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About

This case study manual was born from the desire to make type design more accessible, especially for those just starting out. More than presenting fixed rules or rigid formulas, it proposes a thoughtful, analytical, and grounded approach to the construction of letterforms. Throughout its pages, readers are guided through essential concepts in type design and encouraged to develop a critical mindset when approaching form.

The foundation of the project is a case study focused on the design of a sans serif typeface, created specifically for this purpose. It explores construction strategies, shape relationships, optical compensations, and formal decisions as they apply in practice. The choice of a sans serif style allows the structural logic to be observed more clearly, minimizing stylistic distractions and highlighting core design principles. The content is structured to be both visual and pedagogical, striking a balance between explanation and observation.

By relying on a single typeface, the manual maintains visual coherence while offering a consistent analytical framework. This uniformity supports comparative observation, enabling readers to focus on subtle structural nuances and recurring patterns across different letters.

This work is primarily intended as a support tool for type design education, helping beginners students grasp essential principles such as letterform construction, proportion, spacing, contrast, and optical adjustments. These fundamentals provide a starting point for designing and making informed decisions. At the same time, the manual offers a foundation for the development of more advanced technical and methodological knowledge in the field.

Each section is accompanied by explanatory captions, technical notes, and opportunities for practical experimentation. The purpose is not to encourage copying, but to foster formal awareness and critical observation. Type design is a system of interdependent parts: solving one letter inevitably affects the others. Seeing how these relationships are handled within a single typeface helps illustrate how consistency and exploratory direction can be built into any project.

The content is divided into two main sections:

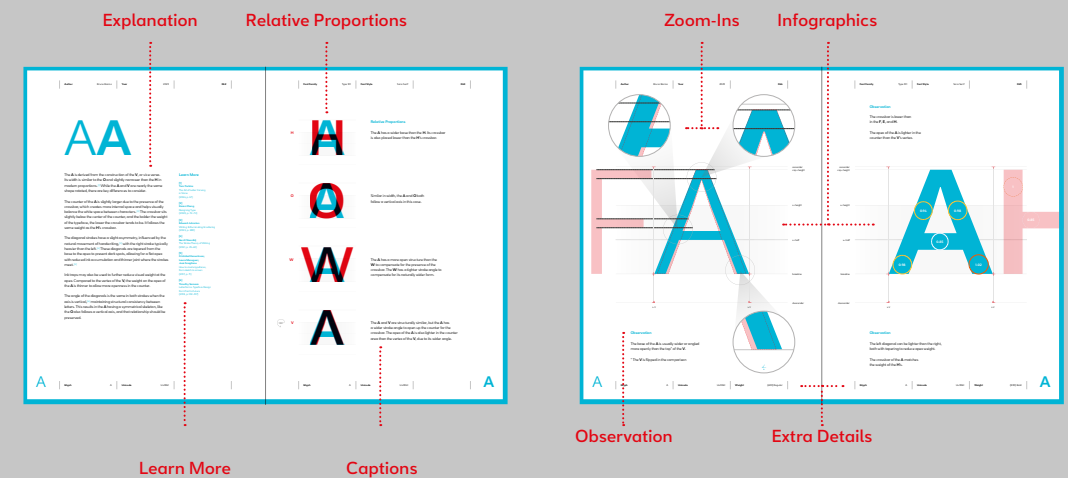
Technical Guides

This first section presents explanations and illustrations of foundational topics such as anatomy, optical compensation, shape classification, genealogical relationships between forms, and spacing. The aim is to build both a visual and conceptual vocabulary that helps readers critically analyze, compare, and design coherent and intentional letterforms.



Character-by-character Analysis

The second section focuses on each Roman letter individually, offering technical commentary, formal comparisons within the same typeface family, and visual diagrams that highlight key construction strategies. Through these entries, readers are encouraged to observe carefully and to understand the logic behind each design decision.



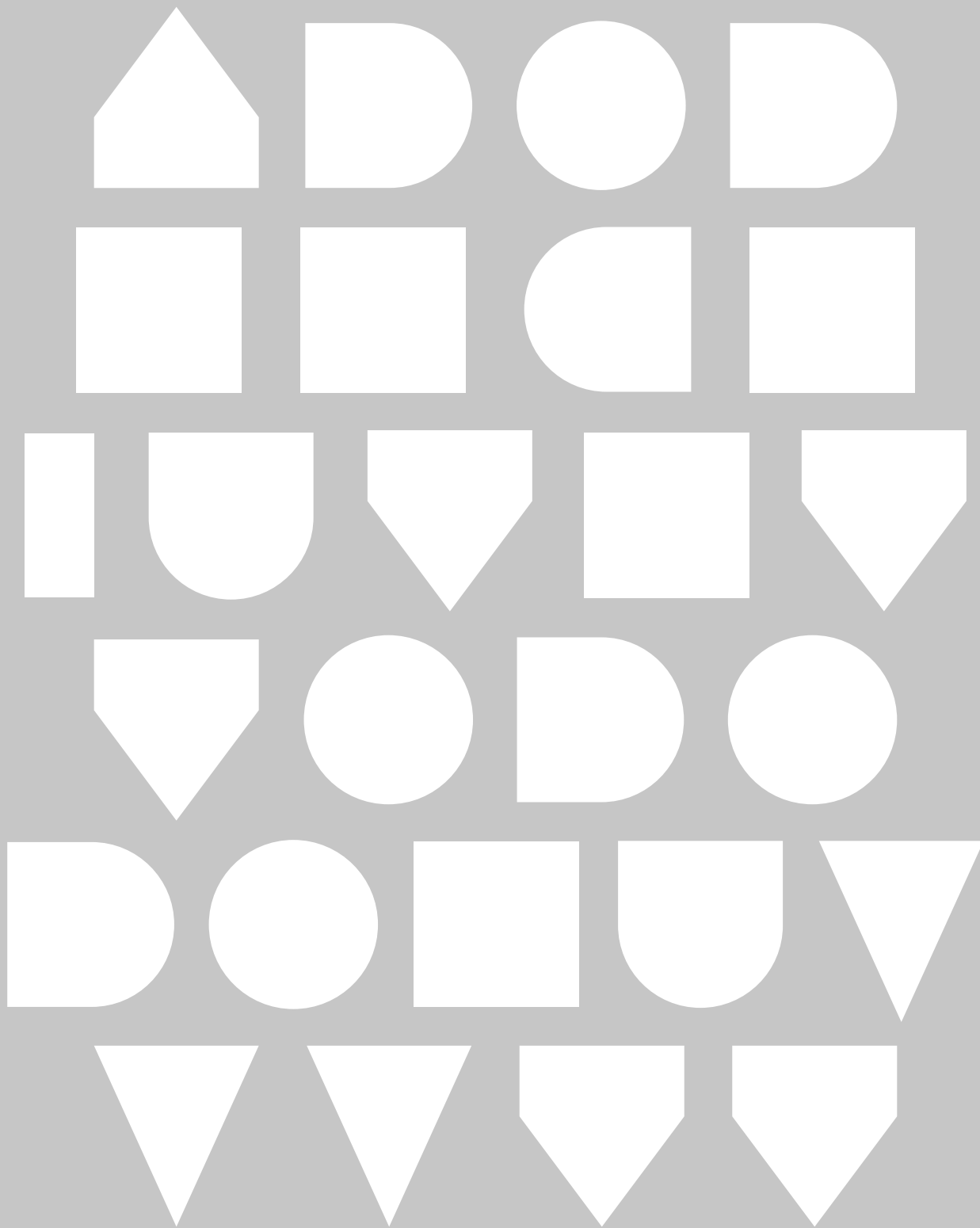
BB

Technical Guides

Before diving into individual letterforms, it's essential to establish the foundational principles that structure type design. This section introduces core elements such as construction guidelines, anatomy, optical alignment, shape groupings, genealogical relationships, sidebearings, and word spacing.

These topics offer more than just terminology, they provide the visual logic behind how letters are built, balanced, and spaced. Rather than setting rigid rules, the aim is to present strategies that encourage visual analysis and critical decision-making.

Together, these tools build a base for understanding consistency and variation in type, preparing the way for the detailed, letter-by-letter explorations that follow.



Guidelines

Before starting the design of a typeface, it is essential to establish clear directions. Defining concrete objectives helps reduce subjectivity and ensures that every decision supports the functional and expressive purpose of the typeface.^[1]

Key questions should be considered early on, such as the usage context or briefing^{[2][3]}: What is the goal of the project? Who is the target audience and in what context will it be used? What type of reading will be required? Will it be applied to body text, titles, or both? Will it be reproduced in print or on screen?^[4] What tone is intended? And what typographic style is most appropriate, serif or sans serif, geometric, humanist, or grotesque?

Likewise, visual elements such as contrast, axis, terminal shape, proportions, and structural rhythm should align with the font’s intended function. Studying and observing other existing examples also helps contextualize the project and supports more informed design decisions.^[5]

In this case, the guidelines were applied through the design of a sans serif typeface for printed editorial use, aimed at students and developed with coherence and legibility in mind. The resulting typeface provides a practical foundation for exploring core principles of type construction, illustrating the concepts discussed throughout the project.

Learn More

[1]

Chris Campe;
Ulrike Rausch
Designing Fonts: An Introduction to Professional Type Design (2020, p. 22–24)

[2]

Erik van Blokland
TypeCooker (2025)
<https://typecooker.com>

[3]

Pedro Amado;
Ana Catarina Silva
SLOType (2025)
<https://typedesign.fba.up.pt/slotype/v7>

[4]

Cristóbal Henestroza;
Laura Meseguer;
José Scaglione
How to create typefaces, from sketch to screen (2017, p. 49–51)

[5]

Karen Cheng
Designing Type (2020, p. 15)

Anatomy

Letter anatomy is essential for talking about letter shapes. While there’s no universal standard, across languages and traditions some terms are widely accepted and help build a common language across the field.^[1]

Many terms are based on human anatomy, self-explanatory concepts,^[2] or have roots stretching back over 2 000 years.^[3] Recognizing this terminology helps in making design decisions, giving and receiving feedback, and identifying typographic features and styles.

Throughout this manual, some of these terms are used to guide explanations, helping to simplify direction and make abstract concepts more concrete. Anatomy ultimately serves to clarify design thinking, providing a shared language that supports clearer communication and more informed decisions.

It is also important to clearly distinguish between a font and a typeface. A typeface refers to the overall design, the artistic style and appearance of the letters, such as Helvetica, Garamond, or Times New Roman. A typeface includes all variations of weight (Light, Regular, Bold...) and style (Italic, Condensed...). A font, on the other hand, refers to a specific version of that typeface in a particular style. For example, Helvetica Bold is a font, a digital file representing one instance of the typeface.^[4]

Traditionally, the concept of a font also included the size, originating from metal type casting. In the digital world, a font is the software file you install and use on your computer (such as a .ttf or .otf file), while the typeface is the broader design system behind all fonts that share the same visual identity.^[5]

Learn More

[1]

Pedro Amado
Multilingual Typeface Anatomy Terminology (2012)
https://www.academia.edu/11939417/Multilingual_Typeface_Anatomy_Terminology

[2]

Chris Campe;
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[3]

Timothy Samara
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[4]

[5]

Karen Cheng
Designing Type (2020, p. 32–33)

x-height

The height of lowercase letters without ascenders, such as **x**. It defines the proportion of the text body.

cap-height

The height of uppercase letters, like the **H**. It sets the upper limit for capital letters.

ascender

The part of a lowercase letter that rises above the x-height, either reaching or slightly exceeding the cap-height, as in **h**, **b**, and **l**.

ascender
cap-height

x-height

x-half

baseline

descender

baseline

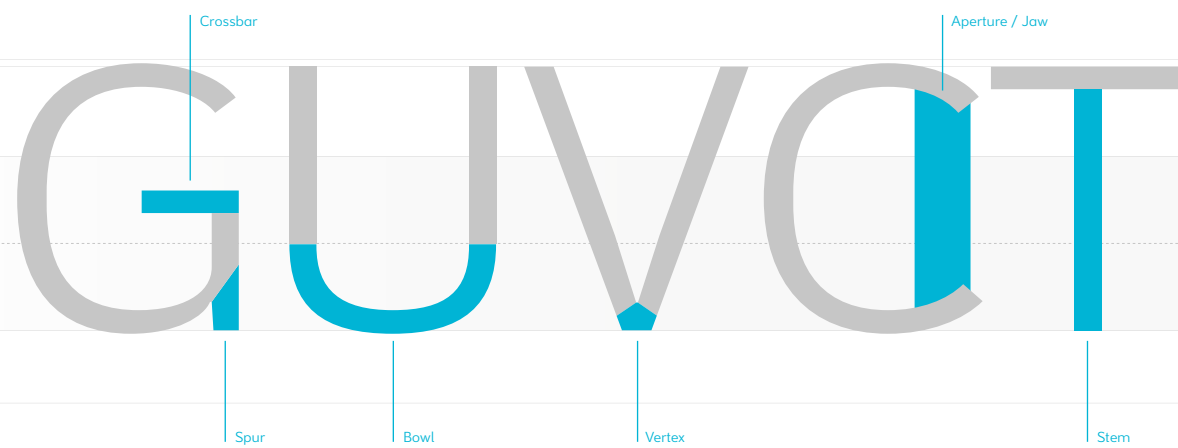
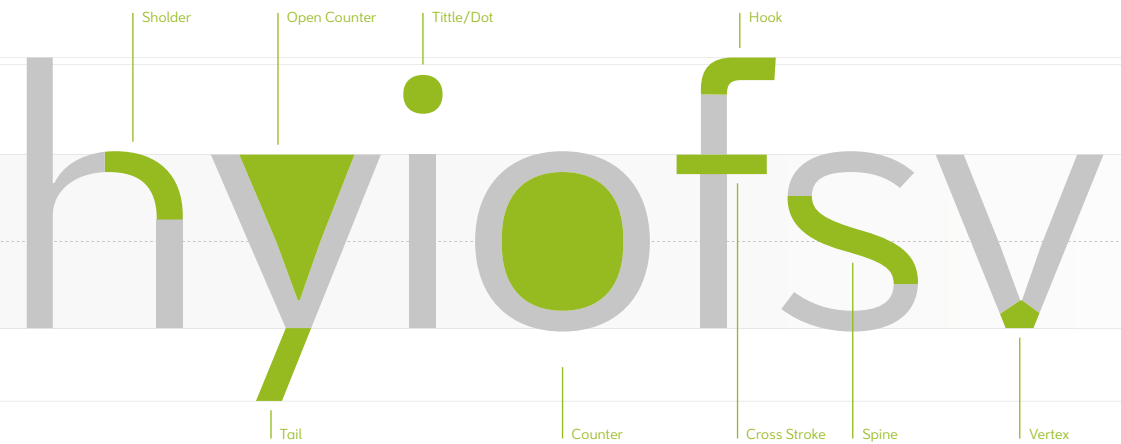
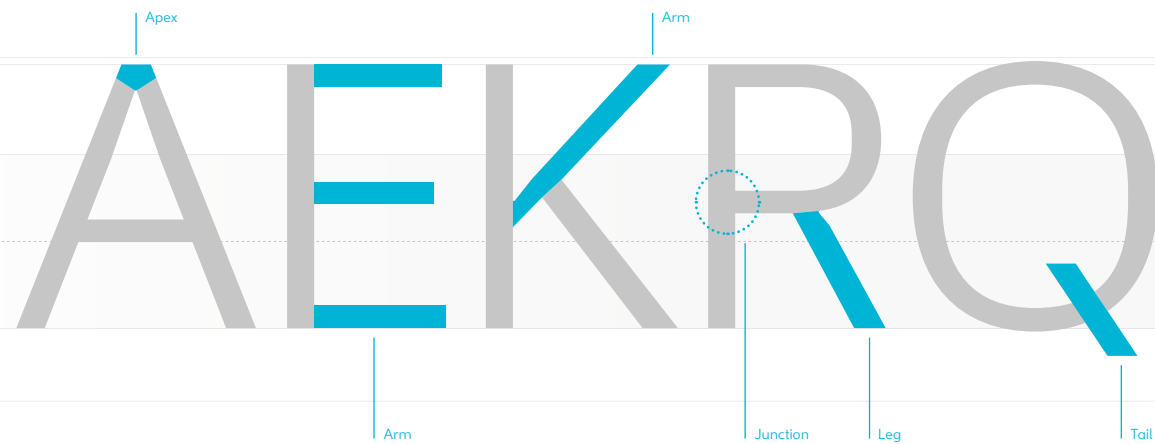
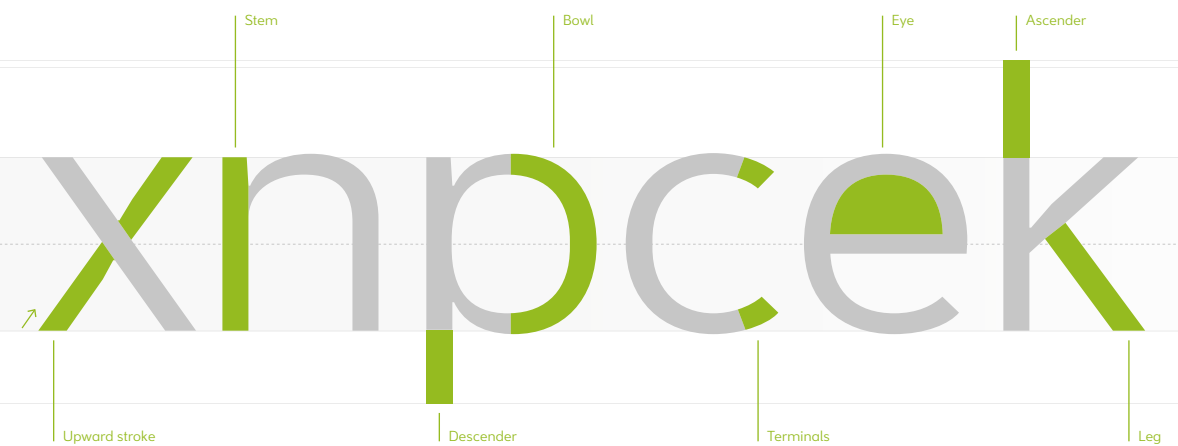
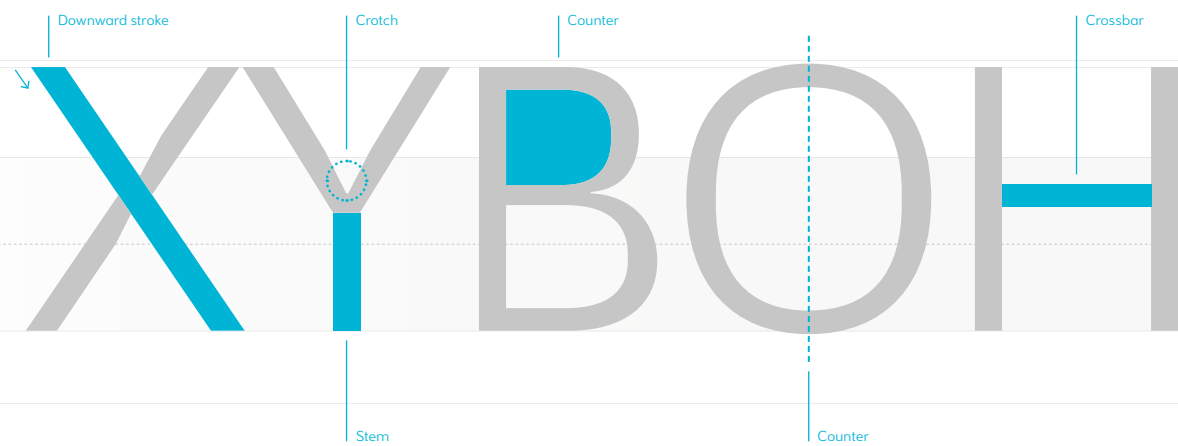
The support line on which most letters stand up upon. It serves as the starting point for measuring ascender and descender heights. Also known as the zero height point.

x-half

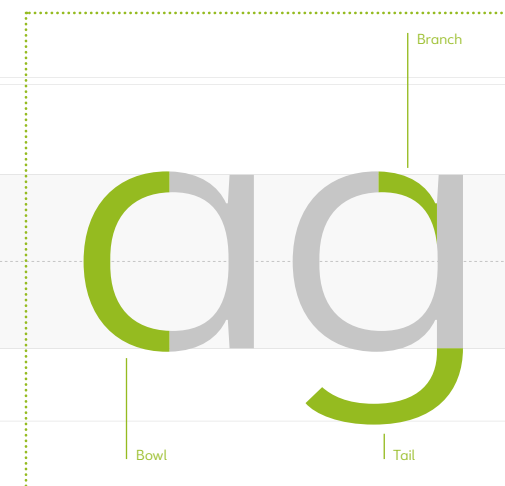
An imaginary line marking the geometric halfway point of the x-height. It serves as a visual reference to guide the positioning and proportion of internal elements.

descender

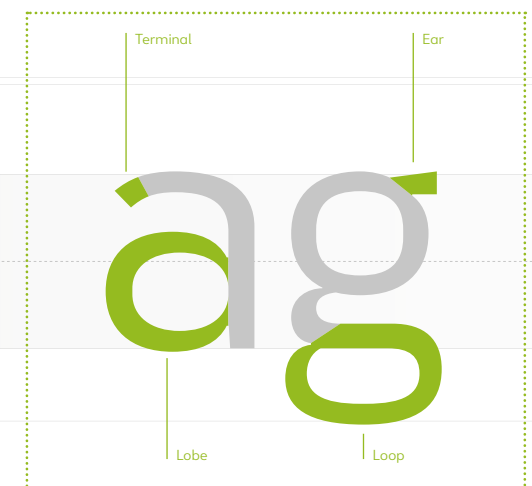
The part of a lowercase letter that falls below the baseline, as seen in **p**, **q**, and **g**. Descenders are often slightly shorter than ascenders to maintain visual balance.



Single-Storey



Double-Storey



Optical Alignment

Balancing letterforms is essential to achieve good visual harmony between characters. Certain shapes or strokes may appear shorter or smaller when aligned purely based on geometric measurements.^[1]

To correct these visual inconsistencies, optical compensations such as overshoots are used. These are slight extensions beyond alignment guides, like the baseline or cap height, and help visually align the height or position of characters.^[2] Their application should be assessed visually, as the degree of compensation depends on the form and contrast of the typeface.

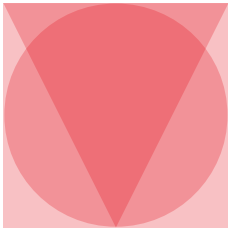
For example, in rounded letters like **O** or **o**, these adjustments are necessary because, when placed next to more squared characters like **H** or **n**, they appear smaller without overshoot. The same principle applies to characters with pointed vertices, such as some versions of **A**, **V** or **v**, where the point of contact with the baseline is minimal, affecting perceived alignment. Slightly extending the curve or vertex below the baseline creates a wider contact zone, improving alignment perception and balancing visual weight.^[3]

These compensations can be consistent across all characters or vary between uppercase^[4] and lowercase^[5]. However, it’s uncommon and generally not recommended to use different overshoot measurements within the same case group (e.g., within all the same kinds of curved or triangular uppercase letter groups). One exception includes very thin or narrow vertices, which may require an additional alignment zone.

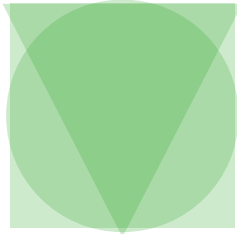
Some typefaces intentionally disregard these compensations for stylistic reasons. In such cases, the most important thing is to maintain consistency across the typeface, establishing it as a guiding rule of the design.

Learn More

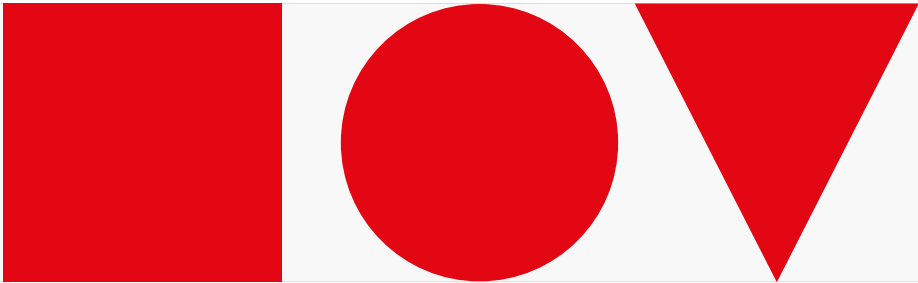
- [1]
Cristóbal Henestrosa;
Laura Meseguer;
José Scaglione
How to create typefaces,
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(2017, p. 46–48)
- [2]
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Ulrike Rausch
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- [3]
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- [4]
Microsoft
Character design standards:
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(2025)
<https://learn.microsoft.com/en-us/typography/develop/character-design-standards/uppercase>
- [5]
Microsoft
Character design standards:
Lowercase for Latin 1
(2025)
<https://learn.microsoft.com/en-us/typography/develop/character-design-standards/lowercase>



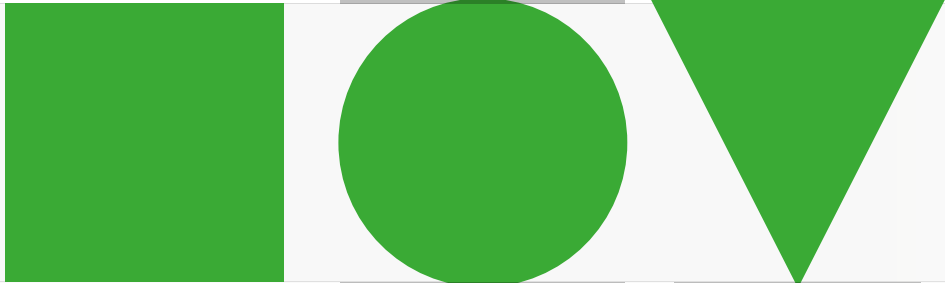
■●▼
XOV



■●▼
XOV



x-height



x-height



x-height



x-height

Shape Groups

When letters are simplified to their most basic forms, they can be organized into different groups. These groups highlight the shared relationships between base shapes, helping to clarify the design process. The goal is to identify graphic relationships that make it easier to guide the construction of letter groups.^[1]

The alphabet is built from different kinds of strokes, vertical, horizontal, diagonal, and curved. Based on these structures, letters can be grouped into three basic families: square forms like **H** and **n**, curved forms like **O** and **o**, and triangular like **V** and **v**. Together, these groups provide the essential building blocks for designing a complete alphabet, where related letters often share one or a combination of these foundational shapes.^[2]

Another way to organize these groups is by expanding them to speed up and simplify the understanding and the development of the typeface. For example, in the uppercase set, drawing an square form like **H** provides the shared structure needed to create **E**, **F**, **L**, and **T**. The circular shape, like the **O**, supports the creation of rounded letters. Meanwhile, the triangular **V** helps define the dynamics for **W** and **X**. This triangular group (**V**), combined with the square group (**H**), also lays the foundation for letters like **A**, **K**, **M**, **N**, **Y**, and **Z**, which combine square and diagonal features.^[3]

With these subdivisions in mind, it becomes easier to understand other relationships: for example, combining the rounded forms (**O**) and the square forms (**H**) help generate letters like **D**, **B**, **P**, **G** and **U**.^[4]

The letter **I** can be considered separately, serving as a reference for establishing the height and weight of stems, a measurement that, as we will see, tends to remain consistent across the entire design process.

Learn More

[1]
Chris Campe;
Ulrike Rausch
Designing Fonts: An Introduction to Professional Type Design (2020, p. 46–48)

[2]
Joep Pohlen
Letter Fountain, From Drawing to Font (2025)
<https://www.letterfountain.com/drawingtofont.html>

[3]
Stephen Moyo
Fontographer: Type by Design (1995, p. 62–68)

[4]
Timothy Samara
Letterforms: Typeface Design from Past to Future (2018, p. 50)



Genealogy

At a more structural level compared to the Shape Groups, genealogy helps maintain consistency between the strokes of different characters. Similar to the grouping approach, it proposes a way to anticipate how strokes might behave according to their direction or form.

Genealogy can provide a flexible system that guides the construction and visual direction of the typeface, rather than imposing a rigid structure^[1]. It serves as a foundation for developing coherent relationships between different parts of the alphabet, ensuring that shared shapes behave logically across characters. Certain strokes can be directly repeated, while others are adapted according to the needs of each form.^[2] The aim is not to achieve strict modularity, but rather to encourage consistency through intelligent adaptation, allowing the alphabet to feel both unified and dynamic.

In sans serif design, certain structures can be reused almost unchanged, for example, the vertical and horizontal stems, or the bowls in **b**, **d**, **p**, and **q**, depending on the axis of construction. Other elements demand more variation, yet even in these cases, a visual relationship between forms remains perceptible.^[3]

For instance, stems should generally remain visually consistent throughout the design, although minor variations and optical compensations are often necessary. These go beyond simple overshoots, as we will see in each glyph later on. Lowercase letters, for example, typically feature slightly narrower stems than uppercase letters, as their smaller counter spaces make strokes appear optically heavier. In these cases, adjustments are guided more by visual perception than by strict geometric measurement: if two shapes do not appear equal to the eye, they must be corrected accordingly to achieve visual balance.^[4]

Learn More

[1]
Stephen Moyo
Fontographer: Type by Design
(1995, p. 68–69)

[2]
Chris Campe;
Ulrike Rausch
Designing Fonts: An Introduction to Professional Type Design
(2020, p. 46–48)

[3]
Cristóbal Henestrosa;
Laura Meseguer;
José Scaglione
How to create typefaces, from sketch to screen
(2017, p. 41–48)

[4]
Timothy Samara
Letterforms: Typeface Design from Past to Future

A B C D
E F G H
I J K L M
N O P Q
R S T U V
W X Y Z

a b c d
e f g h
i j k l m
n o p q
r s t u v
w x y z

Sidebearings

Defining sidebearings means controlling the horizontal spacing on either side of the letter. Ideally, they should be adjusted progressively throughout the design process, leaving only minor refinements for the end. Spacing characters as they are developed allows for testing in context, resulting in more accurate adjustments based on real reading conditions.^[1]

Sidebearings play a key role in word legibility: if too wide, they isolate letters; if too tight, they appear visually merged, making shapes harder to recognize.

As a starting point, it's helpful to define the control characters like **H**, **O**, **V**, **n**, **o**, and **v**. Based on each letter's counter, space is distributed proportionally. In a sans serif typeface, the **H** can begin with about 20% of the counter width on each side; the **O** with around 7%; and the **V** with the minimum possible value, since it has little lateral contact. Lowercase letters follow a similar logic, but with different values, such as 25% of the counter width for **n** and 12% for **o**.^[2] Remember, these values are just a starting point, they may vary depending on the style of your typeface.

To test and refine initial spacing, combinations like **nnnooovvv**, **nnonnvnn** or **nnoonnvvnn** can help identify if any letters appear too loose or too tight, revealing visual imbalances and guiding spacing adjustments.^{[3][4]}

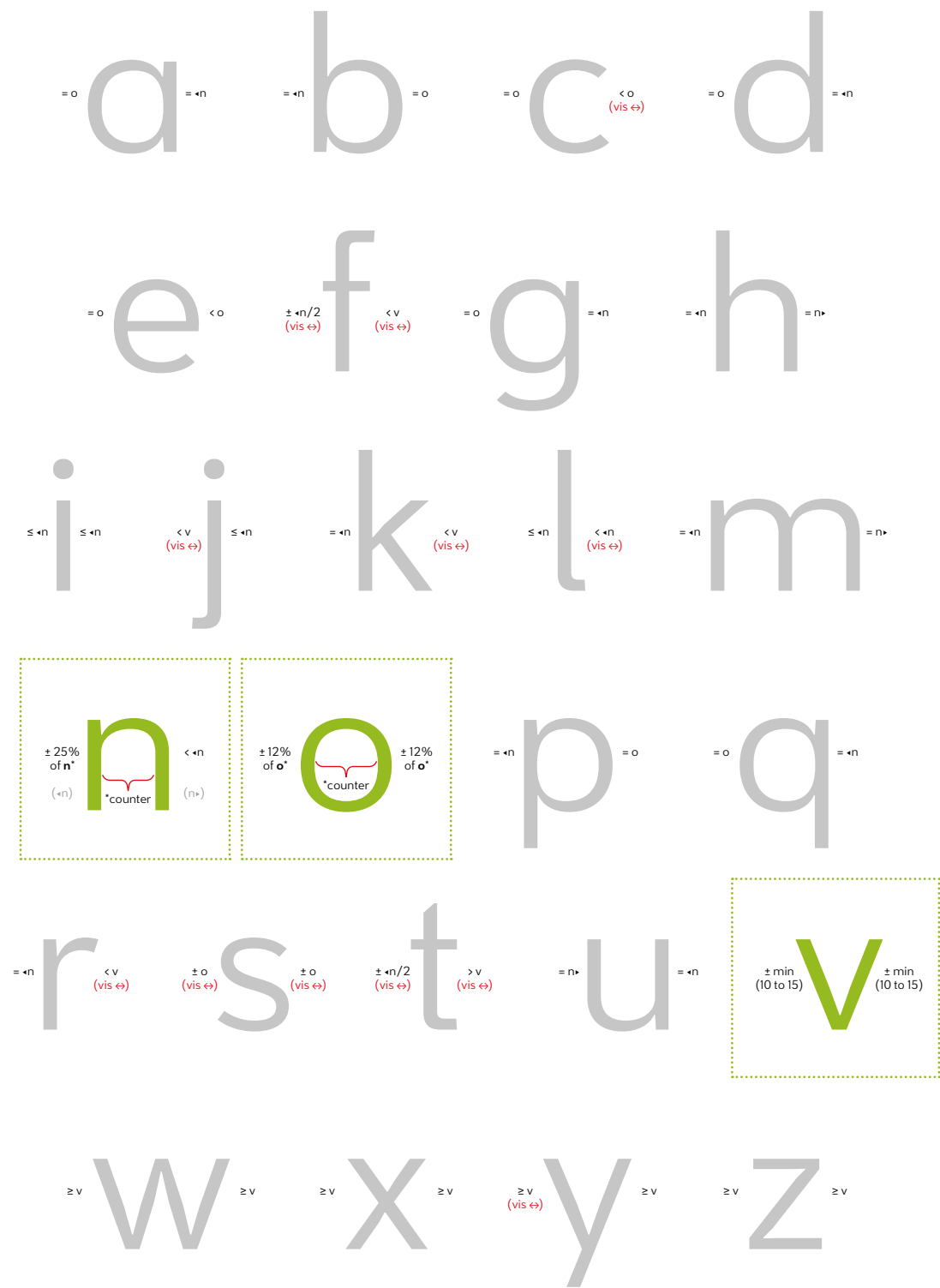
Other characters can then be visually adjusted based on these reference letters, adapting their sidebearings according to their structure and genealogy, whether wider, narrower, or similar.

Learn More

^[1]
Cristóbal Henestrosa;
Laura Meseguer;
José Scaglione
How to create typefaces,
from sketch to screen
(2017, p. 79–84)

^[2]
^[3]
Walter Tracy
Letters of Credit:
A View of Type Design
(2003, p. 70–80)

^[4]
Karen Cheng
Designing Type
(2020, p. 82–53)



Word Space

Word space is essential for perceiving words as distinct visual units. Its measurement directly affects legibility: spacing that is too tight makes it difficult to distinguish the beginning and end of words, while excessive spacing breaks the reading rhythm, making the text feel fragmented and harder to follow.

Historically, in metal type, word spacing was commonly set to an **en** space – half of an **em**. These terms refer to the width of the letters **N** and **M**,^[1] with the **em** being 100% of the type’s body size, and the **en** equal to 50%.

Nowadays, it is more common to use narrower word spaces. A consistent space across different weights can be achieved by using, in the Regular weight, more or less, the width of the lowercase **i** plus its sidebearings. Some designers prefer using the full width of the letter **o**, or start with a base value of around 240 units within the standard 1000-unit **em** square construction grid.^[2]

Opting for a unified space measurement approach benefits from natural compensation across weights: lighter styles like Light tend to have wider sidebearings, while heavier styles like Bold are typically tighter. This built-in variation helps maintain balanced word rhythm and consistent readability across all weights.

For finer control word spacing can also be adjusted using **em** units. Light styles may benefit from a space between ¼ and ⅓ **em**, Regular around ¼ **em**, and Bold slightly tighter, between ⅓ and ¼ **em**. These proportions help ensure visual harmony and consistent readability regardless of stroke weight.^[3]

These references, however, should be seen as starting point, each method may require further optical adjustments to ensure proper rhythm and balance, depending on the specific characteristics of the type design.

Learn More

- [1]

[2]

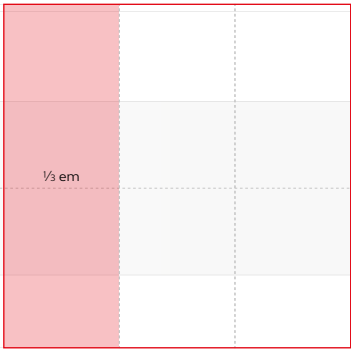
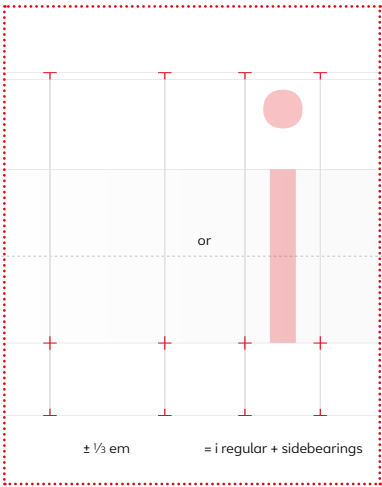
Karen Cheng
Designing Type
(2020, p. 58)
- [3]

Microsoft
Character design standards:
Space characters for Latin 1
(2025)
<https://learn.microsoft.com/en-us/typography/develop/character-design-standards/whitespace>

Light

More spacing ($\pm \frac{1}{3}$ em)
or
Regular i + Sidebearings

Word Space – Light



1 em

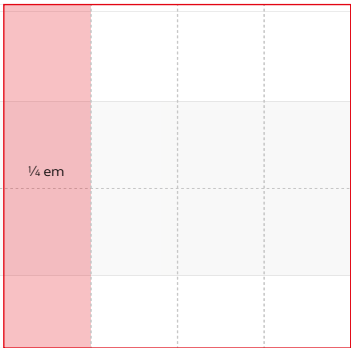
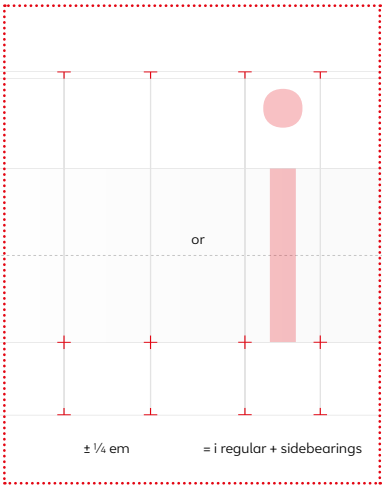
the space

word space

Regular

Balanced spacing ($\pm \frac{1}{4}$ em)
or
Regular i + Sidebearings

Word Space – Regular



1 em

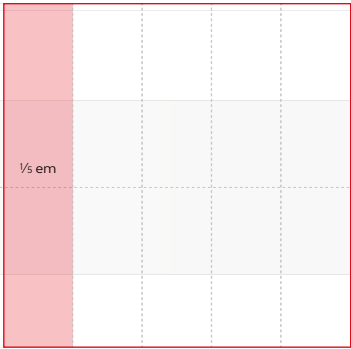
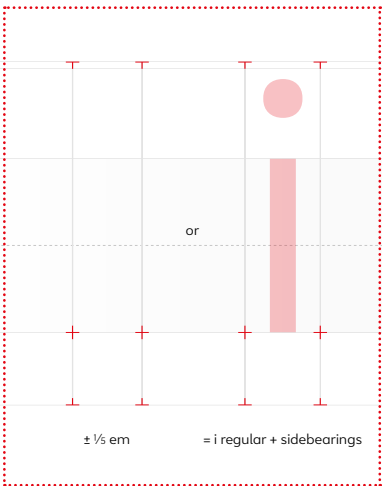
the space

word space

Bold

Tighter spacing ($\pm \frac{1}{5}$ em)
or
Regular i + Sidebearings

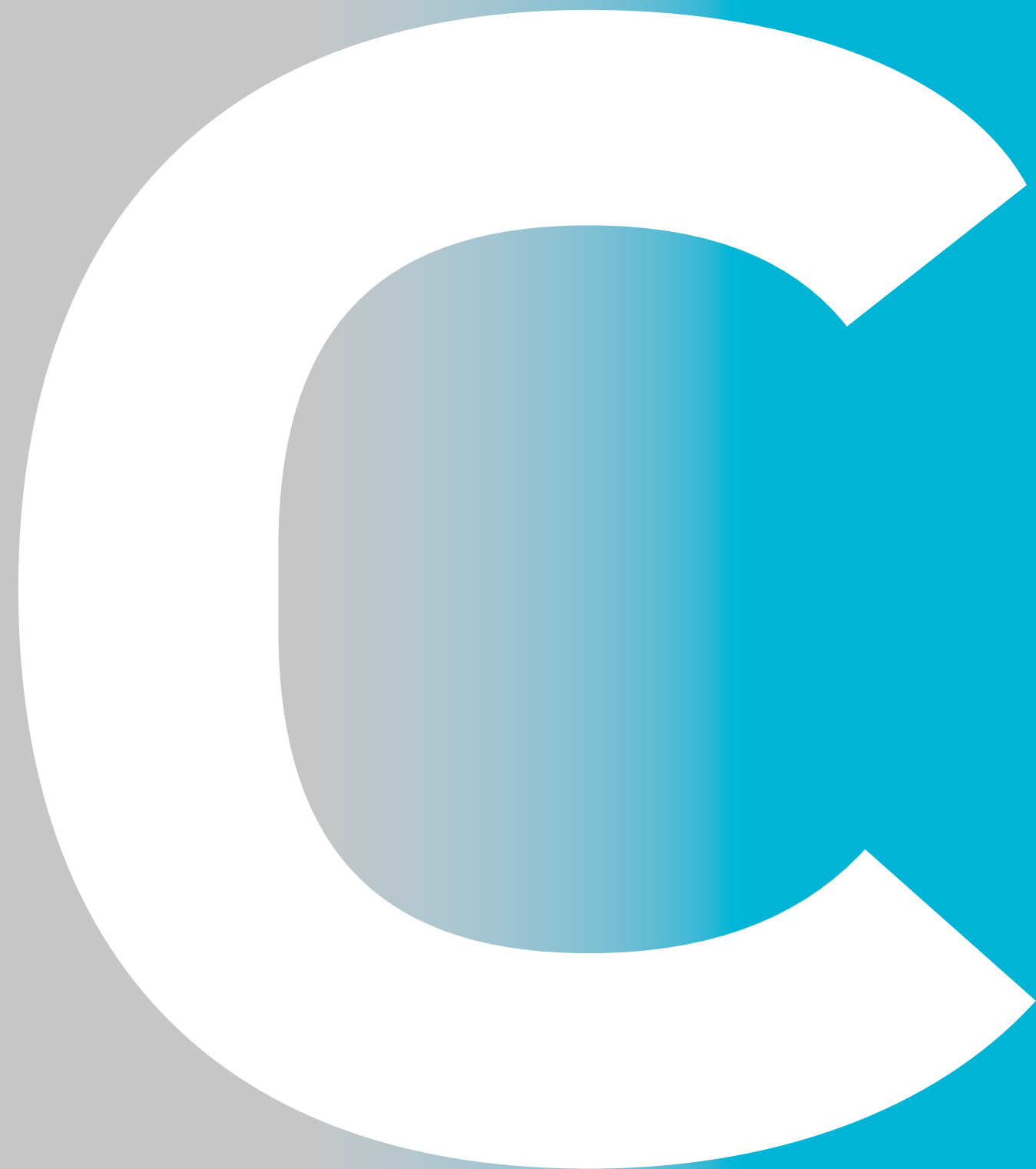
Word Space – Bold



1 em

the space

word space



A B C D E
F G H I J K
L M N O P
Q R S T U
V W X Y Z

Uppercase

The design of uppercase letters is rooted in early Roman inscriptions. In movable type systems they were physically stored in the upper case of a type drawer, a detail that gave them their name. In type design, uppercase letters form a distinct visual system, characterized by wider proportions, a mix of straight and curved structures, and relatively consistent heights.

In this section, their internal construction, proportional relationships, stroke weights, and common compensations will be analyzed. Although uppercase letters often appear simpler due to their larger and more straightforward shapes, subtle adjustments in width, angle, and optical weight are essential to achieving harmony within the set and coherence with other glyph groups.



The **A** is derived from the construction of the **V**, or vice versa. Its width is similar to the **O** and slightly narrower than the **H** in modern proportions.^[1] While the **A** and **V** are nearly the same shape rotated, there are key differences to consider.

The counter of the **A** is slightly larger due to the presence of the crossbar, which creates more internal space and helps visually balance the white space between characters.^[2] The crossbar sits slightly below the center of the counter, and the bolder the weight of the typeface, the lower the crossbar tends to be. It follows the same weight as the **H**'s crossbar.

The diagonal strokes have a slight asymmetry, influenced by the natural movement of handwriting,^[3] with the right stroke typically heavier than the left.^[4] These diagonals are tapered from the base to the apex to prevent dark spots, and often feature a flat apex with reduced ink accumulation in the eye, and a thinner joint where the strokes meet.^[5]

Ink traps may also be used to further reduce visual weight at the apex. Compared to the vertex of the **V**, the weight on the apex of the **A** is thinner to allow more openness in the counter.

When the axis is vertical, the angle of the diagonal strokes can be the same on both sides,^[6] maintaining structural consistency across letters. This results in an **A** with a symmetrical skeleton, just as the **O** also follows a vertical axis.

Learn More

- [1] Tom Perkins
The Art of Letter Carving in Stone
(2024, p. 67)
- [2] Karen Cheng
Designing Type
(2020, p. 72–73)
- [3] Edward Johnston
Writing & Illuminating & Lettering
(2023, p. 280)
- [4] Gerrit Noordzij
The Stroke Theory of Writing
(2021, p. 35–40)
- [5] Cristóbal Henestroza; Laura Meseguer; José Scaglione
How to create typefaces, from sketch to screen
(2017, p. 71)
- [6] Timothy Samara
Letterforms: Typeface Design from Past to Future
(2018, p. 102–107)

H



Relative Proportions

The **A** has a wider base than the **H**. Its crossbar is also placed lower than the **H**'s crossbar.

O



Similar in width, the **A** and **O** both follow a vertical axis in this case.

