

Ball State University
College of Architecture and Planning
Dept. of Architecture
5th Year Thesis

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D e s i g n - B u i l d

How Efficiencies Affect Quality in Design



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A b s t r a c t

In modern day society, there is a misconception about Design-Build as a project delivery system. This misconception is that the quality of design must be sacrificed due to the constraints of time and/or money. In some cases it can be proven that this is true, but how and why, and can it be altered to improve the quality, instead of hinder it? In my thesis, I have studied previous design-build projects and pulled apart what about the designs were sacrificed and why. In studying their downfalls of design, I then recovered their benefits, whether it be time management, money, or other. These studies helped me in developing a design-build project for thesis. The benefits will be in quality, time efficiency, cost efficiency, material and site efficiency, etc...

The project I have chosen to develop my thesis topic is a church and dedicated worship space for a small catholic community here in Muncie, IN. The parish of St. Francis of Assisi is located on the Northeast corner of New York and Riverside. Their current status is that of expansion, both of community and gathering space. This expansion could entail an addition to the existing building, or development of a new church.

This type of delivery system-"Design - Build," has become very common with the private sector of religious spaces. Their funding comes solely from the community, so cost efficiency becomes a major issue. Also, because of such a close community, we find that most want to become a part of the building, be more involved by offering their assistance, especially in the construction. This contribution of community labor will help it the development of cost efficiency. Design-build is the most effective type of delivery system for this type of community project, and creates a number of issues to be addressed. The quality of design, cost effectiveness, and time management, will create cohesion of parts, to develop a well-managed building, from design to construction. Instead of one aspect of design-build hindering the other, a synergistic effect is achieved, and all aspects are positive.

Issues and Postitions

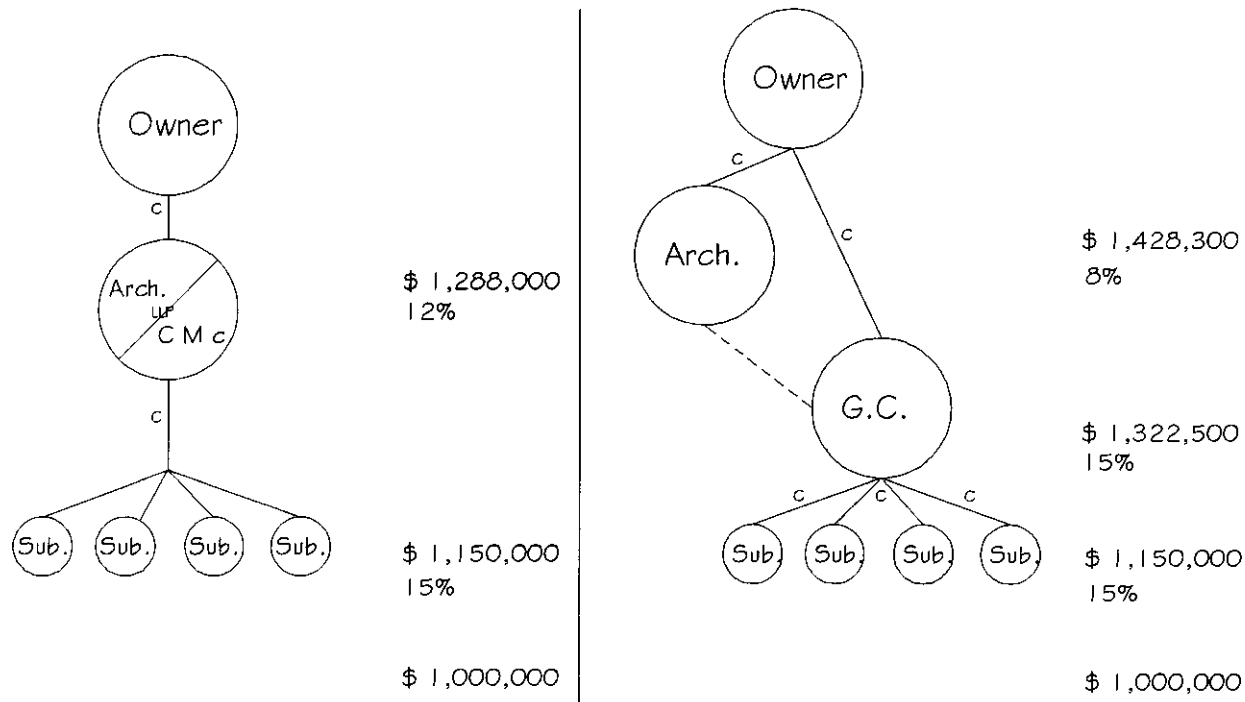
Looking back to the days of Palladio and Alberti, architects were master craftsmen and construction managers, as well as head architects who worked on site. They saw and participated in the development of a building from beginning to end. They had the opportunity to be on site for the entire construction process. Thinking back to some of those buildings, mainly the gothic cathedrals, there is a great sense of quality and greatness about the architecture. From the preliminary design, to the development of the last detail, the architect had the final touch. If such quality was achieved during such a technology-deprived time, compared to current times, why is that today's design-build architecture develops such poorly designed structures. We have advanced so significantly with technology, that time efficiency should help cost and let quality be the driving factor.

My thesis topic deals with this concept. I believe we have become so dependant on the efficiency of time and money in Design-Build, that the whole essence of architecture is lost. My feeling about the idea of 'design-build' both as a concept and a delivery system is that both quality and quantity drive the design. The cohesion of both to develop a design is more effective, architecturally, than forcing quantity over quality, or vise versa.

Organization

In Design-Build there are many ways to structure the organization of involved parties; mainly the Architect, Owner and Contractor. For my thesis I have studied many ways around the liabilities, responsibilities, quality control, etc...and the best way to facilitate this design-build project is to have me as the architect and the contractor. Relying solely on my construction background helps me act as contractor, and then my studies at Ball State help facilitate the architecture.

The following charts comparatively represent the difference between traditional practice and the benefits up front with the design-build delivery system, not to mention the deletion of lines of red tape. This is the method of delivery for my thesis. (Conceptually)



