4. Design intervention
Building facade

4.1 Site analysis

Purpose

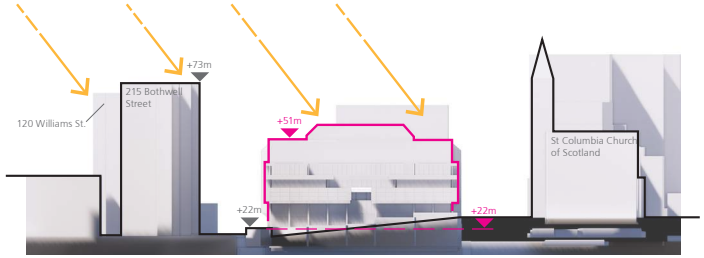
The replacement of the existing building envelope will employ a fabric first approach to passive measures. The design of the facade will respond to the building massing and orientation, and the extent of exposure to direct sunlight.

Building massing

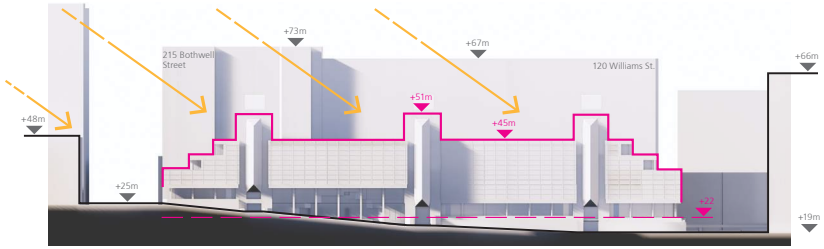
301 St Vincent Street is a low lying building mass, nestled into the city topography to the north and east, and sheltered by the 12 and 14 storey high rise buildings to the immediate south. Two central courtyards reduce the depth of the upper floorplates while providing natural daylight via large light-wells into the lower floorplates.

Building orientation

The building sits on an axis of 13 degrees northeast, with the primary building façades facing predominantly to the north and to the south. The building massing to the east and west is tiered, stepping back from the perimeter as it rises to create a ziggurat profile.



Section North - South



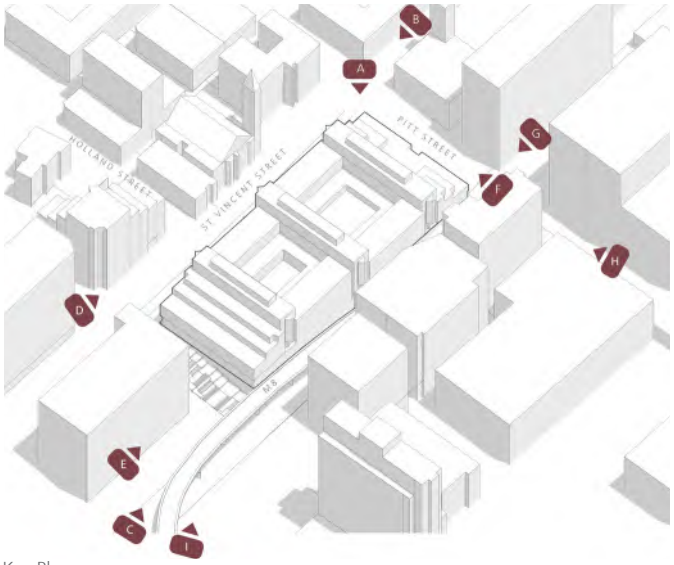
Section East - West

4.2 Key vistas

Occupying an entire city block along St Vincent Street, the building mass dissects the city grid at the base of Holland Street. It is knitted into Glasgow's unique urban fabric and topography, responding to the severe slope of the site, providing the backdrop to a range of long and short vistas across the west of the city.

Significantly, the building fronts the M8 motorway and slip road, with stepped green terraces and shimmering glass façades defining the city gateway on arrival from the south (I).

The elevated pedestrian approach from the city (A & B) and the approach from Charing Cross (D) present views east and west along St Vincent Street are considered of key importance. The approach from Bothwell street (G) at a lower pedestrian level reveals the scale and massing of the building.



Key Plan

View A

View B

View C

View D

View E

View F

View G

View H

View I

4.3 Sun path

Sunlight review

The orientation and massing in relation to the high-rise buildings to the south, ensures 301 St Vincent Street remains in shadow for significant periods through the seasons.

During winter months, the low angle of the sun casts long shadows across the entire building. Intermittent sunlight bathes the upper floor of the courtyards south facing elevations, while late afternoon sunlight bathes the west terraces. The south facade remains in almost continuous shadow.

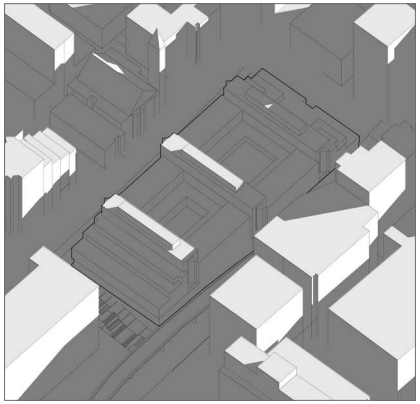
During the spring and autumn equinox, the building emerges from the shadows during the midday hours. The mid angle of the sun reaches into the 3 storey courtyards and the upper most floor of the south elevation experiences some direct sunlight.

During the summer months, the south facade experiences greater levels of sunlight from the high angle of the sun. The courtyards and terraces are also bathed in direct sunlight.

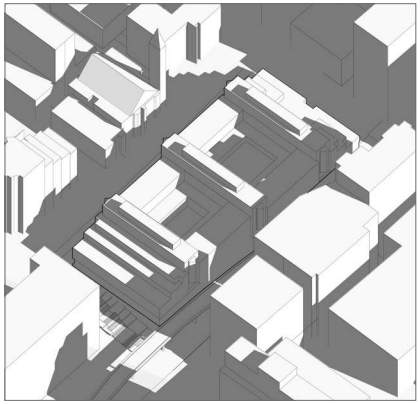
Internal condition

Evenly distributed, indirect natural daylight is considered the optimum condition for comfortable, functional commercial interiors.

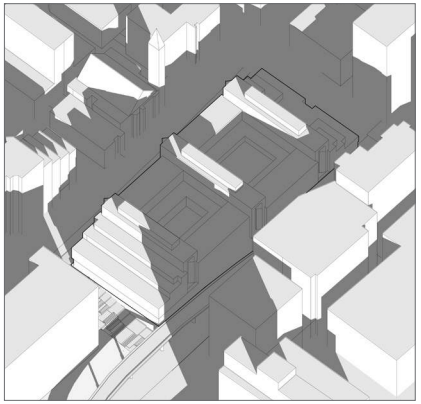
Glazed façades reduce dependency on artificial lighting but must be balanced against thermal heat loss. Direct sunlight will create glare and prolonged periods will generate unwanted heat gains internally.



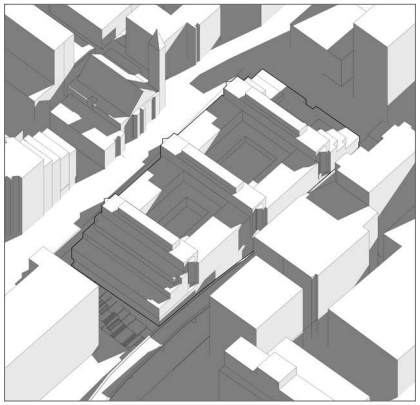
09:00 - Winter solstice



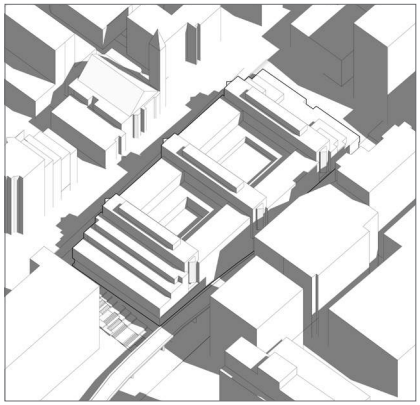
12:00 - Winter solstice



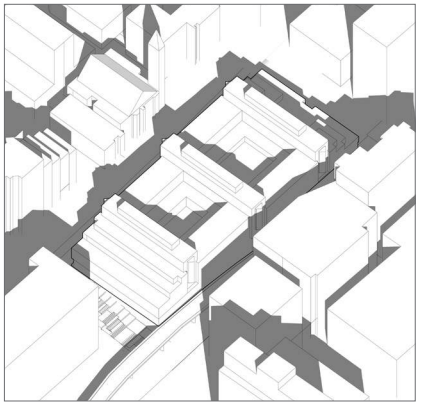
15:00 - Winter solstice



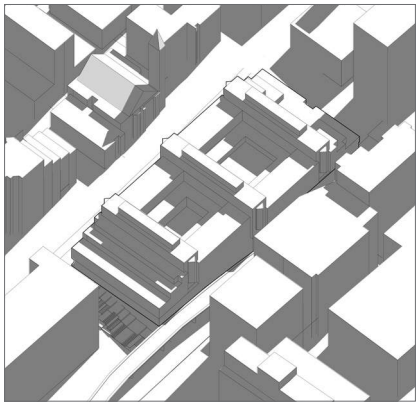
09:00 - Spring/Autumn equinox



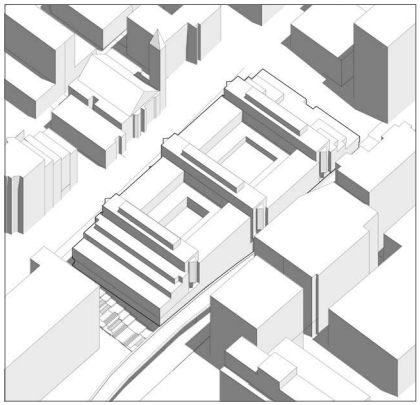
12:00 - Spring/Autumn equinox



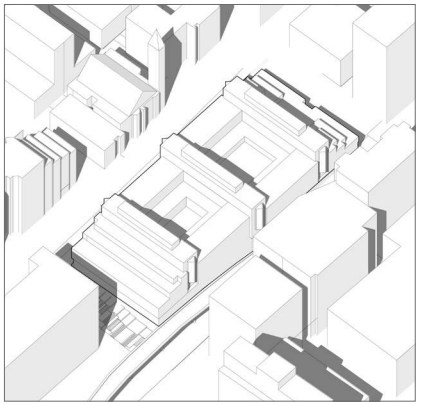
15:00 - Spring/Autumn equinox



09:00 - Summer solstice



12:00 - Summer solstice



15:00 - Spring solstice

4.4 Sunlight exposure

Duration of direct sunlight exposure

A review of the hours of direct sunlight has been carried out to understand the duration and seasonal intensity of exposure across the building façades. Locating areas of increased thermal heat gains and losses has analysis has shaped the approach to the design of the replacement facade.

