To the Graduate Council:

I am submitting herewith a thesis written by Todd White entitled "Connections Between a Residential Area and an Educational District in an Urban Setting." I have examined the final copy of the thesis for form and content and recommend that it be accepted in partial fulfillment of the requirements for the degree of Master of Architecture, with a major in Architecture.

Jon. P. Coddington, Major Professor

We have read this thesis
And recommend its acceptance:

Accepted for the Council:

Associate Vice Chancellor and
Dean of The Graduate School

Connections Between a Residential Area And an Educational District In an Urban Setting

A Thesis
Presented for the
Master of Architecture
Degree
The University of Tennessee, Knoxville

Todd White
August 2000

DEDICATION

This thesis is dedicated to *my* connections on this wonderful living planet· my late mother, Evelyn, my late sister Sandy White West, and my two very living sisters, Tobie and Sherron, who have and always will give me the best support a little brother could ever need. This culmination of a very tough journey is especially dedicated to my late father, Tobias (T. J.) White, who supported me in whatever I chose to do. It is he who gave me most of whatever redeeming qualities I possess Thank you all

ACKNOWLEDGEMENTS

I would like to acknowlege and say thank you to several people who have directly and indirectly assisted with this thesis project and document. First, my committee members deserve credit for workıng with me and puttıng up with a very trying last few months of my lıfe. Tracy Moır-McClean has gıven much tıme and effort to all of us ın my graduate class as she has been "wıth child" and now "with live, crying baby " Tracy's help and expertise have been much appreciated. Professors C. A Debelıus and Mark Schimmenti have lent their expertise and tıme (especially ın their busy schedules) to getting as much work out of me as anyone possibly could have this past year. Both Mark and Chip have also been helpful in getting rid of me as they have been very helpful in assisting me with job opportunities-- especıally Mark.

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People who have brightened up my day on a regular basıs are the "gırls in the office " I will miss Karen, Pamela, Bridgette, and 'Bıllie Jo '

Thıs journey whıch I have been looking forward to for so long is not endıng, but it ıs just beginnıng, and I appreciate everyone's thoughtful ideas and words

ABSTRACT

This study invesitgates the connections a mixed-use bridge structure can provide between a residential area and an adjacent educational district in an urban setting. These connections provide the residential area better opportunities to be self sustaining and a viable piece of the urban fabric.

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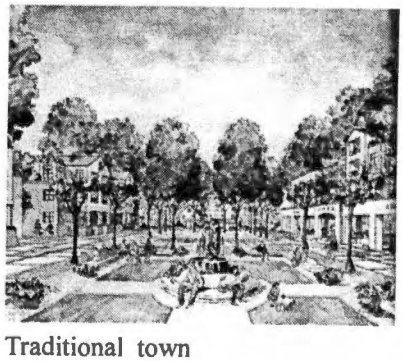
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I. INTRODUCTION TO CONNECTIONS

Initial question

Today in America too many places where people live are isolated from the primary use districts, thereby, making people's lives disjointed. A diversity of functions is necessary for a full and healthy existence. (Jane Jacobs, *The Death and Life of Great American Cities,* p. 13) How can an isolated urban residential area that is too small to sustain itself retain its integrity, yet, be better connected to the primary function districts that make it a viable place in which to live? How can a linking structure or space connect the place of residing to primary use functions and help sustain its place in the urban fabric?

We shall not attain to cities and villages that are beautiful until we learn artistically to plan them.
-Charles Mulford Robinson



Traditional town square. Source Kunstler (192)

Thesis statement

In order to create a more stable community in which to live, creating connections that are vital to everyday living is necessary. Spaces and structures can connect the primary use functions and people together that enable an urban setting to be a more functional and sustaining place in which to live. This thesis explores ways of using and connecting existing contexts to create a more comprehensive and socially sustainable built environment. Better livability can be achieved through a variety of connectors — physical connectors, visual connectors social connectors, and contextual connectors. The design attempts to affirm the vialility of the "compact, close-knit community" (Peter Katz, *The New Urbanists,* p. 22) by connecting living to learning.

Specifically, this thesis will explore how to connect an

isolated residential area to the adjacent university district.

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SUPPORTING ARGUMENT



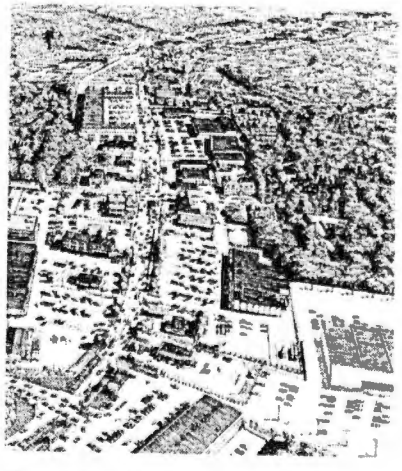
View out of Maplehurst residential area.

This thesis uses the Maplehurst "neighborhood" of Knoxville, Tennessee as a residential area which has, over time, become increasingly isolated from its surrounding context. Maplehurst is situated adjacent to downtown Knoxville and the University of Tennessee campus and between the Tennessee River and the World's Fair Park. Maplehurst is characterized by densely positioned buildings, which are of varying age, architectural style and condition. A mildly diverse group of residents live here—students, lay and professional people. Even though this area is within walking distance to the downtown business district, the university district, the World's Fair Park (which has a diverse set of activities), and the river front entertainment area, Maplehurst lacks easy pedestrian and vehicular connection to these diverse areas.



Henley Bridge

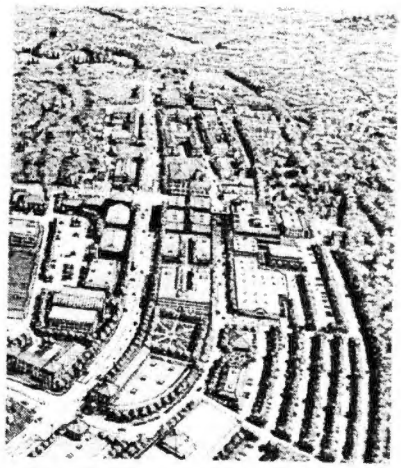
Several bridges are located within short distances from this site. These include the Henley Bridge at the east edge of Maplehurst, a railroad bridge on the west border of the residential area, the Gay Street Bridge to the southeast of the site, and the Clinch Avenue Bridge, which bisects the World's Fair Park. These bridges provided a literal catalyst to explore bridging, or connection, in order to investigate how citizens, activities, and community functions can be linked together to create a rich community in which to live, work and play.



Commercial strip
Source: Kunstler (xxxvi)

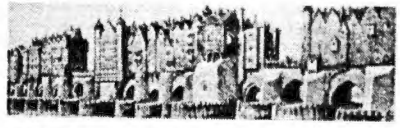
The underlying reason for looking at different types of connections is the problem of disconnection of urban districts and their resultant decay, as well as the necrosis

of the downtown urban fabric of America. The result is the loss of sense of place and community. According to Richard Sennett in *Fall of Public Man*, the typical American is isolated from his built environment by traveling in the car from point of origination to destination with no consideration of path or place. In addition, he maintains that public spaces are dead since they are designed to be only passages on the pedestrian's journey across that public space. Increasingly, Americans have no reason to pause and gather as most built environments isolate and alienate the user, particularly the pedestrian, instead of linking them community, connecting them to vital daily functions, or a sense of a larger whole. New Urbanists like Kunstler, Calthorpe, Duaney, and others describe how America has designed its living around the automobile and sapped the vitality from downtown districts with malls, strip malls, subdivisions and highway systems. They preach about designing towns for the pedestrian with a diversity of use, people and activities in urban settings and to connecting them to that sense of place and community.



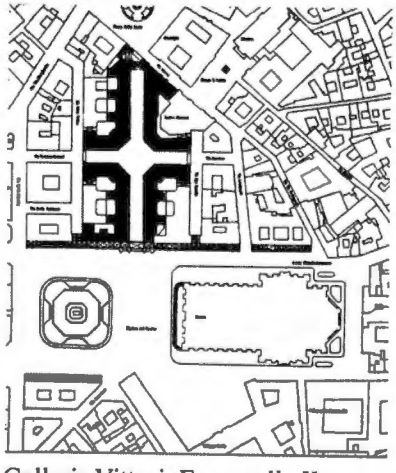
Clustered development.
Source: Kunstler(xxxvi)

This thesis will look to a variety of connection precedents to explore how to connect living and learning areas to one another with a mixed-use pedestrian bridge. The different types of connection includes physical, visual, social, and contextual (including historical, architectural, material and structural aspects).



Old London Bridge.
Source: Whitney (34)

Historically, bridges and like structures have played connecting roles in the urban setting. Mixed-use bridges like the Rialto Bridge in Venice, Ponte Vecchio in Florence, the London Bridge, the Pulteney Bridge in Bath, England and the Ponte Notre Dame in Paris have served citizens by more than just physically connecting areas together. These bridges have brought people



Galleris VittorioEmanualle II
Milan, Italy. Source: Geist (245)

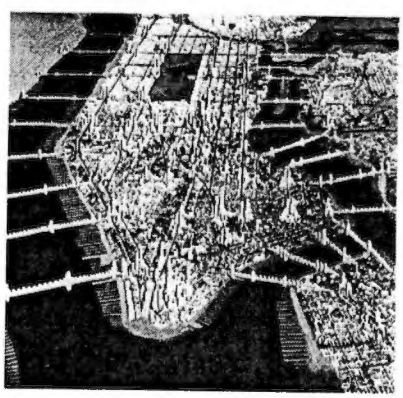
together to live, work, trade and even provide medical services, distributing great diversity and linkage to the urban fabric of their communities.



Visual connection of Spanish Steps

Another typology that provided connection in an urban setting was arcades of the 1800's. In these spaces different types of connections were made. These facilities physically connected at least two major generators of pedestrian traffic by providing an indoor multi-level shopping. By providing a gathering experience for the pedestrian as they passed from one street to another, social connection was accomplished. Some of these arcades include: the Cleveland Arcade, Cleveland, Ohio; The Hague Arcade, the Galleria Vittorio Emanuelle II, Milan, Italy; and a multi-level arcade/ pedestrian/subway system project in London called the Crystal Way.

Connecting different physical levels of activity is anecessity in urban settings where there are significant topographic changes. Physically connecting topographical changes while also providing unique social connections is achieved by several distinct spaces. Such notable spaces include the Campidoglio in Rome, the Spanish Steps in Rome and the Steps of Providence Project in Rhode Island by Machado and Silvetti. The Propylaea at the Acropolis in Athens, Greece, provides a connection between the city below and the hill of ancient temples, while acting as a threshold, connecting the public urban district to the religious site.



Manhatten Island bridges. Source: Hood

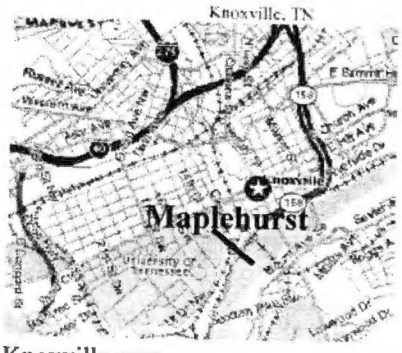
As stated before, a space or structure can serve as a connector in several ways. Physical connection, vertically or horizontally, is the most literal method where this can occur. A bridge isan obvious example of a horizontal connector. A design can visually connect

spaces, levels, structures or other architectural elements. Viewing landmarks such as towers or notable buildings from specific vantage points can connect the user from one space to another. Connection methods have the capacity to socially link people together, either literally in a common space or abstractly in a psychological sense. Finally, connections can occur with reference to context, through the use of materials, scale, architectural elements, construction techniques and/or historical events.



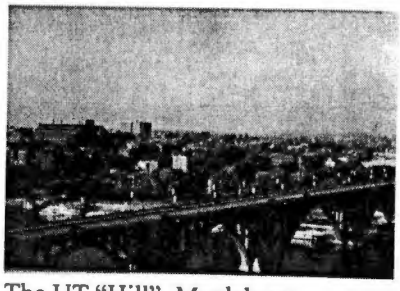
Model of neighborhood with diversity of use.Source: Kunstler (36)

While the literal bridge structure was a starting point for this architectural thesis, the issue of social connection is directly derived from it. Just as literal bridges connect disparate spaces, the exploration of design connections with this linking characteristic willalso be addressed here. Dfferent functional spaces that can be linked include: residential to commercial, recreational to either of the former two, or civic to any of the above.



Knoxville map.
Source: Mapquest

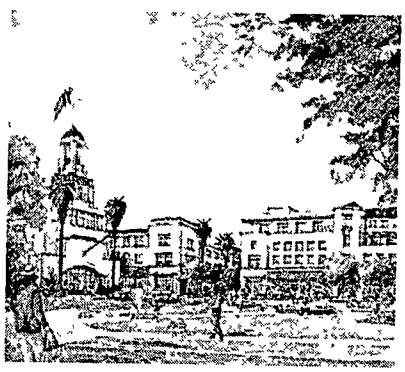
In order to draw people back to downtown, a connection with healthy urban life and sense of community needs to be achieved. Americans' lives are physically dispersed all over as they live in one area, work in another, shop in another, worship in another and recreate in yet another. This disjunction of activities has led to a chaotic, stressful and literally unhealthy lifestyle. Typically, an American has little or no sense of place and community. By linking people's activities to aplace scaled to human dimensional needs, rather than to the car and its dimensional needs, peoplemay once again connect to each other and to a sense of community.



The UT "Hill", Maplehurst, and Henley Bridge.

Design investigation

This thesis will use the bridge and its related connecting typologiessuch as viaducts and stairs (and related vertical connectors) to study how a space or structure can link work, home and play. The site under investigation is Knoxville, Tennessee's Maplehurst residential complex and the adjacent University of Tennessee's "Hill." As stated before, this residential area is sandwiched within a rich urban fabric of great diversity of function Within walking distance are practically all the primary use functional districts—business, education, entertainment and recreation



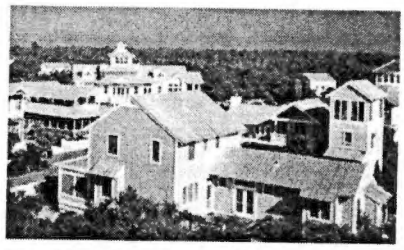
Town square Source Kunstler (186)

However, even though Maplehurst is within walking distance or a very short ride, topography, water, pedestrian unfriendly vehicular traffic streets and roads, and even a railroad isolate this residential area from its surroundings Within the site is also steep terrain and poorly planned arrangement of housing structures, roads and parking which makes circulation throughout the site difficult and even hazardous

The design investigation will be limited to creating a more efficient and direct connection between Maplehurst and the UT campus at "the Hill " The programme will explore a variety of connections with a bridge-like structure that contains mixed-use space for Maplehurst and the University The newer areas of Maplehurst which is located on the lower levels of the site will be master planned for better circulation and public spaces.

Knoxville native and author, James Agee describes, in great detail, both the Fort Sanders district and downtown Knoxville in his Pulitzer Prize winning book, *A*

Death in the Family. Agee paints a picture of a close knit community where work, shopping, school, and church are all within walking distance of each other-- a place where the human drama could be gracefully accomadated. A true sense of community is understood in the Knoxville of the early twentieth century. The picture Agee has painted illustrates the type of community where Knoxvillians stopped and talked in a public space with your fellow shopper or traveler, and where people felt connected to their community. By exploring the connections of a mixed-use pedestrian bridge , this thesis cattempts to affirm in physical form the idea and fact of community and place which Agee describes.



Seaside, FL Source: Katz (14)

II. ISSUES

PRIMARY USE CONNECTIONS

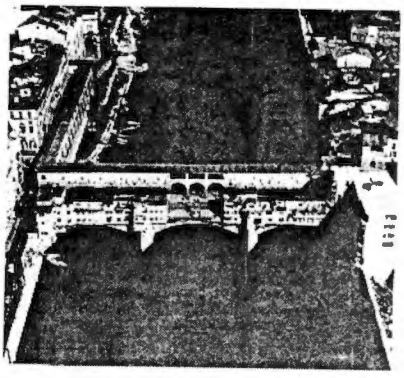
The issues to be explored in this thesis are the identification of various types of connection found in the built environment and how these connections can help support a residential area that in of itself is too small to be self-sustaining. The connection types of physical, visual, social, and contextual are invesitgated in this thesis and its concommitant design. In order for a community to be self-sustaining a variety of functions must be connected together to create a place where the necessities of life are easily attainable. Primary use functional spaces can act as anchors to attract and keep people in an urban community. These primary use anchors include offices and factories, education, certain entertainment, and recreation. (Jane Jacobs, *The Death and Life of Great American Cities,* p. 161) The foundation of the primary use functions is residential and providing efficient connections to the other functions enables the residents to have a better place in which to live. This thesis specifically explores the connection of the residential area of Maplehurst to the educational "Hill" district of the University of Tennessee by using a mixed-use pedestrian bridge to connect the two areas in the typological ways stated above By exploring the mixed-use design of a bridge, this thesis re-examines the bridge and expands its role beyond just as "a structure built over a river, .. to provide a way across for vehicles or pedestrians." (*Webster's New World Dictionary, Third College Edition,* p 174)

You might say the overall consequence is that we have lost our sense of connection Living in places where nothing is connected properly, we have forgotten that connections are important

-James Kunstler,
The Geography of Nowhere

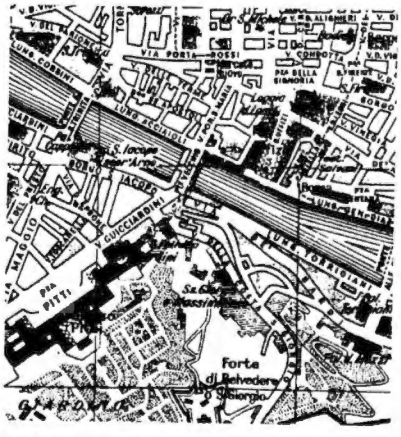
HORIZONTAL AND VERTICAL CONNECTIONS

A space or structure can physically connect in many ways. A horizontal or vertical connection can be given architectural form. A bridge is a method of connecting horizontally the spaces and activities which abut its ends. The Ponte Vecchio in Florence, Italy is a good example of a bridge precedent that connects more than just two spaces on either side of a water barrier. Not only does this famous linkage device built in Renaissance Florence span a river, but also it provided a private linkage from a residence on the bridge to an office complex, the Uffizi. This bridge also connected a diversity of functional spaces, like public circulation, public gathering, retail, and private. This bridge continues to provide a diversity of connection—physical, visual, social, and contextual. These connections will be analyzed in more detail later in this study.



