

motus et re-creation

movement and re-creation on

accotink creek

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abstract:

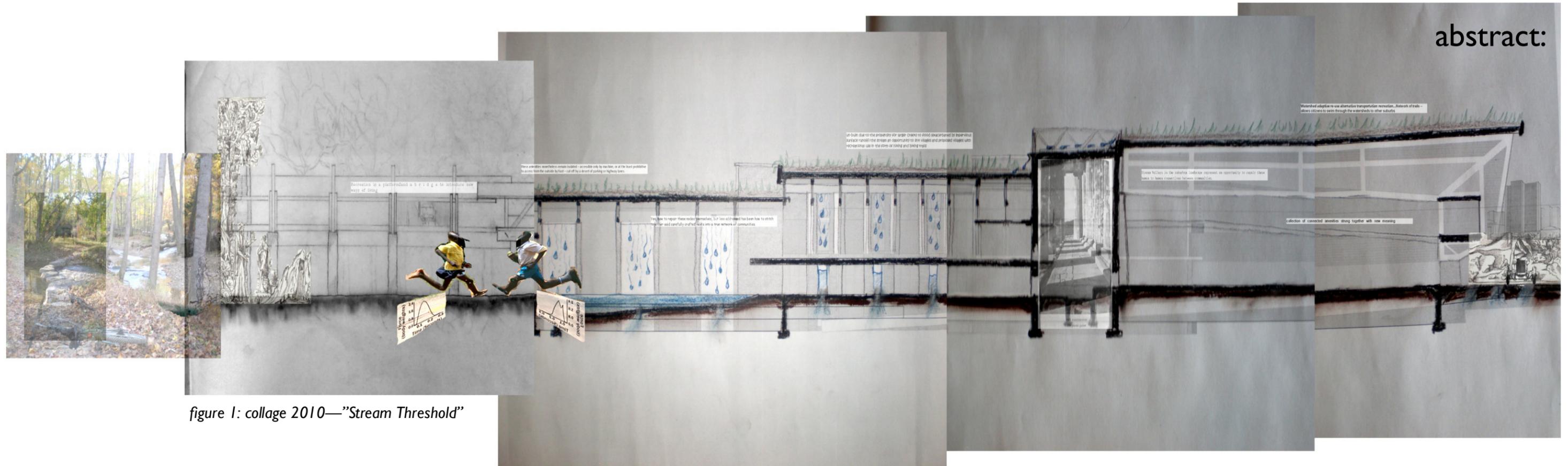


figure 1: collage 2010—"Stream Threshold"

Speed has long been equated with "progress". The Romans' paved roads begot much of this concept, allowing faster travel that improved communication, commerce, and enabled control over vast territories. Additionally paved surfaces whisked insect-breeding water away from homes, improving the health of those in town. Today, part-and-parcel of the definition of the developed world are tremendous amounts of solid surfaces, mostly asphalt and concrete, to move mechanized devices and water quickly. Even the shoes we wear could be seen as complementary technological devices, cushioning our feet to allow us to barrel forward more quickly along firm, manmade foundations. But the push towards this progress has had destructive consequences on our environment, including, but not limited to, our stream valleys.

Often abutting intense, impervious development, the stream valley watersheds have morphed from spongy spines dense with aquatic life to de-facto storm sewers, with thick foliage merely masking severe erosion and paltry ecosystems. Quite simply, the speed at which the water is pushed down the ever-narrowed corridors as paved development encroaches, coupled with pollution from this fast runoff, renders the former fish streams dead.

The recent advent of nature trails (following a mix of old hunting paths and former gristmill horse-cart ways), along unbuildable flood plains has exposed this problem in the Accotink stream valley in Northern Virginia. This thesis addresses the topic of water runoff of the Accotink stream valley and trail network. After analyzing and studying the area as a whole, the thesis focused on two scales: the larger scale of Fairfax Circle in Fairfax City in suburban Northern Virginia and a piece of this area -- a small section that acts as a threshold from urban village to natural park/trail/creek bed. This smaller section is also along the most eroded section of the Accotink Creek. At the "master plan" scale, the thesis transforms Fairfax Circle to a "village" using environmental remediation design principals to repair and regenerate this environmentally-degraded area. At the architectural scale, the thesis examines the site through the lens of the regional trail network along the stream valleys and the potential urban village at Fairfax Circle to design a trail-stop fitness center that straddles the break between conceptual urban space and repaired, stormwater-soaking stream valley.

Steven Kattula

acknowledgements

Thanks goes out to my committee, friends both at the WAAC and those I've known my whole life, my family, people with the City of Fairfax Northern Virginia Regional Park Authority, and most of all my wife Amy for her love and patience and my son Benjamin.

All images are by Steven Kattula unless noted otherwise.

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background

Philosophy : In his famous work, *The Structure of Scientific Revolutions*, philosopher Thomas Kuhn observed that science is marked by “revolutions”, shifts in which the “existing paradigm has ceased to function adequately in the exploration of an aspect of nature to which that paradigm itself had previously led the way”. “These are episodes,” says Kuhn, “ - exemplified in their most extreme and readily recognized form by the advent of Copernicanism, Darwinism, or Einsteinianism - in which a scientific community abandons one time-honored way of regarding the world and of pursuing science in favor of some other, usually incompatible approach to its discipline.” (140). While arguably limited to hard science, this concept of revolutions is allegorical to our shifting attitudes to how to develop, move through, and recreate our physical environment—in this case the “roadway” of the inland watershed. In lieu of Copernicus and Einstein, the classical writings of Vitruvius & Alberti, naturalists like Olmstead & Lethaby, modernists like Corbusier, and contemporaries such as Christopher Alexander represent shifts in priorities towards our built environment abutting these streets of water, and consequently how we perceive natural movement (water) and human movement.

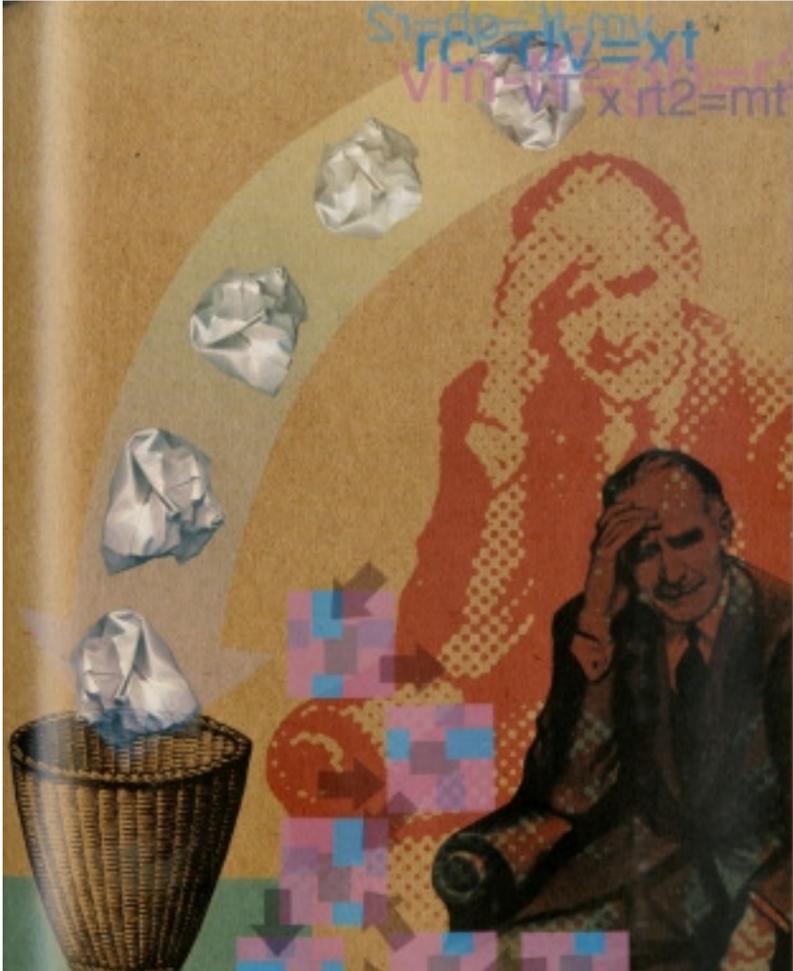
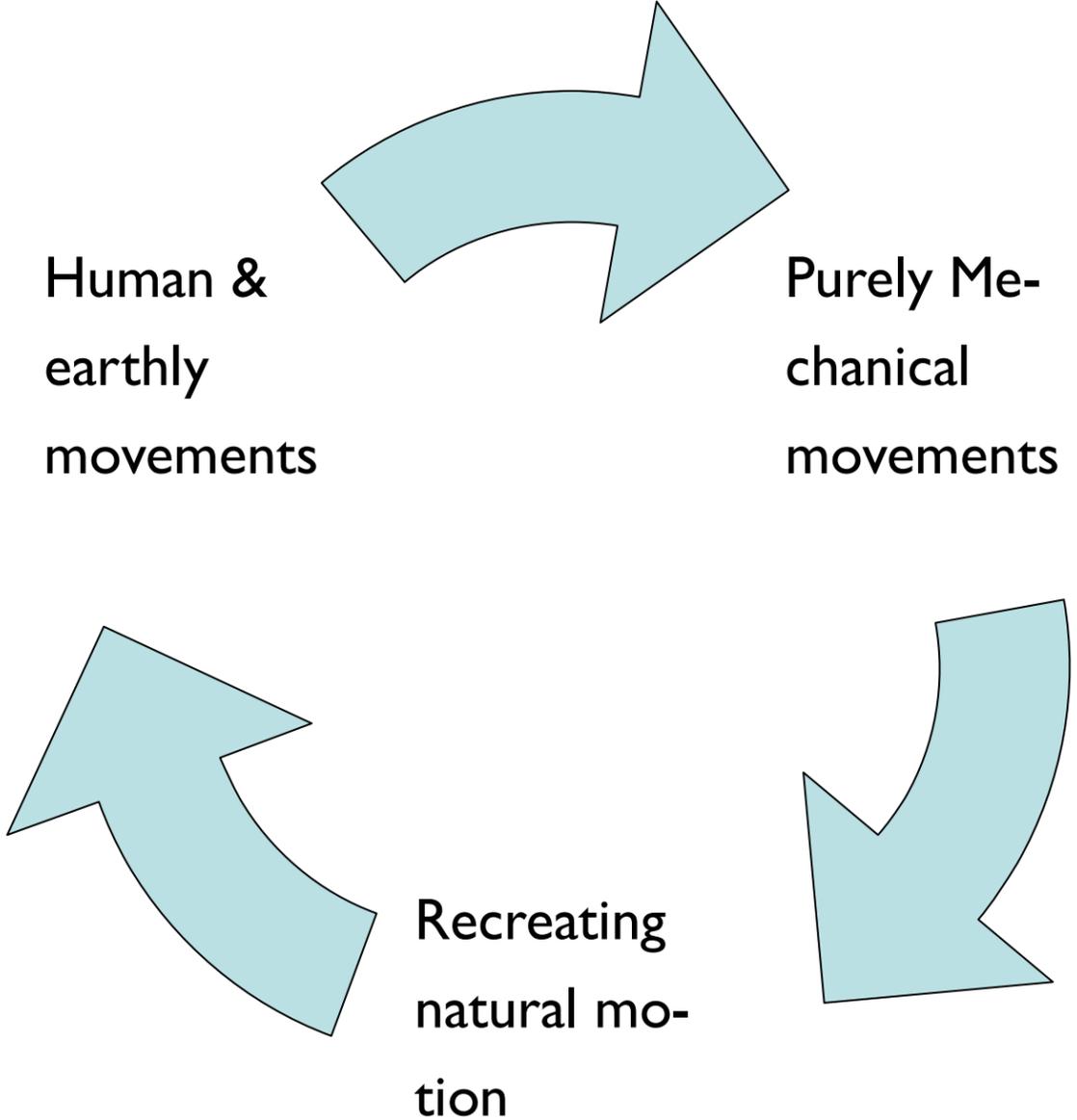
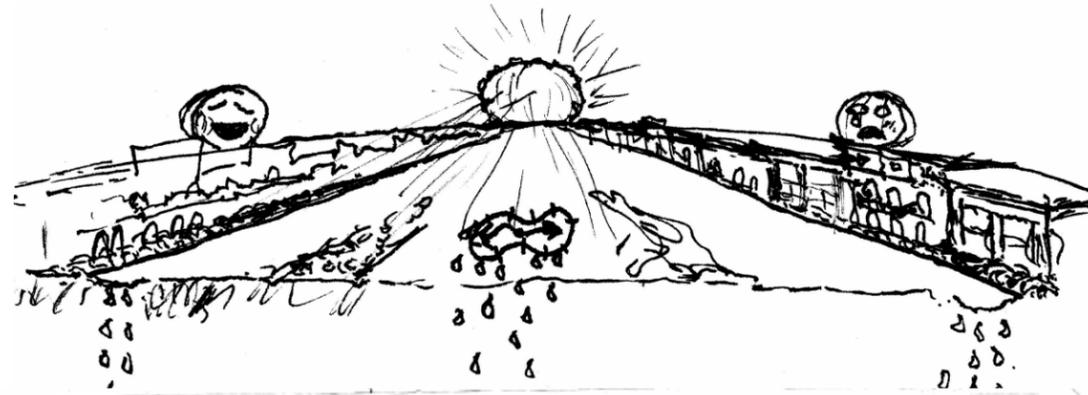


figure 2: Loewer, *Kuhn's Scientific Revolutions—50*

figure 3: rough hand sketch depicting Vitruvian ideals for the civic street.



background: classical ideals

Ancient Roman writer and Architect Vitruvius proposed looking at roads from the paradigm of public health concerns – laying out streets collectively according to the prevailing winds for all to avoid sickness, for instance, and managing wastewater in ways to have clean water for drinking and fishing. Today we focus on moving storm water away from buildings and individual lots fast, but we do it without thought of the consequences downstream to our neighbors. Large parking lots, maintenance facilities, storage yards, and asphalt plants are built tight against critical areas of the watershed in valleys that already act as collection pools for storm water runoff from miles around. The results are silt buildup at the bottom of stream hills, and water that pools, floods homes in valleys, and breeds disease against these silt buildups. Still other parts of the stream move so quickly the erosion tears apart the root systems of old growth trees. Both scenarios are incompatible with the moderation in movement that healthy life requires

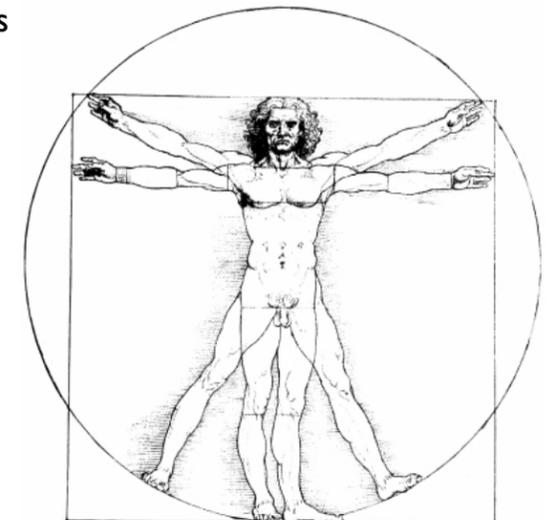


Figure 5: Leonardo Da Vinci's, Vitruvian Man (1485)

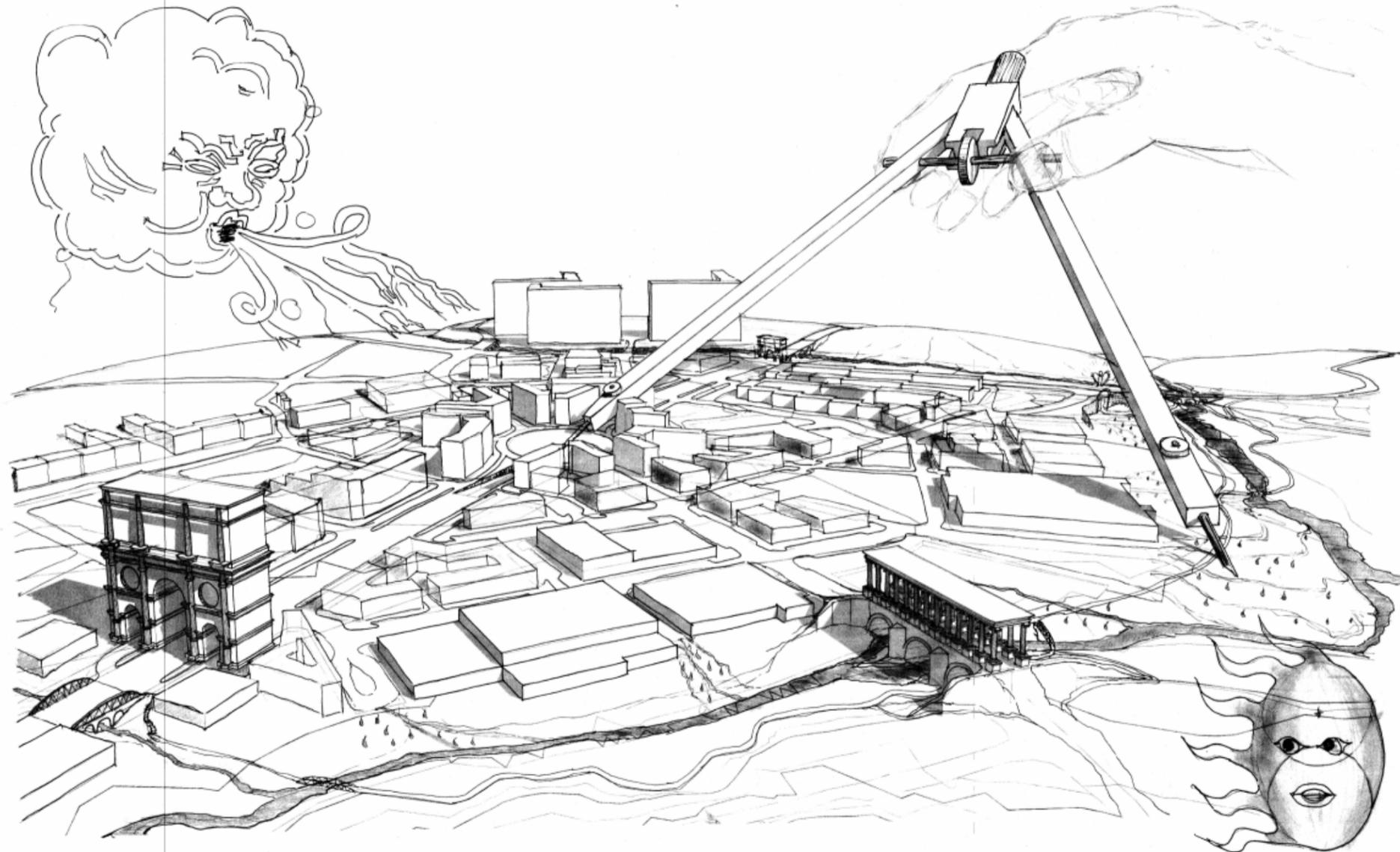


figure 4: digital & hand-drawn collage. Spring 2010—"Fairfax Circle Concept"

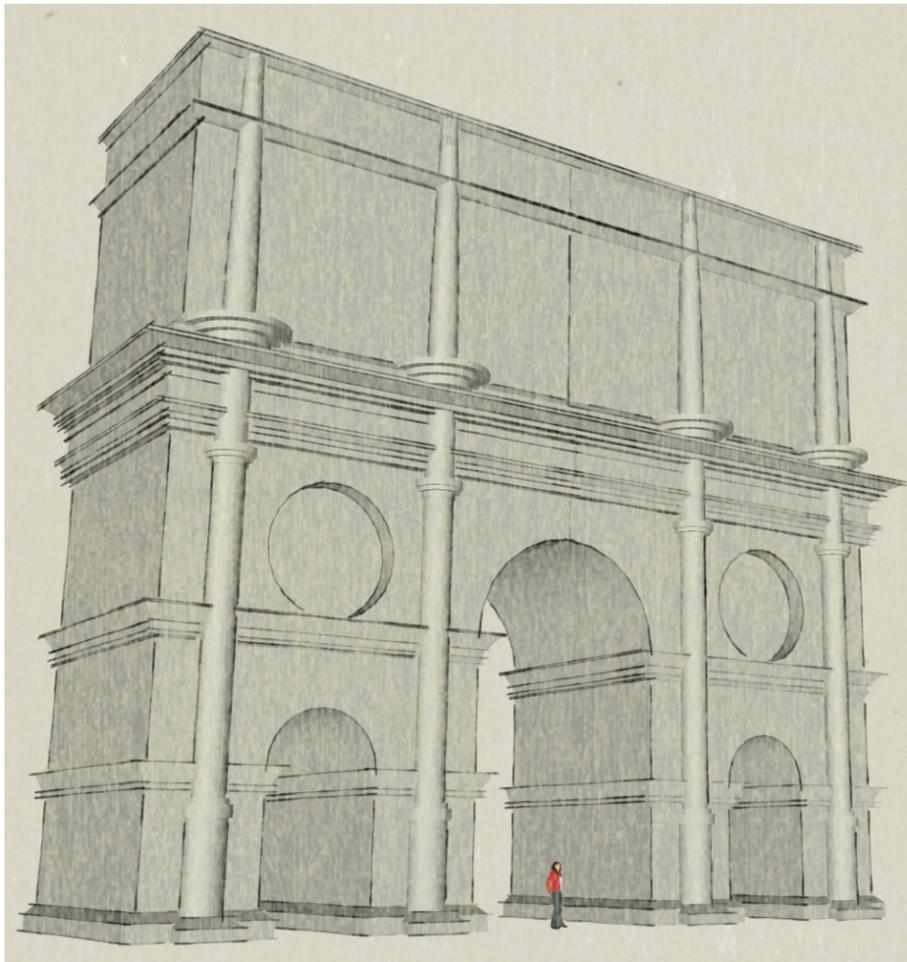


figure 6: digital recreation of Alberti's triumphal arch



figure 7: rough hand sketch depicting Alberti's city.

background: transitions of the renaissance

Leon Battista Alberti was an Architect and writer from the Italian renaissance. In describing his utopian city, Alberti used the triumphal arch as an ideal threshold between the town and country, with the city gradually building in intensity to a circle or plaza. In contrast, today's entry is not a sensible transition from developed to natural, but rather acres of parking lot abruptly terminating against eroded weedy creek forest, guaranteeing that runoff enters the streams at maximum velocity. As we look at the function of stream valleys today, we often see them accidentally perform as a barrier between parking-lot-laden commercial districts and leafy residential areas (bypassed only by a prefabricated concrete bridge, designed almost to ignore the transition), rather than the life-sustaining focus they once were. But as the commercial area is reconstructed and water is slowed, and the stream valley repaired and allowed to heal, the potential exists for this harsh accidental barrier to be molded into a civilized threshold, signifying man's capacity to think about the repercussions of his actions.



8: Alberti, Triumphal arch: plan and elevation —267



panorama: looking north on Old Lee Highway and east on the existing Accotink Trail. (Fall 2009)

9: Fairfax Circle, Virginia...office building meeting the ground in no certain manner, abruptly terminating at a level parking lot...parking lot abruptly transitioning to nature trail...creek hidden below bridge



figure 10. Le Corbusier, *City of To-morrow and its Planning*—26

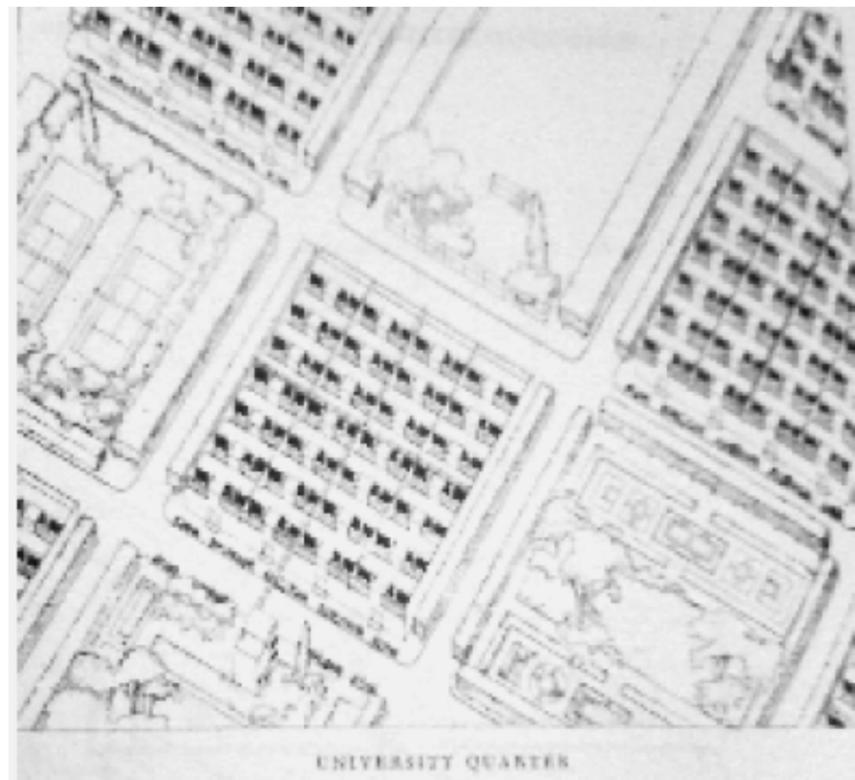


figure 13: Le Corbusier, *Towards a New Architecture*—260

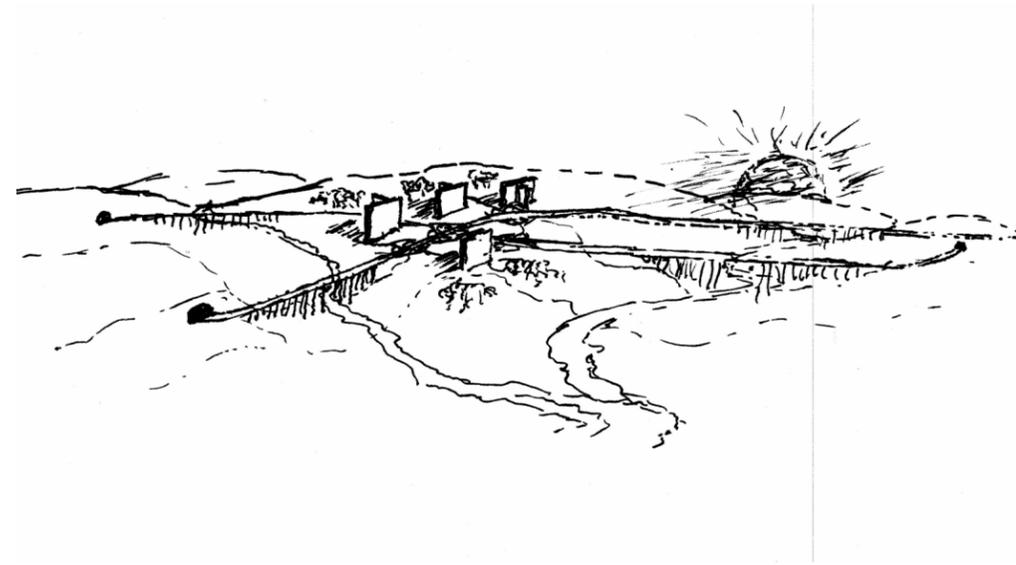


figure 12: rough sketch depicting Le Cobusier's straight lines across rolling stream



figure 14: fall 2009 – winding path to stream valley floor – Cross County Trail at Pohick Creek. Here the Pack Donkey's Way is constructed with homogeneous mixtures in with modular forms

background: modernist modular

Addressing the shift from hand-crafted to mass produced products, Le Corbusier forcefully emphasized standardization of form to purely man-made "homogeneous, artificial [chemical] mixtures" (Le Corbusier—*Towards...*, 232.. 1931) such as steel and reinforced concrete. This was unlike what the building industry previously conceived : building blocks towards a *pure* architecture based primarily on straight lines. This distilling of design to Platonic "form ideals" extended to town planning as well, with Le Corbusier eschewing the "Pack Donkey's Way" (Le Corbusier – *City...*, 8. 1929) as a primitive, un-evolved method of travel (although he advocated leisure paths in his *Towers in the Park* ideal).

In his view conforming to or copying nature represented a reality of the past—one that was merely the best we could do at the time. Le Corbusier proposed that pre machine-age humans constructed these donkey paths as an easier (or only) alternative to what was most-enlightened, rather than conceived of pure reason.

Today we see the standardization that Le Corbusier described—asphalt and concrete dominate the landscape, and land is bulldozed in straight lines (instead of following natural land contours) for quick car travel at the peril of the watershed. With little reverence towards the natural land formations, these methods have resulted in erosion and watershed degradation. But, these materials have the *potential* to be applied in ways that respond to and complement environments, rather than destructively mold the landscape.



figure 15.: Laugier, *Frontispiece—Essay on Architecture*



figure 16: Ruskin: *Trees In a Lane, Ambleside 1847*



figure 17: photographs: Boston Emerald Necklace 2011

background : naturalist reactions

Contrasting Le Corbusier and the modernist logic favoring industrialization, contemporary William Lethaby and other naturalists thought the origins of good architecture were found in craftsmanship of the arts and crafts movement drawing on the idea of the master builder in the field (such as with the cathedrals). Construction was always site specific and the foundations of Architecture were found through a series of deductions based on anthropological observations argued to derive from natural examples. Their reactions reflected early industrialization's brutal effects on the environment and the perceived destructive consequences of mass production towards man. The Parks Movement reflected this attitude as well, with Olmstead's parks perceived as "lungs" for dirty cities. To this day urban spaces like Central Park, Rock Creek Park, and the Back Bay Fens provide tranquil breaks from urban chaos, even if they are not literally purifying the air.

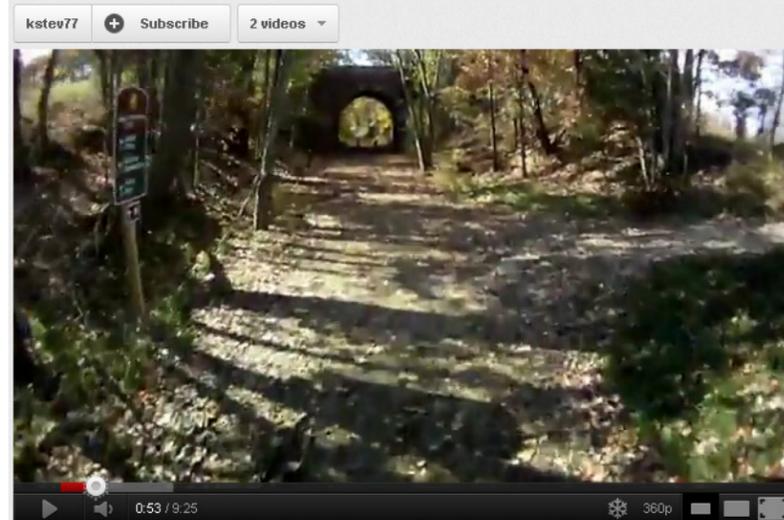
Contemporary writer Christopher Alexander distills this attitude towards modernist tendencies (that use mass-production to dominate the landscape) when he states that "asphalt and concrete surfaces outdoors are easy to wash down, but they do nothing for us, nothing for the paths, and nothing for the rainwater and plants" (Alexander, 1139). Reflecting longer-term consequences, Alexander speaks not so much as to how the built world impacts man's soul and health but about man's destructive tendencies towards the earth.

Cross County Trail (Fairfax County) - Northern Leg



Like Add to Share 651 views

Cross County Trail (Fairfax, County) - Southern Leg



Like Add to Share 836 views

Cross County Trail (Fairfax, County) - Southern Leg



Like Add to Share 836 views

Figure 17-A: helmet cam video still image of my feet in the water at a natural stream crossing (Difficult Run)—from my (sketv77) Fairfax County Cross County Trail video on youtube <http://youtu.be/J2m5Ki2OIUQ?hd=1>

Figure 17-B: helmet cam video still image of crushed stone trail as it approaches a stone archway at Giles Run — from my (sketv77) Fairfax County Cross County Trail video on youtube <http://youtu.be/lu9rHBTfric?hd=1>

Figure 17-C: helmet cam video still image of a depressed conc slab and PCC conc crossing at Accotink Creek—from my (sketv77) Fairfax County Cross County Trail video on youtube <http://youtu.be/lu9rHBTfric?hd=1>

background: nature trails and barefoot running

Today we can see the impact (both good and bad) of many of the aforementioned philosophies on our nature trails along the stream valleys. I hiked, biked, and ran the Cross County Trail through Fairfax County, Virginia extensively during my research for this project (links to videos at left). This stream valley trail system serves as a microcosm for how we approach our built environment. In the best designed parts one sees classical approaches to stream water management, clear gateways that define entries, extensive use of modular materials like asphalt, brick, and mechanically crushed stone, but applied in “Donkey Path” ways that conform to the landscape. In its worst parts, the trail reveals the degradation of the stream valley. This rather new trail provides evidence that manmade materials can be applied gracefully, or destructively and as it cuts through both well-preserved nature and previously hidden destruction.

Similarly, new studies on the impact of running with shoes serve as an example for how manmade materials can both help and hurt us. Recreational running straddles the old (walking on the ground) and new (mechanized travel on concrete and asphalt) methods of travel. With modern running shoes, the idea is for the foot to be heavily cushioned with foam in the heel to disperse the impact of the foot hitting the ground. Of course cushioned shoes help protect our feet from blisters and immediate damage upon strike, but as in an article appearing in *Nature* (Lieberman, 2009), the cushioning changes the way we run to an extent that more stress may be put on the joints over the long term. The study examines a foot strike habit of those wearing heavily artificially cushioned shoes to strike their heel first when running, a movement that, when measured, exacerbates the impact of the foot landing on the ankle and knee joints. When the strike impact of heel-first cushioned-shoe running and barefoot running was compared in the study in a time lapse, the heel first impact graph of the ideally-cushioned foot resulted in a jarring, crooked line, while the

impact graph for barefoot runner, disposed to run on the balls of his feet for a wider point of impact, resulted in an even parabolic graph - a "simply swept" curve, "greater in simplicity" (Sullivan, 33) with an equal peak impact.

As we strive to move constantly faster through via our built environment, these observations suggest slowing down human movement and storm water may offer long term benefits both for us and our stream valleys.

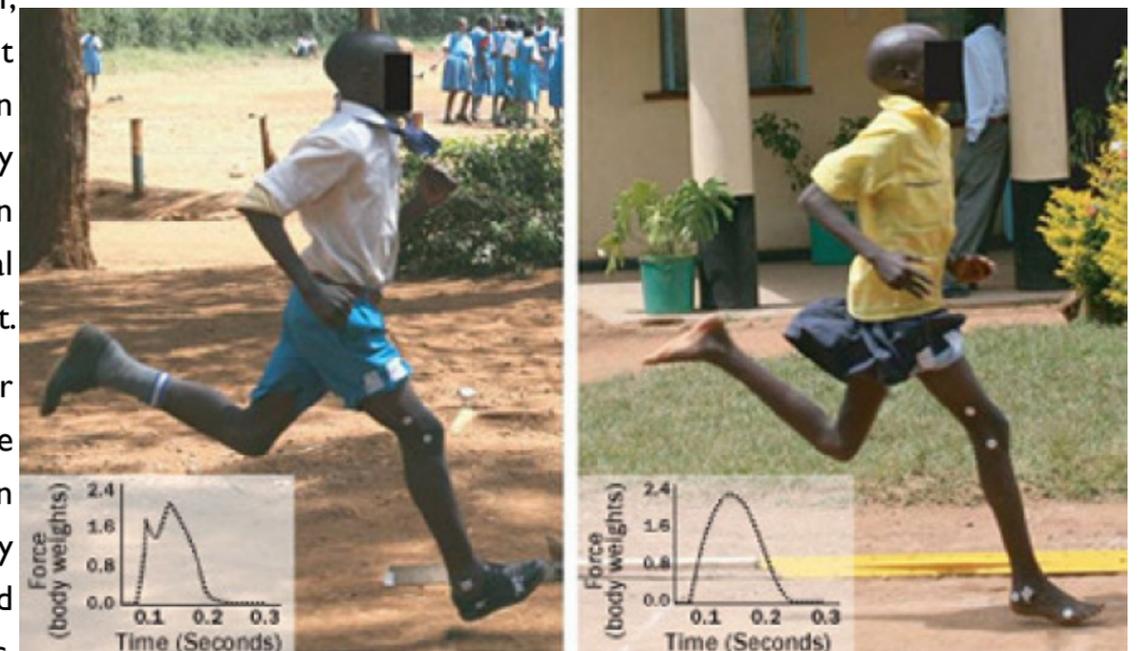


Figure 17-D: Lieberman - diagram from published study in "Nature"



figure 18: Pickett Road bridge over Accotink Creek. Various causes from different eras of land degradation (Fall 2009).



figure 19: Lake Accotink during a summer dredging—decades of runoff require regular heavy machinery intervention (Fall 2009).



figure 20: Accotink Creek at the asphalt plant—the most eroded, damaged section of the entire stream valley trail system (Fall 2009).



figure 21: stream valley bed at the asphalt plant. The line of trees indicates the stagnant water's edge (Fall 2009). Very bad smells.

background: stream valley degradation

Our current built environment (with high speed roads that promote a pace of travel at which villages are bypassed) creates the stress of speed and congestion of heavily mechanized movement. This stress in turn results in demands for more pavement and an ever-growing percentage of dead impervious surfaces. Water, in turn, speeds off the paved environment into the stream valley, turning former fishing, hunting, and farming creeks into heavily forested, but over-glorified storm water leaders – too prone to flooding to build on and devoid of aquatic life due to water moving too fast, or too slow when it is dry. While the stream valley may appear to flourish to the naked eye, the whole suburban system could be likened to the human body, with each stream valley being its spine, apparently strong, but weak when pricked and void of marrow when cut open.

What do these dead spines signify, and in what ways can they be repaired? What opportunities do repairs provide in the way our built environment is constructed and connected? And as we move through this conceivably repaired environment, what does this represent to our collective health and our well being as individuals?



figure 22: Cross County Trail at Difficult Run near Great Falls (Fall 2009).



figure 23: Cross County Trail near the W&OD Trail (Fall 2009).

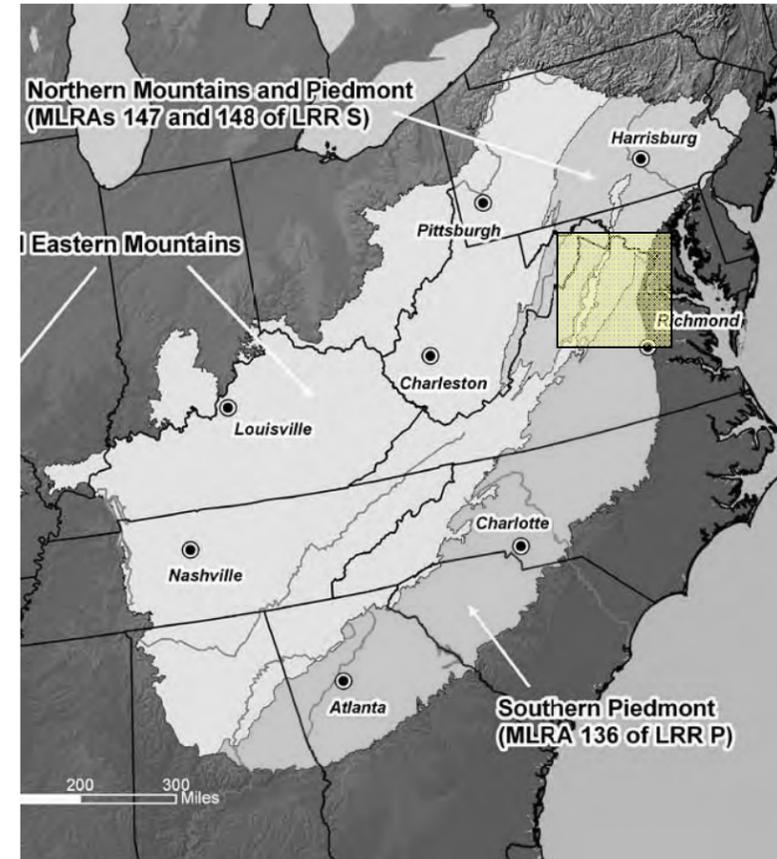


Figure 24: Army Corps of Engineers website: http://www.nap.usace.army.mil/cenap-op/regulatory/documents/wetlands/reg_supp/emtpdmt/EMP_Piedmont.bmp



figure 25: Cross County Trail at Pohick Creek south of Springfield (Fall 2009)

stream valleys: spines of suburban sprawl

Washington DC was built just nearby, but before the fall line, so as fate would have it, the Northern Virginia suburbs lie in the Piedmont foothills of the Blue Ridge Mountains. The resulting drainage pattern is not a patchwork of still lakes like the glacier-carved continental interior, nor manmade canals and dug-out ponds like the plains of Florida, or concrete sewers and mechanical pumps like the marsh of New York City and Northern New Jersey; but a linear system of twisting stream valley veins forming spines gently flowing to the rivers. Modern suburban development has encroached towards these valleys, but due to their purpose as methods to catch runoff, the result has been to leave the immediate banks against the creeks relatively unscathed. The resulting linear preserves reveal the nature of a landscape that is difficult to see when so much of it nearby has been carved up by man. The topography is a rich yet accessible variety of deciduous tree filled high canopy forests with rocky clay hilltops and shale valleys, but with mild grades that are easy to traverse over moderate to long distances and shaded from the harsh sun unlike flat coastal plains. It is no wonder that the native Americans used the stream valleys not only as hunting paths, but as their natural footpath highways linking tribes and villages.

history: root meanings & the valley's true form

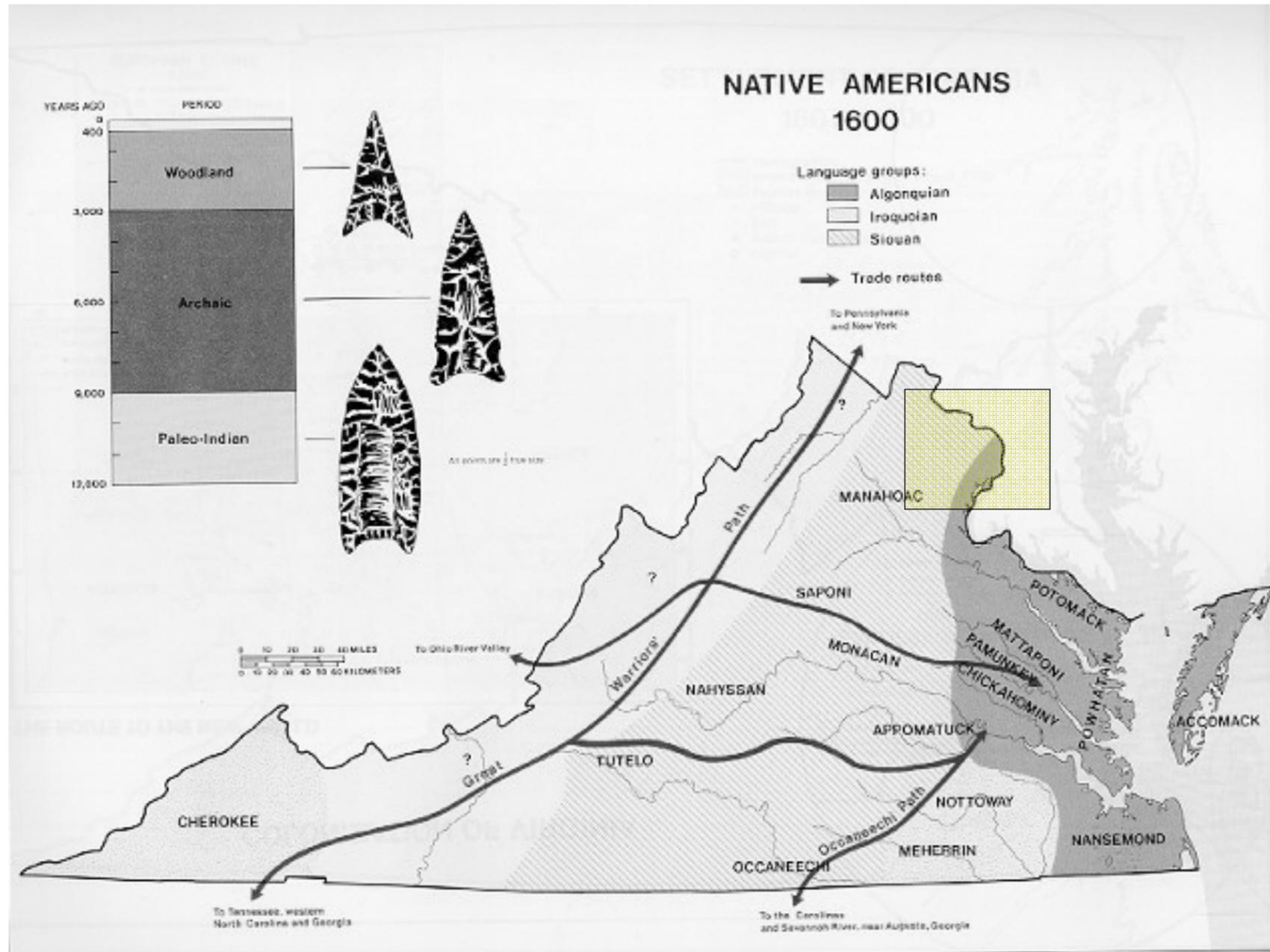


figure 26: Extents of Native American groups. Source: <http://www.virginiaplaces.org/graphics/natives.jpg>

The Accotink Creek, its name taken from an Algonquian root word meaning “at the end of the hill”, runs south from the City of Fairfax midway between the Potomac and Occoquan rivers before emptying out near the two rivers’ junction. The flat plain that was dammed for what is now Lake Accotink was home to the largest native American village in the area according to early English explorers. It is perhaps cliché to suggest that tribal culture, in this case the Powhatan Algonkian groups of the Accotink, existed more harmoniously with nature than today, But in particular, the speed at which native peoples traversed afforded them ample opportunity for exercise, and the way they treated the land made so that water would be soaked up by a virtually un-ending canopy to gradually filter water to the creek at a constant rate, ensuring a stable, constant flow of water for a healthy aquatic environment. This is of course in contrast to the boom and bust asphalt runoff flow of today, (too much flow and silt buildup during hard rains, too little movement and stagnant, dead water during moderately dry spells) making it impossible for fish to thrive. But, it is perhaps even more so in contrast with the ways creek development of the 18th and 19th centuries.