The north northeast facade is exposed to c.3-4h hours of early morning sunlight during the high summer months only, falling back into permanent shadow for the remainder of the year.

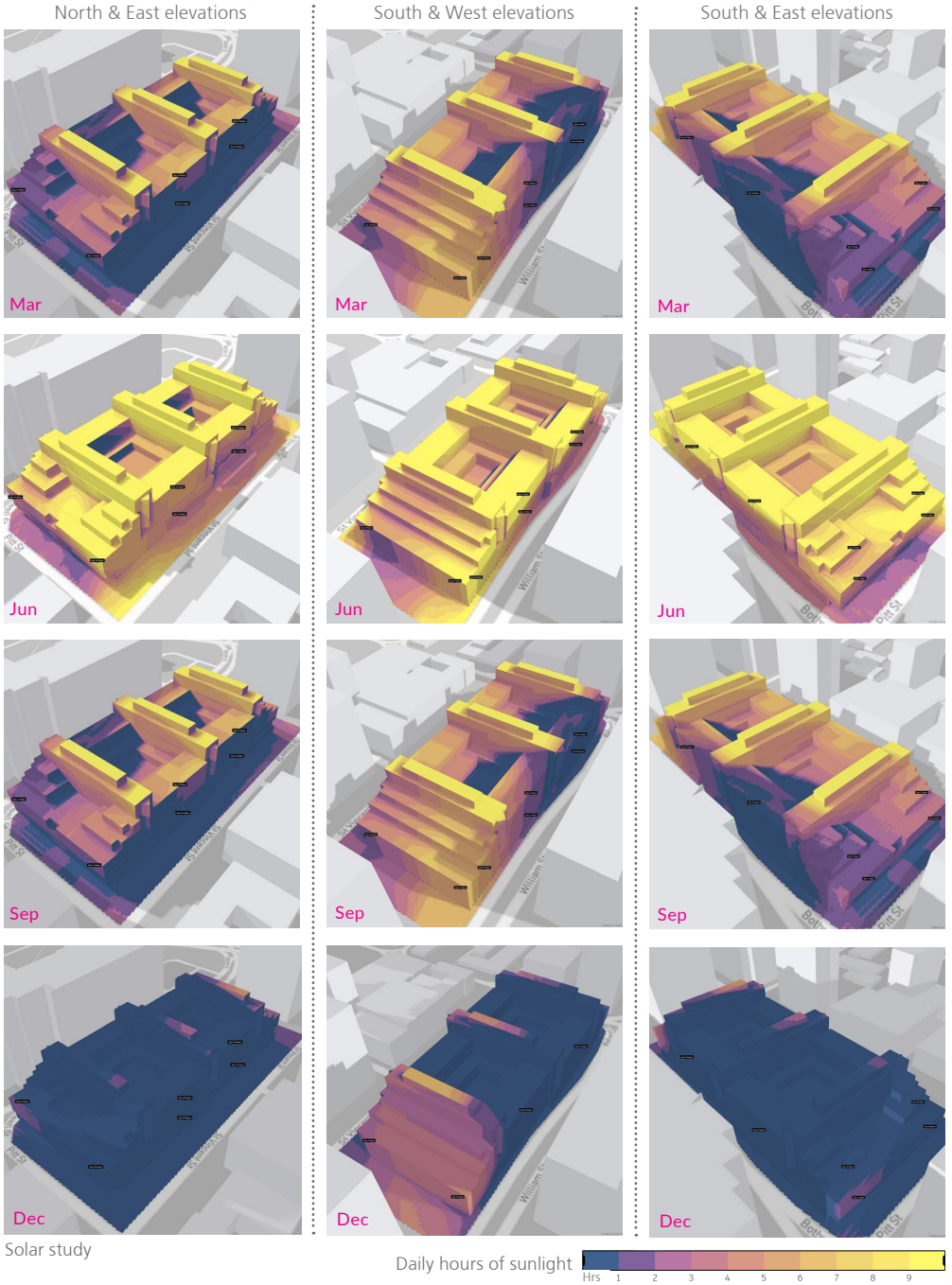
The upper floors of the south southwest facade experience uninterrupted direct sunlight during the summer months, while the lower floors, overshadowed by adjacent buildings experience a maximum of c.3-4 hours of direct sunlight during the same season.

The southwest corner, overlooking the M8 overpass experiences the greatest overall exposure to direct sunlight, with c.8 hours of direct sunlight and uninterrupted views out the Firth of Clyde and beyond.

Summary

The assessment demonstrates the impact of overshadowing, where the differential in temperature fluctuations and solar glare between the north and south façades is significantly reduced.

On the macro scale, this enables a homogeneous approach and a modular design solution that spans the entire building envelope. On the micro scale, this module can be tuned to ensure a responsive approach based on the specific orientation and aspect, in order to manage variations in thermal heat loss, direct sunlight and glare.



Solar study

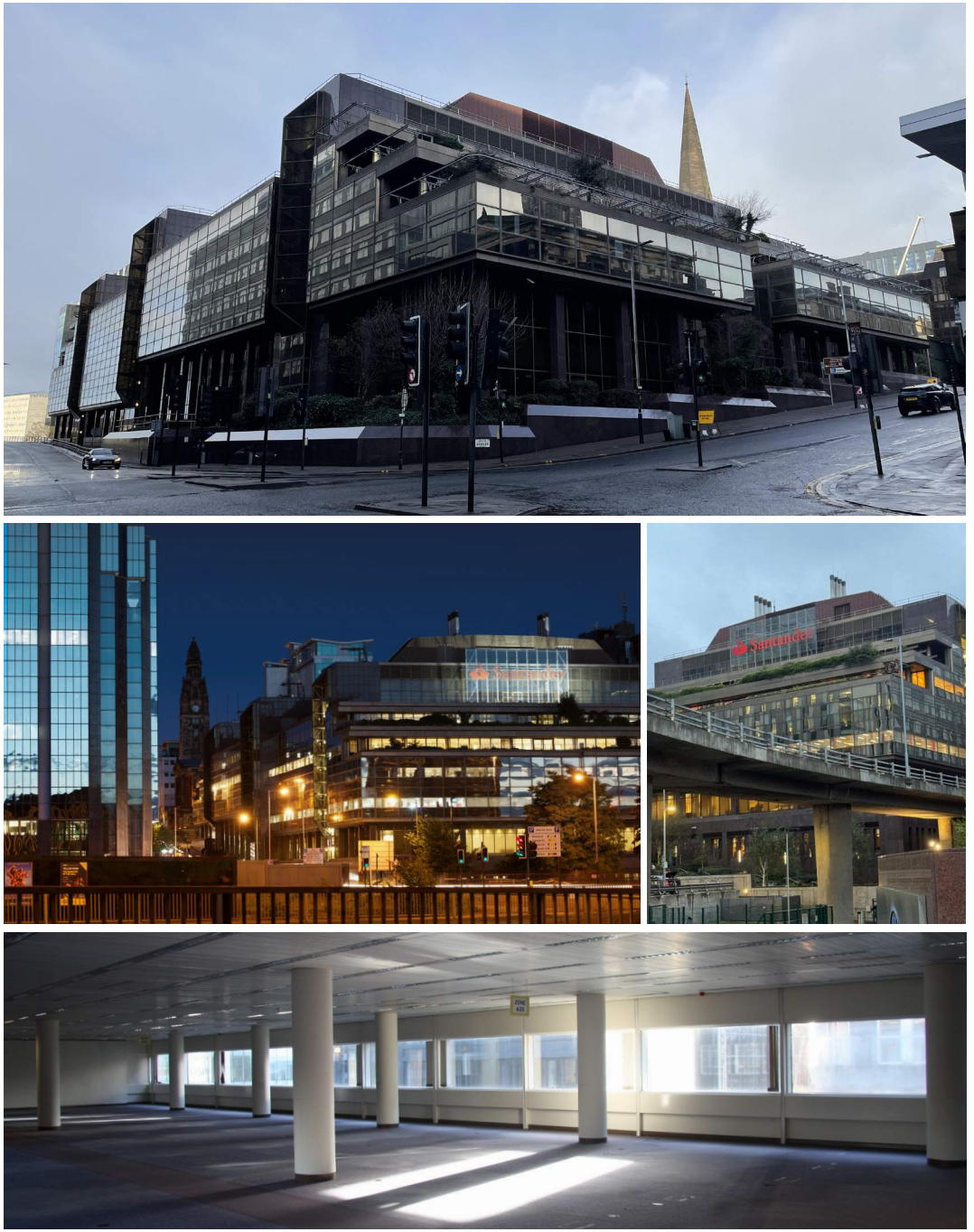
4.5 Existing facade composition

Existing building facade

301 St Vincent Street is a distinctive example of late modernist architecture, with an external envelope that presents a uniform, mirrored glass facade.

Only when illuminated internally, does the facade reveal a more accurate arrangement of solid and transparent elements, with a transparent ribbon window encompassing the perimeter at each storey height.

From within, the raised cill level and dropped bulkhead in turn limit the extent of natural light into the deep floorplates and restrict views out toward the city and beyond.

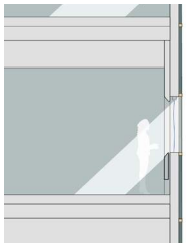


301 St Vincent Street
Facade composition

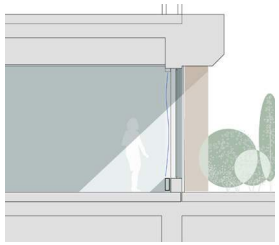
4.5 Existing facade composition

Existing building facade

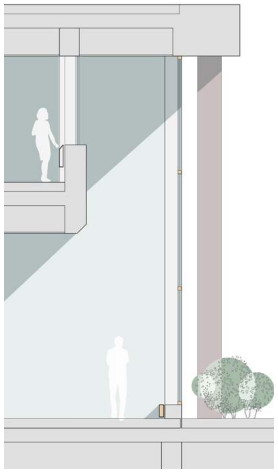
A detailed assessment of the existing facade typologies has been carried out, to understand the scale of variation across the building envelope.



A Window cill and head

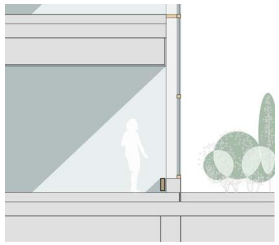


C Floor to ceiling glazing.