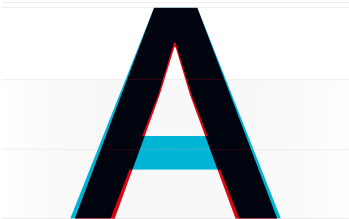
W



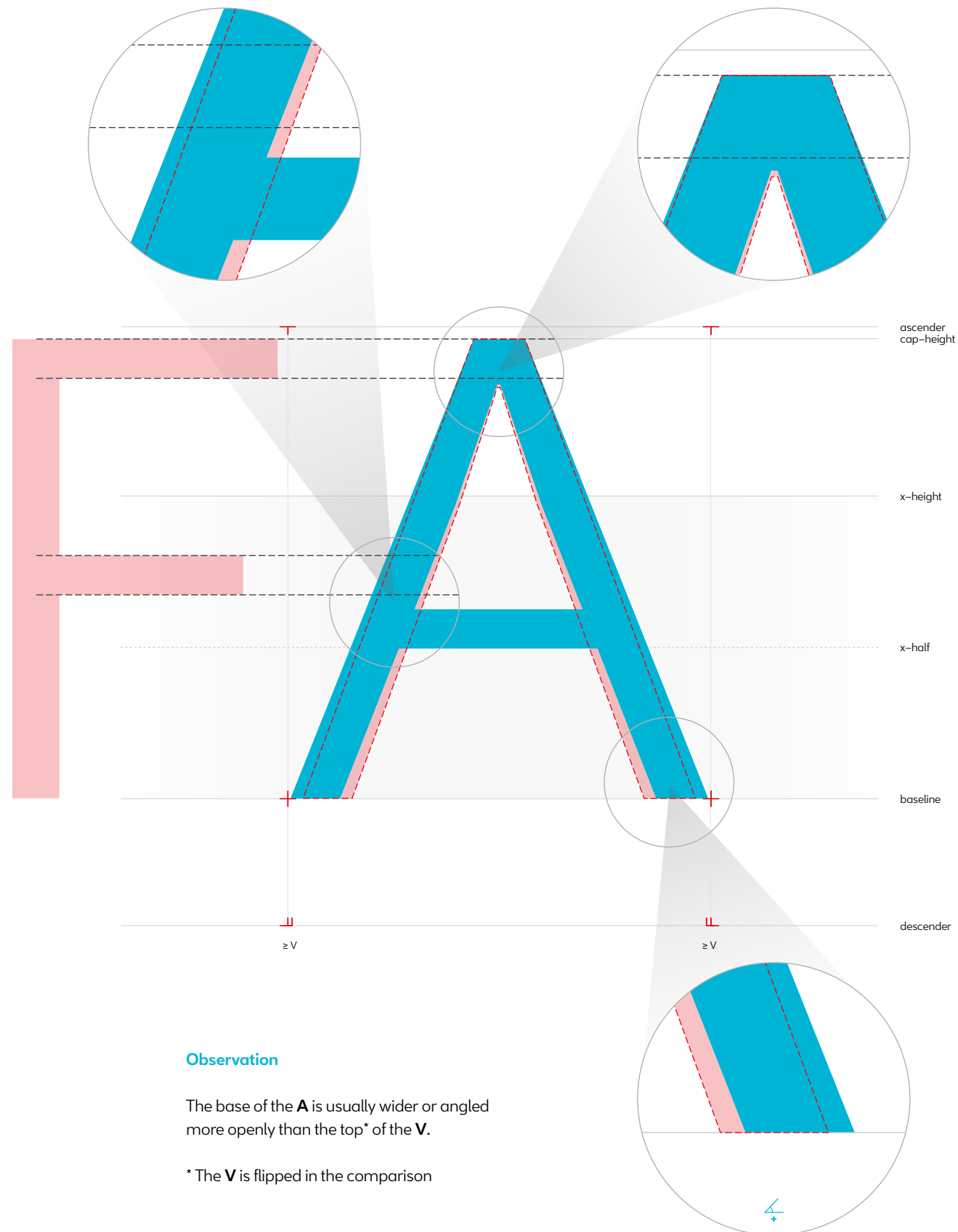
The **A** has a more open structure than the **W** to compensate for the presence of the crossbar. The **W** has a tighter stroke angle to compensate for its naturally wider form.



V



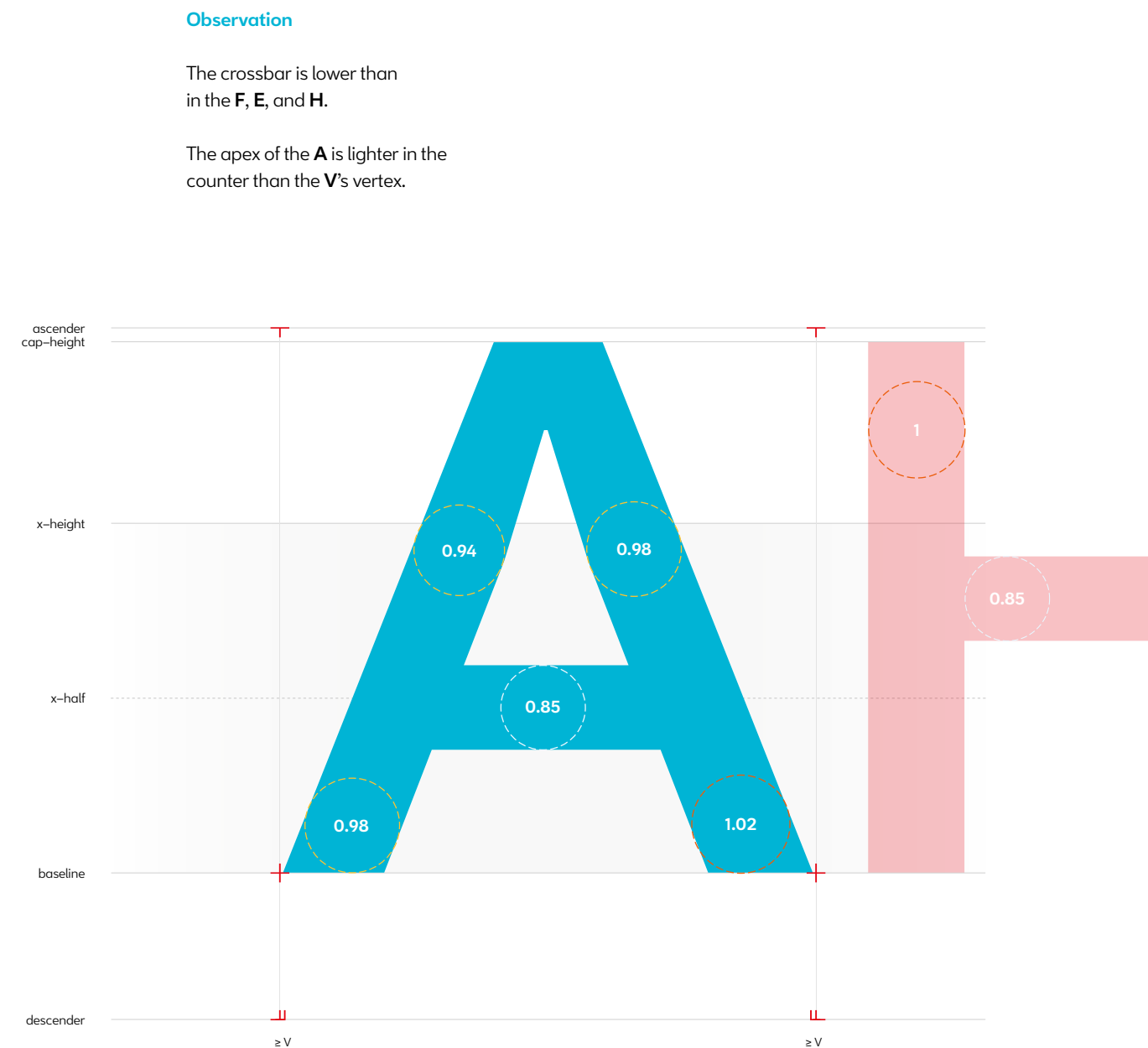
The **A** and **V** are structurally similar, but the **A** has a wider stroke angle to open up the counter for the crossbar. The apex of the **A** is also lighter in the counter area than the vertex of the **V**, due to its wider angle.



Observation

The base of the **A** is usually wider or angled more openly than the top* of the **V**.

* The **V** is flipped in the comparison



Observation

The left diagonal can be lighter than the right, both with tapering to reduce apex weight.

The crossbar of the **A** matches the weight of the **H**'s.

BB

The lower half of the **B** is larger than the upper half in both width and height. This can also be reflected in the weight, with the lower bowl being heavier than the upper one. The lower curved stroke can be drawn similarly to the stroke weight of the **O**, while the upper one slightly thinner.^[1]

The **B** follows a similar vertical division to the **E**. The weight of its middle arm can be adjusted to compensate for the connection between the two bowls. This connection may include optical adjustments, such as a tighter curve or ink traps, to improve clarity and reduce its visual impact.^[2]

It is common to see the **B** with a width similar to the **E**,^[3] but in modern type, **B** tends to be slightly wider to provide more space for the counters. Compared to the **H**, the **B** is narrower.

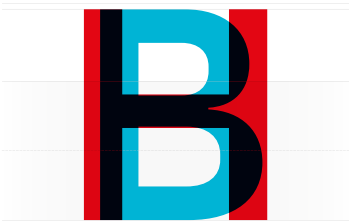
Learn More

[1]
Timothy Samara
Letterforms: Typeface Design
from Past to Future
(2018, p. 97)

[2]
Karen Cheng
Designing Type
(2020, p. 90–91)

[3]
Tom Perkins
The Art of Letter Carving
in Stone
(2024, p. 71)

H



Relative Proportions

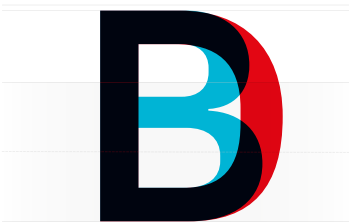
The **B** is narrower than the **H**, and its middle arm may be slightly thinner than the **H**'s crossbar.

E



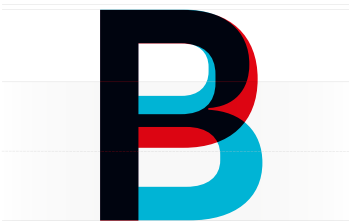
The **B** can be wider than the **E**, and its middle arm may be slightly thinner than the **E**'s.

D



The **B** can be narrower than the **D**.

P

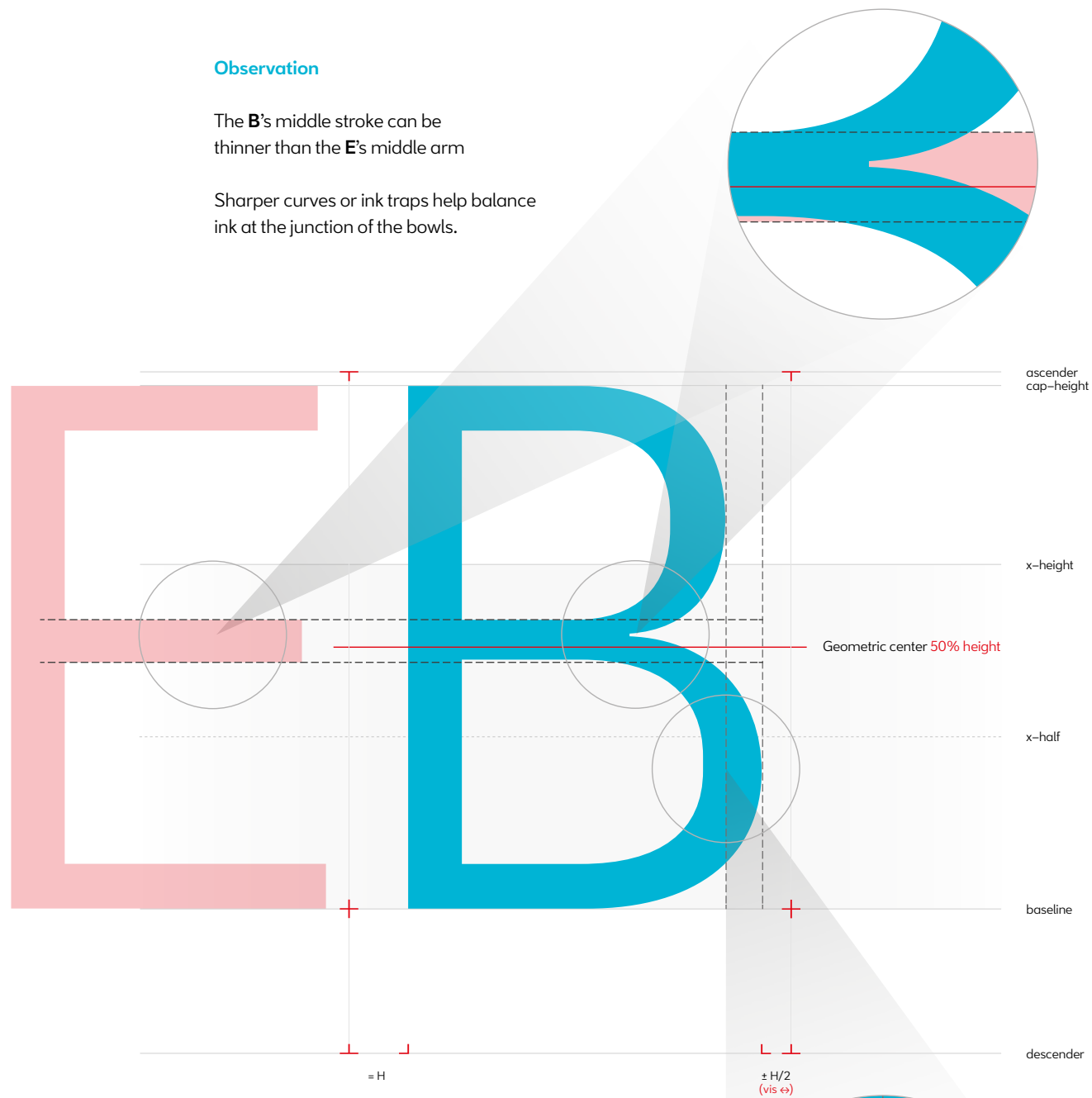


The **B** has a smaller upper bowl than the **P**. The **P**'s negative space at the base makes its bowl and counter larger and taller.

Observation

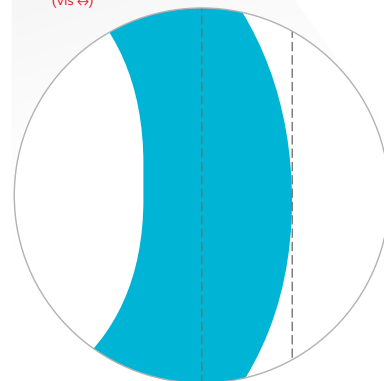
The **B**'s middle stroke can be thinner than the **E**'s middle arm

Sharper curves or ink traps help balance ink at the junction of the bowls.



Observation

The lower bowl and counter are wider than the upper.



B

Glyph

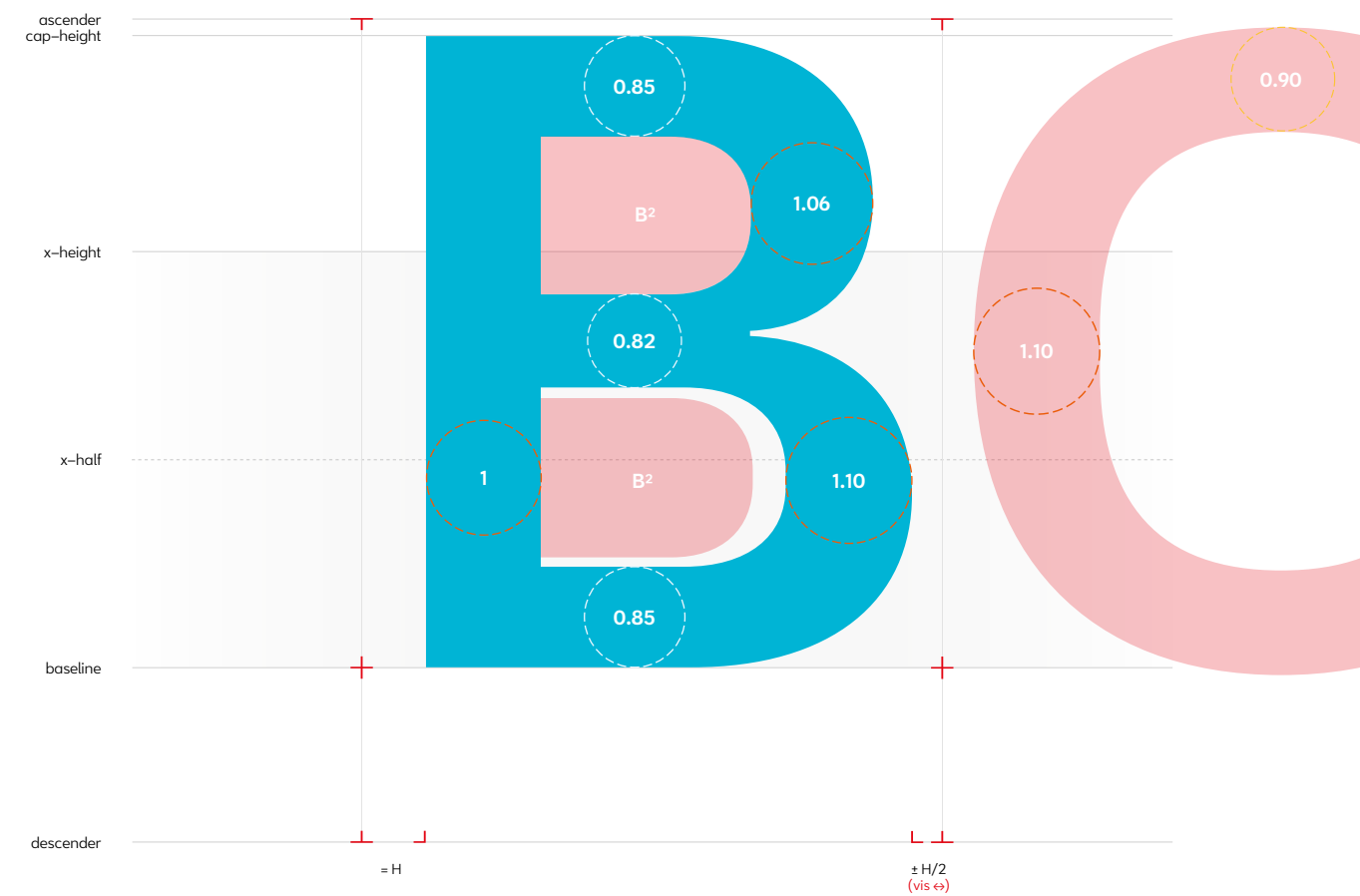
B

Unicode

U+0042

Weight

(400) Regular



Observation

The top counter has less space than the bottom.

The lower bowl has more weight than the upper one.

Glyph

B

Unicode

U+0042

Weight

(800) Bold

B

CC

The **C** is slightly narrower than the **O**. They share similar characteristics, but the **C** has an aperture on its right side.

The aperture can vary, being more open or closed. A open aperture, being more recognizable,^[1] may extend the terminals outward beyond the inner base of the **O**, while a narrower one pulls them inward into the glyph. But this ultimately depends on your design.

The terminals can also be intentionally misaligned. The lower one may extend slightly outward compared to the upper, following a similar adjustment principle as in the **E** but adapted to the open structure of the **C**.^[2] However, overdoing this can push the **C** too far forward, making it feel unbalanced and disrupting its overall flow. These subtle adjustments, depending on the typeface’s personality, help distinguish the character from its counterpart, the **O**.

Terminals can take different shapes, but they should more or less follow the same design principles as in other glyphs that feature them (such as **C, G, J, S, a, c, e, f, g, j, l, r** and **s**). They generally share a similar cut angle relative to the ductus, reinforcing the sense of cohesion within the typeface rather than appearing as isolated characters.^[3]

Learn More

[1]
Sofie Beier
Type Tricks: User Design
(2022, p. 24)

[2]
Karen Cheng
Designing Type
(2020, p. 78–79)

[3]
Timothy Samara
Letterforms: Typeface Design
from Past to Future
(2018, p. 56)

O

Relative Proportions

The **C** is narrower than the **O**, with terminals extending outward from the **O**’s drawing base.

G

The **C** is narrower than the **G**, and they share the same visual approach to the terminal.

S

The **C** and **S** share a similar visual approach to their terminals.

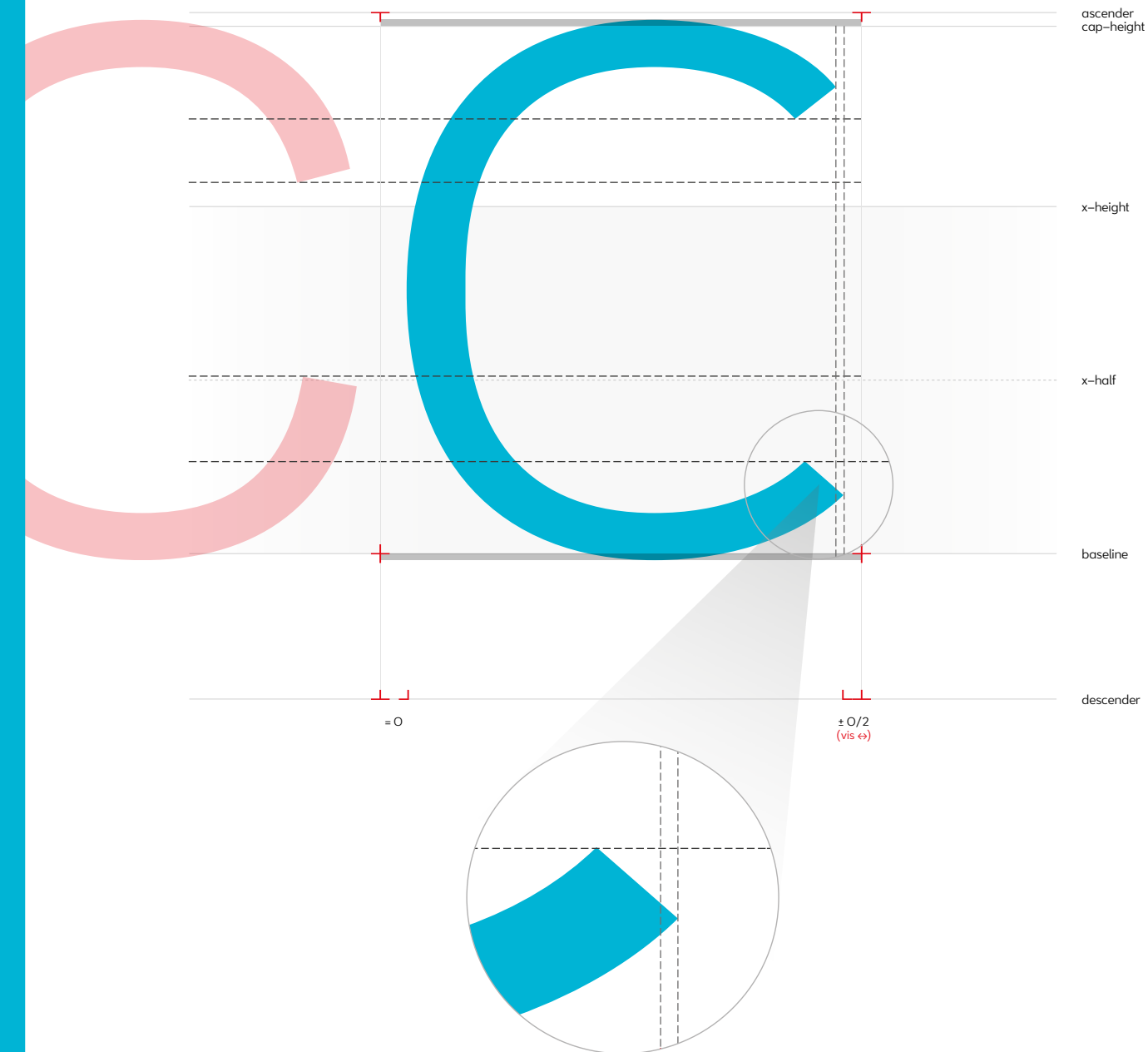
ALT

C

A closed aperture in the **C** features terminals that curve inward from the base of the **O**. It is narrower than the **O**, but its width can vary when compared to a more open **C**.

Observation

The terminal of the **C** extends slightly outward compared to the upper one.



C

Glyph

C

Unicode

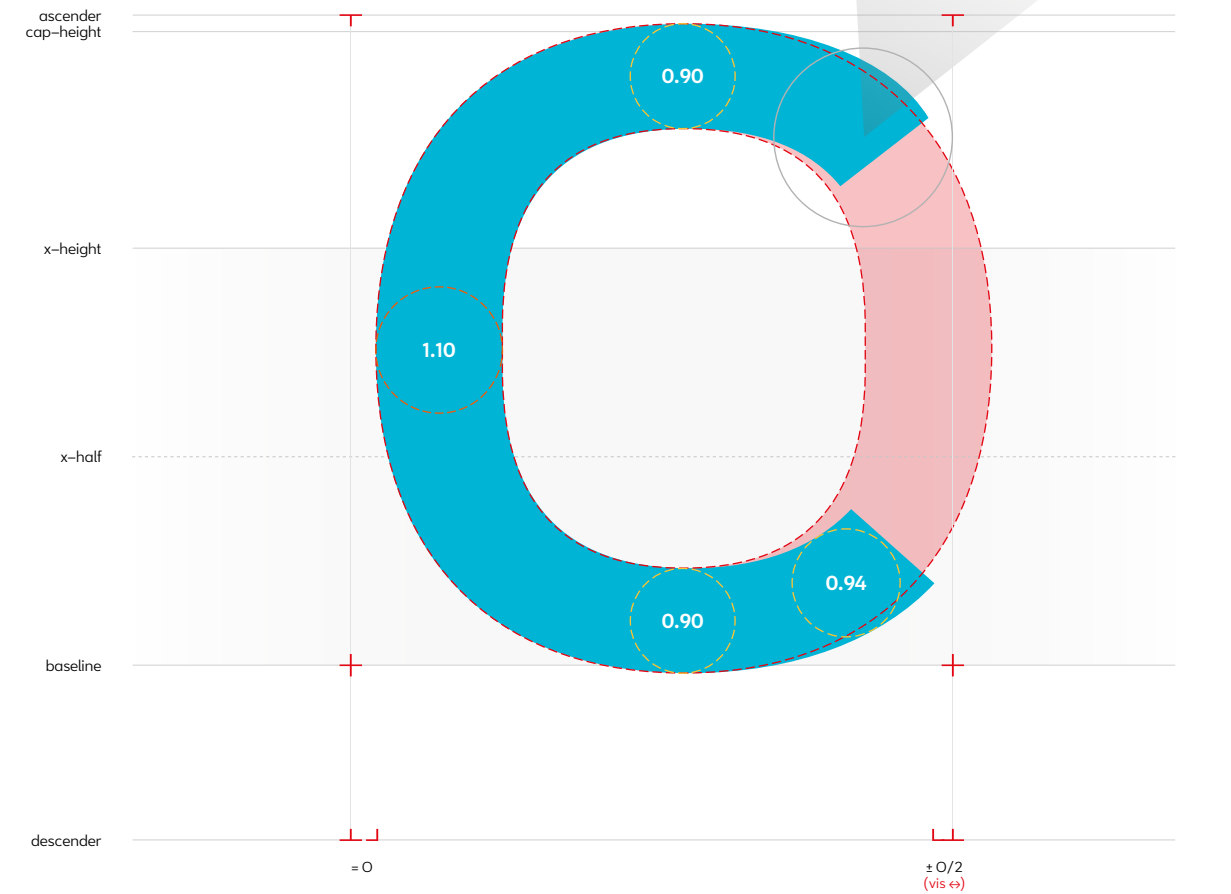
U+0043

Weight

(400) Regular

Observation

The terminal is less smooth, flaring outward before curving back in.

**Observation**

The **C** is narrower than the **O**, with its terminals projecting outward beyond the **O**'s drawing base.

Glyph

C

Unicode

U+0043

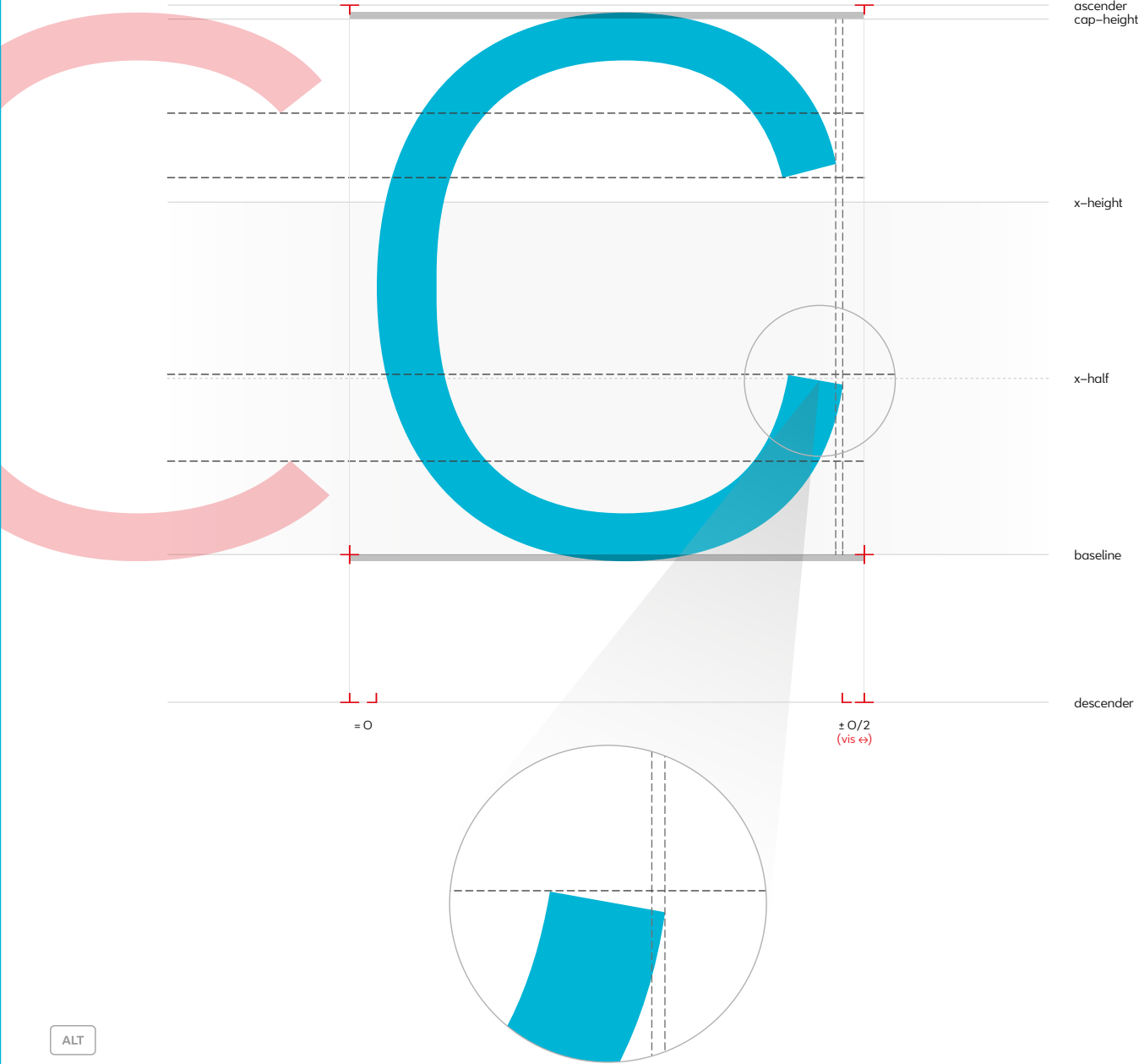
Weight

(800) Bold

C

Observation

The lower terminal of the **C** extends slightly outward compared to the upper one.



ALT

C

Glyph

C.alt

Unicode

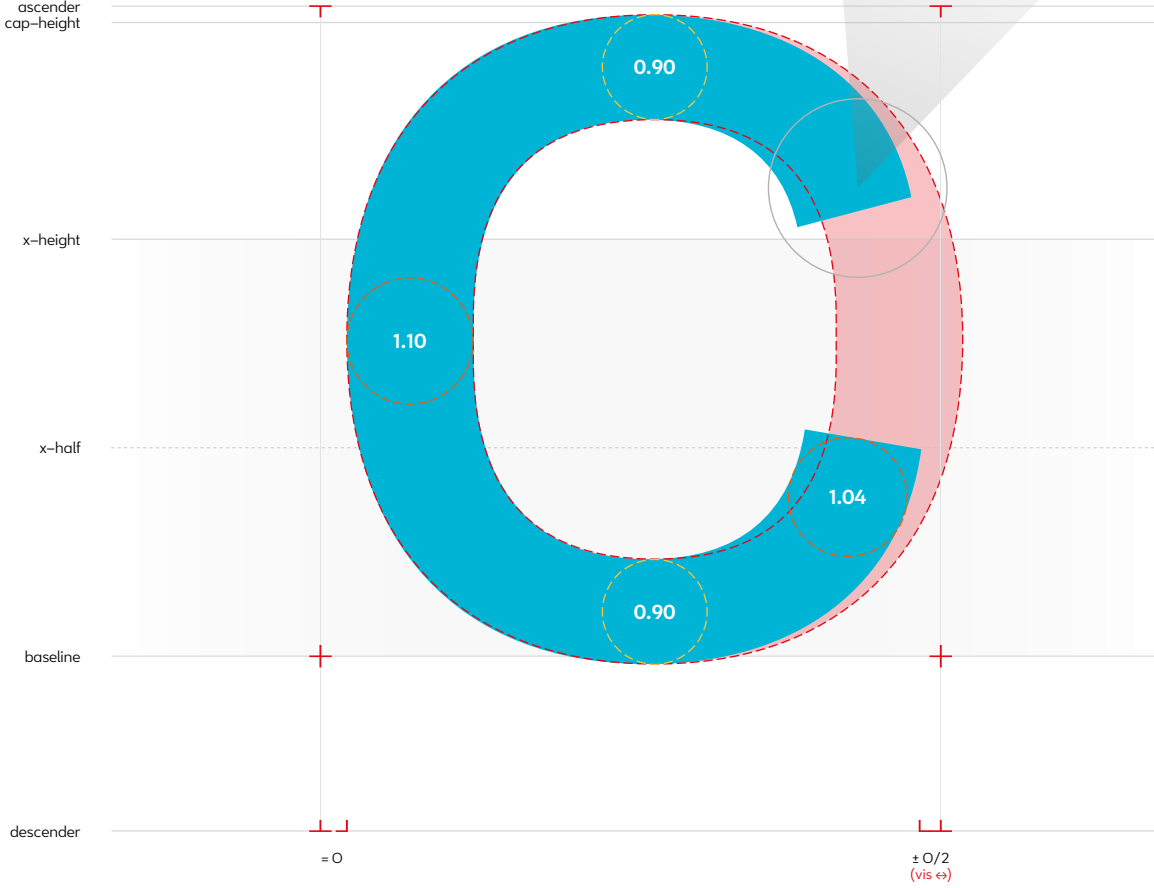
U+0043

Weight

(400) Regular

Observation

The terminal is less smooth, flaring outward before curving back in.



Observation

The **C** is narrower than the **O**, with its terminals projecting inward toward the **O**'s drawing base.

ALT

C

Glyph

C.alt

Unicode

U+0043

Weight

(800) Bold

DD

Compared to the **O**, the **D** is narrower and more squarish. Its bowl takes on this shape due to the horizontal strokes but retains the same weight as the **O** at the midpoint.^[1] Top-to-bottom balance is often achieved by reinforcing the lower curve.^[2]

Unlike the **O**, it has no overshoot, as its top and base are more flat, so no optical compensation is needed.

The **D** can be approximately the same width as the **H** or slightly wider, depending on the intended design direction. It shares the stem of the **H** and uses the crossbar weight for its horizontal strokes.^[3]

Learn More

[1]
Karen Cheng
Designing Type
(2020, p. 88–89)

[2]
[3]
Timothy Samara
Letterforms: Typeface Design
from Past to Future
(2018, p. 97, 148)

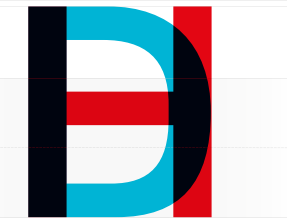
Relative Proportions

The **D** is narrower and more squarish than the **O**. It can feature a softer top curve and a stronger base to improve top-to-bottom balance.

O

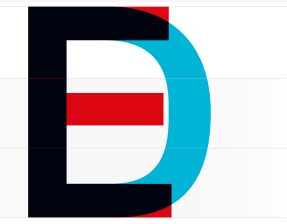


H



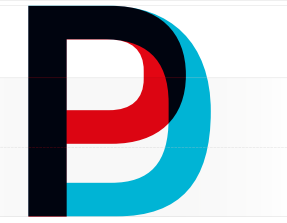
The **D** shares the stem thickness of the **H** but has a bowl like the **O**. It can be slightly wider or equal in width depending on the design.

E



The **D** is wider than the **E** due to its bowl and follows similar vertical proportions.

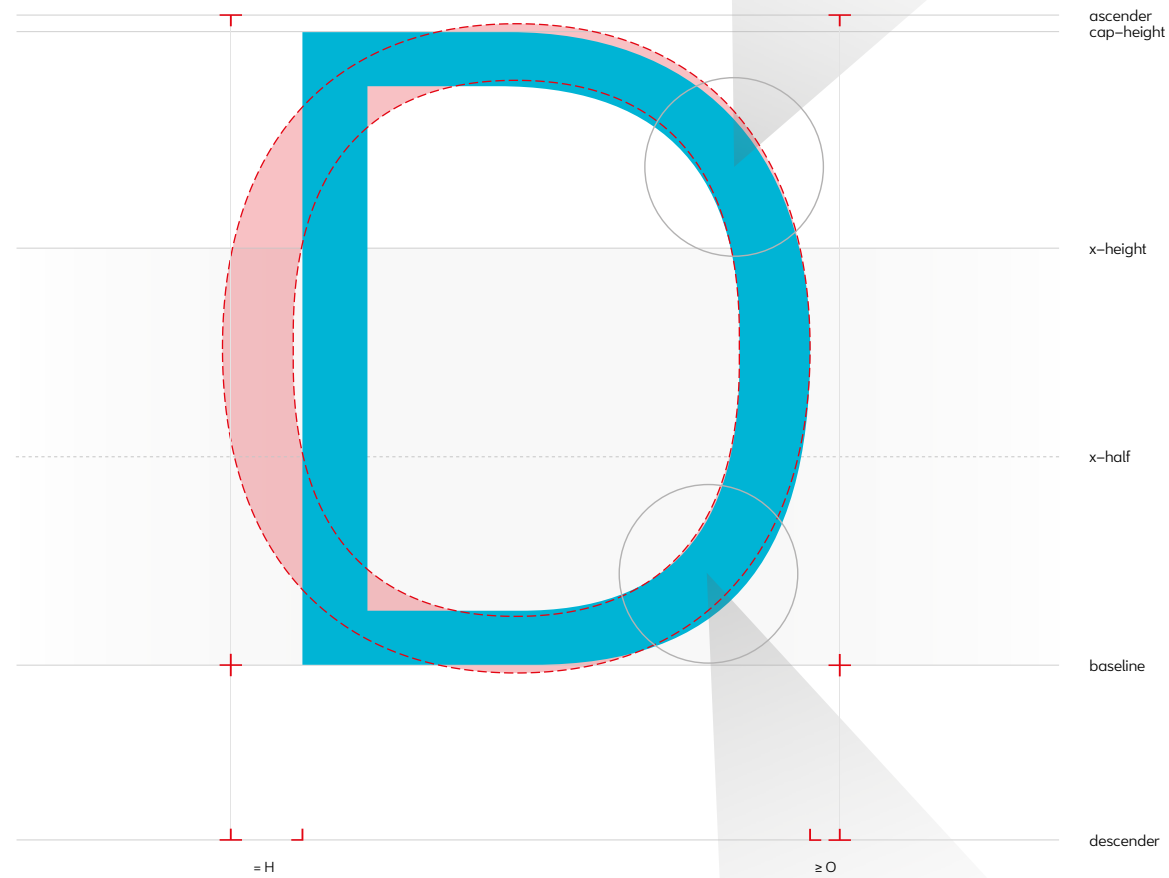
P



The **D** and **P** share a similar structure but the **P** is narrower and has bottom white space.

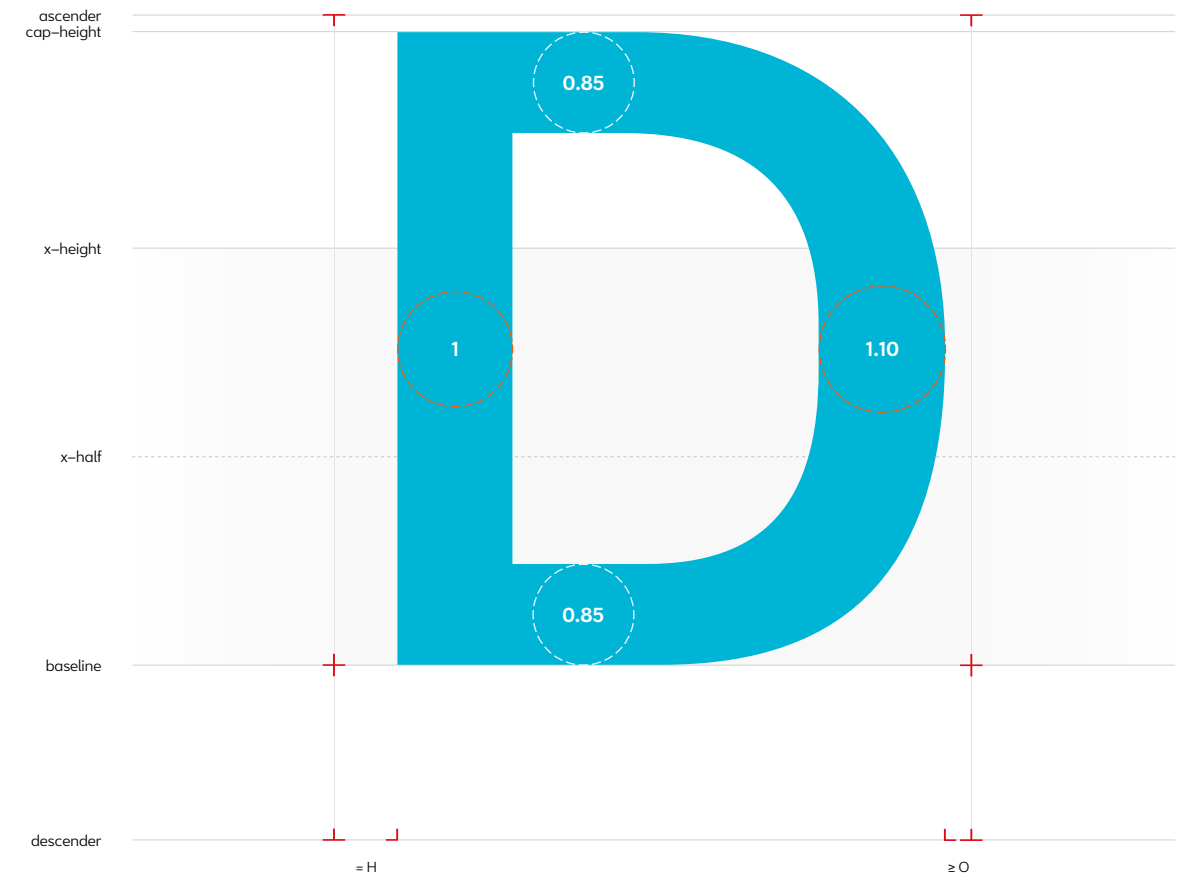
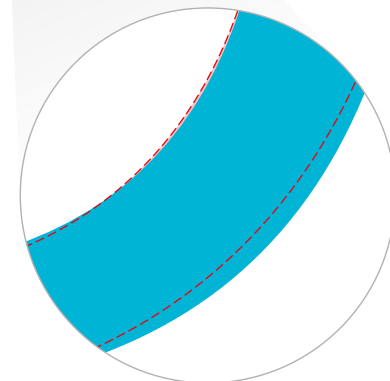
Observation

The **D** is narrower than the **O**, with a softer top curve and a squarish base for added stability.



Observation

A slightly stronger bottom curve helps balance the shape by adding stability to the base.



Observation

The **D** shares the stem weight of the **H** and uses its crossbar weight for horizontal strokes.

The bowl has the same weight as the **O** at the midpoint of the curve.

EE

The **E** shares the stem proportions of the **H** and **I**, and its arms follow the weight of the **H**'s crossbar with some adjustments.

The bottom and top arms have the same thickness as the **H**'s crossbar, while the middle arm is the thinnest. Similar adjustments can be made to their length, but the top arm is often shorter than the bottom, and the middle is the shortest. Following the order: Bottom > Top > Middle.^[1]

The middle arm is the shortest and thinnest.^[2] Its position is usually either aligned with the optical horizontal center in the **E** or share the base of the **H**'s crossbar.^[3]

The final adjustment depends on the overall width of the glyph. The terminals of the **E** should be adjusted to compensate for the lack of a right stem.^[4] Its absence makes the **E** appear visually wider, so the ends of the arms should be moved inward by approximately 1 to 1.5 stem widths.

To determine if further adjustment is needed, compare the **E** and **H** side by side (HEHE). The **E** is historically shorter than the **H**,^[5] but in modern type, they should still appear visually balanced. If the **E** looks wider, its arms need to be slightly narrower. If it appears too small in comparison, increasing its width can help compensate.

Learn More

[1]
Karen Cheng
Designing Type
(2020, p. 72–73)

[2]
Jost Hochuli
Detail in Typography: Letters,
Letterspacing, Words, Wordspacing,
Lines, Linespacing, Columns
(2015, p. 15–19)

[3]
Cristóbal Henestrosa;
Laura Meseguer;
José Scaglione
How to create typefaces,
from sketch to screen
(2017, p. 70)

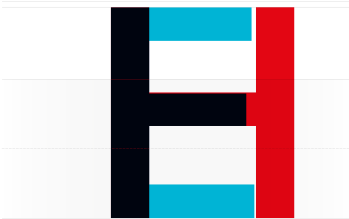
[4]
Timothy Samara
Letterforms: Typeface Design
from Past to Future
(2018, p. 98–99)

[5]
Tom Perkins
The Art of Letter Carving
in Stone
(2024, p. 82)

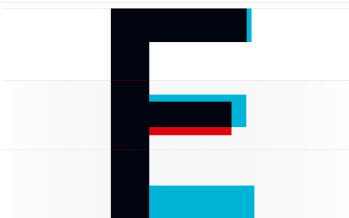
Relative Proportions

The **E** and **H** share the same stem thickness, with the **E** being slightly narrower to balance its open right side.

H

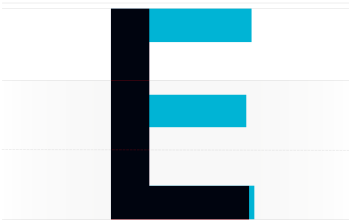


F



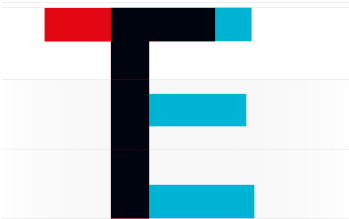
The **E** is wider than the **F**. The **F**'s middle arm is shorter and can be lower than the **E**'s to compensate for the missing bottom arm.

L



The **E** is slightly wider than the **L**.

