

Cast Iron Architecture in **New York City**



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by David Raezer and Jennifer Raezer

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Introduction

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New York City's TriBeCa and SoHo neighborhoods in downtown Manhattan are home to the **largest concentration of cast iron facades in the world**. These architectural gems are the legacy of a now-defunct textile merchant industry that prospered from 1850 to 1890.

To start, this Approach Guide provides the requisite background by reviewing both why textile merchants chose this part of the city and why cast iron was the ideal choice for their “store and loft” building facades.

It then provides a thorough review of the **five prevailing styles of facades** and their defining characteristics: Italian: Roman; Italian: Venetian; Italian: Sperm Candle; French: Second Empire; and French: Neo-Grec. To ease identification of defining characteristics for each style, this guide includes **high-resolution images** that reveal salient architectural features with color highlights to ease identification

Finally, this Approach Guide **profiles eleven buildings in SoHo and TriBeCa** with the most impressive facades; each profile includes a high-resolution image and a detailed review. To facilitate a **walking tour** of these buildings, all profiles are arranged on our custom map of the cast iron zone.

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Approach Guides is based in this neighborhood and writing this guide has made us look at it in a whole new light. We hope it does the same for you.

Enjoy the tour!

A handwritten signature in black ink, appearing to read "David and Jennifer Raezer". The signature is fluid and cursive, with the first name "David" being the most prominent.

David and Jennifer Raezer
Founders, Approach Guides

Cast Iron Building Technology

Cast Iron As a Building Material

A precursor of steel, cast iron was the first material that could be prefabricated for architectural purposes, making it ideal as a strong, durable, and low-cost building medium. With cast iron, all elements of the facade could be mass manufactured by heating iron to a temperature that would eliminate all impurities; this was a dramatic improvement over wrought iron that required that impurities be hammered and rolled out by labor intensive processes. The primary difference: Cast iron, which has high compressive strength, is best suited for columns; and wrought iron, which has high tensile strength, is best suited for beams.

Prior to 1750, cast iron was used chiefly to build tools; but by the late 18th century, the British and French had begun to use it to provide structural support for buildings. And by the 1830s, this technology began to gain footing for architectural applications in New York City. It was ushered into the architectural mainstream by two prominent figures, discussed in detail below, James Bogardus and Daniel Badger.

Advantages of Cast Iron

Prior to cast iron, all buildings in New York City had been made of stone and brick masonry with wood framing and supports. However, cast iron offered several advantages to merchants in the second half of the 19th century that allowed it to carve out a niche as a next generation building material:

- **Fire resistance.** Cast iron's natural fire resistance was extremely appealing to New York textile merchants that had only recently experienced a devastating fire at Pearl Street (1835). While fire resistance was a major selling point for cast iron, it must be remembered that while these new "cast iron buildings" generally employed brick walls and iron facades, their interiors still consisted of wood framing and supports; this necessarily weakened such claims.
- **Lower costs.** Not only was cast iron **less expensive than stone as a building material**, but also buildings comprised of the material could be **built faster**, offering further cost savings. Remember, cast iron buildings (facades specifically) consist of series of discrete elements (columns, bays, window frames, cornices, etc.) that were bolted together on location. To add even more to its financial appeal, builders could choose from a **catalog of stock, pre-fabricated elements**, without having to engage an architect to create entirely new, customized designs.
- **More natural light, and in some cases, increased interior space.** A cast iron facade provided **larger door openings** for the loading and unloading of goods and **larger windows** for increased levels of natural light; interior light was particularly valuable, as these were days before electricity. Further, if cast iron columns were used for support in the interior, this yielded increased space for storage in the upper stories. These were probably the most important functional advantages of cast iron over stone.
- **More visually impressive storefronts.** The prefabricated nature of cast iron allowed for

detail work on the facade that would have been extremely time consuming and costly had it been done in stone.

Cast Iron's Usage in Store and Loft Buildings

The primary use for cast iron was in the facade; note that the facade acted as an independent curtain wall that provided no structural support for the building behind it.