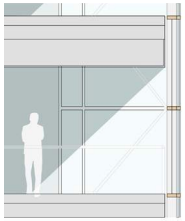


E Double height glazing

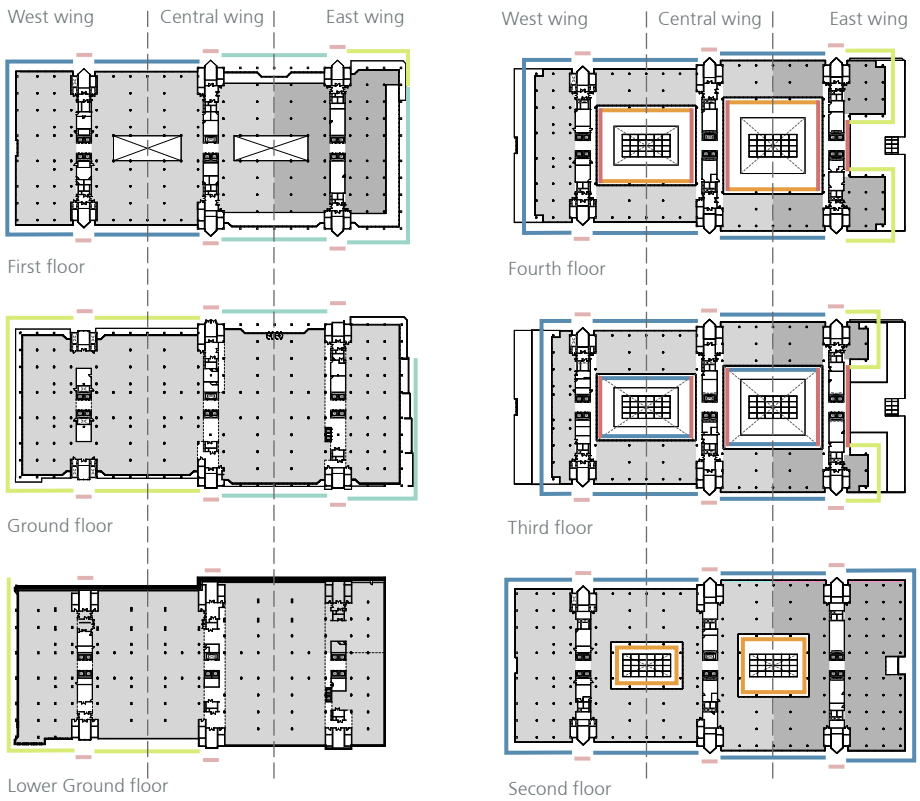
B Floor to ceiling glazing. Type 1

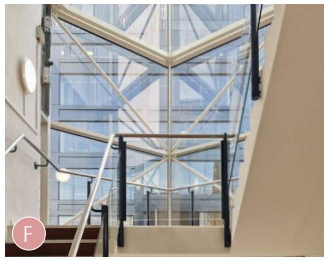


D Cores



F Vertical stair core





4.6 Existing facade condition

Existing facade condition

A detailed internal and external visual assessment of the existing facade has been carried out by an industry leading specialist. This report includes the following facade elements:

1. Curtain walling
2. Stair glazing
3. Glass
4. Gaskets
5. External and internal metal finishes
6. Doors
7. Atrium glazing
8. Smoke vents (AOV's)
9. Stone cladding
10. Aluminium pressed metal panels

The findings of this assessment have been reviewed alongside a broader and deeper analysis of the proposed intervention, by Arup. This design review has included an assessment of the available record information, in order to stress test the proposal against structural, thermal, fire and acoustic performance up to RIBA Stage 2 design.

The analysis has addressed the project mandate to reduce embodied carbon and has identified opportunities for recycling and re-use, to be explored further within Stage 3 design.

Extract from facade report
_Arup

Introduction

Arup have been appointed by Osborne & Co to advise on options relating to the facade of the large office building at 301 St Vincent Street, Glasgow.

The building was constructed in the 1980s as a headquarters for the oil company Bristol. It was the largest single occupancy office building constructed in the 1980s. Arup were structural engineers for the original construction of the building.

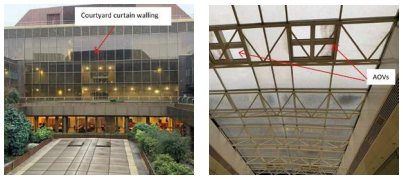
This report focuses on how the architectural intent being developed by LOM architects can be delivered. This is presented through the report by comparing the two facade options (facade replacement and facade refurbishment) based on a series of key technical criteria.

This report should be read in conjunction with the following appendices:

- Appendix A - Arup comments on Cladtech survey report
- Appendix B - Arup site visits images
- Appendix C - Record information
- Appendix D - Refurbishment precedent projects
- Appendix E - Arup archive

This report focuses on how the architectural intent can be delivered. It compares two facade options, looking at key technical criteria.

ARUP



View of curtain walling facing courtyard from Cladtech Associated survey report

View of glazed rooflight from the inside, Cladtech Associated survey report

View of granited cladding from Cladtech Associated survey report

View of sliding door at terraces from Cladtech Associated survey report

Existing curtain-walling:
Cladtech Associates facade survey

Cladtech Associates carried out a non-intrusive survey of the facade of the building. Please refer to Appendix A for Arup comments on Cladtech Associates facade survey report.

Below is a summary of the main conclusions and recommendations presented by Cladtech Associates in their report.

Curtain walling + windows

The systems have exceeded their original design service life. The curtain walling system is still providing weathertightness to the building, but some of the IGUs have previously failed and the gasket seals have age hardened.

If the frame was retained, there would be a risk of water ingress and requirement for bespoke products following attempt to repair the existing seals. Therfore, the recommendation is to replace the curtain walling with a new system, to improve thermal performance, water resistance, airtightness and acoustic performance.

Granite cladding

As the granite cladding is overall in good condition, it is advised to retain the existing cladding, following inspection of brackets and replacement of black sealant between stone joints.

Doors

The doors are generally in a serviceable condition but it is assumed that, because of their age, they will not perform as a modern equivalent product. The recommendation is to replace the doors with new better performing system.

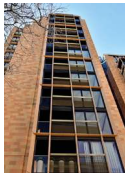
Glazed rooflight

The glazed rooflight experienced water ingress in the past and repairs (external application of new sealant) have been undertaken. Refurbishing the existing system, by removing and replacing all of the seals and IGUs, would improve long term weather tightness, but the system would need to remain "face sealed" with potential risk of future water ingress. Therefore, the recommendation is to replace the glazed rooflight with a new better performing system, specified and tested to achieve a specific CWCT TN 66/67 fragility classification.

Following a facade survey, Cladtech Associates recommended to retain the granite cladding and to fully replace with new systems curtain walling, windows, doors, and glazed rooflight.

ARUP

Existing granite cladding on the west elevation (left) and south elevation (right)



Ibrox Rose House (Matt Architecture) - GRC cladding

Chiltern Place, (PLP Architecture) - Terracotta cladding

Buckingham Green, London - Brick-faced precast panels

Facade proposal
Stone cladding

During Stage 2, Arup investigated possible options for the areas of the facade which are currently covered with stone cladding:

Retained stone cladding

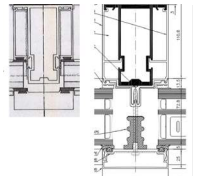
- From Cladtech Associates' survey report and based on Arup site visit report, it is noted that the polished granite cladding is generally in good conditions. It is therefore deemed appropriate considering the option of retaining the existing cladding in these areas of the facade.
- Combustability of existing thermal insulation behind existing stone cladding is to be further investigated, to ensure compliance with the current Building Standards Scottish Technical Handbook.
- Condition of the stone fixings and supporting brackets should further investigated through intrusive survey to determine their ability to continue to support loads.

New opaque cladding

- Different materials and systems can be investigated for the opaque area of the facade, including lightweight aluminium rainscreen, terracotta cladding, GRC panels, stone-faced or terracotta faced precast panels.
- The opaque wall will include thermal insulation for thermal performance. It is recommended for the new insulation to be non combustible and to be a minimum of A2-s1, d0 when classified to BS EN 13501 Pt.1.
- To limit the embodied carbon associated to the new opaque facade, the reuse of the existing stone, previously removed from the building, should be considered.
- Interfaces between opaque walls and curtain walling to be carefully designed to ensure appropriate performance.

Options for the existing granite cladding have been considered, which include retaining the existing cladding, or replacing it with a new system to be further investigated during the next stage.

ARUP



Replacement option: concept drawing for proprietary stick curtain walling system with pre-pecking overcoap

Refurbishment option: example of refurbishment of stick curtain walling by specialist contractor FKN

Profile	U_{fm}/U_f [W/m²K]	Area [m²]	U_f·A [W/K]
Transom	5.90	0.148	0.31
Mullion	6.84	0.133	0.33
Mullion	3.3	0.385	0.83
Transom	3.5	0.441	0.99

Glass	U_g [W/m²K]	Area [m²]	U_g·A [W/K]
Glass	1.0	1.873	3.84

Glass edge seal	Ψ_{sl} [W/mK]	Length [m]	ψ^*L [W/K]
Glass	0.081	5.000	0.41
Glass	0.081	11.8	0.96

Panel	U_p [W/m²K]	Area [m²]	U_p·A [W/K]
Panel	0.28	3.885	0.98

Panel edge seal	Ψ_{sl} [W/mK]	Length [m]	ψ^*L [W/K]
Panel	0.20	7.950	1.18
Panel	0.30	3.3	0.33

Total area of the facade [m²]	12.0350
Thermal transmittance Ucw [W/m²K]	1.9
Thermal transmittance Ucw with 10% contingency factor [W/m²K]	1.1

Preliminary thermal calculation (U-value) for replacement facade option

Profile	U_{fm}/U_f [W/m²K]	Area [m²]	U_f·A [W/K]
Transom	3.5	0.148	0.52
Mullion	3.3	0.133	0.47
Mullion	4.5	0.385	0.85
Transom	3.5	0.441	0.93

Glass	U_g [W/m²K]	Area [m²]	U_g·A [W/K]
Glass	1.0	1.873	2.0

Glass edge seal	Ψ_{sl} [W/mK]	Length [m]	ψ^*L [W/K]
Glass	0.081	5.000	0.41
Glass	0.081	11.8	0.96

Panel	U_p [W/m²K]	Area [m²]	U_p·A [W/K]
Panel	0.28	1.888	0.58

Panel edge seal	Ψ_{sl} [W/mK]	Length [m]	ψ^*L [W/K]
Panel	0.20	3.900	1.18
Panel	0.30	3.3	0.70

Total area of the facade [m²]	12.0350
Thermal transmittance Ucw [W/m²K]	1.2
Thermal transmittance Ucw with 10% contingency factor [W/m²K]	1.4

Preliminary thermal calculation (U-value) for refurbished facade option

Design criteria
Thermal performance

Based on the record information, the following considerations can be done:

- A very thin PVC insulator is included between the nose of the transom/mullion sections and the pressure plate. Although it can be considered thermally broken, the existing frame U-value is still very poor, especially when compared to modern thermally broken curtain walling frame.
- The existing double glazing unit include air filled cavity but without solar control coatings. Air filled cavity leads to poor thermal performance (high glass centre pane U-value). A typical 90% argon filled cavity (optimal thickness of 16mm) and selecting low-E coating for new double glazing units would considerable improve the thermal performance.

