EDINBURGH ART SCHOOL
Abstract

This project explores how an Art School and student affordable housing can be integrated with a historically preserved facade along the Royal Mile in Edinburgh, Scotland. The site is located between the Canongate portion of the Royal Mile and a new town center development behind it named New Waverly. This project seeks to bridge the two - Medieval Old Town aesthetic and historic preservation, and new, modern office, retail, and apartment spaces of New Waverly. By providing a space for learning, culture, and student living that can also be used for local cultural events.

General Audience Abstract

For my thesis I wanted a site where I could combine old and new. A site that had a lot of history and some elements of historical preservation, but not so old that there wasn't flexibility in what could be done with it. I began by focusing on sites in Britain, which has some truly wonderful ancient cities and structures, some of which have been continuously occupied for thousands of years.

The site I chose has a unique development history for Edinburgh, a touch of historic preservation in the facade to keep the exterior walls along the Royal Mills, but otherwise new to be developed as desired behind these walls. The nature of the site, along the North End of a slope downward away from the Royal Mills, and the height restrictions of Old Town, meant that the site itself received even North lighting throughout the year, but not much light. This even lighting, combined with missing roof and entries, was the original inspiration for an Art School here.

The Art School is meant to explore how a place of learning can maximize its sources of natural lighting, how the school can serve the public by displaying student’s artwork and hosting local events, how school support areas can be made both accessible and secure, and how the students who attend can be housed affordably.
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Dedications

To my friends, who I was able to commiserate with and relax with when school got too overwhelming. Thank you, and I look forward to actually seeing you again in person!

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Here's to many more years and adventures together!
Chapter 1: Climate, Geography, and History

City of Edinburgh
A city under siege takes shape.

In the middle ages, because of threat of invasion from England and displacement of various Scottish tribes, Edinburgh became one of the most densely populated cities in the world. The old town of Edinburgh had the oldest housing tenements in Europe, up to 16 stories, and space inside the safety of the walls was so desperately needed that even the bridge stocks would be occupied and cellars would be carved into the soft sandstone under existing buildings. When the threat of war materialized and lifted in the mid-1550s, Edinburgh began to expand with earnest outside its walls and the city began to cover the surrounding hillsides and down the Royal Mile to Holyroodhouse.

Old Town and New Town Edinburgh are collectively a UNESCO World Heritage site. “The World Heritage Committee recognized two distinct areas: the Old Town, dominated by a medieval fortress; and the neoclassical New Town, whose development from the 18th century onwards had a far-reaching influence on European urban planning. The harmonious juxtaposition of these two contrasting historic areas, each with many important buildings, is what gives the city its unique character and outstanding universal value.”
Edinburgh Climate and Sunshine

The average temperature range from a low of 37 degrees up to 50 degrees, relatively moderate temperatures but generally cool in cold. Prevailing winds for Edinburgh are from the West-Southwest. In the winter months average sunshine ranges between 38 and 64 hours, 1-2 hours per day, and in the summer months between 350 and 450 hours, or 6-10 hours per day, both due to average cloud cover and a very high latitude.

Because of the western Highlands, much of the warm, wet air that blows across the Atlantic drops rainfall only on that coast, as shown in Figure 6 below. This leaves the east coast, including Edinburgh very dry, from a low of 15" as a mean of 25" of rain/month, though with generally damp coastal air due to proximity to the sea.

Figure 5

Snapshot taken on the hour over 24 hours, on the 20th day of every month except December, and assumes no cloud cover. Snapshot looks South to North over the site and illustrates the extent of shadowing that occurs, especially in winter, due to

interference on the South side of the Royal Mile.

The site’s northern position on a downward slope, and Edinburgh’s height constraints which reinforce the “stepped” quality of the urban fabric, mean little sun screening is necessary or desirable, and direct day/night opportunities are limited. The front gable exposure of the site and courtyard however gives the perfect opportunity for
even, soft natural lighting - the perfect
light for artists throughout the day and the original inspiration for designing a small art school with affordable student apartments as the project.
Edinburgh Geology

The Royal Mile is formed.