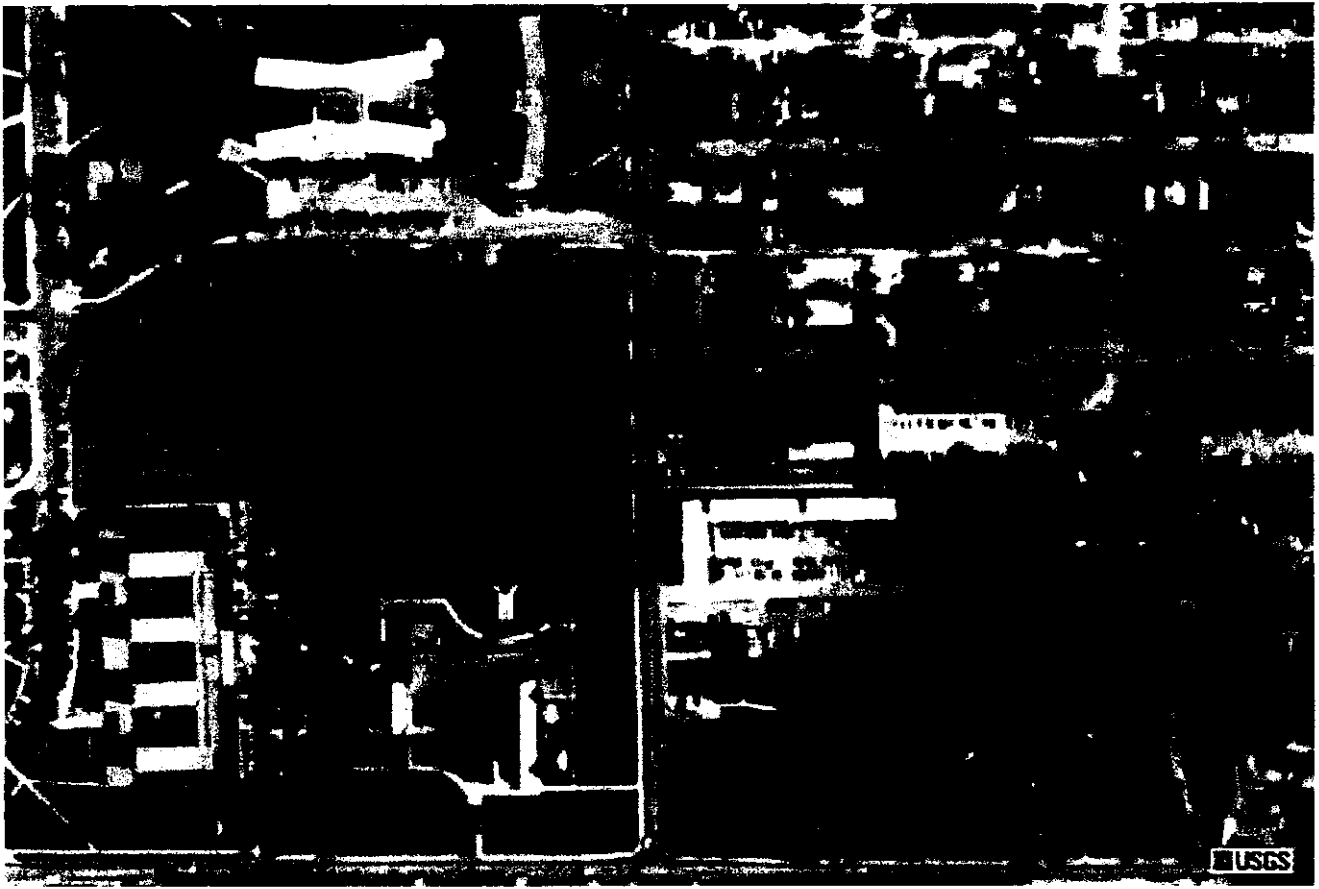
Program

<u>Room</u>	<u>Sq. Ft / Seating Requirements</u>
Sanctuary	500 person max. seating-10 sq. ft. per
Altar	400 sq. ft.
Daily Chapel	20 person max. seating-10 sq. ft. per
Sacristy	200 sq. ft.
Vestry	200 sq. ft.
Bridal Room	250 sq. ft.
Music Rehearsal / storage	450 sq. ft.
Maintenance closet / storage	100 sq. ft.
M / W Restrooms	six fixtures total - 300 sq. ft.
Narthex / Entry	1,000 sq. ft.
Circulation	10% -810 sq. ft.
Mechanical	15%- 1,200 sq. ft.
	<hr/>
Total-	10,246.5 sq. ft.