As part of the replacement facade scenario (Option 1), the existing curtain walling frame would be replaced with a proprietary thermally broken curtain walling frame and new double glazing units. Arup carried out a preliminary U-value calculation which shows that for a replaced curtain walling the U-value is approximately 1.1 W/m²K.

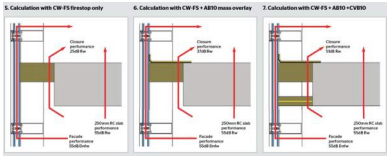
As part of the refurbishment facade scenario (Option 2), the existing curtain walling frame would be thermally improved by introducing a thermal break between the mullion/transom extrution and pressure plate, and new double glazing units. The preliminary U-value calculation shows that for a refurbished curtain walling the U-value is approximately 1.4 W/m²K.

Based on Cundall Energy & Sustainability Statement, the aspiration for the project is to improve the facade thermal performance, by targeting a U-value of 1.2 W/m²K for the curtain walling. Based on Arup preliminary thermal calculation, the target U-value may be difficult to be met if the refurbishment option is adopted.

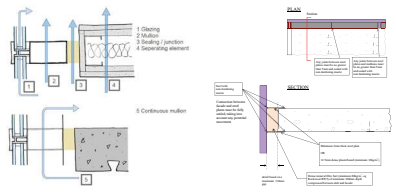
Energy modelling by Cundall would need to confirm if the achievable U-value of the replaced and refurbished curtain-wall would be suitable for the project, bearing in mind that for most office projects cooling rather than heating is the dominant driver for building services.

Thermal performance of existing curtain walling can be improved by either refurbishing frame and introducing thermal breaks, or by replacing it with new thermally broken system.

ARUP



Example of acoustic performance for different details of the interface between curtain walling and slab edge. [source: Sidcrete CPD 22 2017: Acoustic and curtain walling]



Direct flanking paths for sound transmission [source: Proceedings of the Institute of Acoustics]

Example of slab edge interface detail with improved acoustic performance

Design criteria
Acoustic performance

Flanking sound (or flanking noise) is defined as the sound that transmits between spaces indirectly, via different paths, rather than directly through the main separating element.

For curtain walling applications, the flanking path can be broken down to be the sound through the following elements:

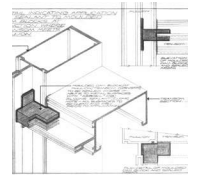
- the glazing - the noise can be reduced by introducing DGU with laminated glass, and design thicker cavities;
- the curtain walling frame (mullions or transoms);
- the interface between the curtain walling and the separating element (e.g. fire stop) - the noise can be reduced by introducing steel plates above and below the fire stop. Connection between facade and steel plates must be fully sealed, taking into account any potential movement.
- the main separating element (floor or partition/compartment wall).

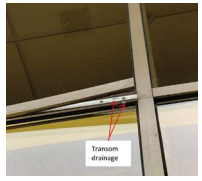
Regardless of whether the curtain-walling frame is replaced or refurbished, all interface details must be very carefully designed and installed to ensure that all sound paths are well controlled in order to achieve the acoustic requirements for sound insulation.

Based on the Acoustic Consultant report at this stage of the project, the curtain walling facing the streets surrounding the building should achieve a minimum sound insulation rating of 28 dB Rw+Ctr. Based on Arup experience, this target is easily achievable with double glazing units which include at least one pane of laminated glass and solar control coating.

All interfaces must be very carefully designed and installed, to ensure that the acoustic requirements that will be specified by the Acoustic Consultant during the next stage are met.

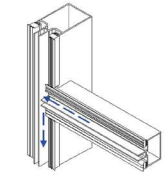
ARUP





is record drawing: sashed "dam block" between mullion and transom

Cladtech Associate report: section of the pressure plate whit visible transom "field drainage"



e path in a typical mullion drained system

Kawneer system: typical mullion drained curtain walling gasket arrangement

Design criteria
Weather performance

Based on the record information, the curtain walling system is a transom drained system, with the glazing rebate drained and ventilated via slots in the transoms. The system includes "dam blocks", sealed at the interface with mullion and transoms with silicone "Arbosil 1081".

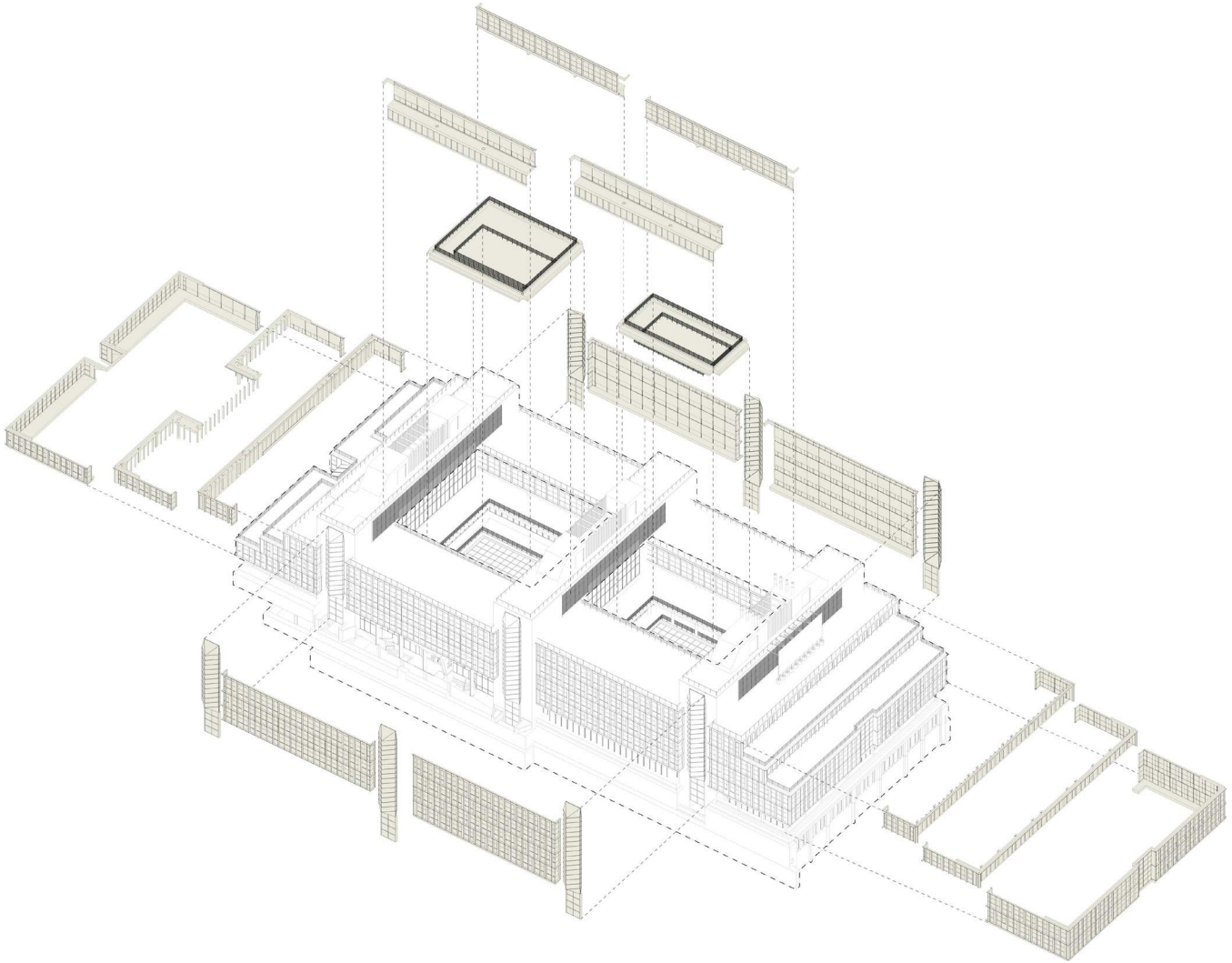
This connection relies on silicon joints all around the "dam block" being properly sealed to prevent water ingress. If the refurbishment scenario was selected, the existing components and the "dam block" solution would be maintained. The silicone around the dam block would need to be removed and reapplied to ensure better watertightness. However, it should be noted that watertightness of the system would still rely as much on the quality of installation and workmanship on site, and on the design life of the sealant.

For the replacement facade scenarios, the removal and replacement of the aluminium frame offers an opportunity to improve the weathertightness of the system and select a more robust strategy for airtightness and water resistance. Mullion drained systems can be introduced, which rely on EPDM gaskets between mullion and transom to drain water along the transoms and then down into the mullion before vacate the system. This system allows for site work to be kept to a minimum, since the gaskets are factory made with higher control of quality. This leads to a more robust interface against water penetration and generally better weather performance over time.

Refurbishment scenario relies on "dam blocks" for weather performance, which are not a robust long-term solution. Replacement option would allow for better weather performance.

ARUP

4.7 Proposed design principles



Wall-to-floor ratio

The ratio is an expression of efficiency in building massing, calculated by dividing the external wall area by the gross internal floor area. With a wall-to-floor ratio of 0.41:1, 301 St Vincent Street is considered an efficient building mass, pertaining to improved energy performance compared to buildings with a greater wall to floor ratio.

Efficient window-to-wall ratio (WWR)

The proposed new facade for 301 St Vincent Street will target environmental excellence adopting a fabric first approach to thermal performance, air tightness and daylight.

Energy modelling will be carried out as the design progresses to establish specific U-values and glazing g-values for the new façades.

Glazing ratios will be optimised by targeting 50:50 (window to wall) to improve natural light into the deeper plan spaces, while minimising heat losses and heat gains.

The design approach to the replacement building envelope will be underpinned by the following key principles:

Performance
Reduce embodied carbon through informed design and specification. Reduce overall operational carbon across the lifetime of the building through improved thermal performance.

Glazing ratio
Improve natural daylight within the internal office environment while retaining a required net ratio of 50:50 window-to-wall in order to minimise excessive temperature fluctuations and solar glare.

Transparency
Enhance the curbside presence of the building with a facade that increases the active frontage and improves the level of transparency to reveal the activity within.

Rhythm
Respond to the structural grid, rhythm and form of the existing envelope in order to remain truthful to the modernist style and proportion of the original building.

Heritage & Context
Acknowledge the building's rich heritage with a design response in materiality and articulation that is in sympathy with the industrial era in which it was built.

