



QUICK DESIGN WEBSITE

www.quickdesign.app

Developed By :
Omar Ashraf

Supervision:
Mohd Yousef

2026

EXECUTIVE SUMMARY

Problem:

- Engineers often spend time searching different tools for structural design.
- Current solutions are scattered and not centralized.

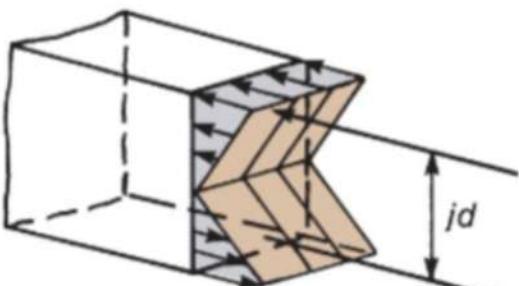
Solution:

- A single platform containing all structural design elements.
- Each element is represented by a clickable tile.
- Clicking a tile opens the corresponding design web in a new tab.
- Easily for drafting and reporting.

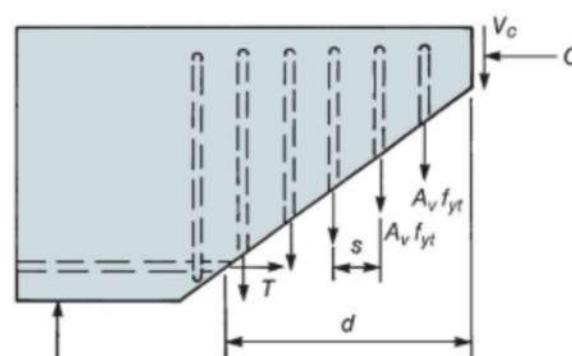


REINFORCED CONCRETE DESIGN

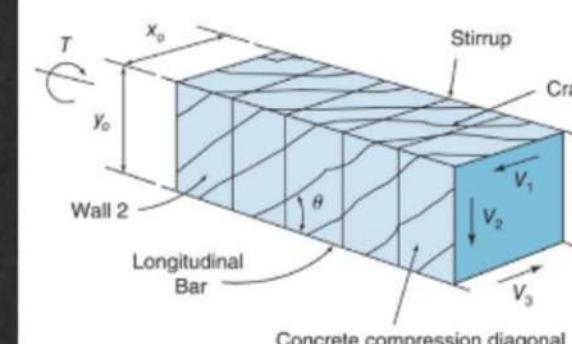
ACI 318-19
RECTANGULAR SECTION BENDING



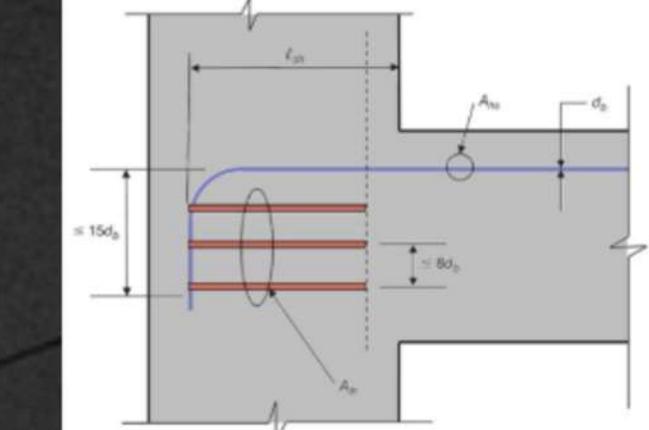
ACI 318-19



