

Portfolio Study

# **Planning with Code: A Rule-Based Planning Engine for Fashion Collections**

Bridging assortment design and operational logic with Python, Excel, and Power BI.

# SUMMARY

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# THE CHALLENGE

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Assortment planning in fashion requires balancing trend responsiveness, brand identity, and efficiency. It's a complex process where creativity and commercial needs intertwine.

**This project explores a rule-based automation to streamline planning decisions.**

The project integrates Excel for quantitative research, Python for the development of the engine, and Power BI for data visualization. Together, these tools simulate how a planning engine can distribute silhouettes, colors, and design details based on predefined rules, while still reflecting brand aesthetics and trend signals.

# OBJECTIVES

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- Translate creative strategy into rule-based assortment planning.
- Build a scalable and automated engine for collection planning.
- Demonstrate integration of data tools (Python, Power BI visualization, Excel Proficiency) into fashion workflows.
- Showcase transferable skills for allocation, planning, and merchandising roles.

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# Planning

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# ASSORTMENT - proportions research

Analysis of the last Autumn/Winter collections from The Row and Loro Piana informed the category distribution.

Using a target gender balance of 65% feminine and 35% masculine, I developed a proposed collection plan, visualizing proportional distribution across categories and gender.

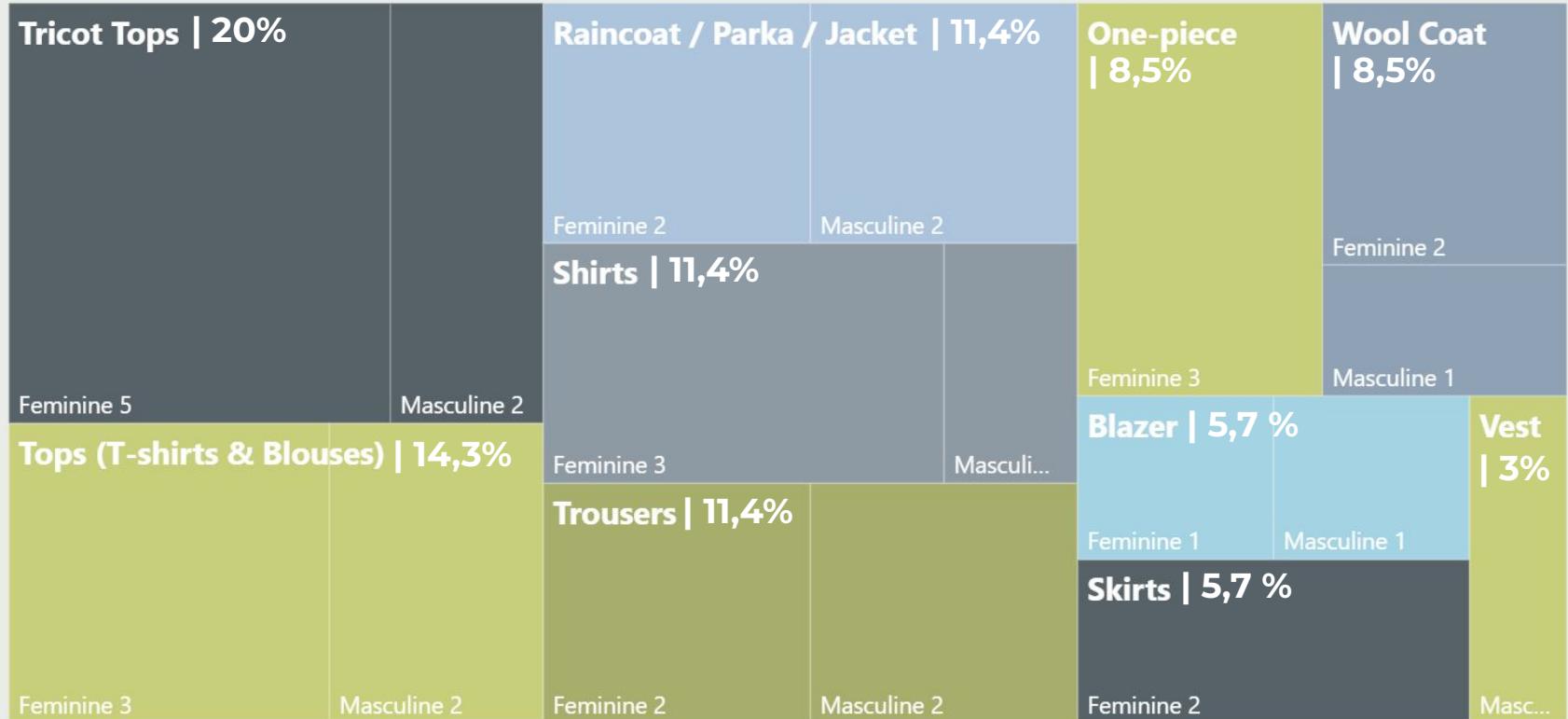
Item	Proposition	Loro Piana	The Row
Tops - T-shirts and Blouses	14,3% - 5 designs	20%	10%
Shirts	11,4% - 4 designs	11%	11%
Trousers	11,4% - 4 designs	19%	12,5%
Skirts	5,7% - 2 designs	5%	7%
Blazer	5,7% - 2 designs	1,5%	9,5%
Tricot tops	20% - 7 designs	25%	11%
One-piece	8,5% - 3 designs	2%	15%
Vest	3% - 1 designs	5%	0%
Rain Coat / Parkas / Jackets	11,4 % - 4 designs	10%	12%
Wool Coat	8,5% - 3 designs	1,5%	12%