T

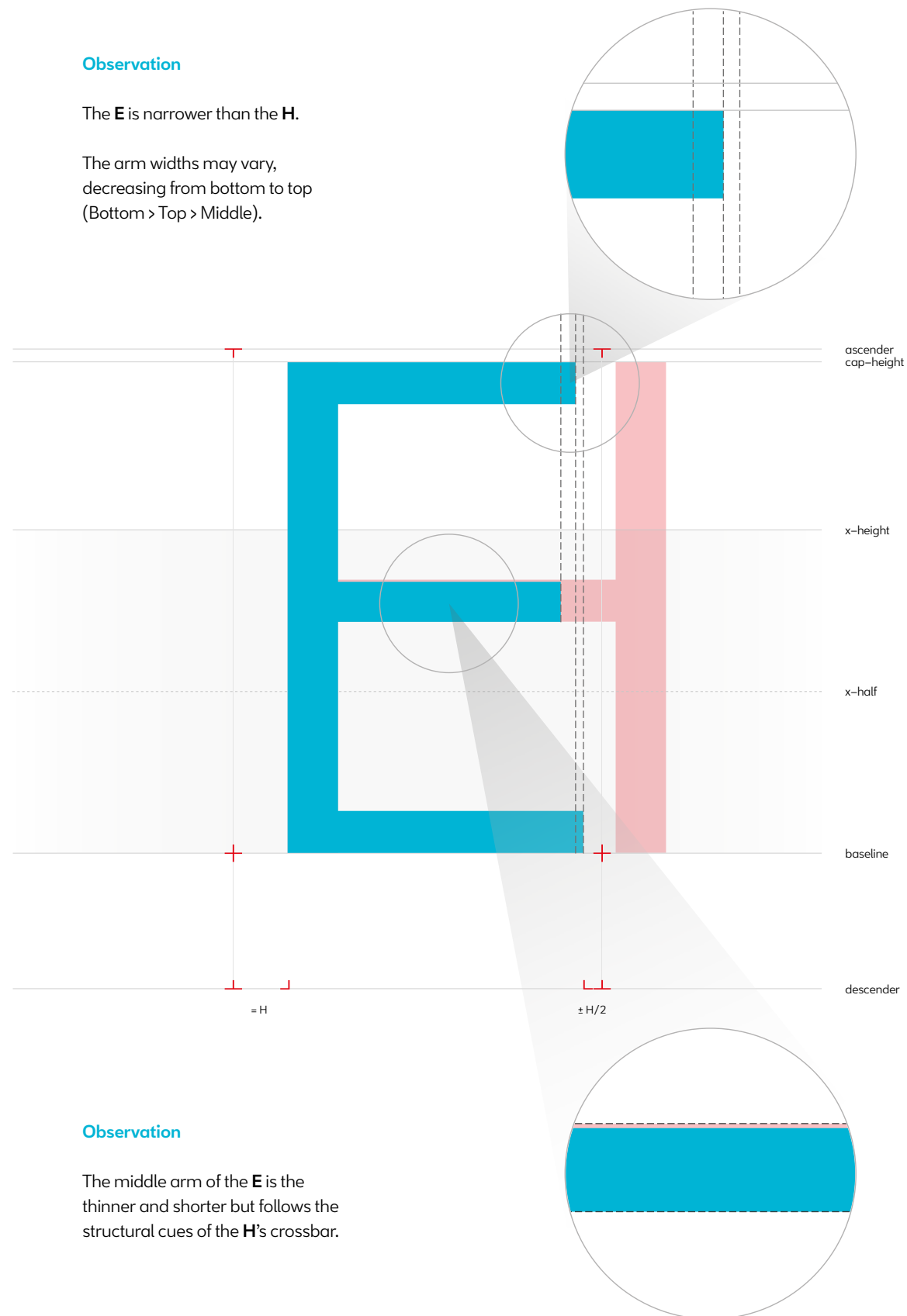


The **T** has a shorter cross stroke than the **E** and **F**'s arms to maintain balance and avoid excessive width.

Observation

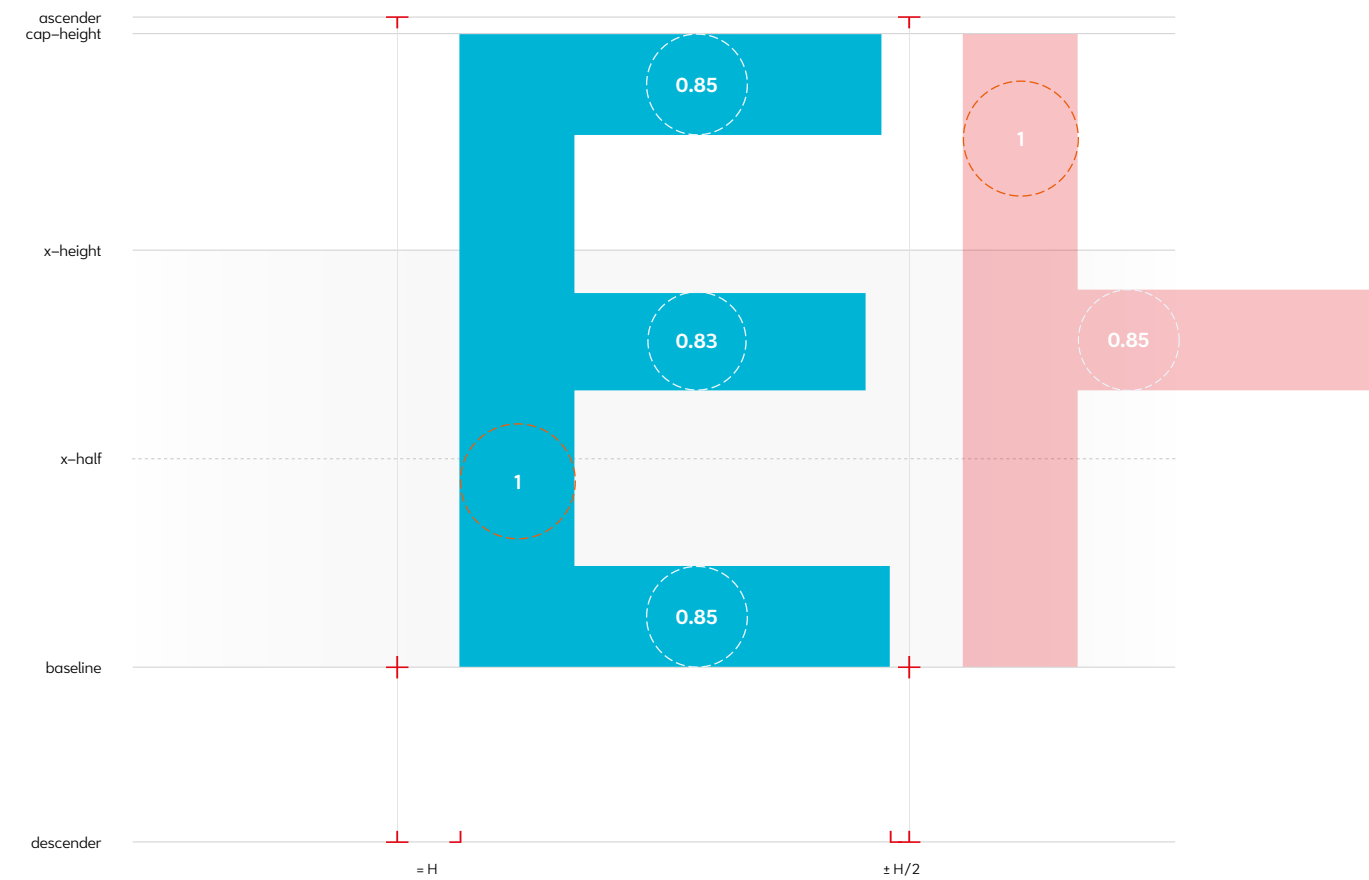
The **E** is narrower than the **H**.

The arm widths may vary,
decreasing from bottom to top
(Bottom > Top > Middle).



Observation

The middle arm of the **E** is the
thinner and shorter but follows the
structural cues of the **H**'s crossbar.



Observation

The **E** shares the stem, top and bottom
arm weight proportions of the **H**.

FF

The design of the **F** has different requirements that must be considered, simply removing the bottom arm from the **E** is not enough to create a balanced and functional **F**.

Due to the negative space created by the absence of a base, a series of optical adjustments must be made.^[1] Otherwise, the **F** may appear to be leaning to the right. We should think of glyph balance as if they were physical objects. When the base is shorter, there is a greater need to counterbalance the top.

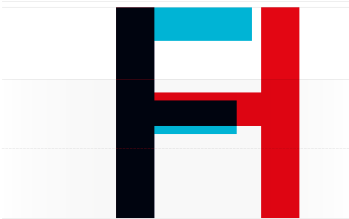
The adjustments include slightly narrowing the arms compared to the **E**. The middle arm undergoes a more significant reduction to help maintain visual balance.^[2]

Another adjustment is lowering the middle arm of the **F** below the geometric center to reinforce the base. It also shares the same weight as the **H**'s crossbar.^[3] Without a bottom arm, keeping the same weight as the **E**'s middle arm would make the **F** appear noticeably smaller.

Learn More

- [1] **Chris Campe; Ulrike Rausch**
Designing Fonts: An Introduction to Professional Type Design (2020, p. 49–53)
- [2] **Timothy Samara**
Letterforms: Typeface Design from Past to Future (2018, p. 98–99)
- [3] **Karen Cheng**
Designing Type (2020, p. 74)

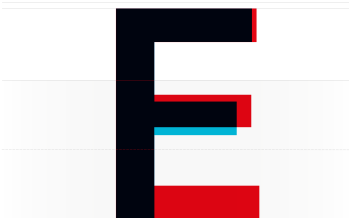
H



Relative Proportions

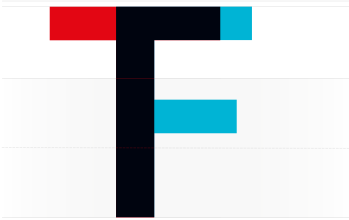
The **F** is narrower than the **H**, and its middle arm is positioned lower than the **H**'s crossbar.

E



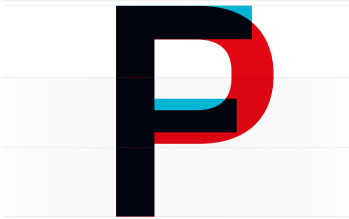
The **F** is also narrower than the **E**. Its middle arm has the greatest width reduction and is positioned lower than in the **E**, as well as compared to the **H**.

T



The **F** has more lateral space than the **T**. Since the **T** only has a cross stroke at the top, it needs to be narrower to balance the negative space at the base.

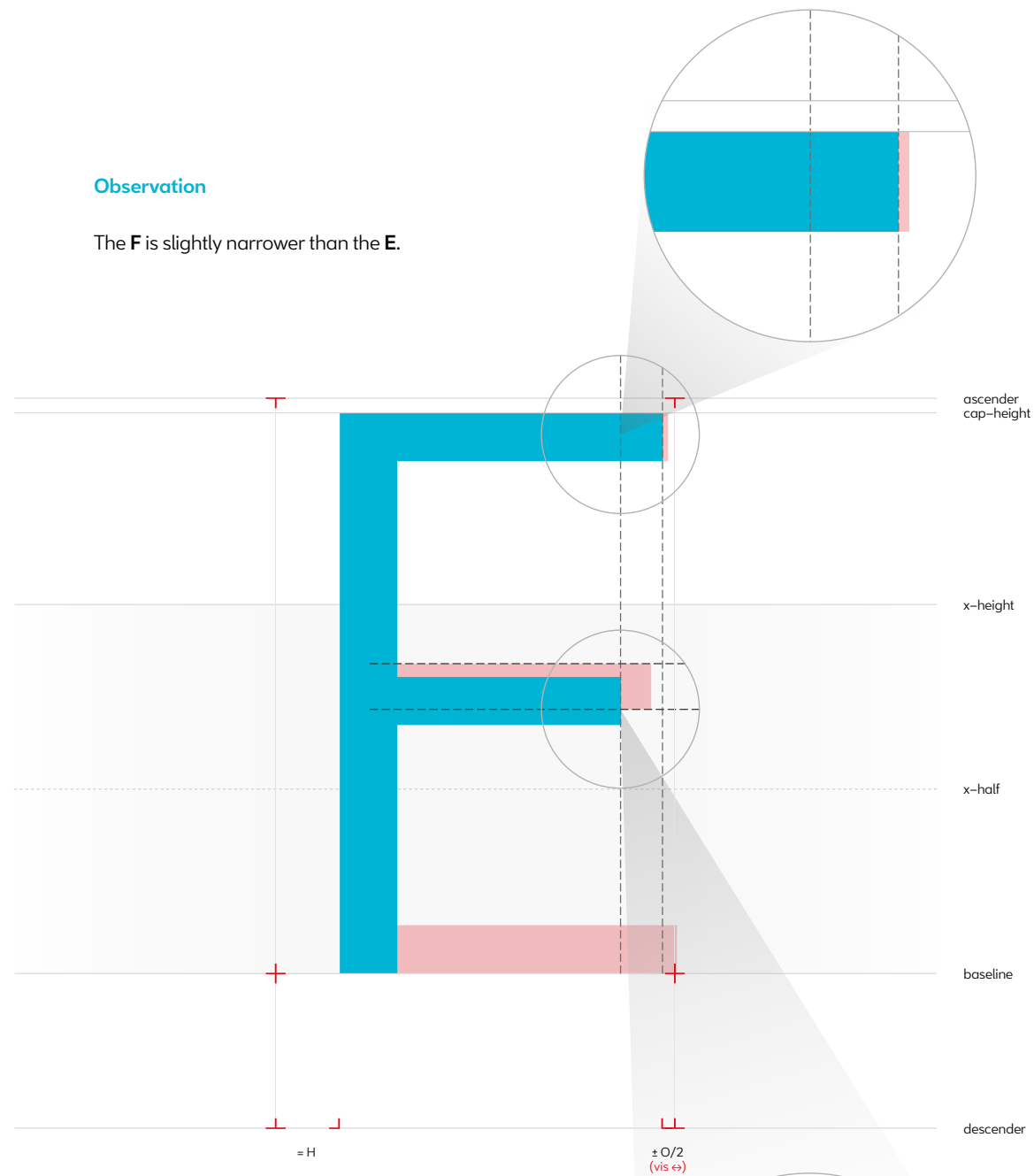
P



The **F** is narrower than the **P**. The **P**, having a bowl in its structure, requires more air in its counter, which makes it expand both outward and downward.

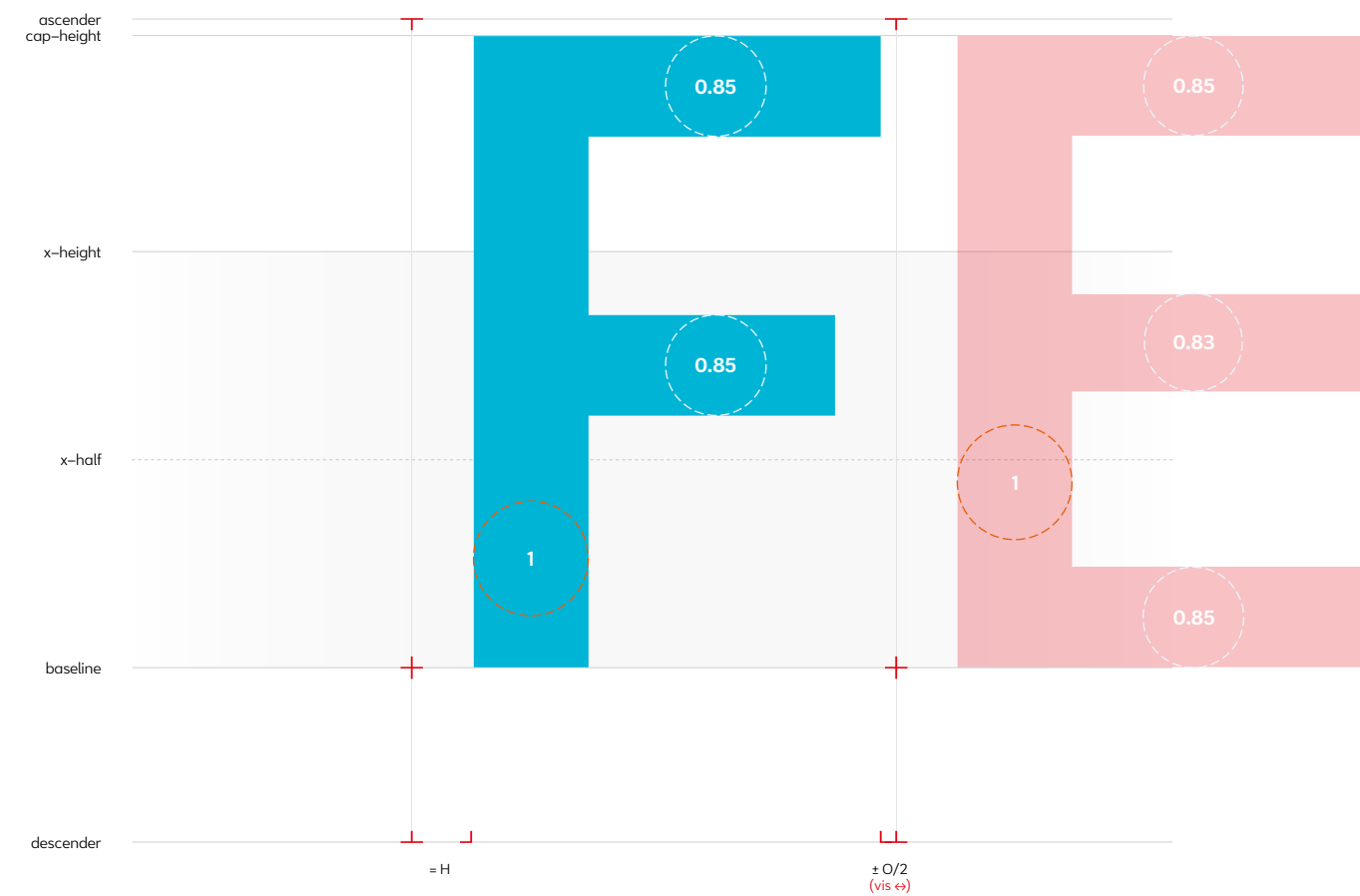
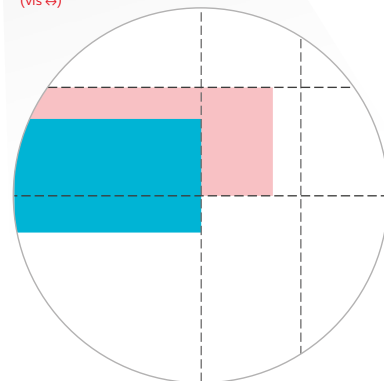
Observation

The **F** is slightly narrower than the **E**.



Observation

The middle arm of the **F** is narrower and slightly lower to compensate the space at the base.



Observation

The middle arm of the **F** has the same weight as the crossbar of the **H**. Normally, it does not require a weight adjustment like the **E**.

GG

The **G** is one of the glyphs that can take on different structural forms. One common construction includes a horizontal bar combined with a vertical stem on the right side of the character, in the chin area. A spur may be added, extending down to the baseline to smooth the transition, or it can be more contained, simply dropping or extending slightly outward from the vertical stem to reinforce the form and enhance distinction from the **C**. In both constructions, the top terminal of the bowl typically aligns with in the jaw.^[1]

The **G** can also have a more geometric appearance, appearing rounder and featuring a horizontal bar too.^[2] The main challenge in this variation is achieving a balanced transition between the bottom bowl and the horizontal bar transition, especially in condensed typefaces. In such cases, the top terminal of the bowl may sit slightly further inward than usual.

In both styles, the deeper the bar enters the counter, the more it helps differentiate the **G** from the **C**. However, if extended too far, it can disrupt the structure and break the reader’s visual expectation of what a **G** should look like, affecting legibility and readability.^[3]

The **G** can also be drawn without a horizontal bar, though this is less common. In the absence of the bar, it’s recommended to include a vertical stem, as this is what clearly separates it from the **C**.^[4] Adding slightly more weight to this stroke than what is standard for vertical stems can help become a more distinctive feature.

It is slightly wider than the **C** due to the presence of the horizontal bar and the extra space needed in the counter.^[5] Compared to the **O**, its lower bowl extends more outward from the center, creating a squarish base. This results from a subtle narrowing in the lower part, which requires adjustments to the curves.

Learn More

- [1] **Karen Cheng**
Designing Type
(2020, p. 80–81)
- [2] **Timothy Samara**
Letterforms: Typeface Design
from Past to Future
(2018, p. 152–153)
- [3] **Sofie Beier**
Reading Letters:
Designing for Legibility
(2011, p. 22–25)
- [4] **Edward Johnston**
Writing & Illuminating & Lettering
(2023, p. 282)
- [5] **Tom Perkins**
The Art of Letter Carving
in Stone
(2024, p. 69)

Relative Proportions



The **G** is narrower than the **O**. Its base is more squarish, as narrowing the form requires curve compensation. The terminal extends outward, creating a wider aperture.



The **G** is slightly wider than the **C**. The terminal shares a similar open-aperture style, extending slightly outward to compensate for the horizontal bar.



The **G** is narrower than the **H**. Its horizontal bar sits lower than the **H**'s crossbar.

ALT

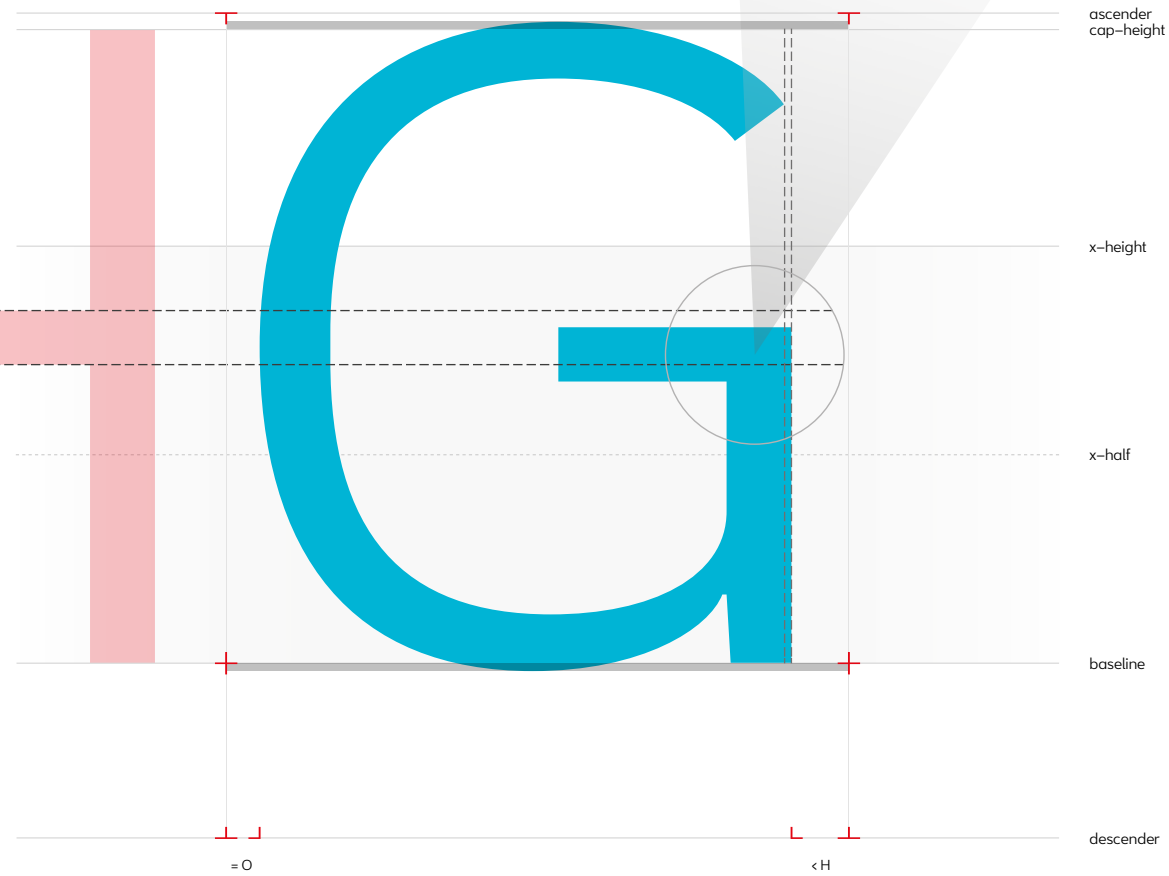


The more geometric version of the **G** extends slightly further outward due to the bowl’s curved base.

Observation

The **G**'s horizontal bar sits lower than the **H**'s crossbar.

The top terminal is about the same length as the jaw and extends slightly outward compared to the **O**.

**Observation**

The base is more squarish compared to the **O**, narrowing the form requires curve compensation.

The spur can take different forms or extend down to the baseline, as in this case.

G

Glyph

G

Unicode

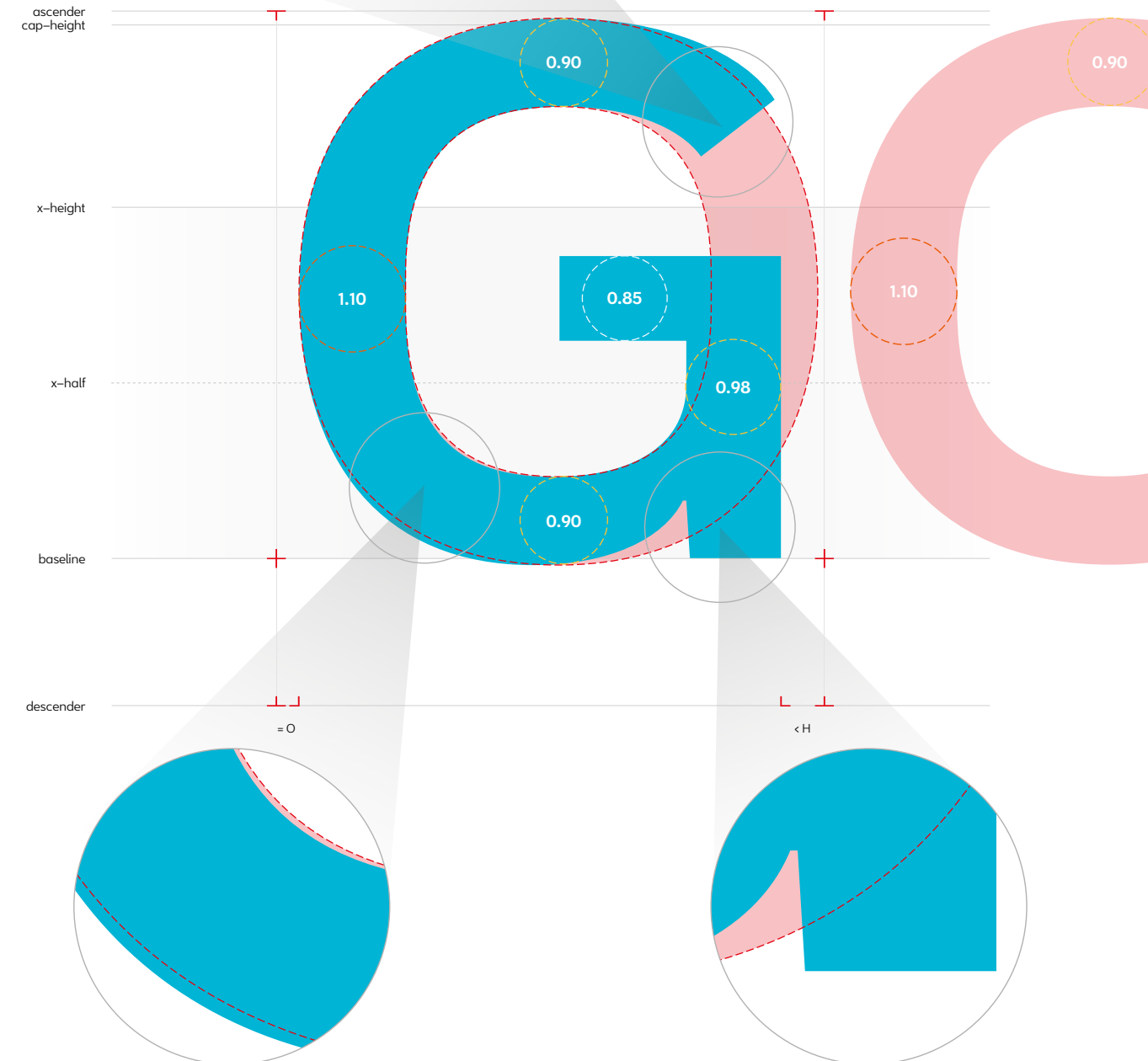
U+0047

Weight

(400) Regular

Observation

The terminal may be less smooth, flaring outward before curving back in.



Glyph

G

Unicode

U+0047

Weight

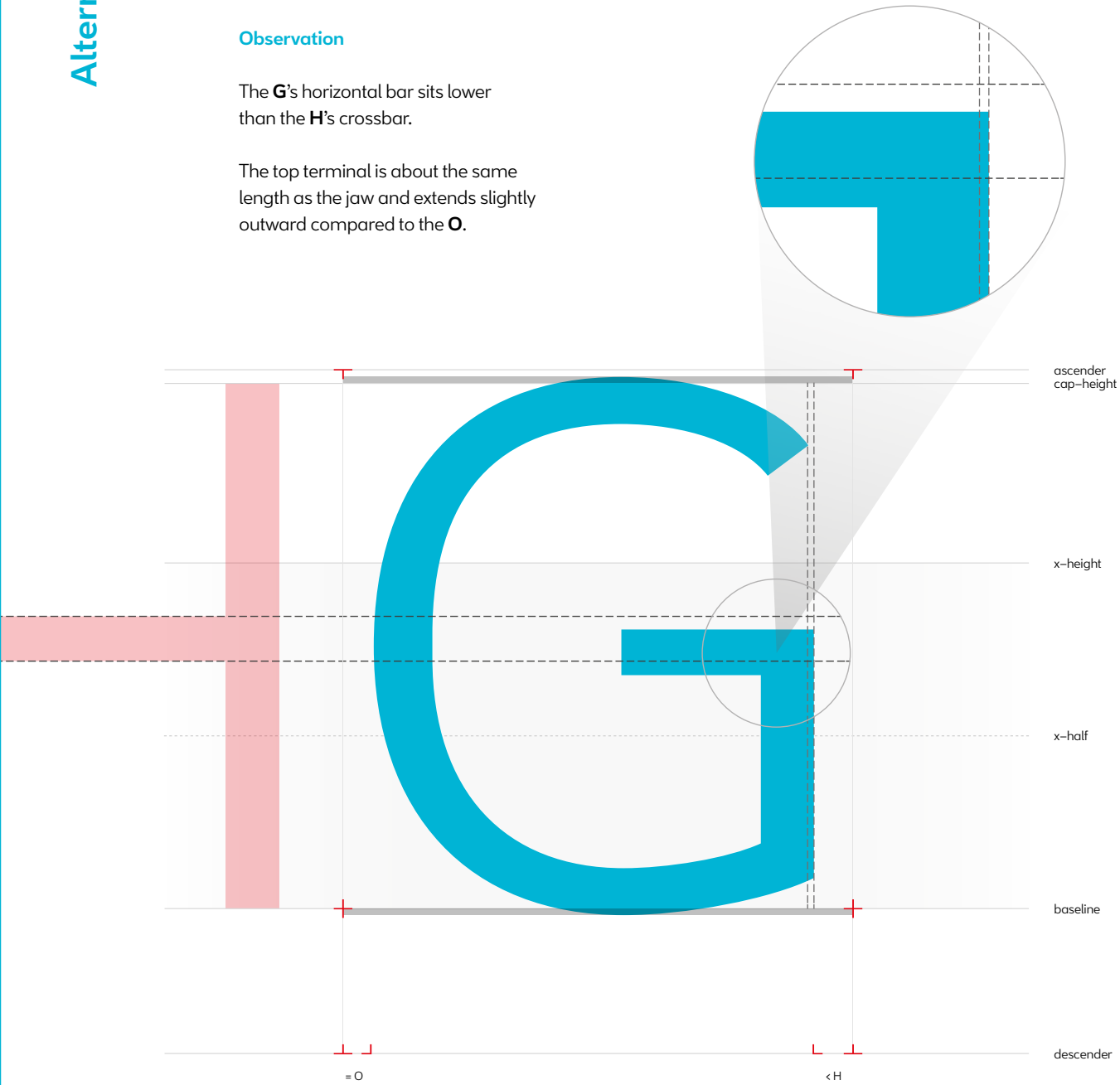
(800) Bold

G

Observation

The **G**'s horizontal bar sits lower than the **H**'s crossbar.

The top terminal is about the same length as the jaw and extends slightly outward compared to the **O**.



Observation

The base is more curved than the **O**, transitioning into a more horizontal curve, which requires compensation.

The chin can take different forms, and in this case, it ends without a spur.

ALT

G

Glyph

G.alt

Unicode

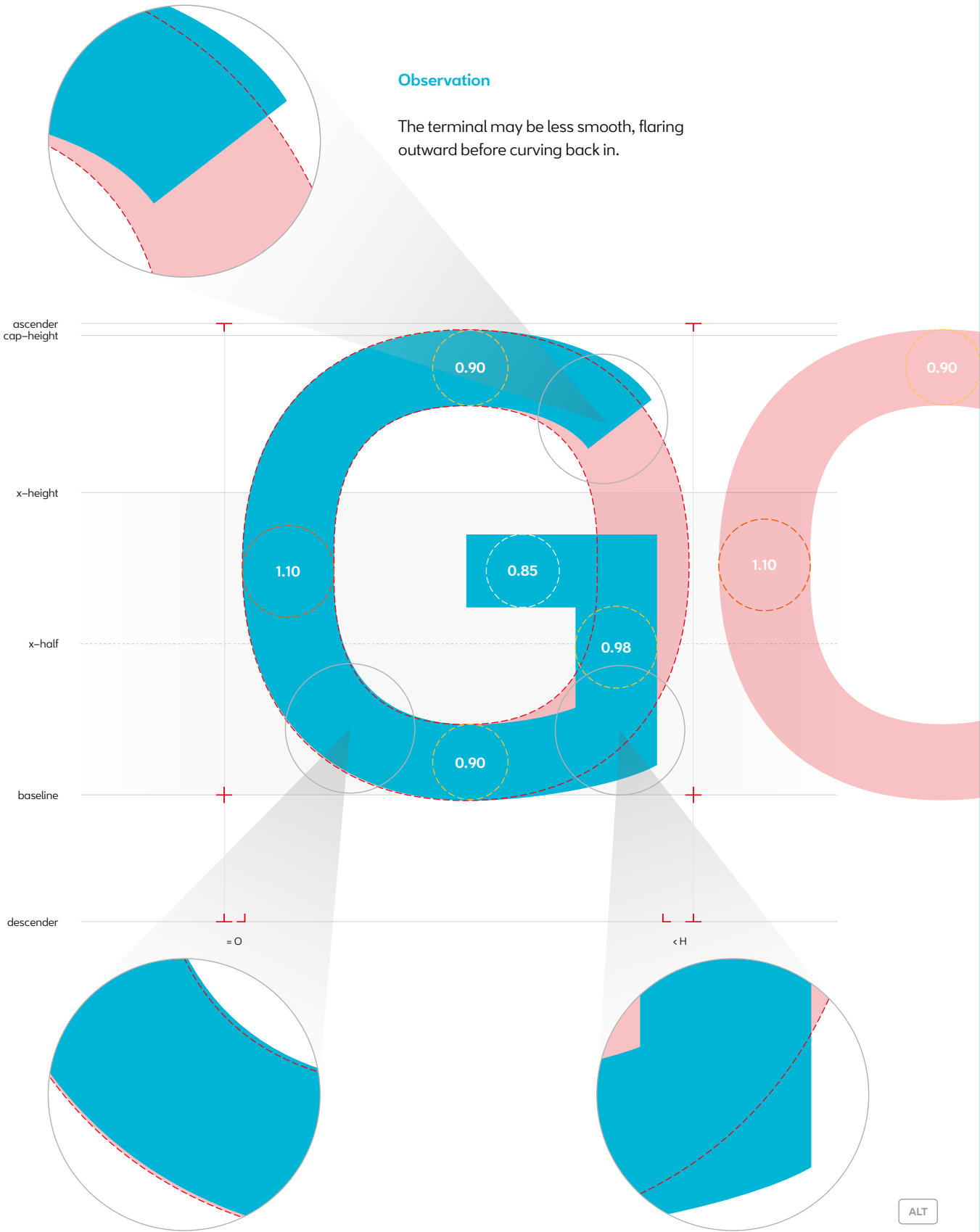
U+0047

Weight

(400) Regular

Observation

The terminal may be less smooth, flaring outward before curving back in.



Glyph

G.alt

Unicode

U+0047

Weight

(800) Bold

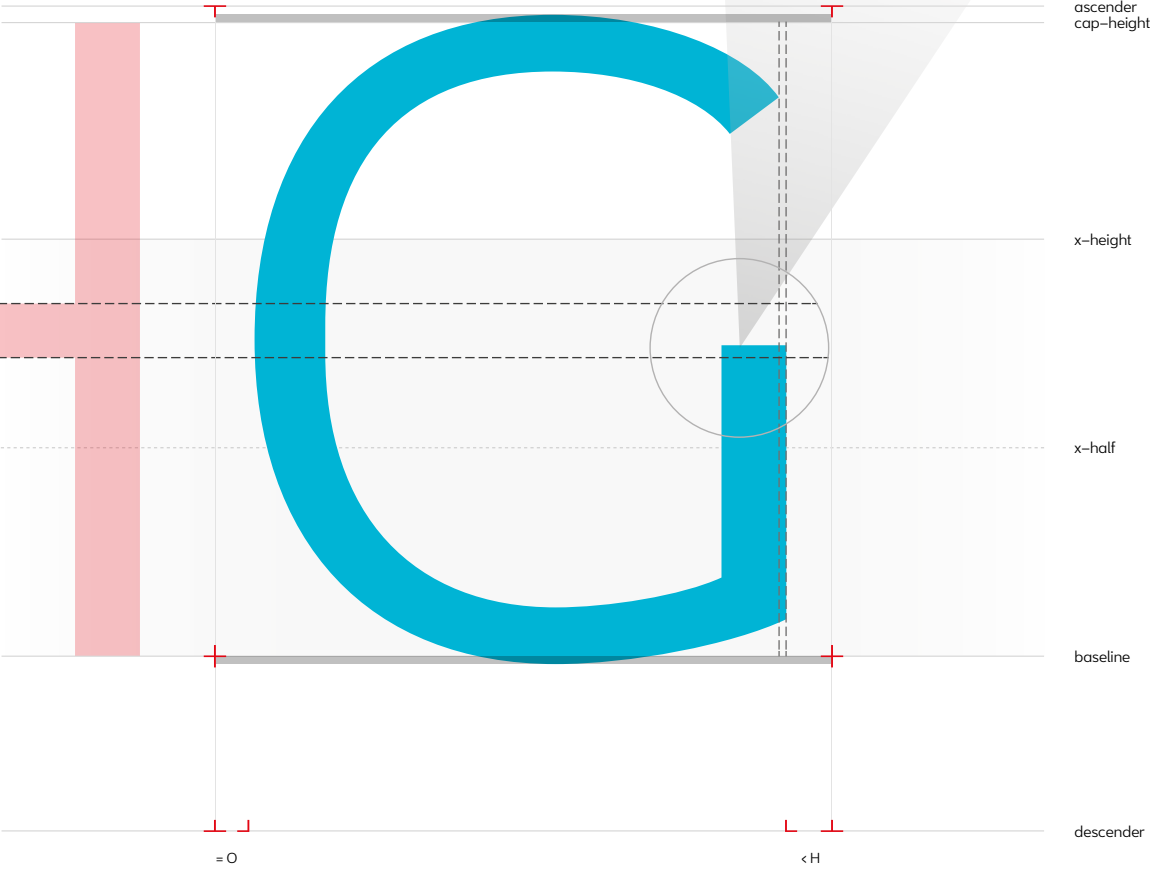
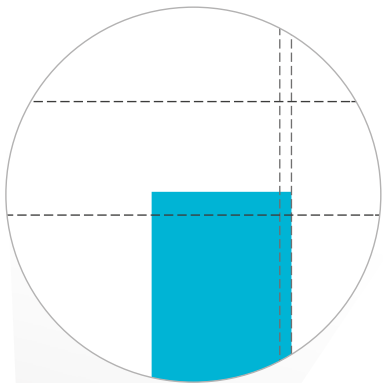
ALT

G

Observation

The **G** has no horizontal bar in this case, and its jaw aligns roughly with the middle of the **H**'s crossbar.

The top terminal is about the same length as the jaw and extends slightly outward compared to the **O**.



Observation

The base is more curved than the **O**, transitioning into a more horizontal curve, which requires compensation.

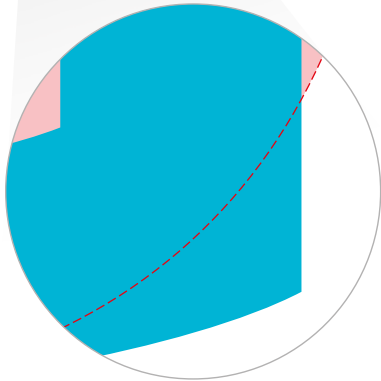
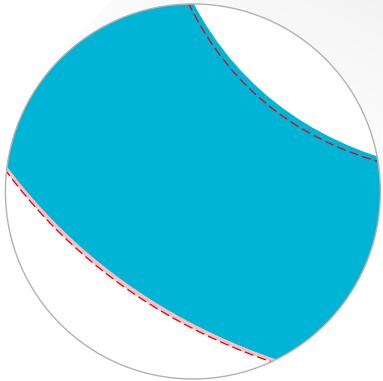
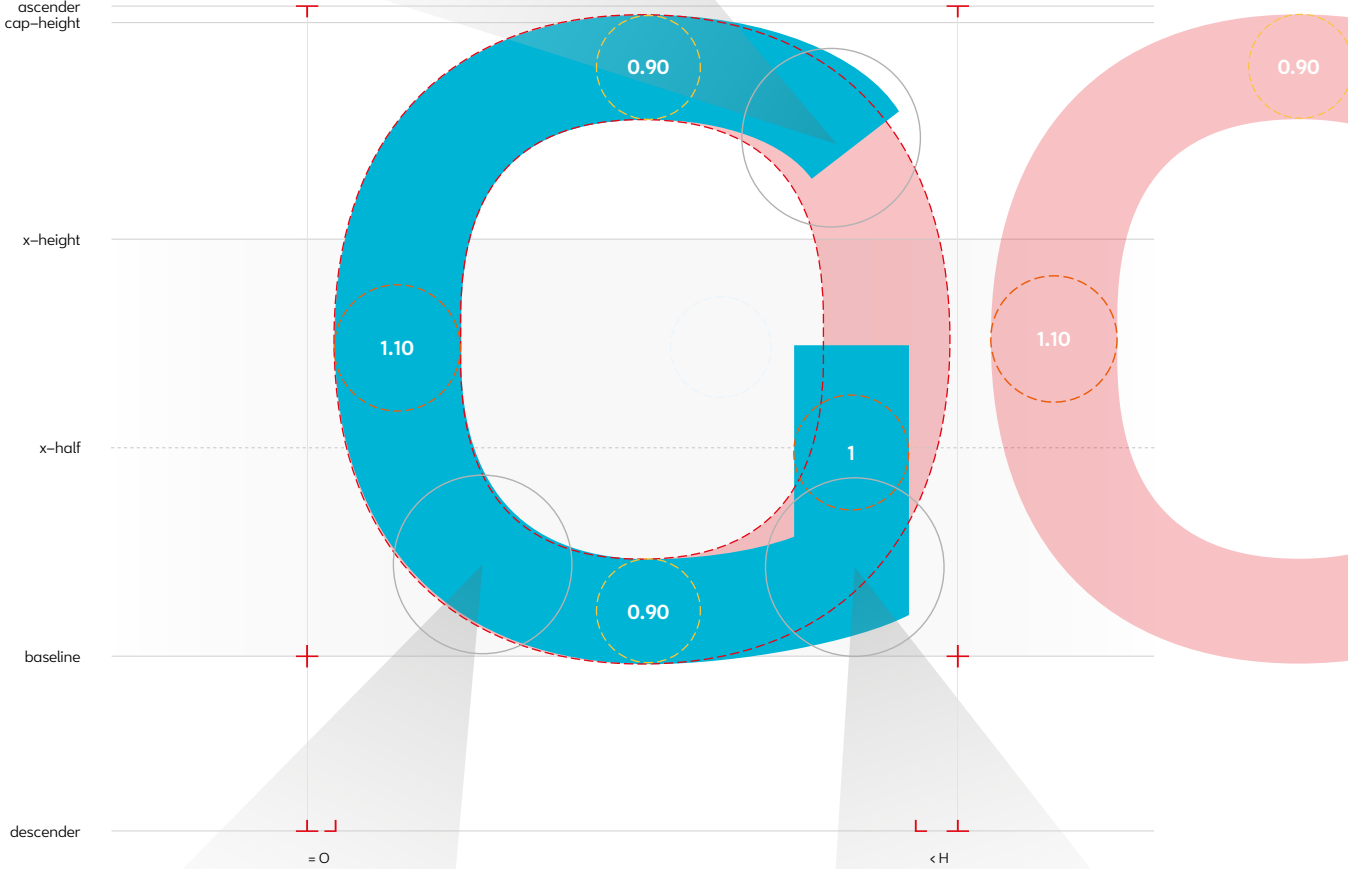
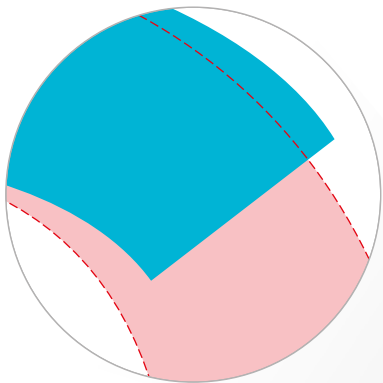
The jaw can take different forms, and in this case, it ends without a spur.

ALT

G

Observation

The terminal may be less smooth, flaring outward before curving back in.



ALT

G



The uppercase **H** is often one of the first glyphs to be drawn,^[1] as it helps establish several fundamental measurements that will be shared or serve as a basis for other characters.^[2]

The vertical stems define the weight within a typeface – Light, Regular, Bold. If multiple styles are present, each variation will have its own corresponding weight. In a Regular typeface, the stem thickness generally ranges between 70 and 95 units, or approximately 10–15% of the total cap height.

The crossbar tends to be thinner than the vertical stems, a characteristic that extends to other horizontal elements. This reduction compensates for an optical illusion that makes us perceive horizontal lines as thicker than vertical ones.^[3] For a Regular weight, a reduction of 5 to 10 units is usually sufficient, though this value may vary depending on the desired contrast. The crossbar is also often positioned slightly higher than the geometric center.^[4]

Additionally, the **H** helps define the base width of the font.^[5] The decision to draw it tighter or wider influences the overall visual coherence of the typeface, helping to determine its width classification: Narrow, Condensed, Regular, Extended or Wide.

Learn More

[1]
Cristóbal Henestrosa;
Laura Meseguer;
José Scaglione
How to create typefaces,
from sketch to screen
(2017, p. 42–47)

[2]
Gerald Unger
Theory of Type Design
(2018, p. 111–114)

[3]
Timothy Samara
Letterforms: Typeface Design
from Past to Future
(2018, p. 86)

[4]
Tom Perkins
The Art of Letter Carving
in Stone
(2024, p. 75–84)

[5]
Gerrit Noordzij
The Stroke Theory of Writing
(2021, p. 13–18)

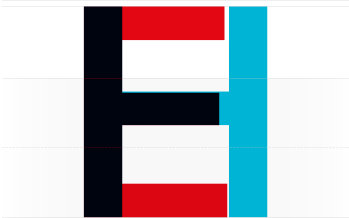
O



Relative Proportions

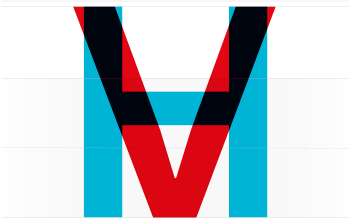
The **H** is slightly narrower than the **O**, helping to establish a more balanced rhythm in the typeface.

