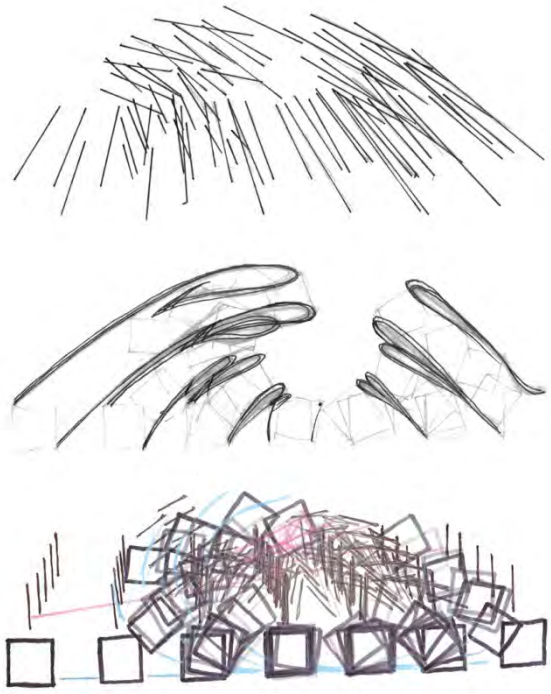
Action and Reaction

Developing an architecture of movement



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M.Arch(Prof)

Design dissertation

Luke Emery

Action and Reaction

Developing an architecture of movement

Luke Emery

SUPERVISORS: Associate Professor Nicholas Coetzer
Melinda Silverman

ASSISTED BY: Tiaan Meyer

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2014

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Abstract

This dissertation deals with the phenomenon of movement in relation to architecture. What does it entail to create an architecture of movement and what possibilities can this type of design offer us outside of 'conventional' architecture.

The research behind the topic bases itself in the theory of Game Design as a tool to structure movement with meaning. Game Design proves itself to be a potent tool in encouraging interactivity, in turn handing over a certain level of control and design over to the players participating. The more control afforded to the players, the more they can affect the outcome and experience of a game. This means games are a medium with the possibility for high replay value as players go back to experience the multiple outcomes of a game.

The theory of using Game Design as a tool in architecture is then tested through my own design located on the edge of the Grand Parade in Cape Town. The design aims to create an architecture of multiple outcomes including an 'Everyday' and 'Festival' narratives through the use of movement. Game Design is used as a tool of analysis in order to determine whether the movement is integral to the architecture and its intended function through spatializing the key principles identified in the theory of Game Design.

The conclusion drawn is that Game Design is an effective tool in aiding design in architecture. Its value emerges through the fact that it challenges design decisions made within architecture based on how integral they are in relation to the social and programmatic rules and expectations the project attempts to deal with.

Contents

Introduction

This dissertation is about movement and what it entails to create movement with meaning. How can movement be used to activate future forms of architecture in order to create buildings that are more flexible and adaptable to constantly changing and contrasting programmatic needs? This paper will trace the process I undertook in order to develop and produce my own architecture of movement.

The first section of the paper deals with a theoretical investigation into narrative and the process of game design as a framework through which to create movement with meaning. What principles can be taken from this form of design and applied to architecture?

The second part of this report will focus on the practical process I undertook in developing an architecture of movement. This starts with an urban analysis of Cape Town CBD in order to inform why I chose my site, and a further analysis of the site in order to develop a programmatic brief.

The design development is then covered from concept through to final product. It is this final product which is evaluated against the theoretical principles covered in game design. Can game design be used as an effective design tool in design and analysis of architecture, or do traditional methods suffice?

Figure 1
"Artefact in Movement"

Narrative and Movement

The initial driver behind this research topic came through interpreting the city through the lens of a theatrical play. In this play we can consider the city as the backdrop, while buildings act as set pieces, and the people of the city as actors bringing meaning to the performance by interacting with these set pieces. This poses the question: how do we create buildings that can be animated through interaction? Through this initial lens of 'the city as a play' I will investigate narrative as a structuring device for movement in the same way that actors interact with their set pieces.

Figure 2
"The City as a Play"

Narrative

The easiest way to describe the structure of narrative is through the Three-Act Structure used in film and literature. Within this structure we are introduced to the main characters of the story whose values are challenged by an event known as the 'turning point' in Act I. Once the characters of the story are confronted by the turning point, they need to learn new skills in order to address the situation, this is known as the 'rising action' which occurs in Act II. The rising action then culminates in a 'climax' in Act III which resolves the event that occurred at the beginning of the narrative.

This Three-Act Structure can be simplified to: [1]

Act I: Setup
Act II: Confrontation
Act III: Resolution

Through this simplification we can see how the movement (rising action and climax) achieves meaning as it is a direct response (confrontation) to a situation presented. Without movement the narrative would be inherently meaningless, as it would present a problem without any resolution.

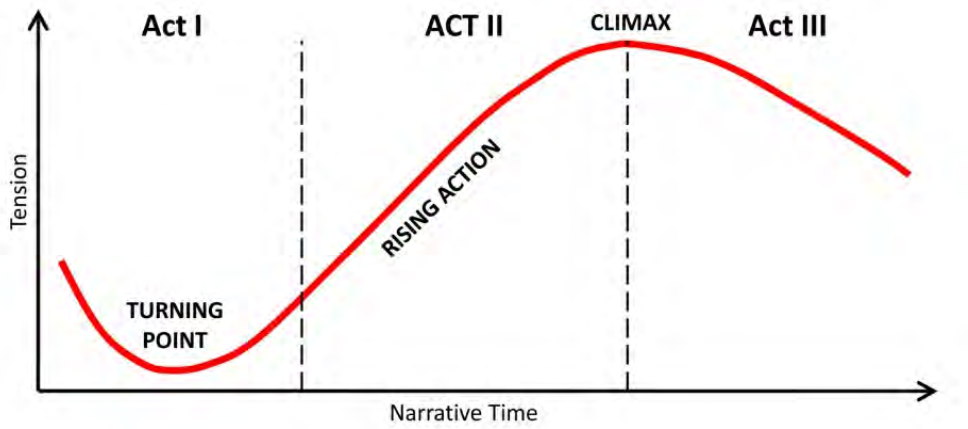

Figure 3
Diagrammatic representation of the Three-Act Structure.

Narrative and Gaming

In the case of film and literature we are presented narratives that we the audience or reader have no control over. This makes for a somewhat linear experience as the author dictates the outcome of the story presented to us, remaining unchanged no matter how many times we re-read or re-watch.

It is for this reason that game design appealed to me as a more appropriate tool in harnessing the possibilities of narrative, as it allows players to effect the outcome of a narrative through interactively participating in the experience. This type of interactive design allows for a non linear narrative to take place with multiple outcomes, creating a product with great 'replay value' as we keep returning to experience the possibility of outcomes designed into the game,[2] while still retaining the same basic narrative principles of setup, confrontation and resolution.

[1] Elements of Cinema: A student's guide to the fundamentals of filmmaking, The Three-Act Structure, <http://www.elementsofcinema.com/screenwriting/3-act-structure.html>.
[2] Ernest Adams, Fundamentals of Game Design (2nd Edition), New Riders, 2009, pp.169

Game Design and Architecture

Boundary and Experience

In order for a gaming experience to be successful the player must be sold on the reality of the game from the very start through conveying a convincing alternate reality that sets the tone for the rest of the experience. This is referred to as 'entering the magic circle', and it is where a new reality is created through defined rules and the experience of play.[3] The beauty of 'the magic circle' is that it allows us to go to a place where it is alright to let something that has no inherent 'real-world importance' absorb us. Think of an ancient story-teller telling stories around the glow of a communal fire, inviting listeners into a space where it is "alright to believe".[4] This circle is where narrative lives, with the beginning and ending constituting the entry and exit of 'the magic circle'.

The tangible metaphor of a circle already allows parallels to be drawn to architecture by acknowledging the fact that a game must take place within spatial boundaries. In game design the nature of boundary relies on what type of game we are entering. As previously stated, the magic circle is constituted through rules and play as this is how we understand games, however the ratio between rules and play is rarely balanced. A game that is understood primarily through rules lends itself to well defined boundaries as rules create a closed system which contains its own meaning that cannot be influenced by any outside ideals held by the player. [5]

A cathedral is a space that embodies a strict set of rules with regard to social conduct. The thick stone walls, flying buttresses, and arches, through to the stained glass windows, and sculpted details all reflect a rational organisation the space through its geometry and cruciform plan in order to enrich the narrative of the space.[6] The cathedral comes to signify much more than the act of worship but rather the god it houses, as the space almost 'fictionalises' its surroundings through this well defined and layered boundary.[7]

[3] Katie Salen, Eric Zimmerman, Rules of Play: Game Design Fundamentals, MIT Press, 2004, pp. 96
[4] James Portnow, http://extra-credits.net/episodes/the-magic-circle/ , Jan 22, 2014
[5] Katie Salen, Eric Zimmerman, Rules of Play: Game Design Fundamentals, MIT Press, 2004, pp. 96
[6] Nigel Coates, Narrative Architecture, John Wiley & Sons, 2012, pp. 16
[7] Nigel Coates, Narrative Architecture, John Wiley & Sons, 2012, pp. 15

Games understood primarily through play (experience) as opposed to rules can form either a closed or open system depending on how much players invest their personal values within the reality of the game. The more real world values placed within the game the more blurred the boundaries of the game become,[8] eventually serving as a reflecting of the players themselves.

Steven Holl's Storefront for Art and Architecture functions through a facade that allows for movement of its various openings. Spatially the facade constitutes the boundary, however the design of the boundary's is handed over to the user as they interface with it through their own preferences in order to create a unique narrative.[9]

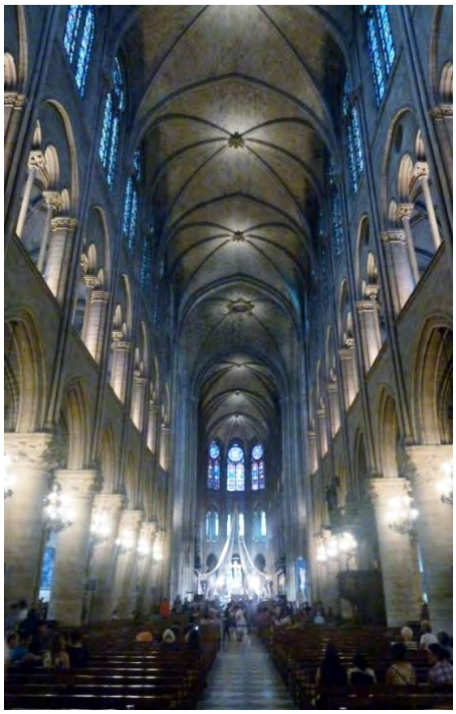

Figure 4
Paris, Notre Dame Cathedral, a space of rules and religion.

Figure 5
Steven Holl's Storefront for Art and Architecture with its facade in play.

Holl's Storefront for Art and Architecture displays an opportunity for interactivity, yet it only effects the boundary of the space, in turn only influencing the narrative of the inner space without the ability to physically change the spatial narrative from the inside out. If we want to change the narrative of the space, we need to change the space itself, not just its boundary.

[8] Katie Salen, Eric Zimmerman, Rules of Play: Game Design Fundamentals, MIT Press, 2004, pp. 96
[9] Nigel Coates, Narrative Architecture, John Wiley & Sons, 2012, pp. 14

Defining Rules

Once we start playing a game, rules must be adhered to in order to facilitate interaction and play. Rules function in the following ways;[10]

- they limit player action
- they are explicit and unambiguous
- they are shared by all players
- they are fixed
- they are binding
- they are repeatable

As rules dictate how we interact within a game, they serve as an essential tool when controlling narrative. Through rules we can define whether our narrative becomes linear through imposing limits,[11] or nonlinear through illuminating rules or allocating different sets of rules to different people/groups. The nonlinear example may seem 'unbalanced', in which case resolving this imbalance becomes an integral part of what the game is about.[12]

Moshe Safdie's Yad Vashem Holocaust Museum bases itself in rules as it follows a linear narrative within a predefined route. The projects central elongated-triangular space and illuminating skylight act as an anchor to the darker exhibition rooms,[13] viewed in its entirety upon entering the museum The visitor must make their way through the sequence of adjacent rooms by crossing the spine at various points in order to fully understand the central space of the museum. Although this is an example heavily set in rules, it still contains rich experiential qualities as the museums narrative unfolds over time through the movement between the set sequence of spaces.

[10] Katie Salen, Eric Zimmerman, Rules of Play: Game Design Fundamentals, MIT Press, 2004, pp. 122-123
[11] Katie Salen, Eric Zimmerman, Rules of Play: Game Design Fundamentals, MIT Press, 2004, pp. 122
[12] Katie Salen, Eric Zimmerman, Rules of Play: Game Design Fundamentals, MIT Press, 2004, pp. 123
[13] Yad Vashem website, museum, architecture, <http://www.yadvashem.org/yv/en/museum/architecture.asp>.

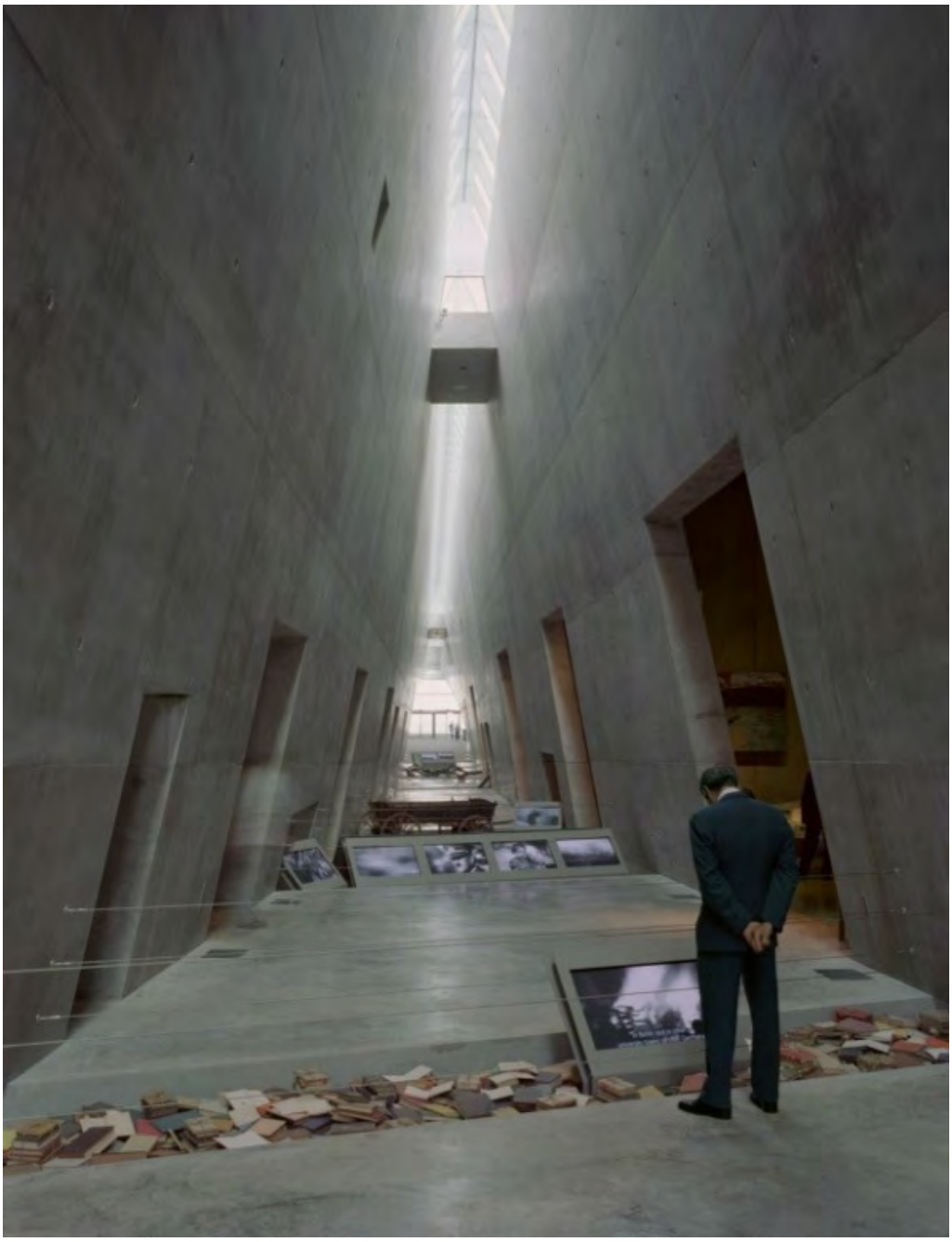

Figure 6
Yad Vashem's Holocaust Museum, spatial narrative grounded in rules.

Encouraging Interactivity and Allowing Choice

Narrative in games is driven by player interaction, but how does the possibility for interactivity make itself apparent? This is done by defining the relationship between the player and the interactive object. Understanding this relationship allows us to effect games on multiple levels, and the fact that choice is inherently linked to interaction means that choice has meaning.[14] Even the act of not interacting through 'passing a turn' has meaning even though no action takes place.

The Gerrit Rietveld's Rietveld-Schroder House encourages interactivity and choice through creating these relationships between action and outcome. The first floor makes use of an open plan layout with partitions that recede into the surroundings of the space.[15] When these partitions are fully receded, the space becomes a homogenous whole, but when they are utilized, a series of rooms are created.

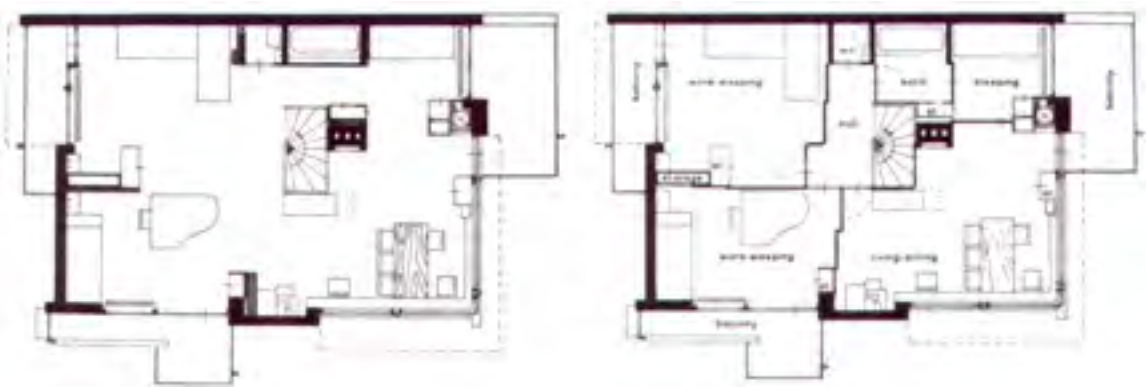

Figure 7
Rietveld Schroder House: first floor plan, open (left) and closed (right).

These spatial possibilities are hinted through the colour co-ordinated floor demarcating the various spaces that can be achieved through moving the partitions, however the choice is always in the hands of the user when and if to interact with these elements. Through stepping outside the constraints of programme by hinting at spaces rather than literally creating them, the house encourages users to create their own hierarchy of space according to personal values through interacting with the choices made available.[16]

[14] Katie Salen, Eric Zimmerman, Rules of Play: Game Design Fundamentals, MIT Press, 2004, pp. 61
[15] Suzanne Merchant, Jim Shi, Stephen Ru, Nicole Ratajczak, The Rietveld-Schroeder House Blog, 08 December 2012, <http://rietveldschroderhouse.blogspot.com/2012/12/diagrams-in-depth-analysis-of-design-of.html>. viewed 30 May 2014
[16] Omar Khan, Dorita Hannah, Performance/Architecture: An Interview with Bernard Tschumi, Journal of Architectural Education, ACSA, 2008, pp. 53

Figure 8
Partitioning devices and colour co-ordinated floor of the Rietveld-Schroder House.

Achieving Meaning through Play

The ultimate goal of a successful game is to achieve 'meaningful play'. However meaningful play cannot be achieved through the game and its pieces alone, it requires context in which to be played and player participation in order for meaningful play to emerge.[17] Meaning is therefore defined by the fact that, through rules, there is a clear understanding of the relationship between action and outcome.[18]

Identifying meaningful play is done through evaluating the relationship between action and outcome on two levels referred to as discernable and integrated relationships within games. A discernable relationship refers to an immediate understanding of an action's outcome on completion, while an integrated relationship entails the same understanding but containing a significant effect on the narrative later on in the game. Meaningful play emerges when both of these relationships are present within a game, allowing a player's understand their actions and effects over the entire course of a game. [19]

The Dee and Charles Wyly Theatre by REX/OMA explores space on these two levels in order to achieve meaningful play. The theatre does this through eight spatial layouts made possible by a floor system capable of articulation, as well as through movable balcony towers flanking the space.[20] This range of movement allows for discernable and integrated relationships to occur in the theatre.

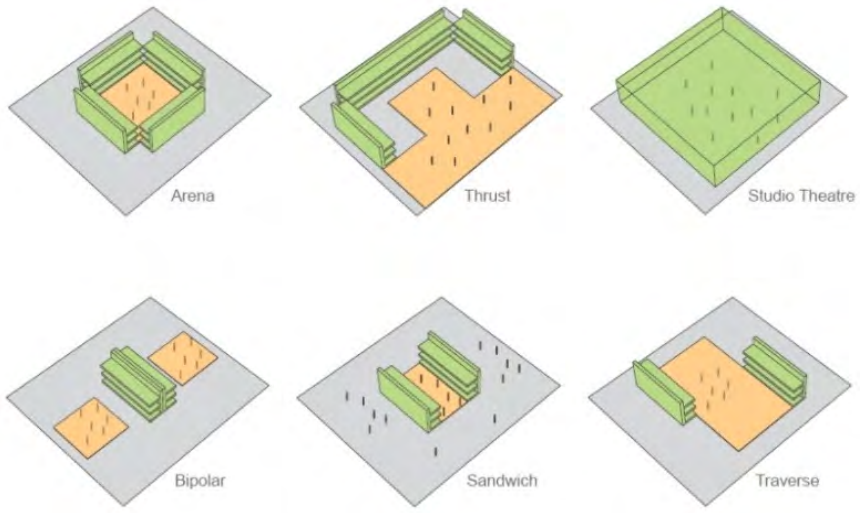

Figure 9
Diagrams of the spatial configurations within the Dee and Charles Wyly Theatre.

[17] Katie Salen, Eric Zimmerman, Rules of Play: Game Design Fundamentals, MIT Press, 2004, pp. 33
[18] Katie Salen, Eric Zimmerman, Rules of Play: Game Design Fundamentals, MIT Press, 2004, pp. 60
[19] Katie Salen, Eric Zimmerman, Rules of Play: Game Design Fundamentals, MIT Press, 2004, pp. 35
[20] http://www.rex-ny.com/work/wyly-theatre/#, 12/34

A discernable relationship can be identified in the theatre floor elements which independently tilt, rise, lower, and rotated with under floor lifts.[21] Through these movements the outcome is immediately understood by interacting with the repositioned floor element (12 seats), at the same time having a minimal effect on the space as a whole.

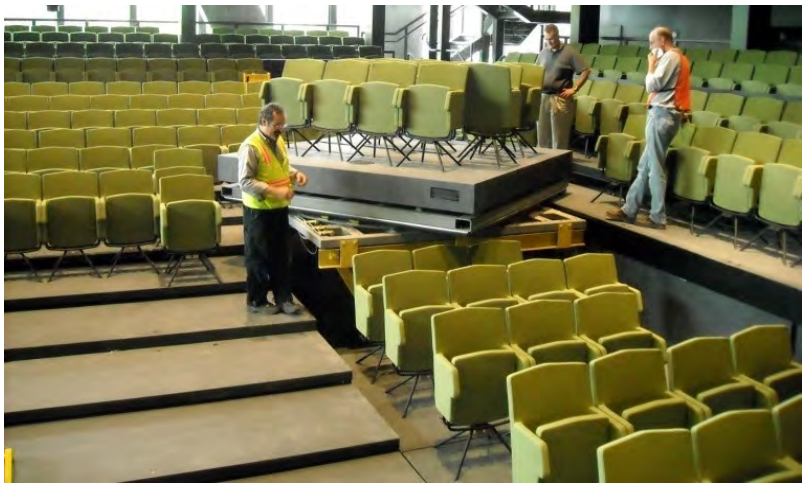

Figure 10
A floor element being moved into position through rotation.

An integrated relationship is achieved by lowering or raising the flanking balconies. The immediate effect is perceived by either creating extra seating or not, yet it also affects the whole narrative of the space by introverting or extroverting the theatres context through turning its back on the urban surroundings or allowing the urban surroundings to become part of the theatre space itself.[22]

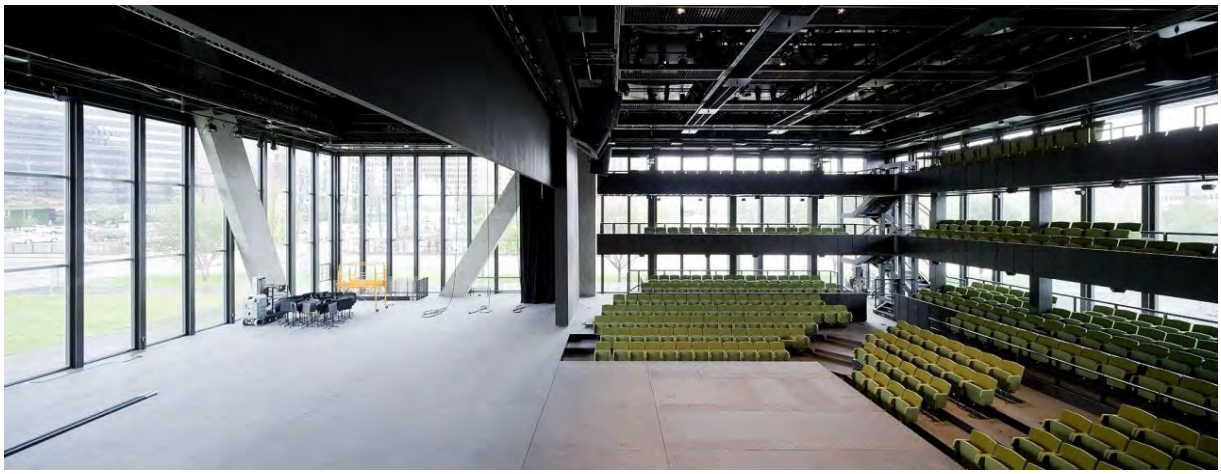

Figure 11
The extroverted theatre on the left and the introverting theatre on the right.

This theatre is a space that contains nonlinear narrative through its 'improvisational nature' allowed by the architect in achieving eight different outcomes through movement.

[21] http://www.rex-ny.com/work/wyly-theatre/#, 14/34
[22] http://www.rex-ny.com/work/wyly-theatre/#, 9-10/34

Site

When deciding on a site I knew from an early point that I wanted the project to be located in an urban setting. The reason behind this is to feed off the energy that the city provides and to profit off of the diverse programmatic opportunities available. Because of this I started with an urban analysis of the public spaces and routes within Cape Town in order to find a complex site with these qualities.

