

Dub City: Sample, Remix, and the Techno-Urban Graft

by

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Submitted in partial fulfilment of the requirements
for the degree of Master of Architecture

at

Dalhousie University
Halifax, Nova Scotia
July 2012

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DALHOUSIE UNIVERSITY
SCHOOL OF ARCHITECTURE

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Dated: July 10, 2012

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Reader: _____

DALHOUSIE UNIVERSITY

Date: July 10, 2012

AUTHOR: William John Vachon

TITLE: Dub City: Sample, Remix, and the Techno-Urban Graft

DEPARTMENT OR SCHOOL: School of Architecture

DEGREE: MArch CONVOCATION: October YEAR: 2012

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ABSTRACT

This thesis looks to techno music, and subsequently to the DJ, as models for a way of understanding urban spatial ecology. In its compositional use of rhythm to create a sense of musical space punctuated by time, the DJ's act of mixing audio in performance is akin to the design process: architects similarly do well to observe and acknowledge the rhythm of city life, history, climate, geology, and to mould their dynamic into an appropriate spatial interface. By aligning aspects of documentation and process with DJ methods, the thesis translates the city's various rhythms to produce responsive, intuitive architecture.

A proposal for a built intervention on a former rail yard in central Halifax, Canada, the architectural response seeks to mix aspects of the city into the site, creating a multivalent graft between military facilities and civilian neighborhoods.

ACKNOWLEDGEMENTS

For their boundless enthusiasm and support, my family: Joanne, Peter, Jeanne.

For wisdom and encouragement (and from a very early age): Piffy and Jimmy.

For keeping me smart and on track: Catherine, Craig and Richard.

For being great: my wonderful friends.

Thank you.

CHAPTER 1: INTRODUCTION

Imagining cities of the future is something of a Science-Fiction specialty. Literature, Film and Philosophy have contributed countless visions of what might be, from Thomas Moore and *Utopia*, to Arthur C. Clarke's *2001: A Space Odyssey*, to the *Jetsons*, and so on. Architecture is central to these speculative urban visions, most of which are described through imaginative takes on dwelling, shopping, work or recreational space. Architects play a significant role in envisioning cities, in defining the structure of every-day city life.

To city-dwellers, however, the City's form is perhaps only partially built, or of buildings. The city seems to move, to be alive, to change. Cultural icons emerge from clusters of activity, and the City takes on a kind of ephemeral figure.

Given this dynamic appearance, Design should be equally nimble—capable of reconciling the moving with the static. It is this condition of Design that the present Thesis seeks to develop.

Briefly, it may be of some use to ponder the mechanics of urban space, specifically with respect to these mentioned temporal elements and modes. Certain concepts found in the work of Michel Foucault, Sergei Eisenstein, as well as Rem Koolhaas and Merce Cunningham may be of use in describing the project scope. Their ideas treat architectural space and cities as systems, relating to a perceived notions of space and time.

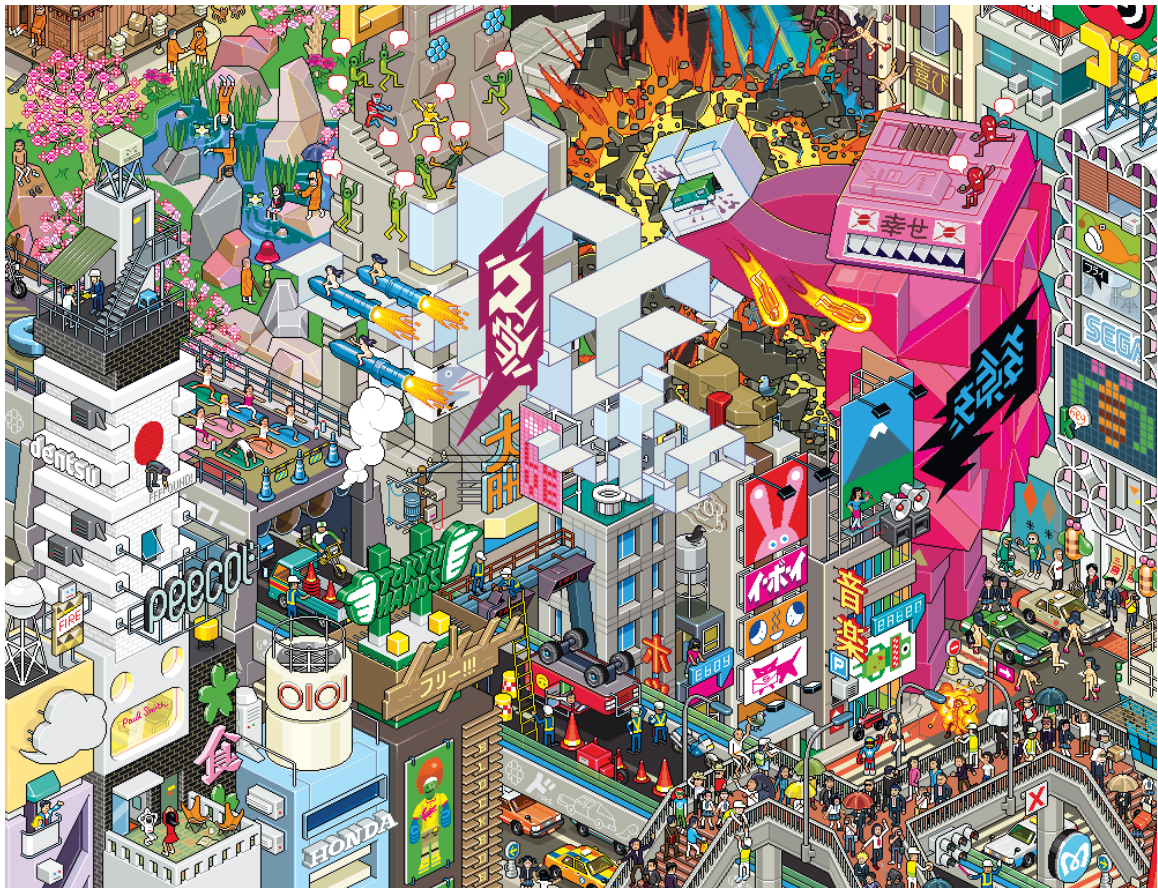
This study will then explore these concepts with the aid of a procedural model, that of the Techno DJ. The DJ's process – essentially of sampling, mixing, re-composing – acknowledges and responds to similar spatial concepts, especially with respect to time. It can thus be a useful guide to a design methodology based on the dynamic states of a city.

The Drone and Space

In cities, the dynamism of human activity generates a kind of trembling hum. The “every-day” is felt in undulating noise, a residue of sound. Footstep blends into ventilation duct, which in turn is masked by arriving bus and ultimately overrun with sirens. The City is “bustling” or perhaps “never sleeps”.

It is a mixture of events such as “rush hour”, “lunch time”, “bed time”, “closing time”. In spite of these events, it’s scheduling remains a nightmare. A casual relationship with time seems most commonplace amongst citizens, of whom the chaos of scheduling is at times liberating and other times infuriating. Rush hour may be perceived as a constant, though the automobile accident from which it arises is certainly a sporadic, chaotic occurrence. The pace of “every-day” tyrannizes its participants. The architect Rem Koolhaas notes: “The City is an addictive machine from which there is no escape.”¹

1 Rem Koolhaas, *Delirious New York: A Retroactive Manifesto for Manhattan* (New York: Monacelli Press, 1994), 7.



Tokyo by Eboy. Berlin, 2010.

And yet, the unspectacular hum—the endless drone—reminds us of this vast encumbrance. It is a song with neither beginning or end, which ebbs and flows only slightly. The constancy of the hum seems perpendicular to the viscera of city life, with its screeches of tires, by toilets flushing, by a xerox being fixed. The many voices of the hum are only faintly discernible.

Heterotopia

In Michel Foucault's text "Of Other Spaces," a similar discussion of space is made:

The space in which we live, which draws us out of ourselves, in which the erosion of our lives, our time and our history occurs, the space that claws and gnaws at us, is also, in itself, a heterogeneous space. In other words, we do not live in a kind of void, inside of which we could place individuals and things.²

Foucault's statement refers to the space of relationships found in life, in the city, which is the realm of every-day experience. The focus is not on defining static objects within a given area, but rather on describing a series of movements, counter-movements and connections between them. He notes:

² Michel Foucault, "Of Other Spaces," *Diacritics: A Review of Contemporary Criticism* 16, no.1 (1986): 23.



Photograph of city structures, with reflections of the surroundings at different times, locations.

One could describe, via the cluster of relations that allows them to be defined, the sites of temporary relaxation—cafés, cinemas, beaches. Likewise one could describe, via its network of relations, the closed or semi-closed sites of rest—the house, the bedroom, the bed, et cetera.³

The “sites” here mentioned are not strictly spatial, static. They refer to unfixed correlations of time and space – not so different from the every-day moments described earlier. Foucault determines subsequently that there are again other forms of site which supersede those regular sites, but in such a way that “all the other real sites that can be found within the culture, are simultaneously represented, contested, and inverted.” He calls these “Heterotopias”.

Koolhaas echoes this sometime later in *Delirious New York* calling the city “a mosaic of episodes, each with its own particular life span, that contest each other through the medium of the grid.”⁴

Rhythm

The spatial form of this dynamism is expression. The phases of its tension: rhythm. This is true for every art-form, and, indeed, for every kind of expression. The quantity of interval determines the pressure of the tension. (See in music, for example, the concept of intervals.)

3 Ibid., 24.

4 Koolhaas, *Delirious New York*, 21.



Still from Jean-Luc Godard's *Tout va bien*. The scene is based around a slow-moving pan from left to right, capturing each room as its own sub-scene.

There can be cases where the distance of separation is so wide that it leads to a break – to a collapse of the homogeneous concept of art. For instance, the “inaudibility” of certain intervals.)⁵

Sergei Eisenstein notices a similar struggle in the above quote –a struggle to define pattern amongst a kind of “organic inertia”. Cities maintain a static form, though perception is through intervals, phases. Rhythm is a kind of extrapolation of the intervals, based on perceived patterns. The timing of elements can provoke attention, build anticipation. Eisenstein is noted for having pioneered the use of “montage” filming, in which a scene is exposed as a juxtaposition of different shots which alter the perception of intervals:

The incongruence in contour of the first picture-already impressed on the mind – with the subsequently perceived second picture engenders, in conflict, the feeling of motion. Degree of incongruence determines intensity of impression, and determines that tension which becomes the real element of authentic rhythm.⁶

The DJ

With the DJ, we find a paradigm wherein the creation of music is based on refining this very balance. The actor is constantly aware of its audience, and proceeds in adjusting elements of rhythm accordingly, in order to produce moments of tension, release, euphoria. This paradigm unfortunately does not translate so directly to architecture, due to music’s dynamic nature. The “architectural DJ” instead should lend rhythm to both static and dynamic elements, eschewing the DJ’s sense of time for one of “space-time”.

The resulting mix can be seen as reflecting these states and perhaps challenging them—rendering motionless the mobile and vice-versa. The DJ and Architecture will be examined through the three stages of this report: 1) the elements of the mix: i.e. what is seen and heard; 2) their impact on the perception of place; 3) possible methods of combining, composing, mixing.

5 Sergei Eisenstein, *Film Form: Essays in Film* (New York: Harcourt, 1977), 2.

6 *Ibid.*, 4.

Mixing

Electro-Acoustics and Sound Production

The “mix”, as it is referred to in the music industry, is the merging of recorded musical “tracks” to form a product such as a single song or album of songs. Mixing is usually the last stage of the production of a piece of recorded music. Similar to a news editor, the mixing technologist controls the final manifestation of the work.

The process of audio mixing itself emerged over the last century. Due to rapid development in recording technology and skills, the realm of the mix has become a medium unto itself. As the capabilities of musical post-production and synthesis grew, new ideas emerged about the act of music making, and about this new musical art form. Descendant of the original “mixers” are the modern Hip-hop and Techno DJ.

The first musical artists to engage in “mixing” recognized in it a great potential:

The position and speed of a sound in space have taken on musical significance; the colour of each sound now serves a function and is no longer an external attribute, so that colours now serve musical language in the same way as pitches; and rhythms have extended enormously between the extremely slow, hitherto unknown, and the extremely fast, never previously experienced in such a way.⁷

Karlheinz Stockhausen, quoted above, saw electronic musical synthesis as a means to unearthing the expressive capacity of sound. Sounds created using Voltage-controlled Oscillators, as well as with the magnetic tape recorders used in “mixing” gave rise to a great lexicon of acoustic elements and functions. “Electronish Musik”, as Stockhausen dubbed his work, began as a way of combating the dominant paradigm of music production and reception:

Music should not be merely a form of body message, an aural psychogram or a thought-programme in sound. It should principally be a current in the supra-conscious cosmic electricity transposed into sound.⁸

The composer now had access to a virtual orchestra of sorts. Stockhausen’s compositions require great accuracy, often employing computer generation and exacting use of acoustic and electronic instruments.

7 Karlheinz Stockhausen, *Towards a Cosmic Music*, translated by T. Nevill (Dorset: Element Books, 1989), 20.

8 *Ibid.*, 45.

Musique Concrète

Other early electronic composers, like Pierre Schaeffer, would use mixing technology in analogous though quite different ways. In his *Musique Concrète*, Schaeffer found musical narrative from within existing sounds rather than through synthesis. His compositional approach looked at how music may be contained within the experience of every day sonic elements, requiring only to be re-positioned and transposed. Through the invention of magnetic tape, it was possible to extract and re-interpret so called “found sounds”. Schaeffer notes: “En faisant frapper sur une des cloches, j’ai pris le son après l’attaque. Privée de sa percussion, la cloche devient un son de hautbois.” (While ringing on one of the bells, I recorded the sound after the attack. Without its percussion, the bell becomes a woodwind sound.)⁹

Schaeffer’s discovery draws attention to something within sound itself, in this case the Attack. Attack is one of four “envelope” periods of a given audio signal. The Attack is simply the beginning portion of a sound as it comes out of silence. In some cases, the onset of a sound can arrive abruptly, as with the bell. By removing that bell’s initially vigorous sound from the “objet sonore”, Schaeffer can reveal qualities which are perhaps less familiar of bells than of other objects. In terms of mixing, and of course the DJ, Schaeffer’s work is a liberation of the ears; music may be formed or found in virtually any milieu. The mix may tweak and bend found environmental sounds, such that they are shown to be different or musical.