Ponte Vecchio, Florence, Italy.
Source: Whitney (55)

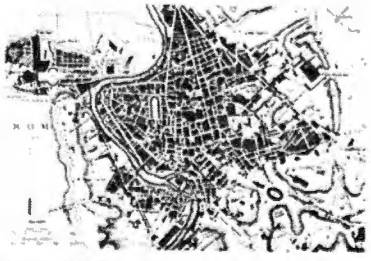
Elements such as stairs are vertical connections between different levels of activity or circulation. The Spanish Steps in Rome do this and more. These wide stairs provide circulation connections between two roads and piazzas while the wide landings create spaces for people to gather.



Map of Florence, IT and Ponte Vecchio. Source: Modified by author

VISUAL CONNECTION

Another type of connection a space or structure can provide is a visual onnection. For example, vertical elements can visually link long axial perspectives and spaces. A combination of elements in Michelangelo's Campodoglio on the Capitoline Hill in Rome visually links one space to another. As one stands at the bottom of the steps that lead up to the piazza, the shorter perspective created by the widening of the steps as they

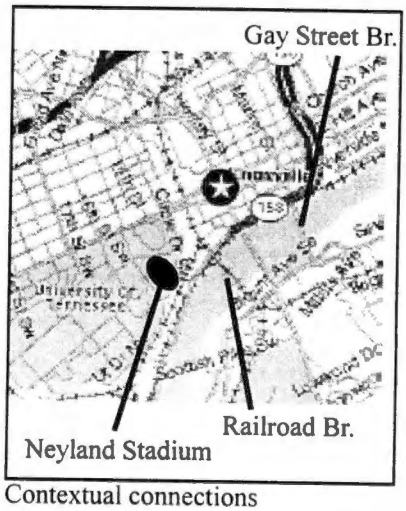


Sixtus Fifth's Plan for Rome.
Source: Moffett (284)

progress up, the framing by the statues that flank the top of the steps and the tower of the central building, can be seen to be visually link ed to the piazza and beyond. Visual linkage is also evident in Sixtus the Fifth's plan for Rome. In plan and in real life ground level perspective, the piazzas, monuments, statues, fountains and obelisks all visually link the long streets to users. Visual linkage is investigated and analyzed more thoroughly in the Spanish Steps, the Steps of Providence, the Ponte Vecchio and the Propylaea.

CONTEXTUAL CONNECTIONS

Contextual connections can also play a role in creating and maintaining successful neighborhoods and places. Context can include a wide range of concepts and elements. Context can refer to vernacular architectural style, materials of local or regional buildings and structures, local history, regional geography and topography, scale of adjacent buildings, or many other site-related factors. The context explored in this thesis will be limited to the relationship between the construction methods of stereotomic mass and trabeated frame. Examples of these relationships can be seen in the adjacent areas of the Maplehurst district. Several existing bridges exhibit this mass and frame construction including the railroad bridge at the western border of Maplehurst as well as the one a few hundred yards further to the west, both of which cross over the Tennessee River. The Gay Street bridge located a few hundred yards to the east of the site and also crossing over the river is a very good study of stereotomic masonry mass piers supporting a steel frame bridge. Another mass/frame structure in close proximity is the football arena, Neyland Stadium, located just west of the Maplehurst site on the campus of the University of



Contextual connections


Neyland Stadium

Tennessee. Further analysis of the stadium and the railroad bridge will be undertaken later Contextual connections between the bridge design project and these existing local structures provide further connection for the user to the thesis intervention to be used

By exploring the different connection issues in an urban setting, this thesis will take these issues and incorporate them into a design project. This project, then, will become a device for creating a better connection between the residential area of Maplehurst and the Hill university district, both located within the urban fabric of Knoxville.

III. CASE STUDIES

***Case Study*: The Steps of Providence Project, Rhode Island School of Design, and Providence, Rhode Island. Architects: Machado and Silvetti.**

This is a case we are going to have to study very deligently, Della
-Perry Mason

Introduction. This case study reflects how the stair element acts as functional (physical), visual, symbolic and social connectors in Machado and Silvetti's Steps of Providence Project in Rhode Island (diagram 1) Therefore, this project relates to this thesis and it's connecting issues

Theme: The Steps of Providence Project displays a diversity of connections in an urban setting, creating better order and circulation to the campus, as well as creating a memorable place .

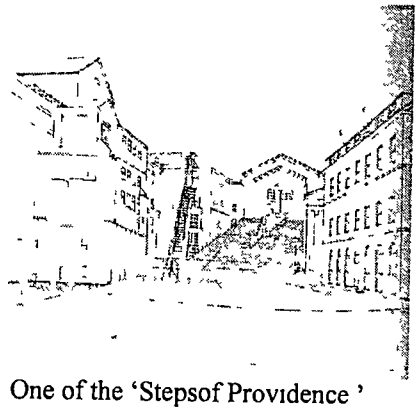
Site/ Context relationships

Location— urban campus spread throughout an area of a city with little boundary conditions

Uses— school of art and architectural design

Entry/ access—solve problem of poorly defined entry and circulation

Contact with surroundings—campus buildings and spaces dispersed throughout area of city



One of the 'Stepsof Providence ' Hays (129)

Activity/ Use relationships

Spatial zones—public (streets, interstitial and

outdoor spaces)

private (classrooms, dorms, faculty spaces)

Access/ circulation—entry points into campus area established

--steps, paths and courtyards established

Form and space—useable outdoor space created with stairs and new buildings

Architectural language—stairs, columns, gates, arcades displayed in post modern/ classic referencing vocabulary within the urban context

The Project

The Rhode Island School of Design (RISD) is a "campus" that weaves itself throughout the urban fabric of Providence and occupies urban buildings—a former bank, church, factories, warehouses and residences—as well as new buildings The goal of this project was to create "tangible, positive space' where "voids and leftover space" once existed Designing existing leftover space into connectors, which were given tieh form as gardens, squares and circulatory axes performed this New buildings were carefully placed to act as generators of new public spaces The sloping topography of the city allows stairs to be major connecting elements in a variety of ways

Issue Physical connection

The topography of the city slopes down towards the river, which necessitates a connection of lower to upper levels within every city block The Memorial Steps

connect the lower Market Square that has the Museum of Fine Arts (both public spaces) to the upper school space of Memorial Hall, the student center. On a larger scale, the Memorial stairs which have smaller extensions that run along either side of Memorial Hall connect the lower campus area on the river to the campus area above Memorial Hall Another set of stairs, the garden steps, connects a lower monumental/public space to more intimate/private garden like upper areas.

Issue Visual connection

The two sets of stairs previously mentioned—the Memorial Steps and the Garden Steps—both provide visual perspective connection between the lower space and the buildings at the top of the stairs. Memorial Hall is viewed as a grand destination at the top of the Memorial Steps as viewed from Market Square Viewed from below and up the garden steps, the campanile of the freshman drawing studio is destination focal point of interest. In both cases the stairs provide a visual connection for the visitor/user

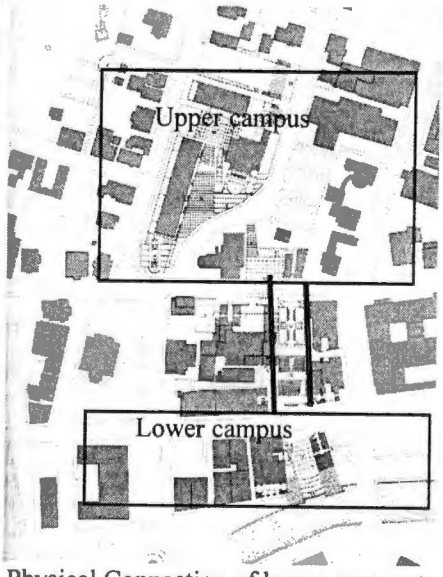
Issue· Social connection

The first set of steps in the journey from the river through the campus introduces the city to the RISD. These steps rise from the river to Market Square creating a connection/entry point between the city of Providence and the RISD campus. The Memorial Steps are the site for different school ceremonies as this 'grand urban stair' is the site of the annual fashion show and commencement ceremonies and, therefore, act as a social connector for different entities on campus and the

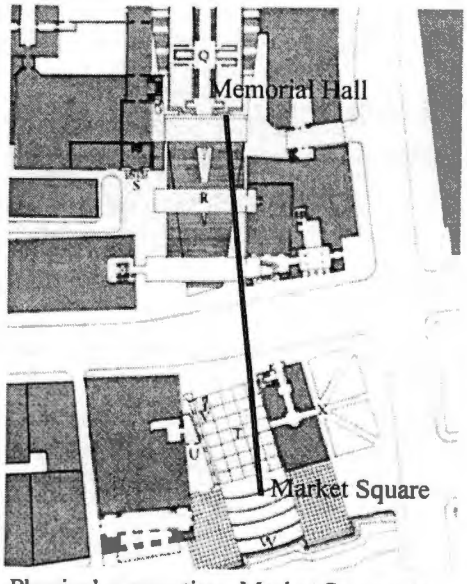
Steps of Providence Analysis Images and Diagrams. Source: Hays and modified by Author



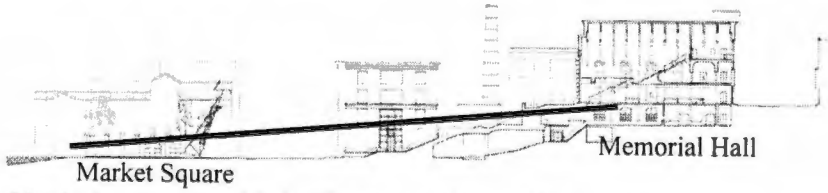
RISD campus and the Steps of Providence



Physical Connection of lower campus to upper campus

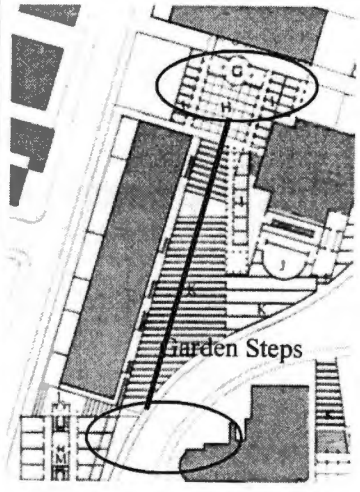


Physical connection- Market Square to Memorial Hall -- plan.

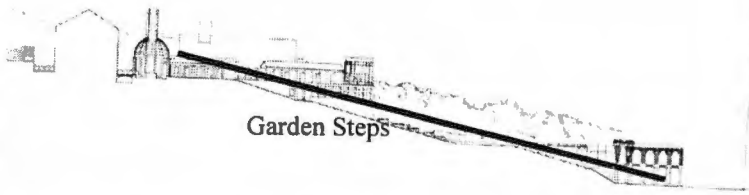


Physical connection- Market Square to Memorial Hall -- section.

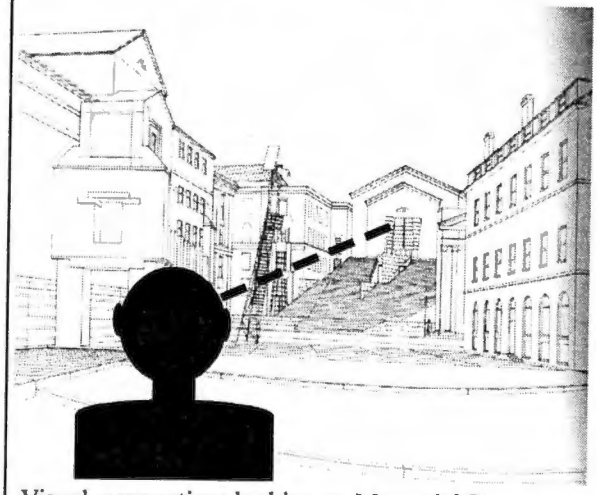
Steps of Providence Analysis. Source Hays and modified by Author



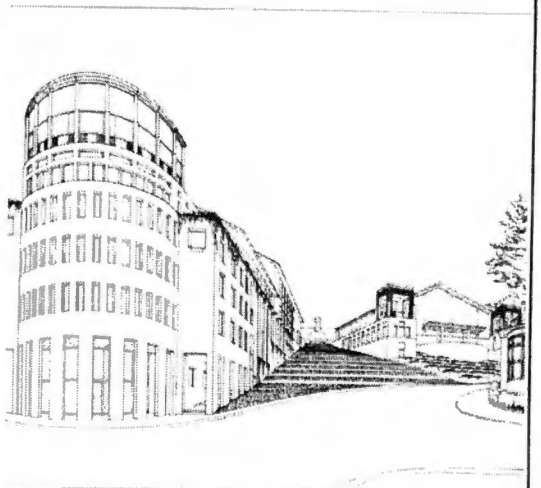
Connection by Garden Steps- plan.



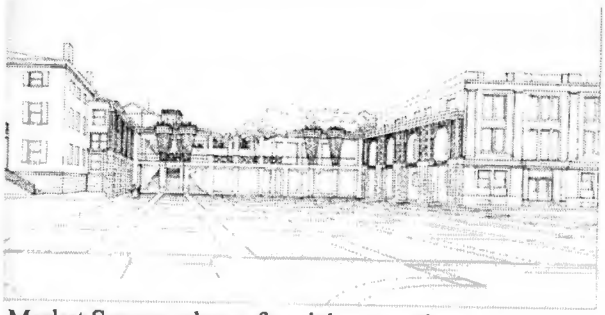
Physical connection by steps- section



Visual connection: looking up Memorial Steps to Memorial Hall



Visual connection: looking up Garden Steps



Market Square: place of social connection

city—students, faculty and the public.

Conclusion

This project's major theme is the visual and functional transformation of the site. The numerous steps provide connections and transitions, as they are the "most powerful feature of the project." For this reason the Steps of Providence Project yeild salient design information to help in the design of a better connection to and circulation within the Maplehurst residential complex.

Case Study: Ponte Vecchio, Florence, Italy.

Introduction: This case study demonstrates how a structure and its spaces connect to an urban. The Ponte Vecchio is an example of several different types of connection—physical, architectural, spatial, visual and social—in an urban setting.

Bridges therefore ought to have the self-same qualifications that are judged requisite in all fabricks: which are, that they should be convenient, beautiful, and durable.
-Palladio

Theme: The Ponte Vecchio displays a diversity of connections in its urban setting.

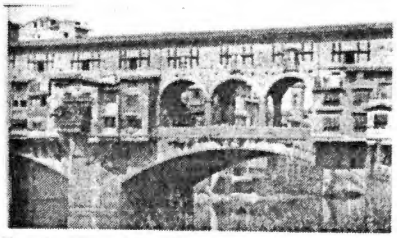
Site/ Context relationships:

Location—urban bridge

Uses—Urban, residential, retail, commercial, and civic connector

Contact with surroundings—mixed-use spaces adjacent to each other

-visual contact with river and city



Ponte Vecchio,Florence, Italy.
Source: Hopkins (41)

Activity/ Use relationships

Spatial zones—Public (circulation, retail, plaza)
-Private (residential, original passageway)

Access/ circulation—axial across bridge; off main axis to retail spaces; central civic space

Form and space—rectilinear elements on arched bridge connecting users to sense of "normal" spaces not on water

Architectural language—Renaissance/classic elements. arches, triumphant arches relate to land architecture.

Project The Ponte Vecchio we know today was rebuilt over the Arno River in the 1340's The medieval practice of lining bridges with residential and retail spaces was common The Ponte Vecchio "was a completely controlled environment " with a roadbed thirty-two feet wide, three hundred thirty three feet long and flanked by forty-eight shops with houses over many of them There was and is an open piazza, located at the middle of the bridge, which looks up and down the river Early shop tenants were tanners, purse makers, and butchers In 1593 Grand Duke Ferdinand I expelled the odiferous butchers for goldsmiths and jewelers, trades that are still present today. Later, the architect, Vasari, designer of the Uffizi, used the Ponte Vecchio as a "base for an elevated (private) corridor linking the Palazzo Vecchio and Uffizi on the north bank to the Pitti Palace on the south "

Issue Physical/Spatial connect

In its primary function as a bridge the Ponte Vecchio spans the river Arno in Florence, connecting the two banks for pedestrian traffic The private passage designed by Vasari described earlier, is still well defined and protected as it crosses the bridge and continues parallel to the bank of the river, emptying out at the Uffizi Museum.