The primary structural support for these store and loft buildings was derived from load-bearing walls of brick that ran along the outer edges of the structure; in [Fig. 1](#), the brick walls that provide the structural support for a cast iron facade building are clearly apparent.

While they did not provide the primary structural support for the building, **cast iron columns were often employed in the interior of buildings** to provide incremental support for floor beams and joists. The floor joists, made of wood or wrought iron, were supported by brick bearing walls on the exterior of the building and by girders on the interior of the building; in turn, the girders carried the floor loads to cast iron columns aligned in a row along the centerline of the building. As mentioned above, since cast iron columns could be thinner or more widely spaced while delivering the same strength as brick or wood, they maximized available interior storage space.

Overview of the Cast Iron Building Style

Characteristics of New York's Cast Iron Buildings

General prevailing characteristics

- **“Store and loft” building profile.** The typical cast iron facade building in SoHo and TriBeCa is twenty-five to fifty feet wide, consisting of three to six bays; it is five or six stories in height. Functionally, these were “store and loft” buildings: the “store”, where sales were executed, was the ground floor; and the “loft”, which was used for storage and light manufacturing, consisted of the upper floors.
- **Balanced, harmonious facades.** For the most part, the organization of cast iron facades was based upon a **strict balance between horizontals and verticals**, resulting in non-directional stasis. While the French styles imbued facades with movement and three-dimensionality, the cast iron aesthetic remained one of balance and harmony.
- **Prefabricated elements increase facade uniformity.** As discussed in the earlier section, while many facades were designed by talented architects and cast to unique specifications, there was significant use of stock cast iron architectural elements. Builders, without the assistance of architects, could select from a catalog of stock pieces (columns, bays, window frames, cornices, etc.) from which to build their customers’ facades. The widespread use of these stock parts created a high degree of consistency both within a single facade and across facades on buildings throughout SoHo and TriBeCa.
- **Increased decorative detail.** The prefabricated nature of architectural elements freed up building owners to opt for increased decorative details, the execution of which would have proved time-consuming and prohibitively costly if they had been rendered by hand carving in stone.
- **Paint colors drive uniqueness.** Cast iron had to be painted in order to protect against rust. The need for painting immediately opened up a **new opportunity for architectural expression** and a means of differentiation among buildings that, for the most part, shared many similar characteristics of form. As a result, the use of distinctive colors became a means of standing out.
- **Style blends prevail.** While there are certainly many “pure” examples of the five styles — Italian: Roman, Italian: Venetian, Italian: Sperm Candle, French: Second Empire, and French: Neo-Grec (all discussed in detail in subsequent sections) — a large portion of buildings display a blend of styles.
- **Step vault lighting.** Buildings typically have storage basements that run under the sidewalk. Over this subterranean space, many employ a **cast iron frame punctuated by thick glass lenses** (often round and in manifold colors) that allowed daylight to pass through and illuminate the interior; it is called a step vault light. A large number of these step vaults survive — they were employed from 1845 until the end of the 19th century, when electric lighting rendered them unnecessary. See [Fig. 2](#).

STYLE GUIDE

Five styles were given expression in New York's cast iron architecture. Each style will be reviewed in turn.

- Italian Style: Roman.
- Italian Style: Venetian.
- Italian Style: Sperm Candle.
- French Second Empire Style.
- French Neo-Grec Style.

To ease identification of the defining characteristics for each style, this guide includes high-resolution images that highlight key architectural elements.

Note that the style profiles that follow are meant exclusively for entirely cast iron facades.

