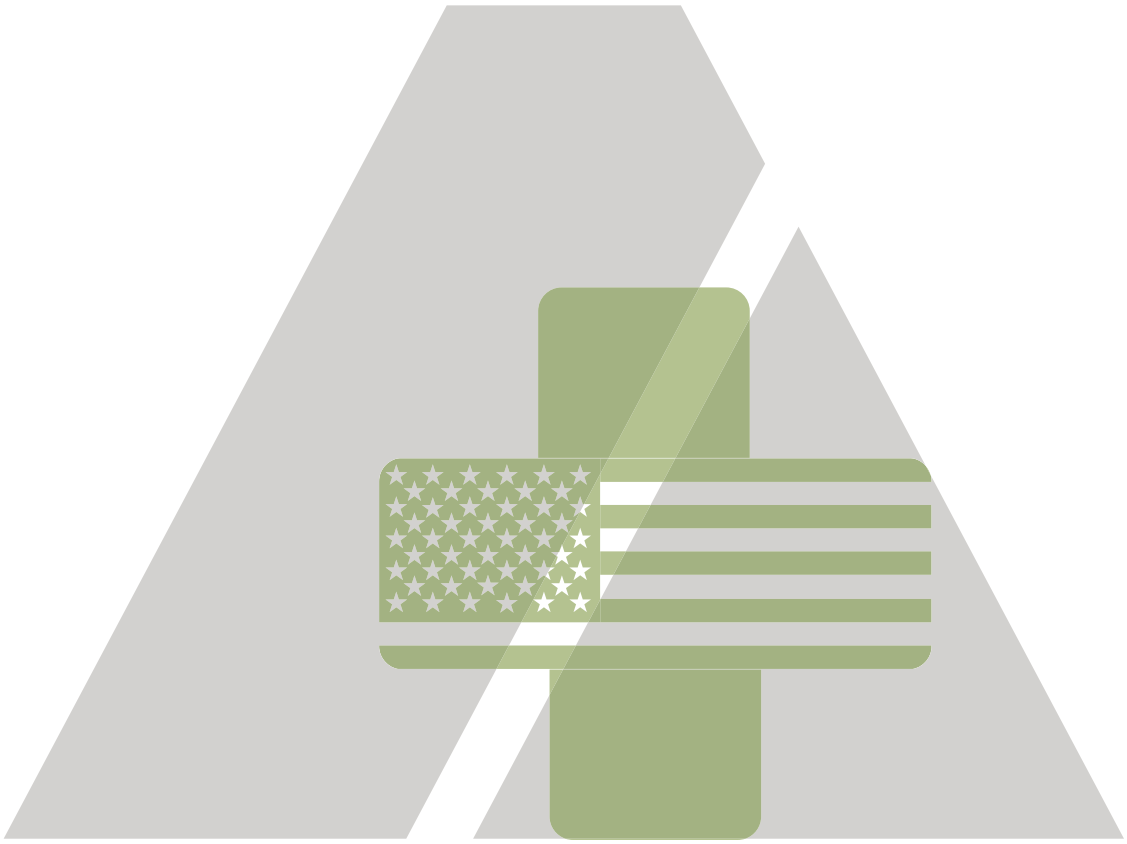
NEURAL REDOUBT:

Keller Army Community Hospital



LEAH K FAGERLAND
NORTH DAKOTA STATE UNIVERSITY
SEPTEMBER 2014

ACKNOWLEDGMENTS

FOR THOSE WHO HAVE CONTRIBUTED TO AND

SHARED IN THE SUCCESSES OF MY STORY - BE

IT THIS CHAPTER, OR THE NEXT -

“Duty, honor, country. Those three hallowed words

reverently dictate what you ought to be, what you

can be, what you will be.”

- GENERAL DOUGLAS MACARTHUR

COVER PHOTO: Figure 0.1

NEURAL REDOUBT:

KELLER ARMY COMMUNITY HOSPITAL - WARRIOR TRANSITION UNIT ADDITION

A Design Thesis Submitted to the

Department of Architecture and Landscape Architecture

of North Dakota State University

By

LEAH KATHERINE FAGERLAND

In Partial Fulfillment of the Requirements

for the Degree of

Master of Architecture

BAKR ALY AHMED, PRIMARY THESIS ADVISOR 9/15/2014

DR. GANAPATHY MAHALINGAM, THESIS COMMITTEE CHAIR

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ABSTRACT

Increased numbers of returning service members from Operation Iraqi Freedom and Operation Enduring Freedom (OIF/OEF) coincide with budgetary sequestration measures which directly impact the Department of Defense, jeopardizing available care for active duty service members and veterans.

It is understood that well-integrated passive design techniques as well as the introduction of natural elements to the medical environment encourage positive physiological responses in patients. This thesis seeks to determine the manner in which satisfactory design quality may be maintained, while energy performance and budgetary constraints may be successfully accommodated.

KEYWORDS:

West Point, New York, Sequestration, PTSD, mTBI, ASD, Cognitive Behavioral Neurology, Neuropsychiatry, Ambulatory Care, Department of Defense, USMA

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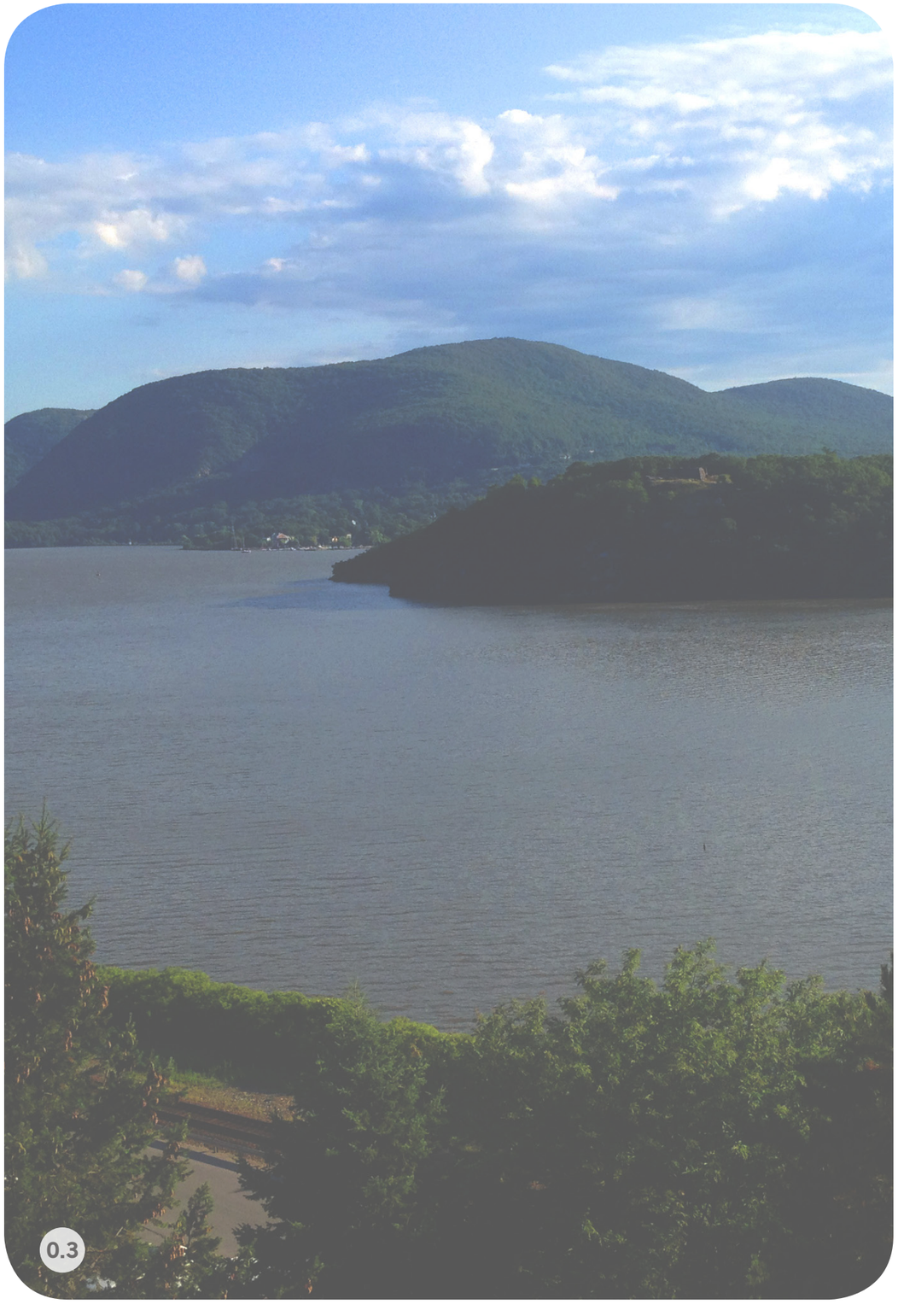
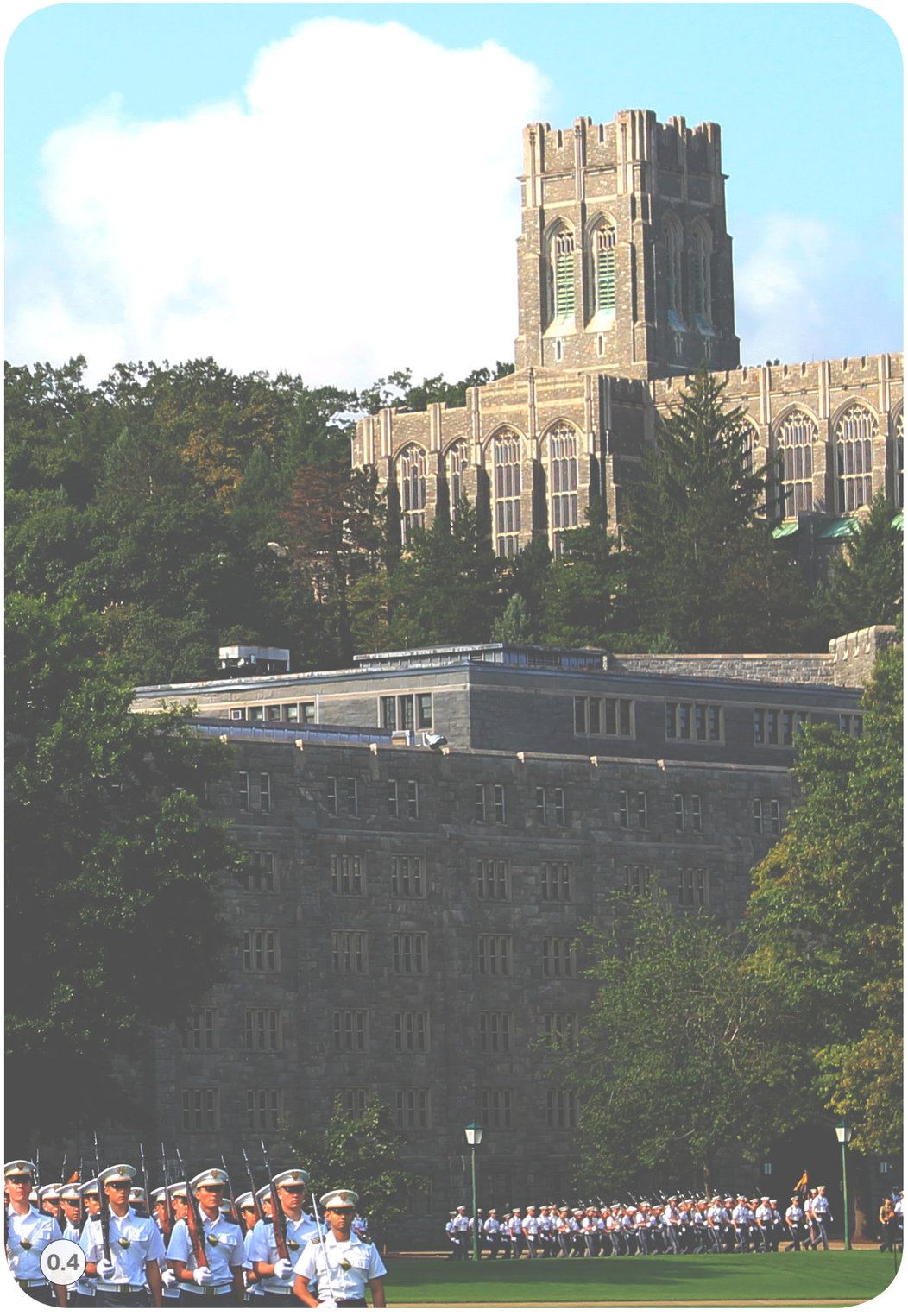
PROBLEM STATEMENT

What practices can encourage the utilization and effective maximization of the imbricate region between budgetary constraints, project timeline, and the ultimate wishes of the client?



STATEMENT OF INTENT



THEORETICAL PREMISE

TYPOLOGY

50,675 SF Neuro-Psychiatric Outpatient Care Center which relocates the current Warrior Transition Unit (WTU) to the existing Keller Army Community Hospital campus

CLAIM

Design practices that promote mental and physical well-being can also support rigid constraints typical to architecture in practice.

PREMISES

ACTOR

Two entities, the Federal government and the returning service members and their respective needs hold equal weight in the direction of the project.

ACTION

Architecture stands silently as a tremendous influence; an indirect agent of healing as the human psyche is well within its sphere of influence.

OBJECT

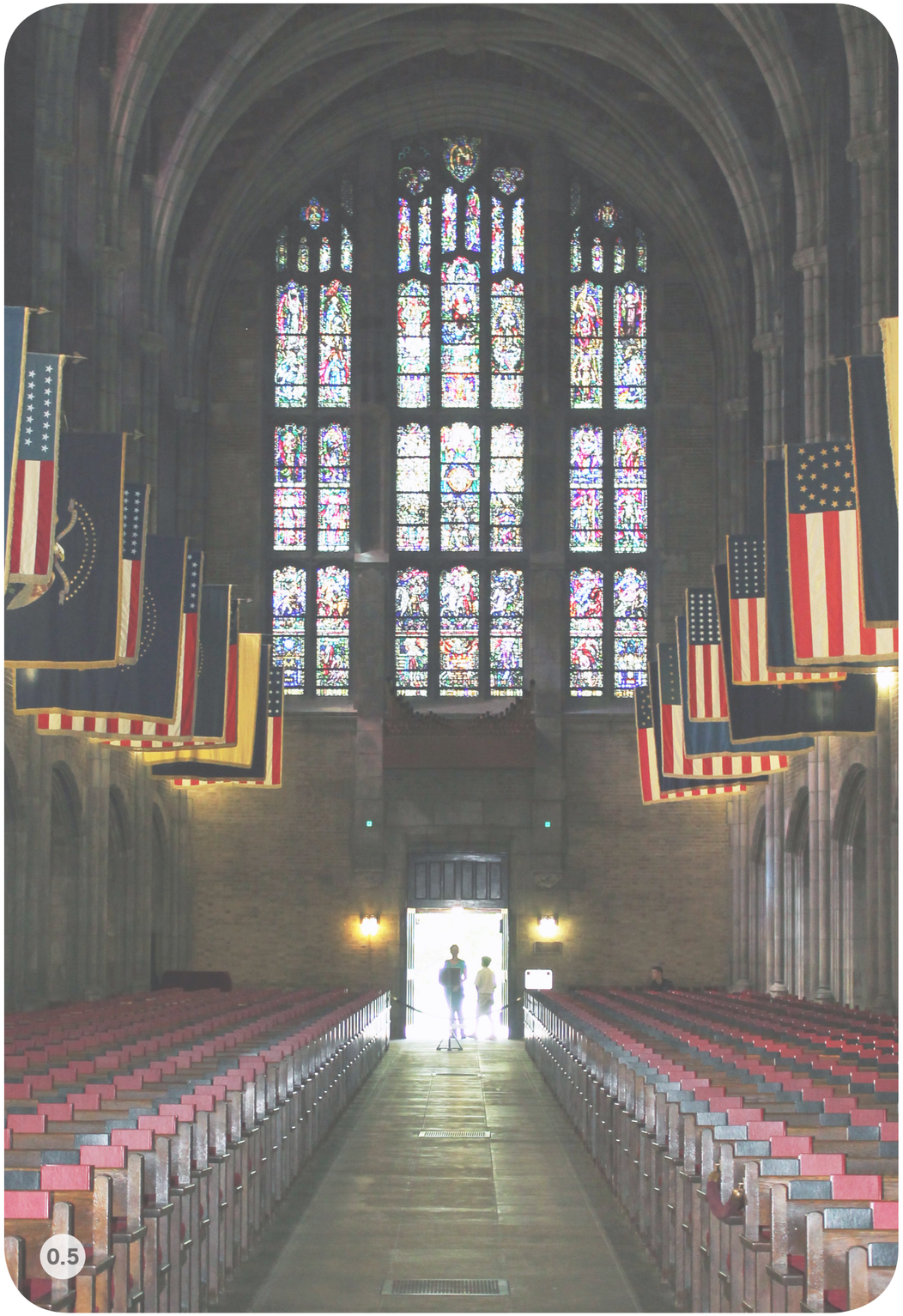
An additional wing on the exisitng army hospital in West Point, NY will serve as a specialized Neurological and Psychiatric Outpatient Center for treatment of returning active duty personnel and veterans facing behavioral or mental disorders.

MANNER

Passive design principles which support the demands of stringent federal requirements for new construction are also contributory to biophilically-influenced design decisions.

UNIFYING IDEA

Design methodology of sole concern for efficiency must should not be a hindrance for design; rather, it enables the development of projects with beyond adequate concern for the end user. This continual struggle between what is easy, less costly and what is of wholesome quality drives the advancement and improvement of architecture.



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PROJECT JUSTIFICATION

"There is no dignity quite so impressive, and no one independence quite so important as living within your means."

- PRES. CALVIN COOLIDGE

Certainly, there is to be proper regard for working within reasonable fiscal means for Federal projects given the current crucial era of desperately needed spending control, but at what expense? There is a small - but significant interspace between IDEAL DESIGN and what is often referred to as VALUE ENGINEERING. Often unknowingly, each individual of the project team makes decisions day to day that are of compromise on the behalf of many parties in play.

For this specific typology and it's respective user group, concern ought to be granted primarily - first and foremost - to the general health and well-being of those returning from service. A clinical study published by BMC Public Health indicates that the greater the postponement of treatment for psychological ailments following return from service, the higher the occurence of worsened overall health (Falvo, et al., 2012). Though it is understood that the needs of the owner - the Federal government - are to be duly noted and respected, clearly the needs of service members in serious need of medical care ought to take precedence. At present, there is "less funding to address military medical facility maintenance and the needed restoration and modernization projects...[with] degradation in the aesethetic quality and functionality of our medical facilities" (Marshall, 2013.), according to Dr. Jonathan Woodson, Assistant Secretary of Defense for Health Affairs. By examining the needs of the user group, a compromise may be established: recognizing the need for increased clinic space primarily for psychological care while also remaining flexible for reassigned future use; preservation of historical integrity essential to the iconicism of West Point.

THE PROPOSAL
THE PROPOSAL
THE PROPOSAL

NARRATIVE
MAJOR PROJECT ELEMENTS
SITE INFORMATION
PROJECT EMPHASIS
PLAN FOR PROCEEDING
SPRING 2014 SCHEDULE
PREVIOUS EXPERIENCE

NARRATIVE

"Our obligations to country never cease but with our lives."

- JOHN ADAMS

First and foremost, I hope to bring due recogition to the sacrifices made by those who have provided selfless service for the protection of the United States against all enemies, foreign and domestic. Evidence of such sacrifices take on countless forms - many of which are scars unseen.

THE PSYCHE

Treatment of psychological disorders is already a complex process providing no guarantee of success and healing. It is a process of trial and error; just as in general medicine, no single case is identical to those that follow. The individuality of the psyche, patient experience and personality make for an event with no clear method of effective treatment, say nothing of the initial hurdle of proper, inclusive diagnosis.

Such complexities are compounded when specifically considering the circumstances of care for veterans and active duty personnel. Subject to budgetary sequestration, staff furloughs and rigorous building performance standards, it is imperative that each new federal facility be carefully and efficiently designed without compromising any measure of design quality where possible. Where medical care is concerned, careful design of the medical environment must be top priority as it has substantial influence over patient recovery.

How do we wrestle with the complexities of the traumatic experien.ces afflicted personnel cite? What architectural and landscape architectural practices can possibly support and supplement the measure taken by psychiatric and psychological professionals to treat these abtruse conditions?

A tremendous amount of influential power is held by our surroundings - the power to manipulate for better or for worse our own well-being, state of mind, who we are and who we wish to be. Within the confines of that which we have control, those surroundings may also reflect our values, desires, dreams and who we wish to be.

THE SYMBOL

The oldest operational military post in the nation, it towers proudly on the western banks of the Hudson river. A monolithic, gray portrait of strength and endurance, where better to introduce a station of care to remind wounded warriors of their own?

USER / CLIENT DESCRIPTION

The Wounded Warrior Transition Unit, an outpatient neuro-psychiatric care clinic, will foster the health and well-being of not only those receiving care, but those providing it:

THE PATIENT

VETERANS / CURRENT SERVICE MEMBERS

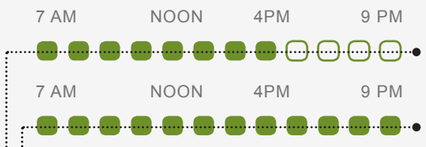
Active duty military and recently discharged OIF/OEF veterans ages 18-60 attending 90 minute Cognitive Processing Therapy (CPT) and Prolonged Exposure Therapy (EPT) sessions in a one-on-one setting with clinician.

Projected peak appointment / visitation hours in a time window of 8 am to 9 pm predict afternoon and evening time slots to be most commonlyutilized. It should be noted that 37.6% of OIF/OEF-era patients attended appointments and continued with treatment following completion after one year; those with the highest treatment dropout rates were male, African American, had combined diagnosis of substance abuse, bipolar disorder and schizophrenia (Harpaz-Rotem & Rosenheck, 2011).

THE PROVIDER

ADMINISTRATION

It is assumed that administrative staff are present for a 7 AM to 4:30 PM workday, where clinical support staff are present for daytime and evening hours as appointments are scheduled.



PSYCHOLOGICAL / PSYCHIATRIC / NEUROLOGICAL / ADV. REGISTERED NURSING STAFF

Assigned to patients on a case-by-case basis, clinical staff members will administer initial patient interviews, and various assessments, including Post-Deployment Health Assessments (PDHA) and Reassessments (PDHRA).

MAJOR PROJECT ELEMENTS

SHARED

Placing nature indoors, circulation spaces and central areas occupied by both patient and provider.

PATIENT

COMMUNAL THERAPY

Age barriers between afflicted personnel by a shared experience; recognition of such experiences is widely recognized as “essential to rehabilitation and recovery”(Ellison, et al., 215). It is clear that psychiatric clinics treating those with PTSD and related illnesses must have congregational areas for spontaneous conversation and quiet contemplation.

INDIVIDUAL THERAPY

Recognizing the critical balance between (installation, incorporation) of biophilic architectural attributes and the Army’s need for efficiency, each exam room shall be equipped with standard clinical equipment for adaptability to accommodate KACH’s future needs.

Each exam room shall have access to views of the Hudson and the Highlands, while also granting direct access to specific communal therapy rooms.

PROVIDER

With additional staff comes the need for increased support space.

OFFICES, ADMINISTRATIVE & M.D.

All staff and clinician offices are to be designed with consideration for spatial flexibility for relocation and addition of personnel. Concern is extended from patient to provider

DIGITAL IMAGING/RELATED SUPPORT

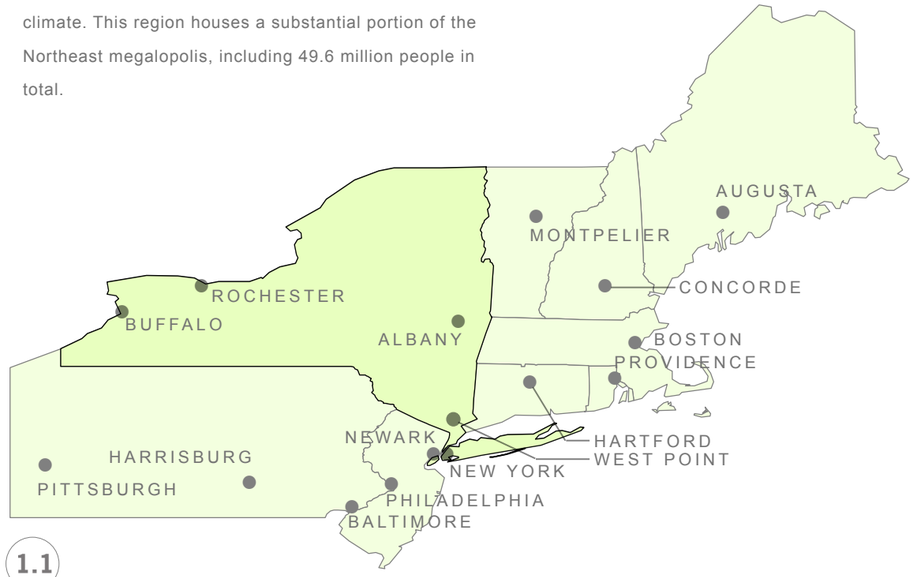
As the Neurology / Psychiatric wing provides care specific to outpatient procedures, examinations and treatment methods, a separate and localized imaging center from any existing tools of KACH is necessary.

SITE INFORMATION

REGION

THE NORTHEAST

The northeastern United States are divided into two main regions by the US Census Bureau, the Upper Atlantic and New England. With rocky coastlines, Northeastern Coastal forests and the Northeast Appalachians, there is also significant variation in climate. This region houses a substantial portion of the Northeast megalopolis, including 49.6 million people in total.