A specifically defined path is marked by this covered extension of the bridge. This axial path across the bridge also provides entry and access to the other spaces that occupy the surface of the bridge—residential, commercial, and civic. This physical connector adds variety to the Florentine urban fabric

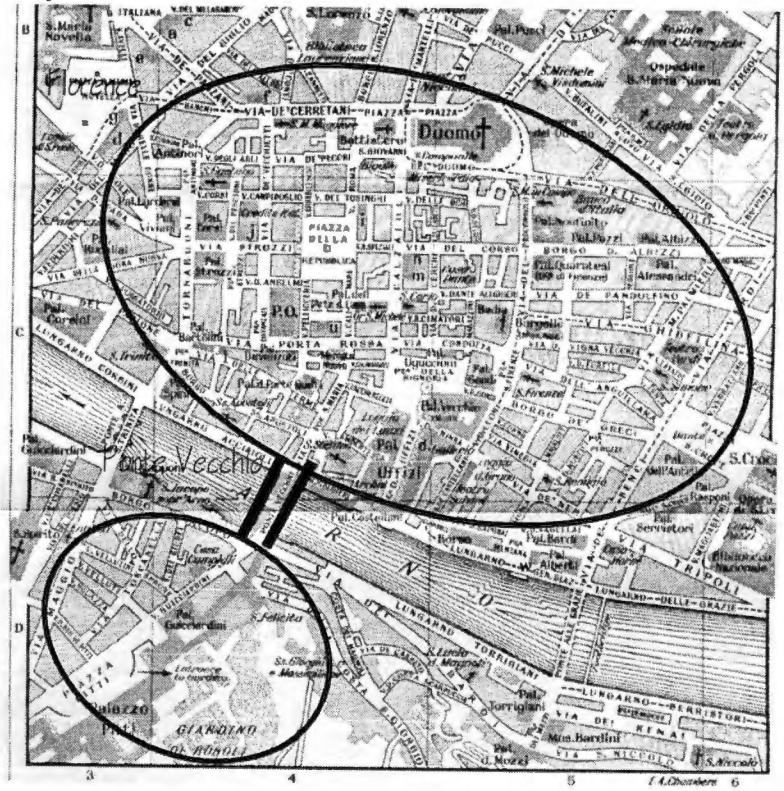
Several functional and formal spaces are connected on the Ponte Vecchio. As mentioned above, spaces of residence retail, civic and circulation are interconnected on the bridge. There are a diversity of forms to these spaces The primary linear circulation space provides access to the smaller cubiform shapes of the retail and residential spaces. The rectangular open plaza/piazza space at midpoint is also off the main circulation corridor. The axial circulation space provides connection to these spaces as well as connecting the urban spaces on either side of the river to one another

Issue Visual connection

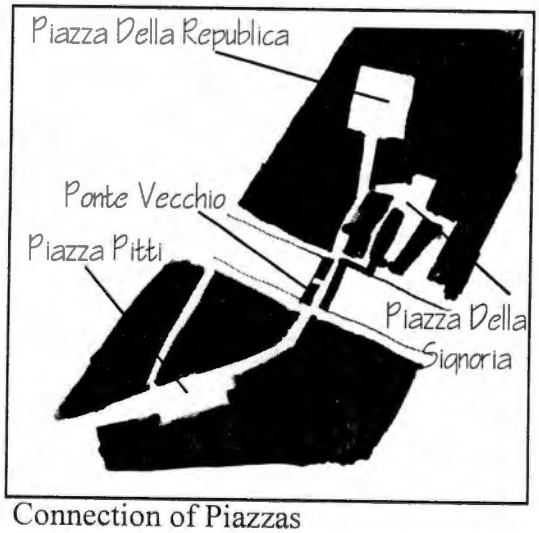
The open plaza located at midpoint of the Ponte Vecchio allows visual connection up and down the river and both banks Even being over water, the user can connect himself to the city as he occupies the bridge space

Ponte Vecchio Analysis. Source: Whitney and modified by Author

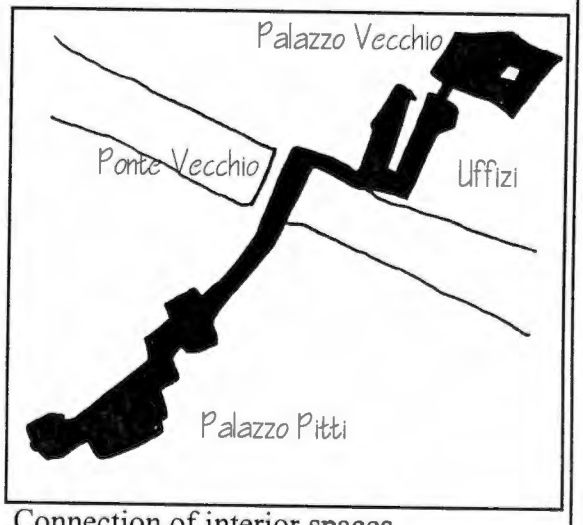
Physical Connection



Connection of districts

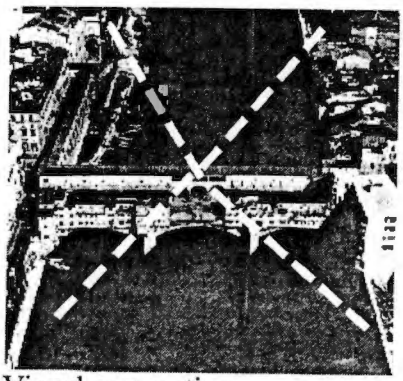


Connection of Piazzas

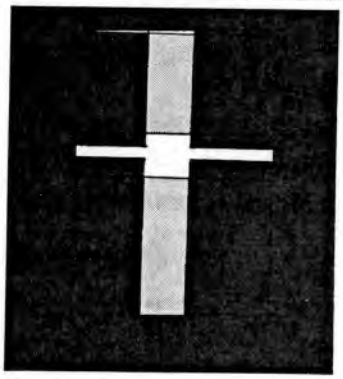


Connection of interior spaces

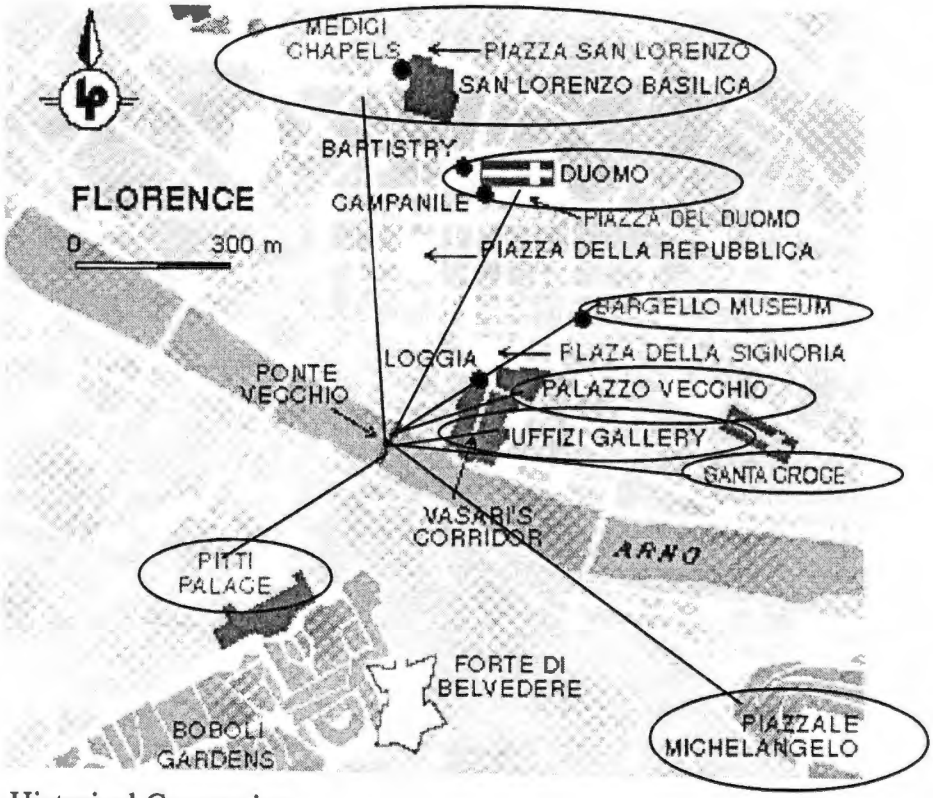
Ponte Vecchio Analysis. Source: Whitney and Moffett and modified by Author



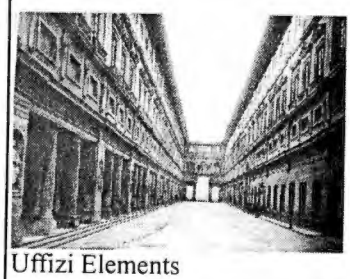
Visual connection



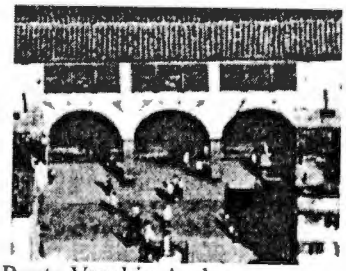
Social Connection



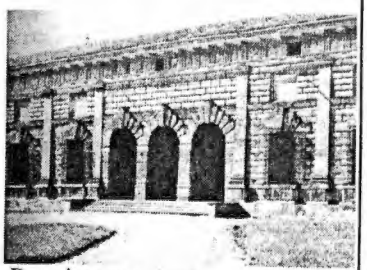
Historical Connection



Uffizi Elements



Ponte Vecchio Arches



Renaissance Arches

Contextural Connection

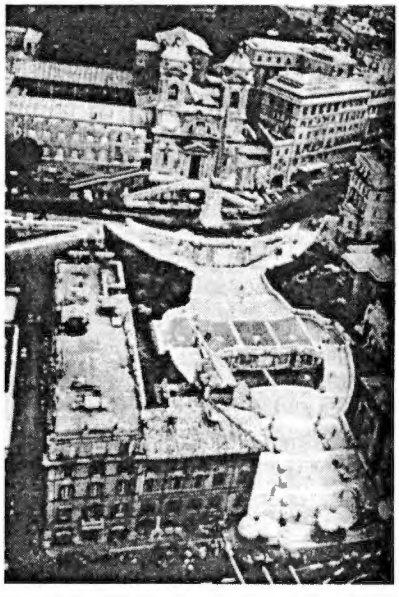
Issue: Contextual connection

The use of classic architectural elements and materials connect the Ponte Vecchio to the rest of the urban fabric, particularly its public and important institutions, which were constructed in the classical manner. This is demonstrataed in the use of Roman triumphant arches at the small civic plaza in the middle of the bridge.

Conclusion: The diversity of connections of the Ponte Vecchio—physical/spatial, visual, social and contextual—speak to thea central issues of this thesis. The issues explored by the Ponte Vecchio can directly and/or abstractly relate to the connections to be investigated at Maplehurst.

***Case Study:* Spanish Steps, Rome, Italy.**

Introduction: This case study demonstrates how this series of inclined spaces connects physically, visually, socially and contextually in a busy urban setting and can serve as a connection precedent for this design project.



Spanish Steps.
Spurce: Zucker (plate 46)

Theme: The Spanish Steps connect spaces and people in an urban environment.

Site/Context relationships:

Location— between two city streets

Uses—primarily a physical connector between grade changes and a social connector.

Contact with surroundings—busy city streets, plazas and buildings, including a church.

Activity/Use relationships

Spatial zones—Public (circulation, gathering)

Access/circulation—the steps primary function is for circulation-connection path between streets at different levels

Form and space—curving forms of steps and their boundaries with expansive landings.
grade changes and a social connector.

Architectural language—Baroque curves, railings and elements.

Project The Spanish Steps were designed by Alessandro Specchi and built by Francesco de Sanctis a decade later between the years of 1723 and 1726 in Rome, Italy The series of cascading stairs and grand landings are located at the top of a steep grade between the via del Babuino, (which leads from the Piazza del Popolo) and the via Sistina.
"From the fountain at its base, gentle curves and counter curves from a dramatic cascading stair that narrows and then divides before reaching an intermediate platform in front of SS. Trinita dei Monte..." (Wodehouse and Moffett, *A History of Western Architecture*, p. 302) The French church, SS Trinita dei Monte, which, (along with the church's corresponding Piazza) is located at the top of the steps, owned the land the steps occupy and helped finance the project. The steps are so named by their proximity to the Spanish Embassy

Issue Physical connections

The Spanish Steps provide physical connection between the two roads, the via del Babuino and the via Sistina, which on a larger scale, connect the Piazza del Popolo and the Corner of the Four Fountains The steps serve to

connect different topographical levels that contain Piazzas—the Piazza di Spagna on the lower level and the Piazza del Trinita dei Monte at the head of the steps. All of these public spaces are physically connected by the Spanish Steps, which provide easier access for pedestrians in Rome.

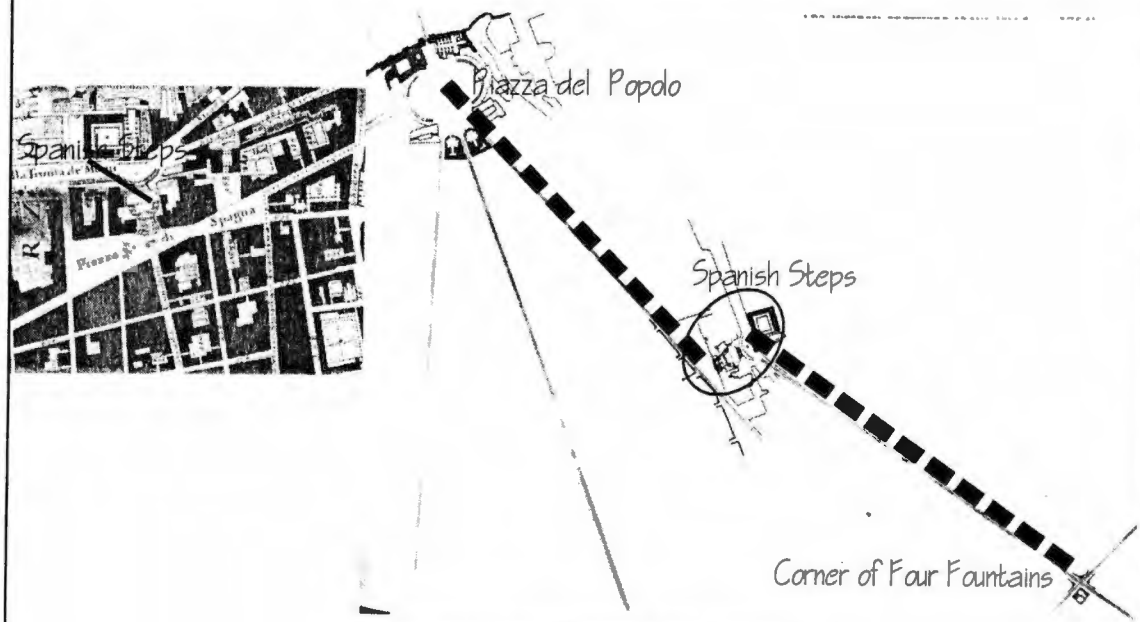
Issue Visual connection

Carrying through with the spirit of Sixtus the Fifth's master plan for Rome of the early Renaissance period, the Spanish Steps visually connect the traveler to the church, SS. Trinita dei Monte and the monument in front, as one ascends the steps

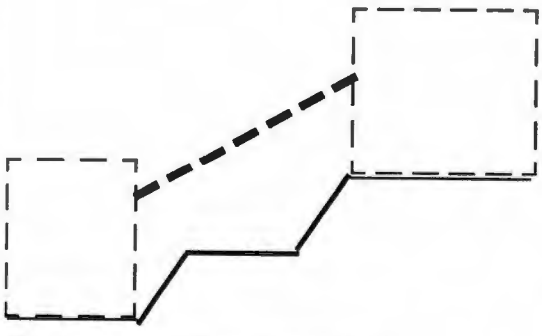
Issue Social connection

One of the most important the Spanish Steps serve today has to do with social connection. "It is a popular and effective stage setting inviting promenaders to be both actors and audience, and the design brings enjoyment to the mundane task of climbing or descending by encouraging the pedestrian to linger and look." (And be looked at) (Wodehouse and Moffett, p. 302) Both formal and informal social connection occurs on the Spanish Steps. Informally, these stairs are a gathering place for tourists and locals, alike, who can stop and gain respite from the busy street scene of modern day Rome Formally, the steps serve as backdrop, audience gallery, and runway space for such events as fashion shows "In the frantic pace of Rome, the Spanish Steps are much appreciated" (Wodehouse and Moffett, p 302) for their social connecting abilities.

Spanish Steps Connections Analysis



Connection of Streets and Spaces

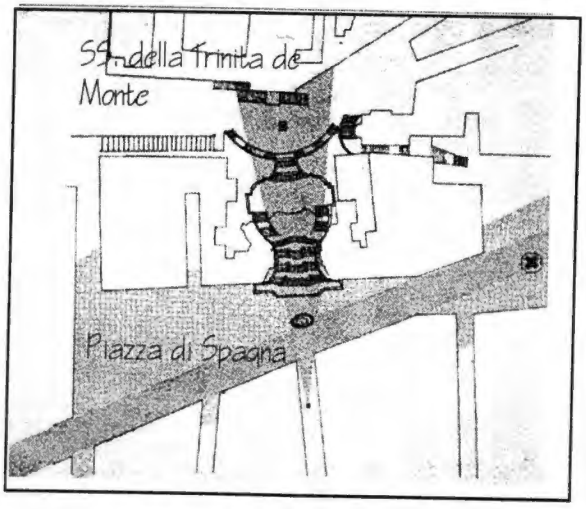


Connection of Levels- section



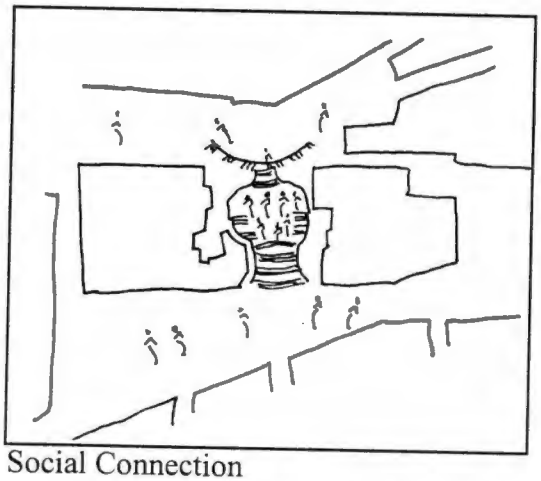
Connection of Spaces

Spanish Steps Analysis

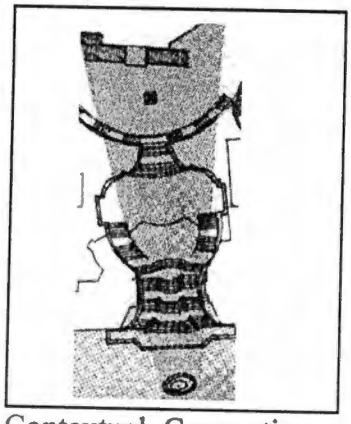




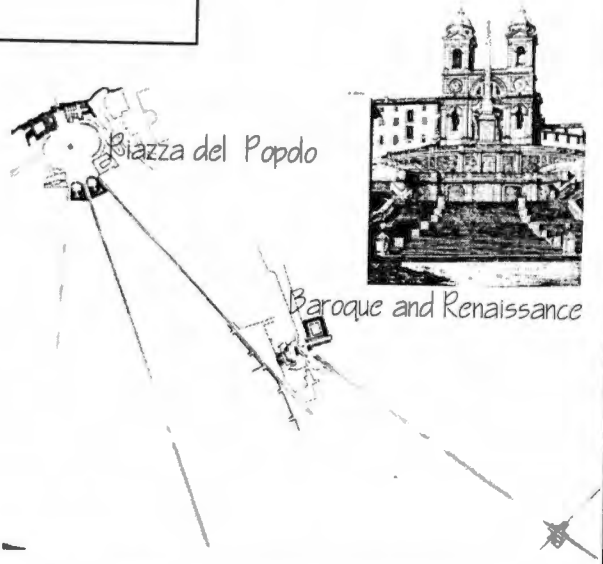
Visual Connection- up steps to Church



Social Connection



Contextual Connection-- Baroque Shape



Contextual Connection-- Architecture

Issue Contextual connection
Contextually, the Spanish Steps connect to the surrounding Baroque and Renaissance architecture. The curves and counter curves reflect the Baroque oval shape The architectural details in the retaining walls, side walls, and banisters refer to the adjacent Renaissance and Baroque architecture Therefore, the Spanish Steps connect to ans consequently add Rome as a city and its context

Conclusion By analyzing the connections of the Spanish Steps, inference and knowledge is gained using stairs as connectors—physical, visual, social, and contextual—and applying these issues to the mixed-use bridge and master plan design of an urban site that is also topographically challenging

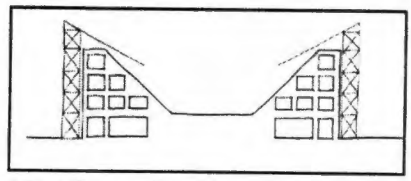
Local Precedents

Case Study: Neyland Stadium, University of Tennessee Campus, Knoxville, Tennessee

Introduction Neyland Stadium is the venue for football at the University of Tennessee, Knoxville This structure is analyzed primarily because of its mass and frame construction. In addition, the structure also serves a mixed-use purpose as these uses (other than for football) have changed over the years. The stadium contains functional spaces within the original masonry mass structure Seating expansion in the last 25-30 years has been accomplished by using steel frame construction that rises and encircles the mass externally and hovers over that mass This analysis of Neyland


Neyland Stadium location

Stadium is confined to the issues of mass and frame as wel as the mixed-use nature of the structure.



