.75	\$303,362.99
40	4.00	0.21	\$1,044,204.81	

* Salvage Values are considered equivalent and are currently not included in Life Cycle Cost Analysis

PW OF Maximum JPC Design

INITIAL CONSTRUCTION ITEM COST

Driving Lane Item Quantity and Cost					Shoulder Item Quantity and Cost				
Code	Description	Quantity	Unit	Cost	Code	Description	Quantity	Unit	Cost
02084	JPC PAVEMENT-8 IN	64768.000	SY	\$3,756,544.00	02078	JPC PAVEMENT-6 IN SHLD	43178.667	SY	\$2,331,648.00
00003	CRUSHED STONE BASE	22344.960	TON	\$552,814.31	00003	CRUSHED STONE BASE	19862.187	TON	\$491,390.50

Initial Total Item Cost: \$7,132,396.81

Note: (for this pavement design section)

Save Reset

Figure 27. Screen for adjusting cost analysis on both asphalt and concrete pavement designs

4.5.6 Design Selection & Notes

On the **Design Selection & Note** tab (Figure 28), some Common General Notes are automatically selected by program based on what designs are specified on previous tabs. Some parameters with default data appear when corresponding notes are checked. Notes 276 and 447, for example, in Figure 28 are selected because *Lime Stabilized Roadbed* was chosen along with a single mix greater than 1,000 tons. Four parameters for Note 276 also appear. They are associated with Note 276. Users can select any other notes associated with this route section on this tab. Designer has to select a pavement design for submitting. Pavement adjustment costs for AC and PCC designs are shown up if designer select *Alternate Pavement* as their submission.

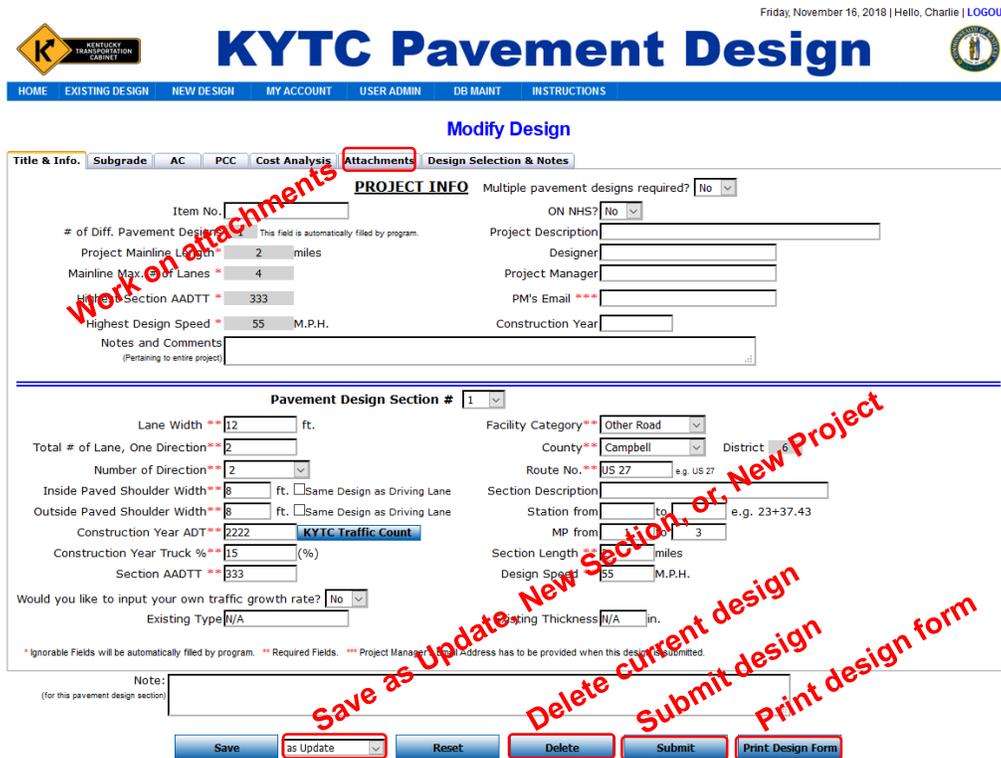
The screenshot displays the 'KYTC Pavement Design' web application. At the top right, it shows the date 'Friday, November 16, 2018' and the user 'Hello, Charlie | LOGOUT'. The navigation bar includes 'HOME', 'EXISTING DESIGN', 'NEW DESIGN', 'MY ACCOUNT', 'USER ADMIN', 'DB MAINT', and 'INSTRUCTIONS'. The main heading is 'New Design'. Below this, there are tabs for 'Title & Info', 'Subgrade', 'AC', 'PCC', 'Cost Analysis', and 'Design Selection & Notes', with the last one being active. The 'Pavement Design Selected' dropdown is set to 'Please Select ...'. The 'Pavement Design Notes' section includes a red-bordered box with the instruction: '(Select following notes for this design by checking the front check box)'. Under 'Common Plan Notes', several items are listed with checkboxes: 233, 275, 276 (checked), 444a, 444b (checked), 447 (checked), 448, 455, 555a, and 555b. Under 'Special Notes', there are sections for 'ASPHALT' (11N), 'JPC PAVEMENT' (11J, 11K, and a special note), and 'OTHERS' (special note for inlaid markers). A note field is present at the bottom with a 'Note:' label and '(for this pavement design section)' text. At the very bottom, there are 'Save', 'as New Project', and 'Reset' buttons.

Figure 28. Screen for design selection and notes associated with this route section

4.5.7 Save Button

Clicking the **Save** button saves a pavement design after all required data have been entered. One more tab, one dropdown list, and three more buttons are brought up after the **Save** button is clicked (Figure 29). Users can upload attachments to the server by using functions on the **Attachments** tab. They can save the design *as Update*, *as New Section*, or *as New Project* by choosing the appropriate option in the dropdown list. Users can delete the current design by clicking **Delete**, submit designs by clicking **Submit**, and print out the Pavement Design Form by clicking **Print Design Form**.

Friday, November 16, 2018 | Hello, Charlie | LOGOUT



The screenshot shows the 'KYTC Pavement Design' web application interface. At the top, there is a navigation bar with links for HOME, EXISTING DESIGN, NEW DESIGN, MY ACCOUNT, USER ADMIN, DB MAINT, and INSTRUCTIONS. The main title is 'KYTC Pavement Design'. Below the navigation bar, the user is logged in as 'Charlie' and can click 'LOGOUT'.

The main content area is titled 'Modify Design' and has several tabs: 'Title & Info.', 'Subgrade', 'AC', 'PCC', 'Cost Analysis', 'Attachments', and 'Design Selection & Notes'. The 'Attachments' tab is currently selected and highlighted with a red box.