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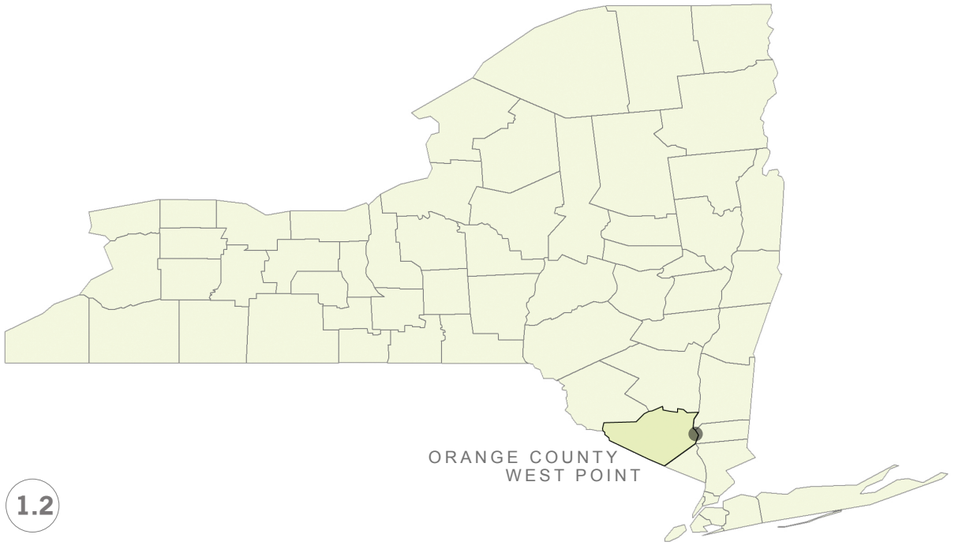


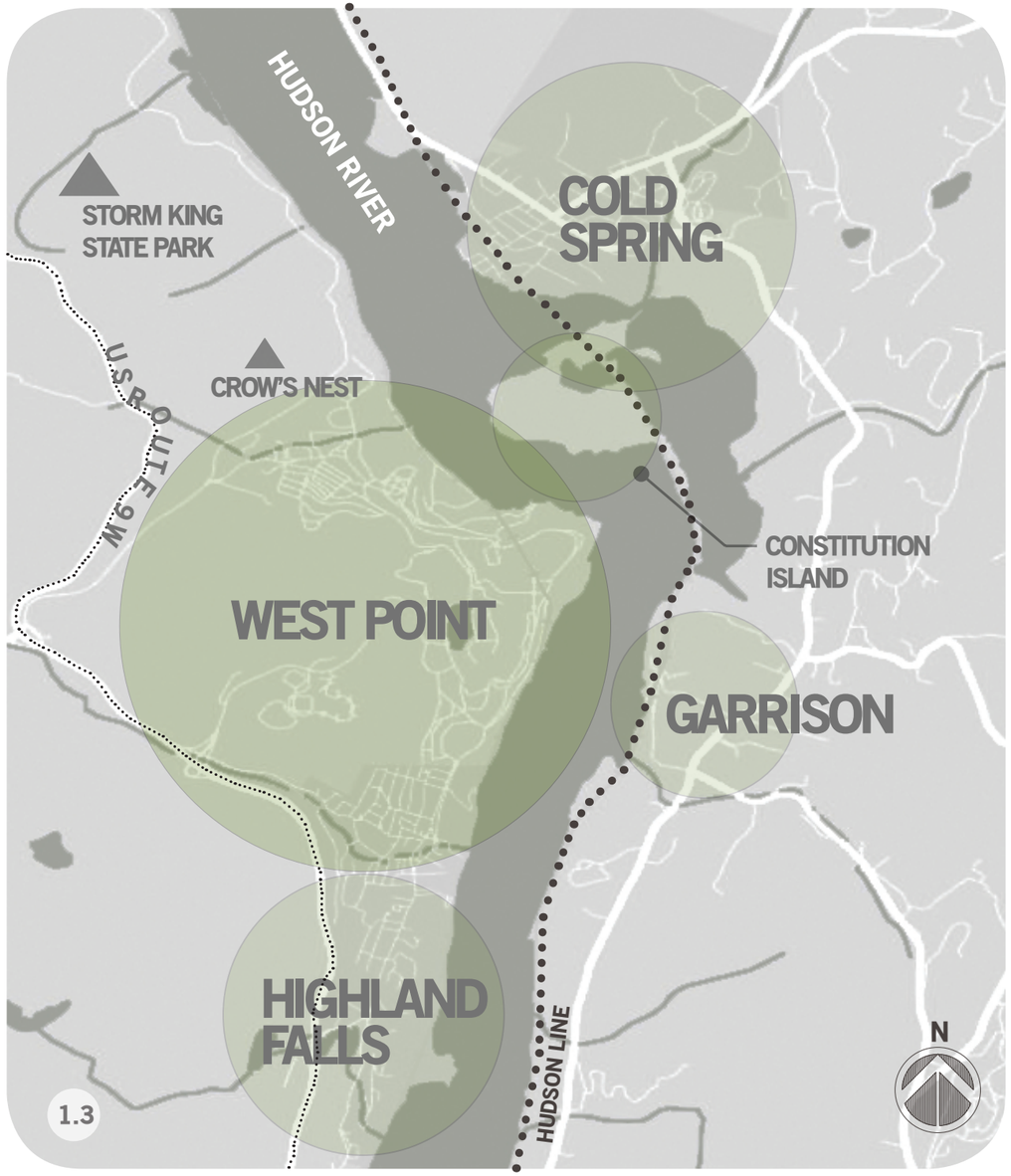
1.2

CITY

WEST POINT, a richly historic army post and home of the United States Military Academy, was established by President Thomas Jefferson in 1802. The army post has a population of less than 7000, 4600 of whom are cadets attending USMA. West Point was formly known as Ft. Clinton, previously know following Benedict Arnold's desertion to the British army during
the American Revolution ("A brief history").

Had Ft. Clinton been lost to the British in Arnold's act of treason, the Revolutionary War may have reached an entirely different outcome.

Much of the architecture at West Point - historical and recent construction - draws influence from the gothic Cadet Chapel, constructed in 1910 with granite native to the Hudson Highlands ("Cadet chapel").



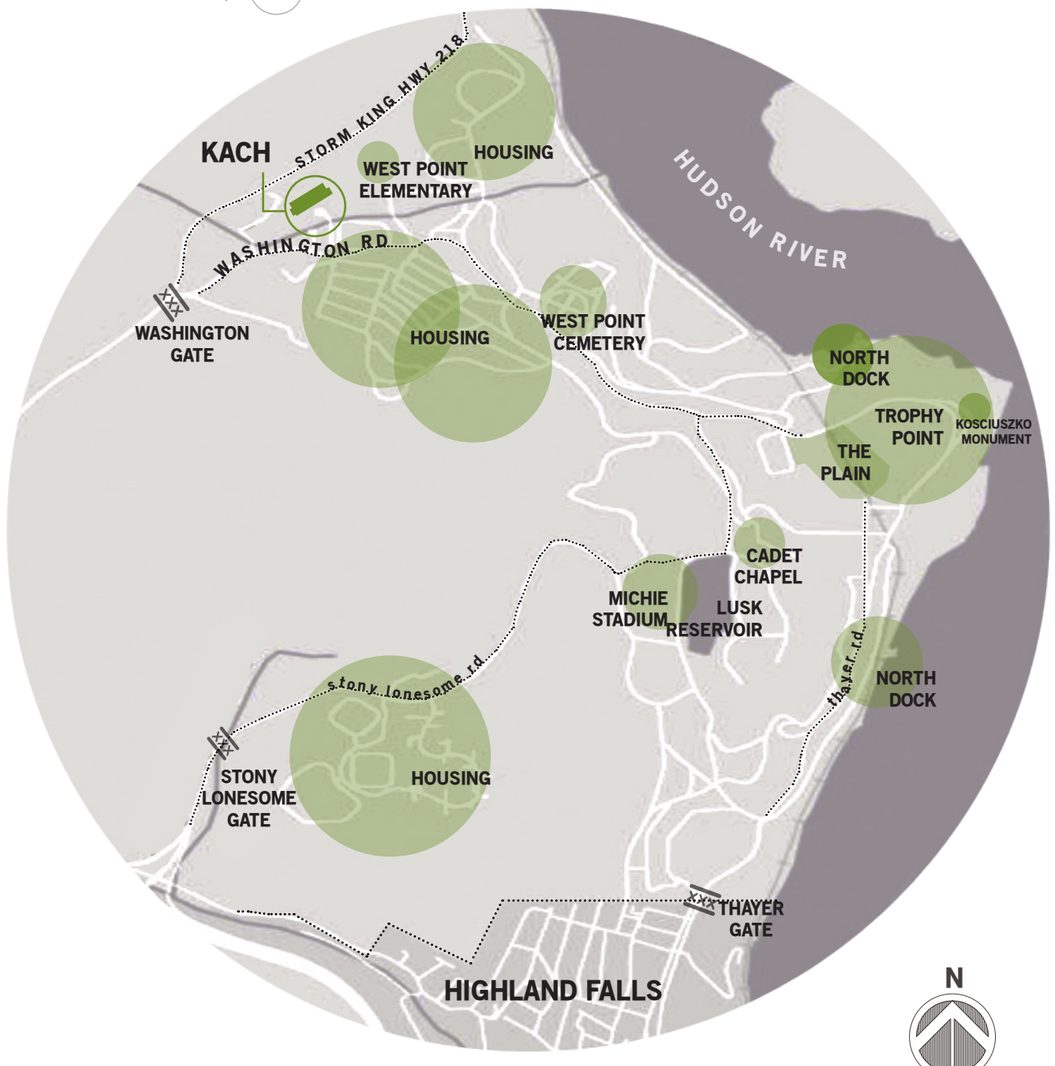
1.3

SITE

900 WASHINGTON ROAD

Completed in 1974, the existing Keller Army Community Hospital campus sits on approximately 8.5 acres of land on the northwestern edge of the post with breathtaking scenery of Storm King in the background. The facility is adjacent to West Point Elementary school and post housing, and the proposed clinic addition joins the existing hospital at its northeast facade with approximately .75 available acres for expansion.

1.7



PROJECT EMPHASIS

Recognizing the substantial influence architecture holds over its occupants, the overlapping areas of pure efficiency and furthermost design aims must be carefully intermixed and balanced. This thesis will further explore and emphasize what can be drawn from either end of the methodological spectrum - maximized - and utilized in a manner that is sustainable and cost-efficient. Such biophilic and sustainable practices are proven to aid in shortened recovery time, preserving patient comfort and securing satisfaction of stress, the ultimate goal of this project.

1.8

PLAN for PROCEEDING

RESEARCH DIRECTION Research will be conducted until project completion. Demonstrating a thorough understanding of the theoretical premise & unifying idea, compiled research will also establish a comprehensive investigation for the project typology, historical context, site analysis and requirements of program.

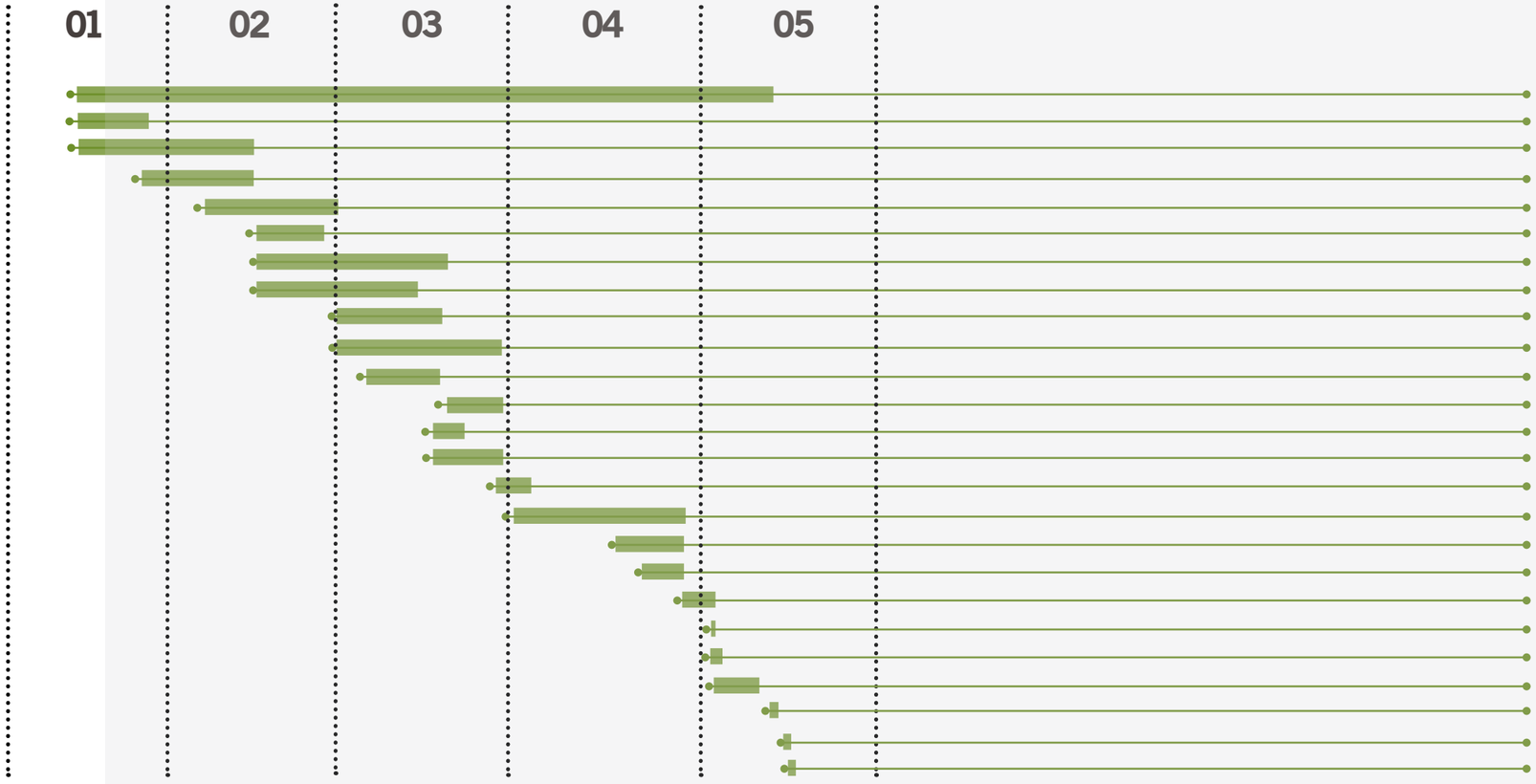
DESIGN METHODOLOGY A mixed methodology of techniques both qualitative and quantitative in nature will be utilized. As it is applicable, research in various forms of sources will be integrated throughout the project book in the form of graphics and text citations. Quantitative research will include both scientific and statistical data; quantitative research shall include observation and archival searches.

DESIGN DOCUMENTATION This thesis will be available for use in the digital repository of North Dakota State University.
Research and respective data collected will be presented in specific intervals as it pertains to each particular stage of development within the thesis development sequence at a bi-weekly interval:

SITE HISTORY / ANALYSIS
PSYCHOLOGICAL & PSYCHIATRIC STUDIES
- Possible conditions and those most likely affected; forms of treatment, both traditional and exploratory

PROJECT DELIVERY METHODS
- Means of expediting the phases of both design and construction

ALTERNATIVE DESIGN METHODOLOGY
- Passive design techniques, sustainable design practices, biophilic design techniques



SPRING 2014 SCHEDULE

84 DAYS	14 JAN-12 MAY	PROJECT DOCUMENTATION
45 DAYS	11 NOV-27 JAN	CONTEXT ANALYSIS
20 DAYS	14 JAN-10 FEB	CONCEPTUAL ANALYSIS
15 DAYS	19 JAN-10 FEB	SPATIAL ANALYSIS
20 DAYS	03-28 FEB	ECS - PASSIVE ANALYSIS
12 DAYS	10-25 FEB	CONTEXT REDEVELOPMENT
25 DAYS	10 FEB-12 MAR	FLOOR PLAN DEVELOPMENT
28 DAYS	10 FEB-05 MAR	ECS - ACTIVE ANALYSIS
10 DAYS	28 FEB-12 MAR	STRUCTURAL DEVELOPMENT
13 DAYS	28 FEB-18 MAR	ENVELOPE DEVELOPMENT
08 DAYS	03-12 MAR	MATERIALS SELECTION / DEVELOPMENT
05 DAYS	12 MAR-18 MAR	STRUCTURAL REDESIGN
05 DAYS	10-14 MAR	MIDTERM REVIEWS
07 DAYS	10-18 MAR	PROJECT REVISIONS
05 DAYS	17-21 MAR	ENERGY MODELING / SIMULATION
26 DAYS	19 MAR-22 APR	RENDERINGS
08 DAYS	11-22 APR	PRESENTATION PREPARATION
04 DAYS	17-22 APR	PRESENTATION LAYOUT
07 DAYS	18-28 APR	COMPLETION OF MODEL / PLOTTING
00 DAYS	28 APR	COMPLETION OF INSTALLATION ON 5TH FLR
00 DAYS	28-30 APR	THESIS EXHIBIT
03 DAYS	01-08 MAY	FINAL THESIS REVIEWS
06 DAYS	12 MAY	CD OF PRESENTATION BOARDS TO ADVISOR
00 DAYS	16 MAY	FINAL THESIS DOCUMENTATION DUE
00 DAYS	17 MAY	COMMENCEMENT

PREVIOUS EXPERIENCE

YEAR TWO

ARCH 271
FALL 2010 - Joan Vorderbruggen
Tea House (Moorhead, MN)
Boat House (Minneapolis, MN)

ARCH 272
SPRING 2011 - Cindy Urness
Montessori School (Fargo, ND)
Dwelling (Cripple Creek, CO)

YEAR THREE

ARCH 371
FALL 2011 - Mike Christenson
City Museum (Fargo, ND)

ARCH 372
SPRING 2012 - Milt Yergens
Agricultural Research Facility (Langon, ND)
Urban Infill (Fargo, ND)

YEAR FOUR

ARCH 471
FALL 2012 - Bakr Aly Ahmed
High Rise (San Francisco, CA)
DLR Competition

ARCH 472
SPRING 2012 - Don Faulkner
Hope's Journey Master Plan (Jeema, GH)
Fargo Boardwalk (Fargo, ND)

YEAR FIVE

ARCH 771
FALL 2013 - Ganapathy Mahalingam
BWBR Research Collaboration: Implications of Changes to IECC/ASHRAE
(Upper Midwest)

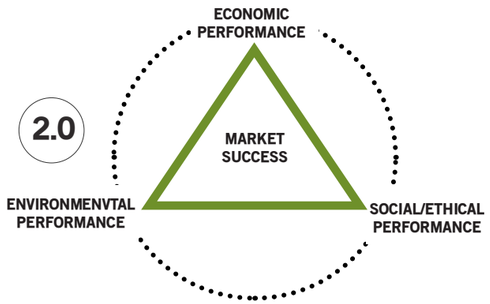
THE PROGRAM
THE PROGRAM
THE PROGRAM

RESEARCH RESULTS / GOALS
THEORETICAL PREMISE/UNIFYING IDEA RESEARCH
TYPOLOGICAL RESEARCH
HISTORICAL CONTEXT
PROJECT GOALS

SITE ANALYSIS
QUANTITATIVE
QUALITATIVE
CLIMATE DATA

PROGRAMMATIC REQUIREMENTS
SPATIAL INTERACTION
SPATIAL ALLOCATION

Design methodology of sole concern for efficiency must should not be a hindrance for design; rather, it enables the development of projects with beyond adequate concern for the end user. This continual struggle between what is easy, less costly and what is of wholesome quality drives the advancement and improvement of architecture.



2.0

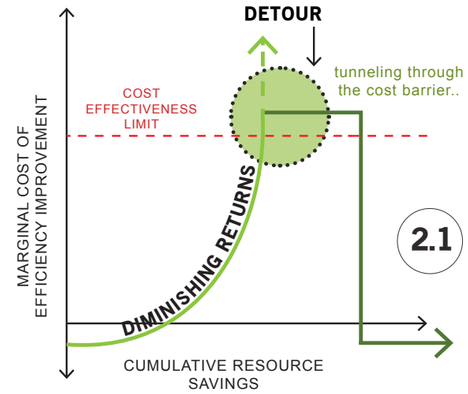
ECONOMICS OF SUSTAINABLE DESIGN

It is critically important for healthcare to learn to adapt its methods, both in practice and design / construction, for “the U.S. health care system is on a dangerous path, with a toxic combination of high costs, uneven quality, frequent errors, and limited access to care”(Guenther & Vittori, 2013). Clearly, healthcare as a whole requires serious examination beyond delivering value to patients.

Of every dollar spent on healthcare, 75 cents are spent on care for chronic diseases, many of which are likely the result of the manner in which we build, the materials we choose, and how we build (Guenther & Vittori, 2013). This link is critical, and though indirectly related to the tremendous costs incurred by the industry, by combining allowing placing equal weight onto three primary issues a hybridized framework of performance may be adopted.The Triple Bottom Line, an ideology which examines and balances socioethical performance with environmental and economic performance. As the American healthcare industry is largely dominated by government-sponsored programs, the industry is actually always engaged in triple bottom line assessments. However, much of the socioethical consideration is preserved while at a heavy economic expense.

With due concern specifically for the environmental performance of healthcare facilities, primary concerns are not typically far from cost. Will the modified, sustainably designed facility ‘cost more’? Whatever the ideal design is compared against must be carefully examined.

Are initial construction costs greater than the initial cost and cost to operate?
What might it cost to not *build a sustainable medical facility?*



2.1

“TUNNELING THROUGH THE COST BARRIER”

Thanks to whole-system engineering, it is possible to save a sizable amount of energy and resources at a smaller cost than saving a small amount of resources (Hawkins, Lovins & Lovins, 1999; Guenther & Vittori, 2013). Common understanding of diminishing returns would recommend that the cost of saving one unit of energy begins to rise at an increasingly steep rate until reaching the limit of cost effectiveness. Beyond this point, any additional expenses are considered unjustifiable, and bring minor benefits.

The tunneling method involves exactly what it implies: by facing the increased costs with low return, in time, the cost will decrease and return on investment increase. Two methods are recommended for achieving a more-for-less outcome. The first requires the design to “integrate the design of an entire package of measures, to that each measure achieves multiple benefits, such as savings on both energy and equipment costs” (Hakwns, Lovins & Lovins, 1999); the entire system must be evaluated as a whole and optimized as such. The second means of tunneling includes piggybacking onto changes or optimizations already in place for other benefits, as optimization for

single components with no regard for others will only "pessimize the whole system" (Hawkins, Lovins, & Lovins, 1999).

Because the theory of diminishing returns is so widely accepted and employed, it is repeated tirelessly time and time again, just as outdated practices may be repeatedly utilized as a result of their predictability and familiarity. To fully optimize and obtain more for less, designers in related fields must develop a new design mentality in order to overcome the counterintuitive nature of tunneling.

Despite the circumstances unique to every architectural project, typical restrictions often remain the same. The typology and user group examined by this thesis are certainly no objection.

Available funding and scheduling can be far more restrictive for federal rather than private building projects. As of 1 March 2013, budgetary sequestration measures were in effect. Anticipating negative effects on the military health care system and environment, Assistant Secretary of Defense for Health Affairs, Dr. Jonathan Woodson, stated that the military health care system will continue to provide health care services for service members, veterans and their families while attempting to fund ventures pertaining to emergent care or directly impact patient safety (American Forces Press Service, 2013), though such attempts will likely be at the expense of the physical state of facilities as funds are redirected. Though care will still be administered, the "delay [of] these medical facility projects only exacerbates the problem, and ultimately the medical staff - and more concerning, the patients – suffer the consequences" (American Forces Press Service, 2013).

HEALER, FIRST AND FOREMOST

Within a world that is so heavily driven by forces of economic feasibility and efficiency, it seems we are lost on creating spaces – environmental or architectural – that create a major human connection or reflect any amount of concern for the human condition. This is detrimental not only to individuals at their weakest, receiving medical care, but even those who are perfectly healthy throughout everyday life.

The connection between health – physical and mental – is undeniably tied to the quality of surroundings. Naturally, our minds search subconsciously for likeness and draw connections between things; this allows individuals to understand and become closer to the environment. When either numbed to this process of connection or the subconscious desire for it subsides, the value of the causal relationship between humankind, health and environment and its due recognition is lost. If the well-being and quality of life are to be preserved for all, careful attention must be given to the creation, care and future development of this mass conglomeration thusly referred to as 'our surroundings' or 'the environment' – a spectrum of scale, inclusive of all things with which we exist alongside – if not also for the safeguarding of our connection to the places in which we do or do not willingly inhabit.

CONDITIONS OF CONCERN

Post-Traumatic Stress Disorder is a highly complex illness, as it often presents as a comorbid disorder frequently alongside anxiety, depression, and substance abuse. With primary symptoms of increased arousal, the need to avoid any potential triggers, and the "recurrent and intrusive distressing recollection of the event" (Gueze, Vermetten, De Kloet, Hijman & Westenberg, 2009), each case is as unique as patients themselves, making the condition even more difficult to properly diagnose and properly treat. A Dutch study published in Depression and Anxiety indicated that patients within the control group scored fifteen times lower on both the Hamilton Anxiety and Depression exams in comparison to those with PTSD; patients with PTSD also "reported greater impairment in social and occupational areas of functioning" (Gueze, Vermetten, De Kloet, Hijman & Westenberg, 2009). If a condition renders a patient incapable of leading a life without complication or normalcy, prompt and adequate treatment is as necessary as that which any non-psychiatric medical condition would require. Though treatment programs for PTSD and related illnesses are continually evolving, it is widely recognized that shared treatment and company between veterans and service members provides notable psychological benefits, as patients are less likely to field alienated or alone in their experience (Garfield & Leveroni, 2000).

"*Belief in the significance of architecture is premised on the notion that we are, for better or for worse, different people in different places – and on the conviction that it is architecture's task to render vivid to us who we might ideally be"*

- Alain de Botton
The Architecture of Happiness

Where architecture may uniquely contribute lies in its quiet influence over its occupants. As triggers vary patient to patient, facilities housing psychiatric care must be carefully designed in a neutral, nonintrusive manner. The potent connection between occupant and environment may be particularly overwhelming and unseen, but the balance is delicate – the balance necessary in order to promote improved patient health, especially for those battling psychological disorders.

EVIDENCE: STRESSORS AND STIMULI

Unwarranted stress on patients in the medical environment is typically the result of improper consideration of spatial use, occupant loads, hours of operation / frequency of use and spatial organization. Where attention is not given to these components of health care facility design, the result is ultimately compromised patient care. When staff and caregivers experience discomfort and stress amplified by the discomforting characteristics of the work environment, patients are susceptible to improper care and often experience similar environmentally-influenced stress; it has become increasingly apparent that “patient well-being is a function of caregiver well-being...studies suggested that high levels of stress and fatigue could have serious implications on performance and patient outcomes” (Pati & Barach, 2010). Access to windows, permeation of natural light into most frequently occupied spaces, improper artificial lighting, noise and spatial proximity – to other caregivers, patients and the physical size of occupiable spaces – all contribute to stress endured by facility occupants. This stress leads to increased heart rate and blood pressure while also negatively impacting the ability of the immune cells to ward off infection, and contributes to lack of sleep over prolonged periods (Sternberg, 2009).

EXPLANATON: EVOLUTIONARY, GENETIC AND PSYCHOLOGICAL

Psychological responses to environmental characteristics – and various stimuli – are deeply rooted in genetic and evolutionary adaptation, as well as cultural influence. Just as unique components of culture vary, so too does perception and formation of experience. According to anthropologist Edward T. Hall, “people from different cultures...what is possibly more important, inhabit different sensory worlds. Selective screening of sensory data admits some things while filtering out others” (Hall, 1969). Our created environments – architectural and urban – are representative of this screening and filtration. As expected, the uniqueness of internalization and synthesis of stimuli is unique to every single individual – even within the confines of shared culture – and vary “with location, the weather, and the time of day – the physical elements of space - but also with our moods and our health. Our sense of where we are continually being created and re-created in our brain, depending on current conditions and on our memories”(Sternberg, 2009). Though many often deny our likeness to our animalistic counterparts. Humans bear similar likeness to other creatures of the wild but have learned to grow our cognitive abilities. As evolution was shifted from our bodies to what anthropologist Weston La Barre refers to as “extensions of his organism”, we have shifted the evolutionary process to develop at a highly accelerated speed. The “extensions” of oneself have so developed our primarily animalistic nature is overlooked, along with relational closeness to the natural world (Hall, 1969). In essence, humans have established a new dimension of culture; this dimension allows “both man and his environment [to] participate in molding each other...man is now in the position of actually creating the total world in which he lives...in creating this world, he is actually determining what kind of organism he will be” (Hall, 1969). According to Steven Kellert, renowned research scholar and Professor Emeritus of Social Ecology at Yale University, “the brain evolved in a biocentric world, not a machine-regulated world... it would be therefore quite extraordinary to find that all learning rules related to that world have been erased in a few thousand years, even in the tiny minority of peoples who have existed for more than one or two generations in wholly urban environments”(Kellert, 1993). Our “machine-regulated world” as human-created “extensions” has brought us to lose sight in our biophilic tendencies and direct reliance on the natural world; degradation of this dependence on nature encourages the likelihood of a “deprived and diminished existence...not just materially, but also in a wide variety of affective, cognitive and evaluative aspects” (Kellert, 1993). In attempting to accommodate and tread lightly around patient needs with the understanding that each individual internalizes and forms perception uniquely, how can an environment be designed to exist in a neutral form? Is a sense of neutrality perhaps the only manner in which these spaces can be most effectively employed?

SOLUTIONS: EXAMINATION OF PROXEMICS

Proxemics, or nonverbal communication including haptic, kinesics, vocalics and chronemics, provides tremendous insight into the perception of space. As distance receptors, of the eyes ears and nose, the eyes are considerably more powerful when internalizing and

transmitting perceived stimuli. When “Comparing the size of the nerves connecting the eyes and ears to the center of the brain…the optic nerve contains roughly eighteen times as many neurons as the cochlear nerve…the eyes may be as much as a thousand times as effective as the ears in sweeping up information” (Hall, 1969).

Recognizing the typical body’s primary reliance eyesight and secondary reliance on hearing, spaces which maximize peer visibility and physical proximity where caregivers may document, oversee and adjust patient care accordingly improves patient care and allows caregivers to more easily coordinate and provide secondary aid where needed. It is recommended that “simply shaped unit configurations that permit as much distal visibility as possible, corner locations of any caregiver work stations within the support core, and back stage corridors linking caregivers stations may be designed within the core space”(Pati & Barach, 2010). Distal proximity is so critical to all patient care that the lack of or difficulty in observing patients is one of the primary factors attributed to affecting patient care and facility failure, according to a study involving 20 American representative hospitals.