Urban Analysis

The urban analysis focuses on public space in the city with an interest in identifying strong pedestrian routes between these spaces. What the mappings indicate is that there are three well established routes running parallel with each other across the city in addition to the newly introduced Fan Walk running perpendicular to these routes. The routes linking most of the public spaces in the CBD and are:
Long Street
St Georges Mall
Adderley Street

Although these routes run parallel with each other, hierarchy shifts as public energy moves diagonally, starting at the top of Long Street and ending on Adderley Street in the area of Cape Town Train Station. Similarly the Fan Walk starts on the same site. This provides insight into what fuels pedestrian routes and public space in the city as the source is predictably public transport.

Cape Town Train Station acts not only as a gateway into the city, but as an 'inner city transport hub' with the addition of a long distance taxi rank on the station deck level, as well as the Golden Arrow bus depot and MyCiti IRT (integrated rapid transport) bus station flanking the station. What this amounts to is a precinct with the potential to link four major transport infrastructures that serve the cities pedestrian demographic.

The following figures were collected on Thursday 12 September by the City of Cape Town.

	daily passengers boarding	**daily passengers aligning**
CT train station	73 535	80 345
Station deck taxi rank	37 549	46 338
Golden Arrow bus depot	42 975	35 231

Although the precinct receives massive numbers of pedestrians on a daily basis, public spaces such as the station deck remain illegible and hard to navigate for a variety of reasons.

Figure 12
Illegibility, void, and traffic are all problematic on the station deck.

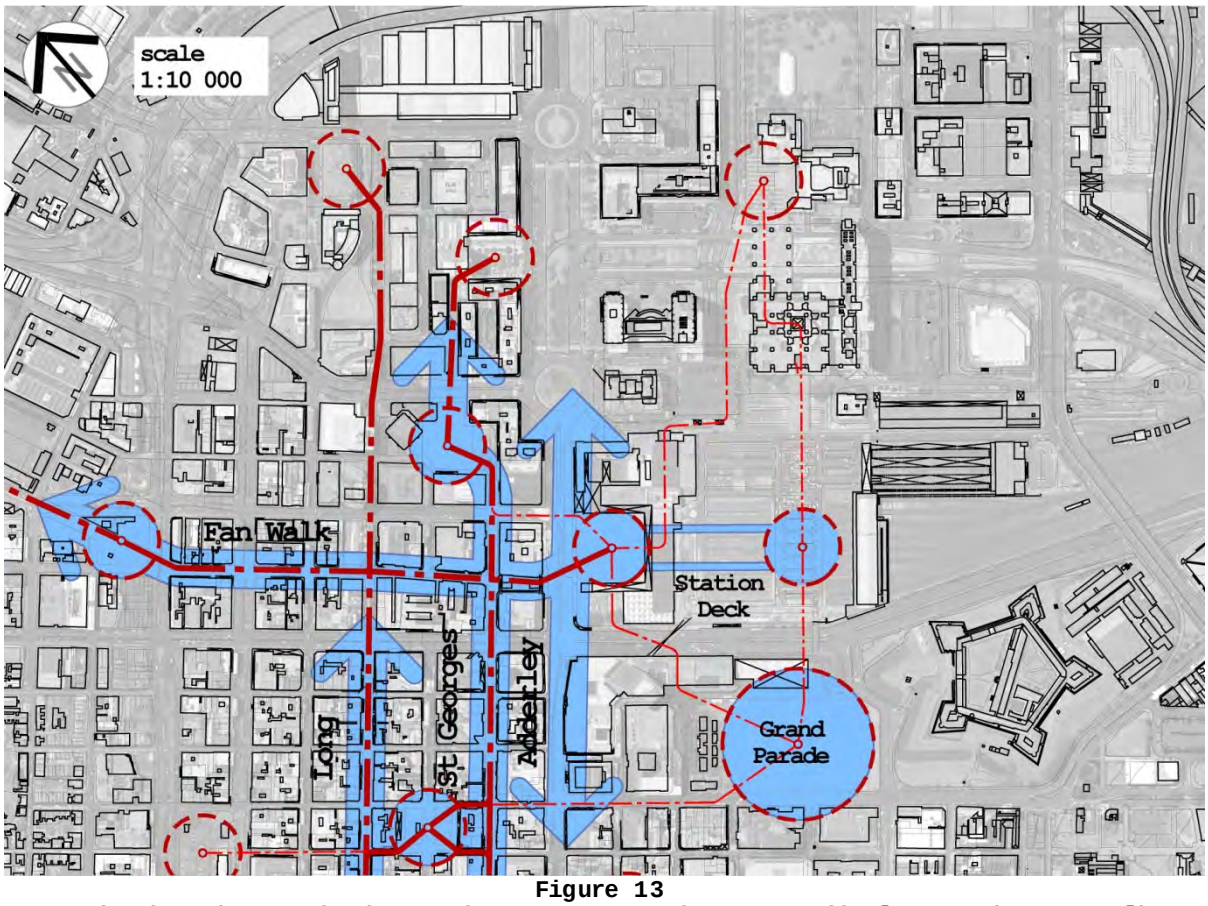

Figure 13
Map showing the 3 main inner city routes running perpendicular to the Fan Walk.

Urban Framework

Due to the complex nature of this inner city precinct I decided to choose a site within the area, proposing an urban framework that takes inspiration from previous as well as current frameworks proposed for the precinct, in conjunction with my own analysis of existing routes in the city in an attempt to predict future needs of the area.

The proposed 1947 foreshore master plan centred around the notion of linking the Grand Parade to Cape Town harbour, this would include crossing the Cape Town train station deck. This was a grand gesture attempting to change the industrial nature of the area into one of civic pride through its use of symmetry, landscaping, and focus on the City Hall, Grand Parade and the Castle of Good Hope. Ultimately the proposal never materialised due to the introduction of Eastern Boulevard and a host of other issues. The proposal still stands as a popular Modernist vision of what the Foreshore could have been.

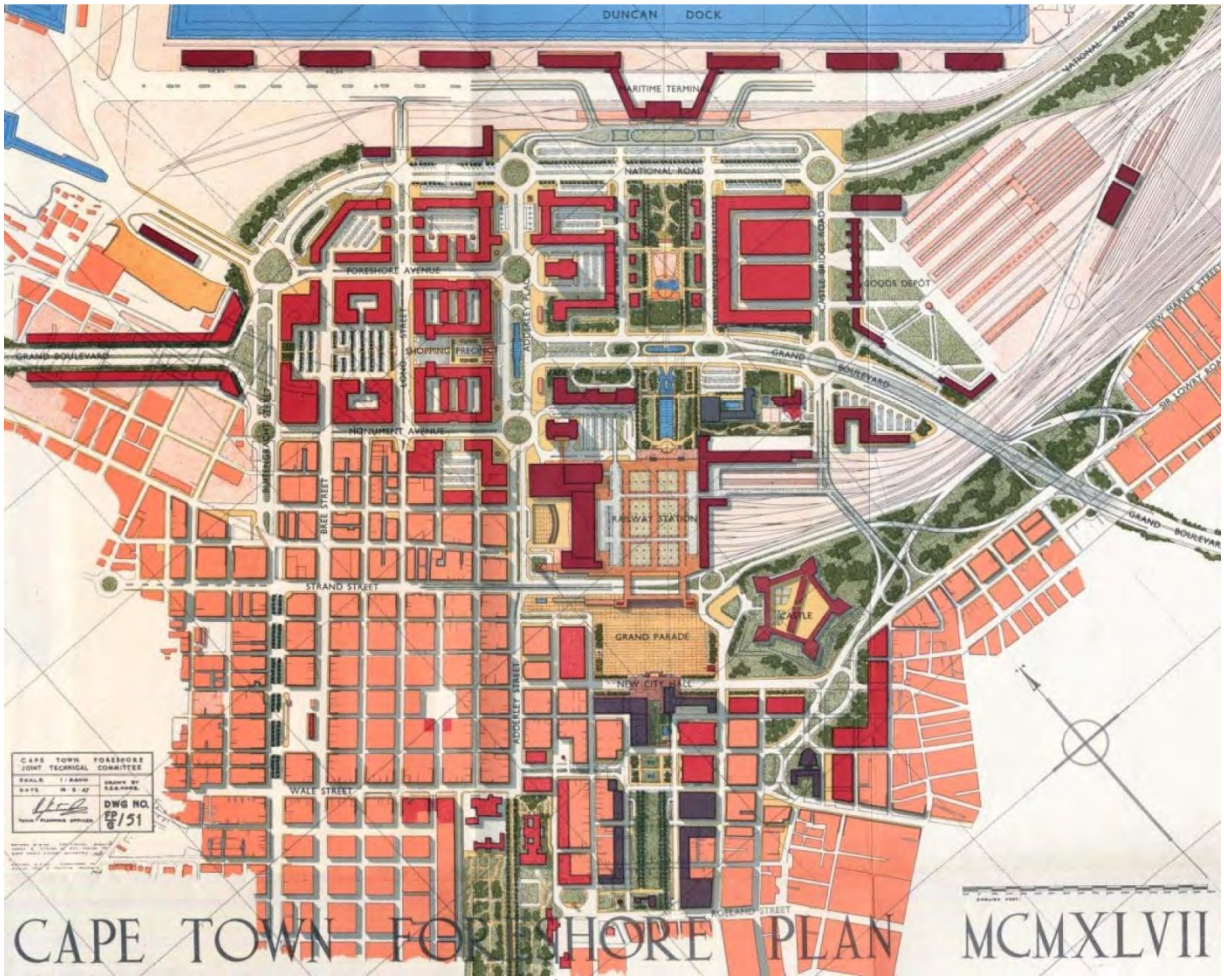

Figure 14
The 1947 Foreshore plan displaying the connection between the Grand Parade and Cape Town harbour over the station deck with civic landscaping and water features.

Meyer and Associates in partnership with Makeka Design Lab are heading the current design for this inner city transport hub. The design only revealed in its conceptual phase at the moment, aims to link the major transport infrastructures including rail, taxi and bus through the creation of a series of new public spaces.[23] It is this proposal that my new urban framework perhaps shares the most similarities in regards to it its approach to public space and the potential to link these infrastructures.

Figure 15
Perspective showing the proposed link over to the station deck.

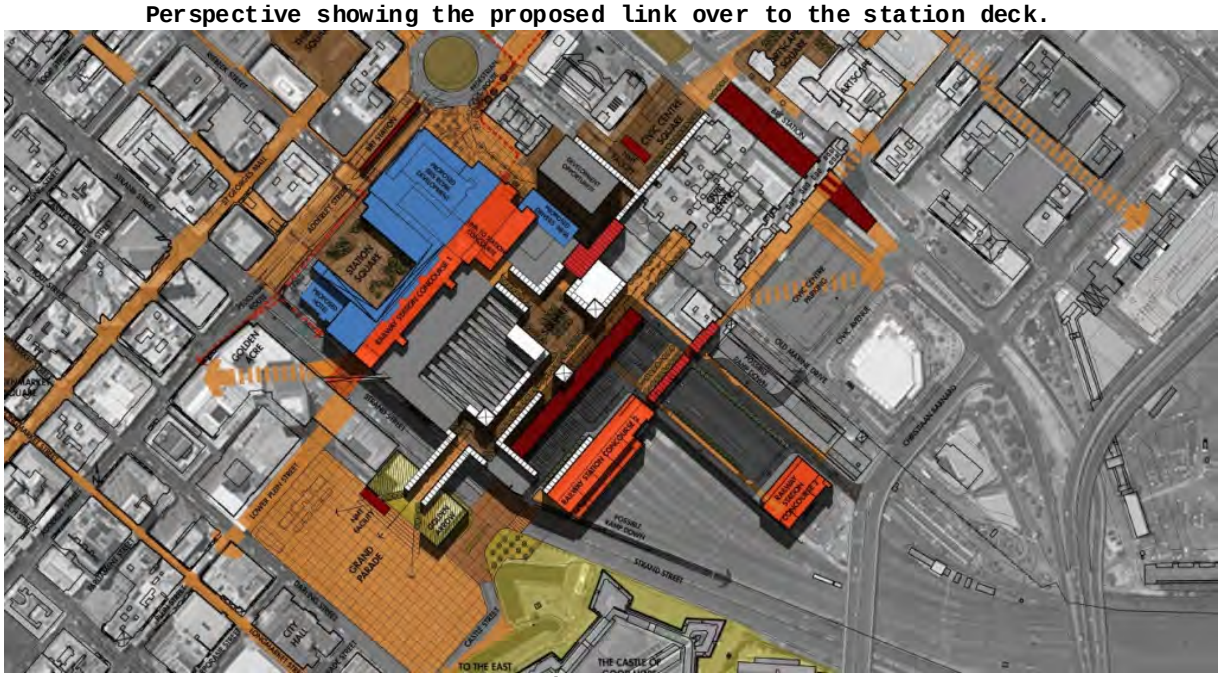

Figure 16
Diagram displaying the reconfigured station deck and link over Strand street.

[23] http://www.meyerandassociates.co.za/projects-transport/inner-city-transport-hub/

Similarly, the main driver behind my own urban framework is to create a link between the Grand Parade and Cape Town station deck, allowing for a fourth pedestrian route to develop towards the Foreshore. The reason behind establishing this new route is twofold:

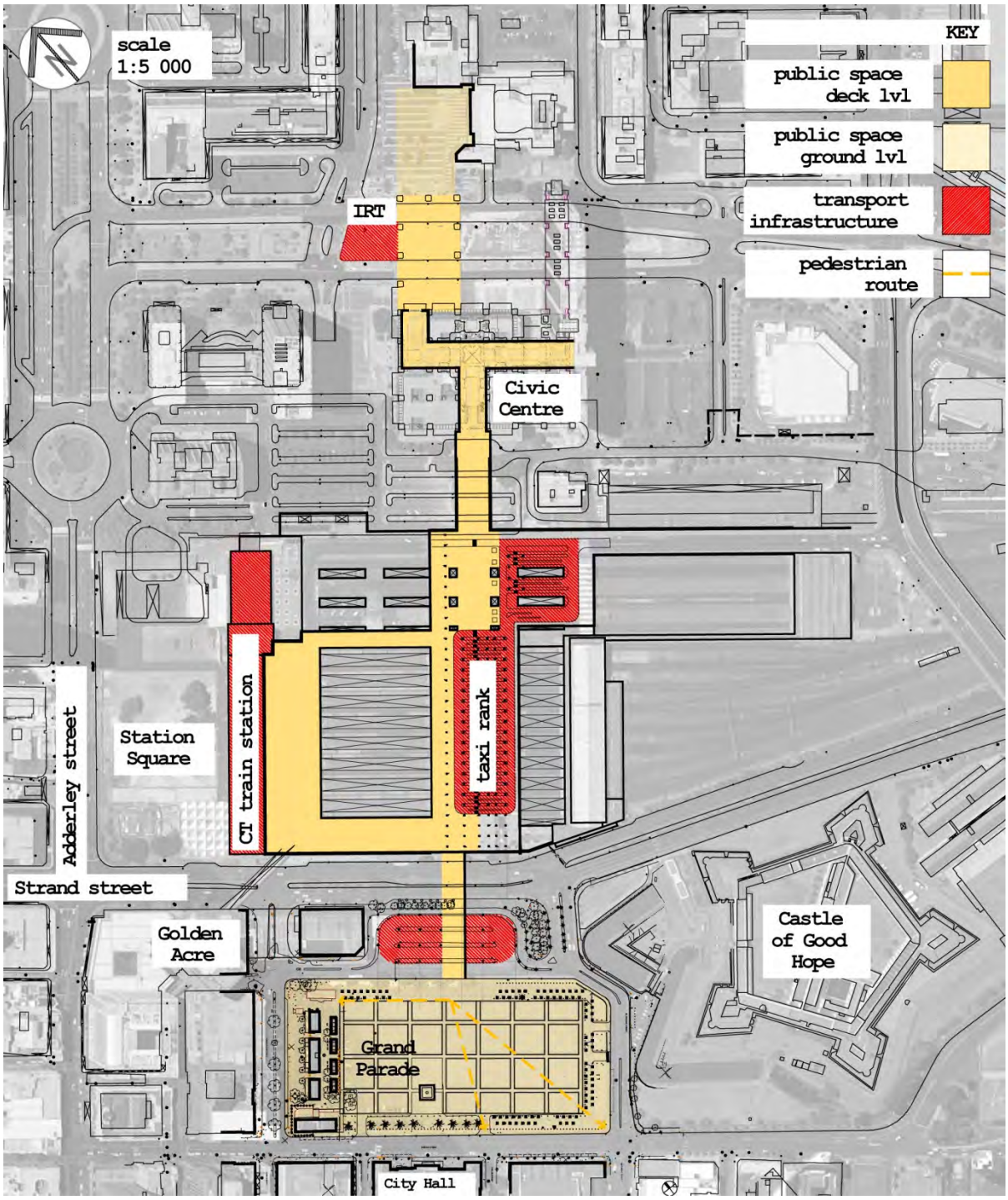

Figure 17
Proposed urban framework linking the Grand Parade up onto the station deck.

1. Bringing a new importance to the Grand Parade

Currently the Grand Parade is an over scaled and desolate space which is properly utilised only a few times per year through festivals and occasional civic events. Enforcing a major pedestrian route onto the Grand Parade, as well as introducing edge and programme, allows the potential for new activity and energy in the space on an everyday basis.

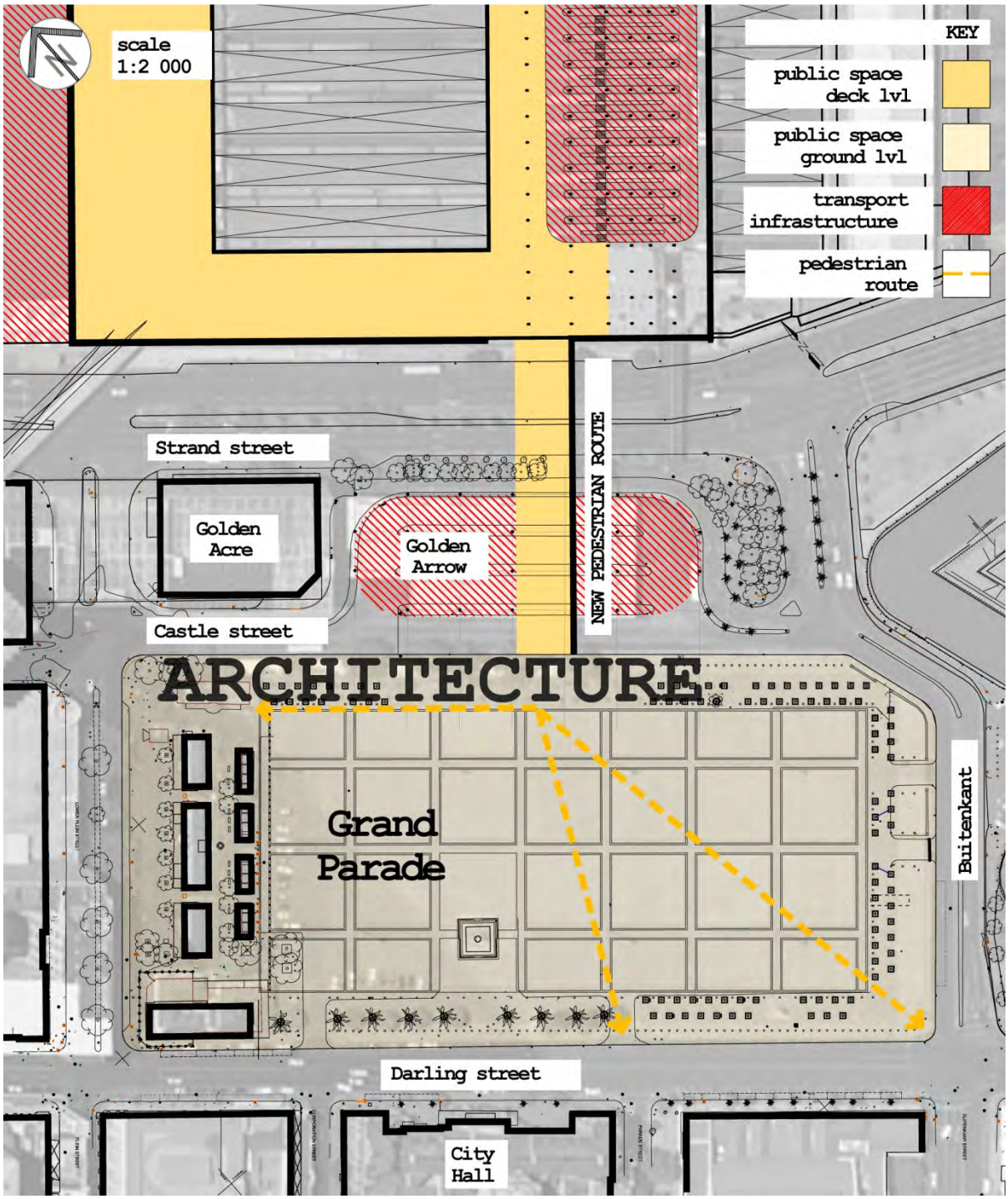

Figure 18
Diagram locating the architectural intervention within the urban framework.

2. Responding to current and future development

The Foreshore area is currently undergoing huge redevelopment with the Culemborg Quarter (DHK Architects), Chris Barnard Hospital Complex (Fabian Architects), and the eastern extension to the CTICC (VDMMA Architects). A new pedestrian link would act as an important connector between these radically rejuvenated areas that will see increased energy and daily activity.

Figure 19
Culomborg Quarter

Figure 20
Christian Barnard Hospital

Figure 21
CTICC extension

Figure 22
Future Culomborg Quarter redevelopment and envisioned pedestrian link.

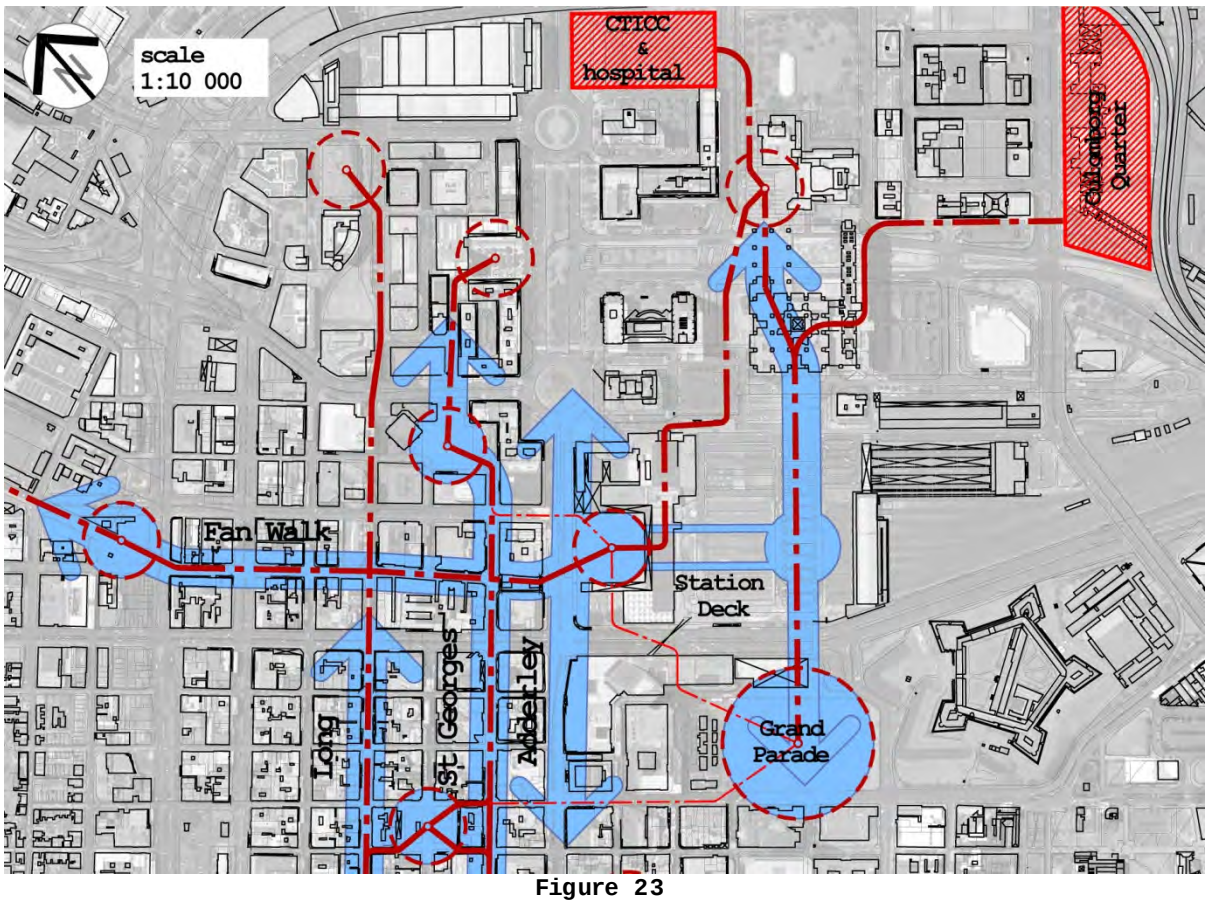

Figure 23
Diagram showing a 4th pedestrian link between the Grand Parade and the Foreshore.

Figure 24
Christian Barnard Hospital and CTICC extension and envisioned pedestrian link.

Site Analysis

Pedestrian and Traffic

This is arguably the biggest issue to consider on site as the new pedestrian route acts as the spine within the proposed urban framework. Currently the site works predominantly for cars as the public are only afforded a small pedestrian bridge crossing Strand street, which is visually and programmatically an afterthought. The bridge terminates before the Golden Arrow bus depot, meaning pedestrians must compete with the hoards of busses moving in and out of the area via Castle street to make their way into the Golden Acre and onto the Grand Parade.

Figure 25
Station deck's pedestrian bridge crossing Strand Street before dropping pedestrians off before the Golden Arrow bus depot.

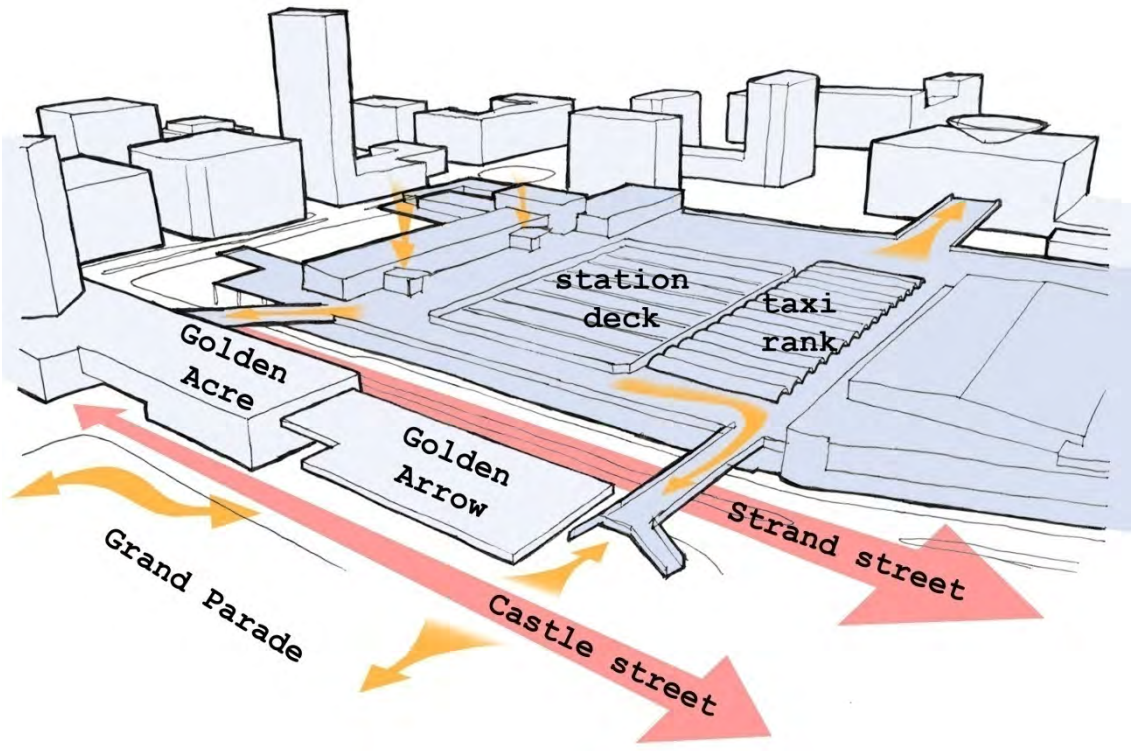

Figure 26
Diagram of the conflict between pedestrian and Golden Arrow traffic.