C o n t e x t

Muncie, Indiana

New York

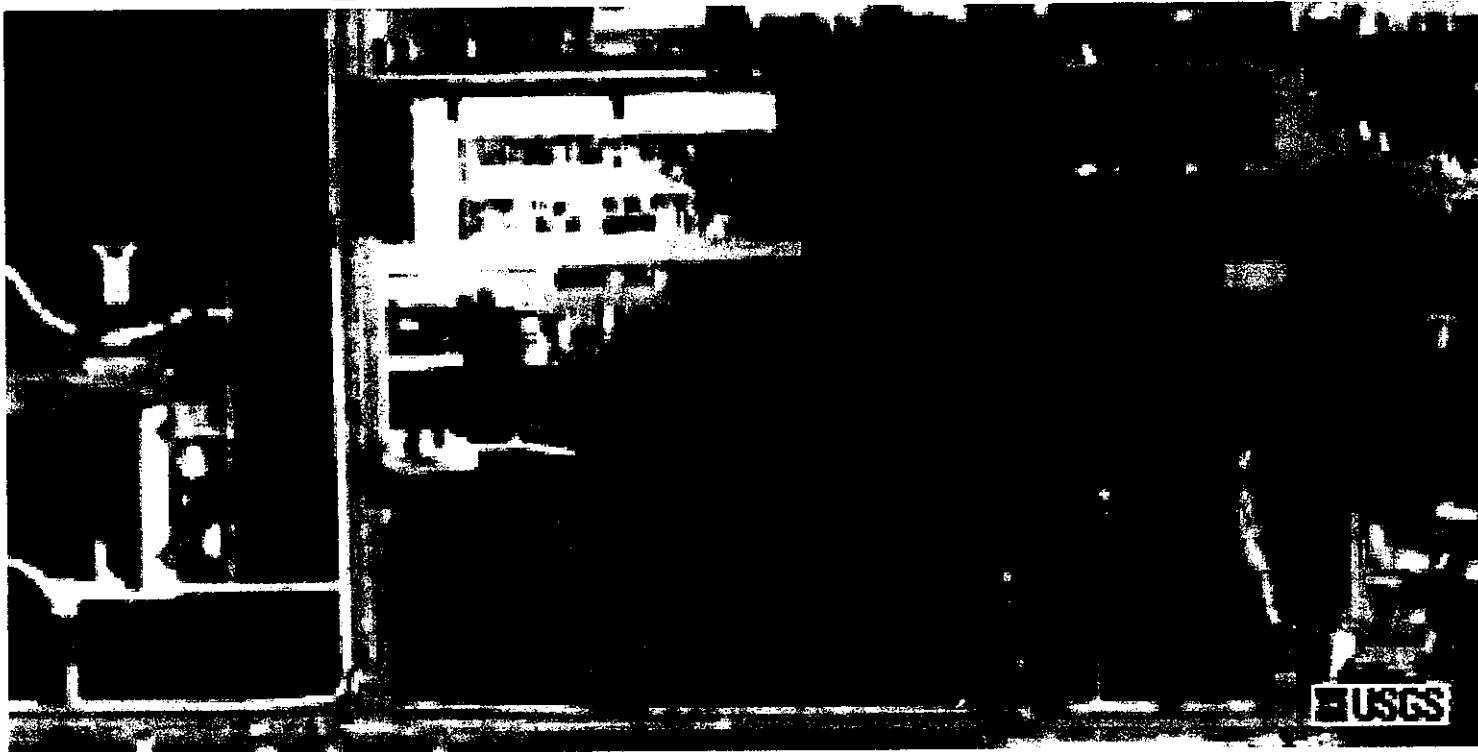


Riverside

D e s i g n B u i l d

S i t e

New York

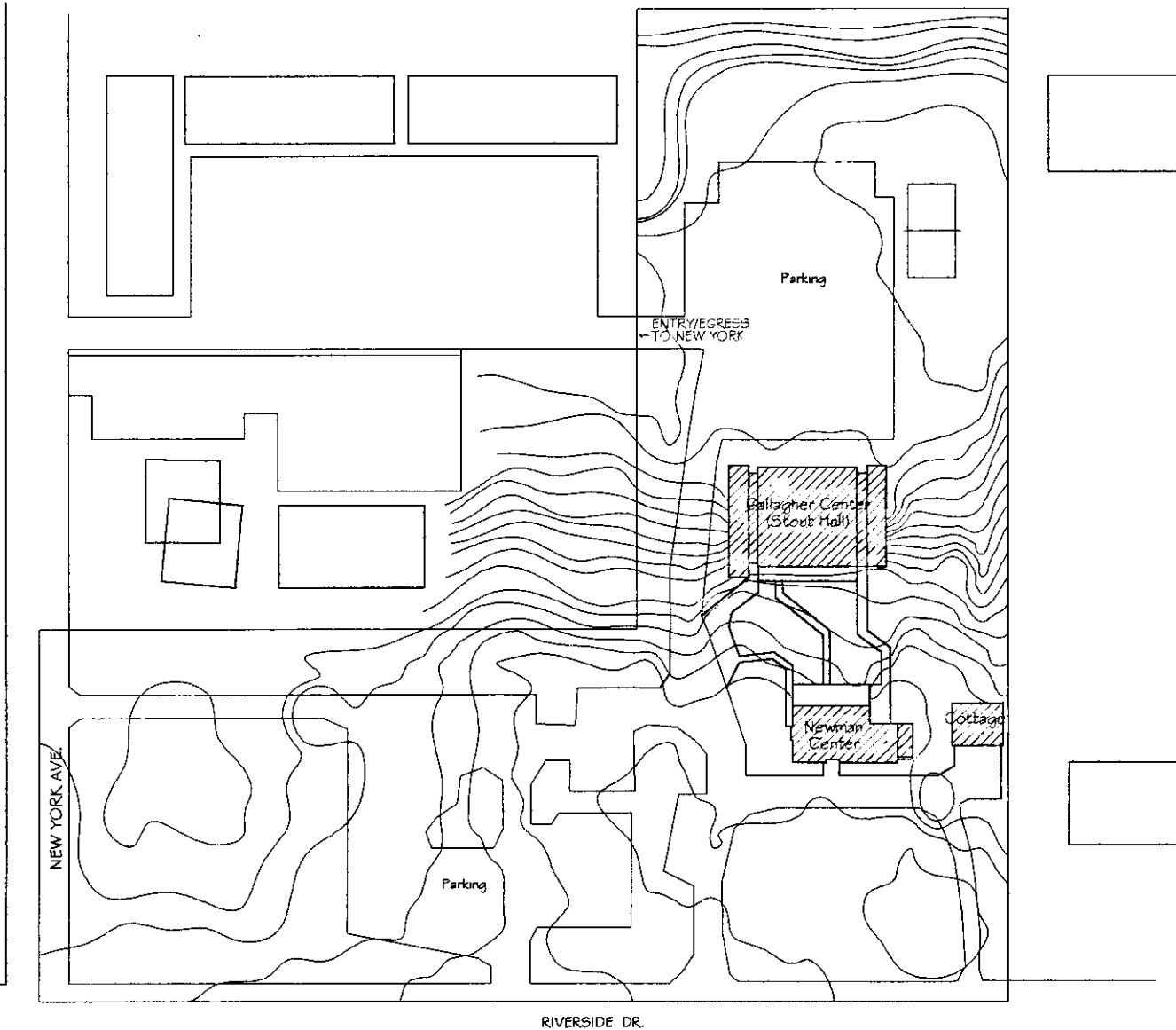


Riverside

D e s i g n ~ B u i l d

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Existing Site



D e s i g n ~ B u i l d

Context Images



Existing worship space



Existing drive



Adjacent Apartments



Adjacent Apartments

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Context Images



Newman Center



Proposed Lot



Presbyterian Church



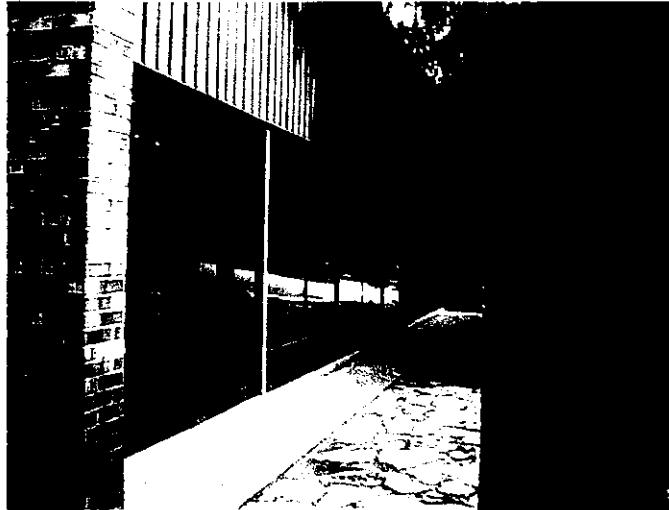
Newman Center

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Context Images



Existing worship space



Existing worship space



View from new worship space



View into atrium space

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C o n t e x t I m a g e s



Houses across Riverside



Adjacent Apartments



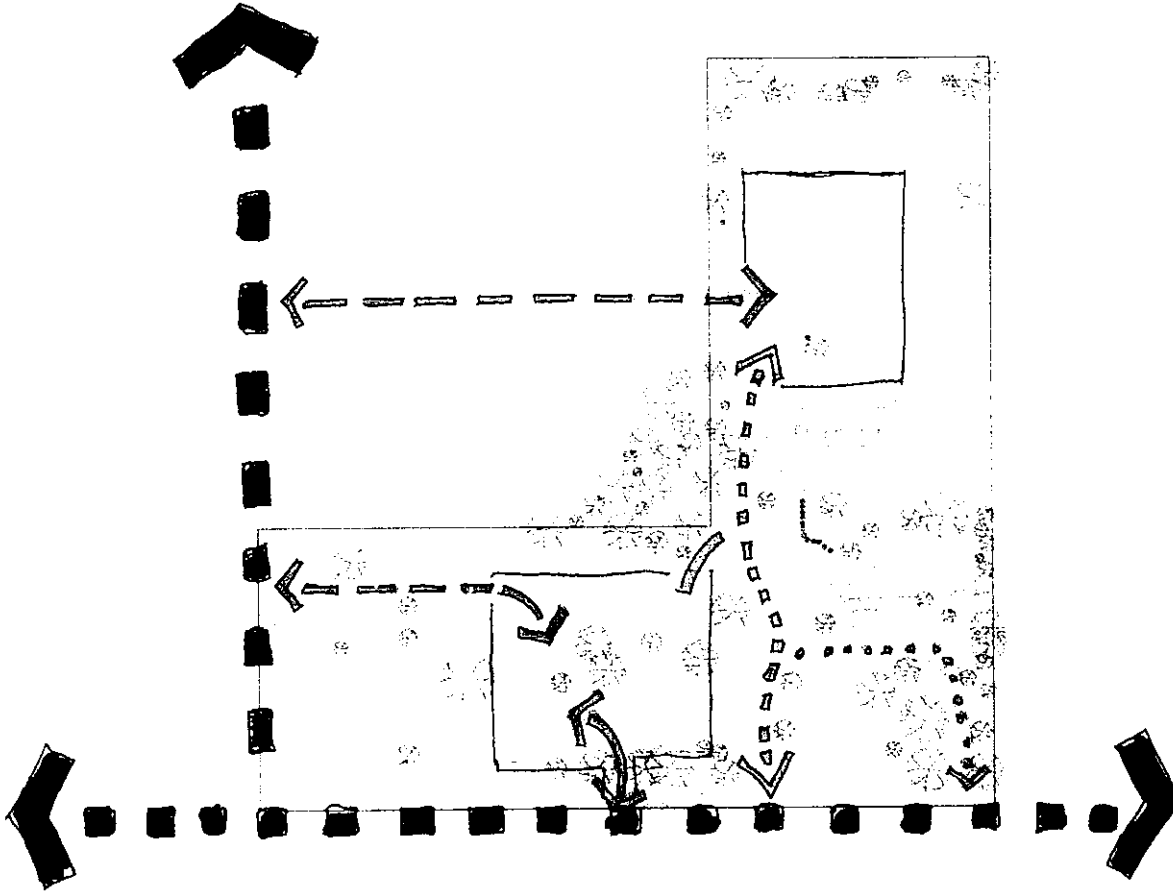
Adjacent Apartments



Adjacent Apartments

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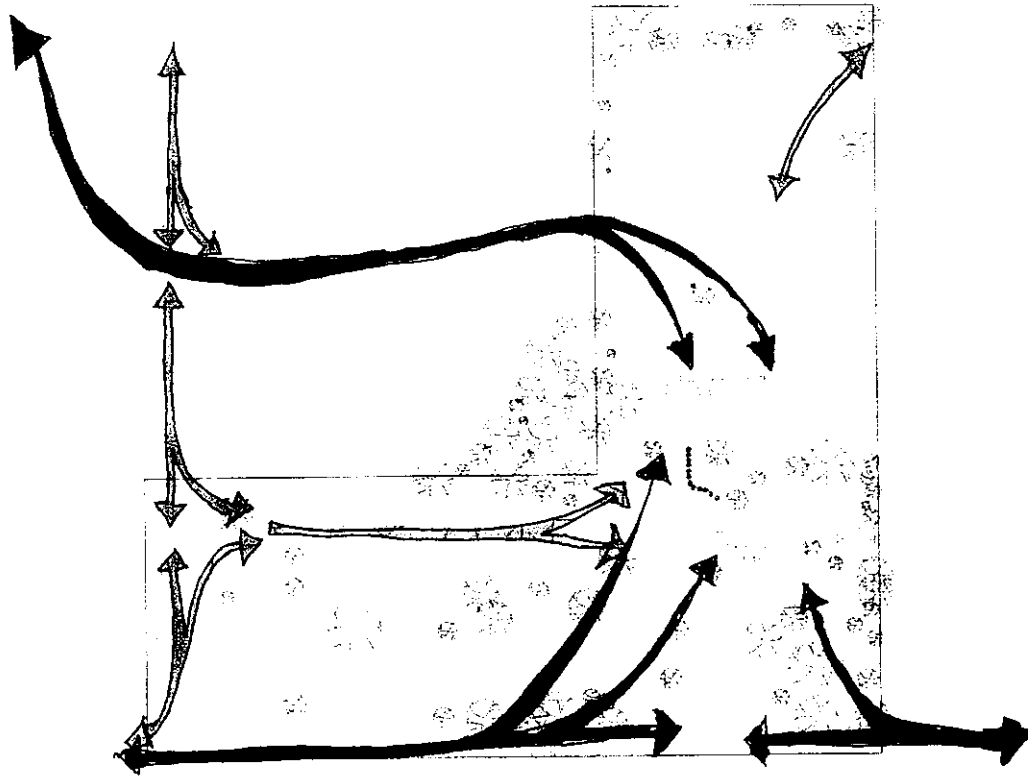
Planning Studies