Though many cultures may have proxemics which commonly vary in intensity and in the role of perception, Americans in particular “in the use of the olfactory apparatus…are culturally underdeveloped”, as it is culturally assumed that most odors are unpleasant and must be stifled. Aromatic dullness may contribute to experiential and varietal deprivation, as smell is known to evoke deep – if not more powerful – triggers of memory than that of vision or sound. Where Hall finds this olfactory deprivation to be detrimental to the character of American civilization – “by banishing all but a few odors in our public life, what have Americans done to themselves and what effect does this have on life in our cities?” (Hall, 1969) – within the context of this thesis, absence of smell may contribute to an ideal neutrality, or sensory safe-zone.

The immediate receptors, the skin and muscles, provide humans with an entirely different form of spatial understanding. These two sensory systems supporting the skin and muscles map space in a drastically different manner, but are typically intertwined and mutually reinforce one another. Proprioreceptors, nerves which provide feedback enabling the body to move smoothly, “occupy a key position in kinesthetic space perception” (Hall, 1969). The exterioreceptors, nerves within the skin, communicate sensations of temperature, pain and touch to the central nervous system. While the haptic realm does not seemingly possess the overload of internalized stimuli as that of sight, it relays messages innate to human nature; it is interwoven and inseparable with the visual-spatial experience. To visualize the location of an adjacent body is a fairly superficial level of interaction; to physically engage and internalize physical characteristics is entirely another.

“*Think of man as surrounded by a series of expanding and contracting fields which provide information of many kinds...we can then begin to learn about behavior...”*

- Edward T. Hall
The Hidden Dimension

So long as specific concerns are addressed, the creation of a medical facility is a far more reachable possibility than most are aware. Though greater costs for lesser returns must be periodically endured, the project will earn a return on investments, and so shall industry as a whole. As these methods also encourage the balance of economy, environmental sustainability and socioethical responsibility, building performance, healthcare costs and quality of patient care may all be fairly addressed. Healthcare should not simply look to current design models for removal of that which is negative, but the addition of that which is positive and above baseline needs.

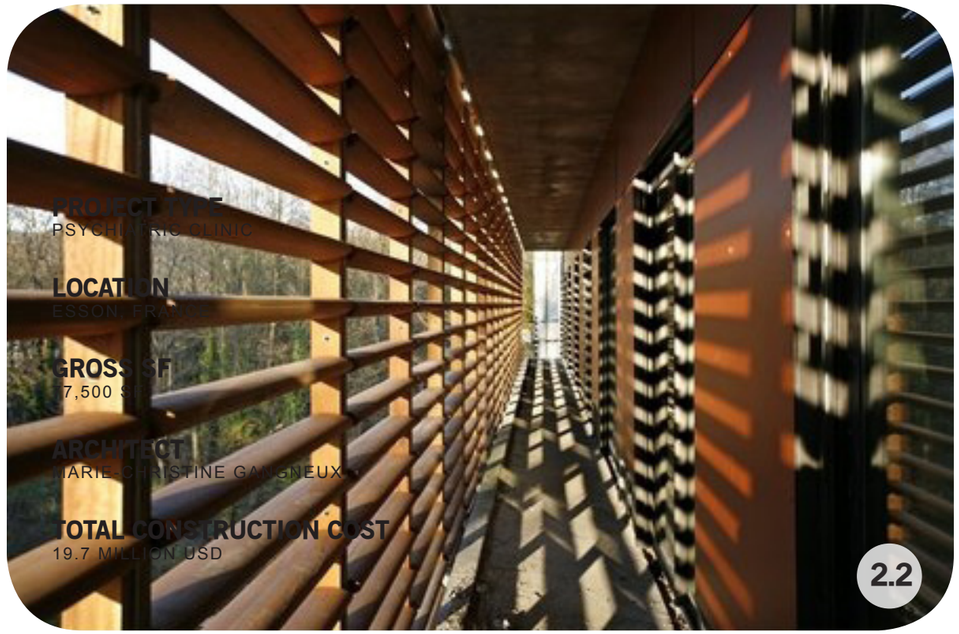
Ultimately, there are two critical misunderstandings of a human’s sense of space. First, that there is a single identifiable cause for every effect; second, the human’s boundary ends with the skin. The means of determining the spatial context and security of man is perhaps most revealing of that which determines individual perception. The need to for proper orientation in space, society and life is a deep one; this knowledge and security is linked ultimately to the survival and sanity of man.

TYPOLOGICAL RESEARCH

POLE PSYCHIATRIQUE de BURES SUR YVETTE
ESSON, FRANCE

HOSPITAL COGNACQ-JAY
PARIS, FRANCE

PSYCHIATRIC HOSPITAL
UPPSALA , SWEDEN



PÔLE PSYCHIATRIQUE de BURES SUR YVETTE

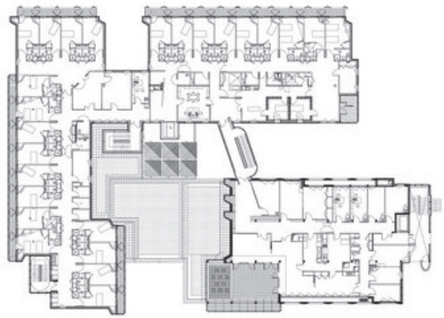
Two existing industrialized buildings built in the 1960s were partially demolished and integrated into the development of Pole Psychiatrique, which houses three departments of the Psychiatry of Orsay's Hospital. The site contains a 17th century manor and its park..

The project stretched physical capabilities and design limits in determining the boundary between the indoors and outdoors. Defining this flexible boundary also allowed architect Marie-Christine Gangneux to lessen burdensome energy consumption, common to the healthcare typology. The immediate solution were variations of a double skinned façade, perhaps the most striking element of the project. It stands boldly with little or no concession for the past; instead it gives meaning to the critical situation of nature in the role of prolonged psychiatric care. The typical wall assembly is highly complex; it is clad in iridescent resin that shifts depending on lighting conditions and amount of solar radiation received,

On the south and west facades are horizontal wood ladders which provide balconies for the adjacent rooms and loggias. The north borders the lawn of the castle; it is an energetic, dynamic glazed skin. With kaleidoscopic echoes of the adjacent buildings and woods, it is clearly the most drastic element of the project. The permeability of spatial boundaries is examined in order to provide improved occupant comfort. With varied designs of double-facades, psychiatric parents are able to view the neighboring woods they are unable to visit, alleviating the ever-present

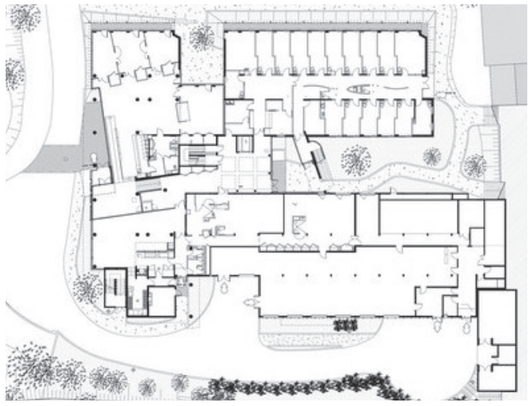
boundary between the patient's quarters and the outside world. A therapeutic garden, flower lawn and diverse occupational therapy rooms were provided to aid in active rehabilitation. Existing park facilities were also renovated and adapted for patients to better live their stay at Bures.

Though physically a separate facility, Poles Psychiatrique at Bures exhibits connectivity with sister facilities and the community. In-house amenities are utilized not only by the admitted psychiatric patients, but by staff, visiting family, patients beyond the psychiatric wing and the community. Pole Psychiatrique also provides service support for the Orsay hospital: solar energy warms hot water for a central kitchen which serves the nursing school, Bures and Orsay.



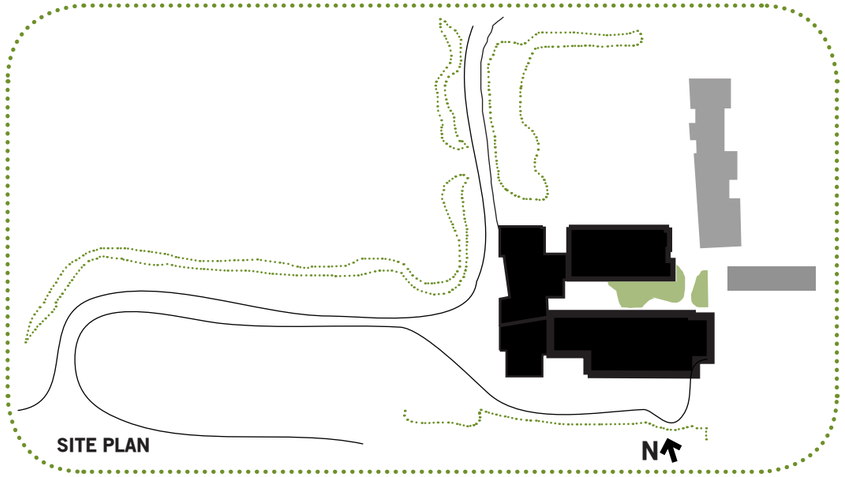
TYPICAL UPPER FLOOR PLAN

2.6



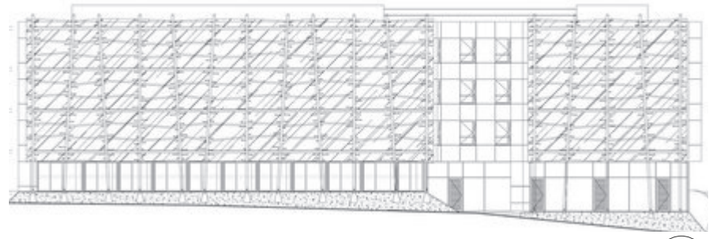
MAIN FLOOR PLAN

2.7



SITE PLAN

N

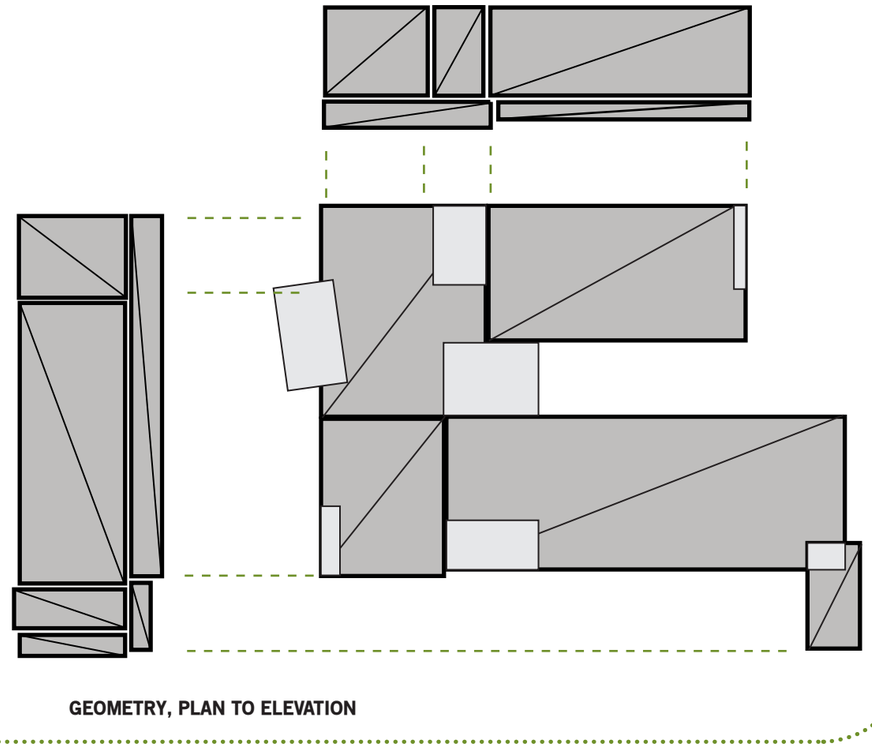


SECTION B

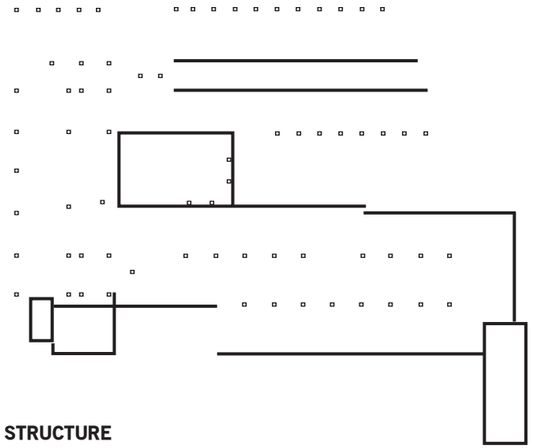
2.8

SECTION A

2.9

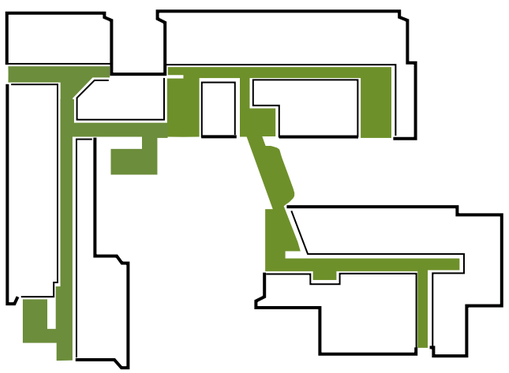


GEOMETRY, PLAN TO ELEVATION

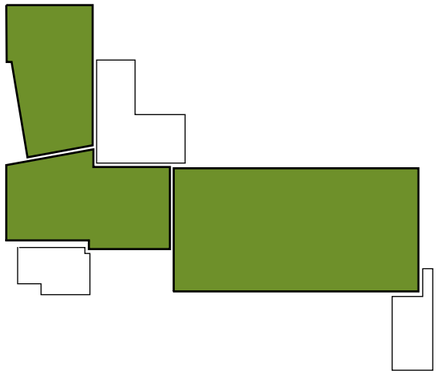


STRUCTURE

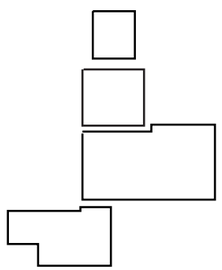
CIRCULATION, GROUND FLOOR



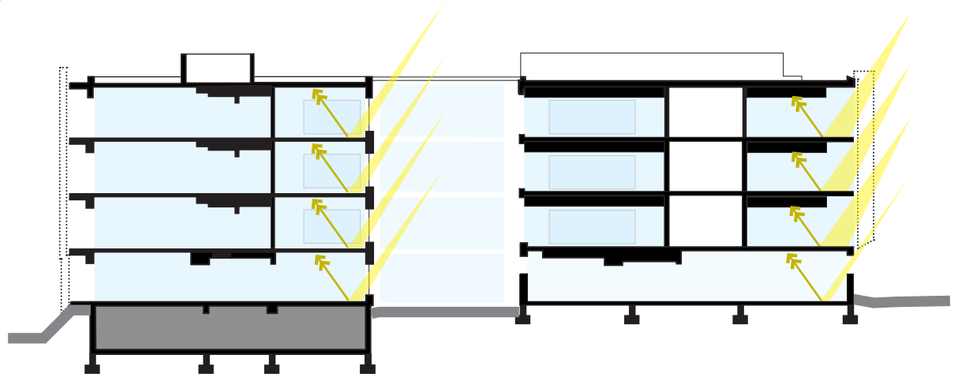
CIRCULATION, UPPER FLOORS



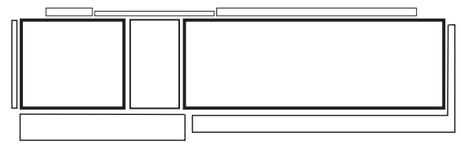
MASSING, GROUND FLOOR

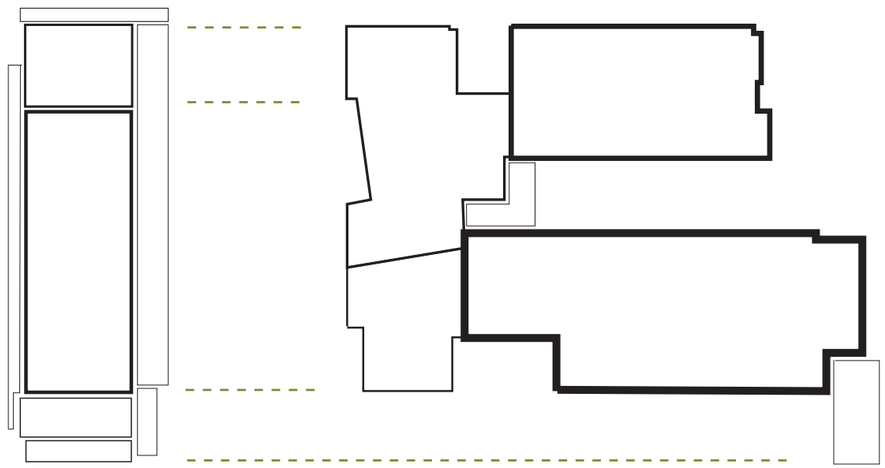


MASSING, UPPER FLOORS



NATURAL LIGHT





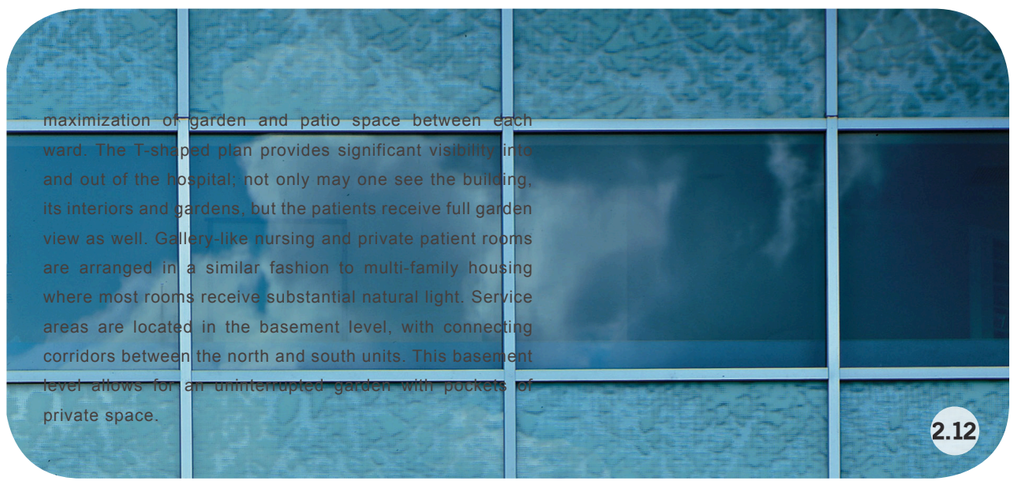
HIERARCHY, PLAN TO ELEVATION

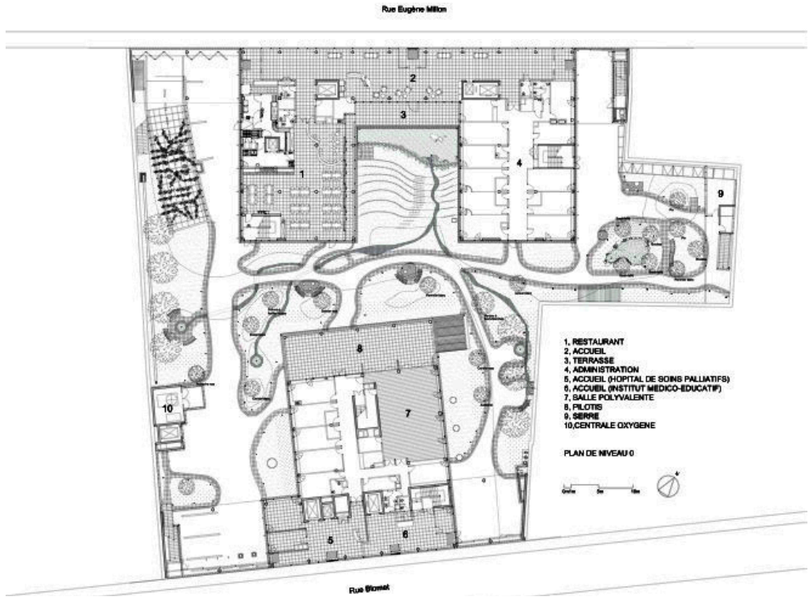
HOSPITAL COGNACQ-JAY

Located within the 15th district Paris near the Eiffel tower is the site of this private hospital with a 100 year history. The design of the rebuilt Hospital Cognacq-Jay, as with Pole Psychiatrique, has little concession for the historic district in which it is situated. The hospital is settled independently amongst its neighbors, as the district is primarily residential with few other hospitals intermixed. In his speech for Hospital Cognacq-Jay, architect Toyo Ito explains his methods of trading historical likeness or replication for transparency and fluidity: “this building needed to relate to the urban context, in order to be built and situated in Paris…the façade is covered entirely with glass…I don’t consider glass to be a hard, stiff, frozen material…[it] can be used to create a certain softness”.

An international design competition was held for Cognacq -Jay’s redesign, as a need for greatly improved patient care, rehabilitation and hospice services was expressed. In order to control the potential undesirable growth of the building’s future footprint, the hospital’s rigid program was determined for participating competitors.

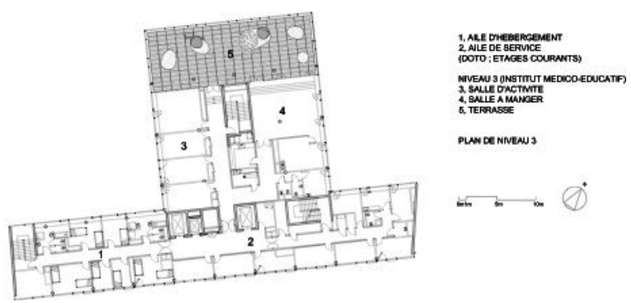
Wings of the hospital branching from either street to the north and south of the facility allowed for greater





MAIN FLOOR PLAN

2.13



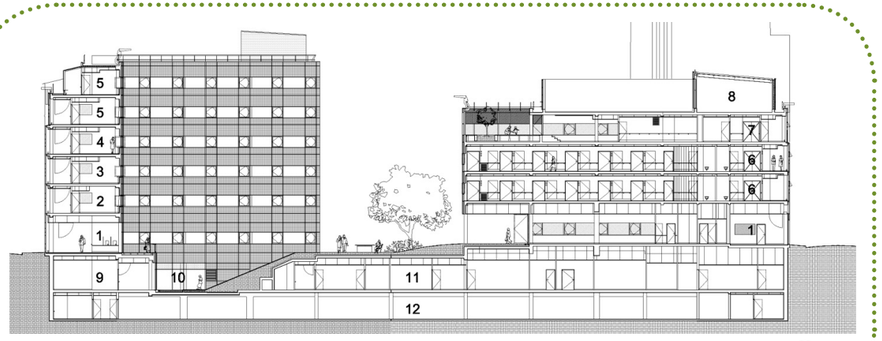
SECOND FLOOR PLAN

2.14

SITE PLAN

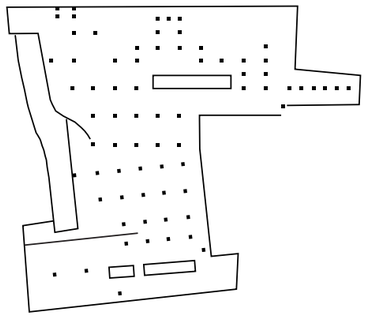
SECTION - ELEVATION A

2.15



SECTION - ELEVATION B

2.16

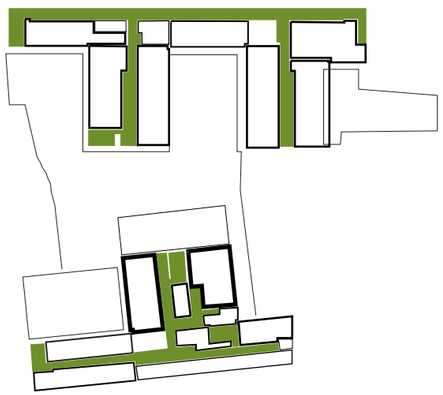


STRUCTURE

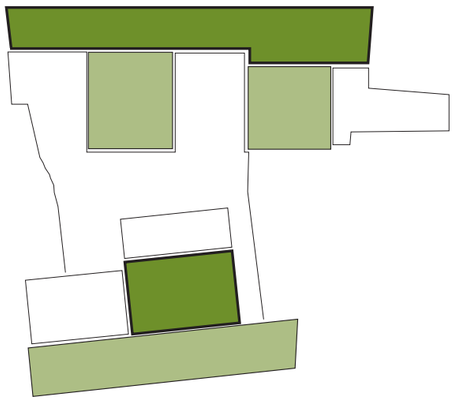
GEOMETRY

CIRCULATION, GROUND FLOOR

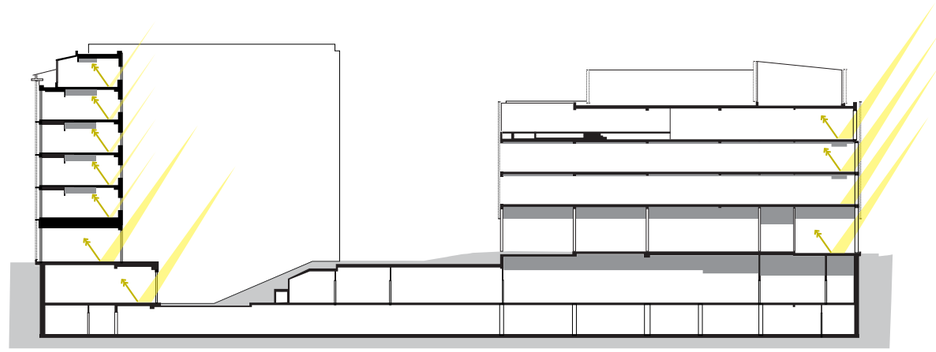
MASSING, GROUND FLOORS



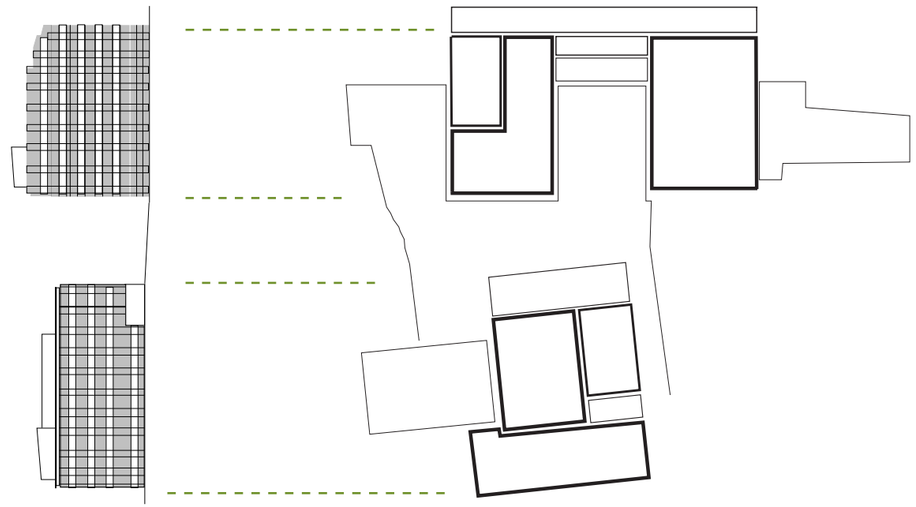
CIRCULATION, UPPER FLOORS



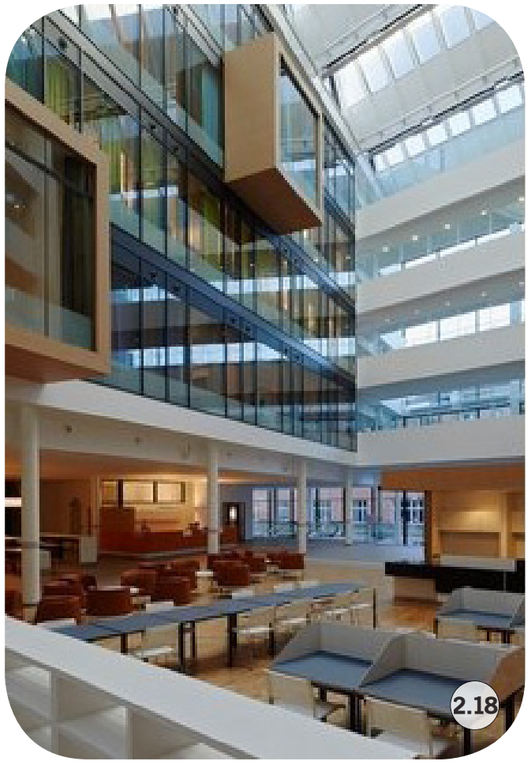
MASSING, UPPER FLOORS



NATURAL LIGHT



HIERARCHY, PLAN TO ELEVATION



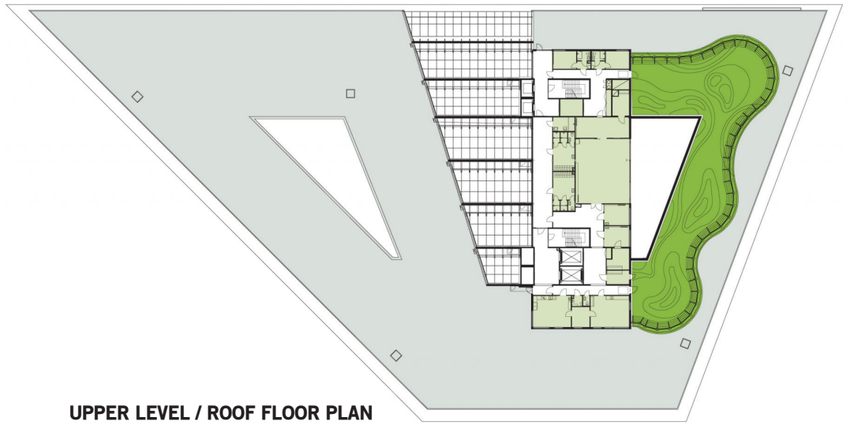
THE PSYCHIATRY BUILDING UPPSALA UNIVERSITY HOSPITAL

With the aims of diminishing and easing illness, Tengbomgruppen AB took the opportunity to design Pyschiatric Hospital of Uppsala as a facility to demonstrate the transition “from hospital to hotel” in the field of medicine. As medical innovations are ever-increasing, as is the understanding of environmental psychology and its role in patient recovery.