Under the 'Attachments' tab, there is a 'PROJECT INFO' section. It includes fields for 'Item No.', 'Multiple pavement designs required?' (set to 'No'), 'ON NHS?' (set to 'No'), 'Project Description', 'Project Mainline Length' (2 miles), 'Designer', 'Mainline Max. # of Lanes' (4), 'Project Manager', 'Highest Section AADTT' (333), 'PM's Email', and 'Highest Design Speed' (55 M.P.H.). There is also a 'Construction Year' field and a 'Notes and Comments' text area.

Below the project info, there is a 'Pavement Design Section #' dropdown menu set to '1'. This section contains various design parameters:

- Lane Width: 12 ft.
- Facility Category: Other Road
- Total # of Lane, One Direction: 2
- County: Campbell
- Number of Direction: 2
- District: 6
- Inside Paved Shoulder Width: 8 ft. (with checkboxes for 'Same Design as Driving Lane')
- Route No.: US 27
- Outside Paved Shoulder Width: 8 ft. (with checkboxes for 'Same Design as Driving Lane')
- Section Description: [empty]
- Construction Year ADT: 2222 (with a 'KYTC Traffic Count' button)
- Station from: [empty] to: [empty] (e.g. 23+37.43)
- Construction Year Truck %: 15 (%)
- MP from: 1 to 3
- Section AADTT: 333
- Section Length: [empty] miles
- Design Speed: 55 M.P.H.
- Would you like to input your own traffic growth rate?: No
- Existing Type: N/A
- Existing Thickness: N/A in.

At the bottom of the form, there is a 'Note:' field and a row of buttons: 'Save', 'as Update' (with a dropdown arrow), 'Reset', 'Delete', 'Submit', and 'Print Design Form'. The 'as Update' button is highlighted with a red box. Large red diagonal text overlays the form, reading 'Work on attachments', 'Save as Update, New Section, or New Project', 'Delete current design', 'Submit design', and 'Print design form'.

Figure 29. More functions show up after **Save** Button is clicked

4.5.8 Attachments – Uploading and managing Attachments

After saving a pavement design, designers can upload design attachments (e.g., pictures; PDF, .doc, or .zip files) using the page shown in Figure 30 and following these steps:

1. Click **Browse** to identify a file to upload.
2. Check the **Check Box** if the chosen file is to be viewed by registered users only.
3. Click **Upload** to send the selected file to the web application server.

If the designer overlooks Step 2 during the upload process, they can check the **Registered User Only** checkbox on the file list and click the **Update Attachments** Button to restrict the use of attachments after uploading.

Wednesday, November 1, 2017 | Hello, Charlie | LOGOUT

KYTC Pavement Design

HOME EXISTING DESIGN NEW DESIGN MY ACCOUNT INSTRUCTIONS

Modify Design

Title & Info. Subgrade AC PCC Cost Analysis **Attachments** Design Selection & Notes

File ApprovalFlowchart.jpg was uploaded successfully

Attached Files for This Pavement Design

File Name	Type	Size	Uploaded By	Organization	Date	Registered User Only
ApprovalFlowchart.jpg	image/jpg	86795	Charlie Sun	University of Kentucky	Nov 01, 2017	<input type="checkbox"/>
PavementDesignForm-27.pdf	application/pdf	105072	Charlie Sun	University of Kentucky	Nov 01, 2017	<input type="checkbox"/>

Upload File/Files (Pictures, .pdf, .doc, or .zip)

Check this if the following file is for registered user Only

Select a file: No file selected.

Note:
(for this pavement design section)

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KYTC Pavement Design | Kentucky Transportation Cabinet | Kentucky Transportation Center

Figure 30. Upload and manage attachments under **Attachment** Tab

4.5.9 Save Option Dropdown List

The **Save Option Dropdown List** contains three save options — *as Update*, *as New Section*, and *as New Project*. Save *as New Section* is a convenient operation when the user designs another section with some common data as current one in current project. The **PROJECT INFO** is updated after a new section is created. Similarly, save *as New Project* creates a new project when a user begins it with some common data as the current project.

4.5.10 View Different Section

Users can review different sections' information by choosing section number in the **Pavement Design Section #** dropdown list under **Title & Info.** Tab.

4.5.11 Reset Button

Clicking the **Reset** button starts a new **Pavement Design Section** portion if the current project has more than one section. This action initiates new portions for both **PROJECT INFO** and the **Pavement Design Section** if the current project only has one section design. In both cases, two tabs — **Title & Info** and **Subgrade** — remain after **Reset** button has been clicked. The remaining tabs disappear.

4.5.12 Delete Button

Clicking the **Delete** button deletes the current section information and moves it onto the next section if it is available. Or it moves it to the previous section if it exists. It begins a new design project if the project only has one section design available.

4.5.13 Submit Button

Users see an error message if they click the **Submit** button without providing the **Project Manager's (PM) Email** address. When users successfully submit their designs, emails with the **Pavement Design Form** attached as a PDF are sent to the **PM** and designer. A link to the web application is provided to the **PM**. The message “*Your pavement design has been successfully submitted. Thank you.*” appears onscreen. All the information for the current project is locked. No one can make changes.

4.5.14 Print Design Form Button

Clicking the **Print Design Form** button creates a PDF version of the **Pavement Design Form**. Users can save this file on their local hard drive or open it onscreen using software for viewing PDFs (e.g., Adobe Reader or Acrobat) and save it later. The printed form is identical to the form sent to **PM**.

4.5.15 Approval Tab

Once the user successfully submits a pavement design, the **Approval** tab appears (Figure 31). Summary information about the pavement design project appears under the **Approval** tab.



KYTC Pavement Design

Wednesday, November 1, 2017 | Hello, Charlie | LOGOUT



HOME EXISTING DESIGN NEW DESIGN MY ACCOUNT INSTRUCTIONS

View Design

Title & Info.	Subgrade	AC	PCC	Cost Analysis	Attachments	Design Selection & Notes	Approval
Item No.	4-397.12	# of Diff. Pavement Designs	1				
Mainline Max. # of Lanes	2	Project Mainline Length	1.2 miles				
Designed By	Ashley McLan	Design Submitted Date	2017-09-11				
Project Description							
This design has been approved by:							
Project Manager:		Approve Date:					
District PDBM:		Approve Date:					
CO Pav. Branch Manager:		Approve Date:					
Note: CBR is based on assumption there is enough rock available for Rock Roadbed.							

Print Design Form

Figure 31. Approval Tab will show up after pavement design is successfully submitted

5. USER AS A PROJECT MANAGER

Any user currently registered on the web application can be designated a **Project Manager (PM)**. A person assigned as a **PM** but who has not registered on the web application can also receive this designation. If a prospective **PM** has not registered, an email is sent to the web application administrator when a designer submits their pavement design, requesting the administrator assist with registration.