Autumn/Winter Collection      Fall and Winter Collections Average

# ASSORTMENT - proportions

Category	Proposition 35 designs	65% Feminine 23 designs	35% Masculine 12 designs
Tops - T-shirts and Blouses	14,3% - 5 designs	3	2
Shirts	11,4% - 4 designs	3	1
Trousers	11,4% - 4 designs	2	2
Skirts	5,7% - 2 designs	2	0
Blazer	5,7% - 2 designs	1	1
Tricot tops	20% - 7 designs	5	2
One-piece	8,5% - 3 designs	3	0
Vest	3% - 1 designs	0	1
Rain Coat / Parkas / Jackets	11,4 % - 4 designs	2	2
Wool Coat	8,5% - 3 designs	2	1

# ASSORTMENT - proportions



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# Visual Research

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# VISUAL RESEARCH

Anchored in the aesthetic codes of quiet luxury, this research draws **inspiration from brands such as The Row and Loro Piana**, where premium materials, impeccable construction and understated design take precedence. The study focused primarily on Italian and American labels that embody this sensibility through approachable yet elevated collections. **Proenza Schouler, Bottega Veneta, Tory Burch and Prada were closely examined for their ability to merge quality craftsmanship with relaxed, versatile silhouettes.**

To introduce a directional edge, **the analysis also considered Spanish brands that inject a fresh, contemporary note into the quiet-luxury space** without compromising subtlety. **Loewe, Massimo Dutti and Phoebe Philo** were explored for their balance of luxurious fabrications, precision tailoring and seasonal colour palettes, complemented by discreet yet distinctive detailing. This approach reflects an evolution of quiet luxury: one that remains rooted in timeless elegance while embracing modernity and nuanced seasonal shifts.



# REFERENCE MOODBOARD



PANTONE®  
16-4451 TCX  
Autumn Glaze



PANTONE®  
12-0500 TCX  
White Down



PANTONE®  
16-4011 TCX  
Spellbound



PANTONE®  
15-5204 TCX  
Morning Mist



PANTONE®  
16-4852 TCX  
Winter Moss



PANTONE®  
12-3703 TCX  
Frosted Mint



PANTONE®  
19-1024 TCX  
Mocha



PANTONE®  
19-1119 TCX  
Cocoa



LORO PIANA, A/W 25/26



FROENZA SCHOUKER, FALL 25



PRADA, A/W 25/26



TORY BURCH, FALL 25



PRADA, A/W 25/26



THE ROW, FALL 25



LOEWE, FALL 25



GABRIELA HEARST, A/W 25



LOROPIANA, A/W 25/26



# VISUAL RESEARCH - colours

With [Vogue US declaring](#) 2025 “the year of Loro Piana” and the brand amplifying its celebrity-led marketing strategy, Loro Piana’s influence in the quiet-luxury space is accelerating and serving as a blueprint for other labels. Its A/W 25 palette anchors around grounded **dark neutrals** such as cocoa brown, dust navy, moss green and black, balanced by **soft, consumer-familiar light tones**. Key innovations include sandy beiges refreshed with mineral undertones, light blues shifting toward muted turquoise, and pale khakis infused with mint freshness.

This direction is echoed across other luxury players, reinforcing the season’s colour story. Loewe’s current collection mirrors Loro Piana’s turquoise notes, while Gabriela Hearst and Prada invest in burnt orange tones that vibrate against turquoise and mint for a subtle yet impactful contrast. Prada further experiments with neutrals, expanding their combinations into unexpected pairings that feel both modern and enduring, resulting in the creation of pieces with **long-term staple potential**.