The benefits of minimized color palette and material selection in the Psychiatry Building are twofold: in future, it secures the flexibility and sustainability of the facility for functions other than its originally intended use, and provides a muted, neutral visual environment for those receiving care. Visual variation is introduced only in furnishings, fabrics, fixed and moveable art. Comparable to Pole Psychiatrique at Bures, patient rooms feature balconies creating an uninterrupted, glazed shell around the inner facade of the facility. This in combination with large clerestory windows over a centralized, unifying atrium allow natural light to penetrate into the core of the building. With ample natural light and lowered visual barriers to the outside environment so that patients feel less removed and detached while during hospital visits – a practice also employed by Pole Psychiatrique. Beyond the adjustment of visual barriers, spatial barriers are designed so that patients may gradually acclimate to varying levels of privacy and social interaction.

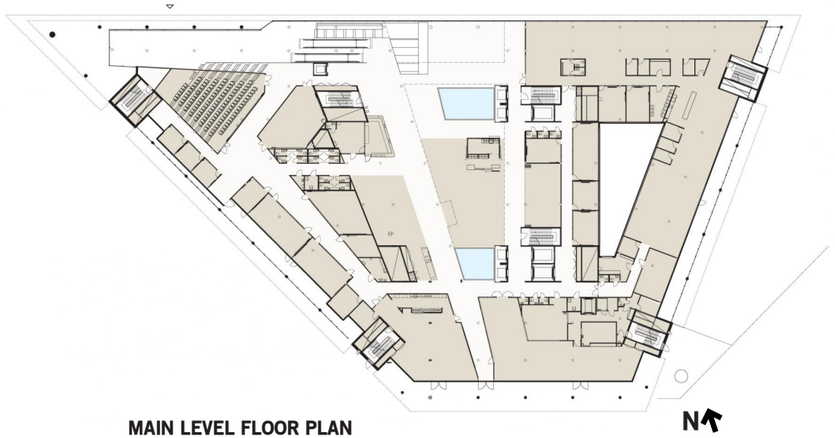
Both in- and out-patient care are offered at the Psychiatric Building on the Uppsala University Hospital Campus.

The building’s structure remains nearly the same from floor to floor. Lower level facilities include somatic care services, intensive / trauma care, and a psychiatric observation ward. Reserved for patient use are activity spaces on the penthouse level with access to a large terraced roof for rest and relaxation. The main level – where public access is permitted – houses a library, café, teaching and lecture halls. Research and teaching breakout spaces are distributed throughout each floor near courtyards in order to “improve psychiatric care processes, create clear connections with somatic care, and to integrate research and teaching into patient care” (The Psychiatry Building).



UPPER LEVEL / ROOF FLOOR PLAN

TYPICAL DEPARTMENT FLOOR PLAN



MAIN LEVEL FLOOR PLAN

N

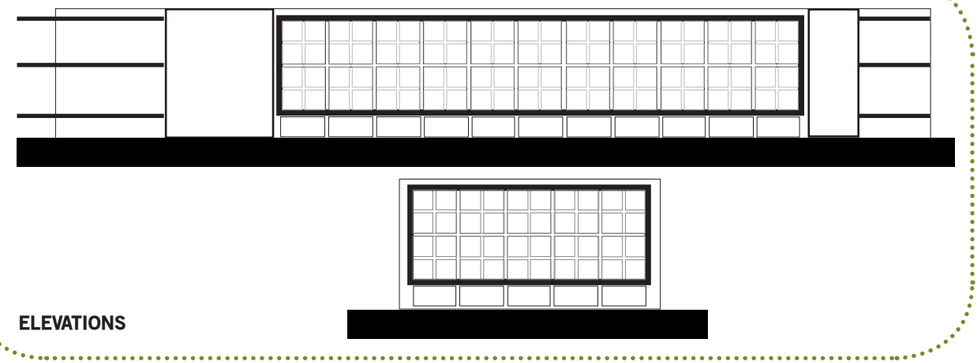
2.2

SITE PLAN

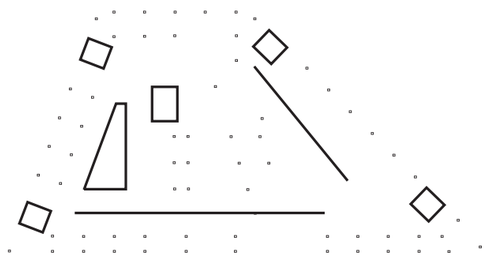
N

SECTION A

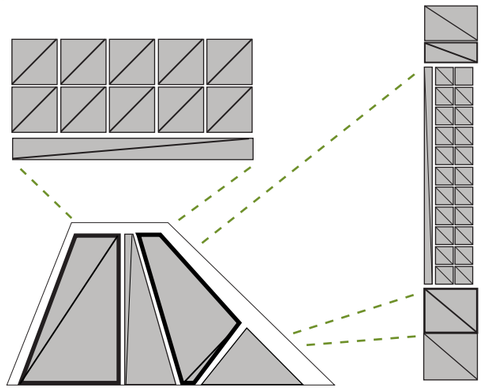
2.21



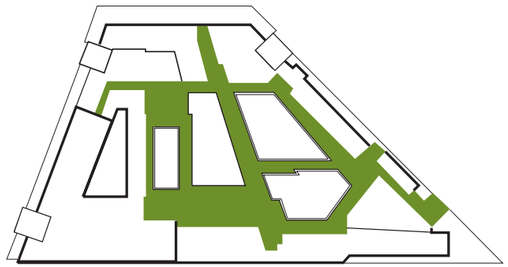
ELEVATIONS



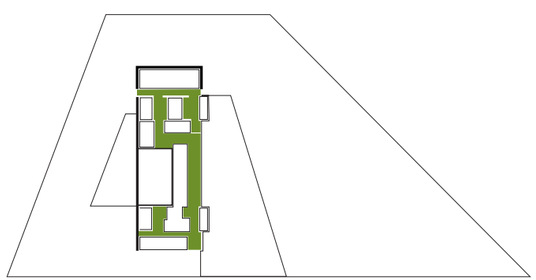
STRUCTURE



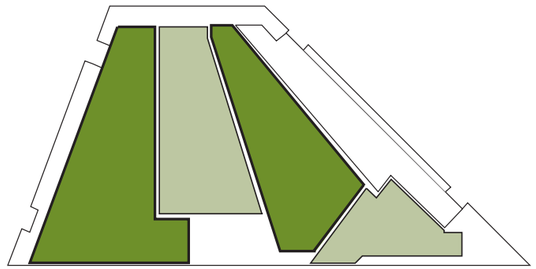
GEOMETRY, PLAN TO ELEVATION



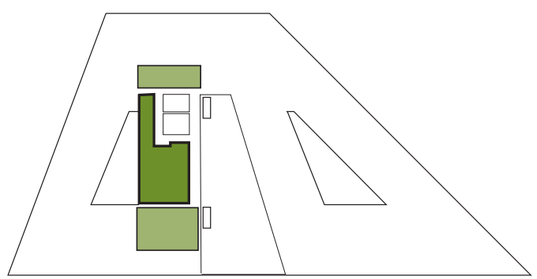
CIRCULATION, GROUND FLOOR



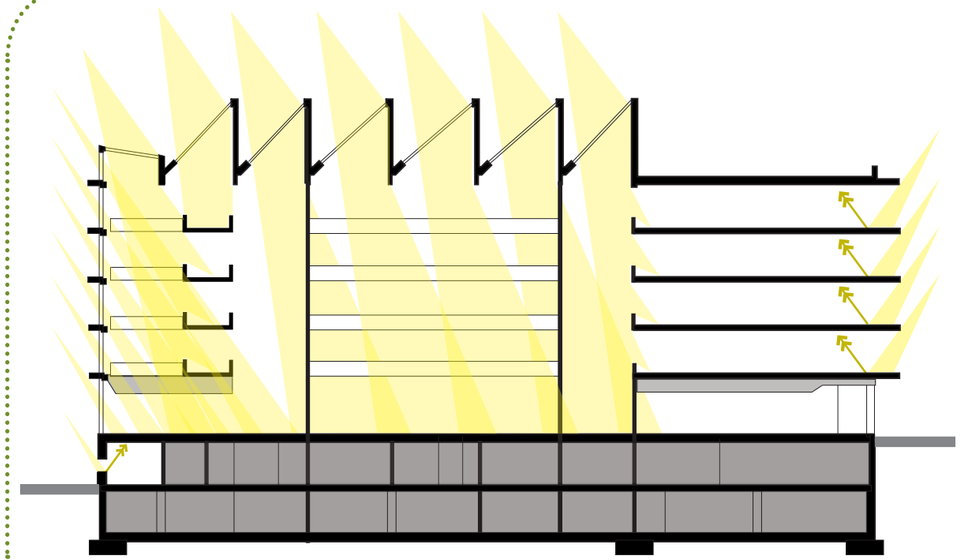
CIRCULATION, UPPER FLOOR



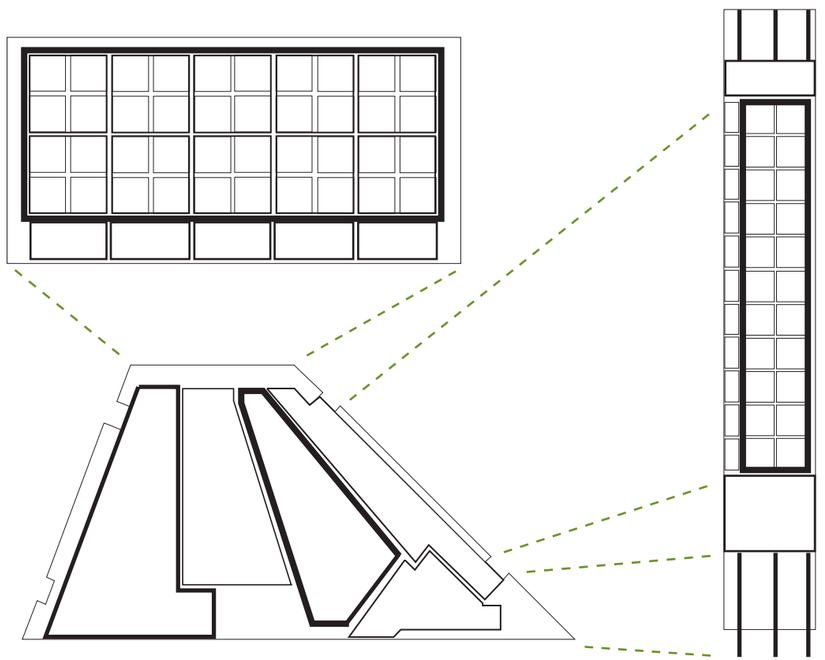
MASSING, GROUND FLOOR



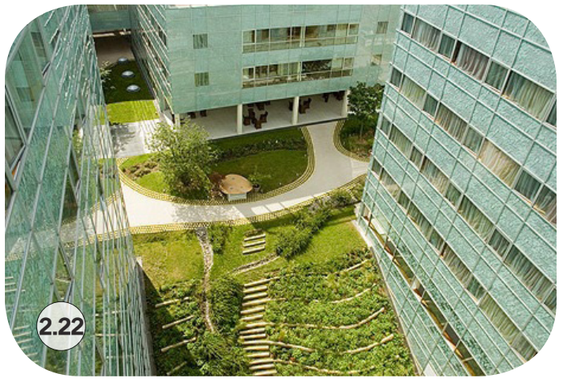
MASSING, UPPER FLOOR



NATURAL LIGHT



HIERARCHY, PLAN TO ELEVATION


2.22


2.23


2.24

TYPOLOGICAL RESEARCH SUMMARY

POLE PSYCHIATRIQUE

+

HOSPITAL COGNACQ-JAY

+

THE PSYCHIATRIC BUILDING

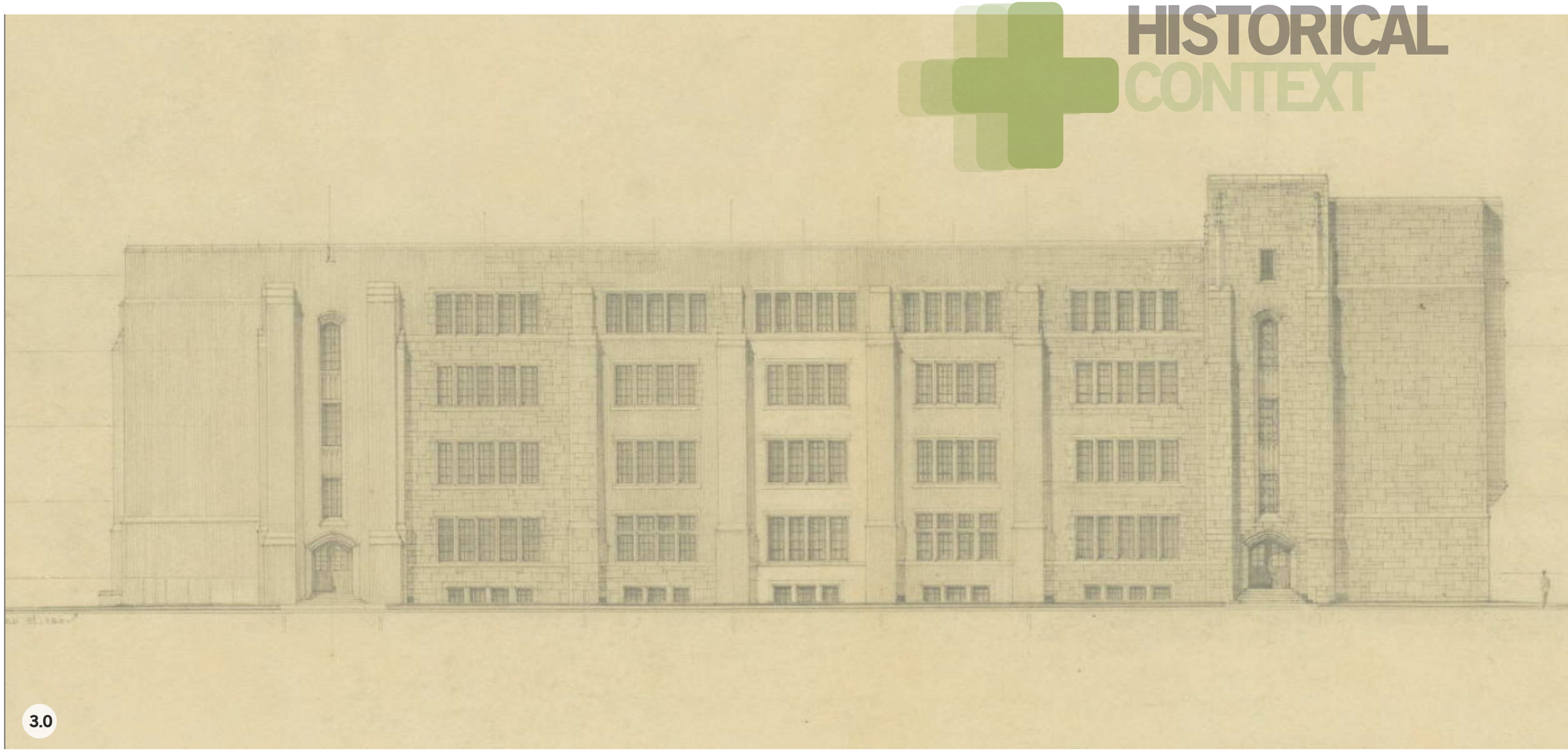
Despite the substantial variation in scale, the three primary case studies each explored the manner in which spatial boundaries are visually defined. Apparently, it is commonly assumed that – when hospitalized–conscious patients must desire to recall their sense of belonging in society, and need a reminder of connection to society. Isolation and confinement, it would seem, are hindrances to the recovery process.

How were these spatial boundaries defined? At least one intermediate buffer zone was placed between patient rooms and either the common means of access to adjacent spaces or the exterior wall of the facility, or both. This buffer acted also as a passive design element, often pulling natural light into patient rooms and adjoining spaces. Material selection too was critical in daylighting spaces and defining boundaries between private, semi-private and public space. Plan-to-section diagramming provided substantial insight into these spatial relationships and the way in which they may facilitate daylighting.

Connectivity is displayed also in each facility's connection to their existing campus and community context in both design image and functional connectedness. None of the three primary case studies made considerable nods to their historical surroundings or predecessors. Rather than attempting to honor the surviving context through weak modernized replication, each facility proudly represented its unique present-day image against varying settings. Was macroculture a determinant in community connectivity? Interestingly, one French facility - Pole Psychiatrique - encouraged the public use of available amenties where the second - Hospital Cognacq-Jay - appeared to allow only visual transparency to the public, heavily concerned with privacy at all levels.

Unlike the examples studied, Keller Army Community Hospital is not situated on a medical campus of these scales, nor is it a component of a larger immediate medical center. What might this indicate of the hypothetical success of the Warrior Transition Unit? Is the scale and relationship to a medical chain-of-command and outreach crucial to clinic effectiveness?

HISTORICAL CONTEXT



3.0

THE GATEWAY TO THE CONTINENT

West Point's location was crucial to its appeal for an army garrison; following the American Revolution, the small garrison was maintained and existing buildings preserved. Once an isolated location – still rugged and a picture of natural, gigantic beauty – its patriotic associations made it the ideal location to establish a military academy.

On a belt of granite forming a deep fjord, this location was a critical divide between New England and the southern colonies; command of the Hudson Highlands meant control of both river and road traffic along the riverbank. If the colonies were to succeed in their plight against Great Britain, control of West Point must be maintained at all costs; otherwise, communication lines, transportation of food, goods, munitions and troops would be compromised (Forman, 1950). In order to ensnare the British from future attack – following an encounter with General Clinton in 1777 from New York City – a 140 to 150 ton chain was forged and drawn from West Point to Ft. Constitution, present-day Constitution Island (Forman, 1950). Ft. Arnold, renamed Ft. Clinton following Benedict Arnold's defection to the British, was the main fortification located just below the Plain; to the west located on the high ground was Ft. Putnam. The last attempt by the British to overtake the Highlands in 1779 brought General Washington to relocate his headquarters to West Point in order to carry out necessary defense commands until late November 1779 (Forman, 1950). Shortly thereafter, Major General Benedict Arnold would arrive at West Point and begin negotiations with British Major John André to sell the Post and defect. Had Arnold been successful, the outcome of the American Revolution may have been drastically different.

THE UNITED STATES MILITARY ACADEMY

Countless military leaders of the Revolution – Gen. Benjamin Lincoln, Gen. Washington, Baron von Steuben, Gen. Jedidiah Huntington – all insisted on the importance of an established military academy; each submitted proposals of locations and academy organization (Forman, 1950). Gen. Washington's final annual message to Congress called for the creation of such an academy.

Shortly after President Jefferson took office, foreign affairs quickly worsened. With piracy of trade ships carrying American goods in the Mediterranean, and uncomfortable relations with France, Jefferson quickly pushed for the appropriation of the Academy in 1802. The organic act of the United States Military Academy was passed by Congress on 16 March of that year.

3.02

MILITARY INSTRUCTION + PHILOSOPHY

Upon entering the military academy, cadets take the oath, and in exchange for a free education must serve a minimum requirement of five years active duty service as a commissioned officer in the United States Army. For the past two hundred years, Cadets have been academically trained by the Thayer Method, a philosophy which leaves cadets responsible for their own learning. Material to be discussed in class must be studied prior to attendance; this material is then reinforced through a combination of active and group learning exercises.

The Thayer Method was established by former Superintendent Sylvanus Thayer, known as the 'Father of the Military Academy'. Thayer's role as superintendent was critical to the success of future cadets; prior to his time at West Point, physical and academic standards were not yet established. Any standards in place were considered lax and ineffective. The academic curriculum was modified to support highly technical professions. Engineering, technical drawing and mathematics were cornerstones of the curriculum.

THE CORPS OF ENGINEERS

Though the presence of army engineers in several hard-fought battles of the American Revolution was evident, the Corps was not officially established until 1802, by which point Congress had established the United States Military Academy at West Point. For a great deal of time, West Point was the single engineering school in the country, and directly commissioned USMA graduates into the Corps.

It was the hope of Congress to create a Corps of Engineers that would oversee military construction, as well as infrastructure development and coastal reinforcement (U.S. Army Corps of Engineers, n.d.). In 1863, the Corps of Engineers and Corps of Topographical engineers were combined.

Following World War II, work completed by the Corps had moved in an unusual direction. The Corps oversaw construction of Nike, Atlas, Titan and Minuteman missile sites, Veterans Administration hospitals, various NASA facilities and armed forces recruiting centers. Meanwhile, work abroad included the revitalization of the Greek transportation and communication network, restoring key ports and canals, along with over 3,000 kilometers of roadway (U.S. Army Corps of Engineers, n.d.). These accomplishments marked the early development of the Corps' first district abroad.

3.03

While the work of the Corps still calls for the maintenance of the nation's public works, the call for infrastructure development does not necessarily require the extent of large construction and maintenance operations as before; rather, it requires "new management techniques, new approaches and new technology to use our resources more efficiently and to reduce resource depletion" (U.S. Army Corps of Engineers, n.d.).

POST HOSPITAL HISTORY

Ground was broken for the construction of the existing hospital on 16 August 1974. A 65-bed facility, available services include allergy and immunization, dermatology, family practice, general surgery, infection control, internal medicine, nutrition care, OB/GYN, ophthalmology, optometry, orthopedics, physical therapy and radiology ("Our History", n.d.). The Cadet Health Clinic, also under the umbrella of KACH's operations, is located off-site in Building 606. The main hospital and Building 606 are the only two buildings in use for medical care at West Point.

The first hospital to serve Post was on the opposite side of the Hudson River and two miles to the south. Known as "Robinson House", it was established in 1778 under the direction of Dr. James Thacher, and was destroyed in 1892 (Reeve, 1904).

In 1824, Gridley's Tavern was purchased by the government for ten thousand dollars and was converted into the Cadet Hospital. The tavern was once a civilian home, "the Old North House", near the Post library. In order to expand available care, a new stone Cadet Hospital with an area of 5200 square feet was later built in 1830 ("Our History", n.d.). Under the command of Dr. (Major) Walter Wheaton, the first hospital commander, eight caregivers staffed and lived in the hospital. A new Cadet Hospital was later built and completed in 1884; in 1960, this hospital was demolished in order to make way for Lee Barracks.

Through this period of the Academy's history, the only available medical care was for cadets. It was not until 1851 that a modernized hospital was built for enlisted and post employees. With two floors and a basement – each at 1400 square feet – the facility housed four wards, a kitchen and dispensary ("Our History", n.d.). This hospital was rebuilt in 1892 and remains in place today, near the Post cemetery.

THE BALANCE OF PASSIONS

Countless cultures have looked upon the occurrence of mental illness with an unfriendly and condemning eye. Greek, Roman and Egyptian ancient writings state

entirely different approach. With any disease – mental or physical – the cause was due to improper physiological function, rather than unseen spiritual or personal forces. In combination with naturalistic observations, ancient science and philosophy, Hippocrates and his followers explored emotions as mental phenomena, uncovering complex connections to both physiology and pathology (U.S. National Library of Medicine, 2011). With this understanding, Hippocrates developed his 'rule of thirds', where one third of patients fail to respond to treatment, one third highly benefits from the same treatment, and the remaining third heals on their own (Frances, 2013).

Though the notion has proven a fairly dependable and reasonably accurate assumption, more valuable is the example the rule demonstrates: the ultimate goal of medicine is, first and foremost, to "diagnose and treat only when there is a favorable risk/benefit ratio – to let people heal themselves when they can; to console those for whom there is no effective treatment, and to reserve risky treatments for those who need and can benefit from them" (Frances, 2013).

Hippocrates also utilized his theory of the four humors - black and yellow bile, phlegm and blood – to determine where the body was out of balance and was essentially failing to maintain equilibrium. Imbalances of the humors were used to determine both physiological and emotional distress. At this time, the humors provided classical medicine a "reductionist bias – the humors were used to explain more complex phenomena like emotional states in much simpler physical terms"(U.S. National Library of Medicine, 2011). Galen, the more theoretically-minded medical authority, further utilized Hippocrates' theory of the four humors, but determined that another dimension ought to be added. The non-naturals, or the "passions or perturbations of the soul" (U.S. National Library of Medicine, 2011), where equally as necessary for balance and equilibrium alongside the four humors in order to preserve health. A fellow rabbi, physician and philosopher, too insisted that "'it is known…that passions of the psyche produce changes in the body that are great, evident and manifest to all. On this account…the movements of the psyche…should be kept in balance…and no other regimen should be given precedence'"(U.S. National Library of Medicine, 2011).

