

ABSTRACT



International Erosion Control Systems' (IECS') Cable Concrete Calculator is a web portal and digital tool to assist engineers in developing and planning for water flow control systems in areas around the world. Currently, IECS utilizes an MS-DOS program to calculate safety factors for each of the different products they offer, and as such, lack a meaningful way to interface with potential clients aside from email, phone and in-person interaction. A modernized Web-based tool with expanded functionality was the focus of the collaborate partnership with Reactr.

The Cable Concrete Calculator was designed to not only make it easier for engineers who are interested in IECS' products to get estimates, but also to enable IECS to manage and view their potential and current client estimates in a more organized and effective way.

By using the online Calculator, engineers who wish to implement erosion control systems within their development projects will now have a way of directly engaging with the estimate process, reducing the need for lengthy email chains and manual estimate processing times. The tool also enables administrators at IECS to directly contact clients after they fill out an estimate, and to track and monitor the state of all estimates generated through the site, so as to better understand the economic and environmental conditions that might affect their business. This will also allow IECS to identify potential clients, as each submitted estimate requires contact information that will allow IECS to communicate directly with prospective clients who use the Calculator.



BACKGROUND

International Erosion Control Systems (IECS) has been producing, marketing and implementing soil stabilization and erosion control products since 1984, and has since become an international industry leader in erosion control, flow control and concrete placement solutions.

At International Erosion Control Systems we are continuously striving to improve our products and services, while offering the latest, most efficient, and cost effective ways to meet your project needs. We will ensure that all our customer requirements are met and will deliver the material in a timely manner, using a management process designed to ensure continuous improvement, and the achievement of our corporate goals and objectives.

With a patented system of interlocking concrete blocks, branded Cable Concrete, IECS offers a rare and effectual service that features many applications, such as overflow control, bank protection, and access roads. Currently, in order to estimate the weight and size of the block necessary to control flow for a particular project, IECS relies on a Fortran-based, MS-DOS calculator to calculate estimates for each individual project's needs. This outdated tool, while usable, is not an effective way to approach a large client base such as IECS' – therefore, the upgrade to an online Web app is a necessary step. The overarching goal of the Web Calculator was to improve not only estimate turnaround times, but also client satisfaction and usage rate. By promoting self-usage and taking a step back from the estimate process, IECS provides clients with a sense of ultimate control over their purchase and decision, but with input from IECS readily available as needed.



INTERNATIONAL EROSION CONTROL SYSTEMS CONCRETE BLOCK CALCULATOR

Developed by: Nick Ireland, Shannon Enwright, Adam Luxton

IECS' Cable Concrete Calculator is 100% device responsive. This allows any client to use this web application on any desired desktop, laptop, and mobile device.

The image shows three devices displaying the IECS Cable Concrete Calculator application. The application is fully responsive, adapting its layout and content to fit the screen size of each device. On the left, a tablet shows a navigation sidebar with options like Home, Quotes, History, Profile, Tips, and FAQs. The main content area displays a 'Most Recent Quote' for 'ROADWAY WATER FLOW' with details like date modified (September 16, 2016) and date created (September 02, 2016). In the center, a laptop screen shows a similar view with additional sections for 'History' and 'Residential Retaining'. On the right, a smartphone shows the same interface, emphasizing the mobile compatibility of the application.

This image provides a detailed look at the 'RECOMMENDED BLOCKS' section of the calculator. It shows a list of recommended block sizes with their corresponding safety factors. The blocks are represented by small 3D models with dimensions and safety factor values. The safety factors listed are 0.23, 1.06, 2.3, 2.3, and 2.3. The section also includes a back button, a continue button, and a list of flow types: Jump, Impinging, Bridge/Culvert, and Undulating Trans Critical.