Techno

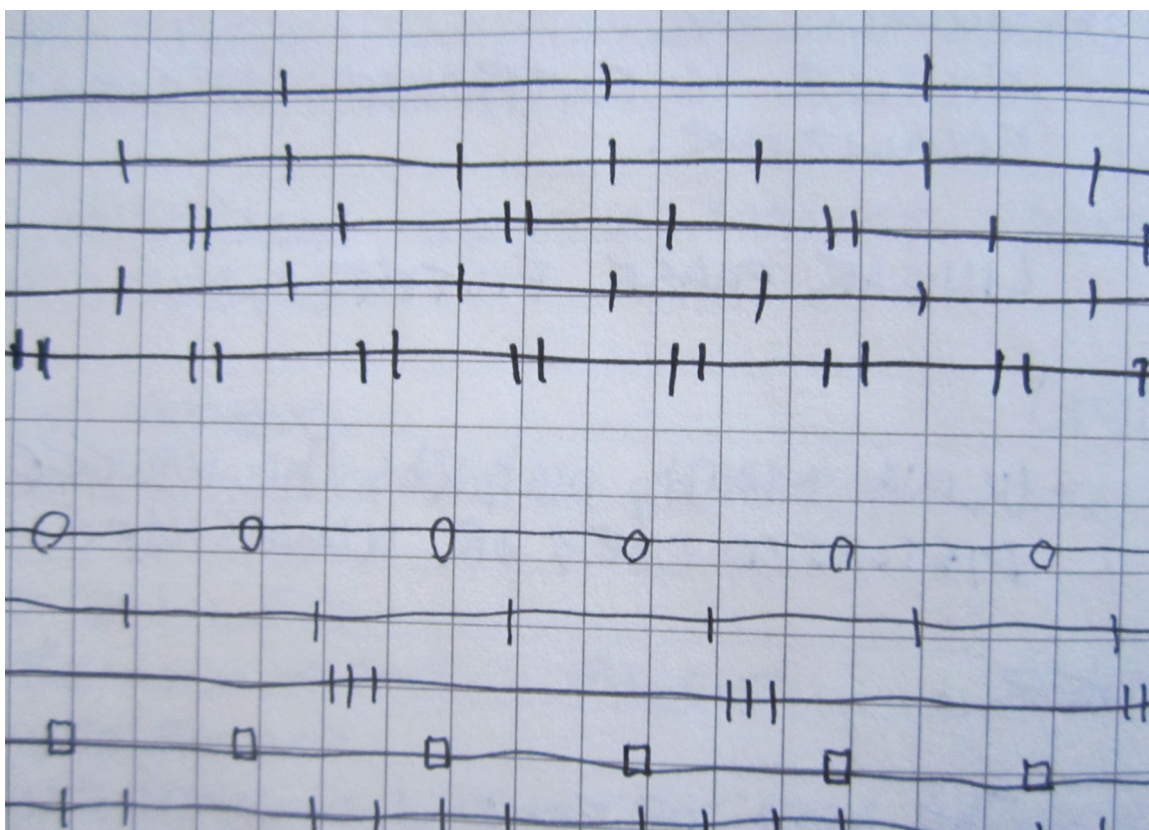
Techno music, which developed discretely during the 1980s in Detroit¹⁰, expands greatly on the spatial potential of mixing. While a piece of music is still produced and played to an audience, it is here combined with other pieces by the DJ to form a seamless, almost endless piece. This Techno is characterized by a consistent rhythm, a 4/4 time signature and only the slightest of structural change over time. The DJ’s skill is applied to maintaining smooth transitions between tracks, layering beats, tuning and de-tuning harmonies.

9 Pierre Schaeffer, *à la Recherche d’une Musique Concrète* (Paris : Éditions du Seuil, 1952), 15.

10 Vladimir Bogdanov, *All Music Guide To Electronica: The Definitive Guide To Electronic Music* (London: Backbeat Books, 2001), 631.

The use of embellishment and ornamental sounds in Techno is typically disdained, as it might detract from the smoothness of the overall mix. This sense of the “overall mix”, – the sense of the previously-heard with the now-hearing– is heightened by the music’s inter-compatibility. In Techno, virtuosity is defined as the ability to compose music that almost disappears from the ears, only to be felt by other organs through the thriving pulse of drums and deep tones.

The Techno DJ may alter the perception of time, movement, space similarly to Eisenstein’s montage; space arises not from the sounds themselves but from intervals, beats, pulses.



Sketch showing an example of a Techno music score. Alignment of rhythms typically happens every 16 bars.

The Former Rail Depot: Thesis Site

For the purposes of this study, a site has been defined as the area surrounding Barrington Street, bookended by the city centre and the Macdonald Bridge, in Halifax, Nova Scotia, Canada.

Both the urban fabric and program is divided by this stretch of land. The area to the north of the site belongs to the Canadian Military, while to the south it is mostly civilian, residential. The site itself has become a no-man's land, specifically due to the military's presence and privacy requirements. There are no privately owned lots within this divide, and virtually no attempt has been made in recent years at building this space aside from a municipal water-treatment facility.

Barrington Street is the most direct link between Halifax's northeast neighborhoods and the cross-harbour bridge with the urban centre. The site is crossed by upwards of 60 000 vehicles daily¹¹, mostly commuting to and from Downtown. During morning rush-hour, the traffic peaks in the Downtown direction; likewise in the opposite direction in the evening. Public transit scheduling reflects this dynamic rhythm, and the overall population of the area follows a similar trend.

The scale of traffic infrastructure limits the site's permeability by foot, and cycling is less than ideal. There are however occasional input/output routes, such as the bridge, 3 intersections, a traffic exchange and a few cross-walks at the northern edge of Downtown.

The rhythms of traffic and working/non-working populations may be practically assessed and represented. The density of activity which follows this pattern can be further analysed to reveal moments of intensity, tension, release, anticipation, suspense: all emotions related to musical composition and mixing.

Together, the data collected should enable a good mix, provided some relationships between the are shown to overlap.

11 Halifax Harbour Bridges. "Halifax Harbour Bridges Annual Report," 2011.



Aerial photograph showing Barrington Street between the MacDonald Bridge and Downtown. Bing Maps, 2010.



Photograph of site looking southeast from the Angus L. MacDonald bridge.

A Brief Physiology of Perception

The Presocratic Greek Philosopher Zeno describes a paradox in which an arrow launched - which appears to clearly travel through the air - is physically motionless: “What is in motion moves neither in the place it is nor in one in which it is not”.¹² Even if the human eye could observe infinitely small increments of time (i.e. precisely on the second, or Time ~ 0 seconds) we would fail to perceive the arrow in motion. Instead, at time = 1 second, we see the arrow at a given location; at 2 seconds, it is in another location. Visually speaking, the world is thus static from one instant to another.¹³

Other senses likewise detect movement - though at first perhaps falsely so: the arrow whizzes through the air as it passes. In order for this sound – the whizzing – to occur, one supposes that a displacement of air, or indeed motion, must also occur.¹⁴ Conversely, when reduced in time as above, the arrow is entirely silent. What is heard cannot be tied to a specific location in space. Sound exists conversely, as a result of motion.

This paradox points to a kind of limitation inherent in the senses. We have a natural “frame rate” of perception in both the eyes and ears, which is usually referred to as “real time”. Objects which operate outside of a given audible or visible “range” will typically appear indistinguishable, muddy, foggy, etc. The act of seeing requires light to reflect from objects into the eye. The ear likewise receives sound waves from emitters either indirectly or directly:

Floors that squeak when walked upon or lamps that wobble when a room is entered are good spatial informants. Smaller, more enclosed, and hard-surfaced spaces usually identify themselves better than do large open spaces, because the former are more resonant. In large spaces, linear forms which respond to sounds distinctively, such as hedges or stone walls, help in navigation. The masking effects of objects can also locate structures in space by forming a silhouette of the building bulk against distant sounds, although this is effective only when foreground sounds are quiet.¹⁵

The above study looks at the perception of sound in the Boston area by way of

12 Diogenes Laertius, *Lives of Eminent Philosophers*, trans. Robert Drew Hicks (London: W. Heinemann, 1925), ix.72.

13 Patricia Curd, ed., *A Presocratics Reader: Selected Fragments and Testimonia*, trans. R. Mckirahan (Indianapolis: Hackett, 2011), 66.

14 Diogenes and Hicks, *Lives of Eminent Philosophers*, ix.73.

15 Michael Southworth, “The Sonic Environment of Cities.” *Environment and Behavior* 1, no. 49 (1969), p.50.

individual testimony. Through their findings, the researchers note a distinction in the way the perception of sound affects the overall apprehension of space. For the visually impaired, sound is a fundamental tool of perception. That said, orientation is only a partial result of this overall apprehension. Sound is also said to trigger deeper psychological responses:

A setting in which his voice will spring back and in which objects rattle and sing in response to his actions, in addition to revealing the space and its contents, invites the involvement of the listener in a man-environment conversation. Such involvement is valued by persons who often feel detached from the world because of limited sensory contacts.¹⁶

This human-environment conversation is of particular significance when difficulties related to legibility and apprehension of space arise. As will be shown, this feeling of detachment is not limited to those with visual impairment. Indeed, it creeps into discussions of music and art, technology and most other aspects of modern society. Preserving or heightening the dialogue between individuals and the built environment is thus the primary intent of this thesis.

Another point drawn by the research is the interdependence between visual and sonic modes of information. Whereas the visual mode permits a kind of static description of space, the sonic offers a description of changes underway. For the designer, author of the Boston report Michael Southworth warns:

Visible form conceived as an isolate can never be experienced as intended by the designer when the sonic form, or even other non-visual factors such as the micro climate or olfactory environments are not designed in correlation.¹⁷

And so, it could be very useful to acknowledge the nuances of sound in relation to sight and the other senses; they do not operate independently. As will be demonstrated, several techniques exist that describe sound in a manner more useful to the designer, particularly when the object is spatial in nature.

Notation

The first method of description is Notation. Much like a piece of music, the site may be notated as a system of parts; each acting upon the experience of the observer in both time and space. In order to extrapolate the patterns and rhythms found within the site, this

¹⁶ Ibid.

¹⁷ Ibid., 18.

system must be made graphic or scored. The practice of scoring musical work has a long history, though in the last fifty years composers have sought better tools for expressing their work graphically. The process of defining a musical signature has also borrowed aspects of contemporary art processes, leading some composers to treat scoring as a conceptual framework rather than mere documentation.

The notation examples shown in John Cage's book *Notations* mark an extroverted period in the field of contemporary music practice. From 1950 onwards, composers would appropriate aspects of conceptual art, such as aleatoric and other chance-based elements. Coupled with this borrowing is a broader scope of interpretation, sometimes preferring graphical scoring's more dynamic translation to that of traditional notation: "A graphical score cannot dictate its own performance with the same exactness in pitch, tone, and dynamics as an elaborately detailed modern orchestral score."¹ Certain aspects of the scores are nonetheless heightened by the adaptation of visual (and sometimes audio) descriptions:

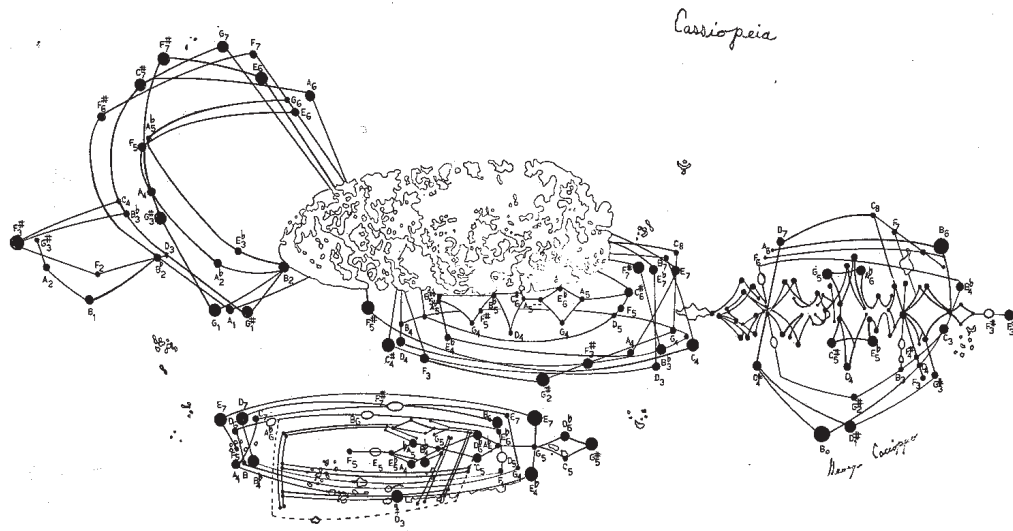
The performers listen to the tape and follow the instructions on the score: "do something similar," "do the opposite," "do something neutral." And I scored a couple of sounds. There is the aural tradition and the written tradition. I never want to give up either of them, though I think we have neglected the aural for a long time now.¹⁸

The performers listen to the tape and follow the instructions on the score: "do something similar," "do the opposite," "do something neutral." And I scored a couple of sounds. There is the aural tradition and the written tradition. I never want to give up either of them, though I think we have neglected the aural for a long time now.¹⁹

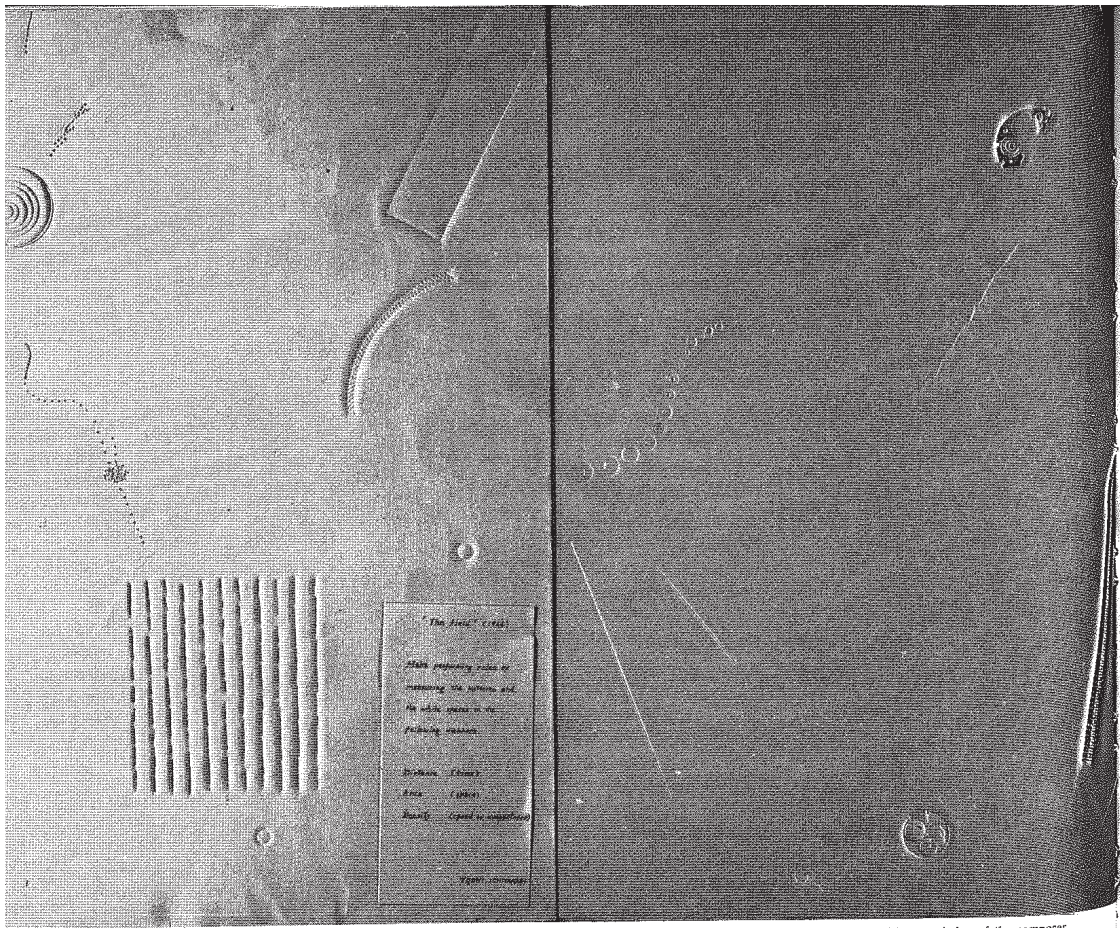
This can be further shown in the descriptions of sonic timbres, periods of emotion or silence. These aspects alone lend the medium a close resemblance to that of architectural drawing. A version of this reasoning is implicit in the DJ skill-set.