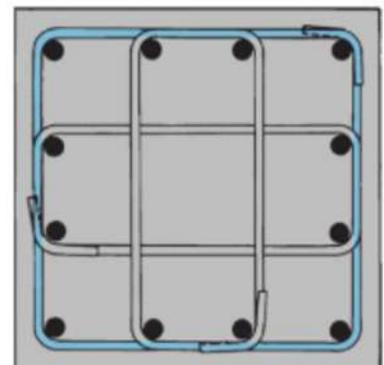
ACI 318-19
RECTANGULAR SECTION TORSION



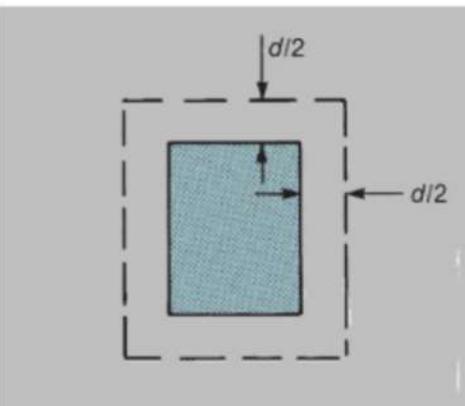
ACI 318-19
DEVELOPMENT AND SPLICE LENGTH



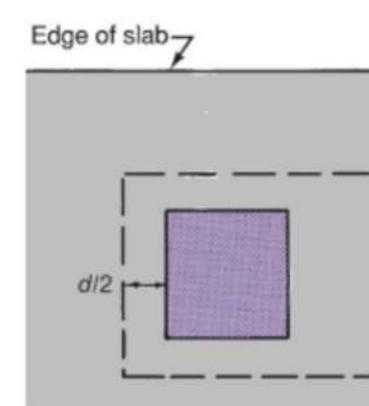
ACI 318-19
RECTANGULAR COLUMN



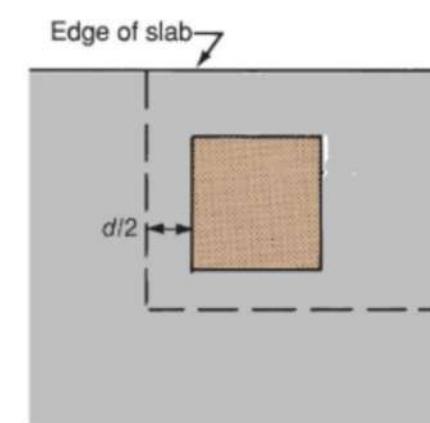
ACI 318-19
INTERIOR COLUMN PUNCHING SHEAR



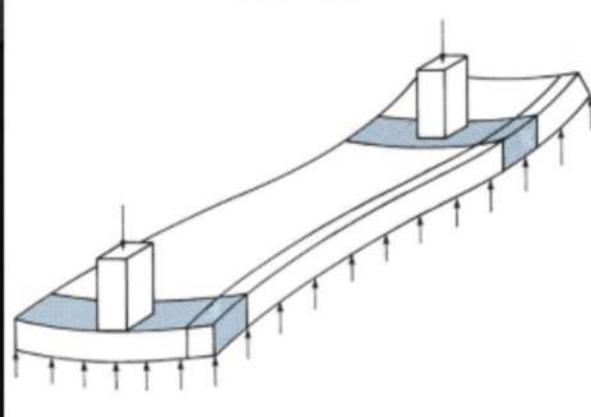
ACI 318-19
EDGE COLUMN PUNCHING SHEAR



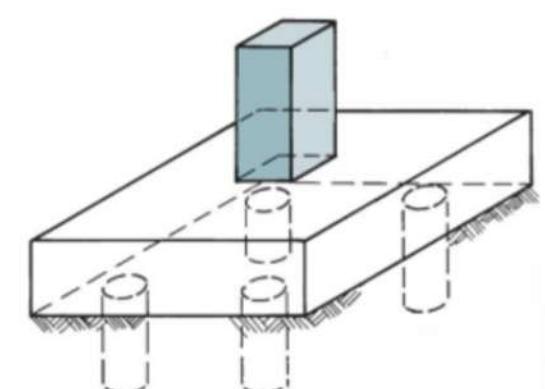
ACI 318-19
CORNER COLUMN PUNCHING SHEAR



ACI 318-19
FOOTING



ACI 318-19
PILE CAP



ACI 224-06
CRACK WIDTH BENDING

ACI 224-06
CRACK WIDTH DIRECT TENSION

ACI 318-19
CORBEL

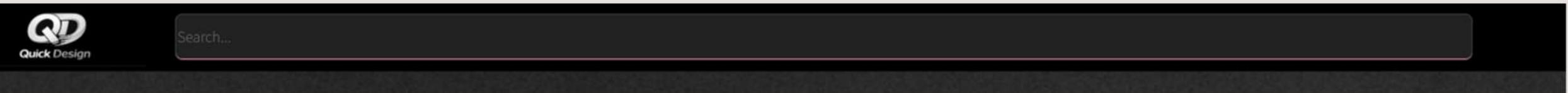
ACI 318-19
SPECIAL SHEAR WALL

HIGHLIGHTS

HEADER SECTION

Components:

