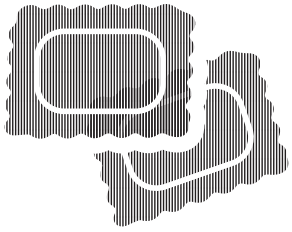
The Vegetarian Restaurant



A Turinese Cookbook

Priscilla Wong

FOREWORD

This design realisation document is a cookbook, of the dishes being served and the spaces within the restaurant. It is an investigation of the relationship between food and architecture: whilst they occupy opposite ends of the scale spectrum, there are a myriad overlaps between the two. There is an importance of the physical process of prototyping and testing; on the scale of facade fragments, and a ravioli parcel. Both products are shaped by a rigorous process of making and remaking.

The intention of the project is to bridge the two, apply an approach towards architecture more conventionally used in food and vice versa. There are incredibly haptic and experiential qualities in cooking and dining that can be applied to architecture, and a certain analytical process that can be applied to food. The document focuses on the experience of food, and the pragmatic requirements and challenges to achieve it.

Turin, and Pietmont, is an important food destination. Over the past few decades, the food climate in the Western world has undergone a myriad of evolutions. In response to a McDonald's opening near the Spanish Steps in Rome, the Slow Food Movement was born in Bra - a few minutes from Turin. The movement aimed to resist the epidemic of fast food culture, and instead celebrate and preserve traditional cuisine and sustainable methods of cooking. Food is a major part in Italian culture, and at times sacrosanct. Within the Porta Pallazzo market, the Antica Tettoia dell'Orologio is dedicated to meat products: stalls upon stalls are adorned with chandeliers of salami and proscuitto. In short, vegetarianism is controversial - and a lifestyle that is deemed offensive to many Turinese locals - evident in the adverse response towards Chiara Appendino's plans for Turin to become the world's first 'vegetarian city'. The project acts as both a political tool and a mediator; it builds upon the existing Italian food culture and architecture.

First and foremost, it is a celebration of food, which so happens to be vegetarian.

Priscilla Wong
The Vegetarian Restaurant
Unit 21 - Year 4 2018

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WINTER MENU

Spinach and Pesto Farinata

A savoury chickpea flat bread topped with spinach and pesto

Butternut Squash & Sage Agnolotti

Pasta pockets filled with creamy butternut squash, with fried sage and butter sauce

Truffle Mushroom Arancini

Mushroom risotto balls coated in breadcrumbs, served with pea puree

Stuffed Artichokes

Baked artichokes filled with parmesan and breadcrumb stuffing

Griddled Chicory with Fig

Griddled chicory and fig served with rocket and drizzled with aged balsamic

Zabaglione with Berries

Light custard served with seasonal berries

SUMMER MENU

Polenta Bruschetta

A crispy polenta base topped with tomato bruschetta

Beetroot and Ricotta Gnocchi

Beetroot gnocchi with wilted beetroot greens and aged balsamic

Asparagus Risotto

Creamy wild asparagus and lemon risotto

Courgette Carpaccio

Sliced courgettes with toasted pine nuts, and rocket, topped with shaved parmesan

Aubergine and Feta Frittata

Baked aubergine frittata served with feta and rocket

Tiramisu

Rich layered desert with coffee, marscapone and Marsala wine

CONTENTS

1.0

BUILDING FORM, SYSTEMS, PLANNING AND CONTEXT

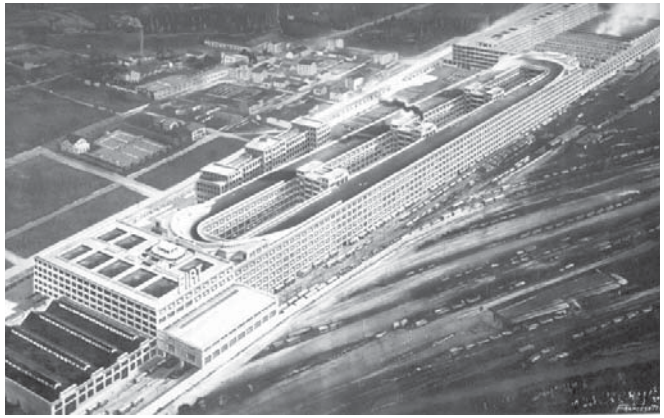
The Restaurant

This section introduces the social, physical and environmental context of the project, and the overall stratgies for the scheme. Due to the sensitive nature of the subject, it is important to highlight the cultural importance of food in Italy, and consequently the implications of the restaurant. The working method of the project is making based, and the series of tests begin with the form finding excercise investigating the extrusion process.

TURIN, ITALY

Turin is a city located in the Pietmont region of Italy, it is an important business and cultural centre. The city is located to the west of the Po river and surrounded by various landforms such as the Susa Valley, the Alpine arch and Superga Hill. Turin is well know for its many art galleries, restaurants, churches, palaces, theatres, libraries, museums and piazzas. Most of its political significance has been lost since World War II; however, it became a major crossroad for industry, commerce and trade along with Milan and Genoa, forming the *Industrial Triangle*. The headquarters of automobile manufacturers such as FIAT, Lancia and Alfa Romeo are located within the city. There is a disparity between the industrial parts of the city and the tourist center. Relics of its industrial past are nestled within the stereotypically Italian classical façades.

The city is famous for its cuisine, and has an innovative approach to gastronomy culture that favours local and sustainable produce. It is home to the Slow Food Movement, an organisation that promotes local food and farming and acts as an alternative to the prevailing fast food culture. The Pietmont region is famous for its cheeses, wines, chocolate, truffles, butter and rice.



TURIN. A VEGETARIAN CITY ?

The current mayor of Turin has plans to make it the world's first 'vegetarian' city: as part of its five year plan are initiatives such as educational projects and the introduction of a weekly meat-free day.

The announcement of this plan has been met, in part, by some hostility: those who feel that the scheme is threatening an important part of the food culture and industry in Turin. Italy has an incredibly rich food culture: one that has been shaped and influenced by history. In that sense, the scheme to promote vegetarian is about taking the existing food culture and celebrating it and adding another layer of ritual to it, and not about replacing it. This concept is applied to the architecture proposal - investigating the existing architectural language and appropriating and adapting it to create a restaurant which celebrates the choreography and culture of food.

M5S MANIFESTO

Despite the adverse economic situation, agriculture is one of the most promising sectors of the Italian economy.

Among the companies led by young people in Italy, more than 8% work, in fact, in agriculture: of these more than 50,000 are driven by under 35. This shows that work in the countryside attracts more and more young people, an interest that is also witnessed by the increase in the number of registrations university courses on the subject.

It is therefore necessary to re-establish the balance and the balance of power within the supply chain between farmers and the processing and distribution industry.

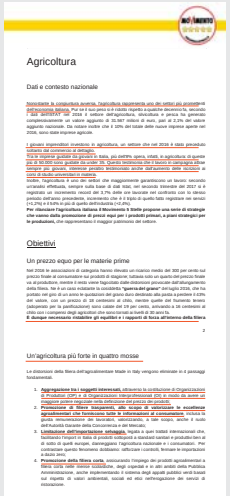
A Stronger Agriculture in Four Steps

1. Aggregation among the subjects involved, through the establishment of Organizations of Producers (OP) and Inter-professional Organizations (OI) in order to have a greater negotiating power in the definition of the price of products

2. Promotion of transparent supply chains, with the aim of enhancing excellence agri-foodstuffs supplying all information to the consumer

3. Restriction of wild importation

4. Promotion of the short supply chain



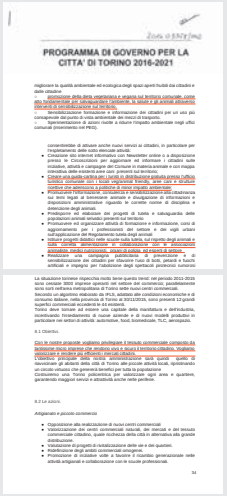
CHIARA APPENDINO'S MANIFESTO

Promotion of the vegetarian and vegan diet on the municipal territory, such as fundamental act to safeguard the environment, health and animals through actions on the territory.

Create a guide for tourists in free distribution at the office municipal tourism with local veg / animal friendly, dog areas and facilities that adhere to policies with a lower environmental impact

Establish educational projects in schools on protection, respect for animals and on proper nutrition in collaboration with animal rights activists, medical nutritionists, police bodies and industry experts

Turin must return to being a capital of manufacturing and industry, encouraging the establishment of new companies and new production models in particular in the sectors of activity: automotive, food, biomedical, TLC, aerospace.



FOOD IN TURIN

The city is famous for its cuisine, and has an innovative approach to gastronomy culture that favours local and sustainable produce. It is home to the Slow Food Movement, an organisation that promotes local food and farming and acts as an alternative to the prevailing fast food culture, industrial food production and globalisation. The Pietmont region is famous for its cheeses, wines, chocolate, truffles, butter and rice. Meat is also an incredibly important part of Italian food culture, where it is incorporated into most meal times.

Slow Food began in Italy with the founding of its forerunner organisation, Arcigola, in 1986 to resist the opening of a McDonald's near the Spanish Steps in Rome. In 1989, the founding manifesto of the international Slow Food movement was signed in Paris, France by delegates from 15 countries.

SLOW FOOD MANIFESTO

Born and nurtured under the sign of Industrialization, this century first invented the machine and then modelled its lifestyle after it. Speed became our shackles. We fell prey to the same virus: 'the fast life' that fractures our customs and assails us even in our own homes, forcing us to ingest "fast- food".

Homo sapiens must regain wisdom and liberate itself from the 'velocity' that is propelling it on the road to extinction. Let us defend ourselves against the universal madness of 'the fast life' with tranquil material pleasure.

Against those - or, rather, the vast majority - who confuse efficiency with frenzy, we propose the vaccine of an adequate portion of sensual gourmandise pleasures, to be taken with slow and prolonged enjoyment.

Appropriately, we will start in the kitchen, with Slow Food. To escape the tediousness of "fast-food", let us rediscover the rich varieties and aromas of local cuisines.

In the name of productivity, the 'fast life' has changed our lifestyle and now threatens our environment and our land (and city) scapes. Slow Food is the alternative, the avant-garde's riposte. Real culture is here to be found. First of all, we can begin by cultivating taste, rather than impoverishing it, by stimulating progress, by encouraging international exchange programs, by endorsing worthwhile projects, by advocating historical food culture and by defending old-fashioned food traditions.

Slow Food assures us of a better quality lifestyle. With a snail purposely chosen as its patron and symbol, it is an idea and a way of life that needs much sure but steady support.

Slow Food®

A SHORT HISTORY

1986 Slow Food is created in Italy after a demonstration on the intended site of a McDonald's at the Spanish Steps in Rome.

1989 The international Slow Food movement is officially founded in Paris and the Slow Food Manifesto is signed.

1990 First Slow Food International Congress is held in Venice. The first Osterie d'Italia guide is published, marking the founding of Slow Food Editore.

1996 Slow Food holds the first Salone del Gusto in Turin, where it presents the Ark of Tasteproject. The Salone goes on to become a biennial event and one of the most important international fairs dedicated to artisanal, sustainable food and the small-scale producers that safeguard local traditions and high quality products.

2004 The first edition of Terra Madre - the world meeting of food communities – is held concurrently with the Salone del Gusto in Turin, Italy, attracting about 5,000 delegates from 130 countries. The University of Gastronomic Sciences is inaugurated in Pollenzo, Italy, close to the Slow Food headquarters.

2011 The Slow Europe campaign is launched, calling for European policies that promote sustainability, biodiversity protection and support for small-scale farmers.

2012 The Sixth Slow Food International Congress also in Turin, welcomes 650 delegates from 95 countries and ratifies the new guiding policy document The Central Role of Food.

2014 Tenth edition of Salone del Gusto, and ten-year anniversary of the Terra Madre network in Turin, Italy. The BBC Food Programme participated as media partner of the Ark of Taste project, the main theme of the event.

2016 The first ever edition of Terra Madre Salone del Gusto held out in the open, from September 22-26, in Turin, Italy, including a series of conferences at the Carignano Theater. Over half a million people attended.

Eataly Torino

Slow Food Festival: Salone del Gusto in Turin

Meat market in Mercato Porta Pallazzo, Turin

FOOD TYPOLOGIES IN ITALY

RISTORANTE

Ristorante signifies the full-service dining establishment. A ristorante will have an extensive menu with antipasti, primi, secondi, contorni, and dolci.

TRATTORIA

Trattorie closely resemble a ristorante in their size and style of service, they offer a more extensive menu of rustic and traditional foods, but unlike ristoranti, trattorie are typically family run and specialise in home-cooked food

PANINOTECA

Paninotecas are very similar to other establishments such as pasticcerias, but they specifically deal in fresh baked bread and artisanal grains.

PASTICCERIA

In Italian pasticceria is a type of cafe that produces and serves sweet and savoury pastries, brioches, croissants and the like.

BAR

An Italian bar has no age restrictions and is similar to what many would consider a coffee shop, although in most of these establishments you can order some bottom shelf liquors, a beer, or a glass of wine. The biggest source of income for an Italian bar is the coffee that they serve.

TAVOLA CALDA

A tavola calda, or "hot table", is less of a type of eatery, and more of an additional piece of cooking equipment at a small food place. A bar with a tavola calda will offer everything a regular Italian bar offers, but also have a small selection of pre-prepared hot dishes

PANINARO

Paninaro is a sandwich food truck lined with open windows displaying a large selection of items.

ROSTICCERIA

A rosticceria is generally considered a deli that specialises in roasted and slice-able meats.

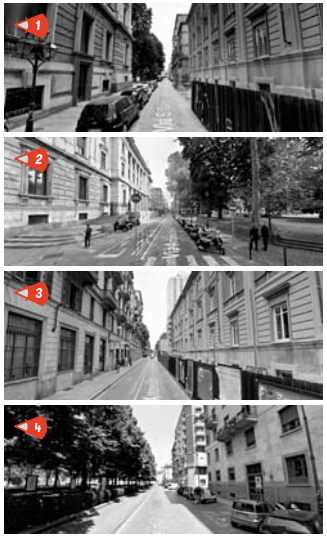
SITE LOCATION

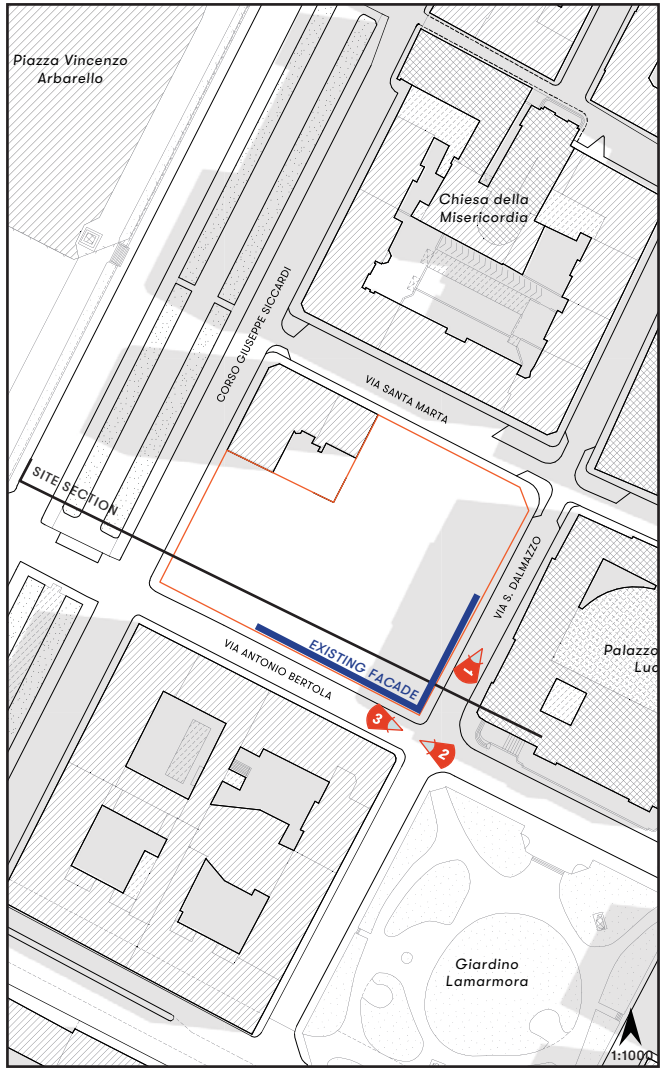
The site is located in the city centre of Turin and houses an existing facade. I started by looking at the idea of a 'recipe for a restaurant', and began by investigating the facade. The initial concept model looks at ways in which the facade could be re-appropriated, how gaps can create vistas into the restaurant and the processes within it in a theatrical way and how creating movement within it can play with the potential and function of a facade. Different parts can unfold and rotate according to mealtime rituals, creating a constant re-appropriation of spaces: for example, on street level part of the facade folds down to create a bar at which people can have their morning coffee and pastry and the entire facade folds down to create an 'Italian' piazza within.

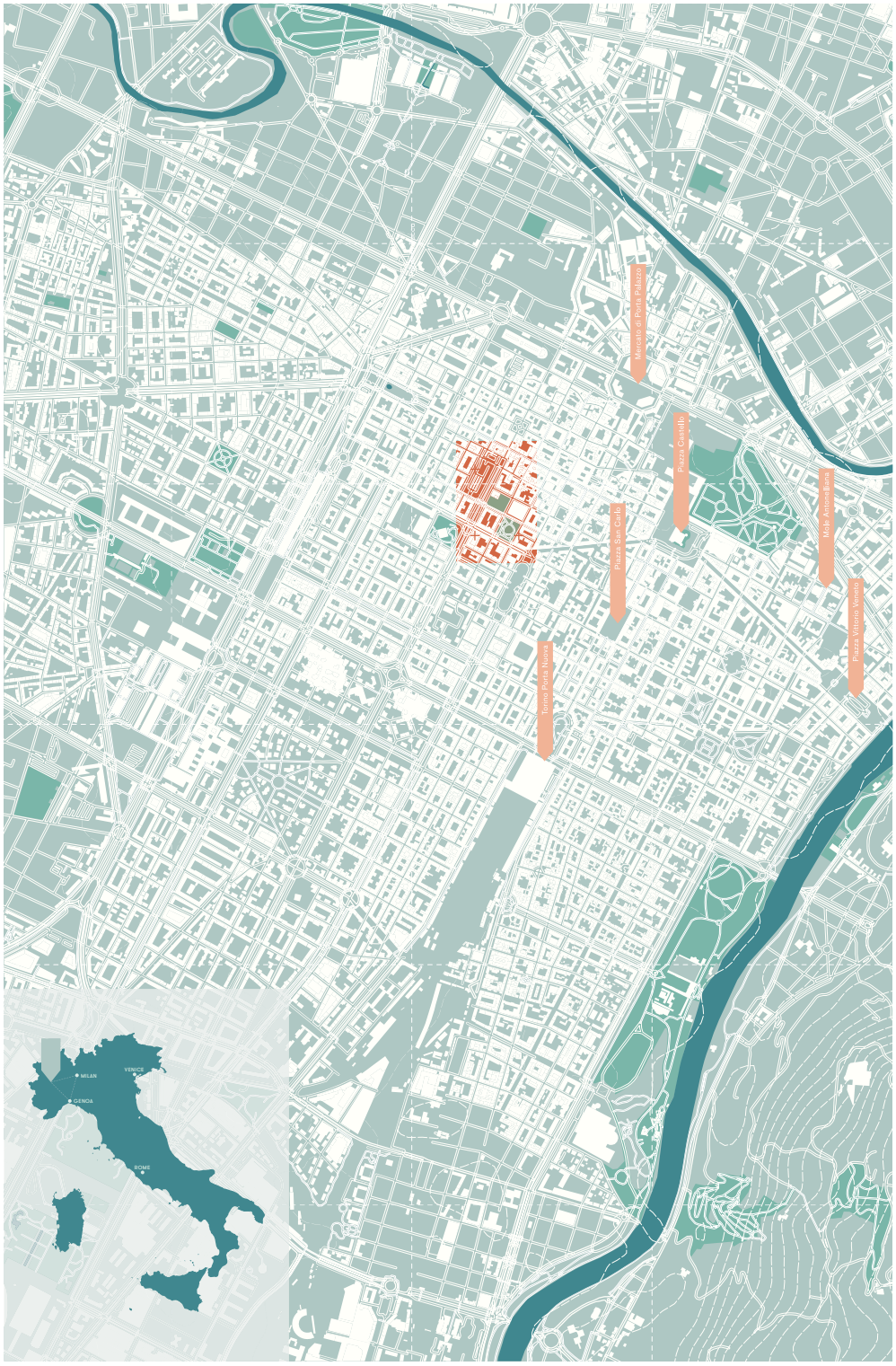
The site is nestled amongst the tourist centre of the city, but behind the man routes of thoroughfare - thus offering a more tranquil atmosphere. Around the site are small restaurants and convenience stores on ground level with residential above, as well as an events venue to the east of the site. Adjacent to the south corner of the site is a park. On the site, there is a retained facade. Its aesthetic is similar to that of its surroundings, but it has been refurbished and is of no historical significance. The neighbouring buildings have much more patina than the retained facade, an indication that it is not a historical facade.

Therefore, the facade will be demolished for the project. However, its form will be resonated within the building in more subtle ways. It is a means of avoiding a facadism approach when utilising the facade, but taking its Classical proportions and elements to integrate its memory into the project.

The buildings facing onto the site vary between 20m - 25m tall, with the residential building on the corner of the site standing at 30m. The buildings in its immediate vicinity seldom exceed 25m; an important point to consider when designing the building.



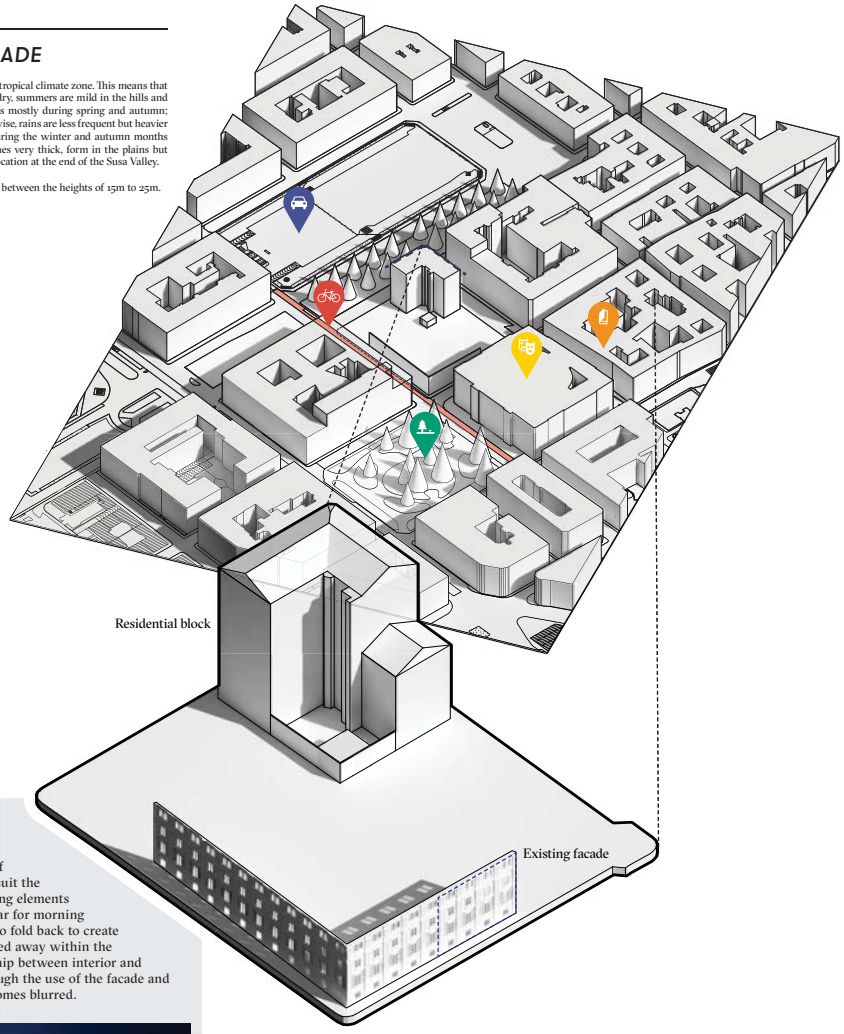




EXISTING FACADE

Turin is located in the humid subtropical climate zone. This means that winters are moderately cold but dry, summers are mild in the hills and quite hot in the plains. Rain falls mostly during spring and autumn; during the hottest months, otherwise, rains are less frequent but heavier (thunderstorms are frequent). During the winter and autumn months banks of fog, which are sometimes very thick, form in the plains but rarely on the city because of its location at the end of the Susa Valley.

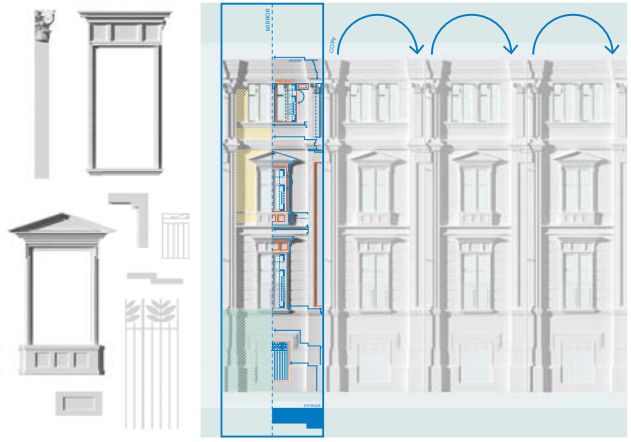
The buildings facing the site vary between the heights of 15m to 25m.



CONCEPT MODEL

Concept model investigating the idea of adapting the facade to suit the meal time rituals. Folding elements in the facade create a bar for morning coffees. Façades can also fold back to create plaza dining areas tucked away within the building. The relationship between interior and exterior is blurred through the use of the facade and the edge condition becomes blurred.

FACADE ANALYSIS



FARM TO FOOD

As part of Chiara Appendino's manifesto for Turin, there is a heavy emphasis on the origins of food and the importance of the agriculture industry. As the food industry becomes more and more globalised, the disparity between food and consumer widens. The wider scheme of the project will involve the farm, which will supply to produce for the restaurant. Whilst the project itself will focus on the design of the restaurant in the centre of Turin. The duality between farm and food is important to the ethos of the project.

The delivery of the produce will be an important part of the scheme, its route from farm to restaurant will become a procession that is celebrated.

The restaurant will be located in the centre of the city and house the main cooking and dining facilities. The farm will, naturally, house the farming facilities as well as educational spaces and potential accommodation for people to learn about the origins of their food.

City of Turin and the locations of the restaurant and farm and the processional route between the two locations

SEASONAL VEGETABLES IN TURIN

The farm will grow seasonal vegetables that are local to the Pietmont region and in its natural climate. The following diagram indicates the harvesting months for specific vegetables in Pietmont. The food served in the restaurant will follow this seasonal cycle.