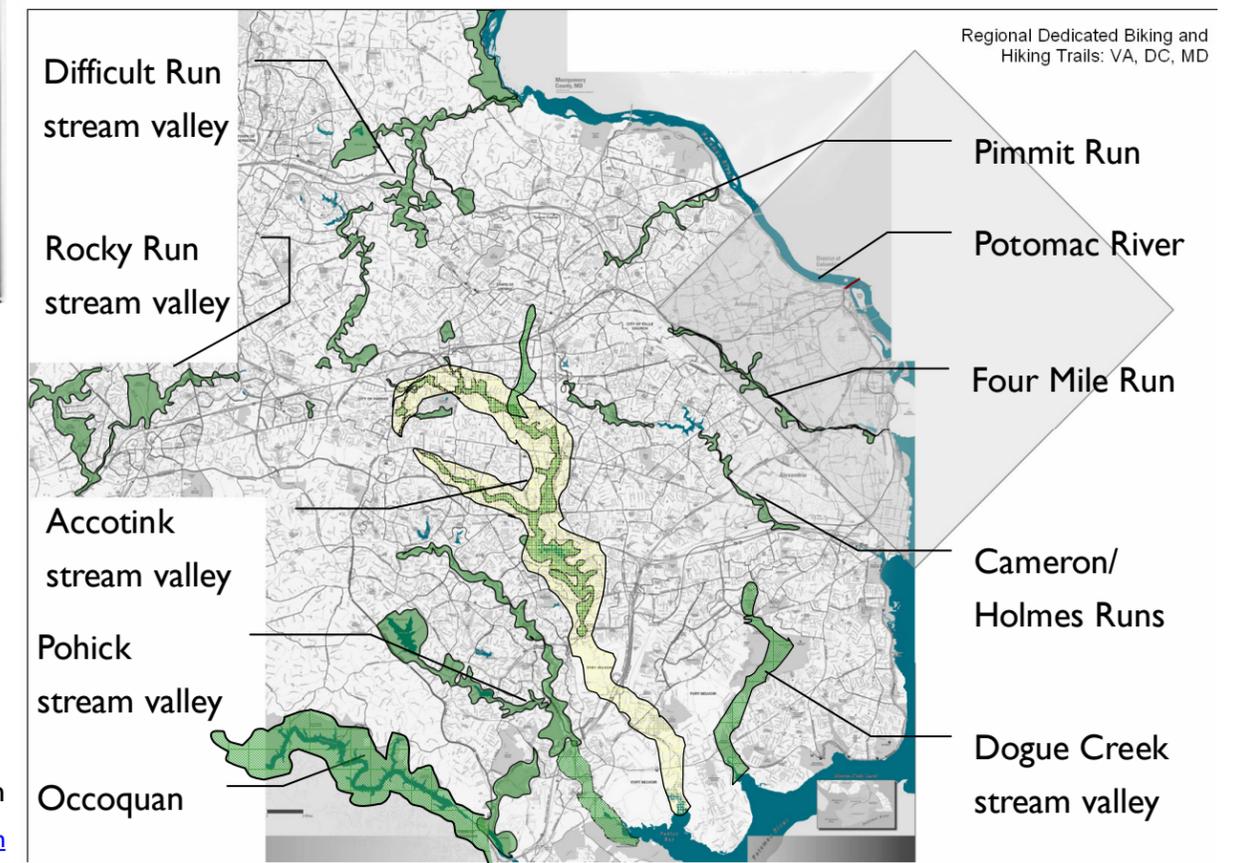


figure 27: stream valley system of the northern Virginia suburbs (in green). Image overlaid on source material from <http://www.fairfaxcounty.gov/fcdot/bike/bikemap.htm>

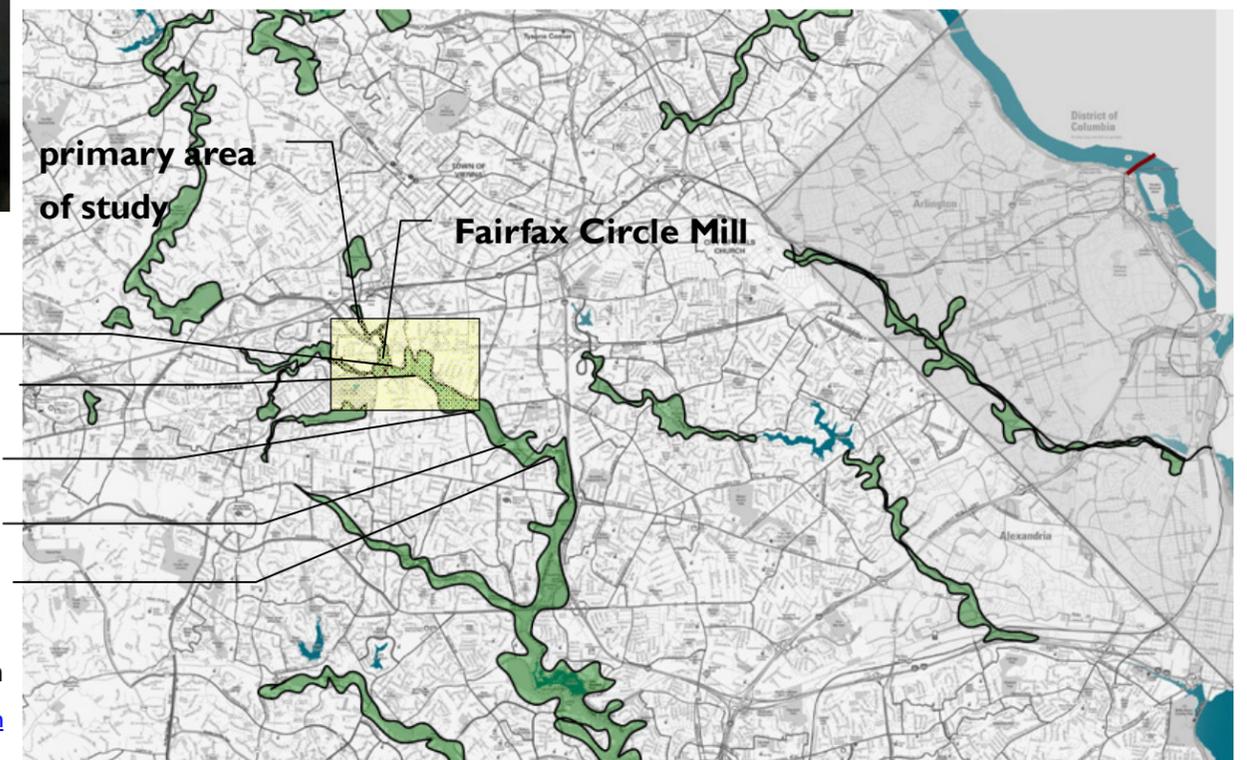
history: pre-industrial degradation



figure 28: History placard along trail by the Fairfax County Park Authority (Fall 2009).

The eighteenth and nineteenth centuries witnessed the clear cutting of land for pre-industrial farming, and the carving of “raceways” into the creek valleys to feed water into the many mills along the Accotink. Trees were torn down right up to the creeks to allow irrigation channels during the era of pre-mechanized farming. The area of the Accotink at modern day Fairfax Circle and several hundred yards down the creek was particularly scarred by this power generation approach, such that their effects are seen till this day. The effects of the Circle Mill raceway are apparent, if not obvious on the land at the circle near the junction of the Accotink and Daniels Run. The Chichester Mill raceway still exists, and combined with high runoff speeds from an impervious watershed, the raceway scars stagnate water and exacerbate runoff and silting problems during downpours.

Poignantly, the era of water-powered mills and often treeless, rugged landscapes were captured well in Civil War photography.—where the war serves as an allegory for man’s war with the land. Mill raceways in particular were meaningful because at the dawn of industrialization they were manifestations of peoples’ desire to move faster and their willingness to mould and often destroy their environment to achieve their goals.



- Mill Dam
- Chichester's Mill
- Wakefield's Mill
- Rock Hill Mill
- Little River Mill

figure 29: close-up of stream valley system of the northern Virginia suburbs (in green). Image overlaid on source material from <http://www.fairfaxcounty.gov/fcdot/bike/bikemap.htm>



figure 30: Cross County Trail at Giles Run north of Laurel Hills Park/Lorton Arts Center (Spring 2010).



figure 32: Cross County Trail at Accotink Creek (Fall 2009)



figure 31: Feeder trail for the Cross County Trail over the VRE railroad tracks near Lake Accotink (Fall 2009)



figure 33: Cross County Trail at Difficult Run (Spring 2009)

suburban flood raceways – accidental woodland preserves

For all the problems with degradation, the Accotink, as most areas around Washington DC, did avoid the era of harsh manufacturing pollution and scaring factory construction that affected similar landscapes throughout America and Europe (machine industry largely avoided the seat of federal government.) In skipping one era of land degradation, destruction to the valley was visually mitigated. In most of the valley the hills still gently roll to the creek bed (rather than being lined with chain link fences and level land from early 20th century factories), slowly revealing the granite beds that serve to keep the water well oxygenated. And in the time since the end of farming and milling in the area, the flood plains around the creek have again grown thick with high canopy and foliage.

That said, the Accotink is still a stream without fish. While the era of suburban encroachment to the valley has been less visually arresting, it has still been destructive. Lush suburban landscapes cover up small, modular, mass-produced reinforced concrete raceways to carry stormwater (depositing chemically fertilized sediment) faster than ever, but largely hidden from view. Retail parking lots, laid with factory produced asphalt, out of site of the stream carry more water still, turning the whole valley ecosystem into a granite gutter all the way to the Potomac during storms.

figure 34: study:Cross County Trail and other nearby dedicated recreational use trails.

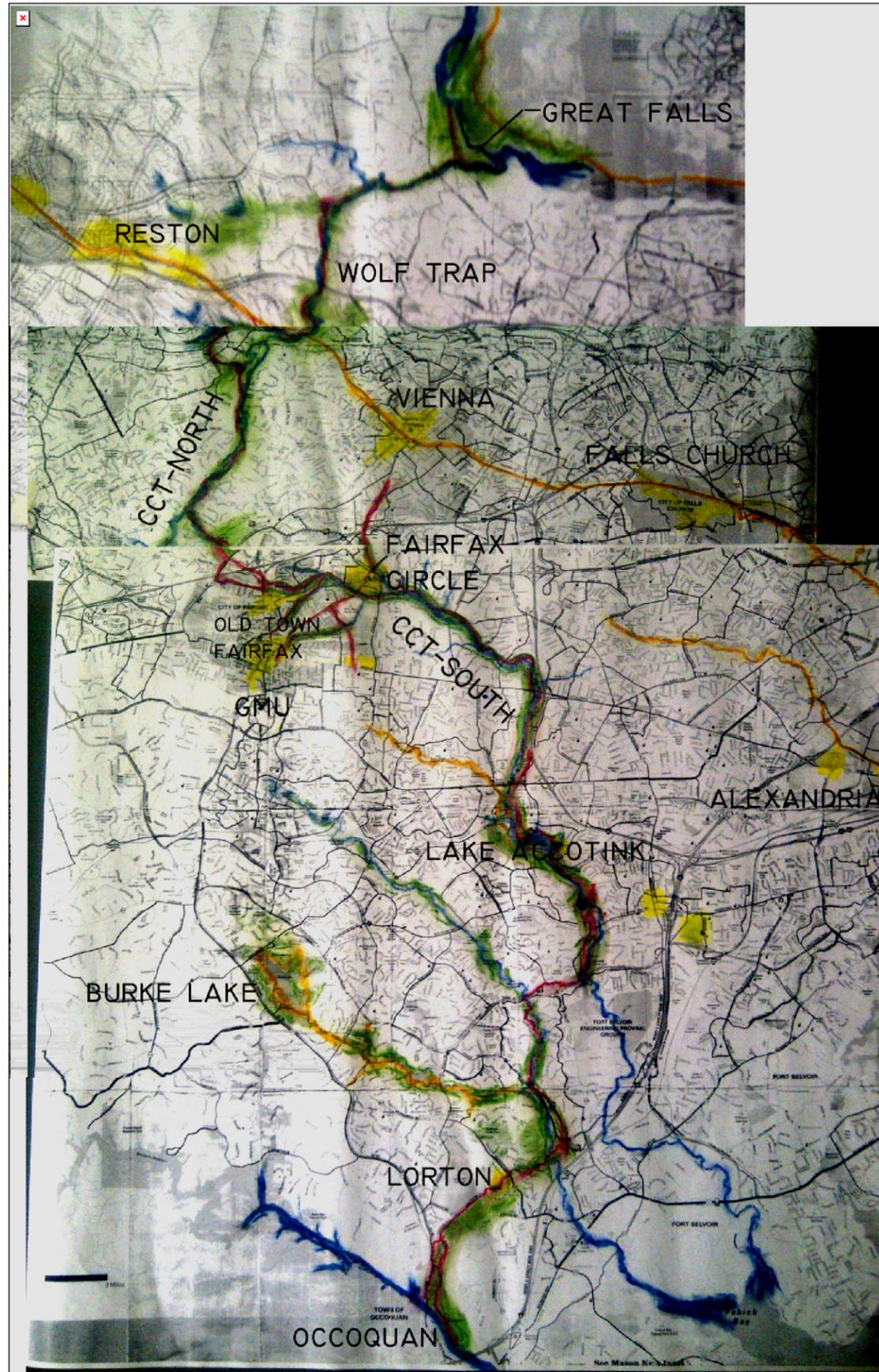


figure 35: Cross County Trail on old railroad bed in the Laurel Hills section south of Pohick Creek (Spring 2010)..

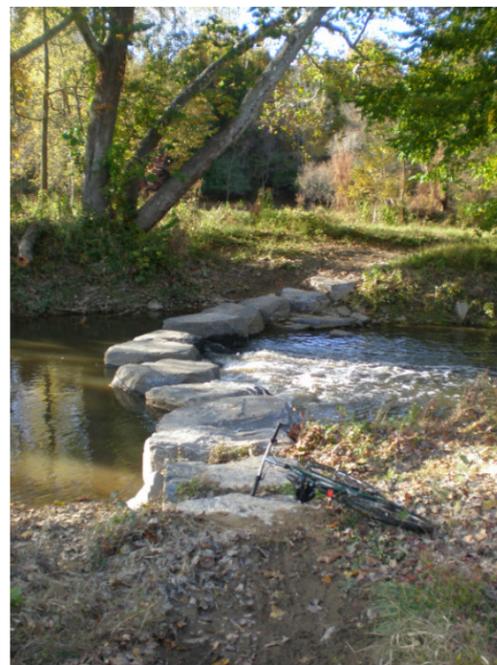


figure 36: Cross County Trail at Difficult Run (Fall 2009)

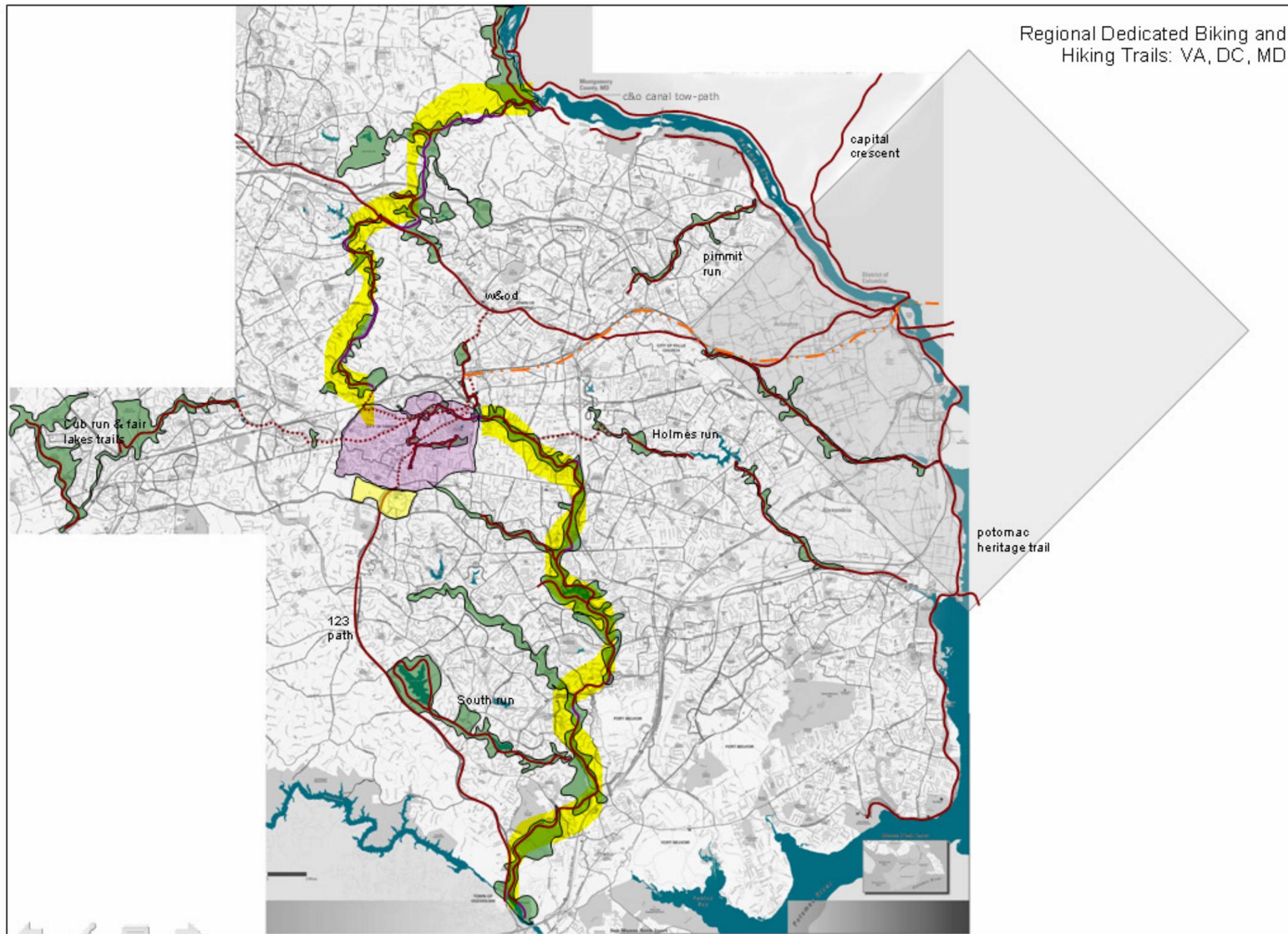


figure 37: Existing Accotink Trail at Fairfax Circle (Fall 2009).

region

accidental re-creational preserve:
the cross county trail

The blessing of this transformation from ecosystem to scenic storm water gutter is that the banks of the Accotink and other suburban creeks have been left unbuilt due to a propensity for flooding,. Unintentionally this has created a network of linear parkland, and in the case of the Accotink, Pohick, Giles, and Difficult Run creeks in Fairfax County, a highly developed trail has quietly been incrementally developed over the last decade - the CCT (Cross County Trail). The southern portion runs from Fairfax Circle to Occoquan Regional Park, and the northern leg runs from Oak Marr Rec Center all the way to Great Falls National Park. The south trail in particular has been built with a surprising level of sophistication; employing a variety of bridge designs, engineered concrete & stone fair weather crossings, multiple trail surfaces (asphalt, crushed stone, concrete, brick), ample width, and connecting some of the regions best recreational amenities (Wakefield mountain biking trails, Lake Accotink Park, the massive Laurel Hill Park/adaptive re-use area, Lorton Arts Center, and Occoquan Regional Park. The north trail employs a still wider variety of fair weather crossings (several large boulder crossings of Difficult Run are quite amazing), however it is less refined - with a good portion (perhaps 30%) only single track dirt. In addition to linking W&OD Regional Park, Reston, and Great Falls National Park, the potential exists to connect an improved north county trail to Wolf Trap National Park and Lake Fairfax via the existing park land right of way.

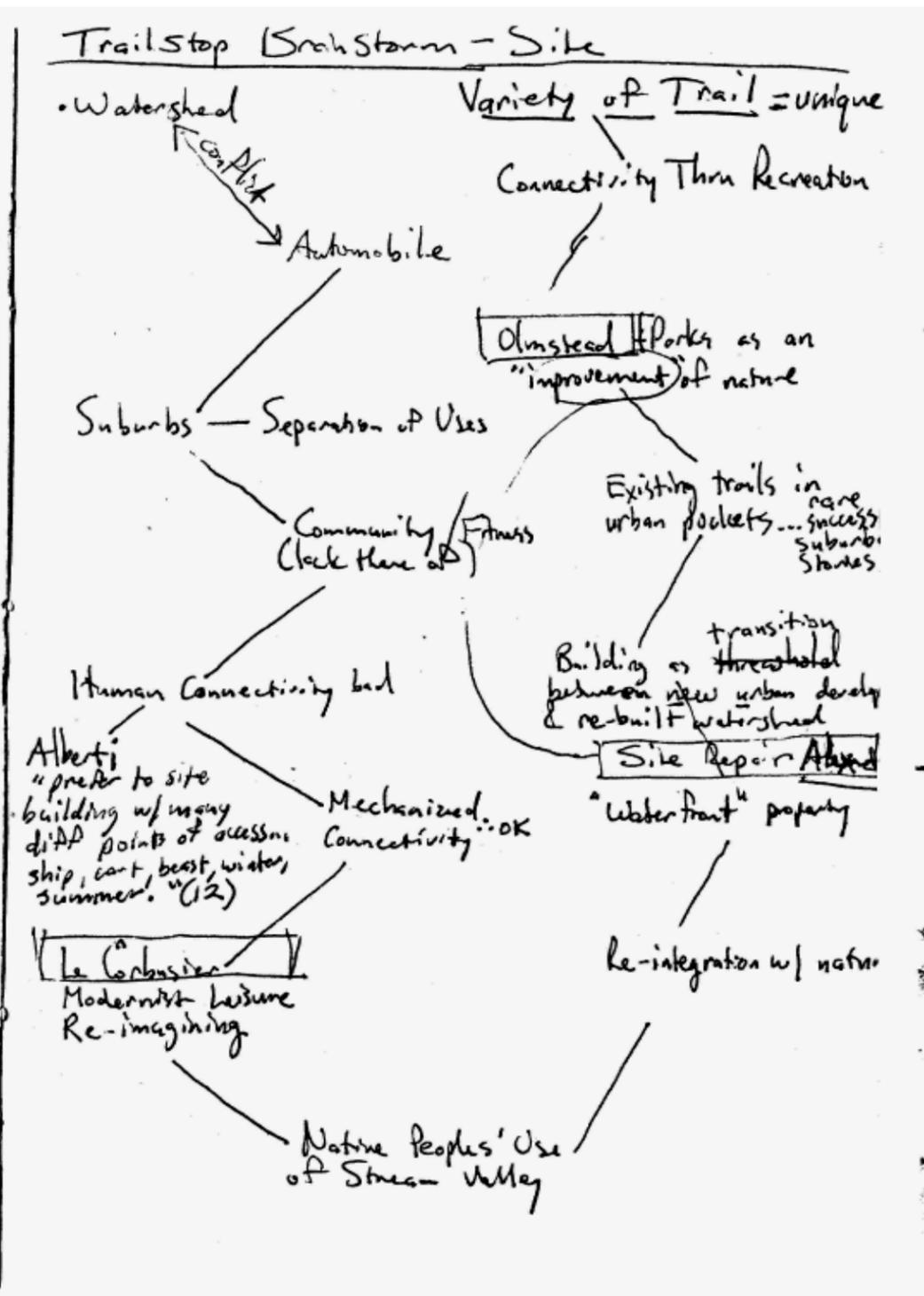
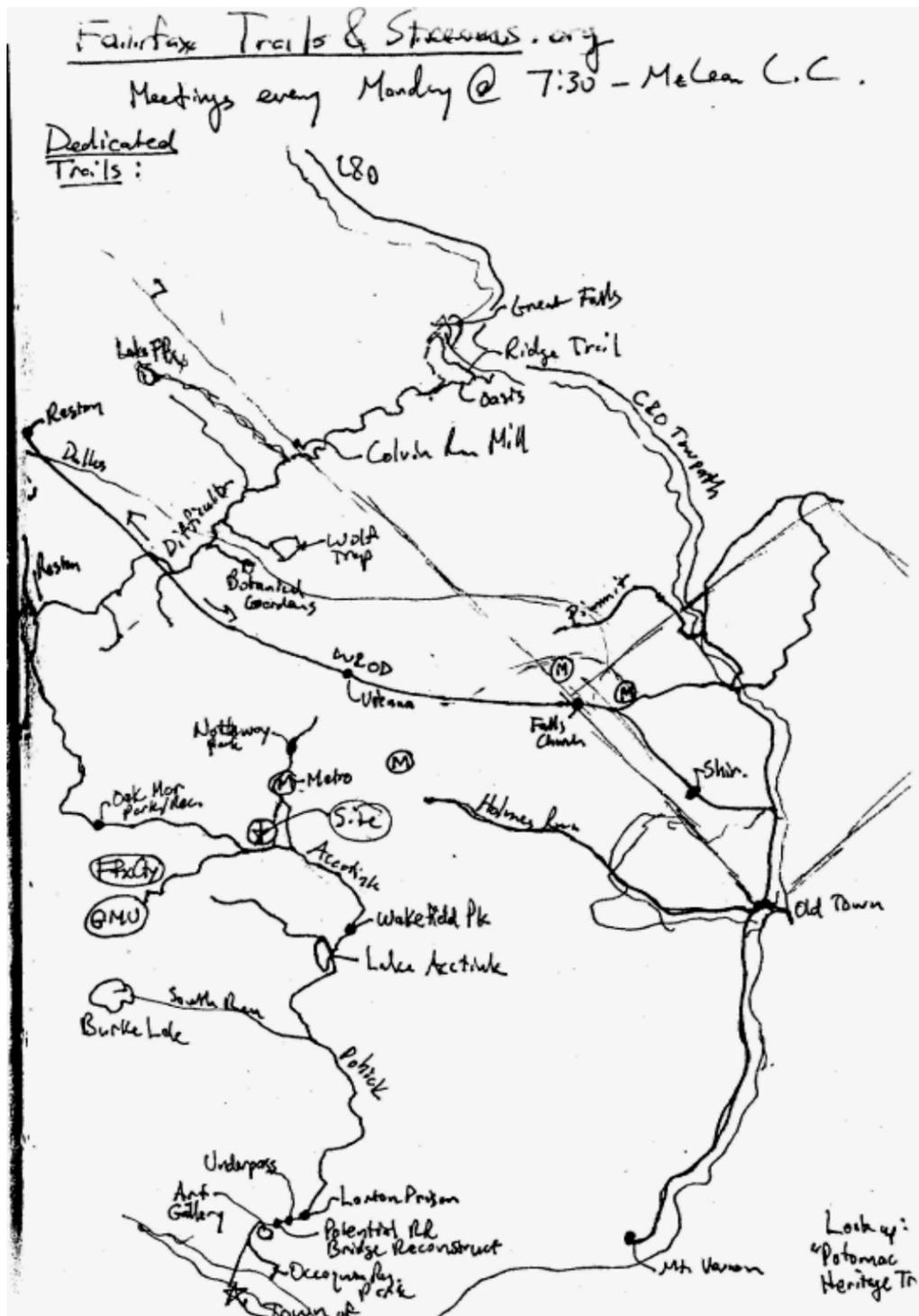


the meaning of recreational trails through suburbia

The trail has been developed as a linear, nature-preserving piece of parkland, but importantly it is not directionless in a circuitous way that is common for recreational paths *within* suburbia. Rather, the parkland, by the nature of the stream valley, connects communities and regional amenities which are otherwise isolated from each other or only accessible by car. So while the development of the trail has been important to the preservation of the stream, plants, and trees within its borders, it potentially holds equal value as a tool to connect the isolated suburbs via recreation (ie: hiking, jogging, and bicycling).

Movement in medium to low density suburbia is a different animal than that of urban space. Outside of the immediate residential neighborhoods, cars travel faster because distances are further. Quicker speeds are possible because roads are wider than in urban spaces. The increased differences in velocity of movement of different modes (car, bus, bicycle, on foot) presents a challenge as far as sharing paths—and even when separated via sidewalks. Quite simply, the differential speeds (cars going 50 MPH whizzing by bicycles going 15 and joggers going 5 MPH) are stressful. The option of stream valleys as walker/jogger/biker amenities to connect suburbia changes this equation—providing a natural grade-separated, low-stress low-speed method to visit neighbors.

figure 38: stream valley system of the northern Virginia suburbs (in green). Image overlaid on source material from <http://www.fairfaxcounty.gov/fcdot/bike/bikemap.htm>



“a string of pearls”: re-creating connections between suburban villages

Trails through stream valleys in the suburban landscape represent a complementary alternative to machine dependency between communities. One need only look at the success of the Washington and Old Dominion Trail, the Chesapeake & Ohio Canal Towpath, and the Capital Crescent Trail to see local examples of how this strategy can enliven communities and work as an advocate for repairing, remediating, and preserving these linear parks (the more they are used, the more people like them and become invested in them, and the more effort is put into maintaining them). In particular, the Cross County Trail (CCT) holds the potential for connections of variety of design epochs and paradigms – old urbanism, new urbanism, towers in the park, radiant city, garden walk-up villages, contemporary suburbia, and regional recreational amenities all straddle the Accotink. Recreation along the CCT is not only a means of momentary escape, but can tie together disjointed islands of community at a human speed and scale. As more commercial pockets of suburbia are transitioned to mixed-use medium density urban villages, the potential exists to connect a string of pearls of varying styles of urban design, and recreational amenities, via respites of genuine, repaired nature.

figure 39: sketches of the regional trail system, amenities along the trails, and existing trail-centric towns in Northern Virginia.

study: trail gap, potential lynchpin

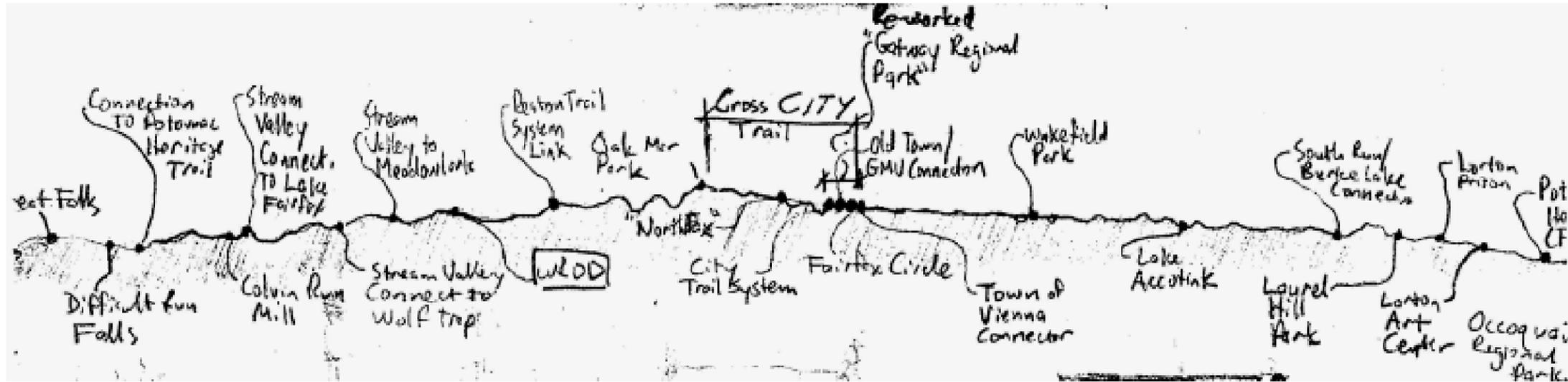
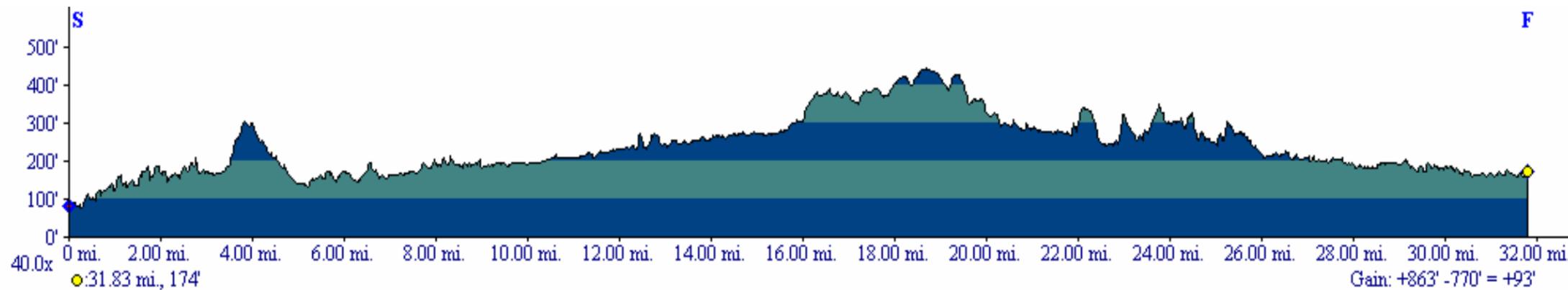


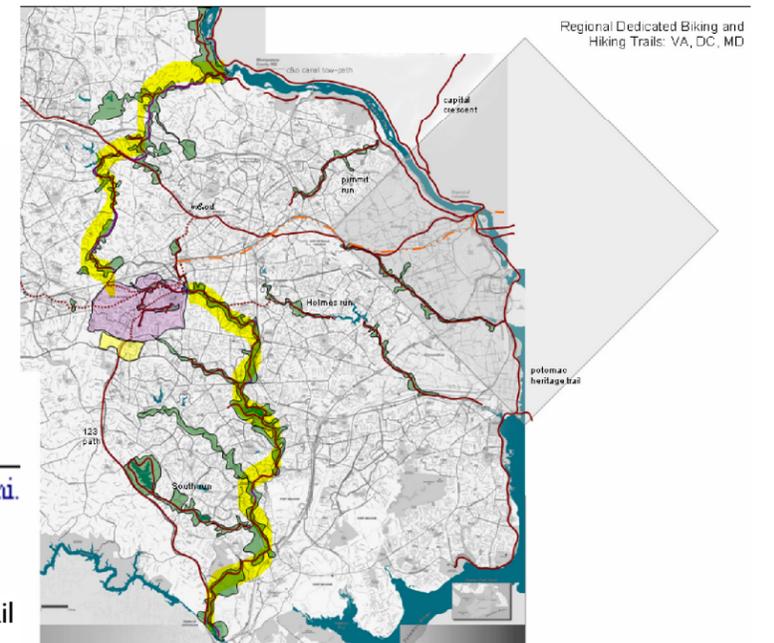
figure 40: cross section sketch of the Cross County Trail

At the mid-point of this potential string of pearls lies Fairfax City, and at the terminus of the southern leg lies a commercial strip area called Fairfax Circle. The trail is routed around the city from the circle, and this portion connecting the northern and southern legs is the only part of the entire trail routed out of the stream valley. On a narrow sidewalk along a busy road called Blake Lane, the routing was an afterthought as the sidewalk is neither wide enough for bicycling nor scenic in any way. Fairfax City and County are separate jurisdictions, and the planning of the Cross County Trail did not include the city despite its location —potentially as a lynchpin and entrance point to the entire system. An attempt to address this “gap” in the trail was made in 1995 with the creation of Gateway Regional Park at the edge of Fairfax Circle. However, the park is not directly accessible from the trail and has not been successful in its purpose thus far.



Profile created with TOPO!® ©2006 National Geographic (www.nationalgeographic.com/topo)

figure 41: nationalgeographic.com terrain application image—Cross County Trail



trail network: fairfax city & central fairfax county

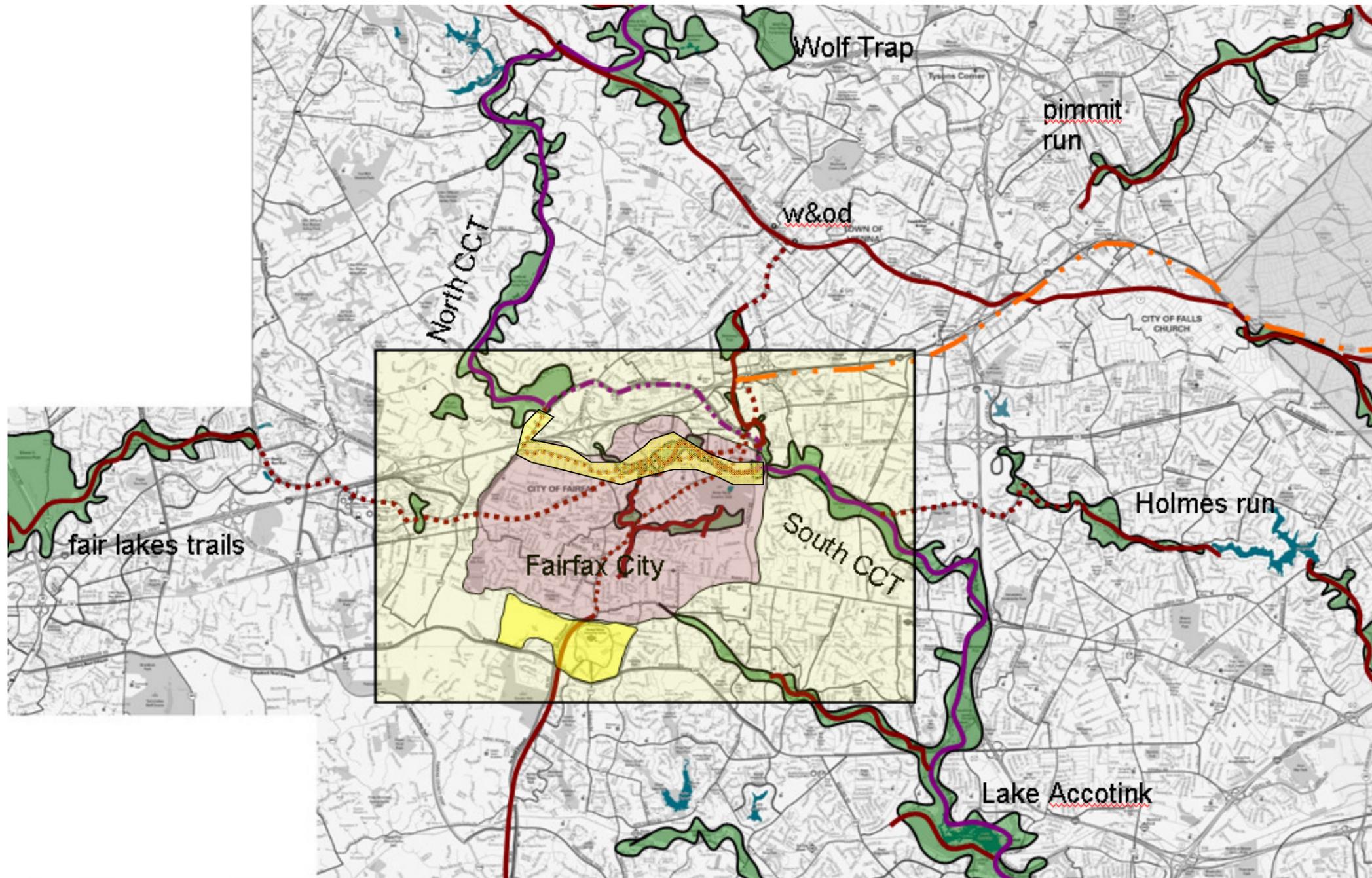
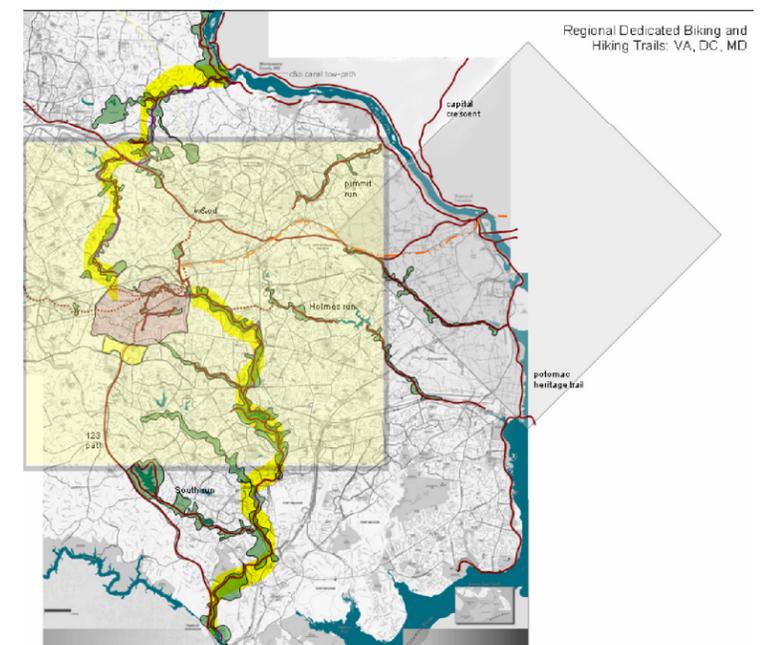


figure 42: digital overlay of showing central Fairfax County and Fairfax City over the Fairfax County Bicycle Map.

Through the city, the potential exists for a Cross City Trail linking the northern and southern legs, with a re-worked and expanded Gateway Regional Park in a radial pattern around Fairfax Circle as a refined promenade and showcase entrance to the entire Cross County Trail (CCT). And as we can see on the map at the left, the potential exists for the city trails network to connect not only the CCT, but the Route 123 trail, the western Fair Lakes/Cub Run, Rocky Run trails, the WAOD Connector Trail, and even the Holmes Run Trail to Alexandria. But within the City, the Fairfax Circle area, lying at the junction of the most of the streams and thus the junction of most existing trails and potential connections, can serve as a recreational lynchpin for the entire regional trail network.





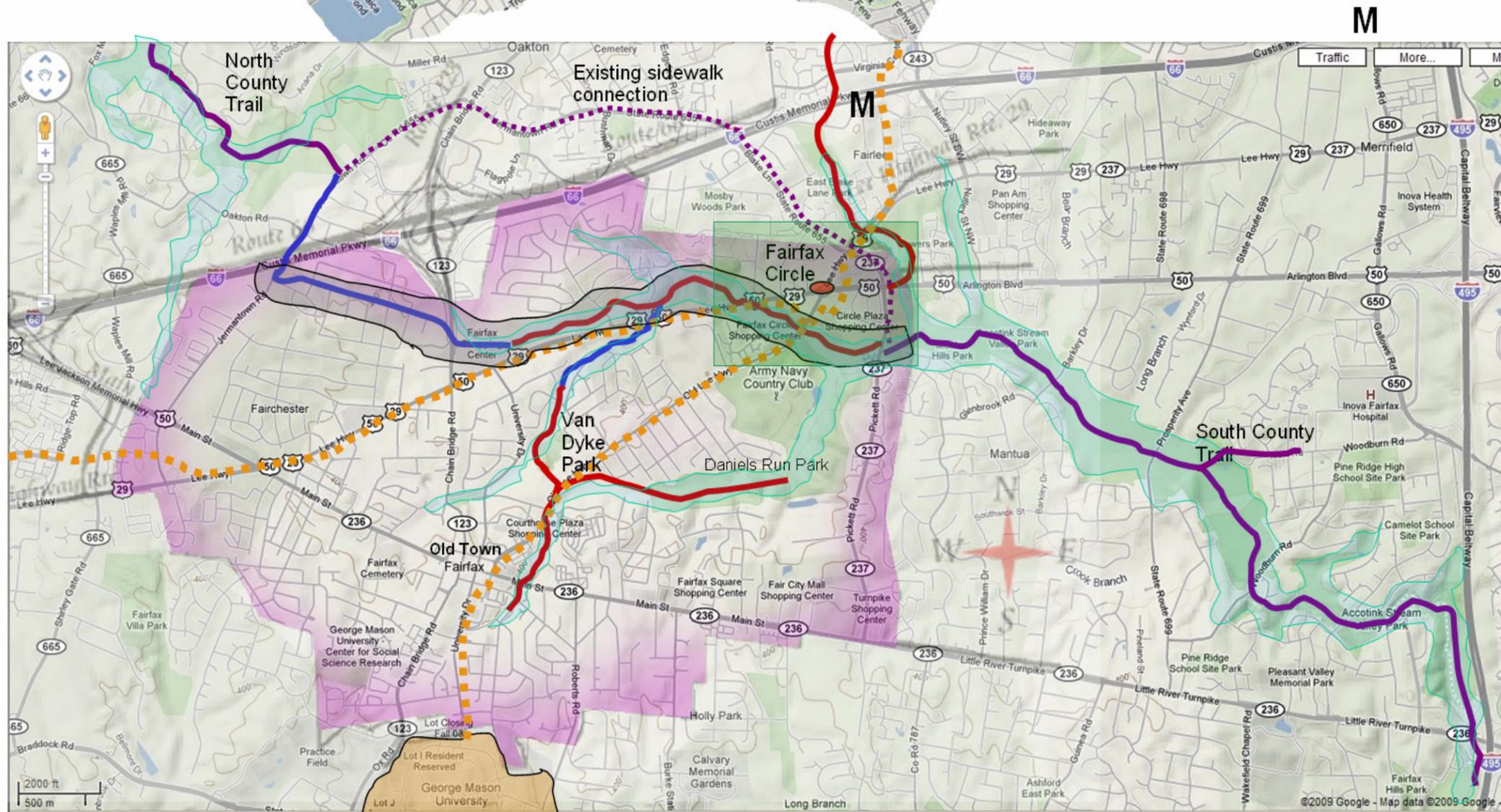
Equal scale comparison to Boston's Golden Necklace

City Trail Network; Existing and Potential

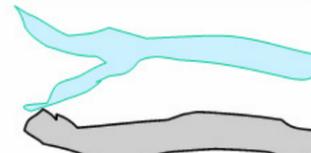
the trail network: fairfax city

Several existing stream valley trails exist within the city, connecting near the CCT. Along the Accotink the city plans to extend this stream valley trail network towards Route 123, and the branch towards Old Town Fairfax provides a right of way for a future connection. In addition, the city has a growing network of preferred commuter bike paths, including a GMU to Metro sharos/bike lanes under study on George Mason Blvd and Old Lee Highway. Redevelopment along Fairfax Blvd west through the city provides still more potential for commuter bike paths. And these existing, studied and potential paths all converge at the circle.

Regarding the potential for a Cross City Trail, its potential length is about the same as Olmstead's famous Golden Necklace in Boston, suggesting a similar level of refined design is workable. While the larger county system suggests rugged escape, the city section could offer refinement, with the "Gateway Park" trail arc around Fairfax Circle serving as a treed Olmstead-inspired promenade, encouraging long-distance hikers, joggers, and bikers to stop and visit, and locals to enter the trail system.



G.M.U.