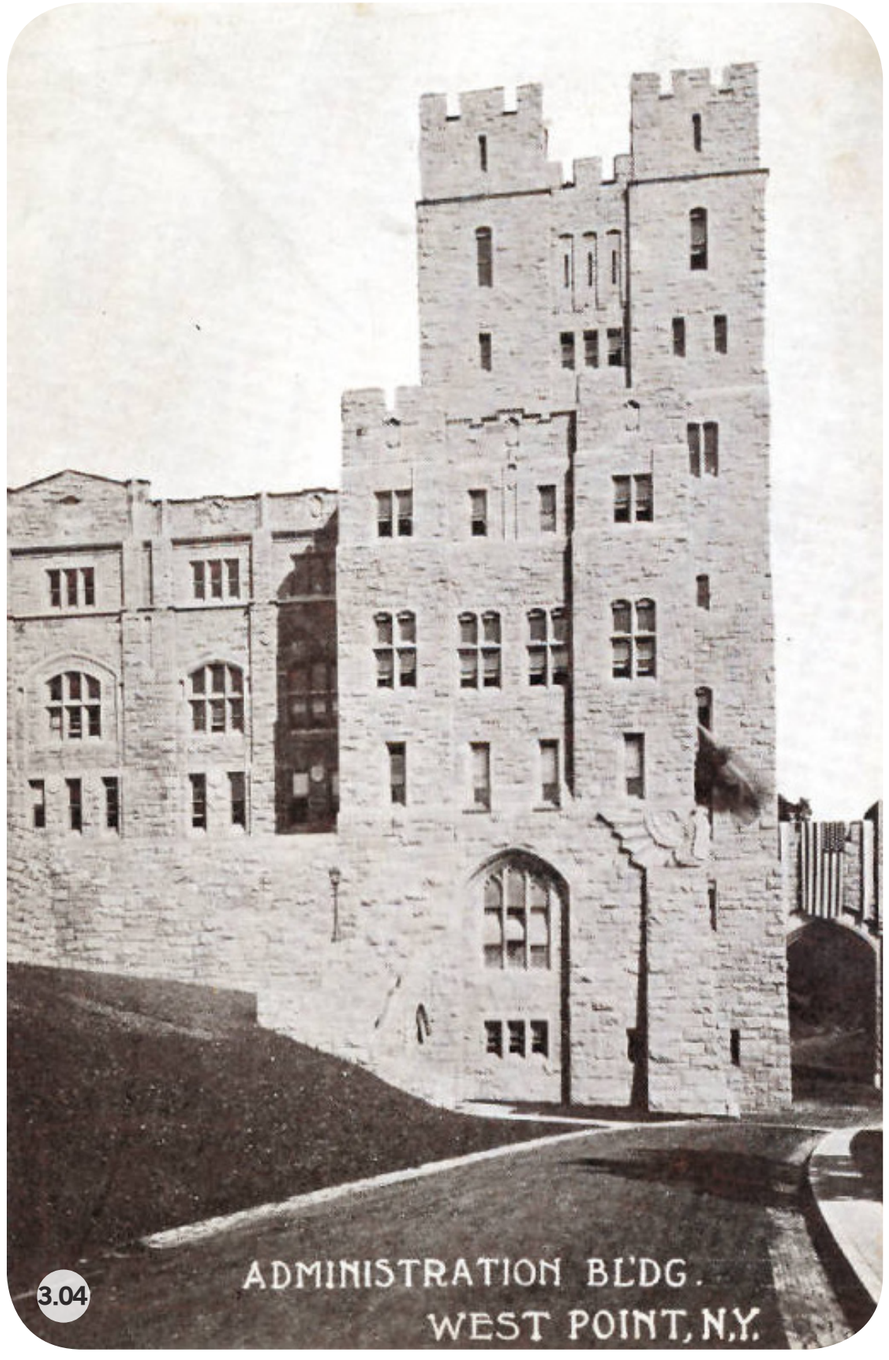
From the Renaissance into the nineteenth century, there was increased popularity of emotional understanding and the potential physical havoc wrought when unchecked. As understanding of the human anatomy at a microscopic level grew, the notion of "organismic unity implicit in classical and early modern medical theory" (U.S. National Library of Medicine, 2011) was disjointed; emotions grew increasingly distant from disease. In the mid-nineteenth century, two physicians performing post-mortem dissections began to examine the central nervous system in hopes of unearthing a physiological connection to extreme emotion and mental disorders. As the nervous system is highly complex, physicians Cullen and Whytt found no visual lesions or noticeable defects (U.S. Library of Medicine, 2011). The examination of likely functional disorders of the nervous system became an area of major clinical studies.

"The physician should make every effort that all the sick, and all the healthy, should be most cheerful of soul at all times, and that they should be relieved of the passions of the psyche that cause anxiety."

- Moses Maimonides (1135 - 1204),
The Regimen of Health

TO DEINSTITUTIONALIZATION

The mid-nineteenth century brought serious attention to the living conditions of the mentally ill, and by the end of the century, the U.S. government funded the construction of 32 state psychiatric hospitals ("A brief history", 2013). At the time, the inpatient treatment model was regarded as the most effective means of managing these conditions. Though the initial motivations for establishing mental health institutions were to improve living conditions and to provide ample access to care, patients still faced tremendous human rights violations and poor living conditions. With the development and increased popularity of antipsychotic medications across the globe, the push for deinstitutionalization soon followed as a community-care approach. The shift from institutionalization to deinstitutionalization was transformative for the nature of modern-day psychiatric care. The Community Mental Health Centers Act of 1963 enacted the closure of state psychiatric hospitals opened only decades earlier. Admission was strictly limited to those "who posed an imminent danger to themselves or someone else"; as a result, admitted patients dropped from a high of 560,000 in the 1950s to 130,000 by the 1980s ("A brief history", 2013). While there have been several reported patient benefits from deinstitutionalization – adaptive behaviors, friendships, patient satisfaction – while others report exactly the opposite. Though there are greatly polarized views of methods which are more effective and beneficial to the patient – in or outpatient – most healthcare professionals, families



3.04

and advocates agree that a “combination of more high-quality community treatment programs (like intensive case management) and increased availability of intermediate and long-term psychiatric inpatient care for patients in need of a more structured environment” (“A brief history, 2013); patients must be thoroughly assessed and administered treatment in accordance to the severity of symptoms, rather than committing all to an institution or all to loose, community-centered outpatient care.

MENTAL HEALTH IN MODERN MEDICINE

Tremendous leaps have been made in the diagnosis and treatment of mental disorders in the past 50 years following the introduction of antidepressant and antipsychotic medications. Though they remain primarily palliative than curative – easing and alleviating symptoms rather than eradicating the source – developments provide greater potential for improved symptom control, functioning and quality of life (Drake, Green, Mueser & Goldman, 2003).

The prevailing model for understanding severe mental illness has since shifted from a psychosocial model which stressed parental and intrapsychic influences to biopsychosocial model which stresses biological and psychosocial influences (Drake, Green, Mueser & Goldman, 2003); as focus has shifted to also consider biological dysfunctions, it follows that a portion of a patient’s treatment plan may include pharmacotherapy. In addition to pharmacotherapy, methods of psychotherapy and assertive community treatment may be employed. Psychotherapy, various forms of mental health counseling, operate in a structured individual or group setting. Effective for various disorders is Cognitive Behavioral Therapy (CBT), which includes methods of cognitive therapy and behavioral therapy. By moderating a person’s thoughts as they influence moods and behaviors and individual actions, maladaptive thought processes and behavioral patterns are improved (“Treating Psychological Disorders”, 2012). Alternatively, Assertive Community Treatment (ACT) combines several care services: individual therapy, crisis / hospital services, rehabilitative services, substance abuse therapy, medication delivery and skills lessons for family members. Typically, ACT is best suited to individuals with severe mental illness to such an extent that patients can no longer function independently.


PROJECT
GOALS

PERSONAL, PROFESSIONAL & ACADEMIC

Sensitivity to *place* ought not be understated.

As much of my architectural education has continued to remind me, the places in which we dwell, the environments in which we reside hold tremendous influence over us – which each design project of my education has managed to remind me. The consequences of seemingly inconsequential design decisions still possess the capacity to incite feelings slight or intense. We each have interacted with this unnerving connection between 'myself' and 'place'. How could I not possibly desire to better understand this interaction?

Though a basic knowledge of environmental psychology is beneficial to arguably any field of study, it is most certainly the case for architecture and its related professions. I believe it the duty of all architects, ultimately, to recognize this power.

Though my the future of my career path remains unknown, I hope to have developed a commendable solution of which I am proud - and will begin to lay the groundwork for future investigation.

However, I recognize the place and relative insignificance of a design thesis; I do not approach the complexities of the tangled web of concerns surrounding my chosen typology and user group in a light manner, nor do I progress with the belief that I may for certain find any solid resolution.

Above all else, it is my hope that the results of my research, final design, and connection drawn between typology, user group and major current events shall in some way contribute to the pursuits of future students.

I wish that any such student with concern for larger overarching issues of today - current economic climate, global diplomatic affairs and international relations - will find the impetus necessary to draw new conclusions and shed light upon overlooked or not yet unearthed opportunities and perspectives.

3.06

SITE ANALYSIS

3.07

Located on the western edge of West Point, the site Keller Army Community Hospital is located near the west end of Washington Road with undisclosed Post services and Storm King Highway 218 to the rear, single and multifamily housing to the south, and West Point elementary to the east.

Finally in the late evening, the sunlight had begun to dissipate as the sun slipped to the west of the mountainside. The day had been unbearably humid, blindingly bright and intolerably hot. Even for an instant, passing clouds themselves seemed unable to pass before the scorching sun – and certainly not long enough to grant the mass crowds a moment's relief.

It was Acceptance Day weekend of August 2012, where new cadets were welcomed into the Corps of Cadets following completion of basic training. This was my second visit - much alike my first only weeks before.

The air was still damp but had cooled considerably, and the damp surrounding moss and ferns of the nearby forests had a distinct scent all their own. A rose-colored sky slowly began to fade as dusk was settling in; the pomp and circumstance of recent activities had not yet ceased. No surprise, as every activity is somehow ceremonial at West Point. Faintly in the distance is the West Point band, every few notes carry to where I stood at Trophy Point. Completely captivated by the view upriver it seems perfectly likely that on such a still evening, Sousa marches could be heard had I stood across the Hudson on Constitution Island. Parents, grandparents, brothers and sisters of new cadets still wandered the area, snapping photos, laughing and carelessly enjoying the late summer evening as if time might hopefully stop, or pause just for a moment longer – and in this fortress community, a separate world, it seems almost as if it may - so that the cherished moment shared with their cadet may not draw to such a quick close. Even still, I cannot make out what it is exactly that sets West Point apart from society. It stands as a memory of another time, where fanaticism and nationalism flourished in a manner far different than today.

"I believe it is a memorable experience for any American citizen to visit this institution, which for nearly 150 years has contributed so much to the growth and the traditions of our nation. Nowhere else can we find our country's history more vividly symbolized and reflected than in these few acres, and in the careers of the men who have studied here."

- Frank Pace,
Fmr. Secretary of the Army

QUALITATIVE + QUANTITATIVE

HUMAN INTERACTION / DISTRESS

Apart from intermittent vehicular traffic and trauma transportation via ambulance or helicopter, distress or disruption in any form is primarily construction and excavation. The present construction and excavation process extends from the north facade of the existing hospital into the northernmost parking lot.

LIGHTING QUALITY

While there are a sizable amount of mature trees on the site of Keller Army Community Hospital and the neighboring sites, more influential to the number of daylight hours are the Hudson Highlands; almost immediately to the west-northwest is Crow's Nest, at an elevation of 1,407 feet. From early morning to mid-afternoon, there is ample direct sunlight as there are no immediate impeding landforms to the east; landforms to the south are a large enough distance from the site to permit abundant southern sunlight.

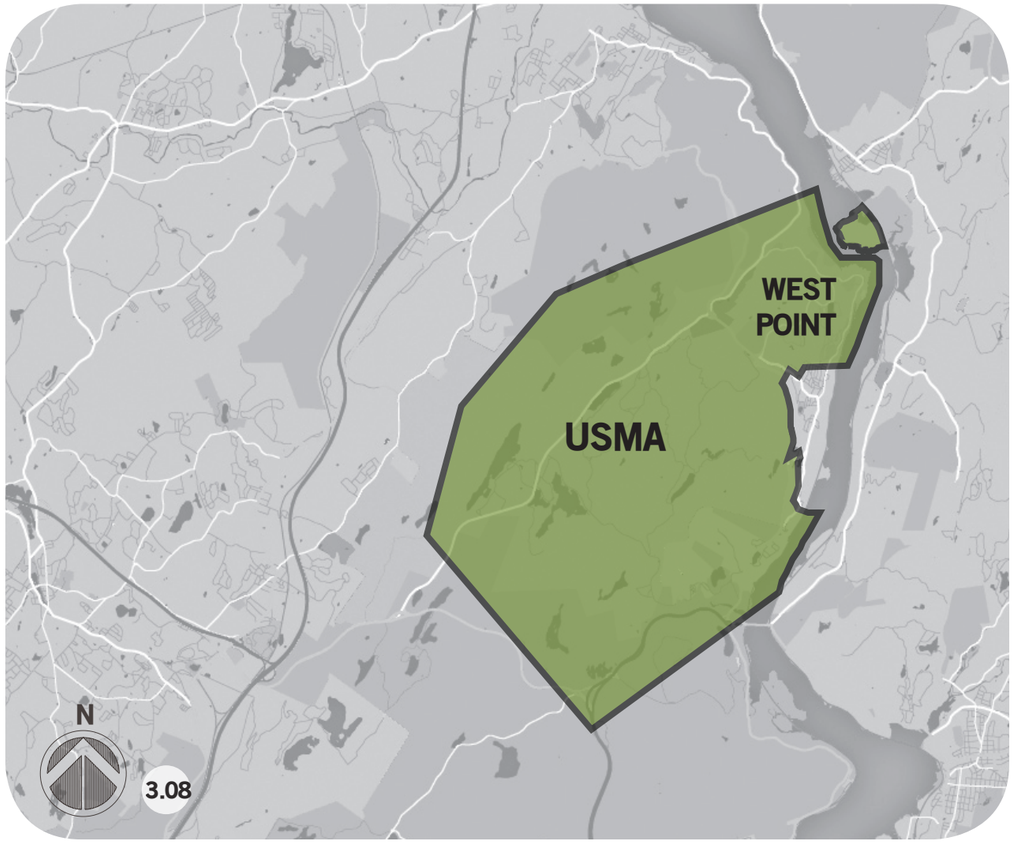
VEGETATION / ECOLOGY

The Hudson River Valley is regarded as a region of tremendous ecological and geological diversity. Vegetation of the Hudson River Estuary corridor is prmarily deciduous forest. Within the Hudson Highlands area a proportionally greater presence of Sugar Maple-Mesic Forest, Oak and Appalachian Oak-Pine Forest than anywhere else in the state of New York. Many deciduous species within the Highlands are subject to disease and deadly pests leading to continuous forest composition changes. Appalachian Oak-Pine Forests were once comprised mainly of the American chestnut, common to the forest. Following the introduction of an Asian fungus in the early 20th century, the population was decimated, leaving behind mere stumps of decomposing trunks. In present-day, the American chestnut has been replaced within Appalachian Oak-Pine Forests by chestnut oak, sugar maple and red oak. Forest floors in nearby low-lying lands with deep leaf litter and uncompacted soils (i.e. inceptisols) are remnants of that which has once covered large portions of the Hudson River Valley.

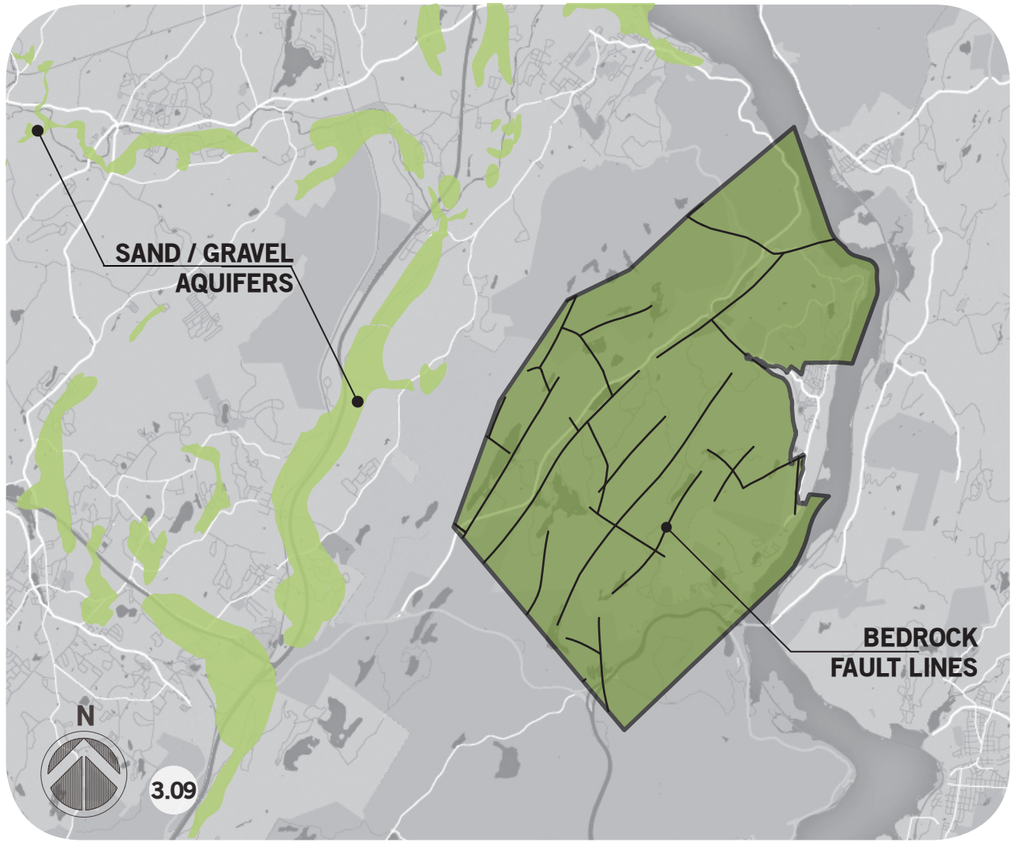
WATER

The source of Crow's Nest Brook is located in the Hudson Highlands near the south slope of Crow's Nest Mountain. Also referred to as Saw Mill Creek or Saw Mill Brook, a clear, slow trickle of runoff from the Highlands enters the west-southwest end of the site and feeds two retention ponds at the main entry of the hospital. The brook continues eastward, and empties into the Hudson.

LEGAL BOUNDARY



SAND / GRAVEL AQUIFERS & BEDROCK FAULT LINES



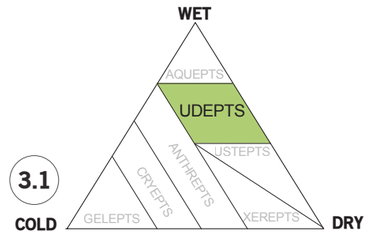
TOPOGRAPHY

Within a branch of the Appalachian Highlands known as the New England Upland are the Hudson Highlands. Located on the Reading Prong of the New England Upland, the Highlands are almost entirely comprised of Precambrian igneous and metamorphic rock; beneath are rock formations believed to be in excess of one billion years old, perhaps the oldest known in the United States. Highest in elevation and the most exaggerated topography of the Highlands are at the northernmost tip of the range, with Storm King and Crow's Nest Mountain on the west bank and Breakneck to the east.

SOILS

Udept Inceptisols

The site – along with much of the state of New York - sits upon Inceptisol soils typical of areas with cool to warm, humid and subhumid climate regions. The largest deposits of Inceptisols are located in the Appalachians and southern New England, but are widely distributed throughout the United States. Inceptisols are often found and develop on steep slopes where the soil is circulated elsewhere by soil erosion, but may also develop on gently sloping convex areas. Typically, inceptisols are moist and immature due to lack of intermittent drying and are composed of very fine



sands or loamy very fine sands. Subsurface horizons, or layers within a soil profile, are faintly developed. Given the tremendous vertical instability of inceptisol soil, landslides are not uncommon in mountainous, humid locations. Most Udept suborders support forest vegetation with mixed shrub and grass vegetation. In the eastern United States, these are hardwood forests.

UTILITIES

All utilities on site are below ground.

Beginning in 2004, the Defense Energy Support Center in conjunction with the United States Army privatized the water distribution system and wastewater collection of West Point. West Point's Water Treatment and Distribution Systems includes the Lusk Water Plant, Stony Lonesome Plant, and Camp Buckner Plant at 4, 2 and .3 MGD, respectively. Water supply lakes within the area's watershed include Lake Popolopen, Lake Stillwell, Mine Lake, Long Pond and Lusk Reservoir.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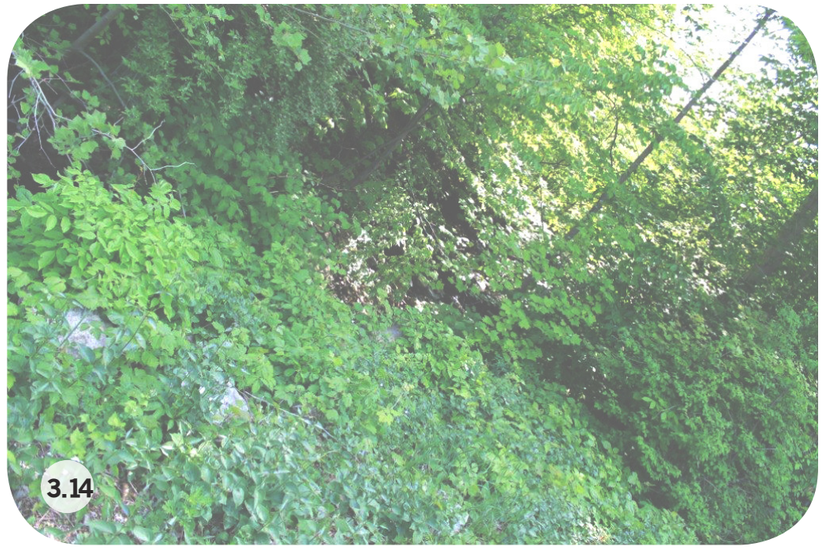
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DENSITY / BUILT FEATURES

KELLER ARMY COMMUNITY HOSPITAL

FIRE STATION

UNIDENTIFIABLE POST SERVICE

HOUSING

SCHOOL & RECREATION

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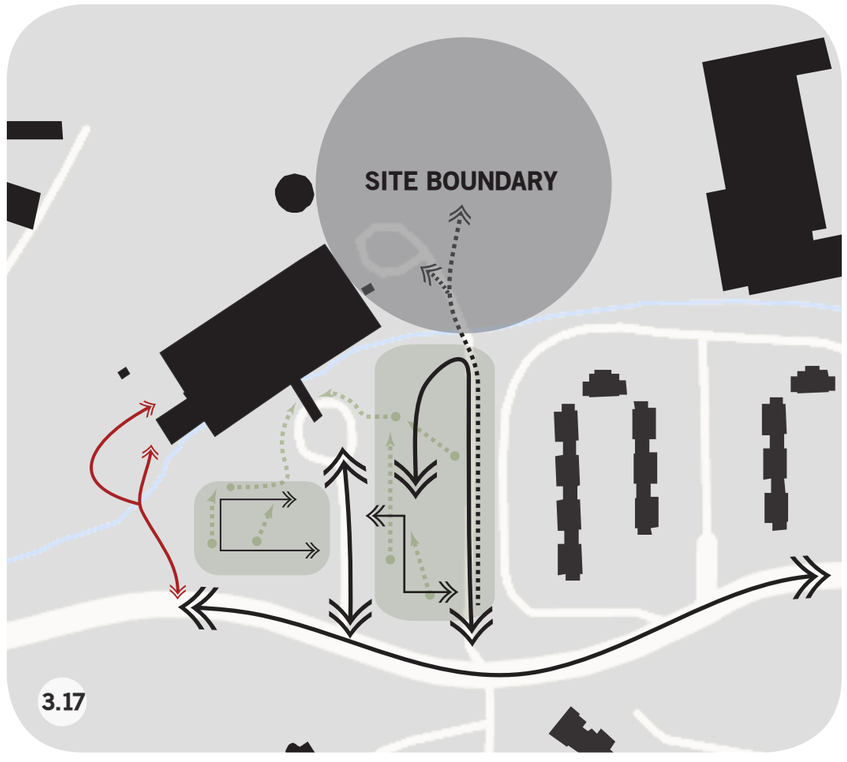
VEHICULAR / PEDESTRIAN TRAFFIC



PEDESTRIAN

EMERGENCY SERVICES

TYP. VEHICULAR

CONSTRUCTION SITE VEHICULAR

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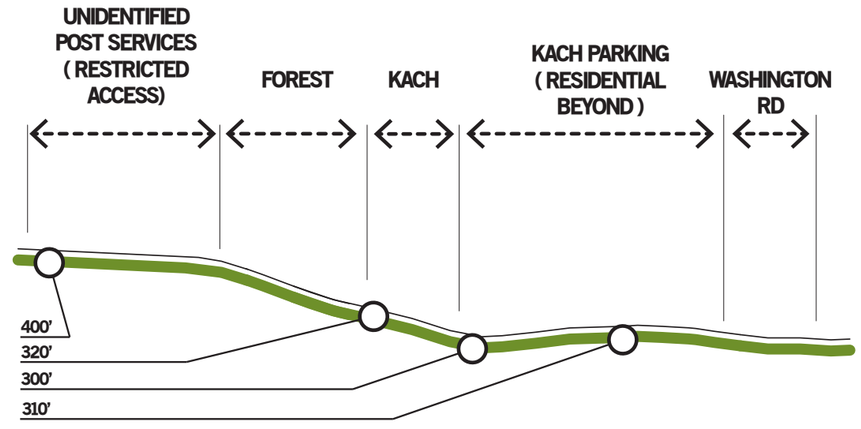

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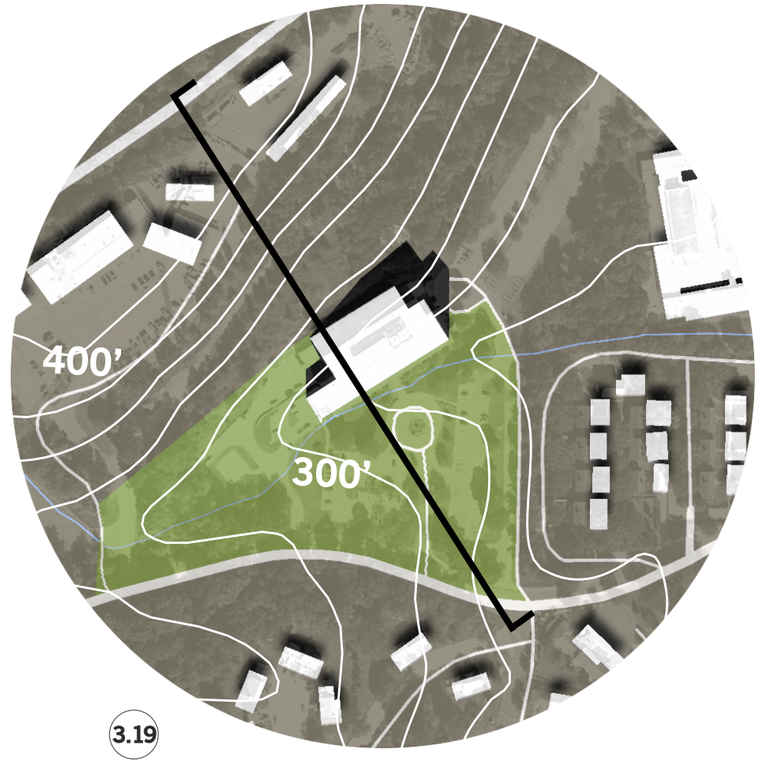