Italian Style: Sperm Candle

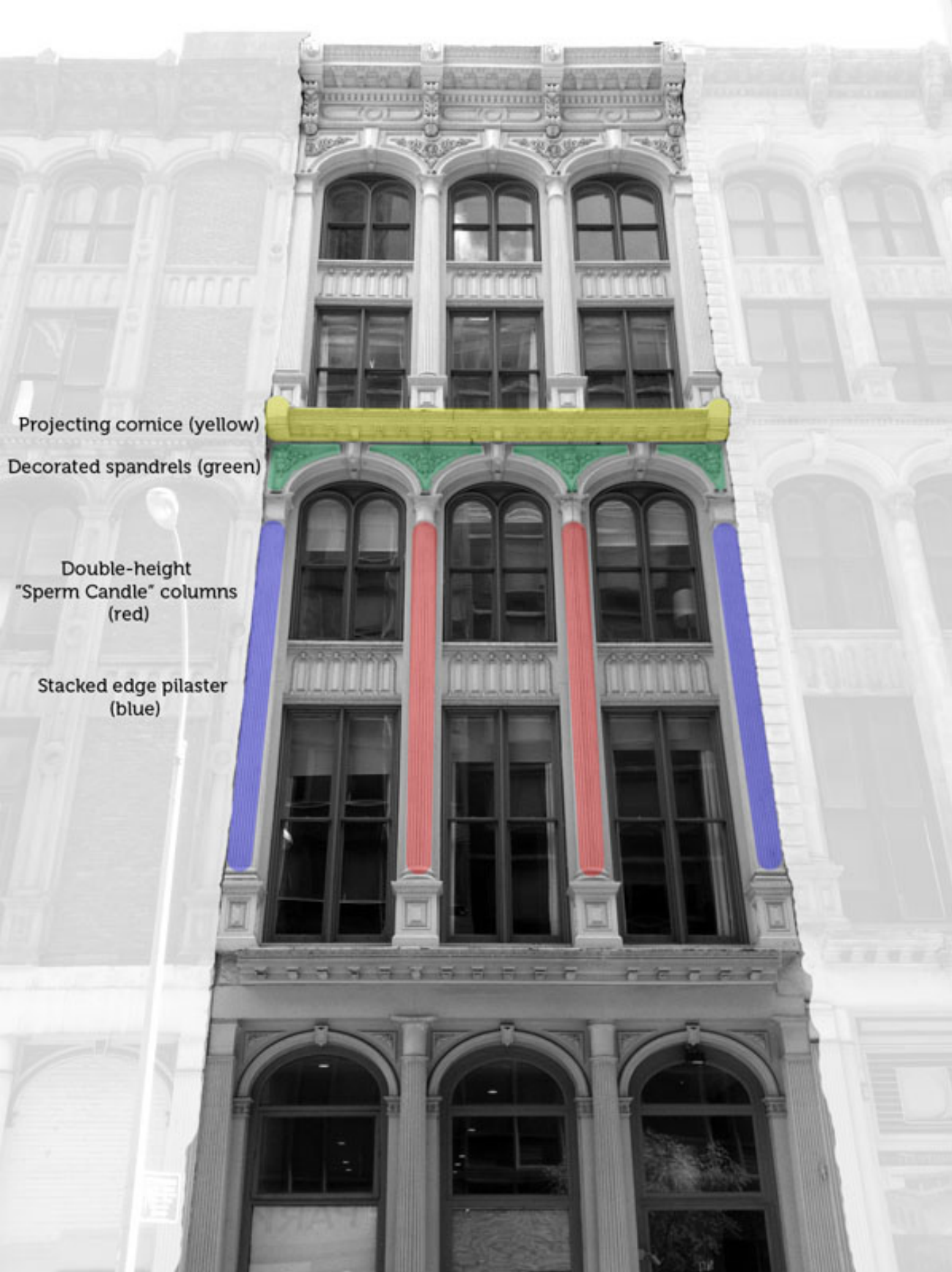


Fig. 5. Sperm Candle Style Facade: 85 Leonard Street, with highlights added.

Time Period

Late 1850s through the 1860s.

Overview

- While **based on Venetian style forms**, it is an **entirely indigenous style** and one that achieves great beauty.
- The name was derived from the use of **two-story columns or pilasters** that resemble candles made from sperm whale oil.

All consistent style from masonry to cast iron

Within the Sperm Candle style, we can see the transition from masonry to cast iron construction. Compare the **entirely cast iron facade of 85 Leonard** (built 1860-61, see facade image below and detailed profile in section entitled “(11) 85 Leonard Street”) with two others:

- **388 Broadway** (between Walker and White Streets in TriBeCa; no image). This all masonry facade was built in 1858-59.
- **502-504 Broadway** (between Broome and Spring Streets in SoHo; no image). This facade — cast iron on the ground floor and masonry on the upper floors — was built in 1860.