Vehicular Traffic

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Planning Studies



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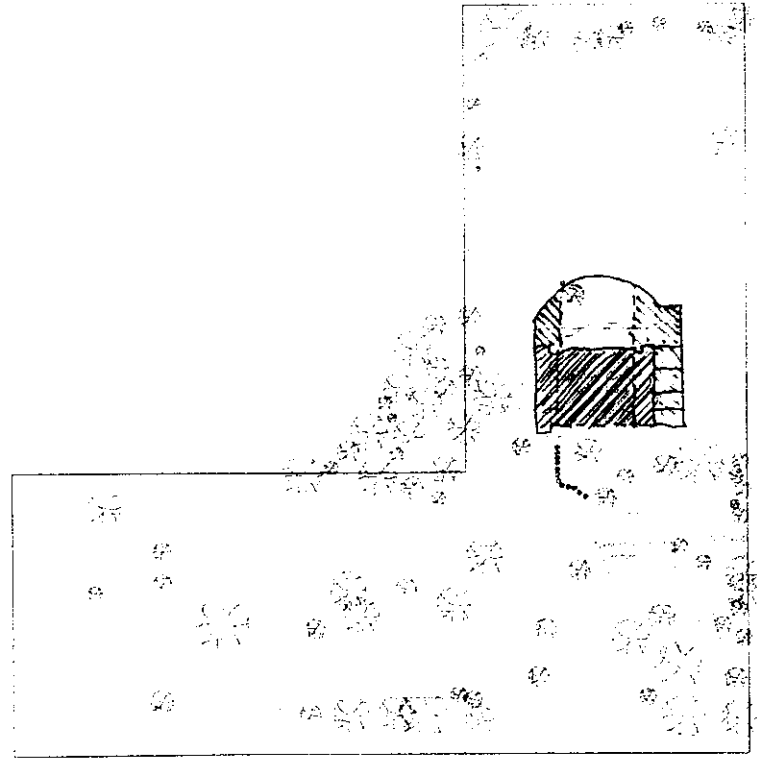
Planning Studies



Filters

D e s i g n i n g B u i l d

Planning Studies-Additions

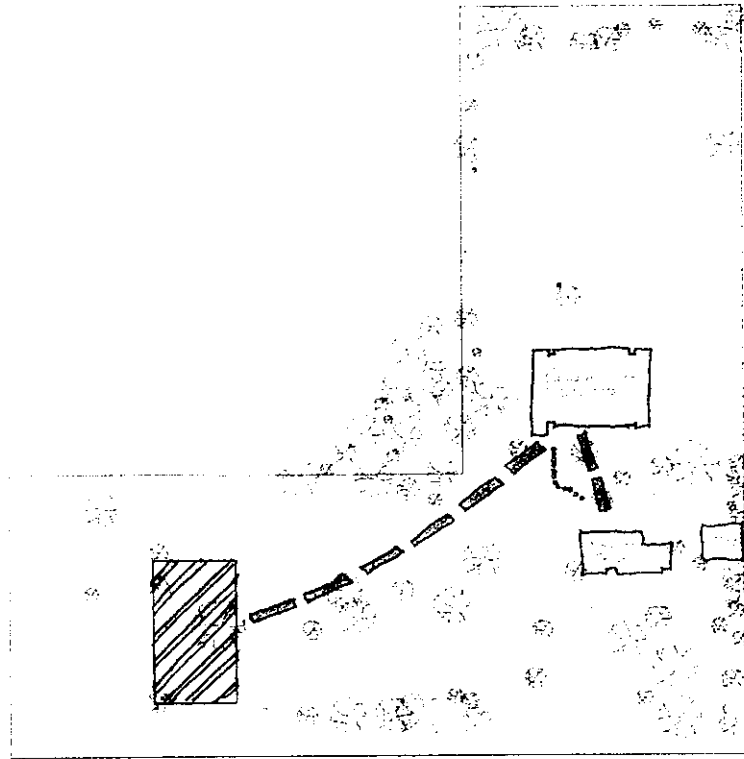


Add to Existing Worship Space

- adapting to existing systems
- outdated /undersized systems
- application of dedicated spaces

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Planning Studies-Additions

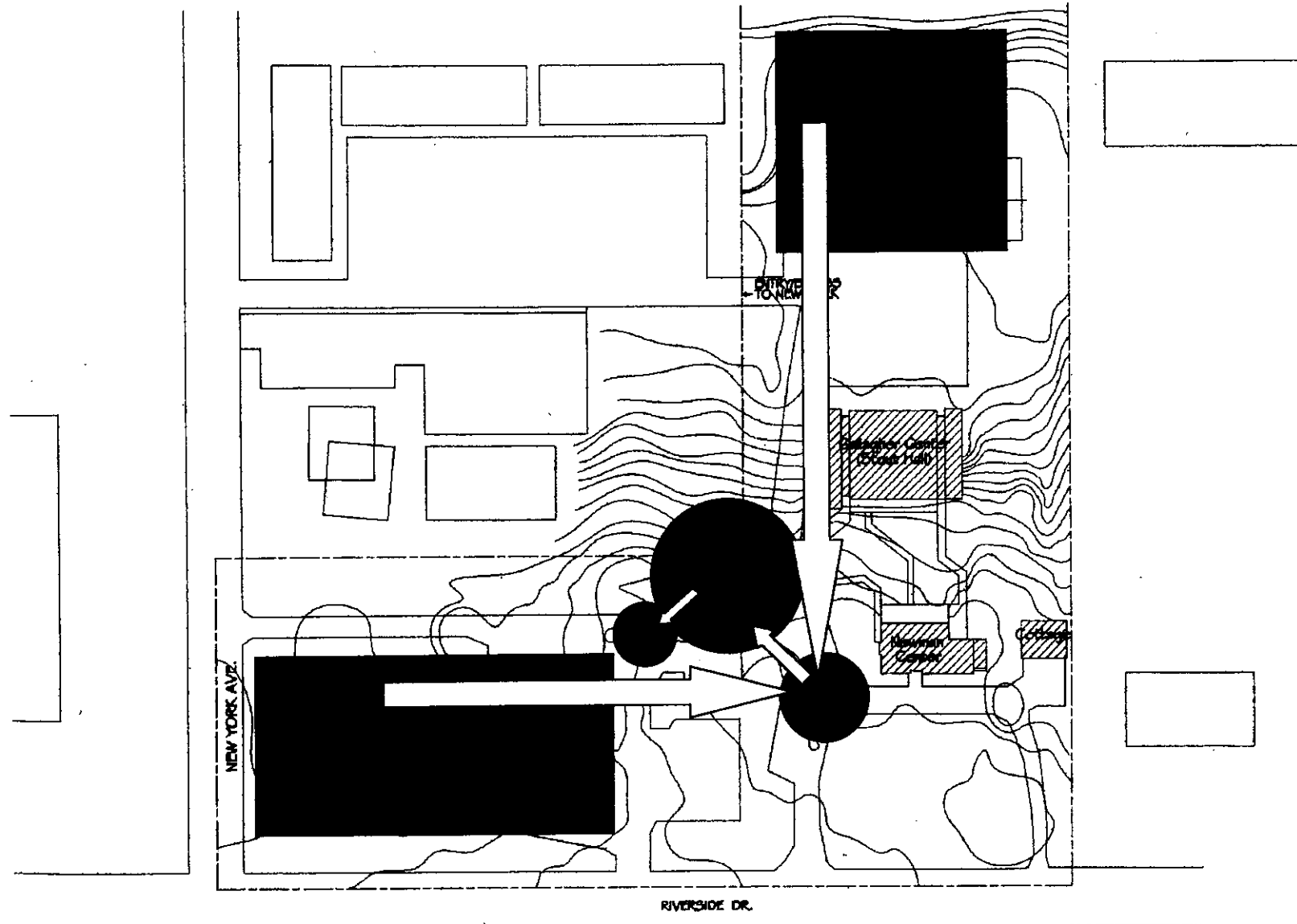


Placement of New Structure

- Seclusion from existing buildings - atrium space
- Efficient for Design-Build
- Transition of old space into Kitchen / Reception Hall