	Jan	Feb	Mar	Apr	May	Jun	July	Aug	Sept	Oct	Nov	Dec
ARTICHOKE	○	○	○	○	○	○					○	○
ASPARAGUS					○	○						
AUBERGINE							○	○	○	○		
BEETROOT					○	○	○	○	○	○		
CHICORY	○	○	○	○	○	○	○	○	○	○	○	○
COURGETTE				○	○	○	○	○	○			
GARLIC						○	○	○				
ONION							○	○	○			
POTATO							○	○	○			
BUTTERNUT SQUASH									○	○	○	
SHALLOT	○	○	○	○	○					○	○	○
TOMATO					○	○	○	○	○			
MUSHROOMS									○	○	○	

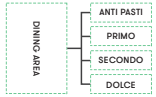
SPATIAL ORGANISATION

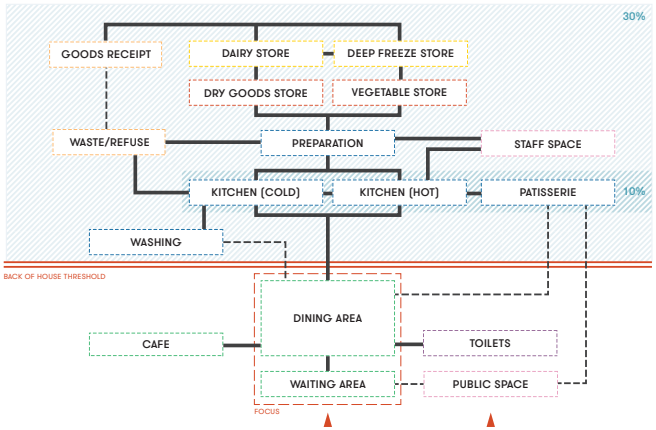
In the arrangement of conventional restaurants, there is a separation between the back of house and front of house functions. As a design decision, these elements will be integrated to better celebrate the choreography of cooking and the food process. This arrangement allows for the process to be seen. Yet, it is still important to create spaces that are still functional in terms of its placement and organisation.

Part of the program is to provide public space: the site itself is surrounded by a number of amenities, which would also benefit from the provision of open public space. It is also a means of playing with the edge condition of the site parameters: disrupting the modularity of the buildings in the city. A sense of the previous building is reflected in the surface texture. Due to the site threshold being punctured with public space, the access into the building is from multiple entrances. Some of the access is shared with the delivery access, disguised as a plaza.

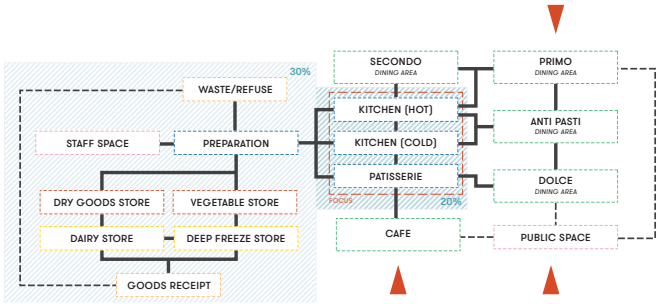
restaurant size/ seats	small (up to 100)	medium (up to 250)	large (> 250)
goods receipts empties waste/refuse office - stores manager	0.06-0.08 0.05-0.07 0.04-0.06	0.05-0.07 0.05-0.07 0.04-0.06 -	0.04-0.06 0.04-0.06 0.03-0.05 0.02-0.03
supplies/waste disposal	0.15-0.21	0.14-0.20	0.13-0.20
pre-cooling room cold meat store dairy products store cold vegetable/fruit store deep-freeze room other cold stores (patisserie/cold meals)	cupboards/ storage surfaces - cupboards/ storage surfaces	0.03-0.04 0.05-0.06 0.03-0.04 - 0.04-0.05 0.03-0.04	0.02-0.04 0.03-0.05 0.02-0.03 0.03-0.05 0.03-0.04 0.02-0.03
chilled goods storage	0.04-0.31	0.21-0.26	0.16-0.21
dry goods/food store vegetable store daily supplies	0.13-0.15 0.08-0.10 0.04-0.06	0.12-0.14 0.06-0.08 0.03-0.04	0.10-0.12 0.04-0.06 0.02-0.03
ambient storage	0.25-0.31	0.21-0.26	0.16-0.21
vegetable preparation meat preparation hot meals cold meals patisserie container washing office - kitchen manager	0.08-0.10 0.06-0.09 0.26-0.33 0.13-0.15 - 0.05-0.08 0.03-0.05	0.05-0.08 0.04-0.07 0.19-0.24 0.09-0.12 - 0.07-0.10 0.04-0.06 0.02-0.03	0.04-0.06 0.03-0.05 0.15-0.21 0.07-0.11 - 0.06-0.09 0.03-0.05 0.02-0.03
kitchen area	0.60-0.80	0.50-0.70	0.40-0.60
dishwasher	0.10-0.12	0.09-0.11	0.08-0.10
servery/waiters' equipment	0.06-0.08	0.08-0.10	0.10-0.15
staff washing facilities and WC	0.40-0.50	0.30-0.40	0.28-0.30
= m² total	1.60-2.10	1.50-2.00	1.30-1.80

Restaurant spatial requirements according to Neufert's Guide



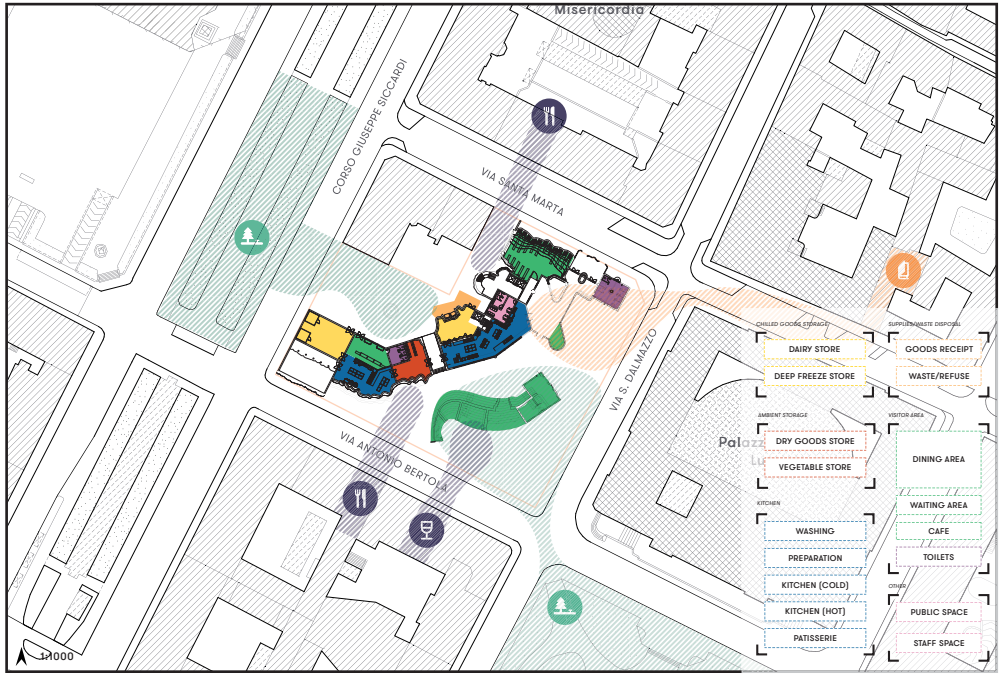


Organogram for a conventional restaurant layout



Organogram showing divided dining area

GROUND FLOOR ORGANISATION



A DAY IN THE LIFE

The day often revolves around meal times, therefore different parts of the building are activated at different times of the day. The Italian meal times tend to be later, with either lunch or dinner being the main focus. Often it is a sit down meal with multiple courses.

FAMILY MEAL

1700-1800

Family meal at a restaurant is when the staff eat together before the dinner service. This is an important part of the restaurant work, as it allows bonding time as well as a chance to test new dishes.

LUNCH AND DINNER

1300-1500 / 2000 - 2200

Either lunch or dinner is the main meal of the day, similar to the rest of Europe. However lunch time in Italy is generally more elaborate, where people will often enjoy a primo and a secondo - if not the full four courses. Since the courses are separated in the building, visitors can choose to enjoy the full experience or only visit one of the spaces.

EVENING

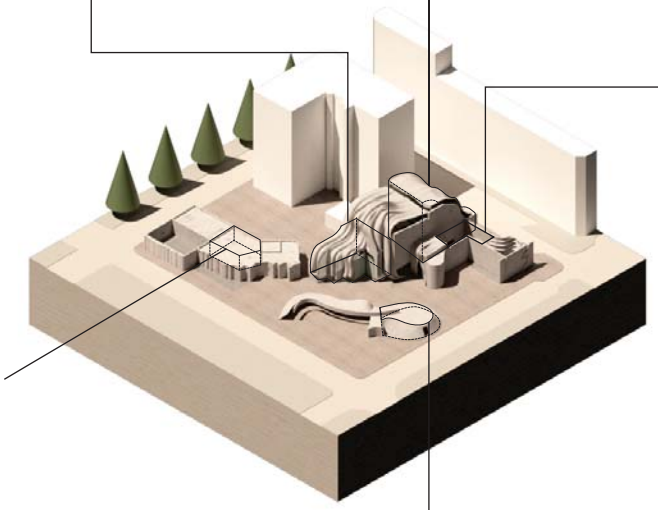
2200 - LATE

The courtyard space and public are will host evening activities, particularly during the warm summer evenings. The bar area will be activated this time of the day.

MORNING

0700-1000

The bakery will open early in the morning to those doing the breakfast run for fresh bread and baked goods



LUNCH

1300-1500

The public area will be particularly busy during lunchtimes where those opting for a lighter lunch can eat paninos on the amphitheatre steps

MORNING

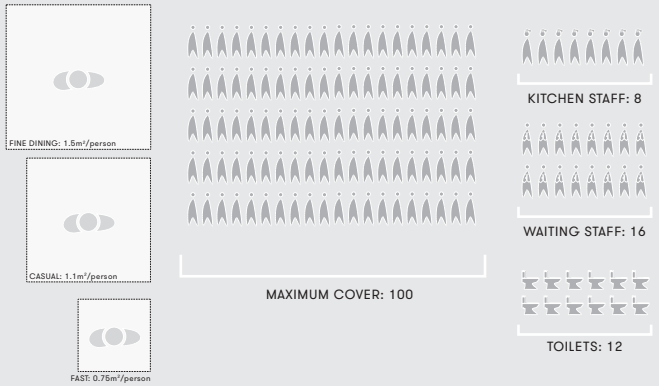
0700 - 1000

The popular choice of breakfast in Turin is a coffee and pastry, often consumed at a coffee bar

SPATIAL REQUIREMENTS

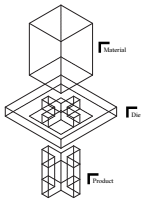
There are ball park figures and minimums regarding the spatial requirements for a restaurant; however, most of the decisions are based off the type of establishment it is and the experiential intentions. The total area of the restaurant building in the project is around 2000m² - which allows for 2m² per person. This is ample and partially due to the amounts of circulation space in between the dining rooms.

For a cover of 100 a minimum of 5 toilets is required; however, there are 12 for the building. This is due to the public space, and providing facilities for that.



EXTRUSION PROCESS

Extrusion is a process in which a material is pushed through a die to create an object. The principle of this process is used in the production of a range of things, such as: pasta, clay bricks and aluminium sections. The process of clay extrusion produces unique forms that are dependent on a number of variables, namely: the extruded medium, the die, and the manipulation of the form as it is extruded. The beauty in the process is in the supposed flaws that are produced as part of the process, cracks, snagging and deformations that are unpredictable to an extent. The initial investigation into this process was driven by an interest in how it could be manipulated and its consequential idiosyncrasies: characteristics that would be deemed defects in the industrial uses of the process.



Principle of the extrusion process

Industrial pasta extrusion

Industrial clay extrusion

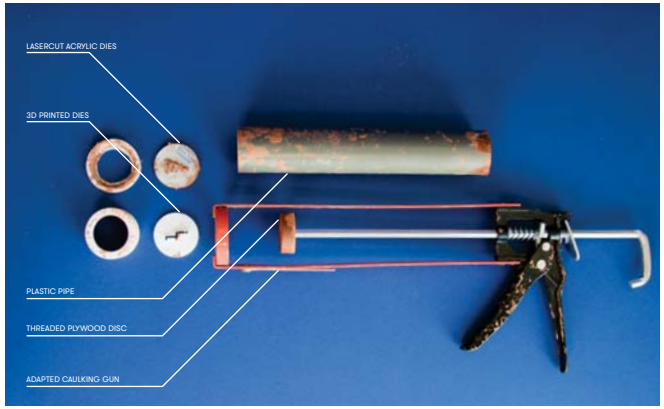
Industrial aluminium extrusion

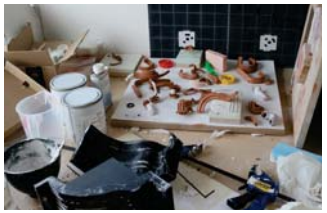
EXTRUDER DEVELOPMENT

In response to the play-doh extruder tests, I wanted to create larger extrusions and have more control over the outcome. Using a caulking gun and adapting it slightly created the force required for extrusion. Initially, lasercut acrylic pieces were used; however, they often cracked under the pressure. I created SLS printed caps and stencils, which also allowed for hollow shapes to be extruded; which created different forms.

Using a more portable form allowed for different types of manipulation as the clay was extruded. I was interested in the way a jig or movement could play with the final form. For example, pushing the clay against a flat surface and extruding in stop/start movements.

There were idiosyncrasies that emerged between the forms - a result of the uniqueness of each extrusion, even with the same die. There is an curious relationship between the process, which used on an industrial scale as a means of mass production of identical objects, and the domestic scale which is evident here. The creases and cracks are celebrations of this process. The forms are scale-less, and can represent any sized element from cutlery to facade or building.

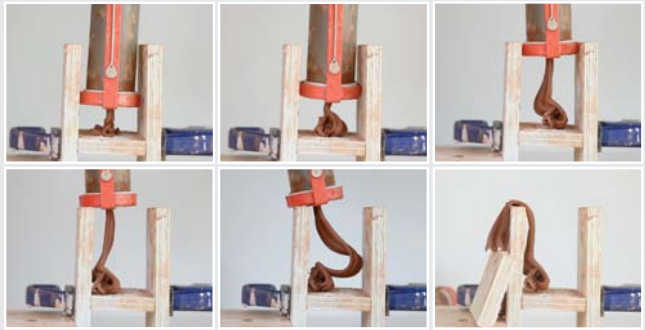


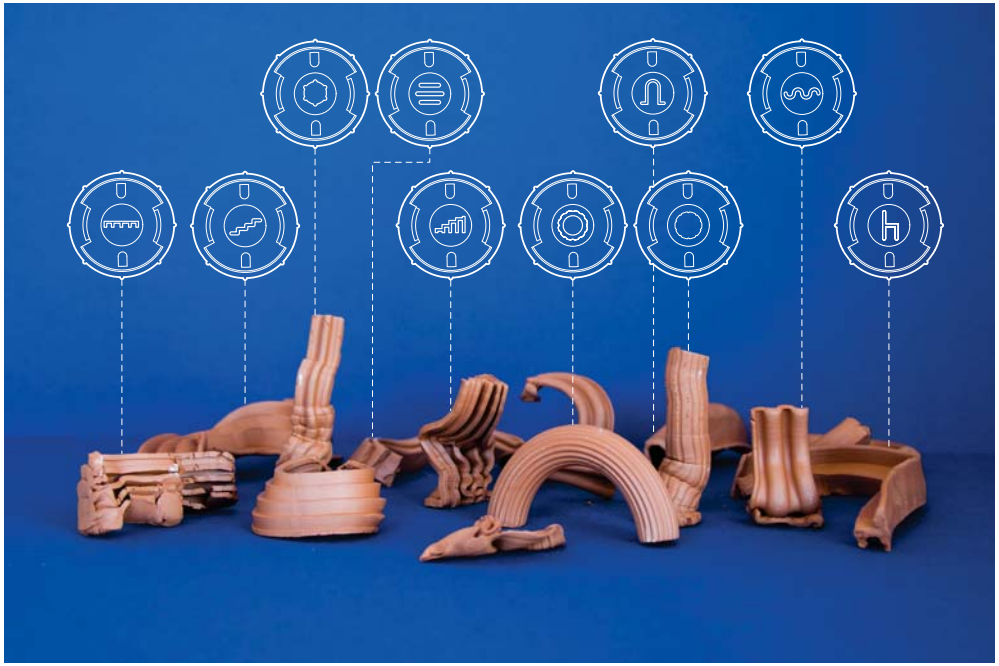


Prototyping work space

EXTRUSION MANIPULATION

In conventional extrusion methods, the forms are carefully sliced and extruded in a uniform manner. I wanted to explore the way in which the extrusions can be manipulated as they are extruded. The following is a documentation of putting vertical pressure against the form as it is extruded and the consequent shapes encompass a so-called flaw but allows for a magnification of the idiosyncrasies.





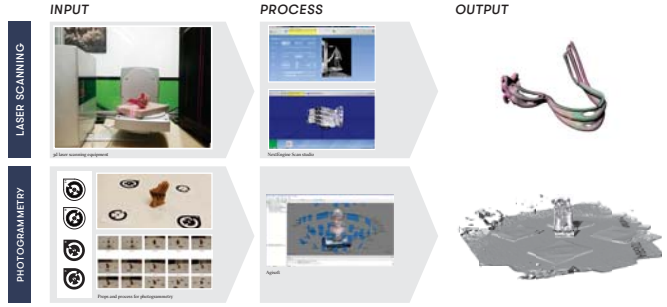
INDEX OF EXTRUSIONS

DIGITISATION OF FORMS

To further experiment with the forms, a digital version was required. Since the extrusions produced unique forms, it was not something that could be replicated in 3d modelling software. Two different methods of 3d scanning were explored.

Photogrammetry uses a series of images taken of the object from a range of angles. The photographic data is then run through a software (Agisoft in this instance) and stitched into a 3d model. The software uses visual cues to map the images. Using targets (as shown on the left) improves its function to stitch the images together. In controlled environments – where the images are taken at the same point - photogrammetry can produce precise 3d versions of the physical object. However, without such equipment, the forms were too small to capture the tactile details of the forms.

With laser scanning, lines of laser beams are passed over an object, which deflects the beam back - this information is read by the receptor and translated into 3d digital data. This method was able to produce more accurate results - though due to the complexity of the forms, parts of information was sometimes missing. Overall, the laser scanning outcome was more appropriate for this function.

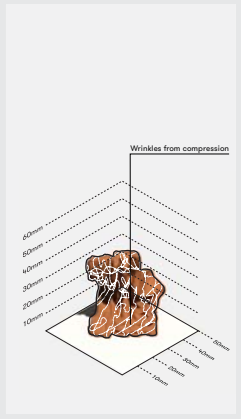


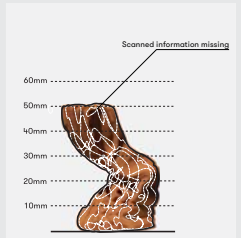
EXTRUSION ANALYSIS 1

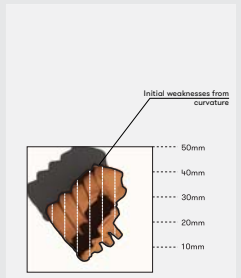
DIRECTION
Downwards

FORCES
Compressive downwards

FEATURES
Wrinkled base from compression, longer ridge curls more





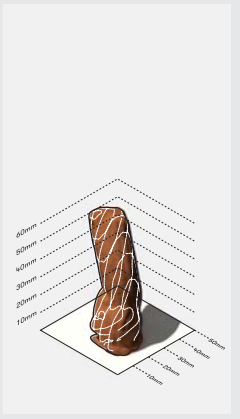


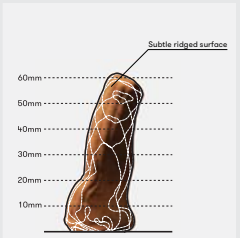
EXTRUSION ANALYSIS 2

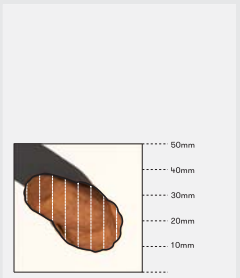
DIRECTION
Horizontal

FORCES
Gravity

FEATURES
Bulges at the base, snagging where extrusion is removed





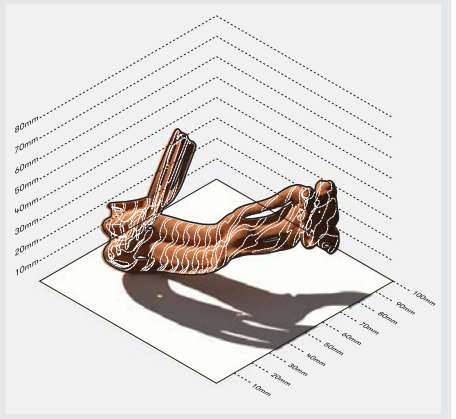


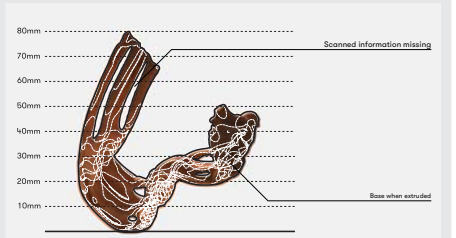
EXTRUSION ANALYSIS 3

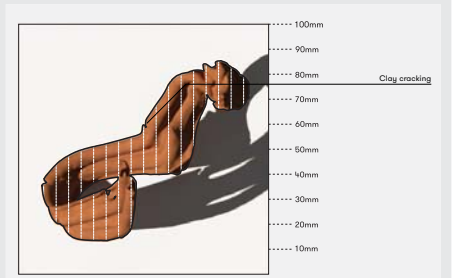
DIRECTION
Horizontal

FORCES
Compressive at base only

FEATURES
Thinness of the section creates fragile moments where extrusion curls





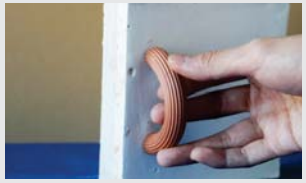


EXPLORATION OF SCALE

There are physical limitations of the process, due to the machinery and the material. The most common industrial use is on the scale of bricks and aluminium sections, though it is possible to extrude benches. The forms serve different functions are different scales. The kinks within the forms and the points of weaknesses on the micro scale become alcoves for dining at the macro scale. The (attempted) replication of these forms and textures on a larger scale opens up opportunities for exploration. How do these forms translate between mediums and size?

1:1
HOMEWARE

The forms can function at 1:1 scale as extruded objects: such as door handles. The human scale of these objects allude to an emphasis on the haptic senses and thus, the tactile qualities of the extrusions at this scale are important. Investigation into the finishes that can be achieved with clay, glazed elements to encourage objects with interaction.



MATERIALITY

Clay

Using the same material the forms were created in. The extrusions can be used in a literal sense to create the tactile, human scale aspects of the project, such as door handles and tiles. The glaze and finish of the clay can also be used to indicate its use; for example, a glossy glaze for parts of the clay to encourage tactile interactions.

Partially glazed bowls

Assemble Studio: A/D/O Clay Factory Facade

Terrazzo

The reductive process of carving offers a juxtaposition to extrusion. I want to utilise the details and textures of the extrusions in a more abstract way, such as for the tableware or tiles. Using 3d scanning to digitise the textures, and then CNC to render the surface pre-casted terrazzo elements. Terrazzo references an important Italian craft, this process is a means of adapting it and utilising new technologies.

Terrazzo bowl

1:50
FURNITURE

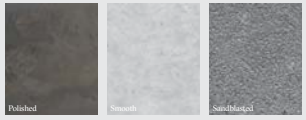
As furniture, the pieces require some level of robustness. The chosen materials must encourage its use so the texture must be suitable.

MATERIALITY

Concrete Canvas

Fabric is impregnated with cement, then drenched with water and placed within a formwork and dried. Since the scale of this architecture is also on a tactile scale, the finishes of the concrete can be adapted to encourage different kinds of use. The extruded forms have textile-like qualities that may be translated well into a concrete canvas, where the bending forms are secured and held together.

Concrete Canvas Stool



Material Finishes

Extruded Metal

In contrast, furniture can be extruded straight from metal and polished to achieve a glossy finish.

Heatherwick: Extrusions

1:50
FIRST FIX

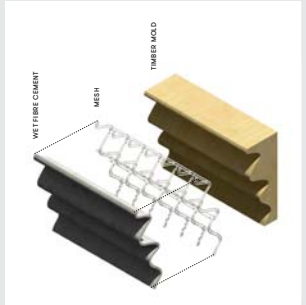
Some of the extrusions can become interior elements, since these will not be structural, the way in which they are fabricated have fewer constraints.

MATERIALITY

Fibre Cement

Dining booths and internal walls that are not carrying loads can be manufactured using fibre cement, where the form can be made thinly due to the glass fibre reinforcement.

Astrid Bornheim: Wash Basin



Fibre Cement Process

1:100
SECONDARY EXTERIOR

A straight extrusion of a section of the extruded forms. This is another means of exploring the clay forms, whilst they are produced with a die, the process manipulates the clay as it is extruded and thus, the sections through the forms are not identical to the die itself.

MATERIALITY

Concrete Panels

Some repetitive elements that originate from the extruded forms, they can be cast on site using different materials for the mold. In the Hanil Visitors Centre, BCHO Architects worked with C.A.S.T to develop a fabric formwork for the undulating facade. The form work consists of pipes with heaving duty fabric places on top. The facade retains the idiosyncrasies of using such a process. The concrete panels are then connected to the structural concrete wall using steel brackets and fixtures. The nature of the process creates folds and textures that are imprinted on the concrete, much like the idiosyncratic nature of extrusion.

Process photos of facade

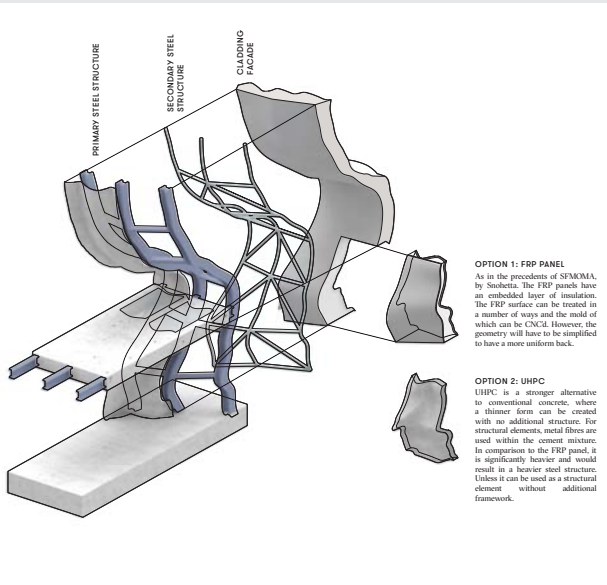
1:200
FACADE

At a larger scale, the shapes can form the facade. However, there are constraints of it acting as a structural element. There must be a medium at which they still retain a formal integrity but also serve a functional purpose. It is likely that the facade must be broken into a series of panels.

MATERIALITY

UHPC/FRP Panels

For the SFMOMA extension, SOM developed a technique using CNC to create the bespoke forms, that are then used as molds for the fibre-reinforced plastic, the forms also double up as the transportation means. Each cladding piece is insulated and backed. The cladding is then attached to a steel structure.