The Sperm Candle style is entirely consistent throughout all three façade varieties, reaffirming the fact that the primary goal of Italian style structures was to replicate masonry forms in a more cost effective medium, rather than to deliver a new architectural aesthetic.

Defining Characteristics of the Style

Elevation description

- The defining feature is the **stacked, two-story, engaged columns** (the “sperm candles”) that rise over a single-story ground floor. See red highlights in [Fig. 5](#).
- We continue to see the **cage-like, skeletal quality** initiated in Venetian facades driven chiefly by the use of cast iron throughout the entire facade (see section entitled “Italian Style: Venetian” for more details). **Facades highlight thin structural elements rather than the flat planes of masonry structures.** This achieves two effects: (a) a more dynamic facade; and (b) the entrance of more light into the interiors.
- The two-story columns are divided by a **strong intermediate cornice** (see yellow highlights in [Fig. 5](#)). Overall, however, the horizontal emphasis of this single cornice is insufficient to balance the strong verticality of the oversized columns. As a result, **sperm candle designs necessarily exhibit the greatest verticality of all styles of cast iron facades.**

- Stacked **double-height pilasters** run along the vertical edges of the building, framing the facade. See blue highlights in [Fig. 5](#).

Columns

- Corinthian and Doric orders chiefly, with little Ionic.

Windows

- In most cases, **molded round arch windows** spring from the top of columns or pilasters; square-headed windows are sometimes employed.
- **Spandrels between the windows** are typically highly decorated. See green highlights in [Fig. 5](#).
- **Balustrades also frequently appear** below second-story windows, and occasionally below the more important windows on other floors.

Roof cornice

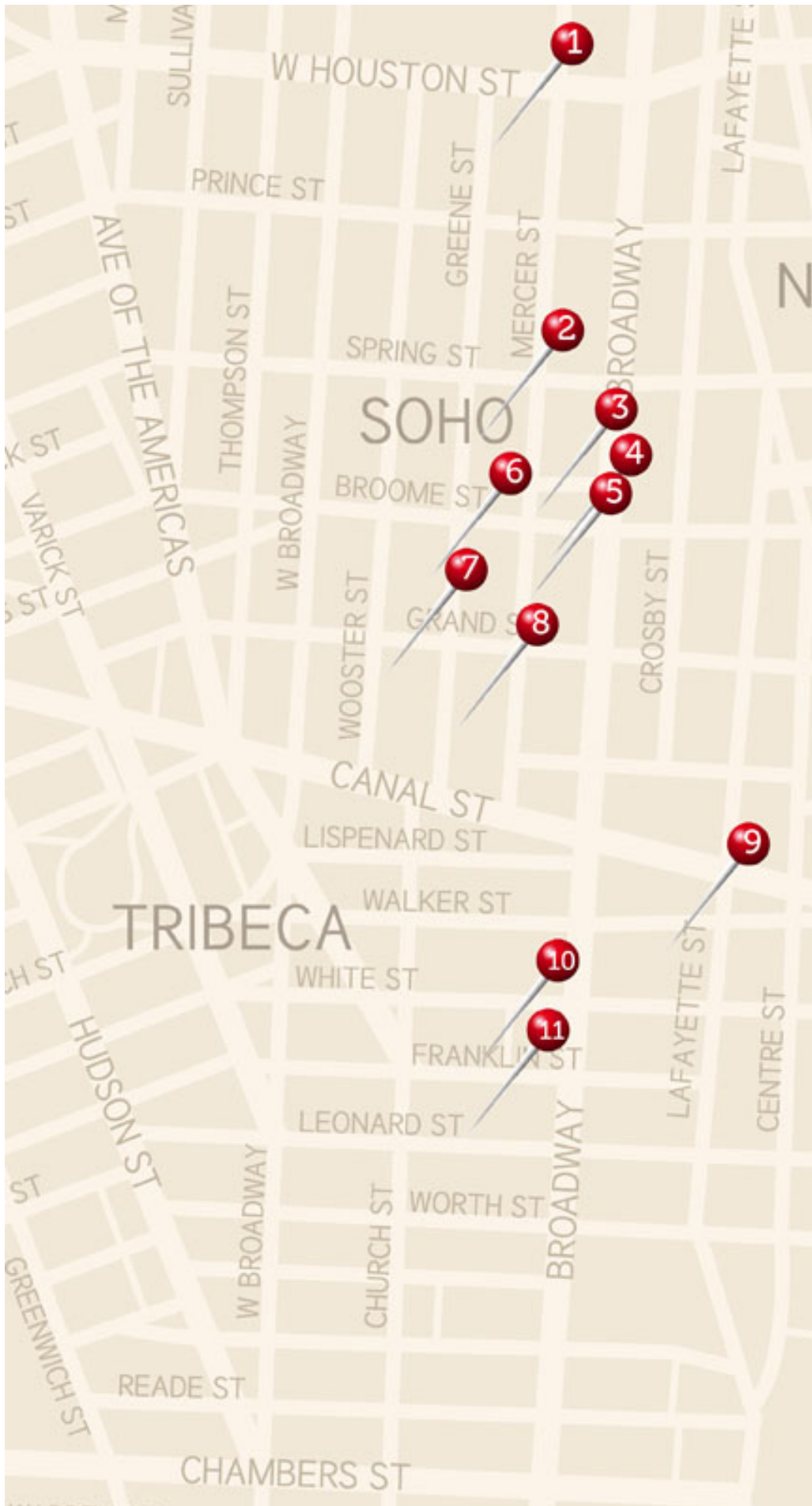
- Consistent with the Venetian style, **roof cornices** gain modestly in size and complexity as compared to their Roman style antecedents; they are usually supported by heavy consoles or paired brackets between which frequently appear frieze moldings.