- Website logo
- Extendable search bar



Function: users can search for structural elements quickly

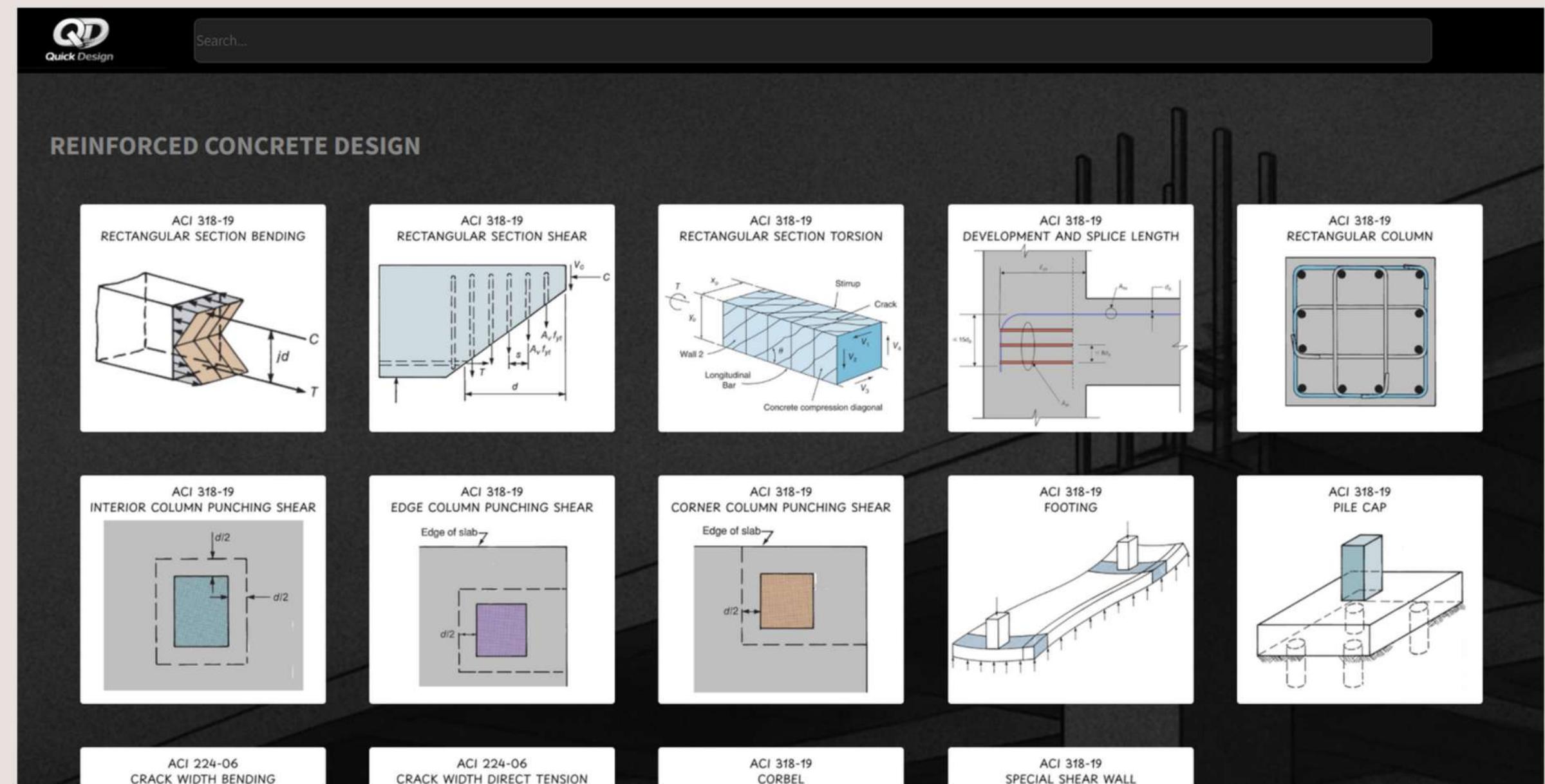
HIGHLIGHTS

MAIN SECTIONS

Sections shown on the homepage:

- Structural Analysis
- RC Design
- Steel Design

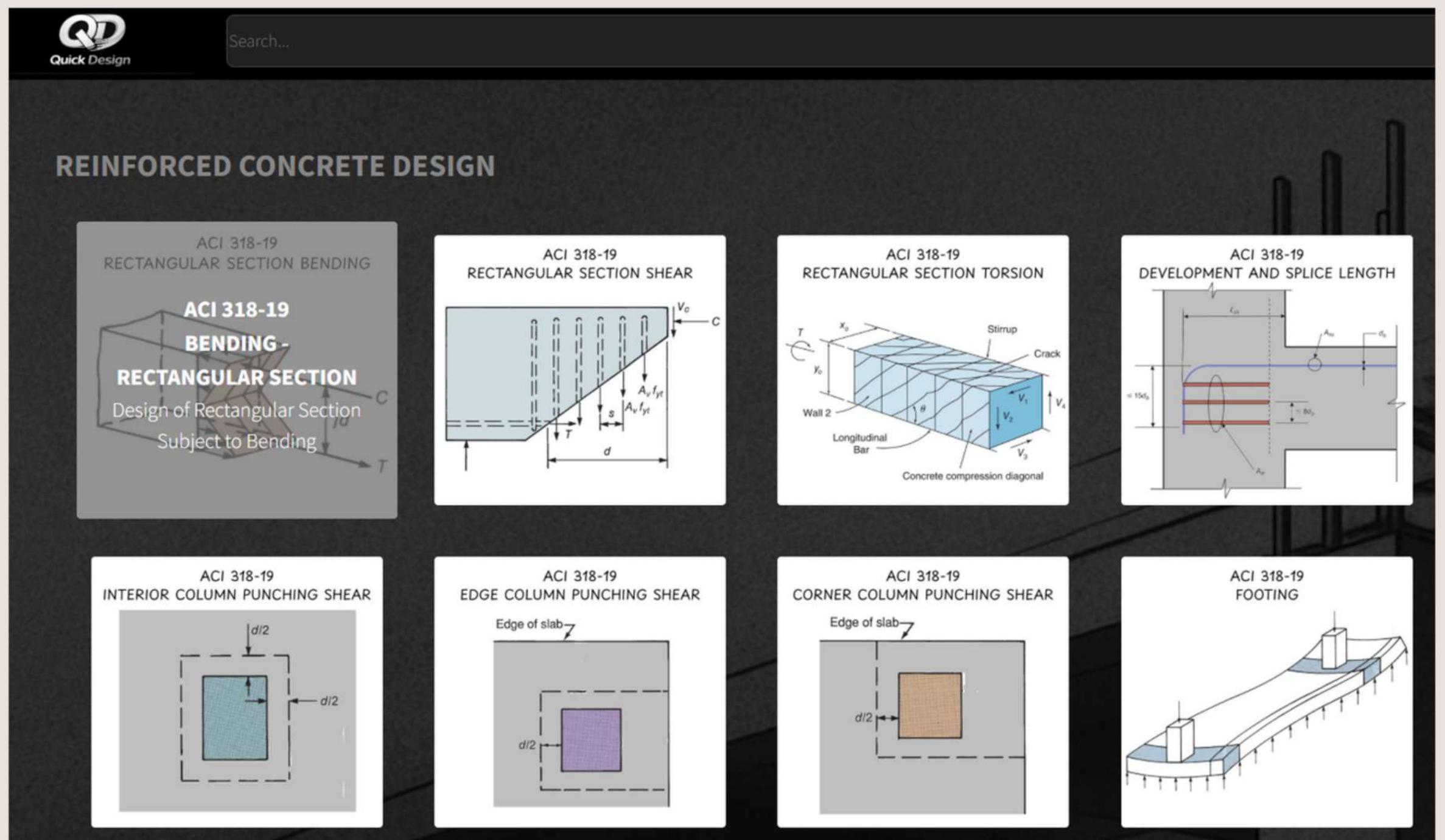
Each section contains tiles for each element design with all applied straining actions.



HIGHLIGHTS

CLICKABLE TILES FUNCTIONALITY

- Tiles represent structural elements like Columns, Beams, Slabs, Shear Walls, Foundations
- Clicking a tile opens the design web in a new tab
- Emphasize: intuitive and fast navigation



HIGHLIGHTS

CLICKABLE TILES FUNCTIONALITY

- Tiles represent structural elements like Columns, Beams, Slabs, Shear Walls, Foundations
- Clicking a tile opens the design web in a new tab
- Emphasize: intuitive and fast navigation

Data

Loads:
Factored Moment, $M_u = 518$ kN-m

Material:
Concrete Strength, $f'_c = 48$ MPa
Reinf. Yield Strength, $f_y = 420$ MPa

Geometry:
Structural Element Type? Beam
Section Width, $b = 600$ mm
Section Thickness, $h = 400$ mm
Effective Depth, $d = 537.5$ mm
Effective Depth, $d' = 62.5$ mm