Mass/frame diagram

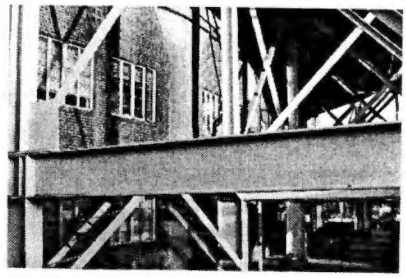
Theme: Neyland Stadium mass and frameconstruction influences the design project of this thesis.

Site/Context relationships:

Location—on university side of site, on river.

Uses—football stadium and office space.

Contact with surroundings—playing surface isolated from surroundings; office space within mass for university use; dressing rooms for playing teams.



Mass and frame
of Neyland Stadium

Activity/Use relationships:

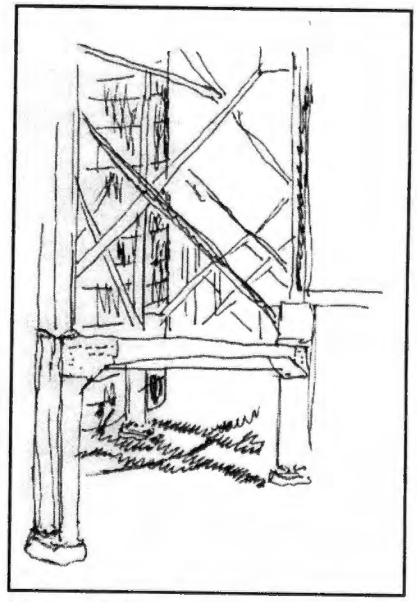
Spatial zones—(Paying) Public: circulation, viewing of sporting events.

— Private: university office use; team dressing rooms.

Access/circulation—entry from exterior into radially-directed ramps and concourses.

Form and space—masonry mass stadium "bowl" surrounding open grass playing surface; steel frame surrounds and reaches over mass bowl, forming a 'web of steel' around the mass.

Architectural language—mass bowl built with concrete arched frame with brick infill giving a hint of classicism surrounded by industrial steel frame.



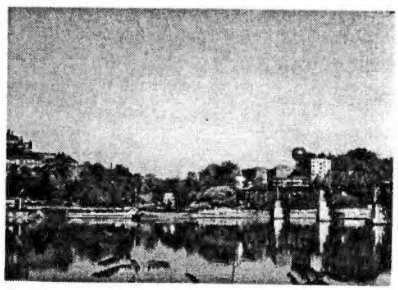
Mass and frame
connections of Neyland Stadium

Issue: Contextual connection—mass and frame Neyland Stadium is a monumental structure exhibiting two construction methods—masonry mass and steel trabeated frame. The mass structure arises from the earth, and spreads tp form a three-quarter stadium "bowl" that, as it rises it slopes away from the center of the mass. The steel frame shoots up from the ground adjacent to the mass, but not attached to it, surrounding

the mass as the frame reaches up and over the mass, supporting angled seating platforms. This masonry mass and steel frame relationship of Neyland Stadium has contextual connection to and influences the design of the thesis's bridge intervention which also employs mass and frame in a "single" edifice.

***Case Study*: Railroad bridges across the Tennessee River in downtown Knoxville**

Introduction: The railroad bridges of downtown Knoxville also exhibit a relationship between mass and frame constructionfurther informing the thesis design project. Connection between mass and frame and the spanning of the frame construction have direct influence on the design of the bridge intervention.



Railroad bridge going into site .

Theme: The railroad bridges, which cross the Tennessee River adjacent to the Maplehurst and university site, serve as precedent for mass and frame contextual connection to the mixed-use pedestrian bridge of the thesis project.

Site/Context relationships:

Location—urban bridge

Uses—industrial, commercial connector

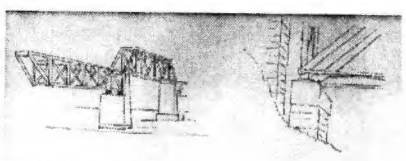
Contact with surroundings—boundary marker and divider of residential and university districts; object in landscape over river.

Activity/Use relationship:

Spatial zones—rail circulation

Access/circulation—Railroad only, axially across bridge and river

Form and space—masonry mass vertical piers

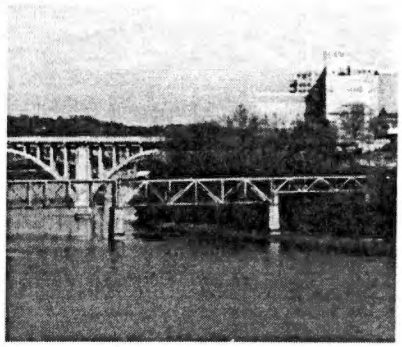


Railroad bridge sketches.

and horizontally spanning steel truss frame.

Architectural language—stereotomic masonry mass connected to trabeated steel frame.

Issue: Contextual connection—mass and frame

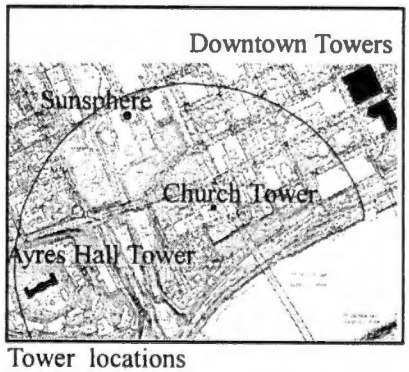


Warren trusses on stone piers of railroad bridge

The railroad bridges spanning across the Tennessee River adjacent to the project site serve as contextual connection inspiration for the architectural language and design form of the intervention. The steel Warren truss frame that spans the river and supports the train loads are supported by limestone mass piers rising from the water and banks of the river. The design intervention (as seen later) is derived from these forms. The steel frame rests on top of the piers and they are connected by bolts and plates. Connection within the steel frame by buttress plates also influences connections in the intervention frame construction as well as in the larger site design of the public plazas. (Also seen later) the railroad bridges serve as a primary design precedent for the intervention in construction detail, major mass and frame relationship of the bridge project, and master planning design of public places.

***Case study*: The Towers of the Site and Urban Context**

Introduction: Several towers are associated with the site and surrounding context. Church Street Methodist Church is located on the Maplehurst site and contains a 154-foot bell tower that serves as a landmark for the Maplehurst area. Ayres Hall is the primary building on the "Hill" and also contains a tower (171 feet) that serves not only as the landmark for the "Hill", but for the university as a whole. The World's Fair Park is adjacent to the site (the new master plan for the Park shows a finger following along Second Creek to the



Tower locations

river and actually passes under the bridge intervention), and contains a landmark tower—the Sunsphere—which can be seen from the project site.
Other vertical objects that serve as tower landmarks for the downtown business district are the Union Planters Bank tower and the Plaza Tower. (These towers will not be directly analyzed) These towers serve to connect visually (by serving as markers to orientate users) and contextually (by relating to the towers on the site).

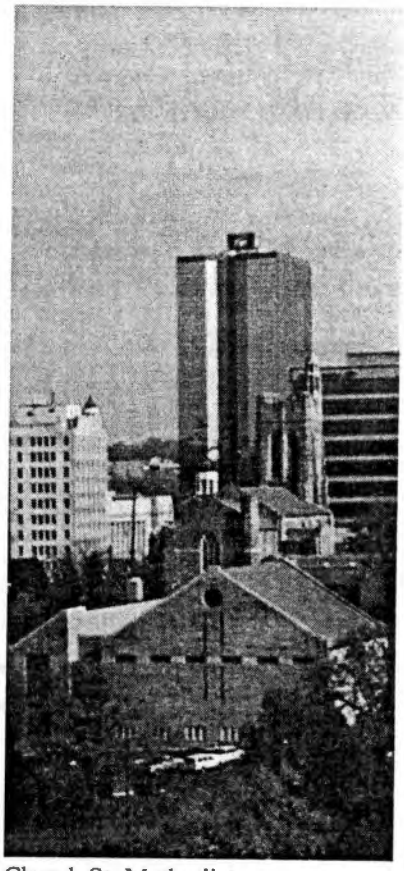

Downtown towers from UT Hill

Site/Context relationships:

Location—urban towers within residential area, university district, and recreational/entertainment area.

Uses—visual connectors and landmarks; markers of time and events; observation tower

Contact with surroundings—visual markers


Church St. Methodist Church and tower with Plaza Tower in background from UT Hill

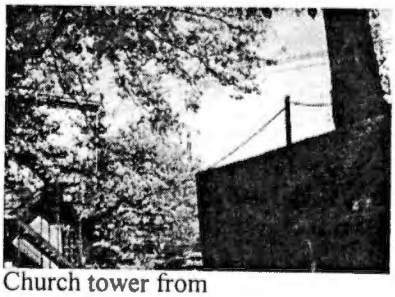
Activity/Use relationships:

Form and space—vertical elements are part of building or stand alone in landscape

Architectural language—Church Street Church and Ayres Hall towers: masonry mass, collegiate gothic and gothic revival, respectively; Sunsphere: steel frame.

Issue: Visual connection

The Church Street Methodist Church tower serves as a visual connector to people traveling within sight of the structure, either on their way to Maplehurst or to the church or just passing by. Within the site of Maplehurst, the church tower serves as an orientation object, ever-connecting the person to the area itself. From the university "Hill" district, the church tower quickly visually connects the viewer to Maplehurst.


Church tower from within Maplehurst

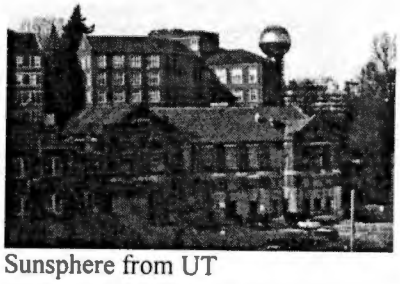
Ayres Hall serves similar visual connections. This

prototypical gothic collegiate tower visually connects people to the "Hill" or to the university in general. This tower is easily visualized from many areas throughout the city, including various locations within Maplehurst. The pedestrian or vehicular traveler is instantly connected to the "Hill" when Ayres Hall is seen. Both the church and collegiate towers mark time and schedules with chimes or music, which serves to audibly and mentally connect the listener to each site.


Ayres Hall tower
from Maplehurst


Sunsphere and
Church tower

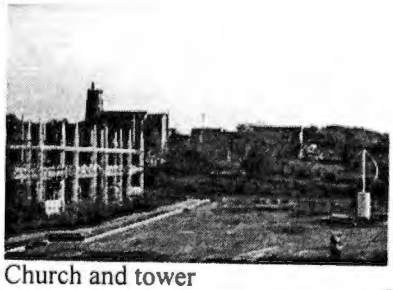
The Sunshpere, located on the World's Fair Park site, serves as the visual landmark for not only that site, but to downtown Knoxville and the city as a whole. From the project site—Maplehurst and the "Hill"—this globed tower is visualized from various areas and connects the viewer to the World's Fair Park. The Sunsphere was originally designed as an observation tower, so visual connection was the primary function of this structure.


Sunsphere from UT

By acting as powerful visual connectors, all of these towers serve as precedent and design inspiration for the design project, and justify a tower element in the bridge intervention.


Church tower
with Sunsphere in background


Ayres Hall tower
from Maplehurst


Church and tower
from World's Fair Park

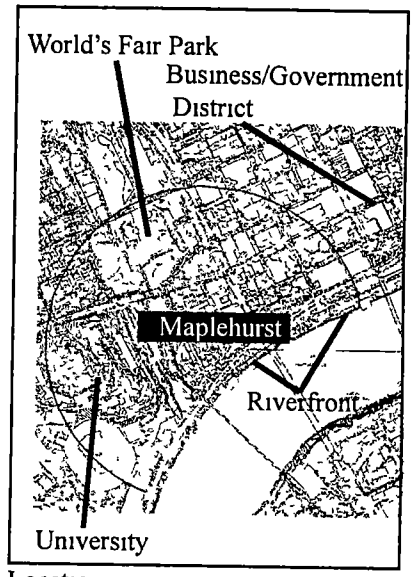
IV. SITE ANALYSIS

Issue: Physical Connection, urban scale

All the stuff in the man-made landscape— towns, streets, buildings, et cetera— had to be viewed as orders of connecting relationships rather than as mere objects in space

–James Kunstler on Alexander's, *A Pattern Language*

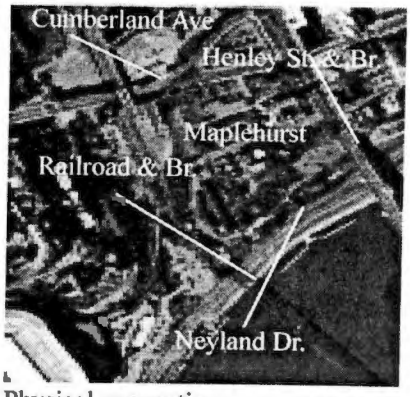
Before exploring the connections associated with Maplehurst, a discussion of the isolation of the residential complex is appropriate. As stated before, Maplehurst is situated on a steep hill Its isolating boundaries are as follows To the west are a very steep slope, a creek (Second Creek), and railroad tracks This separates Maplehurst from the University's Hill district To the east is a very busy four-lane primary traffic artery, Henley Street and Henley Bridge that traverses the Tennessee River This street separates Maplehurst from the downtown districts To the north is a very busy vehicular four-lane street, Cumberland Avenue, which, as it runs east turns into W Main Street These roads keep Maplehurst separated from the World's Fair Park and its diversity of activities And finally, to the south are a twenty-foot steep slope and a busy four-lane road, Neyland Drive These barriers separate Maplehurst from the Tennessee River front area In all, just yards in distance and within minutes walking time to a rich variety of primary use districts, a pedestrian in Maplehurst is isolated from these areas, while the automobile driver is inconvenienced by these isolating elements With this isolation in mind, the site analysis with respect to connection (or lack thereof) was performed.



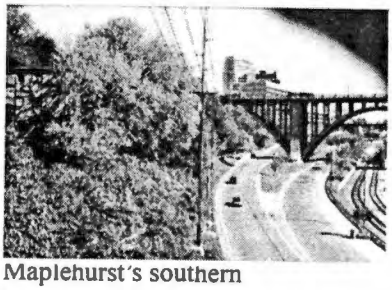
Location map

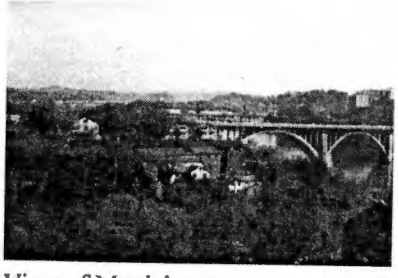
On the urban scale, the horizontal connections include roadways and bridges. Leading into and out of the site is Henley Street which runs north and south and is a main artery to and from the southern districts of Knoxville across the Tennessee River via the Henley Bridge

This is a heavily traveled thoroughfare, especially during the morning and evening rush hour periods. Turning against traffic into and out of the Maplehurst area is prohibited by traffic code. The entry from Henley Street onto W. Hill Avenue is a primary entry point into Maplehurst from the east. As Henley Street extends across the river south, this road becomes Henley Bridge. This bridge is an elegant concrete arched structure completed in 1934. It was built to be a connection of the downtown Knoxville business district with the southern residential neighborhoods across the river, with the town of Maryville fifteen miles to the south, and with the newly opened Great Smoky Mountain National Park. The Henley Bridge still serves that connecting purpose today very well. At the north bank connection, Henley Bridge cuts off a portion of the eastern extension of Maplehurst along Neyland Drive. This slip of the Maplehurst area lies in steep slopes and terraces of terrain facing the Tennessee River. Henley Street and the bridge act as the eastern boundary except where the aforementioned sliver of the site slips under and past the bridge.

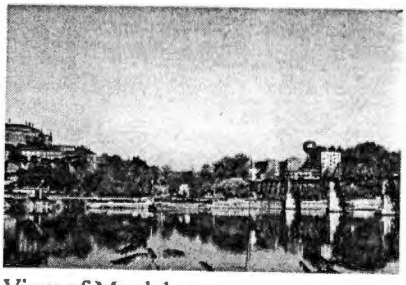


Physical connections of Maplehurst


Maplehurst's southern boundary: Neyland Dr.


View of Maplehurst from UT Hill

Cumberland Avenue, which turns into W. Main Street, is an east-west artery that forms the northern most boundary of Maplehurst. This street connects the UT campus to downtown Knoxville districts. Its sidewalk connects Maplehurst to the UT campus for pedestrians. Because of the topographical barrier to the west of Maplehurst between it and "the Hill," the Cumberland Avenue route is a circuitous connection for students and faculty. The aforementioned W. Hill Avenue that is the entry point also acts as a northern boundary for Maplehurst between the neighborhood and the adjacent Church Street Methodist Church. This east-west street is also a connection eastward to the downtown districts.


View of Maplehurst and UT Hill from Tennessee River

However, this route crosses Henley Street and is currently very dangerous. The western boundary of Maplehurst is a set of railroad tracks and the steep topography. This rail line runs north and south and crosses the Tennessee River. At the southern edge of Maplehurst is steep topography and the connector, Neyland Drive. This busy four-lane road runs east and west along the Tennessee River and under the railroad bridge and Henley Bridge. This roads acts a bypass around the UT campus connecting the east and west parts of the city. The connection to Neyland Drive and the riverfront from Maplehurst is hazardous for a pedestrian, at best. There is a pedestrian bridge connector over Neyland Drive two blocks to the east of Maplehurst that links downtown Knoxville to the riverfront. Connection to this bridge from Maplehurst is difficult and potentially dangerous.



View of Maplehurst
from business district

Mass transit connections from within Maplehurst to other districts are non-existent. The bus lines do travel along Cumberland Avenue and access is available on the street a few blocks away from the residential area. Ironically, connecting elements-- roads, bridges, and railroads-- act to disconnect or isolate Maplehurst from the surrounding areas and districts.



Isolation of Maplehurst

These boundaries/connectors of Maplehurst turned disconnectors— Henley Street and Bridge, Cumberland Avenue/W. Main Street, the railroad line, and Neyland Drive isolate the residents of Maplehurst to easy access to the close by primary use districts. These horizontal connectors are currently not pedestrian friendly. Exploration of the transformation of those boundaries into connectors is the crux of this thesis. Because of the time constraints to this thesis the urban scale connection to be concentrated on is the UT-Maplehurst connection.