¹⁸ Karlheinz Stockhausen, *Towards a Cosmic Music*, 43.

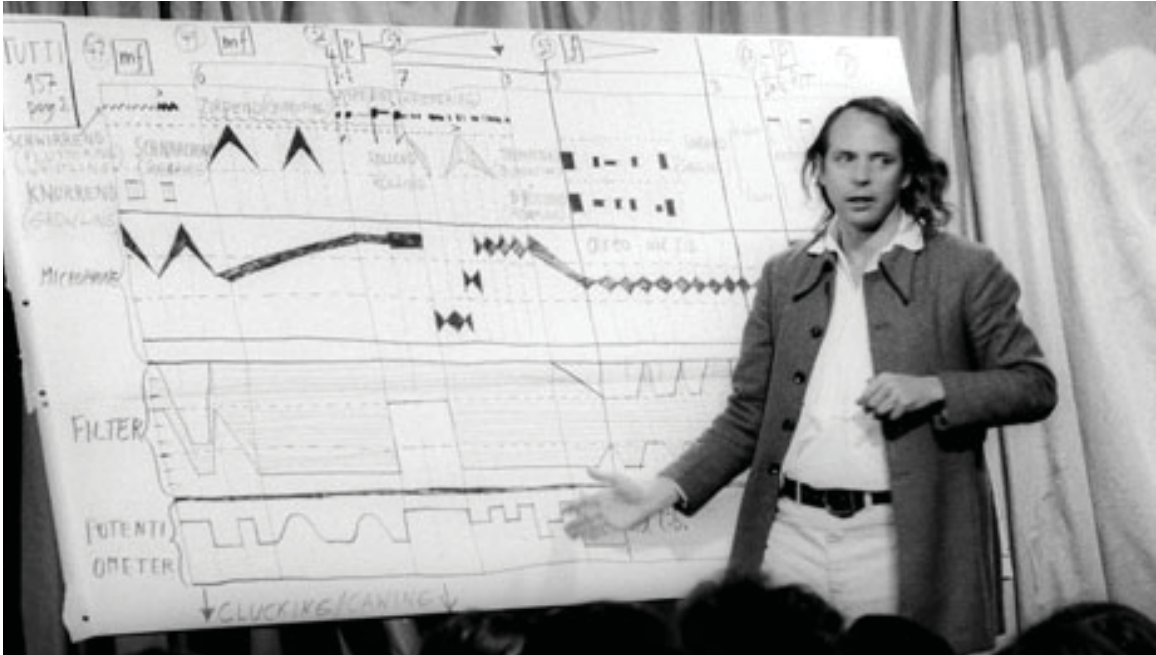
¹⁹ *Ibid.*



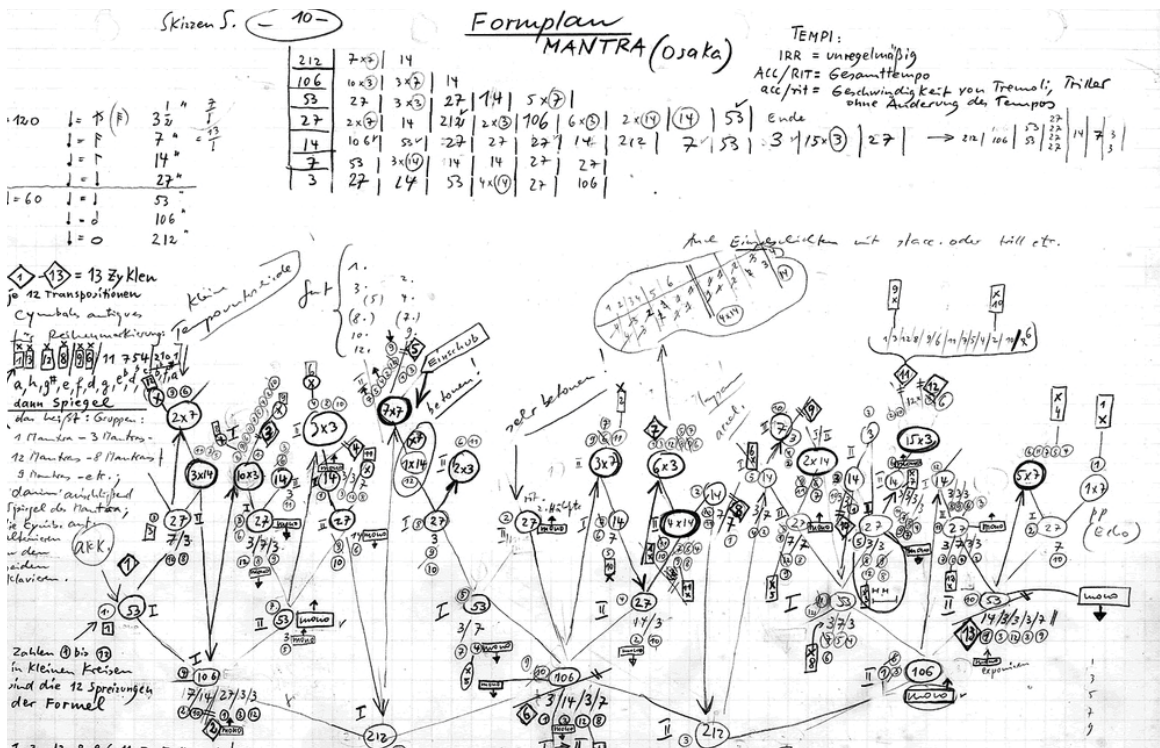
George Cacioppo, Score for *Cassiopeia*, 1962. From Cage, *Notations*.



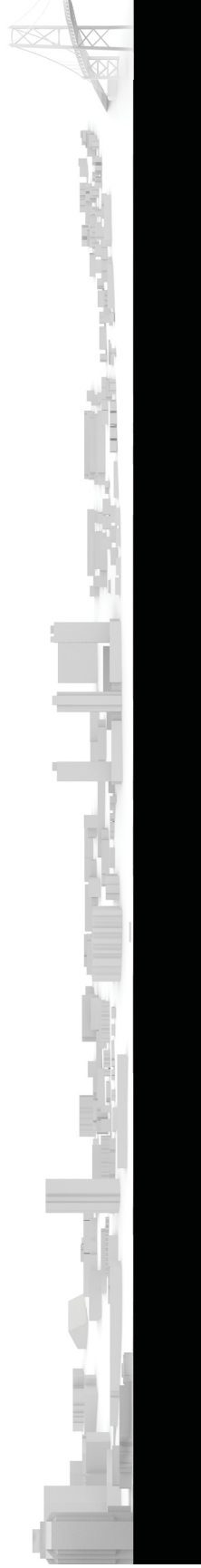
Toshi Ichiyanagi, *The Field*, 1966. From Cage, *Notations*.



Stockhausen, with graphical score of his piece *Plus/Minus* (1971). The piece is composed so as to require input from musicians in “transforming” music within given intervals. Photograph by Ray Stevenson, *The Guardian UK* website.



Stockhausen's “Formplan” for the piece *Mantra* (1970). From Stockhausen “Formplan.”



meters 0 100

Elevation of site looking southwest.

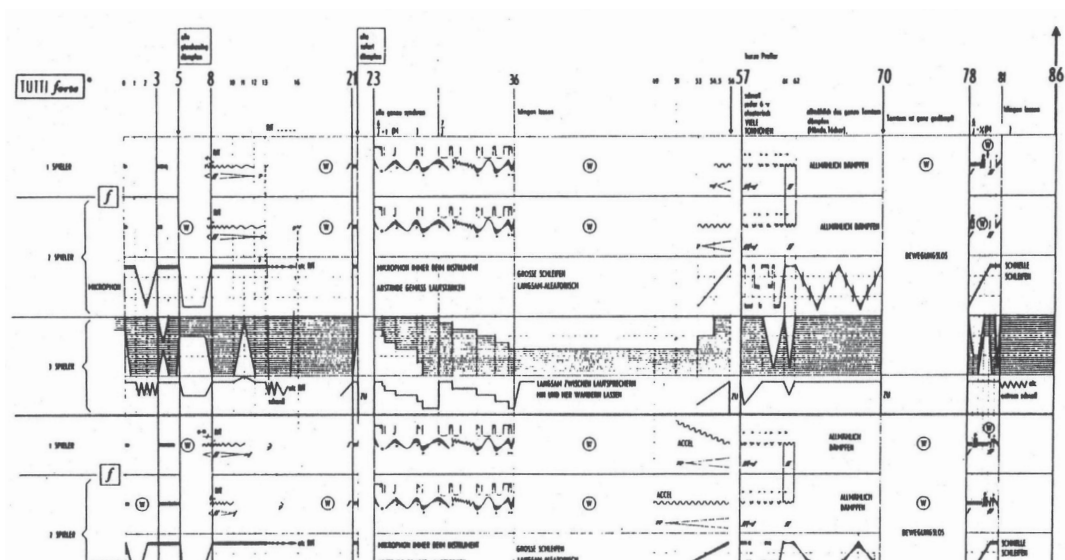
CHAPTER 2: DESIGN

Building up the Mix

The DJ's approach to producing or performing begins by the selection and analysis of a certain amount of "material", from which it is judged a good mix can be made. The analysis is done primarily through listening: evaluating rhythms, considering stylistic elements, speculating on the compatibility of track combinations. This listening also has the distinction of employing a kind of aural "mapping," whereby items are noted, compared for both their timbral qualities and their locations within the track.

Breaking tracks into these fundamental elements, both in time and space, is perhaps the chief understanding of the DJ art-form. As this knowledge grows, so does the DJ's ability to combine tracks while maintaining Techno's absolutely crucial state of seamlessness—i.e. through "beat-matching", "cross-fading", etc.

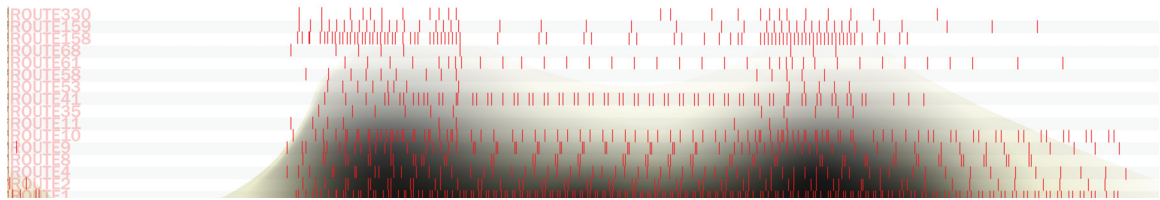
The process is equally critical of substance: certain chains of rhythm are more or less compatible, and thus care is required to order the use of timbral elements and their juxtaposition. Aural mapping of this kind is similar to those early modern scores from Cage's book, as well as with Stockhausen's process, both shown earlier. The architectural DJ can look to a site in such ways, mapping influential elements in time and space such



Karlheinz Stockhausen, *Mikrofonie*. From Medien Kunst Netz website.

that they be readily deployed in the design.

The maps must encompass items at different time-scales, from fast: the growing tree and the speeding automobile, to the slow: generations of buildings past and present and the site's ancient rock-formations. Working with at the scale of the frequent is akin to a DJ's "Beat-matching"; At scale of the The following studies are meant to enumerate such events and to juxtapose them—like tracks—in drawing and model form.



Data from public bus schedules as seen during the weekdays moving through the site. Red lines indicate a bus; resolution is 1 minute.

The Beat and Beat-Matching

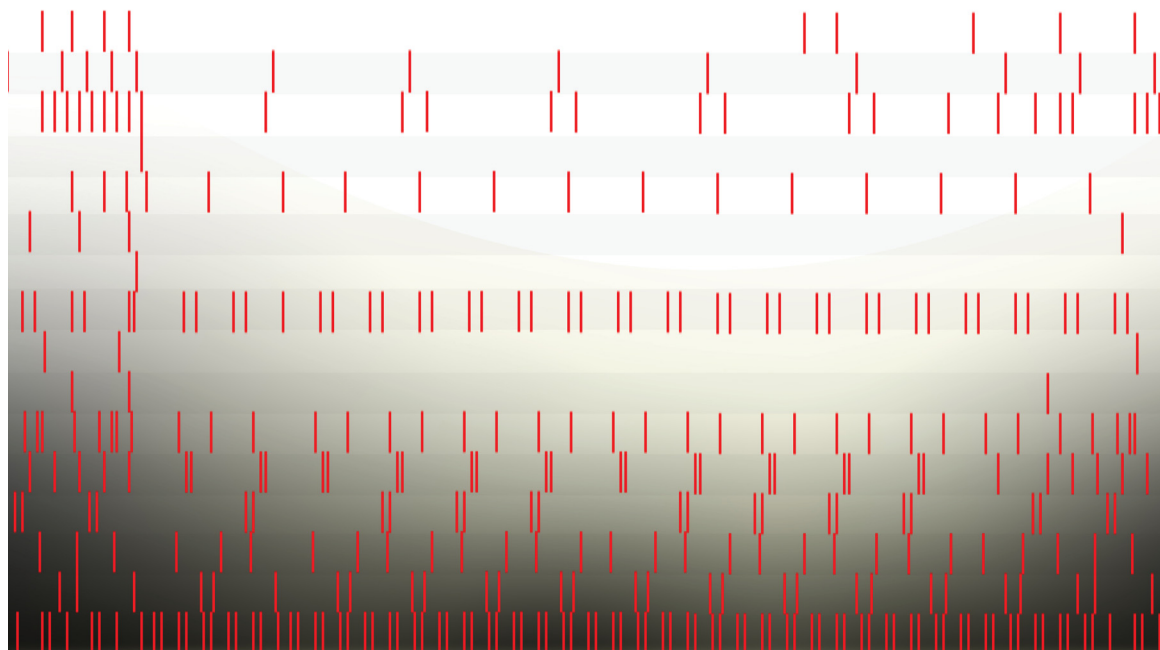
To begin, we take for instance the scheduling of public transit, which runs through the site at selected intervals. The above graph shows the scheduling of all 32 Bus routes that traverse through the thesis site. The timing of each bus arrival is calibrated such that increases and decreases in the overall volume of available busses with respect to demand. The graph thus reveals a behavioural trend which itself requires the use of public transit.

Within this trend (highlighted in gradient), and within each route, busses arrive at regular intervals—every 15 minutes, 30 minutes, 1 hour, and so on. The increase in volume is done by adding supplementary routes at peak times, rather than substantially altering the frequency of arrivals for individual routes throughout the day.