4.8 Proposed design approach

Design principles

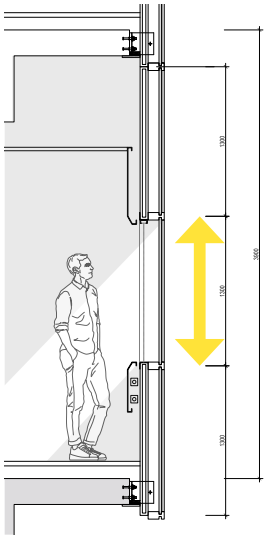
With sustainability at the heart of the intervention, intelligent facade design will reduce M&E dependency by prioritising a passive design approach.

While enhancing the overall building appearance, the proposed facade enhancements will aim to improve the internal environment, optimise performance and minimise operational costs.

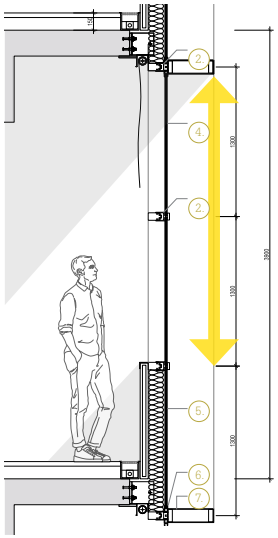
The existing facade module will be retained but the height of the windows will be increased, allowing for natural daylight to penetrate the deeper plan office spaces.

Depth will be created in the facade with extruded horizontal and vertical profiles to provide shading from the low sun from east and west, and the high sun from the south.

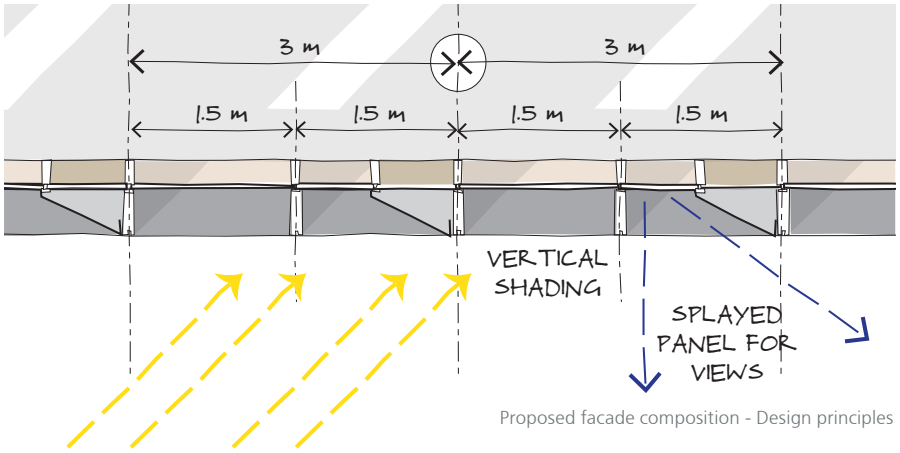
Angled solid panels will help reduce the overall amount of glazing while facilitating views from the office space.



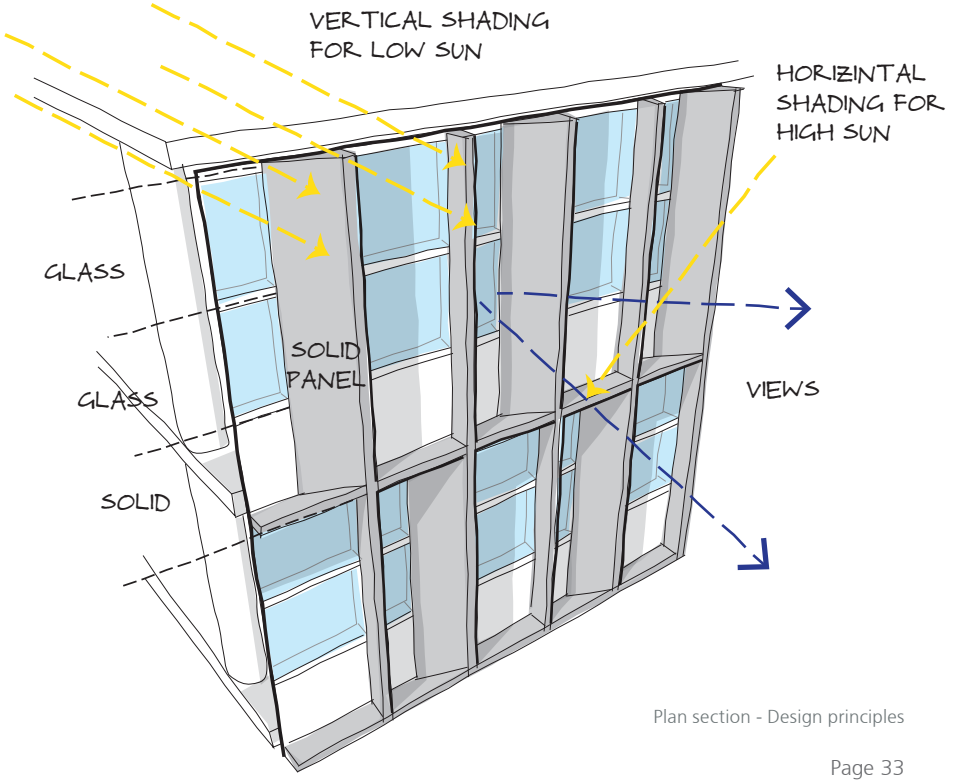
Existing Section - Typical module



Proposed Section - Typical module



Proposed facade composition - Design principles



Plan section - Design principles

4.9 Proposed facade composition

Facade composition

The components and balance of materials that from the new building envelope have been identified. This composition is considered with an understanding of parameters of a replacement curtain wall system.

Existing structural capacities at concrete edge require a facade replacement that does not exceed current loadings. A greater ratio of light weight material build-up, such as insulated aluminium cassettes is targeted in order to offset standard glazing at 25kg/sqm.

A modular approach to the curtain wall system will be pursued in order to extend aspirational reach of the design through economies of standardisation and quality control.

Reflections

Prioritising reflections and allowing the surrounding city fabric to be visible within the massing of the facade

Aluminium

Aluminium is lightweight and malleable, it is a low maintenance cladding material and can be treated in several ways to obtain the desired finish. It can be recycled with 100 percent efficiency

Glass

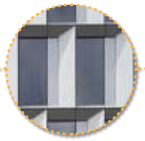
Installing new double glazed build-up with inherent solar treatment will increase the thermal performance of the facade and significantly improve the internal environment

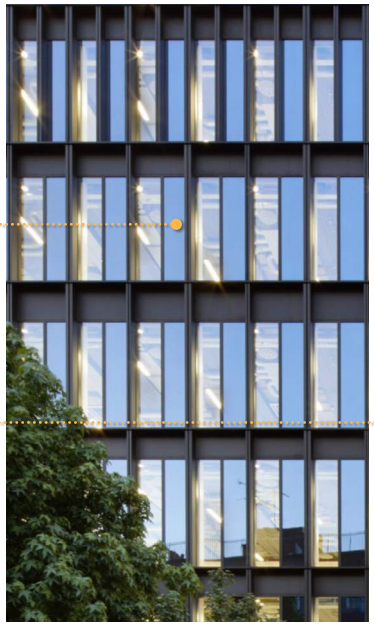
Glass faced spandrels

Glass faced spandrels enable a consistent reflective facade while maintaining the targeted solid-to-glass ratios necessary to minimise operation energy consumption

Articulation

Creating depth through form and volume, light and shadow





Facade precedent images

4.9 Proposed facade composition

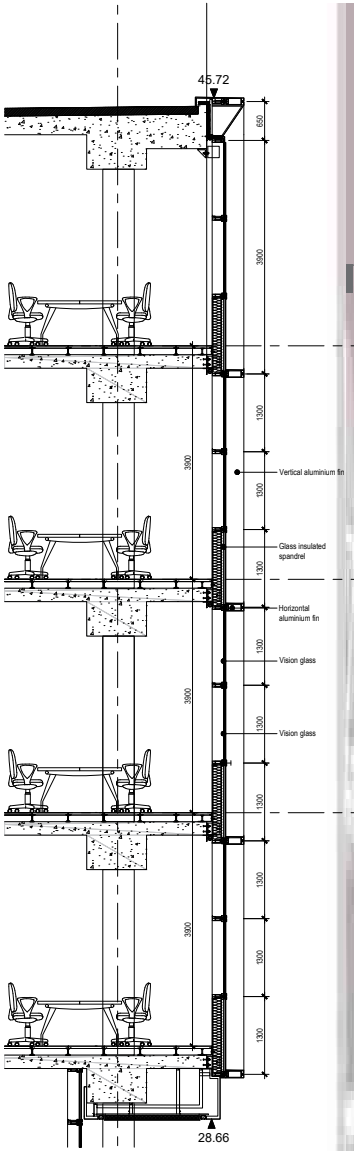
Facade composition

The articulation of the new building envelope will be achieved by creating volume and form along the elevation. The modular fin will protrude beyond the datum of the glass, creating material contrast across the building elevation.

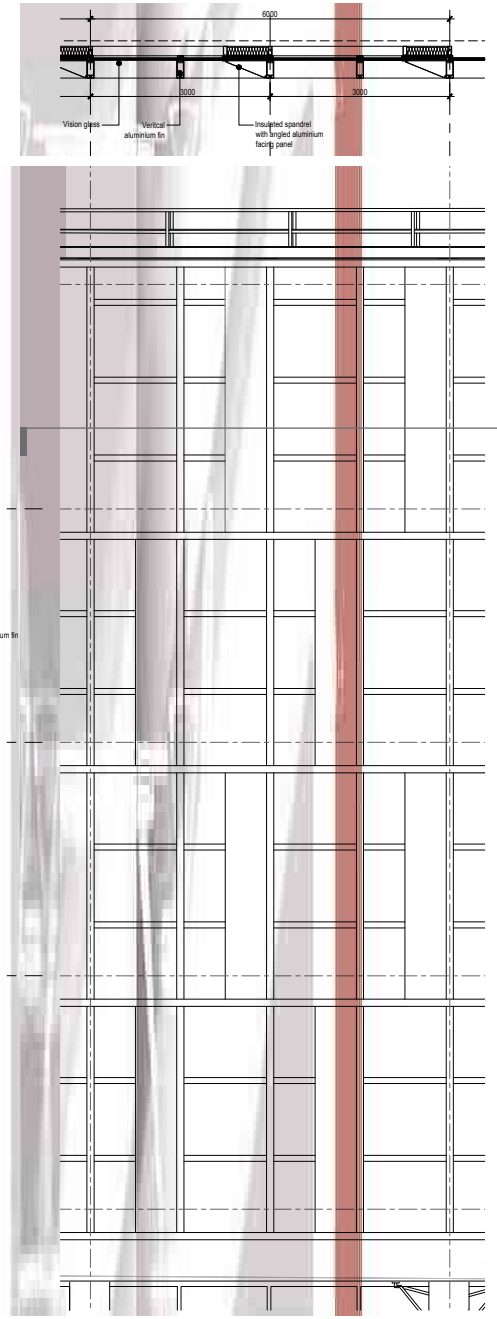
The tonal variation of this fin will naturally occur across the south elevation with to the changing light of the day. The tonal variation to the north elevation will be engineered, with a profile that sharpens and an angle that changes in order to increase the ratio of glazing and prioritise key reflections.