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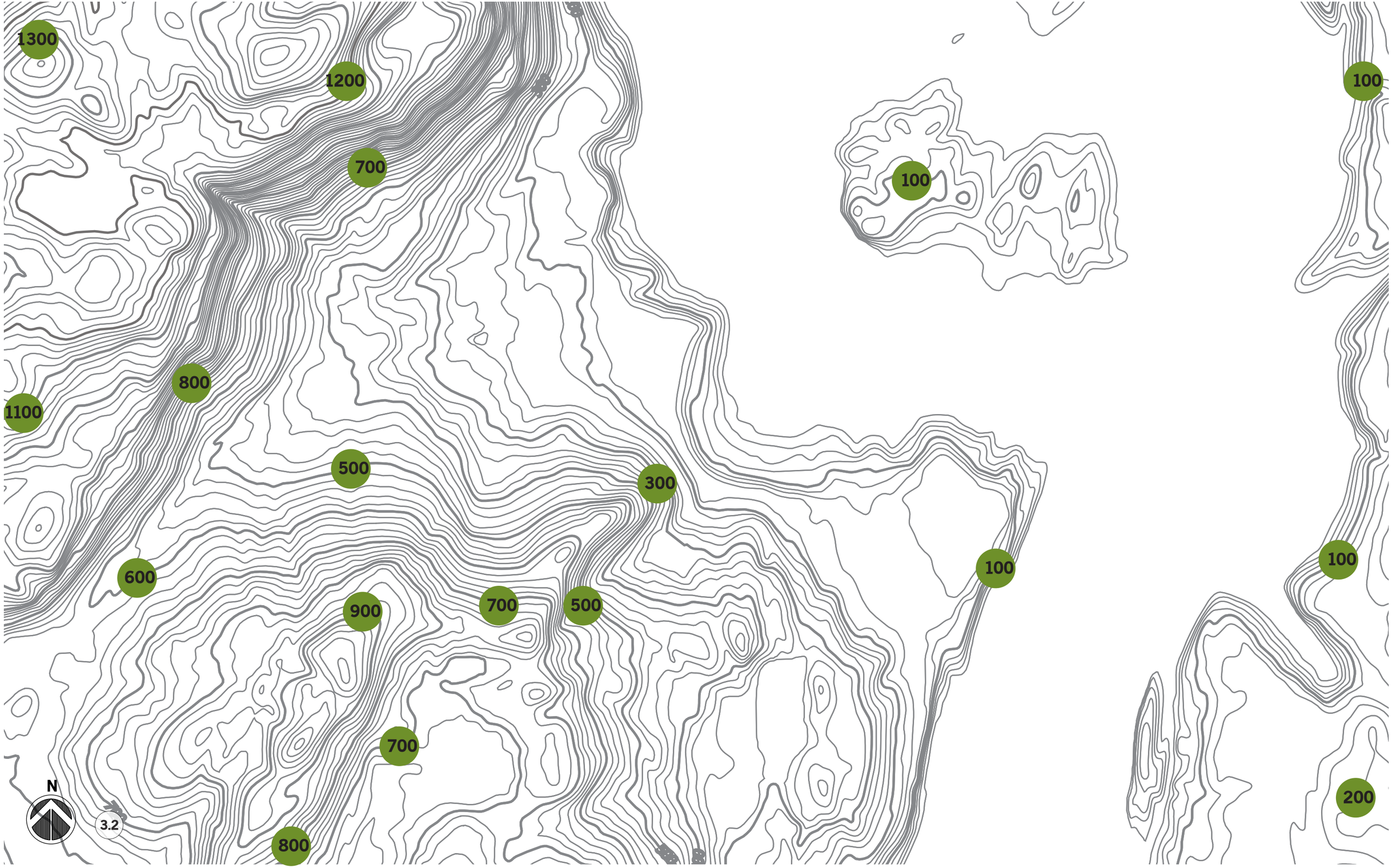
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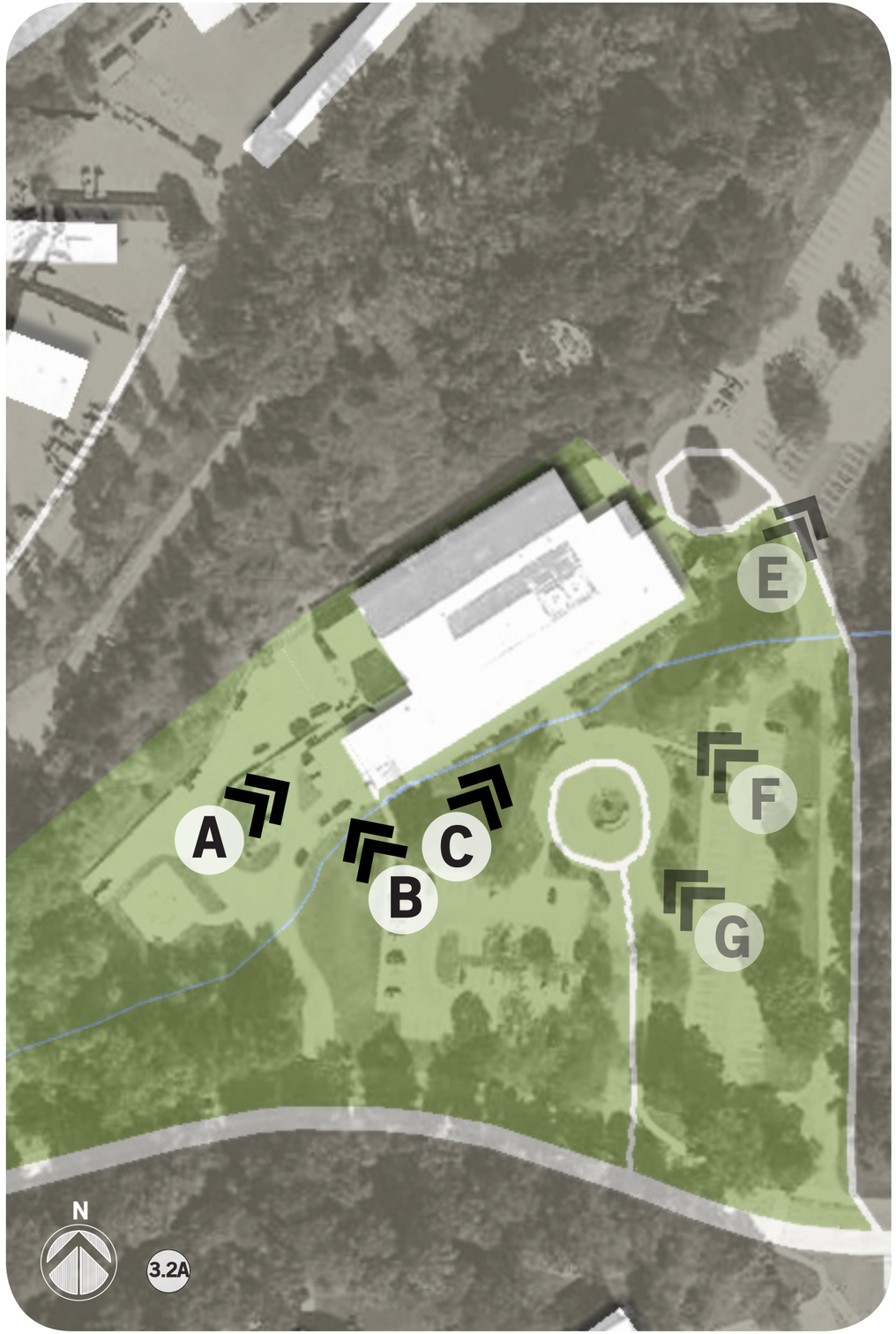

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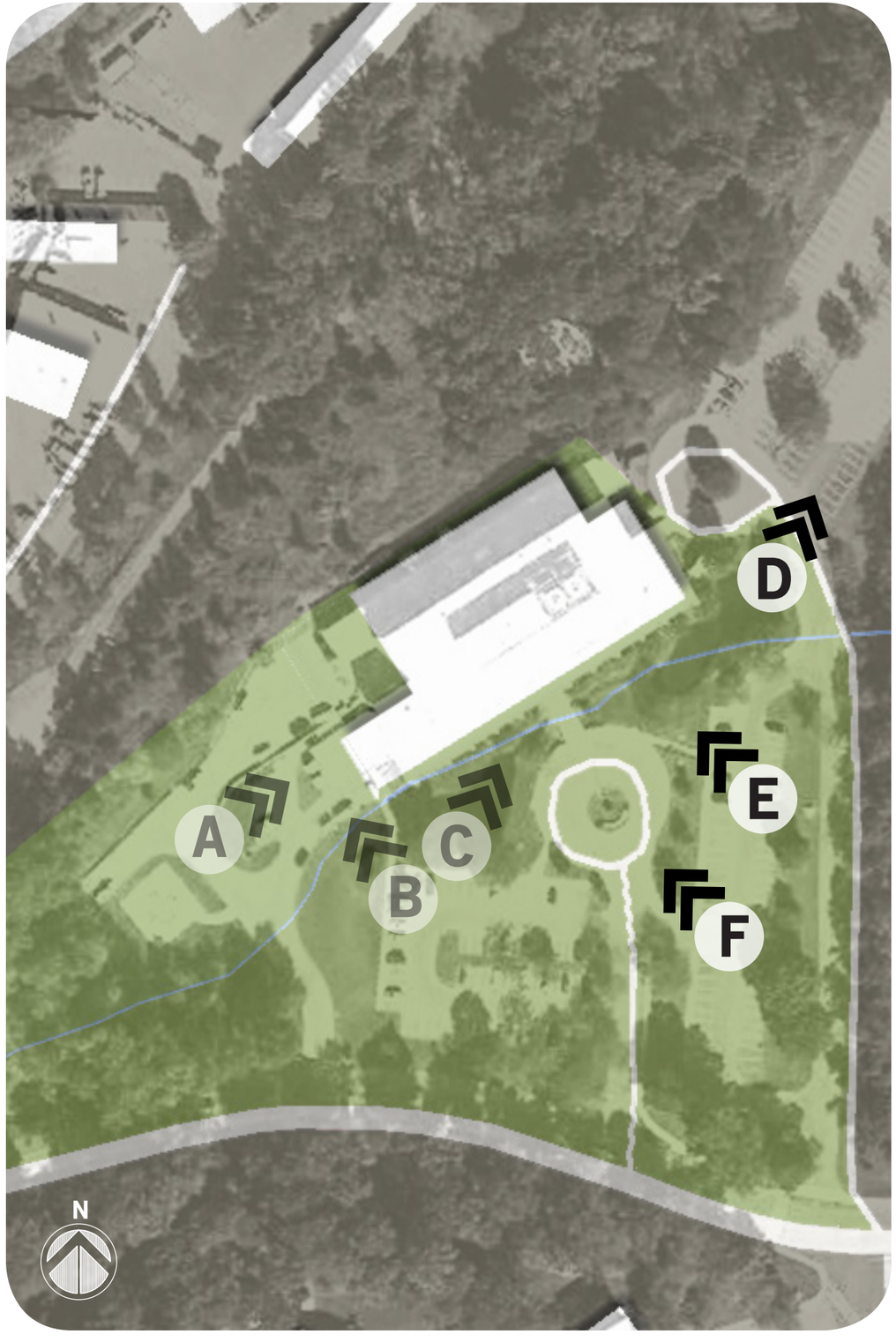

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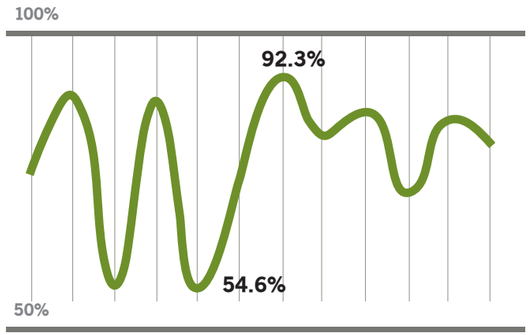
CLIMATE NEW YORK

The entire state of New York lies within the humid continental climate zone with wet, mild to warm summers, cold winters and no dry season. New York may be divided into three climate subregions: the southeastern lowlands; the uplands, which include the Catskills and the Adirondacks; and the snow belt adjacent to the Great Lakes Plain. Common to this climate zone, there is substantial variation between regions; inland locations have wider temperature extremes and higher amounts of precipitation throughout summer months. The warm season begins 4 June ending 15 September; the cold season begins 5 December ending 13 March. The hottest day of the year is typically 25 July with the coldest on 20 January.

A wide variety of air masses are drawn to New York by typical planetary atmospheric circulation. The dry, cold air of the northern continental interior and warm air conditioned by the Gulf of Mexico and neighboring subtropical areas are the primary air masses which determine the majority of the state's climate characteristics. Cool air from the North Atlantic, though less predominant, shapes the climate of southeastern New York into the lower Hudson Valley (New York State Climate Office, 2013).

HUMIDITY
MONTHLY AVERAGE



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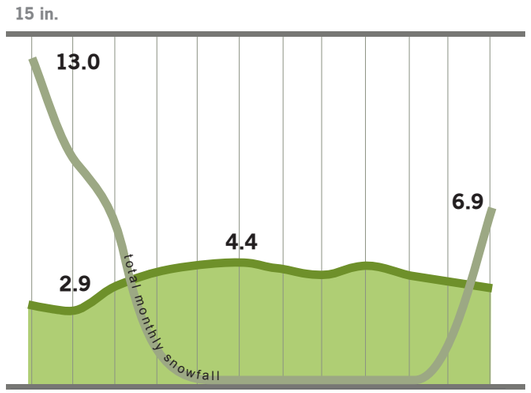
PRECIPITATION
TOTAL MONTHLY



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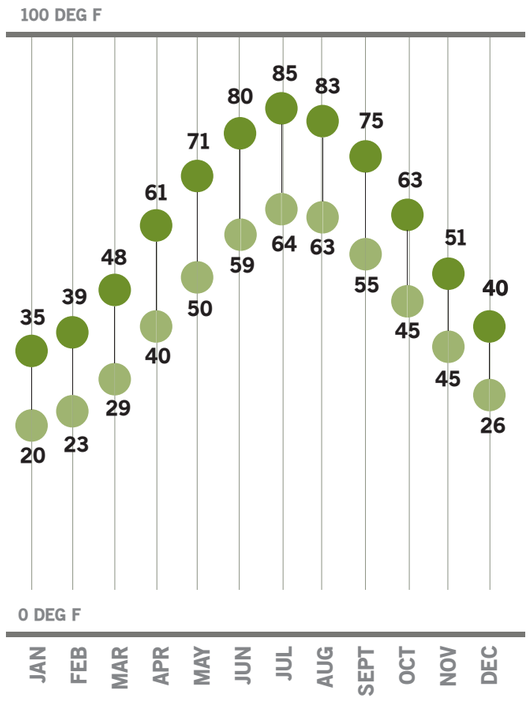
TEMPERATURE
AVERAGE HIGH & LOW



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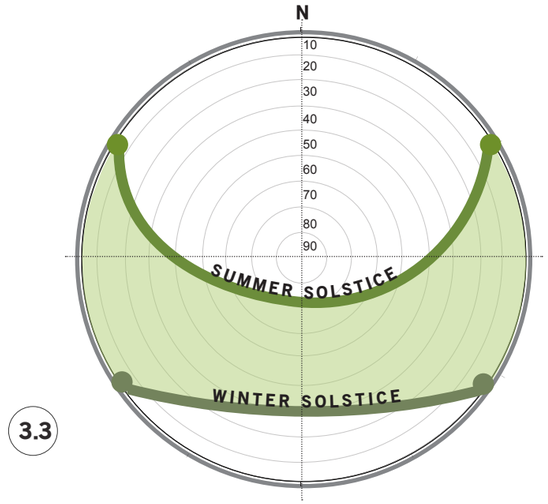

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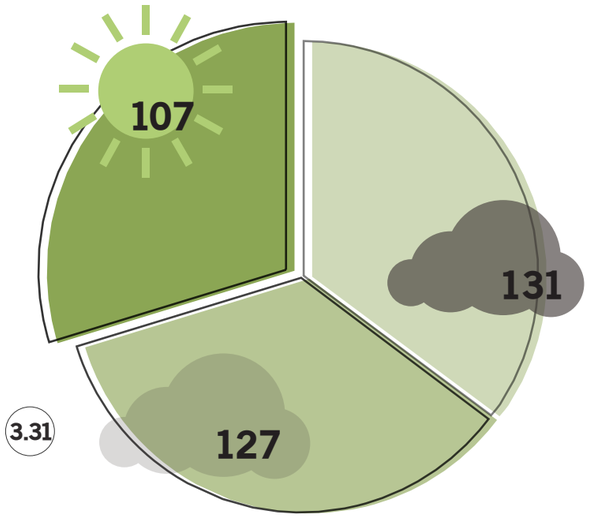
SUMMER / WINTER SOLSTICE SUN PATH



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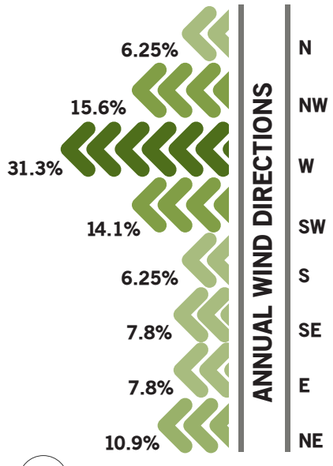
ANNUAL WIND



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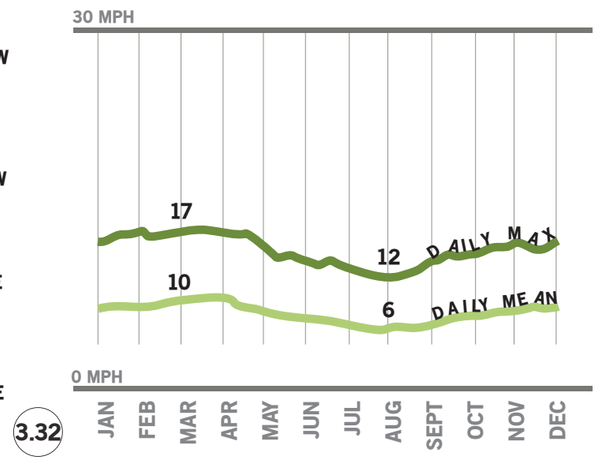
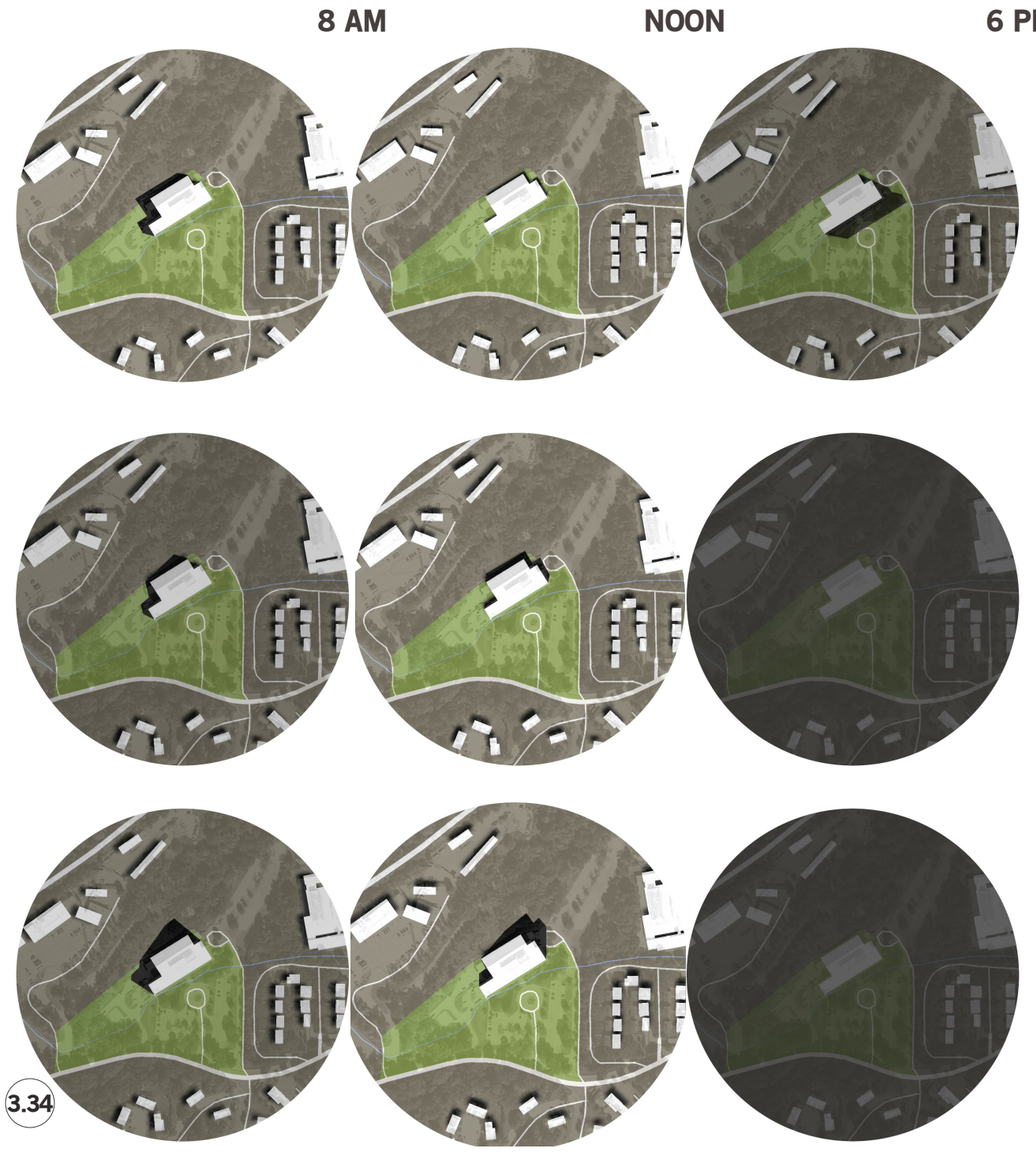


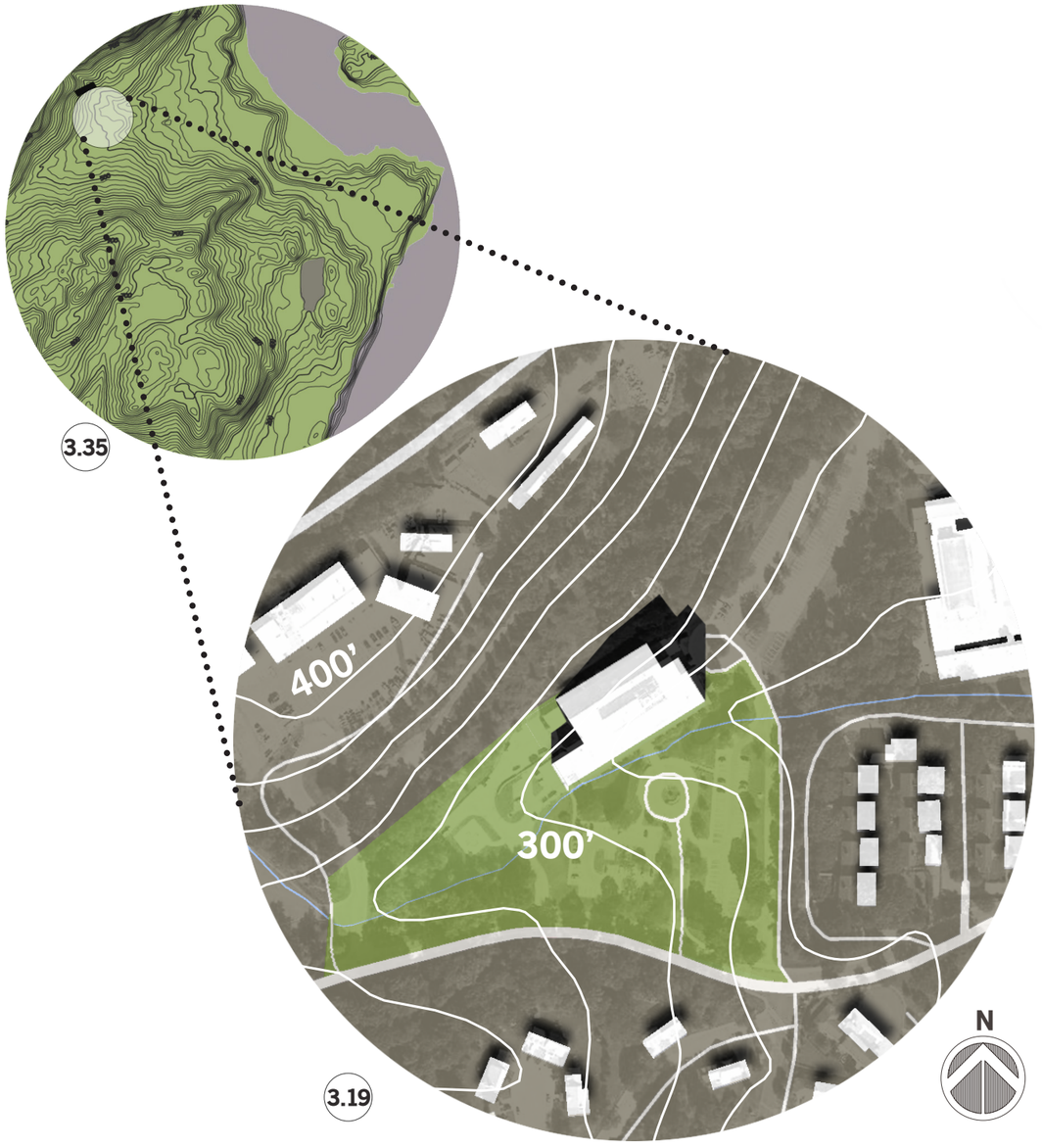
3.32

WIND SPEED

SHADING



SLOPE / TOPOGRAPHY



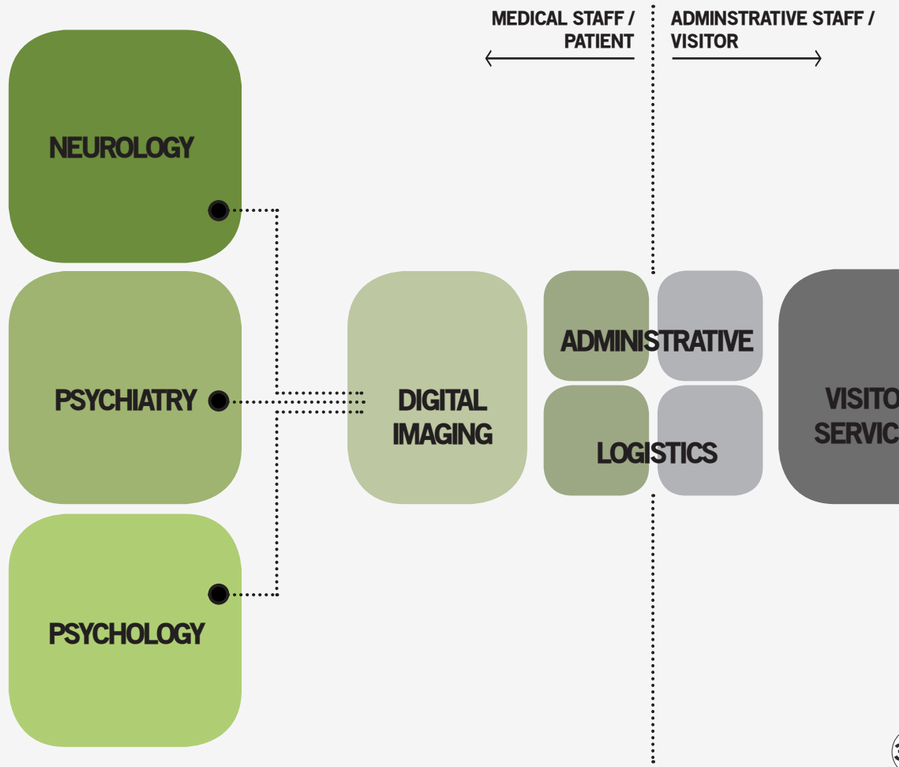
WINDS

3.36

NOISE

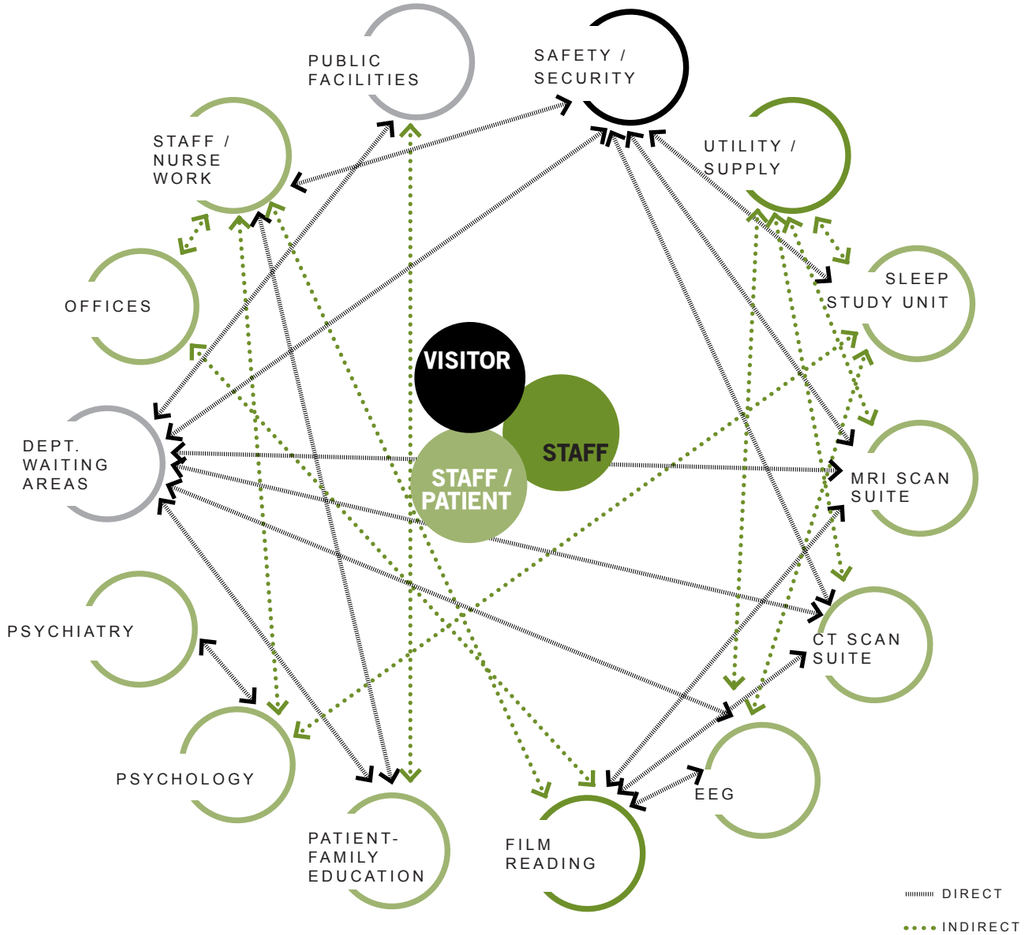
3.37

SPATIAL ALLOCATION



3.38

SPACE ALLOCATION INTERACTION WEB



3.39

SPACE ALLOCATION MATRIX

DIAGNOSTIC & TREATMENT SERVICES

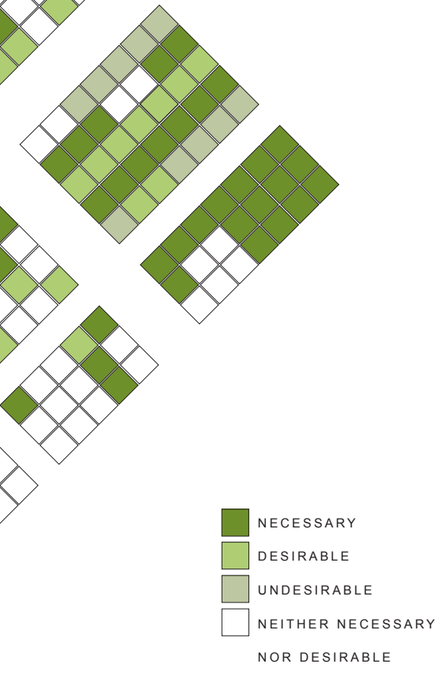
- DIGITAL IMAGING
- MRI Suite
- CT Suite
- EEG
- Film Reading
- PSYCHOLOGY
- PSYCHIATRY
- SLEEP STUDY