Stream Valleys
Proposed re-branded "Cross City Trail", connecting the north and south County Trail

- Cross County Trail
- Exist city trail system
- Potential new dedicated trails on exist ROW
- - - - Potential dedicated commuter bike lanes

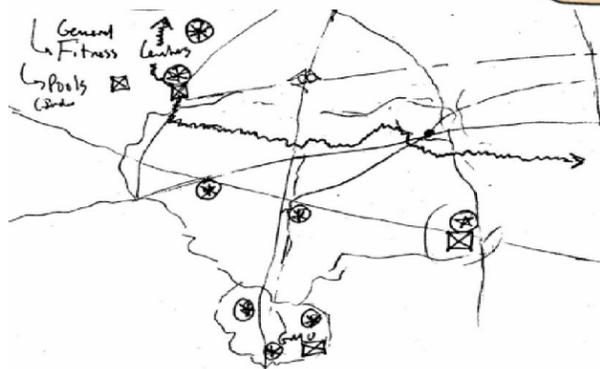


figure 43: digital overlay showing Fairfax City over google maps image

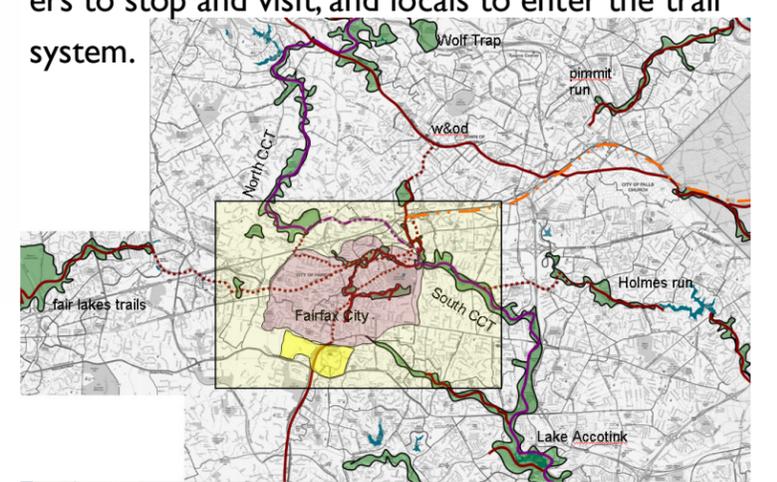
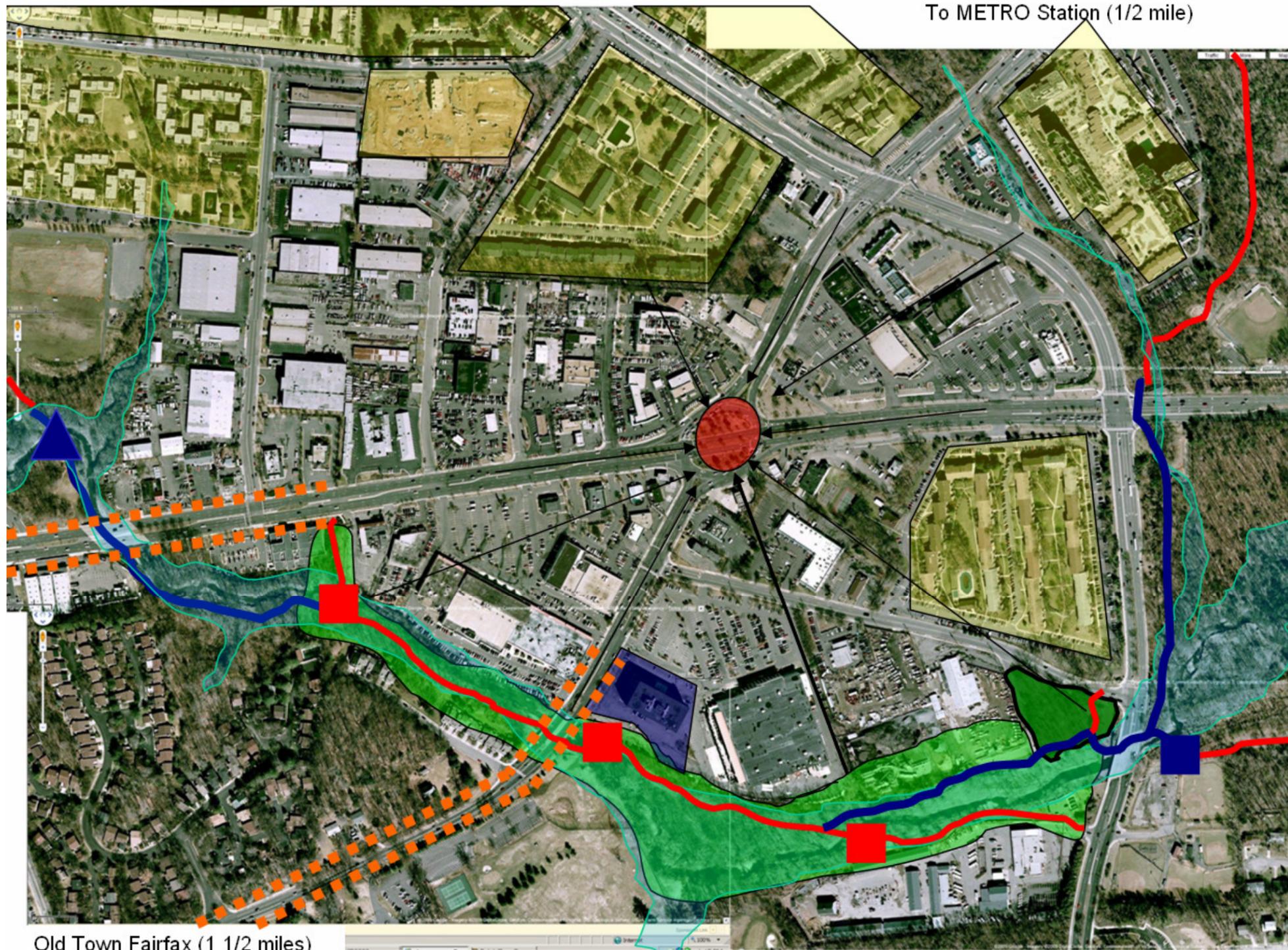
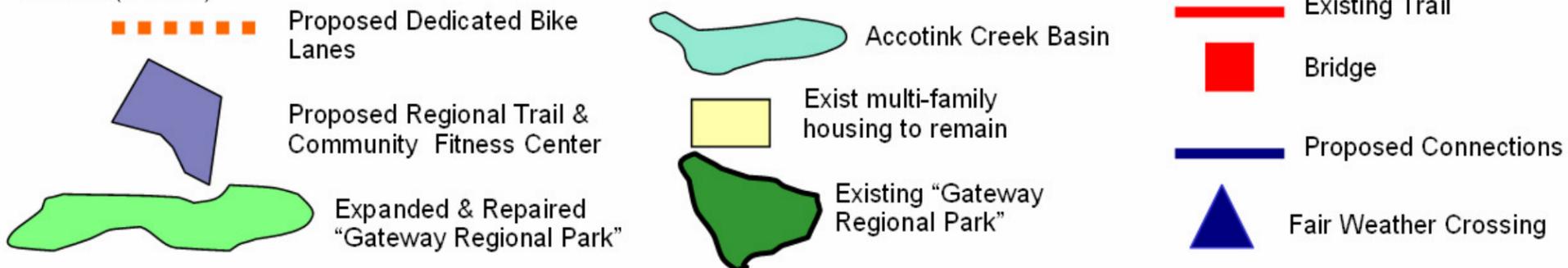


figure 44: digital overlay showing Fairfax Circle over google maps satellite image

village study of fairfax circle



Old Town Fairfax (1 1/2 miles)
& GMU (2 miles)



The existing area of Fairfax Circle is defined by the geometry of its namesake—the traffic circle at the center of the valley. Actually elliptical in shape, the existing circulation stems from the circle, with the streams surrounding it forming the threshold. Residences include a mixture of townhouses, garden apartments, and the Circle Towers modernist style high rise complex. In contrast to the rest of the Accotink Valley, the transitions to the creek are visually harsh. Industrial lots and commercial parking exacerbate the already problematic storm water runoff, such that the arc surrounding the circle is the most eroded, polluted, and stagnant section along the entire Cross County Trail.

From any direction, entrance points to the community are marked either by a bridge or a road that dips over a large drainage culvert. Below these gateways lie areas of silty muck deposited regularly by heavy runoff from the city., along with an unconnected network of trails and the isolated, un-used Gateway Regional Park at the SE corner. But all of this is repairable.

The existing condition , the location, geometry, and existing (if incomplete) amenities provide a great opportunity to transform Fairfax Circle at the master plan scale into a true village. By expanding Gateway Park into a radial, rainwater filtering watershed transition between the potential urban space and the trail/creek, the result could be a grand entrance point for the Cross City Trail, itself the potential lynchpin for the CCT, with this development being a first step towards repairing the entire circle village from the outside in.

Garden City style walk-up concept—residential.

Light Industrial warehouses

“Towers Park” Corbusier style mixed use high-rise concept.

the circle—site repair

At Fairfax Circle, the Accotink and its feeder streams form a defined threshold between parkland & low density residential and the light industrial commercial area of near continuous pavement within this edge. The section of creek just past the junction of the Accotink and its feeder stream Daniels Run houses the most visible erosion, silt buildup, and overall degradation in the entire valley. Even moderately heavy rains turn this section into a dangerously high flow virtual river, catching all of the runoff from the city of Fairfax and sending it barreling under the Pickett Road bridge. Silt is deposited in such a way as to narrow the opening, flood nearby residences, and speed up the water even more as it erodes the parkland beyond, knocking down full-grown trees and leaving a path of devastation barely hidden behind the few weeds that can grow in the debris-strewn muck. Whereas the rest of the stream valley masks its deficiencies, the eroded banks of the creek around the circle, particularly here, serve to put the problems in plain sight.

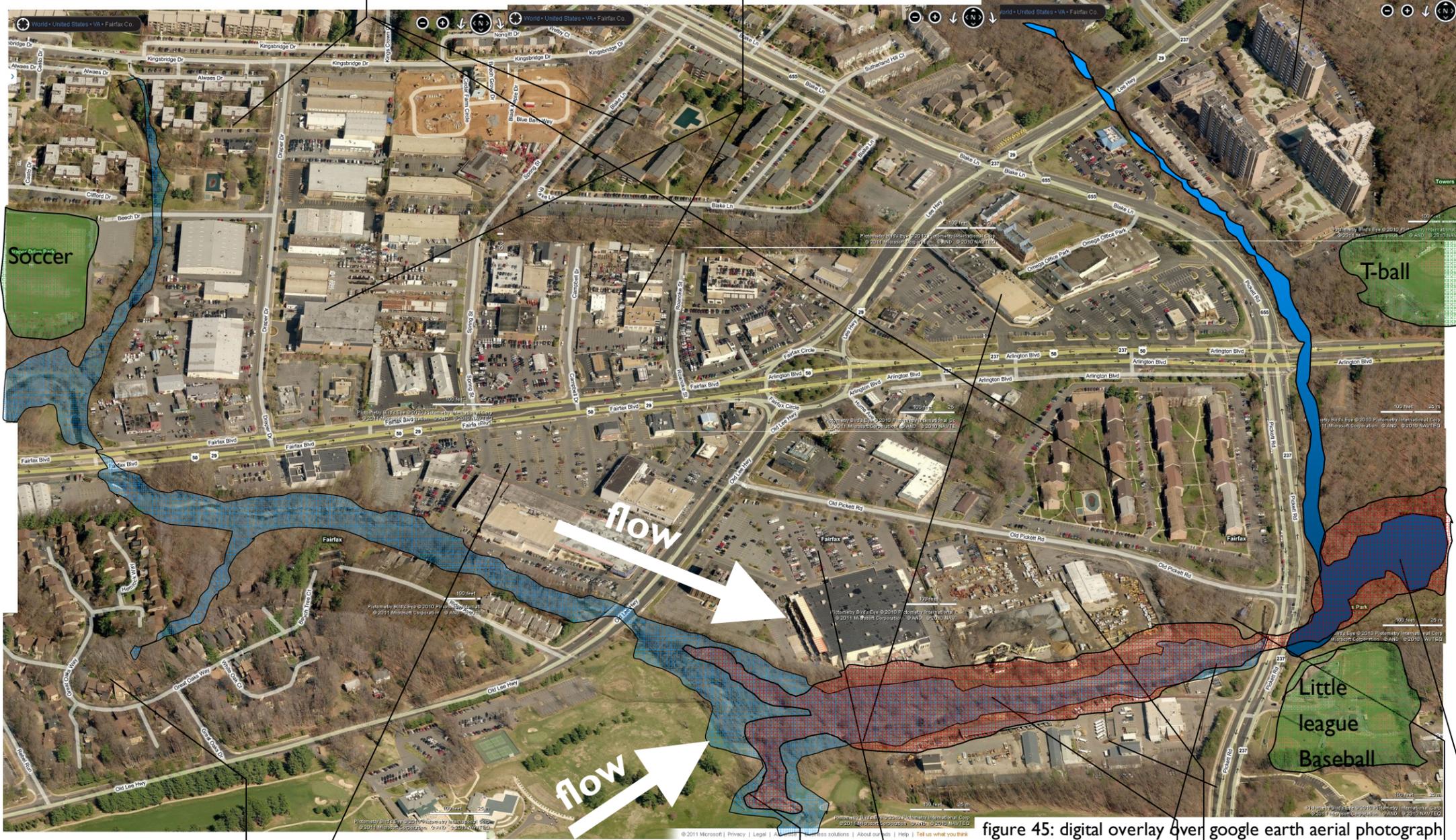


figure 45: digital overlay over google earth aerial photograph

“Tall Oaks” 1970s era contemporary neighborhood - old growth trees retained. Runoff contribution minimal

Daniels Run—runoff from the majority of the city of Fairfax—speed accelerated through the Army/Navy golf course as it enters the Accotink.

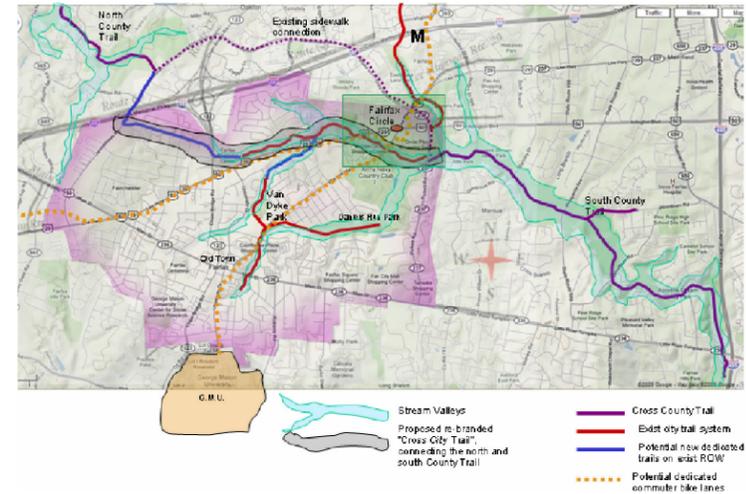
Commercial strip shopping centers—parking lots push tight against the stream banks.

Accotink’s most eroded section

Asphalt plant/industrial yard/city maintenance facility pushed tight against the eroded banks.

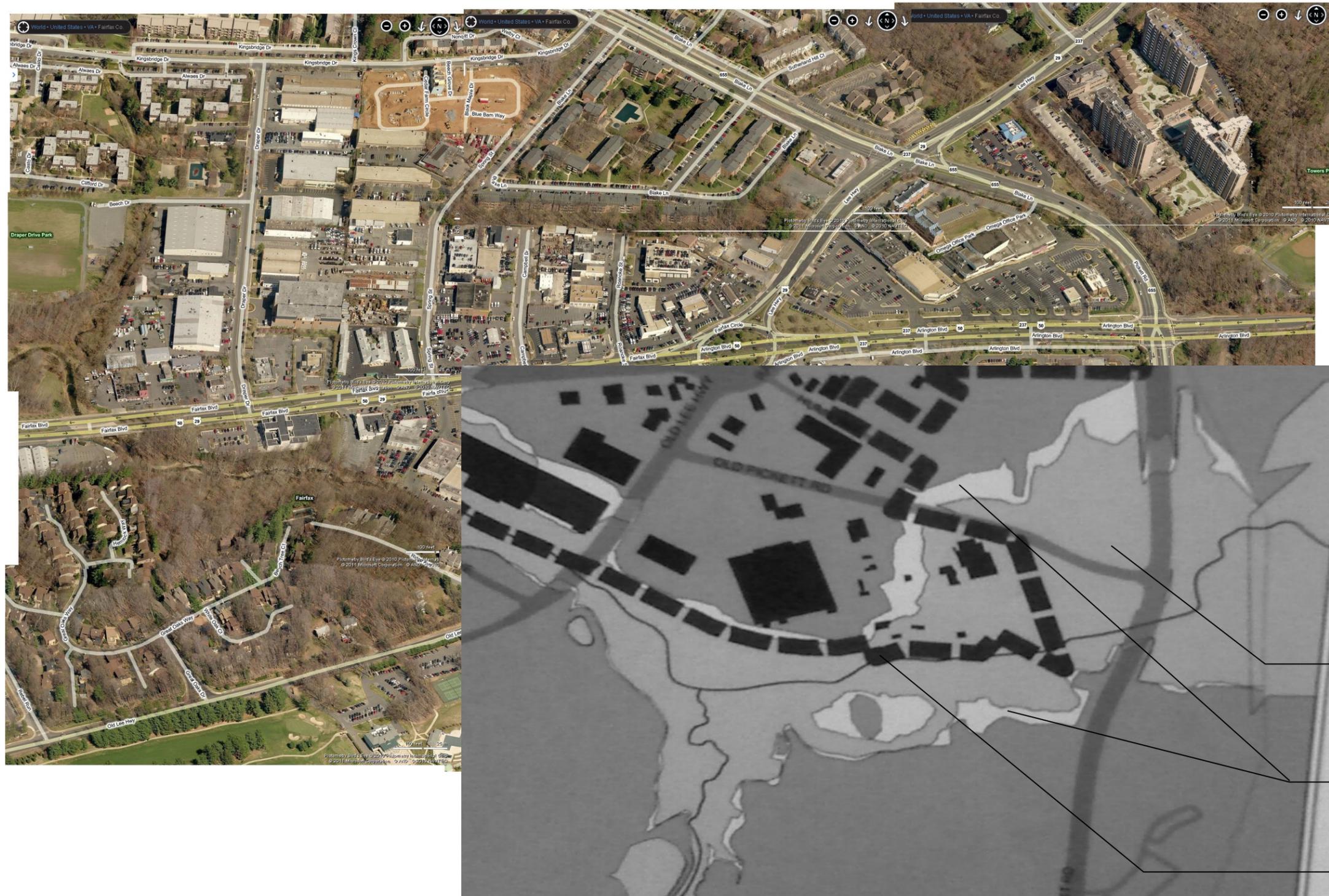
Gateway Regional Park

Debris-strewn parkland and area of former mill raceways beyond



the circle—pressure release

As we the city flood zone map illustrates, the confluence of the two streams, heavy amounts of distant and nearby impervious surfaces, the construction of the industrial lots and the asphalt plant pushed filled in tight against the creek, and past mill and roadway construction that has contorted the creek in unnatural ways has resulted in the valley floor prior to Pickett Road being a pressure release valve for the entire city's stormwater.

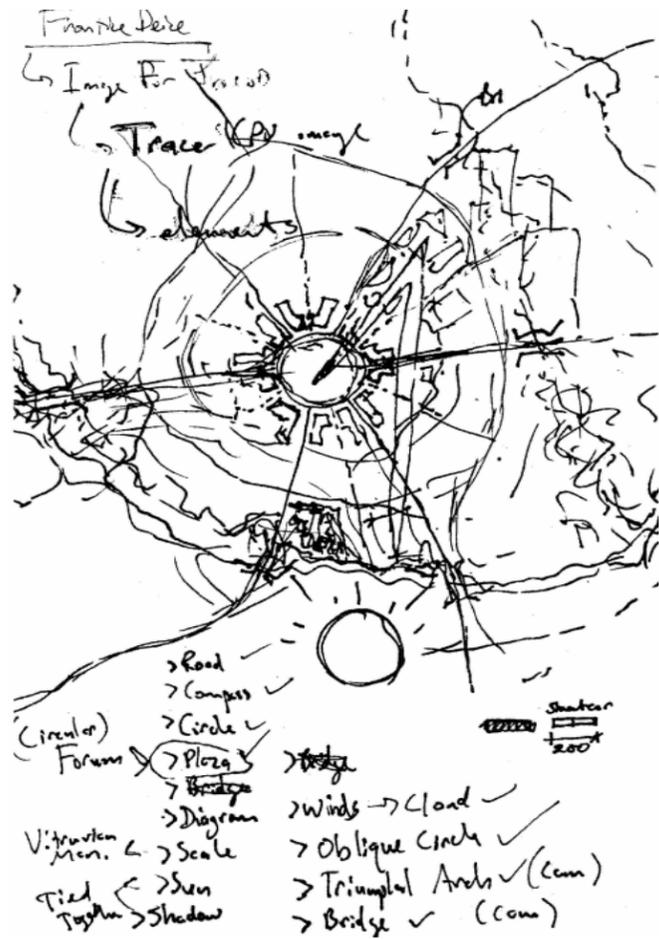


FEMA (Federal Emergency Management Agency) designated flood plain.

2 % annual flood chance

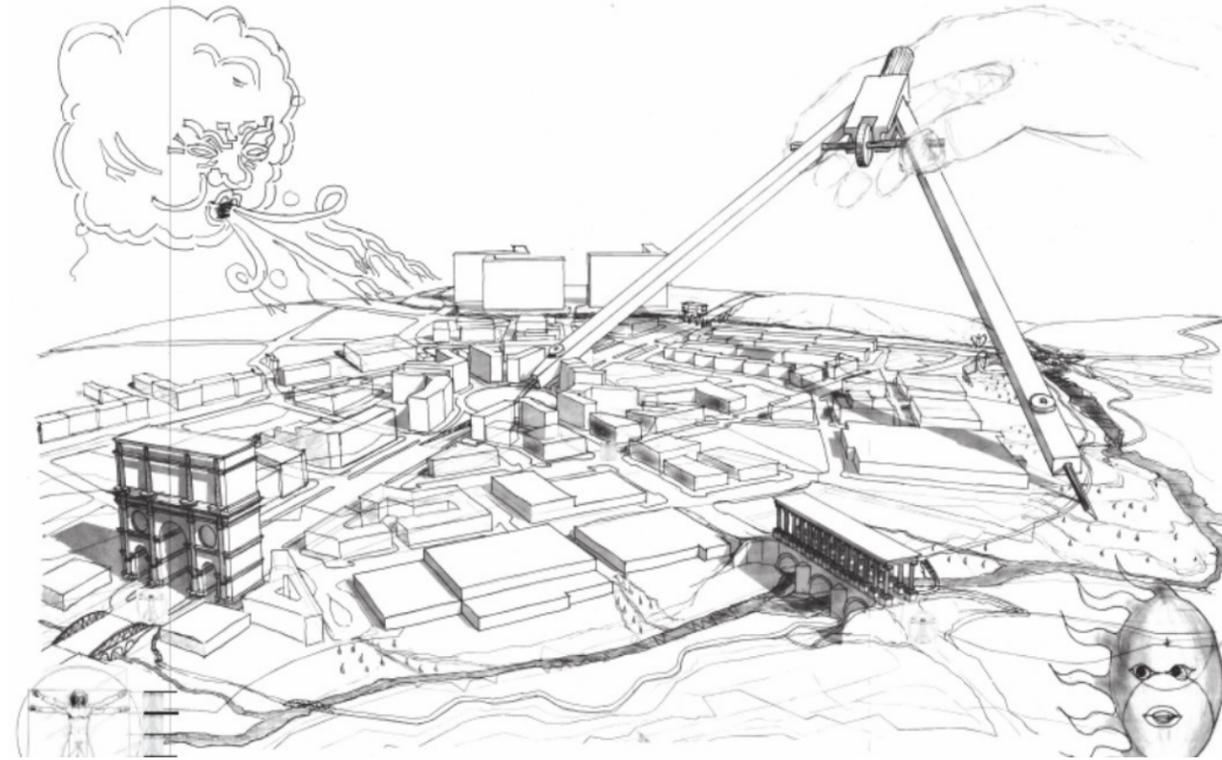
Extent of business improvement district

figure 46: City of Fairfax Flood Zones Map. <http://cofgis.fairfaxva.gov/fairfax/>



figures 47—early word bubble sketch and illustration of a radial grid pattern of street proposed for the community

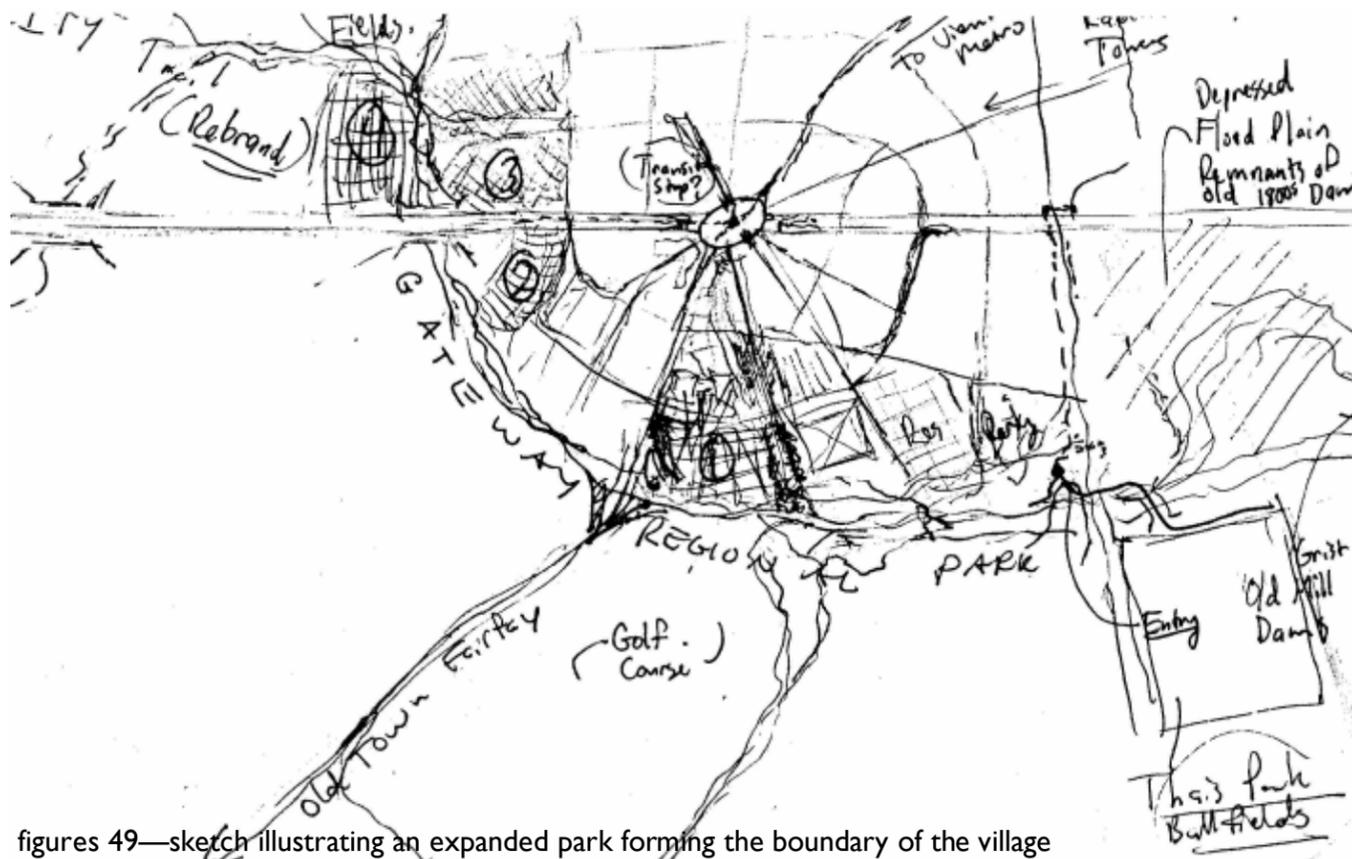
The Civic Street – Omnipresent Qualities and a Changing Reality



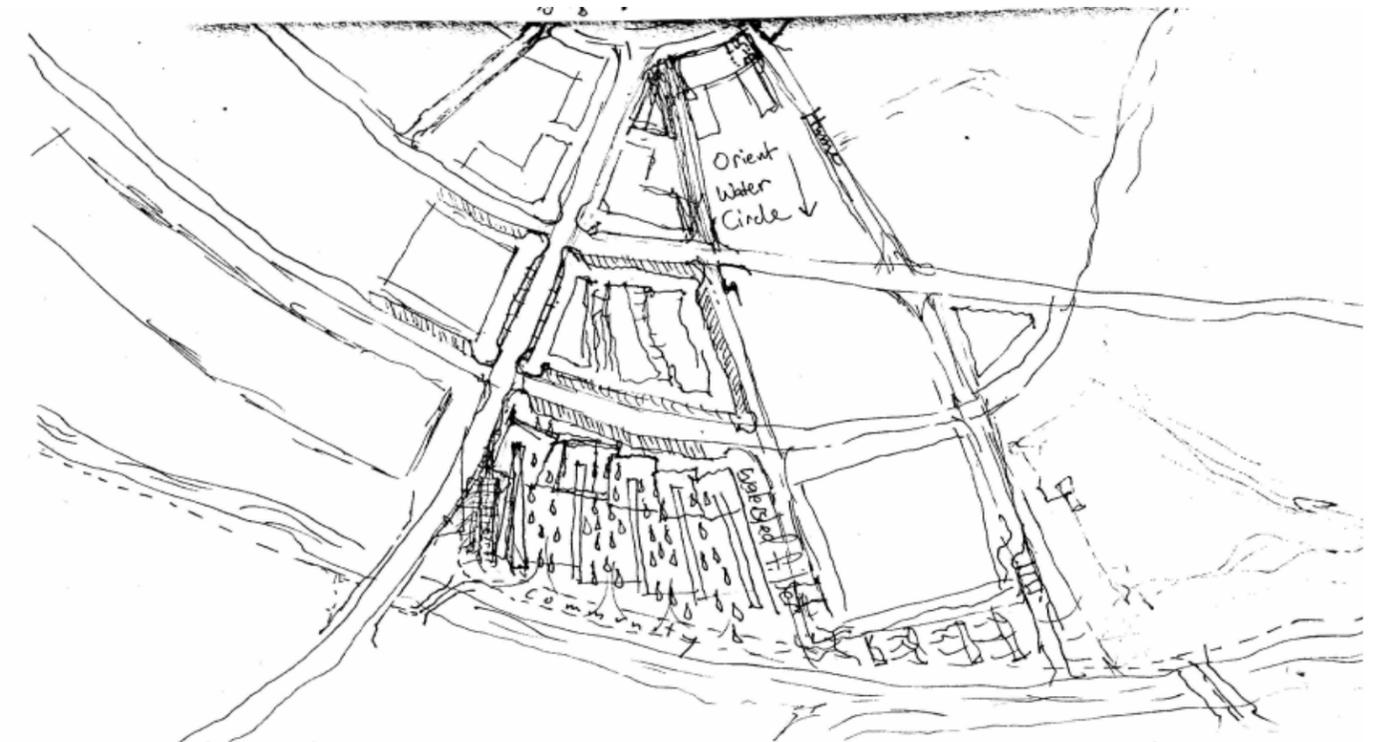
figures 48—digital and hand-drawn collage illustrating classical design elements, both existing and potential, at the circle.

fairfax circle—prototype filtering

The degradation at Fairfax Circle provides an opportunity to start fresh and design an ideal buffer straddling a mixed-use village and repaired parkland. The re-built edge can be a gentle transition from urban to park space and filter runoff and pollution, but at the same time serve a constructive functional purpose relative to each side (urban and recreational). It should conform both to sound urban design principles and meld with the repaired natural world, serve as a civic barker, and be a symbol of what is possible in the village. In choosing a site to exemplify this prototype design for the community's edge, I considered all of these criteria. Early sketches in my design indicate higher density buildings at the circle tapering down to lower density near the community edge at the park and creek.



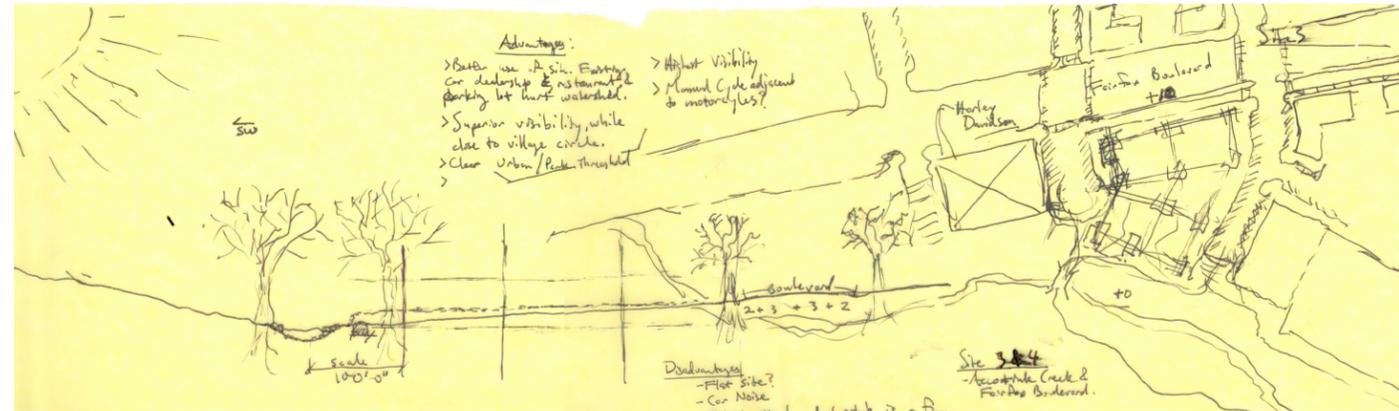
figures 49—sketch illustrating an expanded park forming the boundary of the village



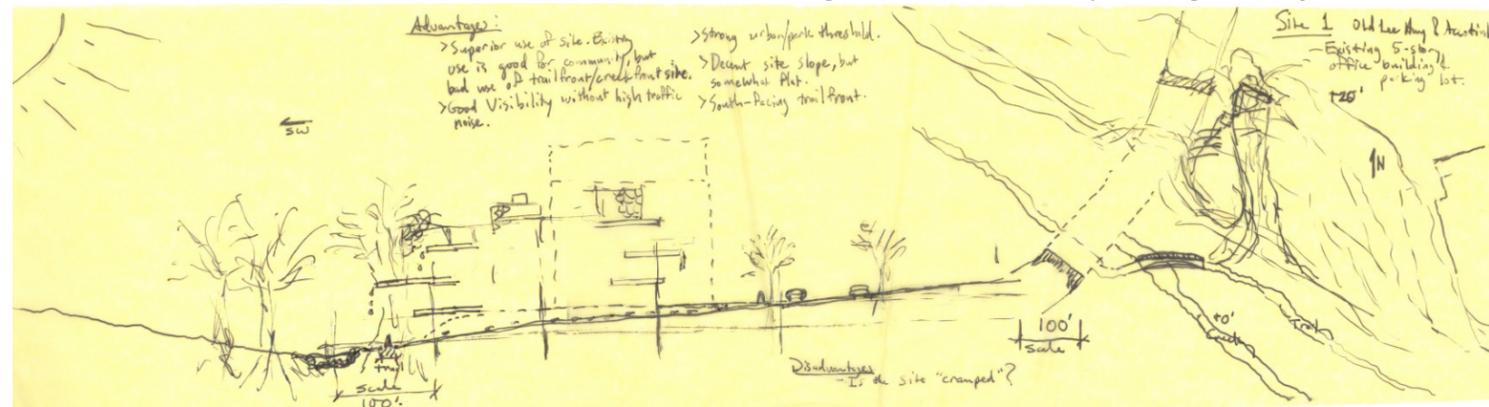
figures 50—sketch exploring buildings at the community threshold serving a filtering purpose.

fairfax circle—potential sites

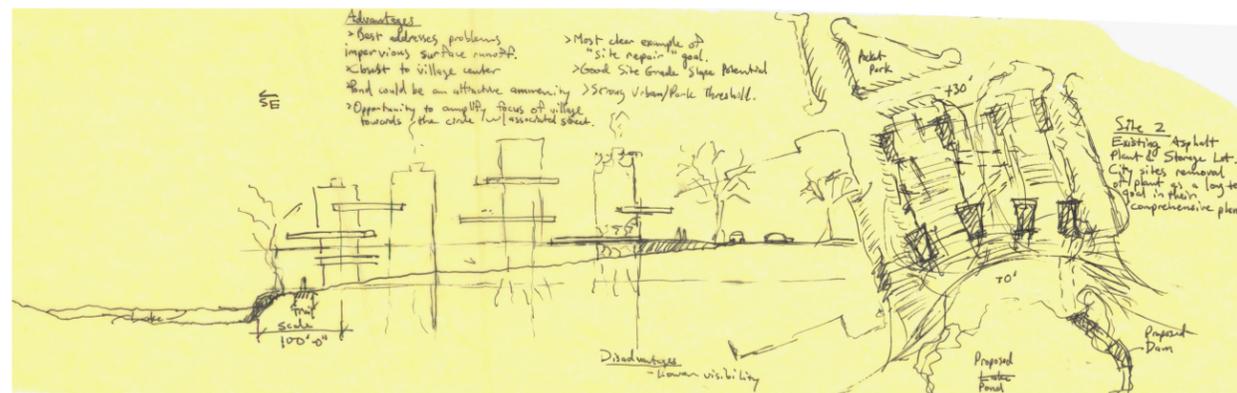
I sketched plans and sections analyzing three potential sites. Site A on Fairfax Boulevard was prominent, but I felt the heavy vehicular traffic adjacent to the site was harsh and uncomfortable for a trail center. It also did not site on the portion of the area most in need of repair, a theme that had emerged from my studies. Site C at the asphalt plant sat at the center of the heaviest erosion and pollution. While building on the asphalt plant offered symbolism with regards to rethinking the use of pavement, the site was too removed from civic view for a public building. Sitting at the crossroads of the trail, planned commuted bike lanes, the secondary artery road through the circle (Old Lee Highway), and the confluence of the Accotink and Daniel's Run creeks, I settled on Site B.



Site "A": Fairfax Boulevard at entrance to existing "Wilcoxin Trail" (existing 1 story commercial)



Site "B": Old Lee Hwy at Accotink/Daniel's Run juncture (existing 4 story business)



Site "C": Asphalt plant at Old Picket Road and the Accotink Creek



figure 51 (A, B, &C): hand sketches of potential sites



Figure 52: Fairfax Circle looking southwest on Old Lee Highway towards the creek (Fall 2009).

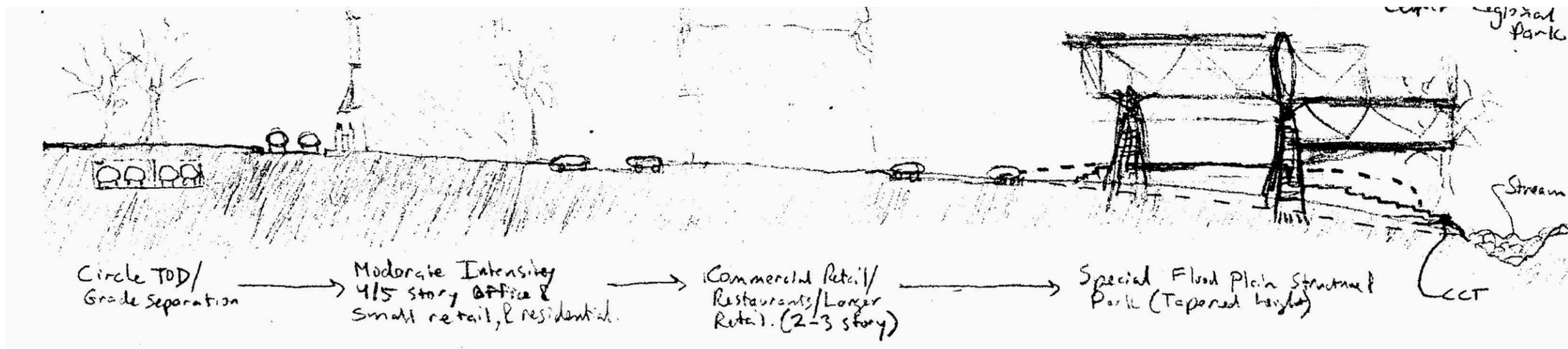


figure 53: hand sketch cross section study of village circle to creek

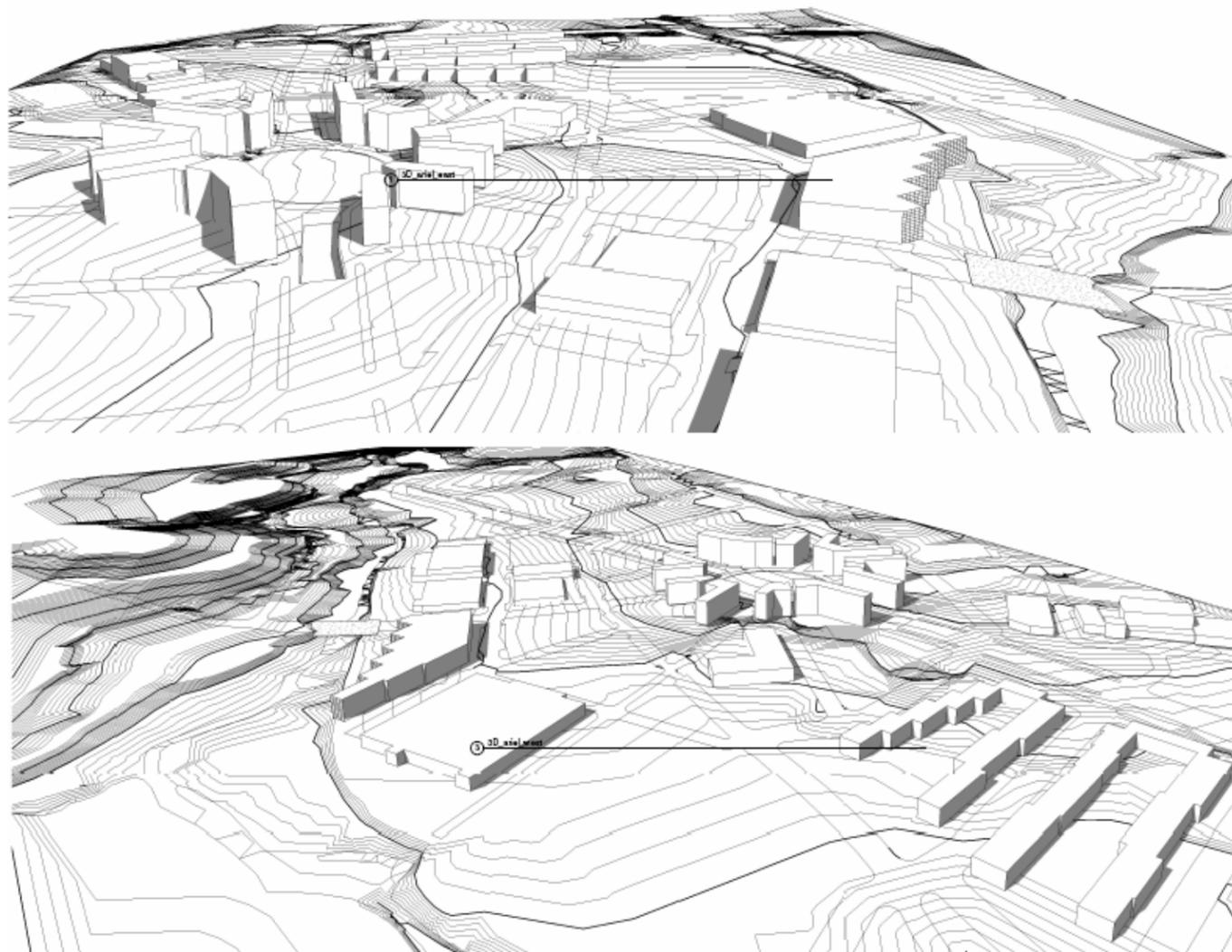


figure 54: digital model study of village topography and views from the circle in different directions

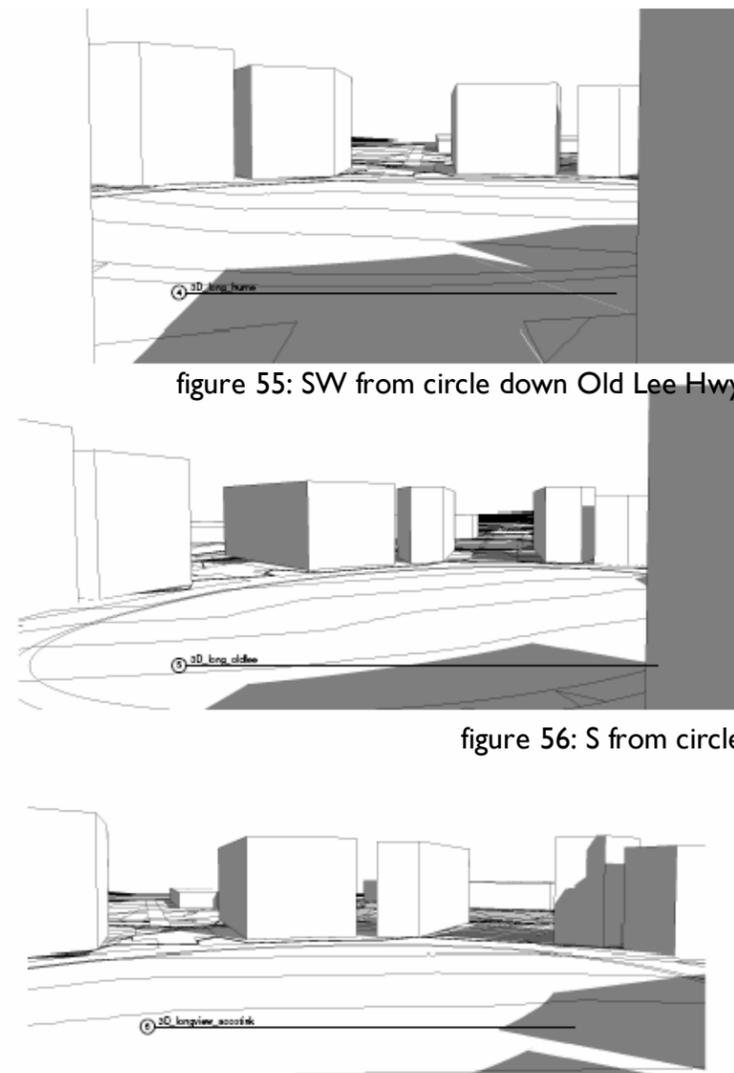


figure 55: SW from circle down Old Lee Hwy

figure 56: S from circle

figure 57: SE from circle to proposed site

site program and function

With regional, community, and stormwater management considerations for the site, I set out to determine its function. That the site should hold some sort of trail center was clear, but early on I felt strongly that the natural, escapist recreation along the trail, and the desire to repair ones health and the stream valley itself through its use, should serve as some analogy to the site. Thus re-creating the site would also coincidentally mean repairing and regenerating oneself through physical recreation, particularly including jogging.

The thesis was based on the belief that the site would contain and release storm water. In early sketches I considered that the site should be a “special flood plain structural park”, and as the project developed the concept of the site and building as a storm water management machine would become central to the work.

That exercise should occur there gave purpose to this desire to catch and release the water. While one tactic is to catch storm water in large, precast series of concrete vaults hidden underground, I desired for the site to reveal this aquatic motion. I determined that swimming pools, using reclaimed runoff and captured rainwater could express this function of both a healthy pace of human movement, and by catching and releasing water slowly, help the life of the stream valley.

Lastly I considered the length of the Cross County Trail and its potential tie-ins to other regional trails in the future. Thus a short term dwelling component, (hotel, motel, trail hostel) would make sense and be a unique beacon, letting visitors know that it is a destination for travelers, not just locals.

the arm from the circle, with a hand protruding into the creek.



figure 58: hand sketch laid over digital topographic model reflecting the traffic circle's relationship to the site

In addition to developing the site from a purely functional standpoint, I sought to develop a master plan for Fairfax Circle that related the site to the existing traffic circle —actually an ellipse - that the area derives its name from. This dichotomy between the ellipse and the site came into play as I conceived of developing the site as a hand with outstretched fingers radiating from the elbow at the center, and arms connecting the two different yet complementary elements.

The first element is the gradation of nature buffer connected by leisure paths for activities of moderate, non motorized speed (ie: foot and bicycle). The latter element for this is the articulated, manmade urban park and potential hub of mechanized mass transit access at the reworked ellipse, the dual purpose represented by the dual foci of the repaired shape.

The creek parkland buffer, repaired to filter storm water in its natural beauty and leisurly recreational movement, hold the same purpose as the triumphal arch—as threshold into the village. The ellipse represents the reality of quickly moving to and from Fairfax Circle to a job, other suburbs, or into the city, while providing safe access for pedestrians as well. Both pieces of the design not only relate to each other, but depend on one another in order for the circle community to exist as a whole, just as people need to work and relax.

village—a tale of three circles

Dupont Circle in Washington DC represents the circle as civic space, and here it is a model to which Fairfax Circle can aspire to. Laden with at grade crossings and stop lights, the Connecticut Ave underpass bypasses a significant amount of traffic below the public space of Dupont Circle. The vehicular traffic at grade is mitigated to a point that comfortably permits pedestrians to cross the street and enter the space. Combined with the distributed grid around the neighborhood, the circle itself is not a pressure point servicing so much vehicular traffic that mayhem ensues—rather, pedestrians are able to safely access the park. Similarly, the size of Dupont Circle, approximately 400 feet in diameter (about 600 feet including the street) relative to the surrounding buildings (600 to 800 feet high) approximates the ideal 1:1 height to width ratio espoused by Christopher Alexander (Alexander, 490), Jane Jacobs (Jacobs, 87), and others.