Matt and satin finishes will be explored to heighten this sense of animation. Aluminium will be used to contrast against the glass and glass spandrels, creating a sense of depth, contrast and layering.

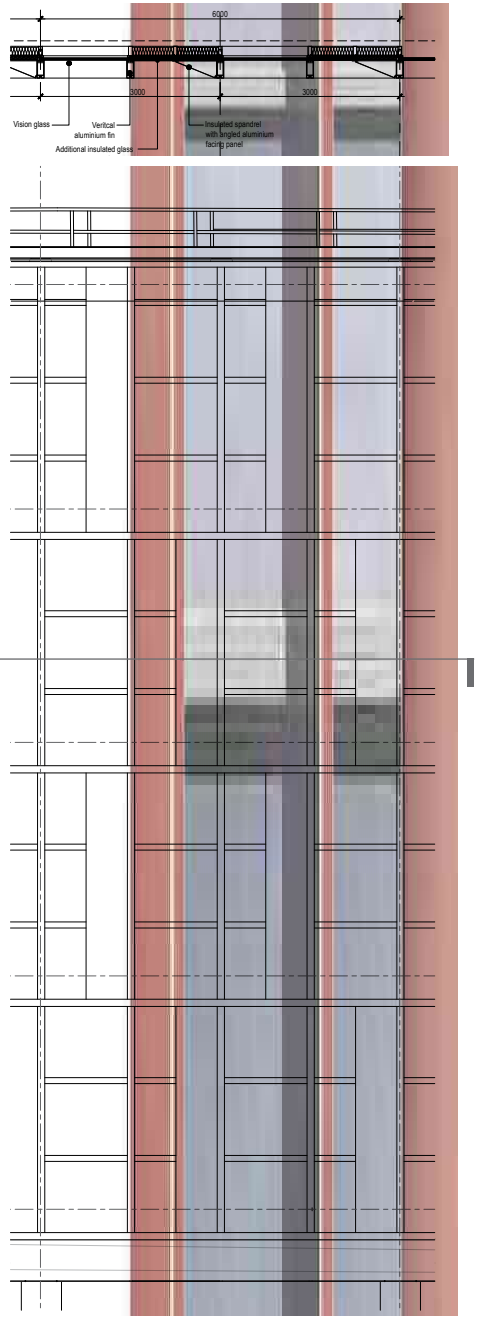
The ratio of glass to glass spandrel across the north and south façades will be tuned to the performance requirement to optimise daylight and thermal performance while managing solar glare.



Proposed storey rod section



Proposed storey rod elevation - North facade



Proposed storey rod elevation - South facade

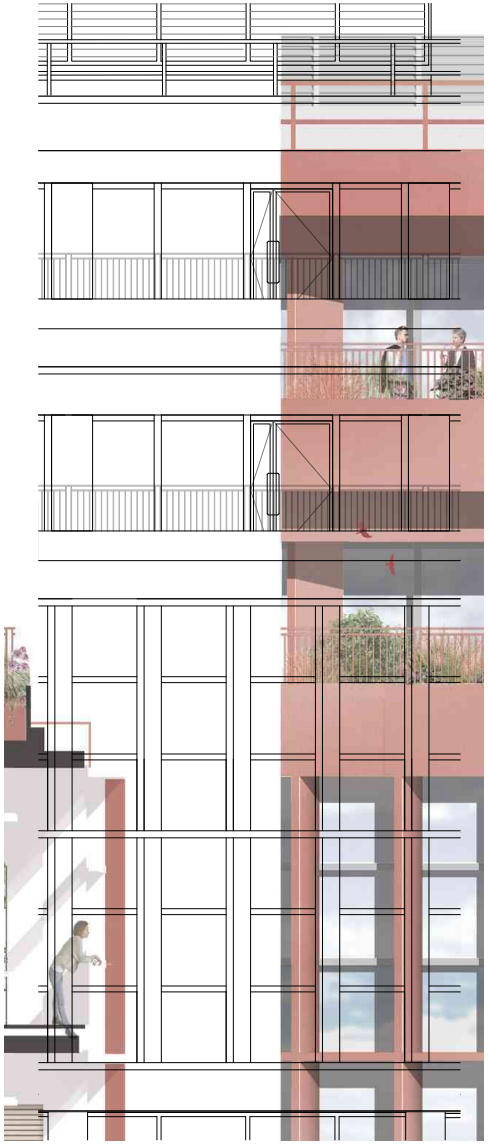
4.9 Proposed facade composition

Facade composition

The composition of the primary façades to the north and south will define the language across the tiered elevations to the east and west.

The vertical mullions will continue the rhythm of the facade, framing the glazed elements and creating shade from the low east and west sunlight.

Proposed storey rod section - West facade



Proposed storey rod elevation - West facade

4.10 Integrating the facade

Existing condition

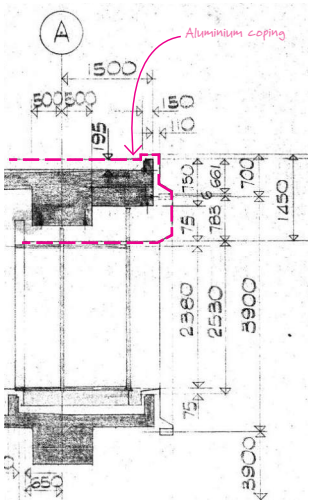
The existing aluminium coping detail is finished in an anodised coating to match the secondary framework of the facade, and has a geometry that creates a deep bulkhead and excessive overhang.

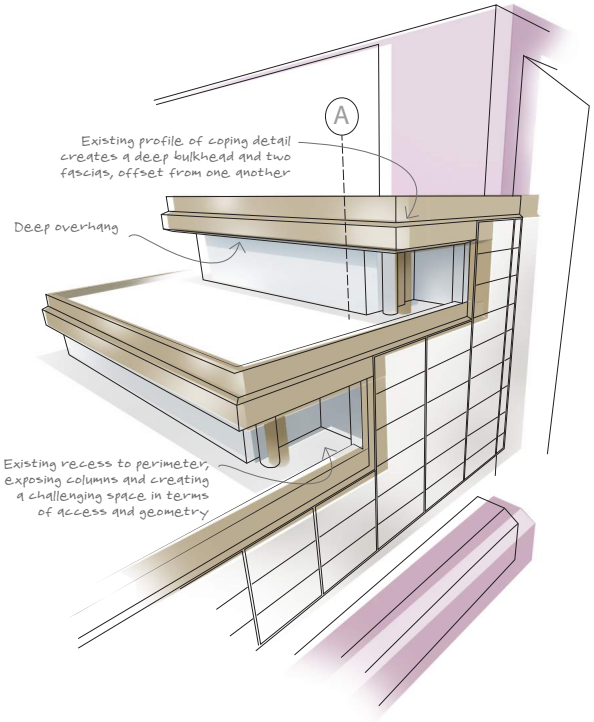
Deconstruction

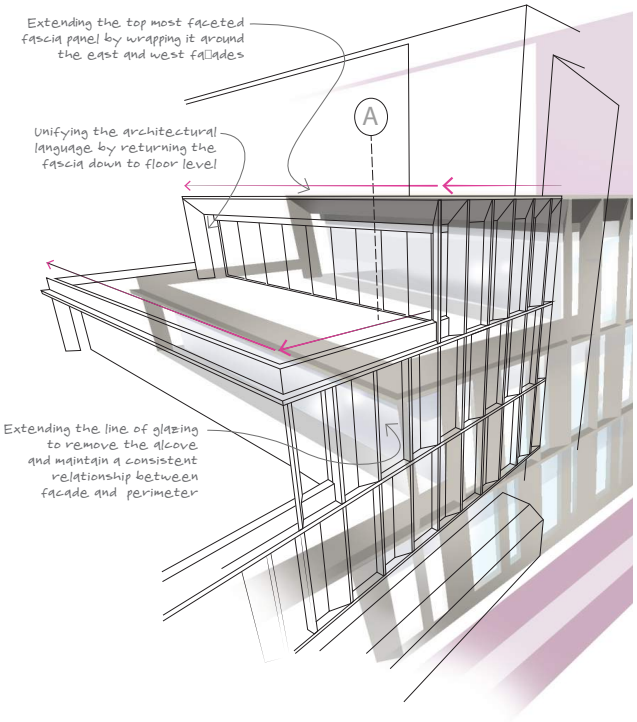
Removal of the existing aluminium coping to expose the concrete floor slab, in order to wrap in a colour and geometry in keeping with the proposed facade design.

Proposed condition

The proposed approach to the facade will seek to unify the four sides of the building by continuing the geometry of the north and south elevations around to the east and the west







Existing condition

Developed proposal - Visual

5. Chromatic harmony

5.1 Existing materials

Chromatic harmony

The proposed design intervention will consider the nature of materials to be retained across the building. Understanding the colour, tone, surface texture and behaviour of these materials will inform a homogeneous approach to the new building facade.

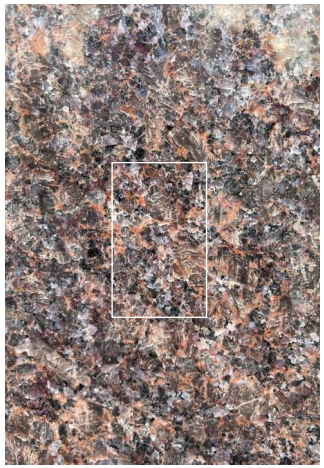
The design will also consider the wider urban context with a response that is in sympathy with the fabric of the wider streetscape

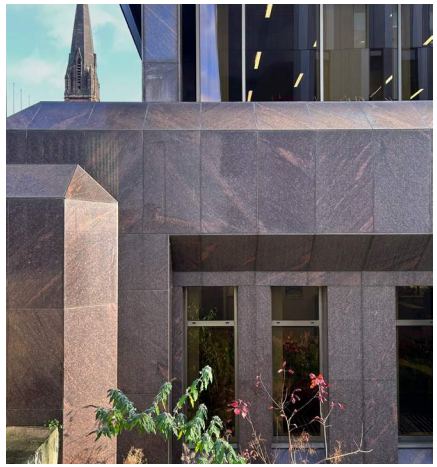
Granite

The primary material retained is the granite cladding. Thought to be Dakota Mahogany Granite from the US and commonplace on commercial buildings commissioned in the 1980's, the granite has a distinctive appearance and character:

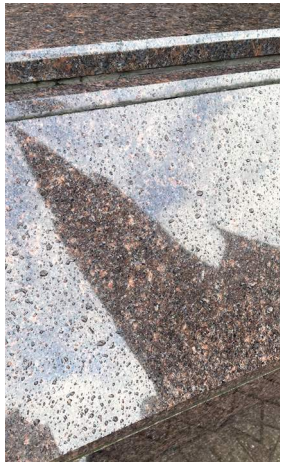
Dense aggregate in a variety of pinks, oranges, reds and blues creates vibrancy and texture. The nature of the quarts creates a sense of depth to the surface which shimmers with the changing light of the day.