WALKING TOUR & MAP

This guide provides a 1-2 hour walking tour of eleven buildings with the most impressive facades in SoHo and TriBeCa.

The following buildings are profiled:

1. 130 Greene Street, SoHo
2. 72-76 Greene Street, SoHo
3. 433 Broome Street, SoHo
4. 488-492 Broadway, SoHo
5. 478-482 Broadway, SoHo
6. 45 Greene Street, SoHo
7. 71-73 Grand Street, SoHo
8. 28-30 Greene Street, SoHo
9. 87 Walker Street, TriBeCa
10. 86-88 Franklin Street, TriBeCa
11. 85 Leonard Street, TriBeCa



(1) 130 Greene Street



Facade 130 Greene Street

Profile

Location: 130 Greene Street, between W. Houston and Prince Streets (east side), SoHo. See #1 on map.

Built: 1888-89. Complete cast iron facade.

Style: French : Neo-Grec.

Distinguishing Features

- This is an excellent example of the “High Style” Neo-Grec.
- **This building employs square-headed windows** (but unlike those of the French Second Empire style, they do not have rounded corners).
- **Consistent with the most extreme form of the Neo-Grec style, the shafts of the central freestanding Ionic columns are exceptionally thin and undersized relative to their capitals**, affording the facade a delicate look and emphasizing the structural strength of the cast iron medium. Further, **shafts are smooth** (other than a single incised vertical bevel down their fronts) and employ **horizontal bands** (midway down their lengths).
- **Wide, stacked pilasters** line the exterior of the building; each has **four vertical incised lines** (imitating fluting) and a horizontal band of **delicate, incised floral-inspired ornament**. The great width of these pilasters is designed to bring out a sharp contrast with the pencil thin columns.
- The simple **cornices that divide each floor are beveled on their undersides**; this linearizes the facade, creating a **series of thin horizontal lines** (rather than a thick horizontal slab) that emphasizes the delicacy of the building.
- **The roof cornice is understated**, with only four modillions (ornamental, elongated brackets) and a row of dentil molding marking the transition from entablature to cornice.

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Los Angeles Times

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