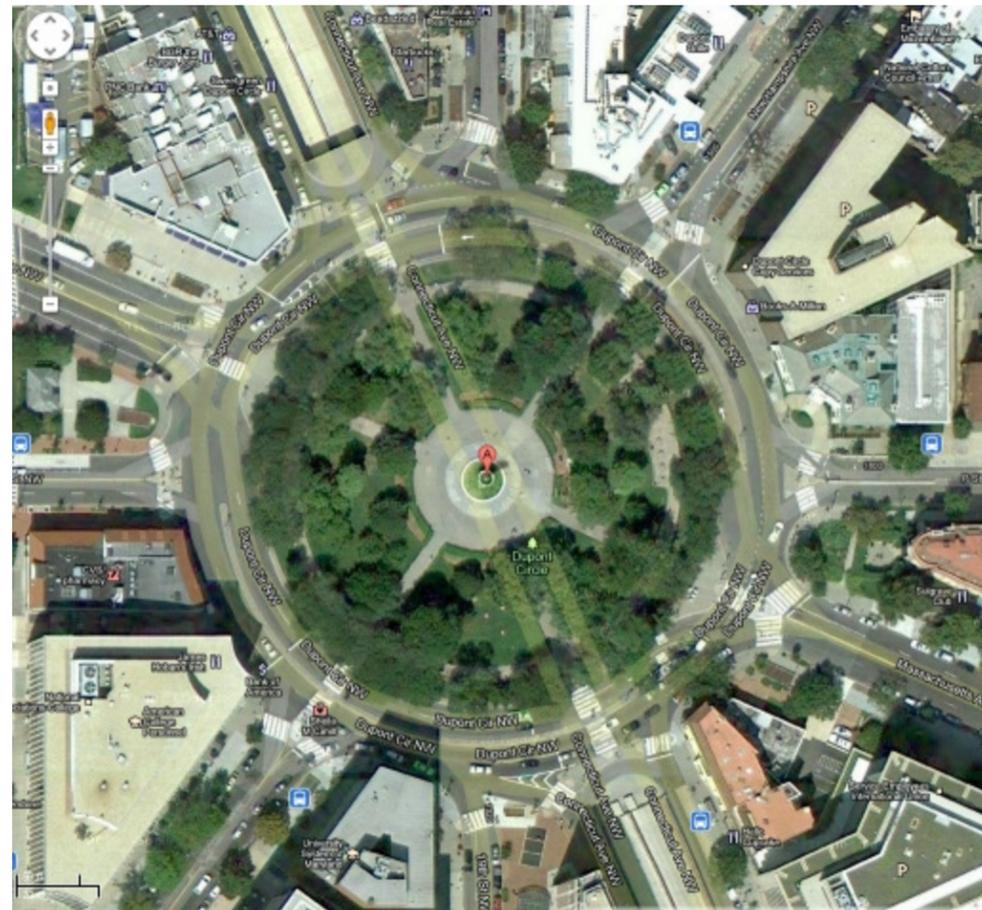


figure 59: Google maps image of Dupont Circle—Washington, DC. Nov 2011



Figure 60: Google maps image of Eisenhower Circle—Alexandria, VA. Nov 2011
(note: 10-12 story buildings are under construction around this circle, framing it in an urban method)



figure 61: Google maps image: Fairfax Circle—Fairfax, VA. Nov. 2011
US Route 50, called Fairfax Boulevard through the city, slices the existing elliptical circle in half. The diameter of the green space is approximately 250 feet, but there is room in the existing footprint to expand this to approximately 300 feet.

In stark contrast to Dupont is Eisenhower Circle near the U.S. Patent Office in Alexandria, Virginia. An oversized “roundabout”, the circle has no crosswalks, nor any stopping of vehicular traffic.. Rather than designed as a public space, here the green grass within the circle is only ornamentation to facilitate the flow of cars. Its sole design intent is to move traffic constantly around it—a feature best reserved for a country road intersection rather than valuable urban park. Likewise, framed with 10-12 story buildings(1000-1200 feet), the circle’s small 200 foot diameter, combined with traffic whizzing by, makes for a constricted outdoor room (4:1 height to width ratio). Even if it were modified with crosswalks, such a space would feel constricted and narrow. Pedestrians would sense cars in front of and in back of them, and the buildings will both cast constant, encompassing shadows and dominate the sense of space.

proposed fairfax circle

Drawing on the success of nearby Dupont Circle, I propose creating an underpass for Fairfax Boulevard beneath the circle and expanding the street grid to eliminate the need for the circle to act solely as a device to move cars. Also learning from the vibrancy of Dupont Circle, I propose an expanded diameter civic space with the proportions of an urban park.



figure 61: expanded image of Fairfax Circle



Unlike Dupont, the space is elliptical. This offers the opportunity not only for a unique geometry, and vistas, but to provide bus stops on either long side of with crosswalks serving dual purposes as transit and park access. Unlike Dupont Circle, vehicular access on the long sides of this ellipse are replaced with pedestrian-only plazas allow for the buses to stop, load/unload, and re-enter the circle safely and effectively. Consolidating the area bus stops here can enhance passenger safety, convenience, and bus flexibility as the ellipse doubles as a bus turnaround.

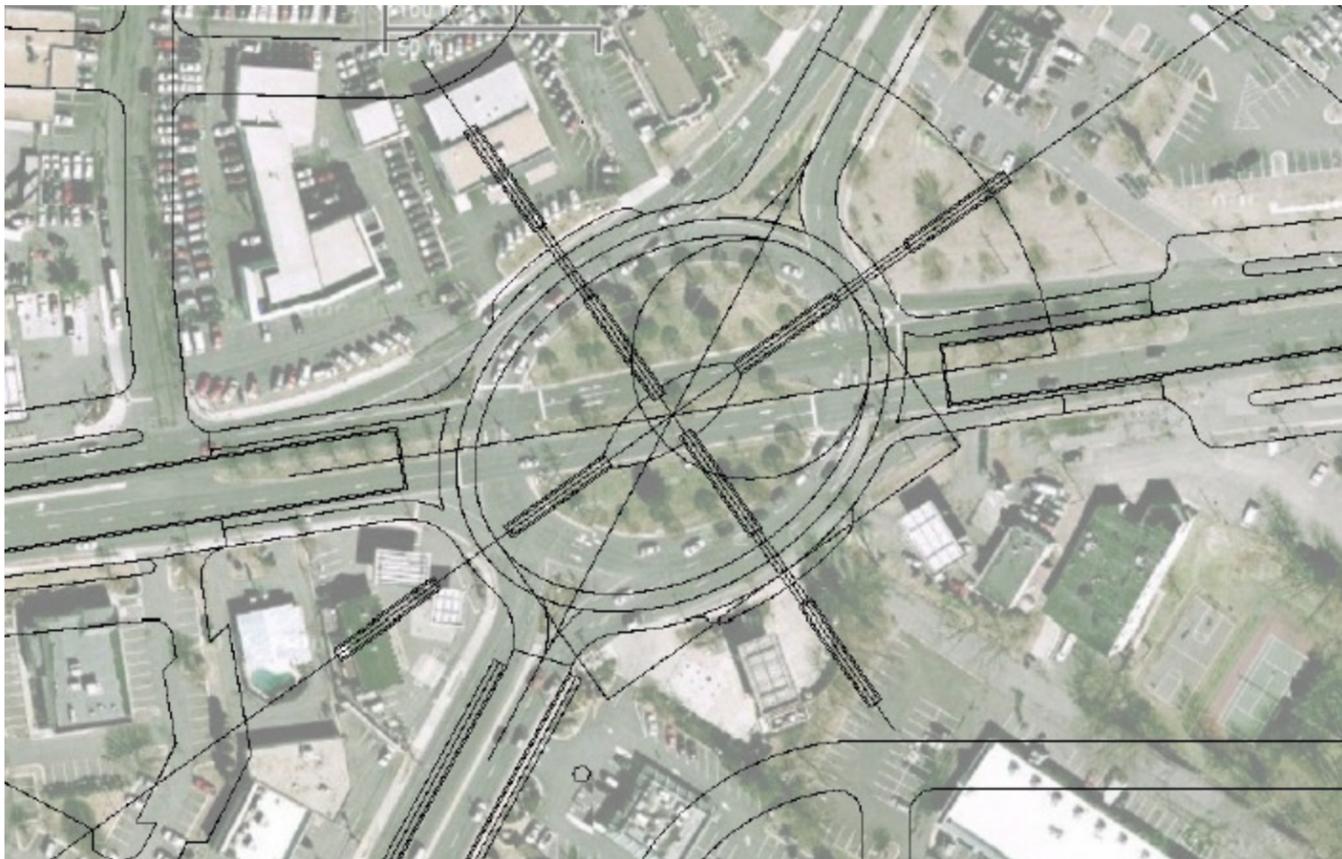


figure 62: CAD overlay of proposed traffic ellipse geometry

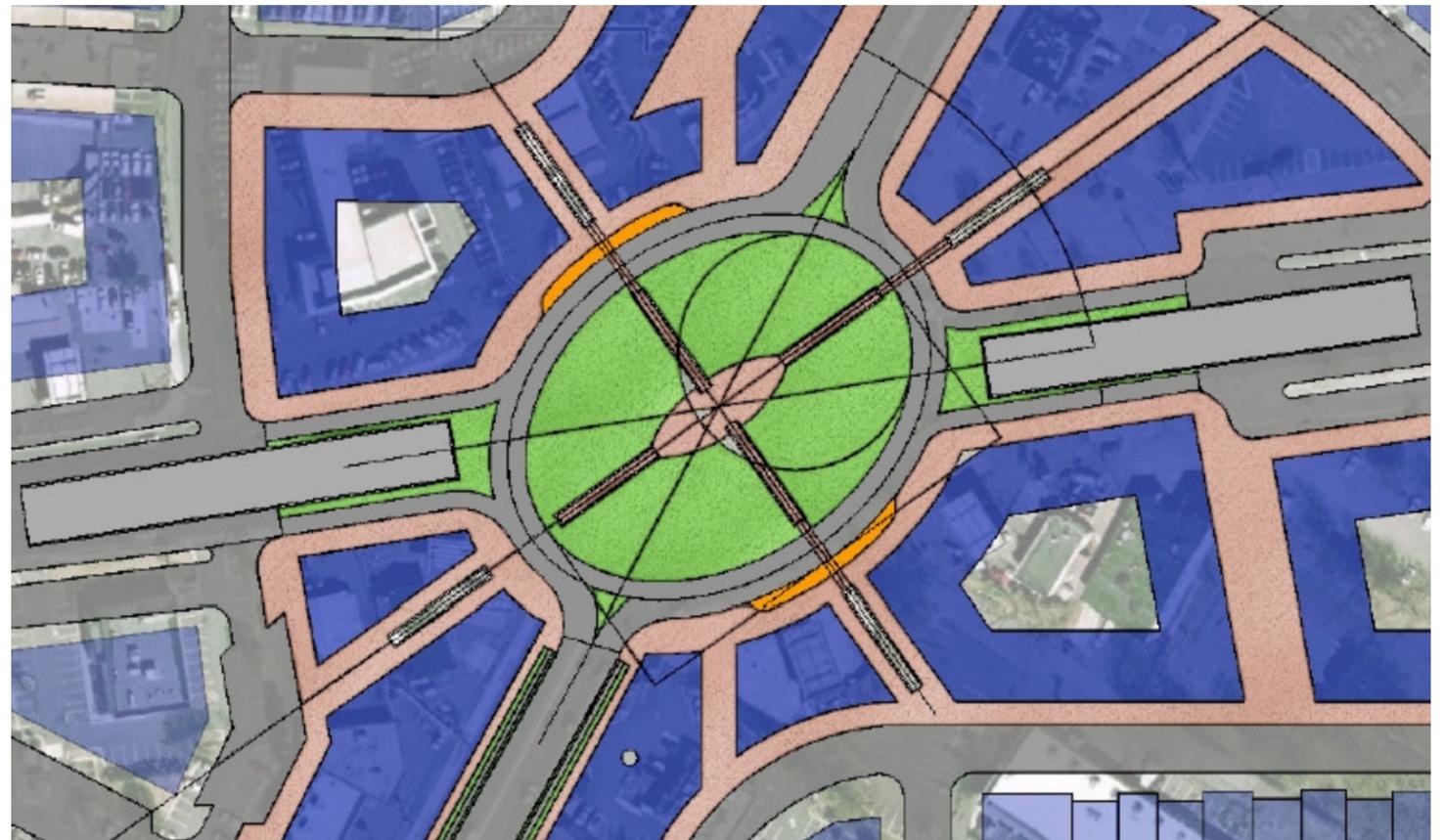
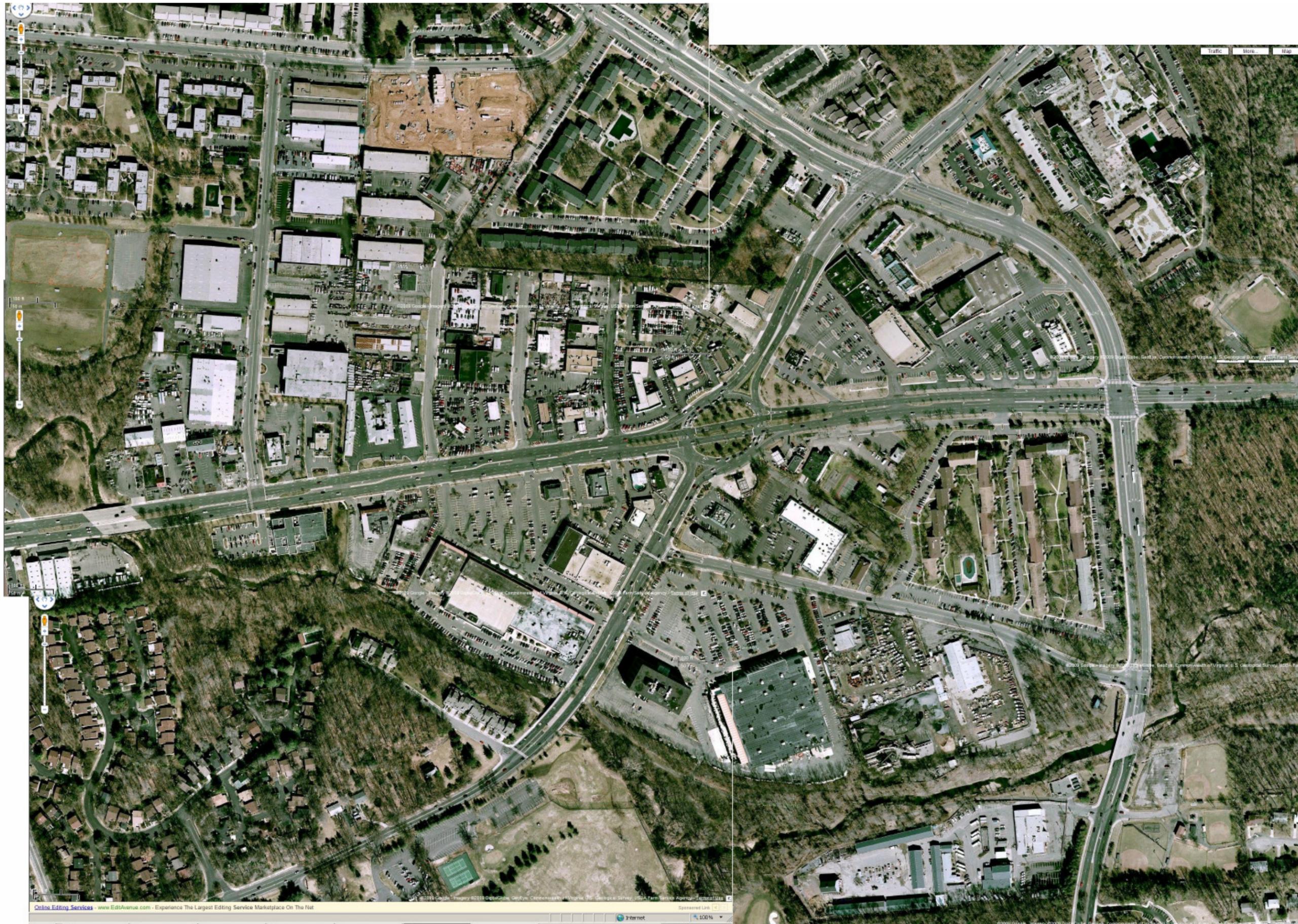


figure 63: digital color-keyed plan of proposed traffic circle



plans

the village

Based on the studies of the trail, the local connections, and the functions of various existing and potential elements, I sought to develop a Master Plan for a revived Fairfax Circle. At the master plan scale, the goal was to redesign this area into a true village and a gateway into town using an outside-in approach starting at the transition threshold of the park/creek/trail.

The park around the circle would be a reworked and expanded Gateway Regional Park, becoming a true gateway to the entire trail and trail system.

The google maps site plan image to the left, reveals existing conditions of the area. Analysis of this existing condition is found on the following pages.



the village-
existing
conditions

This overlay of the circle represents existing conditions.

Aqua shows the extent of the existing flood plan (from the City of Fairfax GIS), yellow residential, red strip commercial, brown industrial, and green parkland. Darker shades illustrate higher intensity. The bulge in the flood plain to the right of the page is due in great part to both overall runoff from the city and to the extent to which the impervious surface is pushed against the creek bed.



the village:
stage I —
the edge

The first step in redeveloping the circle is to excavate the parking lot fill pushed high against the creek to allow room for storm water swell and permit a view plane down to the repaired floodplain. Grassy inlets with storm water soaking plants would provide the new edge, while an expanded trail system (brown existing trails, orange & yellow new hard surface and crushed stone respectively) would connect the regional system and serve as step 1 of 2 for creating an expanded Gateway Regional Park.



**the village:
stage 2—
threshold**

To slow water on its way towards the creek, buildings with water retention functions alternate between grassy, treed drainage swales. A new pond/wetlands preserve past Pickett Road Bridge will mitigate heavy flow into the rest of the creek, with the aqua color showing the revised extent of the flood plain. An expanded street grid (in a spoke & wheel pattern) with public on-street parking (permeable surface, aligned & angled to maximize efficiency) and permeable paver sidewalks begins to replace destructive asphalt lots.



the village:
stage 3—
the ellipse

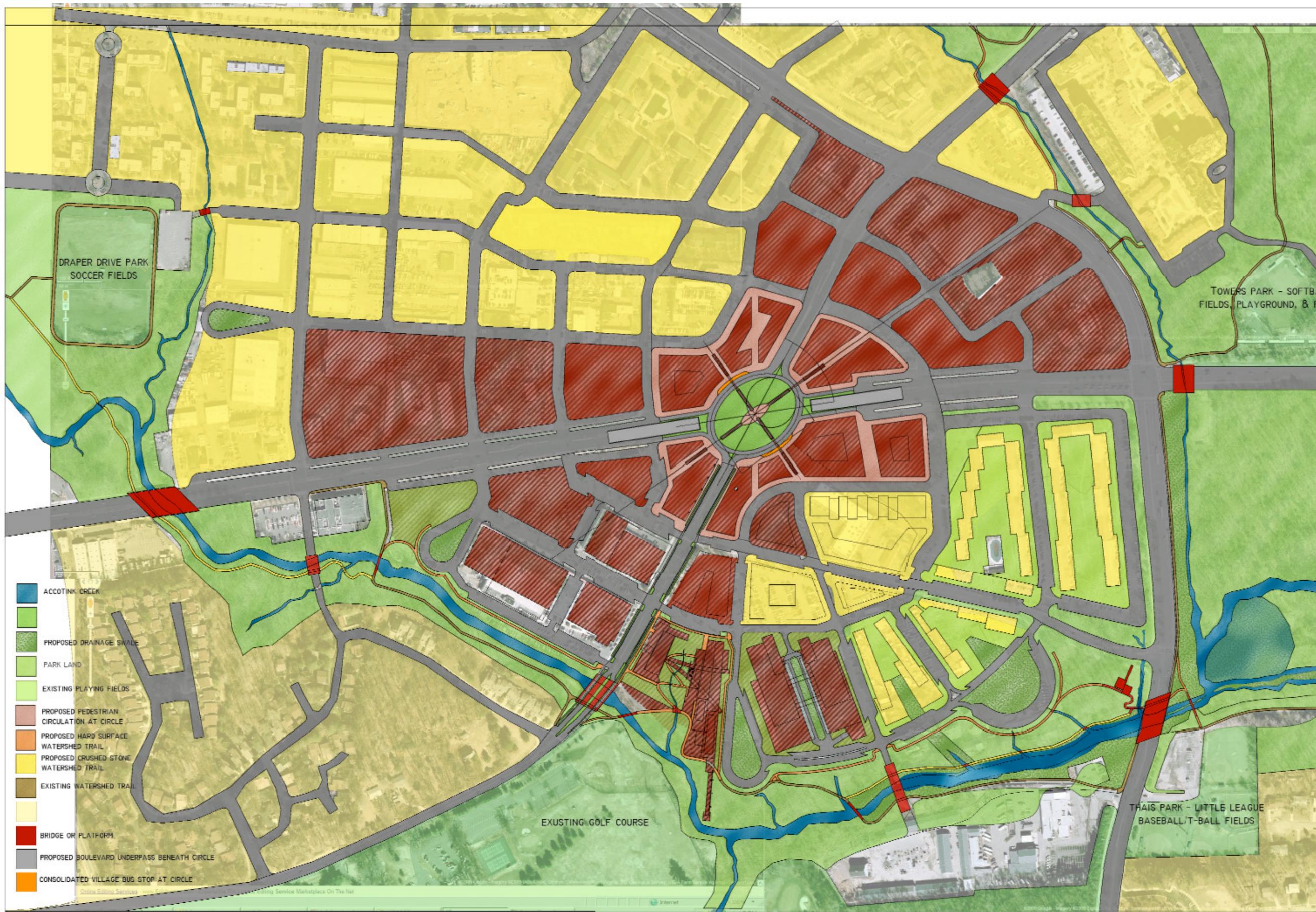
The creek forming a radius edge, it was important to speak to the focus of the radial path, the elliptical traffic circle. Here we see the circle re-built as a mass transit plaza (with central bus/light rail on either long side) and geometrically-defined urban park that provides clear vistas to the surrounding streams. This is primarily accomplished by burying US Route 50 beneath the circle. By reducing the stifling volume of traffic and lowering the speed buses stop, and people comfortably cross the ellipse road and access the park.

figure 67



**the village:
stage 4—
connections**

Together, the creek threshold and traffic circle frame the basic concept of the village master plan. Allegorical to the dual foci of elliptical geometry, the urban ellipse and the repaired natural recreational edge act in concert with one another. At the high point of the valley floor, the urban elliptical center funnels and disperses busy pedestrians, cars, buses, and storm water. Connected by the spokes of the street grid, the park edge receives and filters this movement to a more leisurely, natural pace. The result is an interdependent dualism of urban and natural spaces.



the village: mixed uses

The radial geometry gives a clear sense of direction to the community and provides areas of focus and intensity necessary for successful commerce. Here the red areas in two wedges signify mixed use (with ground floor commercial use) areas that scale down in building height as one moves away from the center. The two remaining yellow wedges would be primarily residential.

figure 69

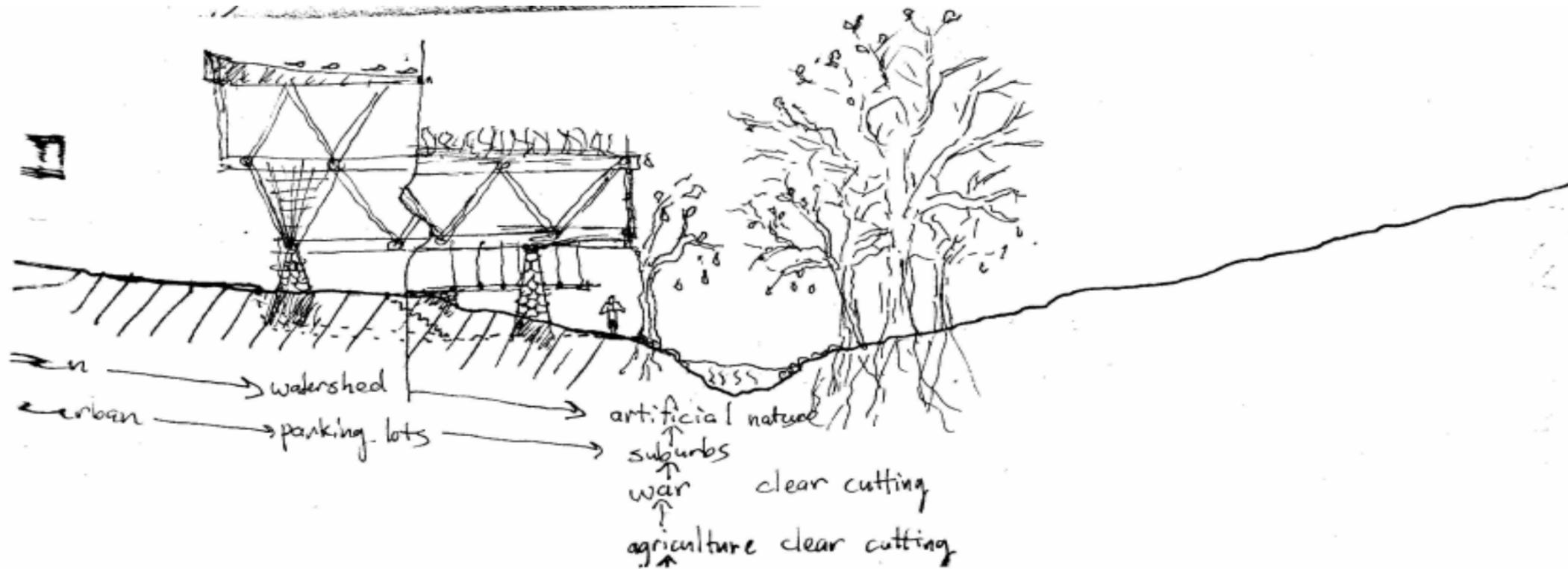


figure 70: section study at creek

site and building studies:

Derived from my master plan studies of Fairfax Circle and the ensuing geometry, the development of the prototypical threshold site began with the metaphor of the arm emanating from the circle, with the hand and fingers touching the radial edge. Thus, fingers protruding into the floodplain were the connection between the circle and stream. In section, I focused on removing the fill from years of parking lots pushing ever closer to the creek edges. As a result, the section view consistently explored the idea of a split level structure stepping down in some way towards the creek bed. Also, the language of cantilevered structure on piers became dominant early on with my desire for the structure to let water pass through and to protrude into the creek flood without disturbing it.

figure 71: program sketches in plan, word bubble, and section

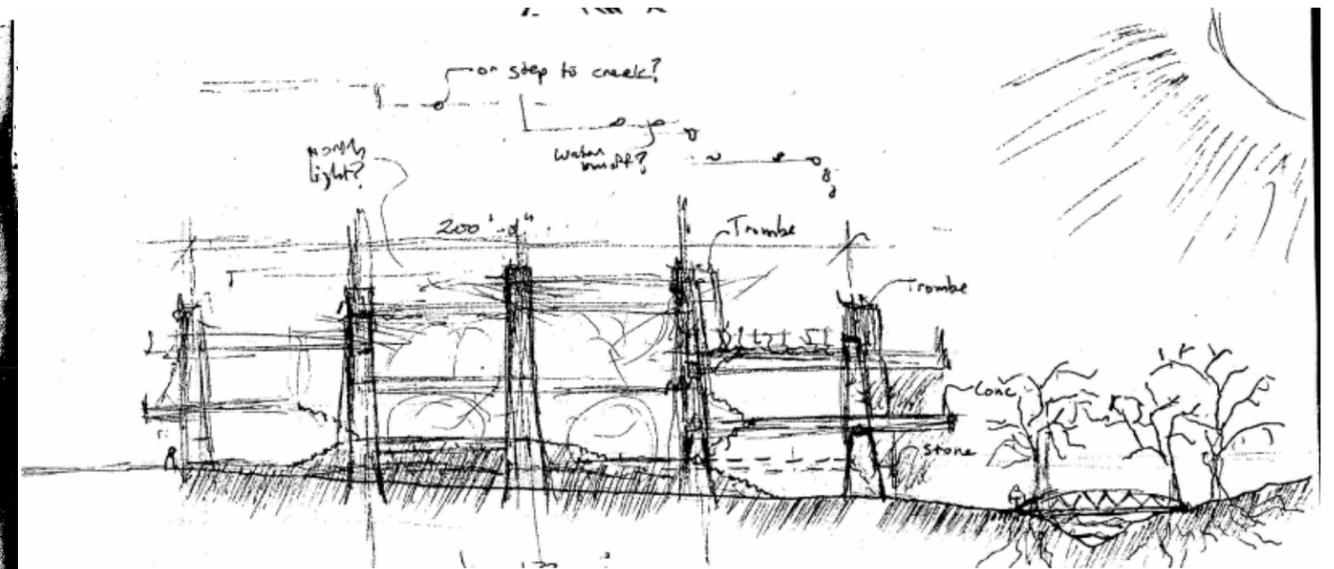
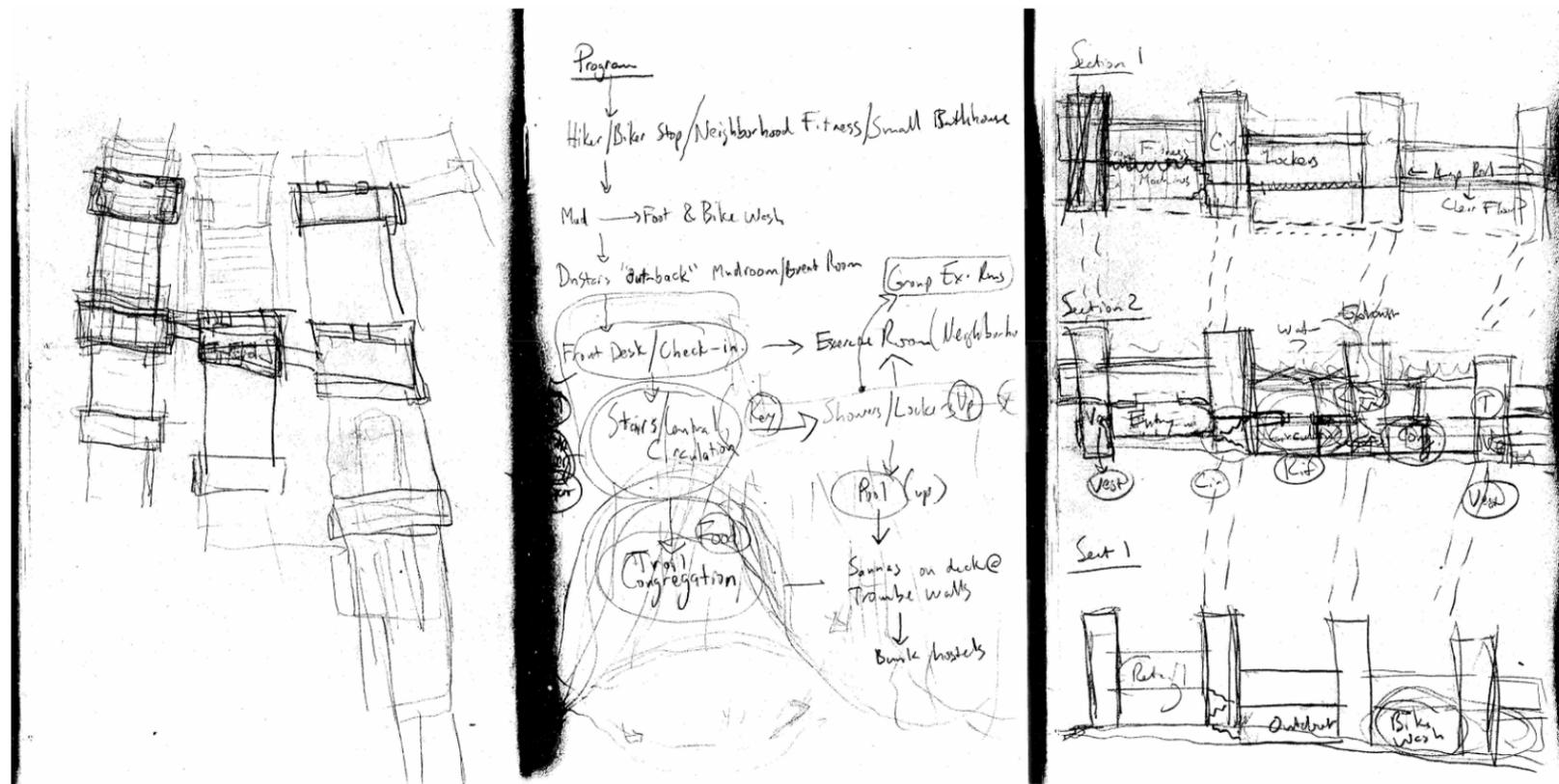


figure 72: section study of elements and building scale



figure 73: sketch looking from trail to proposed building of fingers

early studies: too much building

As I began to work with the nature of building as city, and study the scale of my project, I realized the immensity of five interconnected fingers protruding into the floodplain. Perhaps "five" was taking the hand analogy too literally. In particular, Aldo-van-Eyck's Sculpture Garden brought to mind that I had been applying too much building to the site, and not paying enough attention to and working with the void space (the areas between the finger-like buildings that would actually be filtering the runoff).



figure 74: Aldo-van Eyck's Sculpture Garden Pavilion

Aldo-van-Eyck

- ↳ Pavillion of 1967 → rebuilt in 05-06
- ↳ Sculpture Garden
 - ↳ theme of "building-as-city"
 - ↳ round plazas
 - narrow spaces
 - walls of cheap all CMU
 - separates spaces → singular
 - only @ periphery can one see the whole garden/pavilion
 - ↳ the pavilion questions the relationship between sculpture & the human figure.
- ↳ Nagele Grid 1956
 - ↳ village sited on a large stretch of re-claimed land.
- ↳ Municipal Orphanage, Amsterdam

Thesis Notes:

- ↳ The circulation ^(paths) ~~camp~~ and associated exaggerated ramp changes represent the recognize the individuality of the three buildings.
- ↳ Rather than ~~the~~ Also realizes the reality of the a project built in phases, each settling into the earth in a unique matter. This phasing is ~~not~~ accounted → Rather than a tiny expansion joint resulting ~~in~~ this, floors are not necessarily aligned

Stone → stone facade below ~~to~~ to protect from long term flood damage.

Bike rental storage area

- ↳ Trade in road bike to rent mountain bike, Clean @ cleaning station or pay = fee.

figure 75: notes and sketches

early studies cont...

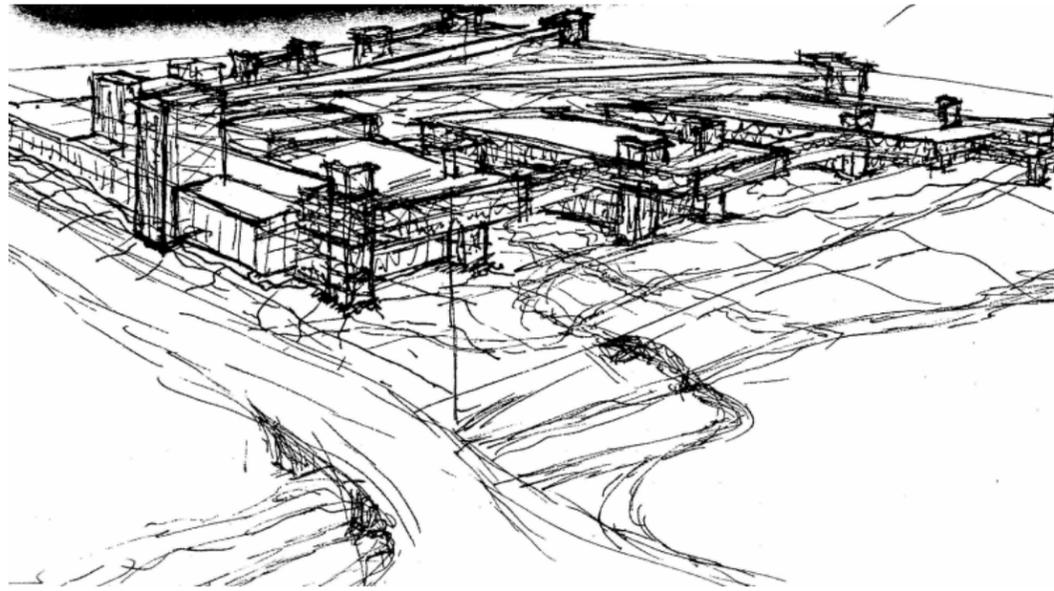


figure 76 a: aerial sketch of site from SW

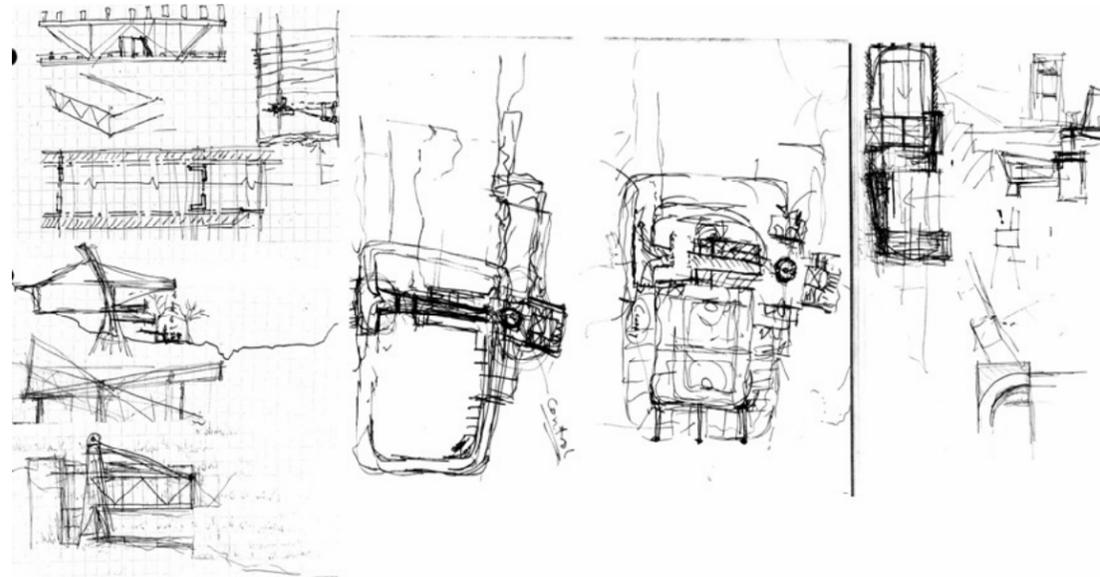


figure 76-b: hand sketches of building structural elements

The fingers became three large, buildings potentially connected with elevated walkways to let storm water pass beneath and between the buildings. Essentially they were piers with bridge connections and cantilevers projecting into the forest. While a nice allegory, more structure necessitated additional program that didn't make much sense for this study. I thus distilled the building down to its elements as they related to both the master plan and the immediate site—a linear projection into the forest, its uses and movement reflecting the transition from urban to recreational park.

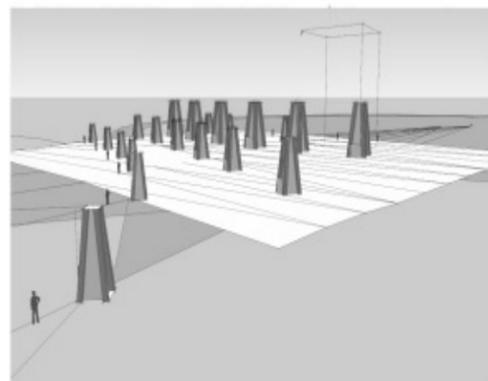


figure 76 j: photo of physical site model—early concept from SE

figures 76 c-h: digital sketches of master plan, site, and digital isometric views of buildings



figures 77a - g: floor plan evolution

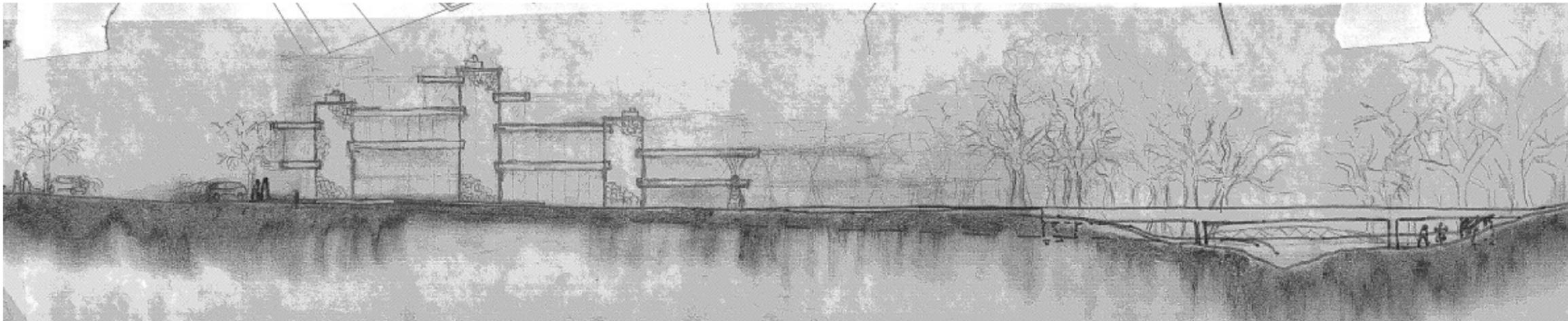


figure 78-a: section sketch through site and creek

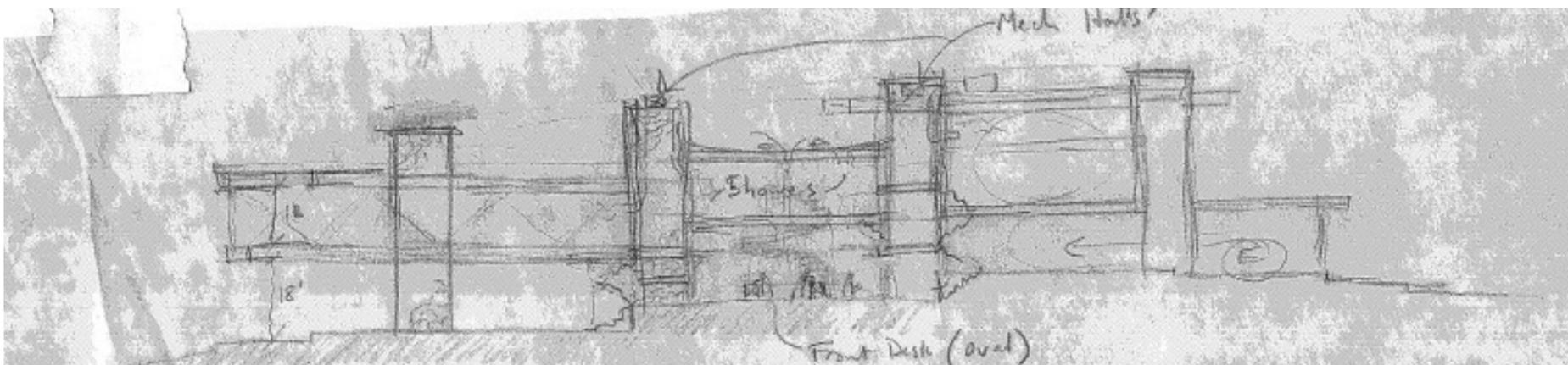


figure 78-b: section sketch through the site



early studies cont...