A consistent pattern across brand research is the use of a signature highlight shade each season, acting as a **recognisable colour marker**. In an era of political uncertainty and post-pandemic recalibration, consumers favour trusted silhouettes reimagined in these directional palettes, reflecting fashion’s cyclical nature while **introducing fresh, investment-worthy updates**.



# VISUAL RESEARCH - colors

LOEWE, PRE-FALL 25



GABRIELA HEARST, A/W 25



PRADA, A/W 25/26



LORO PIANA, A/W 25/26



LOEWE, PRE-FALL 25



HERMÈS, FALL 25



LORO PIANA, A/W 25/26



LORO PIANA, A/W 25/26

# VISUAL RESEARCH - silhouettes

Silhouette exploration this season leans into draping, tie details, and the **interplay between fitted and relaxed sections of garments**. Emphasis on the natural waist and strategic use of excess fabric enhances movement, softening traditionally structured tailoring. Poplin shapes and loose chemises introduce a feminine counterpoint to hard-edged constructions, offering versatility and ease within a wardrobe that might otherwise skew rigid.

Co-ords remain a key story, evolving from S/S into F/W with matching sets of tops and skirts, tops and shorts, and dresses with cardigans. Knit twin sets, in particular, are gaining traction across Prada, Loro Piana, Hermès and Massimo Dutti. Massimo Dutti presents a nuanced take by pairing the same material and construction **ton-sur-ton**, creating seamless combinations that can be worn as sets or individually. This approach presents a **strategic opportunity to increase Units Per Transaction** while maintaining a cohesive seasonal palette.

Accessories continue to play a supporting role in driving style versatility. Long, narrow scarves are re-emerging, offering a subtle upsell option. Worn in monochrome pairings with tops or co-ords, they enhance overall outfit composition and provide brands with easy avenues for collection complementation and merchandising impact.



MASSIMO DUTTI, FALL 25



PRENZA SCHOULER, PRE-FALL 25  
KING  
REWAY

# DRAPE AND CASCADES

LOEWE, PRE-FALL 25



LOEWE, PRE-FALL 25



THE ROW, FALL 25



PROENZA SCHOULER, FALL 25



PHOEBE PHILO, COLLECTION D2025/2026



PRADA, F/W 2025/2026

REIMAGINED MINIMALISM: TAILORING AS THE NEW ESSENTIAL

# TIED UP

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BOTTEGA VENETA, FALL 25



LOROPHANA, FALL/WINTER 25/26



COS, FALL 25



LOEWE, PRE-FALL 25



PROENZA SCHOULER, FW 25



THE ROW, FALL 25



PRADA, F/W 25



# CO-ORDS



MASSIMO DUTTI, FALL 25

REIMAGINED MINIMALISM: TAILORING AS THE NEW ESSENTIAL

# SHIRT DRESS



REIMAGINED MINIMALISM: TAILORING AS THE NEW ESSENTIAL

# POPLIN VOLUMES



# VISUAL RESEARCH - surface design

**Stripes** emerge as the season's core pattern, ranging from classic, thin pinstripes to wider variations that maintain delicacy while introducing casual ease. Expanding on linear motifs, **pleats** add volume and movement, creating soft, feminine silhouettes across both tailored and relaxed styles.

Knits continue to play a key role, with **3D braided effects** elevating everyday pieces. Loro Piana showcases delicate iterations, while Bottega Veneta presents statement cardigans, highlighting texture as a key opportunity for twin-set styling and layered looks.

**Sheer constructions** in lightweight knits add subtle sensuality, particularly in essentials like t-shirts and turtlenecks, allowing for versatile layering. Clean, minimalist **base layers in fresh seasonal colours** encourage repeat purchases, fostering consumer trust in high-quality, comfortable fabrics with thoughtful finishes, free from itching tags or excessive detailing.