The highly polished finish specified for 301 St Vincent Street creates a vibrant, dynamic surface with vivid city reflections. Under certain day light conditions, the granite behaves in a similar way to glass surfaces, reflecting the colours of the surroundings.





Depth and colours within the quartz at different scales



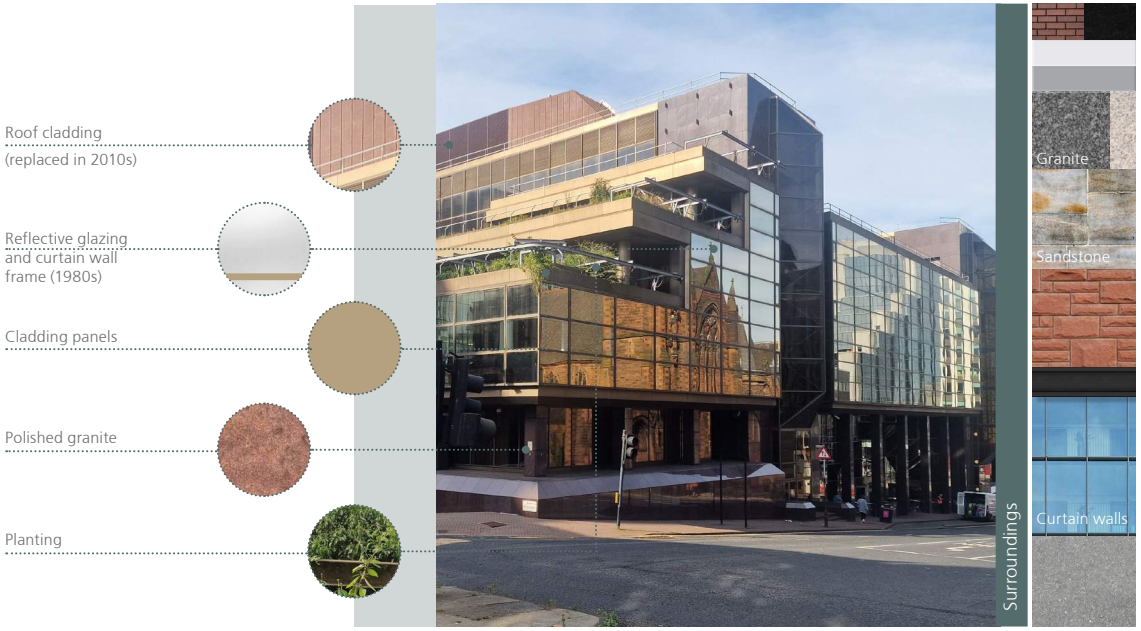
Highly reflective polished surface creates a dynamic material finish

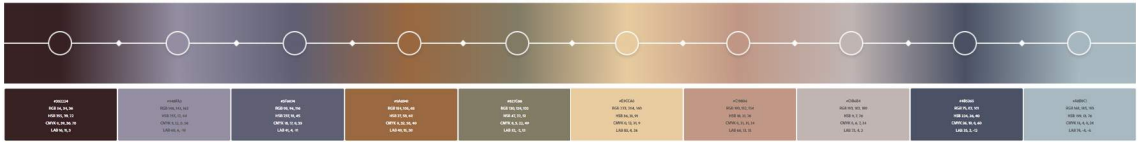
5.1 Existing materials

Existing materials

The proposed design intervention will consider the existing material palette in order to seek a sympathetic approach to the proposed building envelope.

While the primary elements of the facade will be replaced, those that remain will influence the colour, texture and composition of the new intervention.





5.2 Urban fabric

City context

301 SVS occupies a sloping site between two significant city streetscapes.

St Vincent Street to the north is occupied by 5-6 storey heritage buildings in blonde and red sandstone and granite. Bothwell Street to the south has undergone transformation in recent decades to include high rise engineered stone and glass façades.

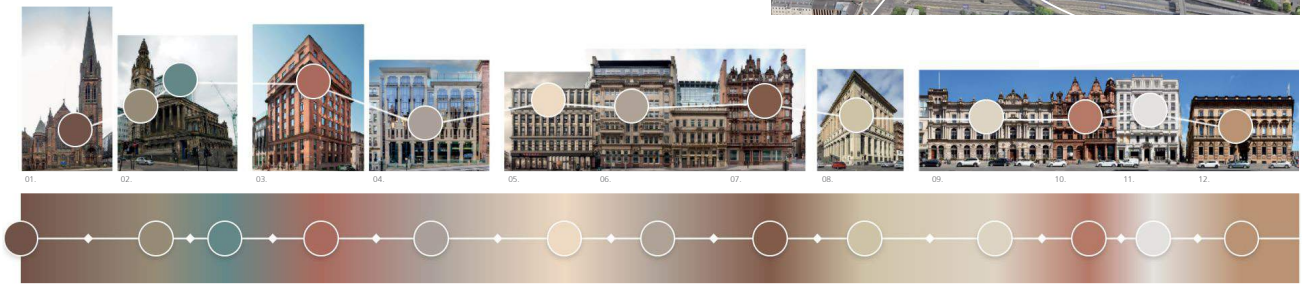
Granite and sandstone

Extensive use of granite in the city of Glasgow, with most examples from the mid-19th century onwards. Used as cladding on the lower floors and for ornamental pillars and balustrades.

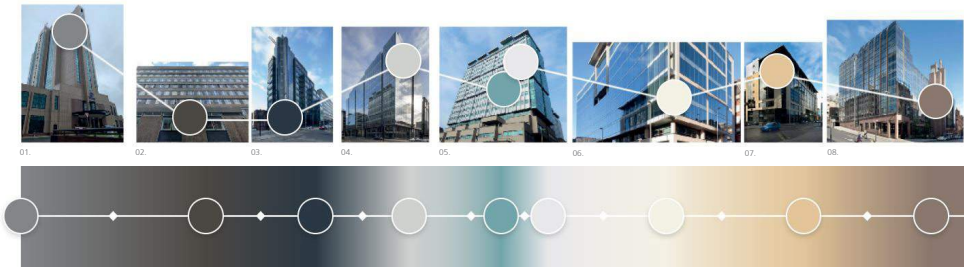
The predominate red aggregate is typically used in combination with red sandstone and dark fine details, such as window frames and gates.

Heritage architecture, St Vincent Street

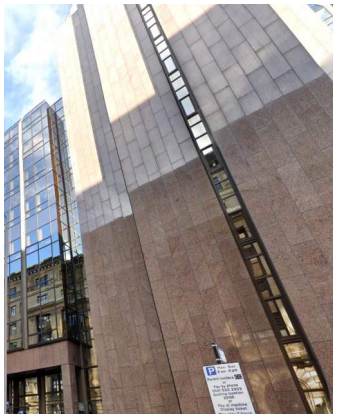
01. St Columba Church
02. Glasgow Free Church
03. 145 SVS.
04. 139 SVS. Kirkstane House
05. 101 SVS.
06. 103 - 105 SVS
07. Adj. 123 SVS
08. 110 SVS. Bank of Scotland
09. 30 SVS.
10. 28 SVS.
11. 26 SVS.
12. 24 SVS.



Modern Architecture, Bothwell Street



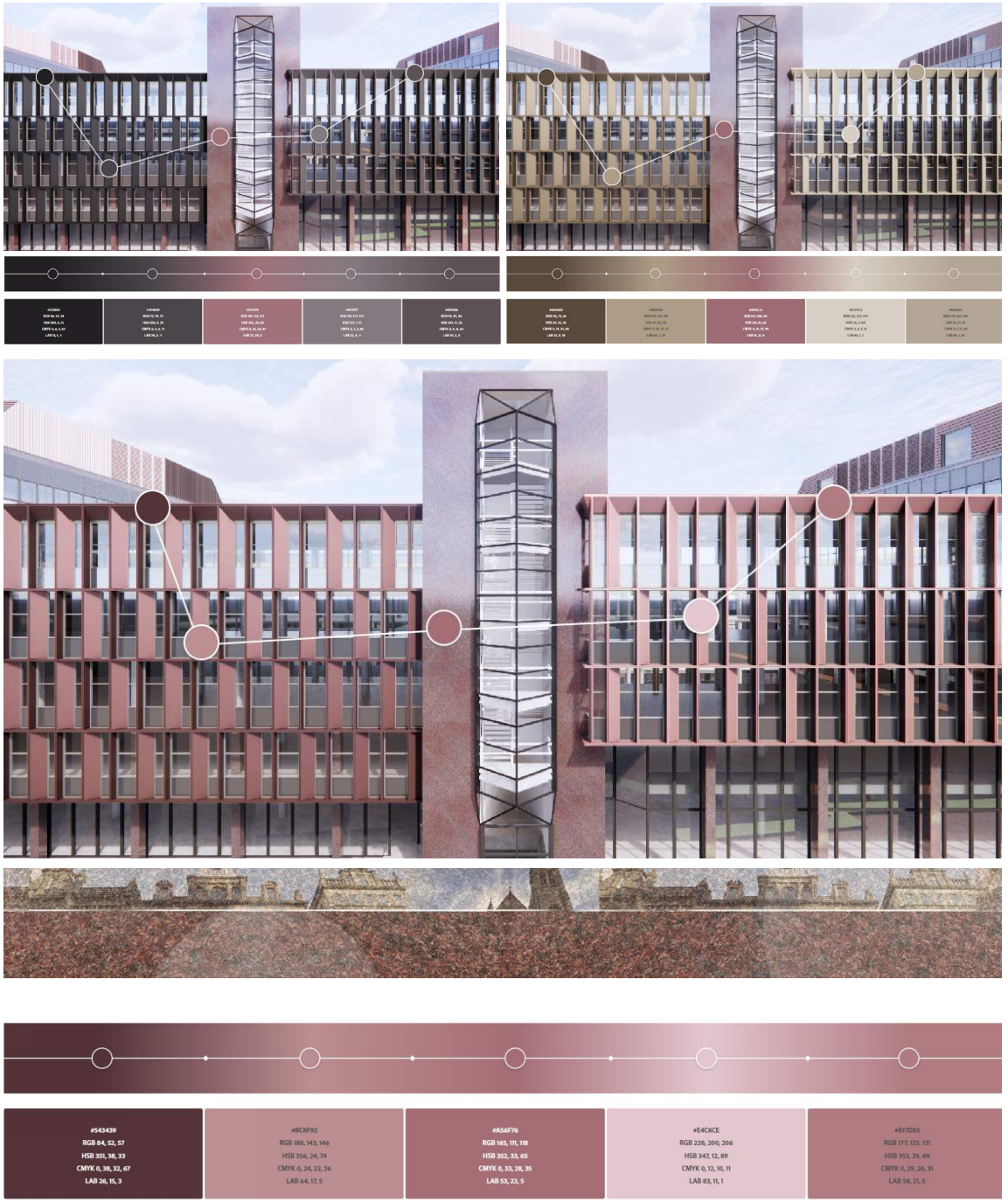
01. Hilton
02. 120 William St
03. 215 Bothwell St
04. 177 Bothwell St
05. Heron House
06. 120 Bothwell St
07. 141 Bothwell St
08. 106 Bothwell St
09. 95 Bothwell St
10. 50 Bothwell St
11. 30 Bothwell St