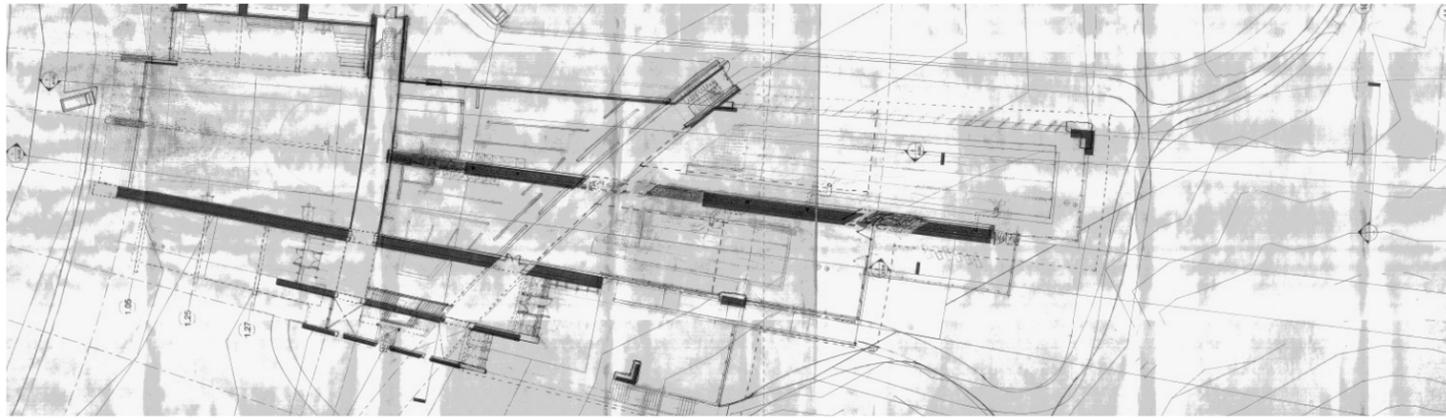


figure 79 a: first floor plan

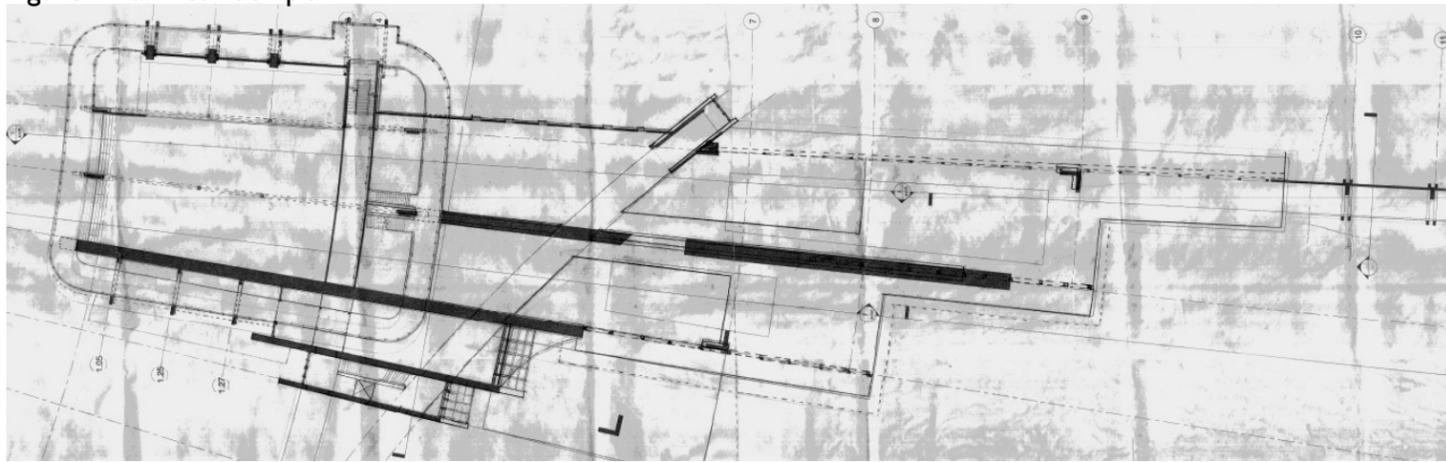


figure 79 b: second floor plan

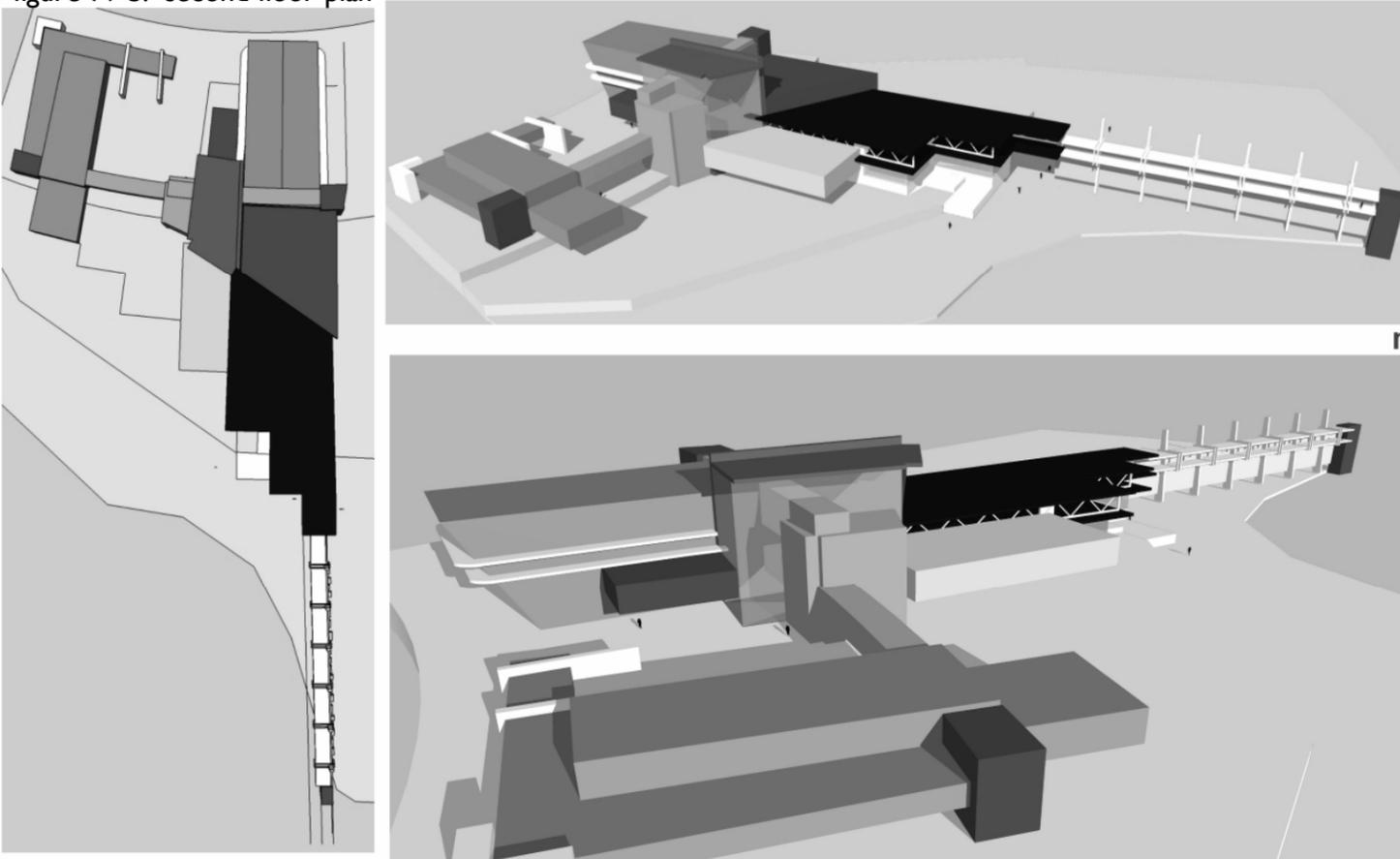
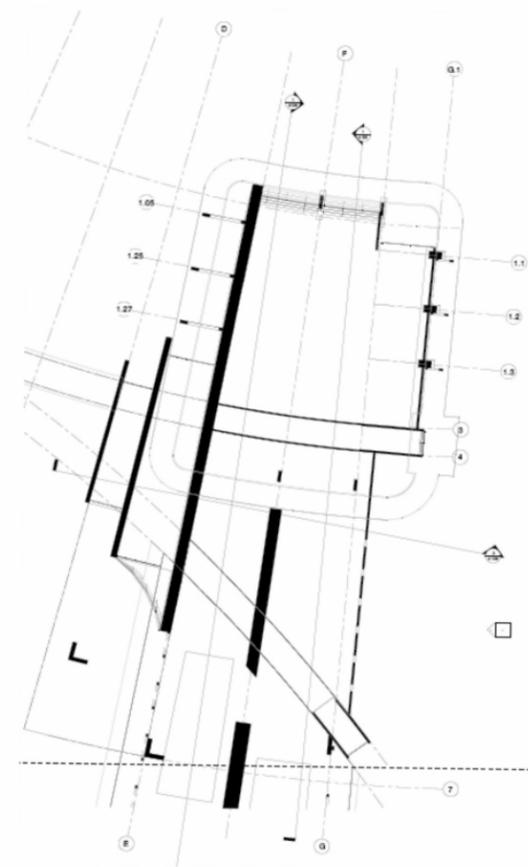


figure 80: digital massing models of building elements



early studies: distilling the concept, from two fingers to one building

After realizing the scale and immensity of the site, I reduced the number of fingers in my building from two to one single finger. Still sizable, the program could easily fit into the single finger, but it was not until many sketch studies, floor plans, and a site model were done that this became clear. As the building was reduced in scale to a workable size, preferred building functions, such as an elevated running track, began to reveal themselves through the Architectural elements—in this case a track projecting over the city street and an “arm of leisure” going into the parkland.

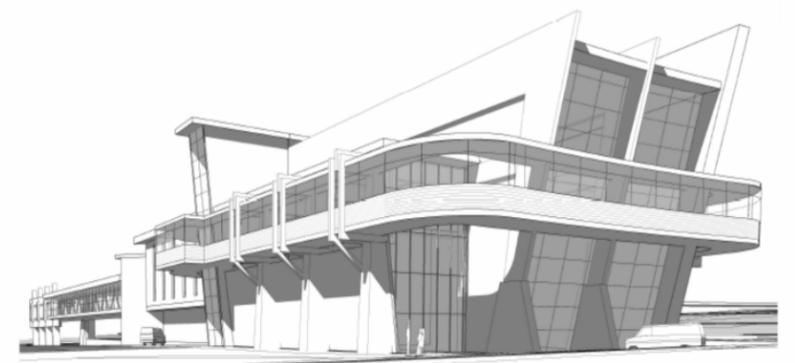
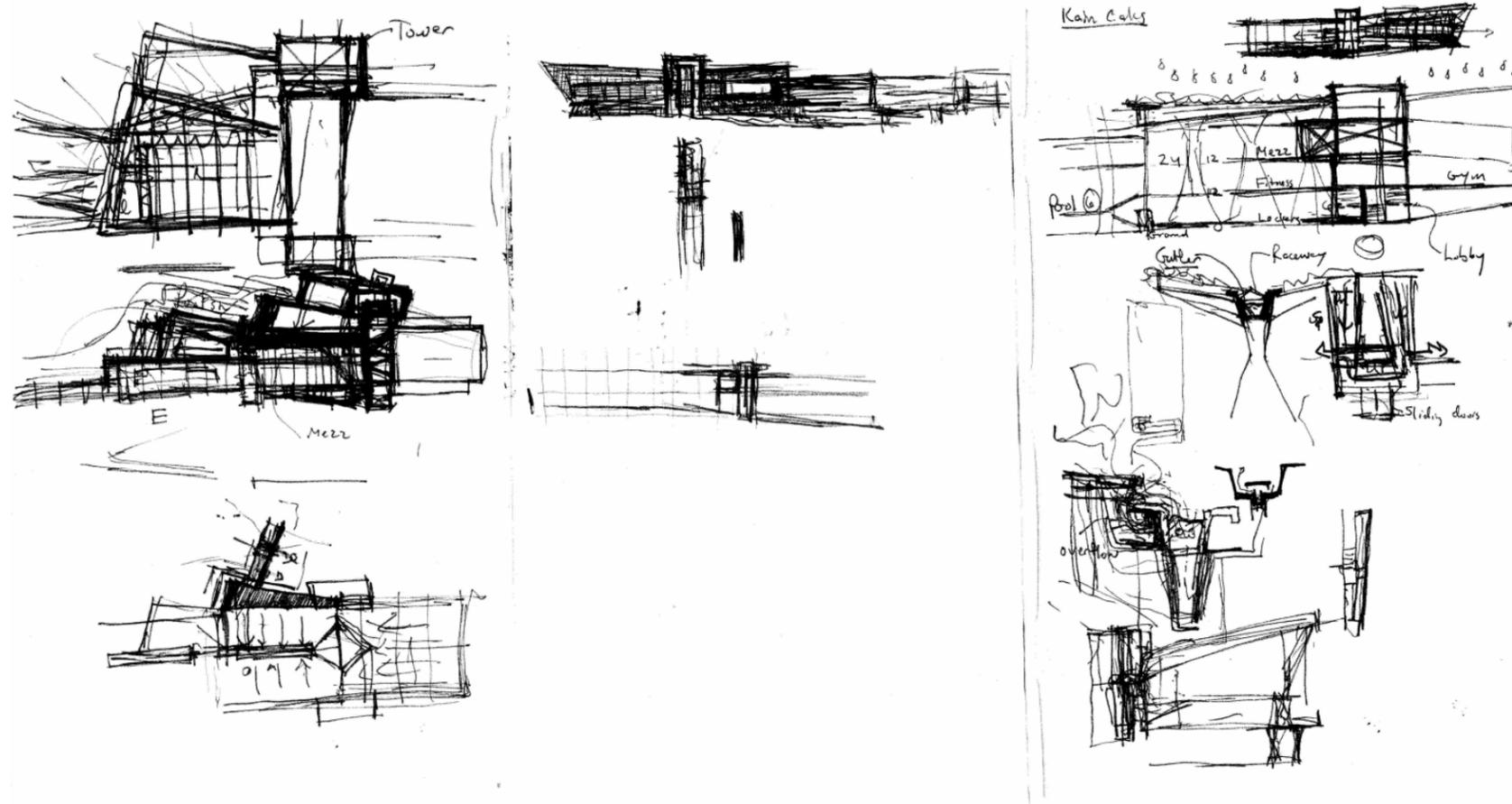


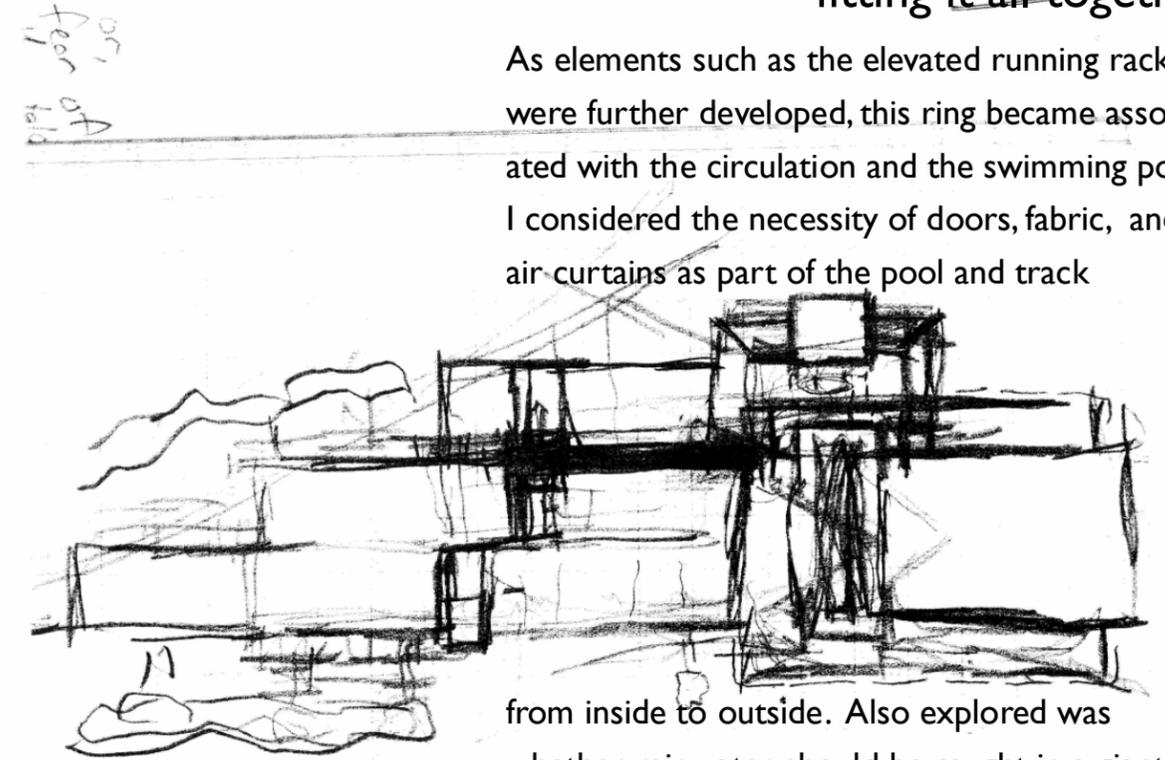
figure 81: digital models progressing from the massing models

figure 82: hand sketches showing the progress of the design

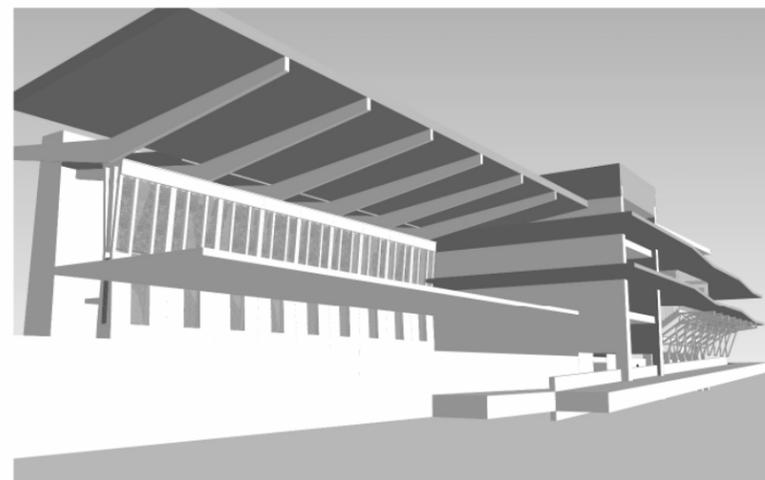
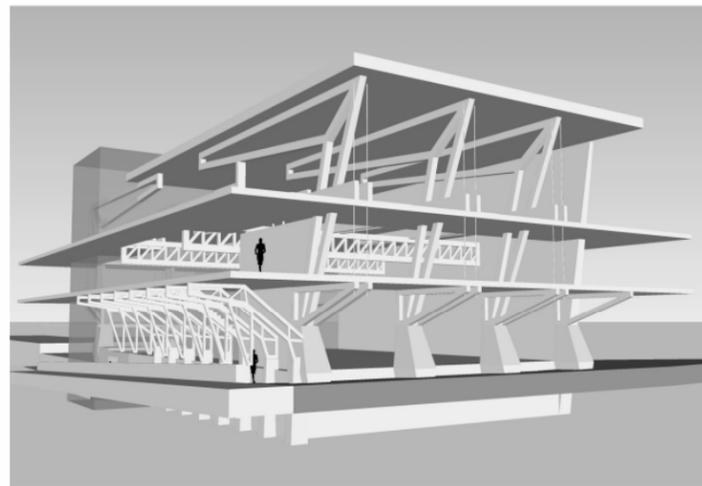


fitting it all together.

As elements such as the elevated running track were further developed, this ring became associated with the circulation and the swimming pool. I considered the necessity of doors, fabric, and air curtains as part of the pool and track



from inside to outside. Also explored was whether rainwater should be caught in a giant butterfly roof and directed inside the building.



april

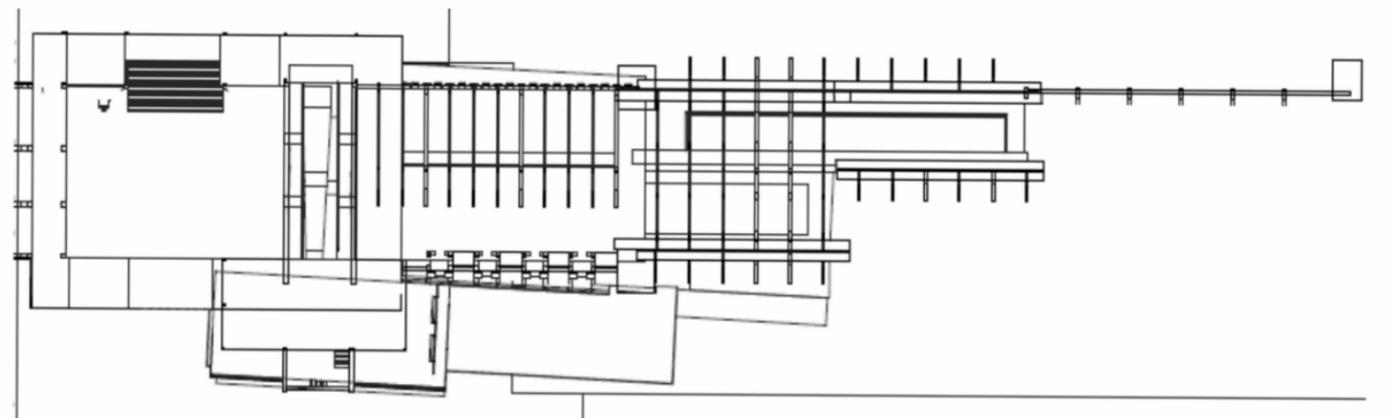
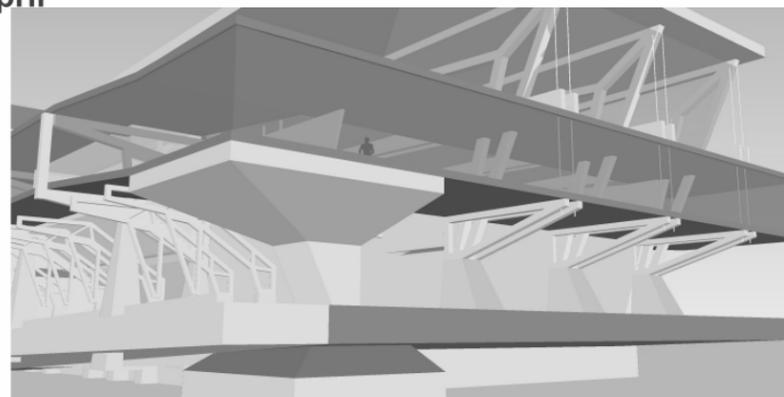
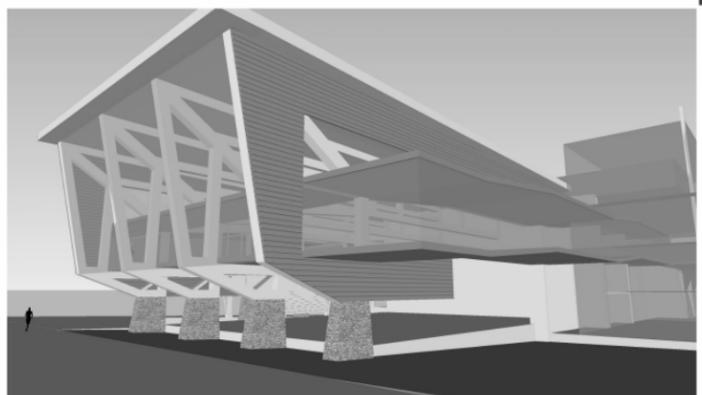
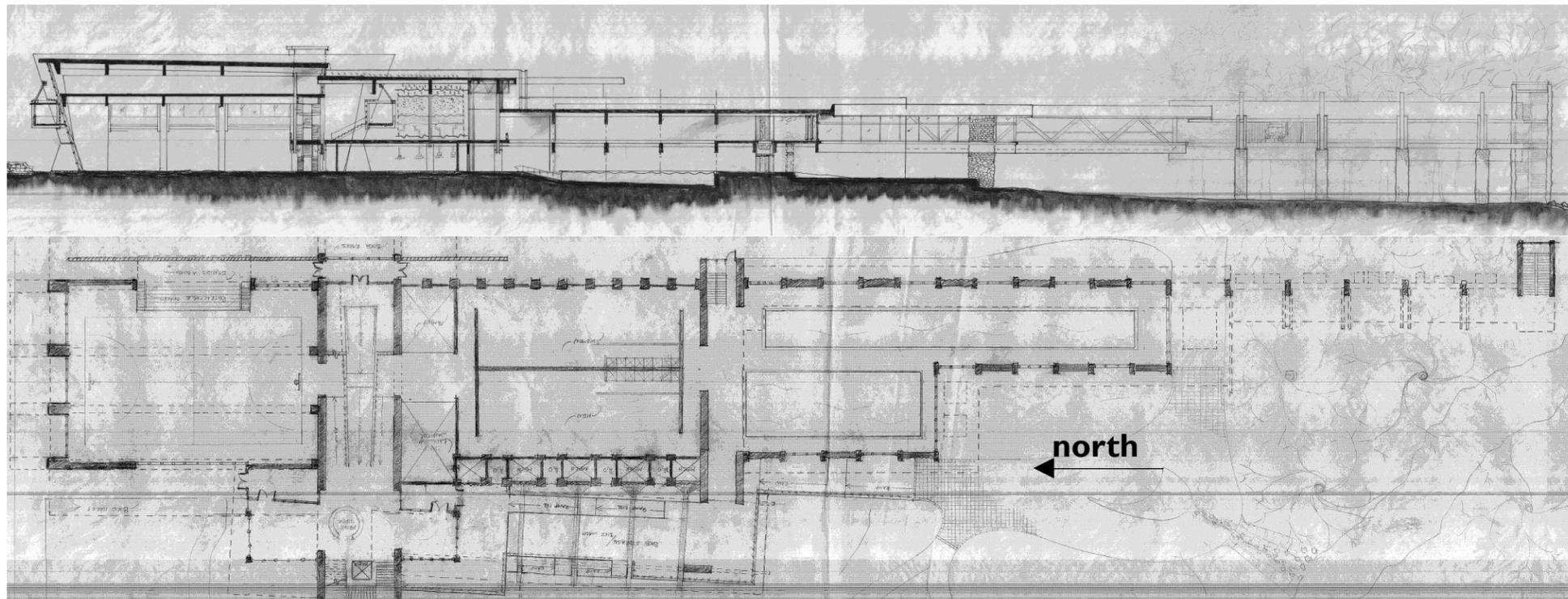


figure 83: digital models showing the progress of the design

tying elements & functions together

These drawings represent the plan developed at the end of the first semester's work. The running track is suspended from the side of the building along the sides and turns into the building over the urban street front at the gymnasium. Water is directed to the center of the building via a butterfly roof and filtered and in central vertical elements, visible to the patrons. Repeating elements of trusses sitting atop stone piers continues back towards the creek, and a large bridge protrudes into and over the stream and into the forest.



figures 84 a & b: plan and section hand sketches



figure 84 c: west elevation



figure 84 d: east elevation

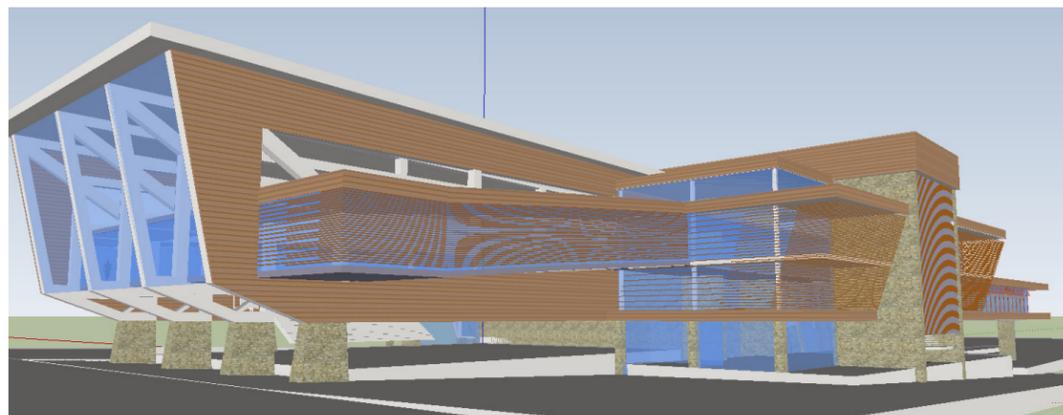


figure 85e: nw perspective

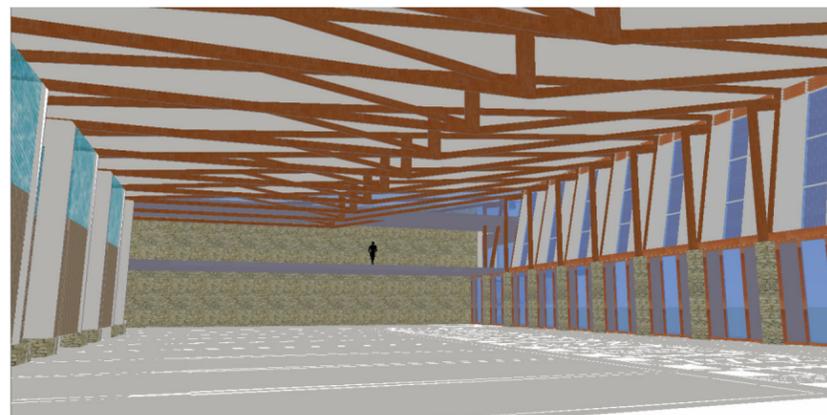


figure 85d: main fitness room

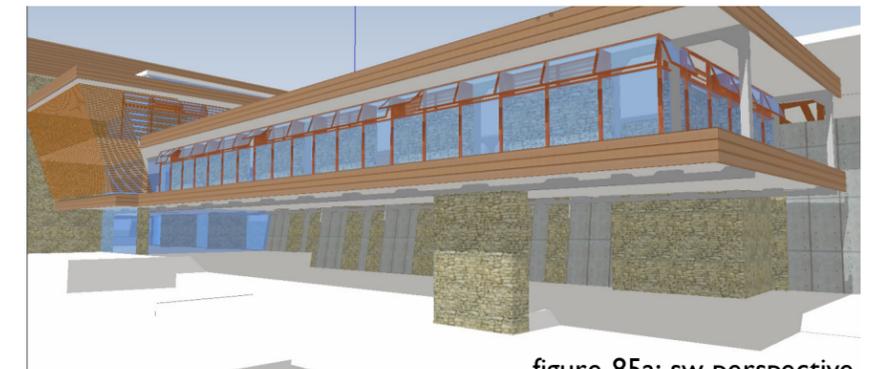


figure 85a: sw perspective

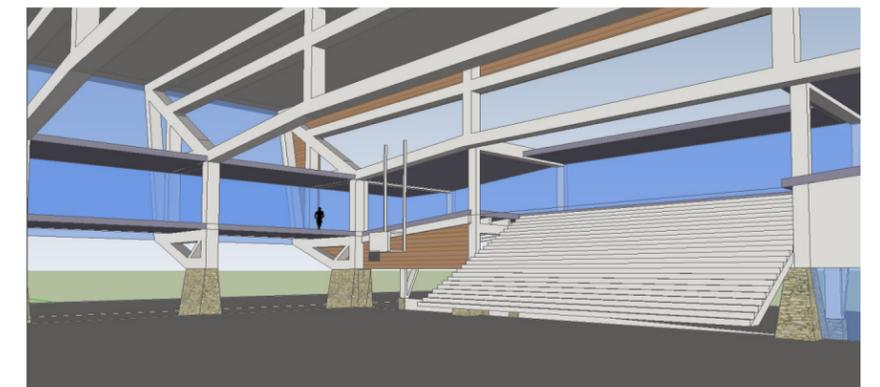


figure 85b: gymnasium perspective

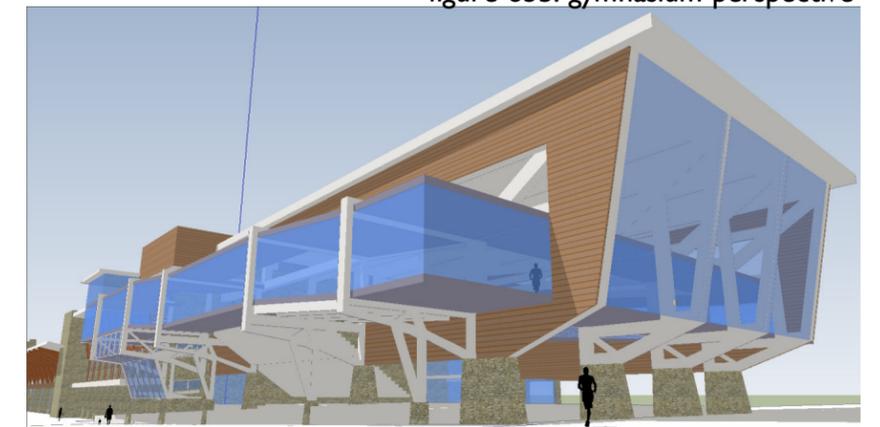


figure 85c: ne perspective

building orientation and roof drainage studies

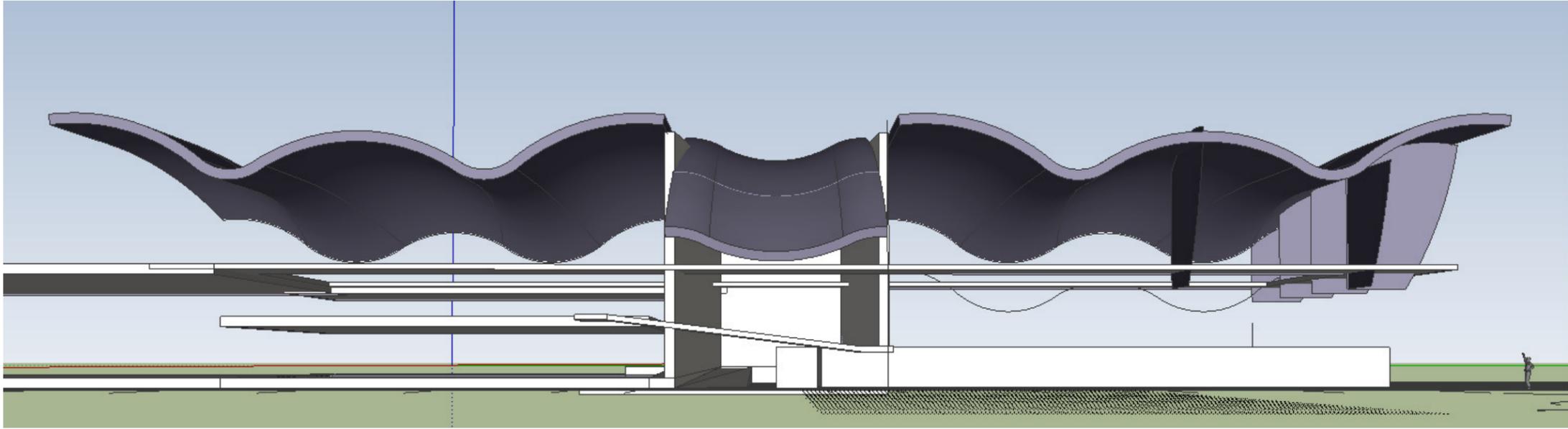


figure 87: digital massing model of elongated building with an orientation towards the long side of the building (roof proposed as a sine curve pattern)

For a short time I abandoned many of the initial decisions I had made about the orientation of the building. While it made sense to orient the building lengthwise, I began to question the functionality, efficiency, and construction methods required to build such an elongated structure. Here, we see studies of a variety of more traditional “bay” element modular structures and parabolic roofs to express orienting the building to its width. Much of this decision was based on a basic determination that moving water through, or towards the middle of the building was a bad idea—especially given the fact that there was little architectural reason to do so.

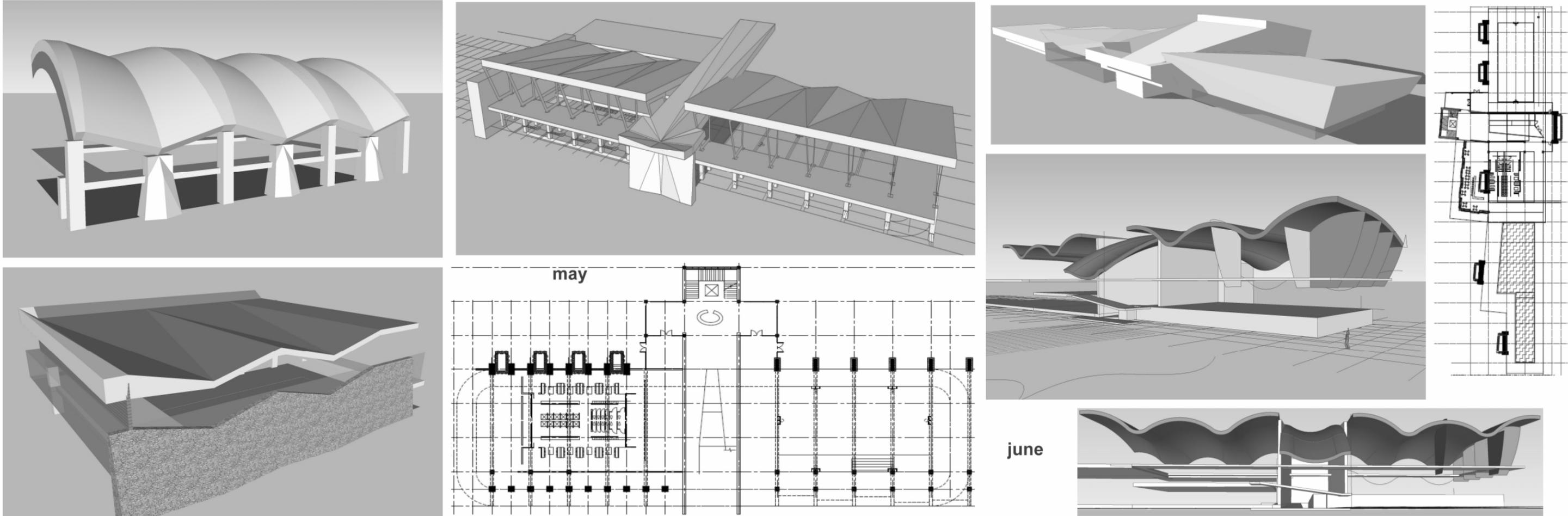


figure 88: more digital massing models

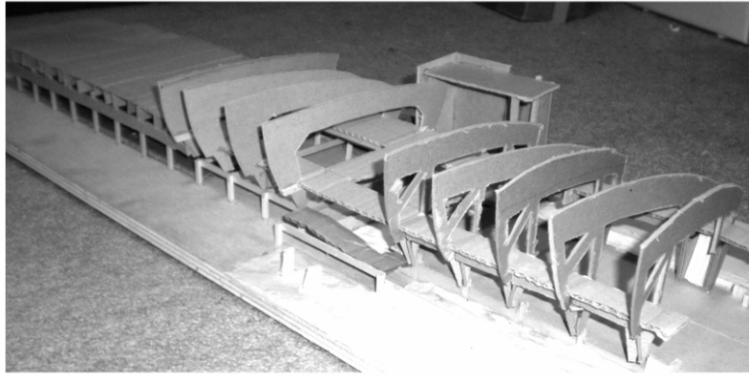


figure 89:
study model
looking SW

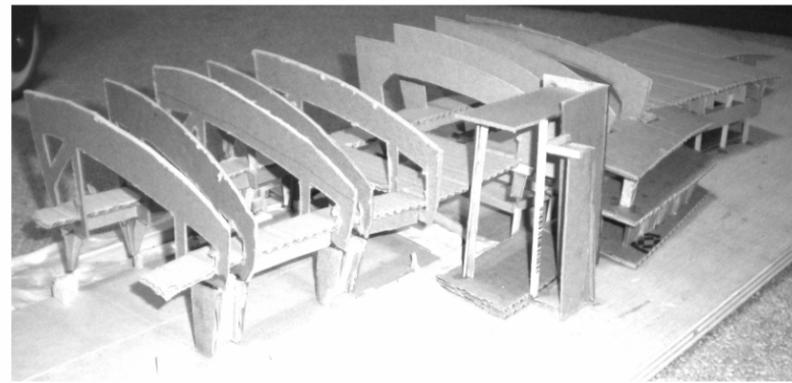


figure 90:
study model
looking SE

further design study: orientation

Here we see a mathematical approach in to design an undulating “flow” to the building (front to back running the length) while still retaining the consistency of bays. But rather than tie together in a rich tapestry, the curve and associated truss structure begins to dominate and overpower the previously clear architectural expression of function. Despite the beauty of large form-based structures, I reconsidered using a large single geometrical mass for a site that I desired to be a series of transitions from refined to natural.

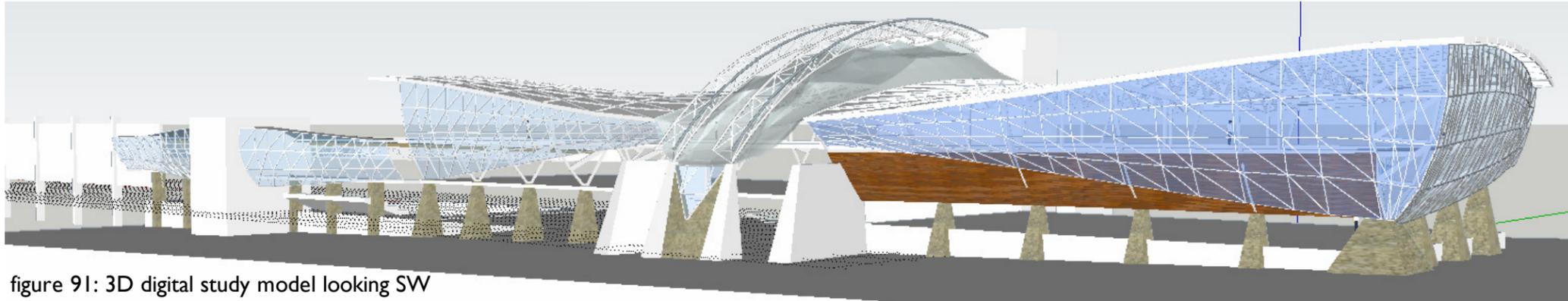


figure 91: 3D digital study model looking SW

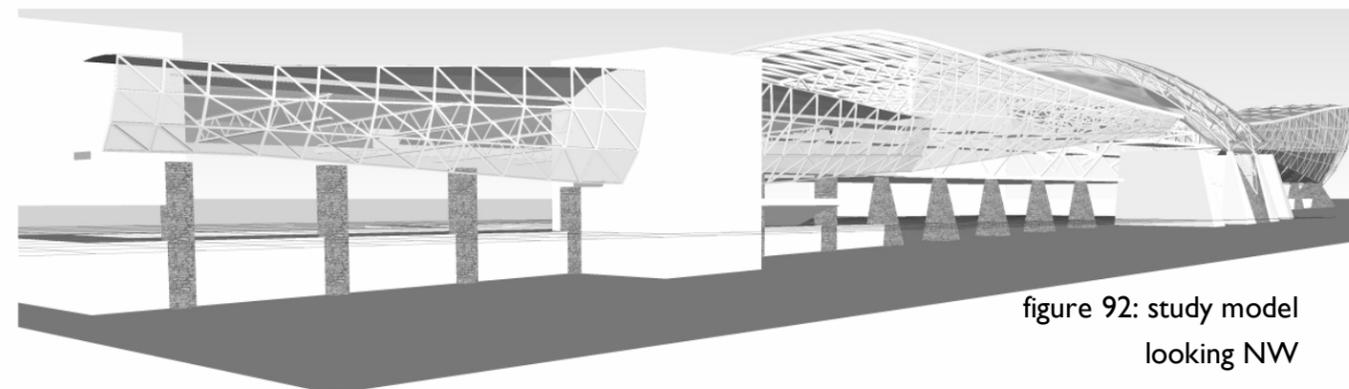
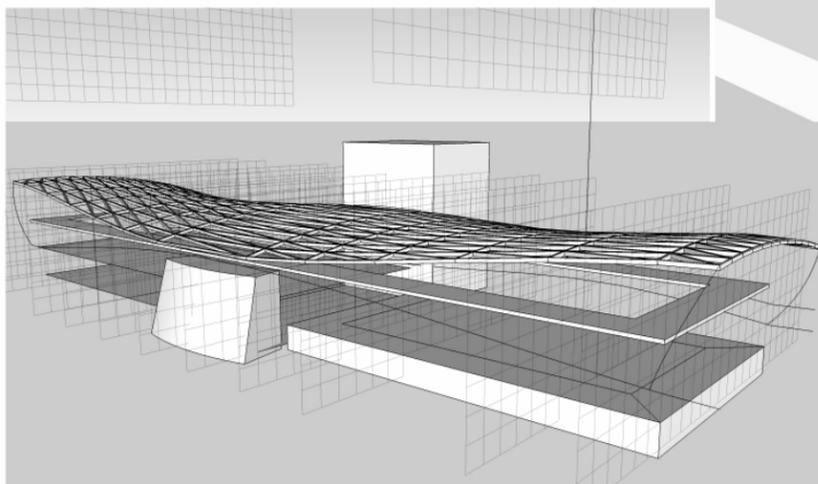
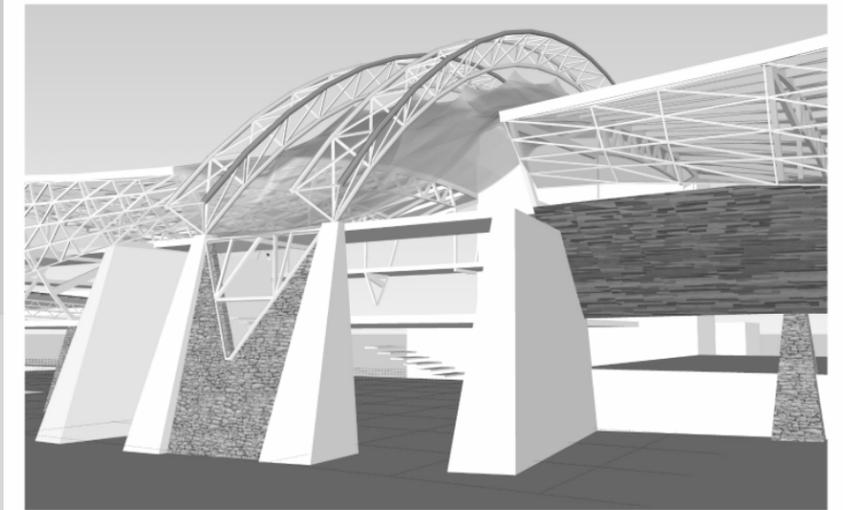
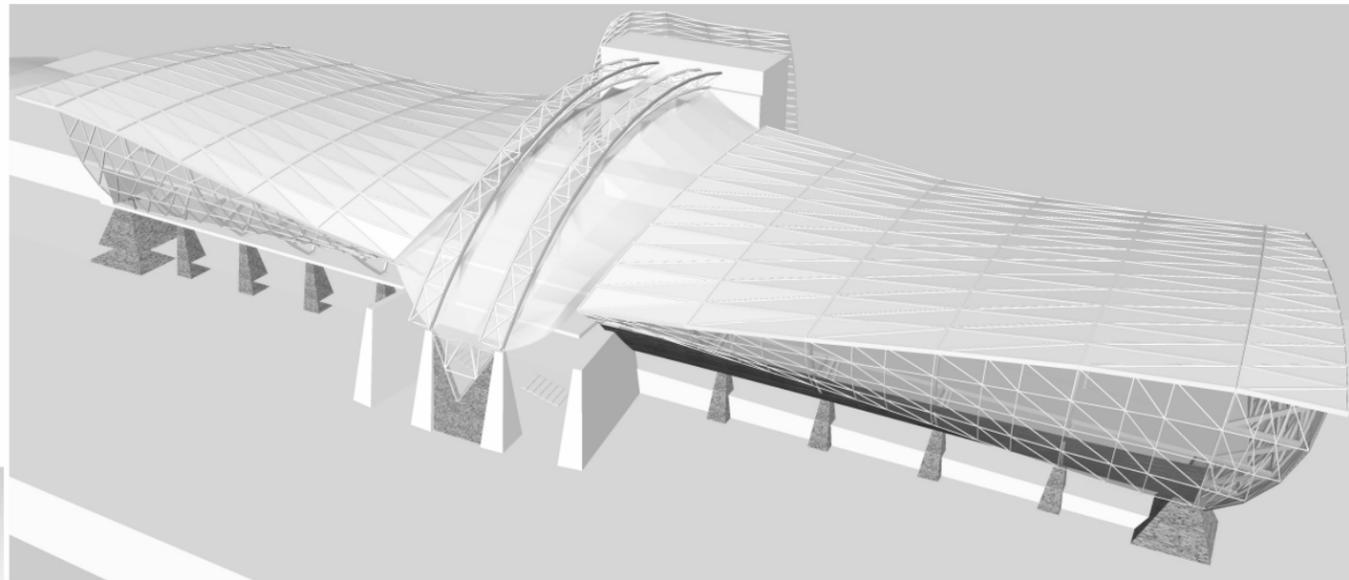
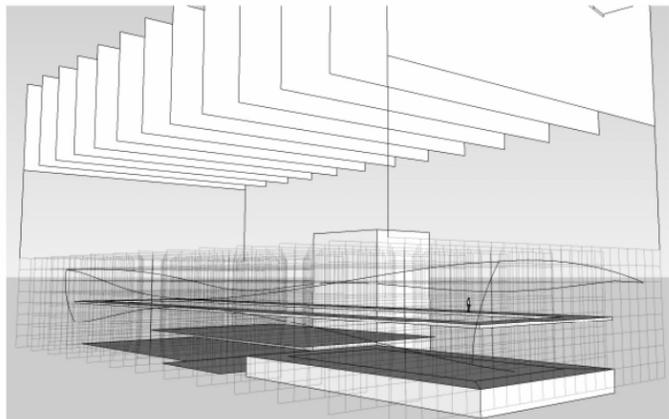
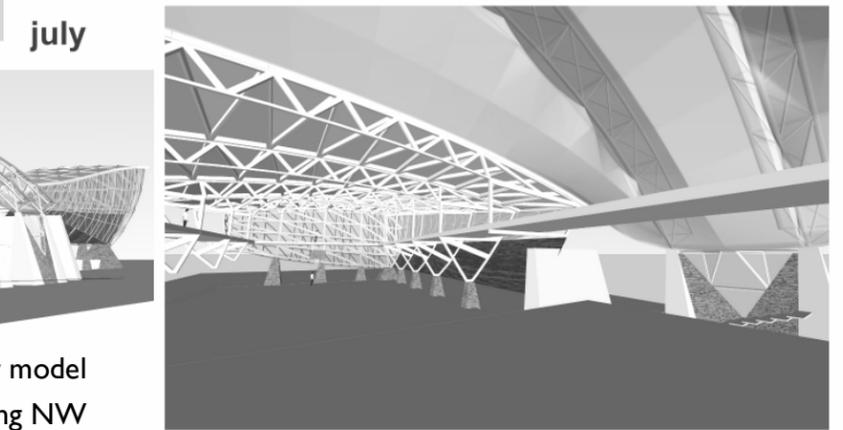


figure 92: study model
looking NW



july



figure 93: digital study model looking SE

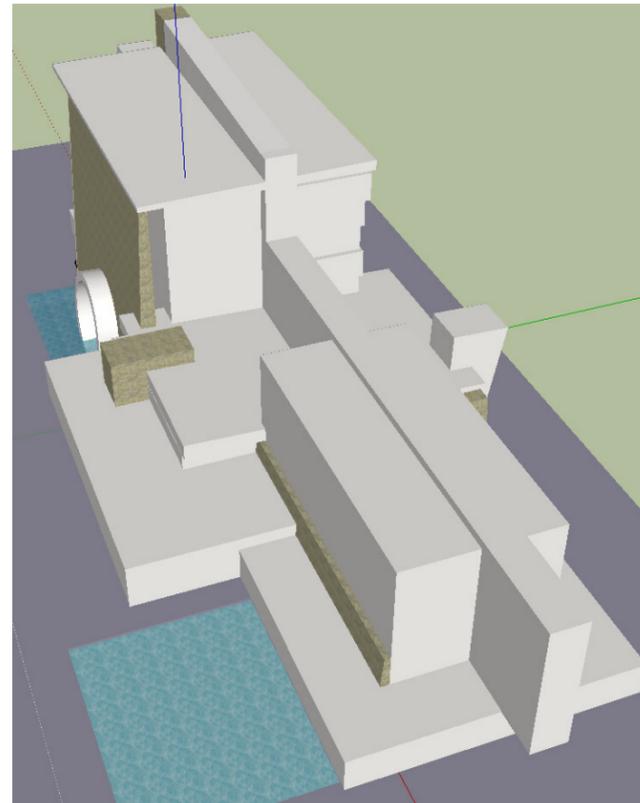


figure 94: digital study model looking NE

design studies: coming full circle.