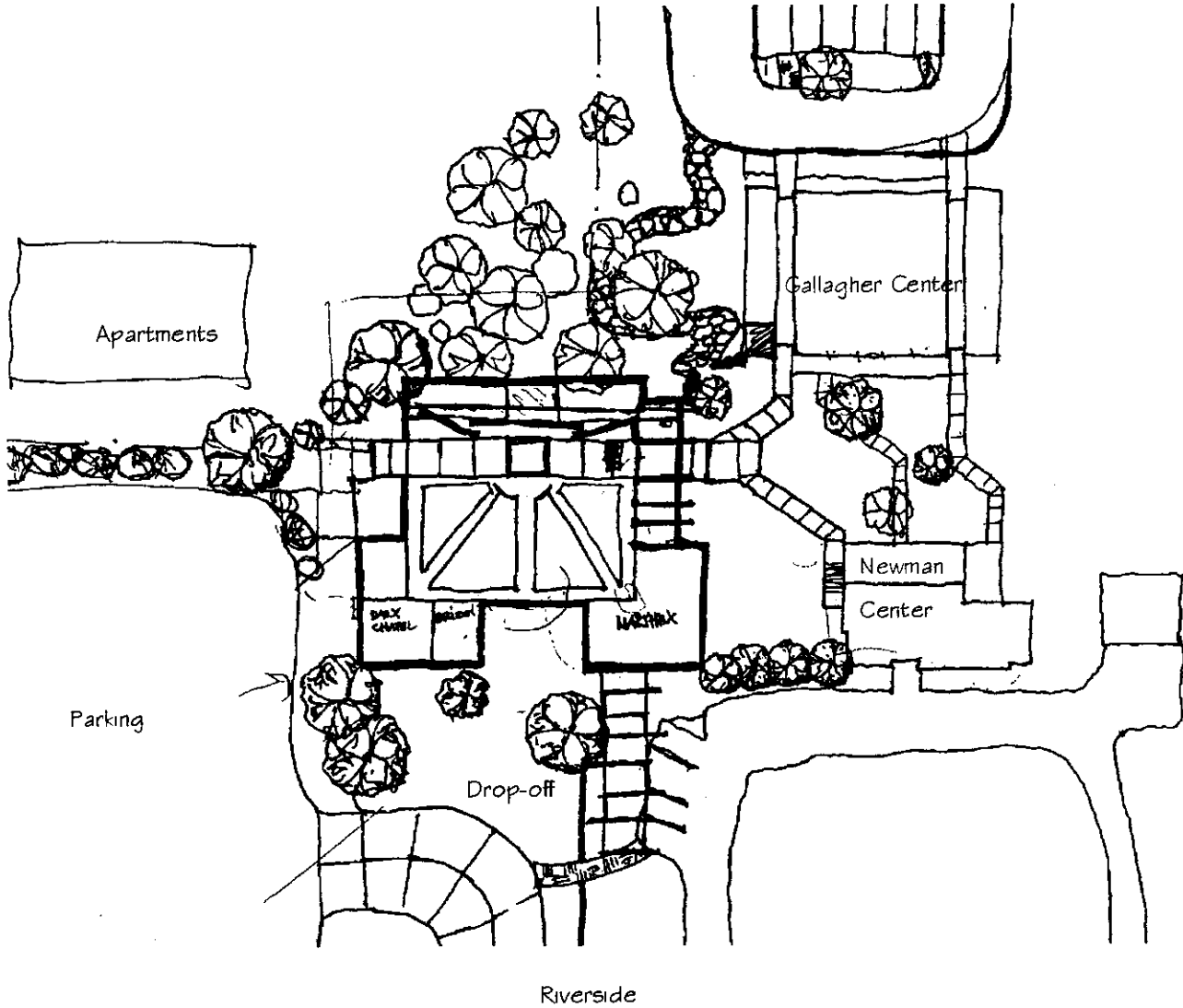
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Conceptual Layout