Some of the analysis site sections performed are cut east west through the Hill across the Second Creek ravine, the railroad line, Maplehurst, and across Henley Street. (Figs. 4.1, 4.2) Several interesting points are observed including many similarities. The UT "Hill" and Maplehurst are approximately the same height and width. (Fig 4.3) Both have landmark structures with towers The "Hill" has Ayres Hall and its majestic collegiate bell tower Maplehurst's Church Street Methodist Church also has a stately bell tower. These towers are virtually the same height. Both hills have upper and lower levels The upper level is the crest of each hill and lower radiating levels of each hill have circulation routes and buildings encircling the southern face of each hill. The circulation routes of the UT hill are much better than Maplehurst as they connect within the hill site and to adjacent primary circulation paths (Fig 4.4)

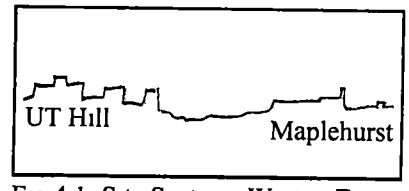


Fig 4.1 Site Section- West to East

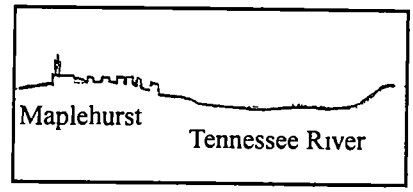
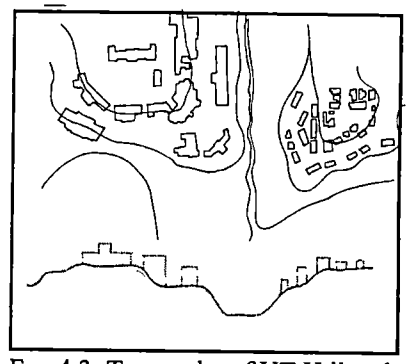
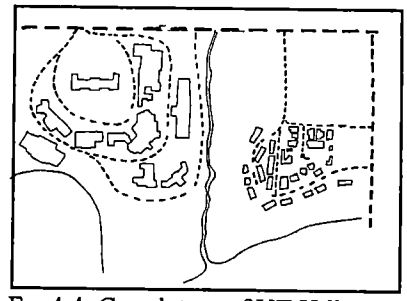


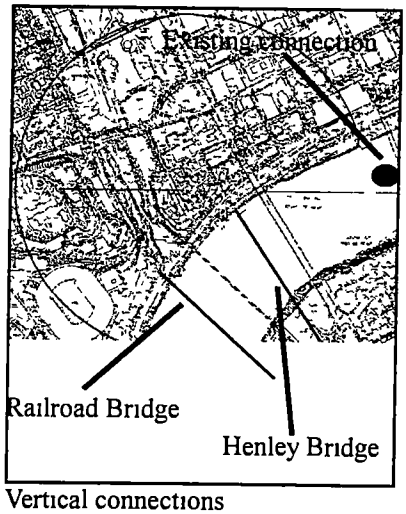
Fig 4 2 Site Section- North to South

Potential connections between the educational hill and the residential hill might between the top-level crests or the lower level terraces. The engineering building on the east second level terrace is a potential barrier to a straight-line connection from Maplehurst to UT. Potential connections between the hills could include stairs, bridge(s), ramps, or even a tram system or a combination of these. There are two relatively large flat areas in the west terraces of Maplehurst These could be sites for a mixed-use structure that represents a grand entry into Maplehurst from UT. This not only could contain uses (as mentioned before) such as housing, computer/ work areas but also provide a connection point for mass transit. This structure could also be the primary connector for Maplehurst and the surrounding districts, not just to the UT campus This space/structure could house the tram, a light rail system, which utilizes the


Fig 4 3 Toporaphy of UT Hill and Maplehurst


Fig 4 4 Circulation of UT Hill and Maplehurst

existing rail line, bus and trolley access, and cyber connections providing connection to Knoxville and the rest of the world.

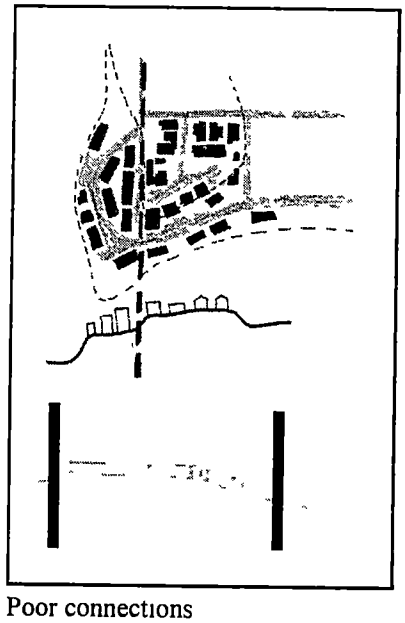


Vertical connections

Issue: Vertical Connection, urban scale

There is no vertical linkage between Maplehurst and lower areas to the west (UT) and to the south (river front) As mentioned, there is a link to the lower riverfront area via a pedestrian bridge over Neyland two blocks to the east, which is not easily accessible from Maplehurst. There is much potential and a need for vertical connection to the river front and especially the UT "hill' area. The railroad trestle or Henley Bridge could be utilized as a structural base or starting point for vertical linkage to these areas.

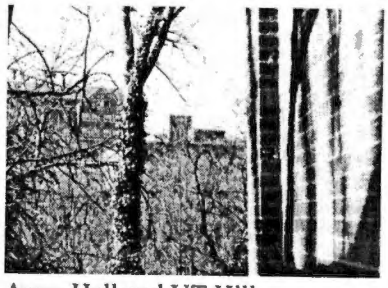
Issue: Physical Connection, local scale


Poor connections within Maplehurst

As Maplehurst has basically two levels— the original upper area and the 'newer' lower area, connections between these two areas are explored The upper level houses a mix of students and non-students The lower level contains primarily student housing in the form of box-like, three to four story apartment buildings with little architectural integrity or thoughtful placement. Current connections within the site between the two levels and between the structures on the lower level are poor. There is one set of poorly marked steps on the west end of Maplehurst Court linking upper and lower Maplehurst Pedestrian un-friendly vehicular links between upper and lower areas are haphazard. The connections between the lower level apartment buildings are uninteresting, chaotic, and potentially dangerous, especially to pedestrian use On upper Maplehurst

there are tree-lined sidewalks faced by houses and apartments of several architectural styles: bungalow/ craftsman, classic revival, tudor revival, Moorish revival and modern. All these elemnets make an interesting and fairly rich neighborhood street scene. There are definitely two faces to Maplehurst: pedestrian-friendly upper level with a sense of place and lower level with a chaotic, unfriendly character.

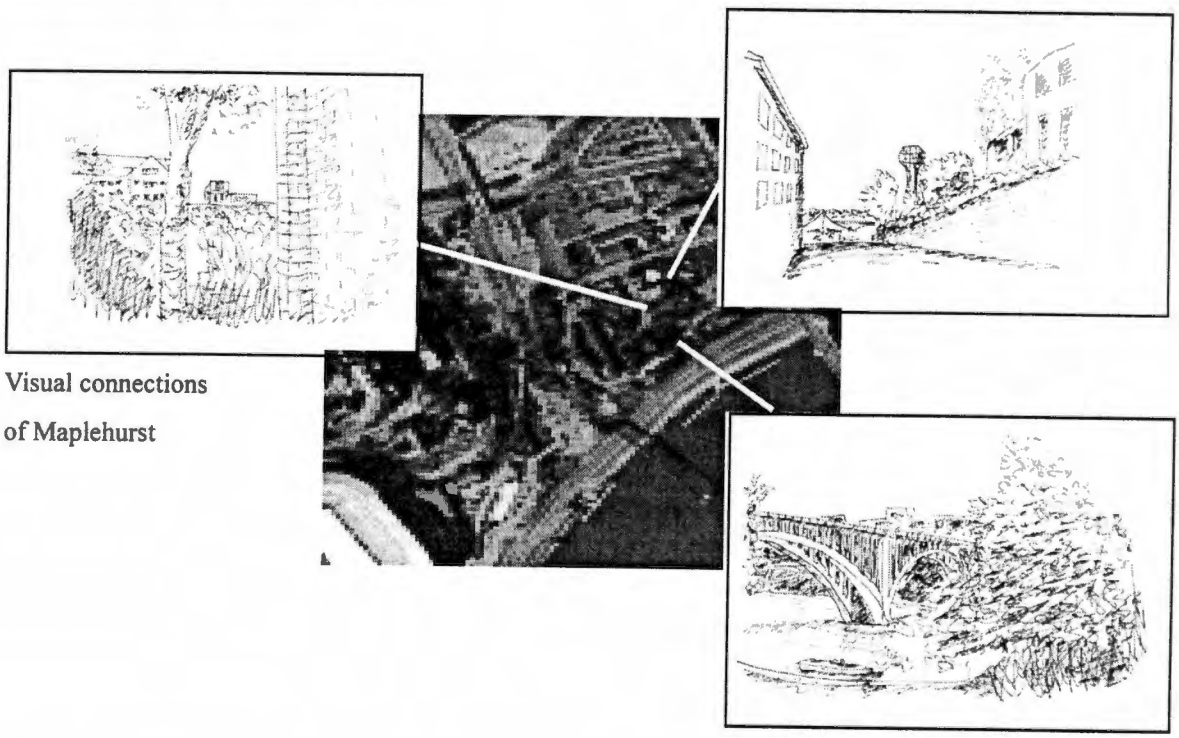
Connection between upper and lower Maplehurst via steps, ramps, grand stairs, change of grade, and areas of repose could be explored. The Steps of Providence Project and the Spanish Steps of Rome provide source material for the diesgn. Connections between the lower area buildings to each other is another a point of exploration. Master planning placement of new proposed apartment structures may also be of value.


Ayres Hall and UT Hill from Maplehurst

Issue: Visual Connection, urban scale

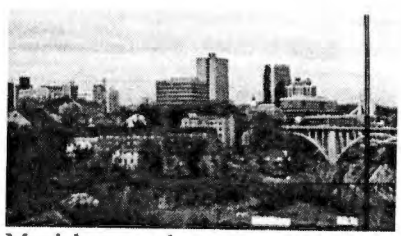
As Maplehurst occupies a hill of substance, a visual connection in and out is an important aspect of the site. There are several important visual links out of Maplehurst connecting it to the rest of the city. Westward, toward the University, the predominant points of interest are on "the Hill." The Ayres Hall tower is visible from most vantage points on the crest of Maplehurst and on the west side. Blockage of this view can be by other Maplehurst buildings, topography, or deciduous trees, depending on the season. Of course, other buildings visually connect the Hill district and Maplehurst. Because of their placement on the eastern slope of the Hill, the engineering buildings in particular, are seen from Maplehurst. Neyland Stadium is also seen from most western vantage points of Maplehurst.

In establishing connections with Maplehurst and to UT, Ayres Hall should be a visual connection leading the user through the site and westward to the university area. Neyland Stadium can also be a visual connection/ destination from within Maplehurst.

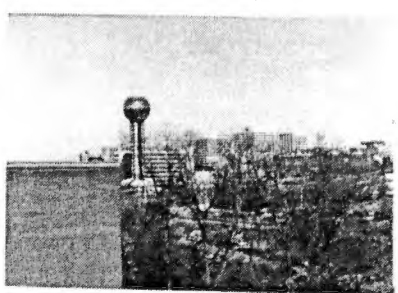


Visual connections of Maplehurst

Visually connecting Maplehurst to downtown districts, several landmarks are seen. The Union Planter's tower is the tallest landmark representing the business district. The clock towers of the new federal courthouse complex (formerly Whittle Communications) are visible from some eastern Maplehurst upper level vantage points. Along with this civic complex the City-County Building is visible and represents the governmental district. Looking northeast is not especially rewarding except from the W, Main entry due to blockage by Church Street Methodist Church. Due north, as stated in the case study analysis, the Sunsphere is a recognizable landmark representing the World's Fair Park area and being more recognized as a symbol for Knoxville. The Clinch Avenue Bridge running east west across the

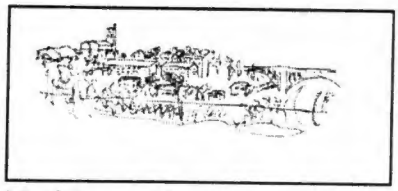


Maplehurst and downtown from UT Hill



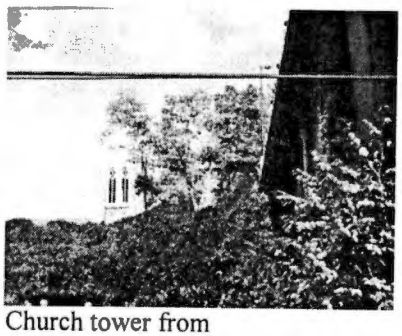
Sunsphere and downtown from UT Hill

World's Fair Park is also visible from the northern areas of Maplehurst. The Sunsphere and this bridge are potentially worthy visual connections from Maplehurst.



Maplehurst and
church tower from UT Hill

Southward the river in general is an aesthetic link for Maplehurst. Baptist Hospital, across the Tennessee River on the south bank, is a potential visual. Both the railroad bridge and especially Henley Bridge are visual connections that are both a landmark for visual destination and objects that connect the viewer to further point away from the Maplehurst site. The elegant Henley Bridge should be taken of advantage visually from Maplehurst.



Church tower from
within Maplehurst

Visually, linkage to Maplehurst from outside the site is also worthy of exploration. In general, the best views into the site are from across the Tennessee River, along Henley Bridge, from Neyland Drive, and from "the Hill." The master planning and placement of the lower Maplehurst apartments will have some bearing on these views. The primary visual connections to be explored will be from the UT Hill, as that is the concentration of this thesis.

Issue: Visual Connection, local scale

Within the site visual connections of significance are numerous. From several areas on the eastern side of Maplehurst, the Church Street Methodist Church tower is able to be visualized and can be an orientation link within the site. The buildings in upper Maplehurst have architectural interest; especially the seven story Moorish revival apartment building on the west end of Maplehurst Court. From the rear south side the building towers seven stories above the adjacent four story apartment buildings and can be a visual connector as

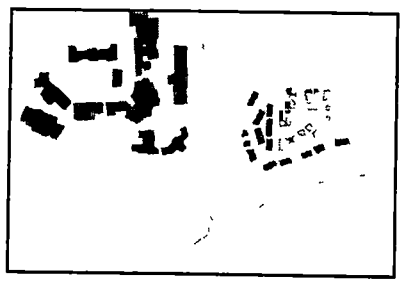


The UT Hill from
from Maplehurst

one travels through the lower site As the site has steep topography, much foliage, and radiating terraces, interesting links and framed views can be investigated with stairs, ramps, public and intimate public spaces, terraces and gardens

Issue: Social connection, urban and local scale

Currently, social connection between Maplehurst and the surrounding districts is limited The primary social connection is between Maplehurst and the university with the presence of many UT student residents. Because the only primary use function currently in Maplehurst is housing, social connection between residents is limited to informal semi-private gatherings like parties There are no cafes, public plazas, or even grand stairs for people to gather and socialize. Maplehurst Court street is the public space most conducive to informal socialization available, other than the laundry rooms of the apartment buildings The lower level of Maplehursthas potential useable space.



Social connection
between UT and Maplehurst

The UT Hill has two major spaces, the top of the hill south of Ayres Hall and the plaza space in front of the Ferris Engineering building.



Spaces of the site

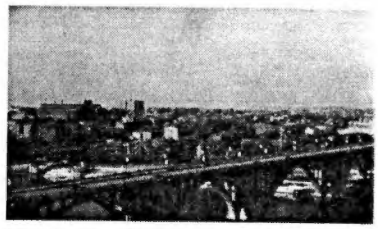
The World's Fair Park master plan extends to the river front between the hills of UT and Maplehurst and is a relatively flat slip of space

With the design proposal of connections— stairs, master planned streets, and public spaces— potential for interconnection of Maplehurst residents is explorable. On an urban scale a design investigation that involves a mixed-use connection structure and spaces as mentioned before could be a very successful

exploration of social connection.

Issue: Contextual Connection, urban scale

Within walking distance of Maplehurst in the surrounding districts are several historical structures and sites. The original founding site of Knoxville, James White Fort— is now situated a few blocks to the east. Blount Mansion, the city home of William Blount (first governor of Tennessee and signer of the Declaration of Independence) is the only true Georgian structure in Knoxville and is also a short distance to the east. The old courthouse is a classic revival building located on the corner of Main Street and Gay Street. Other buildings of architectural integrity nearby include The Lord Lindsay (a Roman revival style former church), First Baptist Church (a Roman revival structure) and Church Street Methodist Church (designed by architect, John Pope.



Henley Bridge,Maplehurst, and the Hill.

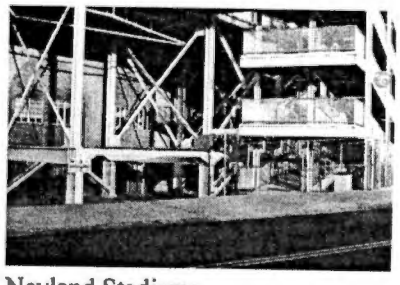
The University's "the Hill" has some magnificent buildings in collegiate Gothic style including Ayres Hall, the landmark for the University of Tennessee. The oldest building on the UT campus is also on "the Hill' which is South College, the last of the original structures on this college site. Henley Bridge is an Art Deco era structure that stretches from the Maplehurst area across the Tennessee River. This concrete structure is worthy of historical connections attention.

Events of social history could also be significant in the design investigation. The home of the Tennessee Valley Authority is in Knoxville and the first dam of this institution, Norris Dam is 30 miles away, as well as several other TVA dams. Country music has roots in downtown Knoxville and James Agee's Pulitzer Prize

novel, *A Death in the Family*, is set in early 19th century Knoxville in the nearby Fort Sanders residential neighborhood, where Agee grew up. The University of Tennessee has a rich history of football under legendary coach General Robert Neyland. All these significant chapters on the history of Knoxville are potentially worthy of exploration or reference.