Recommended Blocks Final Output

Responsive Form

Client/User Login System



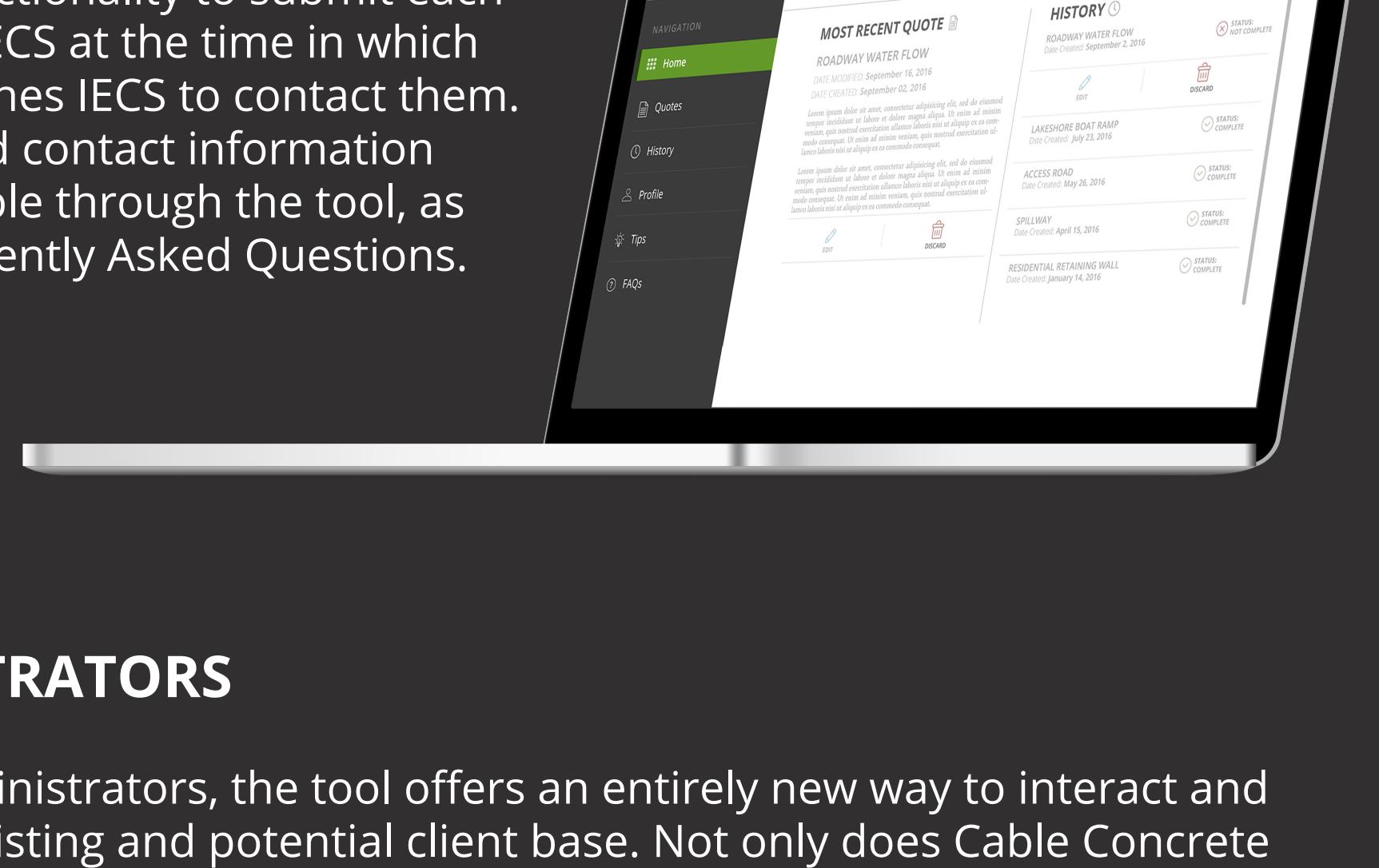
FEATURES

CLIENTS

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Additionally, clients can save, track, edit and delete their estimates, adding to the functionality and user-friendliness of the tool. The tool tracks all client estimates, and adds functionality to submit each estimate to IECS at the time in which the client wishes IECS to contact them. Company and contact information is also available through the tool, as well as Frequently Asked Questions.

A simple, thin white horizontal bar centered on a dark gray background. It has a slight shadow underneath, giving it a three-dimensional appearance.



A screenshot of a mobile application interface. At the top, there's a header with a user profile icon and the text "John Smith" and "ADMIN". Below this is a "RECENT ACTIVITY" section with a green header bar. The activity feed shows two items: "COMPANY 1 Finished form for: Construction job Hamilton" and another item partially visible below it.

of estimates that company has performed and the results of those estimates made readily available.

Estimates made readily available to
the administrators.



variables, the IES Concrete Calculator Web App, were developed using the principles of teamwork and transparency embodied by this framework. Students effectively collaborated on the project. Additionally, students were required to learn and develop skills in their respective team positions that were not

to learn and develop skills in their respective team positions that were not a part of their program curriculum, included new programming languages and frameworks, workflow and timeline planning, and effective collaboration. Furthermore, students developed ancillary skills in addition to the hard skills obtained via research and practice, including client interaction and presentation skills. Finally, students were also required to adopt a 'scalable' approach to development, ensuring ease of future development should other coders need to make adjustments or add functionality, and therefore had to become well versed in industry standard technologies and procedures, many of which were not covered in their core classroom curriculum.

The banner consists of six white hexagons arranged horizontally against a dark background. Each hexagon contains a dark gray icon representing a specific technology: React Native (three interlocking circles), Node.js (a stylized 'N'), Express.js (a stylized 'E'), PHP (the word 'php' in a lowercase, italicized font), MySQL (a flame-like symbol), and MongoDB (a stylized 'M').