Pedestrian counts conducted by the City of Cape Town during peak hours indicate a stronger pedestrian movement towards the CBD area of the city, with people using the Grand Parade, Golden Acre's Eastern sidewalk, and Golden Arrow arcade as predominant routes. Pedestrians heading South of the site typically cut across the Grand Parade towards intersection of Darling and Buitenkant streets as a shortcut.

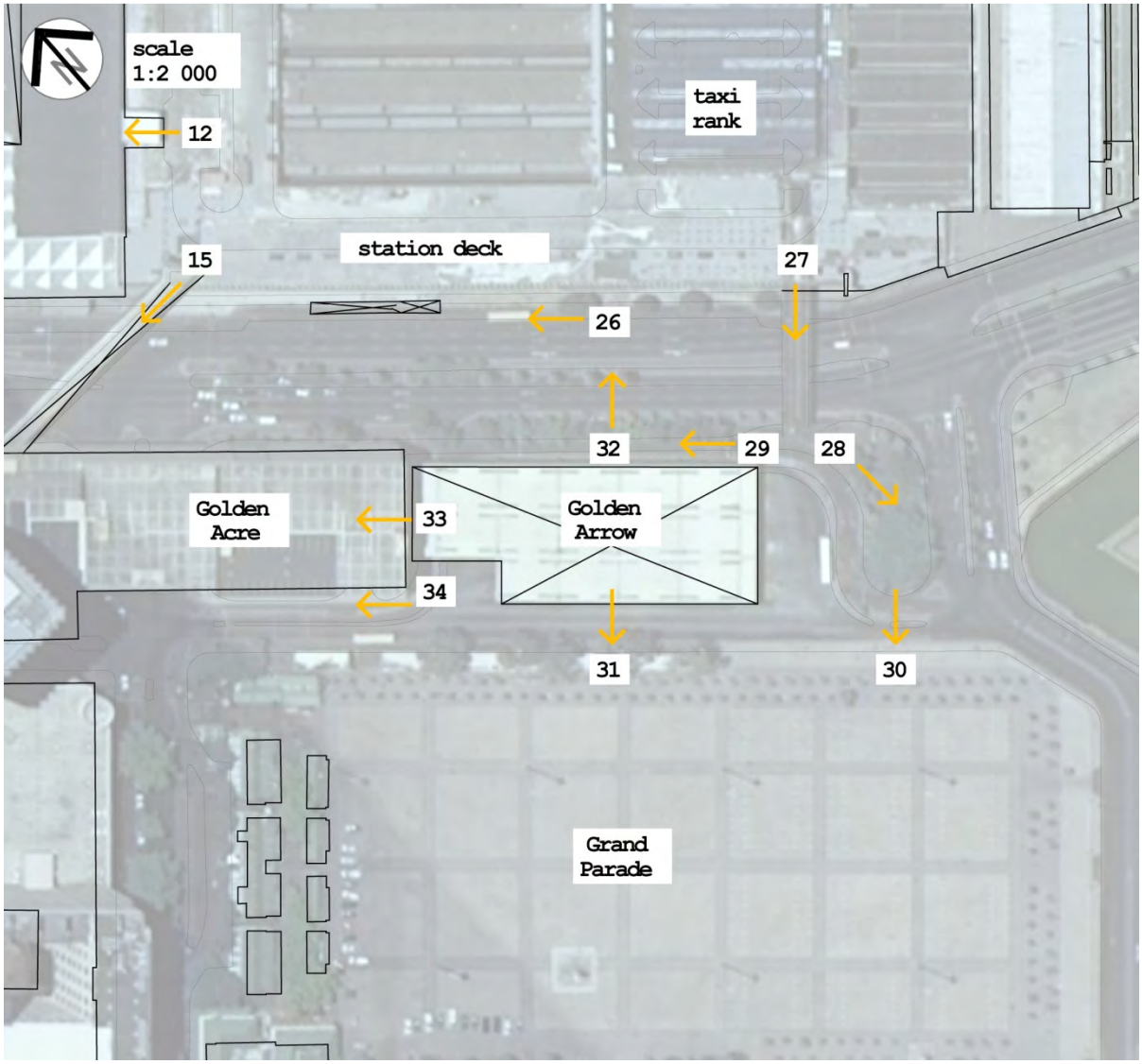

Figure 27
Peak hour pedestrian counts for the Golden Arrow site.

Through these findings, it is clear that there is a complex system of routes to take into account, therefore consideration must be given to existing routes such as the Golden Acre arcade as it still provides an important connection to site. Other important routes such as Golden Acre's Eastern sidewalk and existing routes across the Grand Parade can be refocused within the scheme's new pedestrian route in order to concentrate pedestrian energy.

Climate and Environment

Due to the massive scale of the Grand Parade, the site is unprotected from the South Easter in the summer months. This problem is clearly visible in the architectural response of the neighbouring station deck with large wind blocks erected on the Southern facade.

Figure 28
The Southern facade of Cape Town train station uses wind blocks to protecting the station deck market and taxi rank from the strong South Easter wind.

However the unprotected nature of the site also has its advantages with excellent exposure to Northern sunlight throughout the day. This can be taken advantage of through passive strategies such as daylighting and solar energy. When designing a new pedestrian route and public space, these two environmental factors of wind and sunlight are extremely important as outdoor spaces need to provide adequate shelter from these elements in both summer and winter months.

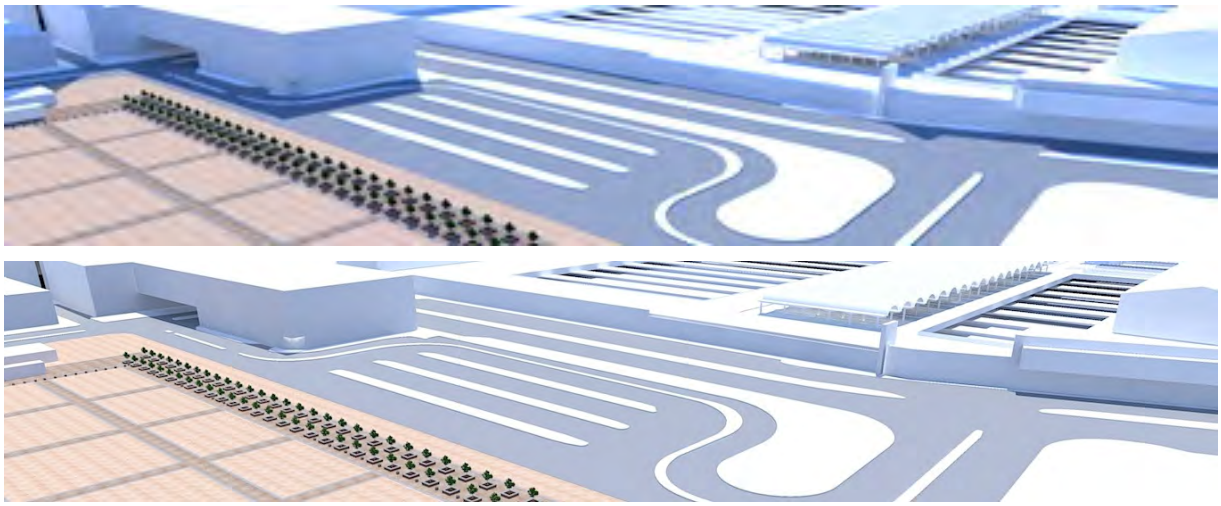

Figure 29
Shadow studies showing the exposed nature of the site. Top-Winter, Bottom-Summer.

Views

The site has the potential to create some breathtaking natural views when facing South towards Table Mountain. However there is also immediate potential within the rich urban fabric surrounding the site. City Hall, a Cape Town icon and tourist attraction in its own right, forms a powerful symmetry with its facade and monument located on the Grand Parade. This could tie in with key forms in my project, enhancing the symmetry of City Hall and the experiential qualities of the Grand Parade.

Figure 30
Table Mountain serves as the backdrop to City Hall when viewed from site.

The Northern side of site can be considered the 'backside' as the purpose of this project is to bring a new focus onto the Grand Parade. Therefore Castle street should cater to 'back of house' programmes.

Figure 31
Castle street will provide service and access needs.

Design Brief

Programme

The brief for this project is to create something that serves and in turn brings a new importance to the Grand Parade. Spatially this needs to be done through introducing 'edge' to the space in order to contain the public space and give it a sense of scale.

Programmatically a host of new functions need to be introduced in order to harness every day energy and activity moving through the site, while also allowing for festival type activities to take place when required. The programmatic brief is therefore broken down into two halves; The Everyday and Festival.

The Everyday	Festival

Public Functions

Pedestrian access from train station deck down to Grand Parade	
Existing Golden Arrow bus service	
Public ablutions	
Rentable retail space – servicing pedestrian route	**Rentable retail space** servicing festival space –
Street furniture – servicing pedestrian route	**Street furniture** servicing festival space –

Private Functions

Office space – Events management – GA ticket office – Public trading office	
Aftercare facility – Safe outside playing areas – Library and homework areas – Kitchen and eating areas – Ablutions	**Festival stage** Backstage loading and prep area – Secure equipment vehicle parking – Infrastructure: lighting/sound – Ablutions –

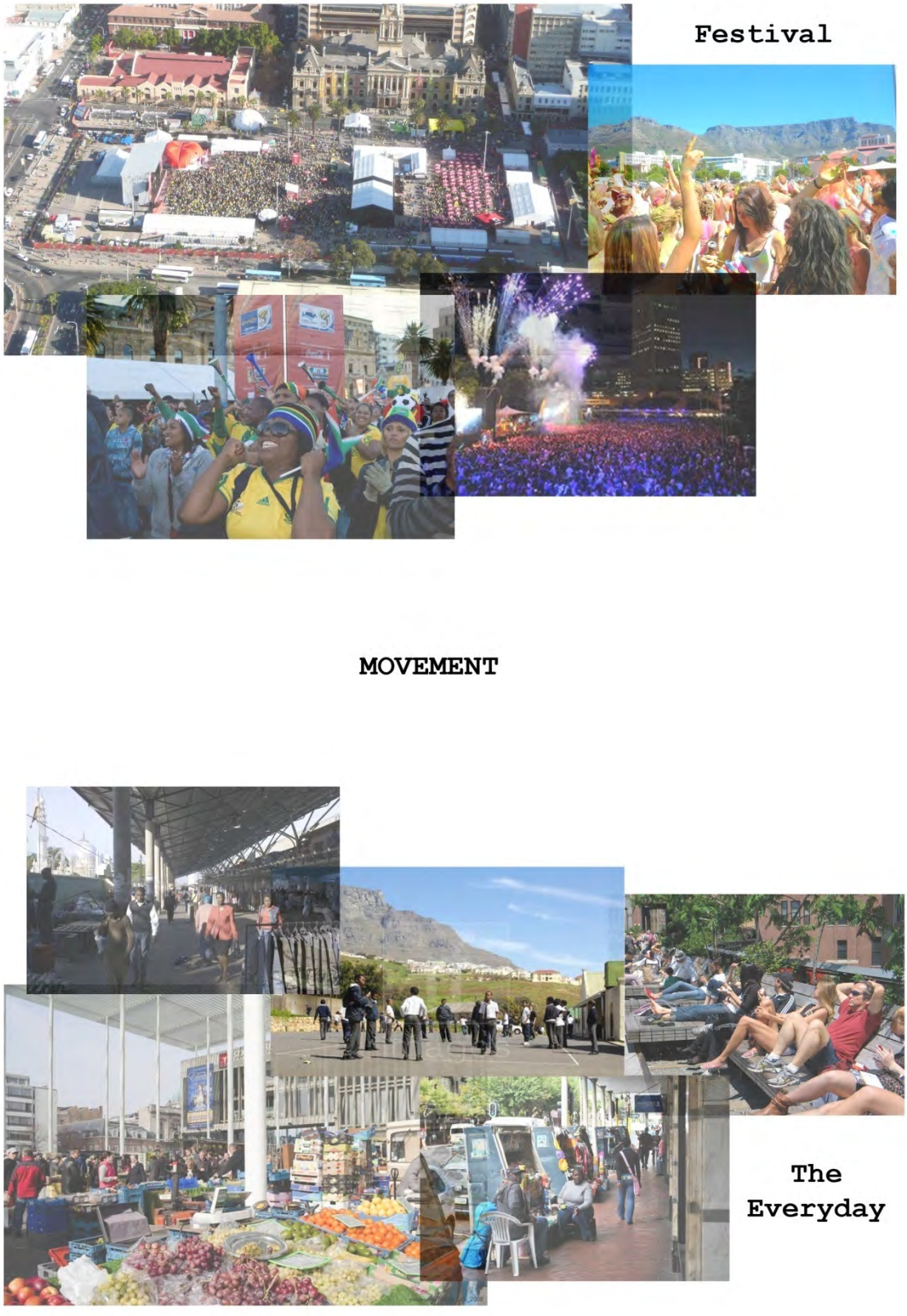

Figure 32
Diagram displaying the two programmatic narratives of the project.

Architectural Principles and Precedent

Touching the ground lightly

Considering the fact that the Grand Parade is such a sensitive site due to its historical significance in Cape Town, the first architectural consideration is 'how' this new piece of architecture sits on the site. The aim is to touch the historic site as lightly as possible.

Studio Bernardo Secchi Paola Viganò's Theatre Square in Antwerp Belgium is a perfect example of architecture touching the ground 'lightly'. The project serves incredibly similar spatial conditions when compared to the Grand Parades current desolate and inactive existence. Once a rigid steel frame canopy was constructed, order and a sense of scale were introduced to the space, allowing for everyday activities, performances and weekend markets to take place under the protection of the 15m high roof.

Projecting activity

Richard Roger and Renzo Piano's Pompidou Centre in Paris France projects its inner activity, through its transparent facade and expressive vertical circulation, onto the public square below. Through this articulated transparency the activity within the building becomes that which is on display instead of the exhibitions housed within it. This allows the building to work for the public space as a spectacle on display, attracting visitors to the area specifically to view the building.

The architectural intervention on the Grand Parade should attempt to achieve the same sense of projection in order to attract more activity to the square on a daily basis.

Figure 33
Theatre Square before the addition of its translucent canopy.

Figure 34
Theatre Square's steel frame structure touching the ground 'lightly'.

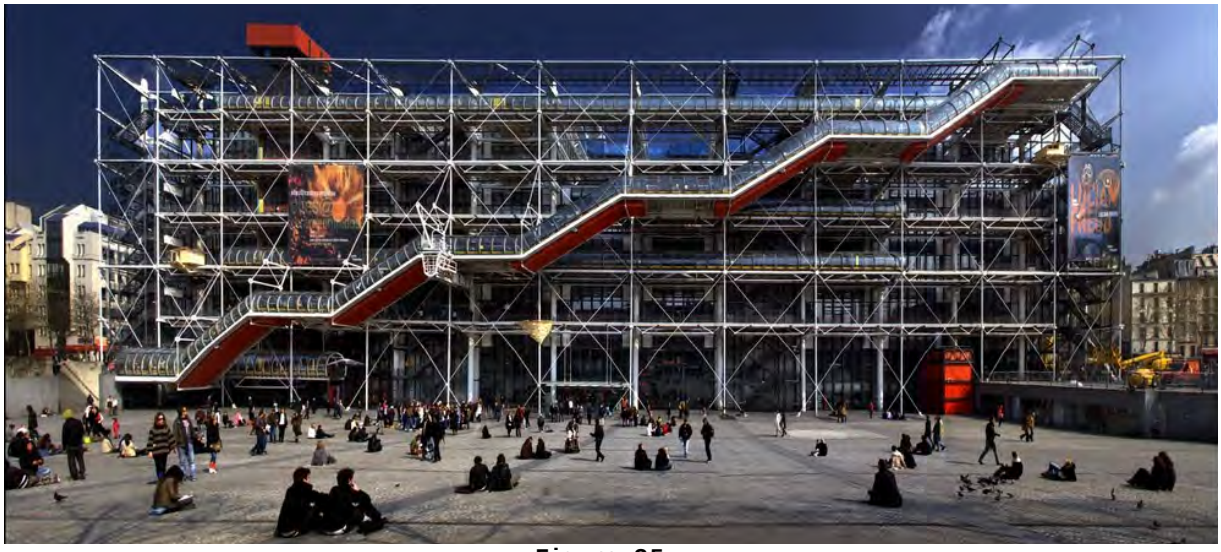

Figure 35
Pompidou Centre projecting its inner activity onto the public square below.

Designing for the pedestrian

The fact that this design started with an interest in public space should be carried through to the smaller details of the project. Simple urban design strategies such as removing the conventional 'pavement' and rethinking floor finishes can instantly give pedestrians a greater sense of freedom, while also controlling the flow and speed of traffic.

Meyer and Associates have done this with a number of park and ride facilities around Cape Town. Through flattening the ground level and introducing bollards and ground markers, cars acknowledge the space as a pedestrian zone where the person on foot is given right of way.

Strategies similar to these will be carried through to the interface between the existing Golden Arrow bus depot and the Grand Parade.

Functionality and durability

One of the key aspects of public space is designing the interface between user and the built form. Public spaces are intended to be used on a daily basis and should therefore respond to these demanding standards of performance through materiality.

Again Meyer and Associates have achieved this with their Kuyasa transport interchange in Khayelitsha. The scheme includes a taxi rank that feeds into a public square outfitted with robust and durable public furniture (something the Grand Parade currently lacks). Through the basic material choices of masonry and concrete, the public space will withstand everyday wear and tear thanks to the hard wearing nature of the architecture.

In addition to this, my architecture will include elements of movement, therefore technologies should respond to the same everyday demands of functionality and durability. New York's High Line designed by James Corner Field Operations achieves this with its public furniture capable of movement, employing basic low maintenance technologies of the wheel and track, with benches that can be grouped into communal seating, or isolated into individual seats.

Figure 36
A stop and drop area making use of bollards and ground markers.

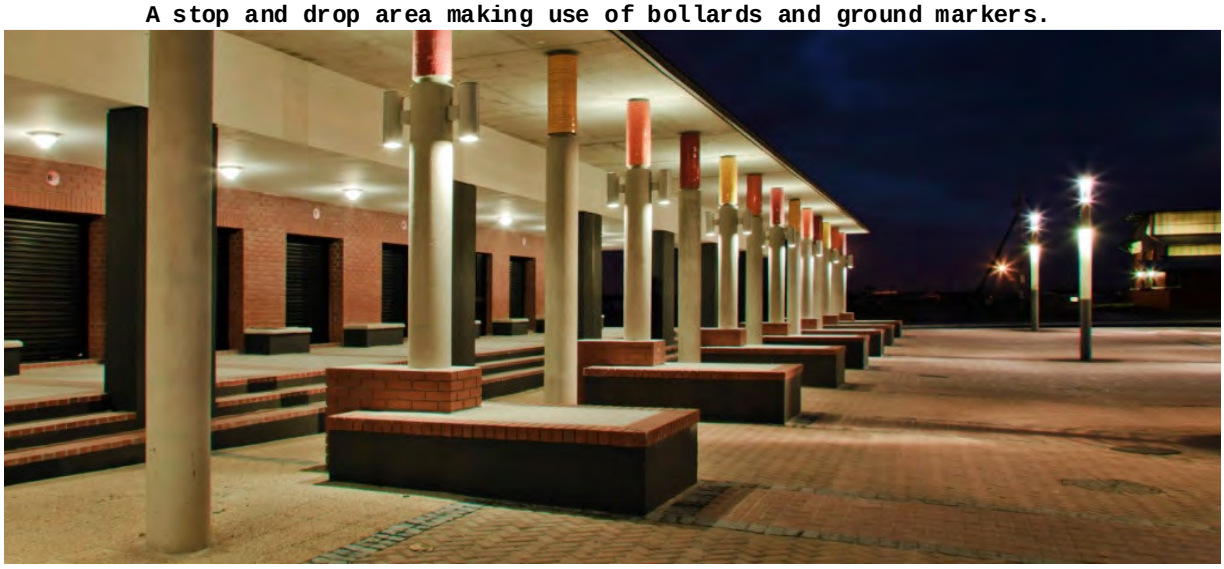

Figure 37
Kuyasa transport interchange with its robust urban furniture and public interface.

Figure 38
High Line's movable public furniture sitting on wheel and track technology.

Design

Concept

Design started by considering the project as a concourse between the Grand Parade and the new pedestrian route on deck level. This resulted in the first sketch design achieving movement through a box that shifted vertically in order to switch between programmatic narratives.

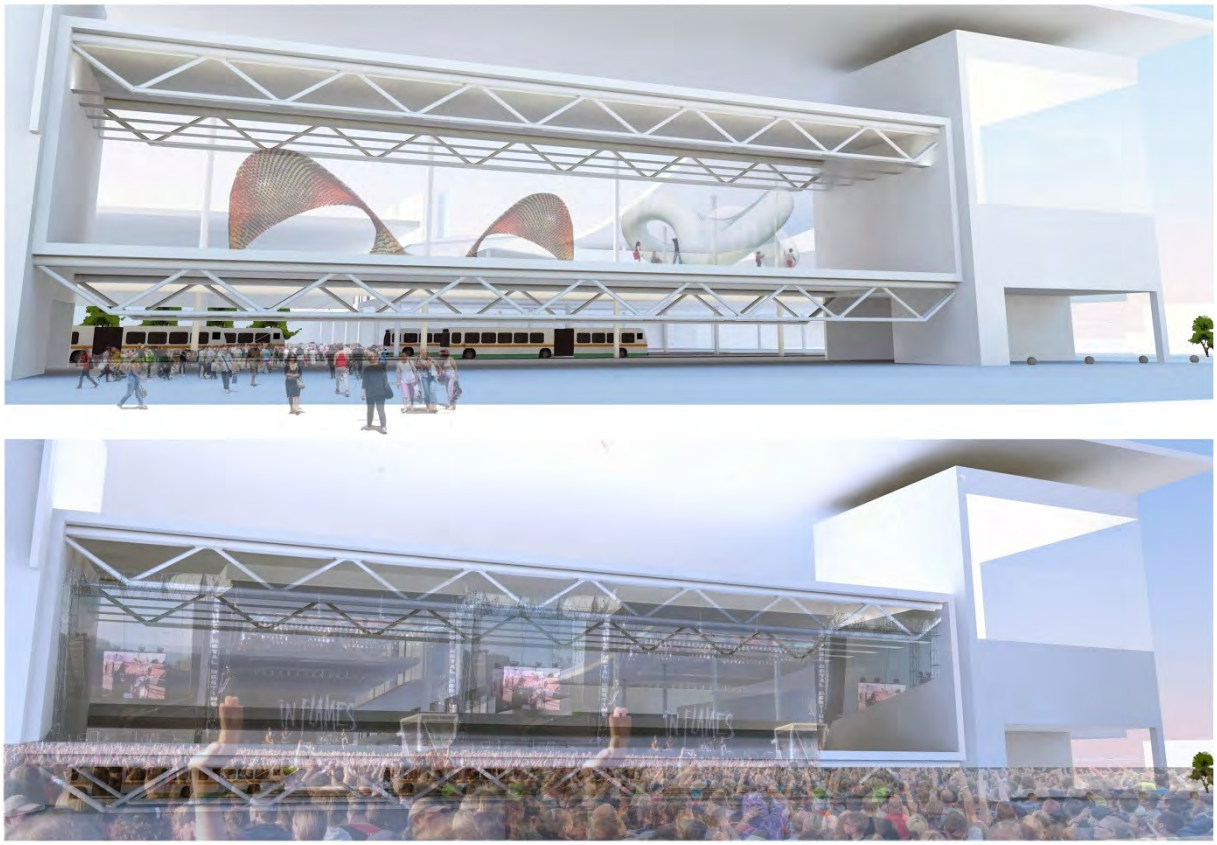

Figure 39
The initial sketch design incorporating a box that moves vertically.

This initial concept developed into an architecture that controls movement between the Grand Parade and the station deck though its ability to move. The resulting form is a rigid steel structure that occupies the edge of the public square, defining the space with a sense of scale, while also creating its own interior spaces. It is within this rigid structure that the architecture of movement takes place, giving rise to a spatial as well as programmatic adaptability. The initial idea of a singular movable box was then broken down into a series of platforms that can move independently, along with a public staircase capable of moving in order to divert pedestrian movement.