E



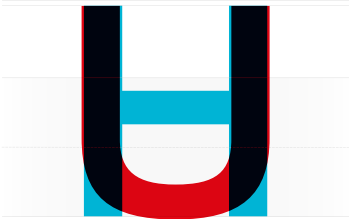
The **E** is narrower than the **H**. The arm of the **E** can be slightly narrower as the **H**'s crossbar.

V

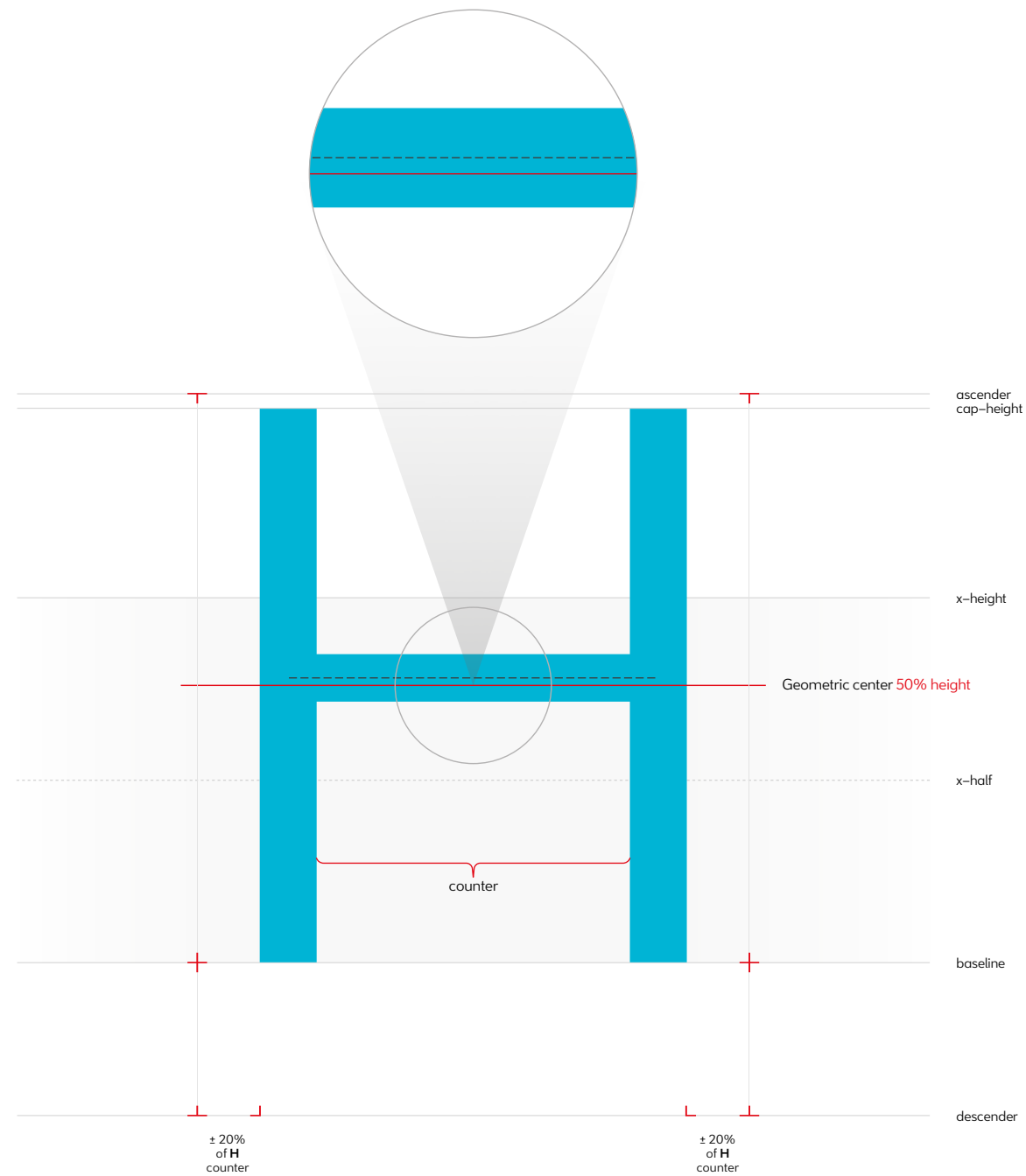


The **V** is wider than the **H**, to compensate for the diagonals and maintain proper optical balance.

U

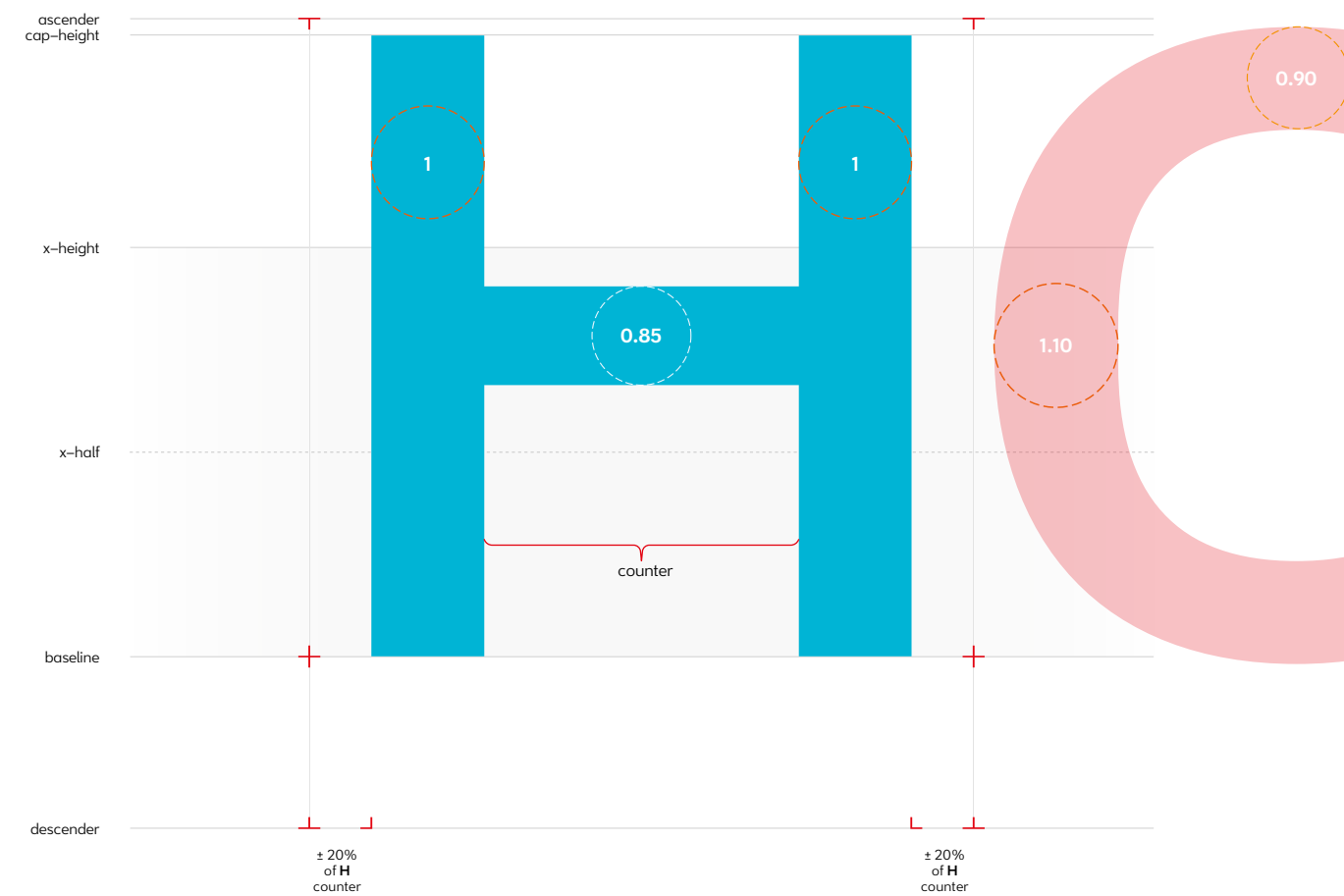


The **U** can be equal, slightly narrower, or slightly wider than the **H**, depending on the design direction.



Observation

The crossbar is positioned slightly above the geometric center of the **H** to create more openness in the lower counter.



Observation

The stems are heavier than the crossbar on the **H**, and both are usually lighter than the **O**'s vertical and horizontal curves, respectively.



The **I** is like a reduced version of the **H**, with only one vertical stem. This should be the same weight as defined for the **H**, or migrate this weight to **H** if **I** is drawn first.

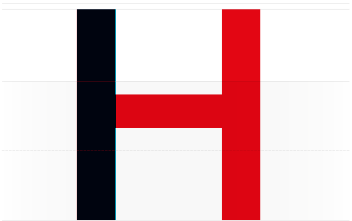
The verticality of the **I** extends from the baseline to the height of the cap-height line, which is usually smaller than the ascenders of lowercase glyphs.^[1] The difference between these guidelines is often more pronounced in Old Style Serif fonts^[2] because of the entry strokes that are usually angled.

In Sans Serif, sometimes the same guideline is used for the uppercase letters and lowercase ascenders. If this direction is chosen, it's important to clearly differentiate the designs of the **I** and **l**, as when they appear consecutively (**Il**), they might resemble a double **I** (**II**) or double **l** (**ll**). The **I** can have top and bottom horizontal bars depending on the design or the need for irregularity to enhance readability;^[3] in this case, their thickness should match the thickness of the **H** crossbar or be smaller.

Learn More

- [1] Karen Cheng
Designing Type
(2020, p. 38–40)
- [2] Tom Perkins
The Art of Letter Carving
in Stone
(2024, p. 88–96)
- [3] Sofie Beier
Type Tricks: User Design
(2022, p. 69)

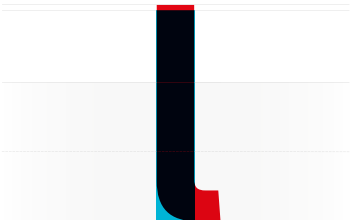
A



Relative Proportions

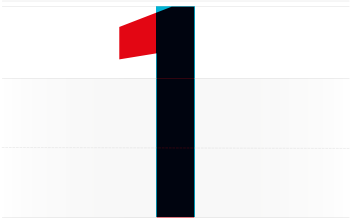
The stem of the **I** should have the same weight and height as the vertical stems of the **H** to maintain consistency in the typeface.

l



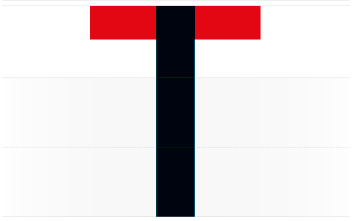
The **I** has slightly more weight on the stem than the **l**. Uppercases letters appear thinner due to having more space between strokes, so a slightly lighter stem can be added to lowercase letters to balance the proportions.

1

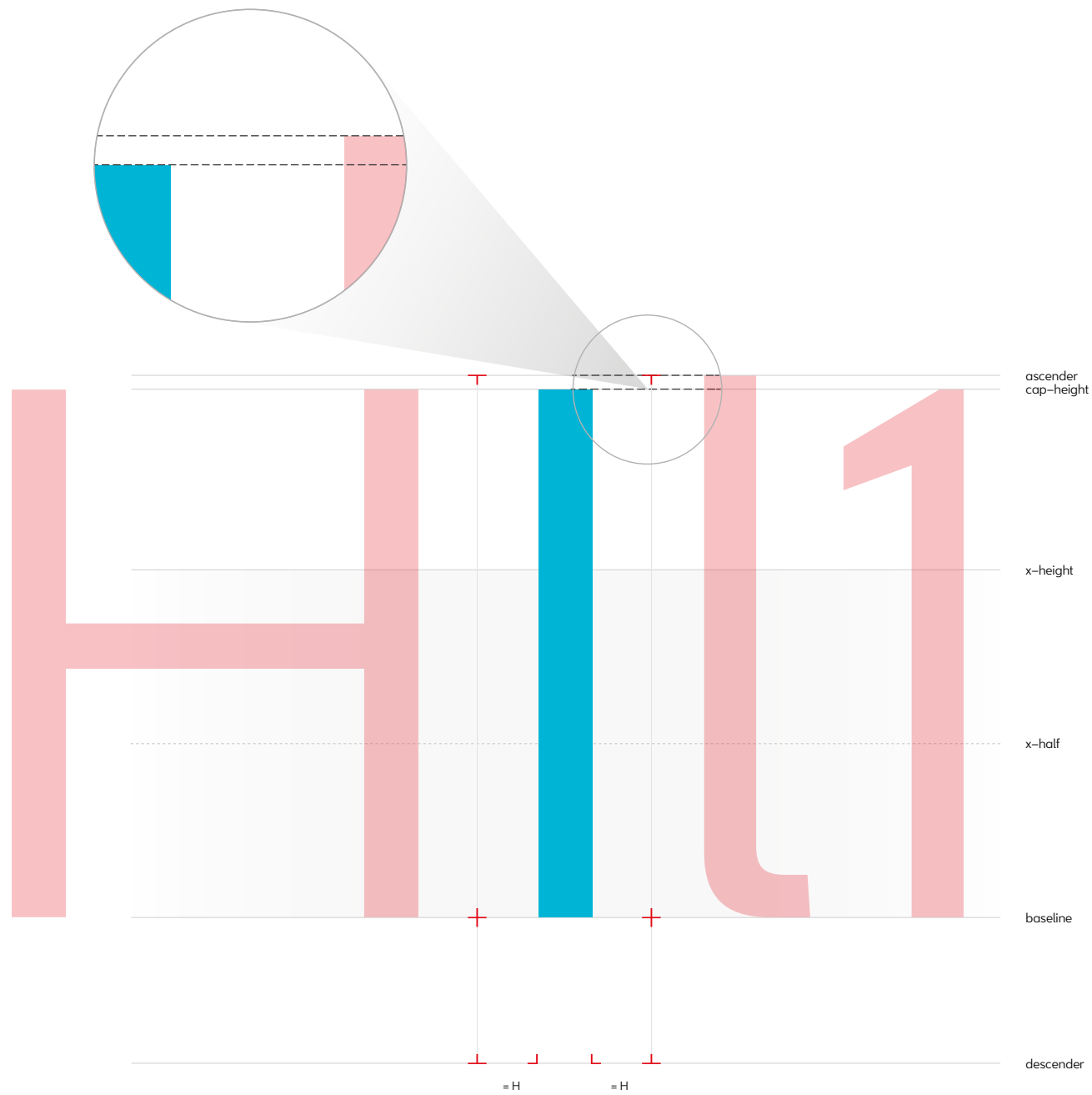


The numerals borrow a lot of information from the uppercase letters, as they also have larger spaces between strokes.

T



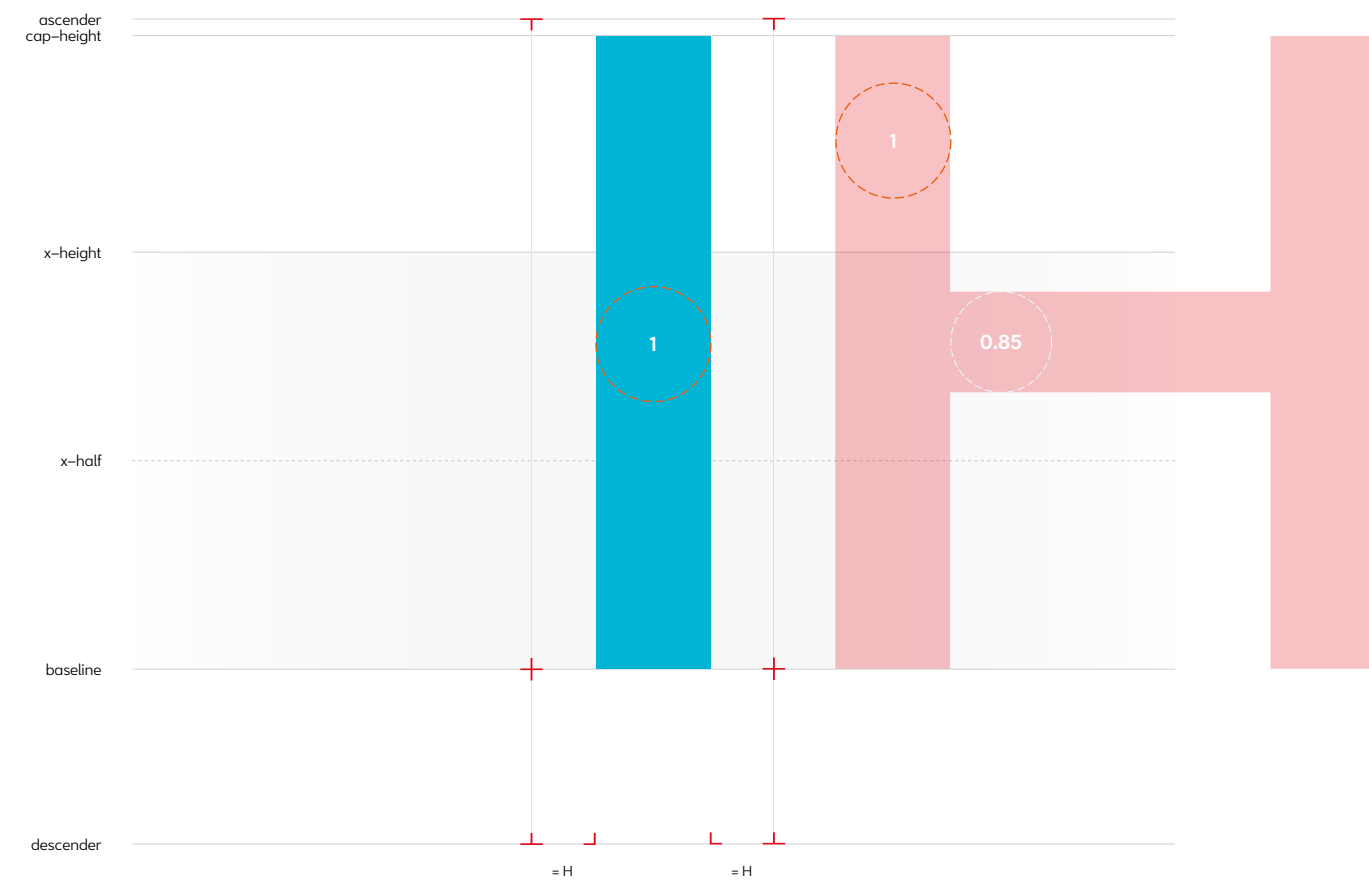
Both the **I** and **T** share the same stem, with the **T**'s crossbar matching the weight of the **H**'s crossbar.



Observation

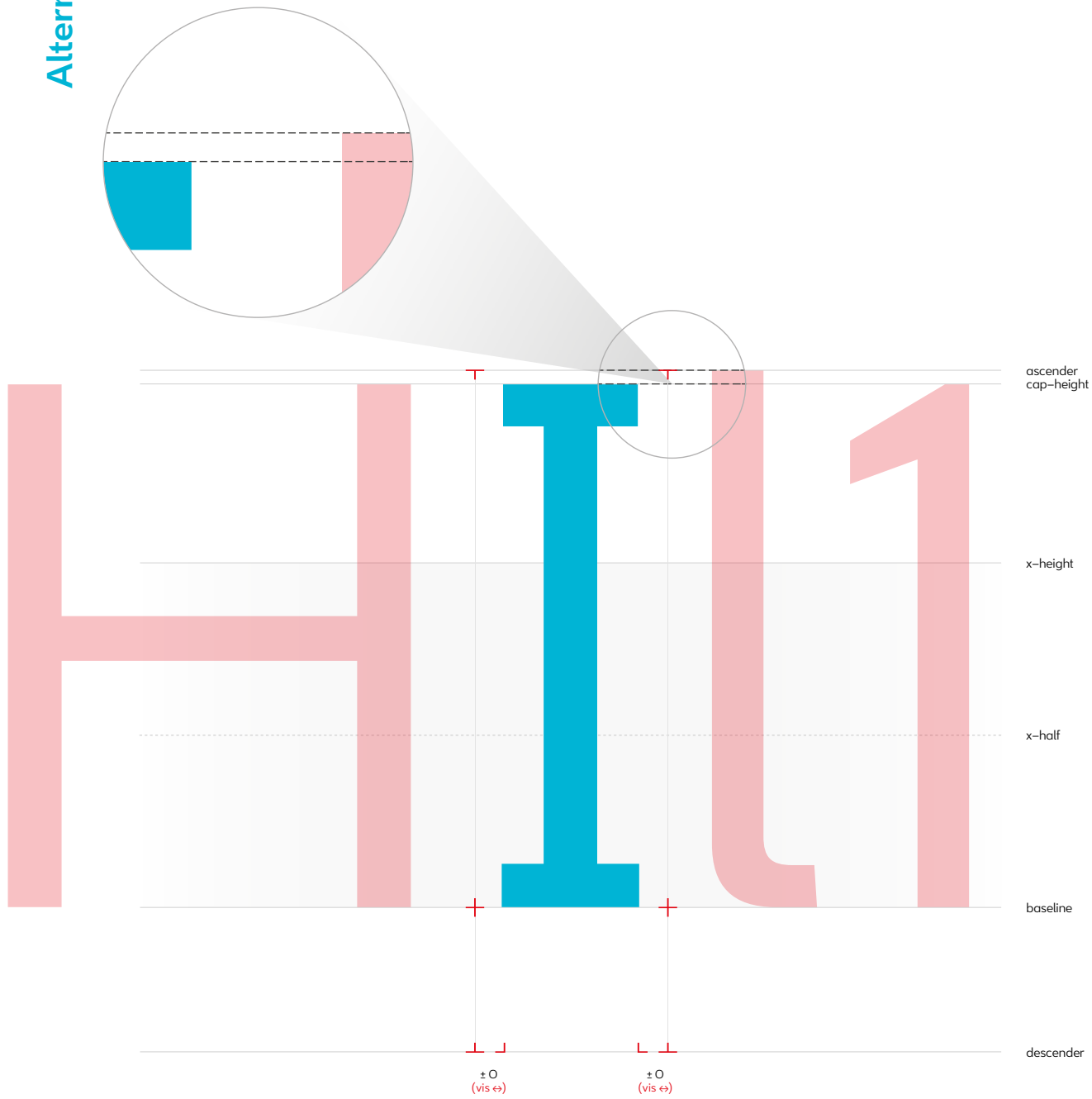
The **I** and **l** follow different top guidelines.

Uppercase letters can share the same guidelines as numerals.



Observation

The stem of the **l** is the same as the **H**.



Observation

The **I** and **l** follow different top guidelines.

Uppercase letters can share the same guidelines as numerals.

ALT

I

Glyph

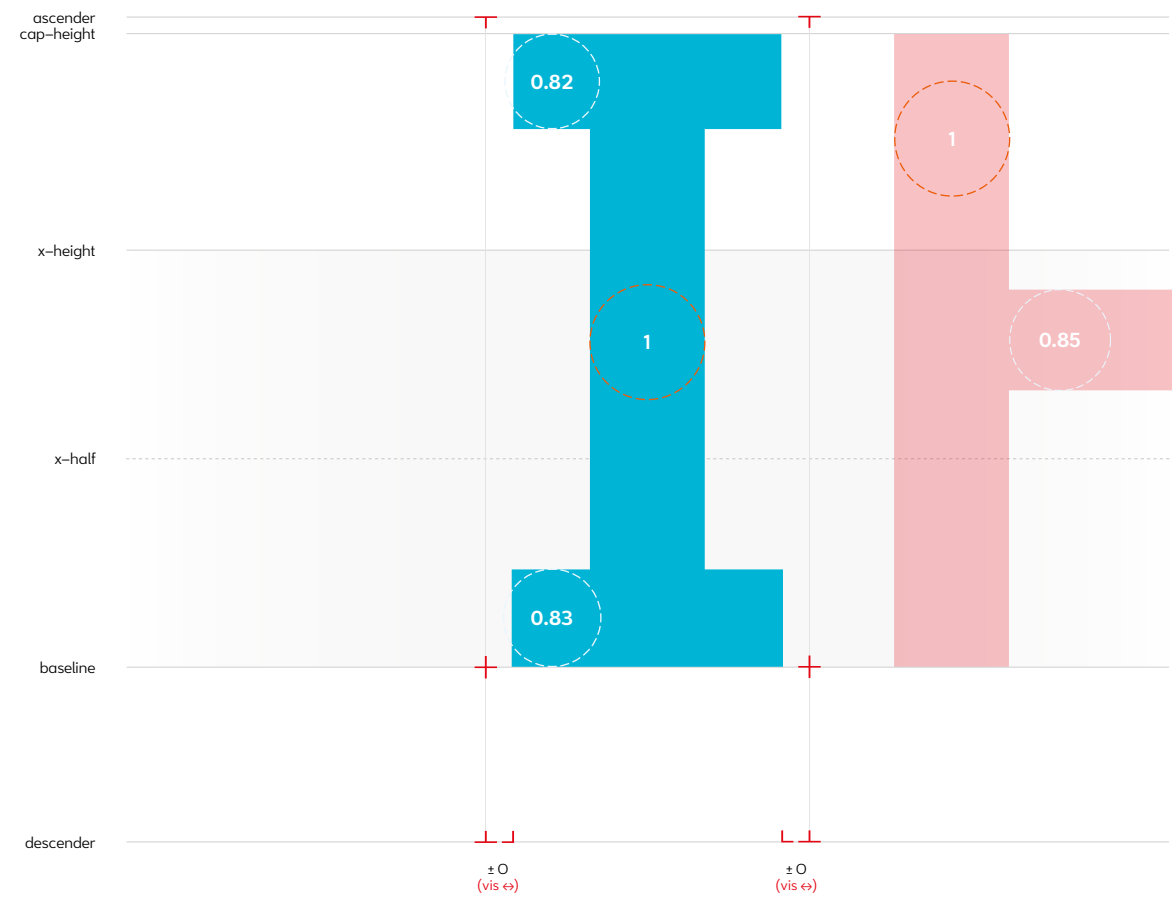
I.alt

Unicode

U+0049

Weight

(400) Regular



Observation

The stem of the **I** is the same as the **H**.

The top and bottom horizontal bars should match the thickness of the **H**'s crossbar or be slightly lighter.

ALT

I

Glyph

I.alt

Unicode

U+0049

Weight

(800) Bold

J J

The **J** is essentially an **I** with a tail.^[1] It can be drawn in various ways and the more classical form features a tail that extends below the baseline.^[2] If this approach is chosen, it's recommended not to stretch the tail all the way to the descender line, as this would make the **J** appear too large compared to the letters around it. Think of it like the lowercase **t**, which also doesn't reach the ascender line.

A more modern and straightforward option is to align the tail similarly to the base of an **O** or **U** and using the same undershoots.^[3] In this case, the curve must also be narrower to avoid creating excessive negative space at the top of the tail. Simply using a **O** or **U** as a start and cutting into it to form the terminal is not enough — this would leave the **J** feeling unbalanced, as if it's tipping to the right.^[4]

Its terminals are generally shared with characters like **S** and **C**, helping maintain visual consistency across the typeface.^[5]

Learn More

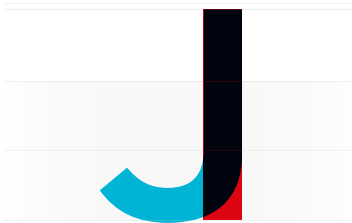
[1]
Edward Johnston
Writing & Illuminating & Lettering
(2023, p. 283)

[2]
Tom Perkins
The Art of Letter Carving
in Stone
(2024, p. 72)

[3]
Karen Cheng
Designing Type
(2020, p. 86–87)

[4]
[5]
Timothy Samara
Letterforms: Typeface Design
from Past to Future
(2018, p. 152)

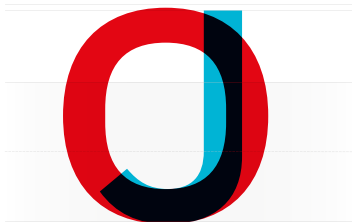
I



Relative Proportions

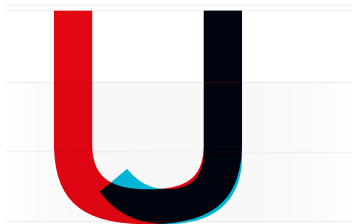
The **J** and **I** share the same stem weight.

O



The **J** and **O** follow the same base shape group and use similar undershoots.

U



The **J** is narrower than the **U**, and its tail is more squarish at the base to help balance the form.

S

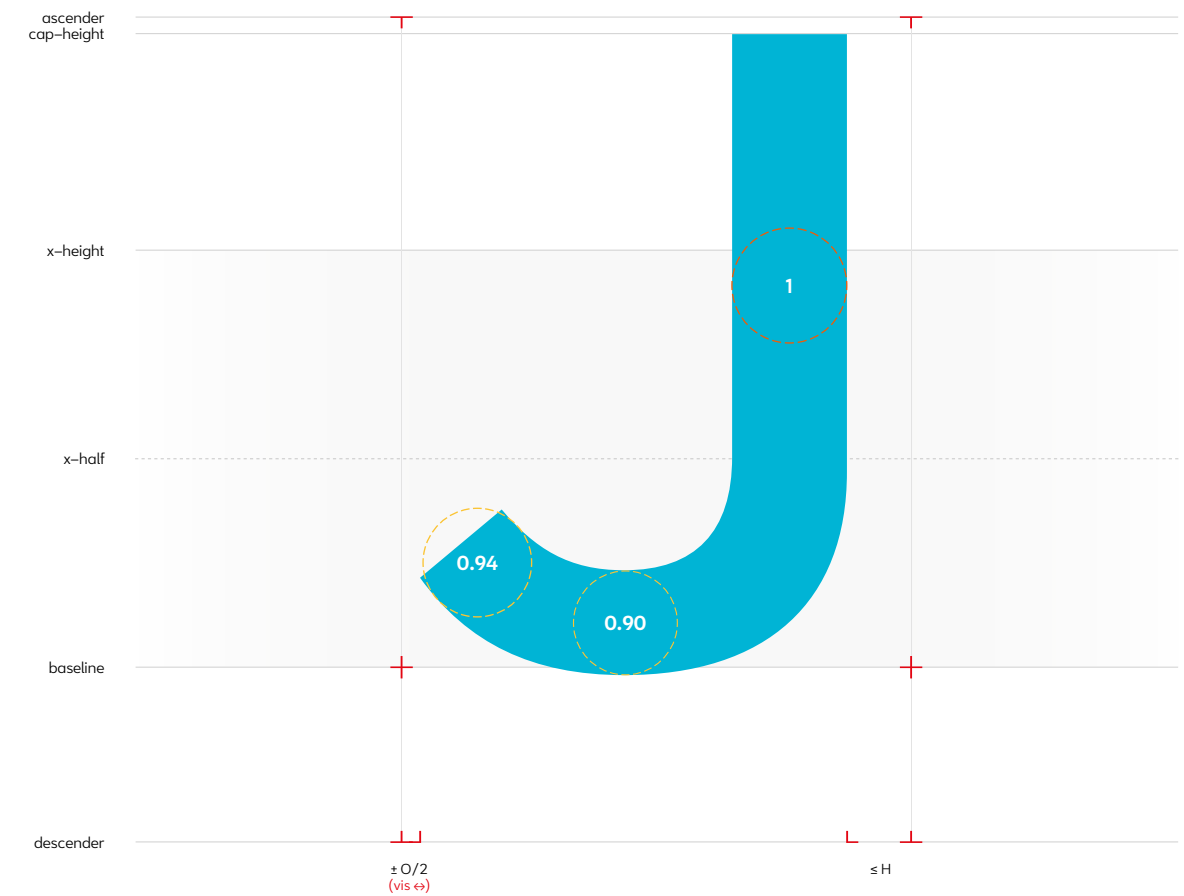
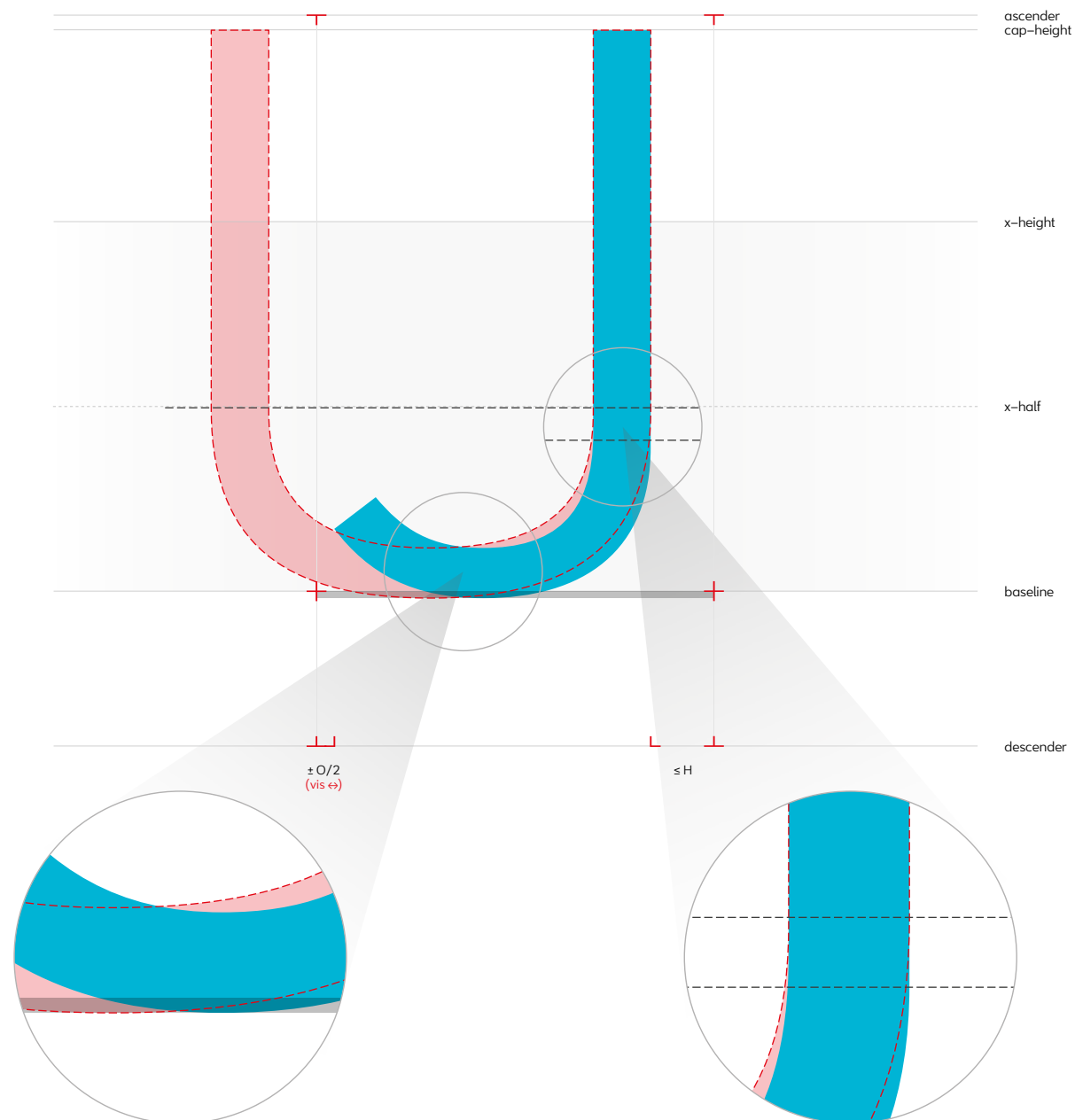


The **J** and **S** share a similar terminal design approach.

Observation

The **J** has an undershoot, like other round-shaped glyphs.

The curve of the tail starts lower than in the **U** and is narrower.



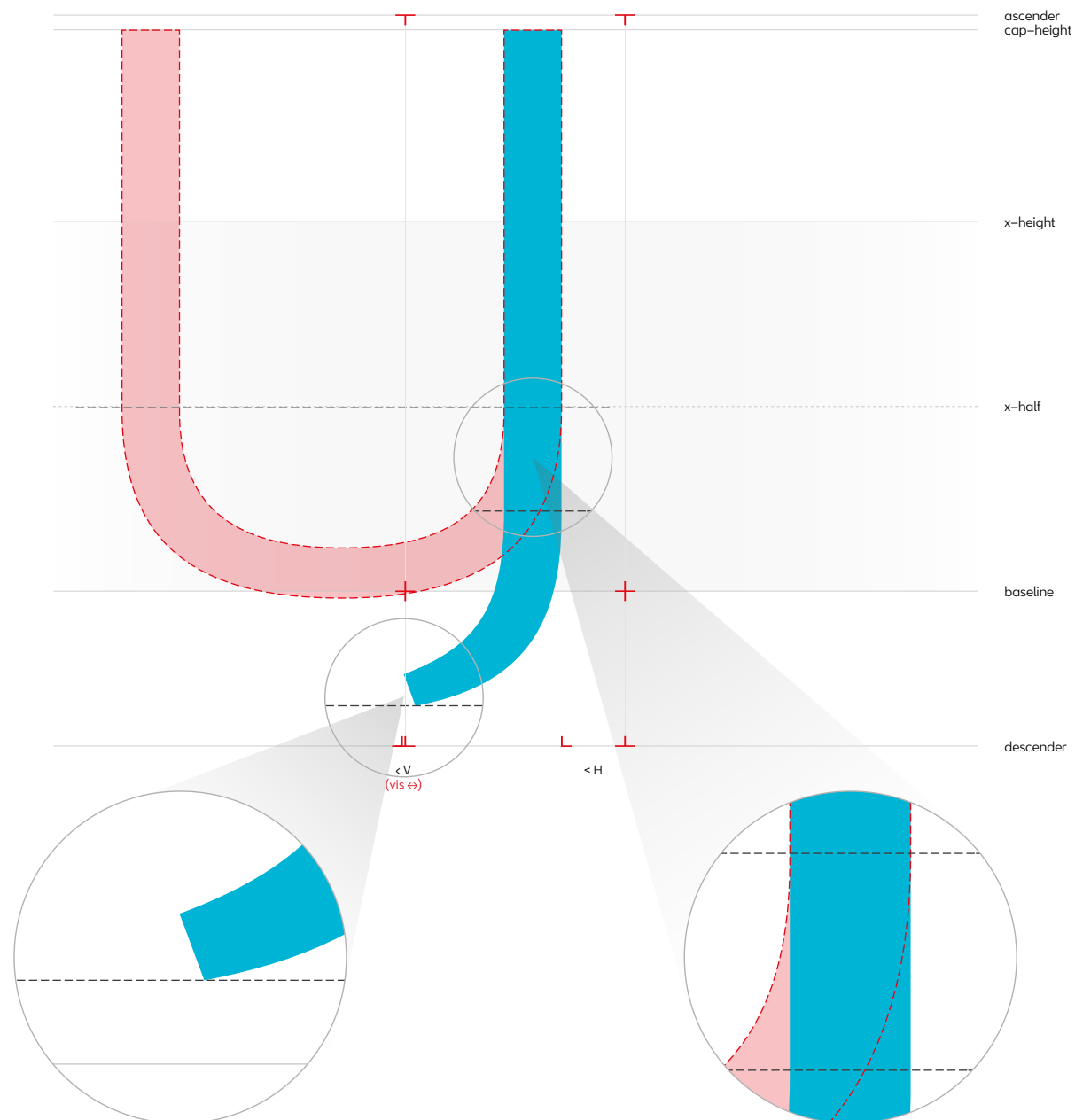
Observation

The **J** shares the stem weight with the **I** and **H**, and the tail matches the weight of the **O**'s base.

Observation

The **J** drops below the baseline, reaching 65–80% of the way to the descender line.

The curve of the tail starts lower than in the **U** and is narrower.



ALT

J

Glyph

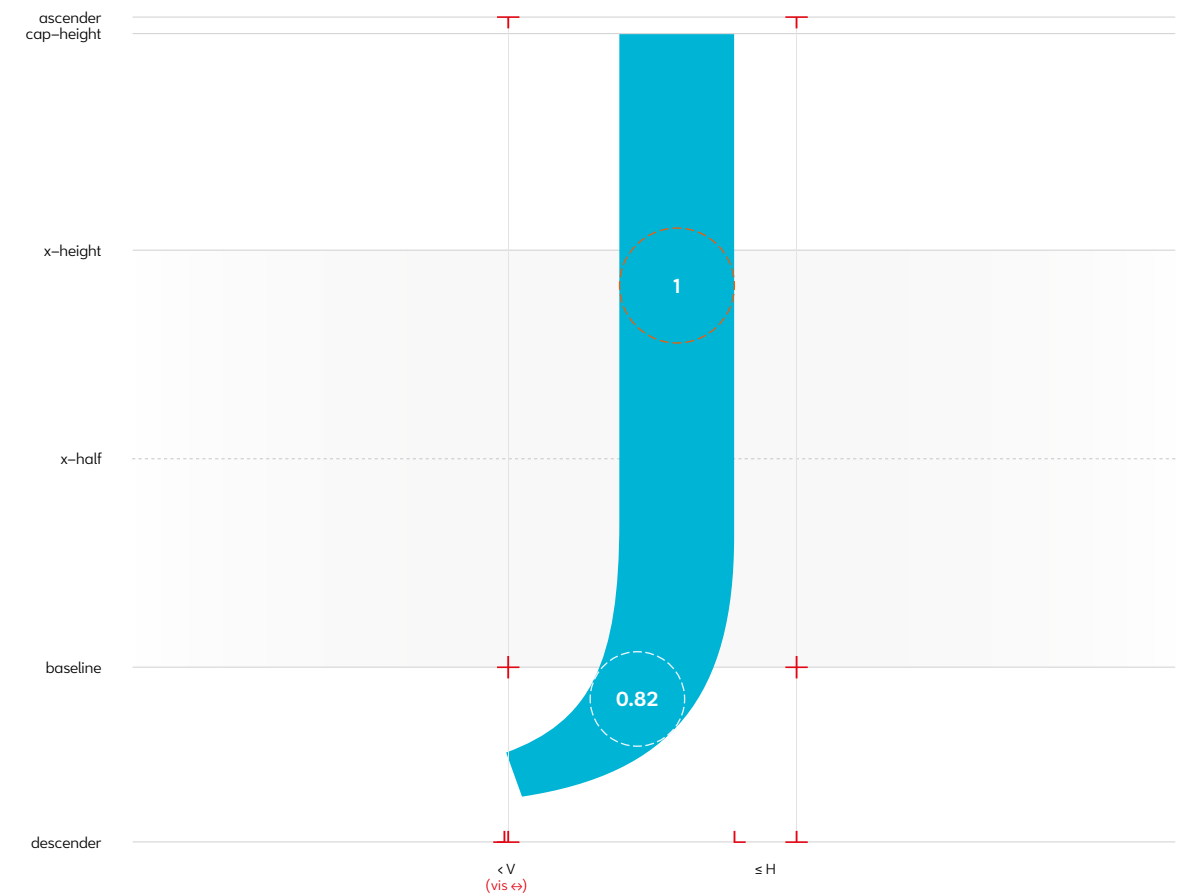
J.alt

Unicode

U+004A

Weight

(400) Regular



Observation

The **J** shares the stem weight with the **I** and **H**, and its tail features tapering.

ALT

J

Glyph

J.alt

Unicode

U+004A

Weight

(800) Bold

KK

The **K** can be considered very similar to the **R** in terms of construction logic. Both consist of a vertical stem and a leg. The main difference lies at the top: the **K** has an arm, while the **R** features a bowl. ^[1]

The leg of the **K** is heavier, as it is a downward stroke; the stem matches the **I** or **H**, while the arm is the lightest stroke, being an upward stroke. ^[2] This contrast reflects the influence of handwriting and broad-nib calligraphic tools. ^[3]

The **K** is usually similar in size to the **R**, though the leg may extend slightly further depending on the design style. This allows for more openness in the lower counter.

The junction point of both characters (**K** and **R**) sits at roughly the same visual height, but due to the diagonal structure of the **K**, the arm typically connects to the stem slightly lower. ^[4] The leg often originates from the arm, and in some designs it doesn't connect to the stem at all. The arm and leg connect slightly above the geometric center. ^[5] For the same reason that the arm connection is lowered, the leg connection is raised to create a more balanced structure and help in the counter space.

Both the arm and the leg feature tapering, transitioning from thinner to thicker strokes from the inside outward. To balance the junction where all three strokes meet, a slight weight reduction or ink trap is often used at the arm-stem connection.

Learn More

[1]
Karen Cheng
Designing Type
(2020, p. 122–125)

[2]
Gerrit Noordzij
The Stroke Theory of Writing
(2021, p. 35–40)

[3]
Tom Perkins
The Art of Letter Carving
in Stone
(2024, p. 71)

[4]
Edward Johnston
Writing & Illuminating & Lettering
(2023, p. 284)

[5]
Chris Campe;
Ulrike Rausch
Designing Fonts: An Introduction to
Professional Type Design
(2020, p. 50)

Relative Proportions

The **K** is about the same width as the **H**.

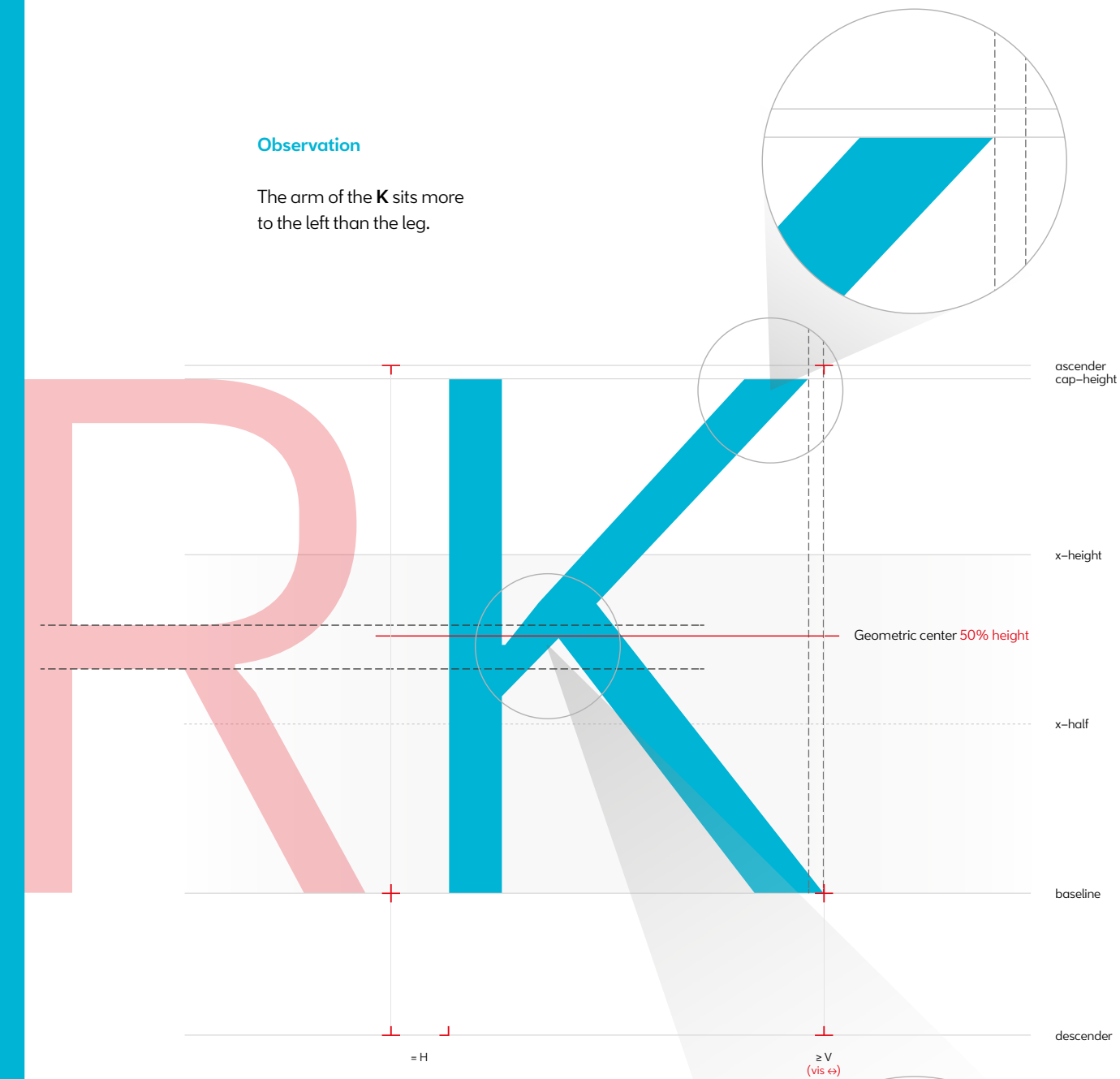
Both share a vertical stem and a leg. The **K** has an arm instead of a bowl and a slightly longer leg to open the lower counter.