Railroad bridge
from Maplehurst

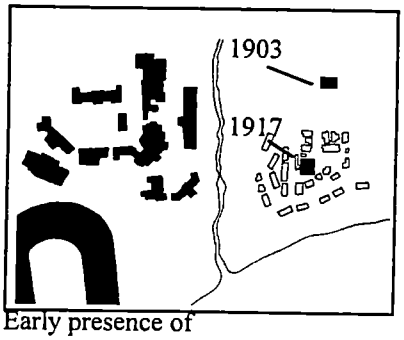
The towers of the World's Fair Park and the business have already been discussed in the case study section. To narrow the scope of exploration relating to context, I have chosen to investigate the connection between stereotomic mass and trabeated frame construction and towers of the site and surrounding areas. Analysis of several structures with that construction relationship has been presented—Neyland Stadium and the railroad bridges across the Tennessee River. This construction method relationship and the towers have direct and indirect influence on the design of the thesis as mass and frame is investigated in the mixed-use pedestrian bridge.


Neyland Stadium:
contextual connection.

Issue: Contextual Connection, local scale

The Maplehurst site, according to city maps has evolved over the years. The map of 1903 shows a large house on the current site Maplehurst Court. The Church Street Methodist Church is not present yet so High Street continues to W, Main Street. A small street, Emmerson Avenue, is parallel to W. Hill Avenue and is between it and W. Main Street and contains several small lots and houses along it. Small houses are also on Poplar Street, W. Hill Avenue, W. Front Avenue and River Avenue (now Neyland Drive). At the corner of High and W. Main Streets is a larger building labeled "East Tennessee Female Institute." A larger home is

also located at W Hill Avenue and High Street. The 1903 map shows Maplehurst as an area of mixed house sizes. Larger homes are along Henley Street and W. Hill Avenue. Medium sized houses line W. Main Street and Cumberland Avenue and smaller houses are along Poplar Street, Emerson Avenue, W. Front Avenue and River Avenue The Maplehurst Court Street has not been cut as this area contains only one large structure on the site



Early presence of
the University of Tennessee

The 1917 map shows a higher density of residential units in the Maplehurst The Maplehurst Court Street has been cut in and is labeled "Maplehurst Park." The large building that was present in the 1903 map but not labeled is now labeled "K. E. Fraternity House." The East Tennessee Female Institute is now labeled "Tennessee Hall, University of Tennessee " The presence of the University has been present in Maplehurst since its official inception.

Maplehurst has a history now entering its second century. The University of Tennessee had an early presence and still has representation is the form of students living in apartment units. Therefore, it is appropriate that the connection from Maplehurst to the University be strengthened and made more physical as well as honorific

V. PROGRAMME

The site analysis and case studies made the decision for the type of project and the placement of that project intervention. Several project types are of worthy exploration to provide better connections for Maplehurst. Being isolated from all the districts within walking distance or further, paring down the choice as to which district to investigate connection was necessary for the scope of this thesis. From the site analysis it appears that exploration of connection between Maplehurst and the University is most important: the UT Hill district is closest in proximity and a majority of the residents of Maplehurst are University of Tennessee students. The topographical similarities and historical/social connections also play a vital role in the choice of structure type and placement. The plaza in front of the Ferris Engineering building is not only one of the best public spaces on campus, but it is at the same elevation as the west edge of Maplehurst Court street. (This Maplehurst location is also the site where upper and lower Maplehurst currently connect the best) Therefore, the connection ofUT to the residential area was chosen to be placed from the engineering plaza to the western edge of upper Maplehurst. This connection is to take the form of a mixed-use pedestrian bridge. This intervention placement serves several connection exploration opportunities. First, by placing one end of the bridge at a UT public space, several connections can be achieved: spatial connections, social connections, and visual connections, all within this plaza space. By the same token, placing the other eastern end of the bridge at this Maplehurst location, viable connections for Maplehurst are explored: physical connection of

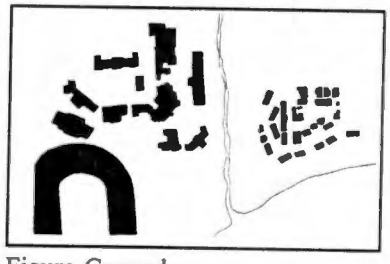
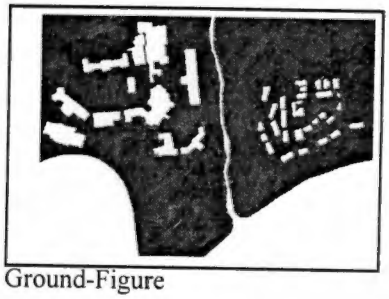
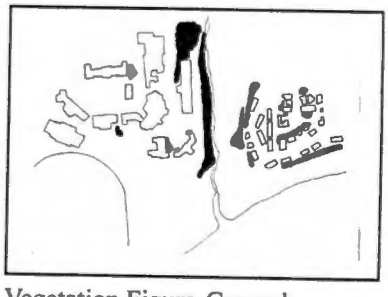


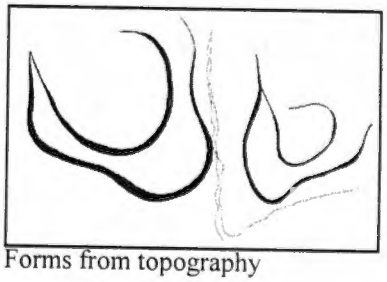
Figure-Ground



Ground-Figure

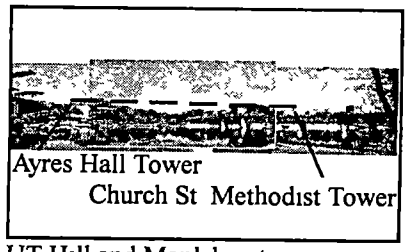


Vegetation Figure-Ground



Forms from topography

upper and lower Maplehurst, visual connections to various views and structures, and social connections Programming mixed-use spaces at the Maplehurst portal of the bridge structure have the capacity to perform these social connections.



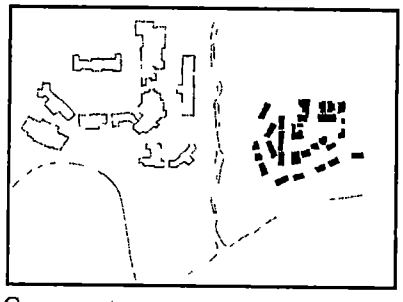
UT Hill and Maplehurst connections

Issue: Physical connection

A mixed-use bridge of Maplehurst can provide a physical connection to the university at "the Hill." This structure would be the specific means by which top the residential area of Maplehurst and the educational district of UT connect via a pedestrian bridge. The top level is the primary circulation/connection path, and contains 20,000SF in the form of a pedestrian platform 40 by 625 feet.

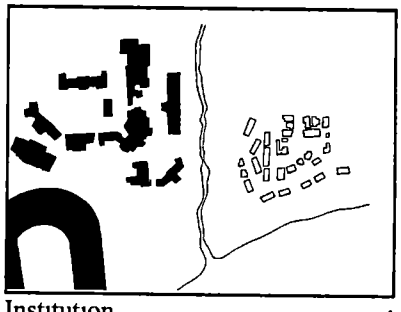
Issue: Visual connection

There are numerous areas that can be used for visual connection. Anywhere along the top level one can make visual connection with landmarks and points of interest, but for programming purposes the observation tower and the central bridge plazas (which will also be considered for social connection programming) will used to address this type of connection The central bridge plazas contain 6200SF (the top level 60 by 50 feet and the fourth(lower) level 80 by 40 feet) The observation tower has 225SF in the form of a platform 15 feet square.


Community

Issue: Social connection

Many areas are dedicated to social connections in this mixed-use bridge.These spaces include: the top level central plaza (3,000SF), the fourth level gathering plaza

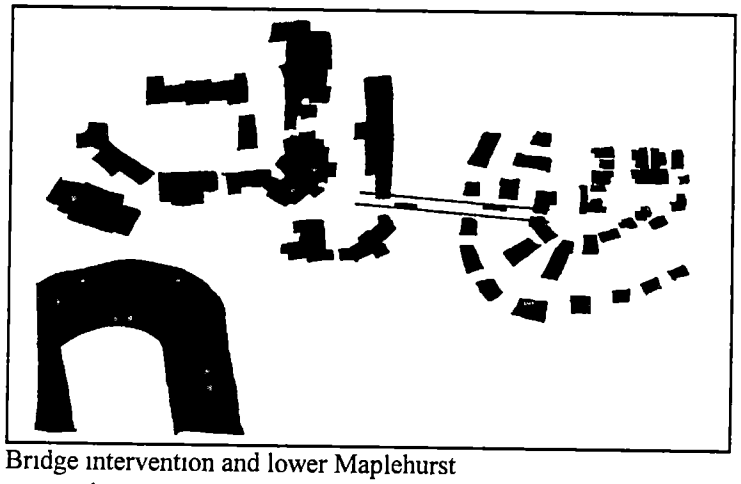

Institution

(3200SF), the indoor and outdoor auditoriums (1,800SF each), the Maplehurst meeting/multi-use spaces (4,960SF), the UT meeting/classroom space (11,894SF), and a recreational/gym space (4,350SF) Just as the central bridge plazas can be both visual and social connectors, and the top level circulation path can be a physical and social connector, for programming purposes, the central plaza will be counted only as social connection.

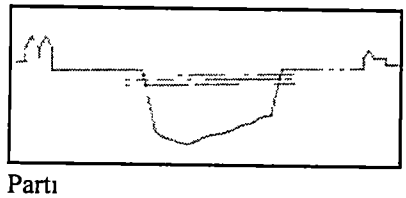
Issue: Contextual connection

Stereotomic mass and its connection/relationship with trabeated frame is a major contextual issue addressed in this thesis. This contextual issue has been discussed in the precedent studies and the site analysis. In general, the project investigates the use of stereotomic mass as it relates to the bridge being connected to the earth at the respective UT and Maplehurst hills and the trabeated frame spanning the creek and low ground areas that separate the two districts

Pragmatically the program also calls for 6,550SF of mechanical space and 3,915SF for living space.



Bridge intervention and lower Maplehurst masterplanning and parti

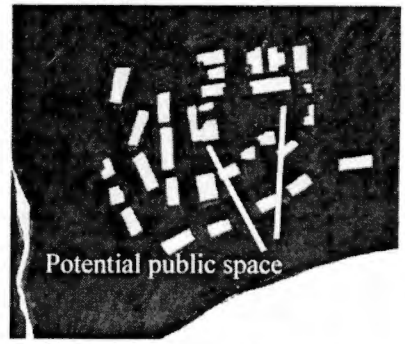


Parti

VI. THE DESIGN PROJECT

Issue: Physical connection

Connect- 1. to join or fasten together.
-Webster's New World Dictionary



Ground/figure- Maplehurst space

The mixed-use pedestrian bridge physically connects itself to the environment and the community in several different ways. First, via the top level, the bridge connects two districts—the Maplehurst residential area to the University of Tennessee Hill district, (Fig. 6.1) just as the Ponte Vecchio connects two disparate districts over the Arno River. And alsosimilar to the Ponte Vecchio and the Spanish Steps, this bridge connects public gathering spaces on either side of Second Creek.



Ground /figure-- UT space

On the university side the existing engineering plaza has been expanded to contain the landing for the west side of the bridge intervention. Middle Road, which is currently open to all university traffic, is redesigned to be primarily utilized for pedestrian traffic and service vehicles only. This road passes through a rectangular plaza space, which is defined by low-growing greenery and trees at the corners, to delineate the central plaza space. Connected to this central plaza space would be the rectangular landing area that is, in turn, connected to the top level of the bridge. (Fig. 6.2). At this UT plaza, the "old" plaza (represented by the central plaza) is connected to the "new" plaza (the bridge landing), which is then connected to the Maplehurst plaza via the bridge.

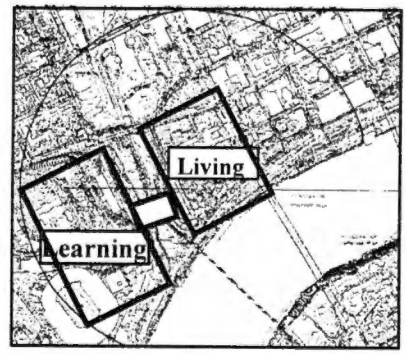
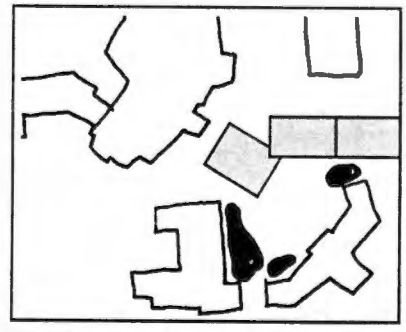


Fig. 6.1: Connection of districts


Fig. 6.2: Connection of UT Plaza spaces

On the Maplehurst side, a new public space is designed

to connect the newly master planned lower Maplehurst to the existing upper Maplehurst. This Maplehurst Plaza is round in shape, (which is derived from the existing round shape of the Maplehurst Court street cul-de-sac) and is the eastern landing of the bridge. The level of the Maplehurst Court street is extended to the new landing/ plaza, which provides a physical connection between upper and lower Maplehurst, as the circles of the "old" and "new" plazas interconnect. (Fig. 6.3) The top level of the pedestrian mixed-use bridge connects the UT plaza and the Maplehurst plaza

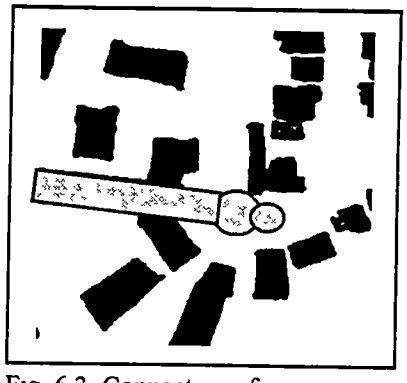
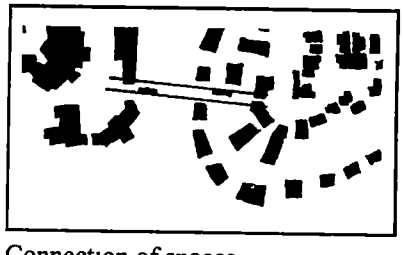


Fig. 6 3 Connection of Maplehurst Plaza spaces

The bridge intervention is connected to each hill by structures. On the university side, the Dougherty Engineering building is expanded to the south to intersect with the top level of the new bridge, thereby connecting the bridge to the educational building and the UT Hill. At the residential area, two newly designed buildings , intersect the top level and connect the bridge to the Maplehurst hill.



Connection of spaces by bridge intervention

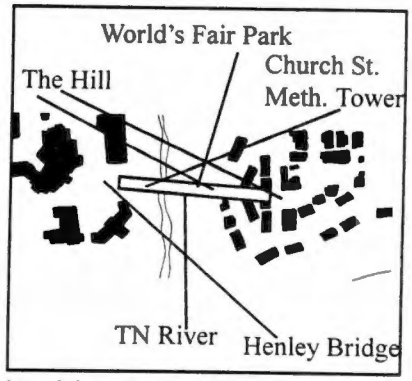
The top level of the bridge, and by extension the UT Hill and Maplehurst, are connected to the World's Fair Park as it passes underneath the bridge intervention, as vertical circulation in the form of elevators, a ramp, and stairs are placed on either side of the bridge. In the central steel frame truss stairs provide vertical connection from the upper level to the spaces on lower levels.



Vertical connection

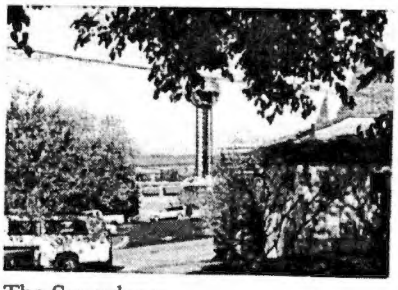
Issue: Visual Connection

Connect- 2. to show or think of as related.
-Webster's

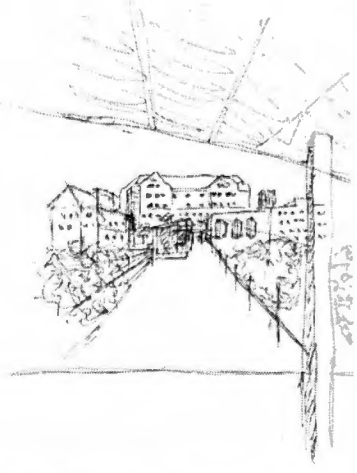


Maplehurst's visual connections

As discussed in the site analysis and programme section, Maplehurst has several significant visual connections. This occurs as landmarks of the different adjacent districts are seen from certain vantage points within the site. From the UT Plaza, Maplehurst structures, including the Church Street Methodist Church, are seen, connecting the UT Hill to the residential area. The World's Fair Park is also visually connected to the UT, as the Sunsphere is seen from the UT Plaza. The Henley Bridge can also be seen from the UT Plaza, connecting it and the river to the site. These three district-representing landmarks—the church tower, the Sunsphere, and the Henley Bridge, can be seen from different spots on the top level and lower levels of the bridge intervention. Of course, similar visual connections are made from the Maplehurst Plaza. Connecting from the residential area to UT, the Hill buildings, and particularly, Ayres Hall tower, is visualized from the Maplehurst Plaza. Each of the representative hill's landmark towers—the church and Ayres Hall—can visually lead the traveler across the pedestrian bridge as well as givea the user a sense of place and placement.