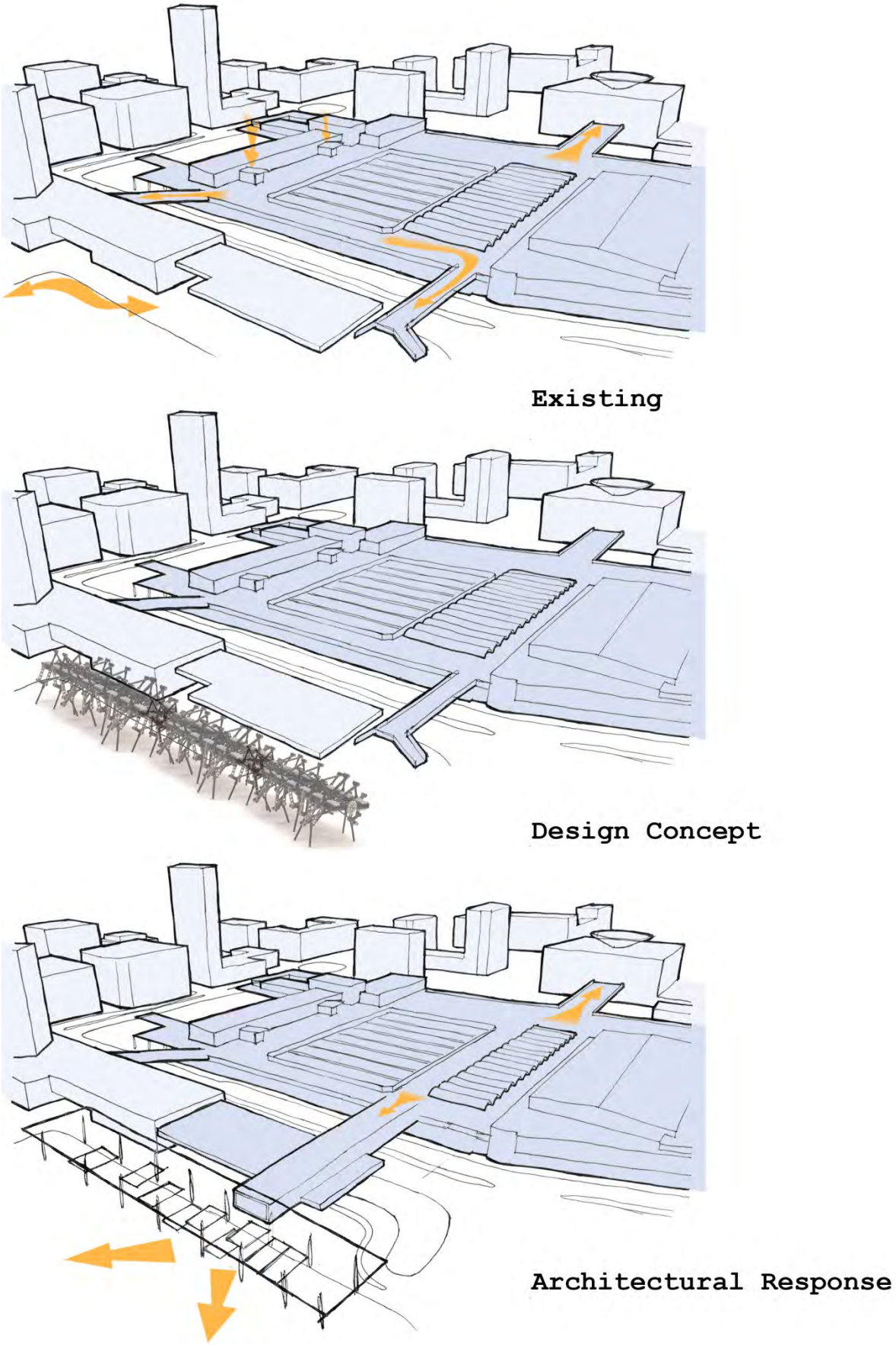

Figure 40
Progression from existing site, to design concept and architectural response.

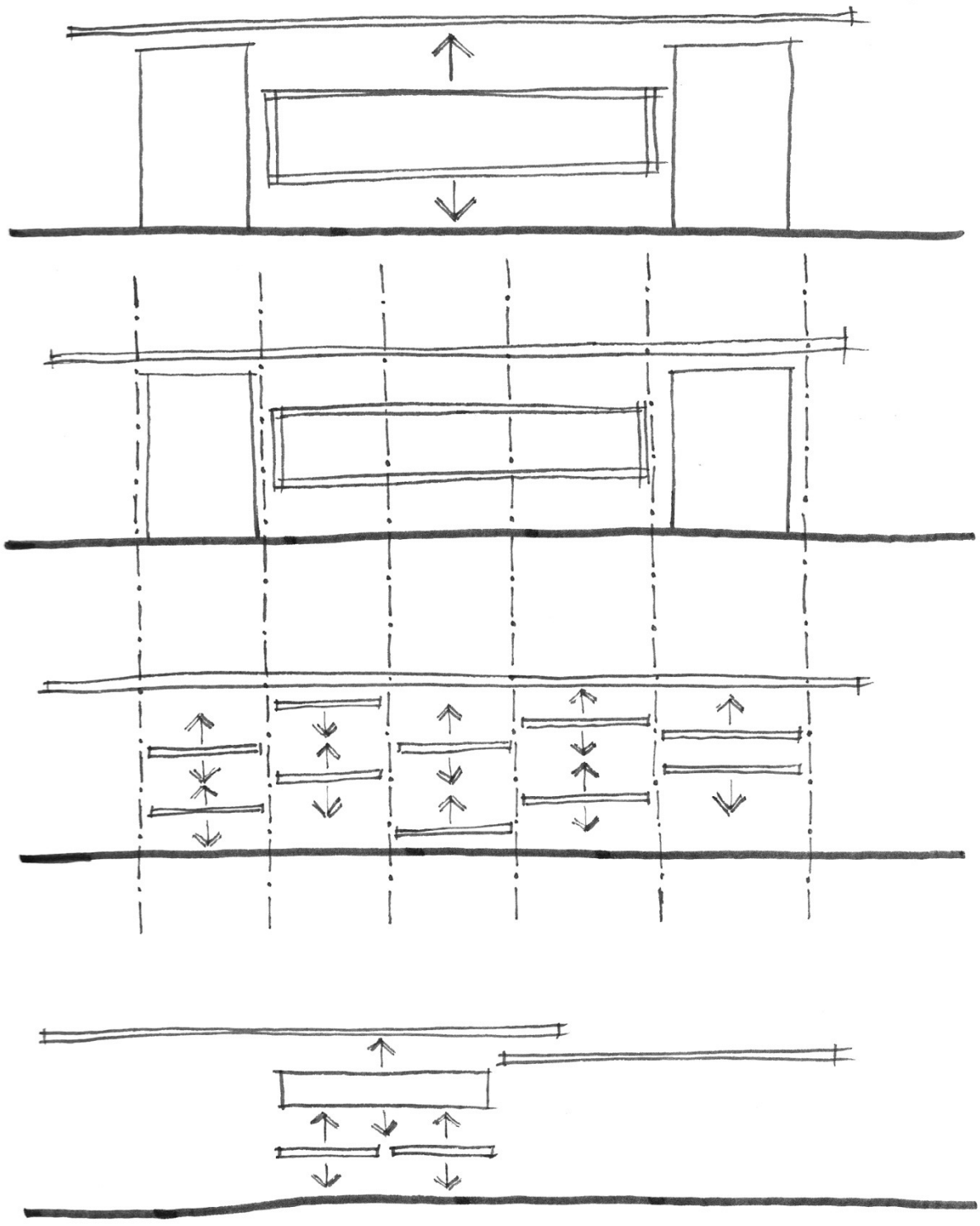

Figure 41
Conceptual sketches from the initial sketch design through to the final concept.

Design Development

In order to gauge how the design performs in the context of game design, it will be evaluated through the four principles of boundary and experience, rules, interaction and choice, and meaningful play in order to analyse whether the design satisfies the design brief laid out.

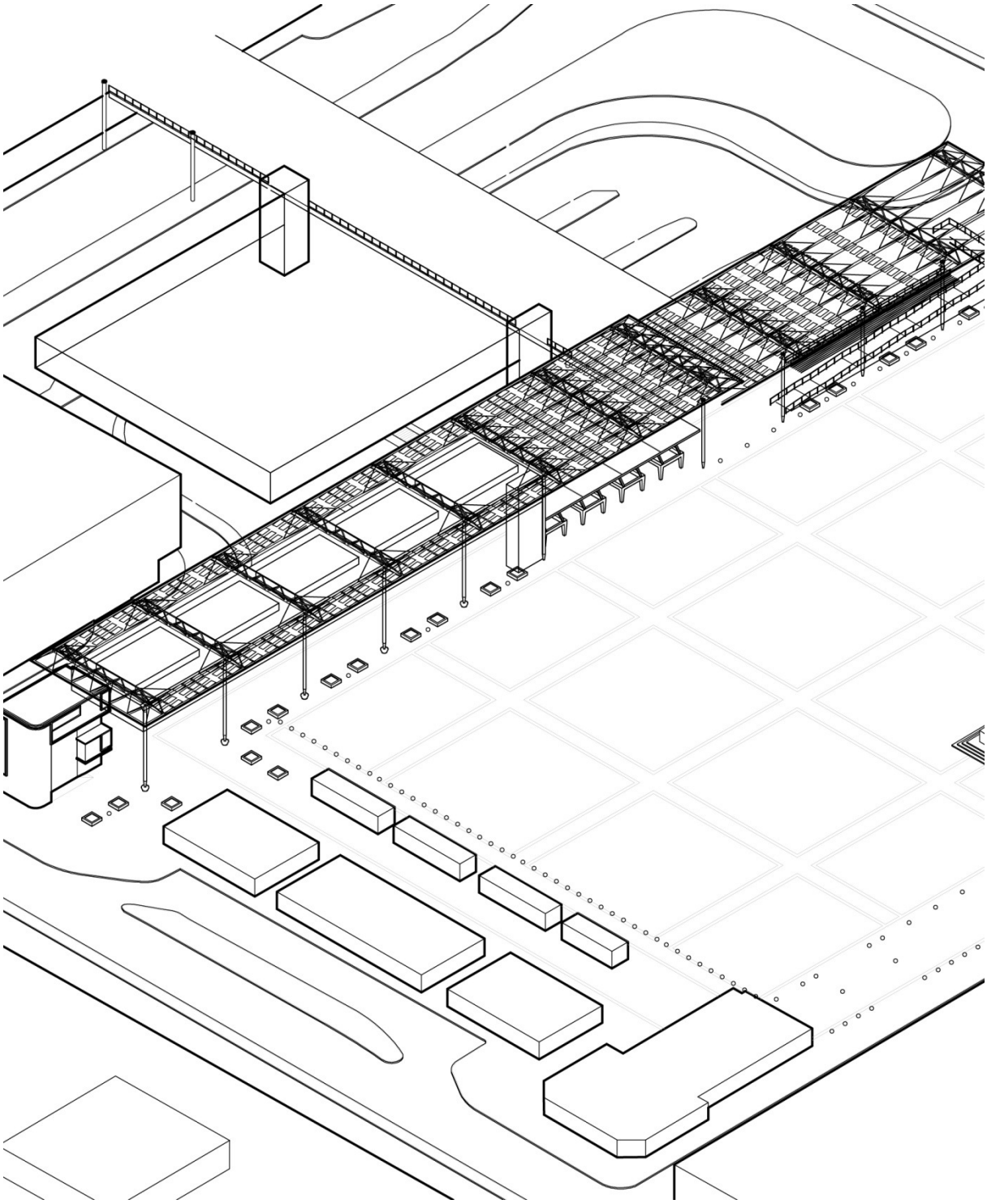

Figure 42
Axonometric view of the final design.

Boundary, Experience and Rules

Considering the architecture of this project has little by means of 'enclosed' space, this part of the analysis will be conducted with reference to how the project affects the narrative of the Grand Parade with regard to boundary. Analysing this dimension of the project, as opposed to the spatial qualities within the architecture, should by no means be seen as a short coming in the project as the architecture was always intended to serve the Grand Parade first and foremost.

The Everyday

When the Everyday narrative of the project is in play, the architecture acting as boundary on the Grand Parade allows for permeability. Within Game Design a permeable boundary would indicate a space (game) understood primarily through play instead of rules. This is fitting as the beauty of public space is that people are free to do what they please. Free reign is handed over to the public to the extent that they have a series of choices with regard to route and activity.

Permeability occurs on an everyday basis through:

- A new pedestrian link created by extending the pavement across Castle street in order to link the Golden Arrow bus depot to the Grand Parade.

- Direct access from the Grand Parade onto the station deck via the new pedestrian route stretching across Castle and Strand street.

- Linking the Golden Arrow bus depot directly to the new pedestrian route through vertical circulation.

- Architecture permeability: slender steel structure and glass project interior activity onto the square below.

Figure 43
Architecture during The Everyday narrative.

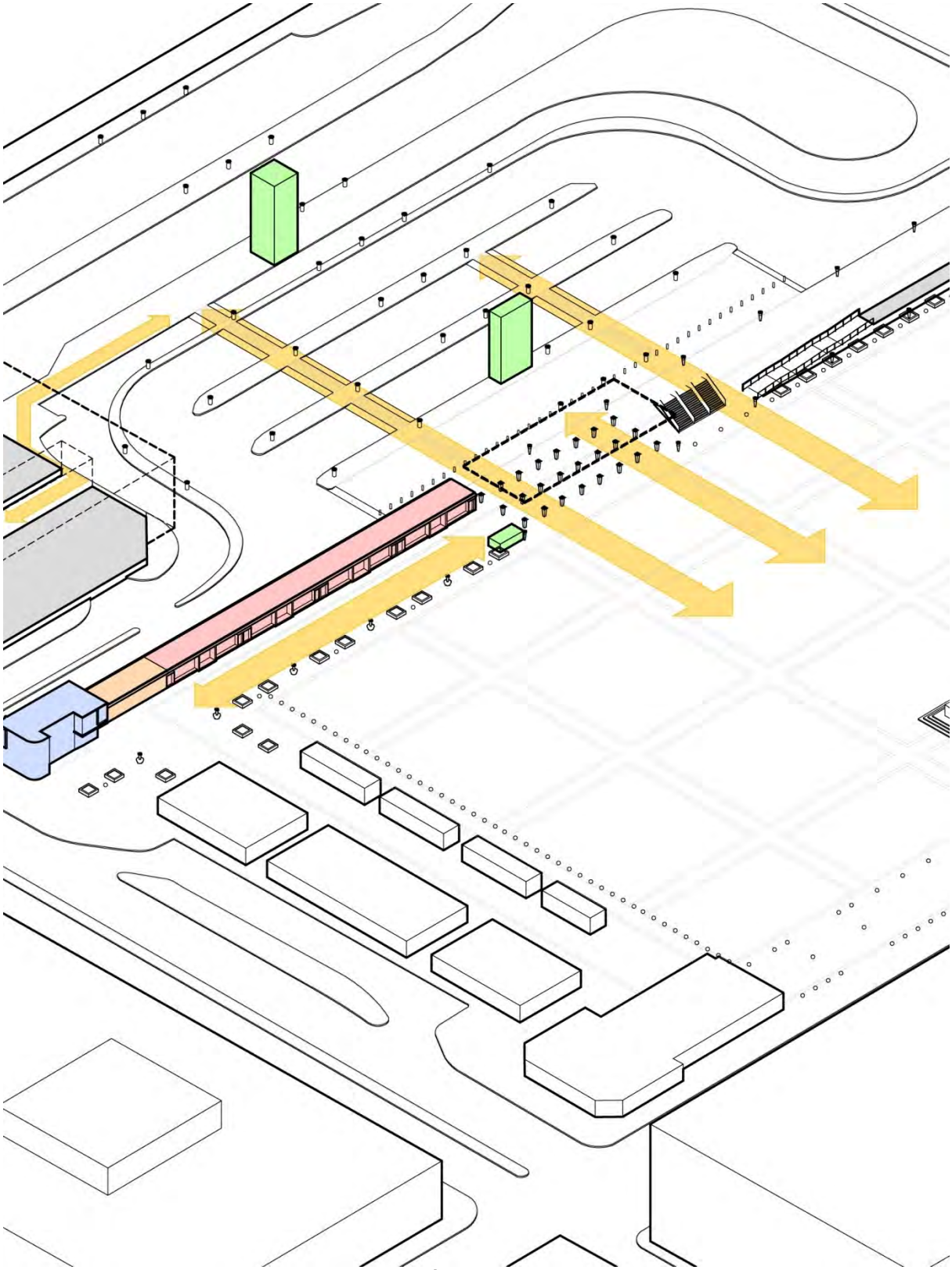

Figure 44
Permeability between Golden Arrow and the Grand Parade via the extended sidewalk. New retail spaces serve the newly concentrated pedestrian flow moving into the CBD.

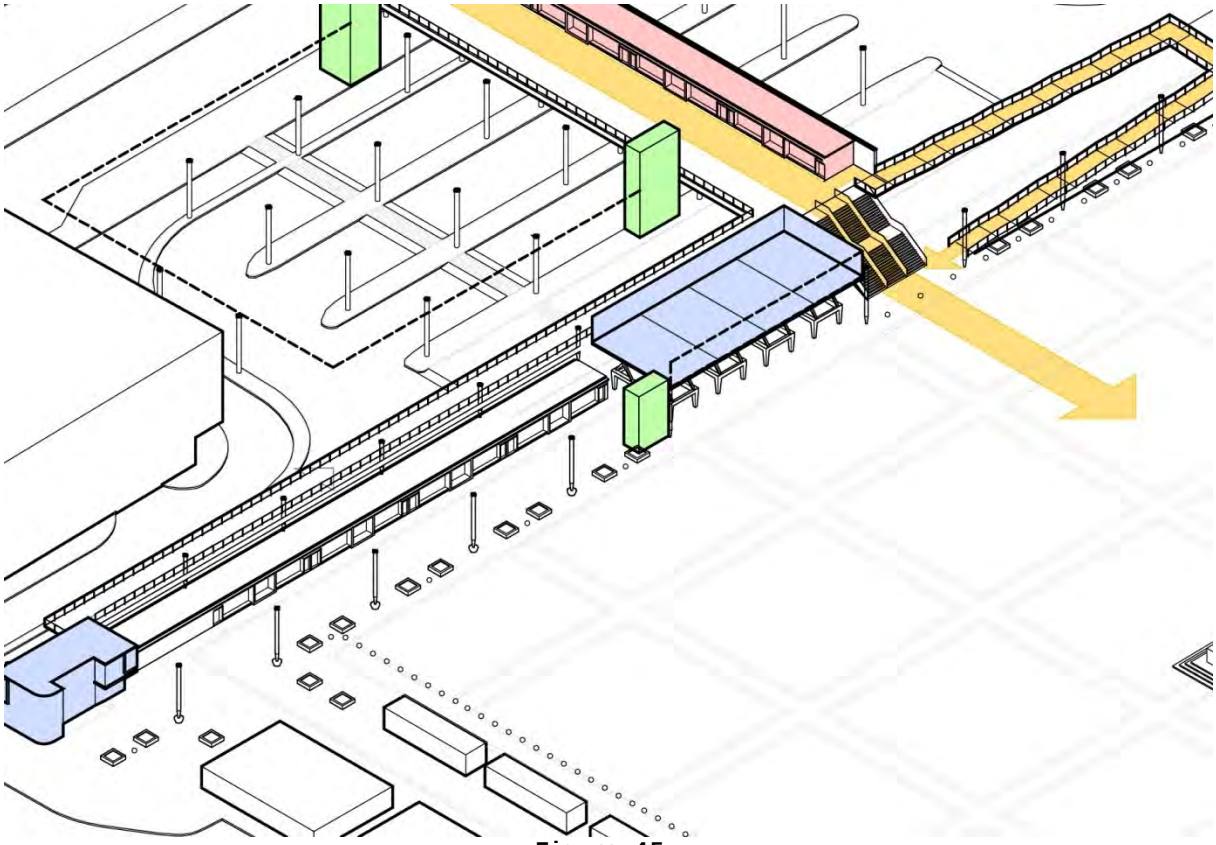

Figure 45
Permeability between station deck and the Grand Parade via the new pedestrian route.

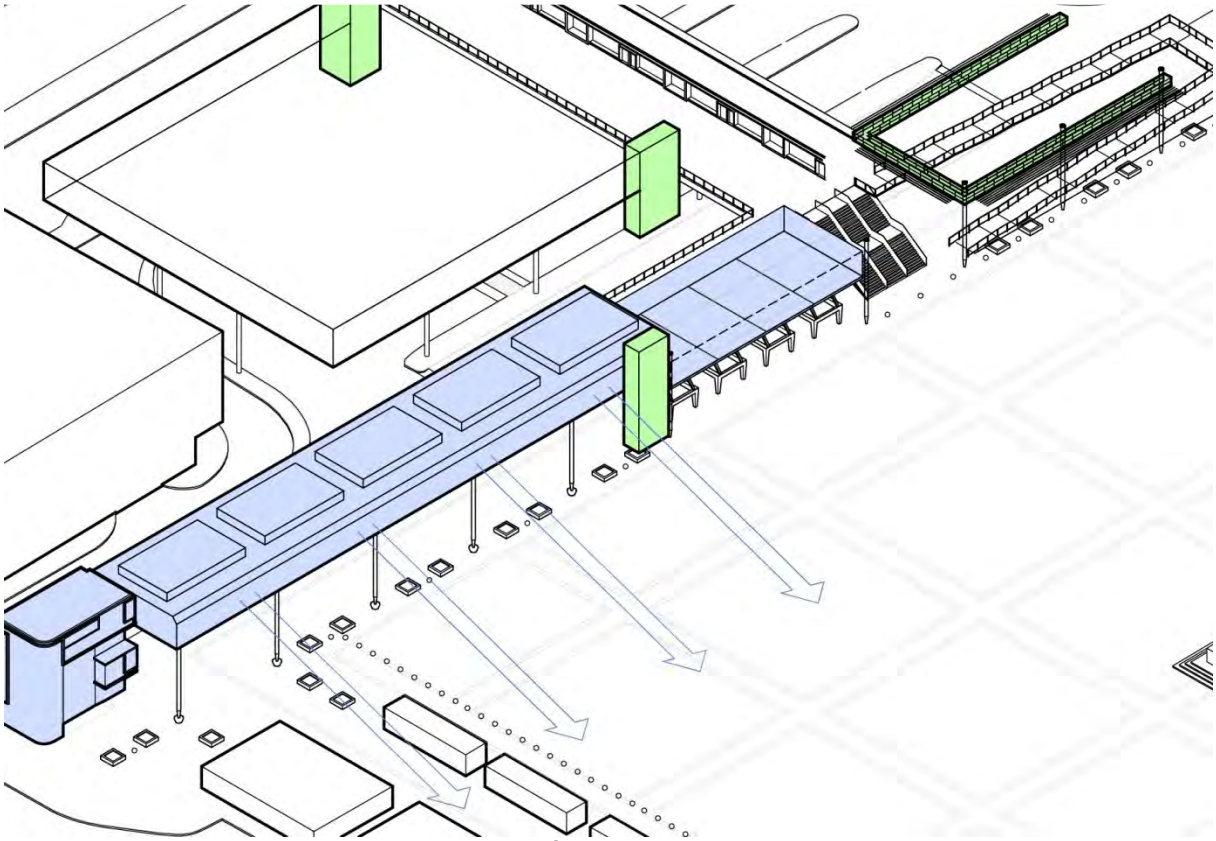

Figure 46
Activity within the aftercare projected onto the square below.

Festival

Once the Festival narrative is activated in the project, the nature of boundary becomes much 'harder'. This is done in order to create an enclosed narrative of light and sound as the stage speaks inwardly to the Grand Parade. Apart from enriching the festival narrative, this new boundary also embodies a very strict set of rules as the public stay within their domain as the audience, while the performers and staff work within the restricted confines of the stage and backstage area.

Boundary occurs during the festival narrative through:

- Terminating the direct link between the Golden Arrow bus depot and the Grand Parade: this space gets replaced with stage and backstage functions

- Erecting temporary crowd barriers to contain the audience.

- Redirecting the pedestrian route around the North East edge of the Grand Parade and down into the existing market area.

- Visual permeability becomes redirected and cut off through stage, video, and lighting design specific to the performance.

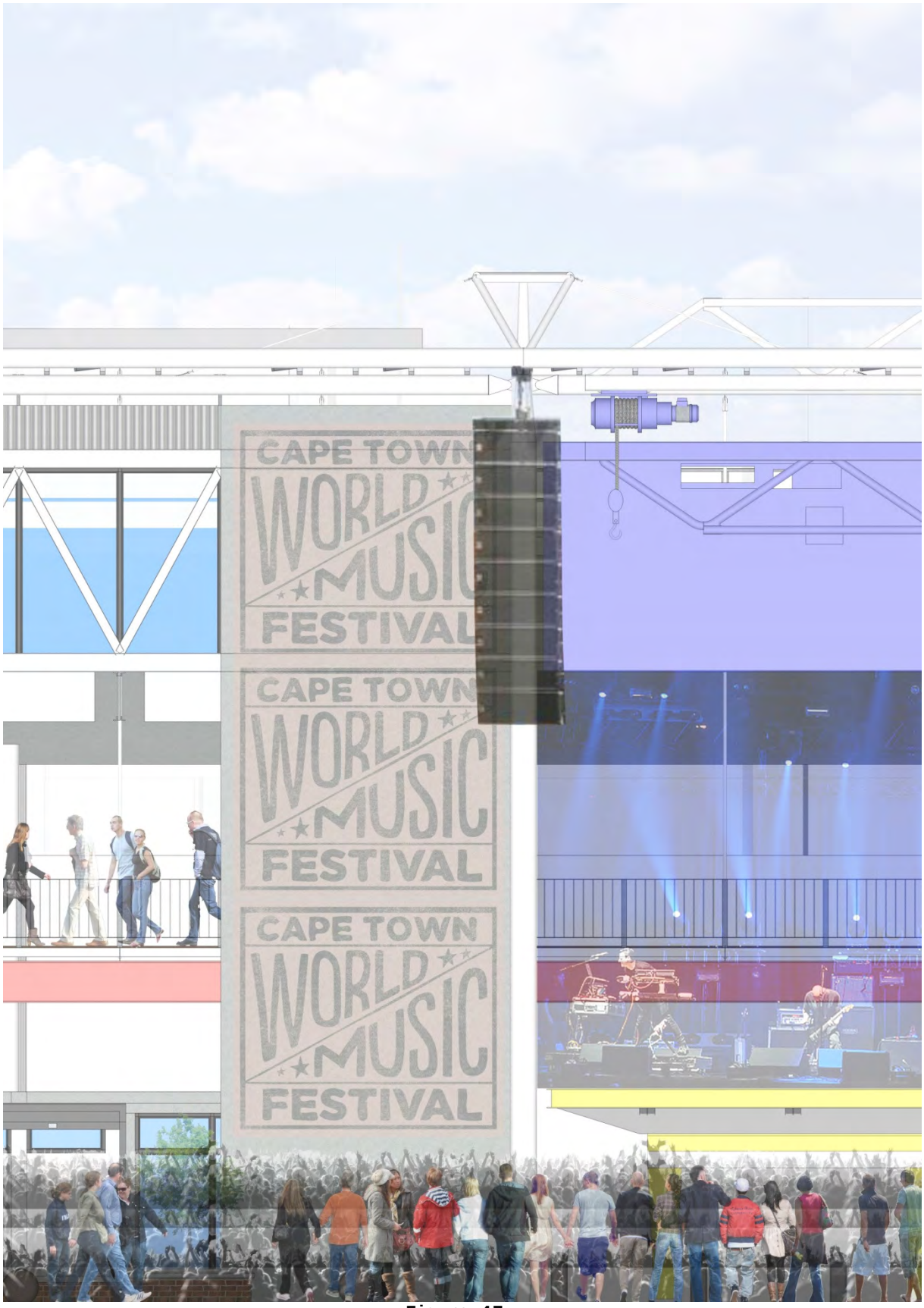

Figure 47
Architecture during the Festival narrative.