If the prospective **PM** is registered on the web application, refer following sections for details on usage and some important operations:

4.4 Starting Page after LOGIN

4.5 NEW DESIGN – Create and Submit a New Pavement Design

Upon logging in, if a pavement design is awaiting the **PM**'s approval, the **PM**'s Decision on the **Approval** tab will be active (Figure 32). When a **PM** decides whether to **Approve** or **Request Changes**, they fill out the corresponding information and name and click the **Submit** button. A PDF version of the **Pavement Design Form** is emailed to corresponding users.

If the **PM** approves the design, three emails with the **Pavement Design Form** attached in PDF format are sent out. The email recipients are 1) the corresponding District **TEBM** for Project Development, 2) the designer who submitted the design, and 3) the **PM** (for recordkeeping purposes). If the **PM** requests design changes, an email with suggestions is sent to designer. A copy of this email is sent to the **PM** for recordkeeping purposes.

The screenshot displays the KYTC Pavement Design web application interface. At the top, there is a navigation bar with the KYTC logo and the text "KYTC Pavement Design". Below the navigation bar, there are several tabs: HOME, EXISTING DESIGN, NEW DESIGN, MY ACCOUNT, and INSTRUCTIONS. The main content area shows a "View Design" section with the following details: Item No. 4-142.20, # of Diff. Pavement Designs 2, Mainline Max. # of Lanes 4, Project Mainline Length 4 miles, Designed By Charlie Sun, and Design Submitted Date 2017-11-01. Below this, there is a section for "This design has been approved by:" with fields for Project Manager, District PDBM, and CO Pav. Branch Manager, each with an "Approve Date" field. The main section is titled "Project Manager's Decision:" and contains a radio button for "Approve" and a link for "Request Changes". There is an "Email to designer:" field with the value "charlie.sun@uky.edu". Below this, there is a section for "The following email will be sent to above email address by system:" with a preview of the email content. The email content includes a greeting, a message about the design not being approved, and a list of items that need to be modified. There is a "Submit" button at the bottom of the form.

Wednesday, November 1, 2017 | Hello, Charlie | LOGOUT

KYTC Pavement Design

HOME EXISTING DESIGN NEW DESIGN MY ACCOUNT INSTRUCTIONS

View Design

Item No. 4-142.20 # of Diff. Pavement Designs 2
Mainline Max. # of Lanes 4 Project Mainline Length 4 miles
Designed By Charlie Sun Design Submitted Date 2017-11-01
Project Description

This design has been approved by:

Project Manager: Approve Date:
District PDBM: Approve Date:
CO Pav. Branch Manager: Approve Date:

Project Manager's Decision:

Approve @ [Request Changes](#)

Email to designer: charlie.sun@uky.edu

The following email will be sent to above email address by system:

Hello (First Name of Designer),

Your new pavement design, (Pavement Design Item Number, Route Number, County, and Route Description), cannot be approved at this time. The following items need to be modified before further consideration: (item list customized by sender) Please contact me with any questions or suggestions you may have about this approval process. Thank you.

My Name
Program Manager
My Email Address

You can customize red portion by modifying following to fit your needs if you want:
(item list customized by sender)

Project Manager's Name:
Today's Date: November 01, 2017

Submit

Figure 32. Project Manager submits her/his decision

6. USER AS A DISTRICT TEBM FOR PROJECT DEVELOPMENT

The **District TEBM for Project Development** is a designated user on the web application. There are 12 District TEBMs for Project Development throughout Kentucky. In addition to having all the privileges of users classified as **Designers**, the **District TEBM** can approve the design or request changes and modify the prices of bid items for their district. When the **District TEBM** logs in, an additional link appears in the **Header** section — **DB MAINT → Bid Items** (Figure 33). The **District TEBM** can refer following sections for details on use and some important operations:

4.4 Starting Page after LOGIN

4.5 NEW DESIGN – Create and Submit a New Pavement Design



Figure 33. Header settings for District TEBM for Project Development

6.1 APPROVE or REQUEST CHANGES – District TEBM’s Decision

After a **District TEBM** logs in, if a pavement design in their district is awaiting approval, the portion of the **District Project Development Branch Manager's Decision** on the Approval tab will be activated (Figure 34). The **District TEBM** can decide to **Approve** or **Request Changes**. After deciding, they fill out the corresponding information, and click the **Submit** button. Emails with the **Pavement Design Form** attached in PDF format are then sent to corresponding users.

A pavement design project designated as “**On NHS, or AADTT ≥ 1000, or ≥ 5 Lane Miles**” requires approval from **Central Office TEBM Pavement**. In this scenario, after the **District TEBM** approves design, an email is sent to **Central Office TEBM Pavement**. Another email is sent to the **Program Manager**. A third email is sent to the **Designer** who submitted the project. A copy of the email goes to the **District TEBM** for recordkeeping purposes. All emails contain the **Pavement Design Form** attached in PDF format. If the pavement project is not designated as “**On NHS, or AADTT ≥ 1000, or ≥ 5 Lane Miles**”, the District TEBM’s approval stands as the final decision.

If the **District TEBM** requests changes, separate emails with suggested revisions are sent to the **Program Manager** and **Designer** who submitted the project. A copy of the email is sent to the **District TEBM** for recordkeeping purposes.

Thursday, November 2, 2017 | Hello, Charlie | LOGOUT



KYTC Pavement Design



HOME
EXISTING DESIGN
NEW DESIGN
MY ACCOUNT
DB MAINT
INSTRUCTIONS

View Design

District Project Development Branch Manager's Decision:

Approve Request Changes

The following email will be sent to designer and project manager by system:

Hello (FirstName),

Your new pavement design, (Pavement Design Item Number, Route Number, County and Area Description), cannot be approved at this time. The following items need to be modified before further consideration: (item list customized by sender) Thank you.

My Name
District Branch Manager
My Phone Number

You can customize red portion by modifying following to fit your needs if you want:

(item list customized by sender)

District Branch Manager's Name:

Today's Date: November 02, 2017

Note:
(for this pavement design section)

Figure 34. District TEBM for Project Development submits their decision

6.2 DB MAINT -- Database Maintenance on Bid Items for Their Own District

In addition to approving or requesting changes on **Program Manager**-submitted pavement design projects, the **District TEBM** can access the link in the **DB MAINT → Bid Items** for their district. Clicking this link takes the **District TEBM** to the **Database Maintenance** page. This page contains six categories of bid items — **Asphalt, Concrete, Stabilization, Aggregate, Drainage Blanket, and Fix Method** (Figure 35). Each category, when it is clicked, directs the **District TEBM** to a page that lets them modify existing bid items or add new bid items for their district.

To modify an existing bid item, the **District TEBM** clicks a bid item on the item list (Figure 36). Details for the bid item appear at the bottom detail area. Clicking the **Save to Database** button saves changes the **District TEBM** makes.