Reinforcement:
Compression $A'_s = 804$ mm²
Tension $A_s = 3216$ mm²

Results

Stress Block Data:
 $\beta_i = 0.71$
 $c = 75.2$ mm
 $a = 53.2$ mm

Reinforcing Criteria:
 $\rho_{temp} = N.A.$
 $\rho_{min} = 0.0041$
 $\rho_{max} = 0.0260$
 $\rho_b = 0.0404$
 $\rho = 0.0100$
 $A_s \text{ temp} = N.A.$ mm²
 $A_s \text{ min} = 1330$ mm²
 $A_s \text{ max} = 8399$ mm²

Ultimate Moment Capacity:
 $e'_s = 0.00051$
 $f'_s = 101.4$ MPa
 $et = 0.01844$
 $\phi = 0.90$
 $\phi M_n = 618.4$ kN-m

Check / Reference

(Note: this worksheet excludes sections that qualify as "Deep Beams" per ACI 318-19 Code, Section 9.9)

Req'd Tension Reinf. for Singly Reinforced Section:
 $A_s = 2663$ mm²

ACI 318-19 Section 9.6.1.2 for Min. Flexural Reinforcing:
 $A_s \text{ min} = 1330$ mm²

ACI 318-19 Section 9.6.1.3 for Waiving Min. Flexural Reinforcing Requirements:
 $4/3 A_s = N.A.$ mm² $A_s \geq A_s \text{ min}$, thus Not Applicable

ACI 318-19 Section 7.6.1.1 for Min. temperature Reinforcing:
 $A_s \text{ temp} = 426$ mm²

Bar Size	Dia. (mm)	Area (mm ²)
6	6	28
8	8	50
10	10	79
12	12	113
16	16	201
20	20	314
25	25	491
32	32	804
40	40	1256

f'_c (MPa)	Max. Reinf. Ratio for "Tension-Controlled"		
	f_y= 275 P	f_y= 420 P	f_y= 550 P
28	0.0249	0.0148	0.0105
32	0.0285	0.0170	0.0120
36	0.0320	0.0191	0.0135
40	0.0356	0.0212	0.0156
44	0.0391	0.0233	0.0165
52	0.0462	0.0276	0.0195
60	0.0533	0.0318	0.0225
68	0.0605	0.0360	0.0255

Spacing (mm)	Reinforcing Bar Area for Various Bar Spacings(mm ^{2/mm})								
	6	8	10	12	16	20	25	32	40
50	565	1005	1570	2261	4019	6280	9813	16077	25120
75	377	670	1047	1507	2679	4187	6542	10718	16747
100	283	502	785	1130	2010	3140	4906	8038	12560
125	226	402	628	904	1608	2512	3925	6431	10048
150	188	335	523	754	1340	2093	3271	5359	8373
175	161	287	449	646	1148	1794	2804	4593	7177
200	141	251	393	565	1005	1570	2453	4019	6280
225	126	223	349	502	893	1396	2181	3573	5582
250	113	201	314	452	804	1256	1963	3215	5024
275	103	183	285	411	731	1142	1784	2923	4567
300	94	167	262	377	670	1047	1635	2679	4187
325	87	155	242	348	618	966	1510	2473	3865
350	81	144	224	323	574	897	1402	2297	3589
375	75	134	209	301	536	837	1308	2144	3349
400	71	126	196	283	502	785	1227	2010	3140
425	66	118	185	266	473	739	1154	1891	2955
450	63	112	174	251	447	698	1090	1786	2791
475	59	106	165	238	423	661	1033	1692	2644
500	57	100	157	226	402	628	981	1608	2512

HIGHLIGHTS

FOOTER SECTION

Contains:

- Reference link for the author
- Contact info: form for sending comments

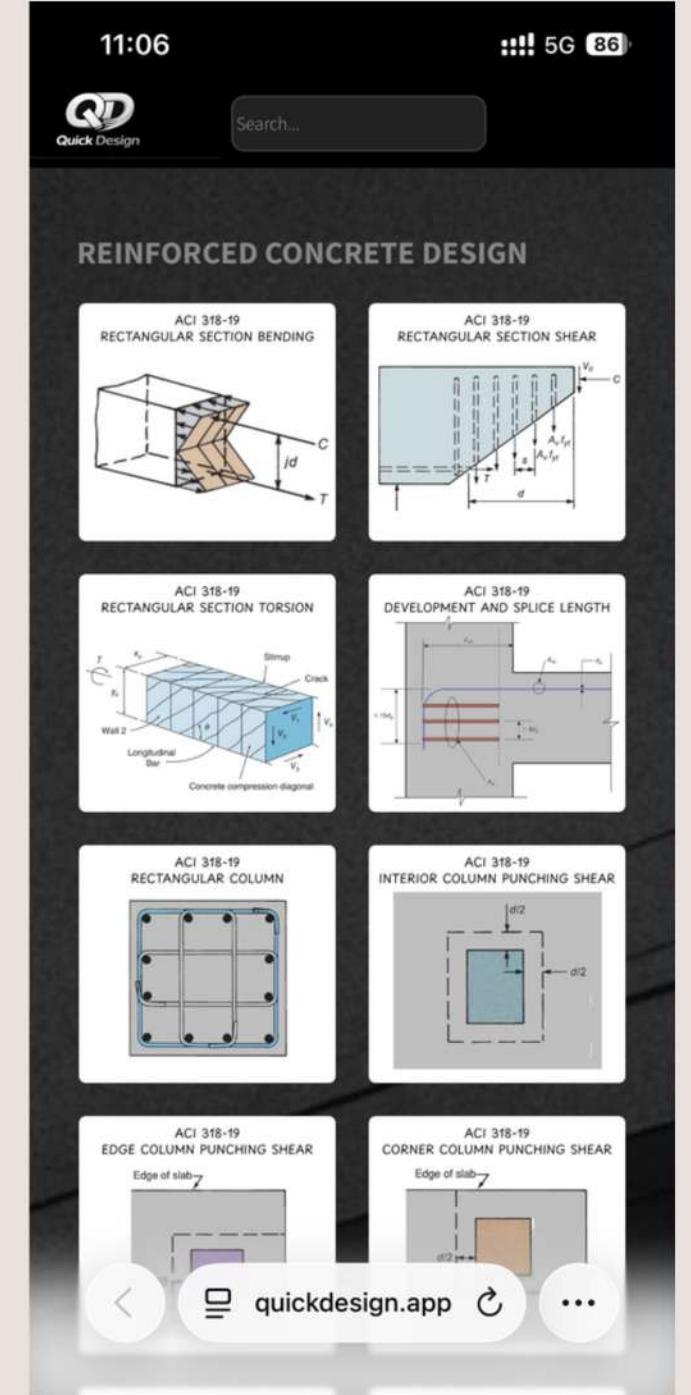