After taking a semester break for the birth of my first child with my wife I reconsidered the idea of use and motion through the building. The building acted as a point of transition with the master plan and site and for the elements to express their uses and the motions involved. I returned to many of the elements in my mid-term project like the track and arm of leisure, retained the concept of draining water to the side of each building, but developed a computer study model that expressed this in pure rectilinear forms. This distilled the elements of the building.

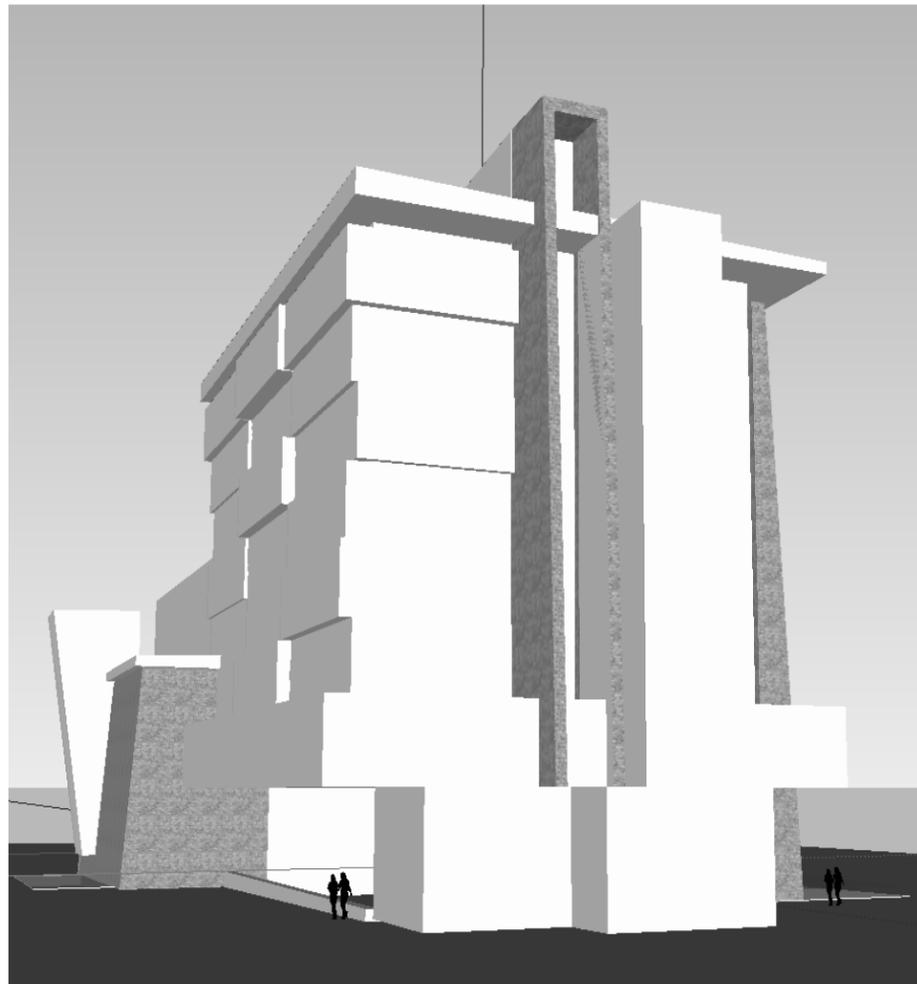
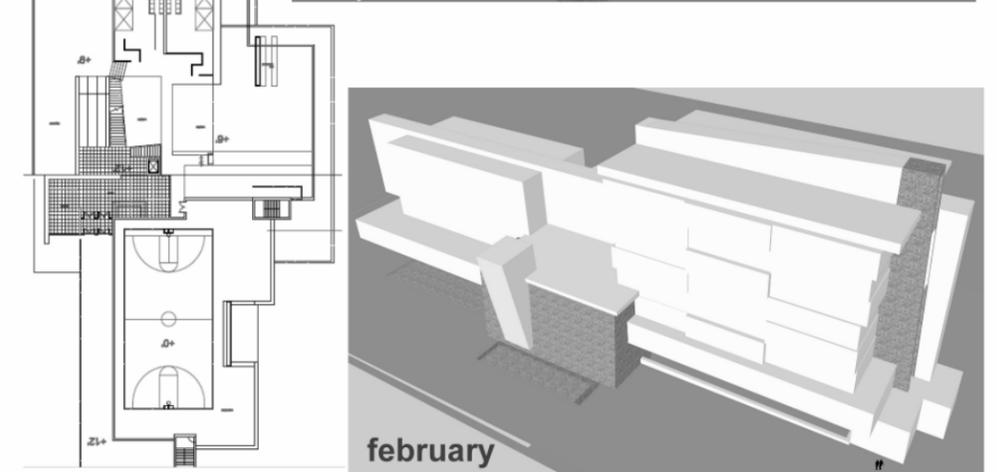
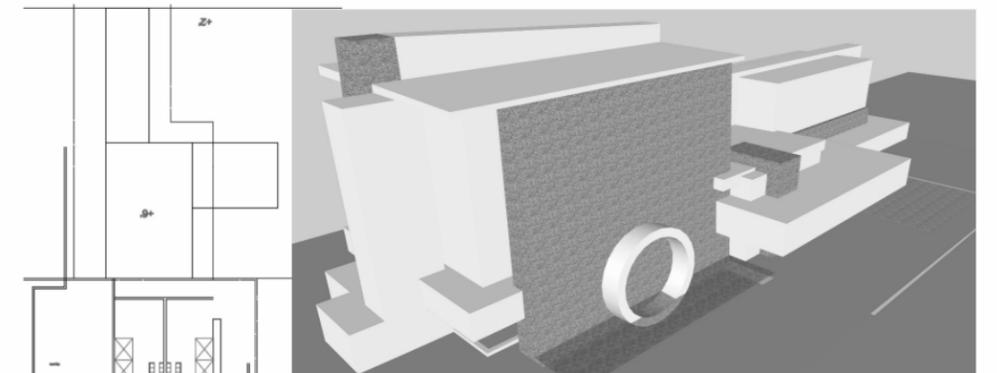


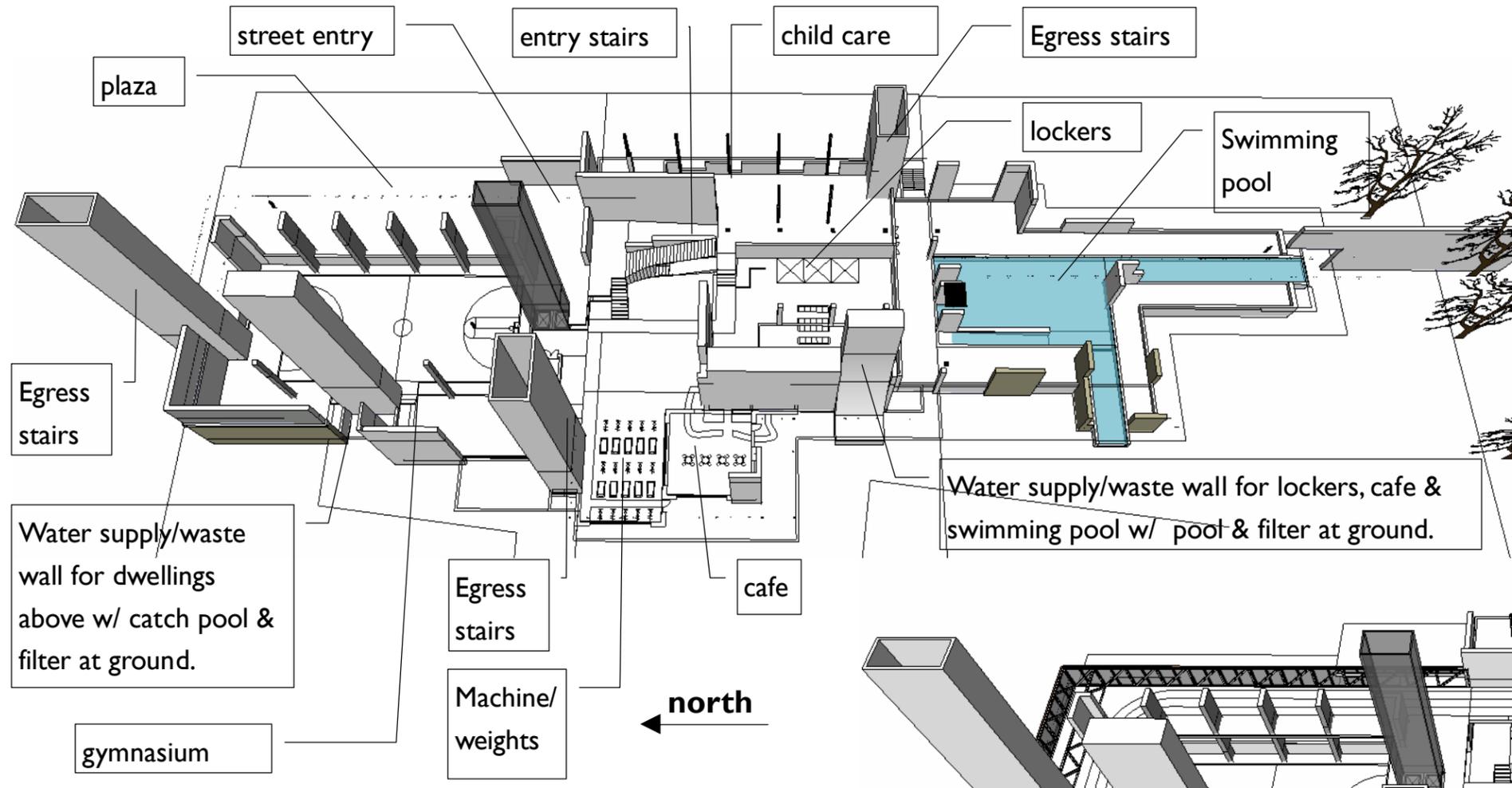
figure 95: digital study model looking SW



august - jan

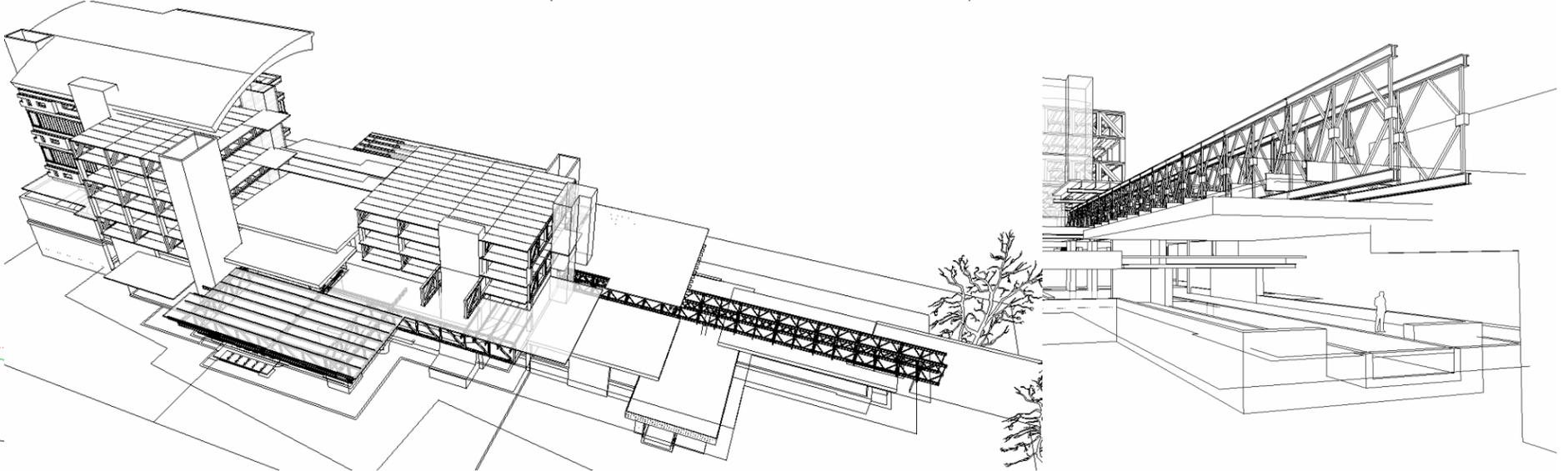
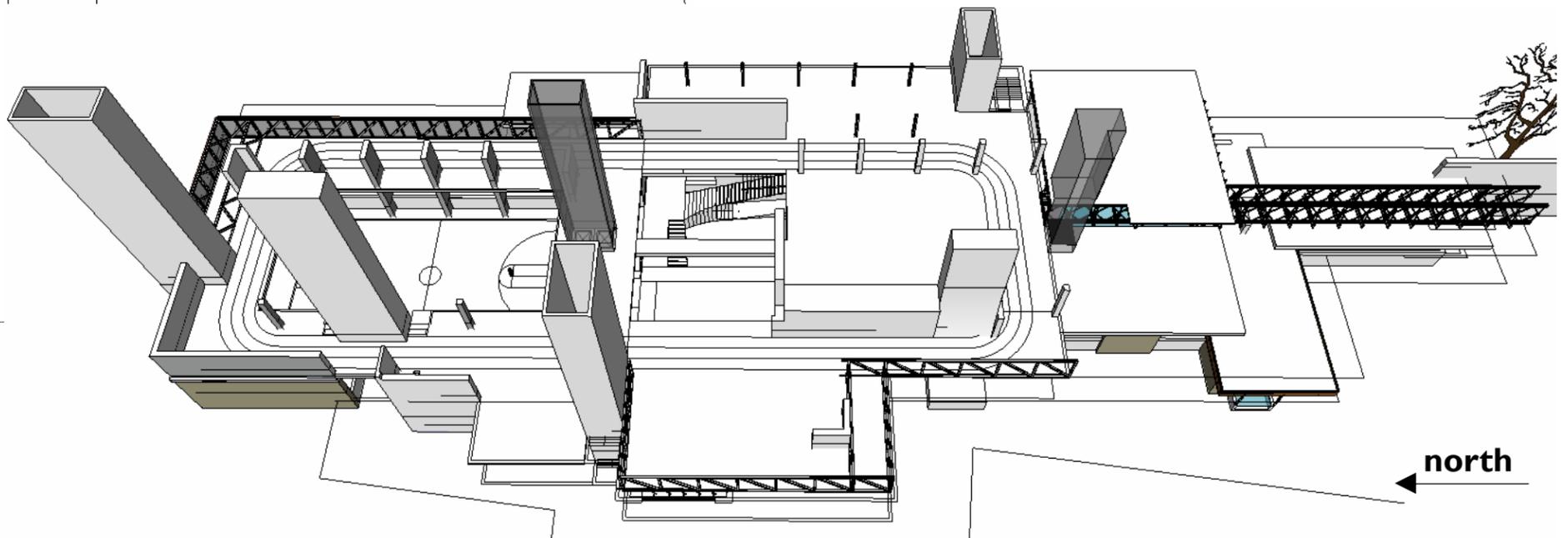


february



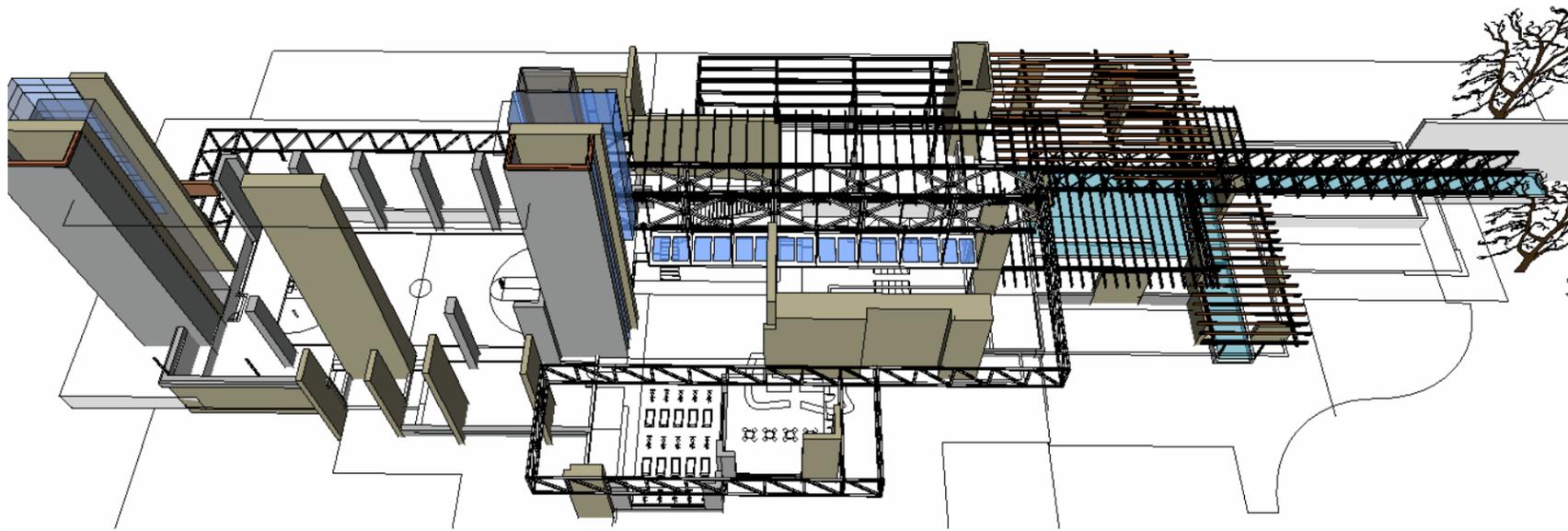
design studies: coming full circle.

Working with simpler geometries, the relationship of elements (running track, swimming pools, gymnasium, and dwelling above the gymnasium) began to take shape. Working out vertical circulation (both for people, water supply, and water waste) helped frame the structure both literally and helped define how the uses and elements met each other visually.

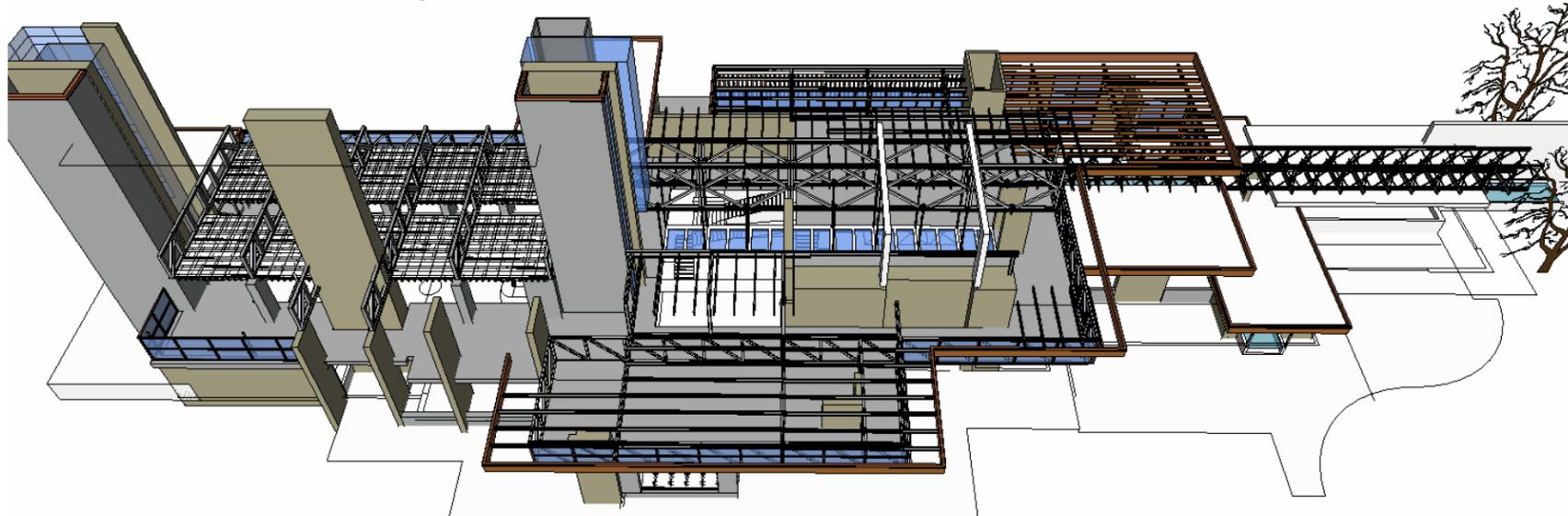


the modular

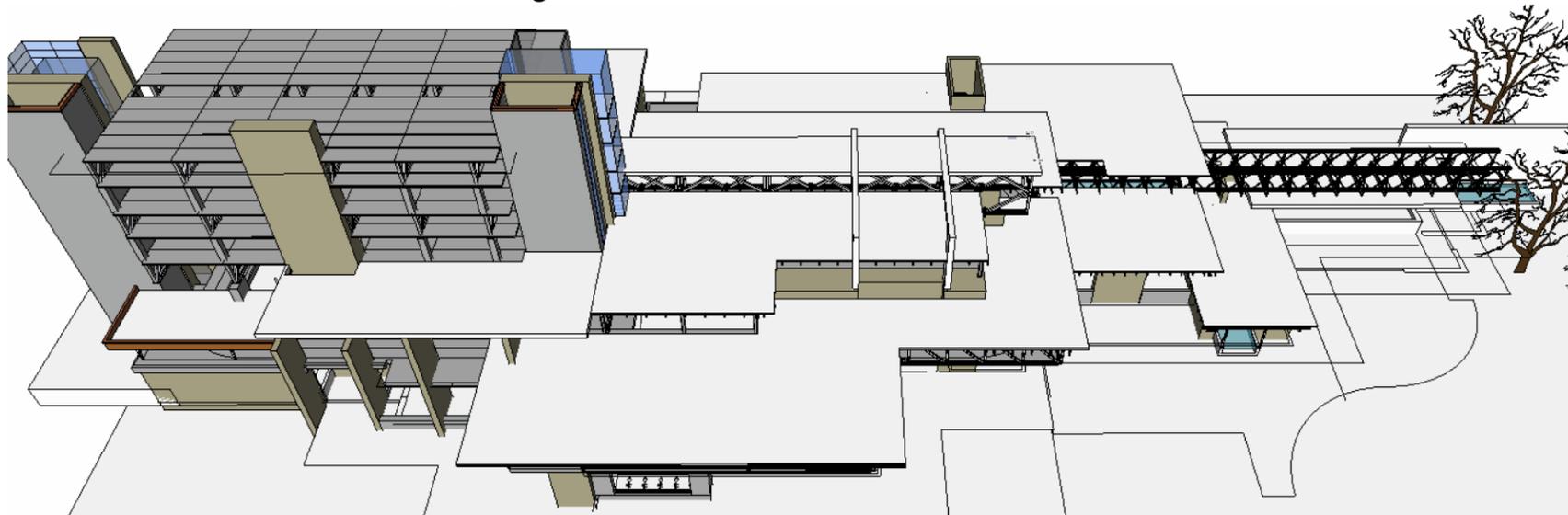
Simpler geometries enabled modular construction methods. Concrete trusses in the mixed use portion of the building transition to steel, then to cedar tongue & groove ceilings as the last arm terminates into the forest.



isometric first floor with ceiling and roof structures



isometric second floor with floor, ceiling and roof structures



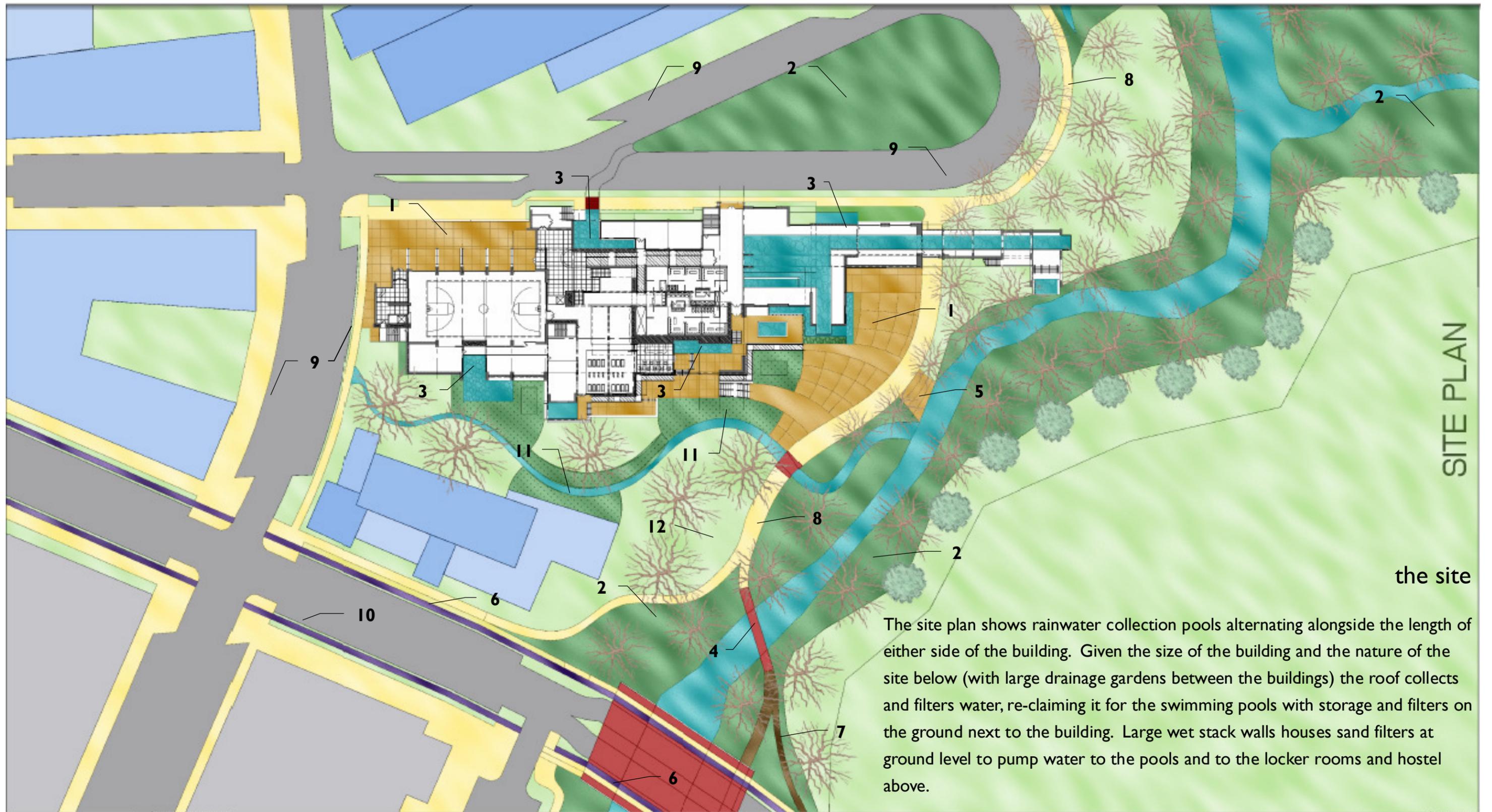
Isometric structural view



figure 96: ER-Post precast concrete system: <http://www.ericksen-roed.com/>



figure 97: ne perspective view—looking at main entry plaza

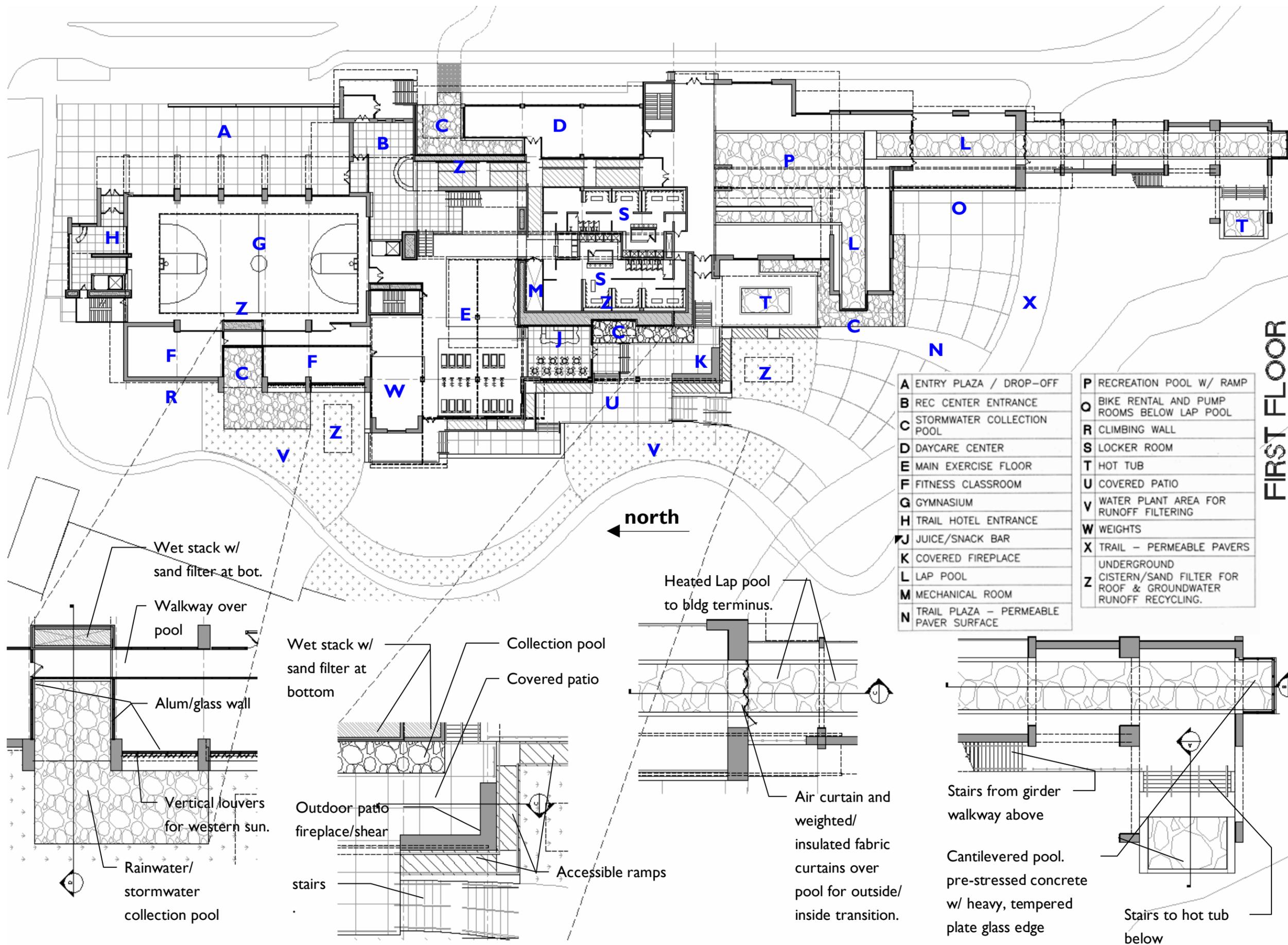


The site plan shows rainwater collection pools alternating alongside the length of either side of the building. Given the size of the building and the nature of the site below (with large drainage gardens between the buildings) the roof collects and filters water, re-claiming it for the swimming pools with storage and filters on the ground next to the building. Large wet stack walls houses sand filters at ground level to pump water to the pools and to the locker rooms and hostel above.

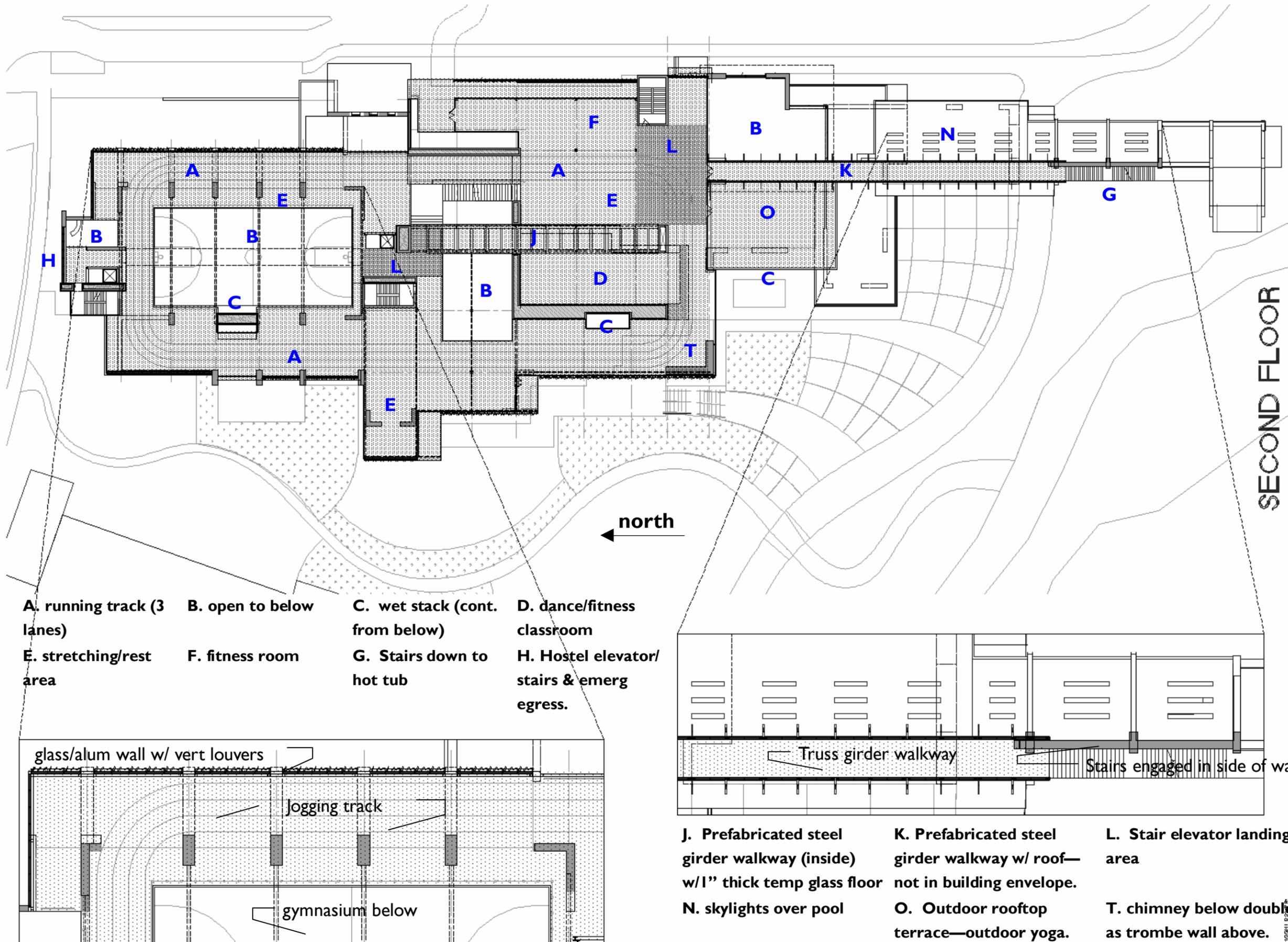
1. conc/brick paver plaza w/ ground drainage at 6'-0" o.c.	2. drainage swale w/ tall water grasses	3. collection pond w/ sand filter at base of bldg wet stack (typ.)	4. red represents bridge over creek or culvert.	5. brick paver steps down to creek's edge—foot bath.	6. dedicated commuter bike lane
7. crushed stone trail — 6'-0" wide (existing to remain)	8. permeable asphalt trail—min 8'-0" wide (12'-0" wide at plaza)	9. angled parking-crushed stone on comp fill w/ conc border	10. parallel street parking—permeable asphalt base.	11. manicured rain garden	12. lawn

floor plans

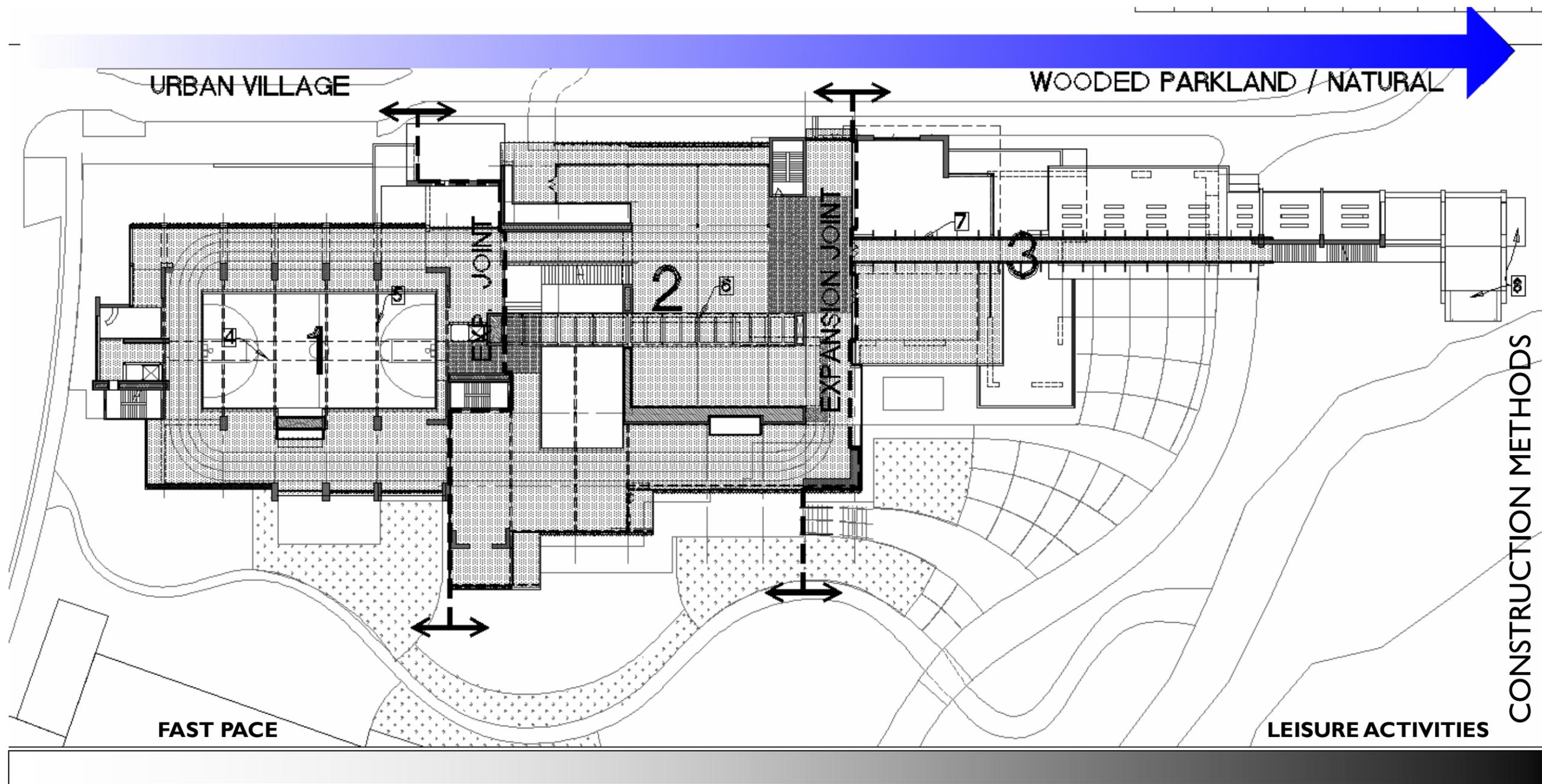
The building elements reflect the length relative to the site. The poetry here is the expressive nature of the rectilinear forms, at once elongating the building with forced perspectives into the creek forest, and at the same time providing powerful right angles that hide elements to provide drama. The main lap pool is aligned with the building and protrudes into the park, with a cantilevered, open-air turnaround. At the main entry one can see through the building all the way to the end of the lap pool while the hot tub at the building terminus is not seen until one reaches the end of the pool, where one steps down a wide staircase to relax at the steam bath at the edge of the babbling brook.



plans cont.



A 1/7 mile running track ties together elements on the second floor, going over the gymnasium, fitness area, café, and sweeping by south side for a panoramic view of the creek bed forest. Inside the ring, a fitness/dance studio (“D”) is accessible from the central stairs & elevators without crossing the path of joggers. Adjacent to the jogging track on both the east and west sides are flex areas (“E”) that can serve for stretching/cool down or informal instruction. The swimming pool ceiling structure is suspended from girder (“K”), and this also serves as an exterior pathway from the second, via a staircase (“G”) built into the side of the pool wall, to the hot tub bldg terminus.



plans cont.

The rectilinear approach also helped bring a clear language to the transitions of different building materials as the structure progressed into the creek bed.

The structure at the urban edge is poured in place concrete columns and modular waffle slab (over the gymnasium ceiling) progressing to simpler pre-cast concrete "T"s, with a modular glass floor beneath the center hall of the double loaded dwelling corridor above.

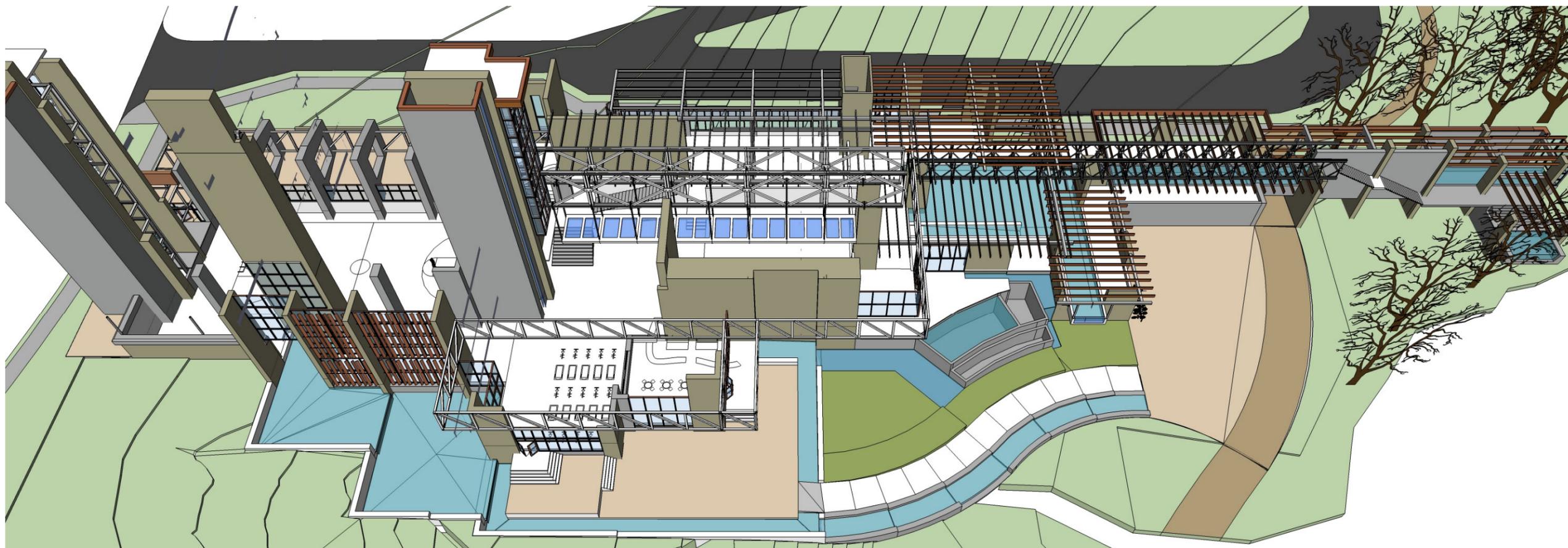
Each new mass represents a progression from high density materials (concrete and steel) to more park structure like elements (such as cedar). The concrete pool brings continuity to these masses and ties them together.

CONSTRUCTION METHODS

1	REINF. CONC. PEIRS, & WAFFLE-SLAB CEILING OVER GYM W/ P.C.C. "T" FLOORS IN HOTEL ABOVE	5	ONE-STORY HIGH P.C.C CONC. TRUSSES ABOVE
2	REINF. CONCRETE & STEEL W/ STEEL PANEL BRIDGE ABOVE.SUPPORTING CENTER OF STRUCTURE.	6	STEEL STEEL PANEL BRIDGE WITH ROOF. STEEL STRUCTURE SUPPORTED ABOVE AND FROM BELOW. OPAQUE GLASS FLOOR TO REVEAL WATER SILLOETTES BELOW.
3	CONCRETE FLOOR AND COLUMNS & CEDAR STRUCTURE AND T&G CEILING ABOVE.	7	GALV. STEEL STEEL PANEL BRIDGE - OPEN TO ELEMENTS. CEDAR ROOF STRUCTURE SUPPORTED ABOVE AND FROM BELOW.
4	FIRE-RATED GLASS PANELS AT GYMNASIUM CEILING TO COMPLETE LIGHT WELL THROUGH HOTEL TOWER	8	CANTILVERED CONC. POOLS AT END OF BUILDING (TREAED AREA AT CREEK)

building model

With the computer building model, here we see the building being erected. The finished structure is an attempt to express the materials and elements and let them speak clearly, and result in a building language that reflects the site and village transition from intense urbanity to tranquil parkland.