To add a new bid item, the **District TEBM** clicks the **Add New** button, types in detailed information for the item, and clicks the **Save to Database** button to save it in the current category.

Thursday, November 2, 2017 | Hello, Charlie | LOGOUT



KYTC Pavement Design



HOME
EXISTING DESIGN
NEW DESIGN
MY ACCOUNT
DB MAINT
INSTRUCTIONS

Item List for **Asphalt**
 District: **Asphalt**
 Concrete
 Stabilization
 Aggregate
 Drainage Blanket
 Fix Method

Item Description	Item Number	Rec. Price 1	Rec. Price 2	Rec. Price 3	Unit
CL 2 ASPH BASE 0.75D PG64-22	221	74.95	74.95	74.95	TON
CL 2 ASPH BASE 1.00D PG64-22	212	70.73	70.73	70.73	TON
CL 2 ASPH BASE 1.50D PG64-22	203	67.12	67.12	67.12	TON
CL 2 ASPH BIND 0.50D PG64-22	272	78.44	78.44	78.44	TON
CL 2 ASPH SURF 0.38B PG64-22	307	77.87	77.87	77.87	TON
CL 2 ASPH SURF 0.38D PG64-22	301	74.80	74.80	74.80	TON
CL 2 ASPH SURF 0.50D PG64-22	309	74.90	74.90	74.90	TON
CL 2 ASPH SURF 0.38B PG76-22	311	85.00	85.00	85.00	TON
CL 2 ASPH SURF 0.50A PG64-22	23647ES400	73.50	73.50	73.50	TON
CL 2 ASPH SURF NO.4D PG64-22	21653ES403	78.10	78.10	78.10	TON
CL 2 ASPH SURF 0.50B PG64-22	340	75.91	75.91	75.91	TON
CL 2 ASPH SURF 0.38D PG76-22	340	85.71	85.71	85.71	TON
CL 3 ASPH BASE 0.75D PG64-22	223	64.46	64.46	64.46	TON
CL 3 ASPH BASE 0.75D PG76-22	225	83.23	83.23	83.23	TON
CL 3 ASPH BASE 1.00D PG64-22	214	65.29	65.29	65.29	TON
CL 3 ASPH BASE 1.00D PG76-22	216	77.72	77.72	77.72	TON
CL 3 ASPH BASE 1.50D PG64-22	205	59.42	59.42	59.42	TON

Item Description:
 Item Number:
 Rec. Price 1 (\$): per
 Rec. Price 2 (\$): per
 Rec. Price 3 (\$): per

Add New
Save to Database

Figure 35. District TEBM has the ability to modify existing bid items or add new bid items for their own district

Monday, November 6, 2017 | Hello, Charlie | LOGOUT



KYTC Pavement Design



HOME
EXISTING DESIGN
NEW DESIGN
MY ACCOUNT
DB MAINT
INSTRUCTIONS

Item List for **Asphalt**
 District 6

Item Description	Item Number	Rec. Price 1	Rec. Price 2	Rec. Price 3	Unit
CL 2 ASPH BASE 0.75D PG64-22	221	74.95	74.95	74.95	TON
CL 2 ASPH BASE 1.00D PG64-22	212	70.73	70.73	70.73	TON
CL 2 ASPH BASE 1.50D PG64-22	203	67.12	67.12	67.12	TON
CL 2 ASPH BIND 0.50D PG64-22	272	78.44	78.44	78.44	TON
CL 2 ASPH SURF 0.38B PG64-22	307	77.87	77.87	77.87	TON
CL 2 ASPH SURF 0.38D PG64-22	301	74.80	74.80	74.80	TON
CL 2 ASPH SURF 0.50D PG64-22	309	74.90	74.90	74.90	TON
CL 2 ASPH SURF 0.38B PG76-22	311	85.00	85.00	85.00	TON
CL 2 ASPH SURF 0.50A PG64-22	23647ES400	73.50	73.50	73.50	TON
CL 2 ASPH SURF NO.4D PG64-22	21653ES403	78.10	78.10	78.10	TON
CL 2 ASPH SURF 0.50B PG64-22	340	75.91	75.91	75.91	TON
CL 2 ASPH SURF 0.38D PG76-22	340	85.71	85.71	85.71	TON
CL 3 ASPH BASE 0.75D PG64-22	223	64.46	64.46	64.46	TON
CL 3 ASPH BASE 0.75D PG76-22	225	83.23	83.23	83.23	TON
CL 3 ASPH BASE 1.00D PG64-22	214	65.29	65.29	65.29	TON
CL 3 ASPH BASE 1.00D PG76-22	216	77.72	77.72	77.72	TON
CL 3 ASPH BASE 1.50D PG64-22	205	59.42	59.42	59.42	TON

Item Description:
 Item Number:
 Rec. Price 1 (\$): per
 Rec. Price 2 (\$): per
 Rec. Price 3 (\$): per

Add New
Save to Database

Figure 36. How to modify or add new bid items for their own district

7. USER AS A CENTRAL OFFICE TEBM PAVEMENT

The **Central Office TEBM Pavement** has the most user privileges in the web application. In addition to the links **Designers** can access, the **Central Office TEBM** sees the following links on the **Header** after logging in: **USER ADMIN** → (**User Admin**, **User List** and **Groups**) and **DB MAINT** → **Bid Items** (Figure 37). The **Central Office TEBM** has final authority to approve or request changes. **USER ADMIN** → (**User Admin**, **User List** and **Groups**) links to pages for maintaining all the information of registered users and groups; on these pages, new users can be added and information for existing users can be modified. **DB MAINT** → **Bid Items** links to a page on which bid items can be updated or added. A **Central Office TEBM** can modify existing bid items or add new bid items for all KYTC districts. On all pages listing existing pavement design projects, the **Central Office TEBM** can activate or archive projects. Attachments can be managed on the **Attachments** tab. To understand how to navigate privileges available to **Designers**, refer to the following sections:

4.4 Starting Page after LOGIN

4.5 NEW DESIGN – Create and Submit a New Pavement Design



Figure 37. Header – after a Central Office TEBM Pavement logs in

7.1 Screen for Managing Existing Project List

On the page listing existing pavement design projects the **Central Office** **TEBM** can archive or activate a pavement design project by checking or unchecking the archive checkbox and clicking the **Update** Button (Figure 38). The **Central Office** **TEBM** can click on **Retrieve Archive** or **Retrieve All** to view different groups of pavement design projects.