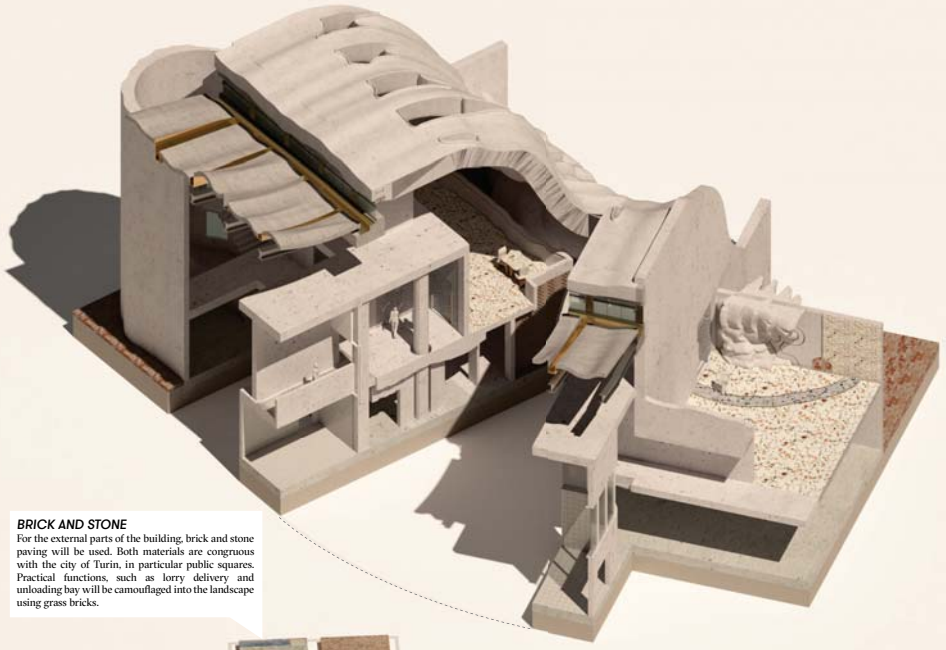
OPTION 1: FRP PANEL

As in the precedents of SFMOMA, by Snohetta. The FRP panels have an embedded layer of insulation. The FRP surface can be treated in a number of ways and the mold of which can be CNCd. However, the geometry will have to be simplified to have a more uniform back.

OPTION 2: UHPC

UHPC is a stronger alternative to conventional concrete, where a thinner form can be created with no additional structure. For structural elements, metal fibres are used within the cement mixture. In comparison to the FRP panel, it is significantly heavier and would result in a heavier steel structure. Unless it can be used as a structural element without additional framework.

MATERIALITY



BRICK AND STONE
For the external parts of the building, brick and stone paving will be used. Both materials are congruous with the city of Turin, in particular public squares. Practical functions, such as lorry delivery and unloading bay will be camouflaged into the landscape using grass bricks.

CONCRETE
Concrete is the main material in the building. Using steel reinforced UHPC for the main facade, and fibre cement for the internal cladding: these lighter types of concrete are a more environmentally conscious alternative and able to create more fluid geometry without weight.

TIMBER
Timber will mainly be used in the furniture for the restaurant. Herringbone parquetry will be used for some of the surfaces, the herringbone pattern will continue be resonated in the brick layout and tiling.

CLAY
Clay tiles will be used internally, and for some of the crockery.

METAL
Brass inlays will be used for the surfaces. The crockery will be made using metal, as well as the steel structure.

TERRAZZO
Terrazzo will feature throughout the building; combining the old Italian tradition with new technologies, terrazzo will be Cnc'd to create organic forms whilst exposing the aggregate. Terrazzo will also be made using chips made from the old facade.

TILES
Tiles will be used in the kitchen and toilets for ease of cleaning. The shapes and arrangement of tiles will vary from toilet to toilet. The kitchen will also feature other surfaces specific to commercial kitchens.

FIRE AND ACCESS

Commercial kitchens are high risk spaces for fire safety, this is due to the nature of the activities inside and the equipment that is often used. Therefore, fire safety precautions must be followed rigorously to create a safe environment for both staff and guests.

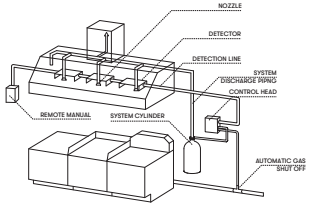
The most common cause of serious fires in commercial kitchens is over-heating of deep fryer oil. Therefore it is recommended that all extinguishers and blankets are suitable for hot oil fires and that they are serviced regularly by a licensed engineer.

The placement of fire extinguishers should follow these rules:

Preferably placed near the exit route in a high-traffic area
- Easy to access
- 100mm high from the floor
- Kept within 2 and 20m from risk of cooking oils and fats blazes – ideally within 10m
- Kept within 40m from appliances at risk of electrical fires

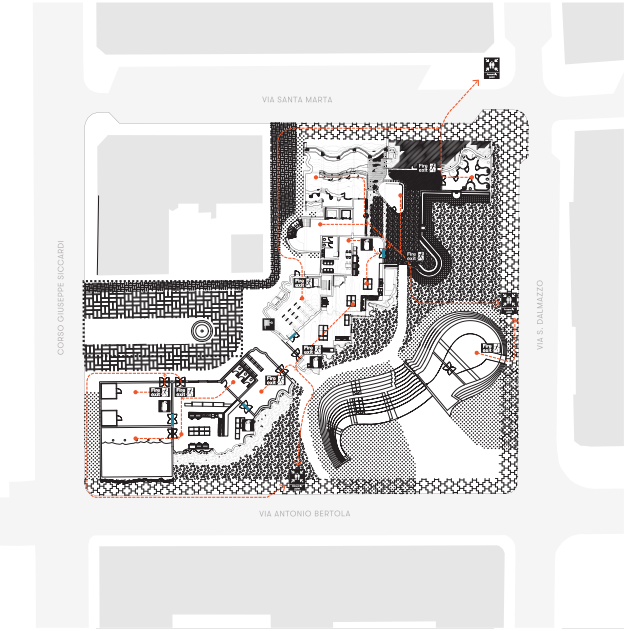
Exits must be clearly signposted and free from obstruction in case of emergency. One exit is required if a space is small enough so that any one point is a maximum 20m from an exit, otherwise two or more are required which comply with building regulations. The escape route must have 2000mm of space vertically and 1000mm horizontally, aside from doorways. Ensure vehicles cannot block exits, simply by placing suitable barriers. Emergency exits must lead to designated safety areas. Consider people with disabilities, ensuring safe and suitable access where reasonable.

SPECIALIST EQUIPMENT

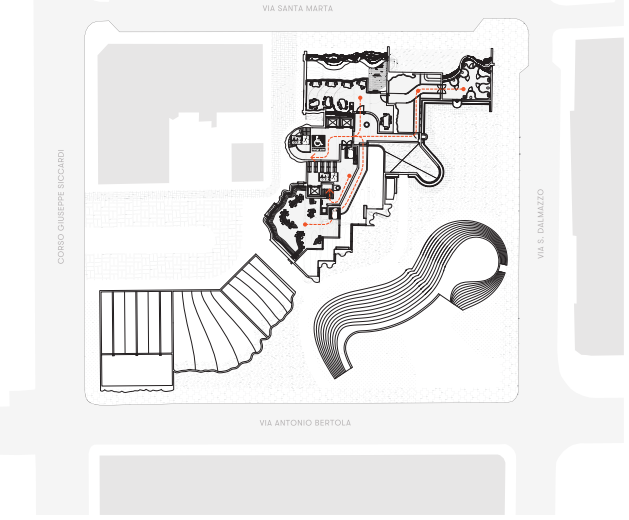


Due to the size of the kitchen, it is advisable to have specialist fire equipment installed. The above is an automatic fire detector and sprinkler system. It can be installed under extractor hoods, which are the main fire concerns. When a fire is detected the gas is automatically shut off and the sprinklers are activated.

GROUND FLOOR



FIRST FLOOR



KEY

Fire Assembly Point

Fire signs to illuminate emergency exits

Fire extinguisher location

Fire extinguisher location

Emergency Escape Routes

Fire Doors

Fire Engine Parking

Disabled Refuge Point

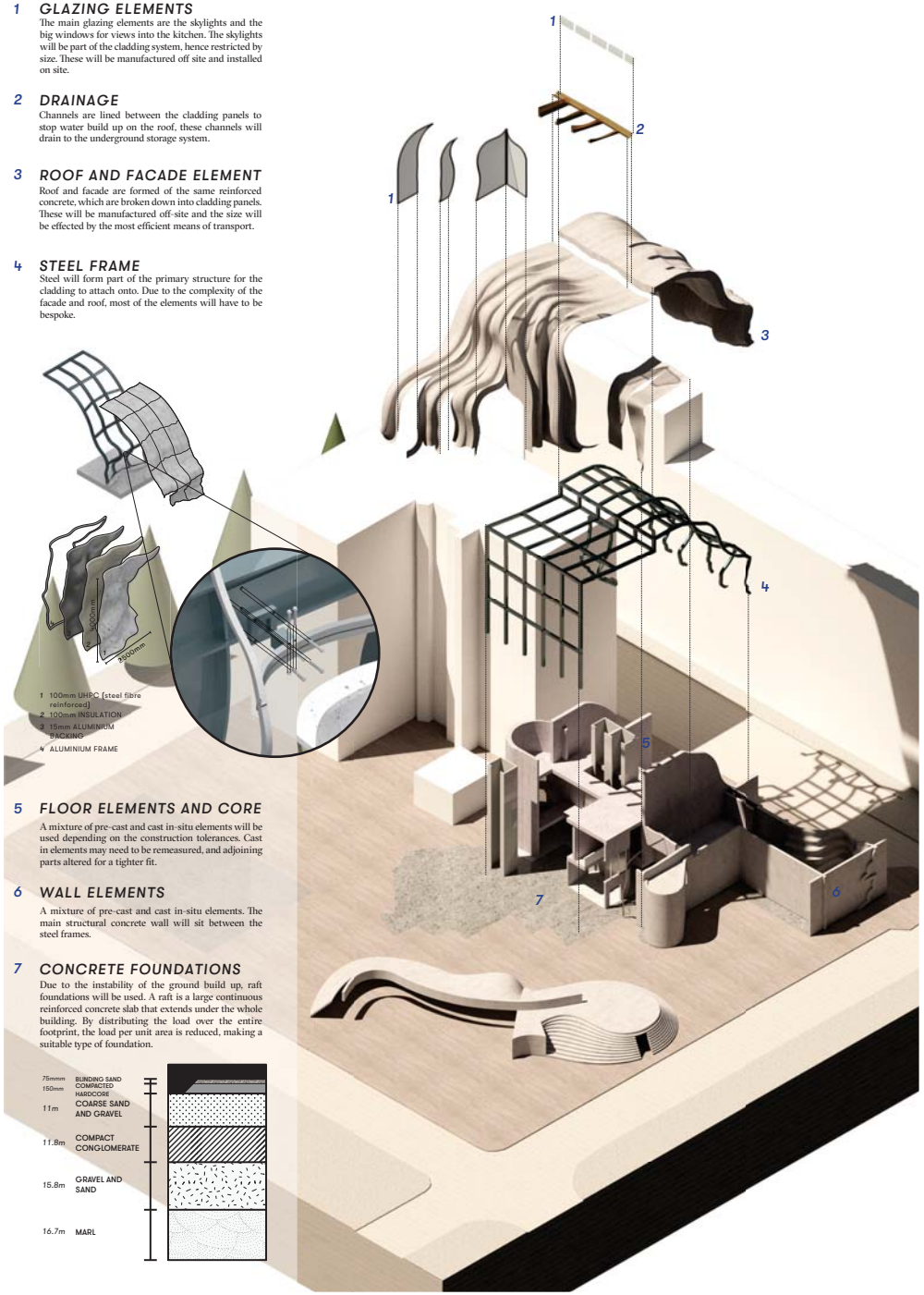
STRUCTURAL STRATEGY

1 GLAZING ELEMENTS
The main glazing elements are the skylights and the big windows for views into the kitchen. The skylights will be part of the cladding system, hence restricted by size. These will be manufactured off site and installed on site.

2 DRAINAGE
Channels are lined between the cladding panels to stop water build up on the roof, these channels will drain to the underground storage system.

3 ROOF AND FACADE ELEMENT
Roof and facade are formed of the same reinforced concrete, which are broken down into cladding panels. These will be manufactured off-site and the size will be effected by the most efficient means of transport.

4 STEEL FRAME
Steel will form part of the primary structure for the cladding to attach onto. Due to the complexity of the facade and roof, most of the elements will have to be bespoke.

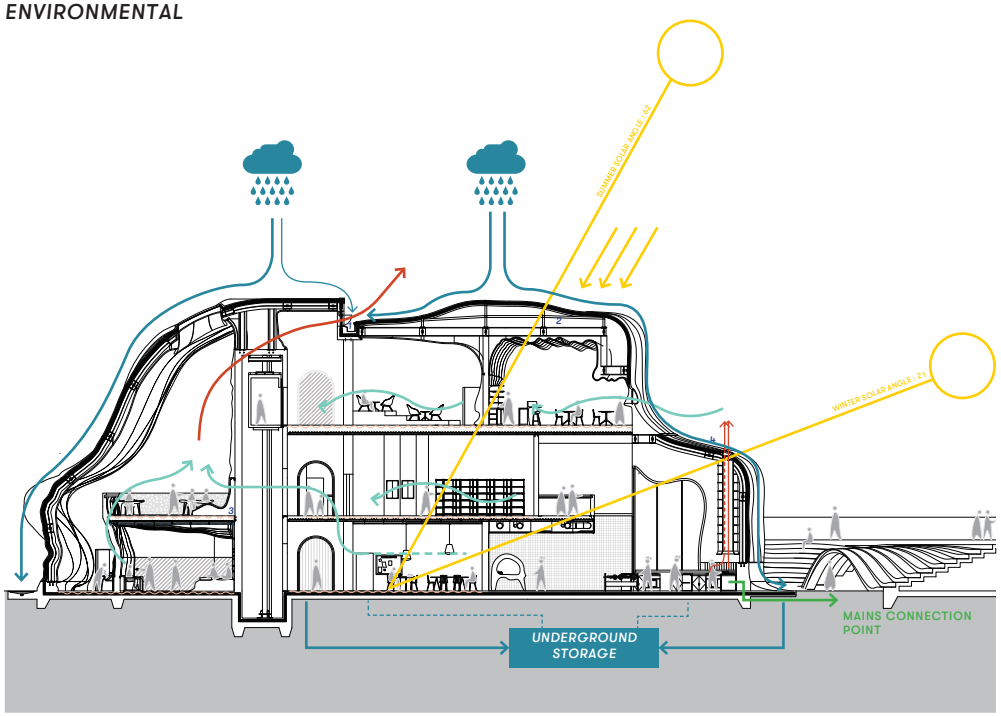


5 FLOOR ELEMENTS AND CORE
A mixture of pre-cast and cast in-situ elements will be used depending on the construction tolerances. Cast in elements may need to be remeasured, and adjoining parts altered for a tighter fit.

6 WALL ELEMENTS
A mixture of pre-cast and cast in-situ elements. The main structural concrete wall will sit between the steel frames.

7 CONCRETE FOUNDATIONS
Due to the instability of the ground build up, raft foundations will be used. A raft is a large continuous reinforced concrete slab that extends under the whole building. By distributing the load over the entire footprint, the load per unit area is reduced, making a suitable type of foundation.

ENVIRONMENTAL



1 VENTILATION AND EXTRACTION
The kitchen within the restaurant is an important space within the environmental strategy of the building. Because of the activities that happen inside, a lot of heat and fumes are produced, which need to be extracted. Extractor canopies are installed over the hobs which draw the hot air and majority of smells outside of the building. Since the kitchen is in an atrium-like space, mechanically-operated openings are located on the roof to allow hot air to escape when necessary. Additional vents will also be located within the kitchen space for extraction.

Where possible, natural ventilation is encourages through stack effect: openings at entry level draw cool air into the building, and openings on the roof allow heat to escape.

Within the dining areas, there will be large gatherings of people at eating hours, this creates a lot of heat. Mechanically assisted ventilation will be used to control temperature in dining areas where there are fewer windows. Cool air will be pumped through the floor and hot air removed through a ventilation unit.

2 SOLAR GAIN
The kitchen is on the south facing facade, which means it has maximum solar glare, especially during summer. Precautions must be taken to ensure the kitchen does not overheat: through methods such as installation of sun shaders or brise soleil. Compared to conventional concrete, UHPC has less thermal mass. However, it still helps in creating a comfortable internal environment. During the day, the UHPC panels and concrete elements warm up in the sun; this heat is then slowly released in the evening/night as the building cools down. This then helps keep the building cool during the day.

3 ACOUSTIC
As part of the dining experience, some of the dining areas will be exposed to the sounds of the kitchen. In others, where a more tranquil environment is required, sound dampeners will be installed within the wall and the choice of interior materials will be more sound absorbent.

4 RAINWATER AND DRAINAGE
Rainwater will be harvested and recycled as part of its environmental strategy. The roof is designed to channel rainwater and it is then stored in a tank underground and will be used for the toilet facilities. Fresh water will be supplied from the mains to the cafe and kitchen.

5 HEATING
During the winter and occasional evenings, the building will require active heating, this should be achieved with minimal energy expenditure. Therefore, providing there is sufficient water in the ground, the building will rely on a ground source heating system which uses the thermal mass of the ground to cool and heat water.

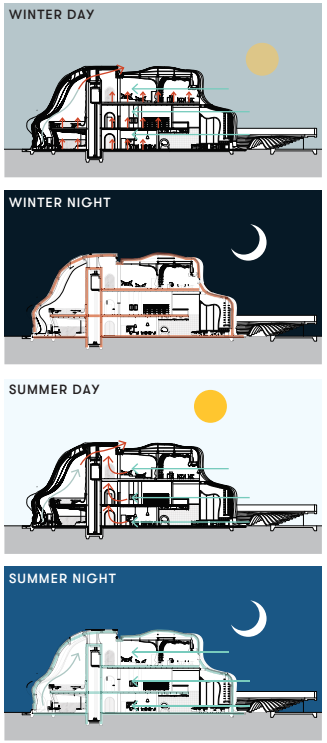
SEASONAL STRATEGIES

WINTER DAY
Windows open to allow for fresh air circulation, underfloor heating system is turned on if the temperture is too cold

WINTER NIGHT
Openings are closed to trap warm air. The thermal mass of the concrete realeases heat slowly. If necessary, the underfloor heating is used.

SUMMER DAY
All vents and windows are open to allow cool air in, and create a stack ventilation where the opening at the top allow heat out. The overhang on the large windows in the kitchen protect the space from direct sunlight during the peak of the day.

SUMMER NIGHT
Vents are left open overnight to allow cool air to flow through and cool the building down. The cold is retained for the next day.

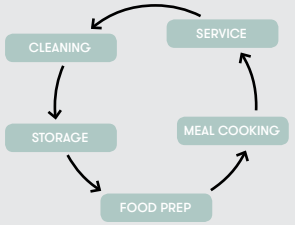


SERVICES

The servicing of a commercial kitchen is very specific to the activities. The layout of the kitchen must be considered with the movement of staff and food in mind; especially the production line of the meals. This dictates the electrical wiring layout. The space must also be flexible enough to accommodate the installation of any new appliances in the future.

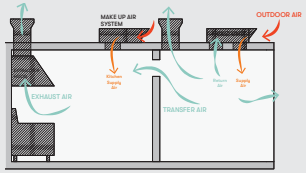
The servicing of the dining rooms however, are dictated by the choreography of dining. The movement of diners and waiters and the layout of the furniture is important for the dining experience.

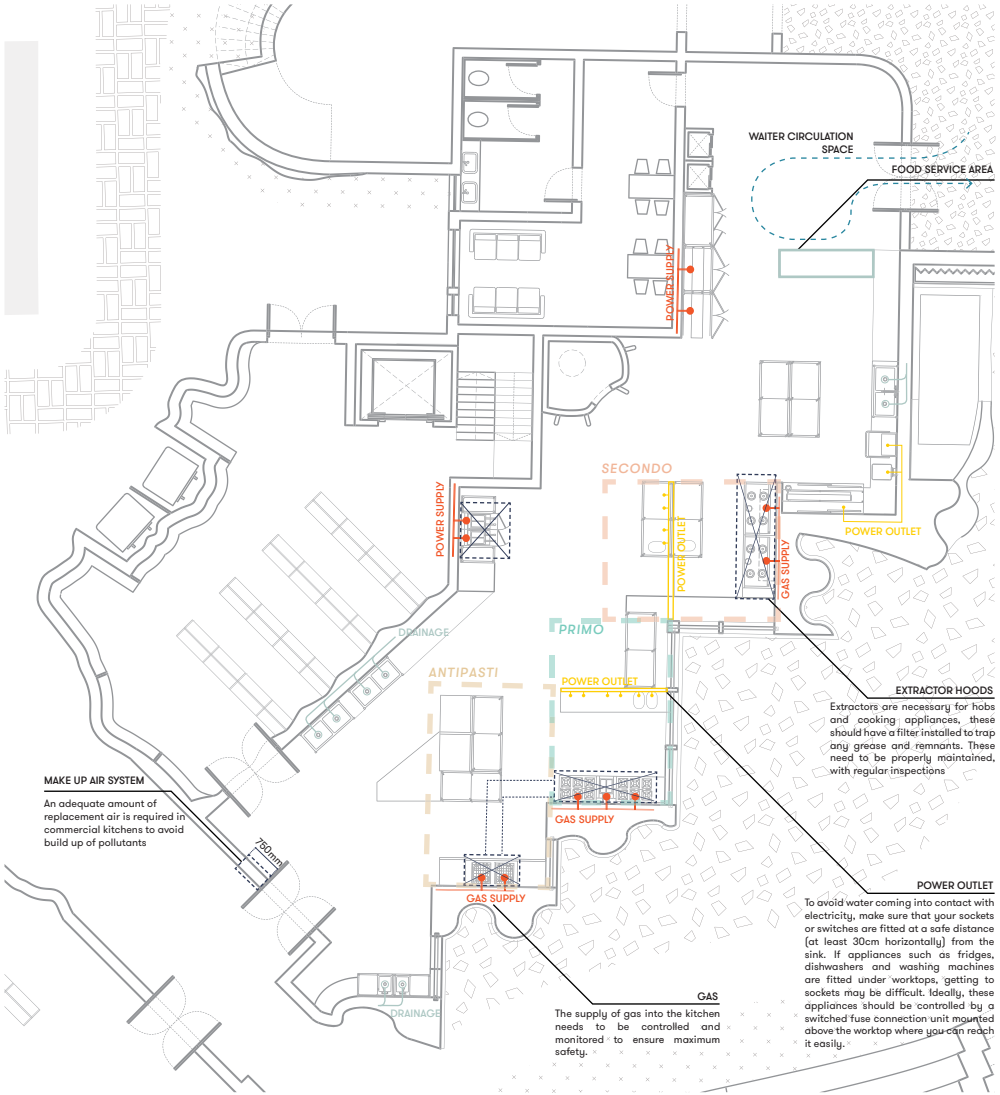
KITCHEN EFFICIENCY & FLOW



AIR FLOW

The flow of air is important within the kitchen for balancing a constant ventilation and temperature regulation, to create a comfortable and safe environment. Due to the number of extractor hoods (required over every hob appliance), a lot of air is moved out of the kitchen, which must be recuperated with filtered air.





MAKE UP AIR SYSTEM

An adequate amount of replacement air is required in commercial kitchens to avoid build up of pollutants

EXTRACTOR HOODS

Extractors are necessary for hobs and cooking appliances, these should have a filter installed to trap any grease and remnants. These need to be properly maintained, with regular inspections

POWER OUTLET

To avoid water coming into contact with electricity, make sure that your sockets or switches are fitted at a safe distance (at least 30cm horizontally) from the sink. If appliances such as fridges, dishwashers and washing machines are fitted under worktops, getting to sockets may be difficult. Ideally, these appliances should be controlled by a switched fuse connection unit mounted above the worktop where you can reach it easily.

GAS

The supply of gas into the kitchen needs to be controlled and monitored to ensure maximum safety.