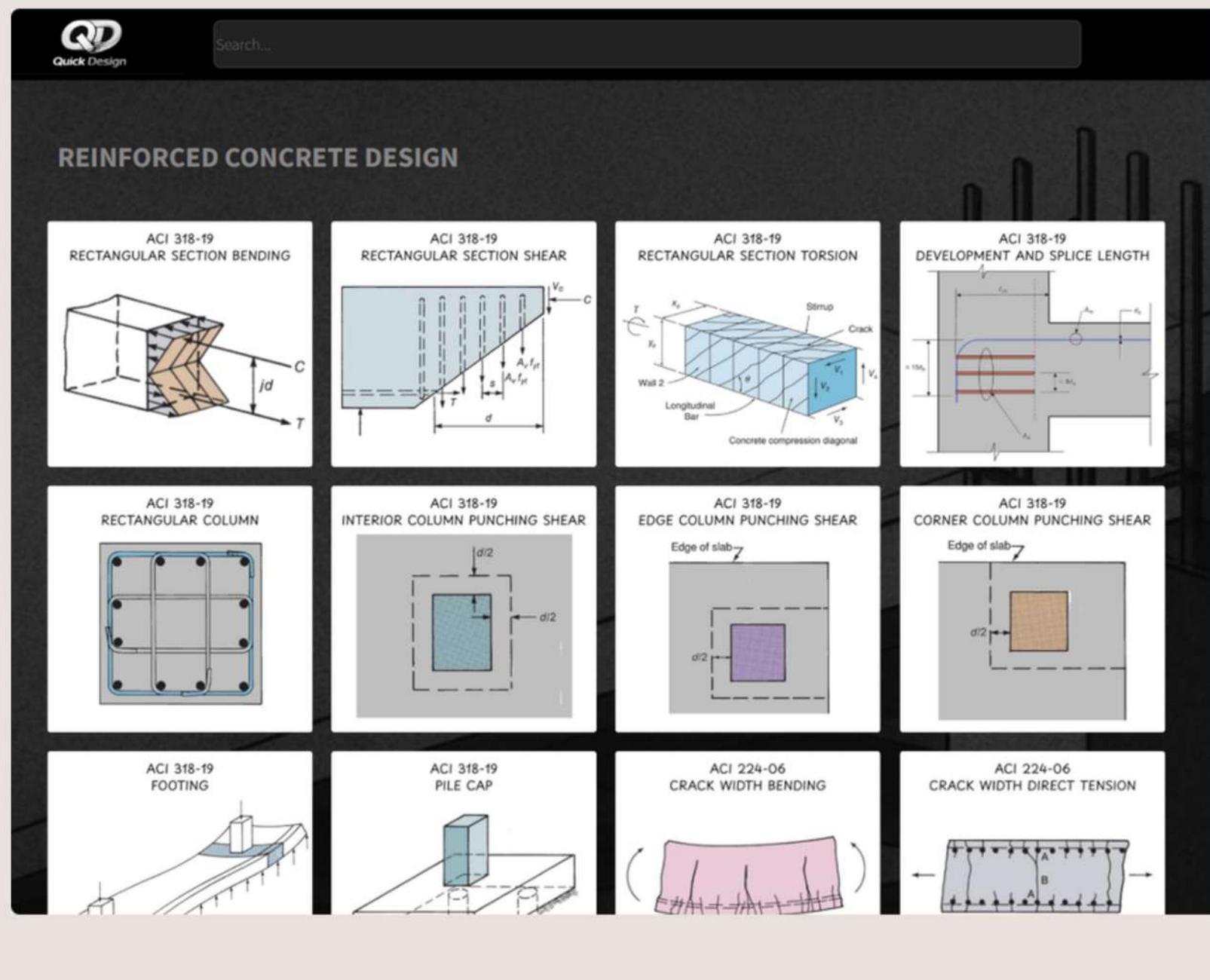
Ensures easy access to references and feedback