The **K** is narrower than the **O**.

The **K** is about the same width as the **Z**. Its arm may follow the same angle as the **Z**'s diagonal or become slightly more horizontal. Usually, the wider the characters, the greater the angle difference.

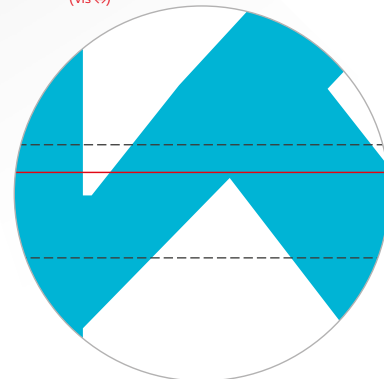
Observation

The arm of the **K** sits more to the left than the leg.

**Observation**

The junction is similar to the **R**, but the **K**'s arm may connects lower.

The arm and leg meet slightly above the geometric center.



K

Glyph

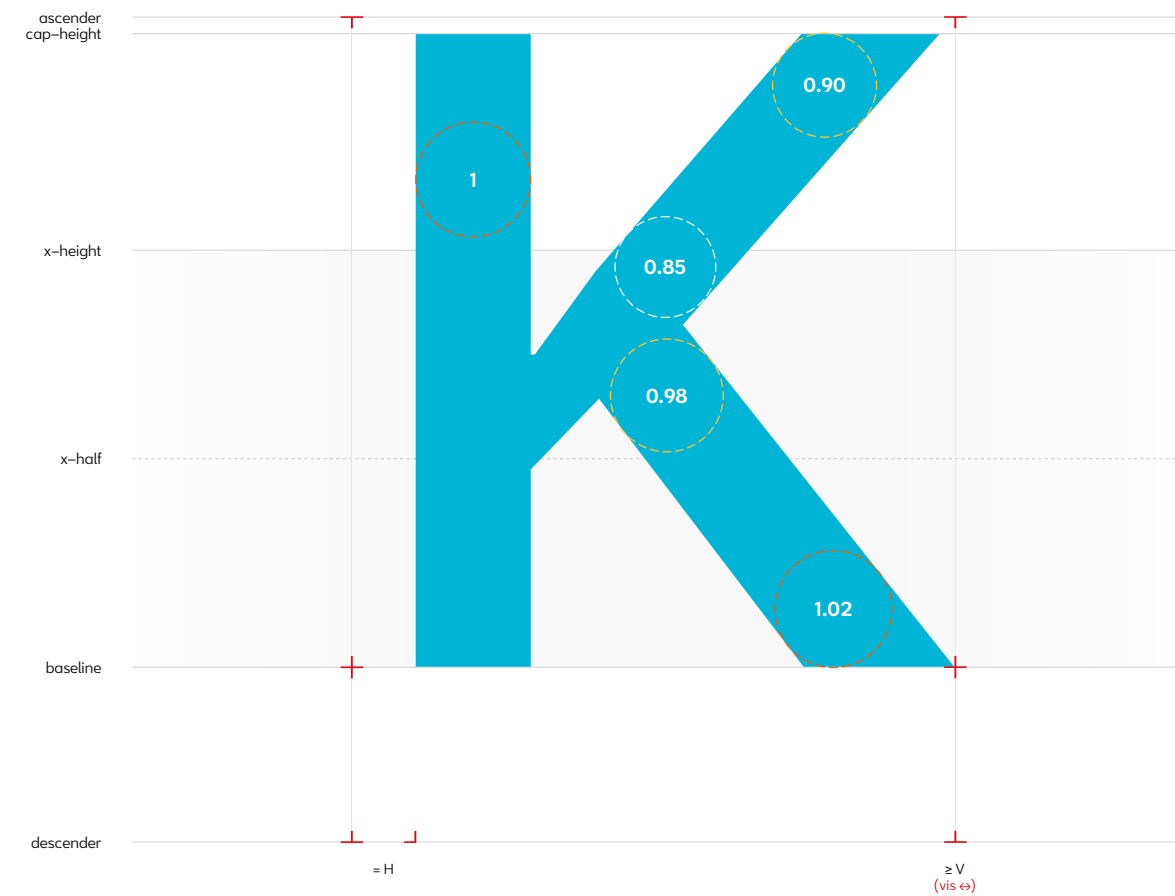
K

Unicode

U+004B

Weight

(400) Regular

**Observation**

The stem matches the **I** or **H**.

The leg is heavier, the arm lighter, and both feature tapering.

K

Glyph

K

Unicode

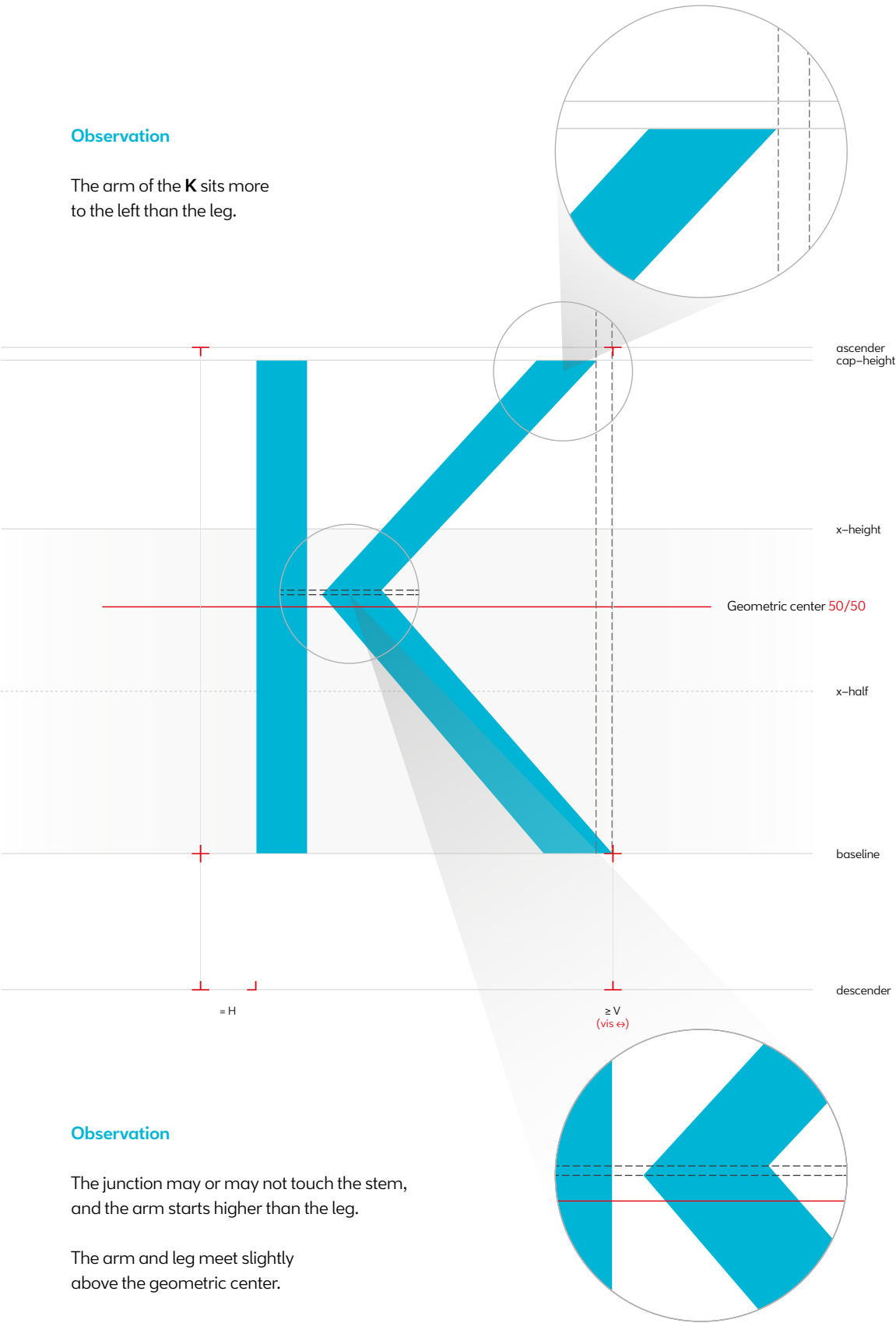
U+004B

Weight

(800) Bold

Observation

The arm of the **K** sits more to the left than the leg.



Observation

The junction may or may not touch the stem, and the arm starts higher than the leg.

The arm and leg meet slightly above the geometric center.

ALT

K

Glyph

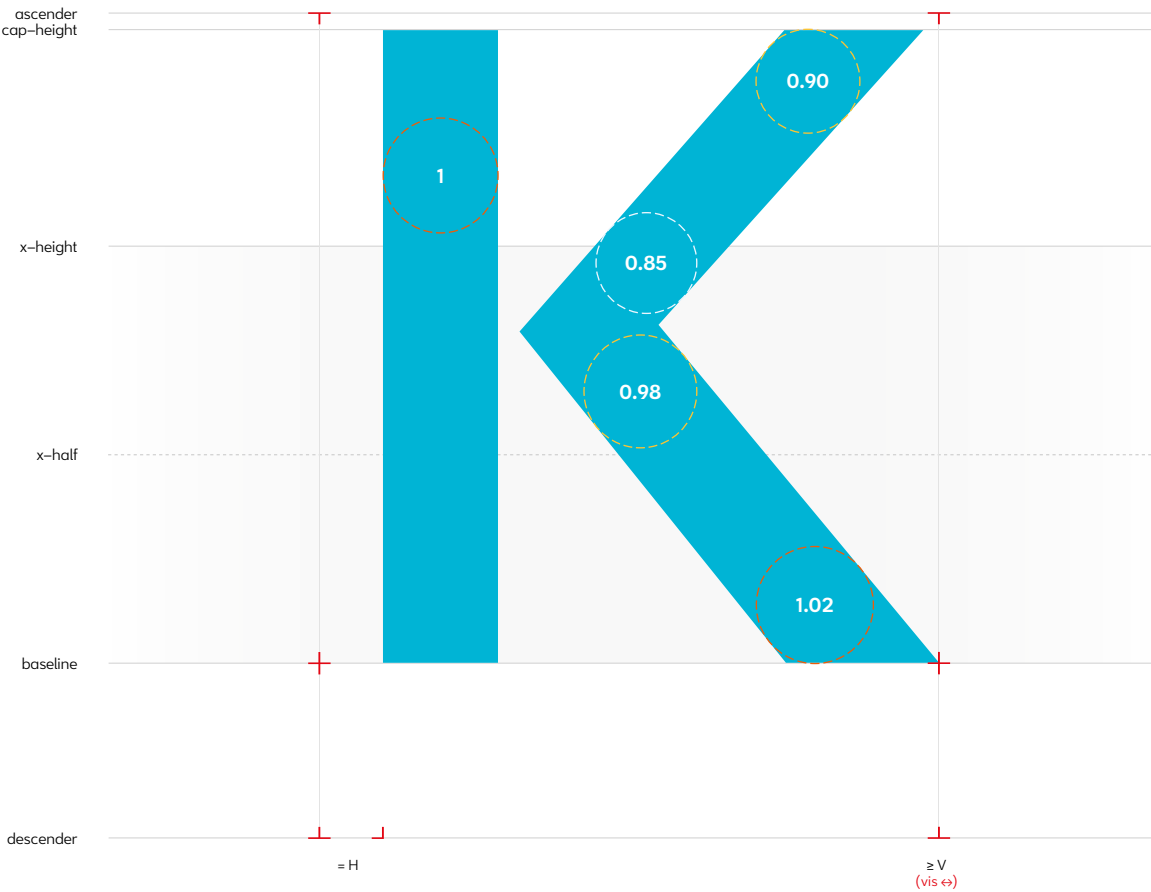
K.alt

Unicode

U+004B

Weight

(400) Regular



Observation

The stem matches the **I** or **H**.

The leg is heavier, the arm lighter, and both feature tapering.

ALT

K

Glyph

K.alt

Unicode

U+004B

Weight

(800) Bold



The **L** consists of a stem and a leg, both following the weight of the **H**. The stem has the same weight, while the leg follows the weight of the crossbar.

The **E** can be seen as a base for constructing the **L**.^[1] The **L** is usually slightly narrower than the **E**,^[2] helping to compensate for the negative space in the top right. This also improves spacing, as an oversized **L** could be perceived as a gap or space between characters.^[3]

Learn More

[1]
Tom Perkins
The Art of Letter Carving
in Stone
(2024, p. 70)

[2]
Timothy Samara
Letterforms: Typeface Design
from Past to Future
(2018, p. 98–99)

[3]
Karen Cheng
Designing Type
(2020, p. 74)



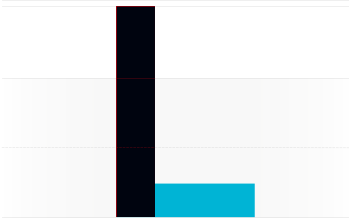
E



Relative Proportions

The **L** is narrower than the **E**.

I



The **L** and **I** share the same stem.



T

The **L** has more lateral space than the **T**. Since the **T** only has a cross stroke at the top, it needs to be narrower to balance the negative space at the base.

H

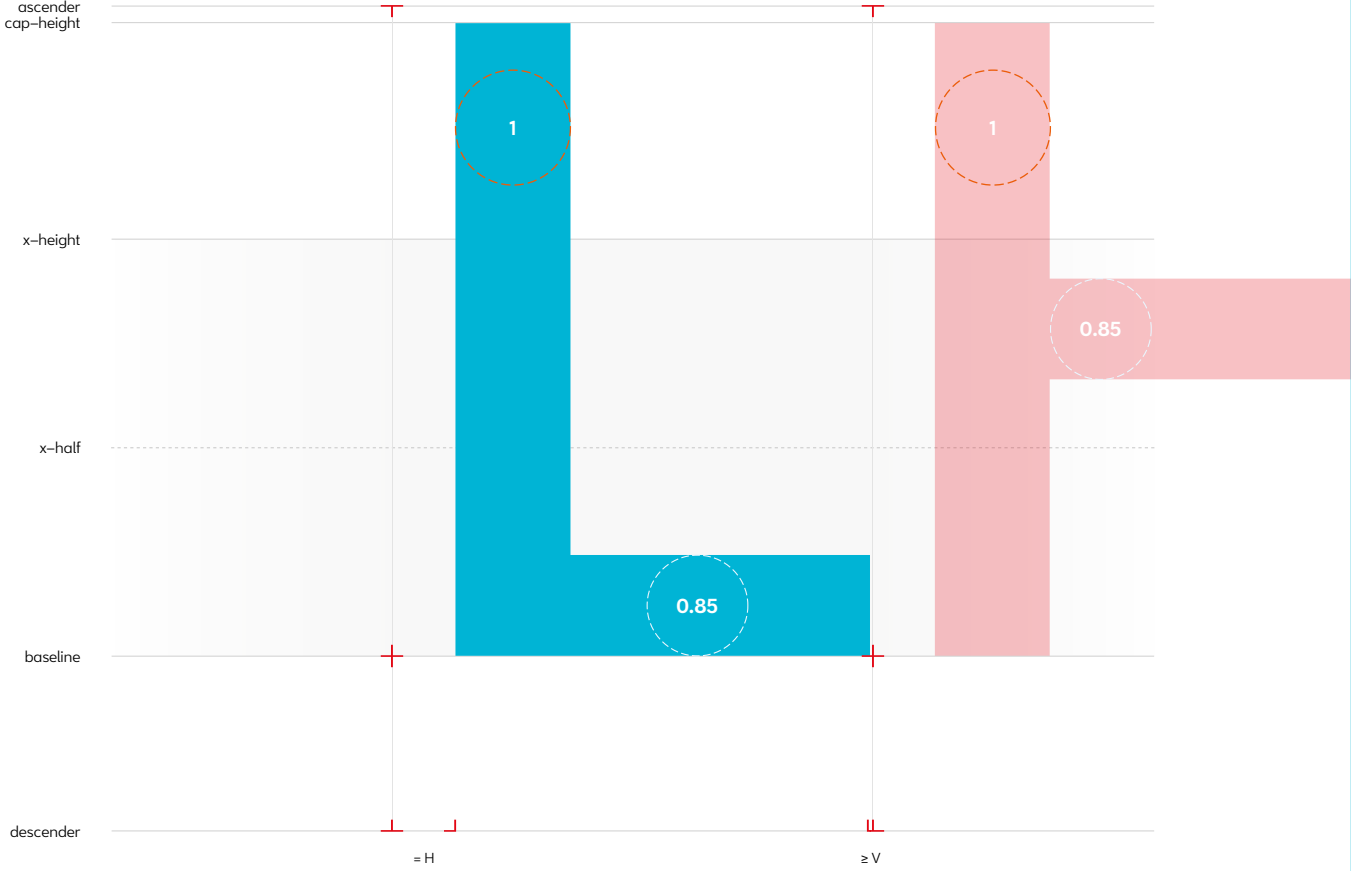
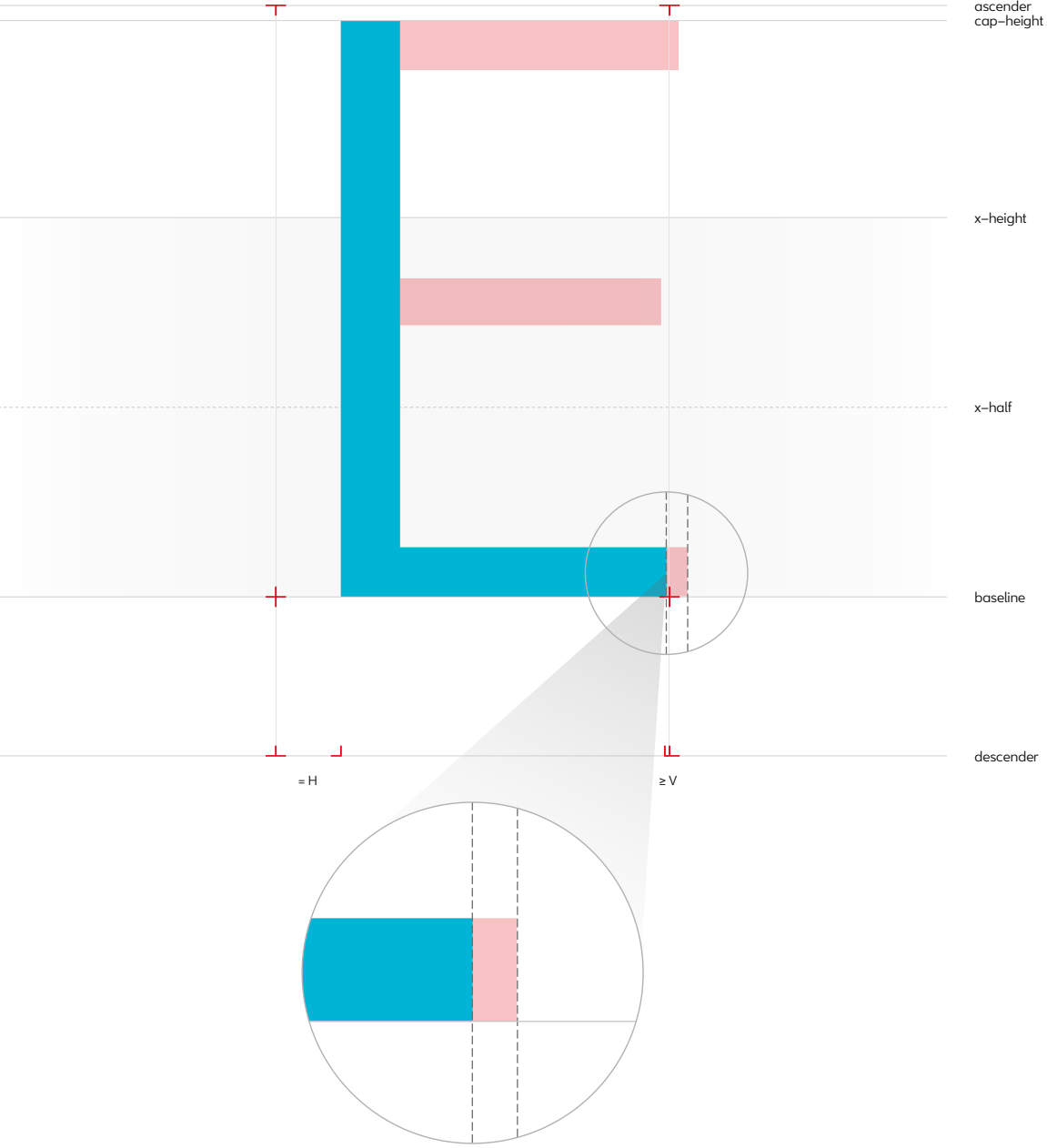


The **L** has a stem and a leg identical to the stem and crossbar of the **H**, respectively.



Observation

The **L** is slightly narrower than the **E**.



Observation

The **L** shares the same stroke weights as the **H**.





The **M** can be thought of as a **V** with vertical stems or additional arms as a starting point. While the **V** is approximately the same width as the **O**, the **M** is wider than the **O**. To maintain graphic coherence and balanced weight, different compensations can be applied.

The most common form is vertically constructed. The connection between the stems and diagonals pushes the stems slightly outward to reduce ink buildup at the junctions, while keeping them straight.^[1]

The stems may also have their weight slightly reduced to balance with the diagonals, either both equally, or with the left stem slightly lighter.^[2] This occurs due to the left side tends to appear visually heavier when composed of two downward strokes, making compensation on that side important. This helps lighten the overall feel of the **M**, which contains many closely spaced strokes.

The vertex should generally match the style of the **V**'s vertex or the apex of the **A** to maintain consistency. In the case of pointed apexes, the **M** can follow the same approach.^[3] Weight may also be reduced at the intersection, whether the strokes end in flat or diagonal cuts. Some designs raise the vertex to create more space in the base of the **M**.

Another, less common but equally valid solution is to angle the stems slightly outward, expanding the base beyond the glyph's inner structure. This helps open up the base and balance the overall stroke color.^[4]

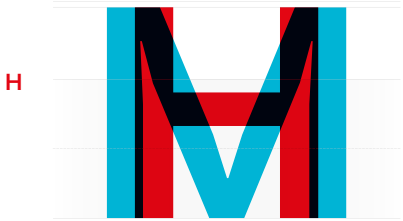
Learn More

[1]
Karen Cheng
Designing Type
(2020, p. 118–119)

[2]
Tom Perkins
The Art of Letter Carving
in Stone
(2024, p. 71)

[3]
Timothy Samara
Letterforms: Typeface Design
from Past to Future
(2018, p. 102–105)

[4]
Edward Johnston
Writing & Illuminating & Lettering
(2023, p. 284–285)



Relative Proportions

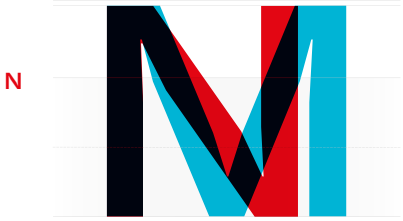
The **M** is wider than the **H**. Its vertical stems may be slightly thinner than those of the **H** to help balance the overall weight of the letter.



The **M** is wider than the **O**.



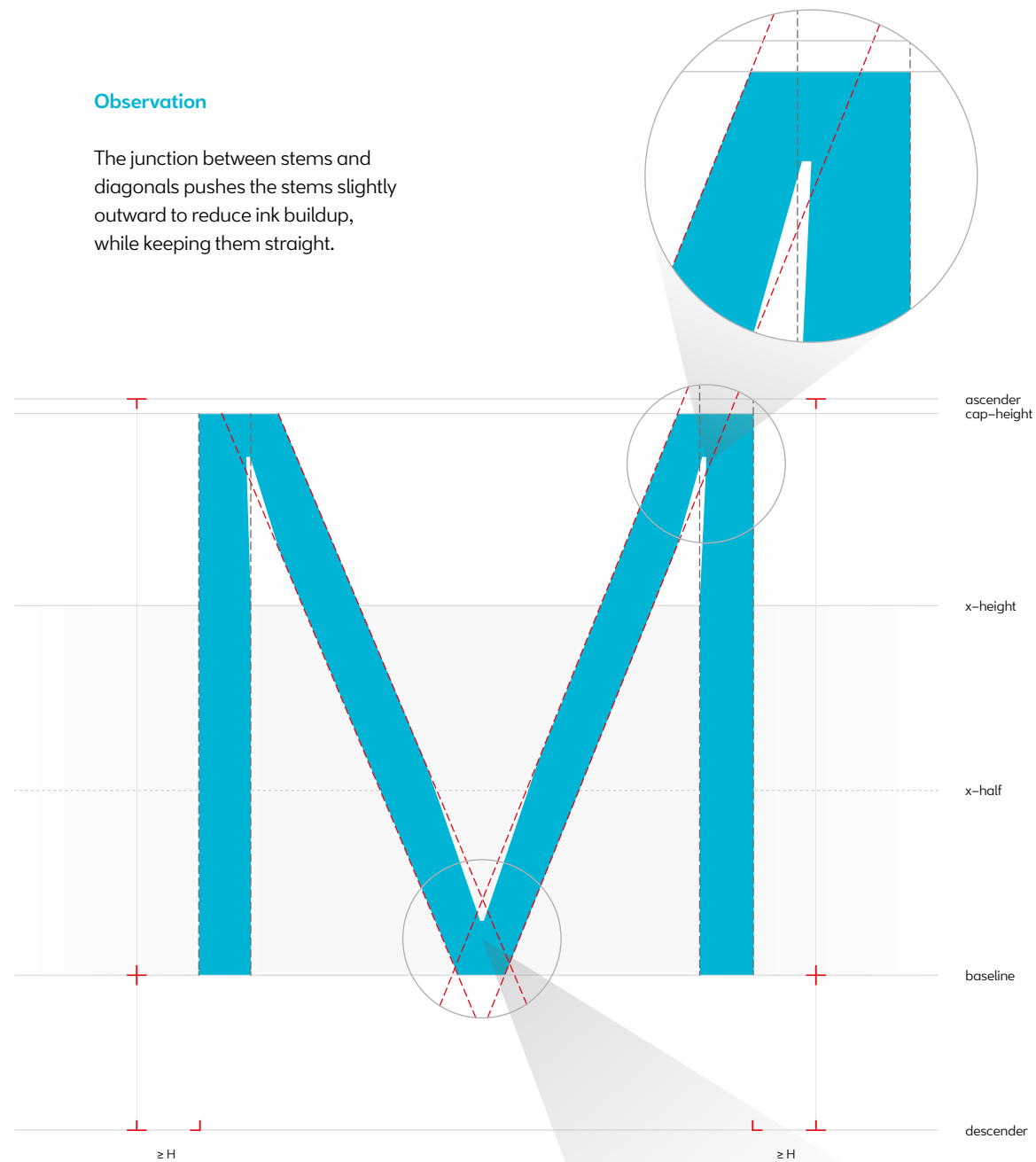
The **M** and **V** share similar diagonal strokes. The vertex of the **M** may be slightly smaller than the **V**'s.



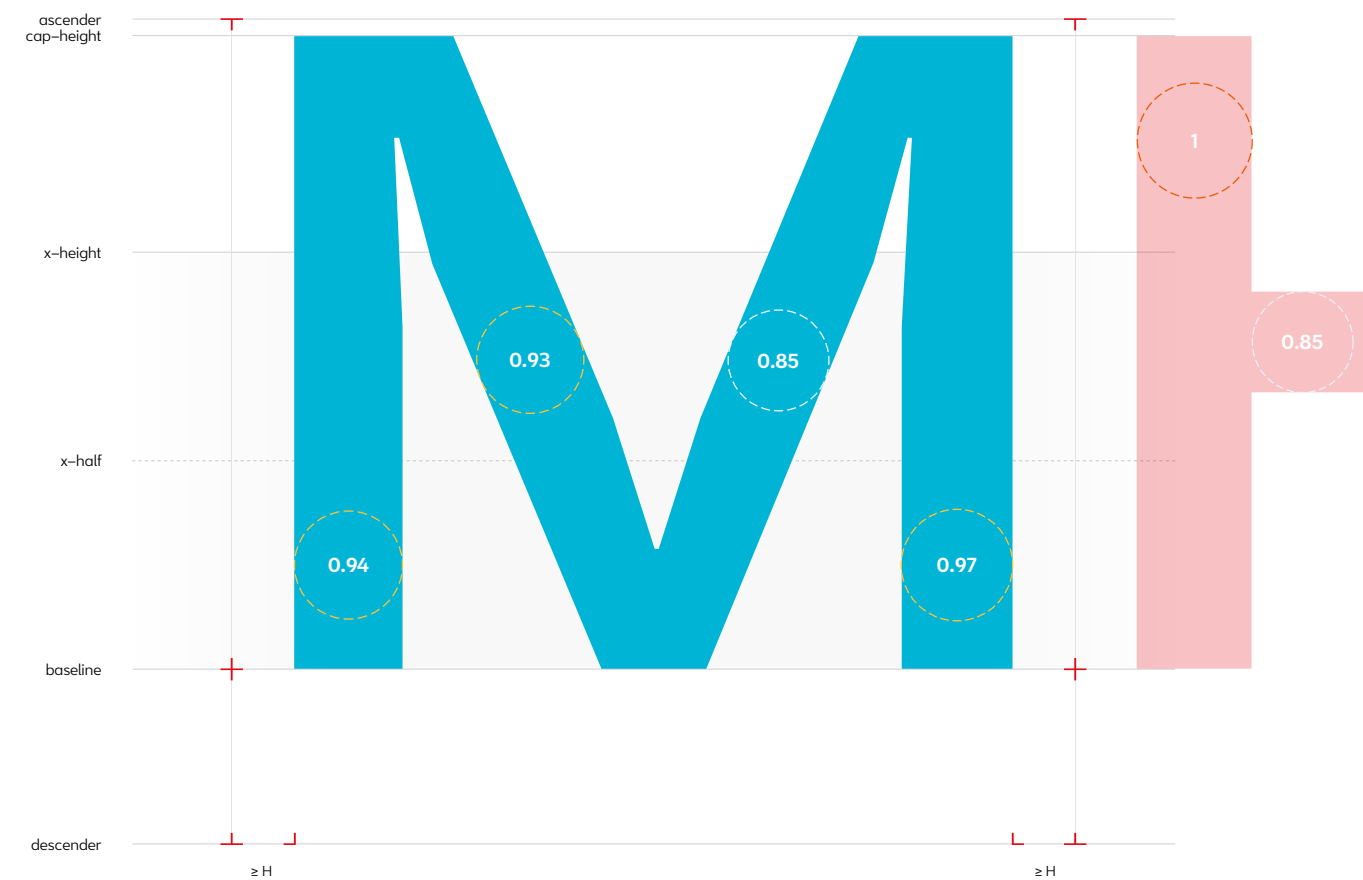
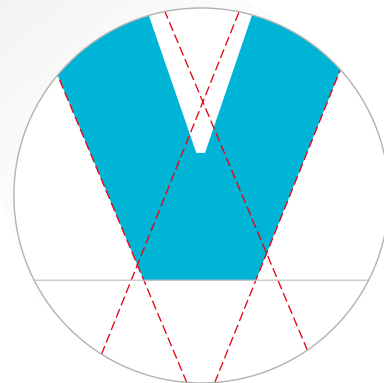
The **M** and **N** share similar stem weights.

Observation

The junction between stems and diagonals pushes the stems slightly outward to reduce ink buildup, while keeping them straight.

**Observation**

The vertex of the **M** may be slightly smaller than the **V**'s.

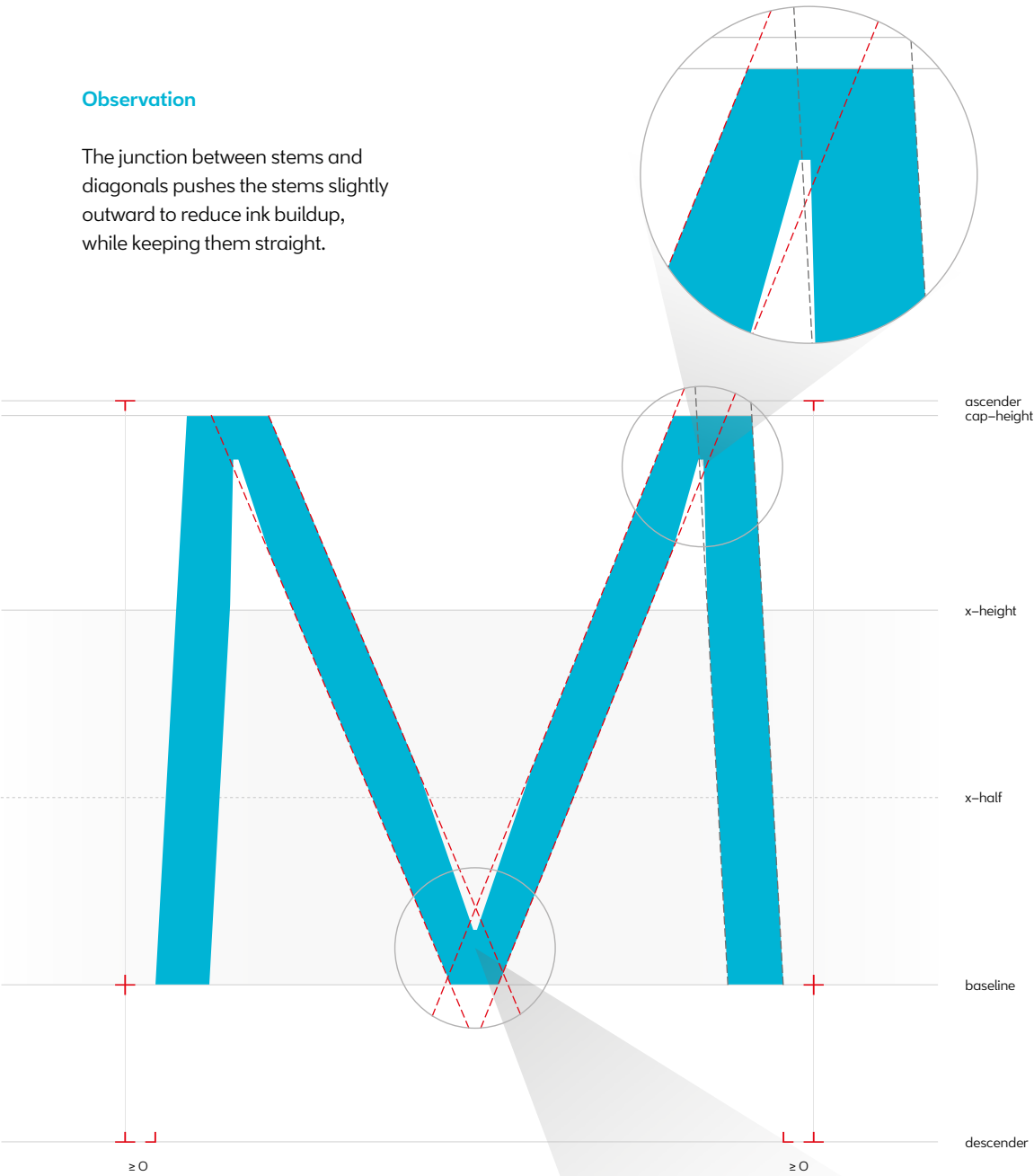
**Observation**

The arms may be slightly thinner than the stem of the **H**, and the diagonals follow the same weight logic as the **V**.

The junctions may feature ink traps.

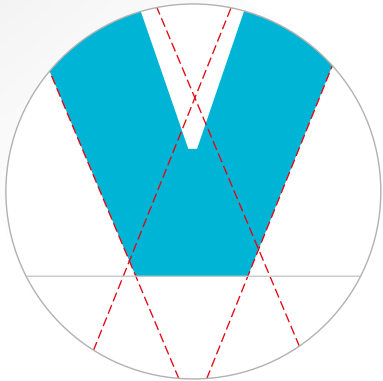
Observation

The junction between stems and diagonals pushes the stems slightly outward to reduce ink buildup, while keeping them straight.



Observation

The vertex of the **M** may be slightly smaller than the **V**'s.



ALT

M

Glyph

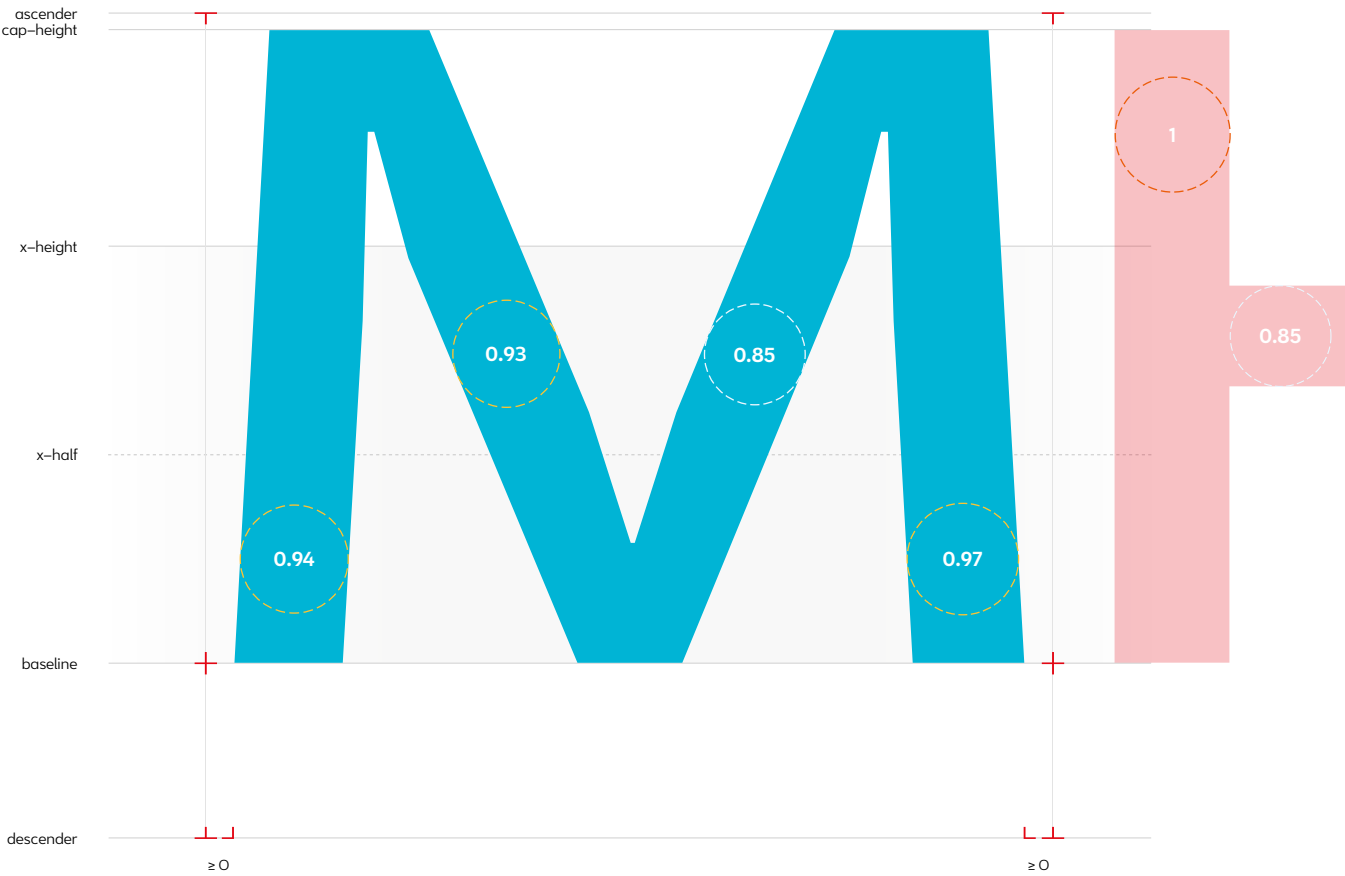
M.alt

Unicode

U+004D

Weight

(400) Regular



Observation

The arms may be slightly thinner than the stem of the **H**, and the diagonals follow the same weight logic as the **V**.

The junctions may feature ink traps.

ALT

M

Glyph

M.alt

Unicode

U+004D

Weight

(800) Bold

NN

The **N** consists of three strokes (1 |) (2 \) (3 |), two vertical arms and one diagonal downward stroke. The weight is often distributed as follows: the diagonal (2 \) is the heaviest, ^[1] the left arm (1 |) the lightest, and the right arm (3 |) falls in between. This helps balance the character’s weight and prevents the center from appearing too light. ^[2]

As with the **M**, the left counter is more open to create breathing space, otherwise, if both counters are equal, the left side may appear slightly more compressed due to its structure. ^[3]

The upper junction often appears slightly heavier than the lower one. ^[4] This is achieved by starting the diagonal slightly inward from the left arm and letting it end slightly inside the right arm. ^[5] The junctions may include ink traps to help with ink management.

Learn More

[1]
Timothy Samara
Letterforms: Typeface Design
from Past to Future
(2018, p. 102–105)

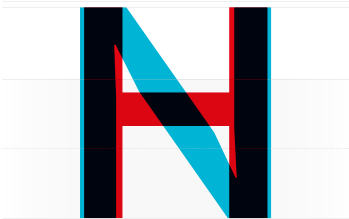
[2]
Tom Perkins
The Art of Letter Carving
in Stone
(2024, p. 67)

[3]
Gerrit Noordzij
The Stroke Theory of Writing
(2021, p. 35–40)

[4]
Karen Cheng
Designing Type
(2020, p. 120–121)

[5]
Edward Johnston
Writing & Illuminating & Lettering
(2023, p. 285)

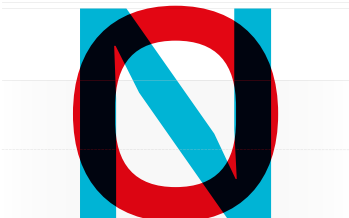
H



Relative Proportions

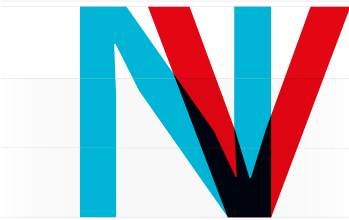
The **N** is slightly wider than the **H**.

O



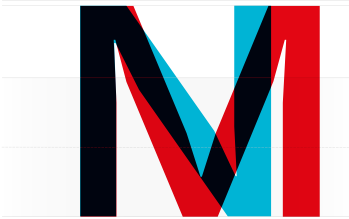
The **N** is slightly narrower than the **O**.

V

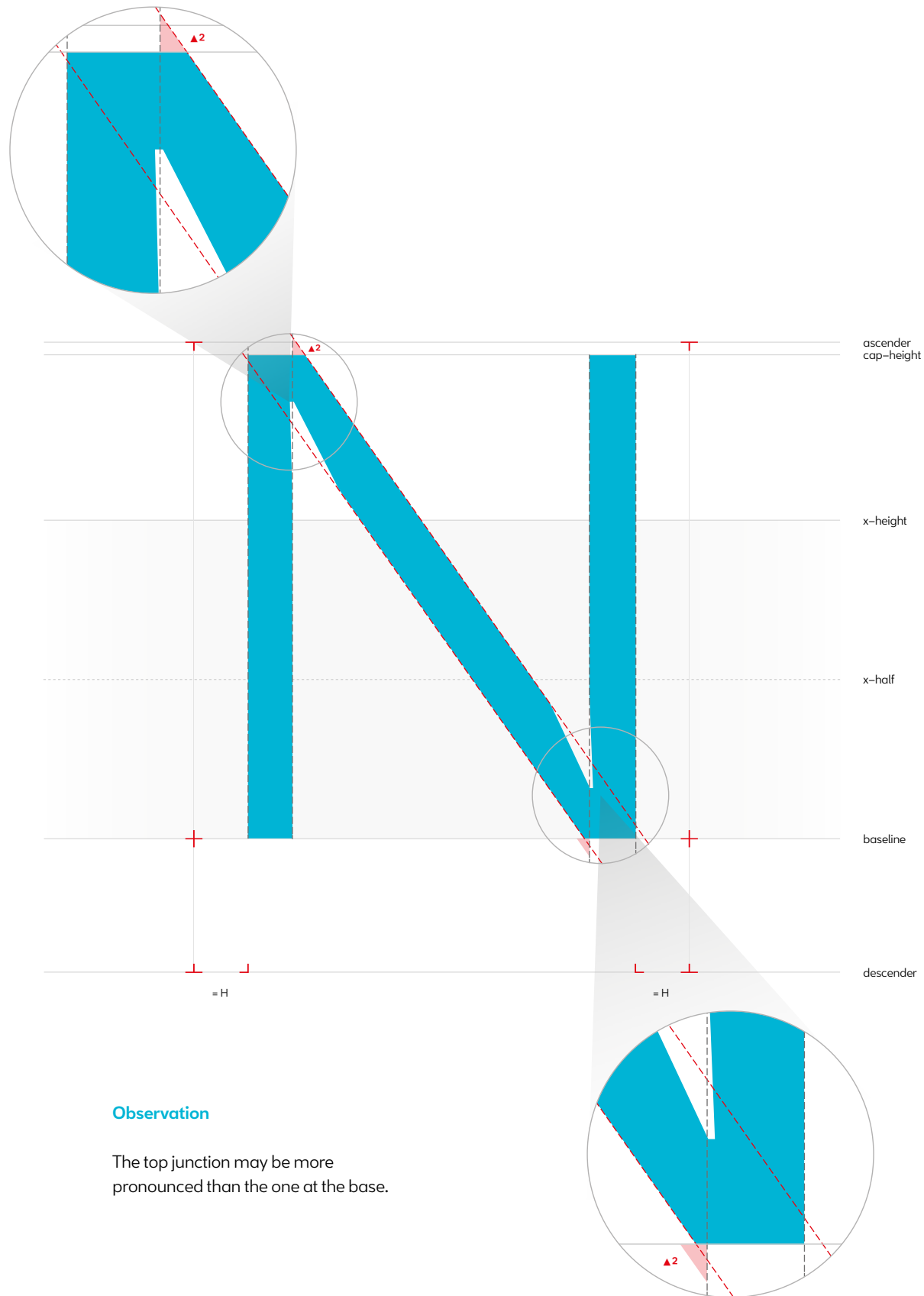


The **N** has a open diagonal angle than the **V** to provide more width and avoid compressing the counters.