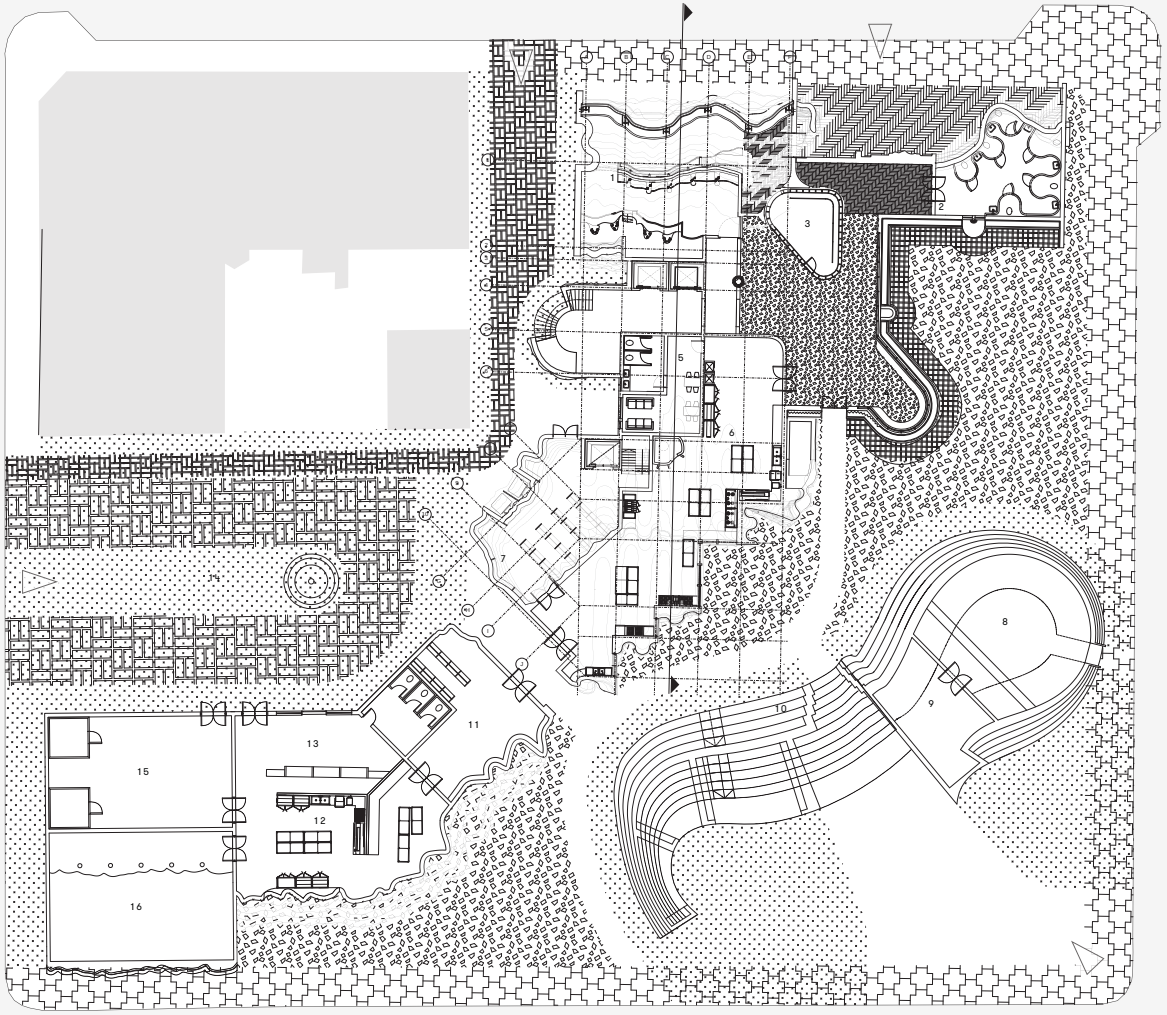
DRAWING PACK

GF Plan 1:200
1F Plan 1:200
Long Section Composite Drawing

VIA SANTA MARTA

CORSO GIUSEPPE SICCARDI

VIA S. DALMAZZO



VIA ANTONIO BERTOLA

A VEGETARIAN RESTAURANT

PLAN A : Ground Floor

Turin, Italy

1:200 @ A1

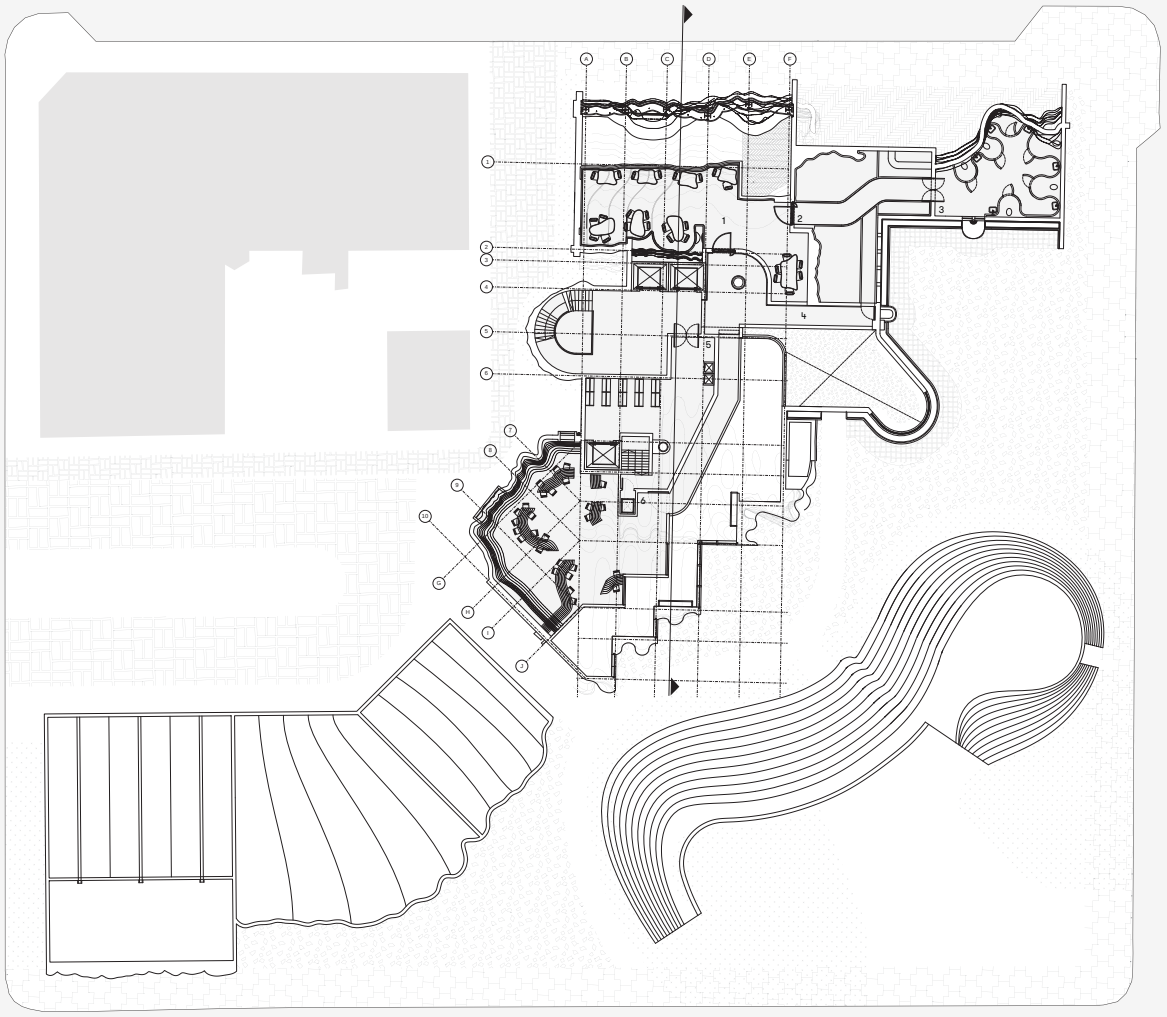
1 ANTI PASTI DINING AREA
2 TOILETS
3 CLOAKROOM
4 SEATING AREA
5 STAFF AREA
6 MAIN KITCHEN AND PREPARATION
7 STORE ROOM
8 CAFE
9 CAFE STORE ROOM
10 AMPHITHEATRE WAITING AREA
11 STORE ROOM
12 PATISSERIE KITCHEN
13 PATISSERIE FRONT
14 DELIVERY / PIAZZA
15 STORE ROOM (FROZEN)
16 HERB GARDEN

0m 2m 5m 10m 20m

VIA SANTA MARTA

CORSO GIUSEPPE SICCARDI

VIA S. DALMAZZO



VIA ANTONIO BERTOLA

A VEGETARIAN RESTAURANT

PLAN 8 : 1st Floor

1:200 @ A1

Turin, Italy

1 PRIMO DINING ROOM
2 COURTYARD
3 TOILETS
4 MEZZANINE VIEW INTO KITCHEN
5 SERVICE SPACE/STORAGE
6 SECONDO DINING ROOM

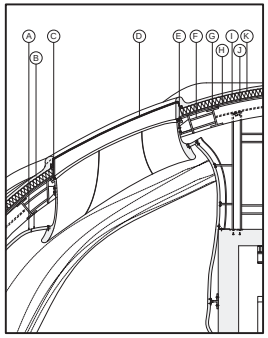
0m 2m 5m 10m 20m

A VEGETARIAN RESTAURANT

Long Section Composite Drawing

This section drawing cuts through the scheme at various scales. The project is an investigation into the scales at which the project exists; the human micro scale that food is consumed at, and its relationship to the facade that shapes the atmosphere. Every element of the project contributes and alters the dining experience, hence it is important to acknowledge the details at each moment; from the joint between the lumiere to the facade panel, to the seam of the pasta pocket.

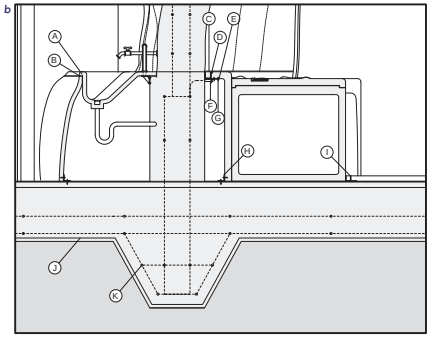
a



1:50

A HANGING POLE
B UHPC OUTER LAYER 50mm
C EMBEDDED STRIP LIGHT
D INSULATED TEMPERED GLASS
E STEEL STUD ø10mm
F SECONDARY STEEL STRUCTURE
G PRIMARY STEEL FRAME
H ALUMINIUM BACKING 15mm
I INSULATION 100mm
J ALUMINIUM FRAME
K BREATHABLE MEMBRANE

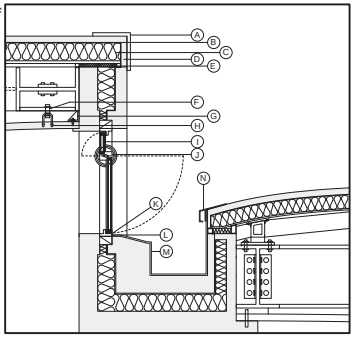
b



1:20

A FIBRE CEMENT CAST SINK 100mm
B SILICONE SEALANT
C CONCRETE FILLER
D BRASS STRIP
E STEEL L-BRACKET CAST INTO FIBRE CEMENT
F SECONDARY STEEL STRUCTURE
G STEEL STUD ø5mm
H STEEL L-PLATE
I METAL STRIP SET IN EPOXY
J DAMP PROOF MEMBRANE
K STEEL REBAR ø30mm

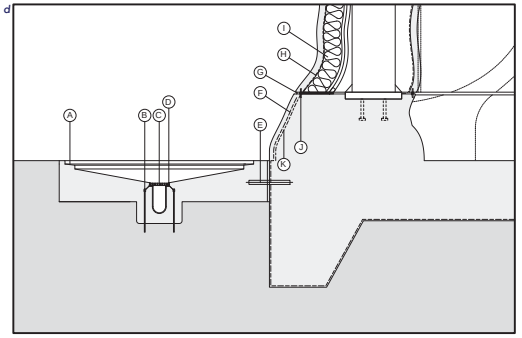
c



1:20

A ALUMINIUM FLASHING
B BREATHABLE MEMBRANE
C INSULATION 100mm
D UHPC WRAPS ABOUT PANEL END
E INSULATION SPRAY
F HANGING POLE ø30mm
G STEEL ANGLE BRACKET
H HANGING POLE CONNECTION CAST INTO FIBRE CEMENT
I DOUBLE GLAZED GLASS
J MIECHANICAL PIVOT HINGE
K ALUMINIUM WINDOW FRAME
L SEALANT
M COPPER GUTTER LINING
N COPPER FLASHING

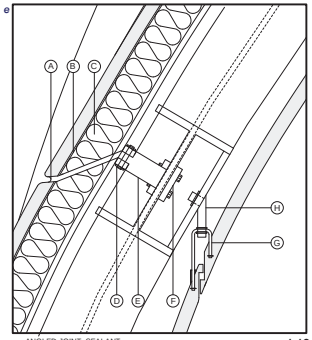
d



1:20

A CAST CONCRETE DRAIN
B POUR REINFORCEMENT
C DRAIN GRATING
D STRUCTURAL STEEL FRAME
E DOWEL MOVEMENT JOINT
F DAMP PROOF MEMBRANE
G SILICONE SEALANT
H BREATHABLE MEMBRANE
I INSULATION 100mm
J TAPED MOVEMENT JOINT
K BREATHABLE MEMBRANE (OVERLAP)

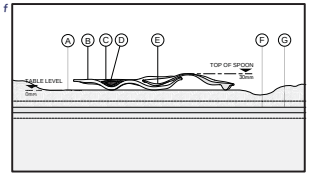
e



1:10

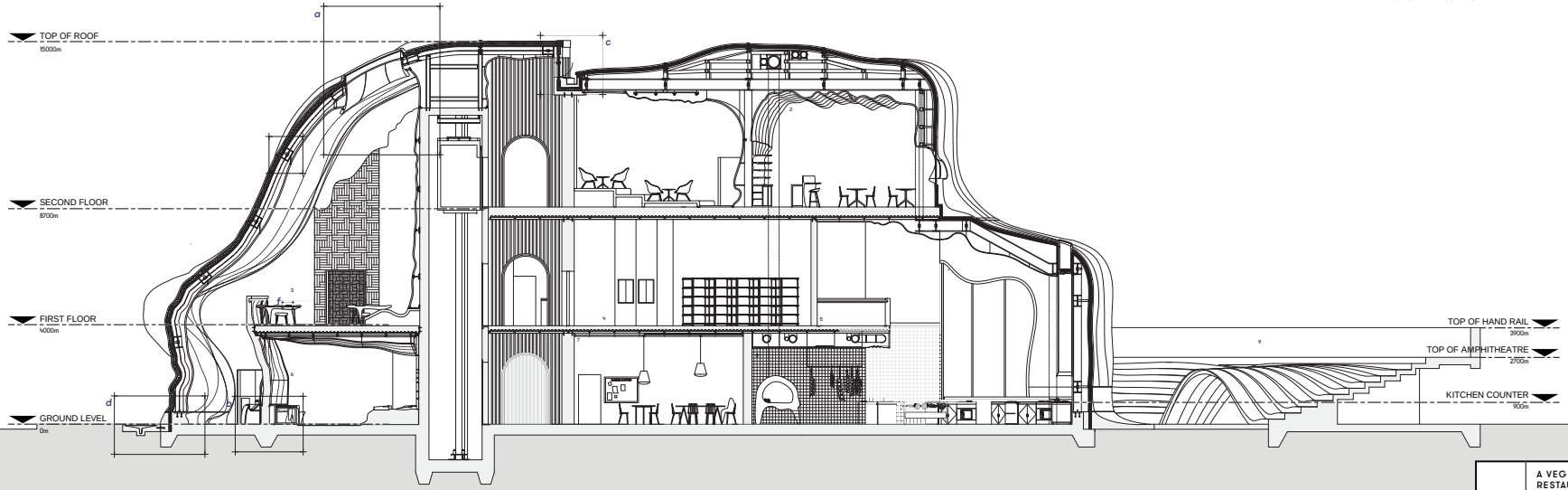
A ANGLED JOINT, SEALANT
B BREATHABLE MEMBRANE
C INSULATION 100mm
D STRUCTURAL STEEL STUD
E WELDED SQUARE SECTION
F BOLTED STEEL PLATE
G HANGING POLE ø 30mm

f



1:5

A CNC AND CAST TERRAZZO SURFACE ~30mm
B GLASS PLATE
C PASTA LAYER ~ 1mm
D BUTTERNUT SQUASH FILLING 15g
E CAST METAL SPOON (LOST WAX METHOD)
F METAL INLAY WITH BRASS TRIM 10mm
G CARVED WOOD BASE



	A VEGETARIAN RESTAURANT
	LONG SECTION
1:200 @ A1	Turin, Italy

1 DOLCE DINING ROOM
2 WINE BAR
3 PRIMO DINING ROOM
4 SERVICES/STAFF AREA
5 MEZZANINE OVER KITCHEN
6 ANTIPASTI DINING ROOM
7 STAFF AREA
8 KITCHEN
9 AMPHITHEATRE

0m 2m 5m 10m

2.0
BUILDING CONSTRUCTION

The Antipasti Dining Room

This section focuses on the construction of the building through all the scales of the project: from the facade, to the furniture, to the plate. The main challenges are the material and structural implications of scaling up the clay extrusions and what that means materially. A series of casting tests at a range of scales help identify the potential weaknesses in the process and their necessary resolutions, which is fed back into the design iteration.

The Antipasti Dining Room

A RECIPE FOR A RESTAURANT

The construction of the project will involve a mixture of prefabricated and on site elements. This is due to the complexity of the geometry - where certain parts will have to be manufactured in a controlled warehouse environment. The primary structure will be erected after the raft foundations are poured. The structure will then be remeasured and the panels will be derived from the new measurements to allow for tolerances within the erection.

Ristorante Vegetariana

A vegetarian restaurant nestled in the heart of Turin

Cooking Time: 28 months

Ingredients

Concrete raft foundations
Steel re-bar reinforcement
Steel I-Beams
Cast in-situ concrete walls
Cast in-situ concrete floors
Exterior UHPC panels
Interior cladding panels
Brass inlays

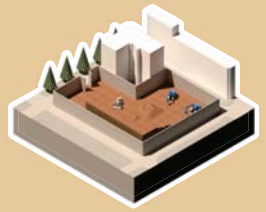
Equipment

Excavator
Pile driver
Crane
Cement Mixer
Harness
Ladder
Skid steers
Graders
Forklift
Bulldozer
Generator
Portable Toilets

Health and Safety

RISKS ON SITE	PRECAUTIONS
Delays and congestions caused by untimely deliveries	Construction manager ensures all schedules are co-ordinated and logical Relevant road closures are organised ahead of time for access to site
Chemical burns from materials	Appropriate protective gear to be worn at all times on site: full length trousers, sleeves, eye protection, gloves, workers boots
Accidents caused by cranes and becoming stuck by airbourne moving element	Appropriate training given to crane operators and workers in the proximity. Proper co-ordination of site so one element is lifted in one area at one time.
Electrocution	All machinery to be earthed to ground when in use and heavy electrical insulating gloves to be used when handling electrical appliances/ machinery
Vehicle collisions	Implemented drop off and delivery points
Falling off height	Safe working platforms constructed with guard rails - hard hats and harnesses to be worn for protection from falls.
Structure collapse	Estimation of structural risks beforehand and ensure construction manager is aware of the potentials risks
Injury by lifting heavy goods	Maximum weight lifting standards should be set up and machine lifting when required
Untrainned personnel on site (i.e. media, campaign overage, political visitors)	Supervision of visitors is required at all times and correct protective gear worn (hard hats and boots). No access to some areas are signposted clearly with boundaries. Safe walkways implemented.

Method



Temporary walls are erected around construction site with particular care regarding the residential block on the corner of the site.

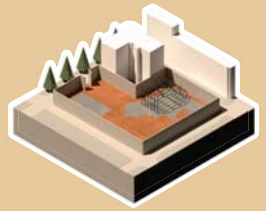
Demolition of existing facade begins with part of the rubble retained for use in later construction phase (terrazzo tiles)

Excavation of site begins: soil is removed to the correct depth for raft foundations

Foundation bed is compacted by ramming

Re-bars and other reinforcement are laid over the foundation bed

Concrete is poured over reinforcement



Steel column bases are placed onto foundation

Main steel structure is delivered to site in logistically practical sizes and welded on site

Steel frame is remeasured to take into account any imprecision and the measurements are sent to cladding manufacturers

Internal structural walls and cores are erected: steel and concrete composites

Formwork for amphitheatre seating is erected and reinforcement embedded

Concrete is poured in-situ for the amphitheatre and formwork removed

Cladding pieces are delivered on site

Panels are attached to the steel frame and sealed to enclose building envelope

External walls are erected

Glazing is delivered on site and fitted

Second fixes and MEP is installed

Exterior surfacing is laid

THE INGREDIENTS

The antipasto is the first course of an Italian meal. It signifies the beginning of the meal; it is also the first dining experience that visitors enter. The dining area focuses on tactility; of the food and of the space in which you eat in. The dishes served on both the Summer and Winter menus are informal and can be consumed using your hands. It is a way of physically placing people in touch with the food; the textures and tactile qualities that are exclusive to your mouth in conventional Western dining. As a result, the space responds by emphasising the sense of touch, hence the other senses are subdued by the architecture.

Spinach and Pea Pesto Farinata

A savoury chickpea flat bread topped with spinach and pesto

Cooking Time: 45mins

Ingredients

For the Socca:
1 cup/120g chickpea flour
1 cup/240ml filtered water
½ teaspoon sea salt, plus more to top
2 teaspoons/10ml lemon juice
¼ teaspoon baking soda
2 Tablespoons/30ml extra virgin olive oil, divided use
2-3 Tablespoons of Spinach Pea Pistou (recipe follows)
1 oz/28g fresh baby spinach leaves
Freshly ground black pepper
9-inch cast iron skillet

For the Spinach Pea Pesto:
1/3 cup/43g cooked peas
1 oz/28g baby spinach leaves
½ oz/14g basil leaves
1 small garlic clove
½ teaspoon sea salt
1 teaspoon/5ml lemon juice
2 Tablespoons/30ml extra virgin olive oil

Method

1. Place the chickpea flour, and salt in a large bowl and slowly whisk in the water and the lemon juice. Allow batter to sit covered for a few hours, or preferably overnight.

2. In the meantime makes the Spinach Pea Pistou. Place the peas, spinach, basil, garlic, sea salt and lemon juice in the bowl of a mini food processor and pulse until finely chopped. Add the olive oil and process until smooth. Cover and refrigerate until needed.

3. When ready to make the socca, preheat oven to 450° F. Measure 1 Tablespoon of olive oil into a cast iron skillet and place it in the oven to preheat.

4. Whisk baking soda and remaining 1 Tablespoon of olive oil into the socca batter until smooth.

5. Remove preheated skillet from the oven and pour the batter into the skillet. Scatter small dollops of about 2 to 3 Tablespoons of the pesto across into the batter and top with the spinach leaves. Top with a few grinds of freshly ground black pepper and a pinch of sea salt. Bake for 20 minutes, or until it's set and golden around the edges.

6. Remove from oven and let cool for 5-10 minutes on a wire rack before cutting into wedges and serving.

Ingredients

Cutlery
Hands

Crockery
Embedded plates where food becomes part of architecture

Cover
20

Waiting Staff
4

Light
300-400 lux

Acoustics
40 decibels

Furniture
Informal seating arrangements that peel off the interior wall. Some form of tables

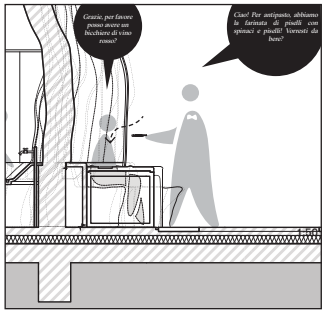
Colour Palette
Tones of grey concrete

Temperature
20C

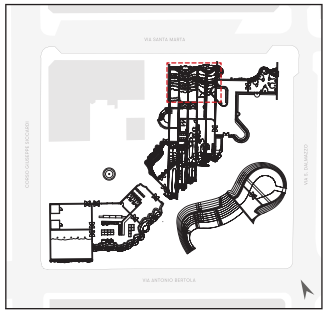
Materiality
Concrete using different finishes

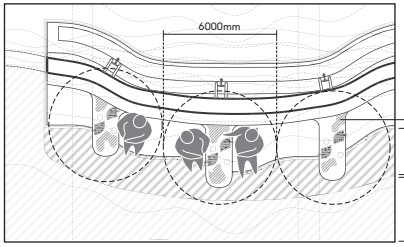
COLOUR PALETTE

THE CHOREOGRAPHY



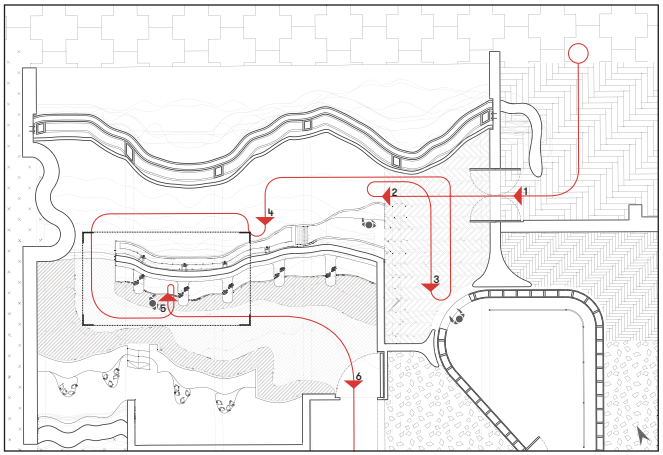
LOCATION





Within the seating for two people, the arrangement is more prescribed than the alternative seating (for larger groups). The diners gather around an arm rest, which serves as the table. Such an arrangement encourages a more informal dining environment. The diners have at least 6m of space between them for a comfortable level of dining.

1 Enter building
2 Greeted by waitress
3 Cloakroom drop off
4 Hand washing
5 Seated
6 Leave Antipasti Dining Room



STRUCTURE

One of the main design challenges is conveying the sculptural forms within the building into the large facade. Due to the dramatic scale difference, there are many implications that must be considered. It is important that the translation of these forms into large scale architectural elements does not hinder the material integrity.

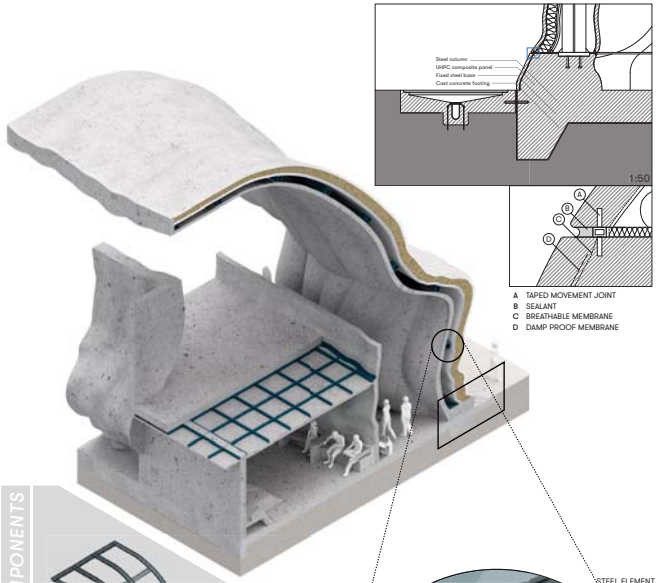
UHPC

UHPC (Ultra High Performance Concrete) is a new type of concrete that has superior performance in durability, long term stability and strength in comparison to conventional reinforced concrete. UHPC is characterized by being a steel fibre-reinforced cement composite material with compressive strengths in excess of 150 MPa, up to and possibly exceeding 250 MPa. UHPC is also characterized by its constituent material make-up: typically fine-grained sand, silica fume, small steel fibers, and special blends of high-strength Portland cement; however, no large aggregate may be used. These characteristics means that a much thinner and lighter layer of concrete can be used.

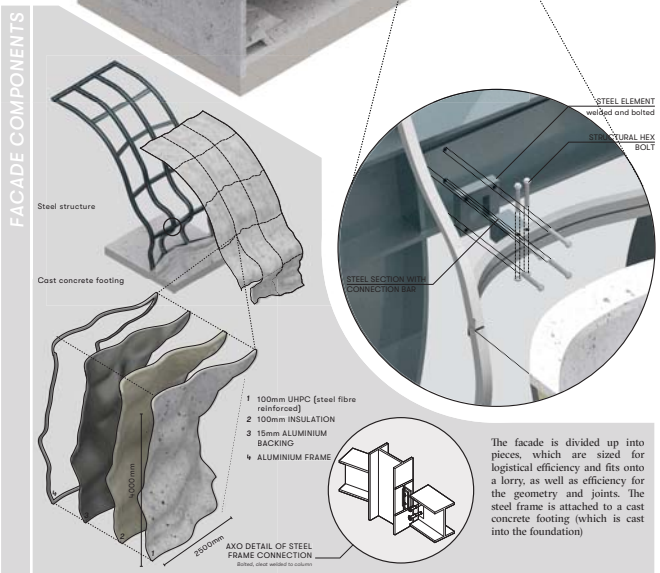
Constituent	Amount in kg/m³
CEM I 52.5 R HS-NA	650
Silica Fume	177
Quartz I	325
Quartz II	131
Sand 0.125/0.5	354
Basalt 2/8	597
Superplasticiser	30.4
Steel fibres	2.5 % by vol.
Water	158

PRECEDENTS: SFMOMA. Snohetta.

The main feature of the SFMOMA extension by Snohetta is the Eastern facade; on which 700 unique panels were used. The bespoke shapes that are used is similar to this project. The panels were produced using FRP (fibre reinforced polymer) and contained the insulation layer within. The panels are fixed to a curtain wall system, constructed out of steel. These principles of construction can be applied to this building strategy, though UHPC will be used instead of FRP for aesthetic reasons; the implications of this decision means the structure will have to be denser than that used in SFMOMA since UHPC panels will weigh more.