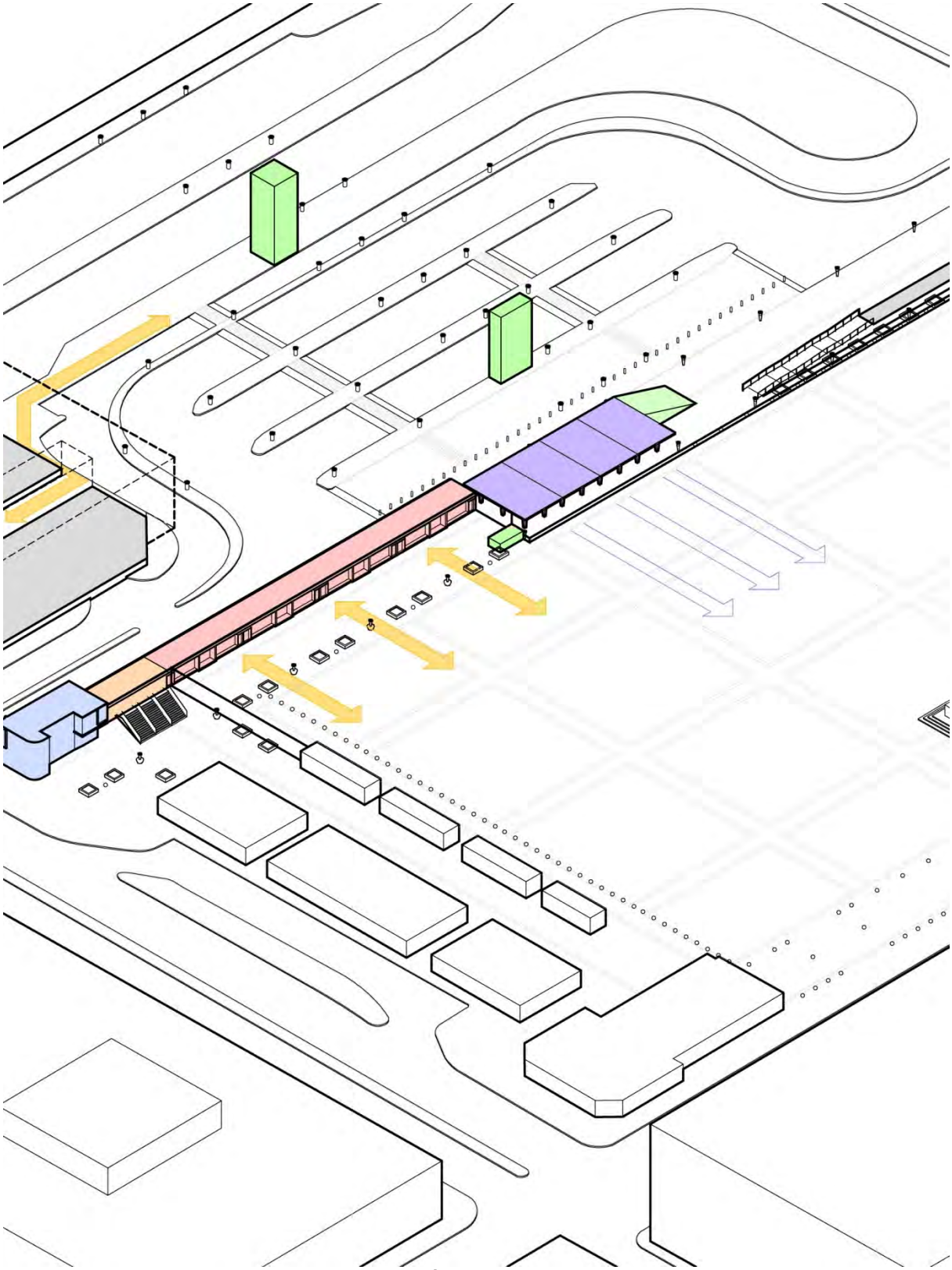

Figure 48
Permeability with the Golden Arrow depot is replaced with stage and backstage functions. Retail spaces now serve the inside of the festival area.

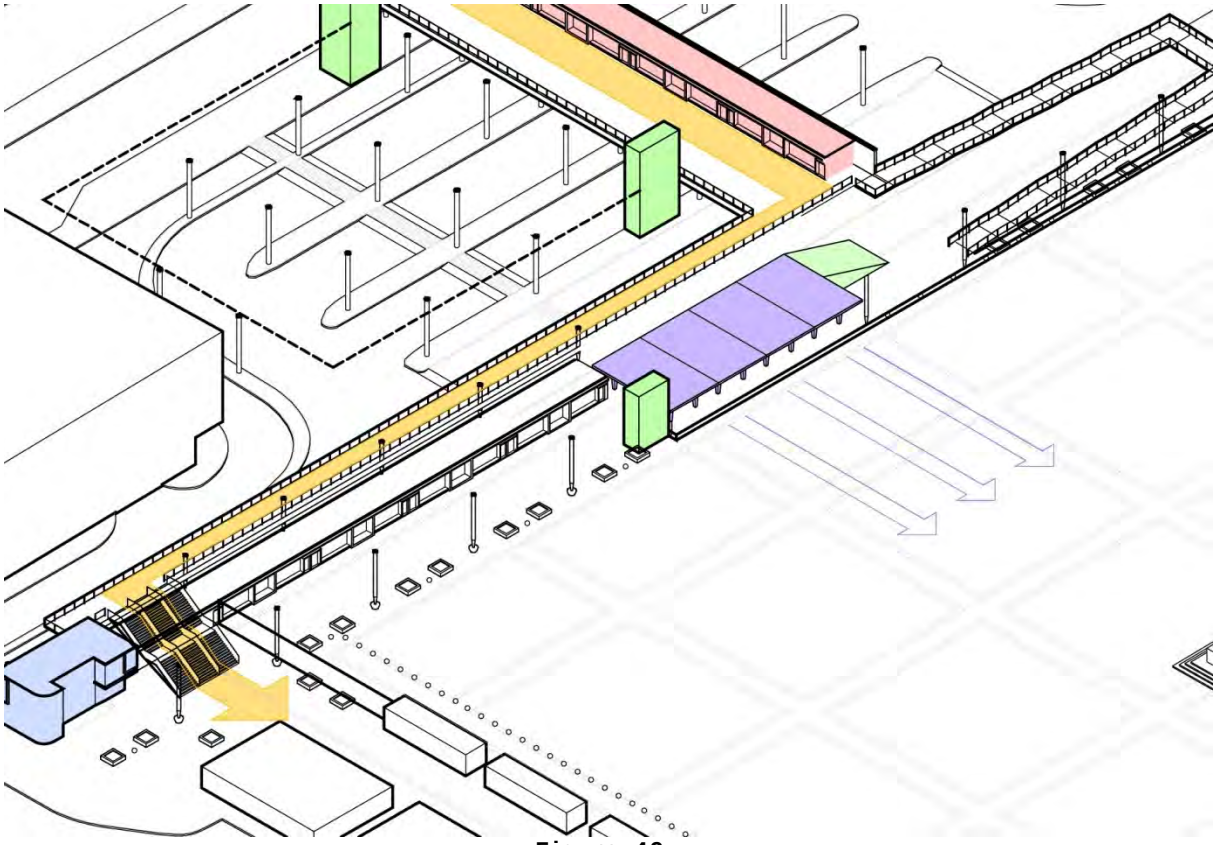

Figure 49
Route from the station deck is diverted along the NE edge of the Grand Parade into the existing market.

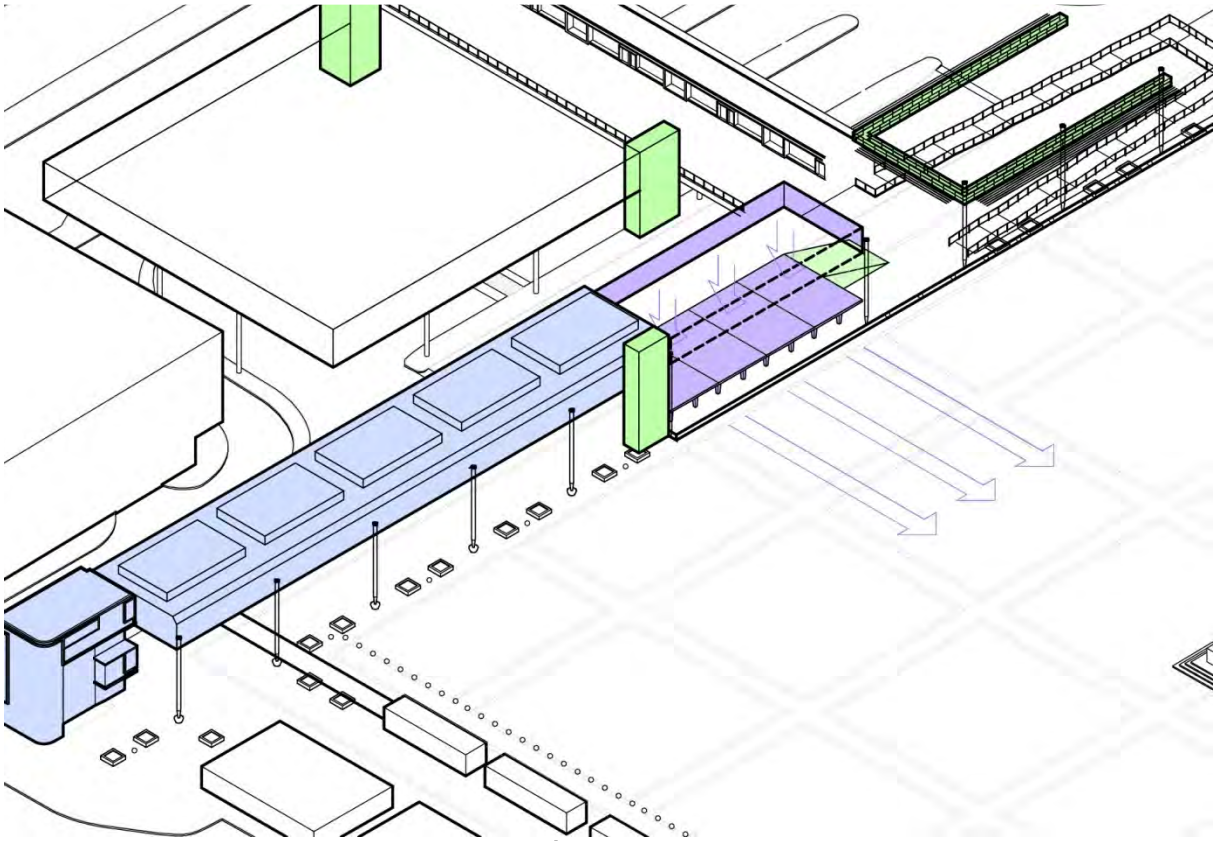

Figure 50
Visual permeability redirected and cut off through stage, video, and light design.

Interaction and Choice

In order to hint at the possibilities for interaction and choice within the project, I decided to look back to the technologies of the train and the train track similar to the High Line in New York. These are incredibly basic and straight forward technologies in the sense that the lay person has an immediate understanding of what they do upon seeing them, therefore perfect for hinting at the spatial possibilities available to the public. To do this single train tracks have been laid out on the ground plane, allocating paths of movement allowed for the various pieces of urban furniture.

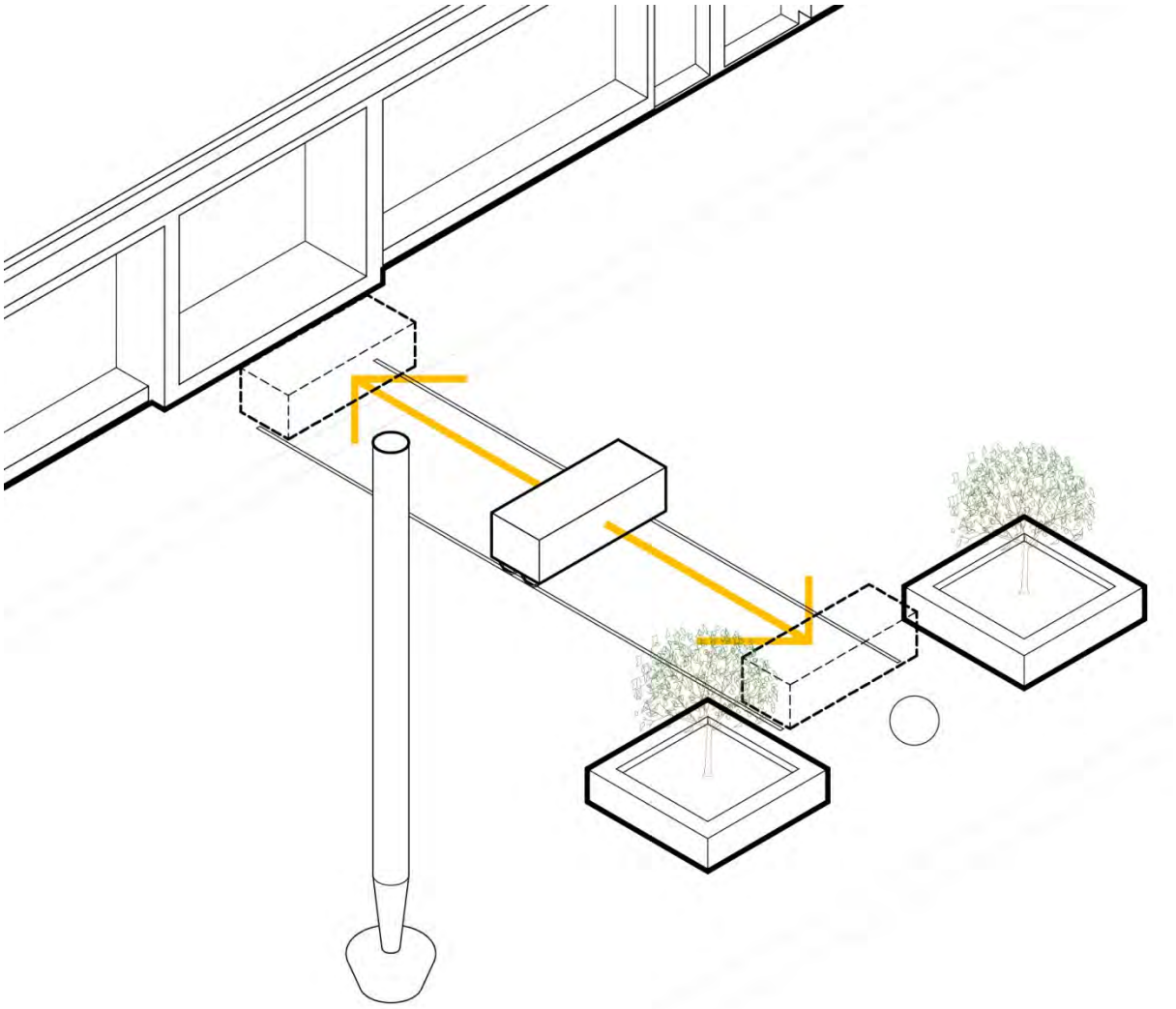

Figure 51
Diagram displaying the movement of public furniture outside of the retail stores.

Who is using these spaces; is it a tourist, a passer-by, somebody on lunch break, an informal trader? The fact is that all of these demographics use this public space, therefore it should reflect their own personal values within the space through interacting with these objects.

Other components capable of movement including the public staircase and platforms that use technologies including hoists and hydraulics. These are perhaps less conceivable to the public, and fittingly so as they are choices limited to event organisers and management of the space.

Figure 52
Pedestrians walk underneath the hydraulic systems of the movable platforms.

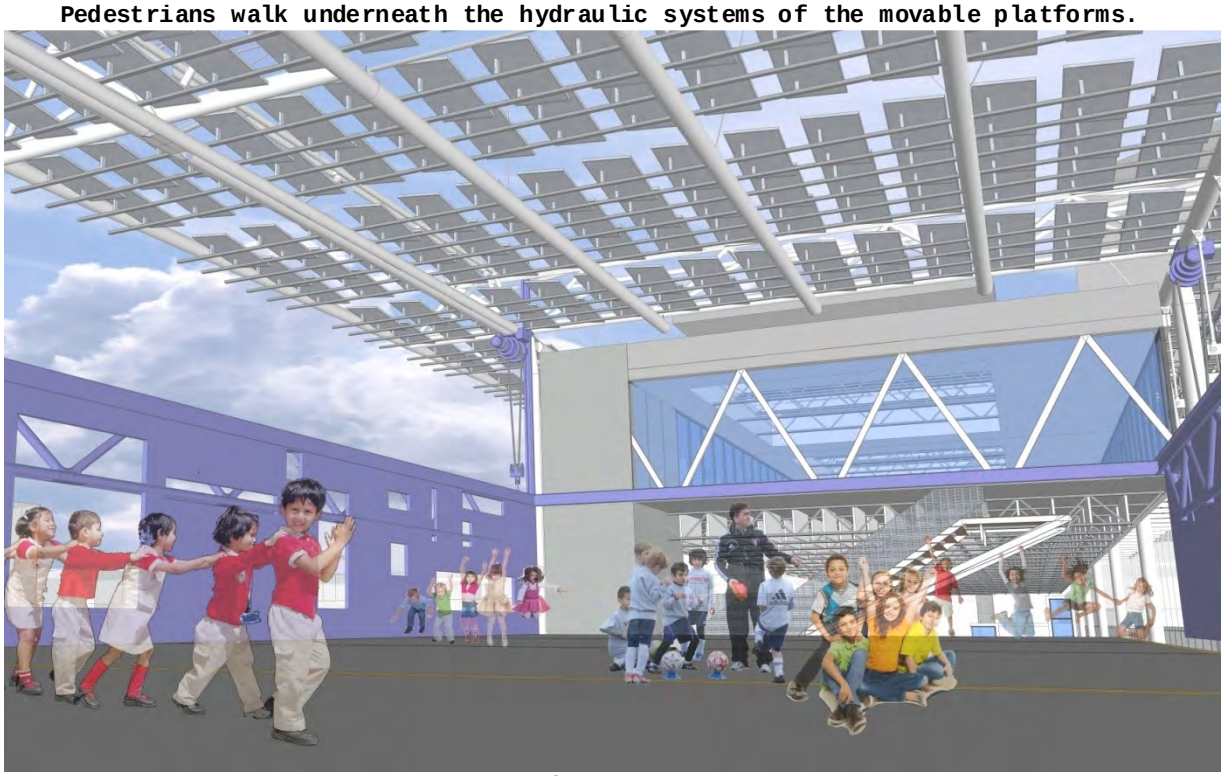

Figure 53
Children play underneath the mechanical hoists of the stage flyover.

Meaningful Play

As covered previously in the paper, a game must contain discernable and integrated relationships in order for it to contain meaningful play. Therefore, where can we identify these two relationships within this architecture?

Discernable relationships

Discernable relationships can be identified in the smaller/contained movements of the architecture. These include the elements of public furniture arranged along the pedestrian routes. Movement of these elements are discernable as the outcome is immediately understood through the containment interacting with the furniture as it is repositioned. These movements can only become integrated once all of these components are adjusted with the same intent i.e.; a pedestrian route becomes an informal market, in order to change the narrative of the space as a whole.

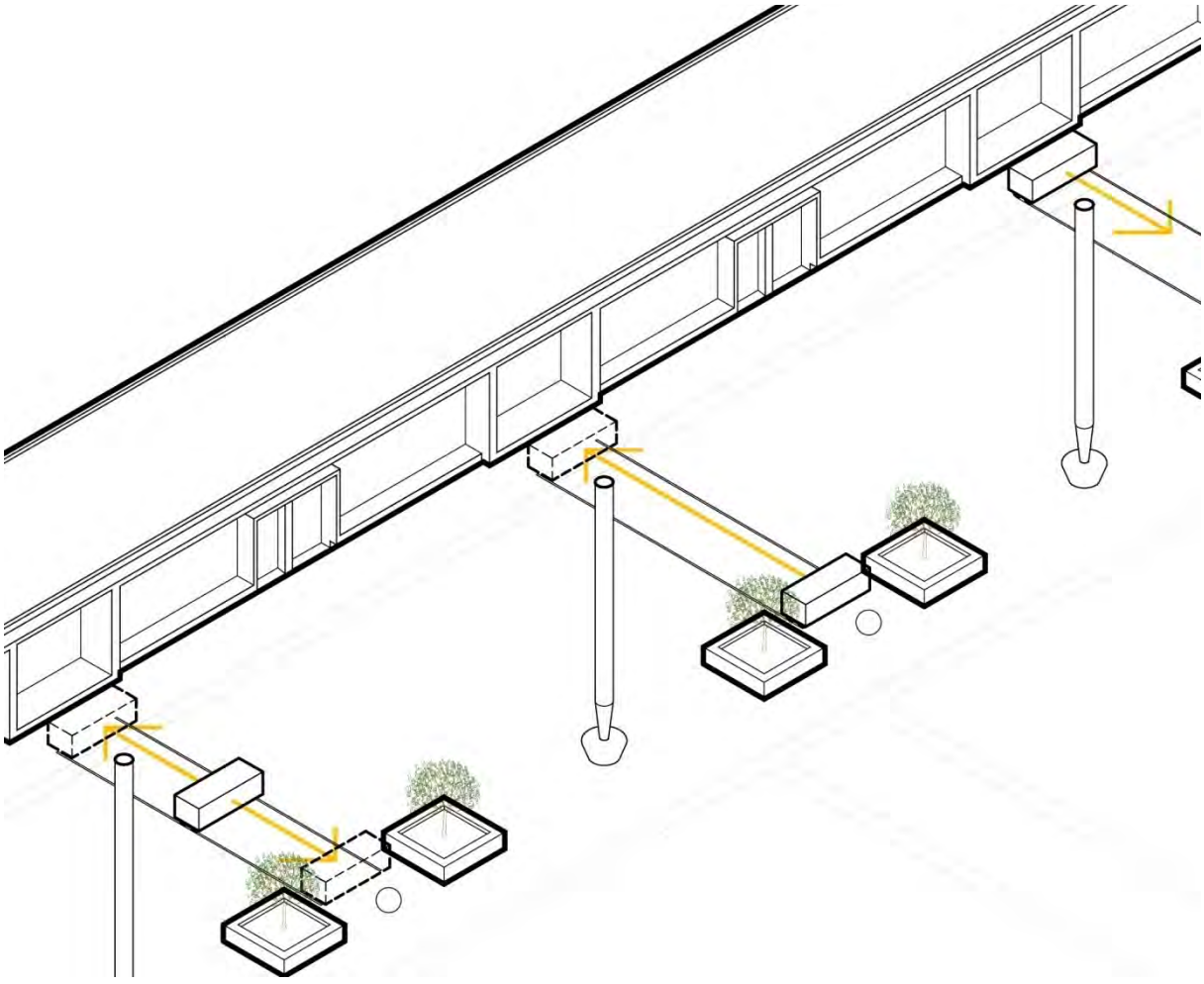

Figure 54
Diagram showing the various possibilities of arrangement of the public furniture outside the retail stores.

Figure 55
Discernable relationships - individuals taking control of singular pieces of furniture. The everydayness of the public route remains.

Figure 56
Integrated relationship - a group of people take ownership of all the public furniture. The Everyday is enriched by an informal market narrative.

Integrated relationships

Integrated relationships can be identified in the larger systematic movements of the architecture, occurring between the two programmatic narratives of The Everyday and Festival. These movements are large gestures that have an effect on the space as a whole. They include the horizontal movement of the public staircase, as well as the vertical movement of the platforms.

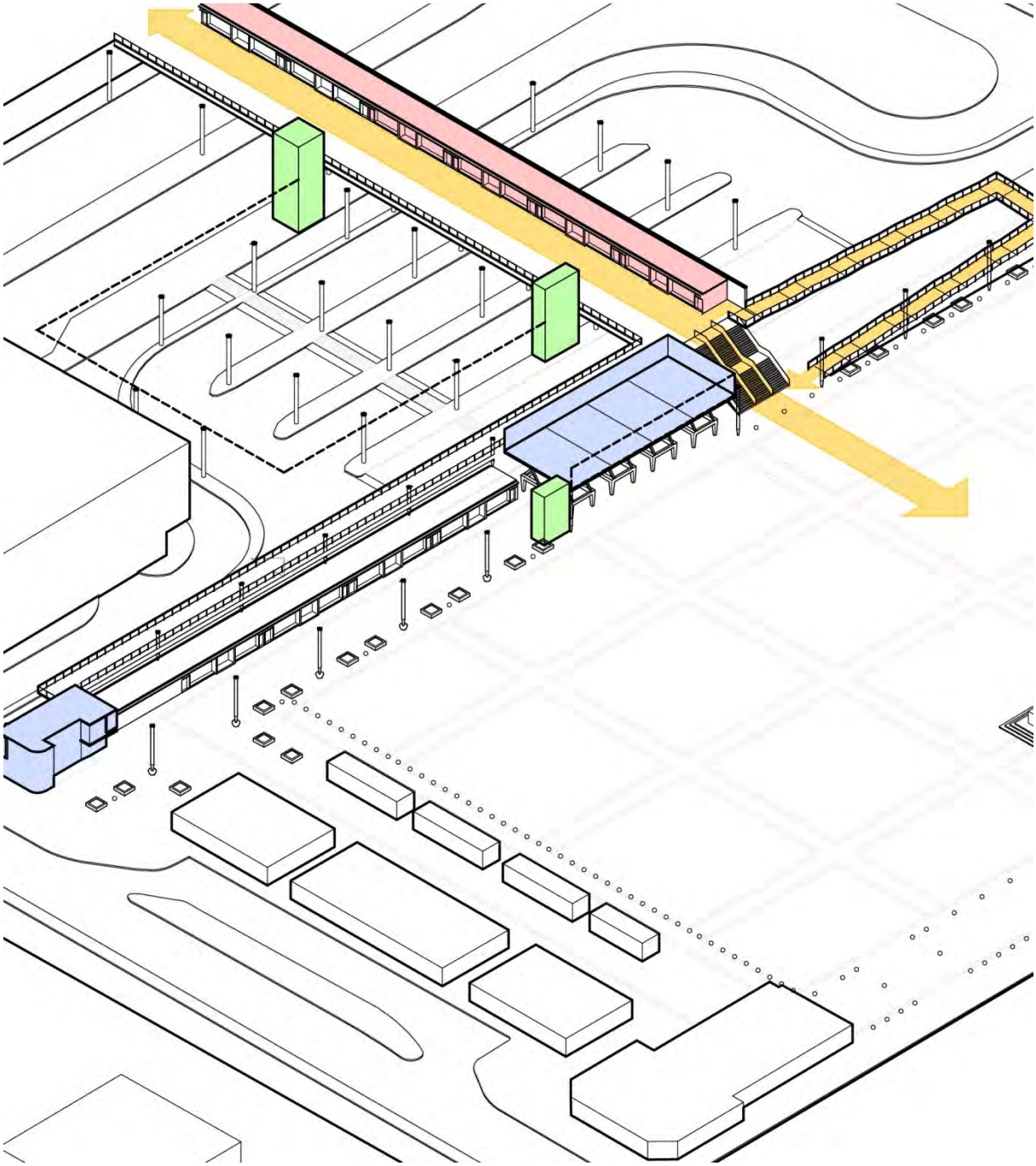

Figure 57
Integrated relationship - public staircase directing movement.

Moving the staircase effects the spatial narrative of the project immediately by diverting route, however this also has a systematic effect as retail spaces that occur on the route of The Everyday suffer through fewer passer by's. Typically this shouldn't be a problem as this movement should only be activated within a Festival narrative, yet it still displays the ability to have such an effect.