5.3 Design evolution

Exploration of colours and tones

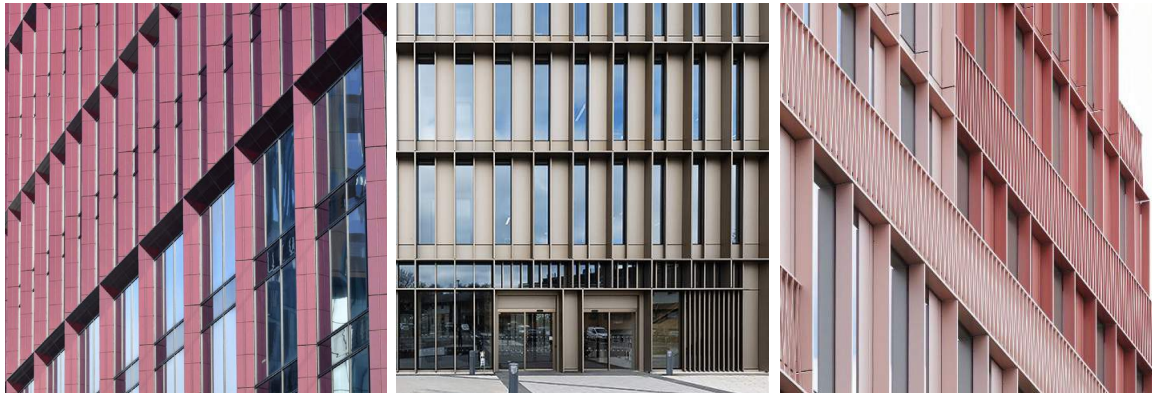
The design process has demanded a detailed analysis of the appropriate tones and colours to work in harmony with the materials to be retained.



5.4 Design precedent

Articulation

Relevant architectural references have been used to inform the design process and explore methods of facade articulation through volume, form, rhythm and colour.

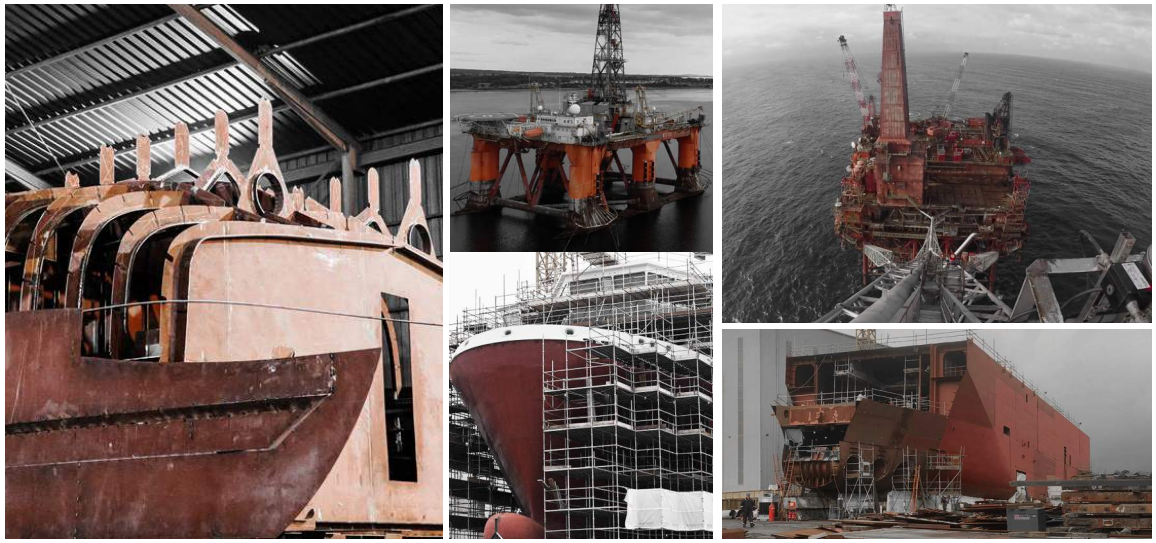


Articulation, form, rhythm and colour

Engineered aesthetic

Glasgow's industrial history is steeped in maritime heritage; a narrative further strengthened in the context of 301 St Vincent and it's origin as the northern headquarters for Britoil.

In finding harmony with Glasgow's urban fabric, the predominance of red sandstone and the deep granite tones of the material retained, the composition and palette of the facade draws reference from the building's past while creating a new and distinctive identity for the building's future.

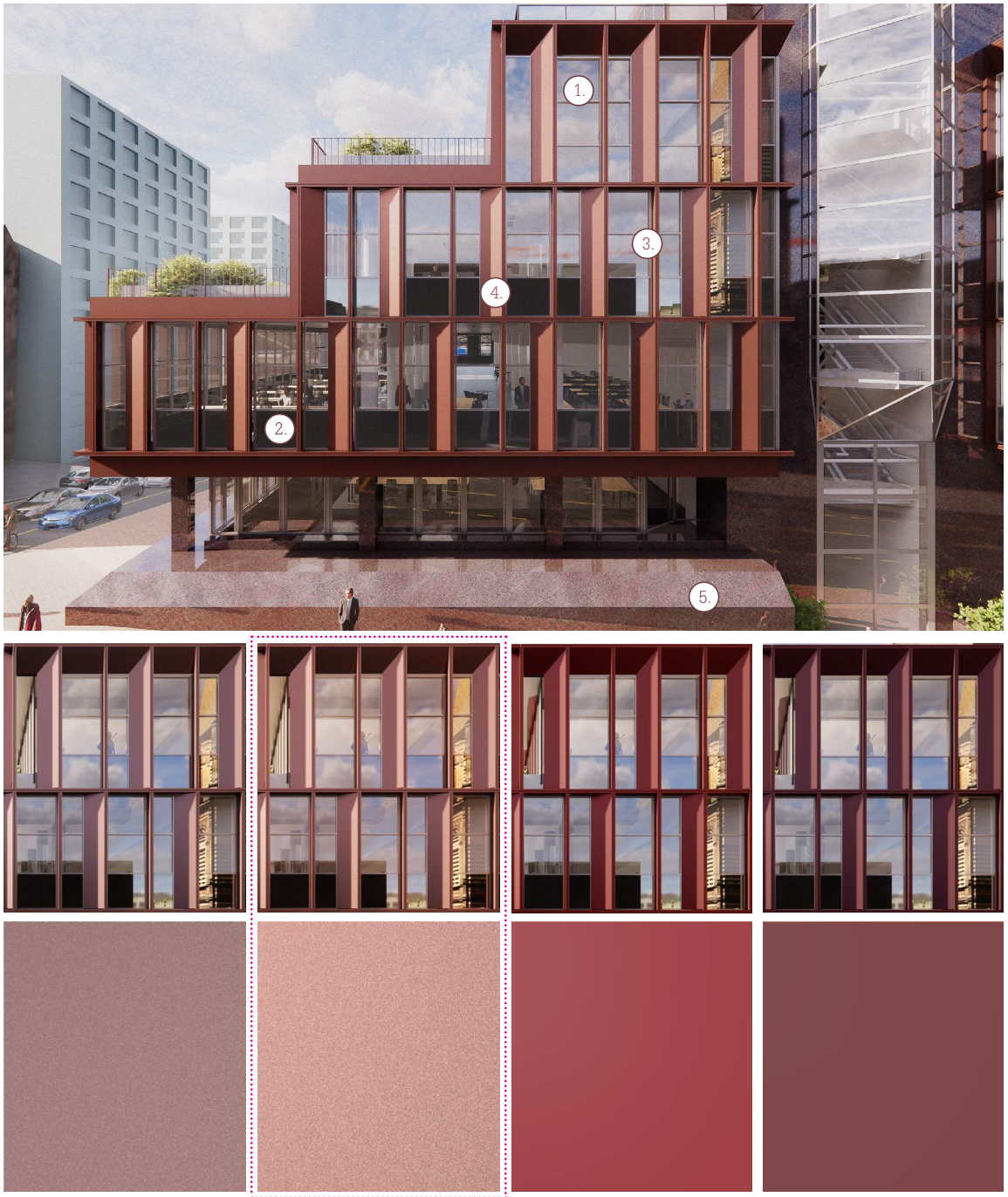


Industrial and engineered heritage

5.5 Proposed palette

The preferred tone and finish of the aluminium facade will harmonise with the existing granite and wider Glasgow streetscape, while the deep earthy colour will draw reference from the building's maritime industrial heritage.

1. Vision glass - high performance double glazing in an aluminium frame. Horizontal transoms are provided to allow for opening units to facilitate natural ventilation.
2. Glass spandrels - insulated glass spandrels of coloured back glass in a dark grey to maximise reflections of the townscape.
3. Frame - extruded aluminium frame on a 1.5m grid provides the facade with order, scale and depth
4. Vertical fins - provide additional rhythm to the facade while helping to reduce the amount of glazing while angled to maximise environmental and views.
5. Granite - existing polished granite plinth and cladding to cores.



Tones of red explored

5.5 Proposed palette

The proposed material palette will be in sympathy with the existing materials to be retained and is considered against the backdrop of both St Vincent Street and Bothwell Street.

1. Existing granite
2. Vision glass
3. Dark grey glass spandrels
4. Grey aluminium frame
5. Earthy toned aluminium fins and frame
6. Light natural tones paving tiles
7. GRC
8. Planting
9. Recessed linear soffit light