FACADE COMPONENTS



The facade is divided up into pieces, which are sized for logistical efficiency and fits onto a lorry, as well as efficiency for the geometry and joints. The steel frame is attached to a cast concrete footing (which is cast into the foundation)

METHOD OF CONSTRUCTION

The production of the cladding pieces will occur off-site. The steel frame will first be erected on site, according to the 3d model of the facade; however, due to the tolerance of the steel frame and specificity of the cladding, the cladding pieces will then be re-measured to fit the erected frame. This will ensure precision of the pieces and allow for the tolerances. The panels will then be transported to the site within the foam molds for added protection. On site, the panels will be installed and waterproofed

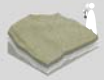
LORRY LOGISTICS

All pieces that will be manufactured off site will be divided into forms that will fit into a standard lorry.

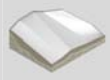
This includes the formwork for the cast in-situ pieces as well as the fully manufactured elements such as the cladding

OFF-SITE PRODUCTION

1. Mold is CNC out of high density foam



2. Release agent is applied to the mold and then a layer of UHPC and insulation is sprayed onto the mold



3. Aluminium backing and frame screwed onto the cladding

TRANSPORT

4. Foam mold is used as protection for the transportation of the cladding pieces

ON-SITE

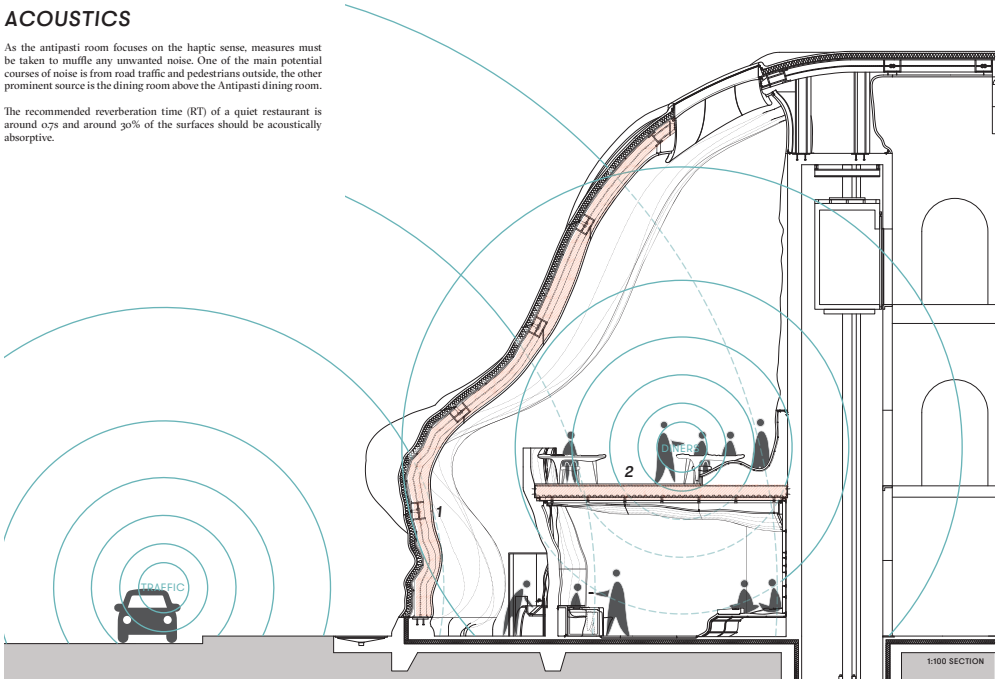
5. Pieces are craned into place one by one and attached onto the steel frame

6. Silicone is applied in between the junctions of the cladding pieces to seal building envelope

ACOUSTICS

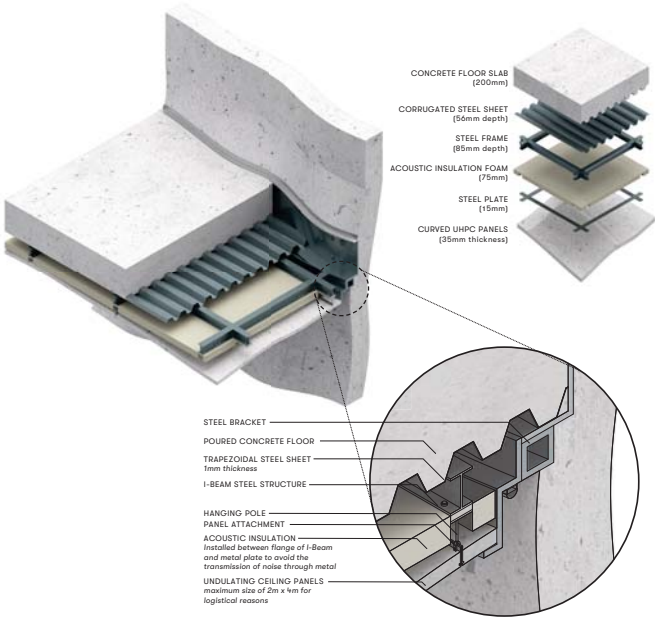
As the antipasti room focuses on the haptic sense, measures must be taken to muffle any unwanted noise. One of the main potential courses of noise is from road traffic and pedestrians outside, the other prominent source is the dining room above the Antipasti dining room.

The recommended reverberation time (RT) of a quiet restaurant is around 0.7s and around 30% of the surfaces should be acoustically absorptive.



1 Concrete/UHPC has material properties that muffles low frequency noises such as traffic. The facade which faces onto the traffic is composed of the outer cladding panel, steel structure and inner cladding. Since the insulation is sandwich within the cladding panels, the steel frame sits within an air gap; whilst it is not a vacuum, it will still contribute to the acoustic isolation of noises.

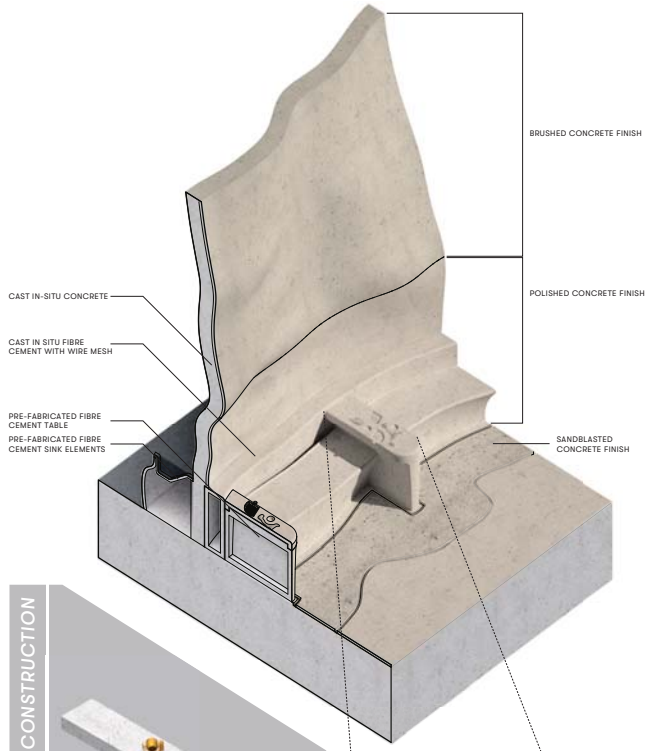
2 The dining room above the antipasti will also contribute to noise levels. Following the recommended percentage, the ceiling should be acoustically insulated to achieve an ambient level. The acoustic insulation foam will be installed between and beneath the steel grid (to avoid the transmission of sound waves through the steel beams). To retain the aesthetic homogeneity, ceiling panels made from fibre cement will be hung off the steel structure, the porosity of the material and movement gaps between the panels will allow sound waves to travel through the ceiling cladding before being absorbed by the acoustic foam.



FURNITURE

The furniture is an important element of the space, it is the part which appeals most to the human scale. The overriding intention of the space is to focus on the haptic sense and for the interior to read as one homogeneous surface. Having chosen concrete as the main material - due to its ability to imprint textures - the material will extend from the interior wall to form the seating and tables.

The challenge in this design agenda is the bespoke quality of each element. Since the forms are unique, the tolerance of each process must be accounted for accordingly. The main elements will be cast on site in order for an accurate fit. The tables will be pre-casted since the are repeated elements.

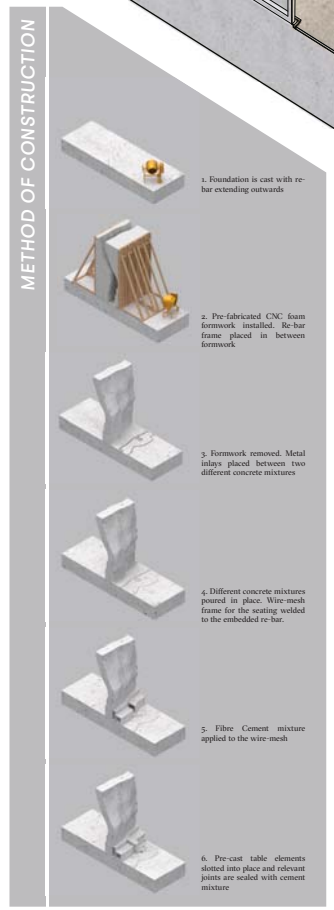


FIBRE CEMENT

The bench and tables will be cast with fibre cement. Since the furniture will not require to withstand great loads, glass fibre can be used to reinforce the cement. The mixture will then be applied to a mold. In comparison to conventional cement, fibre cement is stronger, which means that a much less mixture is required to obtain the same strength. The glass fibres are the principal load-carrying members, while the surrounding matrix keeps them in the desired locations and orientation, acting as a load transfer medium between the fibers and protecting them from environmental damage.

PRECEDENTS: Wash Basin. Astrid Bornheim.

The sink by Astrid Bornheim is made using the fibre cement process, where a fine mesh is moulded into the desired shape and the cement mixture (imbued with glass fibre) is poured onto the mesh mold.



Since the crockery sits flush within the table top, and the crockery is specific to the dish, the table top must be easily removable. Whilst the rest of the table and seats and cast into the internal wall, the top is placed on top, and held in place with a ridge. This allows for the changes in the winter and summer menu but also for future menu changes.

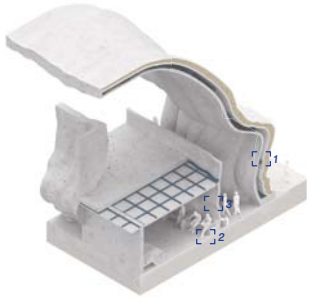
CONCRETE SEAMS

Concrete shrinks and expands with changes in humidity and temperature; as a result, precautions must be taken and these changes will be acccommodated into the design. The external facade also needs to be joined between the panels with a method that is aesthetically appropriate and also functional (waterproof).

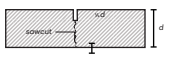
The design of the space is focused on the homogeneity of the concrete, but also incorporating the seams of the facades since it is not possible or very costly to construct them out of one singular piece.

Coefficient of Thermal Expansion

Steel	7.2×10^{-6}/C
Concrete	10×10^{-6}/C
Concrete	12×10^{-6}/C

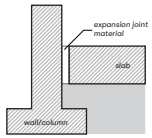


CONTRACTION JOINTS



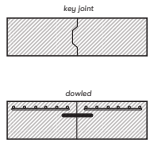
Contraction joints are intended to create weakened planes in the concrete to regulate the location of said cracks. This prevents any aesthetic changes to the concrete.

EXPANSION JOINTS



Expansion/isolation joints are when parts of the struction (such as walls and floors) are seperate or isolate from one another. and sealed using expansion joint material. This allows for independent vertical and horizontal movement, which minimises cracking when movements are restrained.

CONSTRUCTION JOINTS

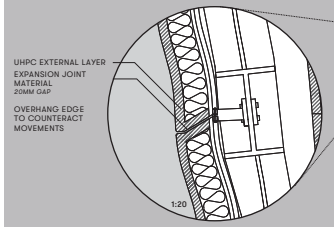


Construction joints are surfaces where two successive placements of concrete meet. In slabs, they are designed to permit movement and/or transfer load.

1
EXTERNAL FACADE

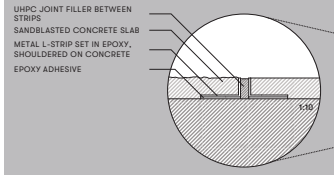
Whilst UHPC is more resistant to thermal and humidity expansion and contraction, it will still deform under environmental changes. A tolerance is required to account for such changes: these considerations contribute towards the aesthetic effects as well as longevity of the materials.

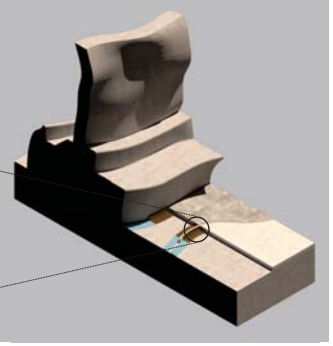
With the main facade, the panels will be effected by movements within the steel structure as well as changes in the UHPC. The edges between the panels will be lipped so allow tolerance for movement.



2
INTERNAL FLOOR SLABS

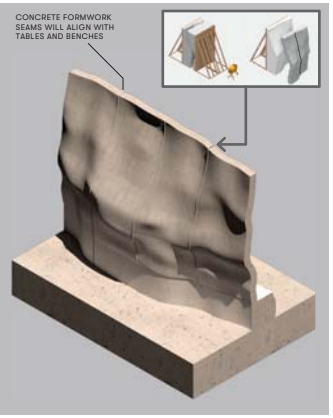
The interior floor will use different finishes, which will be indicative of its use (for example; sandblasted for thorough fare routes, polished surfaces for seating and human scale elements). To design in the tolerance of the concrete expansion/contraction, metal strips will be used where two different slabs meet. The seam will become an aesthetic finish as well as a functional one.





3
INTERNAL CAST WALLS

The internal walls are cast using CNC foam formwork; since these have to be manufactured and transported, the panels are broken down into sections. As the concrete is poured, discrepencies within the formwork will create visible seams. By intentionally designing the seam as part of the formwork, it will make it into a design feature of the wall as opposed to an accident.



MATERIALITY

The process of model making was used in developing the construction of the building. Through model-making there is an investigation of the the materiality/finishes and atmospheric qualities, as well as the junctions between elements. The translation of the processes/materials at 1:100 to 1:1 have both parallels in principle and implications and challenges.

TILES

The indoor and outdoor threshold is linked with a coherence in tiling. The herringbone tiled surface shifts scales as it crosses the building boundary. Whilst the arrangment remains, the materiality will also shift.

1 Brick herringbone paving outdoors, resonating a Turin aesthetic

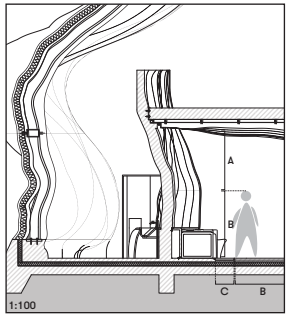
2 Interior ceramic floor tiles

3 Concrete cast tiles for the wall

FACADE PROTOTYPE 1

The initial prototype using a 3d printed mold. Due to the intricacy of some elements, one half of the mold could not be removed. However, certain details were successfully translated to 3d printed texture and casted form. Tests indiscated when the form is printed upright the contours are more aesthetically interesting.

MATERIAL AND FINISHES



Different types of finishes and surface treatments are used to indicate or encourage different uses of the space. Sandblasted textures are used for walking routes, whilst polished surfaces for seating.

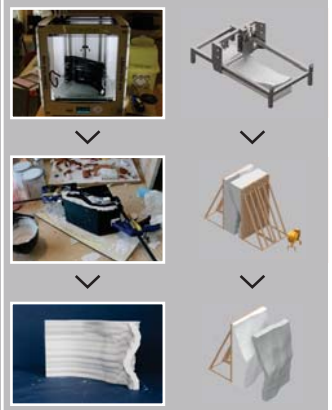
METHOD OF CONSTRUCTION (1:100 - 1:1)

The process of creating the forms at 1:100 and 1:1 have similar principles, yet obvious limitations and its implications when scaled up.

1. CREATING THE MOLD
With the 1:100 the negative was 3D printed with an Ultimaker machine, the physical limitations is the size of the print bed (20cm (w) x 21cm (d) x 20cm (h)). This process gives the mold a unique finish, whereby the lines of the printed medium can be read; such contours gives the form more depth. At 1:1 the form will be divided into 2m x 4m panels (for logistic and CNC limitations) and milled out of high density foam; this process also gives the mold a unique finish, which is dependent on the drill bit used on the machine.

2. THE POUR
The two part mold is clamped together and any gaps created by the tolerance of the print is sealed using clay. The molds are baked with timber and transported to the site, where it will be poured. The formwork is build around the molds; the tolerance of the joints between the molds are taken into account and there is a deliberate 5mm ridge when the mold is milled. The gap between the molds become an intentional shadow gap. A wire mesh is inserted between the molds for reinforcement.

3. RELEASING THE MOLD
With the 1:100 cast, the molds had to be run under hot water for the plastic to expand, hence releasing the positive. The 1:1 formwork will be applied with emulsion products to enable easier separation, but the nature of the milling (no undercuts) means the form will be designed for easy formwork removal.

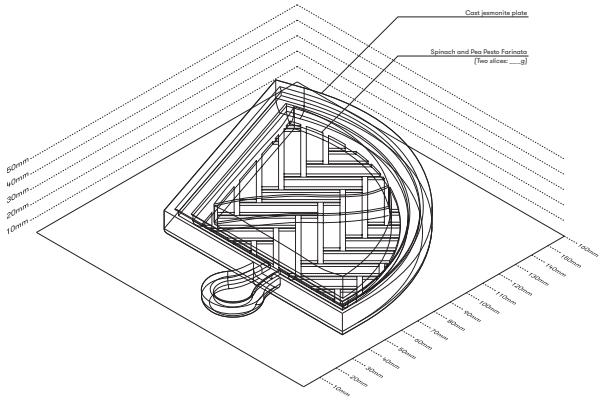


CUTLERY AND CROCKERY

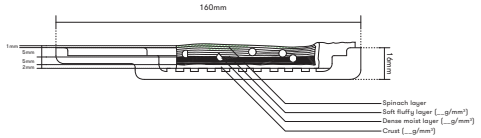
For the antipasti, the farinata (winter menu) is served in a jesmonite cast plate (sealed for food safety). The plate is specific to the shape of the farinata slices and shape resonates the skillet pan in which the farinata will have been cooked. The space will be aesthetically homogeneous, with the furniture and interior elements seemingly carved out of the concrete. The plates will sit flush within the cast tables: the top counter can be replaced easily when the menu shifts to summer. As this course will be eaten using your hands, the interior of the plate resonates with the herringbone tiles that greet the visitors as they enter.

JESMONITE®

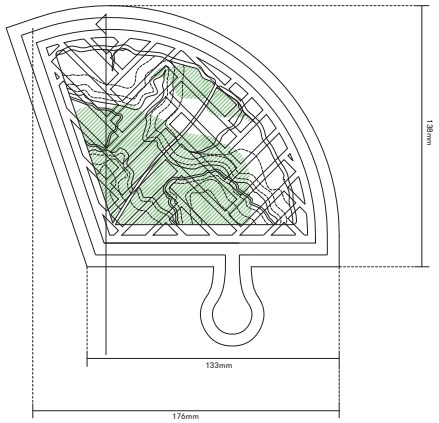
Jesmonite is an acrylic composite which consists of two parts: a plaster base and a water-based polymer liquid. Similar to concrete, it replicates the texture and surface finish of the mold. However, it is lighter than glass reinforced concrete and durable and resistant to high impact. Since it is solvent-free, it is also more environmental and safer than traditional composite materials. The AC200 product was used in the production of the plate, one of the unique properties of this product is that it can be carved once cured and finished in a similar way to concrete.



1:2 ISOMETRIC DRAWING



1:2 SECTION



1:2 PLAN

PIGMENT TESTS

No pigment

40% Powder base / 60% Liquid Polymer

Pale pink

38% Powder base / 60% Liquid polymer / 2% Red tempura paint powder

Duck egg blue

37% Powder base / 60% Liquid Polymer / 1% Green tempura paint powder / 2% Blue tempura paint powder

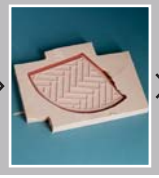
METHOD OF CONSTRUCTION

The method of construction in making the prototype will be the same for the production of the crockery.

MATERIAL SPECIFICATIONS

Wet density	1845 kg/m³
Dry density	1745 kg/m³
Initial set	15 – 20 minutes (18°C, No Retarder)
Expansion on set	0.15%

1. Positive is 3D printed
2. Silicone mold made from the positive
3. Jesmonite casted

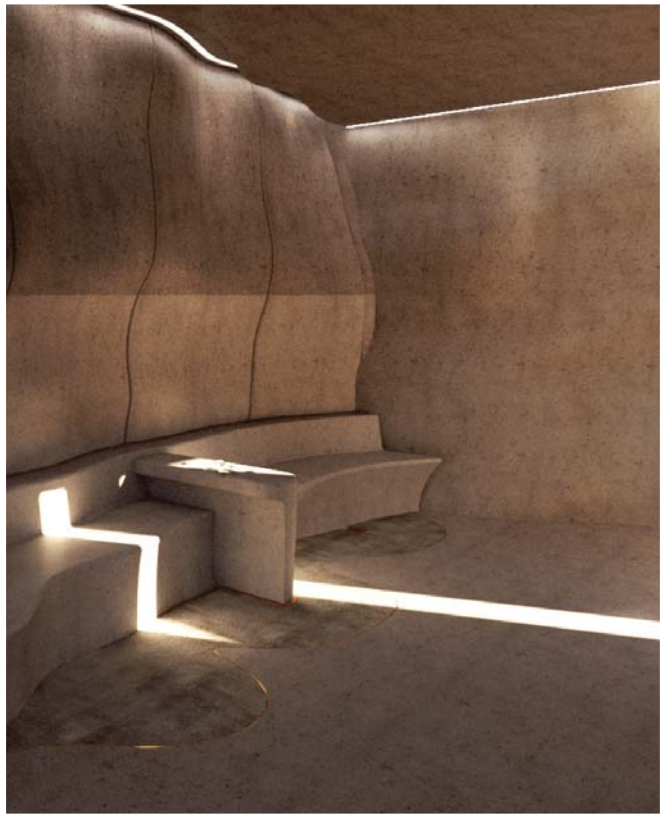


LIGHT

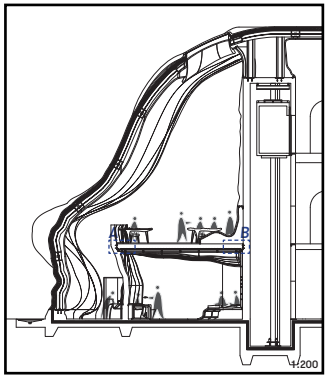
Since the antipasti dining room is the first point of entrance in most cases, it acts as a threshold between the outside and the restaurant. The space has a cavernous atmosphere, a contrasting shift from the external surroundings. Strip lighting will be hidden on the edge of the ceiling slab, to highlight the volumnous forms of the wall. The two doorways - located on either side of the room - are indicated by the lightspill.

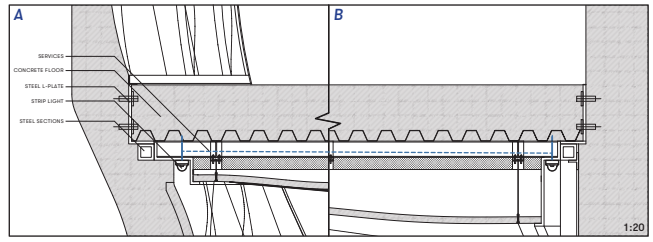
PRECEDENTS: House of Stone. John Pawson.

The house was made entirely from recycled material made from a stone residue formulated by market leaders Salvatori, consisting of 90% stone scrap and just 1% natural resin to act as a bonding agent. Central to the installation layout was the strikingly innovative linear MoMo LED lighting product by KKDC. Slits on the edges and the central section of the construction allowed light in the walls protect, while the cracks breakdown the sense of intimacy and closure as well as providing a source of illumination. At night the linear MoMo LED lights inside the house turned these cuts into brilliant beams.



LIGHTING FIXTURES





3.0
BUILDING PERFORMANCE

The Primo Dining Room

This section investigates the experience and environmental quality of the Primo dining room; the contributing factors focusing mainly on the light and methods of temperature control. In line with the project's ethos of sustainable food, the energy consumption of the building in contruction and use is also an important exploration.

The Primo Dining Room

ENERGY STRATEGY

Food service, inpatient health care (hospitals), and food sales buildings are the most intensive users of total energy among the building types. Food service buildings tend to be small but use relatively large amounts of energy for cooking and refrigeration. The food sales category, which includes convenience stores, is also composed of many small buildings that are often operated for long hours and use a lot of refrigeration.

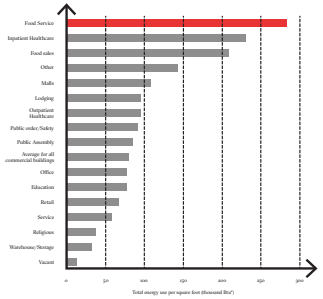
According to the CIBSE Guide F Energy, a (good practice) restaurant uses 1300 kWh/cover. At maximum capacity, the restaurant (excluding cafe and patisserie) has a cover of 100 - divided between 4 dining rooms. This means that during peak hours, 130000 kW is required an hour.

ENERGY REDUCTION

- An efficient kitchen design can contribute to reduction in energy consumption. By organising all the hobs in one space, a more efficient layout of extraction can be used.

- The kitchen size should be appropriate for the cover to avoid over consumption and wasted energy

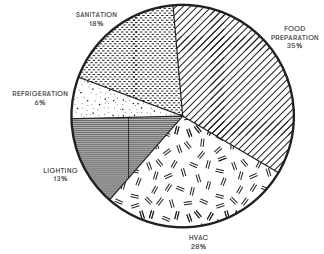
- High quality equipment which is more efficient



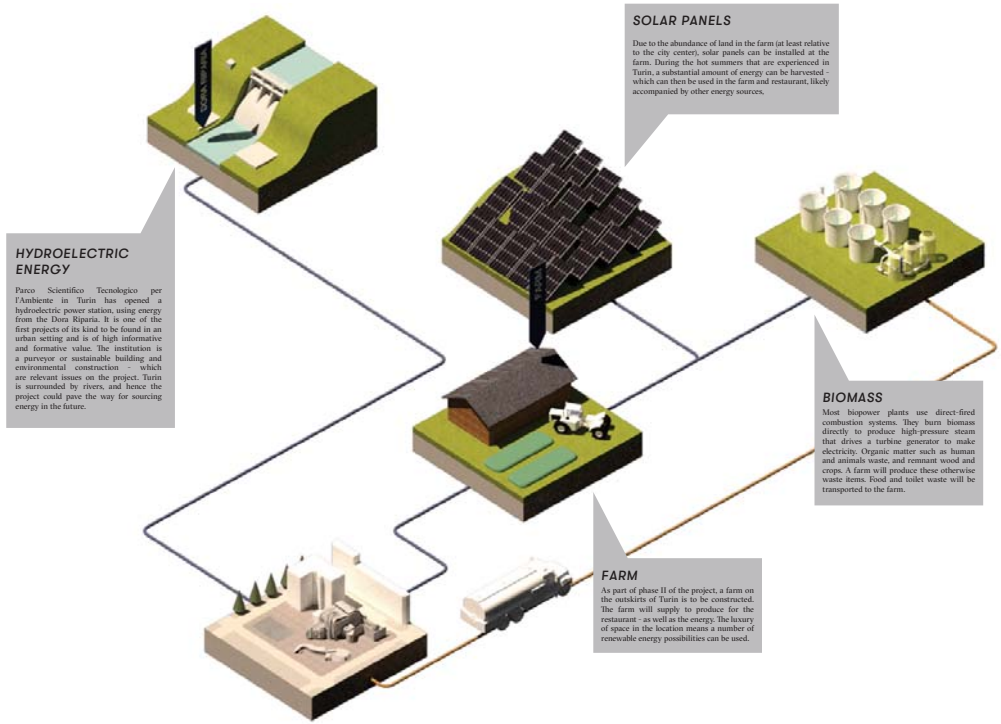
Energy use by type of commercial buildings*
(British Thermal Units**)

* Information is based on commercial buildings in US, in 2012. Figures are used as an indication of energy use. *Source: US Energy Information Administration*, May 2016.