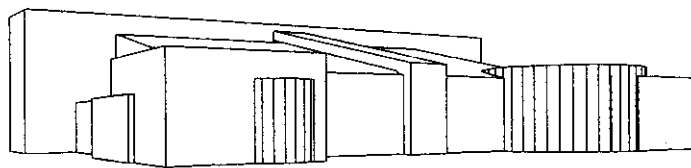
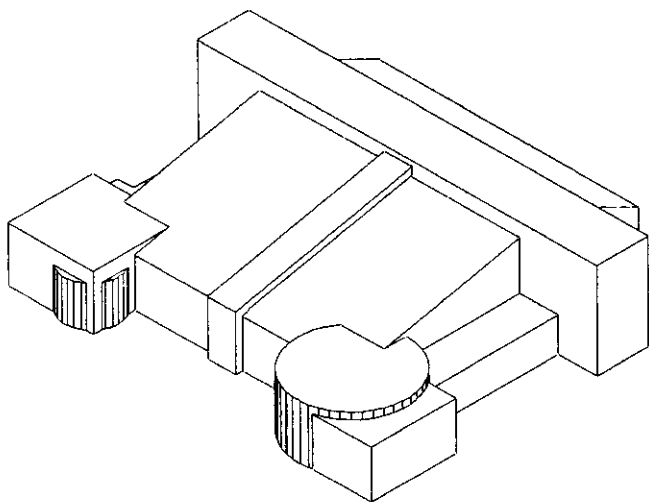
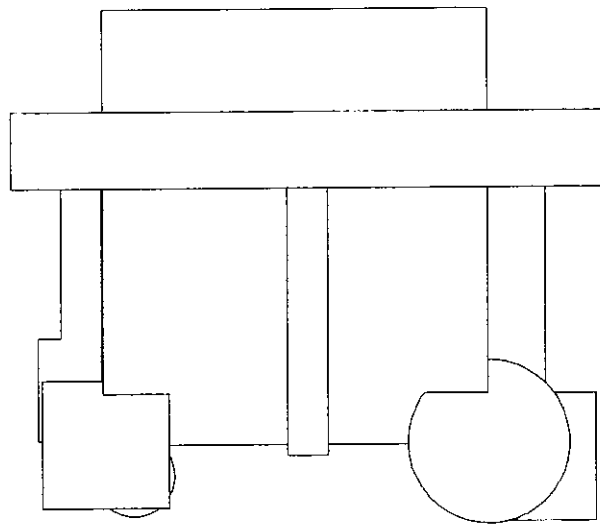
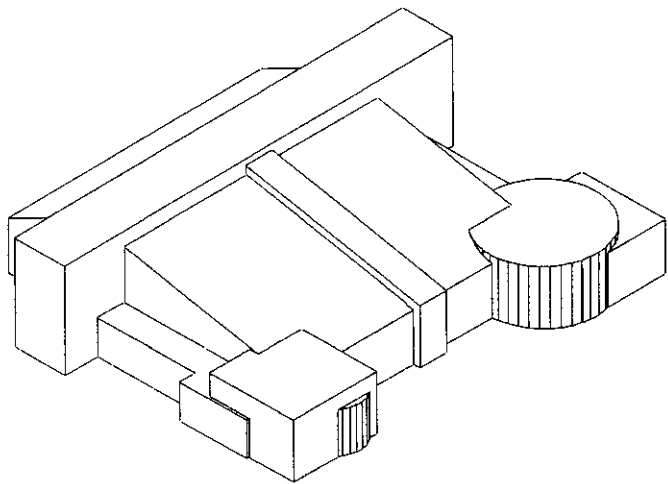
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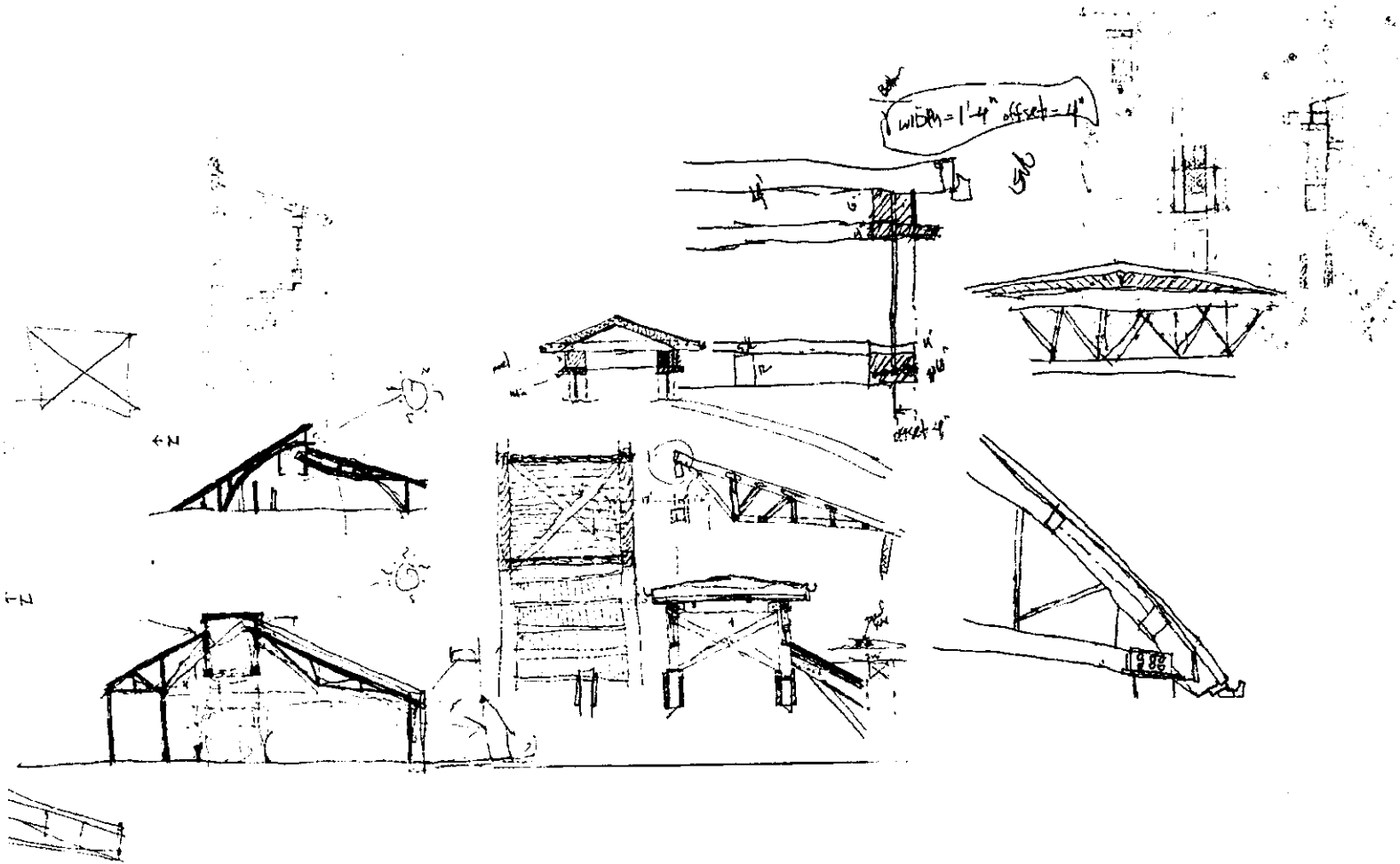
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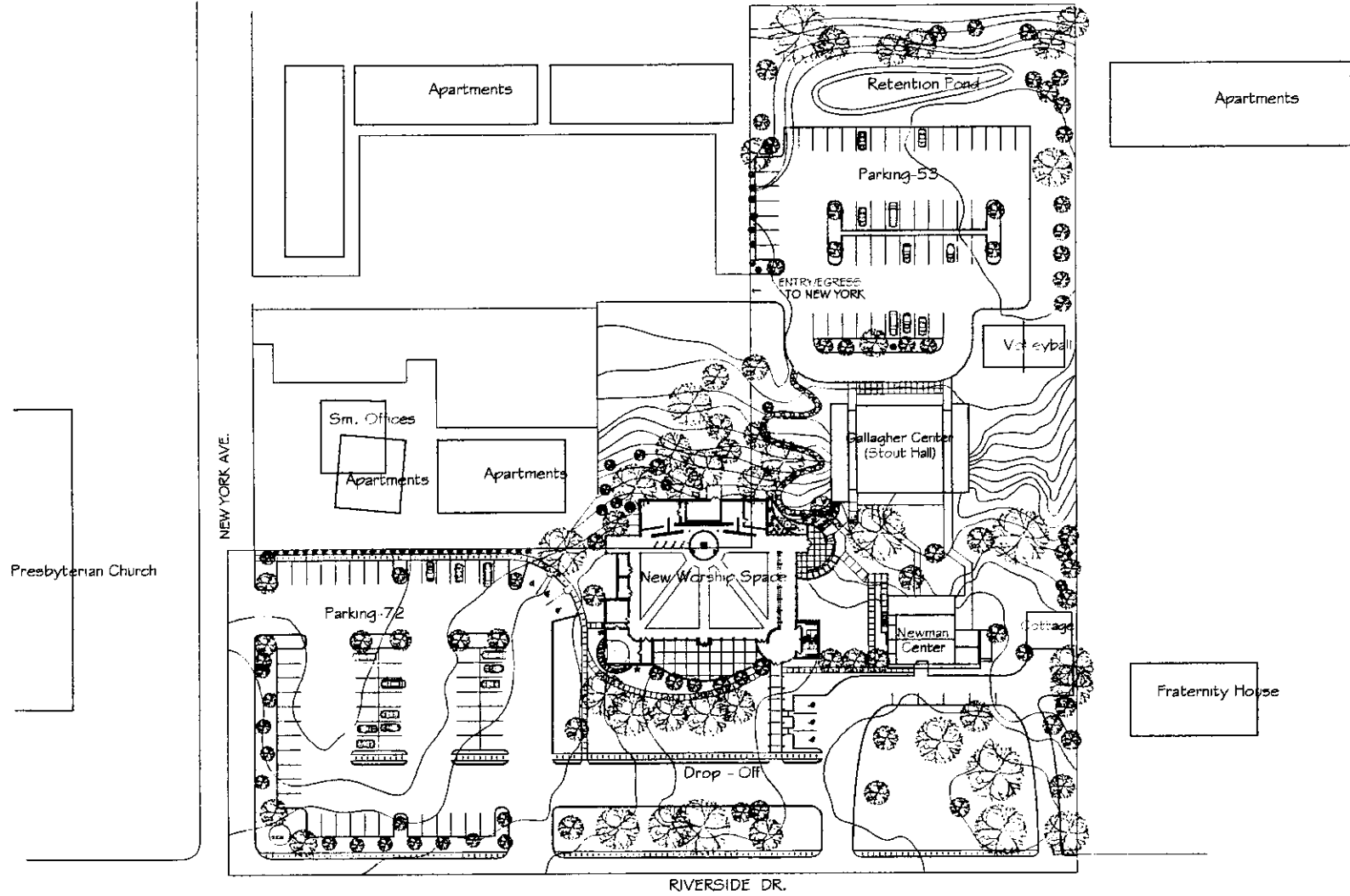
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Concepts - Details