# STRIPES

MASSIMO DUTTI, FALL 25



PRADA, FALL 25



TORY BURCH, FALL 25



PROENZA SCHOULER, FALL 25



THE ROW, FALL 25



# PLEATS

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MASSIMO DUTTI, FALL 25



LORO PIANA, S/S 25



GABRIELA HEARST, A/W 25



PROENZA SCHOULER, FALL 25



PRADA, PRE FALL 25



# KNIT BRAIDS

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RALPH LAUREN, PRE-FALL 25



THE ROW, FALL 25



PRADA, A/W 25



LORO PIANA, A/W 25/26



BOTTEGA VENETA, FALL 25



# SHEER KNITS

BOTTEGA VENETA, FALL 25



MASSIMO DUTTI, FALL 25



TORY BURCH, FALL 25



THE ROW, FALL 25



PROENZA SCHOULER, PRE-FALL 25



# VISUAL RESEARCH - details

Details this season lean toward soft, wearable iterations, with **buttons** emerging as a key design accent. Seen across multiple collections in mother-of-pearl, tonal, and contrasting colourways, buttons serve both functional and decorative purposes, adding quiet polish to minimalist silhouettes.

**Utility** remains a core design influence, integrated into refined collections through scrunch-adjustment ties, cargo pockets and other functional elements that double as embellishment. These details elevate wearability while reinforcing the **practical-luxury narrative**.

**Twist detailing** redefines otherwise simple pieces, adding directional interest through draped manipulations. Frequently placed at the shoulder—as in The Row's latest collection—or reinterpreted as focal points in accessories, such as Loewe's twisted shoe uppers, this technique **refreshes staple items with architectural nuance**.

Within quiet luxury's streamlined codes, **sailor collars** are re-emerging as a key neckline update. Offering a fresh take on polos, they bring structure while softening formality. The deliberate absence of buttons in these styles contrasts the season's broader button trend, introducing an ease and casual chicness that balances tailored construction.



# BUTTON UP

MASSIMO DUTTI, FALL 25



LOEWE, FALL 25



THE ROW, FALL 25



THE ROW, FALL 25



PRADA, A/W 25



LORO PIANA, S/S 2025



# UTILITY

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# TWISTS

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LOEWE, PRE-FALL 25



PROENZA SCHOULER, PRE-FALL 25



THE ROW, FALL 25



COS, FALL 25



MASSIMO DUTTI, SPRING 25



THE ROW, FALL 25



# SAILOR COLLAR

MASSIMO DUTTI, FALL 25



PROENZA SCHOULER, FALL 25



BOTTEGA VENETA, PRE-FALL 25



LORO PIANA, A/W 25/26



THE ROW, FALL 25



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# The Rule Engine

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# PYTHON CODING - the engine

## What The Engine Does

In: The research findings as probability distributions

Out: Complete collection plan with balanced assortment and design coherence

Validates: Ensures all commercial and creative constraints are met

## Technical Foundation

Built with **Python** using advanced probability distributions, constraint validation, and data visualization - bridging creative design with systematic business planning.



# PYTHON CODING - the rules

**Colors** - weighted distribution followed by random assignment of color

50% Group 01:



35% Group 2:



15% Group 3:



+ For categories that has fewer than 2 items per gender , only use groups 1 and 2 for color assortment.

**Silhouettes** - weighted distribution followed by random assignment + extra logical rules

50% Group 01: basics, tied-up, drapes

35% Group 2: poplin volumes, shirt dress

15% Group 3: co-ords

- + At least one Shirt Dress
- + No Shirt Dress for Men
- + Co-ords only under the category 'Tops (T-shirts & Blouses)'

# PYTHON CODING - the rules

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**Surface Design** - weighted distribution followed by random chances