* A traditional unit of heat; it is defined as the amount of heat required to raise the temperature of one pound of water by one degree Fahrenheit



Average energy consumption outputs of full-service restaurant
(British Thermal Units**)



HYDROELECTRIC ENERGY

Parco Scientifico Tecnologico per l'Ambiente in Turin has opened a hydroelectric power station, using energy from the Dora Riparia. It is one of the first projects of its kind to be found in an urban setting and is of high informative and formative value. The institution is a purveyor or sustainable building and environmental construction - which are relevant issues on the project. Turin is surrounded by rivers, and hence the project could pave the way for sourcing energy in the future.

SOLAR PANELS

Due to the abundance of land in the farm (at least relative to the city center), solar panels can be installed at the farm. During the hot summers that are experienced in Turin, a substantial amount of energy can be harvested - which can then be used in the farm and restaurant, likely accompanied by other energy sources,

BIOMASS

Most biopower plants use direct-fired combustion systems. They burn biomass directly to produce high-pressure steam that drives a turbine generator to make electricity. Organic matter such as human and animals waste, and remnant wood and crops. A farm will produce these otherwise waste items. Food and toilet waste will be transported to the farm.

FARM

As part of phase II of the project, a farm on the outskirts of Turin is to be constructed. The farm will supply to produce for the restaurant - as well as the energy. The luxury of space in the location means a number of renewable energy possibilities can be used.

SUSTAINABILITY

SUSTAINABLE AGRICULTURE

Terms such as 'sustainable' are often misused in the food industry as trigger words to suggest organic and local produce - wellness as a whole - regardless of how sustainable the produce truly is. In recent history, the approach to food production has surrounded profit margins and corners that are constantly cut to offer the cheapest food produce to consumers. In the past 50 years, the average price of a new house has increased by 1500%, new cars 1400% - where the price of milk has only increased by 350%, and the price of eggs and chicken meat hasn't even doubled. Taking inflation into account and negating externalised costs, the price of meat costs less today than any time in history *(Source: Jonathan Safran Foer - Eating Animals)*. Statistics such as above raise the question of sustainability in the food industry; it is important to acknowledge these issues in the running of the restaurant through to the construction and maintenance of the building itself. It is an issue that affects both the agricultural and architectural industry.

In simplest terms, sustainable agriculture is the production of food, fiber, or other plant or animal products using farming techniques that protect the environment, public health, human communities, and animal welfare. This form of agriculture enables us to produce healthful food without compromising future generations' ability to do the same.

SUSTAINABLE ARCHITECTURE

Sustainable architecture is architecture that seeks to minimise the negative environmental impact of buildings by efficiency and moderation in the use of materials, energy, and development space and the ecosystem at large. Sustainable architecture uses a conscious approach to energy and ecological conservation in the design of the built environment. Energy efficiency over the entire life cycle of a building is the most important goal of sustainable architecture. Architects use many different passive and active techniques to reduce the energy needs of buildings and increase their ability to capture or generate their own energy. One of the keys to exploit local environmental resources and influence energy-related factors such as daylight, solar heat gains and ventilation is the use of site analysis.

CASE STUDY.
THE PERENNIAL, SAN FRANCISCO

The Perennial calls itself a "laboratory of environmentalism." It tackles the issue of sustainability in innovative ways. Each ingredient on the menu is carefully sourced. Normally known for its large carbon footprint, beef will come from ranches using a new process called "carbon farming" that uses cattle to actually increase carbon storage in the soil. Bread will be made with a perennial grain called Kernza, which has been naturally bred by researchers to store more carbon than something like wheat.

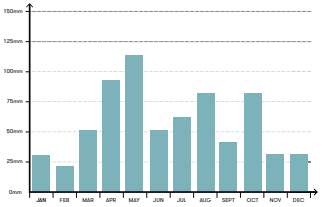
DRAINAGE SYSTEM

An environmentally conscious water strategy is vital, fitting with the sustainable ethos of the restaurant. Rainwater will be collect when and where possible, with the curving geometry channelling the rainwater to an underground water storage system.

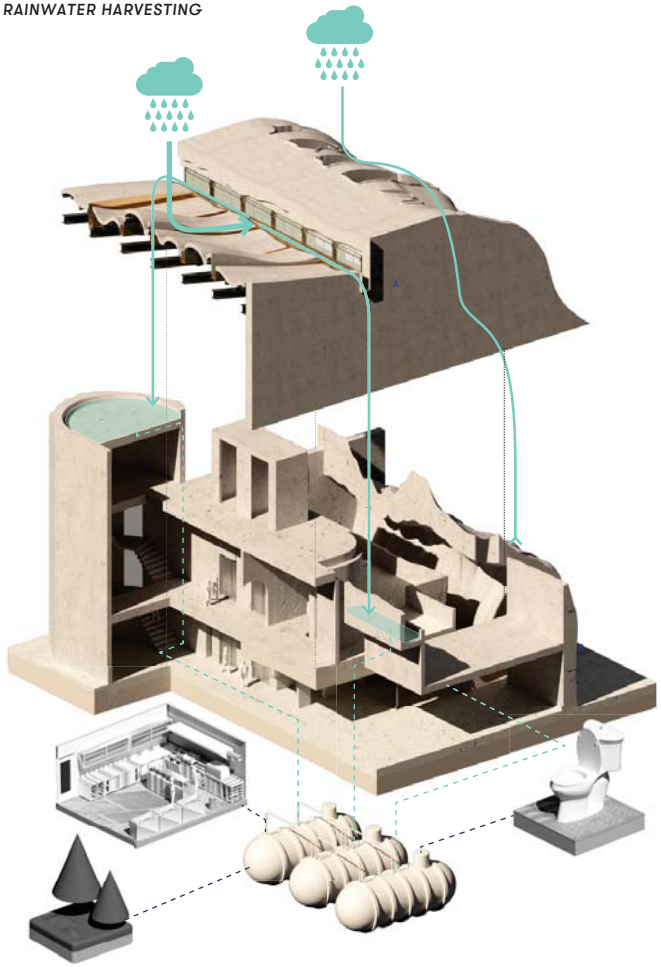
The harvested rainwater can then be used for agriculture, flushing toilets, and cleaning. The rainwater should be filtered before use since it is a restaurant, where cleanliness is important. Regular maintenance checks should be carried out to ensure functioning and cleanliness.

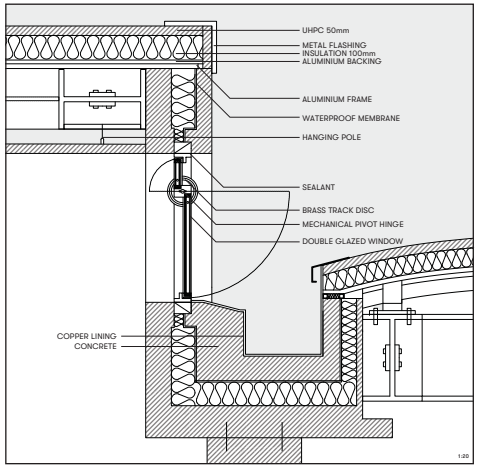
ANNUAL AVERAGE RAINFALL

Rain falls mostly during spring and autumn; during the hottest months, otherwise, rains are less frequent but heavier (thunderstorms are frequent). During the winter and autumn months banks of fog, which are sometimes very thick, form in the plains but rarely on the city because of its location at the end of the Susa Valley. Its position on the east side of the Alps makes the weather drier than on the west side because of the föhn wind effect.



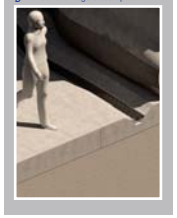
RAINWATER HARVESTING



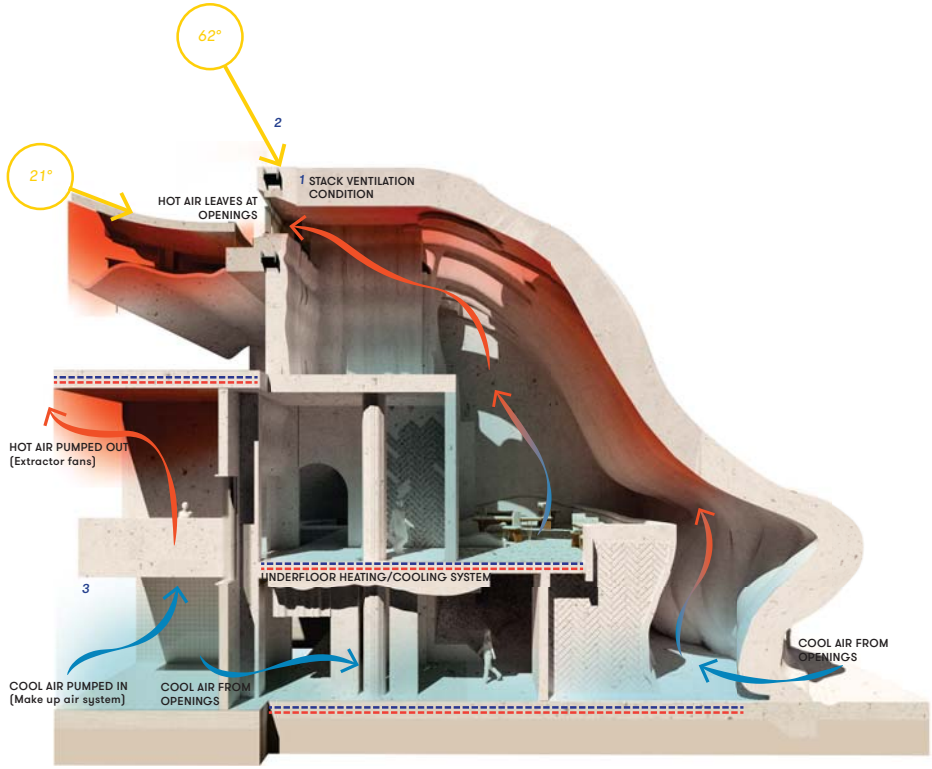


A Cast ground drainage close up

B Roof drainage close up



ENVIRONMENTAL STRATEGY



1

VENTILATION

Since there are potentially large gatherings of people in the restaurant cooling strategies are important, particularly during the summer, where the temperatures in Turin can reach 28C. Due to the high ceiling in the primo dining room, hot air can get trapped at the ceiling, creating an unpleasant dining environment. Mechanically controlled pivot windows will allow the heat to escape; with cool air coming in from the ground level openings, a stack ventilation condition is created, allowing the space to be naturally ventilated. During peak of summer, where natural ventilation may not be sufficient, a underfloor heating/cooling system can be used. In the winter, the underfloor heating system can be used - this will also create a stack ventilation effect.

2

SOLAR GAIN

In July, the average percentage of sunshine during the day can is 60%, and the lowest percentage at 18% during November. During the summer season, due to the thermal mass of UHPC, it is possible to heat the building in part during the evenings.

3

UNDERFLOOR HEATING/COOLING SYSTEM

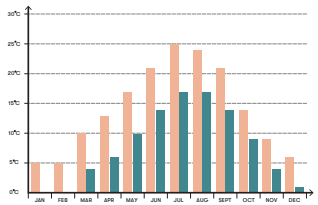
Mechanically assisted ventilation will be used to control temperature in dining areas where there are fewer windows. Cool air will be pumped through the floor and hot air removed through a ventilation unit.

3

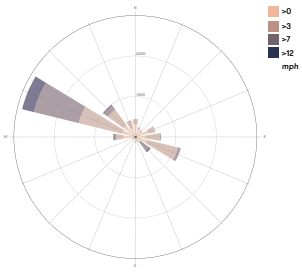
KITCHEN

The kitchen will require mechanically assisted environmental controls; because of the activities that happen inside, a lot of heat and fumes are produced, which need to be extracted. Extractor canopies are installed over the hobs which draw the hot air and majority of smells outside of the building. Since the kitchen is in an atrium-like space, mechanically-operated openings are located on the roof to allow hot air to escape when necessary. Additional vents will also be located within the kitchen space for extraction. Glazing in the kitchen area will also need to be carefully planned to avoid over heating.

ANNUAL HIGH/LOW TEMPERATURES

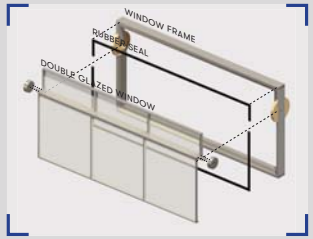


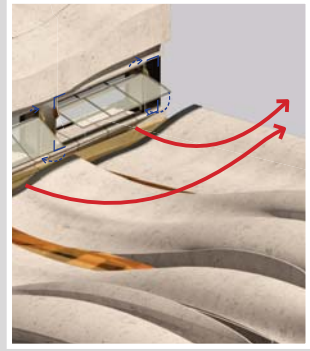
PREVAILING WIND



Turin is located on the humid subtropical climate zone (Köppen climate classification Cfa) in contrast to the Mediterranean climate characteristic of the coast of Italy. Winters are moderately cold but dry, summers are mild in the hills and quite hot in the plains.

1 MECHANICAL PIVOT WINDOWS





THE INGREDIENTS

The first course is called primo platto. Usually, the primo platto is made up of a dish made up of grain such as pasta, risotto gnocchi or polenta. The transition between this and the previous course is a play with light - as the visitor ascends, they enter a small enclosed interstitial space, which is small and dim. This is to exaggerate the sweeping facade in the Primo Dining room. The height of the ceiling is a vast contrast from the previous cavernous space, with lumieres which open the facade to the sky. This space focuses on lighting; how it interacts with the space and the food and the effects of light during different times of the day.

Butternut Squash & Sage Agnolotti

Pasta pockets filled with creamy butternut squash, with fried sage and burnt butter sauce

Cooking Time: 90mins

Ingredients

Basic Pasta Recipe:
1 1/2 cups all purpose flour
2 whole eggs
3 egg yolks
1 tablespoon olive oil

Butternut Squash Filling:
5 cups butternut squash, peeled and cubed (loosely fills cookie sheet)
4-6 cloves garlic, peeled
2 Shallots
2-3 tablespoons olive oil (give or take)
10 whole sage leaves (added the last ten minutes of cooking)
2/3 cup of roasted pine nuts
1 1/2 cups parmesan cheese, freshly grated (separated)
Sea salt, pepper, to taste
Chilli (optional)

Browned Butter with Sage:
1 stick butter
6 sage leaves, chopped

Method

Pasta:
1. Put 1 ½ cups flour in a large bowl, make a well in the center, add the eggs and oil.

2. Combine ingredients using your hands.

3. Knead until dough is smooth and feels like firm play-dough, usually 8 minutes or so.

The Filling:
1. Preheat oven to 200C degrees.

2. Place peeled and cubed squash, shallots and garlic on a rimmed cookie sheet lined with parchment paper. Drizzle with olive oil, sprinkle with sea salt and pepper, toss.

3. Roast at 400 degrees for about 50 minutes but set timer for 40 minutes, adding 10 sage leaves to pan for the last ten minutes of cooking.

4. When squash is done cooking remove from oven. Allow to cool for a few minutes.

5. Place all the ingredients on the sheet pan, 1/3 cup pine nuts, and 3/4 cup cheese in food processor and mix to a thick paste.

6. Place a large stock pot filled with water and 1 Tablespoon salt to boil

7. Place filling into pasta sheets and roll into agnolotti shapes

8. Place one stick butter into a small pan on medium heat, butter will melt, then begin to bubble up. After 4-5 minutes the center will erupt in a caramel color. The butter is now browned. Immediately turn off heat and add chopped sage leaves.

9. Gently place raviolis in boiling water. Cook for three minutes.

10. Gently strain in colander, do not rinse.

11. Place raviolis in large bowl, pour browned butter over ravioli, sprinkle with sea salt and garnish with remaining pine nuts and Parmesan cheese. Toss. Serve.

Ingredients

Cutlery
Dimpled and crinkled spoons

Crockery
Cast glass forms

Cover
26

Waiting Staff
4

Light
600-700 lux

Acoustics
80 decibels

Furniture
Informal seating arrangements that peel off the interior wall. Some form of tables

Colour Palette
Light terrazzo, with terracotta coloured chips

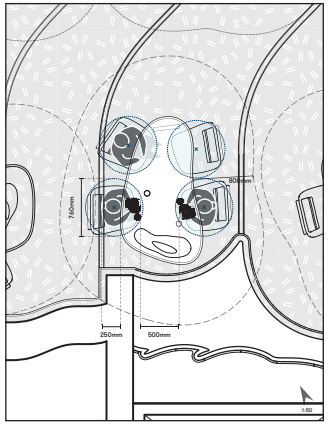
Temperature
23C

Materiality
Glass and Terrazzo

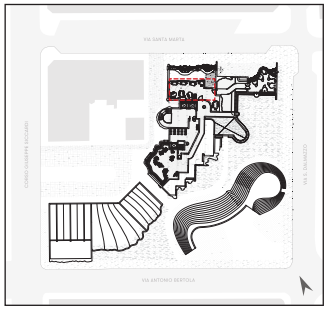
COLOUR PALETTE

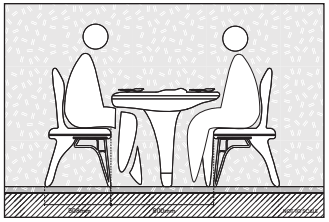
THE CHOREOGRAPHY

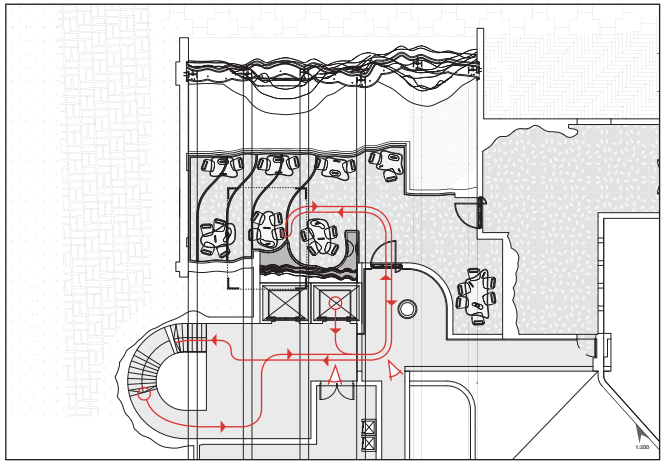
As the visitors ascend, and head towards the primo dining room, they catch glimpses of the kitchen below - exposed to the sounds and smells, as well as other back of house facilities. These moments are constantly revealed, like a stage set. The dining room is the stage, and the light acts as a means of creating drama during the dining experience. Diners are seated at a comfortable proximity from each other (760mm minimum) and there is 800mm between the tables for moving space.



LOCATION

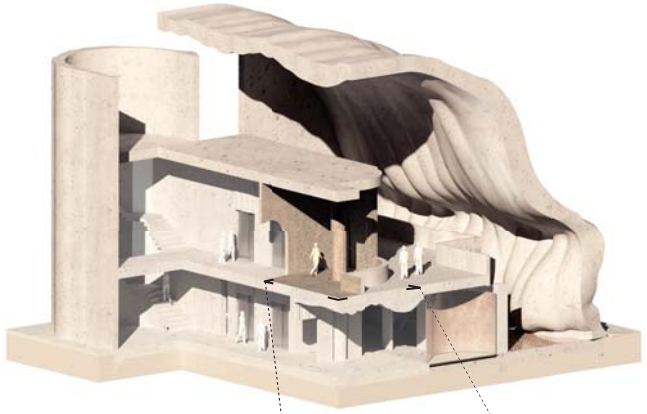


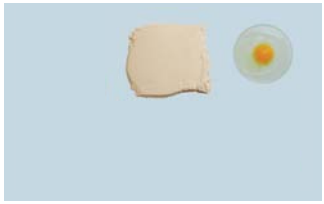




THE ENTRANCE

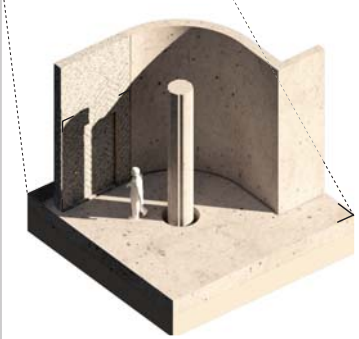
The interstitial space between entering the dining room is small and cosy, a domestic scale space. There is an ironic ionic column, which punctures through the ground, glimpses of the floor below are seen: the thoroughfare of people and food. This space is designed to emphasise the shift in scale: in the Primo dining room, the vastness of the geometry is fully experienced. It is about the curving facade as a whole: the form is exaggerated by the lumieres. The door handle is a domestic touch to the space, its forms inspired by the process of pasta making: the pleats and folds.

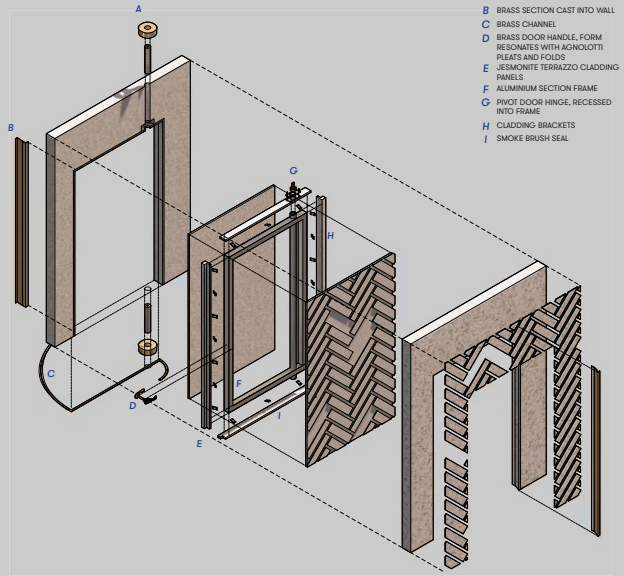




PIVOT DOOR DETAIL

The pivot door is camouflaged as part of the wall , with a continuous chevron tiling (as seen previously in the antipasti dining room). The detailing on the door handle is designed to be tactile and resonates the folding and stirring processes of making pasta and risotto. Using subtle haptic cues, anticipation of the meal is built up.



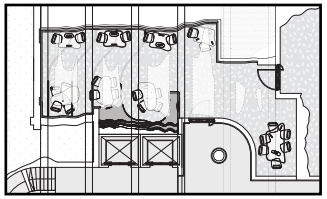


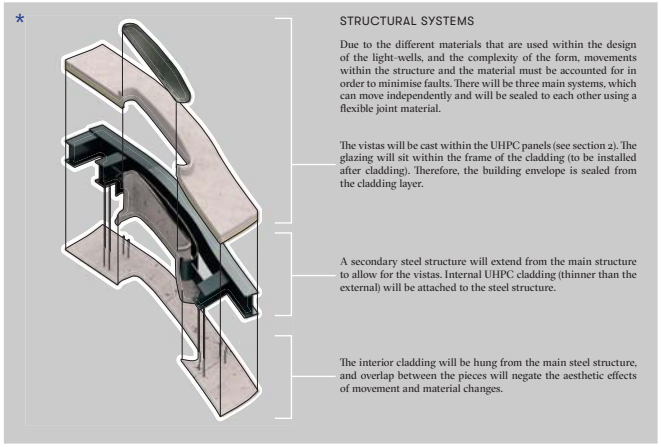
LUMIERES

The shape of the lumieres are derived from the 3d scanning process during which the clay extrusions are digitised. During this process, due to the limitations of the technology, parts of the geometry is lost when a surface undercuts another. In a serendipitous way, it reconfigures the geometry into delicate objects, almost spine like.

3D SCAN OF EXTRUSION

PLAN LAYOUT OF LUMIERES





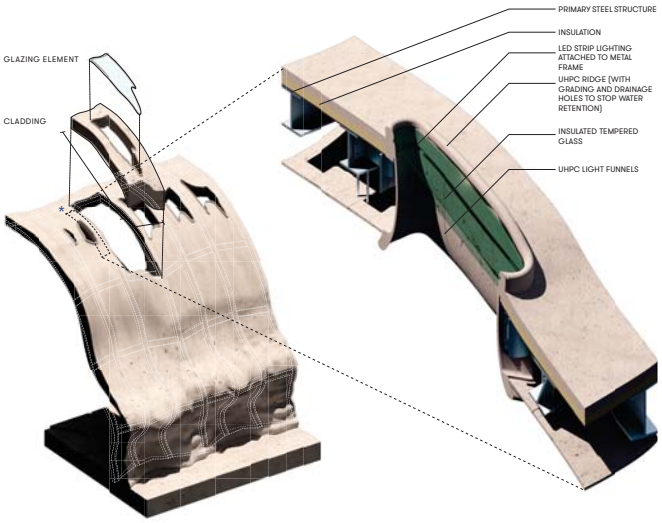
STRUCTURAL SYSTEMS

Due to the different materials that are used within the design of the light-wells, and the complexity of the form, movements within the structure and the material must be accounted for in order to minimise faults. There will be three main systems, which can move independently and will be sealed to each other using a flexible joint material.

The vistas will be cast within the UHPC panels (see section 2). The glazing will sit within the frame of the cladding (to be installed after cladding). Therefore, the building envelope is sealed from the cladding layer.

A secondary steel structure will extend from the main structure to allow for the vistas. Internal UHPC cladding (thinner than the external) will be attached to the steel structure.