The screenshot shows a dark-themed website footer. At the top left is the 'Quick Design' logo. To its right is a search bar labeled 'Search...'. Below the search bar is a small diagram illustrating soil pressure on a foundation. The main area contains two columns: 'GET IN TOUCH' on the left and 'FOLLOW' on the right. The 'GET IN TOUCH' column includes fields for 'Name' and 'Email', and a 'Message' input field. A 'SEND' button is located below these fields. The 'FOLLOW' column features a single social media link represented by a LinkedIn icon. At the bottom of the footer, there is a copyright notice: 'Copyright © 2025 Author. All Rights Reserved | [Disclaimer](#)'.

HIGHLIGHTS

USER EXPERIENCE

- Clean layout with clear navigation
- Tiles for direct access reduce time spent searching
- Responsive on PC, laptop, tablet, and mobile

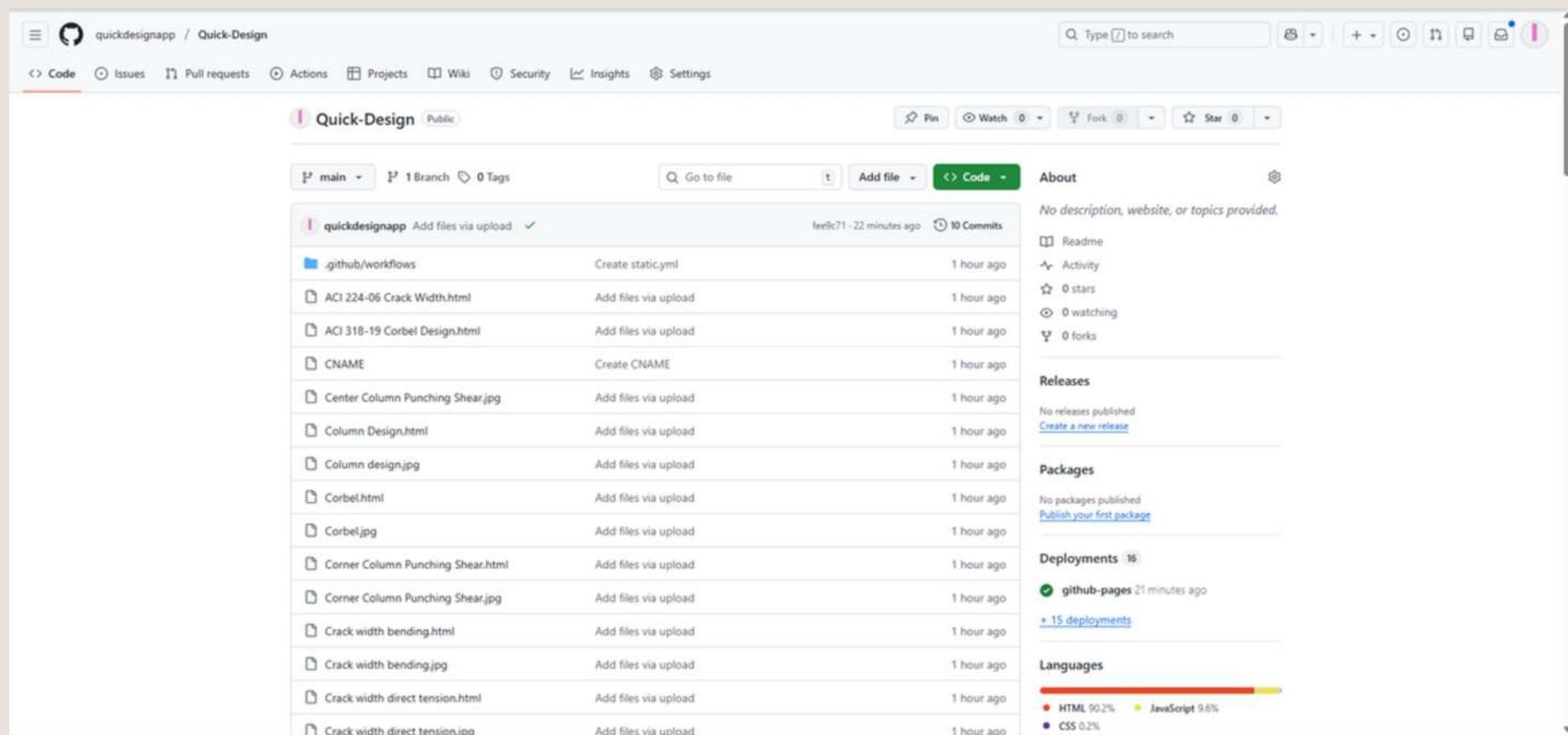


HIGHLIGHTS

TECHNOLOGY USED

- **Frontend:** HTML, CSS, JavaScript
 - **Hosting:** GitHub Pages
 - **Domain:** Namecheap
 - **Additional:** Some frameworks and libraries

```
<!DOCTYPE HTML>
<!--
    Quick Design
-->
<html>
    <head>
        <title>Quick design</title>
        <meta charset="utf-8" />
        <meta name="viewport" content="width=device-width, initial-scale=1, user-scalable=no" />
        <link rel="stylesheet" href="main.css" />
        <noscript><link rel="stylesheet" href="noscript.css" /></noscript>
        <link rel="icon" href="/favicon.ico" type="image/x-icon" />
        <link rel="manifest" href="manifest.json" />
        <style>
            #header .inner {
                display: flex;
                justify-content: space-between;
                align-items: center; /* Vertically center all items */
                gap: 32px;
            }
            .left-content,
            .right-content {
                flex: 0 0 auto; /* shrink to fit logo size */
            }
            .center-content {
                flex: 1; /* take up all leftover space */
                display: flex;
                justify-content: center; /* keep search input centered in its area */
            }
        </style>
    </head>
    <body>
        <div id="header">
            <div class="inner">
                <div class="left-content">
                    <img alt="Logo" data-bbox="108 167 150 200" />
                </div>
                <div class="center-content">
                    <input type="text" data-bbox="108 200 300 230" />
                </div>
                <div class="right-content">
                    <button data-bbox="108 230 150 260" type="button">Search</button>
                </div>
            </div>
        </div>
        <div id="content">
            <h1>Welcome to the Quick Design Header!</h1>
            <p>This is a simple responsive header design using CSS Flexbox. It includes a logo, a search bar, and a button. The search bar is centered within its container, and the entire header is vertically centered on the page.</p>
        </div>
    </body>
</html>
```





A photograph of a city skyline at sunset, featuring numerous skyscrapers and a prominent tower with "meBank" branding. A large, semi-transparent white triangle is overlaid on the left side of the image. To its right, a dark gray rectangular area contains the words "THANK YOU" in large, bold, white capital letters. In the bottom right corner of the dark area, the year "2026" is printed in a smaller white font.

THANK YOU

2026