M

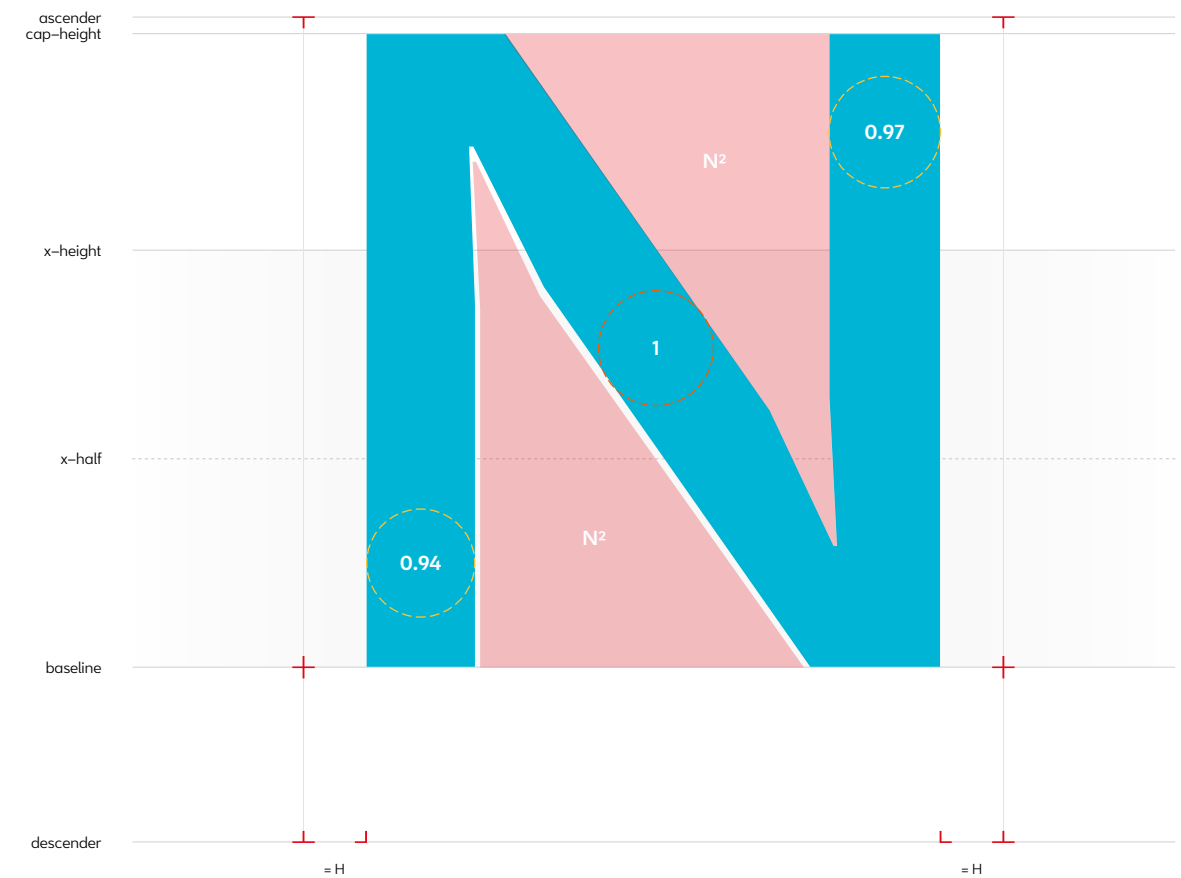


The **N** and **M** share many construction principles. Their arms may have similar weight — both lighter than the **H**’s stem — with the left arm lighter than the right one.



Observation

The top counter of the **N** is narrower than the bottom one.



Observation

The arms may be slightly thinner than the **H**'s stem, with the diagonal being the heaviest stroke.

The junctions may feature ink traps.



The **O** glyph is considered a control letter and one of the first to be drawn. It is the most rounded form of the base characters, and its measurements will be shared or serve as the basis for others.^[1]

It is also slightly wider than the **H**, which helps balance its round shape and contributes to the overall visual harmony of the typeface. Its eye is not a perfect circle or oval; it has visual compensation in the curves to provide more space to the counter, which have a enclosed bowl and may appear more cramped than it is.

The **O**, in this case classified as Sans Serif, typically has a vertical axis,^[2] resulting in a symmetrical form. The axis may also influence the contrast, which is reduced in this style.^[3]

Optical compensation^[4] is necessary to ensure that the curves appear to have the same stroke as the vertical and horizontal stems. The vertical bowl will appear smaller if the same measurements are used as for straight forms, for example.^[5] To compensate for this, it is necessary to extend the stress by approximately 3% to 5% on each side, with the vertical bowl following the stem’s base metrics and the horizontal arcs following the horizontal lines.^[6]

Overshoot is needed to adjust the verticality of the curves in relation to straighter glyphs. This adjustment can range from 7 to 14 units, which is usually sufficient, but these are only guidelines. The best approach is to compare the glyph next to a straighter letter and visually check if more or less is needed.^[7]

Learn More

[1]
Cristóbal Henestrosa;
Laura Meseguer;
José Scaglione
How to create typefaces, from sketch to screen (2017, p. 42–48)

[2]
Google
Axis (in type design) (2025)
https://fonts.google.com/knowledge/glossary/axis_in_type_design

[3]
Gerrit Noordzij
The Stroke Theory of Writing (2021, p. 35–40, 75–78)

[4]
Chris Campe;
Ulrike Rausch
Designing Fonts: An Introduction to Professional Type Design (2020, p. 49–53)

[5]
Timothy Samara
Letterforms: Typeface Design from Past to Future (2018, p. 87)

[6]
Karen Cheng
Designing Type (2020, p. 44–45)

[7]
Microsoft
Round Overshoot Values Rule (2025)
<https://learn.microsoft.com/en-us/typography/develop/character-design-standards/uppercase>



Relative Proportions

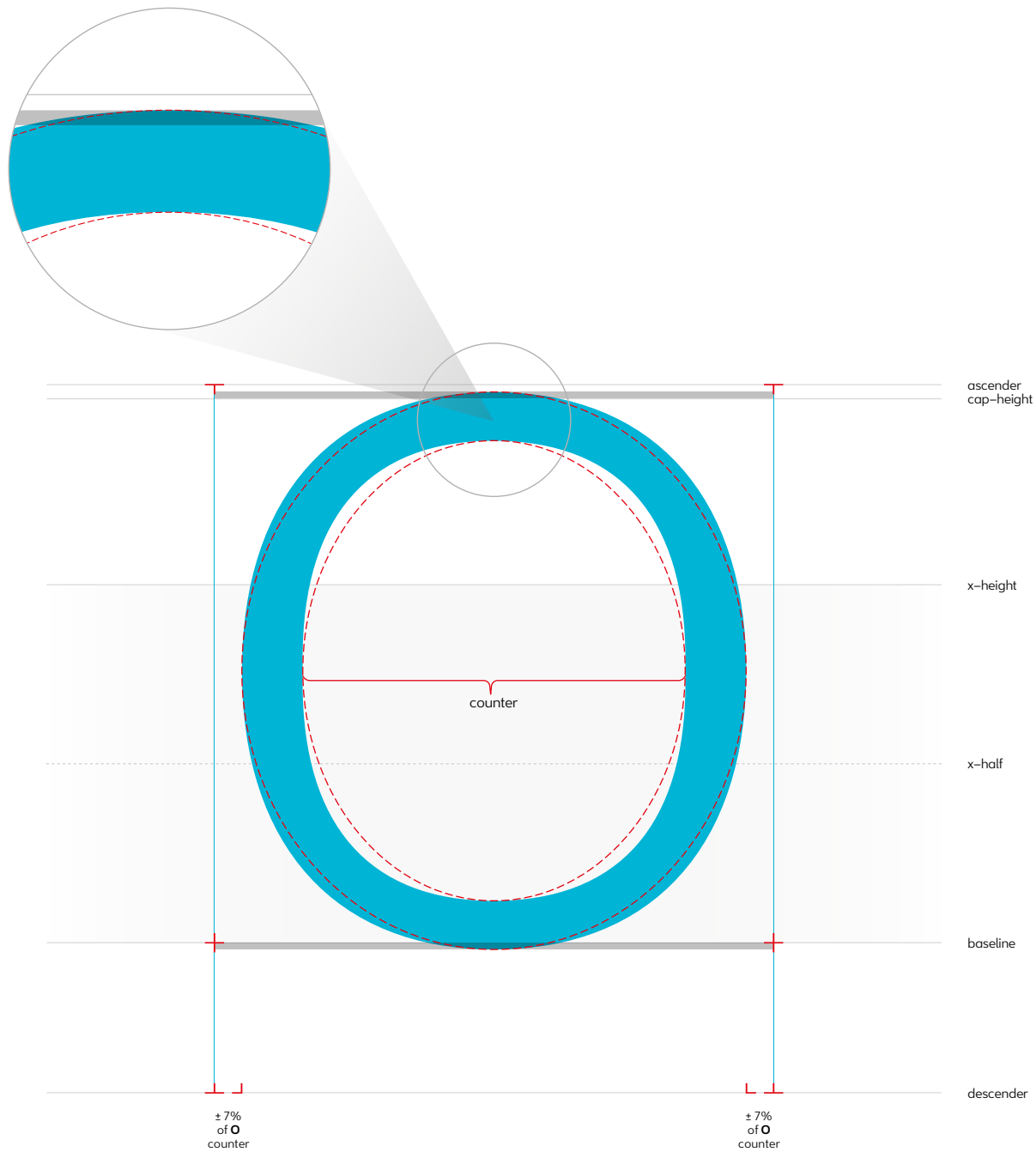
The **O** is slightly wider than the **H**, helping to establish a more balanced rhythm in the typeface.

The **O** should be larger than the **C**, which is the basic guideline. For legibility, a more open aperture in the **C** can be adjusted by extending the terminals outwards. If the aperture is smaller, compensation is made inward to reduce the similarity with the **O**’s bowl.

The bottom of the **G** stroke has a flatter base to balance the crossbar and create more openness in the counter. Its top terminal is similar to the **C**, but slightly more open for a wider aperture.

The **O** is wider than the **D**. Although their ductus is more or less similar, the **D**’s bottom curves are more squared compared to the **O**.

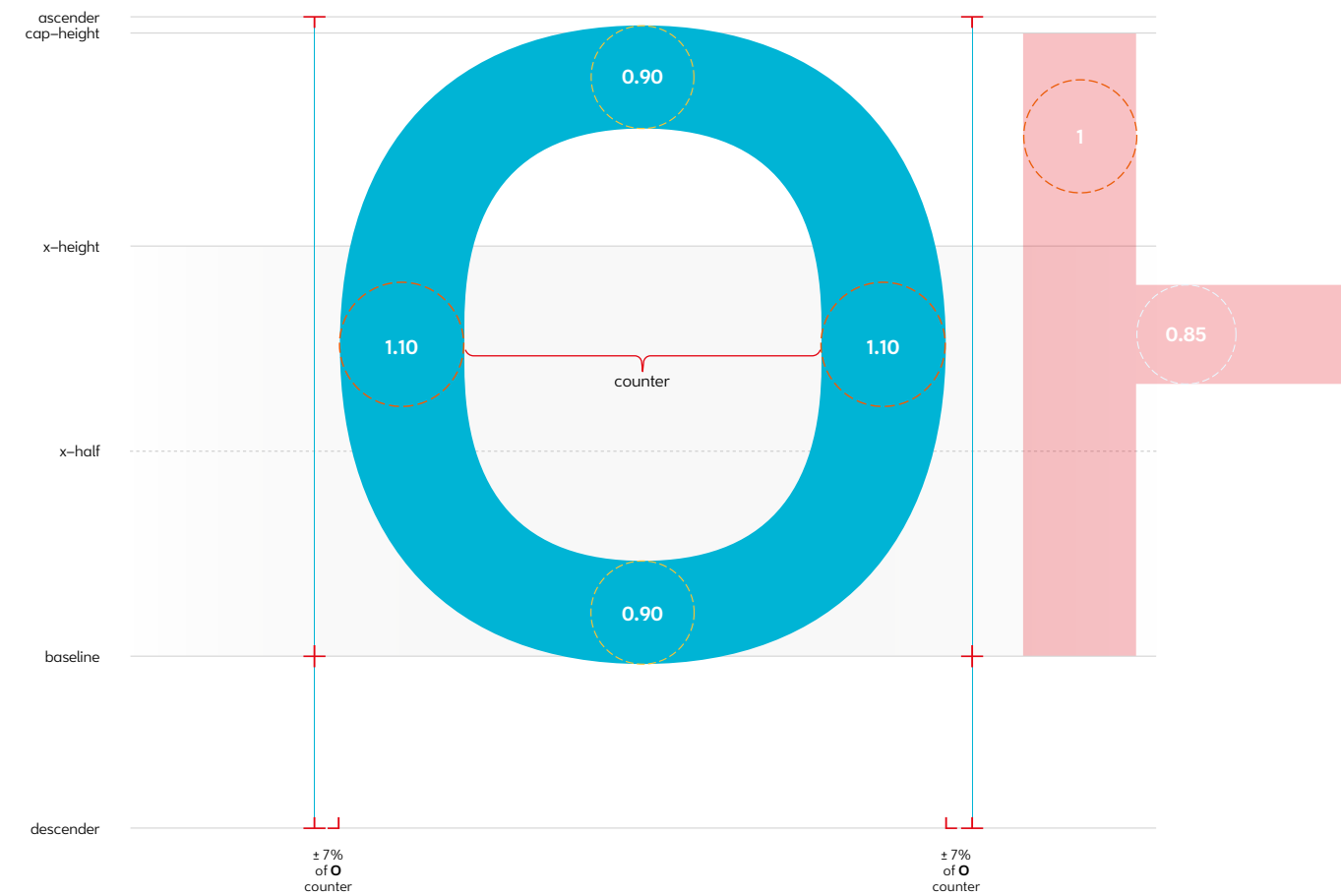




Observation

The overshoot goes beyond the cap height and may also fall below the ascender line.

The **O** is not geometrically perfect; it has slightly squarish shoulders.



Observation

The bowl is larger than the stems in the **H**, and the arc is larger than its crossbar.

PP

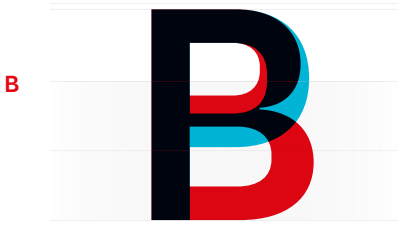
The **P** is derived from the **B** by removing the bottom bowl. Its upper bowl is slightly lower than the bowl of the **B** and **R**, making its middle stroke lower.^[1]

Since the **P** has negative space at its base, adjustment helps balance it.^[2] This optical refinement maintains overall harmony within the typeface and stabilizes the glyph.^[3]

The **P** is usually slightly narrower than the **B** and slightly wider than the **E**. The stem follows the weight of the **H**, while the bowl maintains the weight relationship of the **O**.^[4]

Learn More

- [1] Tom Perkins
The Art of Letter Carving in Stone
(2024, p. 70)
- [2] Edward Johnston
Writing & Illuminating & Lettering
(2023, p. 285)
- [3] Cristóbal Henestroza; Laura Meseguer; José Scaglione
How to create typefaces, from sketch to screen
(2017, p. 70)
- [4] Karen Cheng
Designing Type
(2020, p. 92–95)



Relative Proportions

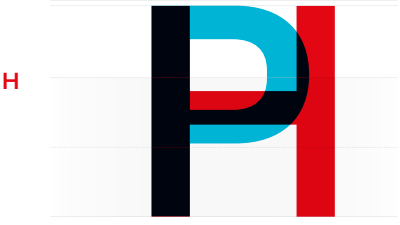
The **P** is derived from the **B** by removing the bottom bowl. It is usually narrower, and its bowl is positioned lower than the **B**'s smaller bowl.



The **P** and **R** share the same stem, and the bowl in the **P** is positioned lower.



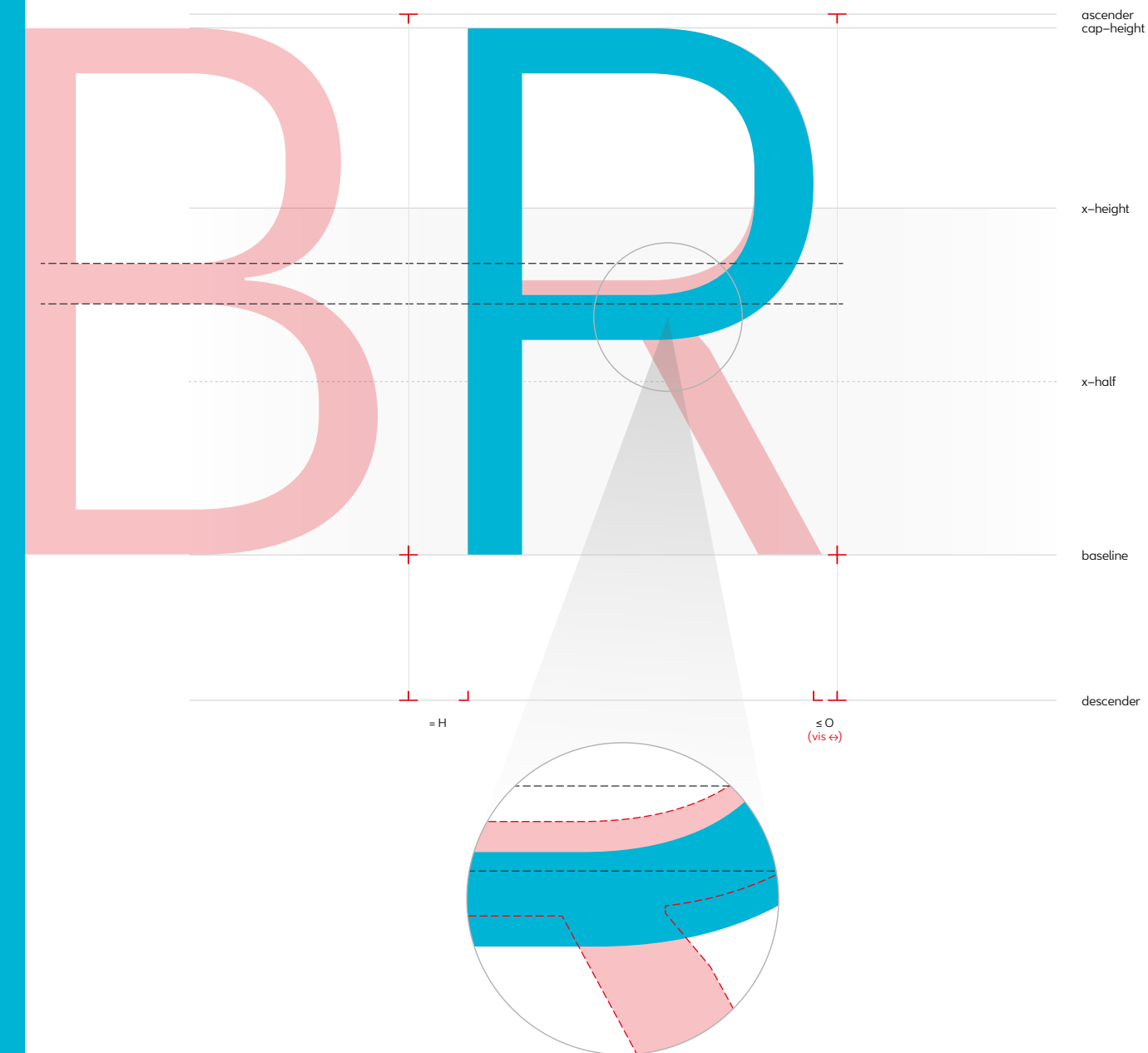
The **P** is wider than the **F**. The arm of the **F** is positioned higher than the middle stroke of the **P**.



The **P** is narrower than the **H**. The two share the same stem weight.

Observation

The **P**'s bowl sits lower than in the **B** and **R**.



P

Glyph

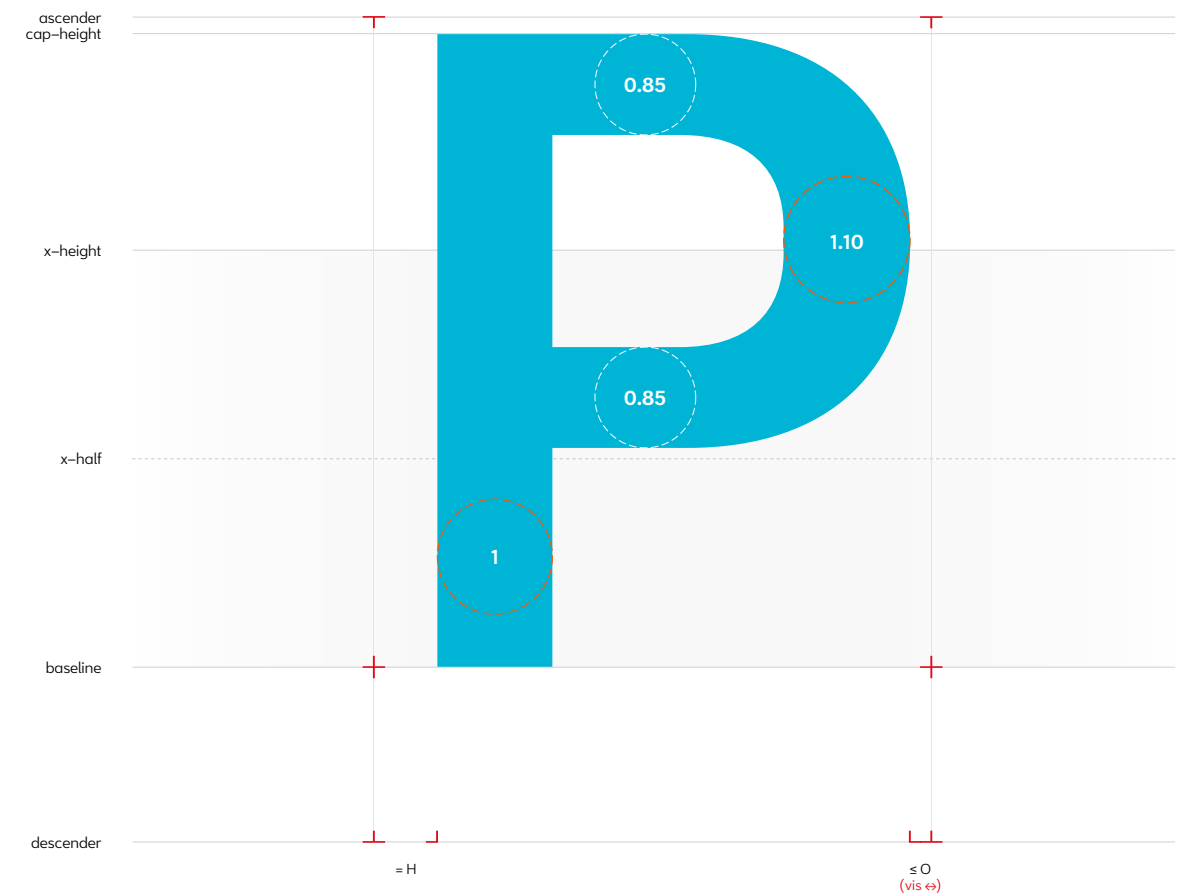
P

Unicode

U+0050

Weight

(400) Regular



Observation

The stem and horizontal strokes match the weight of the **H**.

The bowl has a similar weight to the **O**.

Glyph

P

Unicode

U+0050

Weight

(800) Bold

P



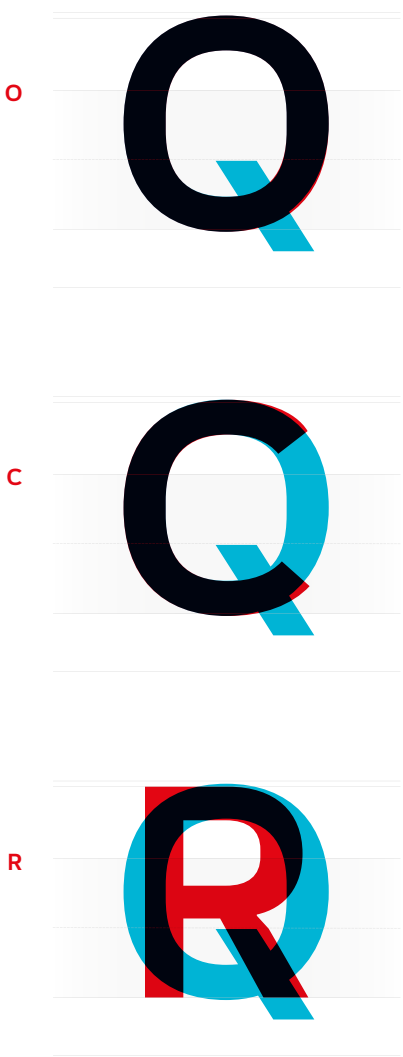
To draw the **Q**, the **O** can be used as a base with the addition of a tail in the bottom part.

The tail can be designed in various ways depending on the intended style.^[1] The most common approach is to match the personality of the **R**'s leg, with the **R**'s angle being slightly more vertical than the **Q**'s, which is more diagonal.^[2] It's important to consider the letters that follow the **Q**, as the chosen tail style may affect spacing. If the tail is very pronounced, adjusting the kerning with the glyphs to its right is essential.

The tail may intersect the counter, touch the baseline,^[3] or remain detached. If it crosses into the counter, a recommended adjustment is to slightly reduce the weight or ductus of the right-side curve to maintain balance.

Learn More

- [1] Karen Cheng
Designing Type
(2020, p. 96–99)
- [2] Timothy Samara
Letterforms: Typeface Design
from Past to Future
(2018, p. 106–107)
- [3] Tom Perkins
The Art of Letter Carving
in Stone
(2024, p. 69)



Relative Proportions

To maintain visual balance, the right side of the **O**'s base shape is slightly reduced in weight when used in the **Q**.

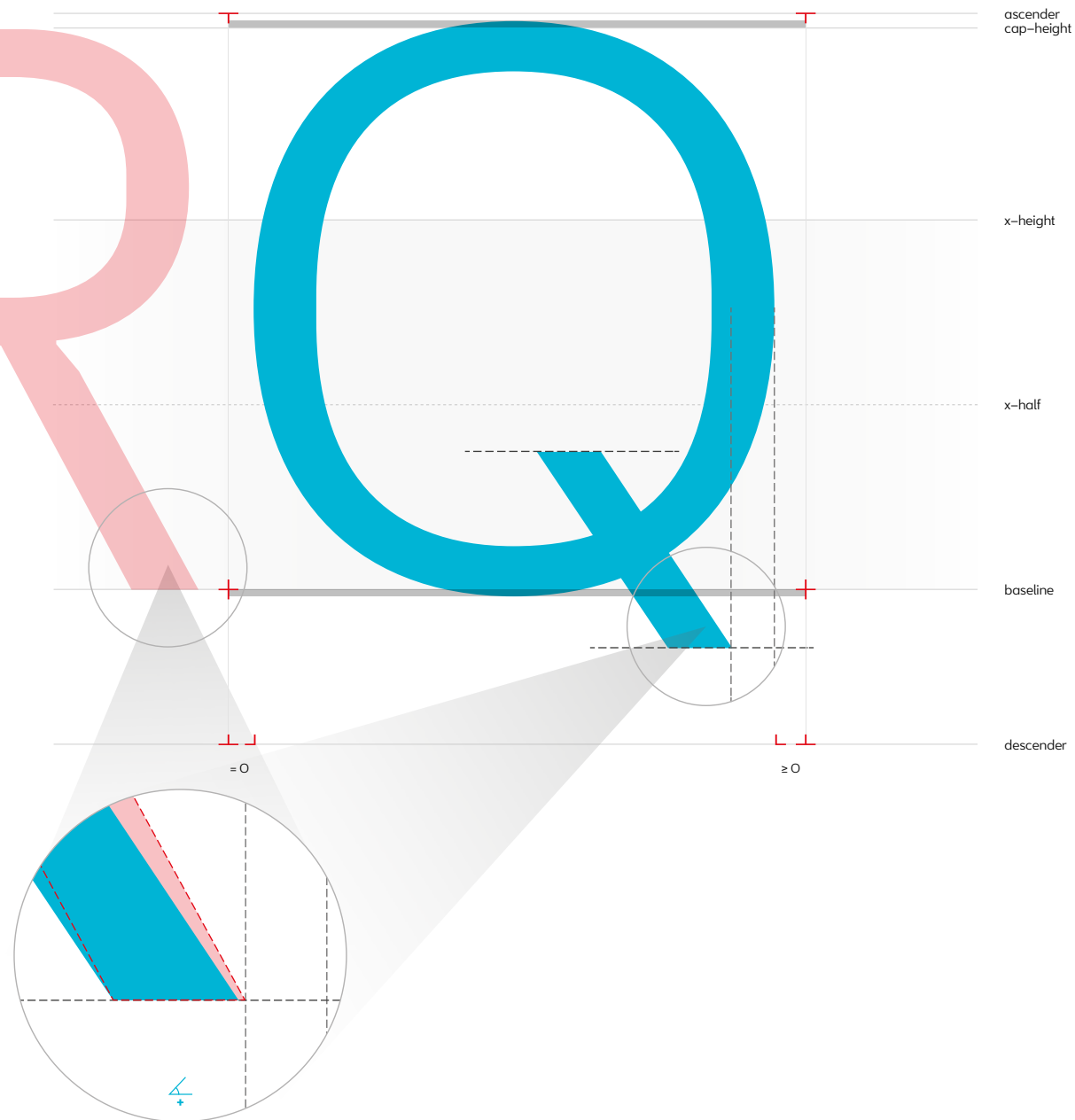
The **Q** and **C** share similar characteristics to the **O** and **C**, with the **C** featuring an aperture.

The axis of the **R**'s leg may be slightly less angled than the tail of the **Q**.

Observation

Depending on the design, the end of the tail may sit slightly further inward than the end of the **O** shaped base.

The tail can resemble the **R**'s leg, but it has a steeper angle.



Q

Glyph

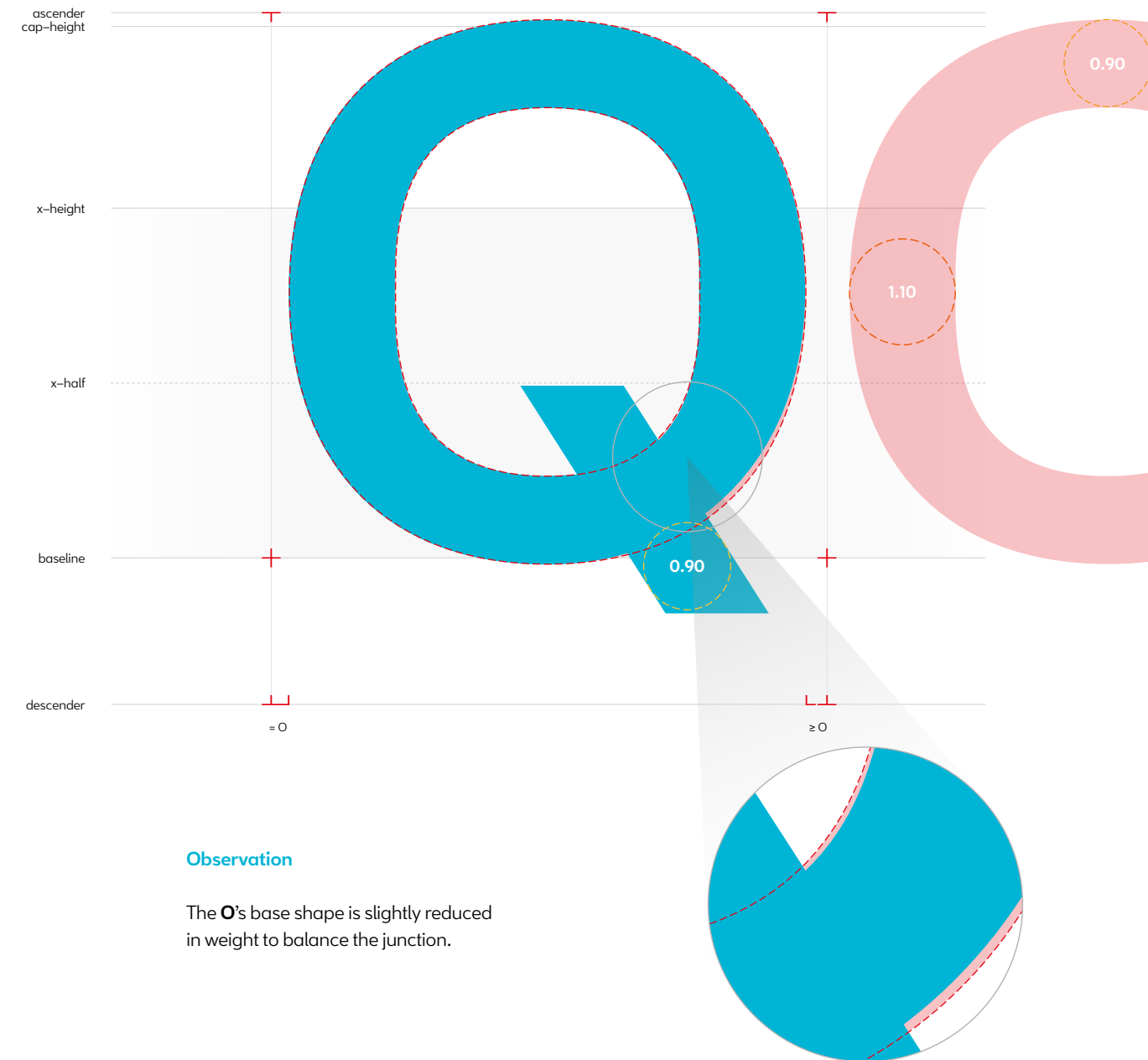
Q

Unicode

U+0051

Weight

(400) Regular



Observation

The **O**'s base shape is slightly reduced in weight to balance the junction.

Glyph

Q

Unicode

U+0051

Weight

(800) Bold

Q

RR

The **R** shares the same stem and upper bowl as the **P**, with the addition of a leg.^[1] To accommodate this extension, the upper bowl is often lower than the **B**'s and higher than the **P**'s, positioning the middle stroke between those of the **B** and **P**.^[2] The leg follows a similar logic to the **Q**'s tail but is usually more vertical than the **Q**'s to maintain balance.

The design of the leg can vary depending on the typeface's personality. The more it deviates from the skeleton, the harder it becomes to recognize or identify.^[3] A more diagonal approach gives it stability, while a more curved or extended form adds movement.^[4] Diagonal strokes appear lighter when drawn with the same weight as verticals.^[5] A slight weight increase helps balance the stroke.

The junction between the bowl and the leg may require optical adjustments, such as ink traps or slight tapering to improve clarity and balance. Its proportions also influence the design of related letters like the **K**.^[6]

Learn More

[1]
Tom Perkins
The Art of Letter Carving
in Stone
(2024, p. 70)

[2]
Cristóbal Henestroza;
Laura Meseguer;
José Scaglione
How to create typefaces,
from sketch to screen
(2017, p. 70)

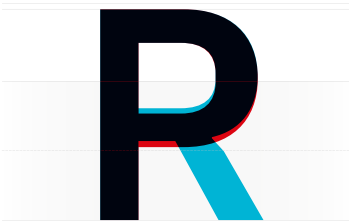
[3]
Sofie Beier
Type Tricks: User Design
(2022, p. 42)

[4]
Karen Cheng
Designing Type
(2020, p. 92–95)

[5]
Timothy Samara
Letterforms: Typeface Design
from Past to Future
(2018, p. 86–91, 150–153)

[6]
Edward Johnston
Writing & Illuminating & Lettering
(2023, p. 286)

P



Relative Proportions

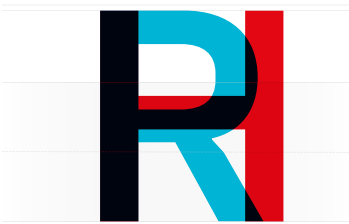
The bowl of the **R** is positioned lower than the bowl of the **P**.

B



The **R** can be derived from the **B** by removing the bottom bowl. Its bowl is positioned lower than the **B**'s.

H



The **R** is narrower than the **H**. The leg tends to extend slightly further than the bowl.

Q

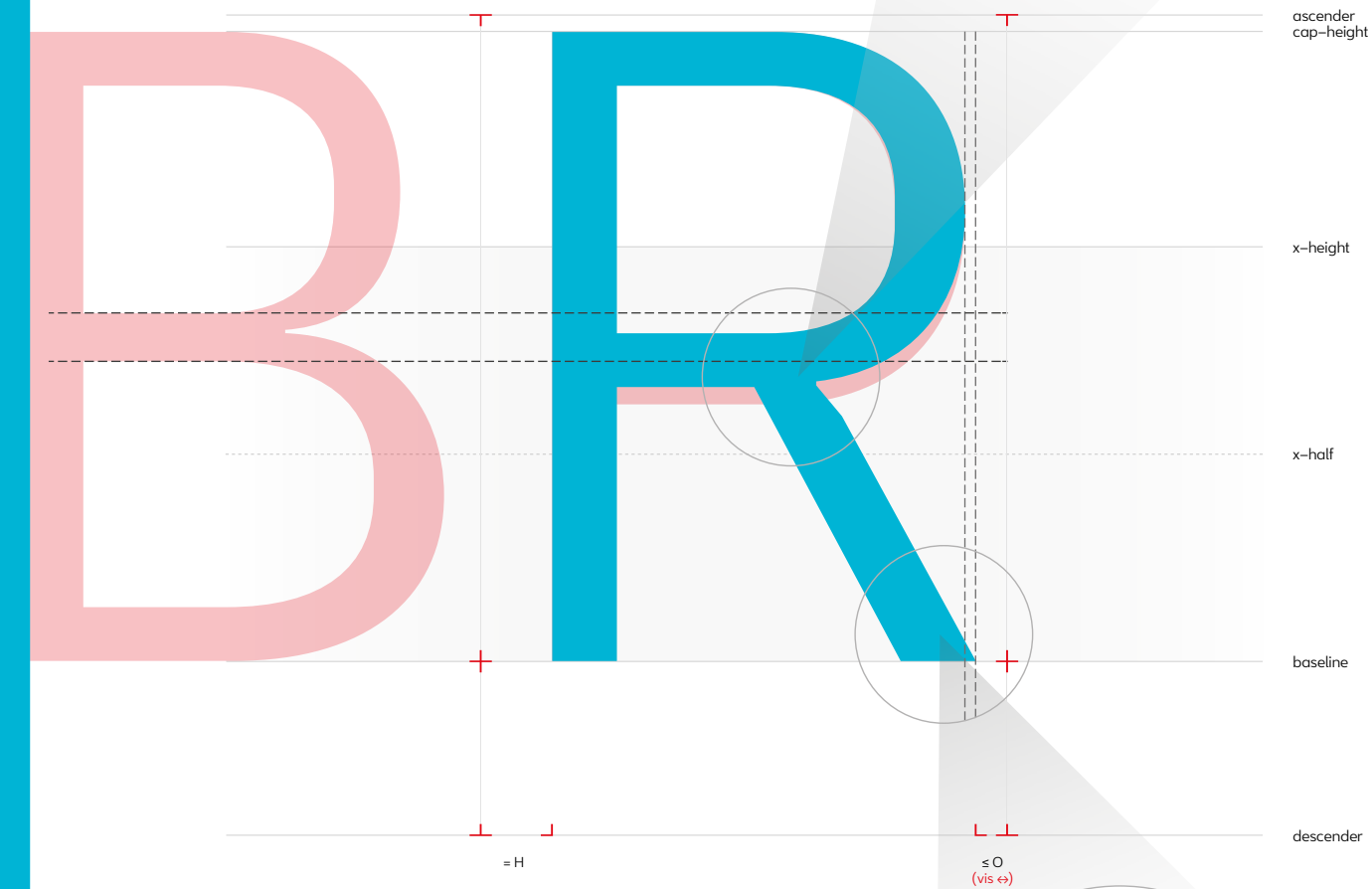
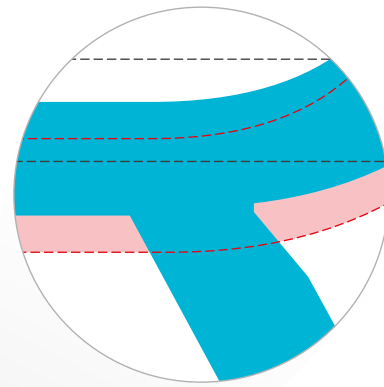


The axis of the **R**'s leg is slightly less angled compared to the tail of the **Q**.

Observation

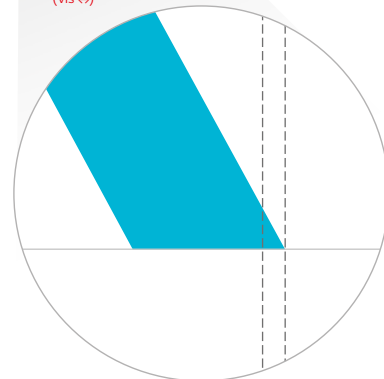
The **R**'s bowl sits between the positions of the **B** and the **P**.

The junction can have a tapering at the top of the leg or include an ink trap.



Observation

The leg of the **R** extends beyond the bowl.



R

Glyph

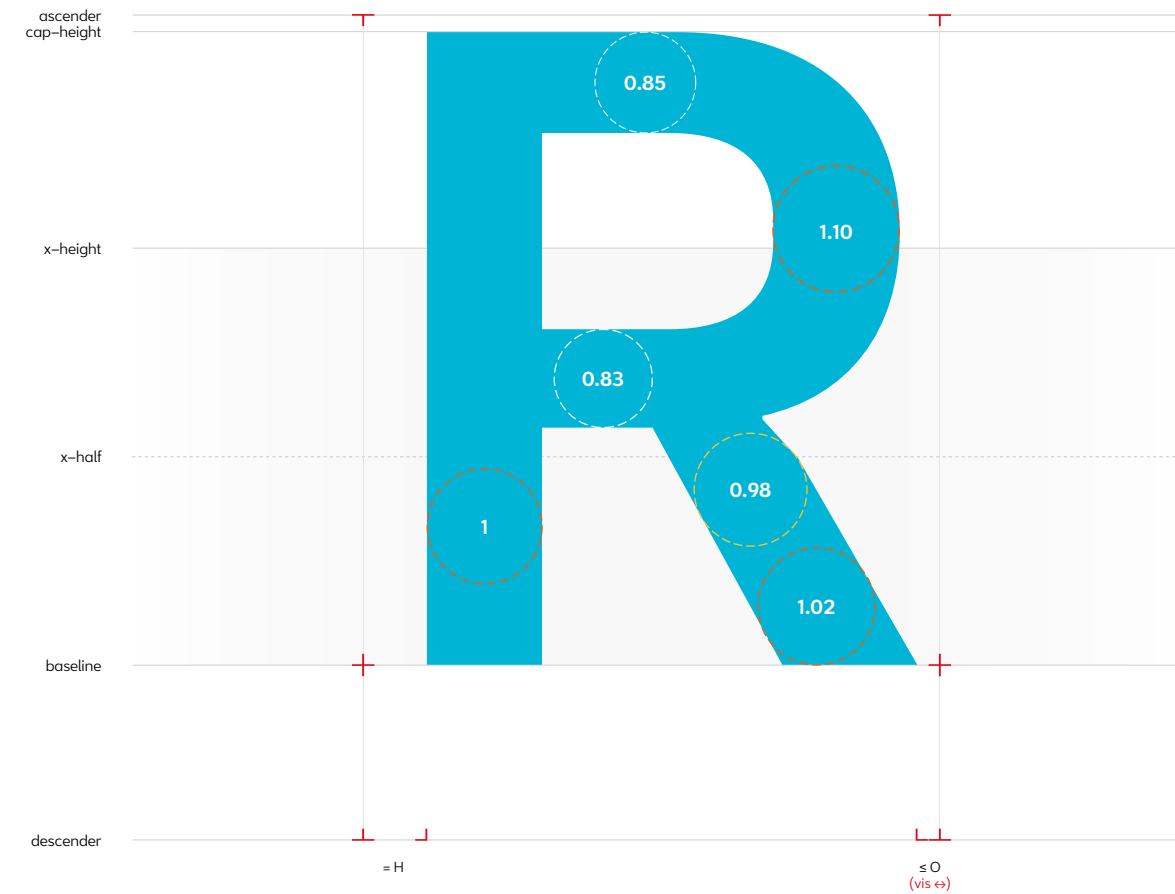
R

Unicode

U+0052

Weight

(400) Regular



Observation

The weight of the **R** is similar to the **P**.
The middle stroke is lighter than the top to help alleviate the junction.

The leg is ever due to its diagonal stroke.

R

Glyph

R

Unicode

U+0052

Weight

(800) Bold

SS

The **S** can be understood as a simplified form made up of two circles with the top one being smaller than the bottom, following a structure similar to the **B**.^[1] Both shapes have openings: one in the top right, and the other in the bottom left. When drawn by hand, the **S** have three main elements: the central curve (called the spine) and the terminals.

To draw a sans serif **S**, the first thing to determine is its width. Typically, it is slightly narrower than the **O**. The narrower the **S**, the more vertical its spine; the wider it is, the more horizontal the spine becomes.^[2]

The **C** can also help define the character’s width, especially since the **S** often shares similar terminal styles. We aim for balance between both characters. Using the **C**’s terminals (top and bottom) as a starting point can help determine the direction and flow of the **S**’s width and spine.^[3]

Just as the character’s width influences the spine’s direction, it also affects its weight. Normally, more narrow the heavier it tends to be. This added structure helps stabilize the form, similar to how we treat the central stroke in the **N**, bringing visual weight to the core of the glyph.^[4]

The curves can match the spine in weight or be slightly lighter to give more fluidity to the ductus. One thing to keep in mind is that the upper counter is smaller than the lower one, and the top width is also narrower than the bottom.

As a curved form, the **S** also requires overshoot to align visually with flat characters.

Learn More

[1]
Tom Perkins
The Art of Letter Carving
in Stone
(2024, p. 71)

[2]
[3]
Karen Cheng
Designing Type
(2020, p. 82–85)

[4]
Timothy Samara
Letterforms: Typeface Design
from Past to Future
(2018, p. 111)

Relative Proportions

The **S** is narrower than the **H**.

H



The **S** is narrower and almost fits within the width of the **O**.

O



The **S** follows the same terminal structure as the **C** and is also narrower.

C



The **SSS** may have a more closed or open aperture depending on the intended style. It should follow the same logic as the used **C**.