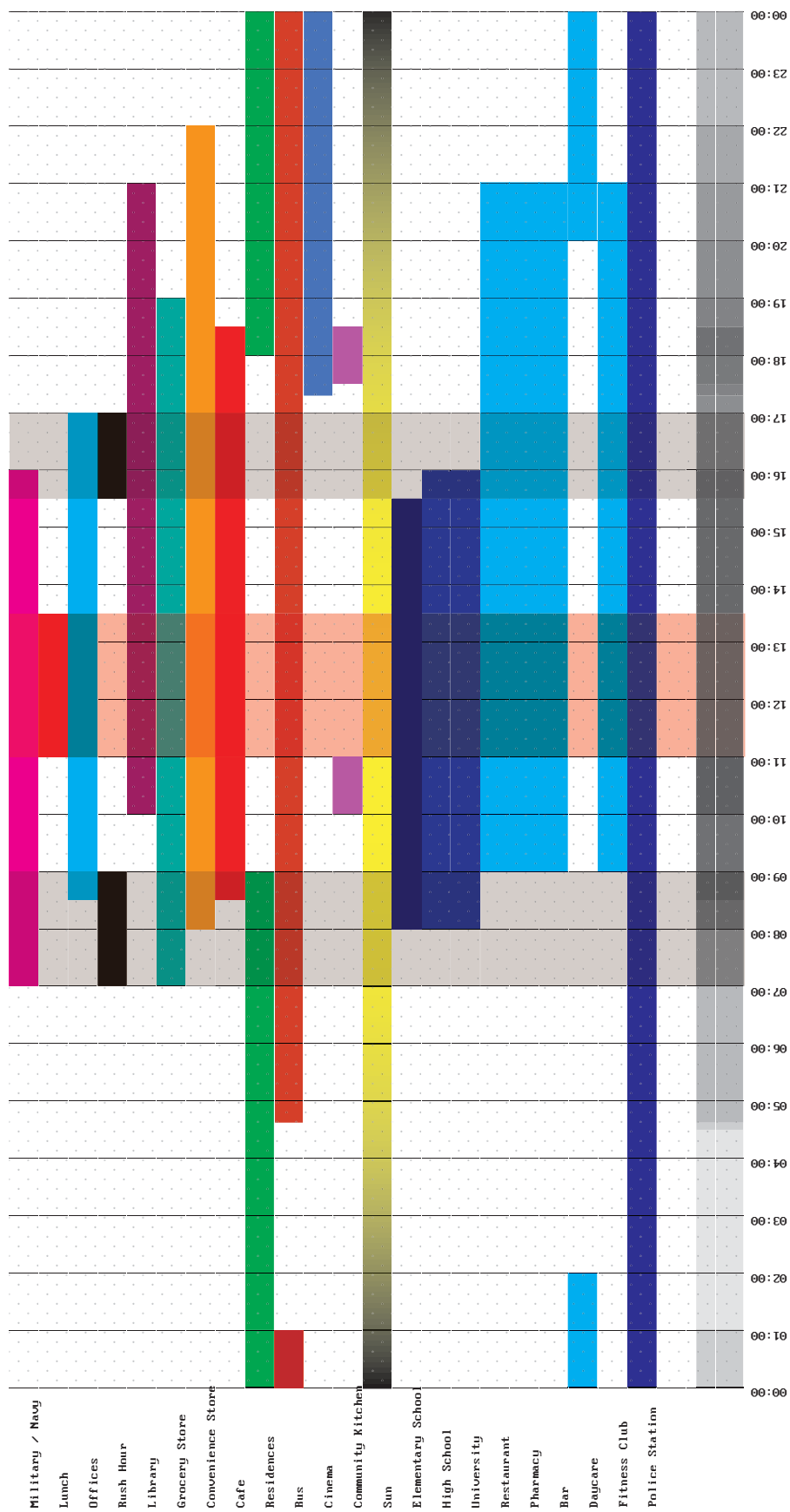
Transit cannot feasibly mimic the variations in ridership demand beyond a certain degree of resolution. In stead, the service becomes an abstracted facsimile of actual demand, built of evenly timed blocks which, when layered, can approximate that demand. The blocks begin somewhat abruptly: rush-hour increases begin promptly at 7:58, pre-

emptively serving initially sparse ridership. Likewise, the end of this period sees a sharp drop in service, leaving remaining regularly-scheduled busses to contend with late-comers.

The scheduling of transit service can meanwhile seem imposed—insensitive perhaps—or timely, reliable. This response to changes in the behaviour of sites ultimately



Detail of bus service graph, showing layered rhythms compared with dynamic activity (demand) in grey. From Halifax Metro Transit.



The schedule of various program elements within walking distance (500m) of the site, for a given weekday. A reading of the density of activity is shown in gradient at the bottom.



- Military
- Commercial
- Residential
- Institutional
- Church
- Site

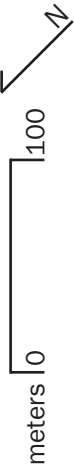


Diagram of existing program elements near site. Based on map from Bing Maps.

takes the form of an arrangement of rhythms, parsing activity into more or less intuitive segments. And it is this arrangement which mirrors the beat of a Techno mix, and which may likewise sever or mend the inhabitant's perceived sense of time or site.

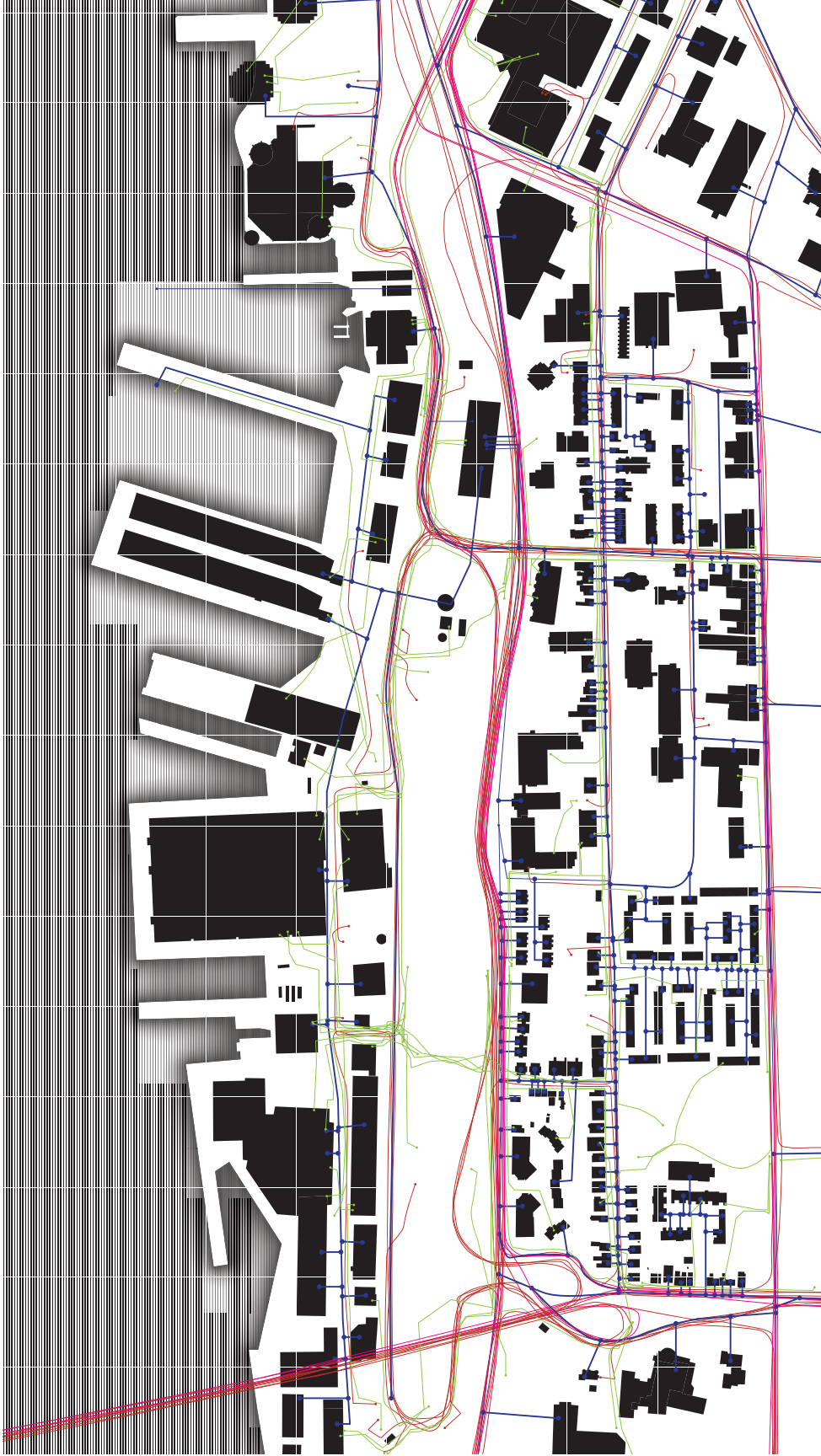
Track Sampling

The site's bus scheduling also parallels many other rhythmic systems, each exerting a certain influence on its spatial development and experience. The paths of those pedestrians who commute through the site are entrenched in the hillsides, and may be a factor in determining street crossings, bus stop locations, small businesses, community services. With every such pathway, there are specific temporal signatures, made of specific movements, activities. The foundation or physical grounding for the "beat" lies, as with the bus scheduling cited above, in working with these rhythms to shape compatible spaces.

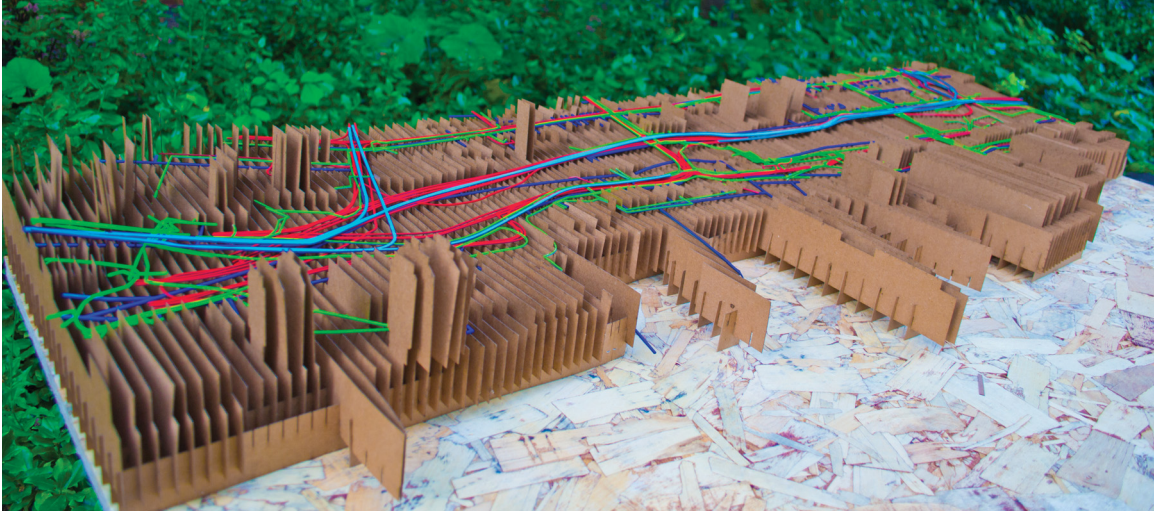
The following model is a mapping of these rhythmic orders, which are constructed as time-shadows, according to their daily trajectories. Red indicates vehicular traffic, green: pedestrian, light blue: public transit, dark blue: utilities, i.e. electricity network, waste and freshwater supply, communications.



Site model at 1:1000 scale, showing pathways of movement in and around the site and relationship to topographic and built events.



Map of urban pathways, with pink lines for automobile traffic, green for pedestrian, blue for utilities and red for public transit.



View of movement model, with emphasis on spaces of coincidence, of overlap. The paths of movement through built and unbuilt urban spaces define potential hybrid-space, or space which may accommodate a mixture of program types. As the adjacencies are compounded, the model becomes increasingly three-dimensional, evoking a new spatial structure for the site.



Paint study of perceptual residue, as experienced when travelling longitudinally through the site.



0 100 meters ↗

Drawing of the site as reflecting the rhythmic structure of the adjacent military base. By transposing this rhythm as the basis for developing the site, intervals of spatial coincidence are built into the new mix.

The objective of this mapping is to locate areas of confluence between patterns, and to determine where they are three-dimensional, e.g. where they interact with buildings and topography.

The Cross-Fade

As an adjunct to the study of the site's various rhythmic orders, a photographic study is conducted to examine haptic events and spaces within the site. This study begins first with video footage as a key map, then moved into photo-montages, in emulation of Eisensteinien techniques of Montage. The initial photo-assemblage predicts certain key factors in the site's perceptual reading, which are seen as threshold objects between rhythmic orders. These objects are shown below in reference to a longitudinal photo-assemblage taken at right-angle to Barrington Street.



Photo-assemblage of site looking northwest.



Composite photograph of adjacent residential buildings with site beyond, using fragmented “montage” to replicate perceptual rhythm.

1



Bridge



Angus L. Macdonald Bridge, as seen from Barrington Street looking towards the site. The bridge remains a constant landmark as one moves through the site, infusing the viewers' apprehension of scale with its own fragmented perspective.

2



Onramp



The on-ramp viaduct, which expedites traffic access to the bridge from the site, weaves overhead. As with the bridge above, the on-ramp comes into prominence visually as a threshold to the site. As one moves onward, fragments of the viaduct remain prominent as markers of distance and time.

3



Crosswalk



The crossing shown above is the only direct pedestrian route between major intersections. It funnels walkers between the naval dockyard and adjacent neighbourhoods. Beyond, the site is a void filled with surface-parking. The void and the sparse tree canopy give clear line of sight to the dockyard's brick structures, to the entry passages, to people and vehicles moving to and fro. The crossing however subsides from attention once passed; a less explicit manifestation of the site's rhythm.

4



Surface parking fills most of the site, though the steeper portions are unused and partially wooded. This pseudo-park condition is the site's most seamless; the trees form a smooth screen against the stark solid/void texture of the surrounding areas. Objects such as billboards, lamp-posts remind of the urban rhythmic structure.

5



Loading Dock



An entrance to the Naval Dockyard coincides with a transit stop and warehouses. The intersection allows pedestrian crossing, and also serves to sort those military vehicles from civilian.

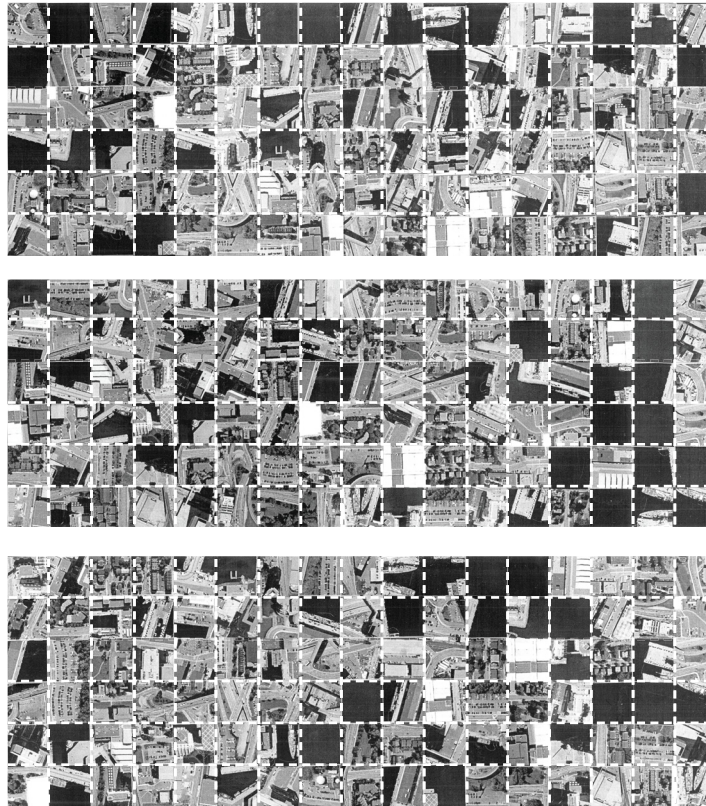
6



Water Treatment Plant



The water-treatment facility is sunken into the hillside, masking all but the sky and dockyard cranes from immediate view. The foreground shows a fence which seems to repeat itself beyond comprehension, having a seemingly endless number of spindles over an inexhaustible length.