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Proposed Site



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Site Sections



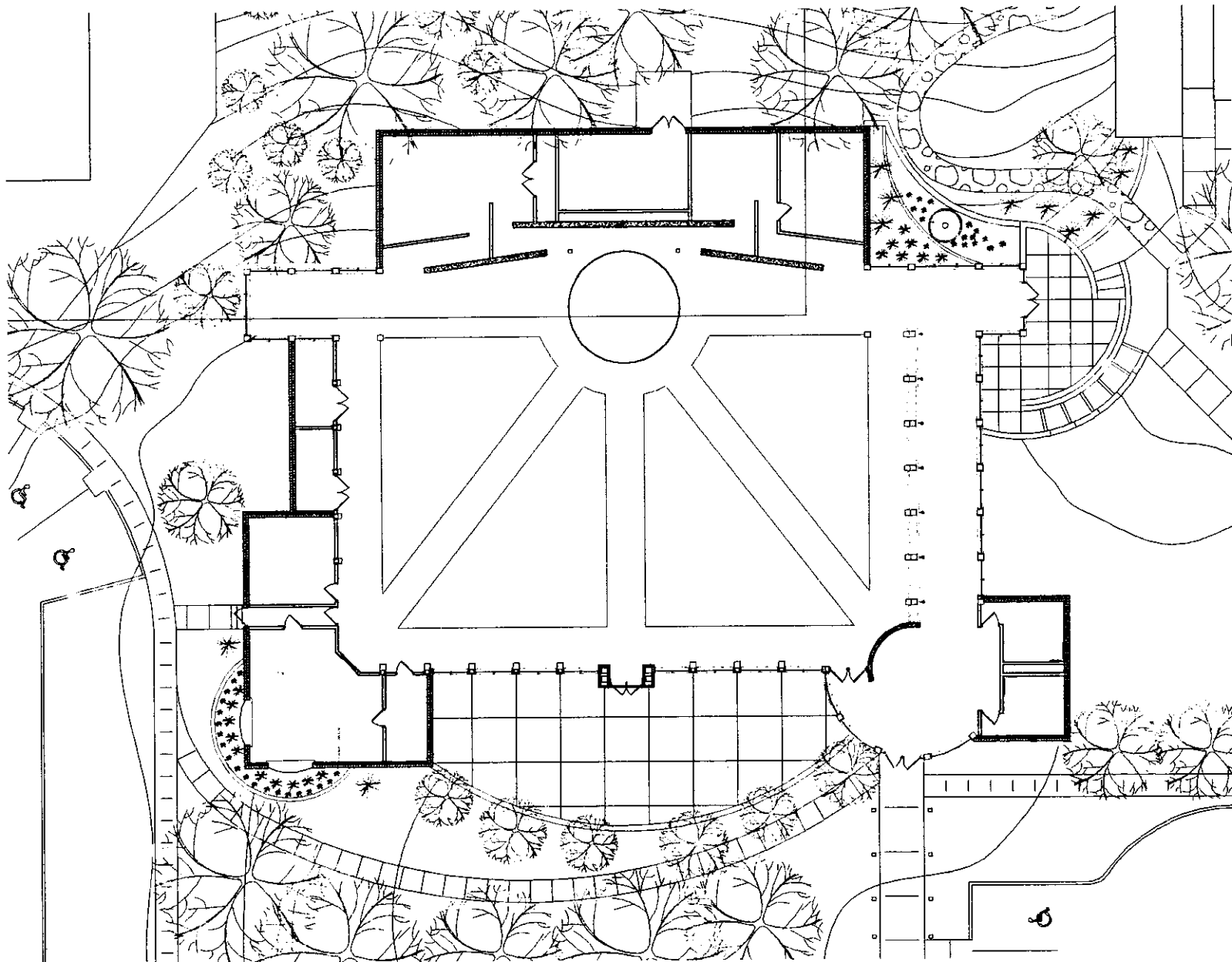
Site Section- Looking North



Site Section- Looking West

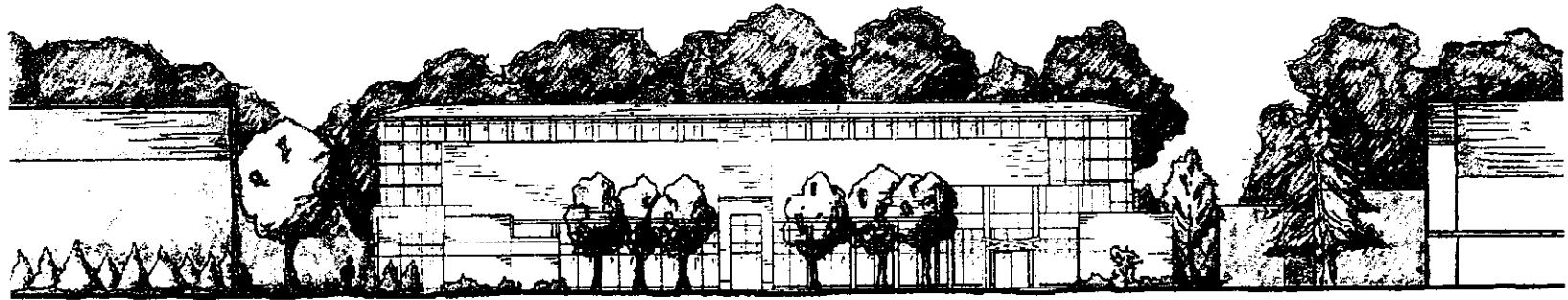
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Landscape Plan



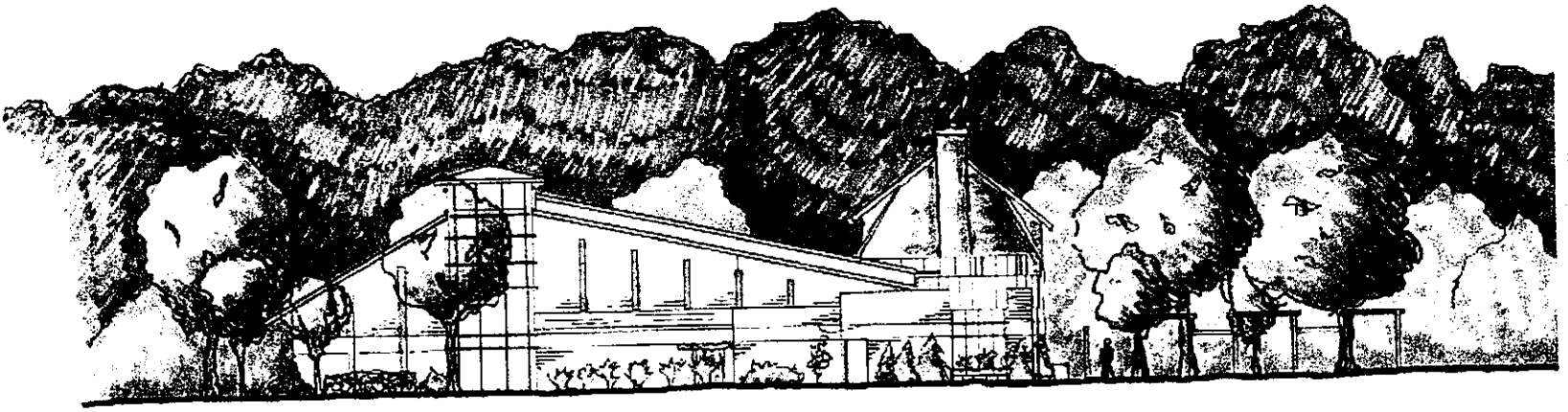
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South Elevation