S

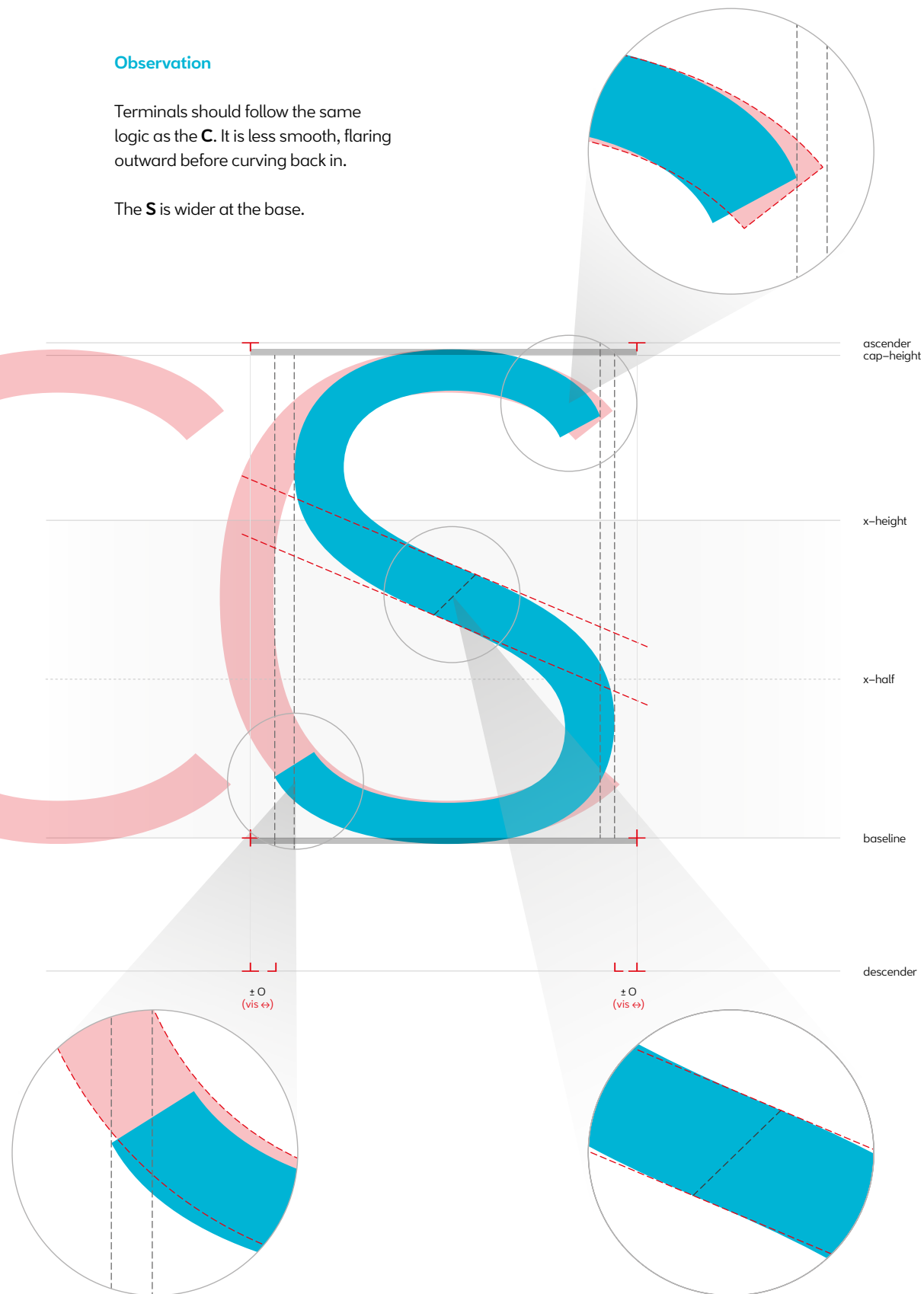
ALT



Observation

Terminals should follow the same logic as the **C**. It is less smooth, flaring outward before curving back in.

The **S** is wider at the base.



S

Glyph

S

Unicode

U+0053

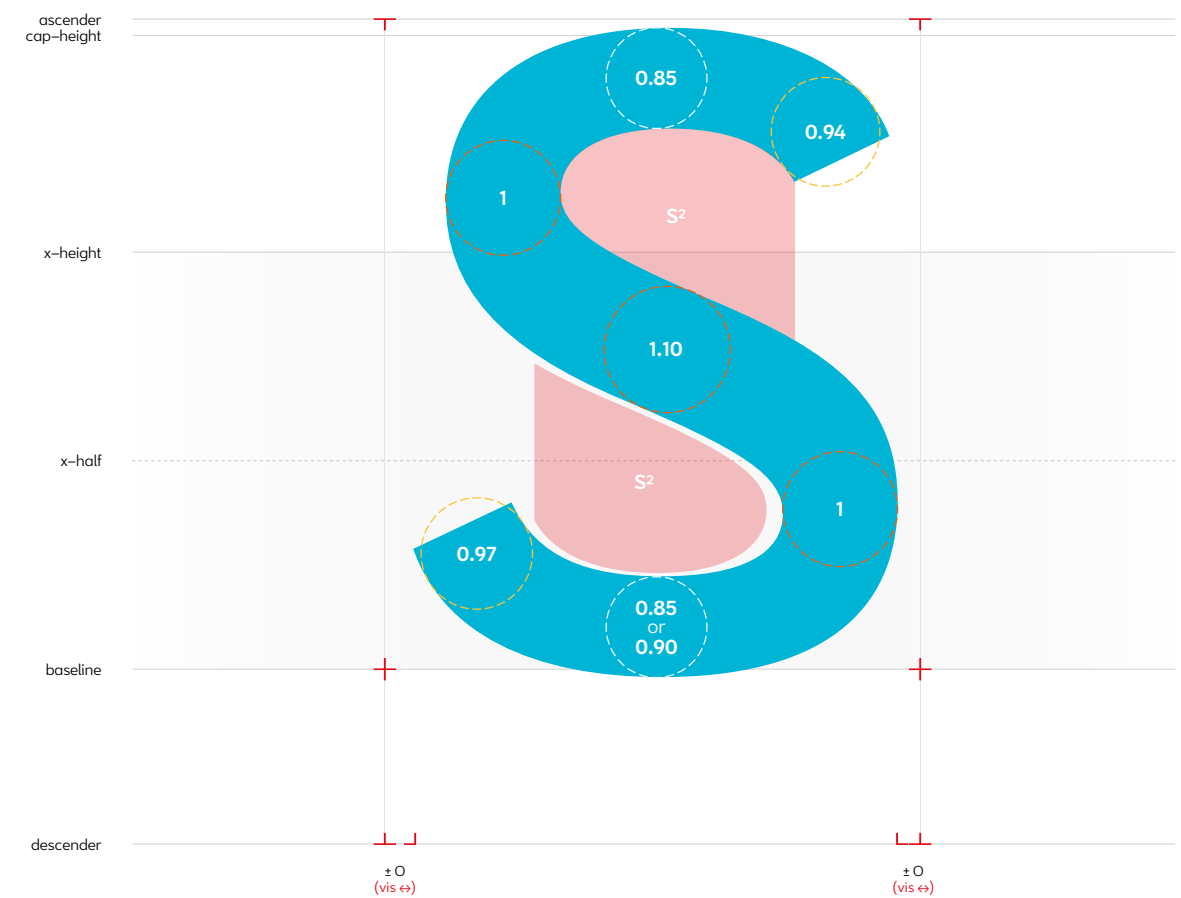
Weight

(400) Regular

Observation

The top curve may be lighter to create more openness in the upper counter.

The bottom counter is wider.

**Observation**

The spine carries most of the weight due to the **S**'s narrow width and can be built with two asymmetrical central nodes.

Glyph

S

Unicode

U+0053

Weight

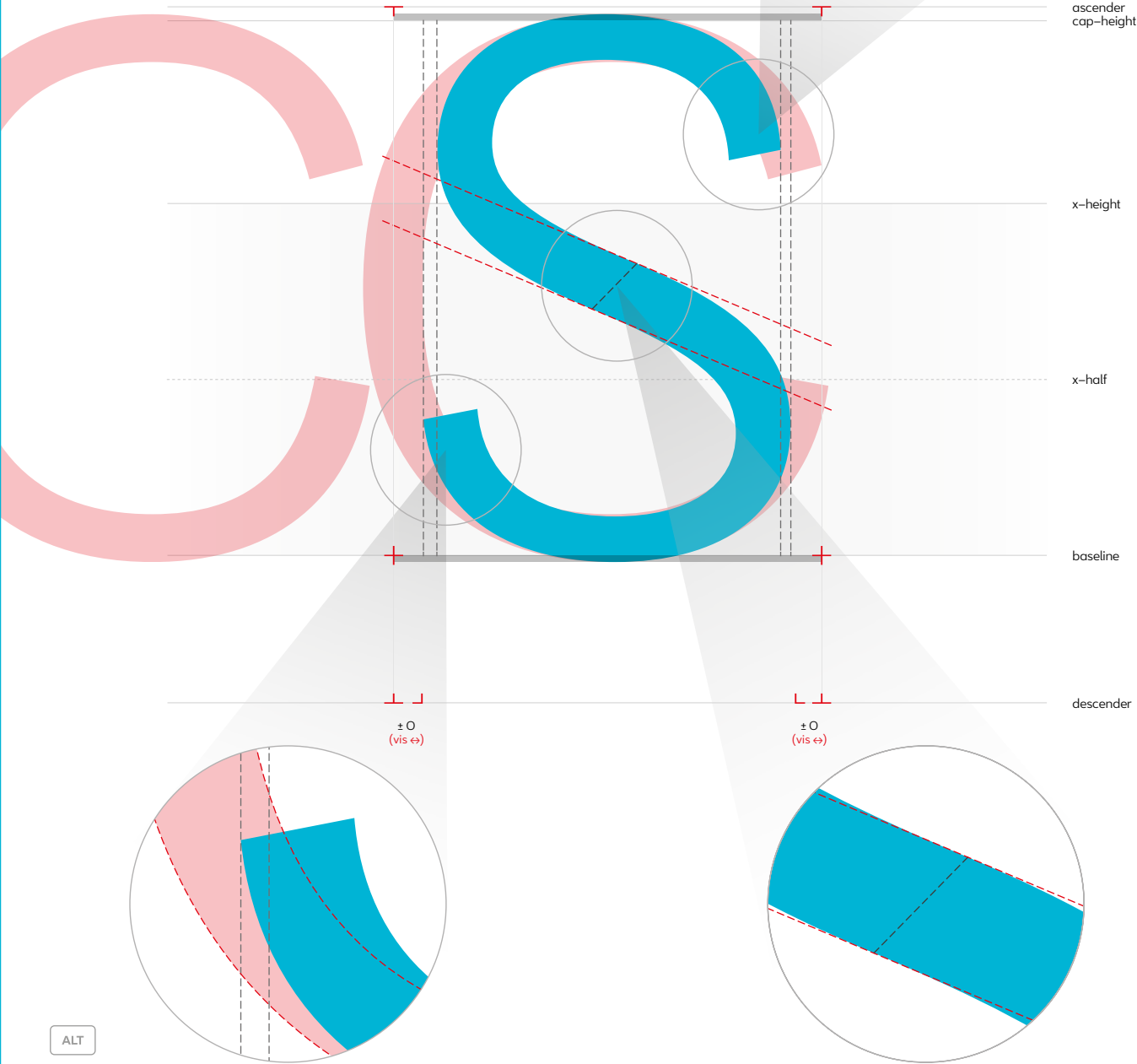
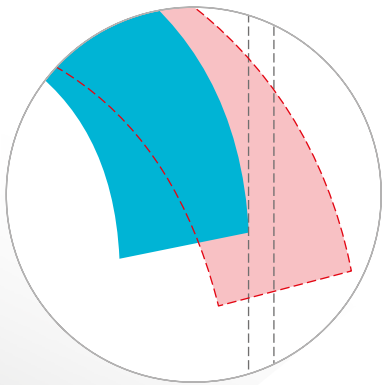
(800) Bold

S

Observation

Terminals should follow the same logic as the **C**. It is less smooth, flaring outward before curving back in.

The **S** is wider at the base.



ALT

S

Glyph

S.alt

Unicode

U+0053

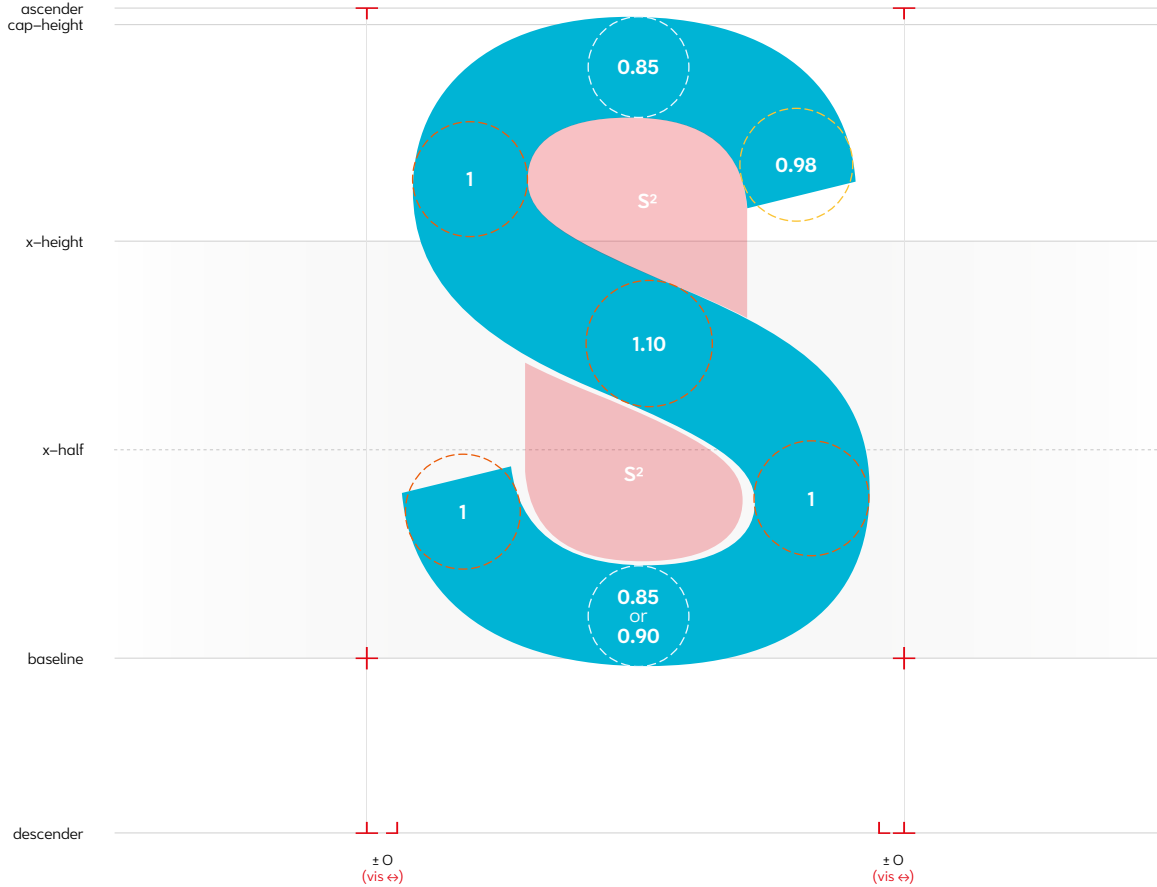
Weight

(400) Regular

Observation

The top curve may be lighter to create more openness in the upper counter.

The bottom counter is wider.



Observation

The spine carries most of the weight due to the **S**'s narrow width and can be built with two asymmetrical central nodes.

ALT

S

Glyph

S.alt

Unicode

U+0053

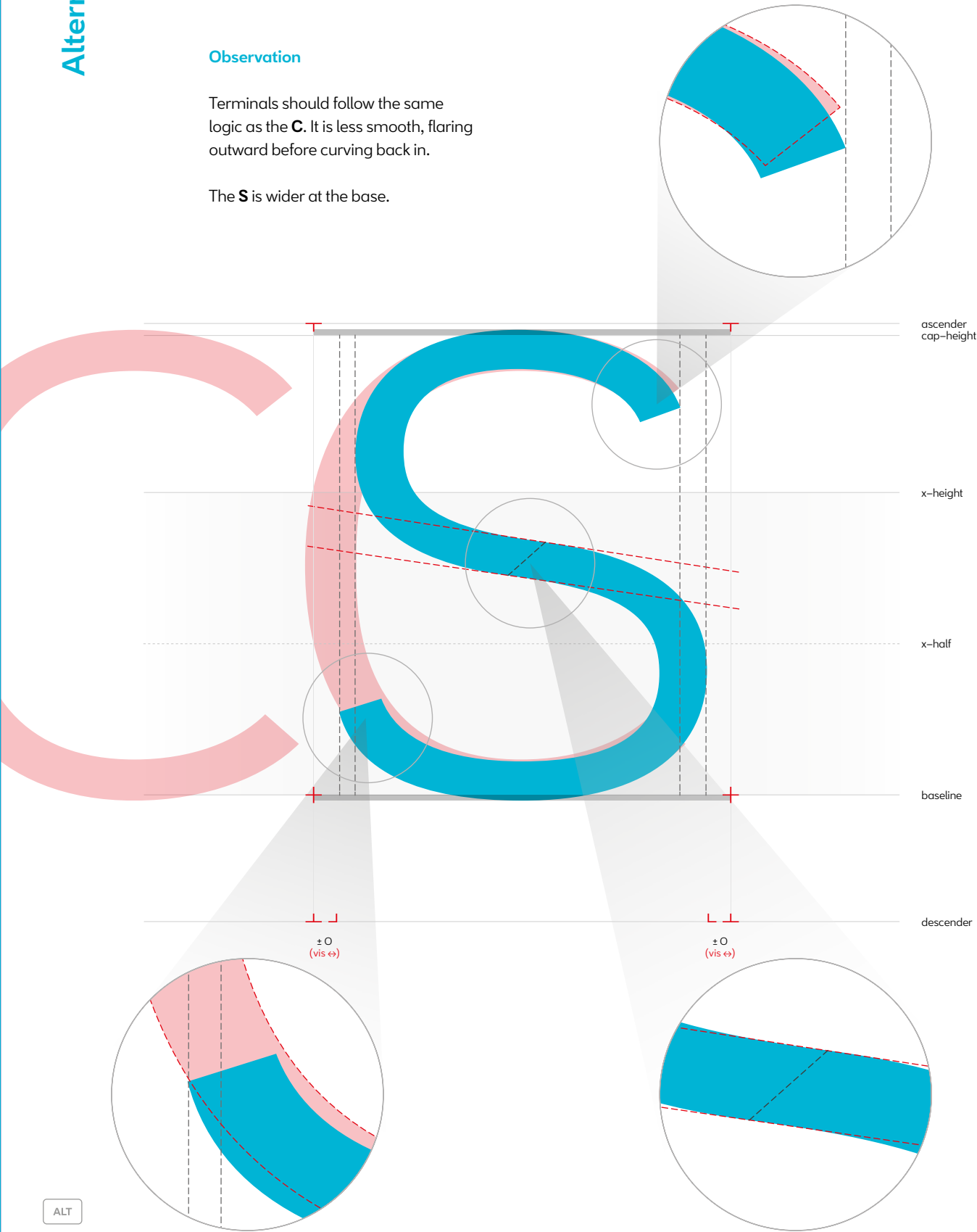
Weight

(800) Bold

Observation

Terminals should follow the same logic as the **C**. It is less smooth, flaring outward before curving back in.

The **S** is wider at the base.



ALT

S

Glyph

S.alt

Unicode

U+0053

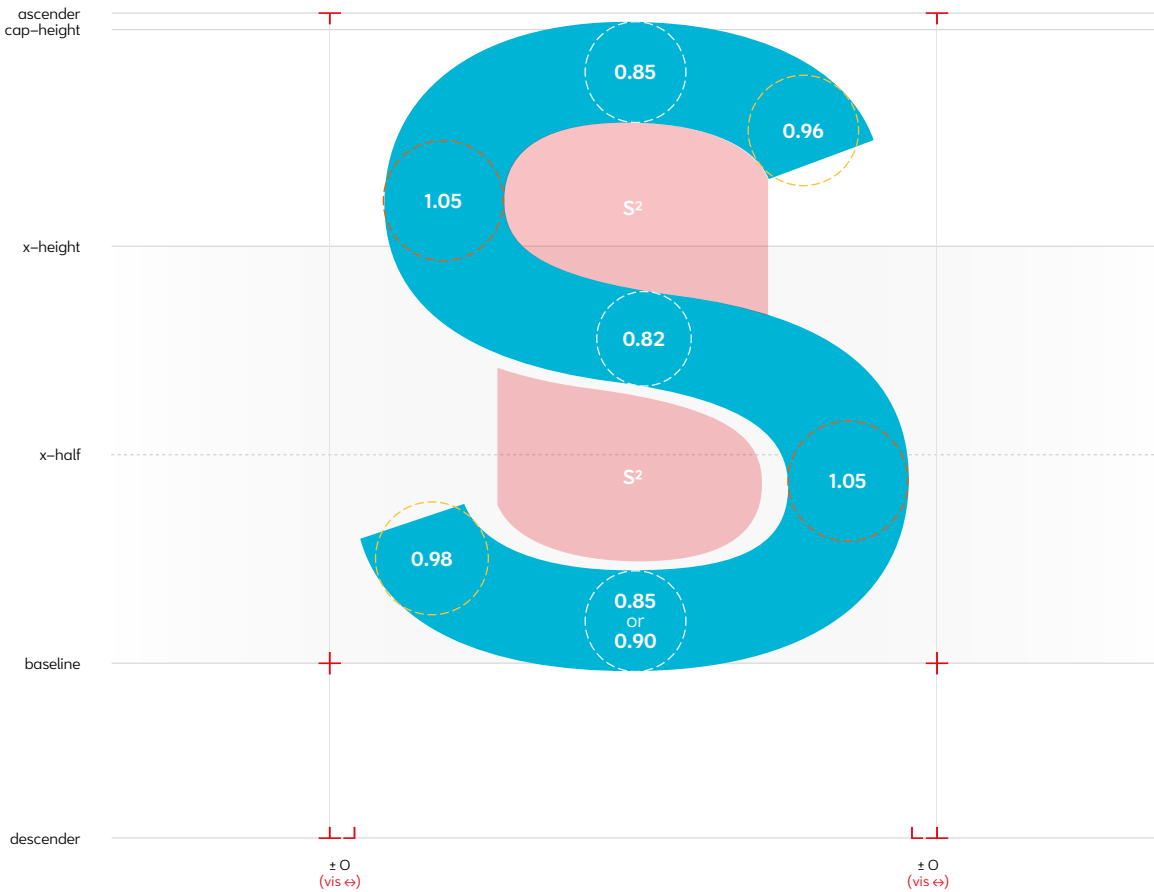
Weight

(400) Regular

Observation

The top curve may be lighter to create more openness in the upper counter.

The bottom counter is wider.



Observation

The spine is lighter due to the **S**'s wider width and can be built with two asymmetrical central nodes.

ALT

S

Glyph

S.alt

Unicode

U+0053

Weight

(800) Bold



The **T** shares the same stroke weights as the **H**, meaning its crossbar may be lighter than the stem.^[1] It also tends to be slightly narrower than the **H**, helping to offset the visual openness at the base.

To determine if further adjustment is needed, compare the **T** to the **H** and **E** side by side (THETHE). Historically, the **T** has the same width as the **H** and is wider than the **E**,^[2] but in modern type, they should still appear visually balanced. If the **T** looks wider, its arms need to be slightly narrower. This adjust improves spacing, especially with lowercase letters, which won't need to tuck under the crossbar.^[3]

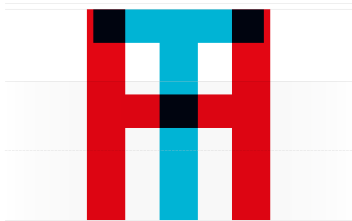
Learn More

[1]
Timothy Samara
Letterforms: Typeface Design
from Past to Future
(2018, p. 98–99)

[2]
Tom Perkins
The Art of Letter Carving
in Stone
(2024, p. 66)

[3]
Karen Cheng
Designing Type
(2020, p. 74)

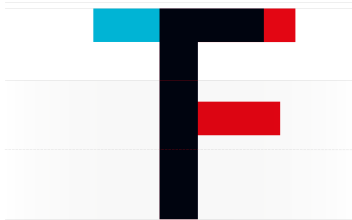
H



Relative Proportions

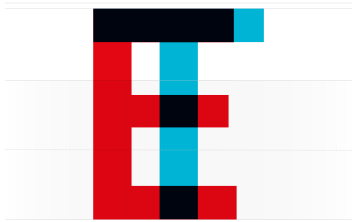
The **T** shares the same stroke weights as the **H** and is slightly narrower.

F



The **T** has shorter sides compared to the right side of the **F**.

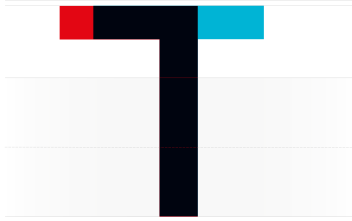
E



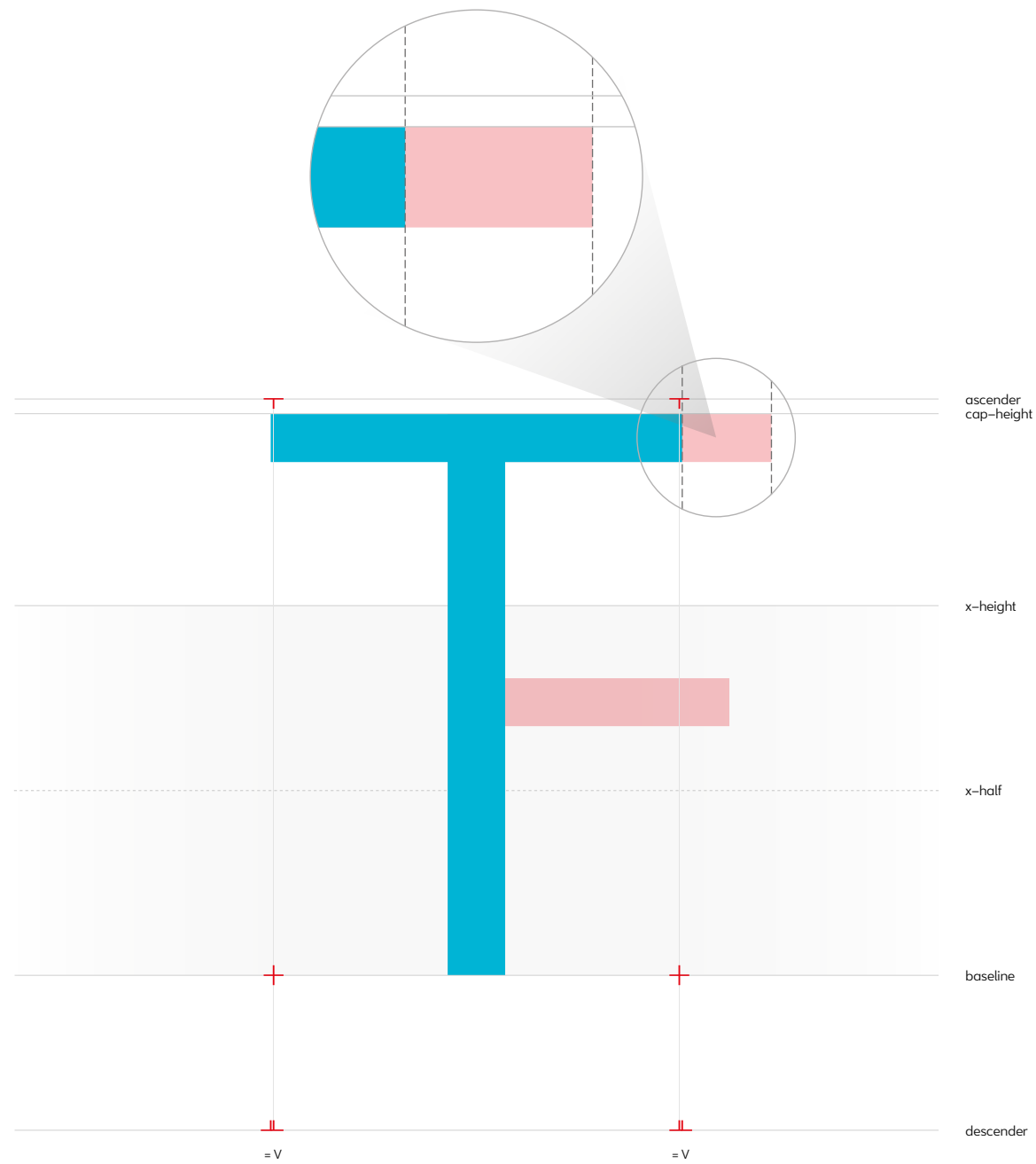
The **T** may be wider than the **E**.



L

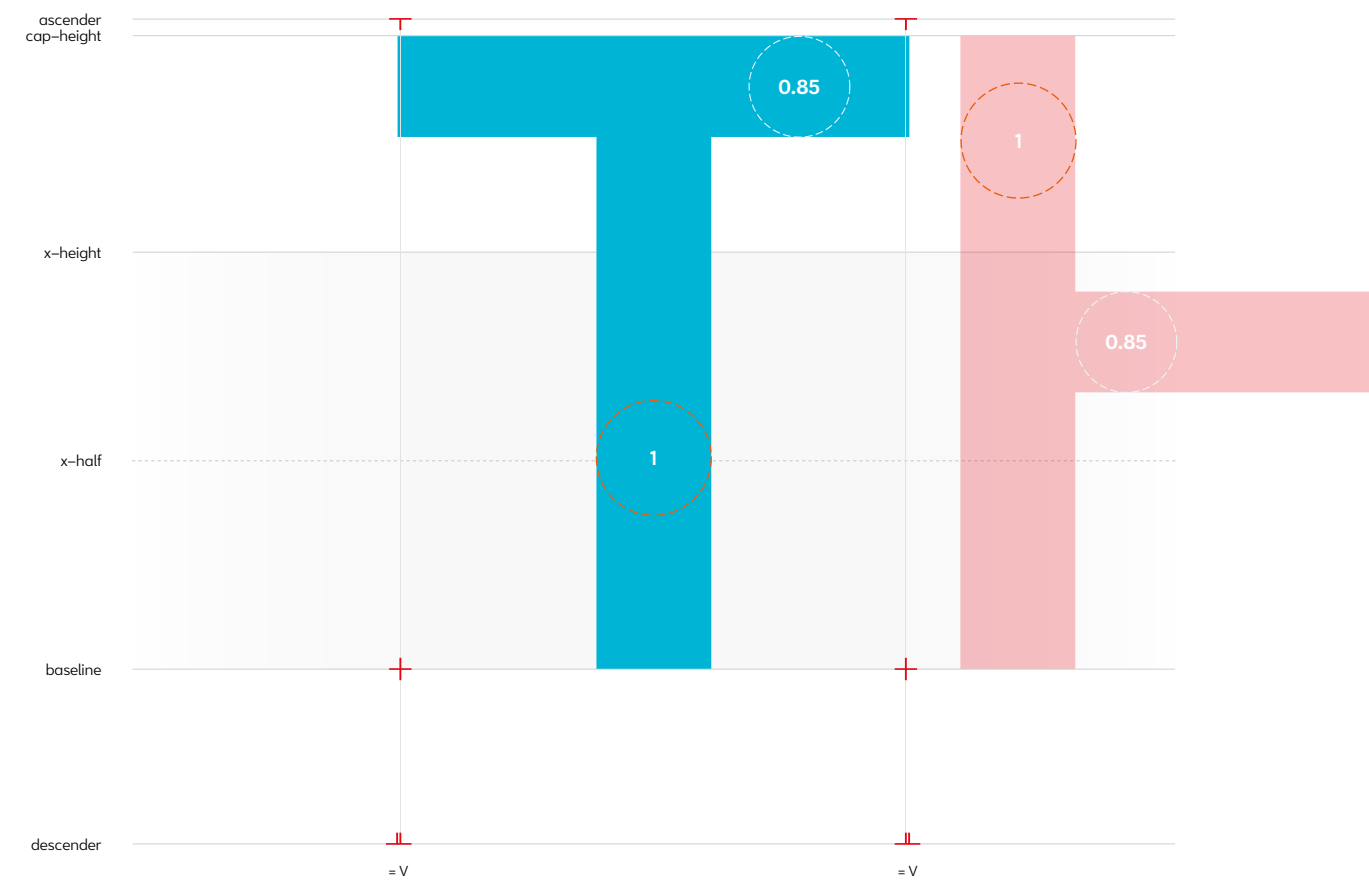


The **T** has less lateral space than the **L**. Since the **T** only has a crossbar at the top, it tends to be narrower to visually balance the negative space at the base.



Observation

The **T** has shorter sides compared to the **F**.



Observation

The **T** shares the same stroke weights as the **H**.

U U

The **U** historically evolved from the **V**, which influences its construction. It consists of two vertical stems that may or may not have the same weight.^[1] In designs with more contrast or serif styles, the right stem is often lighter than the left one, which follows the weight of the **H** or **I**.

Its width is determined in relation to the **V**, with the **U** being slightly narrower. This adjustment compensates for the visual effect of the diagonals in the **V**, which makes its counter smaller and appear tighter than it actually is. Without this adjustment, the **U** would look excessively open.^[2]

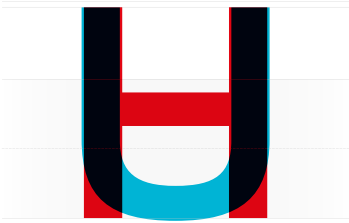
The bowl follows the same base and weight as the **O**, but the ductus curves beyond the midpoint of the glyph to help balance and differentiate its shape. Some adjustments may make the left curve slightly lower than the right, adding dynamism and reflecting the essence of the thinner right stem.^[3]

Like the **O**, the **U** also has an undershoot, ensuring its curved base visually aligns with flat-bottomed characters.^[4]

Learn More

- [1] Edward Johnston
Writing & Illuminating & Lettering
(2023, p. 287)
- [2] Karen Cheng
Designing Type
(2020, p.106–107)
- [3] Timothy Samara
Letterforms: Typeface Design
from Past to Future
(2018, p. 95,111)
- [4] Tom Perkins
The Art of Letter Carving
in Stone
(2024, p. 66)

H



Relative Proportions

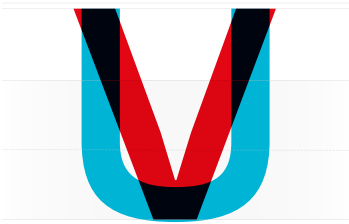
The **U** can be equal, slightly narrower, or slightly wider than the **H**, depending on the design direction.

O



The **U** has a lower curve than the **O**, ensuring better balance and differentiation in its form.

V



The **U** is slightly narrower than the **V** to compensate for the visual effect of the **V**'s diagonals, which make its counter appear tighter.

T

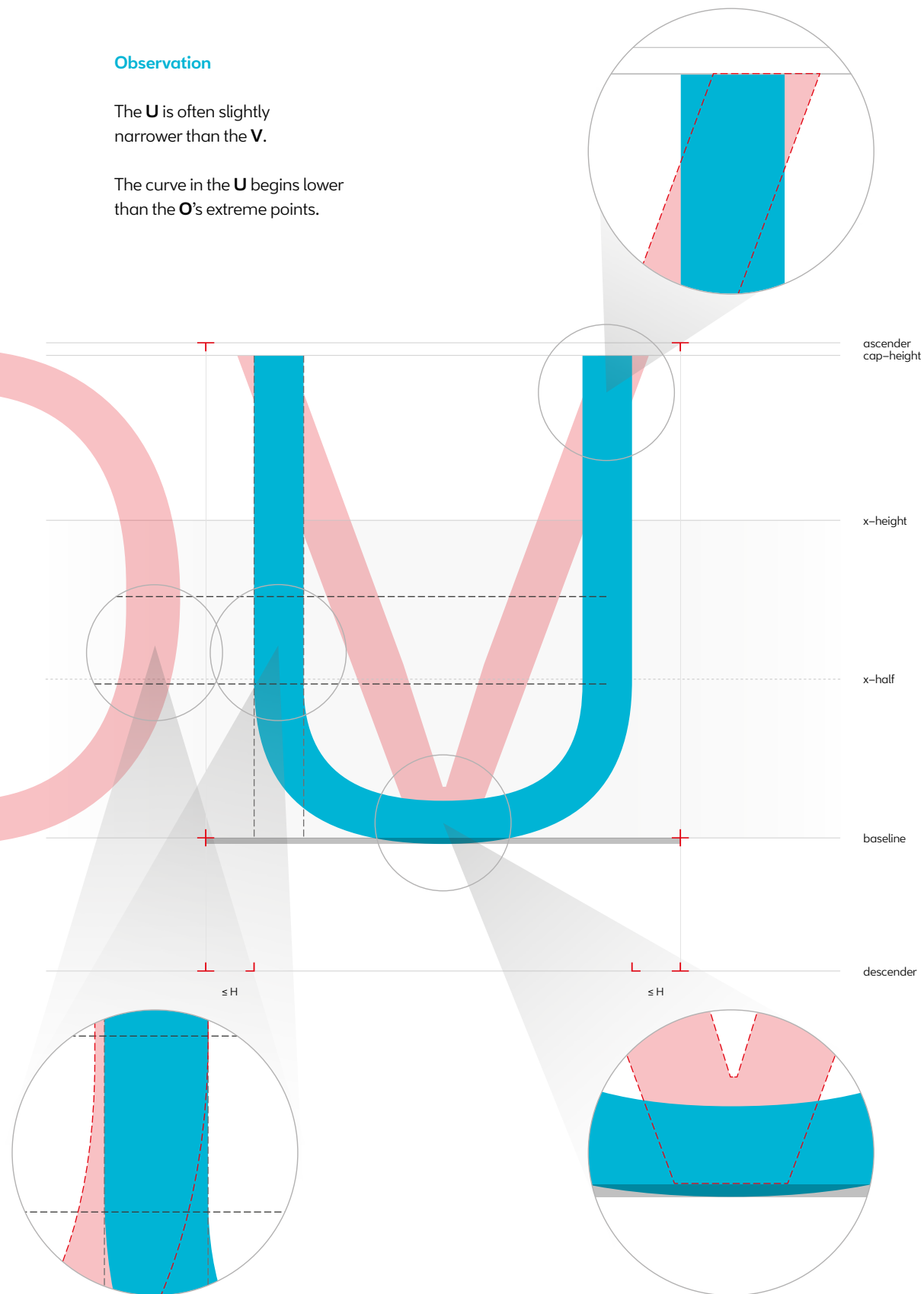


The **U** is often wider than the **T**.

Observation

The **U** is often slightly narrower than the **V**.

The curve in the **U** begins lower than the **O**'s extreme points.



U

Glyph

U

Unicode

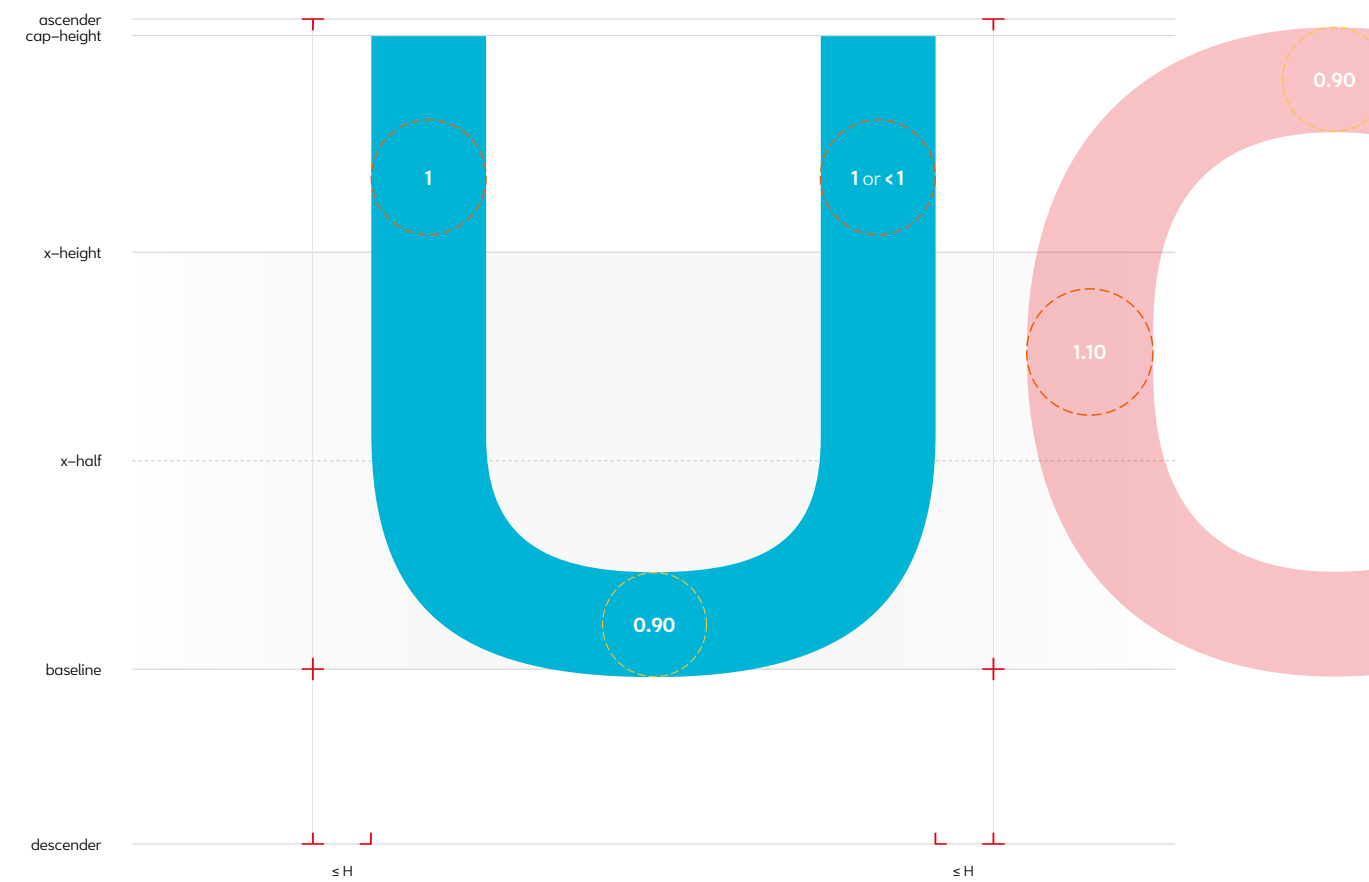
U+0055

Weight

(400) Regular

Observation

The stem of the **U** is equal to the **H**, but the right one may be thinner depending on the design.

**Observation**

The **U** has an undershoot on its curve to visually align with flat-bottomed glyphs.

The **V** is heavier at the vertex than the base of the **U**.

Glyph

U

Unicode

U+0055

Weight

(800) Bold

U



The **V** is a foundational letter, influencing the design of both the **A** and other diagonal characters.^[1] Its structure is based on two diagonals meeting at the vertex. Unlike the **A**, the **V** lacks a crossbar, resulting in a more open counter and making the top of the diagonals slightly tighter than the base of the **A**.

The diagonals in the **V** follow a similar weight asymmetry as the **A**, with the left stroke typically heavier than the right,^[2] influenced by the natural movement of the ductus.^[3] The angle of the strokes remains consistent due to the vertical axis.^[4]

The diagonals are also tapered to prevent a dark spot at the vertex, ensuring smoother weight distribution. This tapering can be applied using an open corner in the inner-bottom node,^[5] which allows better control over the angles without losing the direction of the vectors. Adding ink traps^[6] is also an effective solution to reduce ink at the vertex.

Learn More

- [1] **Cristóbal Henestrosa;**
Laura Meseguer;
José Scaglione
How to create typefaces, from sketch to screen (2017, p. 67–75)
- [2] **Gerrit Noordzij**
The Stroke Theory of Writing (2021, p. 35–40)
- [3] **Edward Johnston**
Writing & Illuminating & Lettering (2023, p. 287)
- [4] **Timothy Samara**
Letterforms: Typeface Design from Past to Future (2018, p. 102–107)
- [5] **Chris Campe;**
Ulrike Rausch
Designing Fonts: An Introduction to Professional Type Design (2020, p. 78–79)
- [6] **Google**
Inktrap (2025)
https://fonts.google.com/knowledge/glossary/ink_trap



Relative Proportions

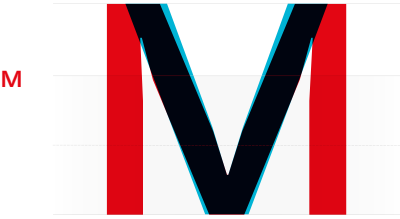
Slightly wider at the top than the **H**, the open **V** helps to equalize the white space in relation to the **H**.



The **V** is approximately the same width as the **O**.



The **V** and **A** are structurally similar, but the **A** has a wider stroke angle to open up the counter for the crossbar. The apex of the **A** is also lighter in the counter area than the vertex of the **V**, due to its wider angle.