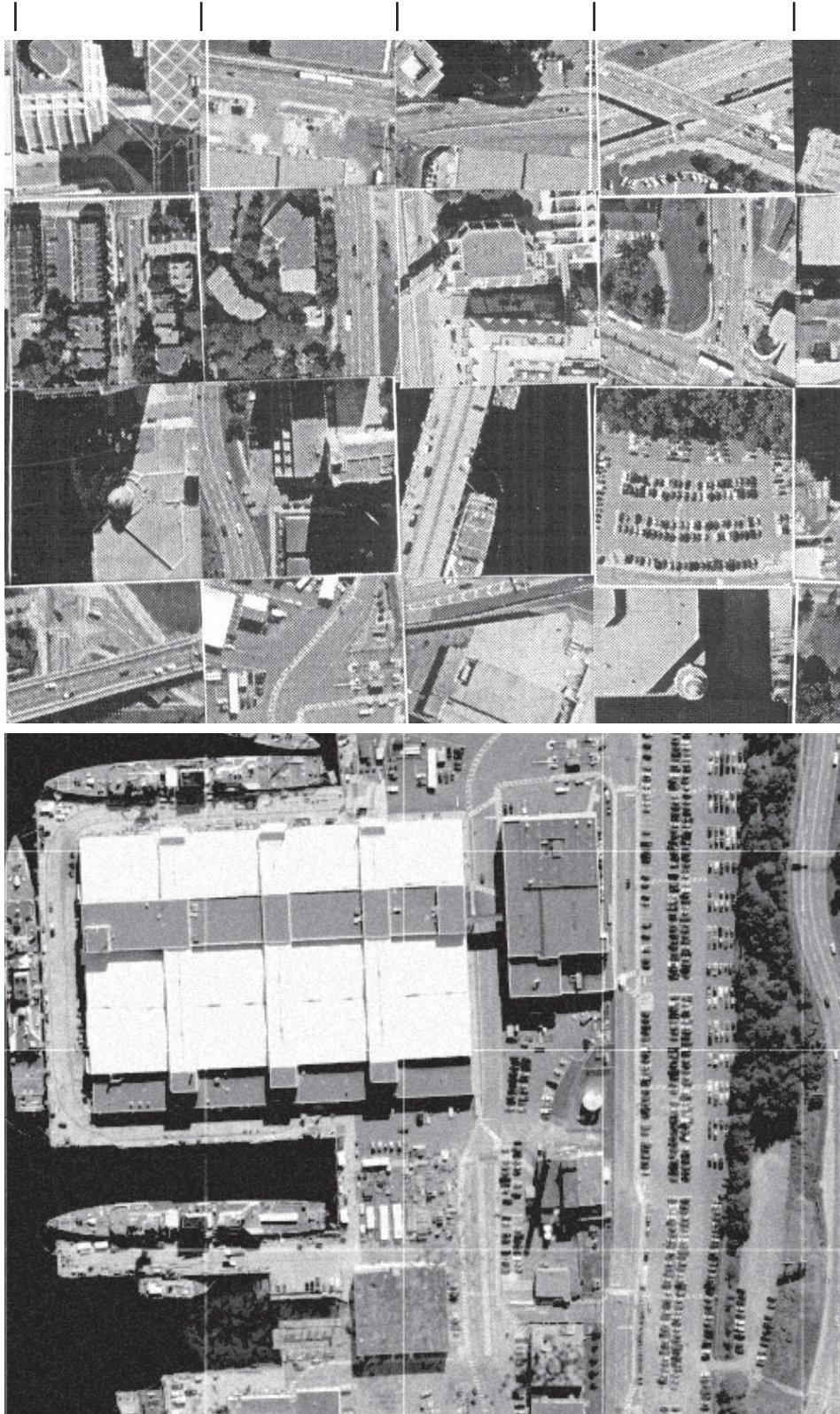


Aerial photographs of the site, having been re-mixed into new urban patterns. The grid spacing is 50m squared.

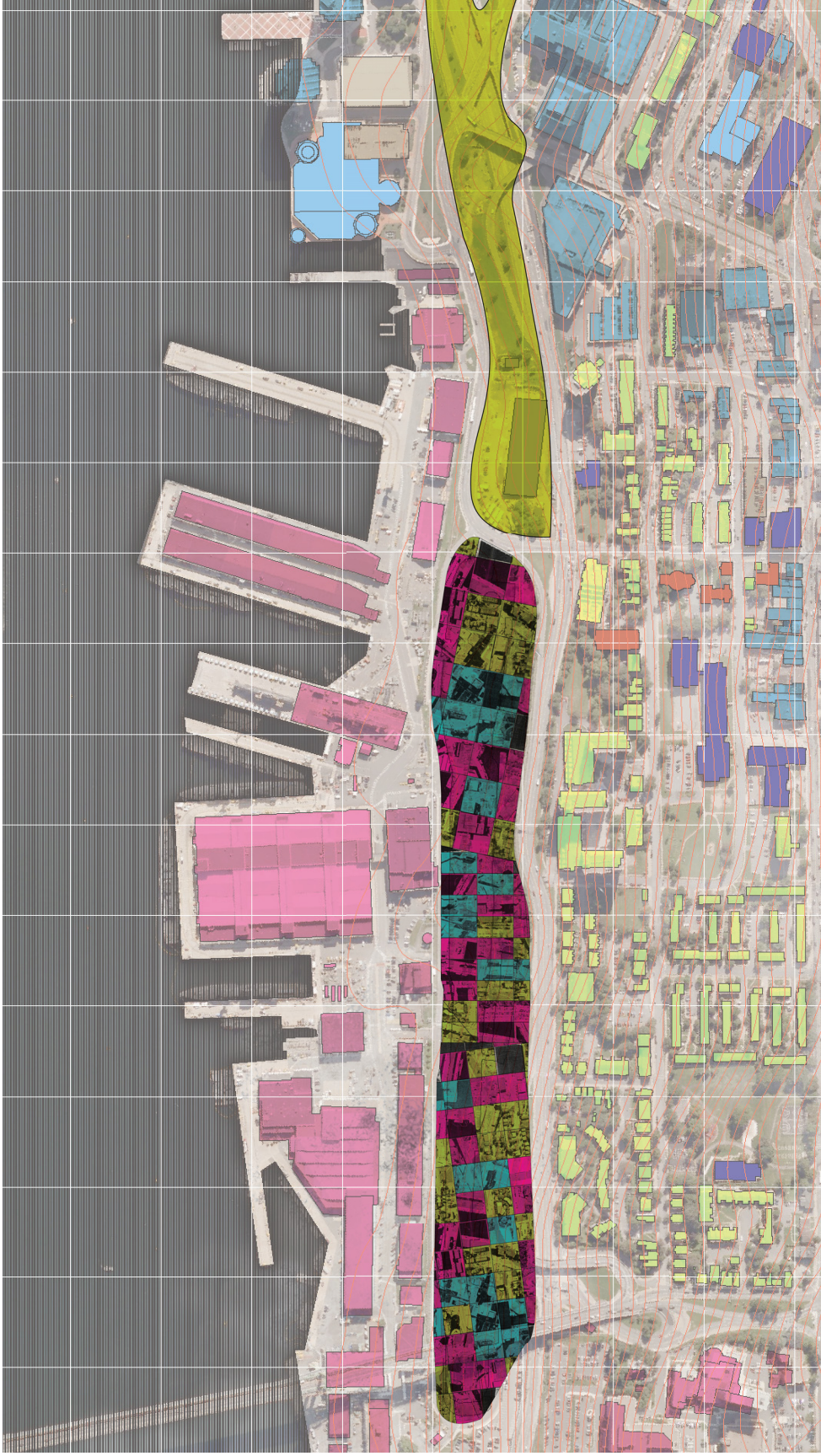
The Mixer

To study the site's existing "mix," a simple game was devised that produces scrambled impressions of an aerial photograph. The mixing creates alternative patterns of built and unbuilt, infrastructure, water, and highlights the relationships between them. A road may now be truncated by a section of the harbour, which is isolated within a residential block. This mixing also prompts a re-envisioning of the site in 3 dimensions, through answering how a road may pass under or over obstacles, or how the space of a park would be affected by adjacent naval operations.

Ultimately, the patterning is useful to define the site's existing genome, or perhaps something akin to Foucault's Heterotopia. Spread evenly the two-dimensional re-arrangement forms a kind of base-line understanding of the side, and is similar to the stoic structure of a techno mix.



A section of a “re-mixed” neighborhood, as performed by the mix-game. The parcels themselves remain intact segments of the site, but their relationships are transposed, re-positioned. This in turn reveals an underlying, fundamental “mix”. From Bing Maps.



An example of urban-scale mixing on the site, with evenly-distributed programming: pink is zoned Military, blue is Commercial and green, Residential.



The mix is refined to reflect the existing spatial cadence of its surroundings. By following these proportions, the new mix is founded on an image of the old, having similar plot size and density.

Phrasing

Phrasing, or “stage matching” in Techno performance is the moment at which two or more “phrases” of tracks are juxtaposed. In terms of technique, the DJ must slow the pace of one or another track usually by transposing or shifting it to a higher or lower pitch. The alignment of timing provides an opportunity to transition from the first track to the next while maintaining the beat.

In addition to aligning the beat, there are ways in which this transition can be addressed by the DJ; Bill Brewster and Frank Broughton, in their book *Last Night A DJ Saved My Life*, emphasize this moment as most crucial of the DJ art-form:

The truth about DJing is that it is an emotional, improvisational artform and here the real scope of artistry lies. A good DJ isn't just stringing records together, he's controlling the relationship between some music and hundreds of people. That's why he needs to see them. That's why it couldn't be a tape.²⁰

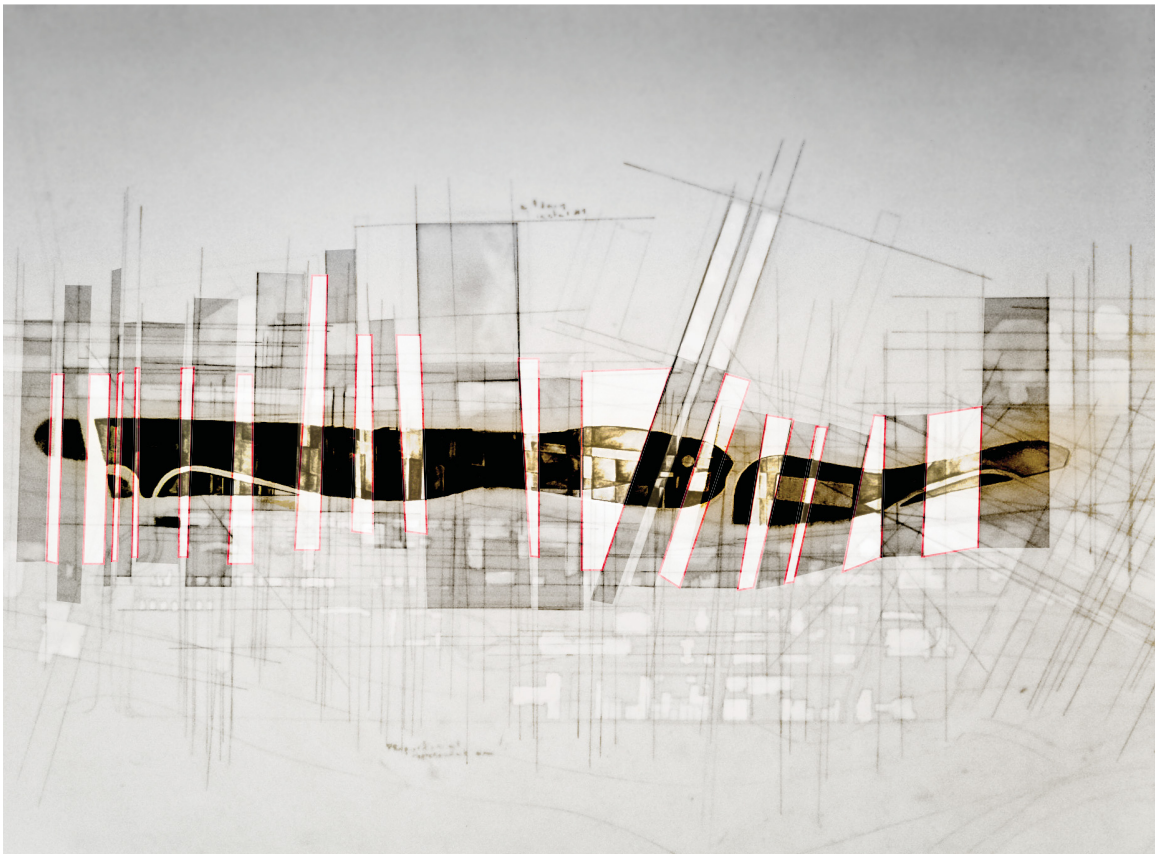
The decision to perform phrasing seamlessly, would likely be influenced by a specific reading of the audience, at any given moment. In this way, the DJ incorporates its surroundings into the mix before and during performance. It is momentarily self-aware. For a brief instant, the DJ works as though an entire orchestra with the crowd as conductor. Phrasing produces a sort of sub-track; taken from various overlapping tracks to form music that is either complimentary, opposite, or somewhere in between.

Here the architect-DJ sees Phrasing as equally crucial. In juxtaposing the elements of found “tracks,” the site, having several “sub-tracks”, emerges somewhere between the existing mix of spaces, programs or user groups and the rhythms of transit. With this juxtaposition there is also an eye to the crowd; the site is perhaps more or less altered by these new tracks and as well in part, the tracks may blend in more or less to the site. They may acknowledge or not the programmatic and phenomenal characteristics found at their respective phrasing moments.