Tuesday, November 7, 2017 | Hello, Charlie | LOGOUT



KYTC Pavement Design



HOME
EXISTING DESIGN
NEW DESIGN
MY ACCOUNT
USER ADMIN
DB MAINT
INSTRUCTIONS

List of Existing Design

Item No.	Route Description	County	Route No.	AADTT	Design CBR	Initiated by	Initiated Date	Archived
	made up design	Adair	US xxx	1600	3	Joseph Tucker	2017-8-18	<input type="checkbox"/>
	made up design	Anderson	US xxx	1600	3	Clark Graves	2017-8-30	<input type="checkbox"/>
		Breckinridge	ky 44	900	4	Clark Graves	2017-5-30	<input type="checkbox"/>
12.201		Bullitt	ky 44	2000	4	Clark Graves	2017-5-19	<input type="checkbox"/>
11-8001	US 421 to Coal Hollow Rd	Clay	KY 2432	495	11	Joseph Tucker	2017-7-27	<input type="checkbox"/>
11-8001	Entrance A	Clay	KY 2432	495	11	Clark Graves	2017-7-27	<input type="checkbox"/>
		Green	KY 900	125	5	Larry Krueger	2017-7-20	<input type="checkbox"/>
4.0170.00	Prather Hwy	Hardin	KY 313	2193	2	Joseph Tucker	2017-5-17	<input type="checkbox"/>
4-170.00	Joe Prather Highway	Hardin	KY 313	2193	2	Joseph Tucker	2017-4-27	<input type="checkbox"/>
4.XXXX		Hardin	US 12	250	3	Joseph Tucker	2017-5-6	<input type="checkbox"/>
7.51	Program Function Test ...	Jefferson	US 27	600	11	Clark Graves	2017-5-30	<input type="checkbox"/>
7-87		Jessamine	KY 169	572	9	Adam Ross	2017-5-16	<input type="checkbox"/>
12-311.79	US 119	Letcher	US 119	292	11	Joseph Tucker	2017-5-25	<input type="checkbox"/>
13-456	Seven Bridges Road	Madison	CR 7777	15	3	Adam Ross	2017-6-19	<input type="checkbox"/>
7-8403	3 Lane Section	Madison	KY 627	1440	2	Joseph Tucker	2017-10-27	<input type="checkbox"/>
7-8403-2	5 Flush Median Section	Madison	KY 627	1440	2	Joseph Tucker	2017-10-27	<input type="checkbox"/>
4-8803		Marion	KY 49	228	3	Larry Krueger	2017-8-3	<input type="checkbox"/>
		Marion	KY 9999	125	5	Larry Krueger	2017-7-20	<input type="checkbox"/>
N/A	Battletown	Meade	KY 228	50	3	Joseph Tucker	2017-8-18	<input type="checkbox"/>
10-8915	Bark Camp Branch Road	Perry	CR 1150	6	3	Lisa Townes	2017-10-10	<input type="checkbox"/>
7.513	Program Function Test ...	Shelby	US 60	1630	2	Clark Graves	2017-5-30	<input type="checkbox"/>
4-142.20	Campbellsville Bypass - Mainline	Taylor	NEW	439	2	Bradley Bottoms	2017-6-20	<input type="checkbox"/>
7.512	Program Function Test ...	Whitley	KY xx	2720	6	Charlie Sun	2017-9-21	<input type="checkbox"/>
7.512	Detail Route Description here	Woodford	US xx	3200	3	Charlie Sun	2017-9-23	<input type="checkbox"/>

Retrieve Archive Retrieve All Update

Function Buttons

Archive checkbox

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Figure 38. Archive/active projects by a **Central Office** **TEBM**

7.2 Screen for Managing Attachments

The **Central Office TEBM** can review or download attachments that have been uploaded by the **Designer** on the **Pavement Design** page's **Attachment** tab. Following review, they can decide whether to delete the attachment by checking the appropriate box. They can also restrict access to registered users only. Once a **Central Office TEBM** has made their selection(s), they should click the **Update Attachments** button (Figure 39).

The screenshot displays the 'Attachments' tab within the 'Modify Design' section of the KYTC Pavement Design application. The interface includes a navigation menu at the top with options like 'HOME', 'EXISTING DESIGN', 'NEW DESIGN', 'MY ACCOUNT', 'USER ADMIN', 'DB MAINT', and 'INSTRUCTIONS'. The main content area features a table of attached files and an 'Update Attachments' button. Red annotations are overlaid on the image to highlight key elements: 'Attachments' (the active tab), 'Registered User Only' and 'Delete' (checkboxes for file management), and 'Update Attachments' (the button to save changes). A note at the bottom of the table area provides additional context for design sections.

File Name	Type	Size	Uploaded By	Organization	Date	Registered User Only	Delete
RA-013-2016.pdf	application/pdf	6363650	Bradley Bottoms	KYTC District 4	Oct 12, 2017	<input type="checkbox"/>	<input type="checkbox"/>
Taylor County Traffic Forecast Oct 23 2014.pdf	application/pdf	4184196	Bradley Bottoms	KYTC District 4	Oct 10, 2017	<input type="checkbox"/>	<input type="checkbox"/>
Taylor County Traffic Forecast Oct 23 2014.pdf	application/pdf	4184196	Bradley Bottoms	KYTC District 4	Oct 10, 2017	<input type="checkbox"/>	<input type="checkbox"/>

Note: Mainline shoulders use full depth design due to possibility of future conversion of roadway to a 2+1.
(for this pavement design section)

Print Design Form

Figure 39. Manage attachments by **Central Office TEBM**

7.3 Approve or Request Changes – Central Office TEBM’s Decision

After the **Central Office TEBM** logs in, if a Pavement Design Project already approved by a **District TEBM** is awaiting their approval, the portion of **Central Office Pavement Branch Manager's Decision** under **Approval** tab will be active (Figure 40). After deciding to **Approve** or **Request Changes**, the **Central Office TEBM** fills out the corresponding information and clicks the **Submit** button. Once submitted, individual emails containing the **Pavement Design Form** in PDF format are sent to the **District TEBM, PM, and Designer** who submitted the design. A copy of this email is sent to the **Central Office TEBM** for recordkeeping purposes.

If the **Central Office TEBM** requests changes, emails which include the suggestions or modifications for further consideration are sent to the **District TEBM, PM, and Designer**.