The Sunsphere from Maplehurst

The bridge observation tower serves to visually connect towards and out from the intervention. Just as the church, the Ayres Hall, and Sunsphere towers connect the viewer to those areas, so can the bridge tower connect the viewer to the intervention, itself. The function of any observation tower is to connect the user/


Visual connection to UT Hill from central bridge plaza

viewer to the object or space they are seeing. Maplehurst, the university, the river, the World's Fair Park, and the downtown are visually connected to the bridge via the observation tower (Fig. 6.4)

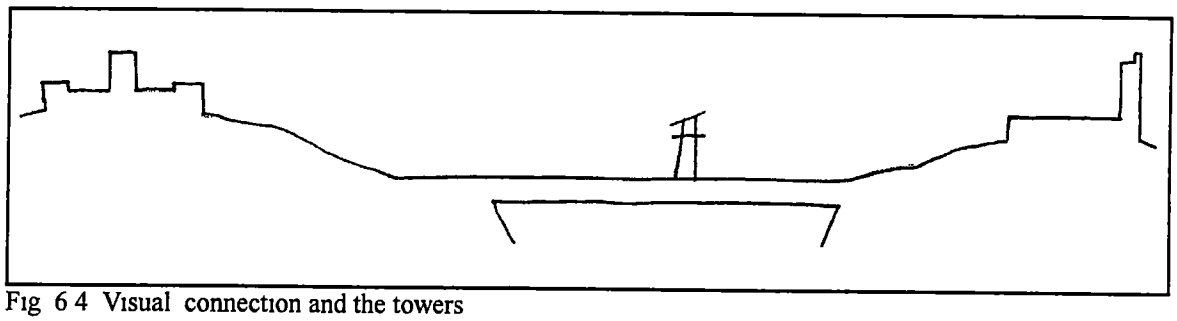


Fig 6 4 Visual connection and the towers

***Issue:* Social connection**

Connect- 3 to provide a circuit for communication
-Webster's

Social connection is provided for in a variety of spaces in the mixed-use pedestrian bridge. The top level, along with each plaza, serves as the primary social connector in this project. The UT Plaza serves to socially connect students and faculty by providing outdoor public gathering space with benches, grass, and stairs in the sun or shade The Maplehurst Plaza, in addition to having the open outdoor circular space, also has café, coffee and magazine retail, and dry cleaning program that would attract people to the plaza area and provide social connection A central plaza on the top level of the bridge is a social connector. (Fig 6 5) The entire top level is designed in the spirit of a city street where users can pause to gather and socially connect

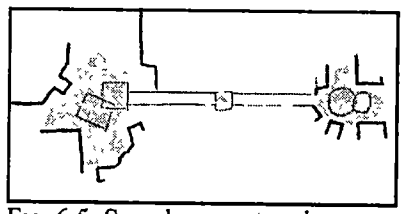


Fig 6 5 Social connection by plazas- plan

Social connections can take place formally or informally in the auditorium and theater space located on the lower second level of the spanning truss section of the bridge. The open-air theater has expansive steps that ascend from the top level and can be a place for informal social connections as well as planned occasions, as the Spanish Steps in Rome. (Fig. 6 6)

Meeting rooms, classrooms, and multi-use rooms in the lower levels of the bridge intervention provide social connection for users of the project. And as stated before, the gym space located in the Maplehurst side of the bridge can also serve as a social connector. The Maplehurst area of the bridge contains work/study rooms that would have computers, which would provide cyber connection to the rest to the world from Maplehurst. (Fig 6.6)

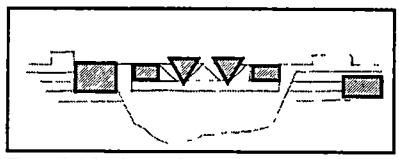


Fig 6 13 Social connection areas- section.

On special event days (e g. Boomsday or the Fourth of July) and UT football Saturdays, the bridge intervention would be a useful space for social connection. The top level and the plazas could provide new and unique spaces for attendants of those events to use.

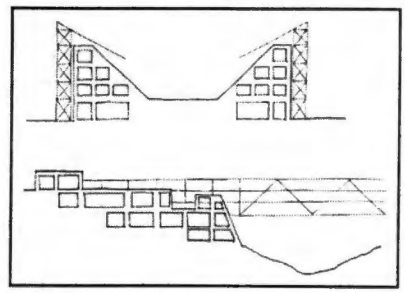
Issue: Contextual Connection

Connect- to be related in some way or in a proper or logical way
-Webster's

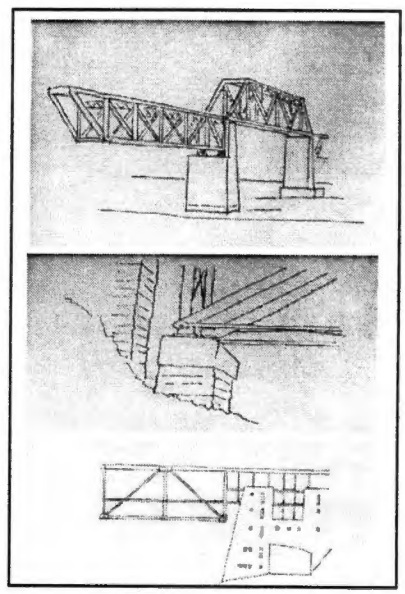
Mass/Frame Connection

The connection with context the bridge intervention makes is limited to the relationship between the two construction methods of stereotomic mass and trabeated

frame. Explained earlier was the influence on design by Neyland Stadium and the railroad bridges. This mass/ frame connection is shown in the form of the bridge project. Stereotomic mass is explored in the connection of the structure to the earth by a large masonry structure with punched fenestrations. As in the railroad bridges, this mass form supports the steel truss frame structure that spans the lower topographical area of Second Creek and the narrow area between the UT and Maplehurst hills. In addition to the bulk of the steel truss form resting on masonry mass piers, a gradual transmogrification from mass to frame occurs from lower level to upper level in the "pier" portion of the bridge. This change from mass to frame appears as frame walls that divide interior spaces rise from within the mass form. Trabeated frame construction of spaces rises from the masonry mass form to the upper levels of the bridge. Mass gradually transforms to frame from the earth to the sky.



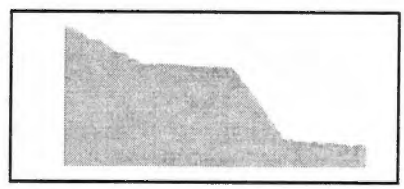
Neyland Stadium and mass/frame connection to bridge intervention.



Railroad bridgeand mass/frame connections to bridge intervention.

Architectural Detail Connection

Larger scale architectural and master planning moves define the scope of this thesis design project primarily . However, connection details have not been totally ignored. The connection of wall and earth is achieved through the mass form. (Fig. 6.7) Wall and sky connection is performed by trabeated frame, as the wall becomes sky through glazing in many areas. (Fig. 6.8) Wall to floor connection is designed in two methods: mass wall to mass floor; and, trabeated frame wall to mass floor, (Fig. 6.9). Connection between interior and exterior is also portrayed two different ways: mass wall providing the connection portal and lighter frame wall letting inside become outside.



Bridge mass connected to earth

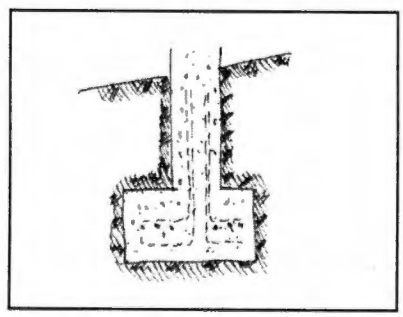


Fig. 6.7: Wall to earth connection

The large Warren truss frame that spans the expanse contains gusset plates to connect the compression and tension members. These gusset plates connect these load distributing elements as the plazas collect, connect, and distribute users of the spaces (Fig 6 10)

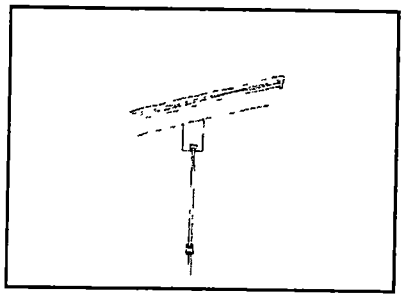


Fig 6 8 Wall to sky connection

Materials can connect the project to the context. The UT Engineering Plaza can use appropriate materials. The paving of the street could be a concrete with smooth stone aggregate, the central plaza paving could be granite or limestone; and the bridge landing area would be granite or limestone pavers with grass in between. Use of indigenous materials such as lime-stone contextually connect to the design project. Similar materials can be used in the Maplehurst Plaza

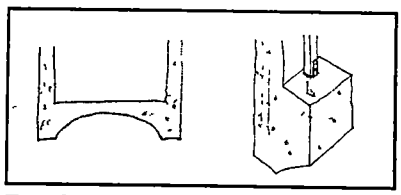


Fig 6 9 Wall to floor connections

Vernacular material is used in the bridge itself as a limestone foundation gives rise to a brick and concrete mass structure. The major truss frame would be steel to reflect the railroad bridges and Neyland Stadium. The framing of the spaces within and on the mass structure would be metal and wood

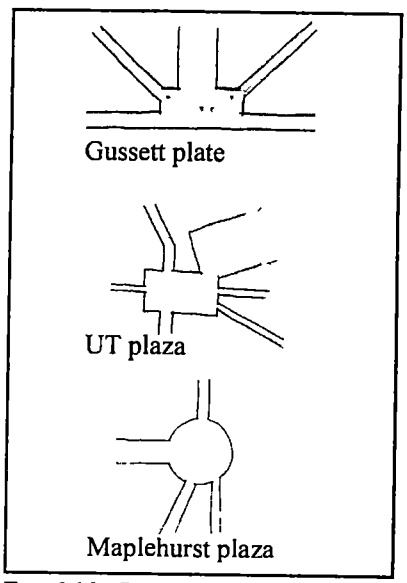


Fig 6 10 Gusset plate and plaza connections

Final Thoughts

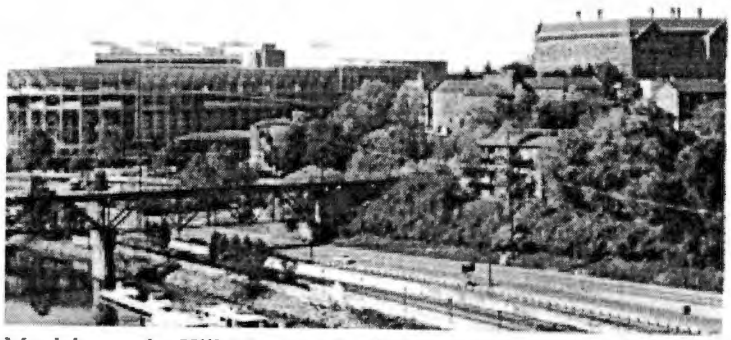
The investigation of connections for Maplehurst does not end with this thesis project On the contrary, the exploration should just be commencing, as the connection between Maplehurst and the university district is the starting point to help provide MH with a better chance of thriving within the city Further exploration of connection to the other districts could be vital in the long-term sustainability of this strategically located residential area. To currently reside in Maplehurst is a worthwhile experience, but in order tobe an essential ingredient in Knoxville's urban fabric, this residential

area's connections must be strenthened

Christopher Alexander in *A Pattern Language* speaks of making the built environment as "orders of connecting relationships rather than as mere objects in space." (from Kunstler, p. 249) Taking this idea further, Alexander argues that "the whole built environment consists not of things at all but only between and within other relationships " (Kunstler, p. 250) Looking to this thesis project, Maplehurst could become one of these "mere objects in space" as its relationship to the surrounding districts and to the rest of the city becomes part of "the discontinuity of the common sprawscape " (Kunstler, p 250) Establishing connections between Maplehurst and the surrounding urban fabric enables this residential area to become part of "a logical sequence" within the surrounding context. The connections studied in this thesis can be seen as part of this "pattern language" that begins " with the largest places, regions and towns (Knoxville), and then working down through neighborhoods (the UT Hill district and Maplehurst), streets (the bridge project top level and new plazas), buildings (the mixed-use pedestrian bridge structure), rooms, ending with the details of construction " (Kunstler, p. 251)

One morning while driving to school in my final days of design studio along Neyland Drive, a university student was walking from the Hill district on this extremely busy vehicular artery This student had a backpack and appeared to be returning to the Maplehurst area after an early class Neyland Drive, of course, does not have sidewalks on this side of the road, so this pedestrian was testing the hands of fate on this school day as he walked mere feet from oncoming 50 mile per hour automobile traffic This bridge project, if

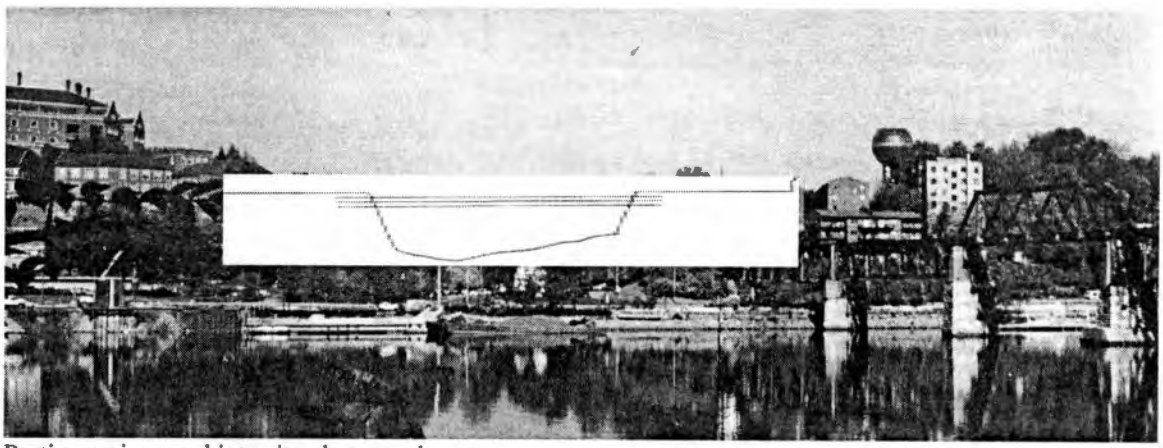
nothing else, could provide a safer, not to mention quicker, connection between his place of residing—Maplehurst—to his place of learning—UT. Because during the time that he was walking on the side of this busy thoroughfare, I doubt that he felt connected to either place.



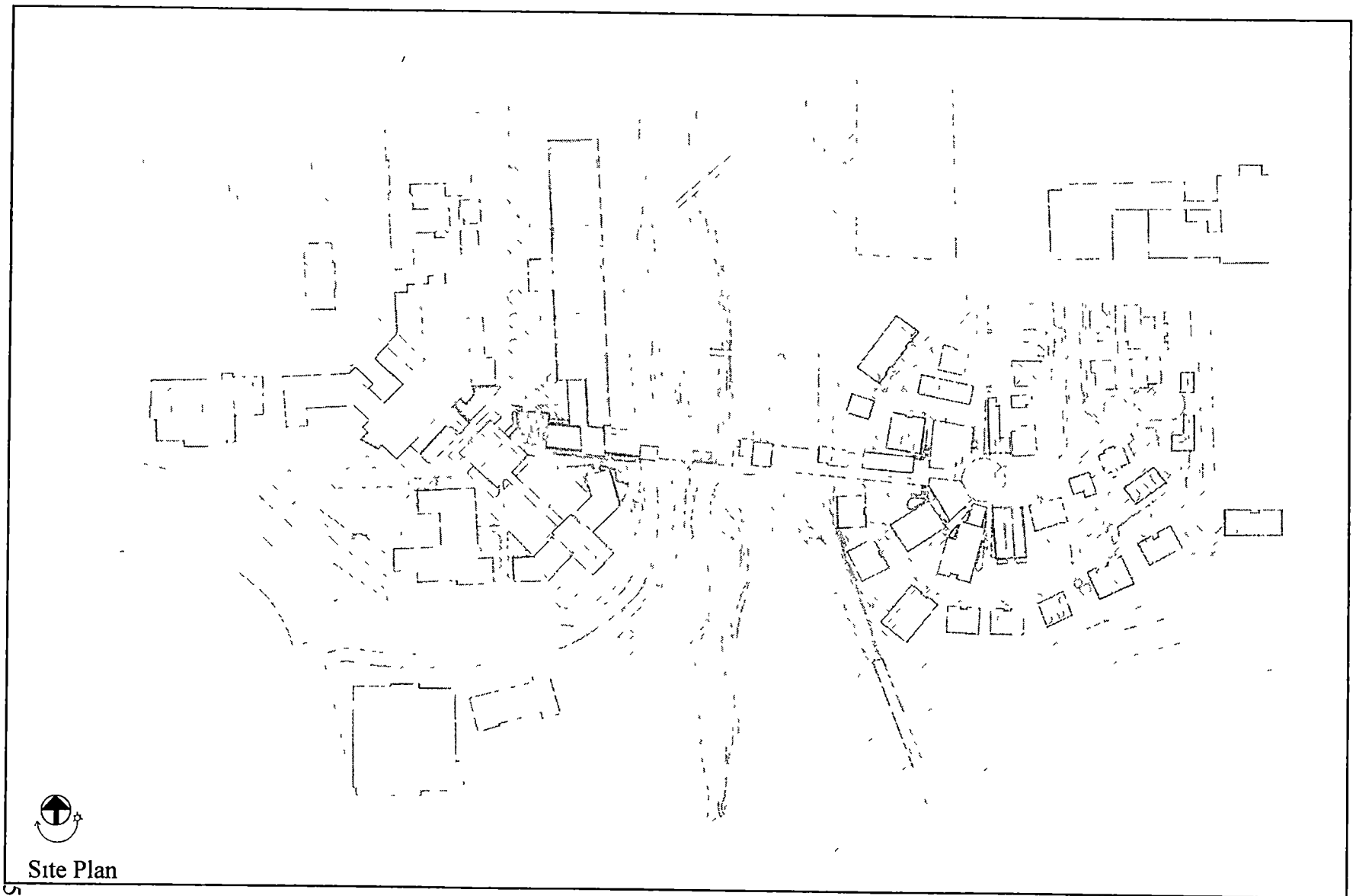
Maplehurst, the Hill, Neyland Stadium and the railroad bridge

VII. DESIGN PROJECT

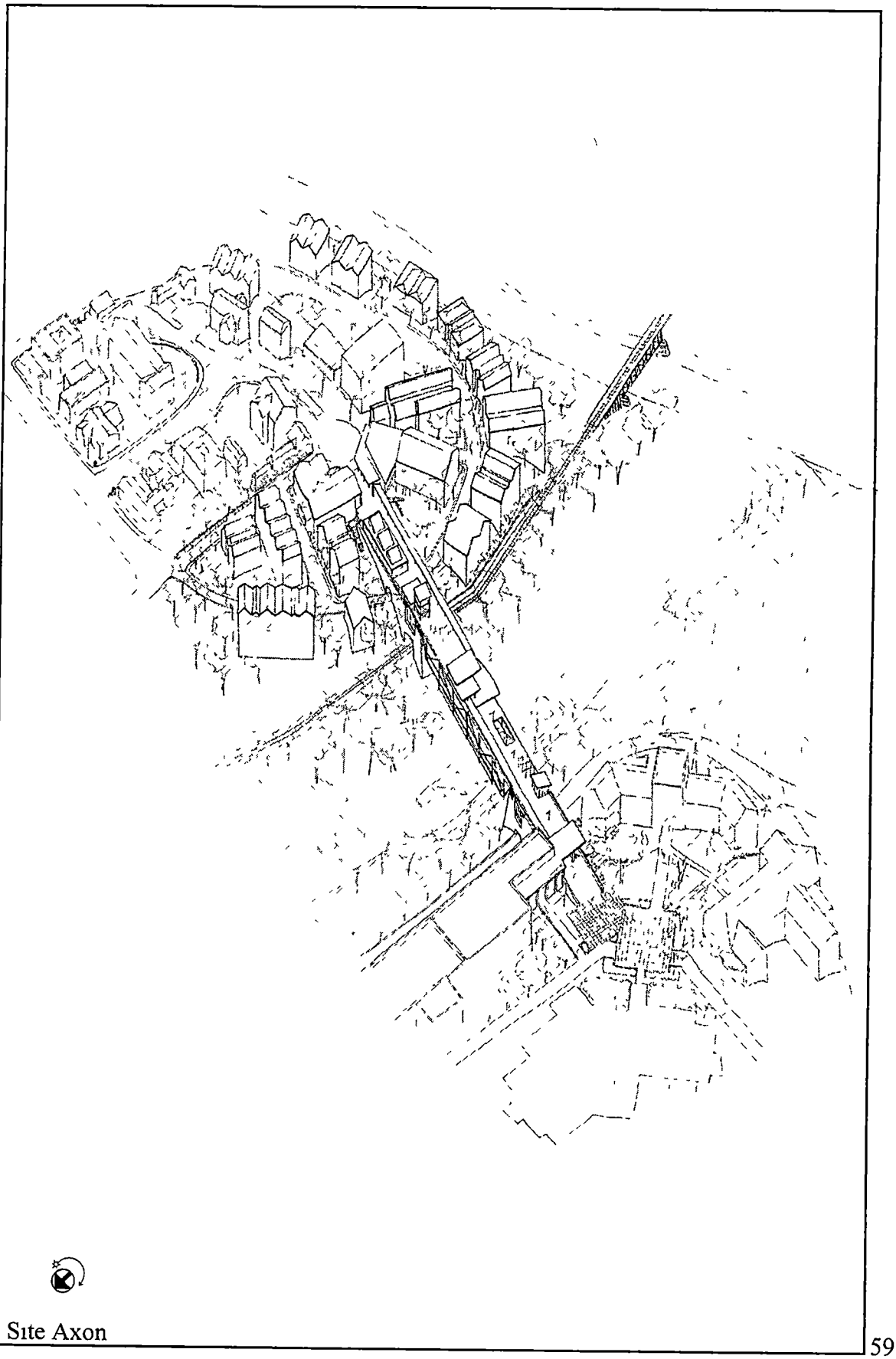
The following pages are the presentation drawings for the design project which includes the mixed-use pedestrian bridge connector, the redesign of the University of Tennessee Engineering Plaza, the Maplehurst Plaza, and the master planning of "lower" Maplehurst. For text explanation of the drawongs and project, please see section VI.