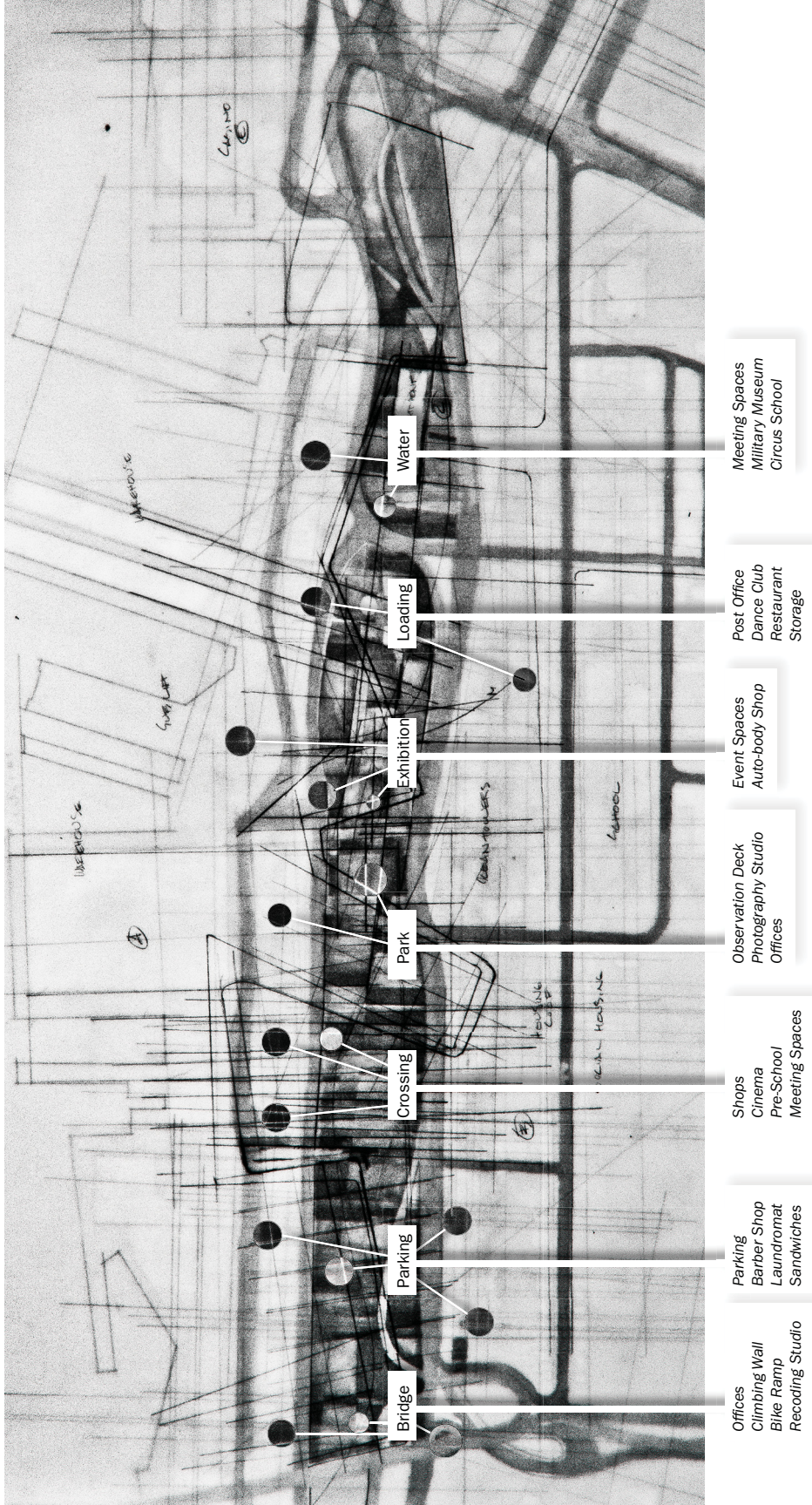
These events thus form the basis for a site reading, and subsequently an architectural proposal. With the involvement of several different user groups, Phrasing generates hybrid space suitable to several uses in parallel. In this way, a barber shop may become a lobby

²⁰ Bill Brewster, Frank Broughton, *Last Night A DJ Saved My Life: The History of The Disc Jockey* (New York: Grove, 2000), 11.

space for a parking structure; a pre-school may sit along side a metalworking shop. Once the events are located on site, their position dictates appropriate uses, potential tenants. The combining of programmatic elements thus serves to amplify that very location, to define the temporal-spatial nature of the place.



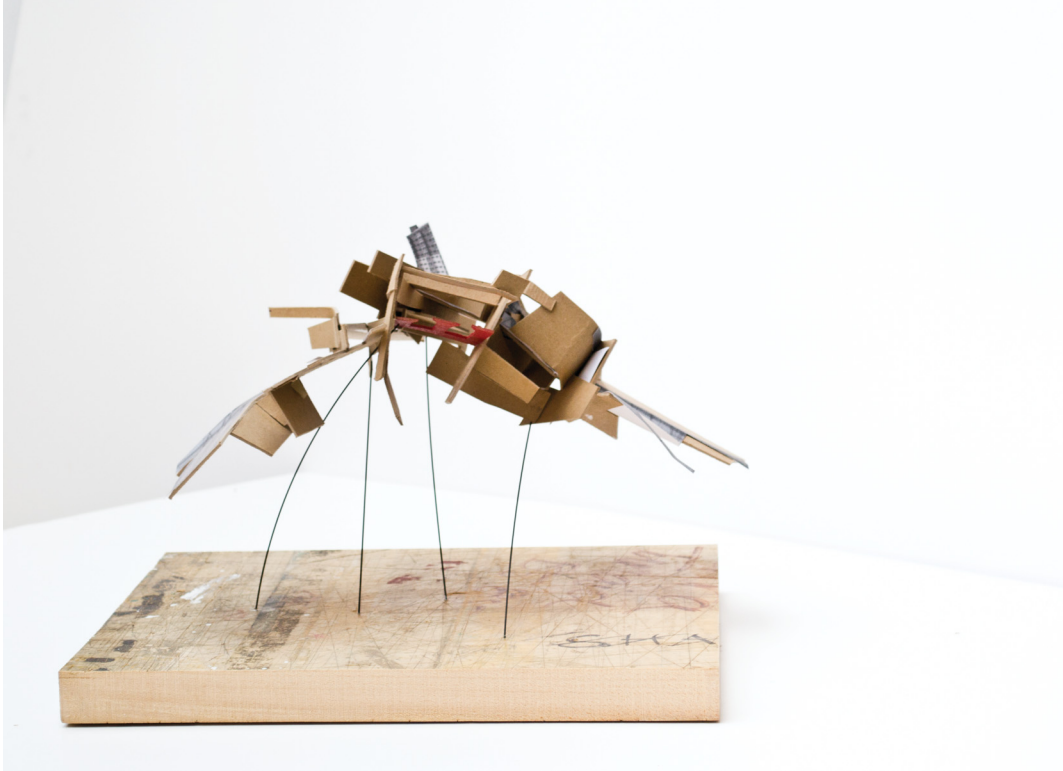
The phrasing moments denoted on site (white), highlighting transverse connections to exterior elements.



Drawing of boundaries created during Phrasing. The duration of each segment reflects the spatial intervals measured around the site, while the orientation is drawn from perceptual mapping, shown earlier. The site's divisions become the seed points of the new mix, both programmatically and tectonically.



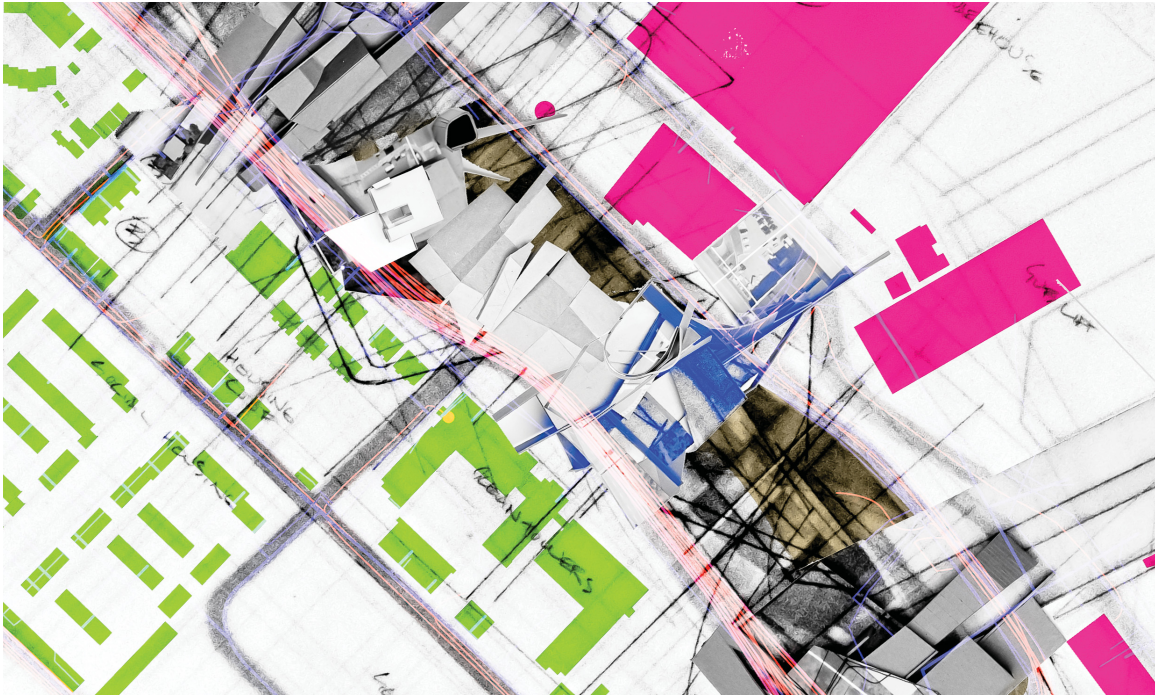
Model of phrasing boundaries at 1:2500. The orientation and thickness of boundaries is elaborated upon, creating relief and thickness between sections of rhythm sections.



Model of phrasing boundaries at 1:2500. The depth of divisions becomes structured, framed to develop a hierarchy of scale in the site as a whole.



In the space between phrasing moments, the site may be allowed to develop according to its fundamental rhythm, as revealed through the mix-game. The drawing above shows the grid of parcels laid according to the orientation of adjacent spaces between phrasing moments. Based on aerial photograph from Bing Maps.



Composite drawing, showing urban grafts, urban fabric.

The Urban Grafts

The next stage in mixing is a layering of information defined as the production of the formal studies correlating to phasing moments, while considering further their respective localities or micro-climates. Each phasing moment has specific parameters, creating the basis of an architectural proposition, e.g. the proximity of public transit access, or the need for expansion of an existing program. In this new mix, the specific needs of the site are analysed and formally sequenced in space.

The Grafts begin as a series of model-studies, built directly from previous drawings and models. The translation of information into these models is direct, which like the DJ references ad hoc fragments of aerial photographs, perspective video-montage.

In iterative steps, the mix's phrasing intervals are actualized, expanded. These suggest details of circulation and program. At this point, the models themselves also imply potential use in their framing of space. From these initial notions, the grafting process is an act of pulling, pushing: an extension of the existing fragments while still complying with forces at work in the larger mix.



Plan view composite drawing of site, showing urban grafts, zoning and urban rhythm and pathways.

First Graft-Model Series



Threshold Studies—initial grafting proposals highlighting phrasing moments.

Loading



The location of this particular phrasing event is at the shipping entrance to the Naval dockyard. It mixes the acts of loading, unloading and moving goods with that of moving people, with spaces planned for a dance-club, post office and restaurant along with storage and shipping-receiving facilities.

Exhibition



The Exhibition spaces responds to this location's proximity to heavily populated centers of both the military and residential neighbourhoods. With the aim of offering social programming, the Exhibition mixes performance venues with maintenance facilities. The auto-body repair shop becomes a theatre by night; the pipe-fitters share space with the art-house cinema.

Crossing



Crossing responds to a heavily-walked portion of the site, between the adjacent neighbourhoods and public transit stops. The hillside is extended to become shelter for informal and formal retail business, as well as spaces for education and a cinema. The singular path is multiplied to reflect the mixture of pedestrian trajectories, of narratives.

Park



Park is the subterranean continuation of Gerrish Street through the site, thereby lifting the hillside into an observation platform. The large terraced shelter also houses, among other things, a photography studio, offices, a fitness center. The hillside surrounding the platform is preserved, re-forested.

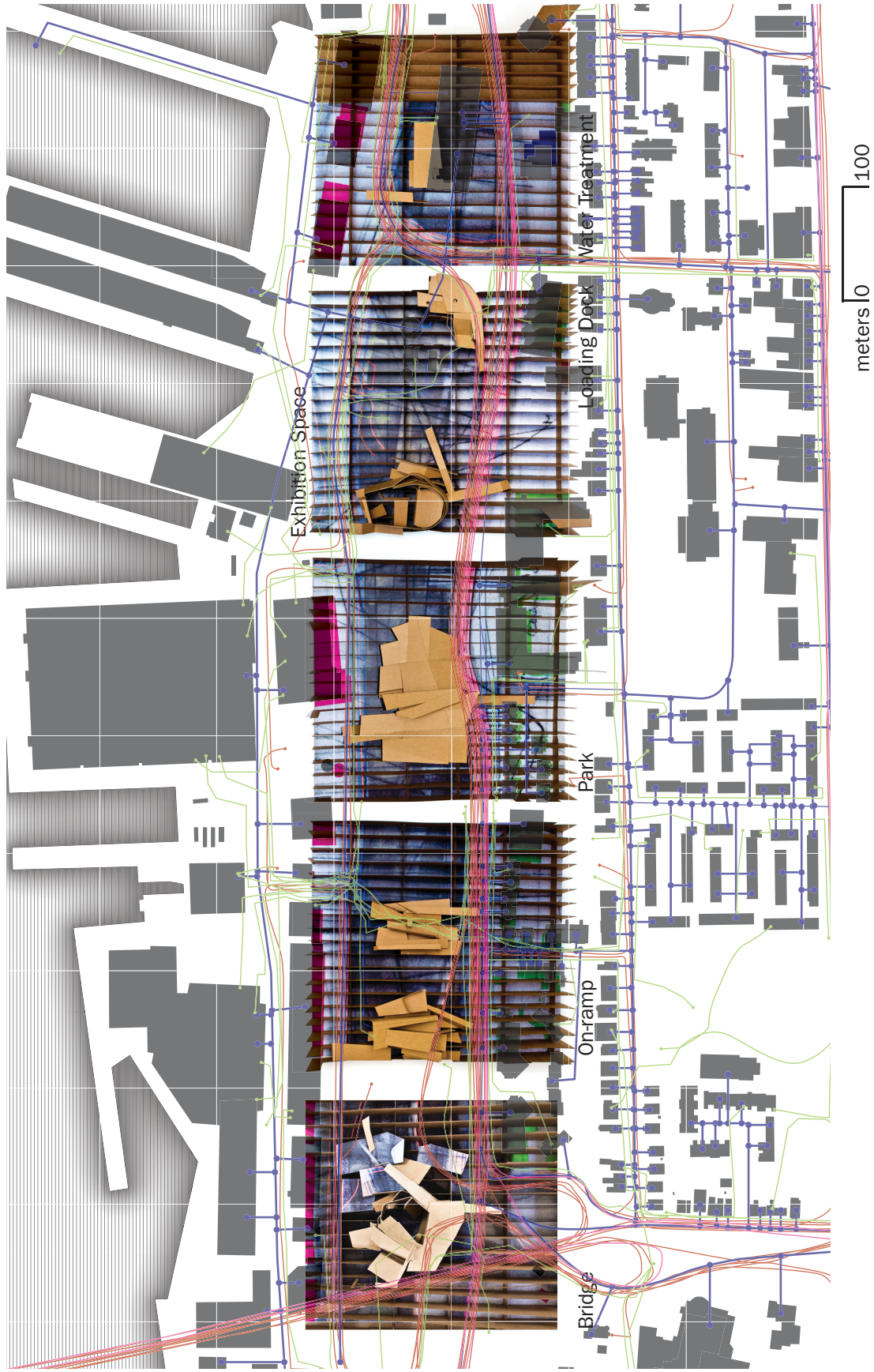
With the addition of a vertical dimension, the relation of existing spaces to the site is altered. These alterations are monitored and subsequently re-mixed with the existing tracks. This kind of “feedback” invokes a key feature of the DJ’s creative process, whose proximity to the audience during a live performance enables them to monitor the effects of mix constantly.