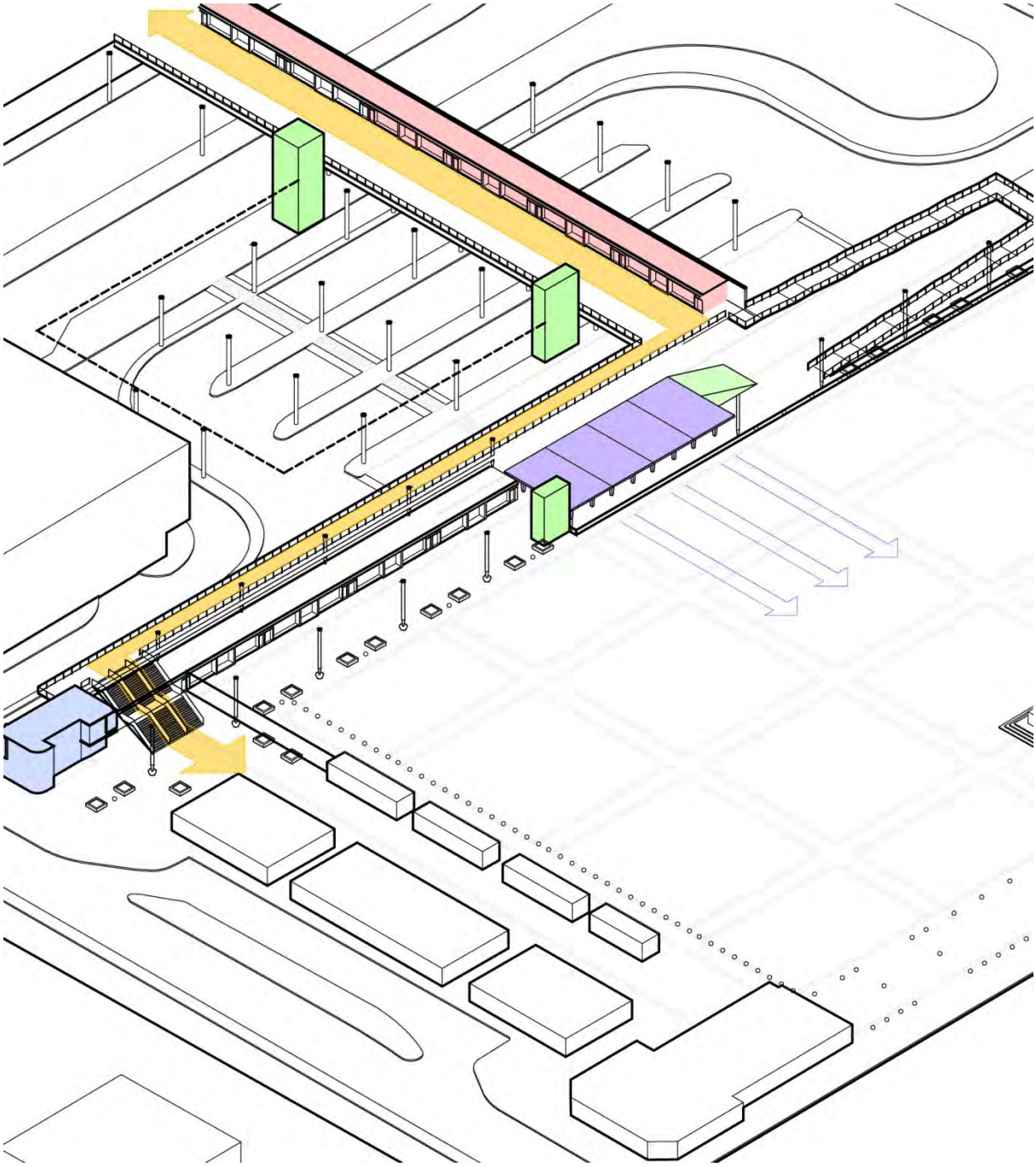

Figure 58
Integrated relationship - public staircase diverting movement.

The movable platforms within the architecture have a similar effect. These components are integral to two of the largest programmatic functions of the project; a raised playing platform for the aftercare (Everyday), and the stage and fly tower (festival). Through activating these elements there is an immediate understanding of the space either created or eliminated above or below the platforms, as well as the systematic effect created through the programmatic change resultant through the movement.

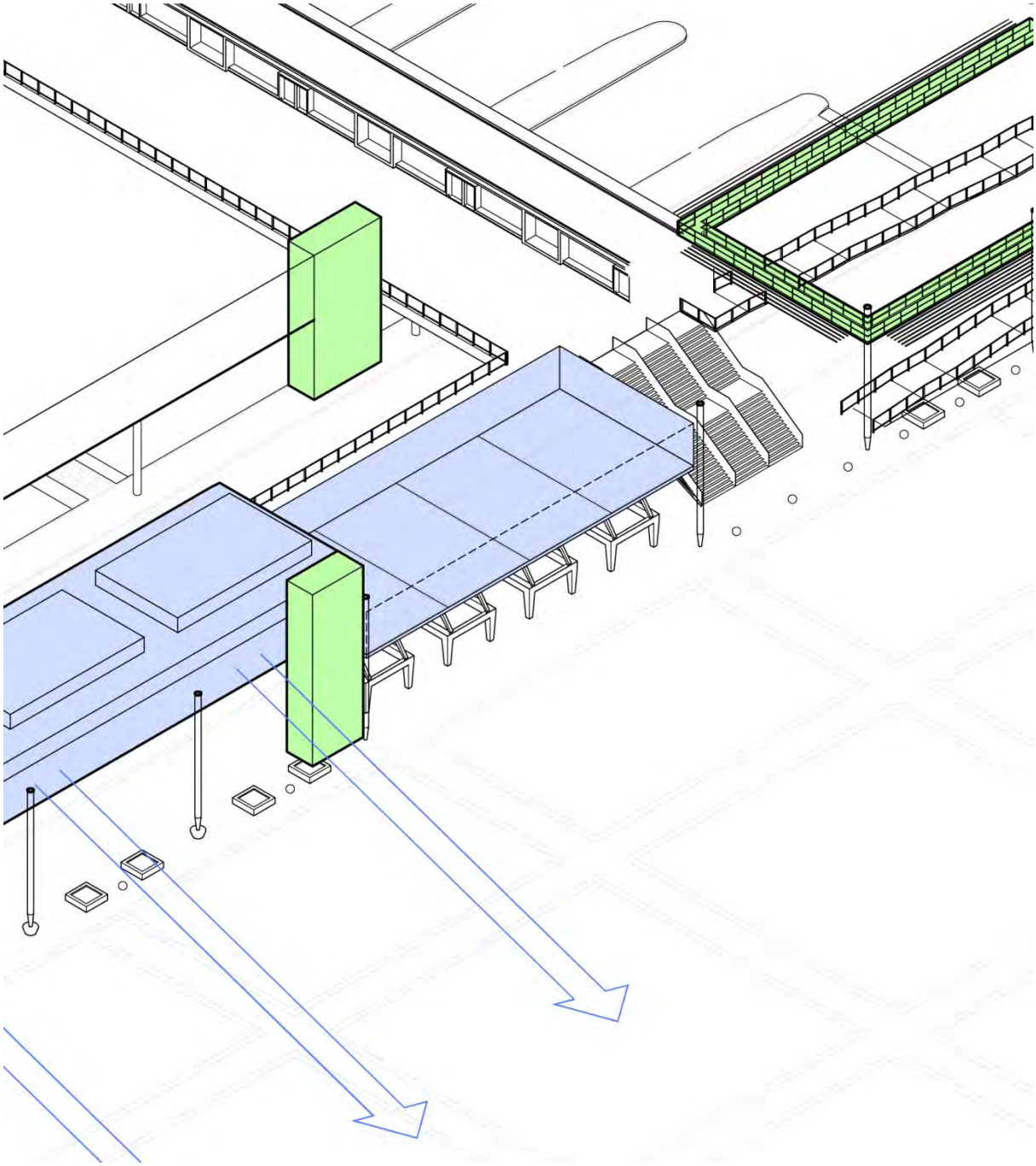

Figure 59
Integrated relationship - platforms and fly over combine to create a safe raised outdoor play space for the aftercare, as well as liberating the ground floor.

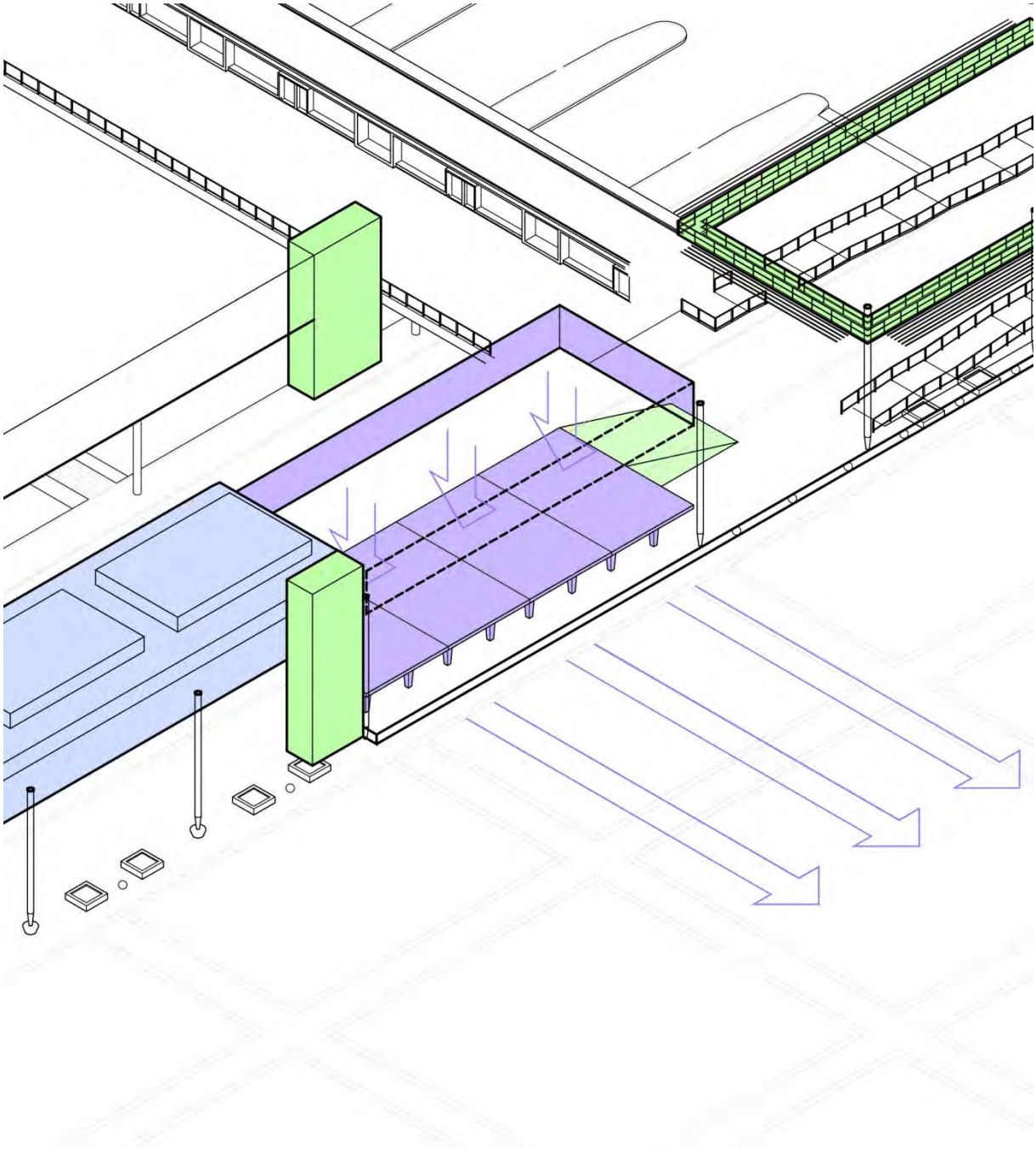

Figure 60
Integrated relationship - platforms and fly over separate to create a stage and lighting rig above.

However the movement of these platforms are capable of discernable relationships through horizontal movements into the Grand Parade itself. These movements are discernable as they have a immediate effect through creating new space within the Grand Parade, while allowing the overall narratives of The Everyday and Festival to still function. It is through these movements that lie somewhere between the discernable and integrated that unique decisions can be made, allowing for deviations within the two programmatic narratives of the architecture.

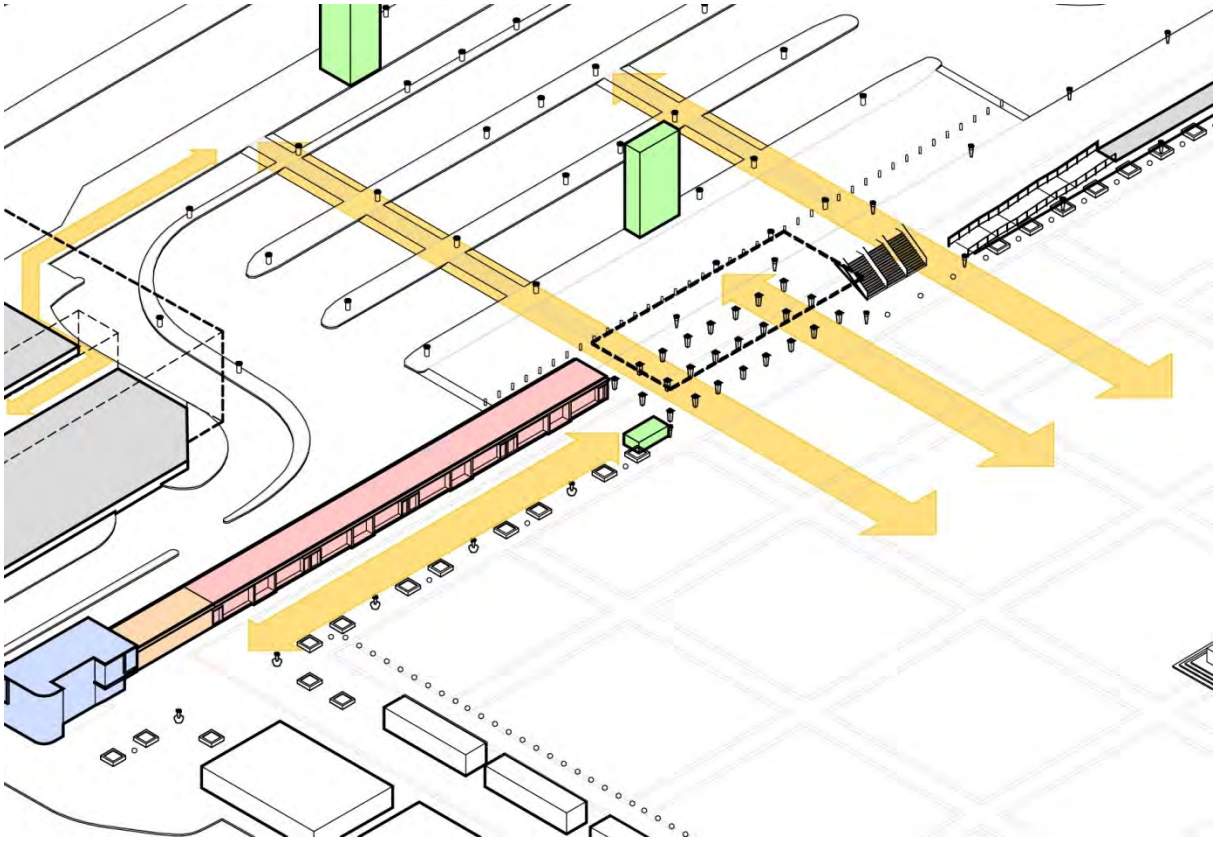

Figure 61
The Everyday narrative.

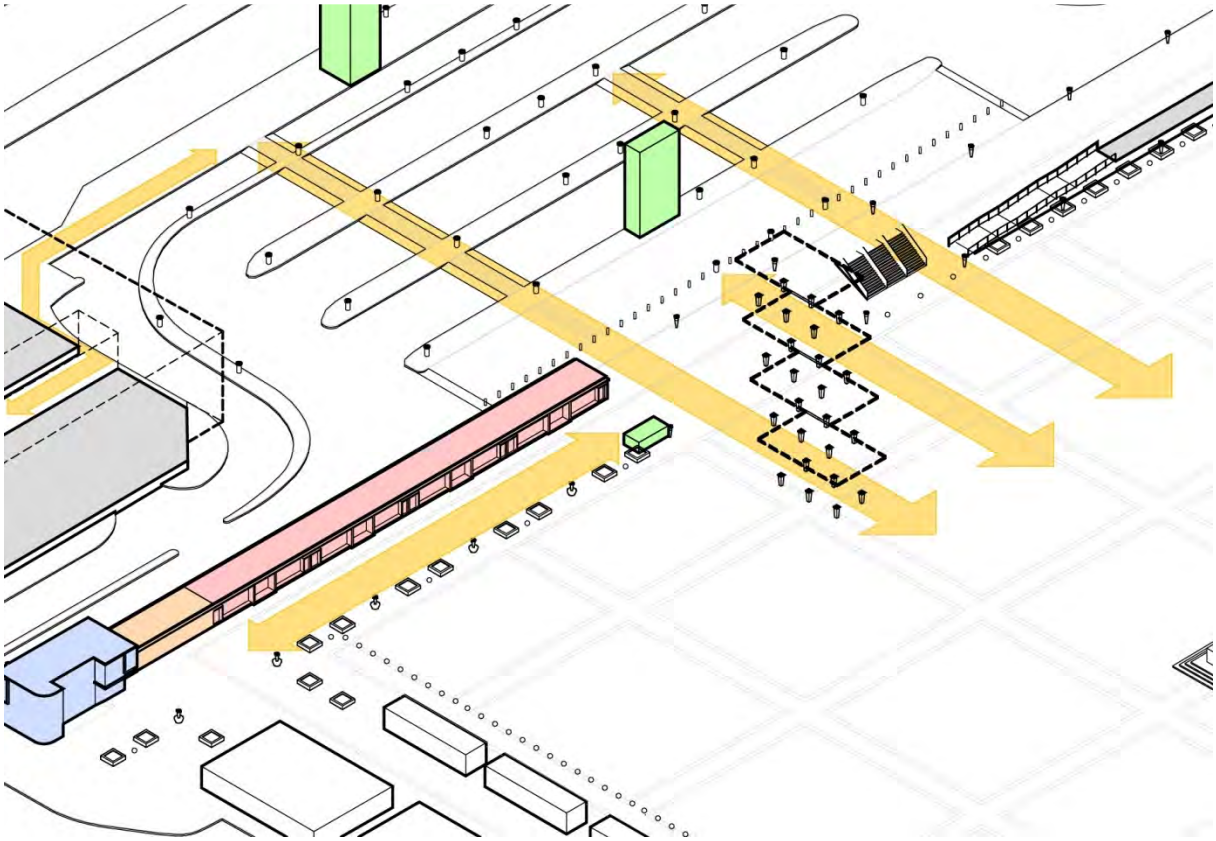

Figure 62
The Everyday narrative - weekend market.

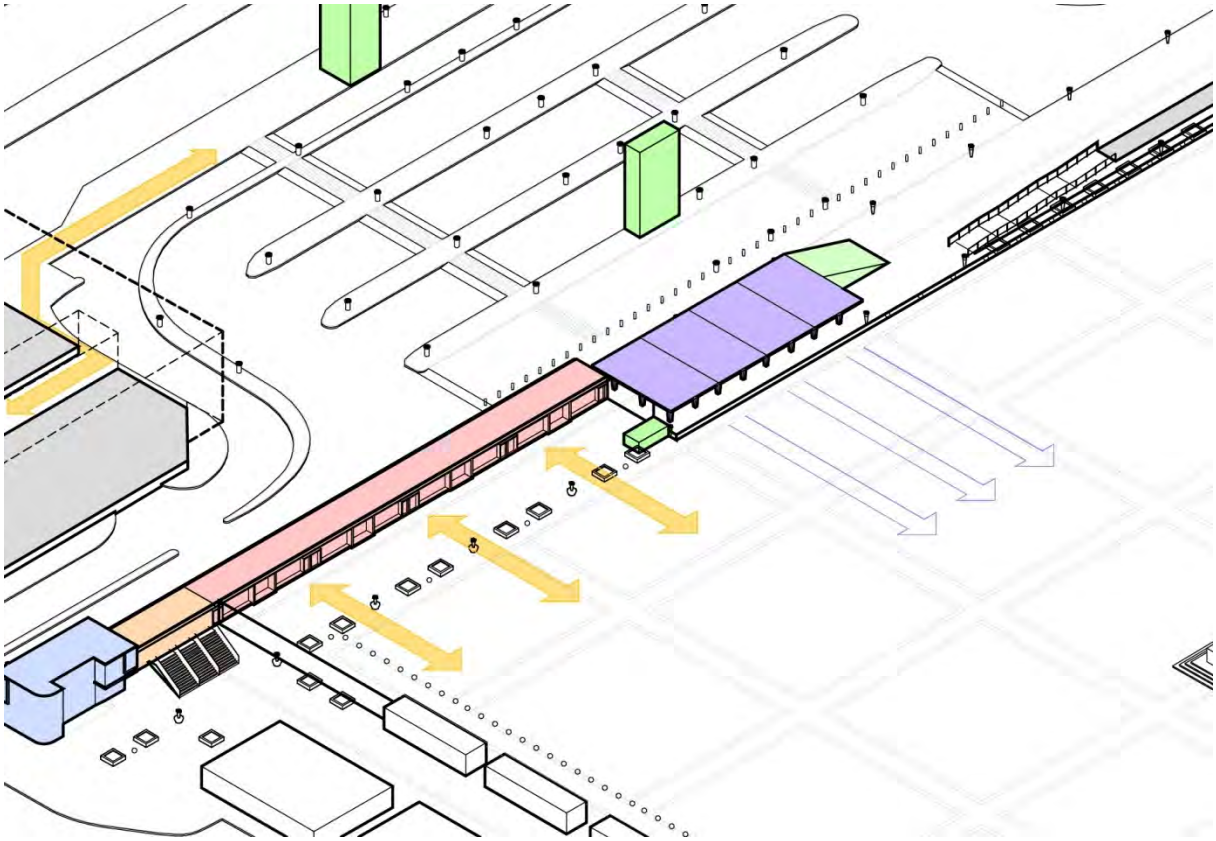

Figure 63
The Festival narrative.

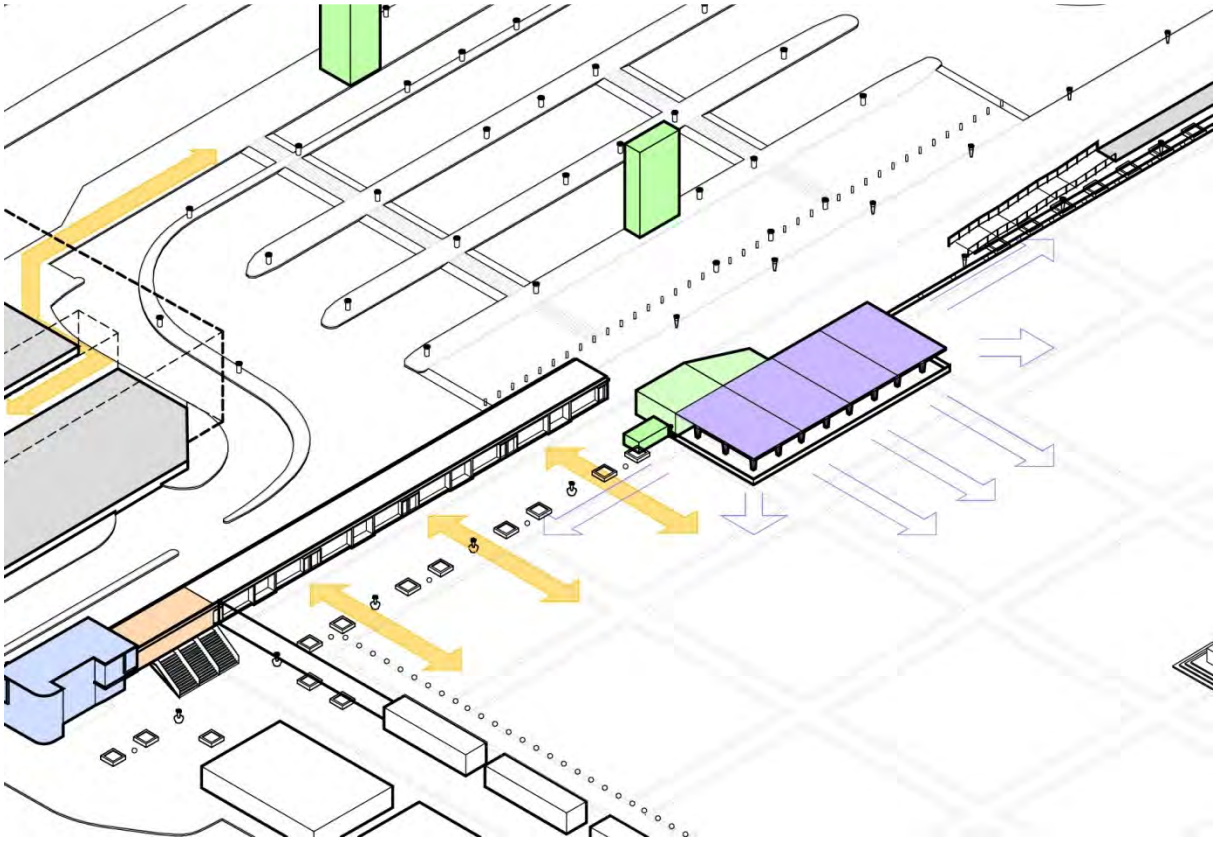

Figure 64
The Festival narrative - thrust stage.

Conclusion

The goal of creating a building that functions through movement can go one of two ways. The first outcome would be that of a superficial product where a building is designed to move just for the sake of movement, meaning function and movement are not integrally linked. In this case I consider the act of movement to fall outside of architectural intents and could be likened to that of decoration. The second outcome would be that of a building whose function is inherent to its movement. In this case, should there be no interaction with the building, and thus no movement, the architecture would be considered 'useless'.

I consider game design to be an excellent tool when designing movement into a piece of architecture. The process of analysing a building through game design challenges the design decisions in the context of the design brief itself, questioning whether these decisions are in fact integral (meaningful) to the functions with regard to social and programmatic rules concerned.

I think the prospect of creating an architecture of movement holds promising opportunities for the future. The idea that a single piece of architecture can contain multiple outcomes through physically changing, creating and erasing space means that it, as well as the public space it has a direct effect on, has the potential to create a product with 'multiple replay' value. Just imagine a building you could visit multiple times only to have completely unique spatial and programmatic experience each time you did so. Perhaps this type of architecture we need to adapt to the constantly changing requirements of the present and capture the public's imagination.

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Figure 26	Luke Emery, University of Cape Town, Masters of Architecture (Professional), 2014
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Figure 35	Michel Chéron, <http://static.panoramio.com/photos/large/35837834.jpg>, viewed on 04 September 2014
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Figure 38	Laura Sandt, <http://mslk.com/wp-content/uploads/2009/08/mslk-tour-the-high-line-rail-bench.jpg>, viewed on 07 September 2014

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ACTION & REACTION

developing an architecture of movement

This dissertation deals with the phenomenon of movement and architecture. What does it entail to create an architecture of movement, and what possibilities can this type of design offer us outside of 'conventional' architecture.