Tuesday, November 7, 2017 | Hello, Charlie | LOGOUT

KYTC Pavement Design

HOME EXISTING DESIGN NEW DESIGN MY ACCOUNT USER ADMIN DB MAINT INSTRUCTIONS

View Design

Title & Info. Subgrade AC PCC Cost Analysis Attachments Design Selection & Notes **Approval**

Item No.: 4-142.20 # of Diff. Pavement Designs: 2
Mainline Max. # of Lanes: 4 Project Mainline Length: 4 miles
Designed By: Charlie Sun Design Submitted Date: 2017-11-01
Project Description:

This design has been approved by:
Project Manager: Approve Date:
District TEBM: Approve Date:
CO Pav. Branch Manager: Approve Date:

Central Office Pavement Branch Manager's Decision:
 Approve Request Changes
The following email will be sent to designer, project manager, and district branch manager by system:
Hello (First Name),
Your new pavement design, (Pavement Design Item Number, Route Number, County, and route Description), cannot be approved at this time. The following items need to be modified before further consideration: (item list customized by sender) Thank you.
My Name
District Branch Manager
My Phone Number
You can customize red portion by modifying following information to fit your needs if you want:
(item list customized by sender)
Central Office Pavement Branch Manager's Name:
Today's Date: November 07, 2017

This portion for Central Office TEBM's Decision

Figure 40. Central Office TEBM submits their decision

7.4 USER ADMIN – User Administration

In the **Header** section, the **Central Office TEBM** has access to **USER ADMIN → User Admin**. Clicking on this link brings up the **User Administration** page. This page contains three tabs — **Pending Designer**, **All Existing Users**, and **Add New User**. Figure 41 displays the **Pending Designer** tab, which lets the **Central Office TEBM** approve or delete pending requests for **Designer** users by clicking the corresponding buttons.

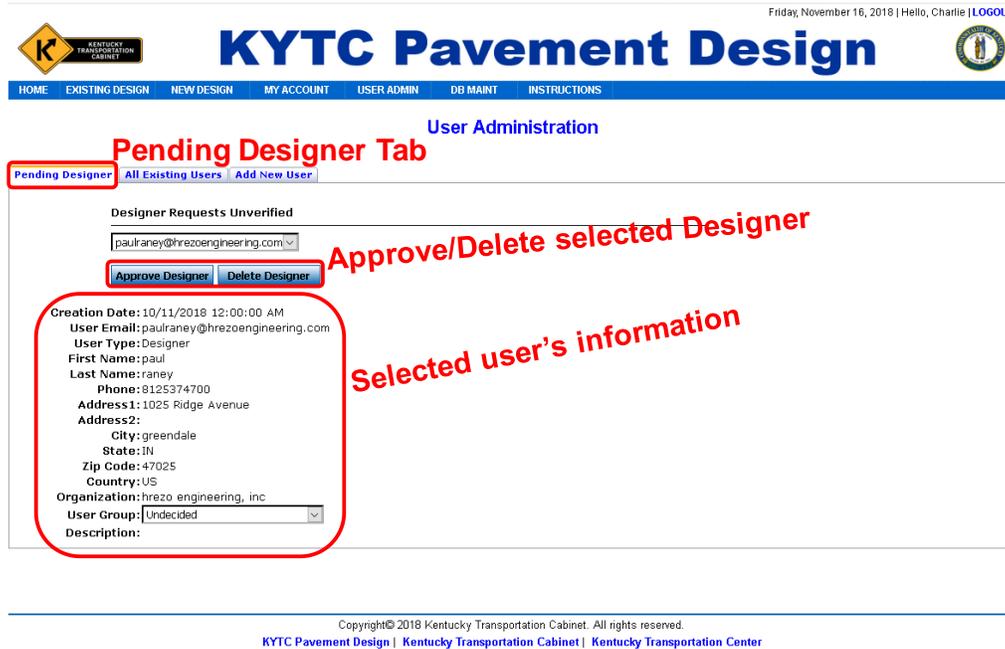


Figure 41. **User Administration** page with **Designer** in pending

7.4.1 Pending Designer -- Approve/Reject Pending Designer

The area on this tab depend on whether **Designer** requests are pending. These situations arise only when a user has registered on web application management system but not activated their account yet. If there are users who have not activated their accounts, dropdown lists appear. When the dropdown list under **Designer Requests Unverified** is clicked and a user is selected, the user information appears as seen in Figure 41.

The **Central Office TEBM** may approve a **Designer**'s request by clicking the **Approve Designer** button. They can reject or delete a request by clicking the **Delete Designer** button. If a **Designer** is approved, the web application management system sends an email to the **Designer** notifying them of the approval. If there are no requests pending, "No Approval pending" appears under **Designer Requests Unverified**.

7.4.2 All Existing Users -- Maintain All Registered User's Information

A second tab — **All Existing Users** — provides the **Central Office TEBM** with a dropdown list of all existing registered users. When a user is selected from the dropdown

list, their personal information appears beneath the dropdown list, which the **Central Office TEBM** can modify (Figure 42). The **Central Office TEBM** can save changes to a user's profile by clicking the **Update** button; change their status by clicking the **Change Status** button; or reset their password by clicking the **Reset Password** button. Clicking the **Reset Password** sends the selected user an email with a new password automatically generated by the system.

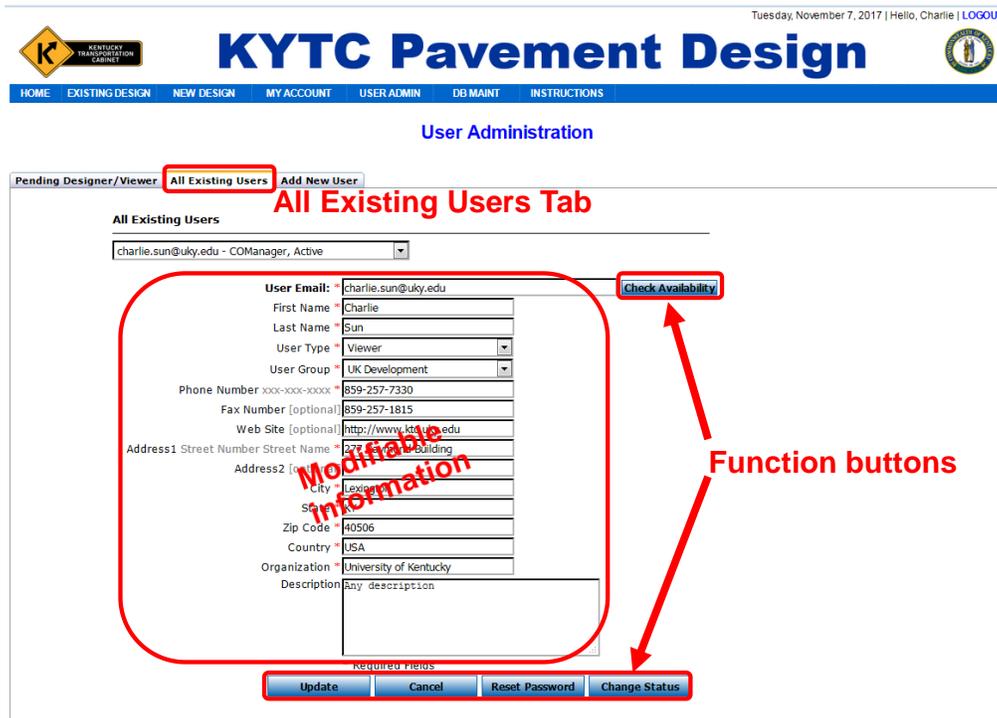


Figure 42. User info appears when user is selected on **All Existing Users** tab

7.4.3 Add New User -- Add/Invite New User

Clicking the **Add New User** button lets the **Central Office TEBM** register and activate a new user on their behalf (Figure 43). This user does not need to activate their account and can directly login to the web application management system via the **LOGIN** link. This page looks nearly identical to the **Registration** page seen in Figure 3 except the **Central Office TEBM** can select **User Type** and **Group** for the invited user. No activation from user's side is needed. After clicking **Register**, the web application management system instantly sends an email to the invited user that includes the **LOGIN** link.