In the case of the architect-DJ, the “live” aspect of the design is considered the compilation of spatial information into a concise format, in model form. This next series of models is a compilation of spatial and programmatic data, creating a dense composition of temporal-spatial artifacts. The information is filtered through a three-dimensional grid representing the existing site, with both topography and built elements abstracted as individual sections.

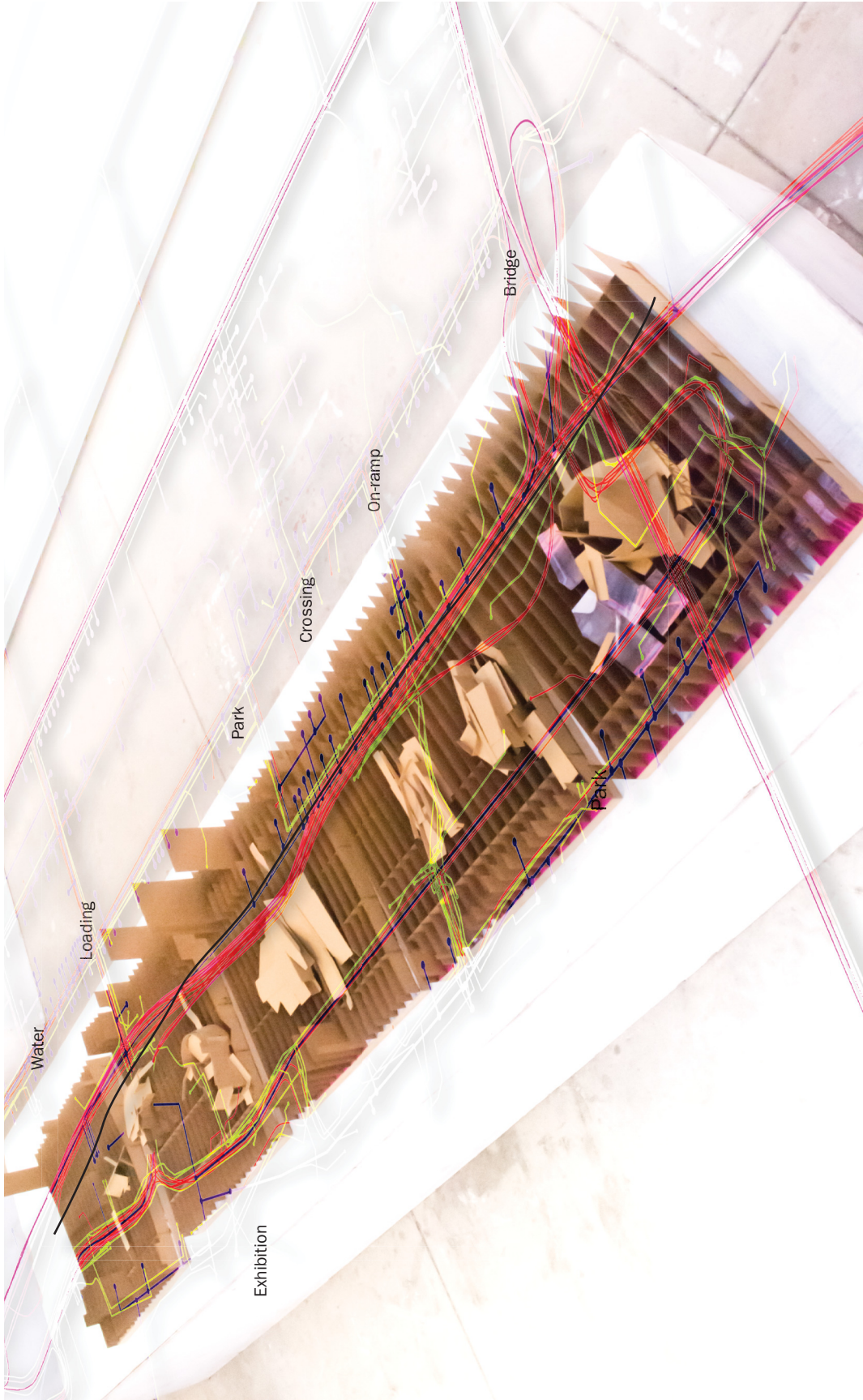
Second Graft-Model Series



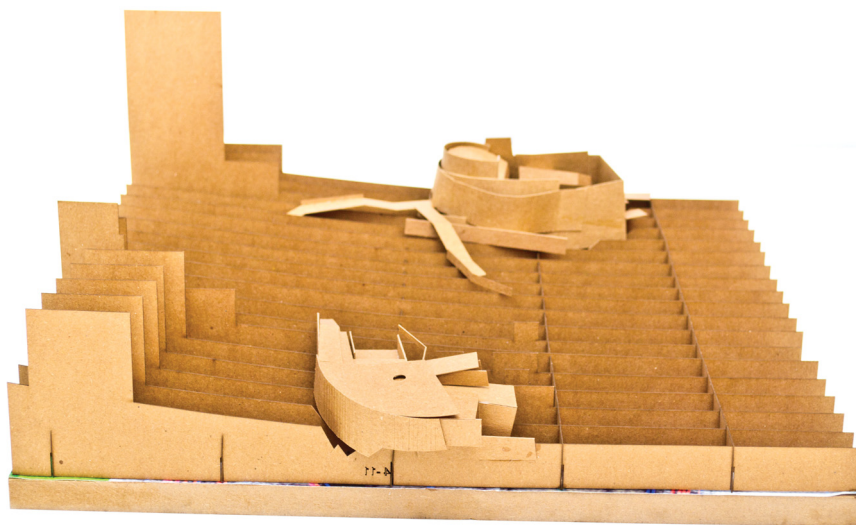
Proposal for area next to the Angus L. MacDonald Bridge, based on a compilation of site-based studies shown previously. 1:500 scale.



Plan view of models shown with underlying rhythmic study map.



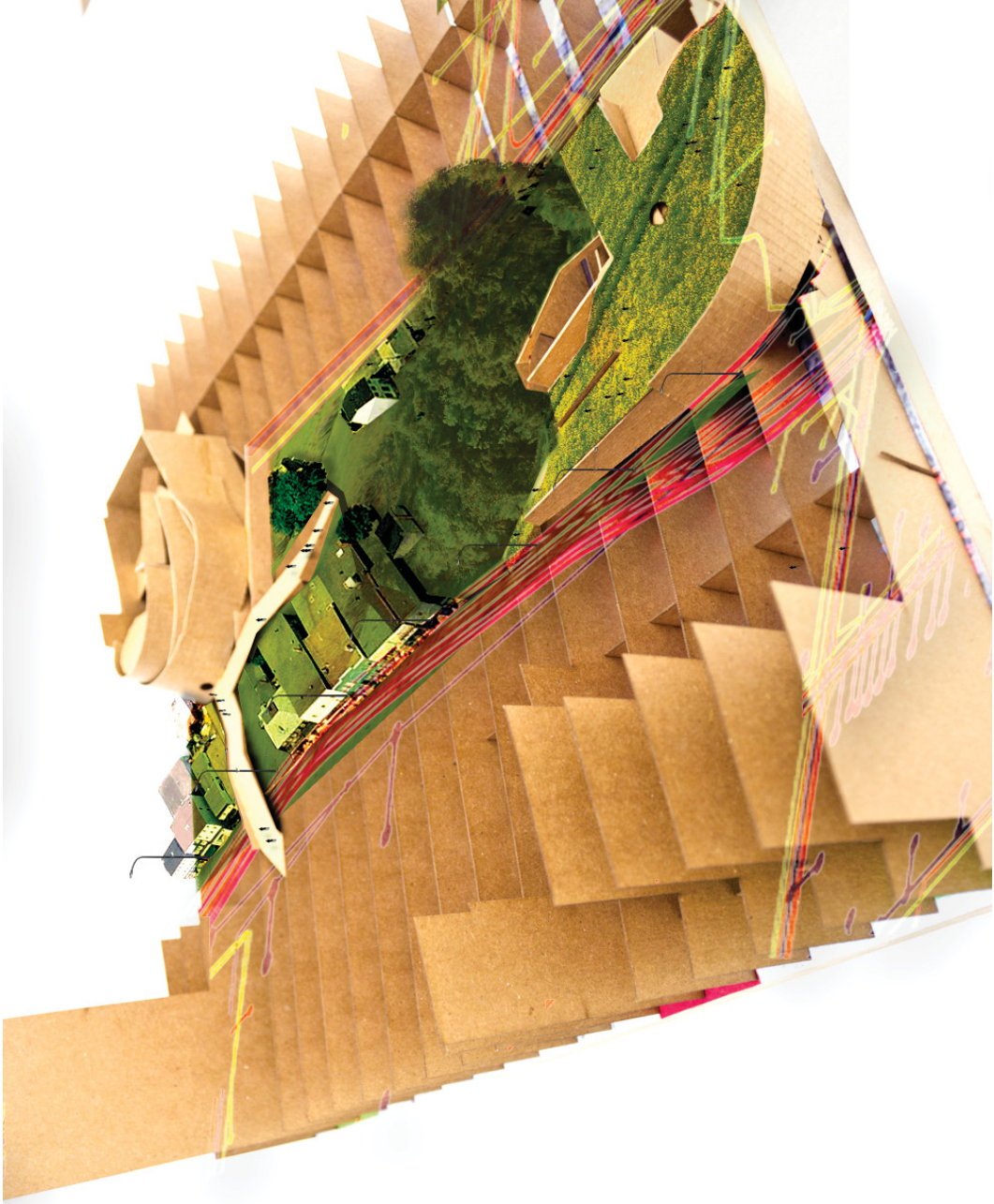
Urban Graft models, 1:500 scale.



1:500 scale model of Loading Dock and Exhibition Space.



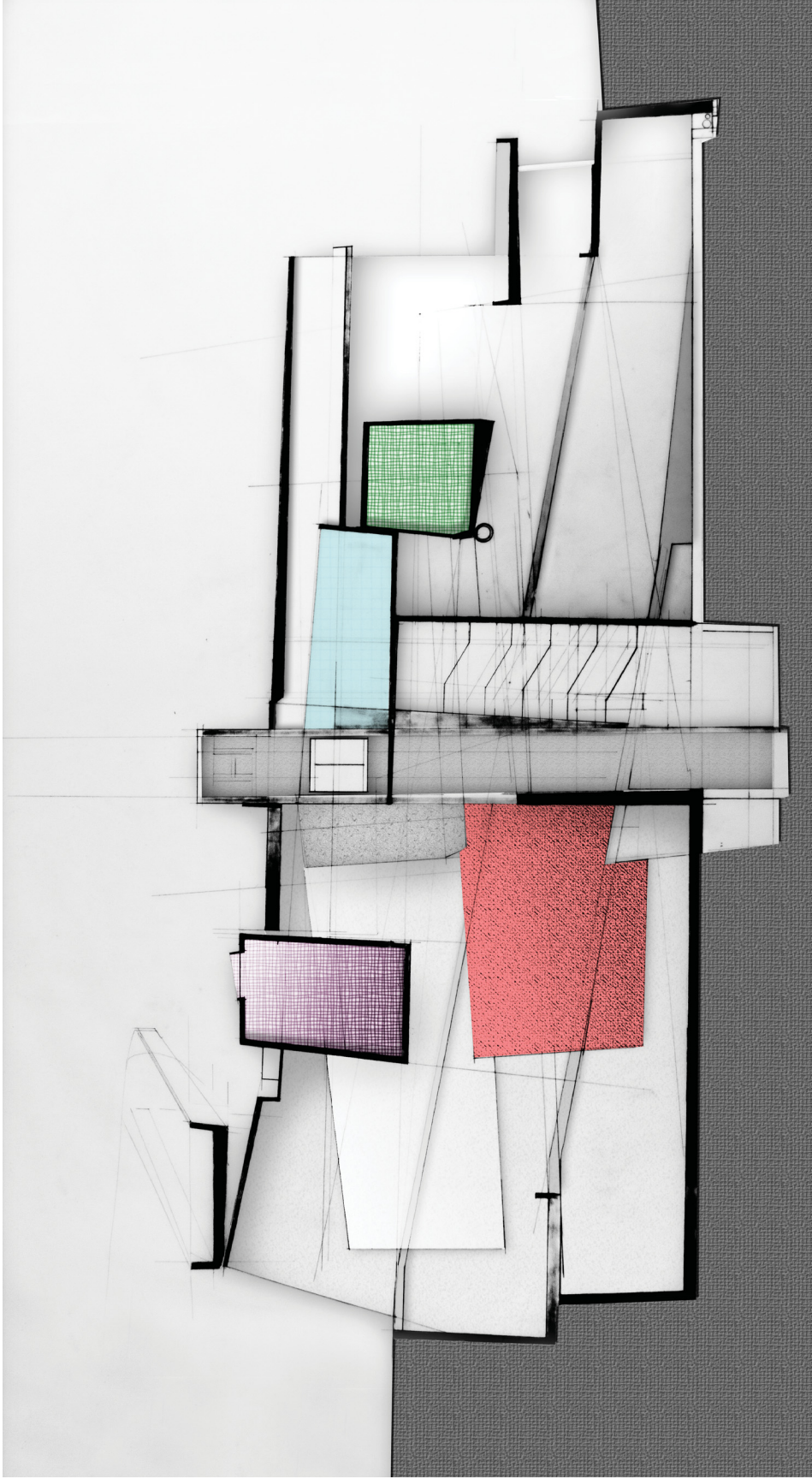
Section drawing of Loading Dock—with services for loading and unloading goods for other site-based functions, such as storage and gantry lifts and also a dance-club. The movement of goods occurs in parallel with the movement of dance.



Composite image of Exhibition and Loading models showing possible new development pattern in between: in this case, to the spatial rhythm of nearby existing neighbourhoods.