Most of Edinburgh sits on soft limestone, which, in the 2000s to 1700s, when Edinburgh's population was growing, was often bulldozed out under many houses building to create additional space for people desperate for a place to live.

Edinburgh is situated on a geographical formation called a crag and tail. All sides leading up to the castle were quite steep, except for the tail formation which had a gentle slope and was used to create the Royal Mile routes.

The formation of a Crag and Tail

Site History

Scotland and England have a long, varied history of warring with one another, and the Wars of Scottish Independence and the House of Stuart raged from the late 1800s to the 1750s, when Scotland saw the last major invasion by the English. Almost 300 years of war had pushed many Scots out of their farms and small towns to seek refuge inside the walls of Edinburgh, driving the city to population pressures rarely seen before in the world.

By 1580, when the charting map shown in Figure 10 was drawn, Scotland had been at peace for 30 years, and Edinburgh was bustling at its seams. Development spread down the Royal Mile road toward, but not quite reaching, the Palace of Holyroodhouse, and the first indications of the site began to appear.
By 1647, when Figure 11 was drawn, development outside the city walls had reached Hollyroodhouse, but New Street, which north of Old Town, has not yet been drained and there is little development beyond it. Behind the Royal Mile tenements are forests, and there is little evidence of the future mad network. New Street has not yet been established, and the site is occupied by buildings lost to history.

The 1765 map, shown in Figure 12, is a fascinating source in town planning and is very specific in how the city's buildings are documented. By this time there is still no sign of New Street, but the two Closes are present as well as what's believed to be Lord Kames' house, the only other substantial building on the site.

Henry Bruce, Lord Kames, was a judge in the Scottish Court of Session, an influential figure in the Scottish Enlightenment, and wrote extensively on morality and law.

By 1784, in Figure 13, New Street has been formally established, along with Jack's Close and Eastcross Jack's Close, and the site's city boundary remains substantially the same until the present day.

By 1852, Figure 15, the Canongate area of Old Town was no longer limited to tenements along the Royal Mile, with gardens behind. 100 years of development had brought urban industrialization. The Edinburgh Gas Works and Fire Department, shown behind the site, was one of the most prominent buildings for this. The area in general was considered slums, the Victorian development of New Town in the north the new focus for gentrified settlement.

The 1877 map shown in Figure 16 is of note because it is intricately detailed and shows the existing streets now named Big and Little Jack's Close, as well as clearly labeling Lord Kames' House. At this point Lord Kames' residence would most likely have been over 100 years old.
The turn of the century saw a push by reformers and city officials to clear slums and develop industrial Old Town. The Clay Works was turned into a city bus depot, and the back streets of the medieval and Victorian buildings on the site were swept away. Lord Kames's house would have been around 200 years old. A new building was dedicated for the corner that would serve as a soap kitchen for the poor, the Old Sailor's Ark, by design of Captain Charles Taylor (Figure 17) and finished in 1856. This building was designed by Tulloch & Wilkes, whose commissions were generally historic renovations or relocations to head with historic sites, such as the Old Sailor's Ark. The Ark only recreated the feeling of Old Town on the façade during the Royal Mile, modern forms and materials were used behind this façade, inspired by the Art Deco movement.

Two tenements next door to the Old Sailor’s Ark were also constructed at roughly the same time, designed by Architects Ernest James McIntosh, seamlessly with the existing Royal Mile façades. The brick of these buildings reveals how modern they truly are, however, with exposed concrete balconies and no historic treatment.

By 2006, only 2 years after they were finished, the Old Sailor’s Ark and its neighboring tenments were in severe disrepair. The street façades along the Royal Mile of all 3 buildings were determined to be historically significant and designated as preservation, however, everything behind these façades could be demolished and constructed anew. The distant old tenement was torn down and a majority of the site cleared for the New Waverley development (Figure 23), by Artaire SRL.