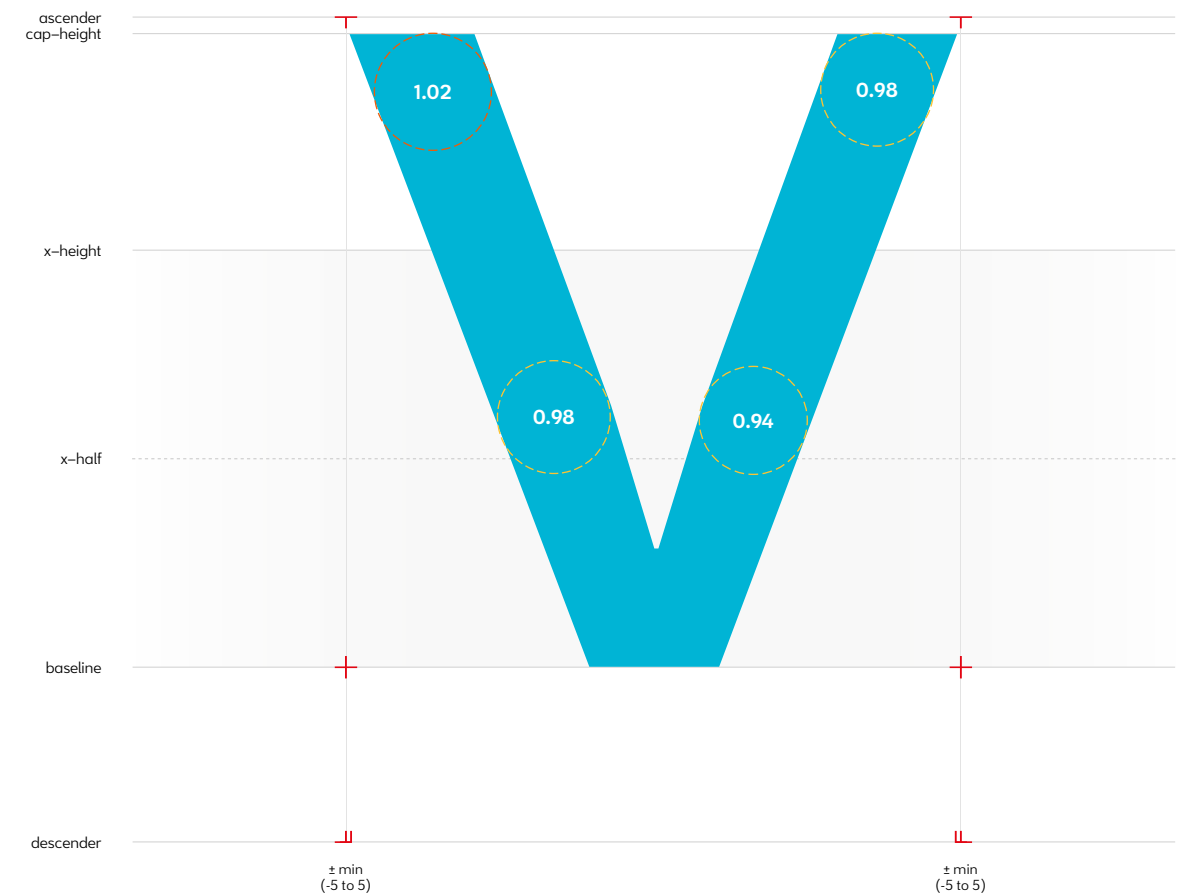
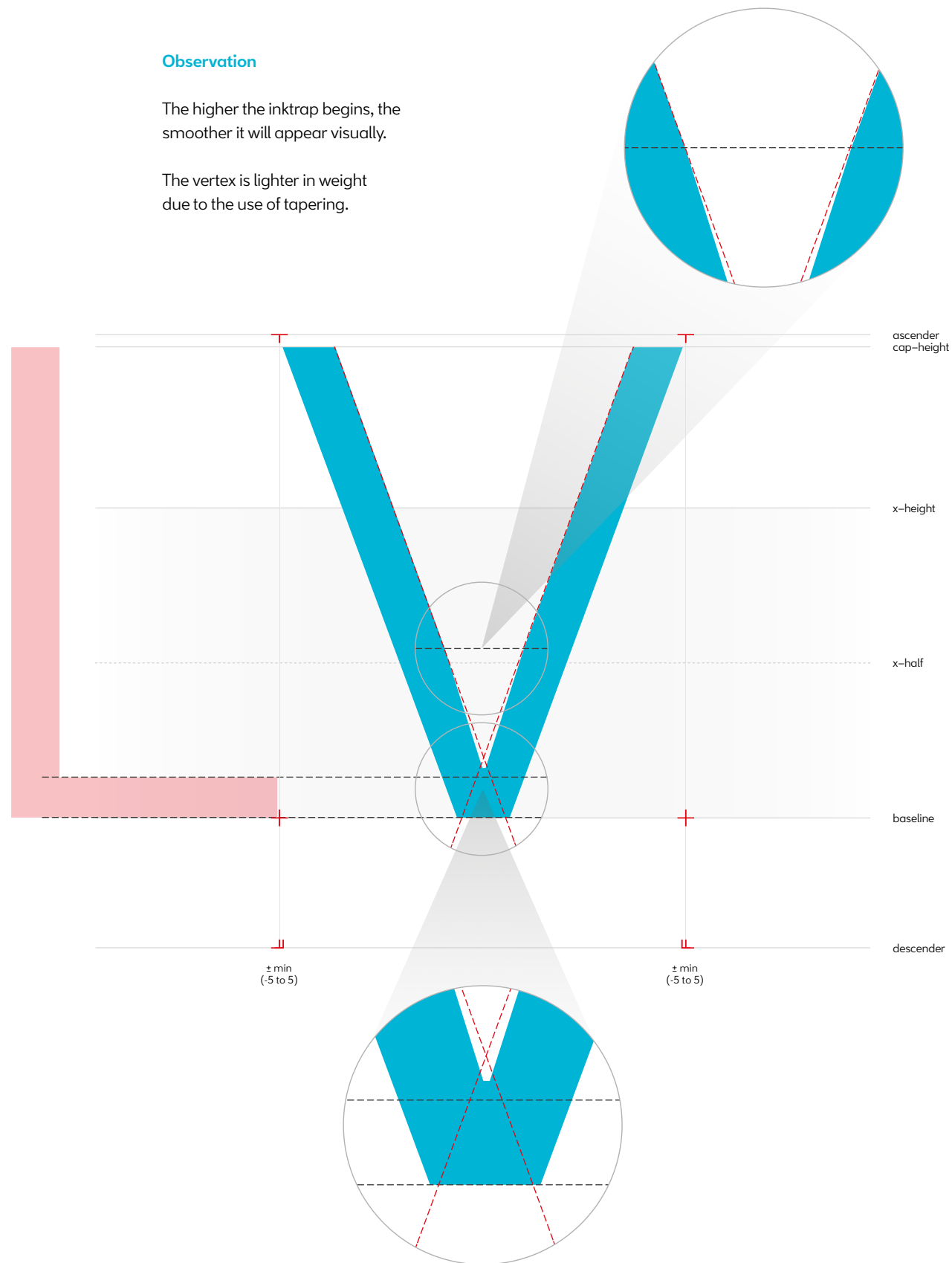
The **V** may have a wider or narrower aperture than the top diagonals of the **M**, depending on the design direction. The **M** has a tighter vertex to balance its smaller bottom counters.



Observation

The higher the inktrap begins, the smoother it will appear visually.

The vertex is lighter in weight due to the use of tapering.

**Observation**

The left diagonal is usually heavier than the right, with both featuring tapering to reduce vertex weight.



The **W** is typically constructed from two condensed **V**s to avoid excessive width. The outer strokes are symmetrical in angle and can be slightly more vertical than the inner ones to help tighten the character’s overall shape. This is a common approach in many characters, where outer strokes tend to be more upright than inner ones.^[1]

The four strokes (1\)(2/)(3\)(4/) can have different weights depending on the design style. In cases where the **W** has a straight joined apex and follows a modern construction, the outer strokes are generally the heaviest, with the first stroke (1\) often being the heaviest of all, followed by the last stroke (4/), reflecting the weight logic of the **V** on the outside of the **W**. The inner strokes follow the logic of the **A**, where the upward stroke (2/) is lighter than the downward stroke (3\) which is a little heavier. (1\)(4/)(3\)(2/) — from heaviest to lightest.^[2]

If the design choice for the **W** follows a more classical approach, with an overlapped^[3] or cropped central apex, the weight order typically follows (1\)(3\)(4/)(2/) — from heaviest to lightest.^[4]

Tapering is also applied to the strokes to reduce dark spots, and ink traps can be used to manage ink accumulation.

Learn More

[1]
Karen Cheng
Designing Type
(2020, p. 112–115)

[2]
Gerrit Noordzij
The Stroke Theory of Writing
(2021, p. 35–40)

[3]
Edward Johnston
Writing & Illuminating & Lettering
(2023, p. 240–245, 287)

[4]
Timothy Samara
Letterforms: Typeface Design
from Past to Future
(2018, p. 48–49, 70–71)

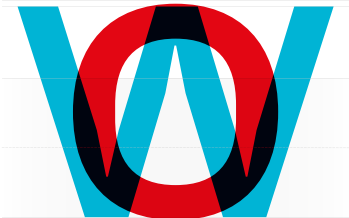
H



Relative Proportions

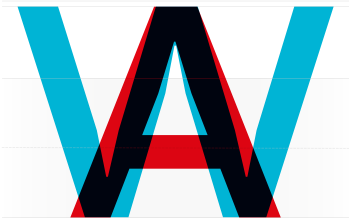
The **W** is wider than the **H**.

O



The **W** is wider than the **O**.

A

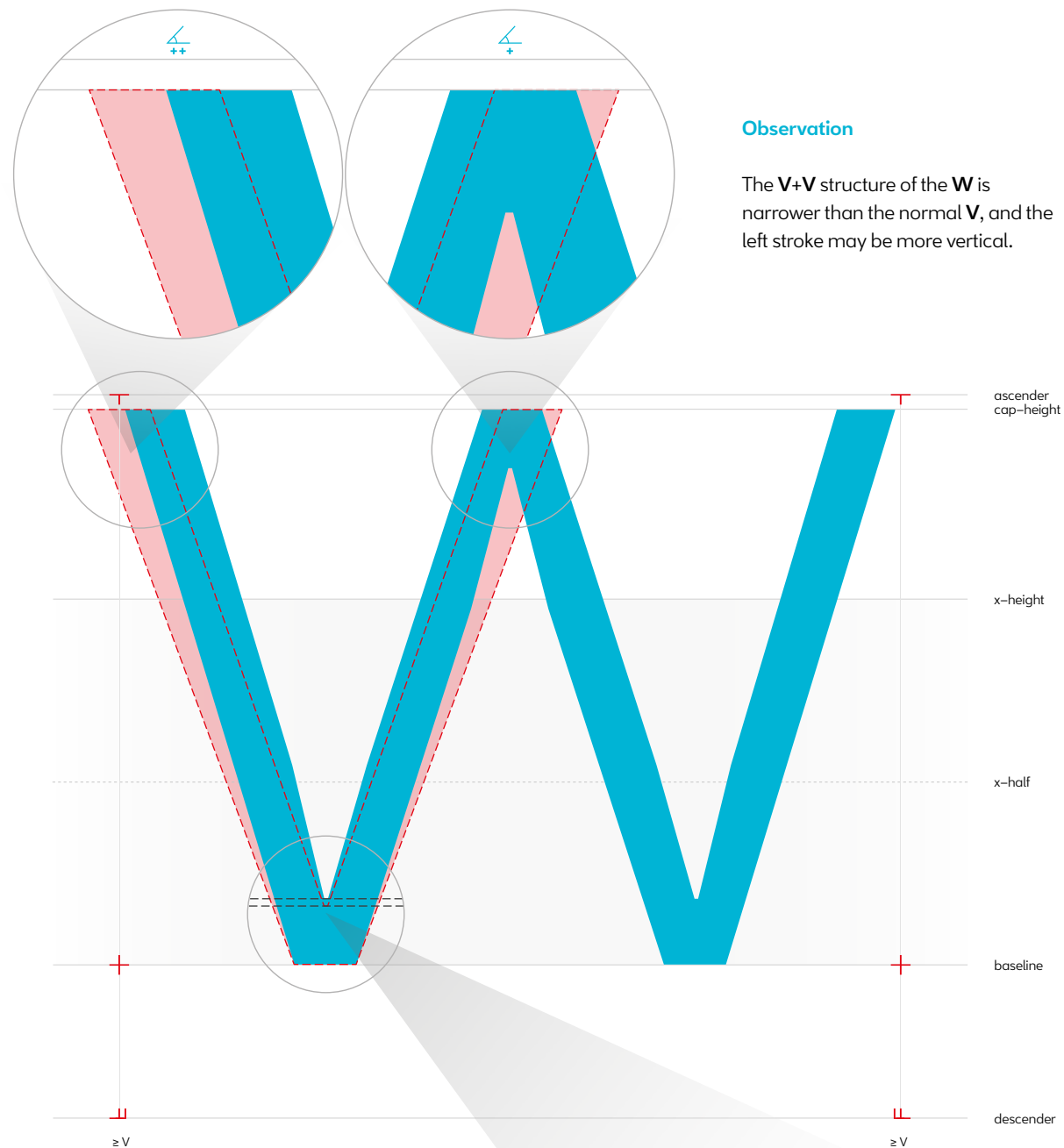


The center of the **W** is narrower than the **A**.

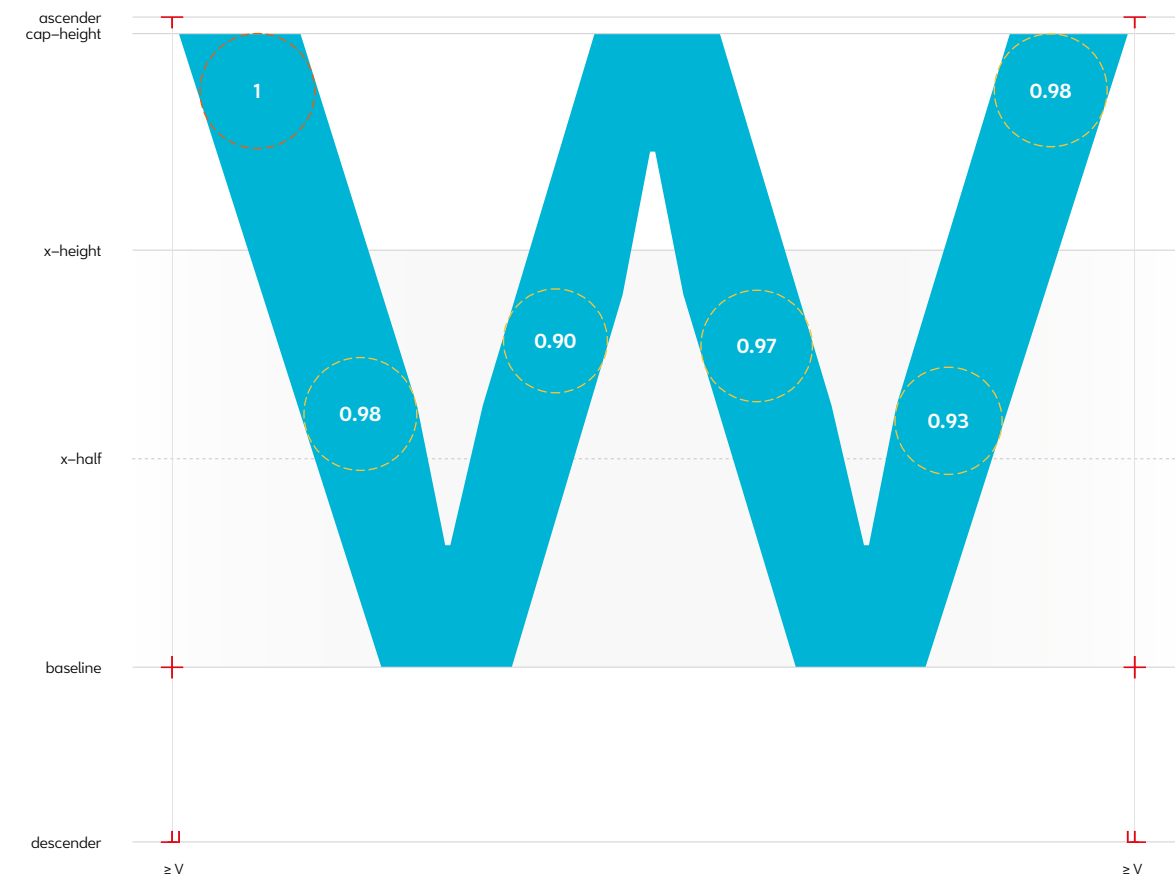
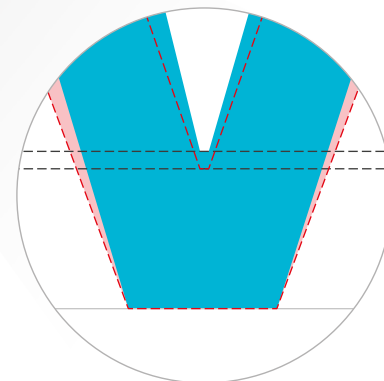
V



The outer sides of the **W** are tighter than the **V**.

**Observation**

The vertex are heavier compared to the **V** due to the condensed structure. Using an ink trap helps reduce visual weight.





The **X** is usually composed of three diagonals: one downward stroke and two upward strokes.^[1] That’s right, the **X** is not simply two intersecting lines. When the diagonals cross, they appear visually misaligned, so the top upward stroke is positioned slightly to the right of where the lower upward stroke would naturally continue. This adjustment becomes more pronounced in typefaces with higher contrast.^[2]

It is about the same height as the **H**, and the downward stroke carries the most weight while the upward strokes are lighter, in line with the typeface’s contrast.^[3]

The stroke junction is often placed slightly above the geometric center, following the same logic as the **H**. This serves two main purposes: it allows for a wider base to support the top of the character and creates more breathing room in the lower counter.^[4]

Both upward strokes can feature tapering, with the center slightly narrower than the ends. Sometimes this tapering is also applied to the downward stroke, sharpening the junction.^[5] Ink traps can also be used to relieve weight at the intersection and reduce visual heaviness at the center.

Learn More

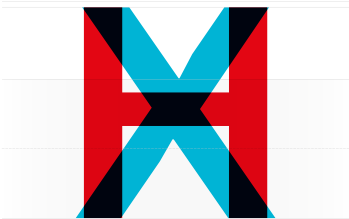
[1]
Edward Johnston
Writing & Illuminating & Lettering
(2023, p. 287)

[2]
Timothy Samara
Letterforms: Typeface Design
from Past to Future
(2018, p. 91)

[3]
Tom Perkins
The Art of Letter Carving
in Stone
(2024, p. 67)

[4]
[5]
Karen Cheng
Designing Type
(2020, p. 108–111)

H



Relative Proportions

The **X** is approximately the same width as the **H**. Its junction sits around the same area as the **H**’s crossbar.

O



The **X** is about the same width or slightly narrower than the **O**.

Z



The **X** and **Z** often share similar widths. In this case, the junction in the **Z** being horizontal cut, can make it appear slightly shorter.

V

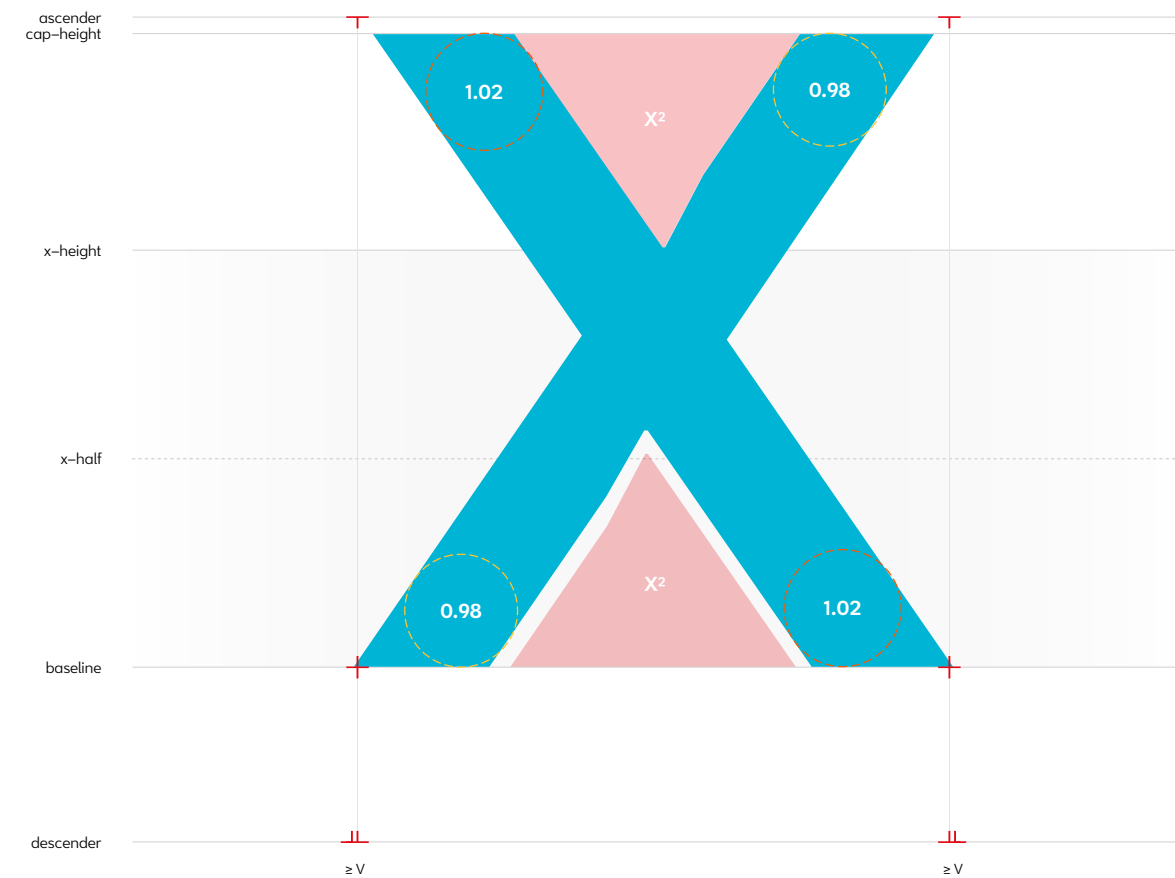
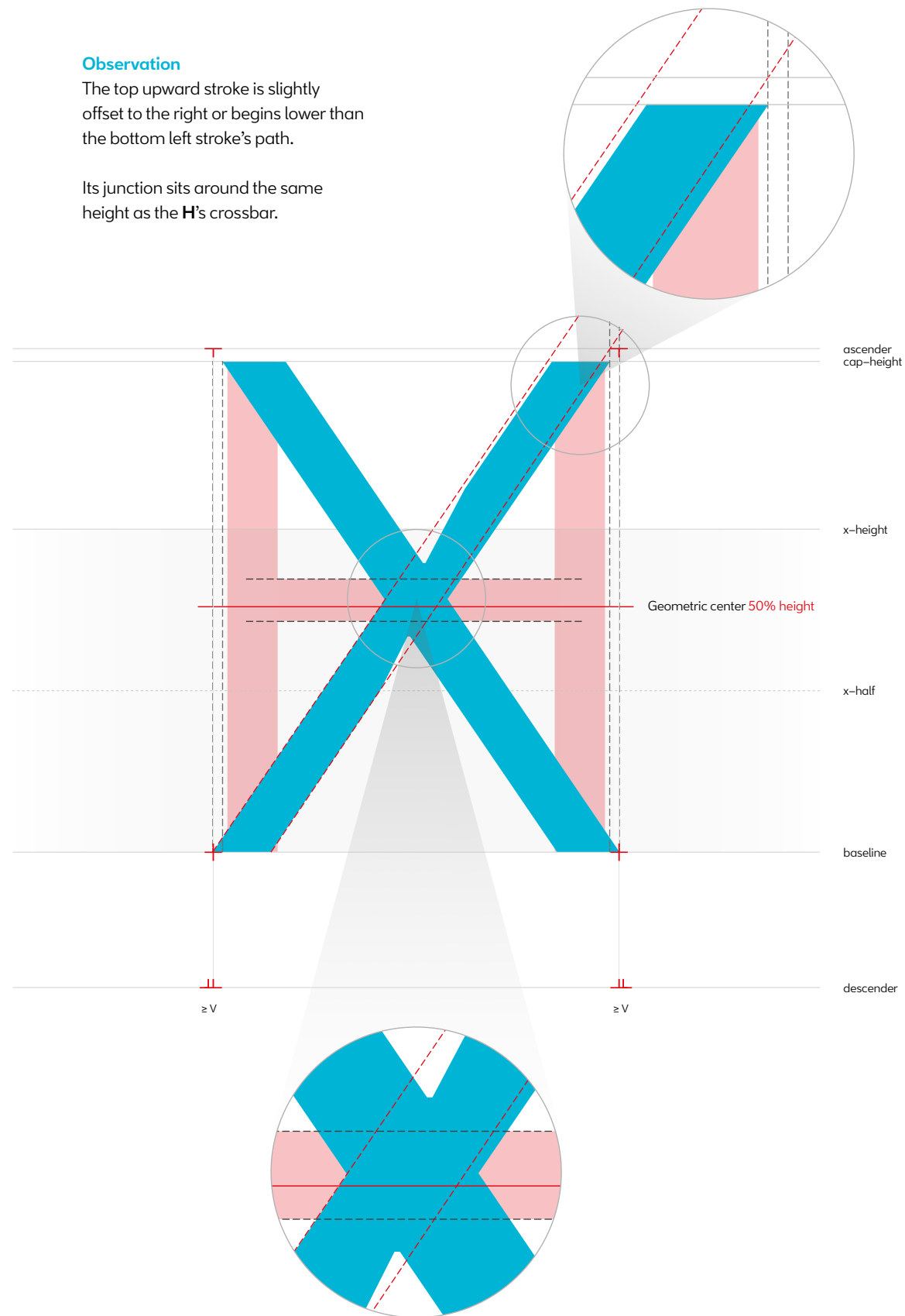


The **X** is usually slightly wider than the **V**, with a broader base and a narrower top.

Observation

The top upward stroke is slightly offset to the right or begins lower than the bottom left stroke's path.

Its junction sits around the same height as the **H**'s crossbar.

**Observation**

The downward stroke is heavier than the upward strokes; upward strokes may feature tapering or ink traps.

The top counter is smaller than the one at the base.



The goal of designing the **Y** is to avoid it being confused with either a **V** or a **T**. Its construction consists of a vertical stem with a defined weight (similar to the **I**) and a smaller, slightly narrower **V** shape at the top.^[1]

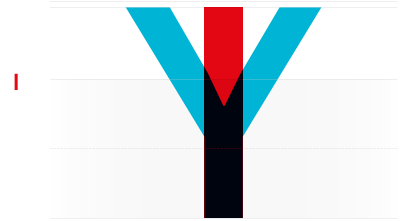
The height of the stem is key for legibility, especially at small sizes or from a distance.^[2] If it's too short, the glyph may resemble a **V**; if too tall, it might be mistaken for a **T**. A stem height between 35% and 50% of the cap-height is generally recommended.^[3]

When compared to the **X**, the intersection point of the **Y** is lower, and its top counter is wider. This is because, with only one vertical stroke forming the base, there is no base counter to visually balance.

The **Y** is approximately the same width as the **O**, and like the **V**, it uses tapering to reduce ink buildup at the vertex. Ink traps can also be used to reduce excess ink or serve as a stylistic feature.

Learn More

- [1] Tom Perkins
The Art of Letter Carving in Stone
(2024, p. 82)
- [2] Timothy Samara
Letterforms: Typeface Design from Past to Future
(2018, p. 96)
- [3] Karen Cheng
Designing Type
(2020, p. 116–118)



Relative Proportions

The **Y** and **I** share the same stem weight. The **Y**'s stem is shorter, usually below 50% of the cap-height.



The **Y** can be slightly narrower, equal to, or slightly wider than the **V**, depending on the design direction.



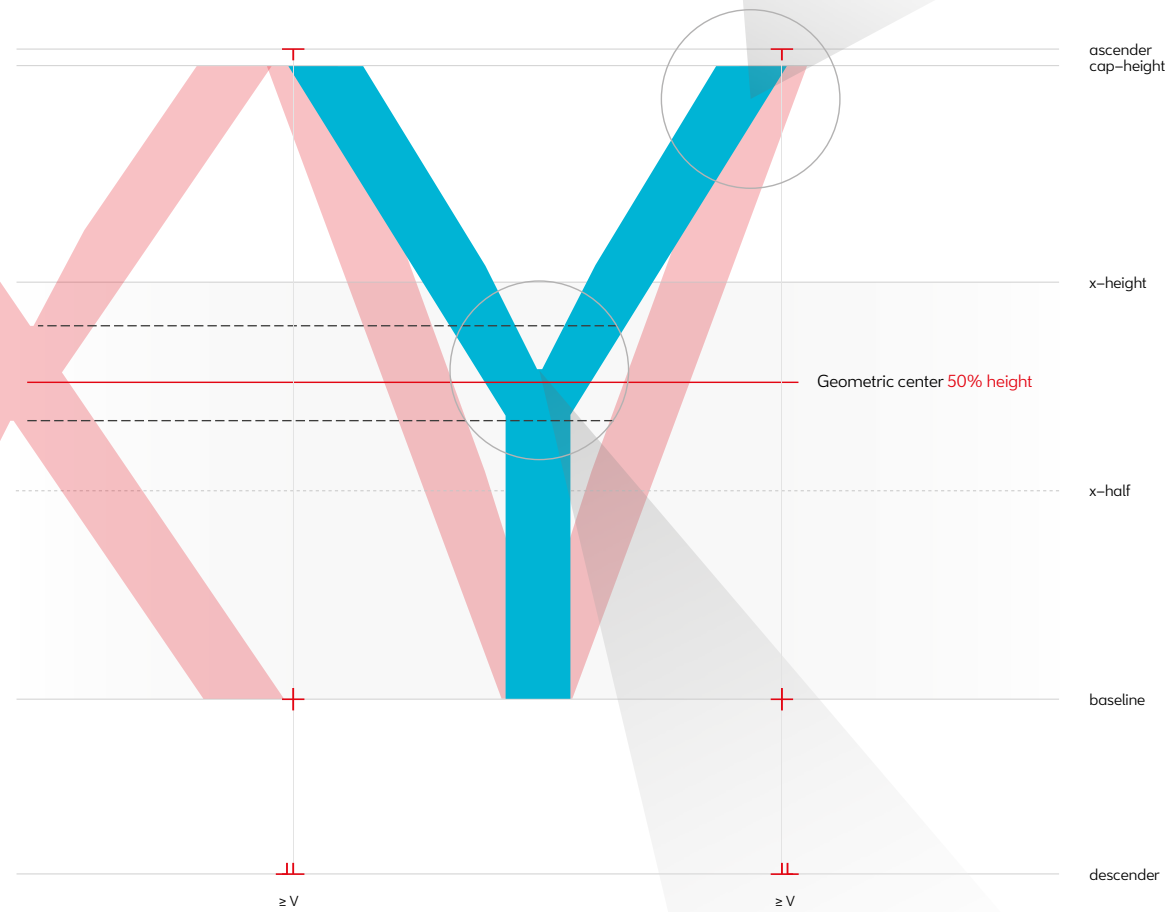
The width of the **Y** is about the same as the **O**.



The top counter of the **Y** is wider, and its intersection point is lower than in the **X**.

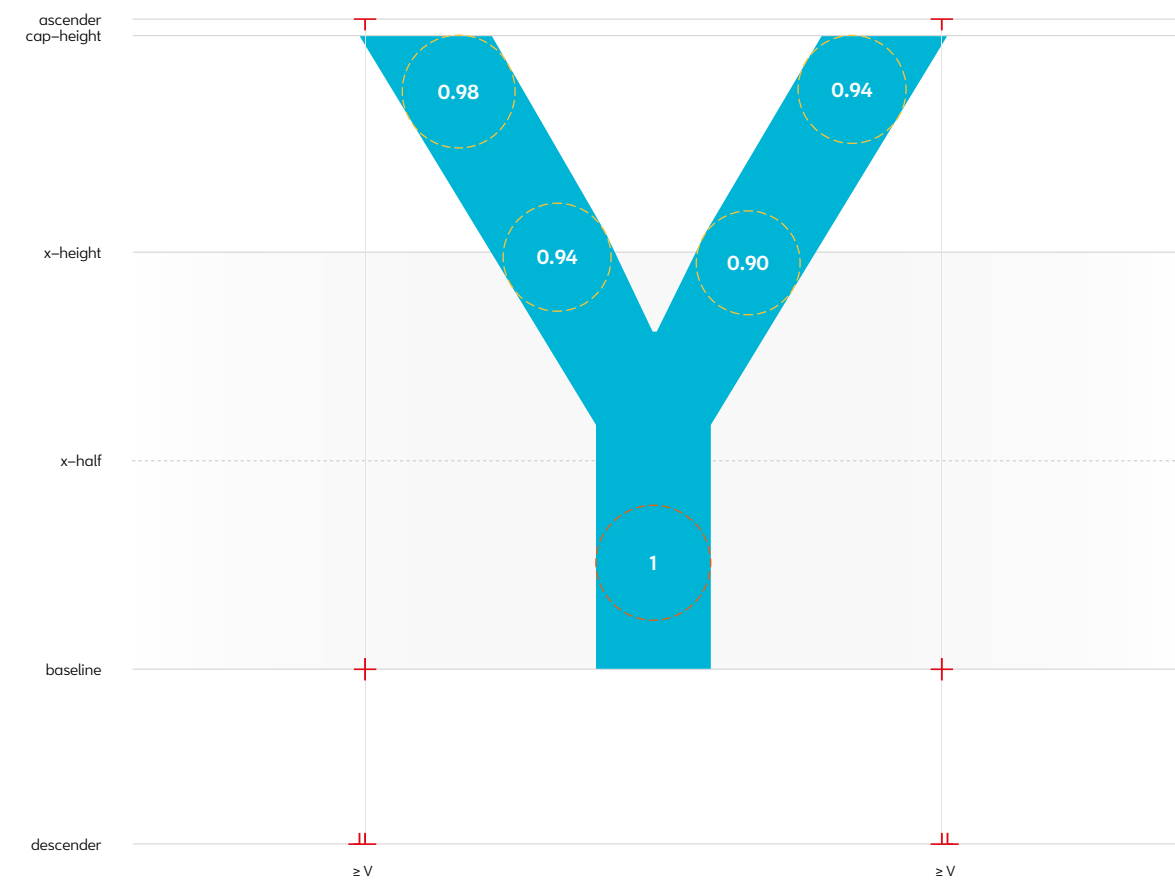
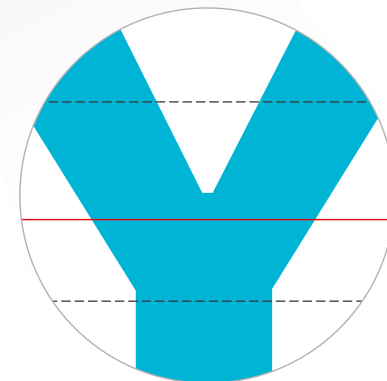
Observation

The **Y** is narrower than the **V**.

**Observation**

The stem of the **Y** is shorter, usually below 50% of the cap-height.

The intersection point is lower compared to the **X**.

**Observation**

The **Y** and **I** share the same stem weight. The left diagonal stroke may be heavier than the right.

Z Z

The **Z** is approximately the same width as the **H**, but it can be wider or narrower depending on how the junctions are drawn.^[1] These can be sharp, have a blunted horizontal cut, or a diagonal cropped. In sans serif styles, the blunted horizontal cut is more common as it helps stabilize the shape. Its weight or alignment usually matches the crossbar height or sits slightly lower.

The **Z** is narrower than the **O**. Its base is wider than the top to improve visual balance, especially on the left side. The goal is to make both arms appear centered, even though the top one is slightly shifted to the right.^[2]

The diagonal stroke is usually the heaviest, while the top and bottom arms typically match the weight of the **H**'s crossbar. However, the opposite approach, with heavier arms and a lighter diagonal, can also be used,^[3] especially in styles influenced by calligraphy.^[4]

Learn More

[1]
Tom Perkins
The Art of Letter Carving
in Stone
(2024, p. 67)

[2]
Timothy Samara
Letterforms: Typeface Design
from Past to Future
(2018, p. 103)

[3]
Gerrit Noordzij
The Stroke Theory of Writing
(2021, p. 68–74)

[4]
Karen Cheng
Designing Type
(2020, p. 126–128)

Relative Proportions

The **Z** is approximately the same width as the **H**, but it can be wider or narrower depending on how the junctions are drawn.

The **Z** is narrower than the **O**.

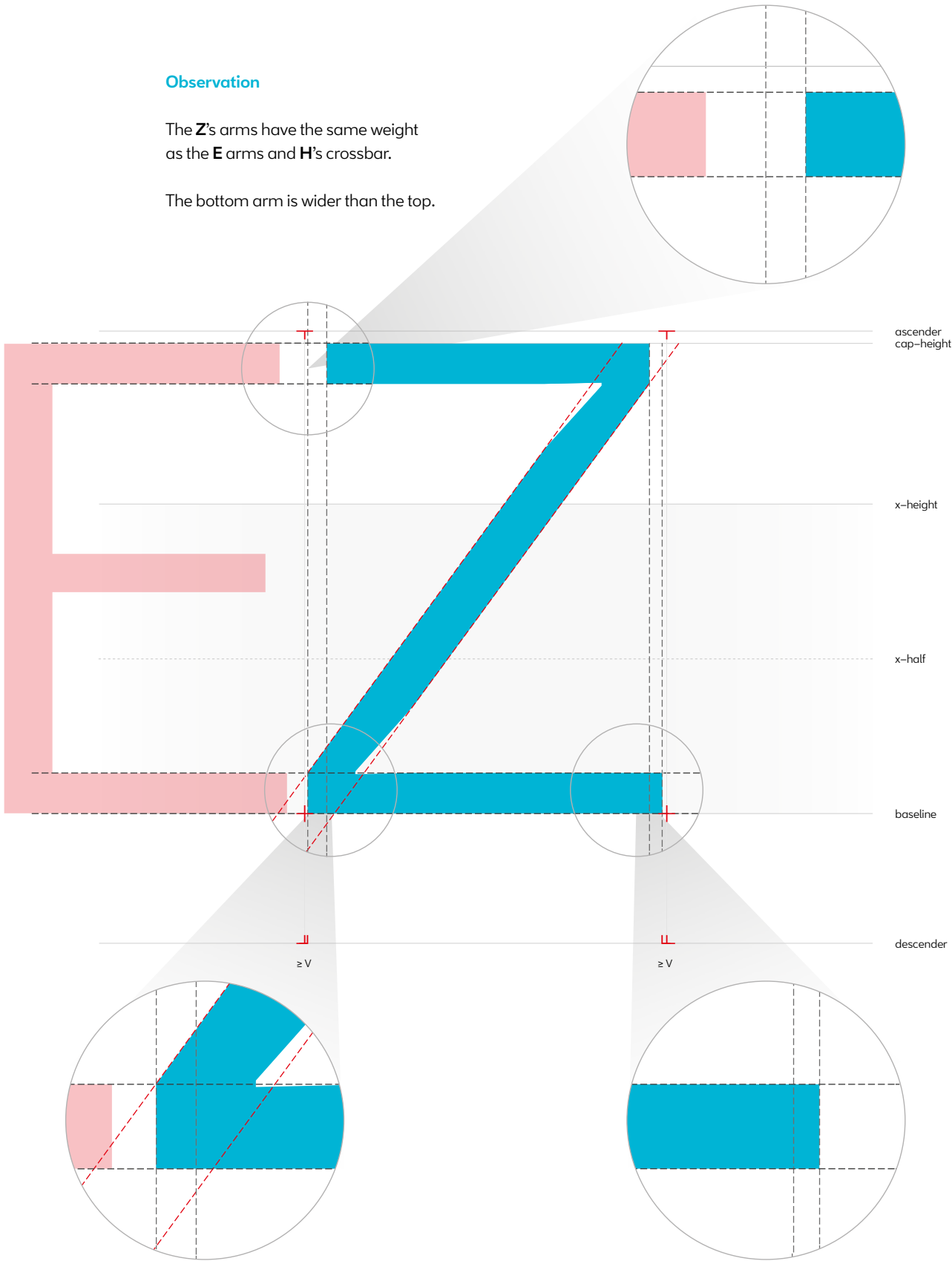
The **Z** and **X** often share similar widths. In this case, the horizontal cut of the **Z**'s junction can make it appear slightly shorter.

Although they may look similar when the **N** is rotated, the difference lies in the balance of the arms. The **Z** has a smaller top, shifted slightly to the right. Their junctions are also handled differently, as the **N** compensates in a different way due to its vertical structure.

Observation

The **Z**'s arms have the same weight as the **E** arms and **H**'s crossbar.

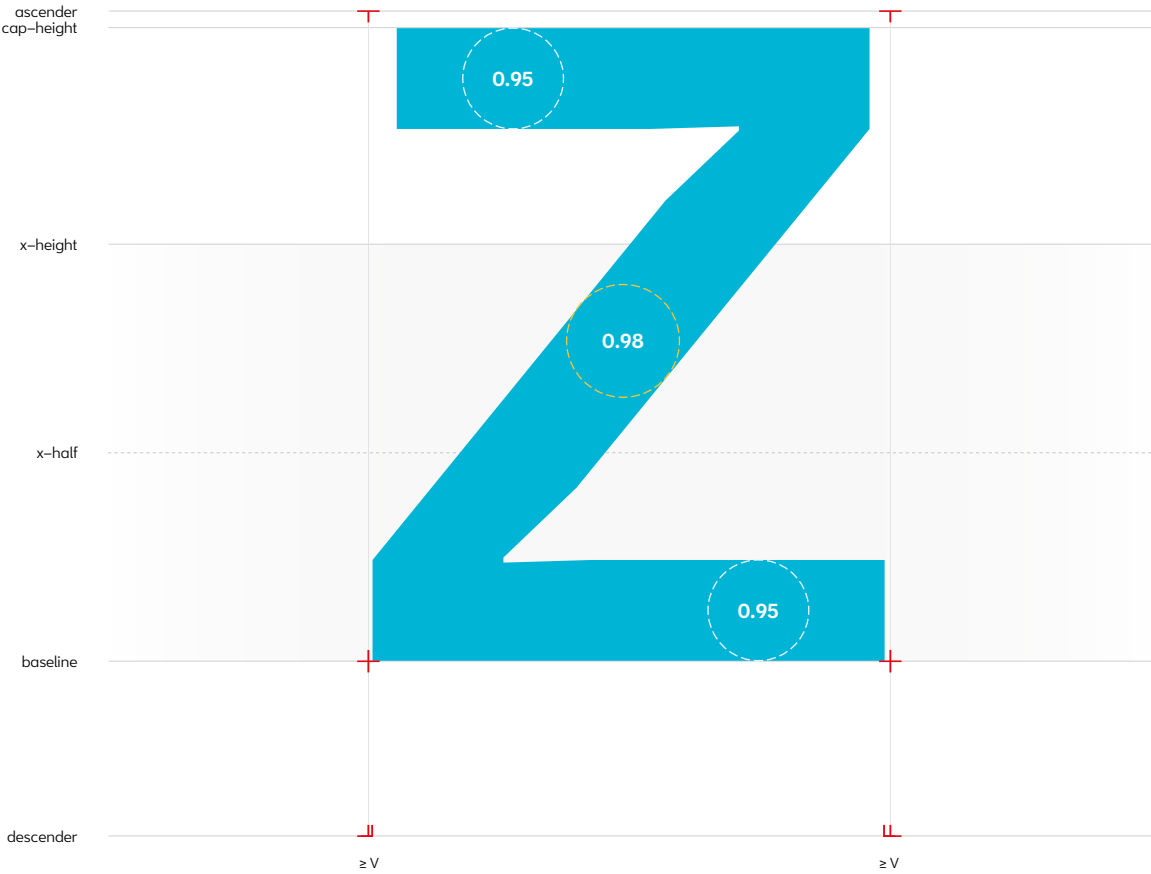
The bottom arm is wider than the top.



Z

Observation

The diagonal is heavier, similar to the **M**, and may include ink traps to reduce buildup at the junction.



Observation

The top arm is slightly shifted to the right, creating asymmetry.

The junction may be blunted, sharp, or diagonally cropped, aligned with the arm weight or slightly smaller.

Z



Glossary

Alternate

A variation of a standard character within a typeface, used to provide stylistic or functional alternatives.

Anatomy

The naming system for the structural parts of letters, derived from body or architectural terms.

Aperture

The open space between a counter and the outside of the letterform, as in a, c, e or s. Wider apertures improve legibility, especially in text.

Apex

The uppermost point where two strokes meet, as in the top of an uppercase A.

Arm

A horizontal stroke that extends from a stem and ends freely at one end, without connecting to another stroke.

Axis

The angle of contrast between thick and thin strokes in a letterform. It can be vertical, diagonal, or oblique.

Bold

A heavier weight of a typeface.

Bowl

The curved, enclosed part of a letterform that contains a counter.

Character

A symbol representing a letter, number, or punctuation.

Chin

The bottom part of the G’s structure, near the baseline.

Classification

The categorization of typefaces based on style and historical model.

Condensed

A style where the characters are narrower than standard proportions.

Construction grid

A framework used to organize and align design elements within type.

Contrast

The variation between thick and thin strokes in a letterform.

Control letter / Control

character

Letters used to establish proportions and spacing for the rest of the typeface (often H, O, V, h, o, v).

Counter

The negative space inside a letterform, fully enclosed (o, d) or partially open (c, n).

Cross stroke

A horizontal stroke that crosses the vertical stem (t or f).

Crossbar

A horizontal stroke connecting two sides of a letterform (A, H, e).

Curve

A smooth, rounded part of a letter’s stroke.

Downward stroke

A heavier stroke that moves downward.

Ductus

The order and direction of strokes used to draw a letter, often based on handwriting traditions.

Em

A relative unit of measurement equal to the point size of the type (muttons).

En

Half of an em (nuts).

Extended

A style where characters are wider than standard proportions.

Eye

A small bowl in the lowercase.

Font

A specific digital or physical instance of a typeface (e.g., Helvetica Bold).

Geometric center

The actual mathematical center of a shape.

Glyph

A visual representation of a character.

Guidelines

Reference lines (baseline, x-height, cap height, etc.) used to align and structure letters.

Height

Vertical measurement of a glyph.

Ink accumulation

The visual buildup of ink in tight or intersecting parts of the letterform.

Ink trap

A small notch or space designed to prevent ink accumulation in dense areas.

Italic

A slanted or cursive version of a typeface.

Jaw

The open curve or counter of a letterform, typically seen in G, g.

Junction

Where two or more strokes meet or intersect.

Leg

A downward-sloping stroke, as in K or R.

Letter

A basic unit of the alphabet.

Letterform

The shape and design of a letter.

Light

A lighter weight of a typeface.

Lowercase

Small letters, as opposed to uppercase.

Metrics

Measurements and spatial data that define letterform spacing and proportions.

Narrow

A style where characters are slimmer in width.

Negative space

The space around and between letterforms.

Optical center

The point where a shape appears visually centered.

Optical compensation

Subtle adjustments made to counteract visual illusions.

Overshoot

When curved or pointed parts of a glyph extend slightly beyond flat alignment lines to appear visually aligned.

Proportions

The relative dimensions of different parts of a glyph.

Regular

The standard weight of a typeface.

Sans Serif

Typefaces without serifs.

Serif

Small strokes at the ends of the main strokes of some typefaces.

Shoulder

A curved stroke that connects a stem to another stroke, such as in n or h.

Sidebearings

The space between a glyph and its bounding box, used to control horizontal spacing.

Skeleton

The underlying structure or framework of a letterform.

Spacing

The control of space between glyphs, managed through sidebearings, to ensure visual rhythm and legibility.

Spine

The central curved stroke of the letter s or S.

Spur

A small projection off a main stroke, often seen in G.

Stem

A primary vertical stroke in a letterform.

Stress

The orientation and distribution of contrast in a letter.

Stroke

A single linear element of a letterform.

Style

A particular appearance or treatment of a typeface (e.g., Italic, Condensed).

Style consistency

Visual coherence and harmony among all glyphs in a typeface.

Styles

Variations of a typeface, including different weights and widths.

Taper / Tapering

Gradual reduction in stroke thickness.

Tail

A decorative stroke, often curved or diagonal, usually found on Q, R, or J.

Terminal

The end of a stroke, shaped according to the ductus and style of the typeface. It may take various forms like a drop, ear, or serif.

Typeface

The overall design of a set of characters (e.g., Garamond, Helvetica).

Undershoot

The part of a rounded or pointed glyph that dips below the baseline to maintain visual alignment.

Unit

A basic unit of measure within a font, often within a 1000-unit em (muttons) square.

Uppercase

Capital letters.

Upward stroke

A lighter stroke that moves upward.

Vertex

The bottom point where two diagonals meet, such as in V or W.

Visual alignment

Optical adjustment of shapes so they appear correctly aligned to the human eye.

Visual balance

The optical sense of evenness and harmony between parts of a letter or composition.

Visual expectation

The reader’s assumptions about letterform shapes.

Weight

The thickness of the strokes that make up a character.

Width

The horizontal measurement of a glyph.

Wide

A style with characters that are more expanded horizontally.

Word space

The space between words in a line of text.

Learn More

Gerald Unger
Gerald Unger Theory of Type Design (2018, p. 218–219)

Robert Bringhurst
The Elements of Typographic Style (2019, p. 315–346)

Stephen Moye
Fontographer: Type by Design (1995, p. 225–230)

Walter Tracy
Letters of Credits: A View of Type Design (2003, p. 13–19)

OERT
Typographic anatomy: Glossary <https://www.oert.org/en/typographic-anatomy>

Words of Type
Words of Type Encyclopedia <https://wiki.wordsoftype.com>

TYPE 101 – SANS

Uppercase Latin

This book offers an accessible introduction to type design through the development of Type101, a didactic sans serif typeface. Focusing on uppercase latin, it combines visual clarity with technical insight to guide beginners through key concepts such as letter structure, spacing, optical corrections, and design consistency.

Born from academic research and iterative user testing, this case study manual is tailored for design students and self-taught learners who seek to understand not just how to draw letters, but why certain decisions matter. Structured around real-world challenges, it bridges the gap between theory and practice with examples and a clean visual language.