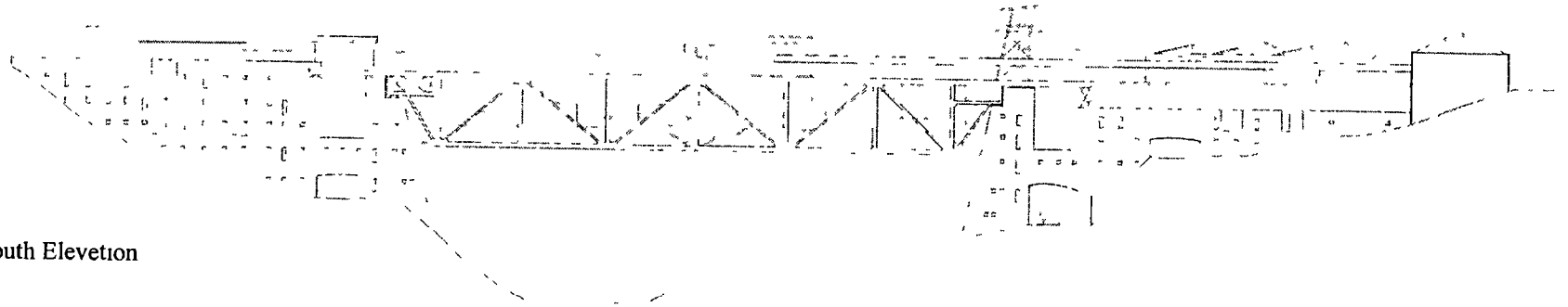
Parti superimposed into site photograph.



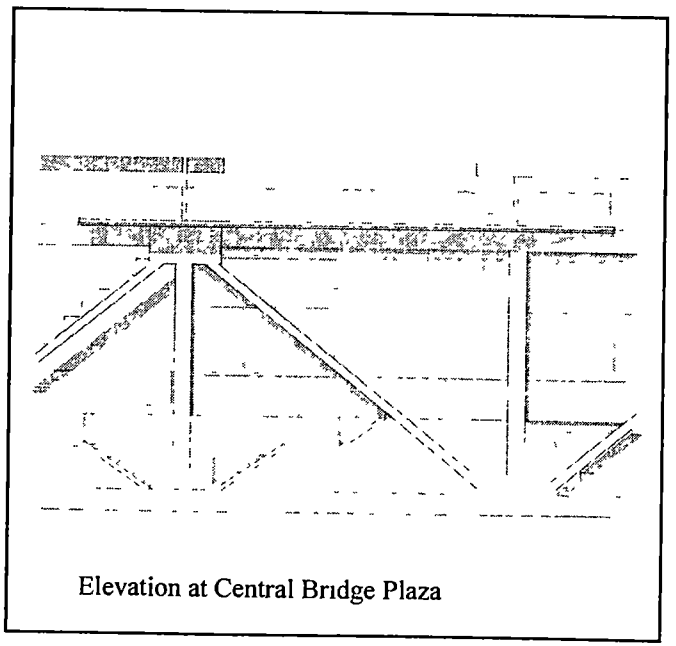
Site Plan



Site Axon

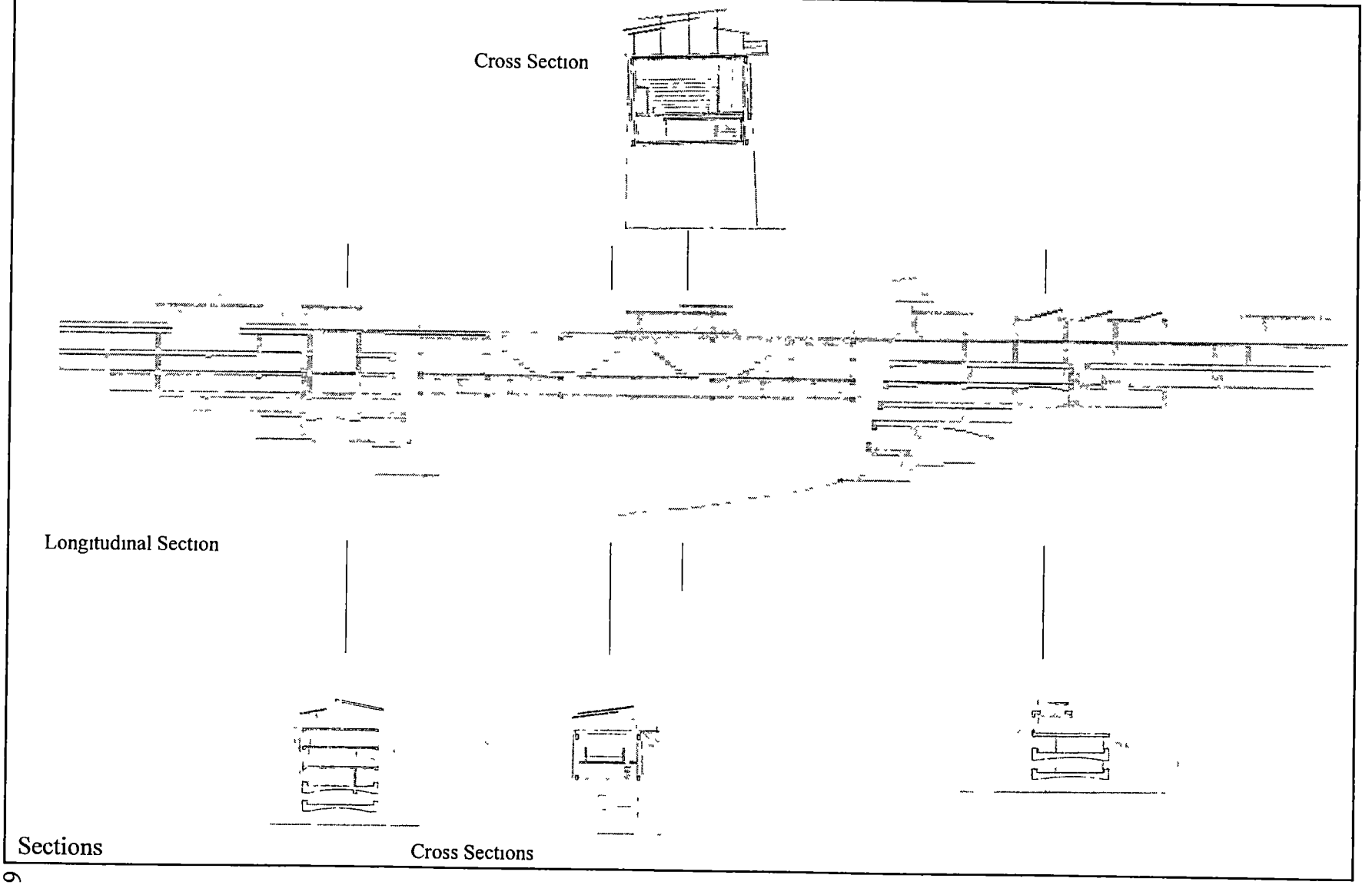


South Elevetion

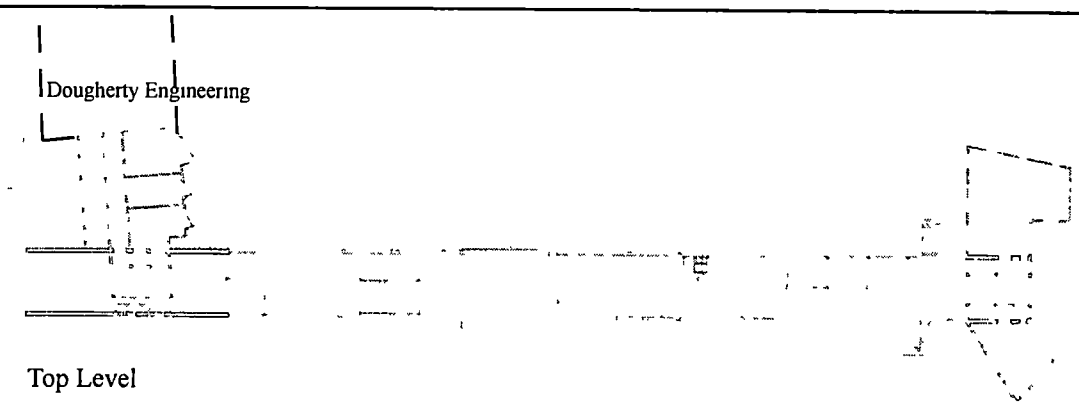


Elevation at Central Bridge Plaza

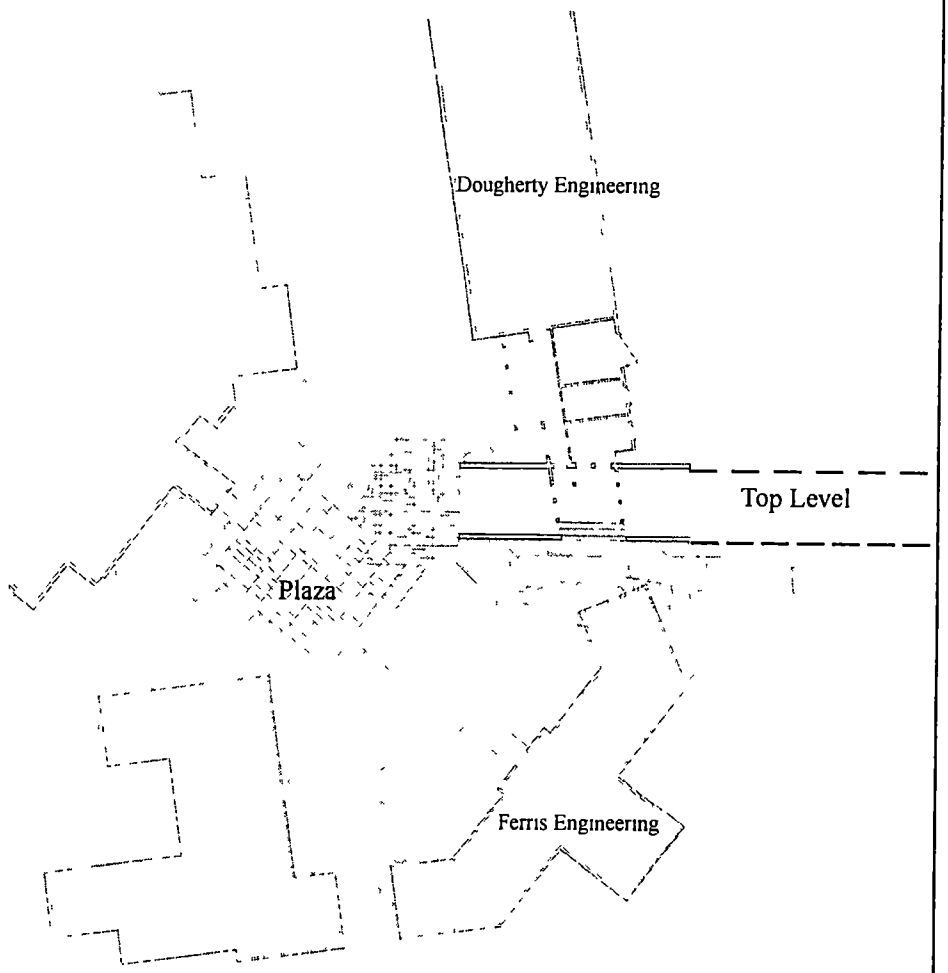
Elevations



Sections

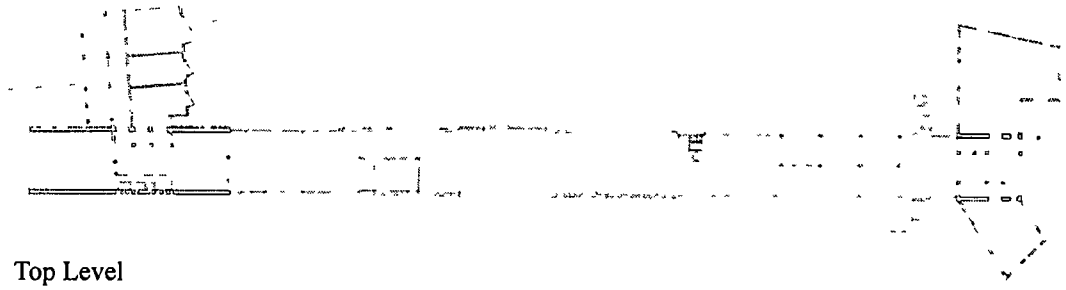


Top Level

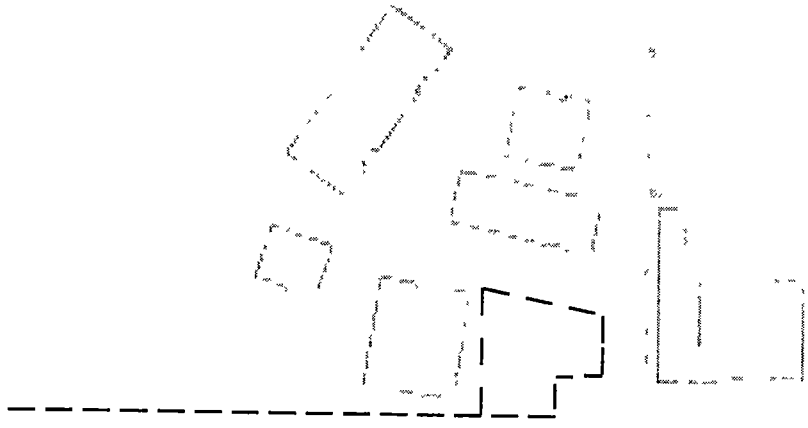


UT Engineering Plaza

Plans

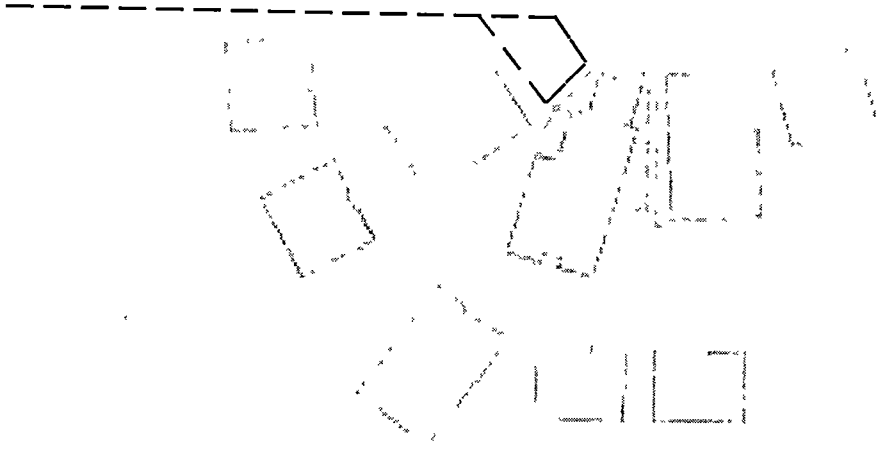


Top Level



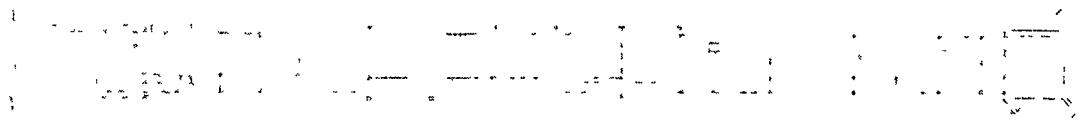
Top Level

Plaza



Maplehurst Plaza and Lower Maplehurst Master Plan

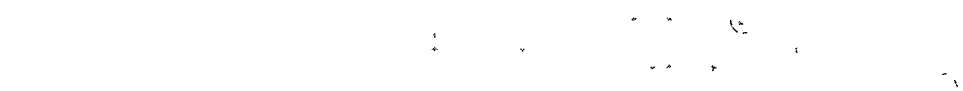
Plans



Level 2



Level 3



Level 4



Level 5



Floor Plans

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BIBLIOGRAPHY

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Todd White received his Doctorate of Veterinary Medicine degree from the University of Tennessee the first time on campus in Knoxville after choosing between pursuing one of his two passions: art/architecture and veterinary medicine. If the art path had been taken, the route to architecture school would have been a much shorter one. However, he practiced veterinary medicine for several years, beginning in Fayetteville, North Carolina and ending up in his hometown of Maryville, Tennessee.



Author and father, T.J. White: the first dgree.

After giving up veterinary practice, he began teaching general biology and physiology at Pellissippi State Community College as an adjunct. Here, another passion was discovered, teaching, which he has continued to the present. The desire to create communities in which to live where sense of place and sense of neighborhood is the focus of his architectural career goals. He plans to pursue the community/urban design arena of architecture and planning in order to reach those goals. He would like to teach in addition to designing good communities.