The new city center incorporates hotels, retail, office space, apartments for both market rate and affordable housing, and a new city plan at the end of Castlegate Street. Thus, this project everything outside the footprint of the Old Sailor’s Ark and the neighboring apartment buildings (Figures 20 & 21) was taken in as saved from the new development zone, rather than existing conditions. The Art School bridges the divide between the historic character of Old Town along the Royal Mile, and a vibrant new city center designed specifically for residents and visitors to live, work, shop, and play.
Chapter 2: Design Concepts and Development

Edinburgh’s urban fabric is dominated by earth tones and textures — brown and grey stones, wood and glass. Modern buildings add a vibrant palette but are generally colored in the natural palette. These colors and textures speak to the historic buildings that predominate in the city, but Edinburgh does not limit its new buildings to traditional forms.

New development in the city is held to a high standard but is almost universally very modern. The city’s adherence to new modern buildings even as they adapt ones hundred of years old, contrasting and honoring the uniqueness of each.

Edinburgh’s old and new towns also have very specific height restrictions, so that buildings step away from the Royal Mile, following the contours of the hill. This preserves the city’s ancient skyline as it meanders across the surrounding landscape.

Edinburgh City Council Building, Figure 22, was particularly inspiring because of how it combined stone, glass, and metal panels, while the National Hotel (Figure 23) and the Higgins Hall Prest Institute (Figure 24) are manifestations of channel glass, integrating this beautiful material in existing ways with the surrounding walls, giving privacy and light at the same time.

The Institute of Genetics and Molecular Medicine building (Figure 21) was particularly influential for several reasons, the first being the distinctive meaning of the building. The second was the floor-to-ceiling glass-enclosed mass, which seems to hang in the air above a recessed, dusted, lower entrance is both highly functional and adds depth and enrichment to the building. The vertical emphasis of the curtain walls, achieved by the addition of a custom curtain rope that projects out from the glass face, unifies the two floors as one unit, pushing away the divisions of plate glass covering the structure and open glass wall for occupied spaces. The curtain motion also adds interest by playing off the exterior curve, the optical illusion making the facade seem to move and change as the viewer moves.

Channel glass is a unique material, with interesting properties that work well in the Edinburgh climate. Since it is translucent but not transparent, it provides the full measure of light but also provides a measure of privacy. Channel glass can be inscribed in double glazed, insulated configurations, with an insulating gel layer, and can reach spans as long as 20′. It can be used in characteristic or vertical arrangement, though vertical installation allows for larger gaps. Edinburgh’s and especially this site’s lack of direct sunshine make channel glass a unique and beneficial material to use to maximize natural lighting.
Historic preservation of the existing stone walls bordering the Royal Mile was given, as shown in yellow in the figure below. The original roof line and appearance from the road also had to remain, though the roof was removed and reconstructed new. The inset photo shows the historic walls from the inside, with the floors and interior walls stripped away during construction.

Starting with the historically preserved walls, I began sketching building masses and form options. This area of Edinburgh requires buildings to step down with the slope of the site, so new building does not focus over another and dominates the skyline. Splitting the building into pieces that could easily be reduced by one floor level became an essential design requirement. Also, maintaining the openness of the center of the site maintained the essential daylight for all building parts, effectively creating a second, smaller place enjoying the site.

The site was relatively flat, but at first I began with the site containing all the way to the new plaza at the end of Old Market Street. I always preserved the connections between the Royal Mile and the new piazza via Old Jack’s Close, but some options explored restoring the historic close that was eliminated when the Old Sutler’s Ark was constructed. Restoring the historic close eventually proved to be a larger sacrifice of precious interior space than was necessary for connectivity, and Old Jack’s Close was widened and enhanced instead.