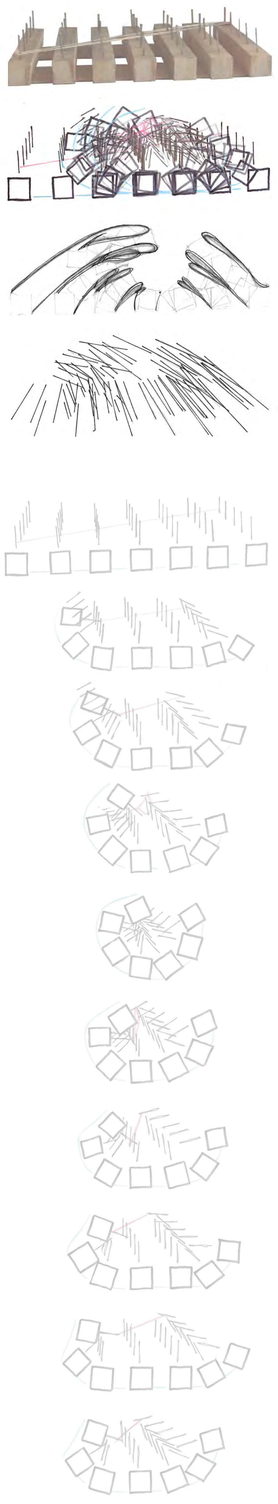
The design is located on the Grand Parade in Cape Town and aims to create an architecture of multiple outcomes including the 'Everyday' and 'Festival' narratives. Switching between these narratives requires users to initiate movement within the architecture in order to reconfigure space to programmatic needs and personal configurations.

Movement is achieved through three primary means within the architecture. The first includes a series of four platforms capable of both vertical and horizontal movement. During the 'Everyday' they serve as a raised outdoor playing platform accompanying an aftercare, while in the 'Festival' narrative they are lowered to create a stage that speaks to the Grand Parade.

The second form of movement entails a series of hoists which raise and lower various panels and rigging equipment. These either create an enclosed boundary for the raised play platform, or create a fly tower with light rigging overhead the stage.

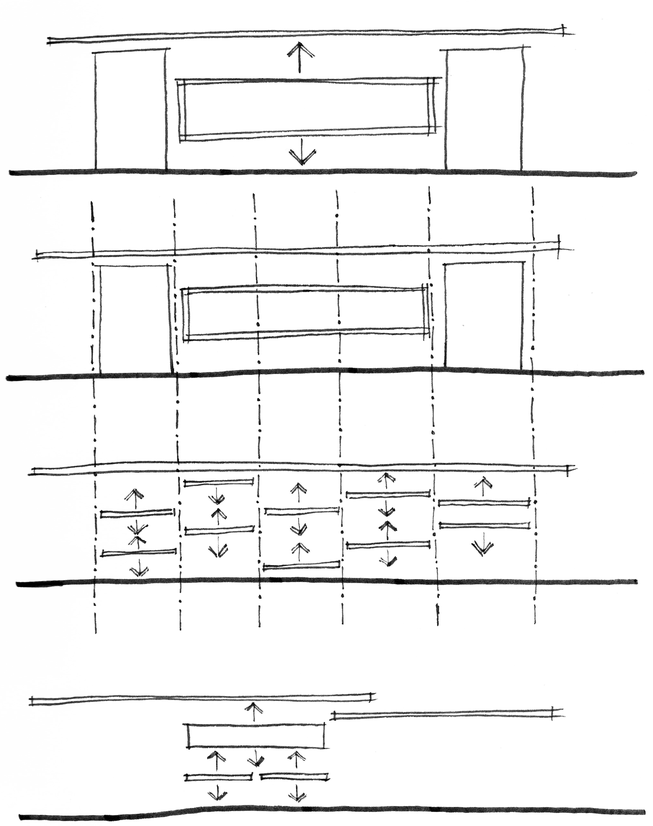
The last form of movement is through a set of public stairs capable of horizontal movement. During the 'Everyday' the stairs serve to *direct* route from the station deck directly down onto the Grand Parade, while in the 'Festival' narrative they *divert* route around the back of the festival area.

Luke Emery
M.Arch 2014



'Artefact in Movement'

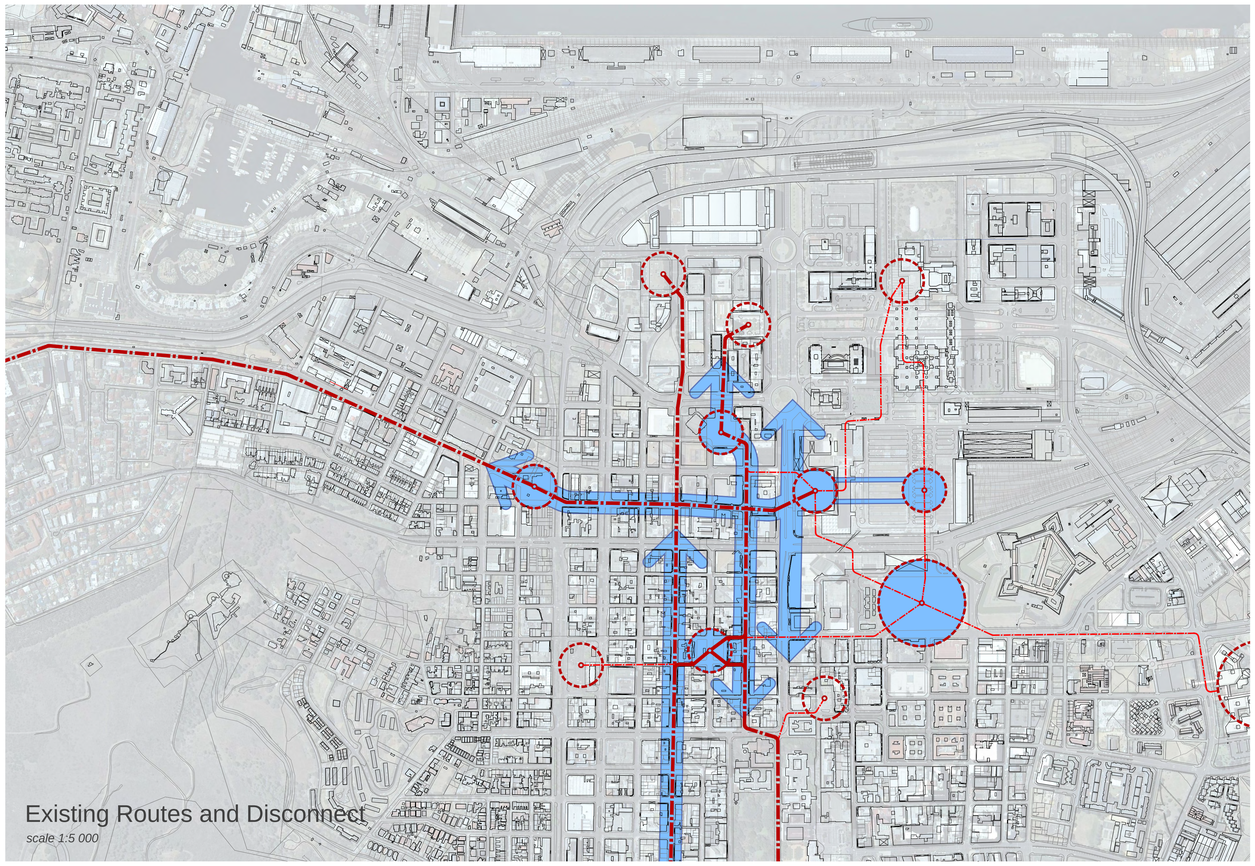
sketch design:
an architecture of multiple outcomes



concept & design development

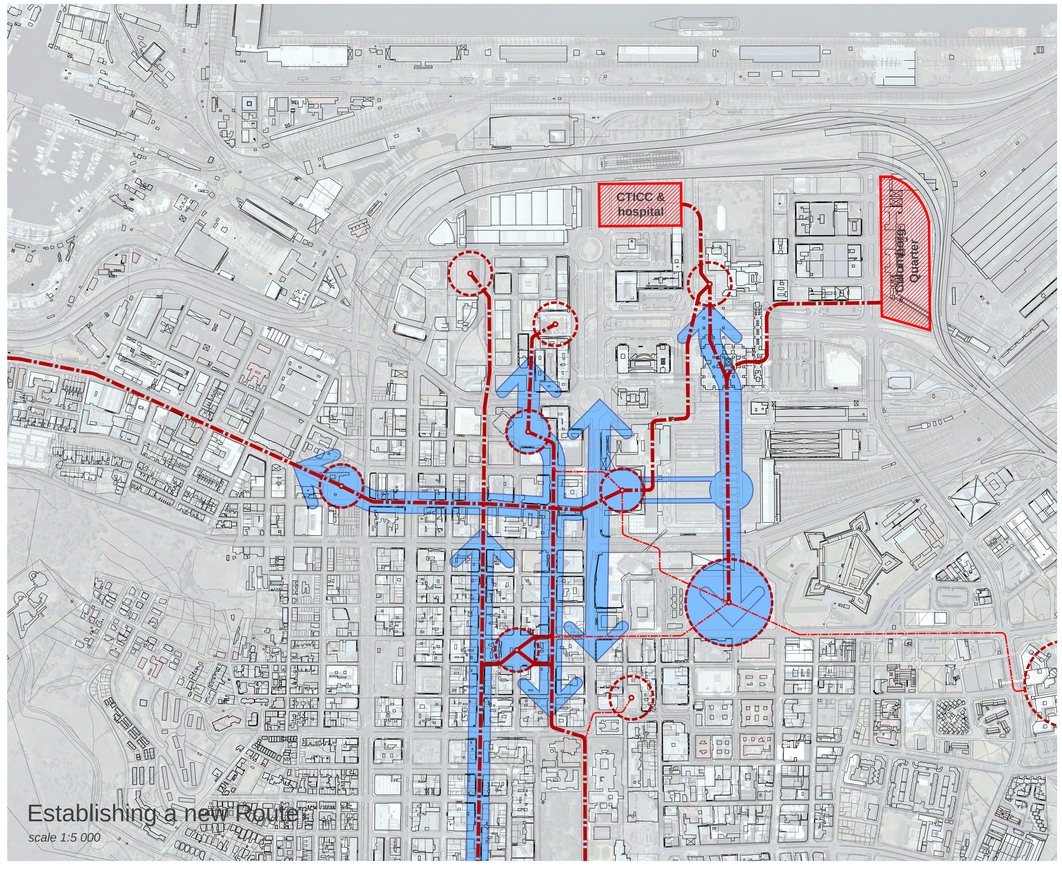
Context - Framework - Architecture

MAPPING



Existing Routes and Disconnect

scale 1:5 000



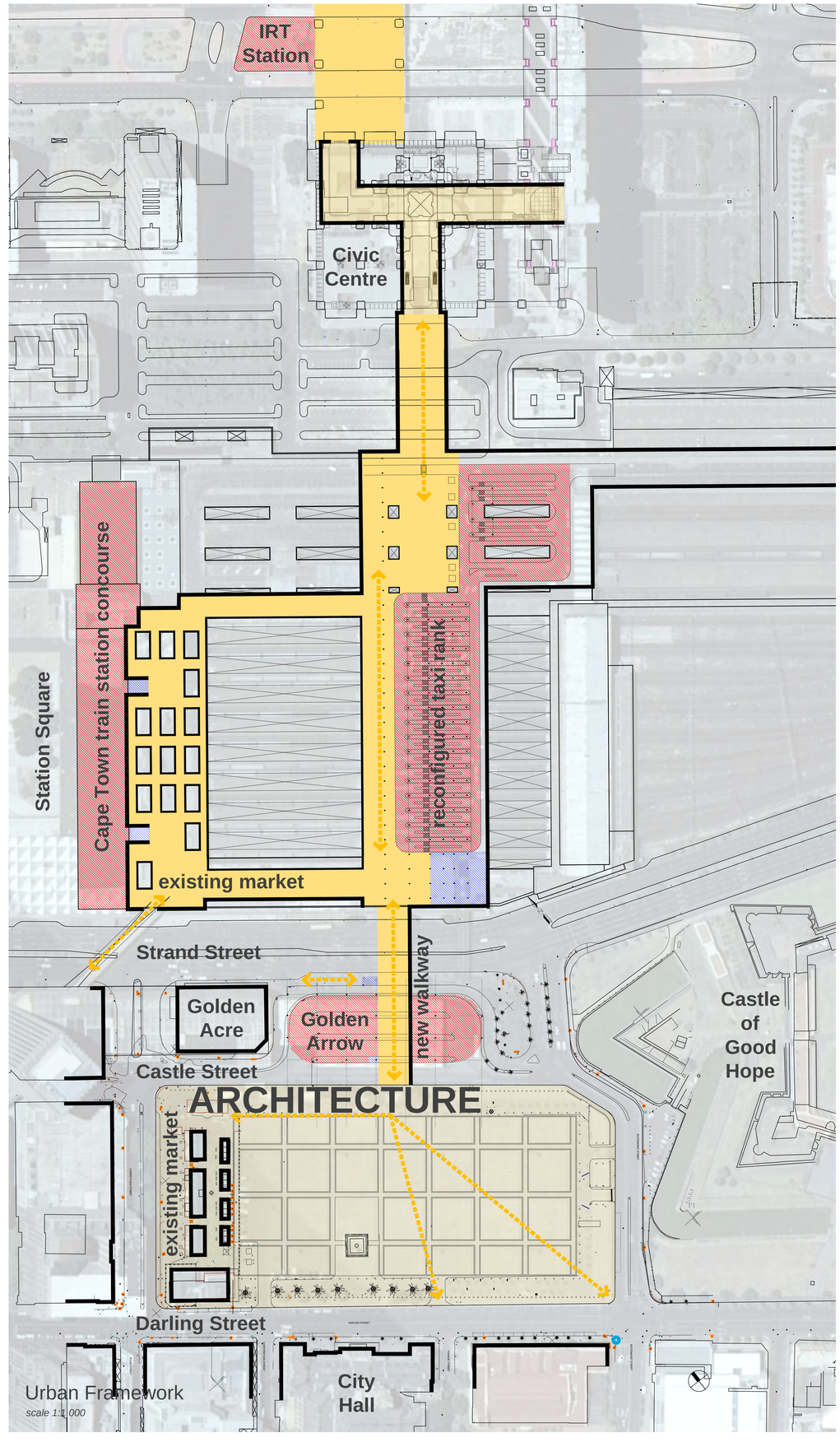
Establishing a new Routes

scale 1:5 000

FRAMEWORK

KEY

- public space deck level
- public space ground level
- transport infrastructure
- service space / vertical circulation
- pedestrian route