ADMINISTRATIVE SERVICES

- ADMINISTRATIVE
- Dept. Waiting Areas
- Staff / Nurse Work Station
- Offices
- Consultation
- Patient-Family Education

LOGISTICS SERVICES

- Safety / Security
- Supply
- Utility



- NECESSARY
- DESIRABLE
- UNDESIRABLE
- NEITHER NECESSARY NOR DESIRABLE

3.4

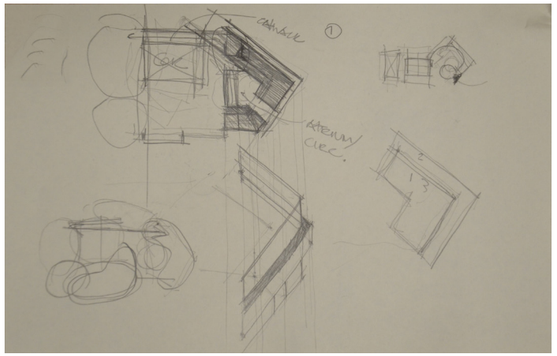
SPACE ALLOCATION AREAS

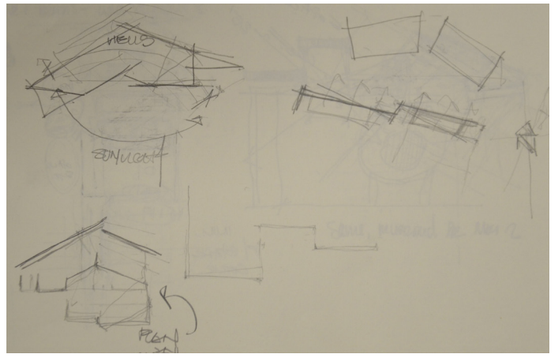
PUBLIC / ADMINISTRATIVE SERVICE	#	SF	TOTAL SF	CLG. HT.
WAITING	1	426	426	9’-0”
RESTROOMS	4	60	240	8’-0”
PATIENT-FAMILY EDUCATION	2	377	754	9’-0”
INTERVIEW	3	154	462	9’-0”
OFFICES - MD + ADMIN	7	220	1,540	9’-0”
INFORMATION	1	359	359	9’-0”
WORK ROOM	1	778	778	9’-0”
STAFF LOUNGE	1	601	601	9’-0”
STAFF LOCKER	2	293	586	9’-0”
SOILED UTILITY	2	40	80	9’-0”
CLEAN UTILITY	2	40	80	9’-0”
STORAGE	1	240	240	9’-0”
IT	1	127	127	-

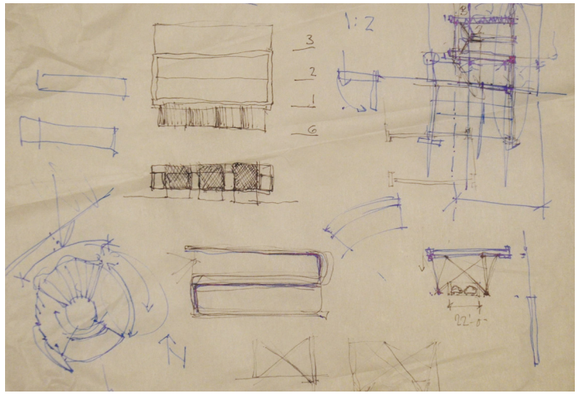
DIAGNOSTIC IMAGING				
MRI SCAN ROOM	2	640	1280	9’-6”
EQUIPMENT	2	195	390	-
CONTROL ROOM	2	175	350	9’-0”
MRI SUITE VESTIBULE	2	320	640	9’-0”
CT SCAN ROOM	2	640	1280	9’-6”
EQUIPMENT	2	195	390	-
CONTROL ROOM	2	175	350	9’-0”
CT SUITE VESTIBULE	2	320	640	9’-0”
SCAN READ ROOM	1	120	120	9’-0”
STORAGE	1	70	70	9’-0”
CUSTODIAL	1	35	35	-
NURSES STATION	1	1004	1004	-
CONSULATION	4	288	1152	9’-0”
EXAMINATION	4	90	360	9’-0”
CHARTING	4	125	500	9’-0”
WAITING	1	445	445	12’-0”
RESTROOMS	6	56	336	9’-0”
SOILED UTILITY	2	20	40	9’-0”
CLEAN UTILITY	2	25	50	9’-0”

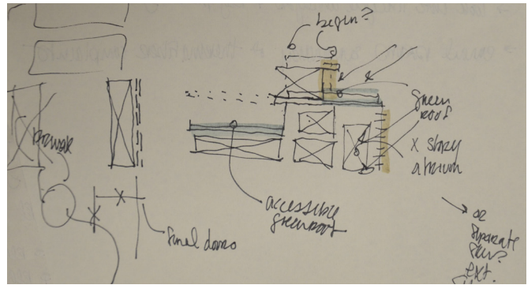
NEUROPSYCHIATRY	#	SF	TOTAL SF	CLG. HT.
VISITATION / EXAMINATION	2	180	360	9’-0”
CONFERENCE	2	503	1,006	9’-0”
SLEEP STUDY SUITES	6	220	1260	9’-0”
CONTROL LAB	1	277	277	9’-0”
RESOURCE LIBRARY	1	2,924	2,924	9’-0”
STORAGE	1	180	180	9’-0”
CUSTODIAL	1	63	63	-
SOILED UTILITY	1	134	134	9’-0”
CLEAN UTILITY	1	63	63	9’-0”
MECHANICAL	1	5330	5,330	-
UTILITY / MAINTENANCE	2	536	1,072	-
RESTROOMS	7	70	490	9’-0”

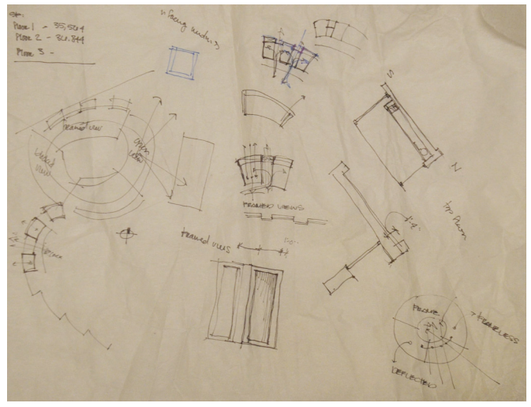
+ CIRCULATION	21,811 sf
TOTAL	50,675 sf

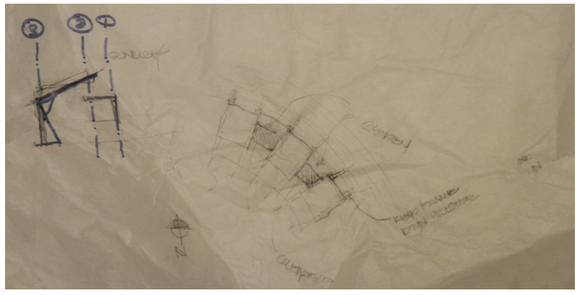


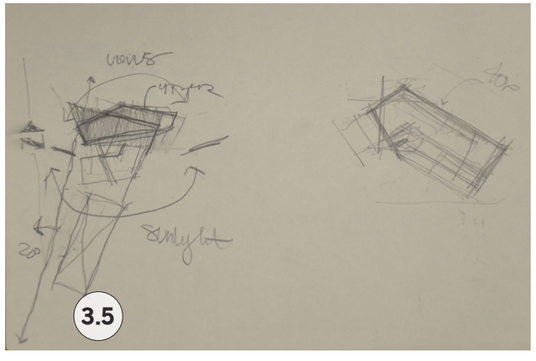


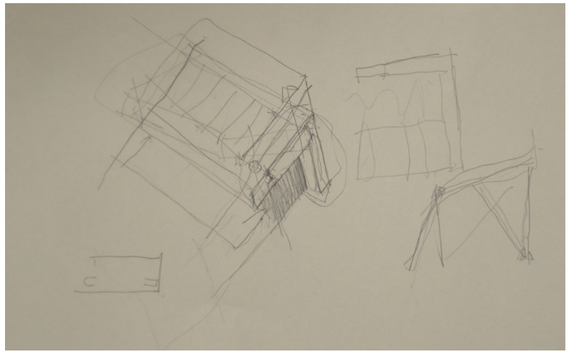






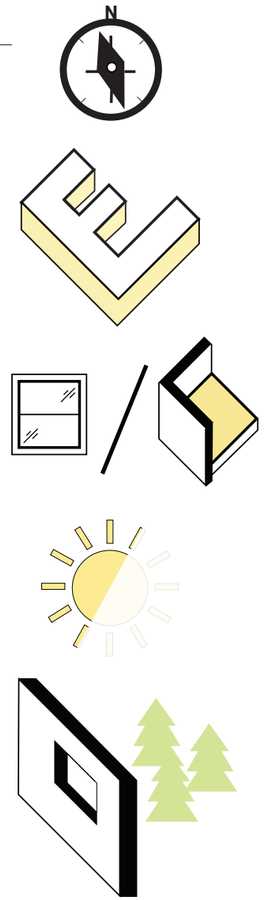






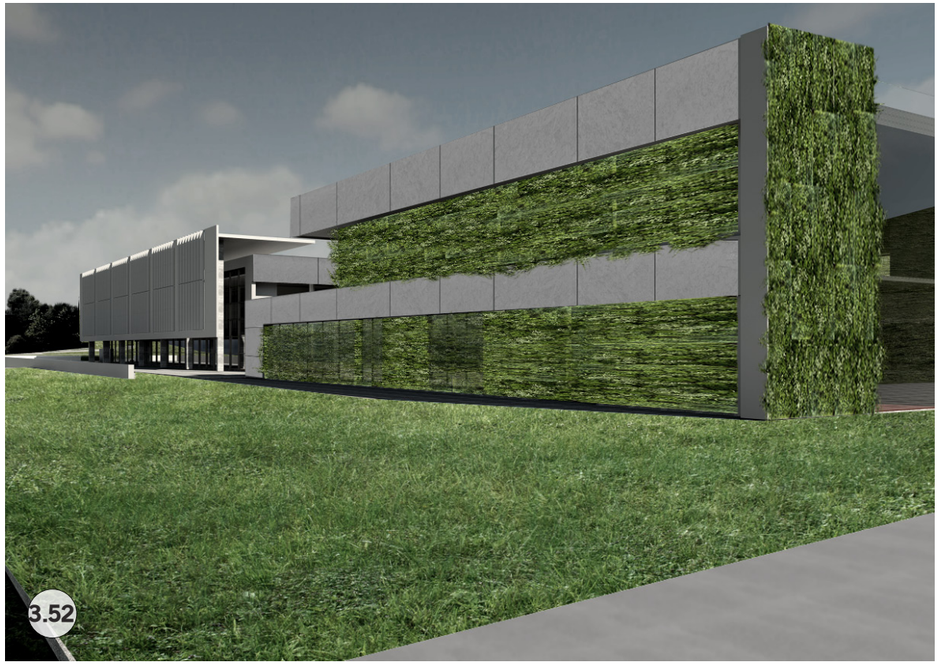
DESIGN PROCESS

- IMPROVED ENERGY PERFORMANCE
- IMPROVED STAFF PERFORMANCE
- IMPROVED CONCENTRATION
- GREATER SATISFACTION + WELL-BEING
- STRESS REDUCTION
- EASED RECOVERY PROCESS
- ERROR REDUCTION
- FATIGUE REDUCTION
- IMPROVED WAYFINDING



- A BUILDING ORIENTATION + LOCATION
- B SHALLOW FLOOR PLATES
- C PERMEABLE DEEP FLOOR PLATES
- D STAFF + PATIENT COURTYARDS
- E CLERESTORIES + SKYLIGHTS
- F SHADING DEVICES

3.51 **OBJECTIVE** → **STRATEGY** → **GUIDELINES**



DESIGN SOLUTION

3.54

3.55

SECOND FLOOR @ ATRIUM WALKWAY

3.56

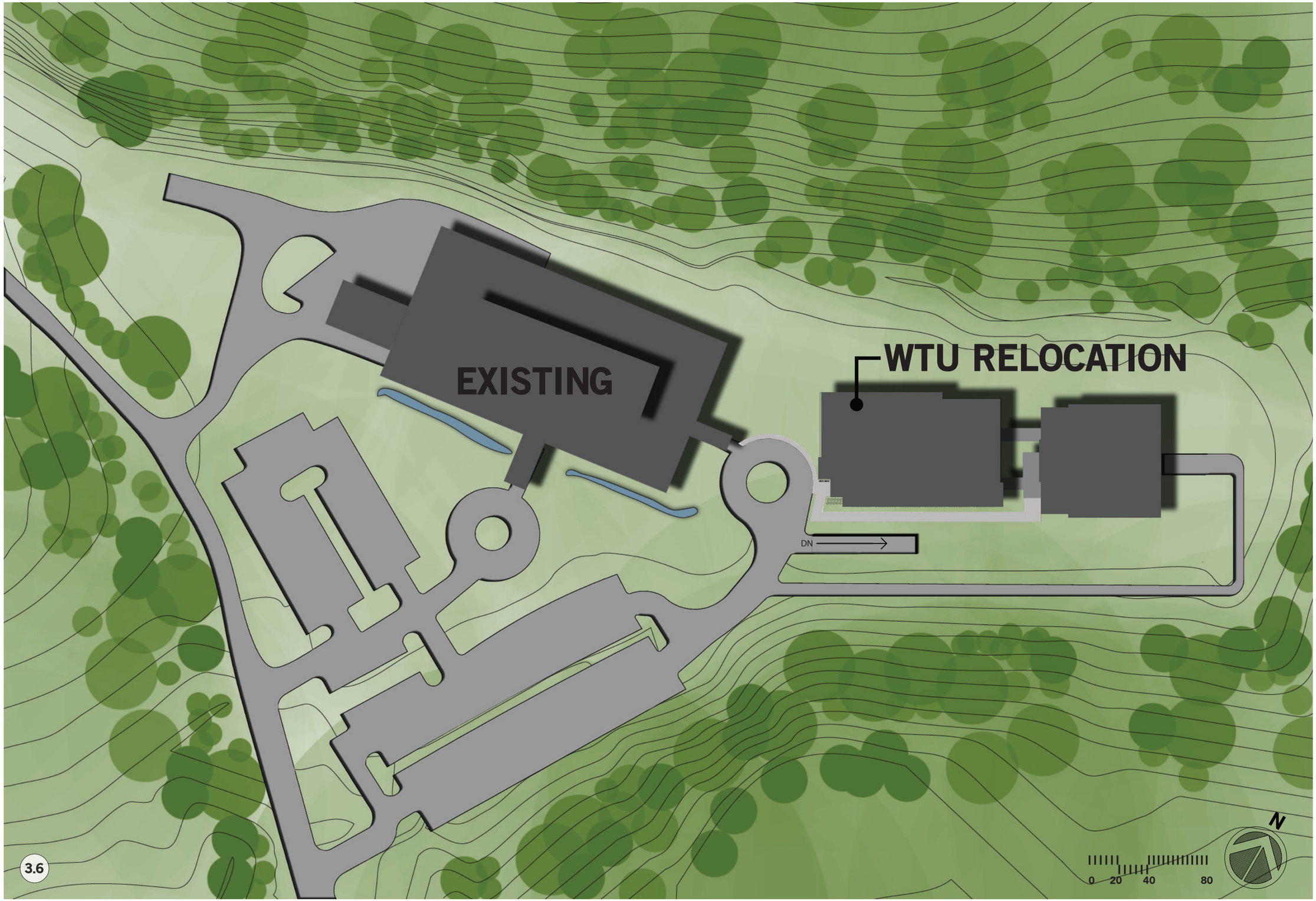
MAIN FLOOR ATRIUM @ ENTRANCE

3.57

CONFERENCE / RESOURCE LIBRARY

3.58

NURSES STATION @ DIGITAL IMAGING


EXISTING
WTU RELOCATION
DN
N
0
20
40
80
3.6

PRELIMINARY CODE REVIEW

3. USE AND OCCUPANCY CLASSIFICATION:

BUSINESS – Clinic Outpatient

Patients within this care facility do not undergo procedures in which they are rendered incapable of self-preservation. As a facility primarily dedicated to research, diagnostic examination and observation, patients are conscious, alert and capable of their own care.

4. SPECIAL DETAILED REQUIREMENTS BASED ON USE AND OCCUPANCY

405: UNDERGROUND BUILDINGS – Underground construction must be of Type 1 construction, and must be equipped with an automatic sprinkler system.

405.7: MEANS OF EGRESS – Each floor level shall be provided with no fewer than two exits.

406: MOTOR-VEHICLE-RELATED OCCUPANCIES

406.4: PUBLIC PARKING GARAGES – Classified as an enclosed parking garage.

406.4.2: CLEAR HEIGHT – The clear height of each floor level in vehicle and pedestrian traffic areas shall not be less than 7 feet. The vertical clearance for each underground parking level is 11'-4".

406.4.4: RAMPS – Vehicle ramps shall not be considered as required exits unless pedestrian facilities are provided. This parking garage does not utilize the exit/entry ramp component as a means of pedestrian egress; two protected exits are otherwise present. Vehicle ramps that are utilized for vertical circulation as well as for parking shall not exceed a slope of 1:15. Both ramps are constructed at this slope with 229 feet of run and 15 feet of rise.

406.4.6: FLOOR SURFACE – Parking surfaces shall be of concrete or similar noncombustible and nonabsorbent materials. The major structural components of the parking structure are concrete with steel reinforcements.

5. GENERAL BUILDING HEIGHTS AND AREAS

504.2: AUTOMATIC SPRINKLER SYSTEM INCREASE – Where a building is equipped throughout with an approved automatic sprinkler system in accordance with section 903.3.1.1, the value specified in Table 503 for maximum building height is increased by 20 feet, and the maximum number of stories is increased by one. Per Table 503, Type IIIA Construction B Occupancies allow for a maximum of five (5) stories at an area of 28,500 square feet per floor.

506.1: BUILDING AREA MODIFICATIONS – Building areas limited by Table 503 shall be permitted to be increased due to frontage and automatic sprinkler system protection in accordance with the following equation:

Aa = {At + [At x If] + [At x Is]}

506.2: FRONTAGE INCREASE – Every building shall adjoin or have access to a public way to receive a building area increase for frontage. Where a building has 25% of its perimeter on a public way or open space having a width of not less than 20 feet, the frontage increase shall be determined in accordance with the following equation:

If = [F/P - .25]W/30

*** The above equations for building area increase are not necessary to calculate for this project. With the addition of an automatic sprinkler system indicated in section 506.3, the building is allowed to increase in area to a size which well accommodates the square footages of this project.

506.3: AUTOMATIC SPRINKLER SYSTEM INCREASE – Where a building is equipped throughout with an approved automatic sprinkler system, the building areas limitation in Table 503 is permitted to be increased by an additional 200% for buildings with more than one story above grade.

6. TYPES OF CONSTRUCTION

Per Table 601, the following building elements must have the following fire ratings:

Primary structural frame – 1 HR
Bearing walls, exterior – 2 HR
Bearing walls, interior – 1 HR
Nonbearing walls & partition, interior – 0
Floor construction & associated secondary members – 1 HR
Roof construction & associated secondary members – 1 HR

602.3: TYPE III – Type III construction is that of construction in which the exterior walls are of noncombustible material and the interior building elements are of any material permitted by the IBC 2012.

8. PLUMBING SYSTEMS

To determine the required number of fixtures for Business Occupancy, the total gross square footage, 50,675 is divided by the occupant load factor, 100, totaling 506 occupants; 253 of which are male, 253 are female. The following indicates required and provided fixture totals:

WATER CLOSETS - 1 per 25 for the first 50; 1 per 50 for the remainder exceeding 50; total required, 7 male and 7 female; total provided, 6 male at the main floor, 3 male at the second floor with 5 female at the main floor and 4 female at the second floor.

LAVATORIES - 1 per 40 for the first 80, 1 per 80 for the remainder exceeding 80; total required, 5 male and female; total provided, 4 male at the main floor and 4 male at the second floor with 3 female at the main floor

and 3 female at the second floor.

DRINKING FOUNTAIN - 1 per 100; total required, 5; total provided, 6.

SERVICE SINK - total required, 1; total provided, 3.

11. PARKING REQUIREMENTS

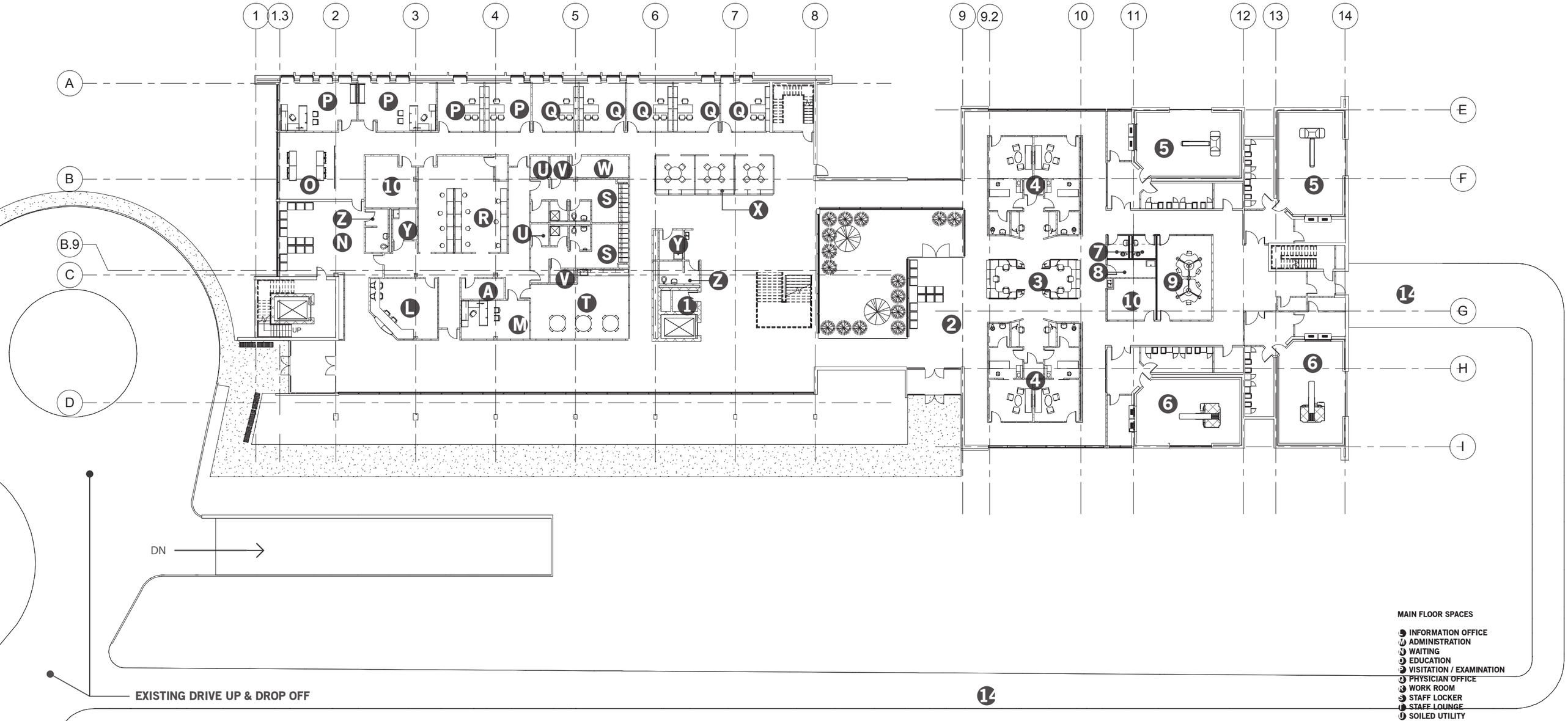
178 parking stalls would be removed with the construction of this project. With the conversion of Moore Loop, 62 surface parking stalls are added. The parking structure provides 316 regular stalls and 8 handicap stalls per IBC 2012 Table 1106.1.

Approximately 28,771 sf are considered office or administrative square footages; these require 1 stall for every 200 sf.

28,771 / 200 = 144

Approximately 14,364 sf are considered patient treatment square footages which require 1 stall for every 300 sf.