Based on window sill heights over the three buildings, and miscellaneous levels on the interior to address the seven-meter difference between road and plaza, the existing buildings had approximately 27 different floor levels. Addressing these height changes became an incredible challenge; and the building evolved from one continuous interconnected series to three independent functioning buildings, one of which was dedicated to apartments and does not connect to the art school.

Channel glass was always a part of the design, combined with metal panels to create a horizontal/vertical dictionary that complemented Edinburgh’s stone buildings and cliffs.
Chapter 3: Final Design

The building evolved into 5 different "zones" as outlined below, loosely named as follows: 1 - Flats, 2 - Studios, 3 - School Foyer, 4 - School Administration, 5 - Flats. Of these, zone 5 Flats was eventually removed from the project as it felt unnecessary for addressing the current Art School and had no historic preservation. This area is taken as a given along with the rest of the site.
Beginning with the basement, this floor is over 20' lower than the corner of Lassongate and New Street, and the courtyard here is a continuation of the plaza at the end of East Market Street. Old Jack's Close opens onto this plaza as well as the new Close steps down from New Street. This floor is primarily dedicated to Retail and Mechanical uses because of the extremely high ceilings, almost 18' clear.

The building 1 Flats have a more regular floor to floor height since they do not directly access the Art School. Water gardens in the middle of the plan add interest but do not block viewlines or walkways to the retail.
The first floor of building 3 is the original entrance to the Old Sailor's Ark from the Royal Mile. This is the primary school entrance for visitors and students alike, and the vestibule leads directly to the firstfloor Art Gallery. This gallery is meant to be a rentable event space, as well as a space for students to hold end-of-semester art shows and art sales, but would not be open to the public on a daily basis. There are connecting stairs leading up and down to the Studio levels which can be closed off for events and exhibitions, but otherwise are open for students and faculty. An elevator connects all floors of the Art School and Studio for accessibility.
The second floor of building 3 and 4 are classroom spaces for students. The computer lounge is open at all times for student use, and the drawing, painting, and ceramics rooms are located in building 4 both so they can be secured as well as to maximize their intake of natural light.

The student’s studio space in building 2, on floors NR3 and NR4 as shown on plan, is held back from the exterior wall for two reasons. First, this breaks the connection between the floor levels and the existing windows, creating a high ceiling for the studio spaces. Second, the roof of the building 2 studios is made of Kalwall translucent panels, casting daylight down through the atrium and allowing the existing windows to cast light as broadly as possible. With the north wall of the studio space a combination of channel glass and storefront windows, the studios maximize their natural lighting from all directions.

The building 1 flats range between 500 sf and 650 sf, all are one bedroom units designed to be affordable and primarily available to the Art School students.
The third floor of building 3 and 4 are dedicated to administrative and support spaces. Break rooms with kitchenettes and bistro seating are provided for both students and faculty, and the main offices of faculty and administration maximize their intake of natural light and are able to be secured during off hours. Offices are separated by solid walls in the East-West direction to create privacy and dampen sound from space to space, but in the North-South direction are separated by floor to ceiling storefront instead, to maximize natural light and views through the office. The studios and flats remain substantially the same as the previous floor.
The fourth floor of building 3 is given to the student’s library and lounge space, and building 4 opens into a roof terrace space to satisfy the city of Edinburgh skyline protection codes. At this level the building 2 studio space is looking down at the same space as the previous view, and the flats remain the same as the lower level.
The roof plan opens up to show the building's terrace, complete with border planters and steel scaffolding creating an exterior "room" as well as providing a potential place for students to exhibit exterior artwork. Building 2 shows the extent of the Kalwall roofing, extending from the peak of the existing historically preserved roof to the edge of the channel glass North wall.

Building 1 also eliminates one flat on the north end to create a private terrace for the residents, accessible from the elevator/stair core, and continues the stepped building skyline to avoid looming over the existing building next to it.
What lies behind us and what lies before us pales in comparison to what lies within us.