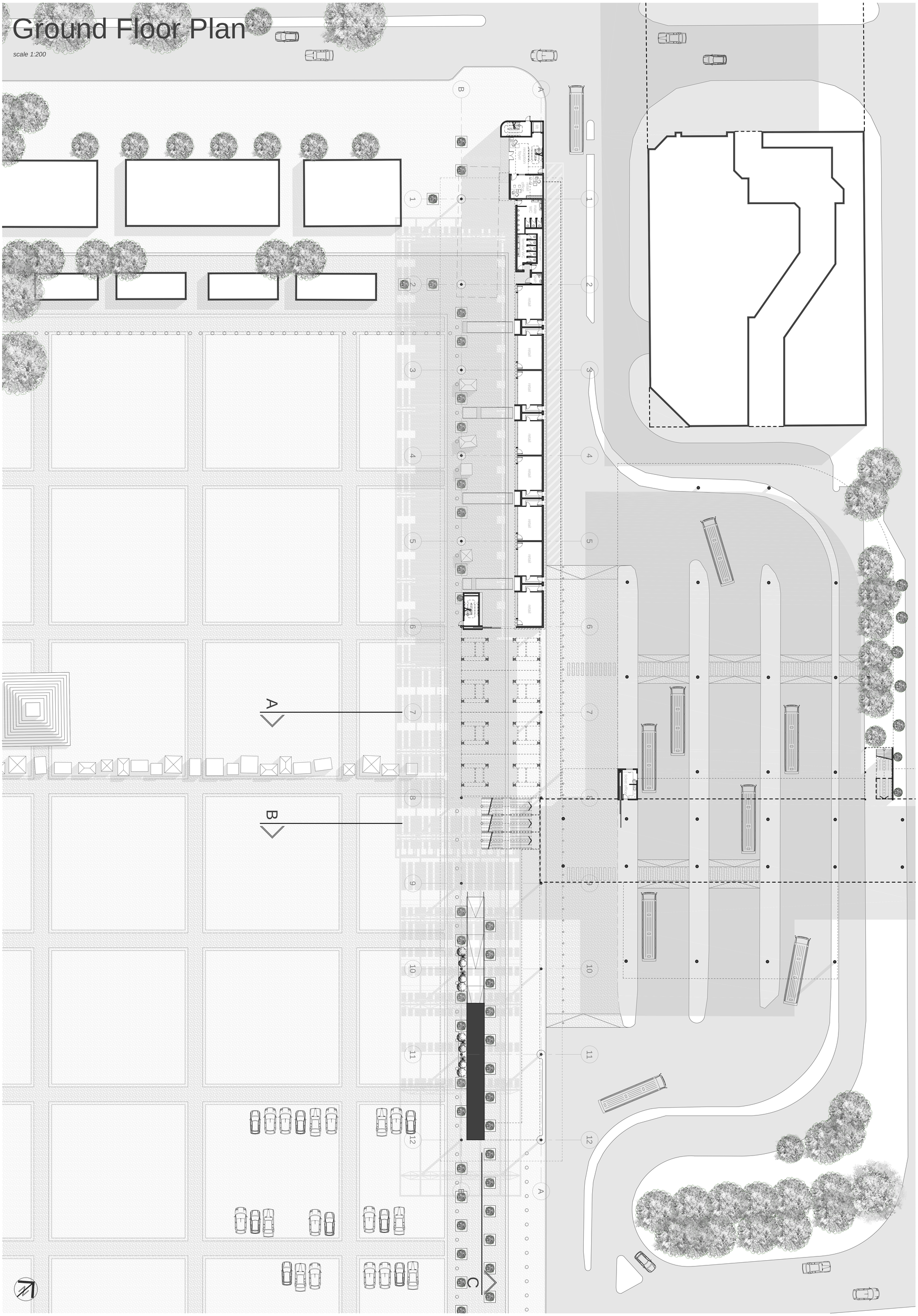


Urban Framework

scale 1:1 000

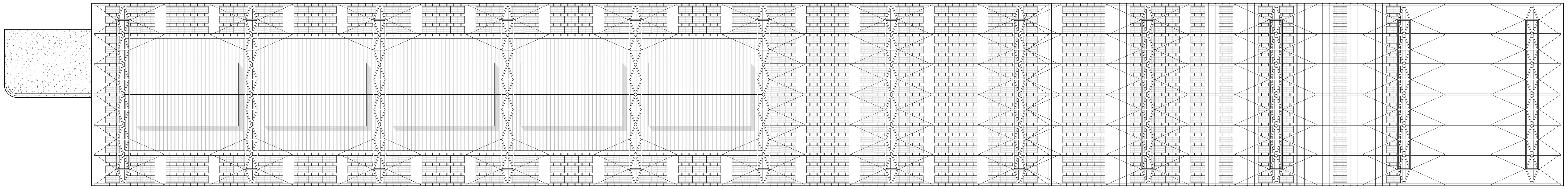
Ground Floor Plan

scale 1:200



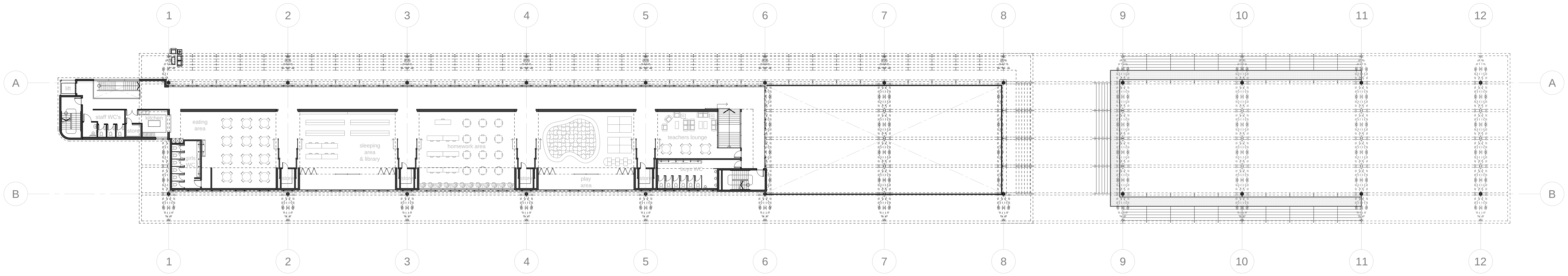
Roof Plan

scale 1:200



2nd Floor Plan

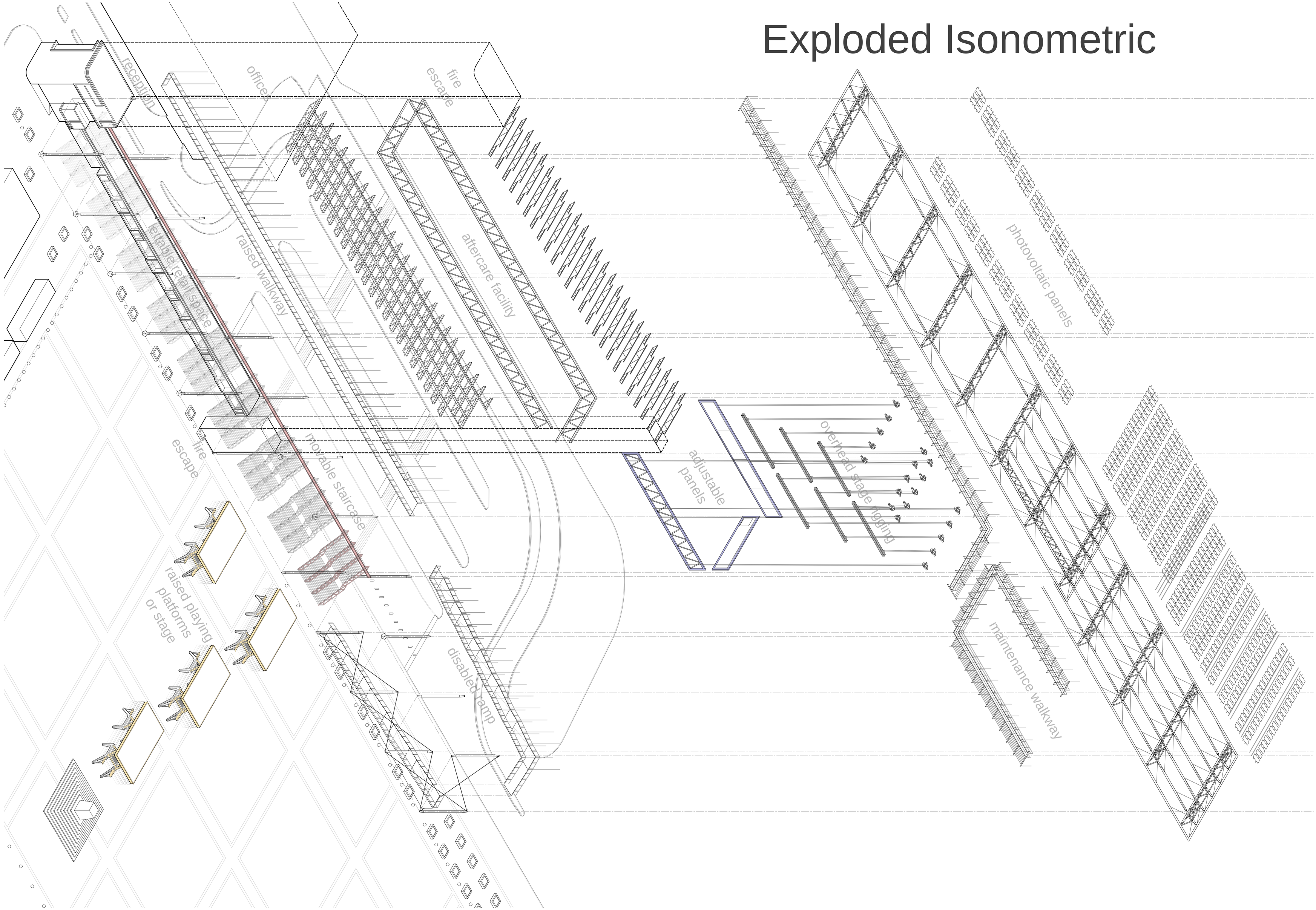
scale 1:200

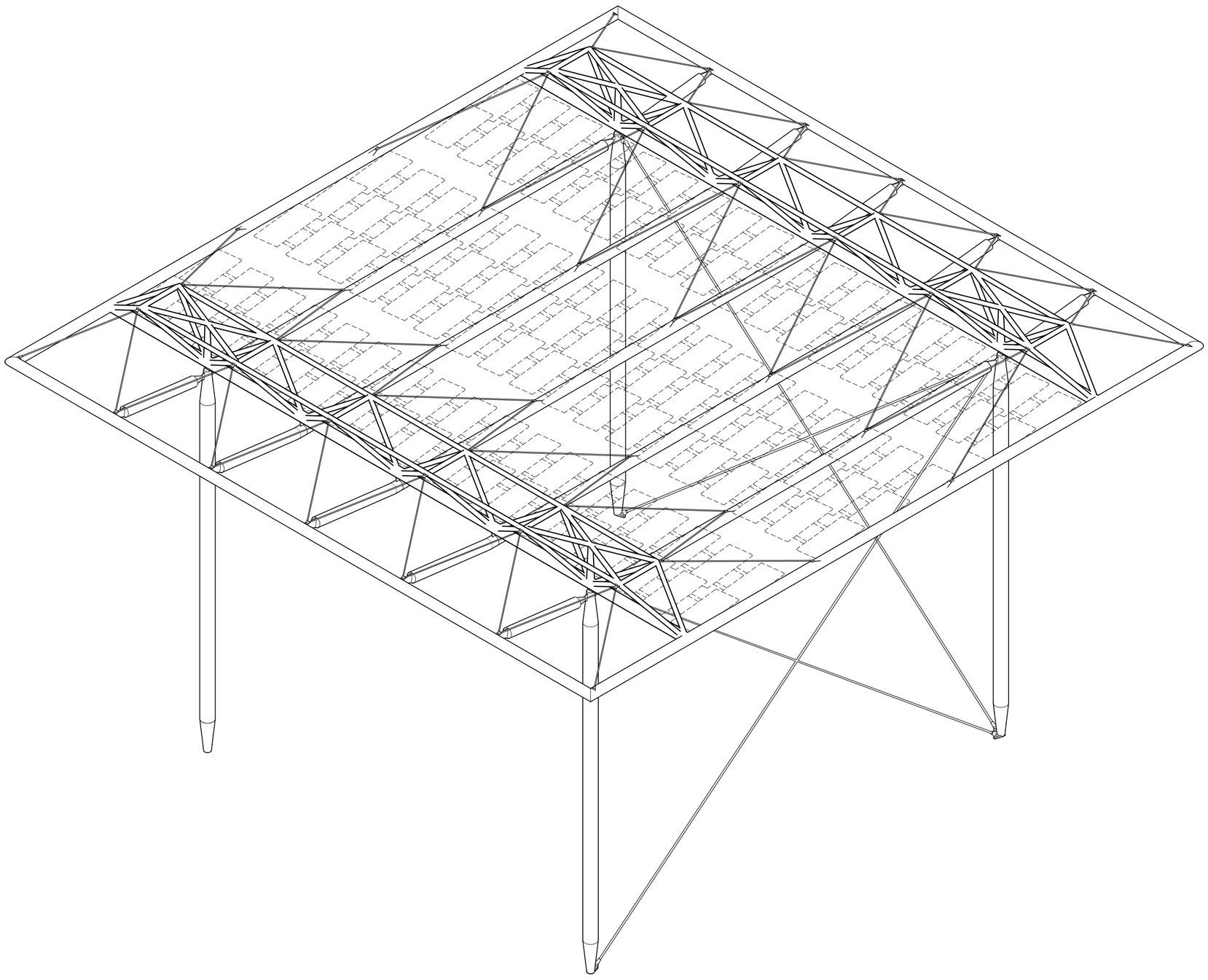


1st Floor Plan

scale 1:200

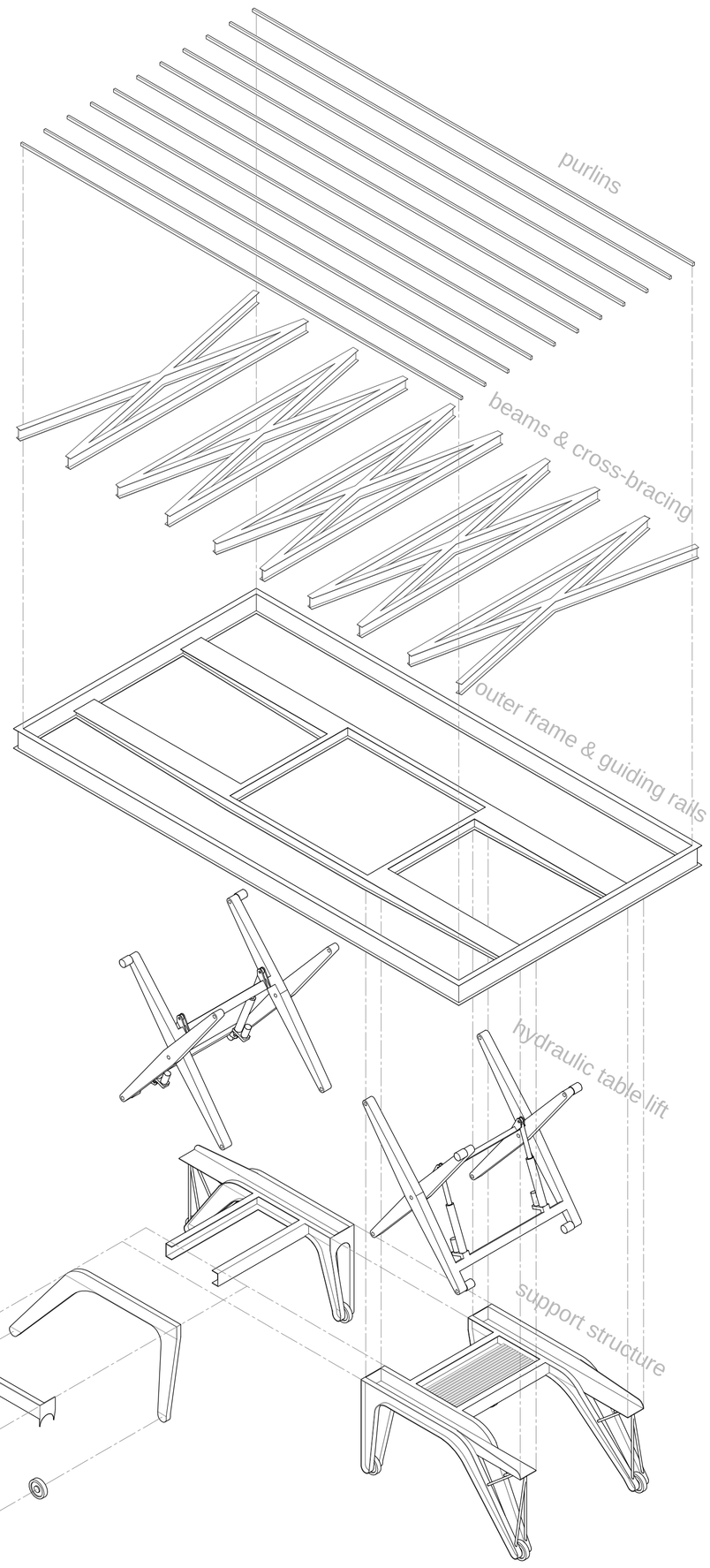
Exploded Isonometric

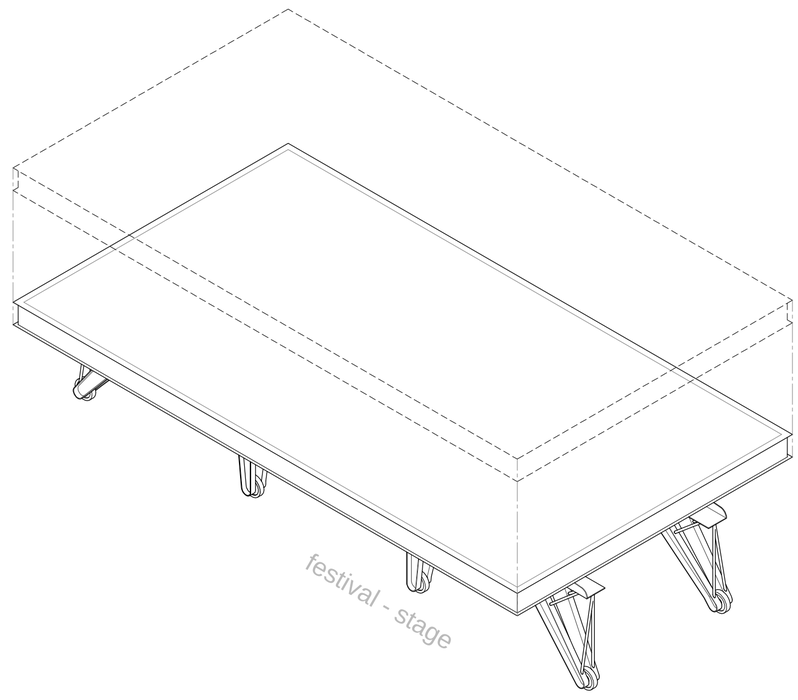


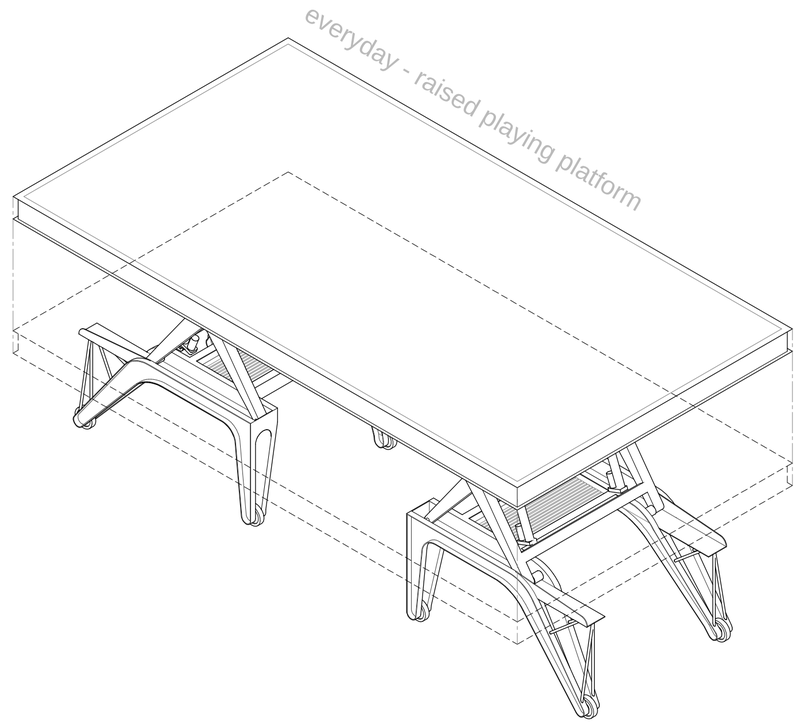


Isonometric: structural bay

scale 1:100







Exploded Isonometric: adjustable platform

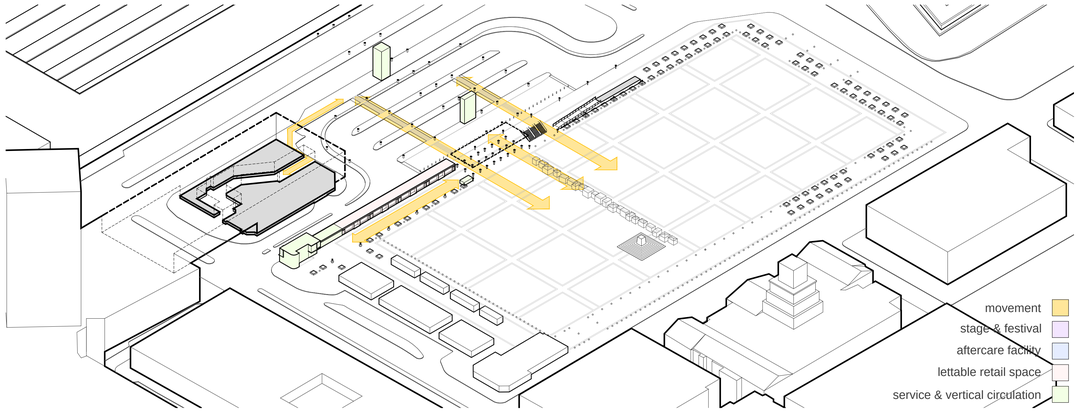
scale 1:100

EVERY DAY

Ground Floor Isonometric

scale 1:1 000

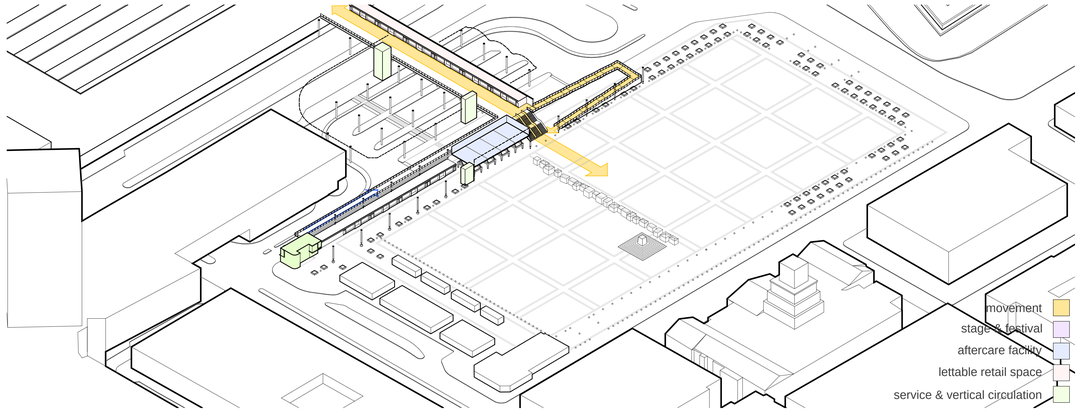
Permeability
Freedom

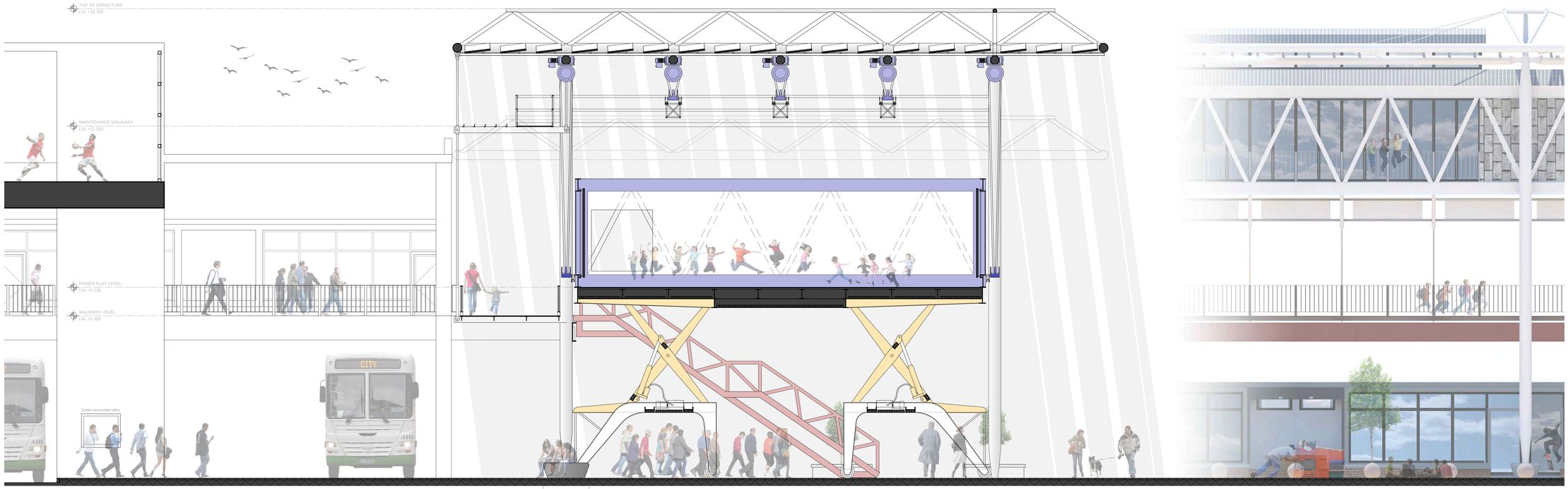


First Floor Isonometric

scale 1:1 000

Directing Route
Connecting





A Section A

scale 1:50

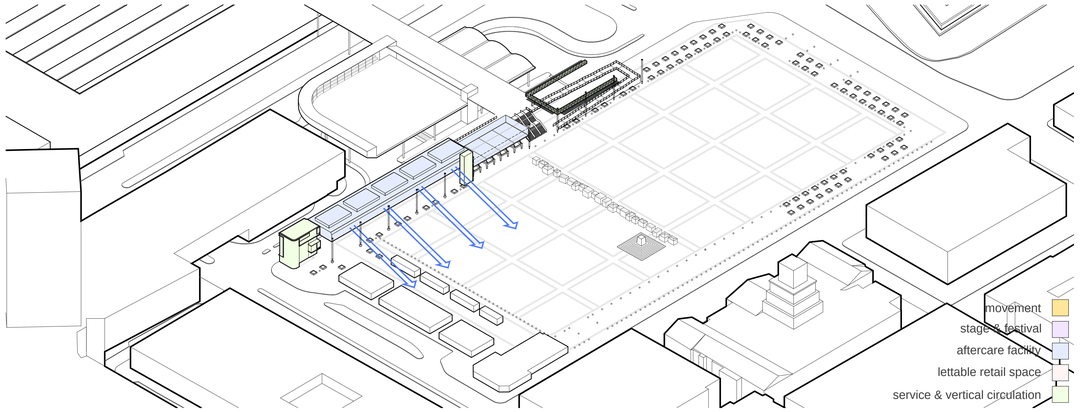
Facade Swatch

scale 1:50

Second Floor Isonometric

scale 1:1 000

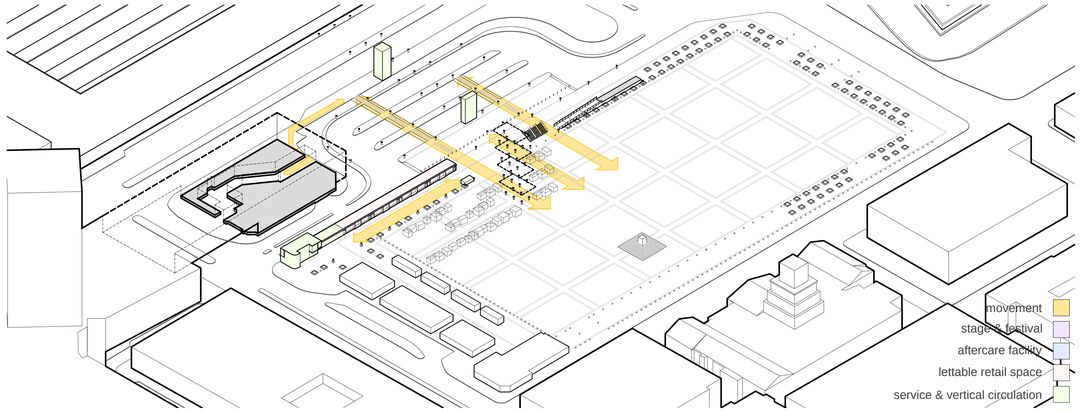
Transparency
Projecting Activity



Ground Floor Isonometric

scale 1:1 000

Everyday
The Weekend Market



Perspective

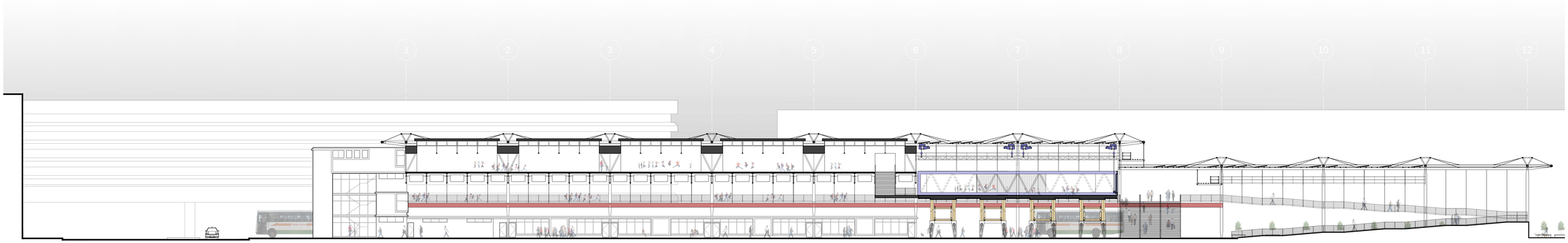
street interface

Perspective

disabled persons ramp

B Section B

scale 1:200



C Section C

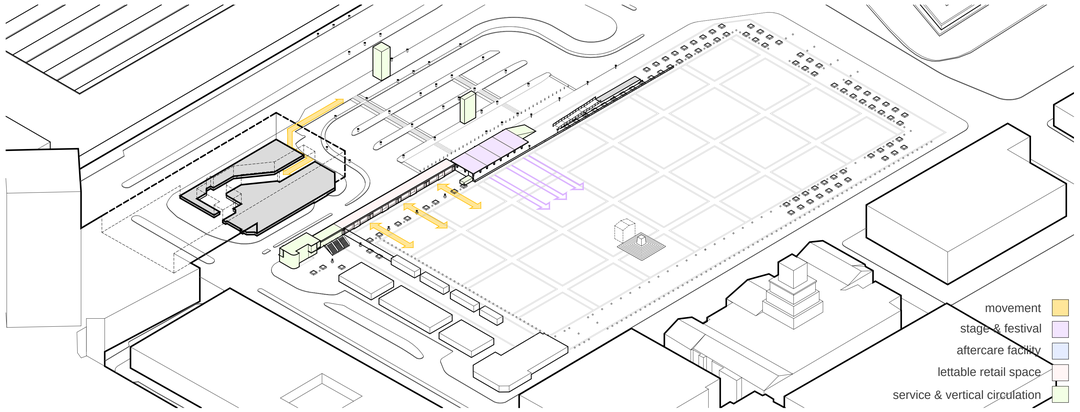
scale 1:200

FESTIVAL

Ground Floor Isonometric

scale 1:1 000

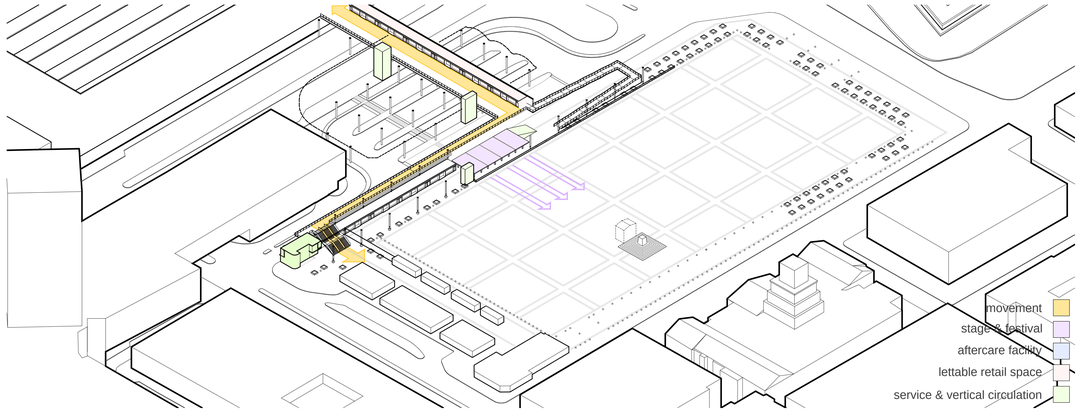
Boundary Rules

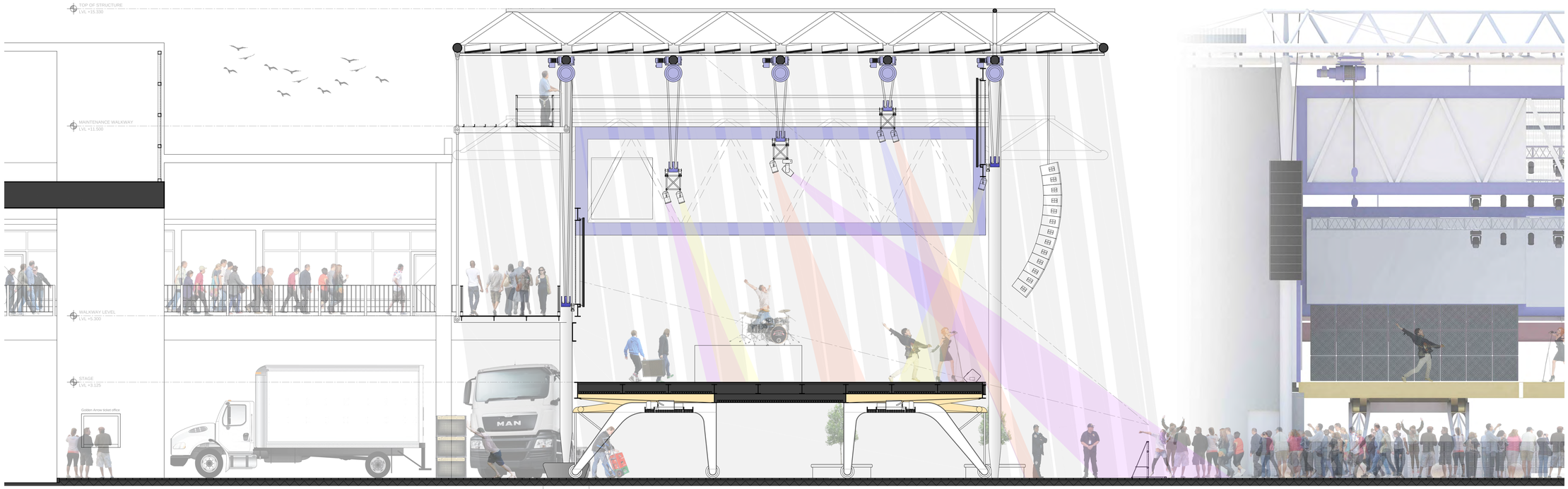


First Floor Isonometric

scale 1:1 000

Diverting Route Segregation





A Section A

scale 1:50

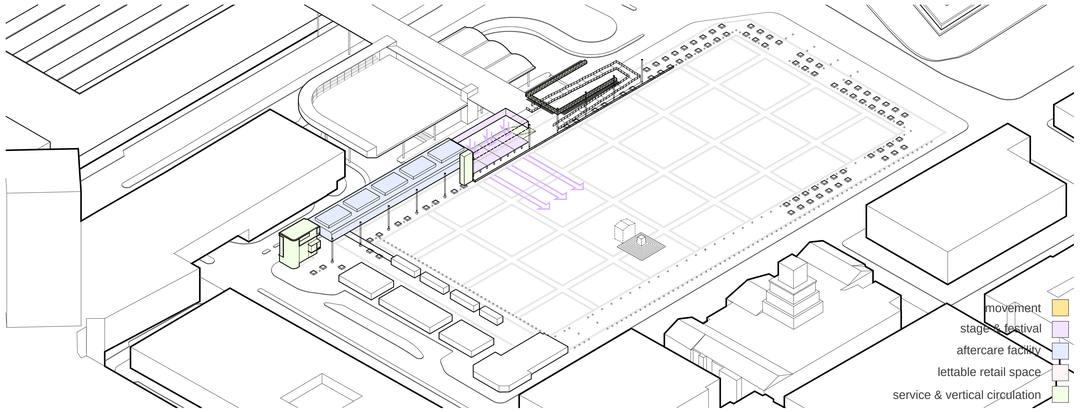
Facade Swatch

scale 1:50

Second Floor Isonometric

scale 1:1 000

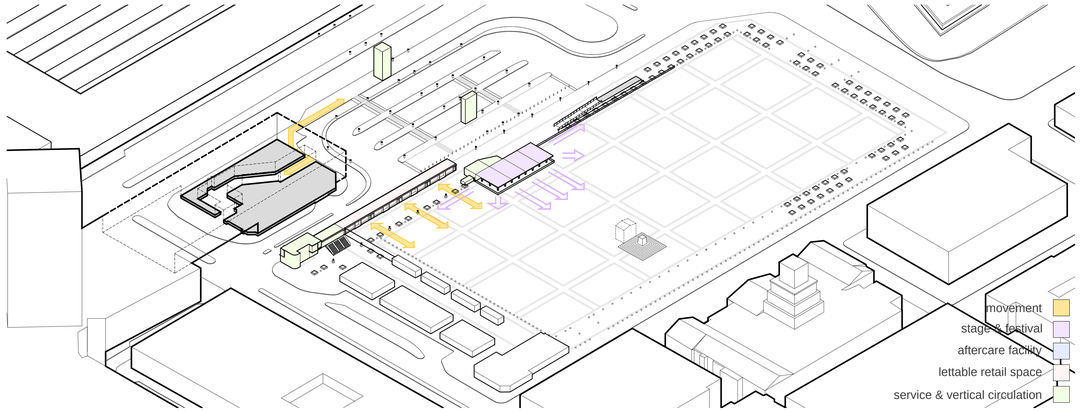
Introversion
Focal point



Ground Floor Isonometric

scale 1:1 000

Festival
Thrust Stage



Perspective

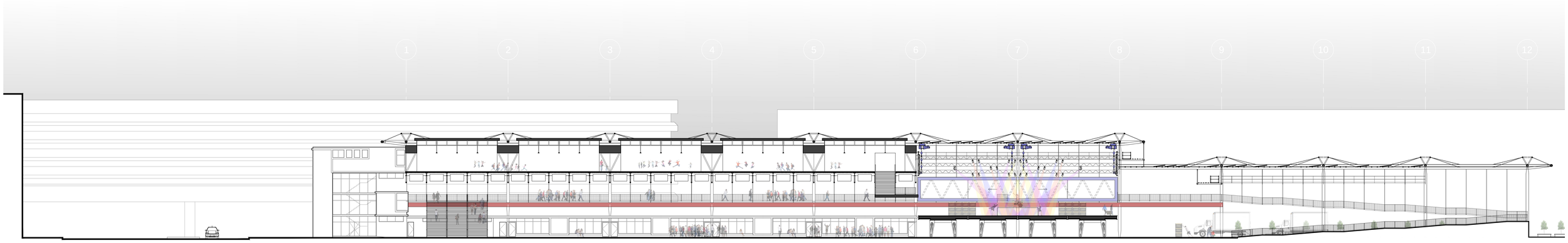
diverting route along Castle street

Perspective

aerial view

B Section B

scale 1:200



C Section C

scale 1:200