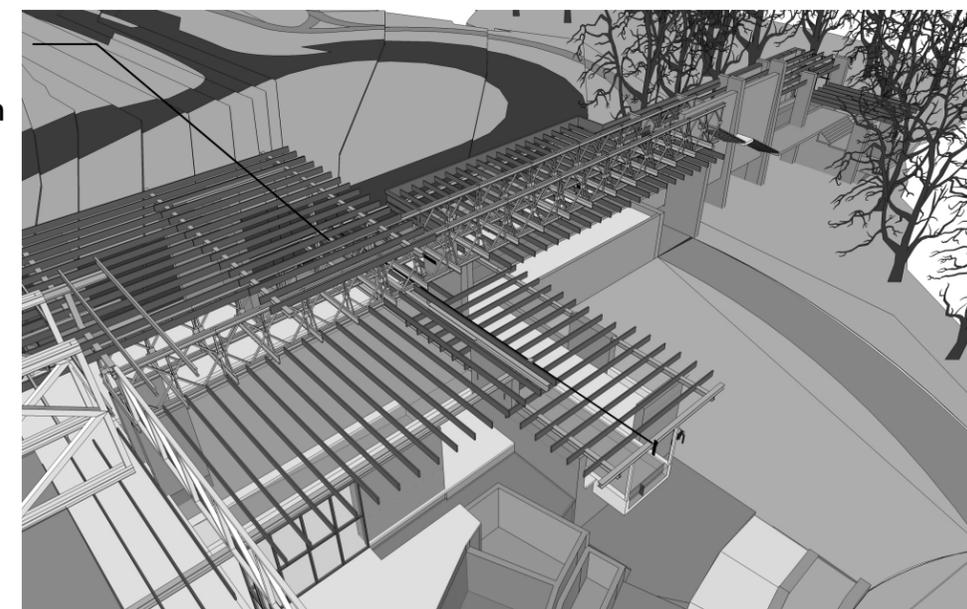
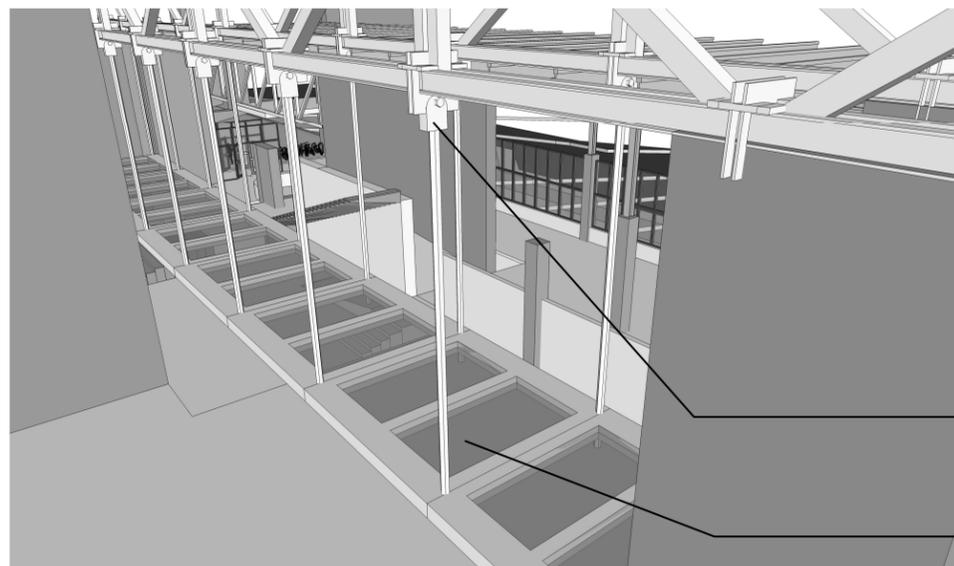


Isometric view—first floor (ground level)



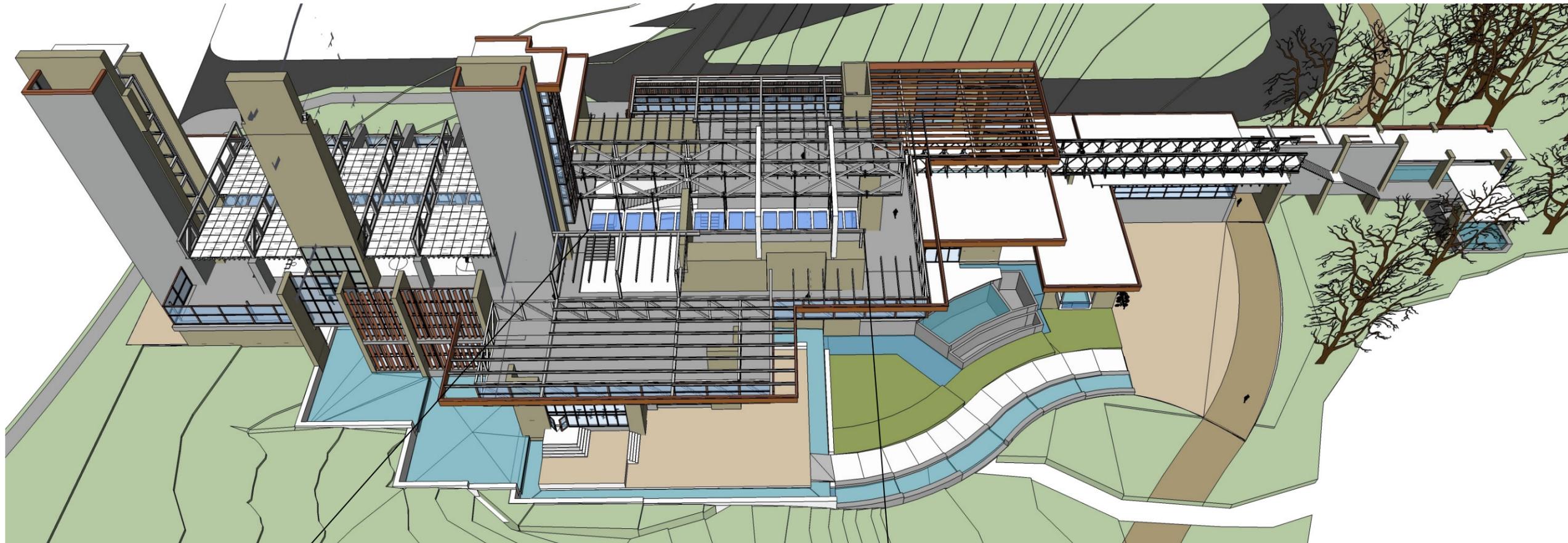
Reinforced concrete piers to hold up the modular concrete construction. It would have been ugly to fire-wrap or steel to provide the use-separation construction required. At the same time, the dwelling portion of the building prohibitively tall such that steel would have been required.

Heavy timber cedar beam ceiling w/ painted steel beams at swimming pool—essentially a separate building due to fire separation and air conditioning concerns (diff temperature than the rest of the bldg.)



Floor suspended from truss with pin, rod, and turnbuckle connection through welded steel plates, with diagonal bracings.

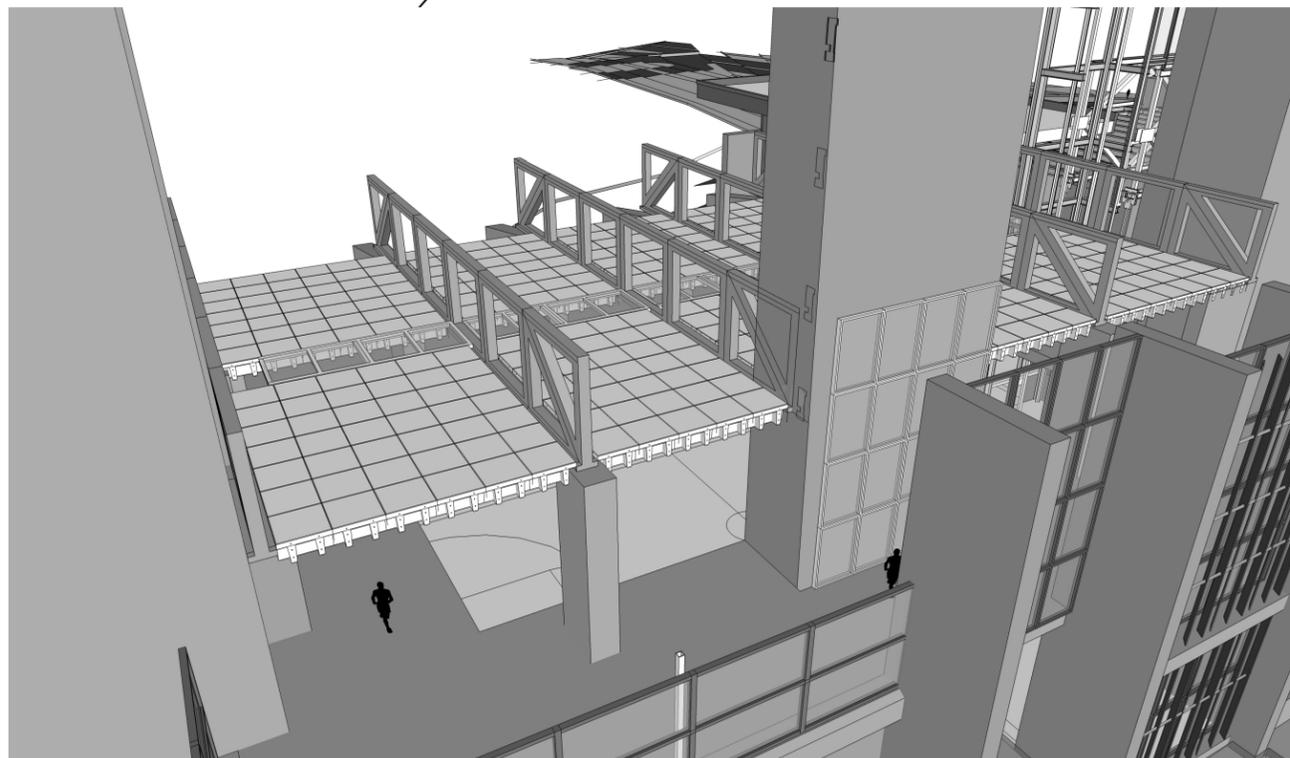
Suspended modular steel frame and heavy tempered glass floor—over fitness classroom to project shadows from people above.



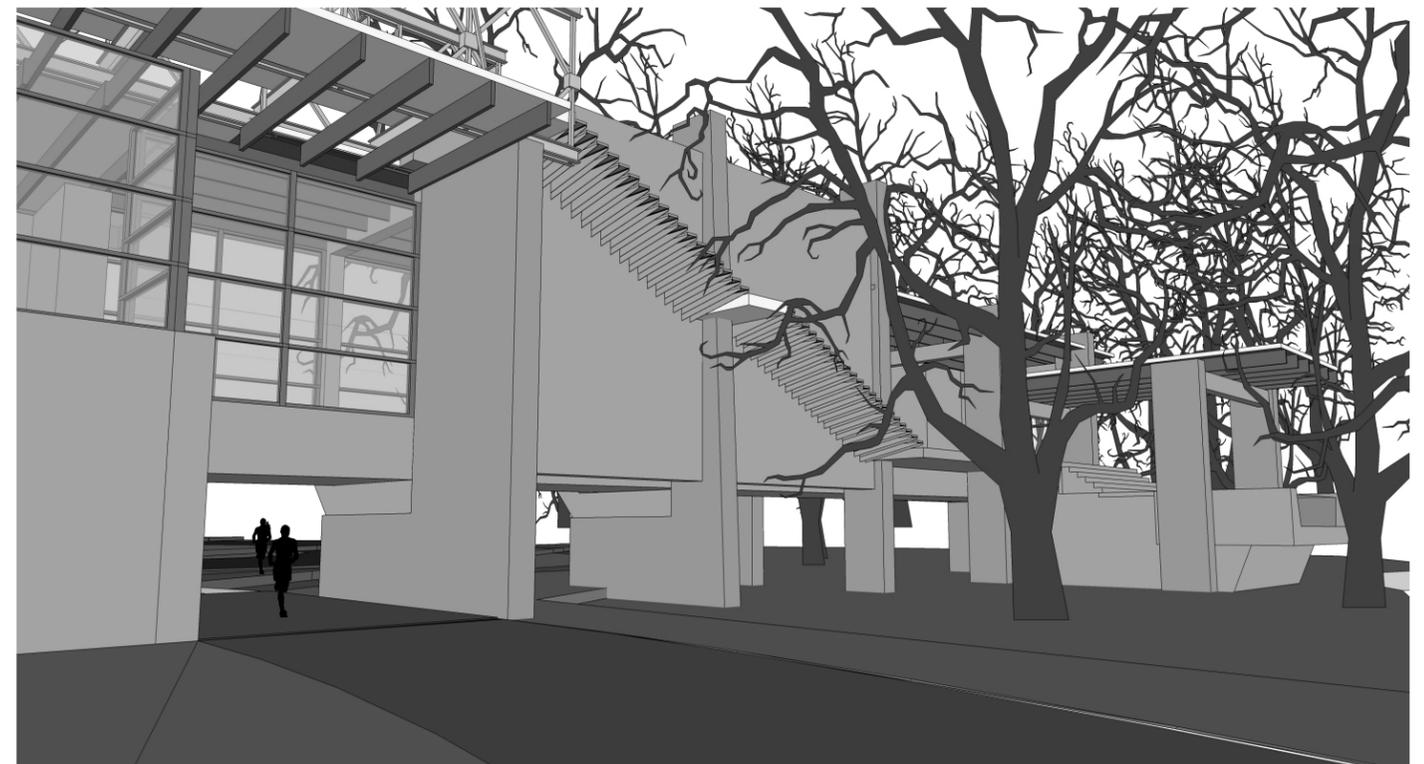
building model

As the second floor goes up, the repetitive modular nature of the city side of the building begins to take shape. Much of the steel frame structure middle of the building is suspended from a larger truss bridge that connects and serves as a transition between the two different ends of the building.

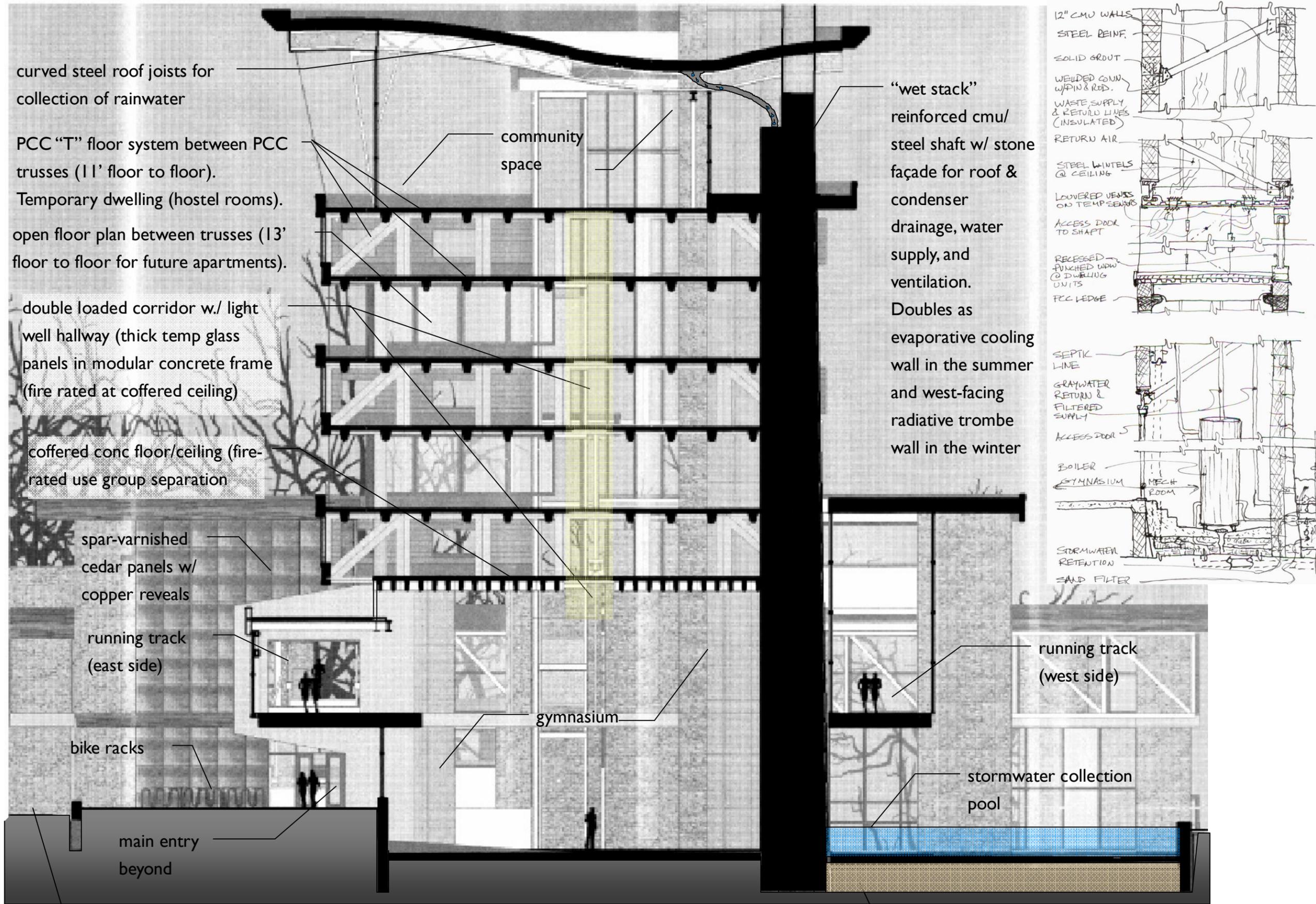
Isometric view—second floor



Isometric view—waffle slab ceiling of gymnasium w floor to floor modular concrete trusses running the width of the building.



The pool bridges the trail as it projects into the trees. The large wall on the west side of the forest pool hides the view of the hot tub, providing drama and holding the stairs from the roof.



curved steel roof joists for collection of rainwater

PCC "T" floor system between PCC trusses (11' floor to floor).
Temporary dwelling (hostel rooms).
open floor plan between trusses (13' floor to floor for future apartments).

double loaded corridor w./ light well hallway (thick temp glass panels in modular concrete frame (fire rated at coffered ceiling)

coffered conc floor/ceiling (fire-rated use group separation

spar-varnished cedar panels w/ copper reveals

running track (east side)

bike racks

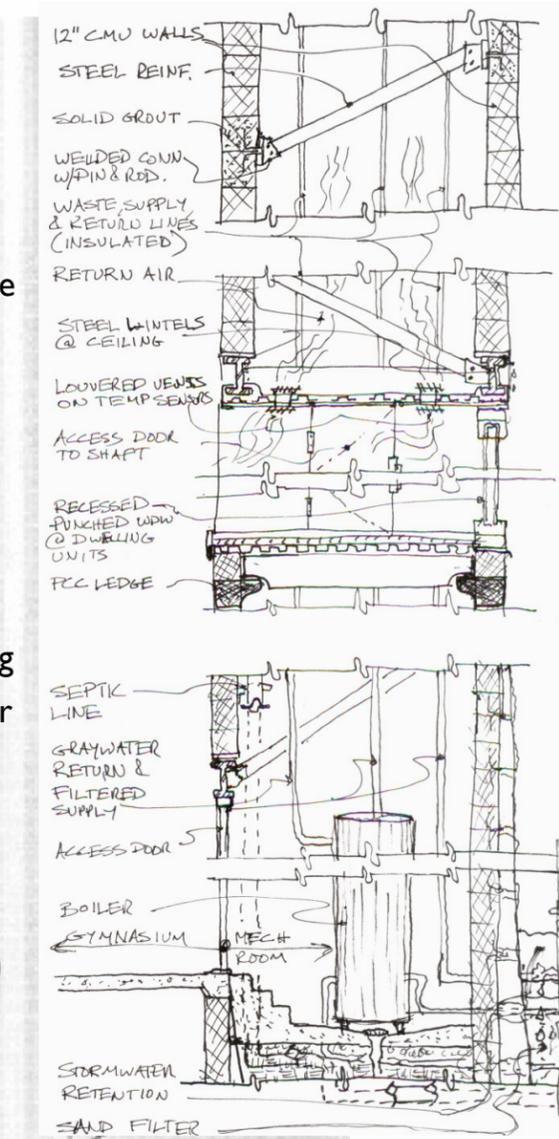
main entry beyond

pickup-drop-off & bicycle unloading

community space

gymnasium

"wet stack" reinforced cmu/ steel shaft w/ stone façade for roof & condenser drainage, water supply, and ventilation. Doubles as evaporative cooling wall in the summer and west-facing radiative trombe wall in the winter



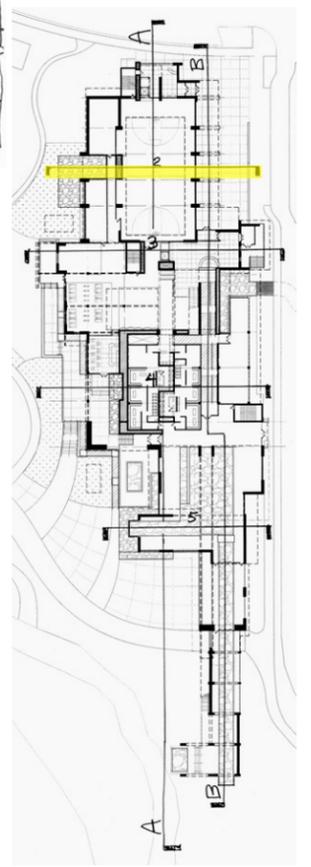
running track (west side)

stormwater collection pool

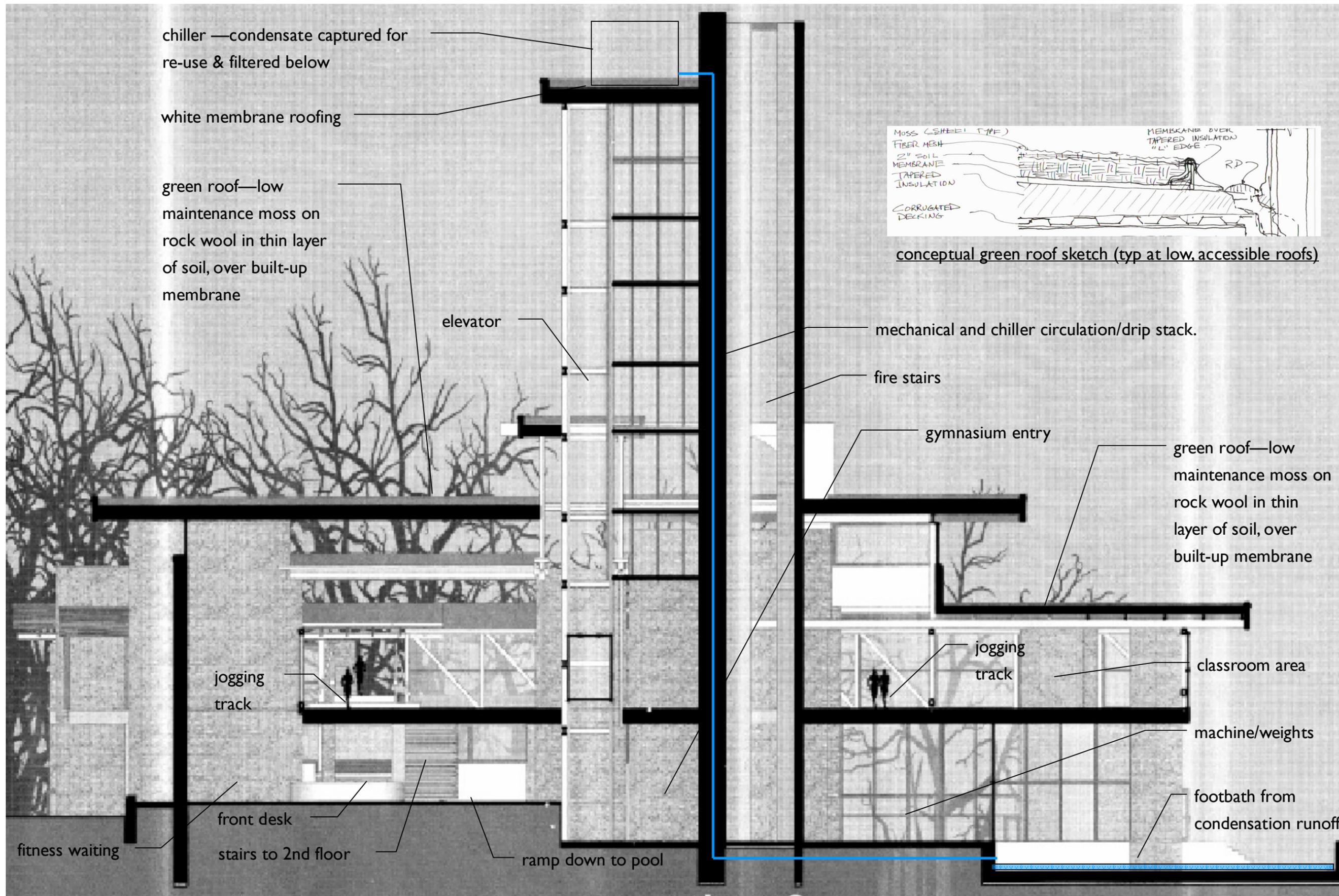
sand water filters/graywater treatment system

bldg sections

Section I cuts through the gymnasium (aprox. 6'-0" sunken beneath the main entry plaza), the running tracks, and the dwelling units above. The detail at the right illustrates the conceptual "wet stack" wall.



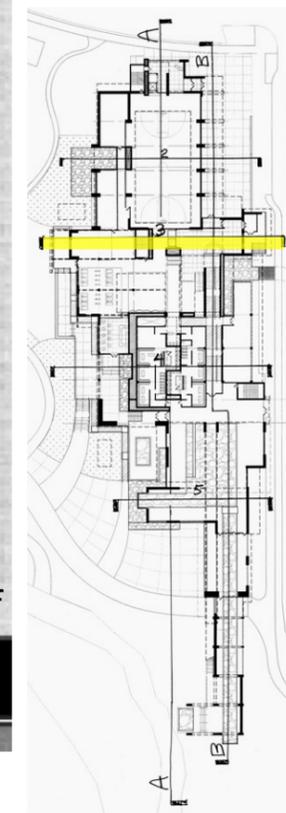
section I

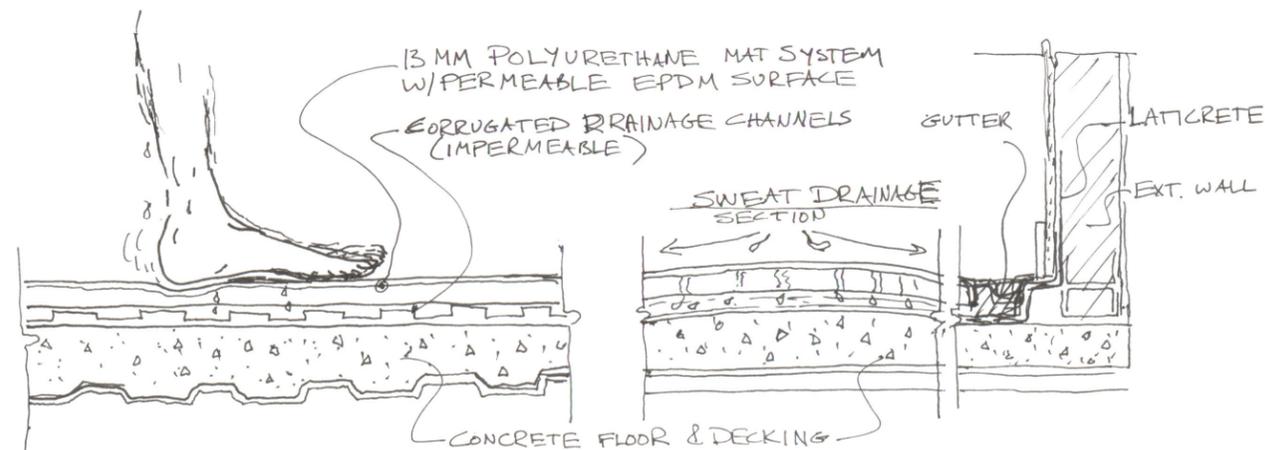


section 2

bldg sections

Section 2 illustrates the conditions at the front desk, the main fitness floor, and the central elevators/fire stairs. Here, moss roofs begin the water filtration process. The high southern tree canopy makes shade roof gardening optimal. Water retention is at ground level.

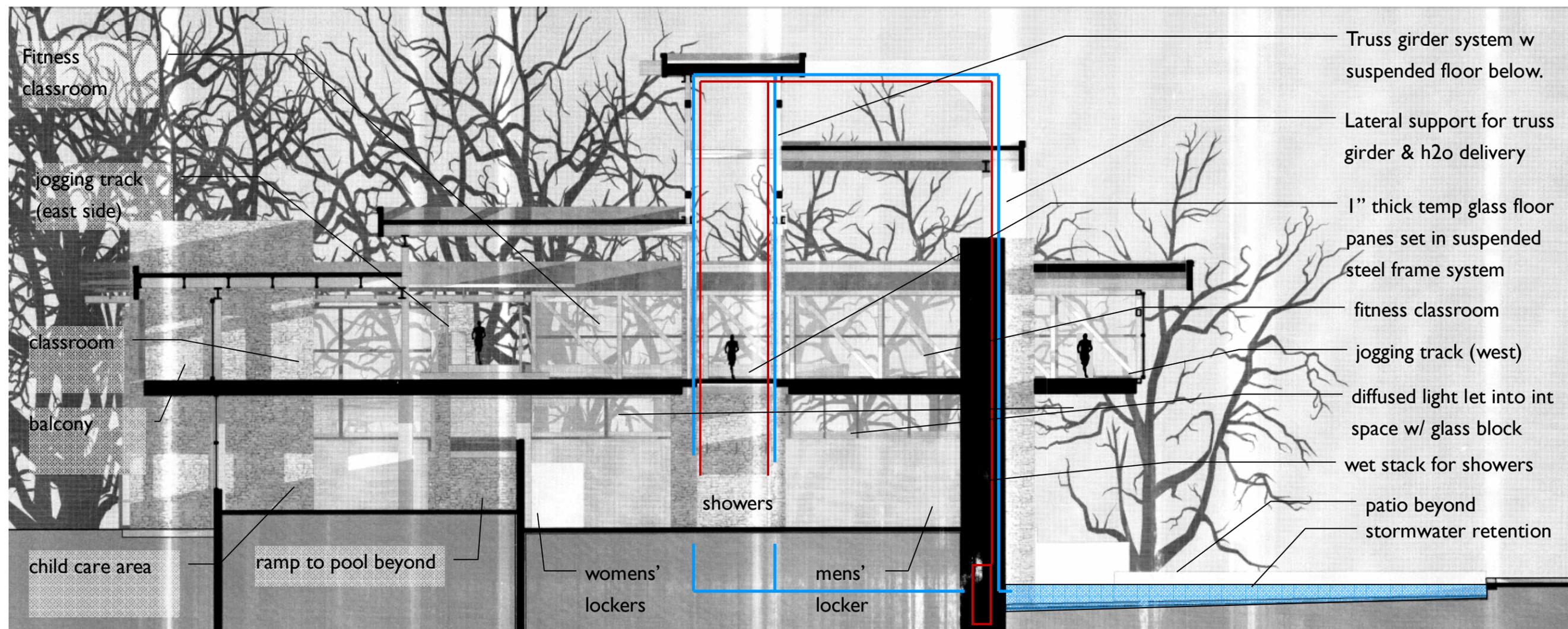




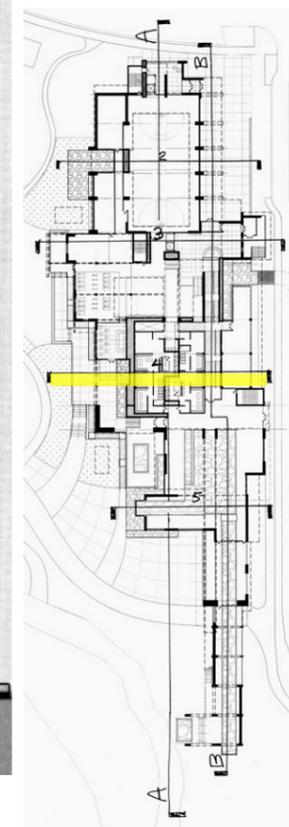
conceptual jogging track floor section (typical)

the building

Section 3 illustrates the transition to the swimming pool & the continued track. One may bypass the locker rooms via a ramp down to the swimming pool level. Continuing with the theme of site as stormwater sponge, site water is filtered and used for the showers.



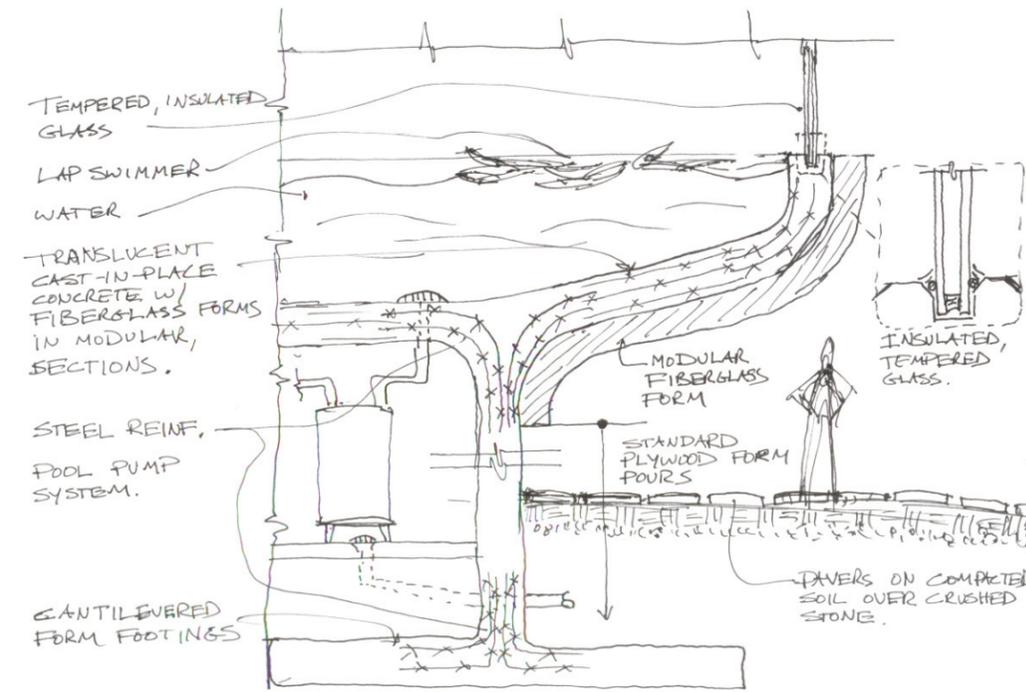
section 3



the building

In section 4 poured-in-place translucent concrete forms accentuate the shadows of the swimmers against the hikers, bikers, and runners along the trail below.

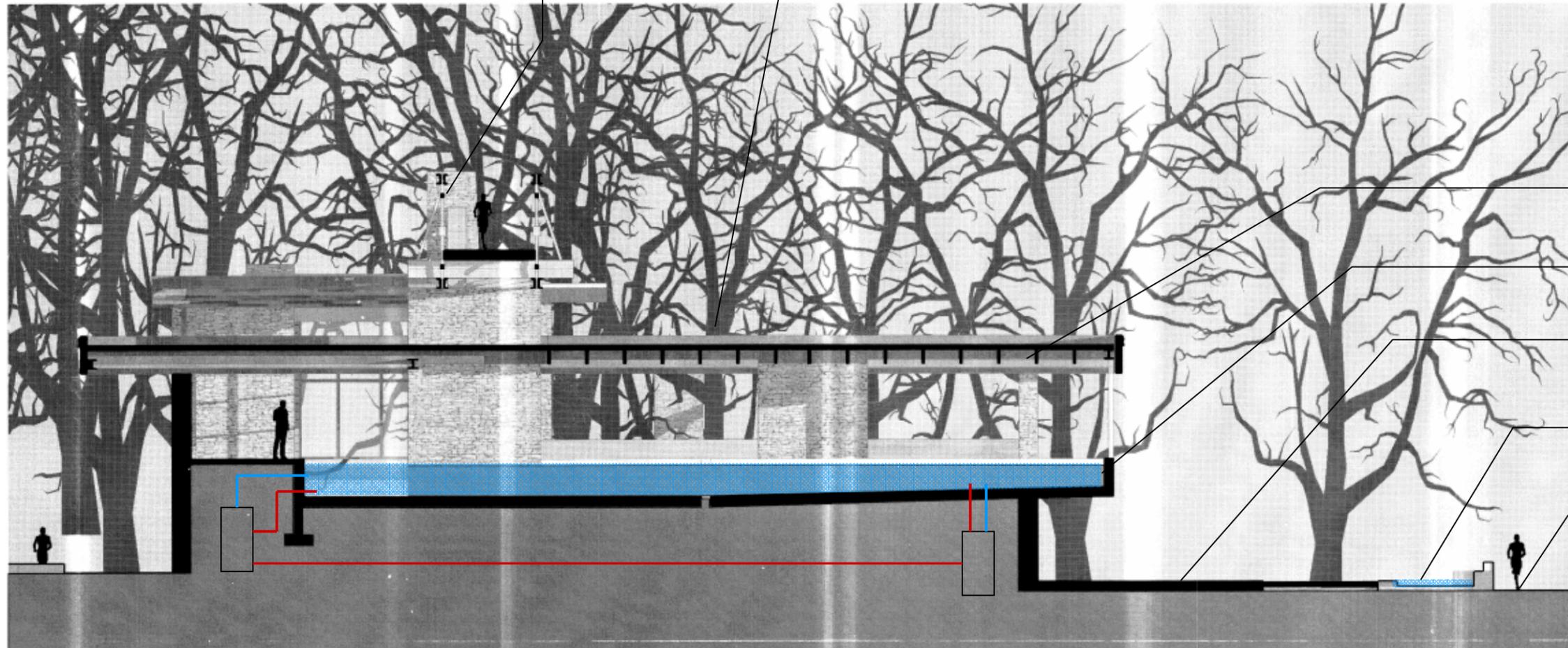
Those on the steel truss girder bridge above are walk to the hot tub casting similar shadows from the open structure.



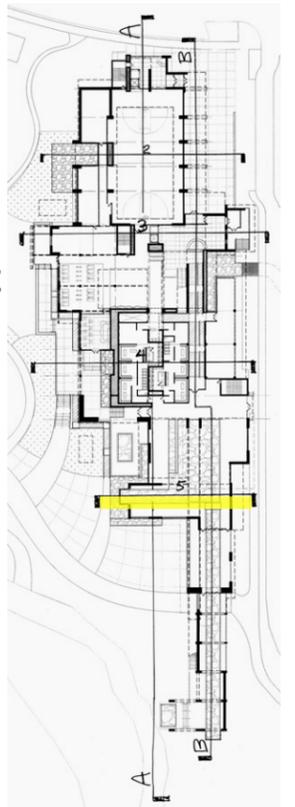
conceptual section sketch of lap pool projection (fiberglass formed)

structural steel truss bridge over pool (to the hot tub stairs at the end of the building)

green roof (moss)



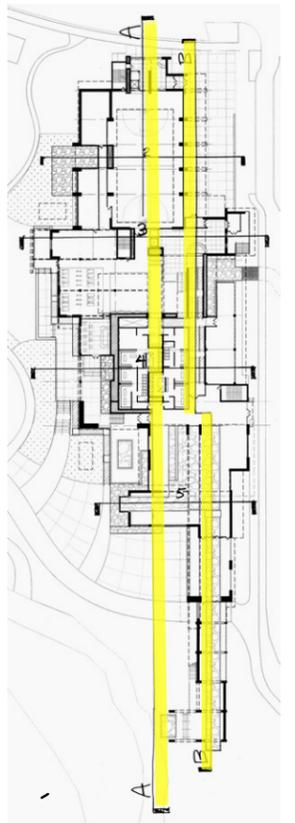
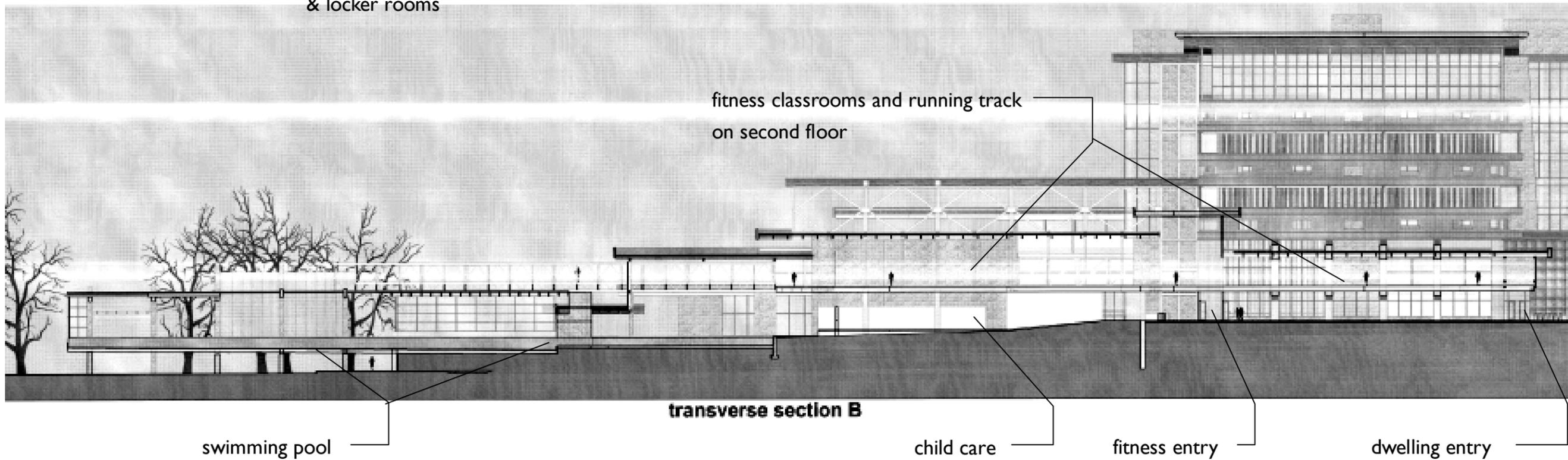
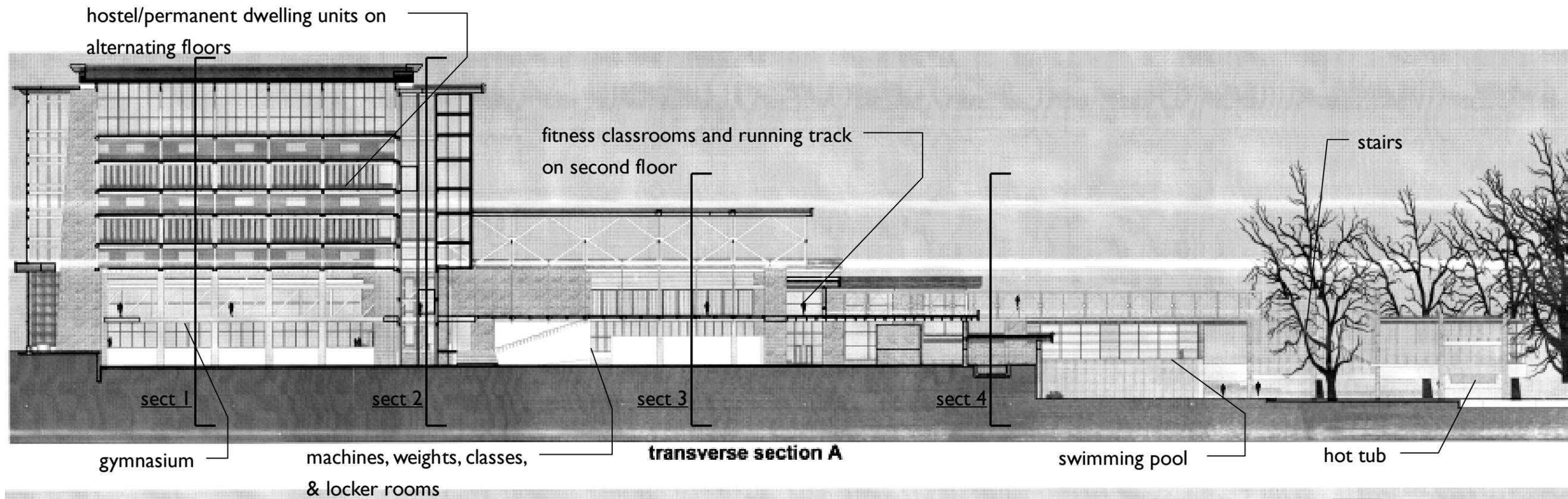
- heavy timber/t&g ceiling w spar varnish
- lap pool projection
- paver plaza with 4" OC drainage spacing
- foot bath/ stormwater
- trail

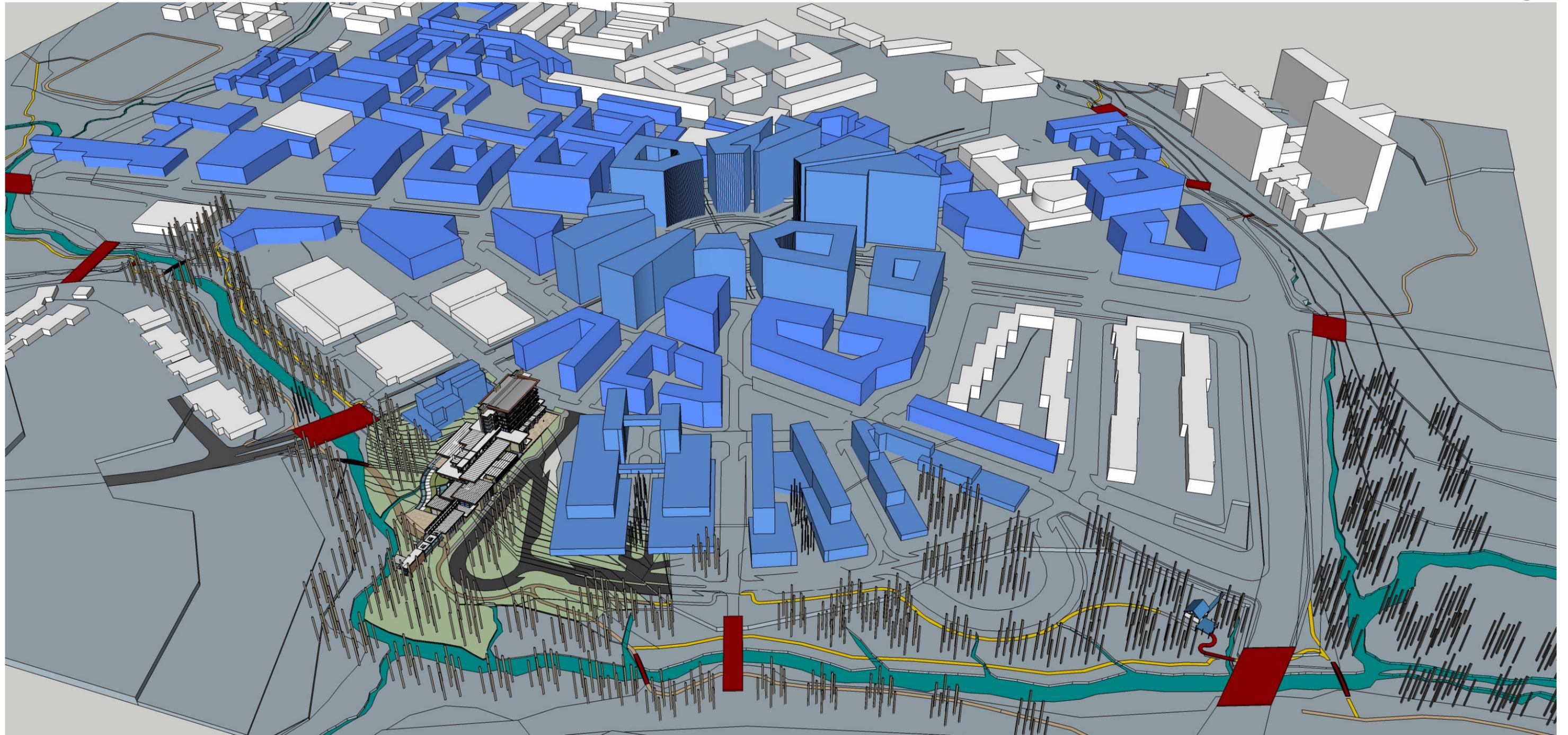


section 4

the building

Transverse sections A and B showing the building elements as the structure transitions through several stages of design and construction, each conforming to the land and requirements of each use.