50% Group 01: basics/plain

40% Group 2: sheer, stripe #1, stripe #2

10% Group 3: braids

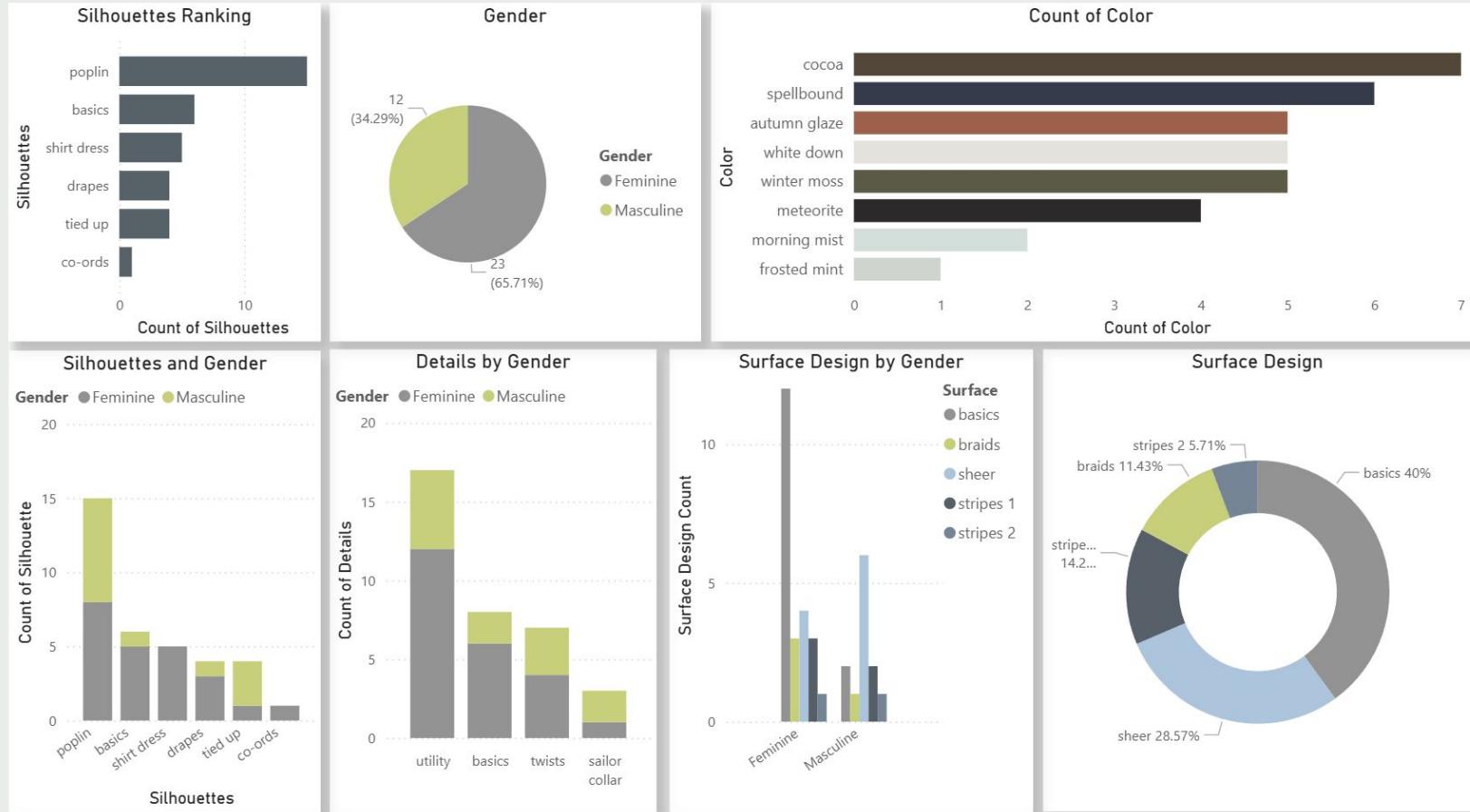
+ At least one of each for each gender

**Details** - random distribution: basics, utility, twists, sailor collar

+ At least one Shirt Dress

+ Sailor Collar only under the category 'Tops (T-shirts & Blouses)' and 'Tricot Tops'

# OVERVIEW IN POWER BI



# OVERVIEW IN POWER BI - breakdown

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## Purpose

- Visualizes the automated engine output.
- Provides designers with a quick, data-driven overview to guide final collection development.

## Designer Insights

- Identifies gaps or overrepresented elements to adjust in the final design phase.
- Serves as a visual checklist for design, merchandising, and planning teams to align on the next steps.
- Converts rule-based engine logic into a human-friendly format for creative decision-making.

## Business Value

- Accelerates planning-to-design handoff with clear visual validation.
- Reduces manual revisions by flagging deviations early in the process.
- Supports data-informed creativity, merging analytics with design intuition.

# CONCLUSION AND IMPACT

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This project demonstrates how **data analytics and creative design** can work together to transform fashion assortment planning. By integrating Python automation, Excel analysis, and Power BI visualization, the solution bridges trend research with scalable, rule-based decision-making.

This project demonstrates **advanced analytics, business logic automation, and visual storytelling**. (transferable skills to planning, allocation, CRM, and merchandising analytics roles in fashion and retail)

## Proof of Concept Delivered

The Power BI dashboard validates that the engine accurately distributes silhouettes, colors, and details according to strategic and aesthetic requirements.

## Strategic Advantage

Introduced data-driven creativity: moving from intuition alone to evidence-based design decisions without sacrificing artistic vision.

## Future Potential

- Integration with real-time e-commerce data for dynamic collection planning.
- Scaling the engine for multi-season, multi-brand product lines.
- Expanding into predictive analytics for demand and inventory alignment.
- Expand into more categories of design, furthering detailing design needs.

# Thank you!



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