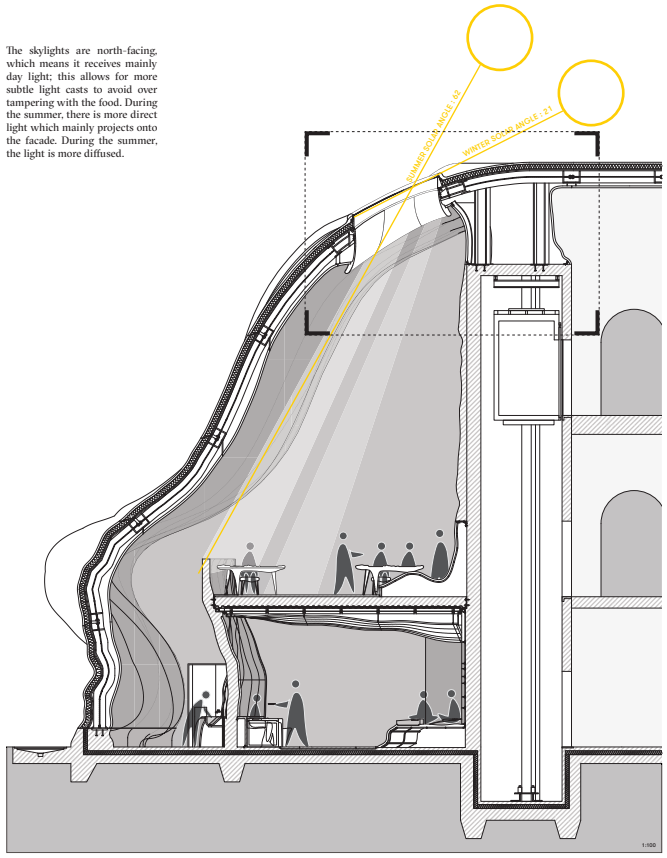
The interior cladding will be hung from the main steel structure, and overlap between the pieces will negate the aesthetic effects of movement and material changes.

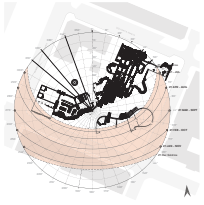


DAYTIME LIGHT STUDIES

There are changes in the lighting conditions during the day and night, and winter and summer seasons. It is important is evaluate how the position of the sun affects the experience of the dining room. In accordance with these findings, the seasonal menus will include food that reacts better with direct, contrasted light during the summer and with a more subtle diffused light in the winter.

The skylights are north-facing, which means it receives mainly day light; this allows for more subtle light casts to avoid over tampering with the food. During the summer, there is more direct light which mainly projects onto the facade. During the summer, the light is more diffused.



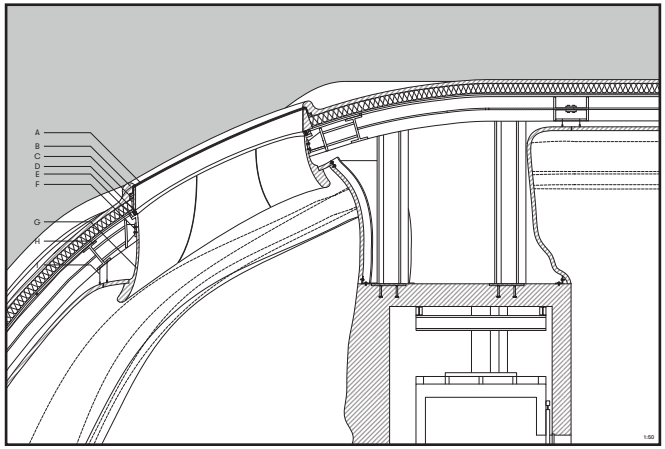


SUN PATH

The skylights are slanted in the North-East direction, therefore, direct sunlight is prevalent in the during summer, whereas there is a more diffused lighting condition during winter. The buildings around the site seldom surpass 14m, therefore there is currently no concern of excess shading on the site.

The lumieres themselves are restricted in size by the steel structure and panel size (also logistical implications). This also helps to avoid overheating of the dining space.

A INSULATED TEMPERED GLASS
B UHPC RIDGE (WITH GRADING AND DRAINAGE HOLES TO STOP WATER RETENTION)
C INSULATION
D LED STRIP LIGHTING ATTACHED TO METAL FRAME
E ALUMINIUM SECTION (UHPC PANEL)
F SECONDARY STEEL FRAME
G UHPC LIGHT FUNNELS
H PRIMARY STEEL STRUCTURE
I HANGING POLE FOR INTERIOR PANELS



FURNITURE

The form of the furniture resonates the geometry of the lumieres, and the materiality is the same as the terrazzo floor. They are forms that have been carved out of the floor surface, creating a terrazzo landscape, which is fragmented in parts by the carved wooden table and chair legs.

The ground terrazzo is divided by brass inlays, which mimic the movement of the spotlights throughout the day.

EVENING STRATEGY

LED strip lights are installed within the lumieres for the evening. The strength of the light is adjustable so the chef has control over the method in which his dish is lit. The lights can also be implemented to support the natural light during darker days.

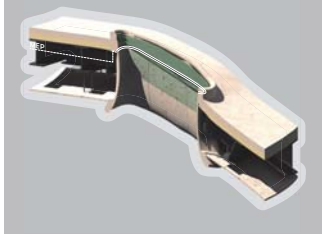
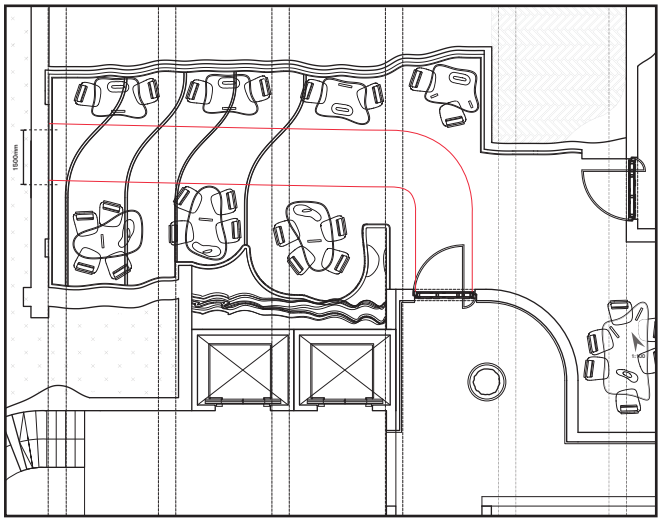
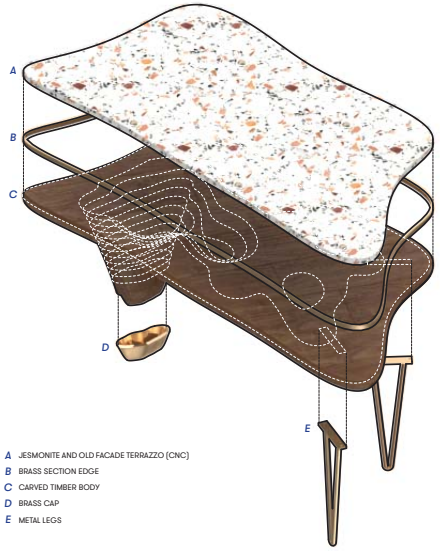
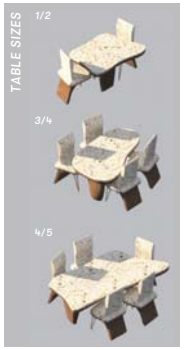


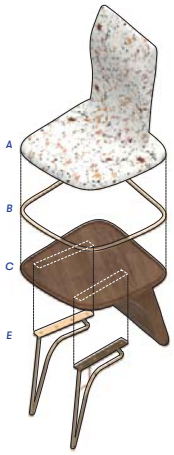
TABLE LAYOUT





A JESMONITE AND OLD FACADE TERRAZZO (CNC)
B BRASS SECTION EDGE
C CARVED TIMBER BODY
D BRASS CAP
E METAL LEGS





MATERIALITY

The materials used in the project resonate with the architectural aesthetic in Turin, since the form is unconventional, a familiar material language is necessary to create a congruous link with the rest of the city. The material process is also an important part of the project methodology: it is about using old processes and re-appropriating them with technological advances, much like the approach to food culture that the project is trying to encourage. It is a marriage of old and new. Local craftsmen will collaborate with technical advisors and makers to innovate an old craft. A history is encompassed in the way the building is made along with the materiality itself.

It is also important to consider the environmental impact of the materials and construction process. Since the restaurant is about promoting a sustainable ethos to food, it should also be reflected in the materials and processes involved. By using local craft and trade where possible, the project is helping preserve artisanal craft which may be at risk of being lost.

TEXTURAL TESTS

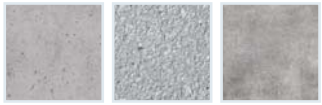
Testing clay as a mold: this creates a feedback loop of clay extrusions, which are scanned and then printed and embossed into the clay. Clay provides a highly detailed textural surface for the plaster. The pigment from the clay is also transferred onto the cast - if removed after the plaster has cured for 24 hours, less pigment is transferred.

UHPC/CONCRETE

Ultra-High Performance Concrete (UHPC), also known as reactive powder concrete (RPC), is a high-strength, ductile material formulated by combining portland cement, silica fume, quartz flour, fine silica sand, high-range water reducer, water, and steel or organic fibers. With the external facade, steel fibres will be used for its structural quality. Whereas the internal cladding panels will use polymer fibres. In comparison to conventional concrete, UHPC is superior in strength and durability and can also be finished in the same way. Its weighs significantly less, which is important in reducing the density of the steel structure required.

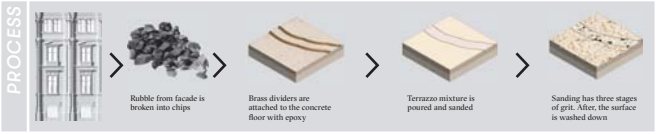
ENVIRONMENTAL IMPACT

In the European Union about 40% of total energy consumption is attributed to the building and construction sector. This highlights to importance of sustainability in the building industry. The cement industry contributes around 5% of global CO_2 emissions, this is due to the high temperatures required to produce cement. A means of reducing the environmental of cement production is to use alternative renewable energy sources. Since UHPC is a reasonably new material, there is ongoing research into how its environmental impact can be reduced. Since much less UHPC is required, compared to conventional concrete, it carbon footprint is small relatively. Another main avenue of investigation is the substitution of cement in the UHPC mixture. At the Royal Institute of Technology in Stockholm, a research project looked at using quartz filler material in place of cement for >30% of the mixture weight. The mixture had similar workability and compressive strength. There is a number of such research projects globally investigating the ecological impact of this material, most of which shows promise in substituting cement with an alternative filler.



TERRAZZO

Terrazzo is a composite material, poured in place or pre-cast, which is used for floor and wall treatments. It consists of chips of marble, quartz, granite, glass, or other suitable material, poured with a cementitious binder (for chemical binding), polymeric (for physical binding), or a combination of both. After it is cured it is ground and polished smooth or otherwise finished to produce a uniformly textured surface.



ENVIRONMENTAL IMPACT

Although the history of terrazzo can be traced back to the ancient mosaics of Egypt, its predecessors come from Italy. The form of terrazzo used today derives partly from the 18th century pavimento alla Veneziana (Venetian pavement) and the cheaper seminato. It was created by venetian workers utilising the waste chips from slab marble processing. The origins of the material is based on a recycling ethos.

For the restaurant, the terrazzo will be made using recycled materials. Such as the old facade that inhabited the site: the parts of the building will be crushed and re-appropriated as new decorative parts of the building. The food industry as a whole is notorious for its waste, parts of the food process that can be recycled will be used in the making of new parts of the building (such as glass bottles). As per the precedents, technological advances are being incorporated into the process. Such duality of old and new is parallel to the food evolution towards a more vegetarian food culture.

TERRAZZO TESTS

Testing carving terrazzo using plaster as prototype. The plaster is coloured using tempera paint powder, once set it is broken into chips and recast into shapes. The chips are revealed when the surface is sanded

PRECEDENT: Oesterplat by Marjolein Stappers

Oysters are increasingly popular as a delicacy, but they are also cultivated for being excellent natural water filters. Marjolein Stappers investigated yet another interesting feature of these versatile creatures. Struck by the beauty of their shells after savouring them at a restaurant, and noticing how they were thrown away as garbage, she came up with the idea for Oesterplat. She started to collect the empty shells from restaurants and found a way to turn them into something more durable. The result is an elegant tile collection made of concrete, marble and... oyster shells, showing their mother-of-pearl shine as newborn fossils.

PRECEDENT: Aectual

Aectual uses huge robotic 3D printers to create the framework for its sustainable floors, which it infills with terrazzo.

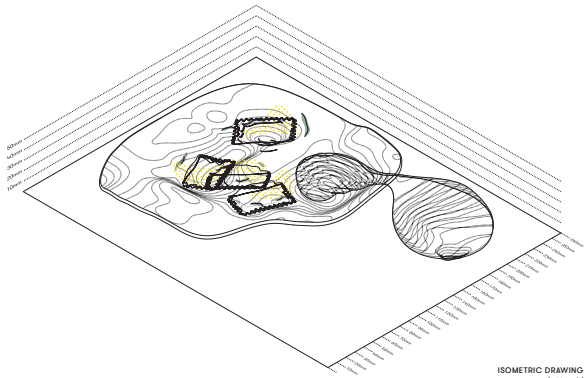
The process involves printing out the desired pattern using a robot with six degrees of freedom. Once the printing is complete, the framework is transported to its final destination. This mould, which measures just a few centimetres high, is then infilled with a terrazzo made from recycled granite or marble chips, and a bio-based binding agent.

CROCKERY AND CUTLERY

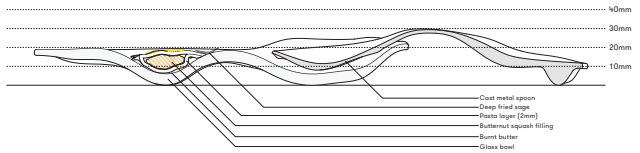
The cutlery and crockery is an important part of the dining ritual. It acts as the architecture on a micro scale. The crockery in the primo dining room is shaped for the agnolotti, with pockets to hold the butter sauce. The spoon is a fluid form which ergonomically fits the hand.

INITIAL SPOON PROTOTYPES

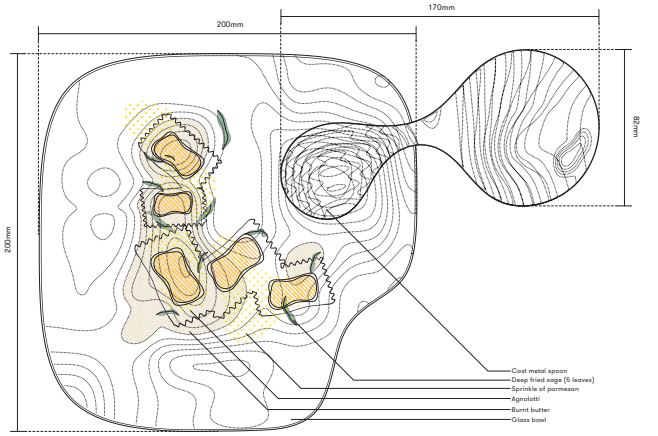
Using liquid silicone to investigate the surface texture of the spoon, a very intimate object in the dining experience. The forms that are produced from the silicone is a free frame of the messiness of eating. The underside of the spoon is important for haptic senses.



ISOMETRIC DRAWING
(not to scale)



1:2 SECTION



1:2 PLAN

AGNOLOTTI ANALYTICS

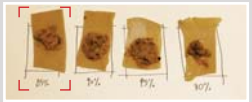
Alternative names	Plat d'angelot, angelotti, agnelotti, agnulot, langaroli, langheroli
Type	Ravioli
Region	Pietmont

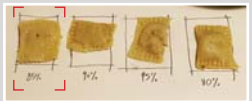
Although their primitive shape was semi-circular, traditionally agnolotti are of a square shape with sides of about 1 or 2 inches. However, they can also be of a smaller, rectangular shape when they are called agnolotti al plin. Plin means "a pinch," because one pinches with thumb and forefinger to seal the little pasta packets.

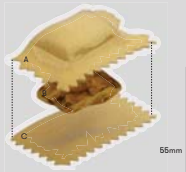
The amount of filling within each agnolotti is a specific science: it must be a delicate taste balance between the pasta and the filling, but is also affected by the cooking process. Too much filling and the structural integrity of the pasta layer is compromised.

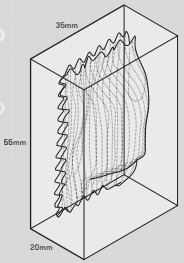
FILLING TEST

Testing how the ratio between filling and pasta affects the structural integrity of the agnolotti - pre and post boil. Blind tests show 85% is the most ideal ratio.









PROPERTIES
Pinched longitudinal profile
Hollow cross section
Smooth surface
Crenellated edges
Folded junction

A Top pasta layer (2mm)
B Butternut Squash filling
C Bottom pasta layer (2mm)

Median size of agnolotti (batch 3)

SHAPE TESTS

Using different utensils to seal the agnolotti - the "traditional" style recreated using the back of a fork. The rounder shapes create dense pockets of pasta which become undercooked.

CUTLERY PROTOTYPE

The cutlery is the most haptic element of the dining experience. It is something that is constantly being touched and moved. In the primo dining room, the cutlery and crockery are two pieces in delicate equilibrium of each other, there is intrinsic relationship between the two. The weight of the spoon is more than a conventional spoon, which acts as a constant reminder of the action of eating – something second nature it is often forgotten. The underside of the spoon is crinkle cut to stimulate the nerve endings on the tongue.

Detail of spoon underside

3d printed prototype

The 3d printed prototype was useful to assess how ergonomic it felt and how the action of eating would work with its shape. The protrusion on the base and dimple on the top fitted well with the hand. However, the spoon element was too thick to successfully retrieve edibles.

PRECEDENT: Sensoaesthetic Spoons

The purpose of the event was to study the taste of solid metals, and involved inviting a group of people including chef Heston Blumenthal and food science writer Harold McGee to eat Indian food using seven different freshly polished spoons in copper, gold, silver, tin, zinc, chrome and stainless steel. The tastes of copper and zinc were found to be "bold and assertive, with bitter, metallic tastes". The silver spoon "tasted dull", while the stainless steel had a "faintly metallic flavour".

CROCKERY PROTOTYPE 1

Through creating 1:1 prototypes of the crockery and cutlery, its ergonomic and haptic value can be tested. Whilst the process is not as it would be for the final product, it is useful to test the parallels between the processes. In this prototype, a 3d printed negative is used and glass wax is cast directly onto it. Due to the 3d printing process, the contours of the geometry are emphasised (see detail photograph).

3d printed negative mold

Surface details

Outcome

The outcome was not the expected. The glass was too brittle to be removed from the mold in one piece. The mold had also warped under the heat despite the melting point of the filament being 220C and the melting point of glass wax at 110C. However, the wax imprinted the contoured texture of the print.

CROCKERY PROTOTYPE 2

For the second prototype, I will be using a silicone mold from a positive 3d print of the plate. The result was more successful despite the uneven texture of the glass wax, the texture of the print was evident. However, the wax was not viscous enough to retain the contours on one side. Therefore, a two part mold is likely necessary for the next prototype

Silicone mold

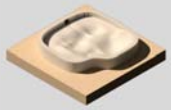
Surface details

Glass wax poured into mold

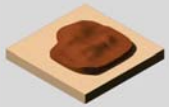
CROCKERY IN CONTEXT

LIGHTING CONDITIONS

SAND CASTING GLASS



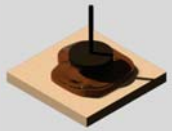
An adapted positive mold is created by whichever means (3d print/CNC/clay)



"Green" sand* is packed into the mold. Sand should also be damp.

*Green sand is a mixture of sand, bentonite clay, pulverized coal and water

Molten glass is heated and poured onto the mold in a circular motion to ensure coverage of mold

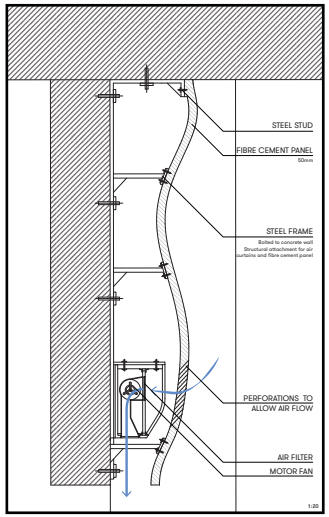


Mold is used to flatten the base

OLFACTORY CURATION

Smells are an important element in cooking, it contributes to the sense of taste but also heavily influences the process of cooking. It is a vivid memory trigger and possibly the most intangible sense of all. The restaurant intends on showcasing the activities behind the scene: the choreography of mess and chaos that is often hidden from the public. As part of the performance is the smell. By using doors with specific seals and air curtains, the chef is able to curate the smells that travel through to the dining room. With displeasing scents such as toilets, there is a outdoor courtyard which acts as a buffer zone between the toilet and the dining room. In the kitchen, grease is extracted using efficiently located extractors, whilst some smells are free to travel upwards when the air curtain is switched off. The control of the movement of smell is a means of allowing the chef to curate their dish.

A *AIR CURTAINS*

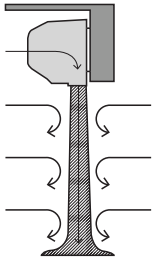


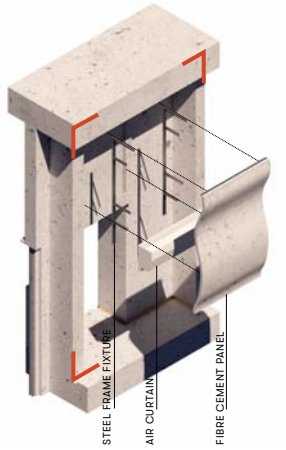
B *DOORS*

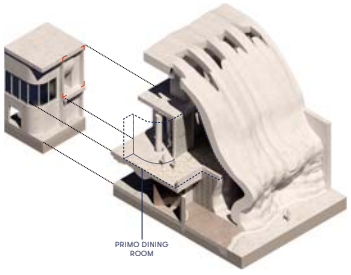
The outdoor smells will be controlled simply by the door; generally positive smells such as flowers or rain depending weather, it is not necessary to implement another means of olfactory control. This outdoor space also acts as a buffer zone between the dining area and the toilet.

AIR CURTAINS

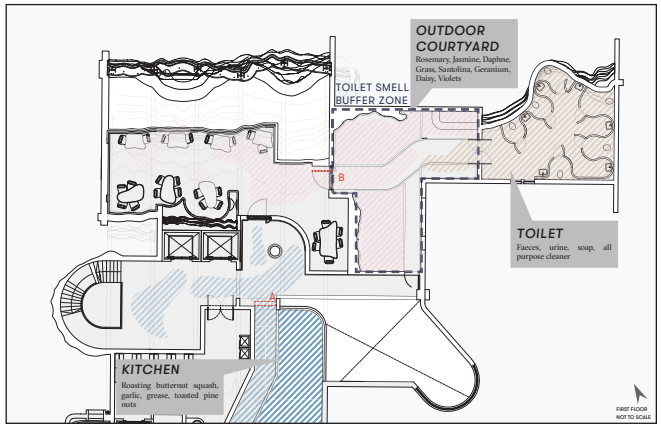
An air door or air curtain is a device used to prevent air or contaminants from moving from one open space to another. The most common use is a downward-facing blower fan mounted over an entrance to a building, or an opening between two spaces conditioned at different temperatures.







SMELL PLAN



4.0

ENTREPRENEURIALISM AND DELIVERY

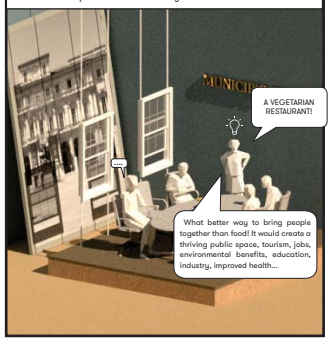
This section is a story about the project, told through the RIBA Stages of Work. The working relationship betwen all parties of the project and their relevant responsibilities will be explored, in such a collaborative project, how much autonomy does each party have? Along side the conventional risks of an architectural project, the client being the mayor of the city carries implications. Such a project is particularly vulnurable to the volatility of politics, and thus precautions must be considered.

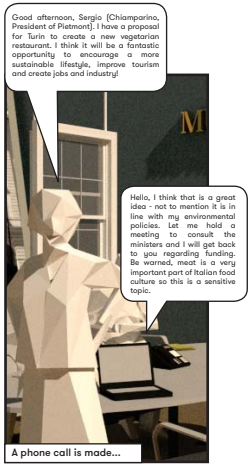
STAGE 0 Strategic Definition

The Politics of Pietmont

One morning, Chiara Appendino - the mayor of Turin - is having her coffee when she read an article...

Chiara feels the pressure after reading the article this morning and decides to hold an emergency meeting with her party about how to act on the policies in the manifesto. She feels strongly about the current environmental crisis and the effects of the overconsumption of meat. She has a light bulb moment.





ARCHITECTURE AS A POLITICAL TOOL

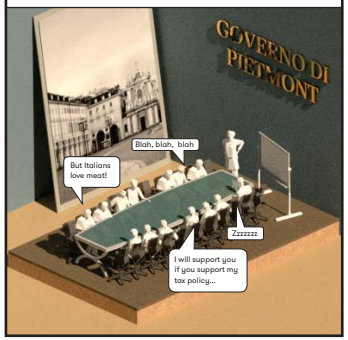
Turin is a presidential representative democracy, whereby the President of Regional Government is the head of government, and of a pluriform multi-party system. Executive power is exercised by the Regional Government. Legislative power is vested in both the government and the Regional Council. Turin has the highest population in Pietmont; hence, as the Mayor of Turin, Chiara Appendino has significant power within the government. The Five Star Movement is variously considered populist, and the five stars within the movement represents five key issues: public water, sustainable transport, sustainable development, right to Internet access, and environmentalism. Chiara Appendino was elected mayor in 2016, and as part of their manifesto was a proposal for Turin to become the world's first 'vegetarian city'. The manifesto states:

'The promotion of vegan (milk/egg-free) and vegetarian (meat-free) diets is a fundamental act in safeguarding our environment, the health of our citizens and the welfare of our animals... Leading medical, nutritional and political experts will help promote a culture of respect in our schools, teaching children how to eat well while protecting the earth and animal rights'

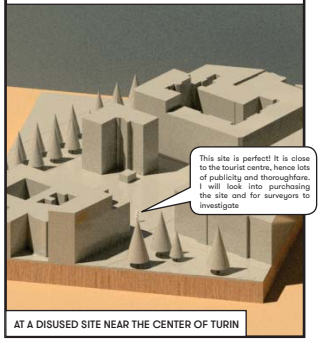
THE RESPONSIBILITY OF THE ARCHITECT

- Review site information: designing for the site
- Concept design
- Consultant co-ordination
- Review material testing
- Review colour tests
- Negotiate with various contractors
- Reviews with Chiara Appendino, Turin Council, and various design teams
- Preparing drawings and specifications
- Planning documents
- Public consultations
- Reworking and elaborating on the above
- Providing contractors with construction drawings and details

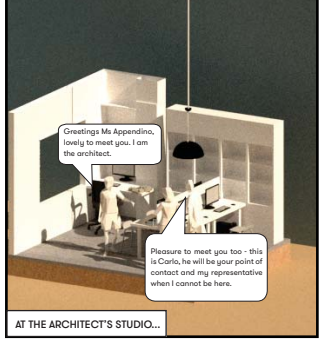
After approval from the president of Pietmont to progress, Chiara Appendino consults with the regional parties to discuss how best to go forward and address any concerns



After bartering and haggling, the brief is finally approved. A council member is placed in charge of the project so the responsibility is shared.