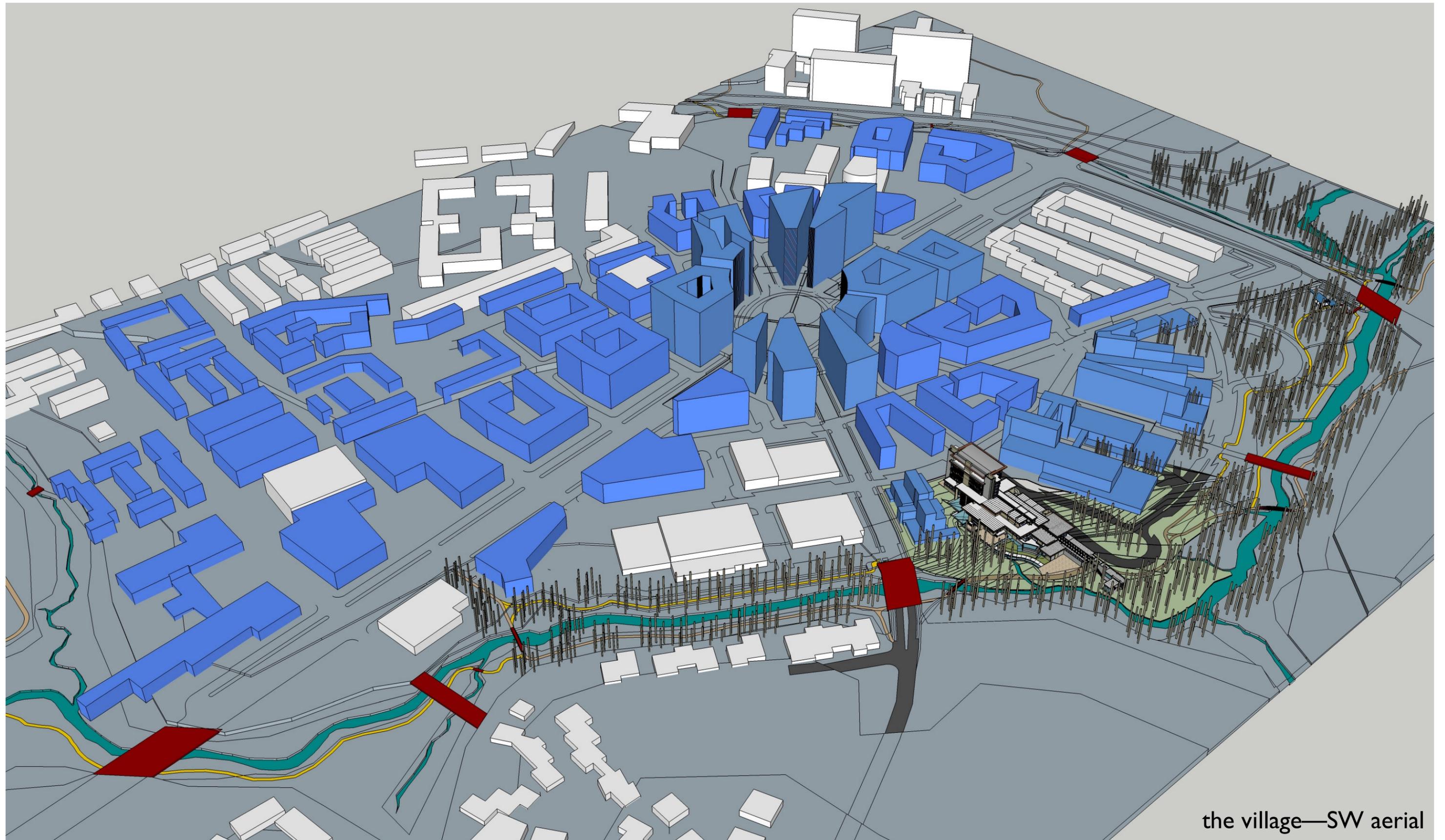
the village—SE aerial

...begin to repair Fairfax City into a suitable gateway into town using an outside-in approach starting at the transition threshold

...give purpose to Gateway Regional Park – making it in fact a true gateway to the entire trail and trail system

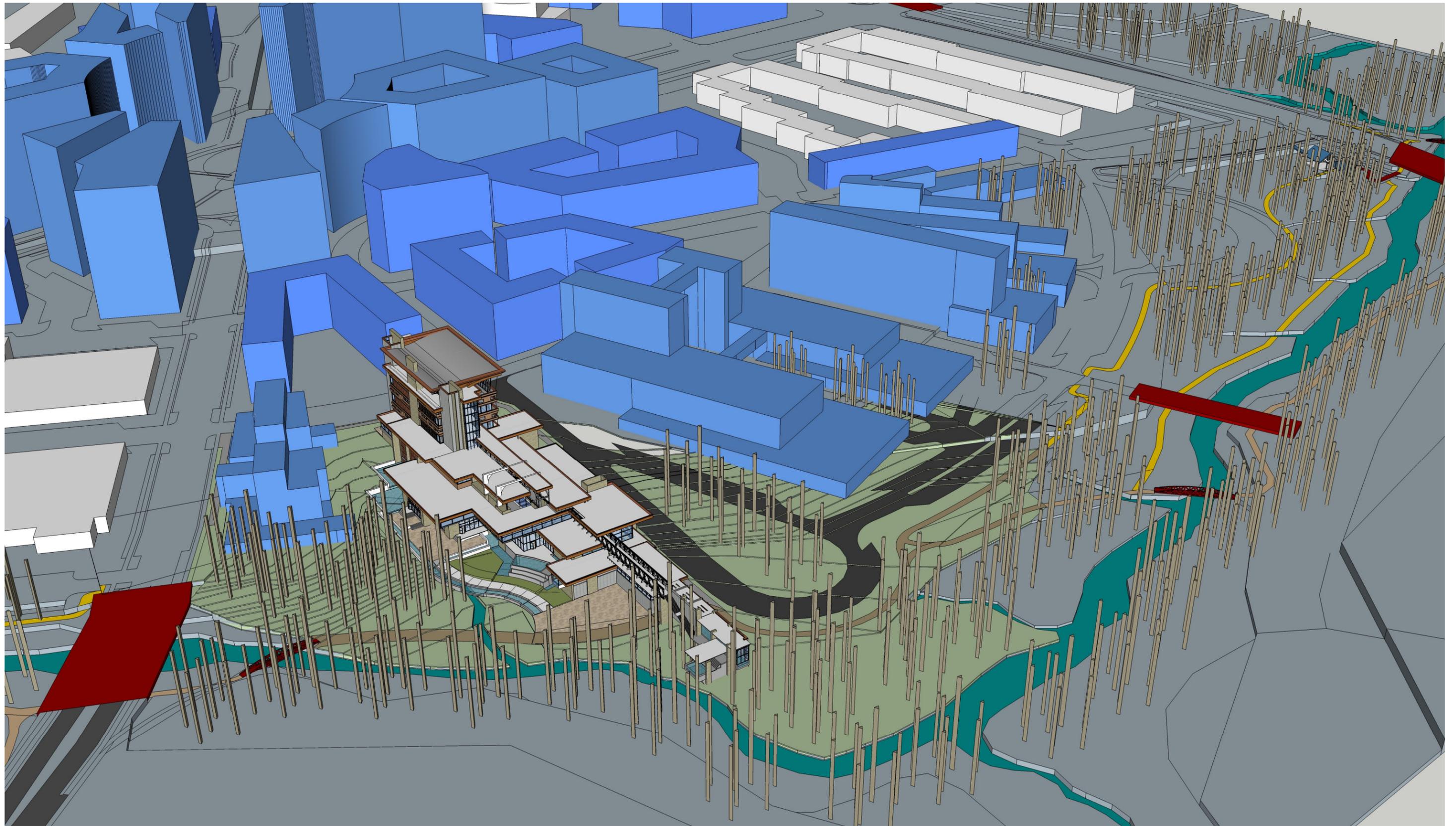
...sew the torn fabric separating local communities separated by man made barriers and mechanical deserts through recreation.

figure 98



the village—SW aerial

figure 99



the site—SW aerial

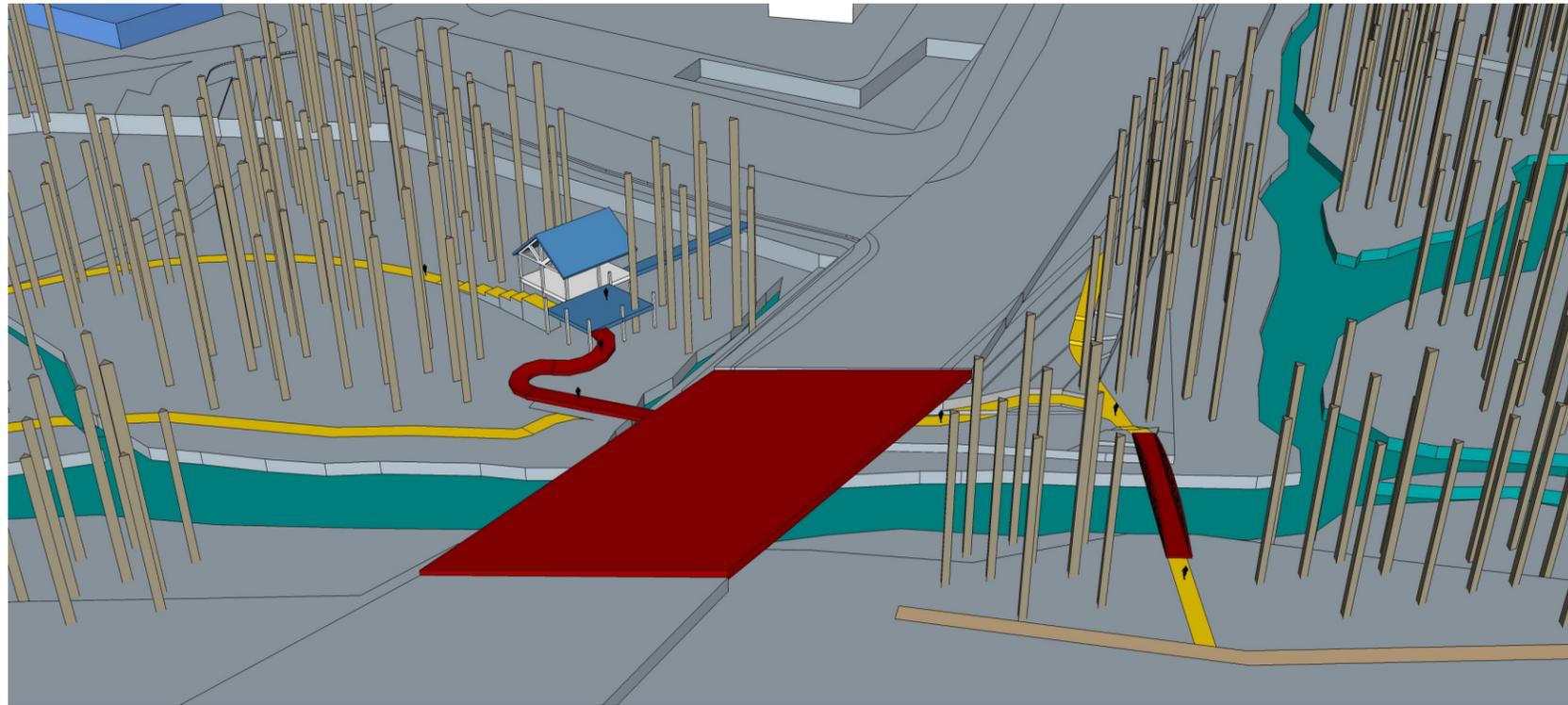


figure 101: Gateway Regional Park, proposed east entrance –SE aerial

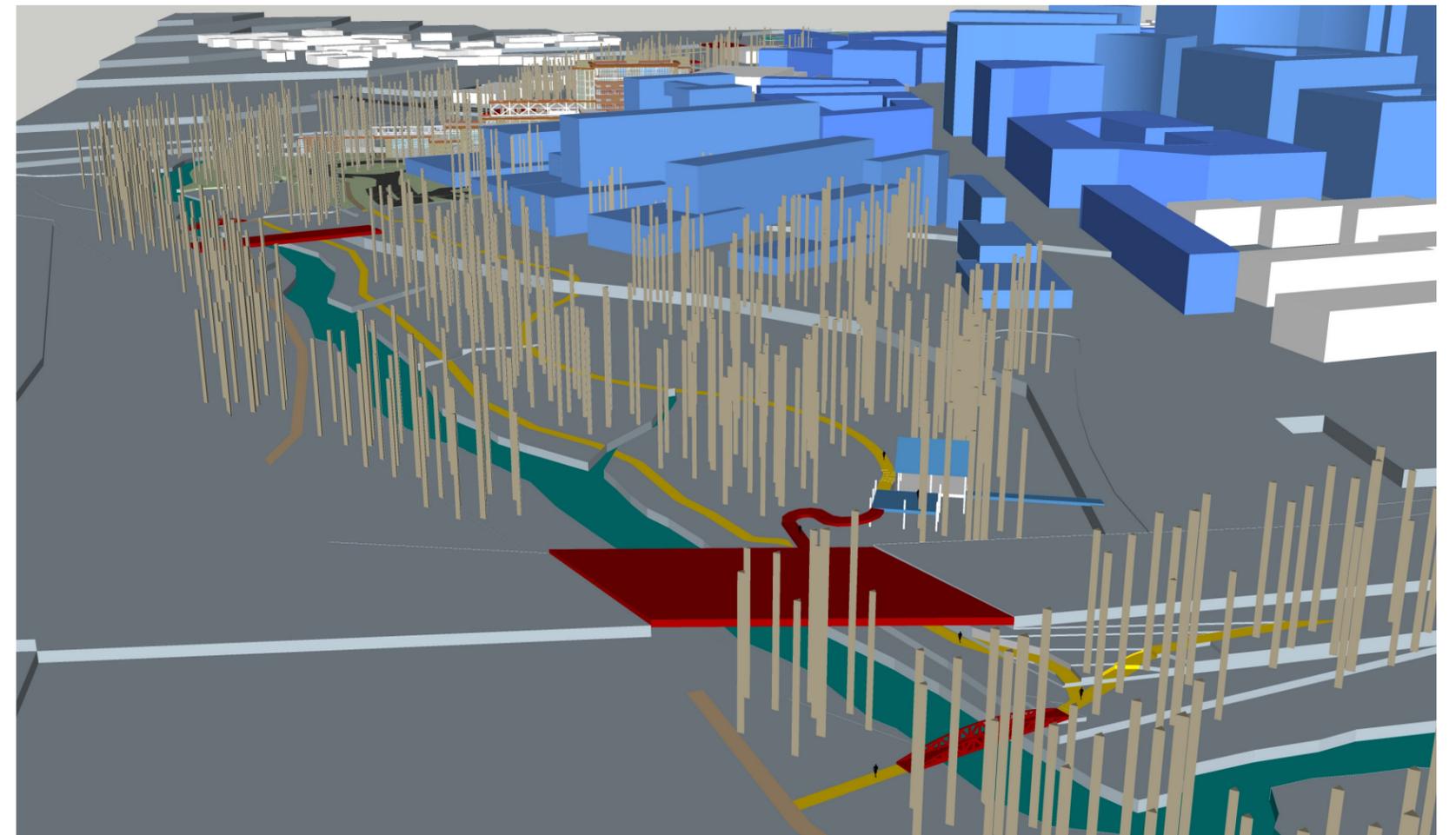


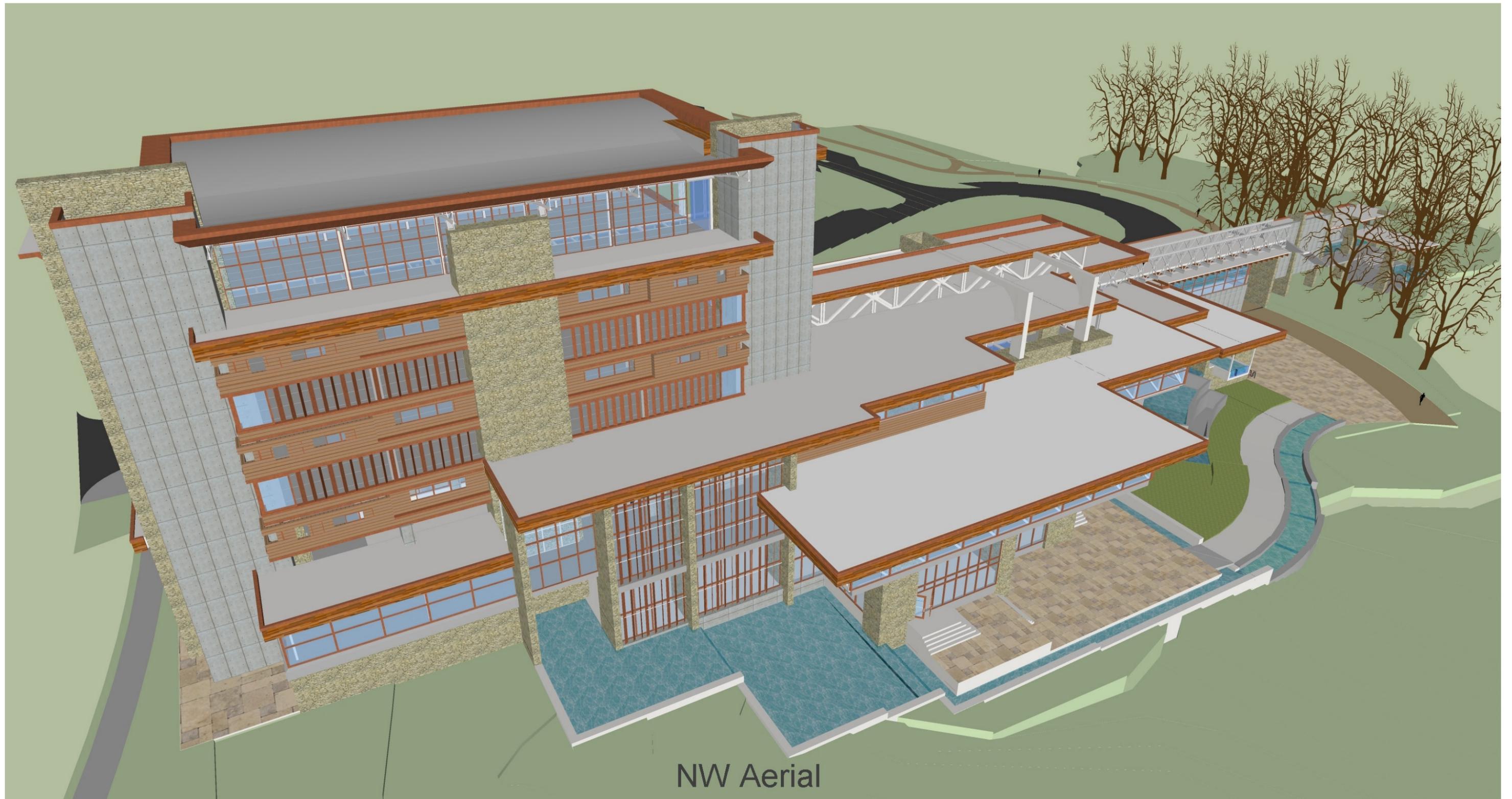
figure 102: Gateway Regional Park, proposed east entrance –E aerial



NE Perspective



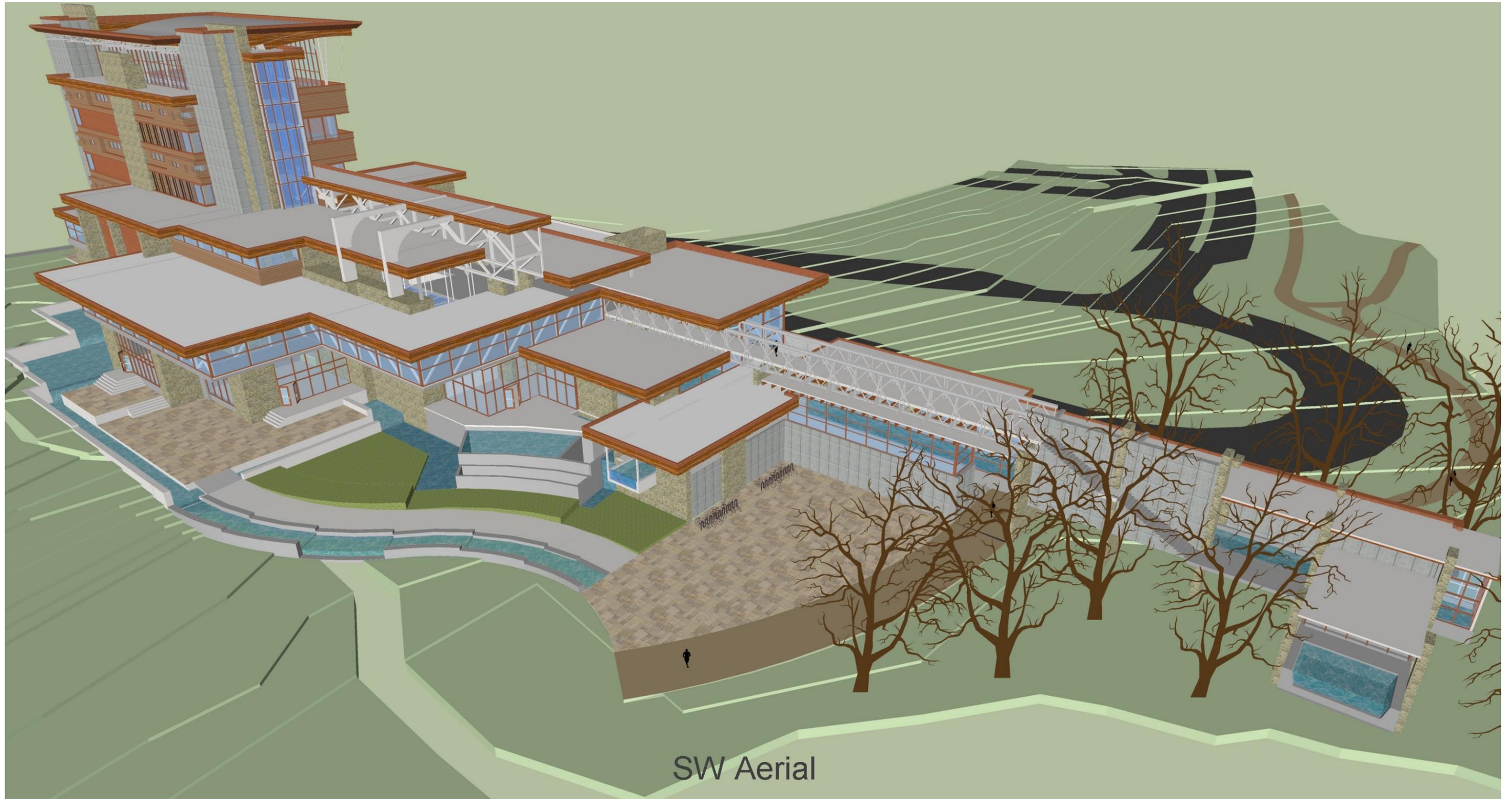
SE Perspective



NW Aerial



SW Aerial



SW Aerial

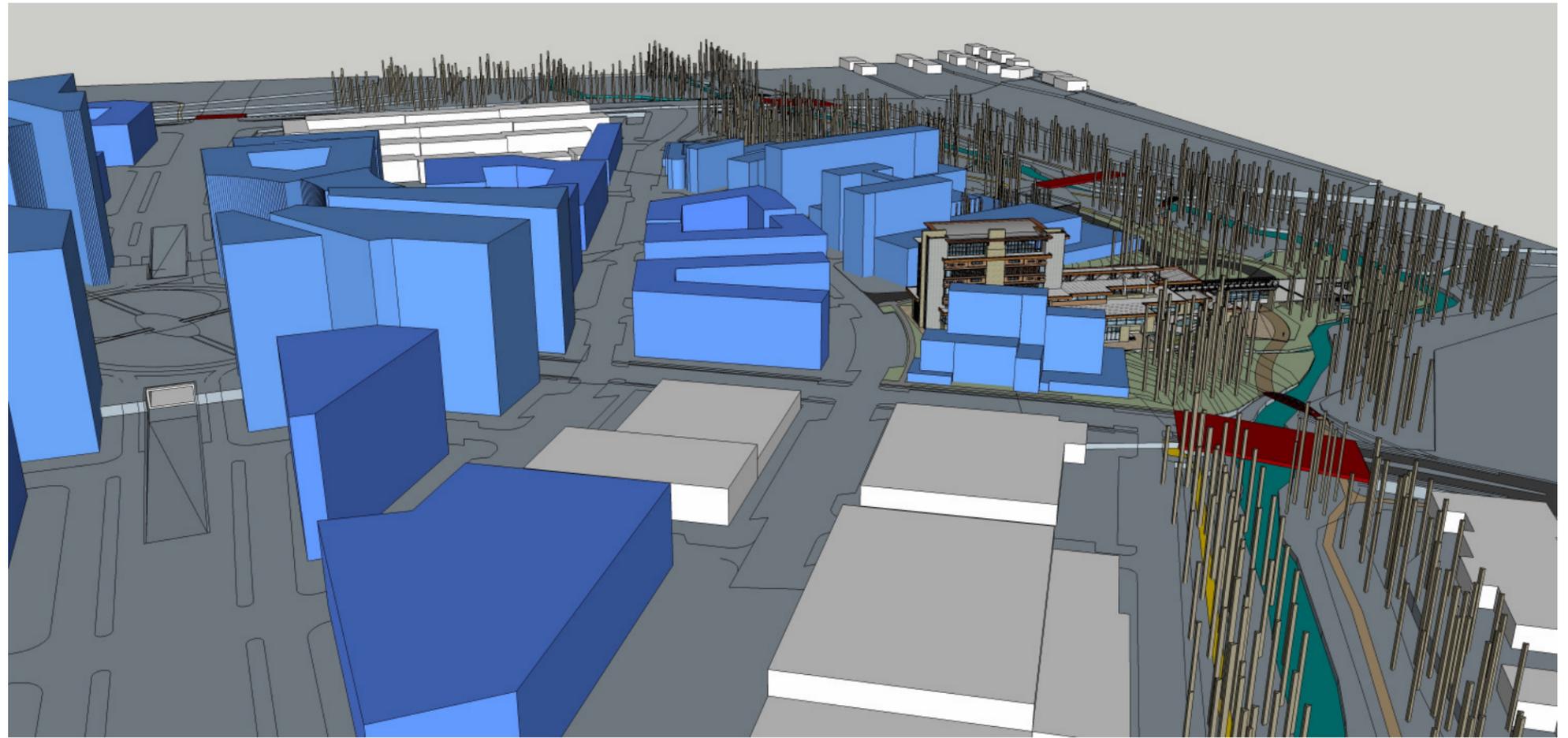


figure 108: Village—west aerial.



figure 109: Village—west perspective

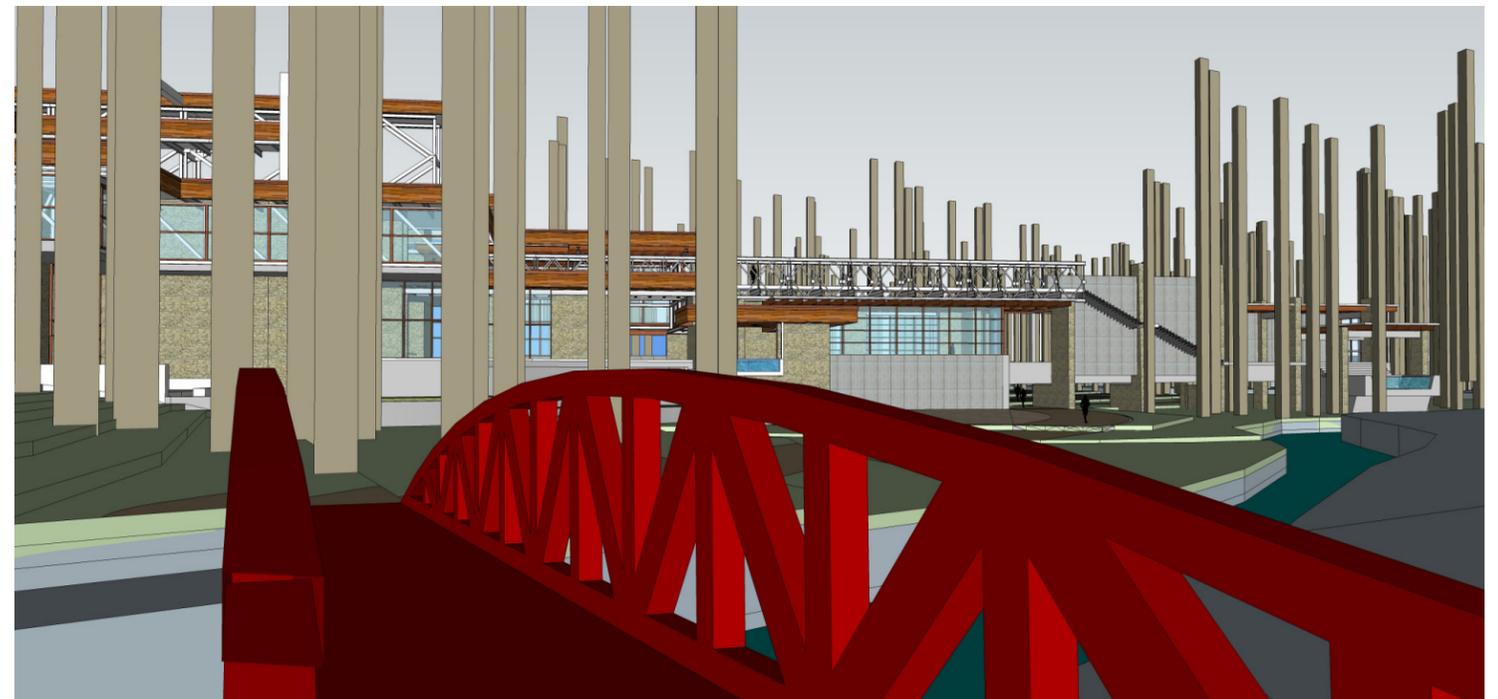


figure 110: Site—SW perspective

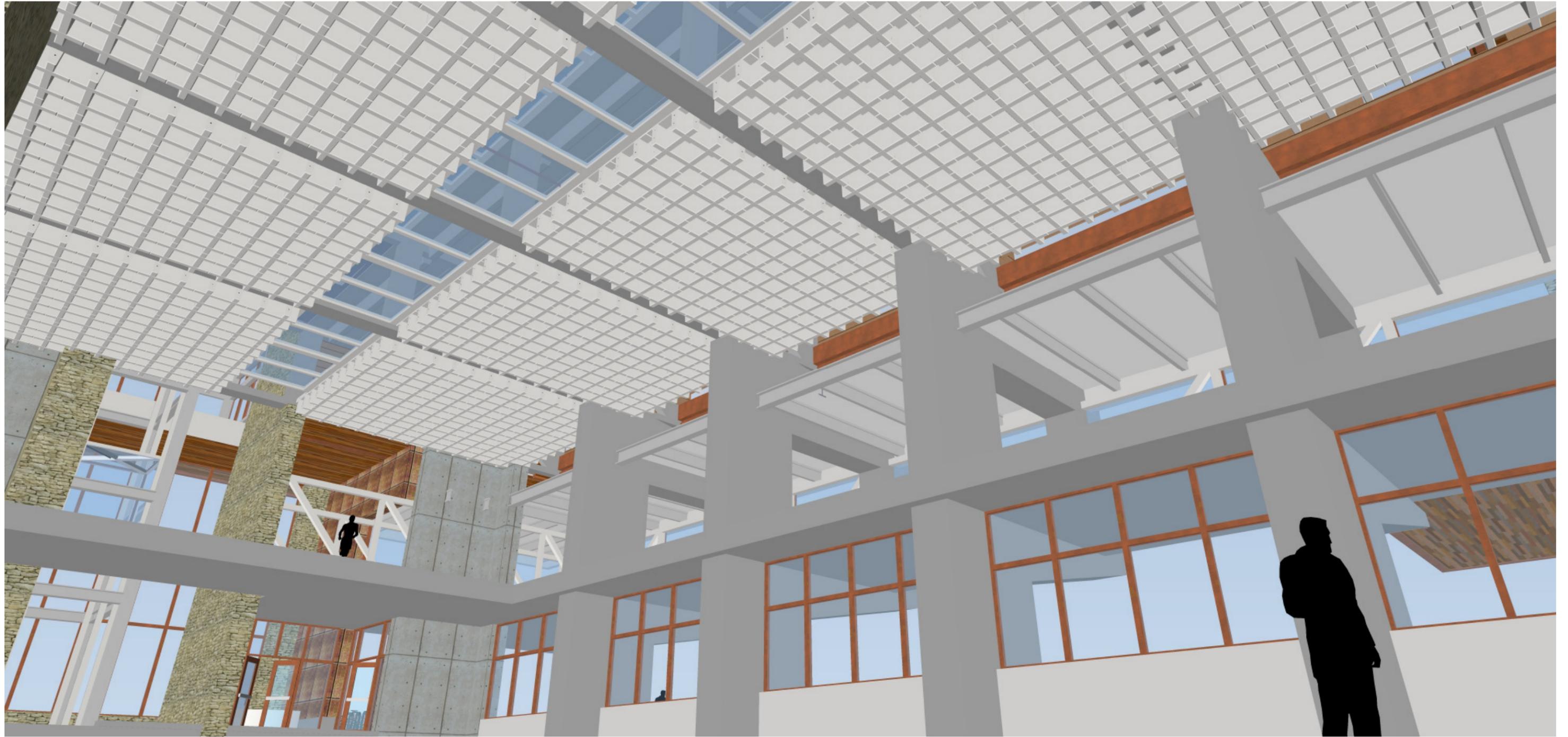


figure 111: Gymnasium with PCC ceiling and light well beneath dwelling corridor above.

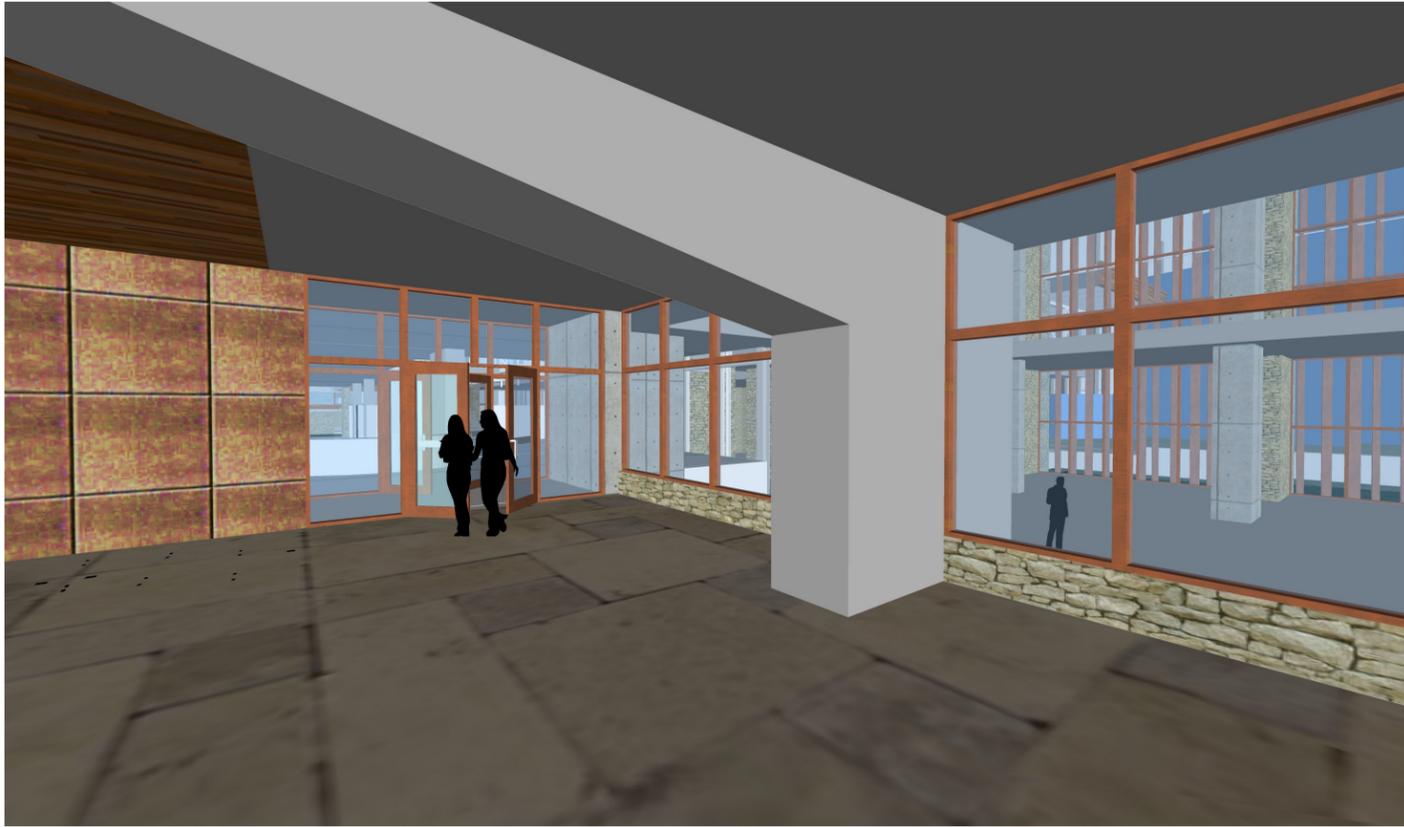


figure 112: Main fitness entry (urban plaza side)



figure 113: Main fitness entry looking down the ramps (left) towards the pool and looking towards fitness floor



figure 114: Looking down to the fitness floor and up to classrooms floor.



figure 115: Cantilevered hot tub and lap pool at the creek's edge.

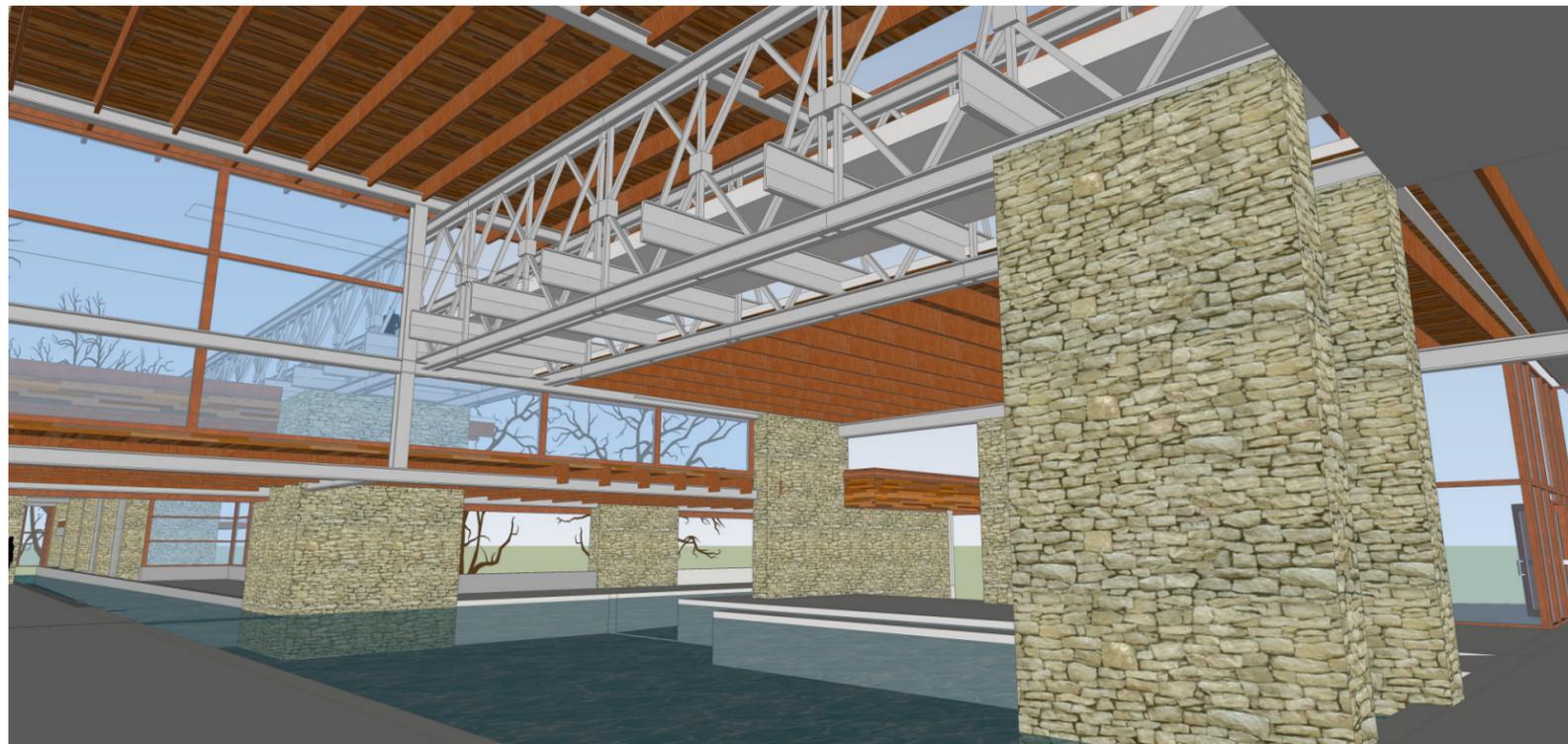


figure 116: Swimming pool inside thermal envelope.



figure 117: swimming pool at Hemeroscopium House, a Spain residence by Ensemble Studio

conclusions

Looking back on the origins of this project, I had visions of a comprehensive, storybook-like arching, concluding plot. In it, all aspects, of my research from video studies of the regional trail system to the village master plan and down to the material studies of the indoor track would tie together in a neat bow with a new meaning for town planning and watershed renewal. And while there is somewhat of an overarching theme of the value of slowing down (from the health and psychological benefits of quiet leisure travel to constructing buildings and applying materials more thoughtfully with regards to storm water), I don't feel the value in this study was to unearth a new truth. This thesis does not posit any sort of paradigm shift. Rather, its worth is as a series of vignettes that reveal timeless wisdoms of many design epochs.

Vitruvius speaks to a Roman Empire in which wastewater management and aqueducts were marvels of the age, if not engineered works of art. Perhaps the reverence towards, thankfulness for, and attention paid to this was due to the constraints and limitations of manual labor—it was incredibly time-consuming work (!). Whereas today we take for granted the ingenuity of our mass-produced concrete systems—so much so that we bury them. The resulting erosion is not so much a result of using concrete, but that the abundance and cheapness of the storm water modules has allowed us to apply them haphazardly and lazily. When removing standing water from the village, we cause unforeseen, more complex problems of dead streams.

Alberti's framing of civic spaces and focus on defining the edge/entry of the city also offers insight to defining edges and transitions, but with modified applications. Far too often we see a shopping center with a faux triumphal arch standing next to a concrete curb gutter entry point, with the edge of the property framed by a haphazardly dug drainage ditch (or in the case of Fairfax Circle, parking lots that dump straight into the creek). Again, the mass production of asphalt provides such an easy way to treat land up to a creek that we end up modifying nature—via our own laziness in material application; in this case turning streams from life-sources to storm water sewers. So here we ask, what does the boundary of the community need to be in order to rectify this? In what ways do we limit the application of manufactured, impervious surface, and in what ways can we apply it better?

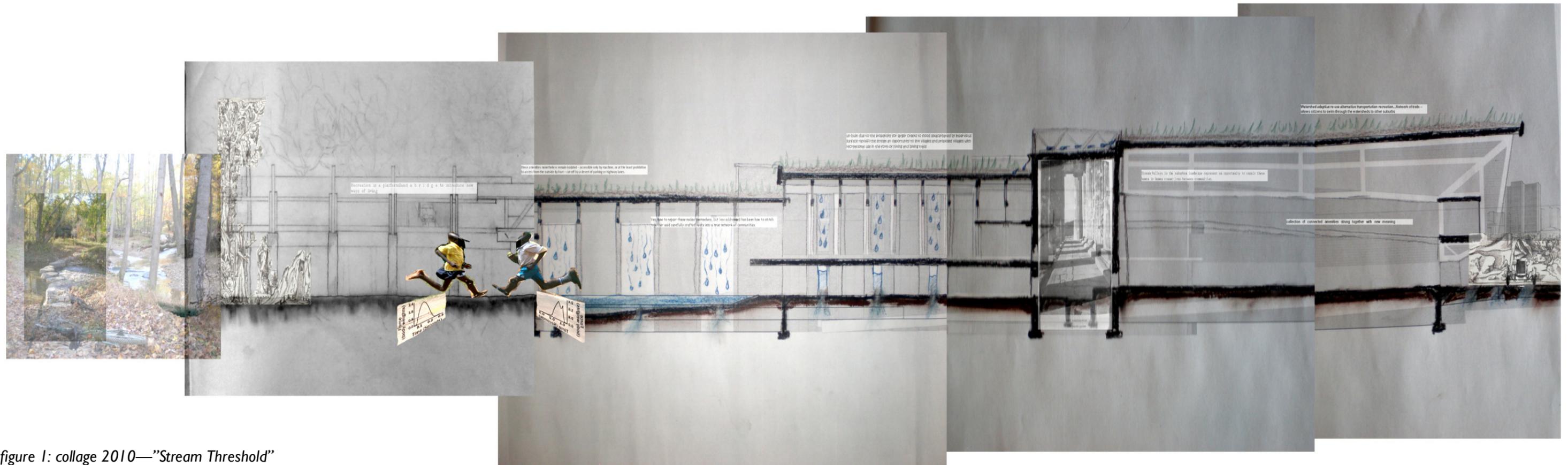


figure 1: collage 2010—"Stream Threshold"

Le Corbusier's advocacy of the use of mass produced materials would seem to be far less problematic to the landscape than would be than the Radiant City or Contemporary City rational grid models. The reason is mass produced materials can be applied with respect to their environment, while the nature of the Radiant City model is to rebuild the environment to conform to the modular. At the man-made material level a naturalist approach can coexist with the machine age. When applied with respect to surroundings, modular, manufactured methods can work in harmony with nature. As constructed on the Cross County Trail in Fairfax, Virginia, crushed stone and asphalt paths twist and conform to the landscape, and concrete bollards serve as step crossings on wide concrete pads slow down the water and do not degrade the landscape. In fact we see that carefully-applied homogeneous artificial mixtures constructed to follow the topography, can retain trees and help repair the stream valley. The modular unit at the material building block level results in an inductive approach to building, one that can allow landscapes, and villages to conform to the landscape rather than the other way around. At the material level, the advocacy of straight lines and the resulting efficiencies represents the higher level of human accomplishment that Le Corbusier posited, but these modular units are applied in the donkey path way.

In the case of the inland stream valleys, a variety of mass produced building blocks such as finely crushed stone, asphalt pavers, and even concrete can be the glue for the recreational string of pearls that results in a collection of connected amenities strung together with new meaning. These repaired and freshly activated watershed systems can catalyze and permit the vibrant human scale connections that rejuvenate walking-density / walk-up height villages and recreational amenities along the way. Even though modular systems have been used destructively in the past, if applied with craftsmanship, classical thoughtfulness, and environmental care, they can contribute to healthy movement and *recreate*.



figure 118: CCT at Pohick Creek

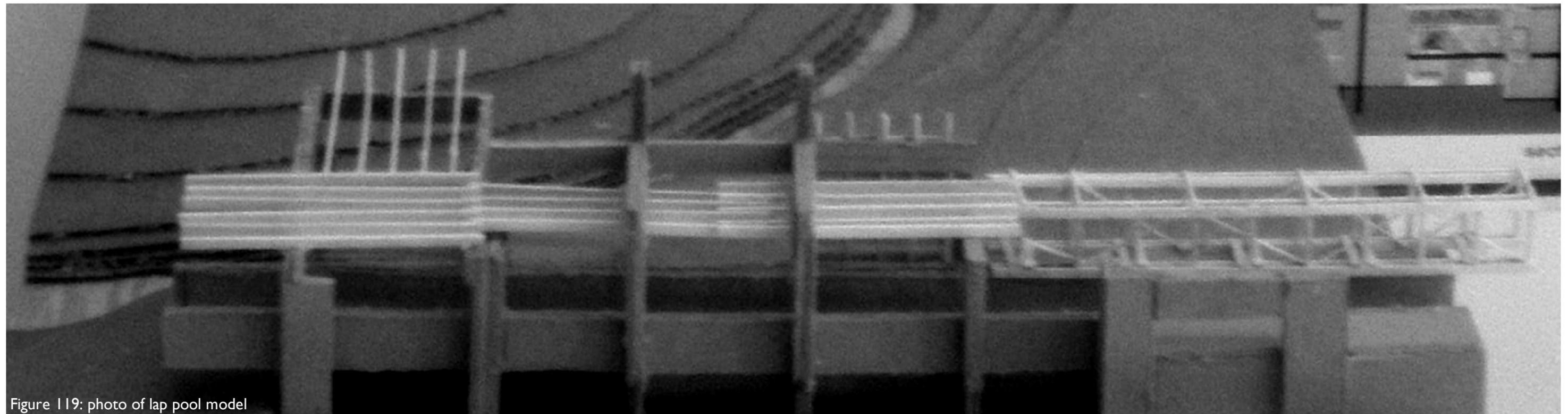


Figure 119: photo of lap pool model

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