Friday, November 16, 2018 | Hello, Charlie | LOGOUT

KYTC Pavement Design

HOME EXISTING DESIGN NEW DESIGN MY ACCOUNT USER ADMIN DB MAINT INSTRUCTIONS

User Administration

Pending Designer All Existing Users **Add New User**

Add New User Tab

Please provide following information to create a new account

First Name *
Last Name *
Email * [Check Availability](#)
This will be new user's Log In ID
An Invitation Email will be sent to this address
Also, in case s/he forgets her/his password, this address will be used for reset
Password * Minimum 6 characters
Retype Password *
Phone Number XXX-XXX-XXXX *
Fax Number [optional]
Web Site [optional]
Address1 Street Number Street Name *
Address2 [optional]
City *
State *
Zip Code *
Country *
Organization *
User Type Designer
 District Manager
 Administrator
User Type
User Group * Please Select ...
User Group
Description
* Required Fields
[Register](#) [Reset](#)

Figure 43. Add New User tab lets Central Office TEBM to add/invite new users

7.5 USER List

The **Central Office TEBM** has access to the **USER ADMIN** → **User List** link in the **Header**. Clicking this link takes the **Central Office TEBM** to the **User List** page (Figure 44). On this page, the **Central Office TEBM** can search users by using any string included in any fields. All titles of columns function like “**sort by**” key when any title is clicked. The **Central Office TEBM** can copy users’ email addresses by selecting the checkboxes in the front of users and clicking the button of **Copy Selected Email Addresses**. They can go to user detail page and modify their data by clicking on a user.

Friday, November 16, 2018 | Hello, Charlie | [LOGOUT](#)



KYTC Pavement Design



HOME
EXISTING DESIGN
NEW DESIGN
MY ACCOUNT
USER ADMIN
DB MAINT
INSTRUCTIONS

String Search User List

String Included:

Titles work as sort by keys

Select	First Name	Last Name	Email Address	Phone No.	Organization	Street	City	State	RegisterDate	Active
<input type="checkbox"/>	Chris	Kuntz	chris.kuntz@ky.gov	270-898-2431	KYTC District 1	5501 Kentucky Dam Road	Paducah	KY	2017-12-19	<input type="checkbox"/>
<input type="checkbox"/>	Carlton	Watkins	carlton.watkins@ky.gov	270-898-2431	KYTC District 1	5501 Ky Dam Road	Paducah	Kentucky	2018-2-7	<input type="checkbox"/>
<input type="checkbox"/>	Jeffrey	Sutton	jefferysutton@ky.gov	2708982431	KYTC District 1	5501 ky dam road	Paducah	ky	2018-2-7	<input type="checkbox"/>
<input type="checkbox"/>	Patsy	Banister	patsybanister@ky.gov	2708982431	Kentucky Transportation Cabinet-D1	5501 Kentucky Dam Road	Paducah	KY	2018-8-24	<input type="checkbox"/>
<input type="checkbox"/>	Charlotte	Cotton	charlotte.cotton@ky.gov	270-824-7080	KYTC District 2	1840 N Main Street	Madisonville	Kentucky	2018.6.12	<input type="checkbox"/>
<input type="checkbox"/>	Jean	Jones	jean.jones@ky.gov	270-824-7080	KYTC District 2	1840 N. Main St.	Madisonville	KY	2017-10-16	<input type="checkbox"/>
<input type="checkbox"/>	George	Phelps	GeorgeB.Phelps@ky.gov	270-824-7080	KYTC District 2	1840 North Main Street	Madisonville	KY	2018-3-8	<input type="checkbox"/>
<input type="checkbox"/>	John	Rudd	John.Rudd@ky.gov	270-824-7080	KYTC District 2	1840 North Main Street	Madisonville	KY	2018-4-9	<input type="checkbox"/>
<input type="checkbox"/>	Andrew	Stewart	Andrew.Stewart@ky.gov	270-746-7898	KYTC District 3	900 Morgantown Road	Bowling Green	KY	2017-10-3	<input type="checkbox"/>
<input type="checkbox"/>	Stewart	Lich	stewart.lich@ky.gov	270-746-7898	KYTC District 3	900 Morgantown Road	Bowling Green	KY	2017-10-3	<input type="checkbox"/>
<input type="checkbox"/>	David	Erickson	david.erickson@ky.gov	2707467898	KYTC District 3	900 Morgantown Rd	Bowling Green	Kentucky	2018-3-15	<input type="checkbox"/>
<input type="checkbox"/>	Benjamin	Hunt	benjamin.hunt@ky.gov	2707467898	KYTC District 3	900 morgantown road	bowling green	ky	2017-10-3	<input type="checkbox"/>
<input type="checkbox"/>	Jim	Hudson	jim.hudson@ky.gov	270-746-7898	KYTC District 3	900 Morgantown Road	Bowling Green	Kentucky	2018-3-19	<input type="checkbox"/>
<input type="checkbox"/>	christopher	walden	christopher.walden@ky.gov	2707467898	KYTC District 3	900 Morgantown Rd	Bowling Green	Kentucky	2018-9-24	<input type="checkbox"/>
<input type="checkbox"/>	Bradley	Bottoms	BradleyBottoms@ky.gov	270-766-5066	KYTC District 4	634 E Dixie Ave	Elizabethtown	KY	2017-6-23	<input type="checkbox"/>
<input type="checkbox"/>	Larry	Krueger	Larry.Krueger@ky.gov	270-766-5066	KYTC District 4	634 E Dixie Ave	Elizabethtown	KY	2017-6-1	<input type="checkbox"/>
<input type="checkbox"/>	Travis	Thompson	Travis.Thompson@ky.gov	502-210-5400	KYTC District 5	8310 Westport Road	Louisville	KY	2017-10-2	<input type="checkbox"/>
<input type="checkbox"/>	Keith	Downs	keith.downs@ky.gov	502-210-5446	KYTC District 5	8310 Westport Road	Louisville	KY	2018-1-5	<input type="checkbox"/>
<input type="checkbox"/>	Timothy	Showm	TimE.Showm@ky.gov	502-210-5475	KYTC District 5	8310 Westport Road	Louisville	KY	2018-5-18	<input type="checkbox"/>
<input type="checkbox"/>	Scott	Gabbard	scott.gabbard@ky.gov	859-341-2700	KYTC District 6	421 Buttermilk Pike	Covington	KY	2018-6-15	<input type="checkbox"/>
<input type="checkbox"/>	Rachel	Pingleton	rmp222@uky.edu	8595836289	Federal Work Study, UK	300 Quinton Court 21201	Lexington	KY	2018-10-29	<input type="checkbox"/>
<input type="checkbox"/>	Test	User	Joetucker125@gmail.com	5027824915	KYTC	200 metro street	Frankfort	KY	2018-1-8	<input type="checkbox"/>