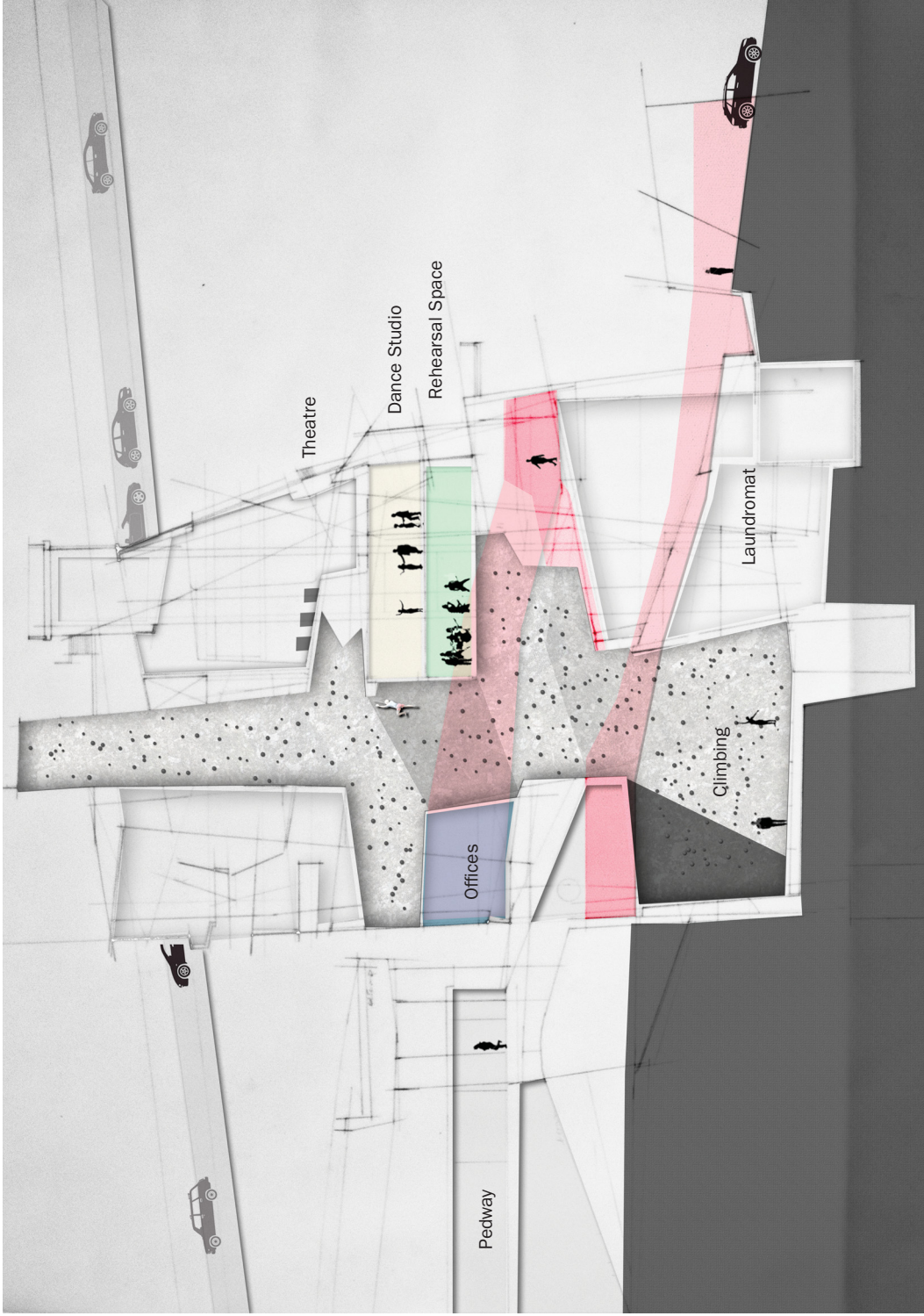
1:500 scale model of Crossing and Parking structures.



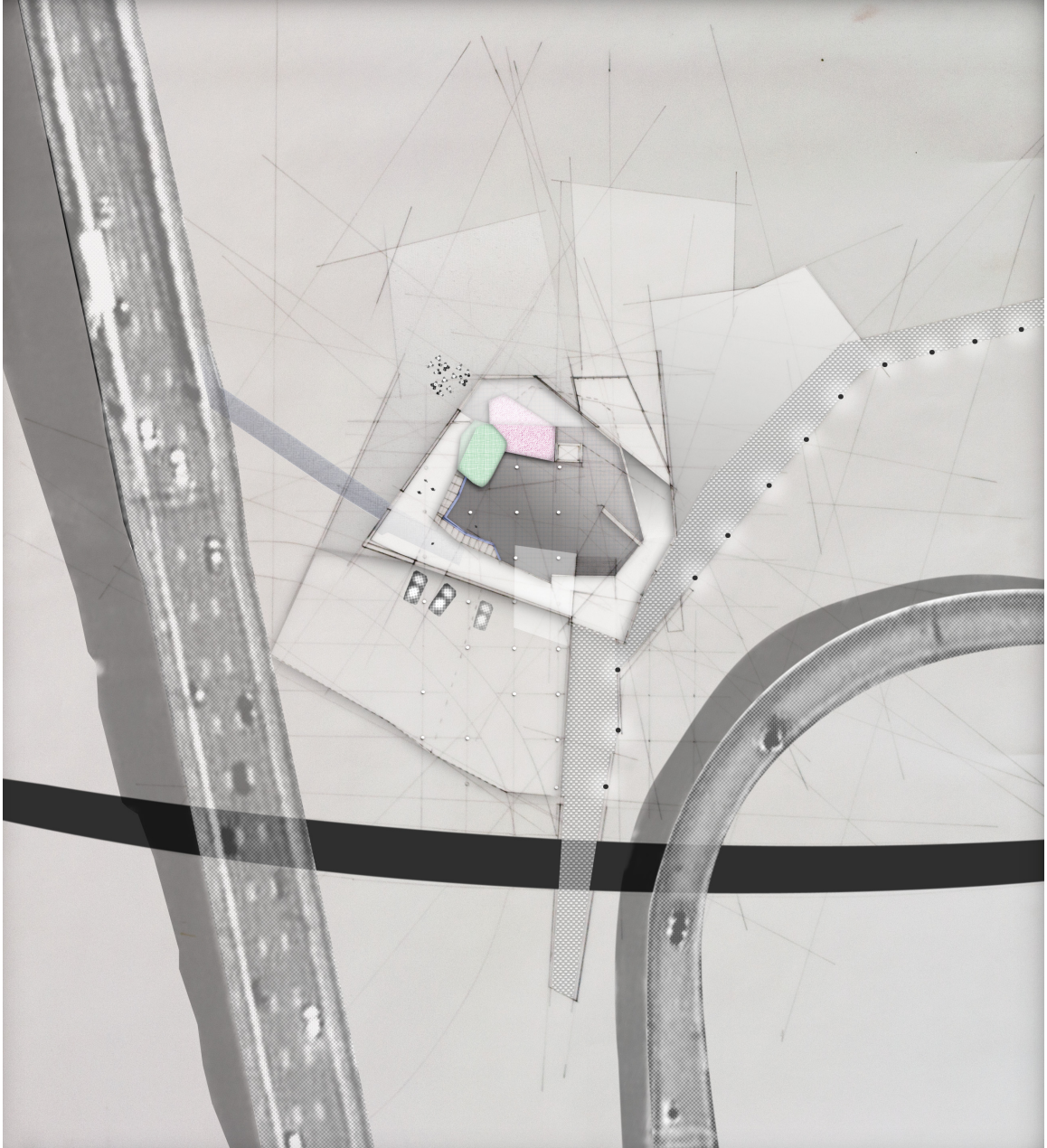
Section drawing of Park structure—a spatial hybrid of parking-garage and meeting spaces. The spaces cling to the structure's helical ramp.



1:500 Scale model of the Mountain structure.



Section drawing of Mountain structure—a spatial hybrid of climbing wall and flexible meeting spaces. The ascension to the bridge above, and to the neighbouring community of Dartmouth occurs by way of elevators, ramps, stairs and the climbing wall.



Lower-level plan of Mountain structure, as an example of synthesis of local temporal and spatial influences.

CHAPTER 3: CONCLUSION

Techno City

The central premise of this thesis is that these urban rhythms can be read, understood explicitly and ultimately render that understanding into the built environment. The Techno DJ's approach to making and performing music here parallels the architect's making of architecture.

In a Techno City, the elements of urban spatial rhythm are at once driving and scrutinizing development. Coincidence or contradiction to these rhythms becomes the central act of architecture. New forms of inhabitation are constantly proposed, dissected, repeated, analyzed; the transitions between urban rhythms are the nexus points of a great iterative cycle.

Presumably, the effects of this study can aid to harmonize new development with existing localities. There has however been no attempt to judge urban "harmony" in this text. In stead, the predominant approach to design has been to follow perceived patterns in the city, and therefore to evidence potential incongruities between these patterns and the spaces they occupy. These relationships are not necessarily pejorative; indeed in many cases they fail to correlate almost entirely.

With a re-purposed site such as that studied in this thesis, the connections raised prove that what appears as a static, "blank slate" is rather a large system of connections, each with its own timing, purpose, orientation. To inhabit this space is to merge with these existing patterns, to either heighten or subdue their collective rhythm. It is that merging which determines the course of a city, of an architecture of DJ.

There are many parallels present in the work of DJ's and architects. The city's underlying rhythm, in both temporal and spatial terms, can be read as mix in process—a process which can be studied, acknowledged, translated. Architecture may well utilize and act within these patterns; though perhaps it may also go beyond them—to the spontaneous catharsis of the phrasing moment, to the beat drop.

The DJ-architect process has at least two foreseeable outcomes: it may simply and

preemptively define appropriate locations and types of amenities, services, etc.; otherwise, it can suggest new hybrids of these things, such that the city can follow its rhythmic balance as integral, inspiring.

These hybrids—as with Foucault’s Heterotopia—become the every-day temporal and spatial reflections of the city; defining the space of the hybrid then seems truly akin to the work of a Techno DJ. It is that which happens between tracks, beats, phrases that reveals the strength of the DJ; in turn, it is the rhythm between school children and pipe-fitters, between trees, busses, grocery stores and stadiums that reveals the remarkable likeness between the architect and the DJ.

GLOSSARY

Acoustic

Acoustic denotes the relationship between sound and the physical environment.

Amplifier

The amplifier raises the output strength of an audio signal.

Analog

Sound production using electronic signalling and signal modifications. These modifications are made directly to the signal, in series or parallel, without use of digital codification.

Balance

Relative directionality of audio signal. The Balance is used to situated sound objects within acoustic space, by modulating the proportion of output from each emitting device.

Bass Line

Lower frequency sounds, employed to develop the Beat or to provide counterpoint. Usually emphasizes or refers to song structure.

Beat

The beat refers to a pattern of elements within a musical structure either percussive or bass, which create a sense of underlying structure. In Techno music, these are often used to trigger or enable other sounds (see side-chaining).

Beatmatch

The DJ will carefully beat-match between two tracks in order to layer the transition from one to another. This requires that one track be either accelerated or slowed, sometimes changing its pitch.

Bit Rate

Fidelity of a recording sample, in digital format. Bits of information are collected per unit of time (usually seconds.)

Chorus

An effect which consists two or more sound-objects, usually with adjustable syncopation. The chorusing of two or more sounds creates a feeling of depth within the virtual-acoustic space.

Compressor

A compressor is used to consolidate selected sounds above a range of amplitude. Those sounds which are of a certain frequency are made louder, leaving potentially undesirable noise less heard.

Delay

The delay of sound is performed by re-routing the signal path into a storage device, then outputting after a period of time. Delay is sometimes used to emphasize aspects of distance or depth.

Depth

Sense of ambience, or distance created by employing reverb or delay. The depth of a sound-object is usually mimics a physical spatial condition. It can be immediate (dry) or deep (wet) depending on the characteristics of this mimicked space. Combinations of reverb and delay might create echoes or other patterns which distort the perceived sound.

Dynamics / Dimension

The size and proportions of the audio output, defining a kind of virtual-acoustic space (as opposed to a physical, acoustic space).

Filter

A filter shapes the signal path of sounds triggered, typically in four steps: Attack, Decay, Sustain, Release. An electrical circuit that emphasizes or eliminates some

frequencies from a signal. Filters are used in electronic music to alter the harmonic content of a signal, which changes its timbre. Many of the filters used in synthesizers are voltage controlled filters (or a digital equivalent), which allows the filter to be controlled by a signal generated elsewhere in the synthesizer, in addition to or instead of a panel knob.

Frequency

The objective measurement of the cycle rate of an alternating signal, as opposed to the pitch. (There is a tendency to use the two terms interchangeably; musicians are more likely to use “pitch” to refer to frequency, while engineers are more likely to do the opposite.) Although, for a given sound, the frequency of the fundamental usually determines the pitch.

Height

Overall distribution and range of sonic frequencies.

Oscillator

The basic element of analog sound production. An oscillator creates sound signals when controlled by varying its electrical intake. The oscillator will vibrate at higher or lower frequencies according to the amount of electricity it is fed.

Pitch

A sound may be described as having pitch, belonging to the predominant frequency of its harmonic overtones.

Transpose

To pitch-shift an entire musical passage, or chord or phrase, such that its parts retain their relative position and relation.

Portamento

An effect which reduces by a degree the contrast between two sounds created, making them blend together when triggered.

Modulation

In general, periodic variation of a waveform, in which some aspect of the waveform is varied usually according to the instantaneous value of some other waveform. The waveform being varied is often called the “carrier”, while the waveform that controls the modulation is itself often called the “modulation”. Many mathematically specified types of modulation exist, such as amplitude modulation and frequency modulation.

Pulse

A waveform that appears (on an oscilloscope or in a waveform editor) as a series of rectangles, alternately above and below the horizontal center line. The relative widths of the above and below center line portions influence the harmonic content of the wave, particularly in regard to how much even-harmonic content the wave contains. The relative widths are commonly expressed in terms of “duty cycle”, which is stated as the percentage of the time that the waveform is above the center line. For instance, a 75% duty cycle means that the value of the waveform is above the center line $3/4$ of the time, and below the center line $1/4$ of the time. A 10% duty cycle has a very narrow portion above the center line and is below the center line the rest of the time. The 50% duty cycle, where the upper and lower portions are equal width, is usually called a square wave. As the duty cycle moves further from 50% (in either direction), the portion of even-harmonic content increases.

The audio timbre of a pulse wave depends on its duty cycle. The square wave has a nasally sound; as the duty cycle varies farther from 50%, the sound becomes thinner with less bass content. Very high or low duty cycles produce narrow pulses which, at low frequencies, may be heard as individual thumps, clicks, or pops rather than a continuous sound.

Resonance

In a filter circuit: feeding back the output signal at a reduced amplitude to its input. In the types of filter circuits usually used in synths, resonance has the effect of increasing the slope of the filter, and of creating an emphasis peak near the center or cutoff frequency,

which makes frequencies at that peak louder. Some types of filters will, at a sufficiently high resonance setting, self-oscillate.

Reverb

Reverb, short for reverberation, is the effect of prolonging an audio signal's persistence in both time and amplitude. Reverb simulates the feel of emitting sound in physical space, with respect to size and material considerations. In using reverb in a signal path, one may evoke a large cavern or other large spaces.

Sampling

A short recording of a waveform, sound, or phrase intended to capture the essence of the sound being sampled. All modern sampler and sample playback synths digitize the sampled sounds and use digital memory to store the samples, although there have been instruments in the past, such as the Mellotron, which used analog samples.

Techno

A word describing a genre of electronic music that emerged in Detroit and Europe in the 1980s. It is characterized by a 4/4 drum kick beat (varies), mechanistic effects and drum patterns from drum machines and synths with an occasional bass-line, melody and a generally repetitive feel.

Waveform

The illustration of an audio signal such that the different properties of the wave can be seen as a single line.

Width

The sense of direction and movement within an audio signal, and to what extent the sound occupies a space from the left ear to the right.

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