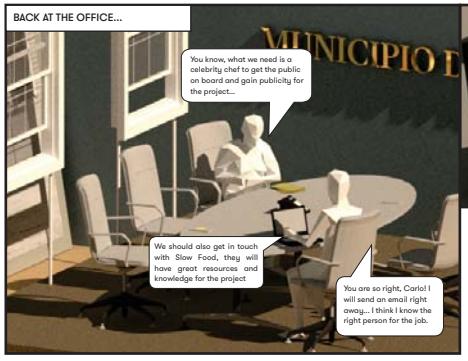


AT A DISUSED SITE NEAR THE CENTER OF TURIN

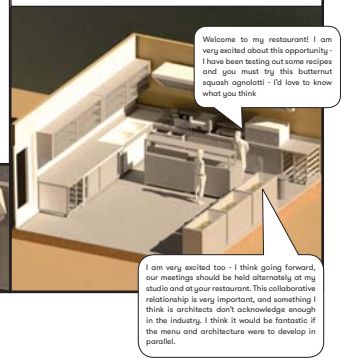


AT THE ARCHITECT'S STUDIO...

BACK AT THE OFFICE...



Architecture is an inherently collaborative process. It is particularly important in this project, which is an investigation of the relationship between food and architecture, the chef and the architect.

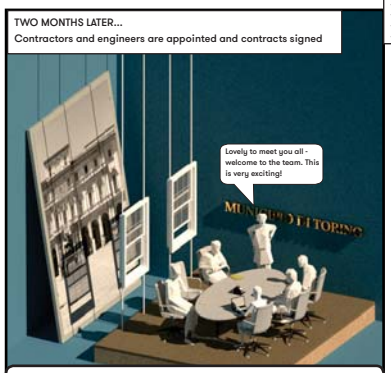


STAGE 1 Preparation and Brief

Mushrooms are Murder

DESIGN TEAM
- Architect
- Structural engineer
- Hydraulic engineer
- Electrical services engineer
- Planning consultant
- Lighting consultant
- Access consultant
- Geotechnical engineer
- Acoustic engineer

TWO MONTHS LATER...
Contractors and engineers are appointed and contracts signed

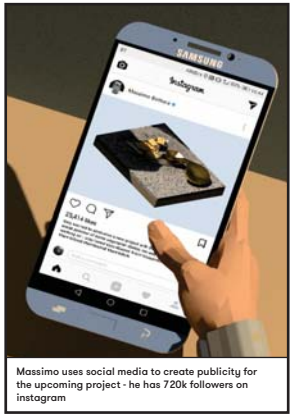


SPECIALIST CONTRACTORS

As the building is unique, with complex form and materiality, small tolerances and error margins, it is unlikely one contractor will have the required skills to carry out all of the works necessary to construct them. Therefore, with contacts from Chiara Appendino, the most experienced specialist contractors, craftsmen and professionals are employed to oversee particular elements of the work. A price is negotiated with the nominated trade contractors and sub-contractor, then appoints them for the work, overseen by the construction manager.

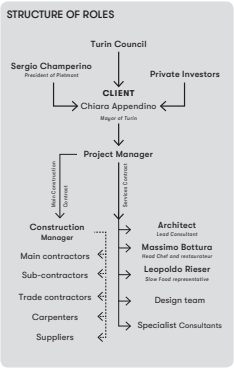
Structural Engineer: Such a large and complex form requires specific expertise. Carpenter: To build and work on CNC facility for bespoke pieces as well as furniture and smaller scale elements. UHPC/ Concrete specialists: for the complex forms. Kitchen Contractor: To advise on the practical design of the kitchen. Local craftsmen: to advise on processes (such as terrazzo) and how they can be used.

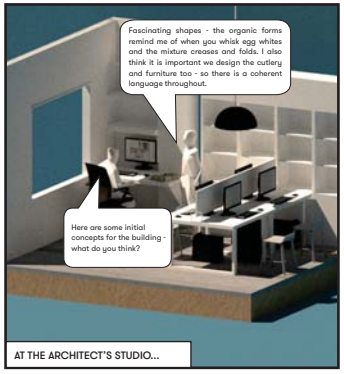
Surveyors are sent to the site to investigate any concerns or potential problems



Massimo uses social media to create publicity for the upcoming project - he has 720k followers on instagram

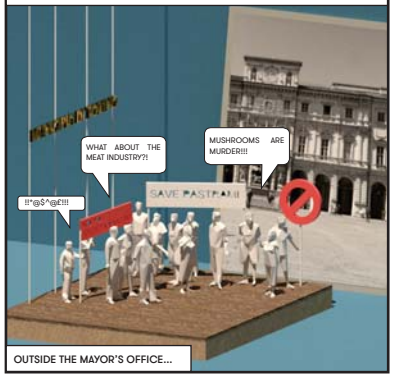
STRUCTURE OF ROLES





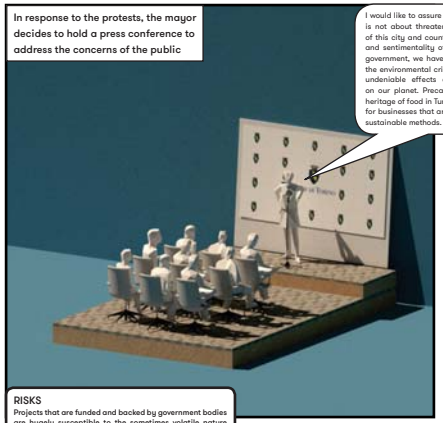
AT THE ARCHITECT'S STUDIO...

As the public catches wind of a potential vegetarian development in the city, a group of meat enthusiasts gather outside the mayor's office



OUTSIDE THE MAYOR'S OFFICE...

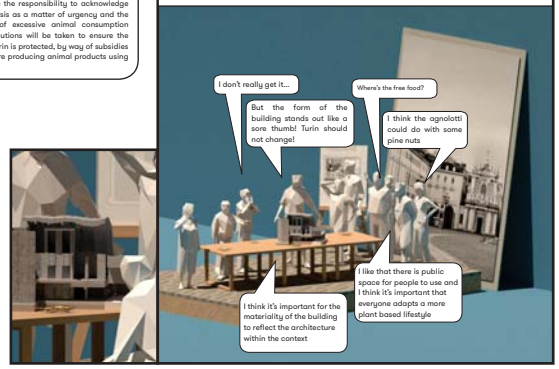
In response to the protests, the mayor decides to hold a press conference to address the concerns of the public

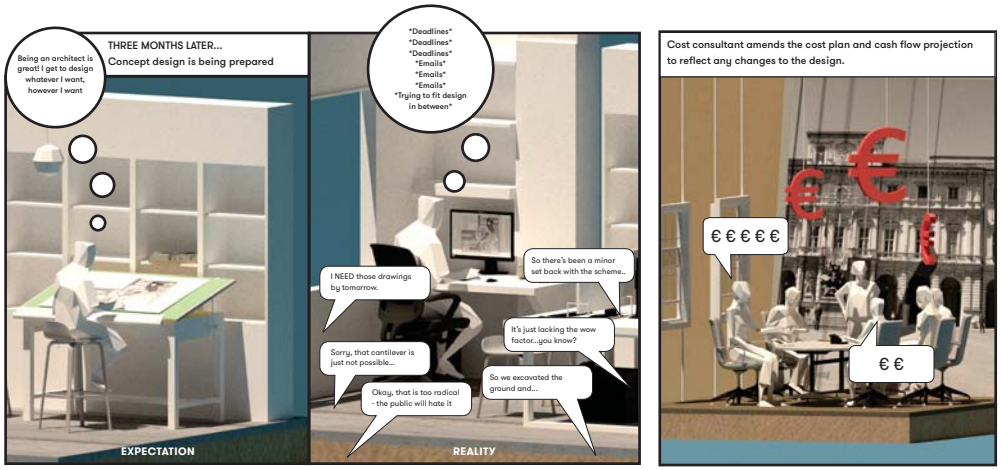


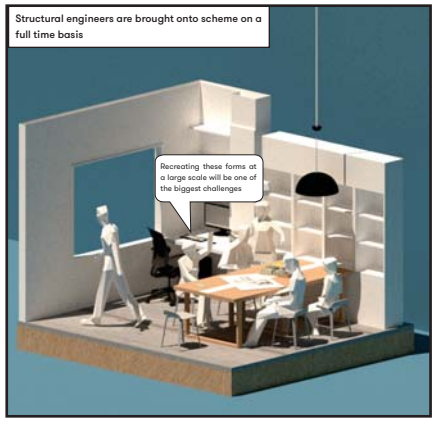
RISKS

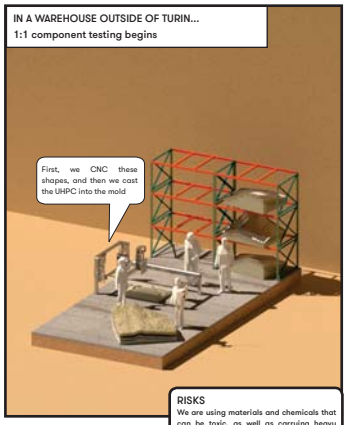
Projects that are funded and backed by government bodies are hugely susceptible to the sometimes volatile nature of politics and the scrutiny of the general public. Such projects are often used as ammunition against political opponents. As a precaution, an external committee will be formed to oversee the project and in the event of political changes, the project will be secure. The issues that are raised by the public must be handled with sensitivity and in a diplomatic manner.

At the town hall, a public consultation is held to discuss the project and gather opinions regarding the design and nature of the project. Butternut squash agnolotti is served at the meeting.



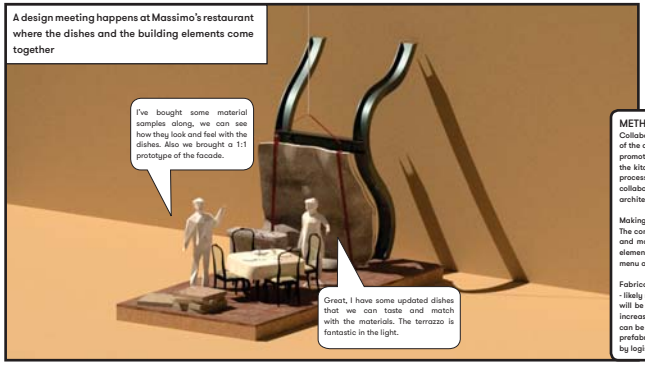






RISKS

We are using materials and chemicals that can be toxic, as well as carrying heavy loads. Masks must be worn when handling toxic materials and extra care should be taken when carrying heavy objects. Appropriate footwear should also be worn.

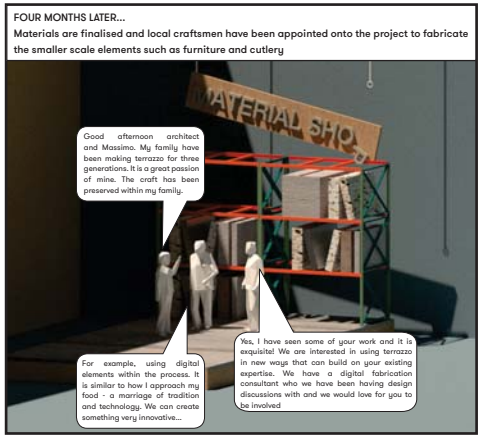


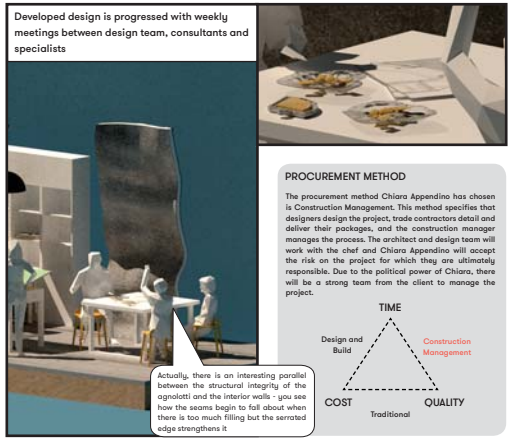
METHOD OF WORKING

Collaboration: The project investigates the relationship between architecture and food. The intention of the design project is to create new food rituals and subvert the conventions of dining - ultimately to promote a more plant based lifestyle. Therefore, the working relationship between the design team and the kitchen team is integral to the success of the project. Architecture is an inherently collaborative process, yet the relationship is often one-sided in practice. This project aims to fulfil the potentials of collaboration and dynamics of an architectural project: where the design of the food and design of the architecture is affected by all parties involved.

Making: The design process is driven by a succession of sketching, model making and material tests The complex geometry - that are derived from clay extrusions on a small scale - has various structural and material implications when scaled up. 1:1 prototypes will also be made of particularly niche elements throughout the design process, this ensures quality control and opportunities to evaluate the menu along side the building.

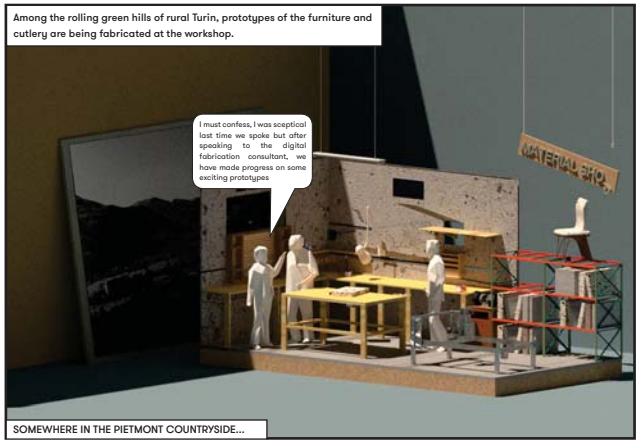
Fabrication: Due to the complex nature of the architecture, challenges will inevitably arise once on site - likely regarding tolerances and joints. In order to eliminate risk, the larger parts - such as the facade, will be re-measured and fabricated once the steel structure is erected. This method of working may increase construction time - but also means additional costs of incorrect panels and wasted materials can be avoided. This also allows for quality control. Elements that are smaller or free standing can be prefabricated off site and assembled on site: this has an effect on the size of the elements (restricted by logistical factors).

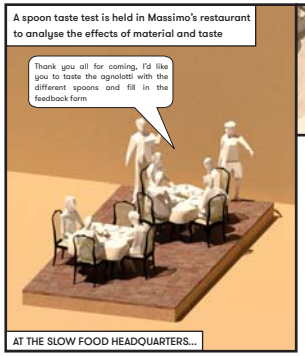




PROCUREMENT METHOD

The procurement method Chiara Appendino has chosen is Construction Management. This method specifies that designers design the project, trade contractors detail and deliver their packages, and the construction manager manages the process. The architect and design team will work with the chef and Chiara Appendino will accept the risk on the project for which they are ultimately responsible. Due to the political power of Chiara, there will be a strong team from the client to manage the project.





The results are in *drum roll*....

WINNER

GOLD

Emphasises the sweetness in the butternut squash

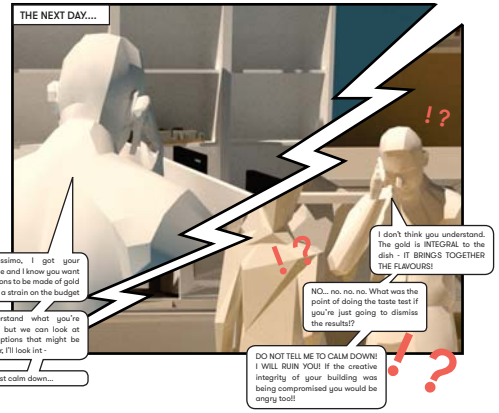
2

TIN

3

ZINC/COPPER

Too metallic



A few bruised egos, passive aggressive tweets and profanities later...

I'm sorry about the other day...We can compromise on the spoons. We can have a look at gold plated options

I'm sorry too, I understand how important the cutlery is to the dining experience

After peace is restored, 1:1 component pieces are built and the joints and tolerances are tested

Due to the complex geometry and tolerances of the material, I suggest we prefabricate these off site in a climate controlled warehouse.

The developed design document is completed and signed off by Chiara Appendino

STAGE 4 Technical Design

Prototyping Penne and Panels

FOUR MONTHS LATER
A set of details are developed from 1:1 testing with input from specialists. The construction manager is liaising with the contractors

The technical design is reviewed with the relevant engineers and consultants

I think this junction needs to be altered, we need to ensure that it is watertight

Construction manager liaises with the contractors

How is the steel frame coming along? We need them for my meeting with the contractors this afternoon

Visits to specialist trade contractors to assess samples, mock ups and tests so any alterations or changes can be done with ample time

Come see this terrazzo mix. I think we've nailed the ratio of aggregate to binding agent. We also did some tests to see how it was react in the weather.

IN THE WORKSHOP...

Great, my only concern is that the tone of the binding agent is a bit too...ivory white. I'm really looking for a more... you know when you have a polished limestone floor and it's an overcast day, but then there's this moment where the sun begins to creep along the surface? Yeah, I want the colour of that moment between the light and the shade.

EUREKA! We've cracked it! We have found the perfect ratio of flour to water for pasta. Here... Have a look into the microscope and you can analyse the molecular structure. We've also developed an algorithm for the form

IN MASSIMO'S FOOD LABORATORY...

ON SITE...

Site work begins and the site is excavated in preparation for the raft foundations, the existing facade is demolished with part of the rubble kept for terrazzo use

RISKS
The excavation of the site and demolishing of the existing facade carries risks such as:

- Dangers of using heavy machinery
- Falling into excavated areas
- Damage of hearing due to loud machinery
- Falling rubble from facade

PRECAUTIONS
- Construction workers are properly inducted for the use of machines
- Excavated areas clearly marked
- Ear protection to be used when necessary
- Marked out area in the proximity of the facade

THE DETAIL DESIGN DOCUMENT PLEASE!

ON SITE...
A wall is erected around the site marking its extent, with particular care of the residential block on the corner

RISKS
- Foundations poured during wet weather
- Collapse of formwork
- Chemical burns from cement

PRECAUTIONS
- Allow for time in the schedule to avoid wet weather conditions
- Concrete specialists should be employed for this work and be fully trained and experienced
- Appropriate protection to be work during pour

Good morning, construction manager! I've just received the survey of the steel structure that was erected and am revising the UHPC panels now. I will send the new measurements over to the consultants and begin the fabrication of the pieces as soon as possible.

AT THE ARCHITECT'S STUDIO...

Due to the complex geometry, the steel structure will be erected first before the panels are fabricated. This is to minimise the need for re making the elements.

Chiara Appendino is reviewing the detail design document with her advisors

This is going over budget. We need it to be cheaper, but the same quality.

I just had a meeting with Chiara Appendino and we need to have a value engineering exercise... Let's look into ways we can save on the logistical plan and material alternatives

The concept design package, strategies and final brief are handed to the council

To reduce on costs and divided into more efficient sizes so it makes more logistical sense.

STAGE 5 Construction

Combine the Ingredients

SIX MONTHS LATER
The construction work has begun...

I am the construction manager, and I am taking control of the site! I need to see all certificates of practical completion as each trade contract is completed.

Following the instructions from the engineer, fabrication of the UHPC panels begins

AT THE WORKSHOP...

Once fabrication is completed, the pieces are packed into a lorry and transported to site

Trade contractors deliver their packages at their own premises if possible, as many components are prefabricated off site. They are then all brought together ans assembled on site whilst managed by the project manager.

Due to the work flow (whereby the steel is erected first and then remeasured), minimal waste is created.

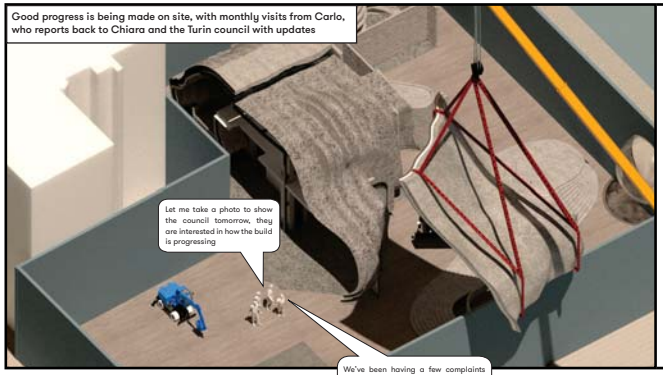
The architect co-ordinates the preparation of any additional inform

Members of the council visit the site and check that the project is being constructed according to the planning proposal

In response to the recent controversies from the locals regarding the secrecy of the build, a window onto the site is opened for the public to see the build.

This photo is so instagram-friendly. #vegetariaturin

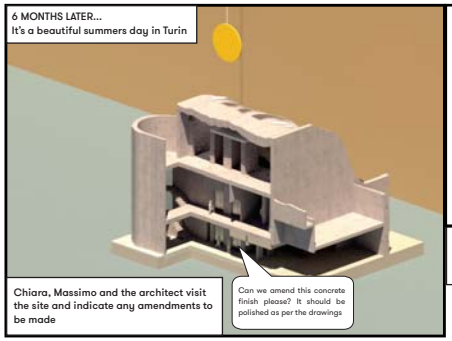
Ooh, the curvy shapes are fun - it kind of looks like tagliatelle!



RISKS ON SITE	PRECAUTIONS
Delays and congestions caused by untimely deliveries	Construction manager ensures all schedules are co-ordinated and logical
	Relevant road closures are organised ahead of time for access to site
Chemical burns from materials	Appropriate protective gear to be worn at all times on site: full length trousers, sleeves, eye protection, gloves, workers boots
Accidents caused by cranes and becoming stuck by airborne moving element	Appropriate training given to crane operators and workers in the proximity. Proper co-ordination of site so one element is lifted in one area at one time.
Electrocution	All machinery to be earthed to ground when in use and heavy electrical insulating gloves to be used when handling electrical appliances/machinery
Vehicle collisions	Implemented drop off and delivery points
Falling off height	Safe working platforms constructed with guard rails - hard hats and harnesses to be worn for protection from falls.
Structure collapse	Estimation of structural risks beforehand and ensure construction manager is aware of the potentials risks
Injury by lifting heavy goods	Maximum weight lifting standards should be set up and machine lifting when required
Untrained personnel on site (i.e. media, campaign overage, political visitors)	Supervision of visitors is required at all times and correct protective gear worn (hard hats and boots). No access to some areas are signposted clearly with boundaries. Safe walkways implemented.

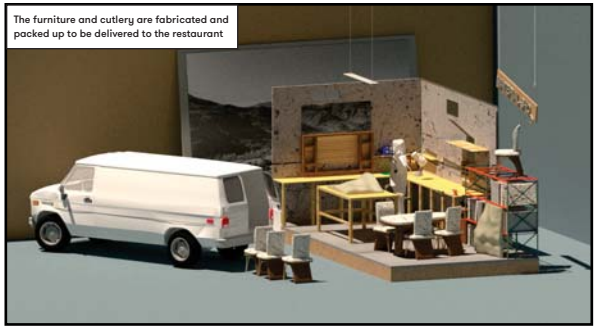
STAGE 6 Handover and Close Out

#Plantbased



Any final defects are rectified and a certificate is issued signifying that the construction works have been completed.

The trade contractors have finished on site and begin clearing and cleaning up



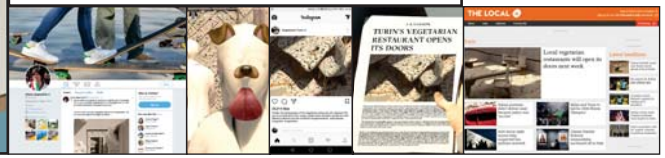
The furniture and cutlery are fabricated and packed up to be delivered to the restaurant

The ribbon is cut at a private opening event, where members of the council and the Italian food industry are invited

Construction completion is signed off

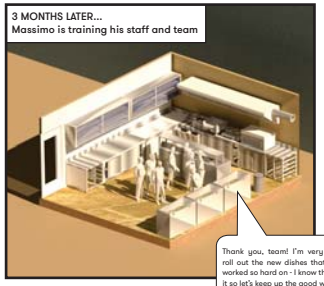
Meat-eaters protest outside the event. But like they say, there's no such thing as bad publicity...

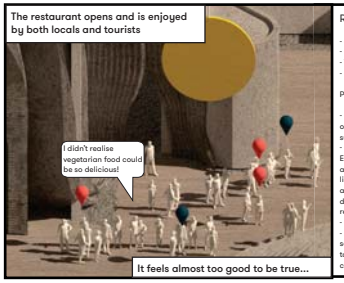
A media frenzy ensues: a myriad of tweets, instagram posts and stories, newspaper and online articles are released offering sneak previews of the restaurant. Massimo announces a new book deal based on the menu. The locals are curious.



STAGE 7 In Use

The Spoon Saga Pt. II





RISKS DURING USE

- Slips and falls
- Fires
- Tripping on stairs
- Food poisoning

PRECAUTIONS

- Deep cleaning, protection and ongoing maintenance of floor surfaces
- Building fulfils fire regulations. Ensure hood suppression systems are regularly inspected by a licensed fire protection provider and kitchen hood and exhaust ducts cleaned of excess grease regularly
- Handrails on both sides of stairs
- A rigorous upkeep of health and safety within the kitchen. Ensure tactile surfaces are regularly cleaned

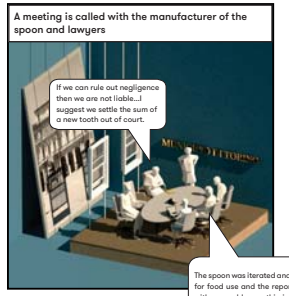
According to RIBA Standard Conditions of Appointment for an Architect:

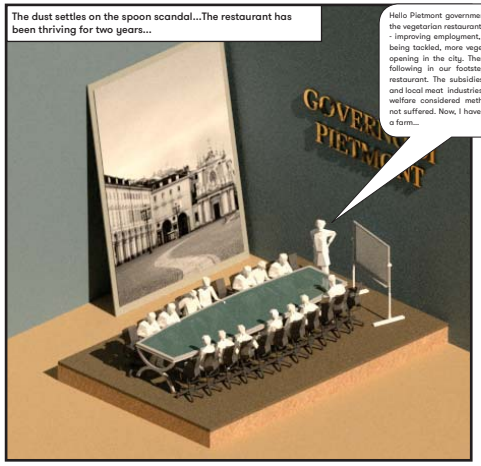
Limit of liability

7.2 In any such action or proceedings:

7.2.1 The Architect's liability for loss or damage shall not exceed the amount of the Architect's professional indemnity insurance specified in the Project Data, providing the Architect has notified the insurers of the relevant claim or claims as required by the terms of such insurance.

7.2.2 No employee of the Architect including any officer or director of a company or a member of a limited liability partnership or any agent of the Architect shall be personally liable to the Client for any negligence, default or any other liability whatsoever arising from performance of the Services.





BUILDING LONGEVITY

The process of the project has involved many contractors and consultants. There may be series of warranties. Since the project is also testing new materials, a rigorous maintenance schedule must be followed to ensure the quality and integrity of the building is retained. These evaluations will be more frequent at the beginning of the building use - once a month; and given there are no major concerns, can be phased to once a year. The maintenance and upkeep of the building is particularly important since it is expecting a large number of visitors and contributes to the tourist image of the city.

The second phase of the project is to create a farm, which would supply the goods for the restaurant. This would also serve as an educational center for the public to learn about animal welfare and environmental issues surrounding the food industry.

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