Function Buttons

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Figure 44. **USER ADMIN** → **User List** page provides CO TEBM an interface maintaining user information and copy user email addresses

7.6 GROUP ADMIN – Group Administration

The **Central Office TEBM** has access to the **USER ADMIN → Groups** link in the **Header**. Clicking this link takes the **Central Office TEBM** to the **Group Administration** page (Figure 45). On this page, the **Central Office TEBM** can modify existing groups' information and add new groups.

The screenshot displays the 'User Group List' page in the KYTC Pavement Design system. The page header includes the KYTC logo, the title 'KYTC Pavement Design', and navigation links: HOME, EXISTING DESIGN, NEW DESIGN, MY ACCOUNT, USER ADMIN, DB MAINT, and INSTRUCTIONS. The date and user information are shown as 'Tuesday, November 7, 2017 | Hello, Charlie | LOGOUT'.

Group Name	Group ID
KYTC District 1	1
KYTC District 2	2
KYTC District 3	3
KYTC District 4	4
KYTC District 5	5
KYTC District 6	6
KYTC District 7	7
KYTC District 8	8
KYTC District 9	9
KYTC District 10	10
KYTC District 11	11
KYTC District 12	12
KYTC Central Office	20
UK Development	21
Palmer Engineering	101

Below the table, there is a form for editing the selected group (KYTC District 7). The form includes input fields for 'Group Name' (containing 'KYTC District 7') and 'Group ID' (containing '7'). There are two buttons: 'Add New' and 'Save to Database'.

Central Office TEBM can maintain Group information

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Figure 45. **USER ADMIN → Groups** page provides CO TEBM an interface maintaining group information

7.7 DB MAINT -- Database Maintenance

In addition to **USER ADMIN**, the **Central Office TEBM** can access the link in the **DB MAINT** → **Bid Items** for all 12 KYTC districts. Clicking this link brings the **Central Office TEBM** to the **Database Maintenance** page. Unlike the page for the **District TEBM**, bid items for Central Office and the 12 districts are accessible for the **Central Office TEBM** on this page (Figure 46). It has the same layout as the one for the **District TEBM**; there are six categories of bid items — **Asphalt**, **Concrete**, **Stabilization**, **Aggregate**, **Drainage Blanket**, and **Fix Method**. Each category, when clicked, loads a page where the **Central Office TEBM** can modify existing bid items or add new bid items for all the state.

Tuesday, November 7, 2017 | Hello, Charlie | LOGOUT

KYTC Pavement Design

HOME EXISTING DESIGN NEW DESIGN MY ACCOUNT USER ADMIN DB MAINT INSTRUCTIONS

Item List for **Asphalt**

Central Office

Item Description	Item Number	District	Rec. Price 1	Rec. Price 2	Rec. Price 3	Unit
CL 2 ASPH BASE 0.75D PG64-22	221	District 1	74.95	74.95	74.95	TON
CL 2 ASPH BASE 1.00D PG64-22	212	District 2	70.73	70.73	70.73	TON
CL 2 ASPH BASE 1.50D PG64-22	203	District 3	67.12	67.12	67.12	TON
CL 2 ASPH BIND 0.50D PG64-22	272	District 4	78.44	78.44	78.44	TON
CL 2 ASPH SURF 0.38B PG64-22	307	District 5	77.87	77.87	77.87	TON
CL 2 ASPH SURF 0.38D PG64-22	301	District 6	74.80	74.80	74.80	TON
CL 2 ASPH SURF 0.50D PG64-22	309	District 7	74.90	74.90	74.90	TON
CL 2 ASPH SURF 0.38B PG76-22	311	District 8	85.00	85.00	85.00	TON
CL 2 ASPH SURF 0.50A PG64-22	2364	District 9	73.60	73.50	73.50	TON
CL 2 ASPH SURF NO.4D PG64-22	2165	District 10	77.72	77.72	78.10	TON
CL 2 ASPH SURF 0.50B PG64-22	2336	District 11	75.91	75.91	75.91	TON
CL 2 ASPH SURF 0.38D PG76-22	340	District 12	85.71	85.71	85.71	TON
CL 3 ASPH BASE 0.75D PG64-22	223		64.46	64.46	64.46	TON
CL 3 ASPH BASE 0.75D PG76-22	225		83.23	83.23	83.23	TON
CL 3 ASPH BASE 1.00D PG64-22	211		65.29	65.29	65.29	TON
CL 3 ASPH BASE 1.00D PG76-22	204		77.72	77.72	77.72	TON
CL 3 ASPH BASE 1.50D PG64-22	205		59.42	59.42	59.42	TON

123

Item Description Rec. Price 1 (\$) per

Item Number Rec. Price 2 (\$) per

Rec. Price 3 (\$) per

Add New **Save to Database**

Figure 46. **DB MAINT --> Bid Items** page provides CO TEBM an interface maintaining bid items for all the state

To modify an existing bid item, the **Central Office TEBM** clicks a bid item on the item list (Figure 46). The details for the bid item then appear at the bottom of the detail area. Clicking **Save to Database** button saves the changes if the **Central Office TEBM** makes any.

To add a new bid item, the **Central Office TEBM** must first select an item category from **Item List**. Next, click the **Add New** button and input detailed information for the new bid item. Lastly, clicking **Save to Database** button saves the new item in the current selected category. If any item needs to be added to all 12 districts, **Central Office** should be picked in second dropdown list. This adds the new bid item to the 12 districts at same time.

8. USER AS AN ADMINISTRATOR

An **Administrator** is an assistant to the **Central Office TEBM** in the web application. The **Administrator** can perform all functions available to the **Central Office TEBM** except approving pavement design projects.

9. LOGOUT

The **LOGOUT** link appears in the upper right corner of every page of the web application. When a user clicks a **LOGOUT** link, the system deletes all session variables and a fresh session begins. The user is then redirected to the original **HOME** page. To reenter the site, the user must click the **LOGIN** link in the upper right corner of the page and enter their **Email Address** and **Password**.

If you have questions or need assistance with the KYTC Pavement Design web application, please contact:

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