14,364 / 300 = 48



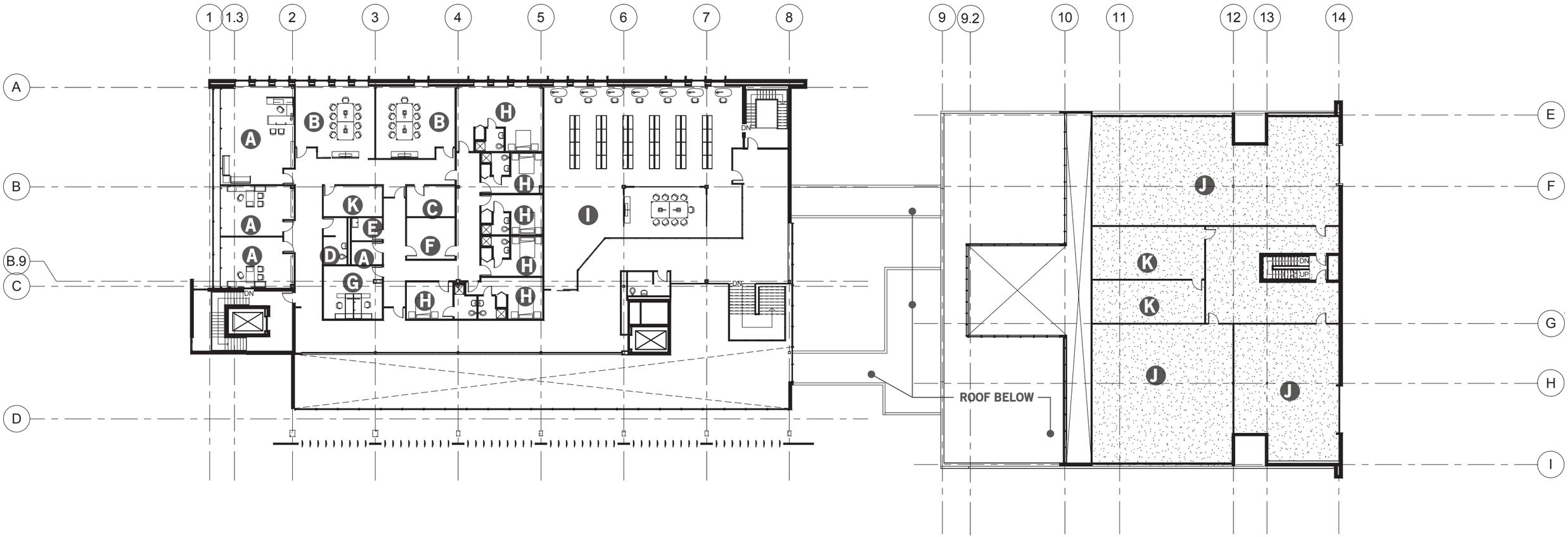
MAIN FLOOR SPACES

- INFORMATION OFFICE
- ADMINISTRATION
- WAITING
- EDUCATION
- VISITATION / EXAMINATION
- PHYSICIAN OFFICE
- WORK ROOM
- STAFF LOCKER
- STAFF LOUNGE
- SOILED UTILITY
- CLEAN UTILITY
- IT / ELECTRICAL
- INTERVIEW
- CUSTODIAL
- FAMILY ASSIST TOILET
- ELEVATOR ELECTRICAL
- WAITING
- NURSES STATION
- EXAMINATION / REVIEW CLUSTER
- CT SCAN ROOM SUITE
- MRI SCAN ROOM SUITE
- UNISEX TOILET
- CUSTODIAL
- SCAN READ ROOM
- STORAGE

3.7

FIRST FLOOR PLAN

3/16” = 1’-0”



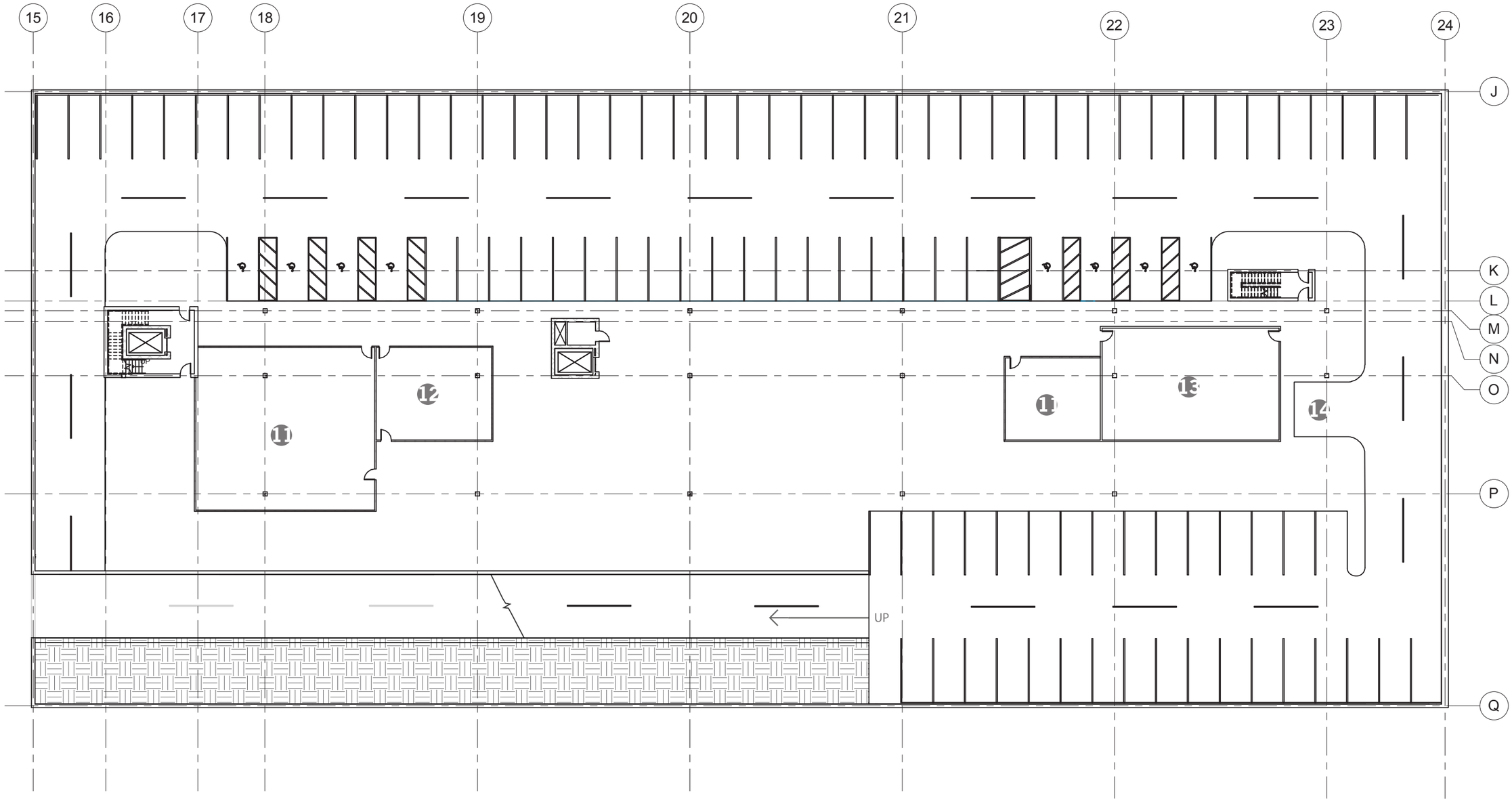
3.71

SECOND FLOOR PLAN

3/16” = 1’-0”

SECOND FLOOR SPACES

- A VISITATION / EXAMINATION
- B CONFERENCE
- C STORAGE
- D FAMILY ASSIST TOILET
- E CUSTODIAL
- F SOILED UTILITY
- G CONTROL LAB
- H SLEEP STUDY
- I RESOURCE LIBRARY
- J MECHANICAL
- K UTILITY / MAINTENANCE



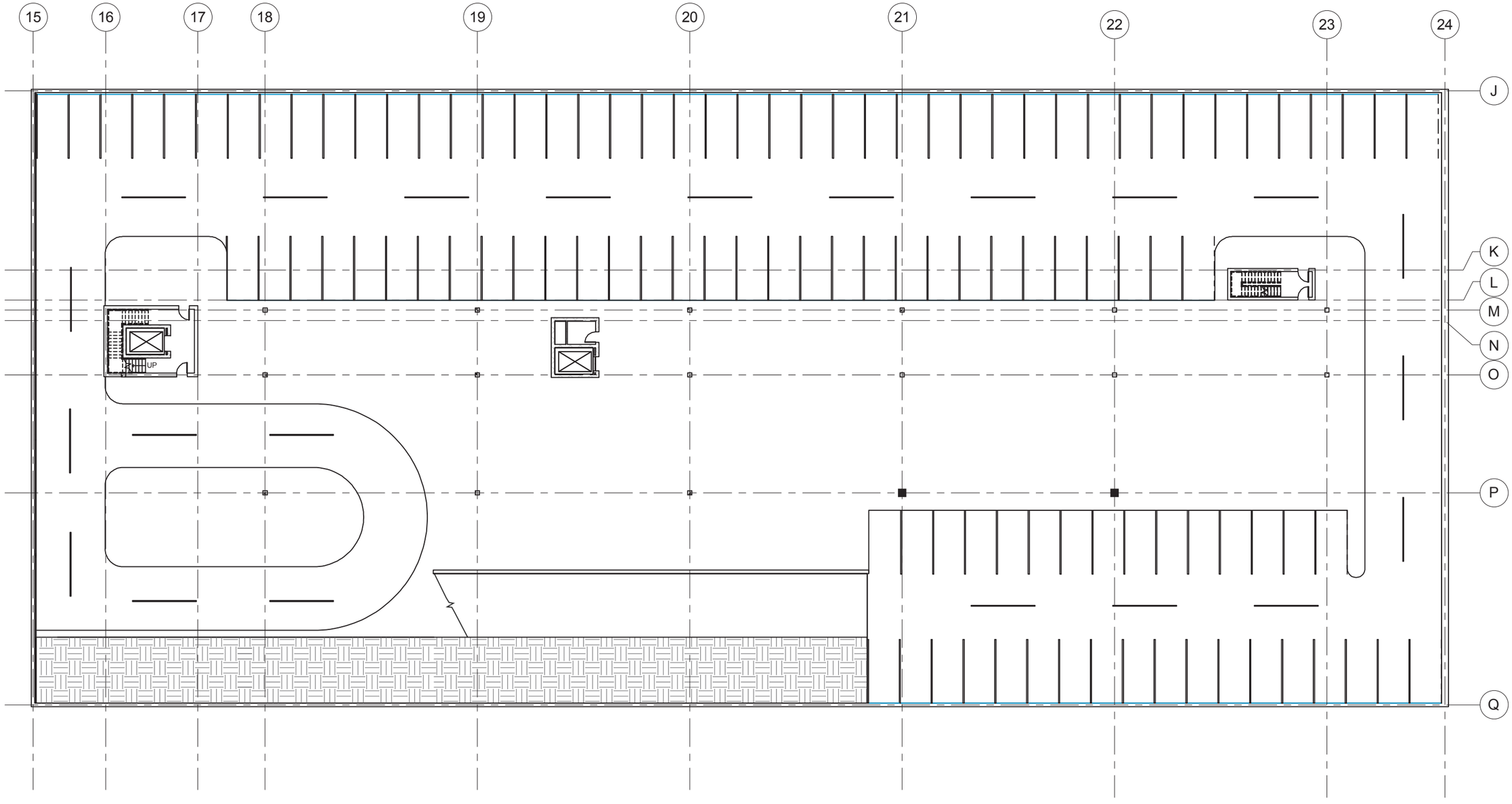
3.72

FIRST / SECOND FLOOR PARKING

3/16” = 1’-0”

FIRST / SECOND FLOOR PARKING

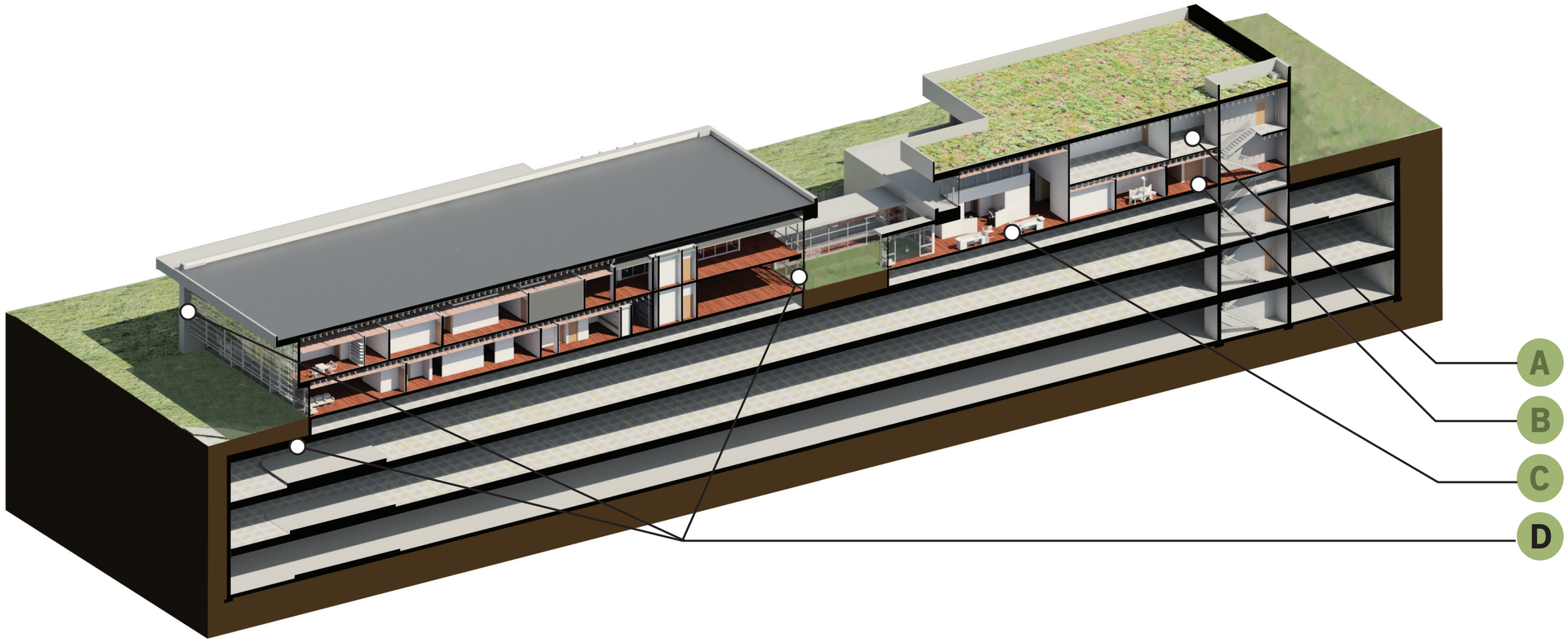
- **MECHANICAL**
- **PUMP / CISTERN ROOM**
- **STORAGE**
- **SERVICE DRIVE**



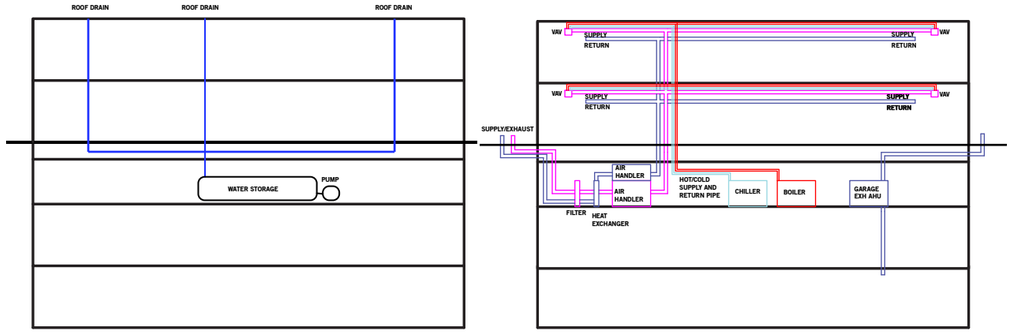
3.71

THIRD FLOOR PARKING

3/16” = 1’-0”



3.8



The HVAC system takes in air, filters it, runs it through the heat exchanger, and then the air is pushed out to the rooms via the air handler. The system terminates at VAV boxes that heat/cool the air, the water is then returned to the boiler/chiller to cycle back via a four pipe system so the system reduces waste heating/cooling by inefficient practices. The air is then pulled back out via the return, looped back into the system is recirculating interior air is desirable, or out via the heat exchanger. This illustration is a diagram and not sized/spaced to scale.

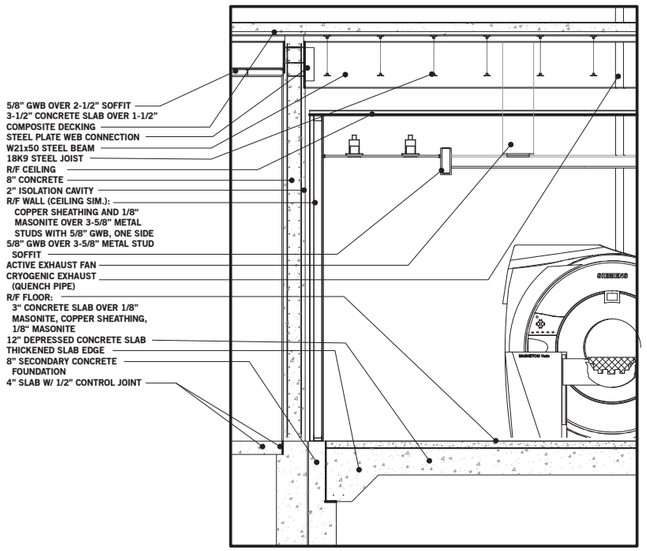
Monthly Volume = R x A x k x e

R = Precipitation
A = Footprint of Collection Surface
k = Conversion factor, cu. ft. to gal
e = Efficiency of collection surface

V = (3 in/mo)(1 ft/12 in)(16,651 sf)(7.48)(.8) --- Assumes 80% efficiency
V = 24,909 gallons of potential rainwater collection

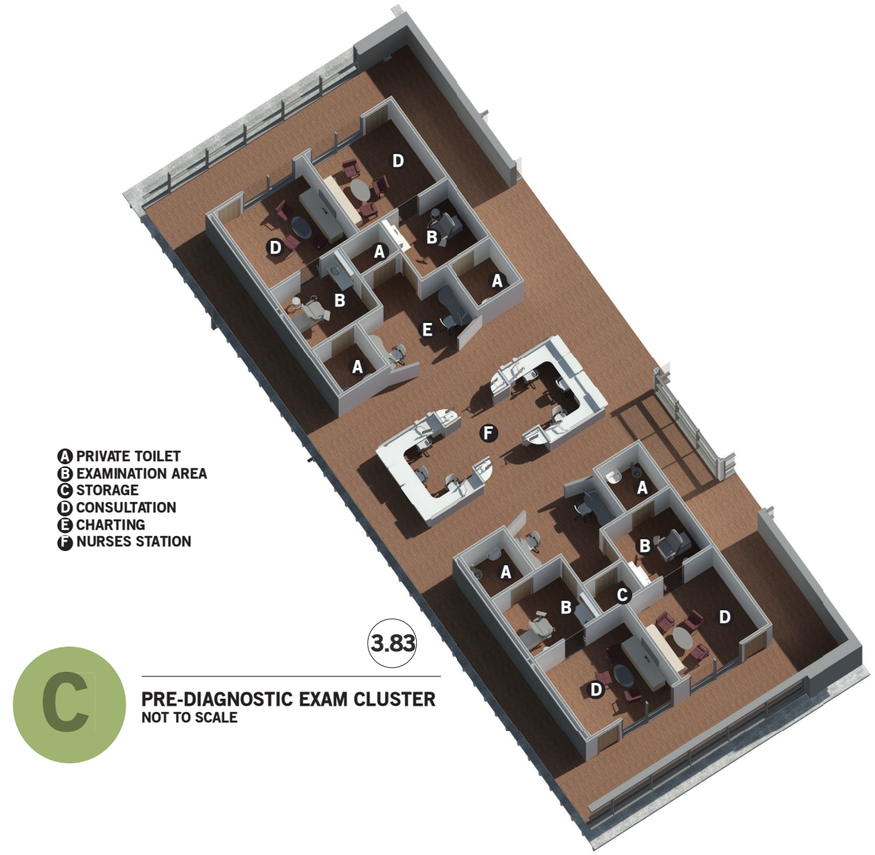
3.81

A HVAC DIAGRAM & RAINWATER HARVESTING SYSTEM
NOT TO SCALE



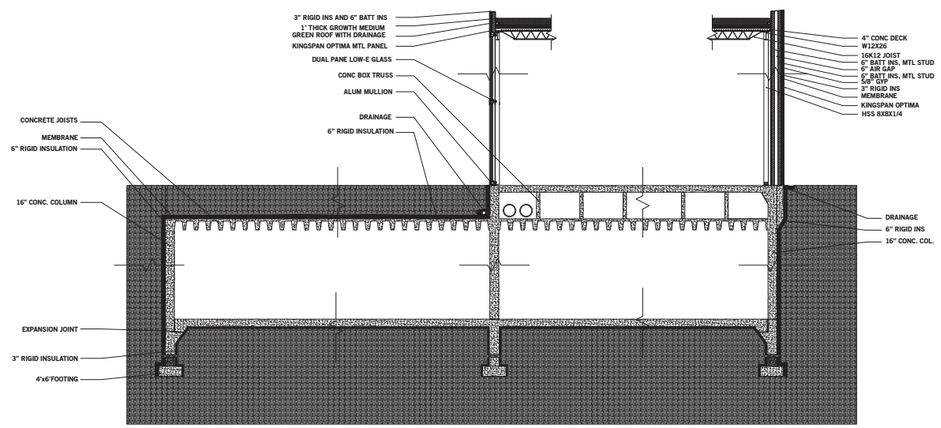
3.82

B MRI SUITE SHIELDING
NOT TO SCALE



3.83

C PRE-DIAGNOSTIC EXAM CLUSTER
NOT TO SCALE



3.84

D TYPICAL WALL, FOUNDATION & MISC. STRUCTURAL DETAILS
NOT TO SCALE

RESEARCH BIBLIOGRAPHY

A brief history of mental illness and the U.S. mental health care system - Unite For Sight. (2013). Retrieved from http://www.uniteforsight.org/mental-health/module2

A brief history of west point. (n.d.). Retrieved from http://www.usma.edu/wphistory/SitePages/Home.aspx

American Forces Press Service. (2013, March 13). DOD's top doctor details sequester's effect on health system [Press Release]. Retrieved from http://www.defense.gov/news/newsarticle.aspx?id=119518

Cadet chapel. (n.d.). Retrieved from http://www.usma.edu/chaplain/SitePages/Cadet%20Chapel.aspx

De Botton, A. D. (2006). The architecture of happiness. New York: Vintage International.

Drake, R. E., Green, A. I., Mueser, K. T., & Goldman, H. H. (2003). The history of community mental health treatment and rehabilitation for persons with severe mental illness. Community Mental Health Journal, 427-440. doi:10.1023/A:1025860919277

Ellison, et al. (2012). Supporting the education goals of post-9/11 veterans with self-reported PTSD symptoms: a needs assessment. Psychiatric Rehabilitation Journal, 35(3), 209-215. Retrieved from http://web.ebscohost.com.proxy.library.ndsu.edu/ehost/pdfviewer/pdfviewer?sid=8dea93e5-632a-4594-947e-9c51ae2771ec%40sessionmgr11&vid=4&hid=18

Falvo, et al. (2012). A retrospective cohort study of u.s. service members returning from afghanistan and iraq: is physical health worsening over time?. BMC Public Health, 1124(12), 1-7. Retrieved from http://www.ncbi.nlm.nih.gov/pmc/articles/PMC3543837/pdf/1471-2458-12-1124.pdf

Forman, S. (1950). West point: a history of the united states military academy. New York, NY: Columbia University Press.

Frances, M.D., A. (2013, May 7). Hippocratic Humility | Psychology Today. Retrieved from http://www.psychologytoday.com/blog/saving-normal/201305/hippocratic-humility

Galloway, K., & Johnson, Jr., R. (1973). West point: america's power fraternity. New York, NY: Simon and Schuster.

Geuze, E., Vermetten, E., De Kloet, C. S., Hijman, R., & Westenberg, H. M. (2009). Neuropsychological performance is related to current social and occupational functioning in veterans with posttraumatic stress disorder. Depression & Anxiety (1091-4269), 26(1), 7-15. doi:10.1002/da.20476

Guenther, R., & Vittori, G. (2013). Sustainable healthcare architecture. Hoboken, New Jersey: John Wiley & Sons, Inc.

Hall, E. (1969). The hidden dimension. (pp. 2-115). Garden City, New York: Anchor Books.

Harpaz-Rotem, I., & Rosenheck, R. A. (2011). Serving those who served: Retention of newly returning veterans from Iraq and Afghanistan in mental health treatment. Psychiatric Services, 62(1), 22-27. doi:10.1176/appi.ps.62.1.22

Hawken, P., Lovins, A. B., & Lovins, L. H. (1999). Natural capitalism: Creating the next industrial revolution. Boston: Little, Brown and Co. Retrieved from website: http://www.natcap.org/mages/other/NCchapter6.pdf

Heerwagen, J. H., & Orians, G. H. (1993). Humans, habitats, and asethetics. In S. Kellert & E. Wilson (Eds.), The biophilia hypothesis (pp. 138-194). Washington, D.C.: Island Press / Shearwater Books.

Kellert, S. R. (1993). The biological basis for human values of nature. In S. Kellert & E. Wilson (Eds.), The biophilia hypothesis (pp. 32-57). Washington, D.C.: Island Press / Shearwater Books.

Marshall, T. C. J. U.S. Department of Defense, (2013). Dod. Retrieved from American Forces Press Service website: http://www.defense.gov/news/newsarticle.aspx?id=119518

Nabhan, G., & St. Antoine, S. (1993). Loss of floral and faunal story. In S. Kellert & E. Wilson (Eds.), The biophilia hypothesis (pp. 229-248). Washington, D.C.: Island Press / Shearwater Books.

New York State Climate Office. United States Department of Commerce:, National Oceanic and Atmospheric Administration. (2013). Climate of new york. Retrieved from website: http://nysc.eas.cornell.edu/climate_of_ny.html

Our History. (n.d.). Retrieved from http://kach.amedd.army.mil/history.html

Pati, D., & Barach, P. (2010). Application of environmental psychology theories and frameworks to evidence-based healthcare design. In J. Valentin & L. Gamez (Eds.), Environmental psychology: new developments (pp. 9-28). New York, NY: Nova Science Publishers, Inc.

Peterson, A. L., Luethcke, C. A., Borah, E. V., Borah, A. M., & Young-McCaughan, S. (2011). Assessment and treatment of combat-related PTSD in returning war veterans. Journal Of Clinical Psychology In Medical Settings, 18(2), 164-175. doi:10.1007/s10880-011-9238-3

Reeve, H. (1904). West point in the revolution, 1778-1783. In The centennial of the united states military academy at west point, new york. Washington D.C.: U.S. Government Printing Office.

Sternberg, E. (2009). Healing spaces: the science place and well-being. (pp. 15-189). Cambridge, MA: The Belknap Press of Harvard University Press.

The Psychiatry Building. (n.d.). Retrieved from http://www.tengbom.se/en-US/projects/60/psykiatrins-hus.

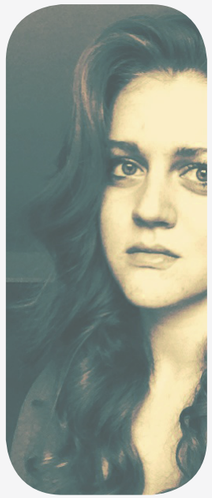
Treating Psychological Disorders - Unite For Sight. (2012). Retrieved from http://www.uniteforsight.org/mental-health/module5

Ulrich, R. S. (1993). Biophilia, biophobia, and natural landscapes. In S. Kellert & E. Wilson (Eds.), The biophilia hypothesis (pp. 73-126). Washington, D.C.: Island Press / Shearwater Books.

U.S. Army Corps of Engineers (n.d.). Conclusion and bibliography. Retrieved from http://www.usace.army.mil/About/History/BriefHistoryoftheCorps/ConclusionandBibliography.aspx

U.S. Army Corps of Engineers (n.d.). Responding to new needs. Retrieved from http://www.usace.army.mil/About/History/BriefHistoryoftheCorps/RespondingtoNewNeeds.aspx
U.S. Army Corps of Engineers (n.d.). Responding to new needs. Retrieved from http://www.usace.army.mil/About/History/BriefHistoryoftheCorps/RespondingtoNewNeeds.aspx
U.S. National Library of Medicine (2011, November 3). Emotions and Disease: The Balance of Passions. Retrieved from http://www.nlm.nih.gov/exhibition/emotions/balance.html

Velarde, M., Tveit, M., & Hagerhall, C. (2010). The link between landscape preferences and perceived restorativeness – current research trends and suggestions for future studies. In J. Valentin & L. Gamez (Eds.), Environmental psychology: new developments (pp. 235-241). New York, NY: Nova Science Publishers, Inc.



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“There is no security on this earth, only opportunity.”

- GEN. DOUGLAS MACARTHUR

Personal Identification Photo - Figure 3.0