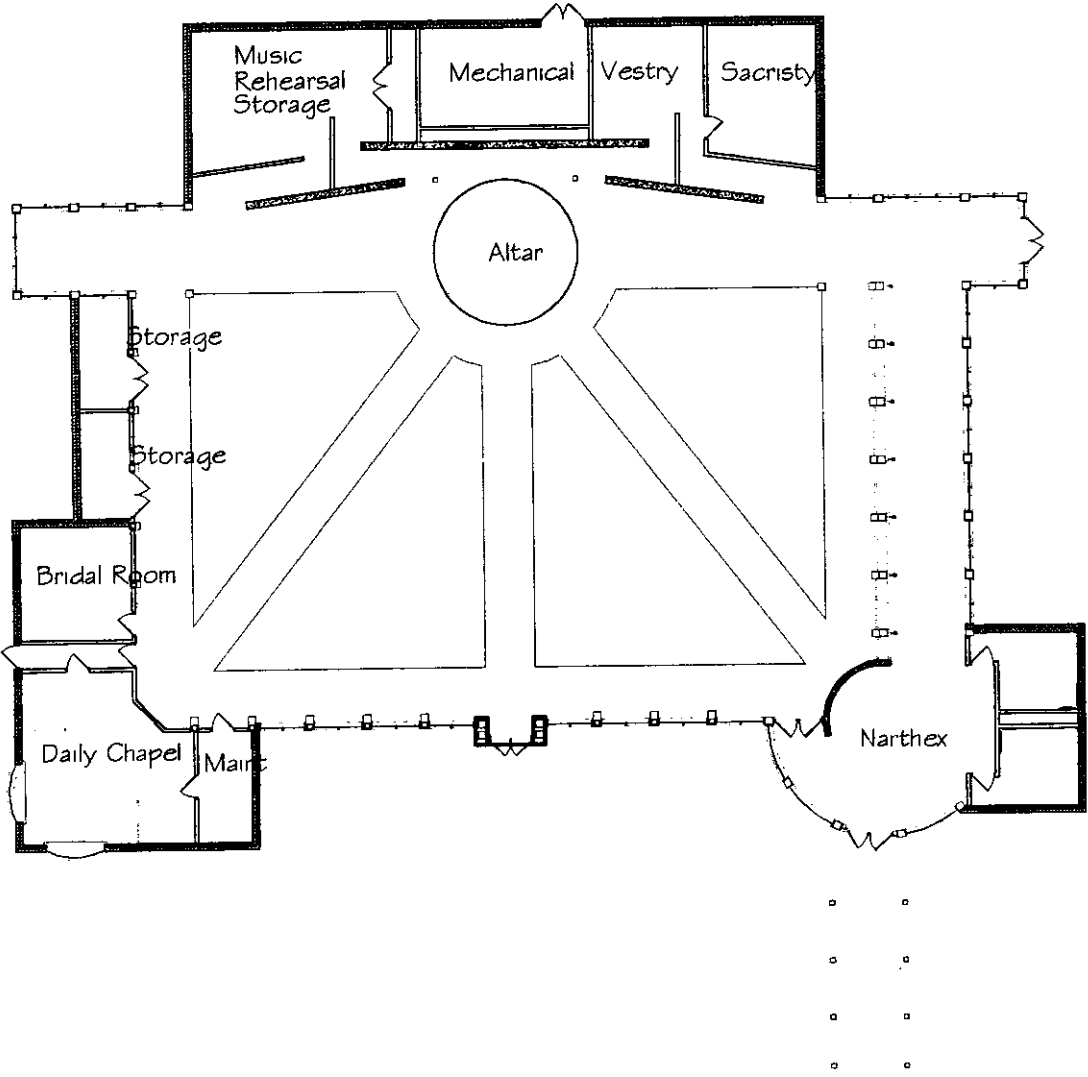
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West Elevation



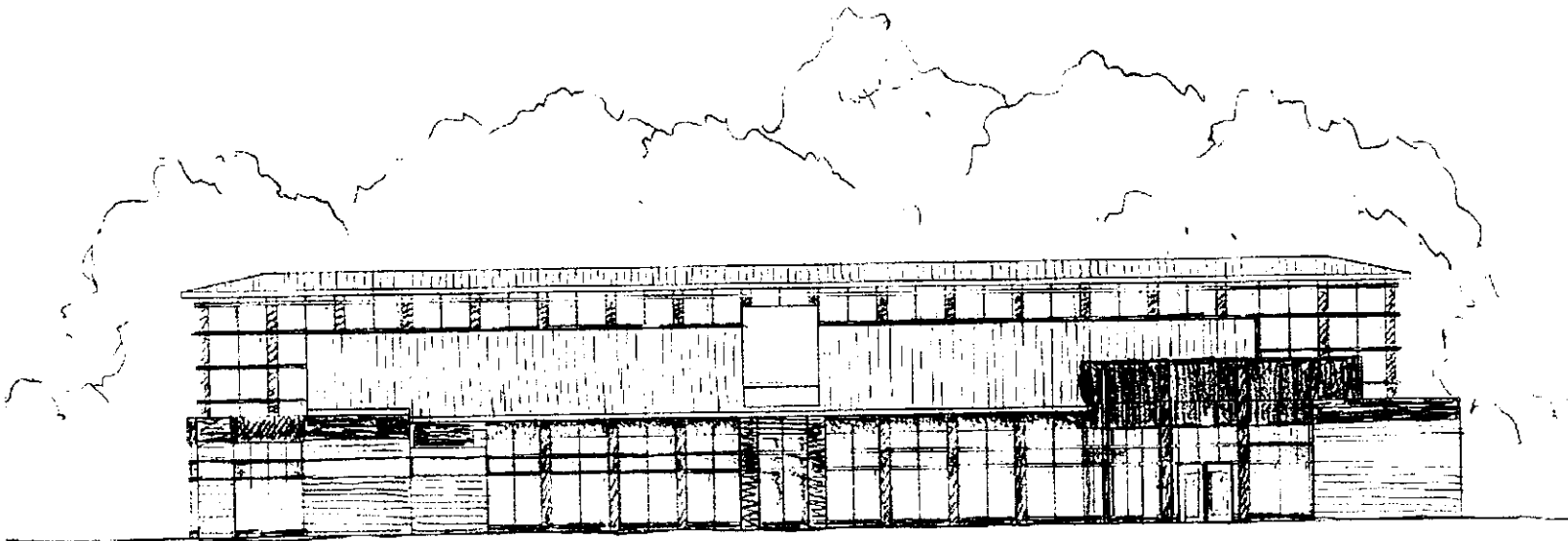
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Building Plan



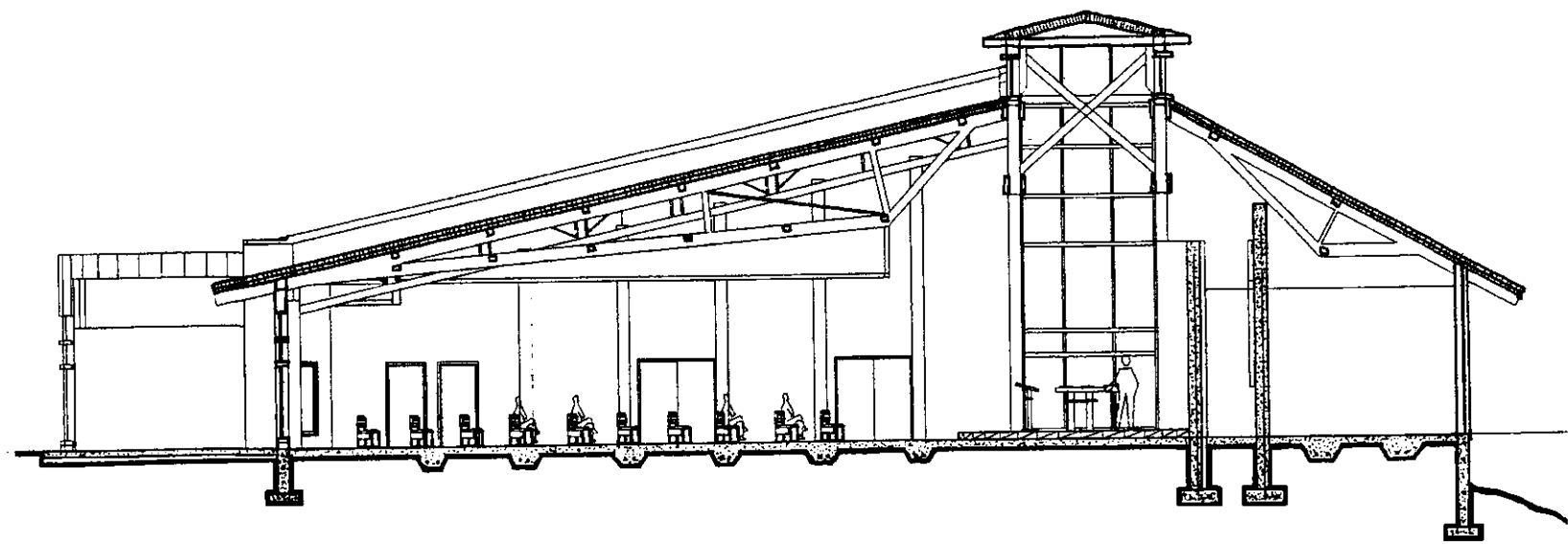
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South Elevation



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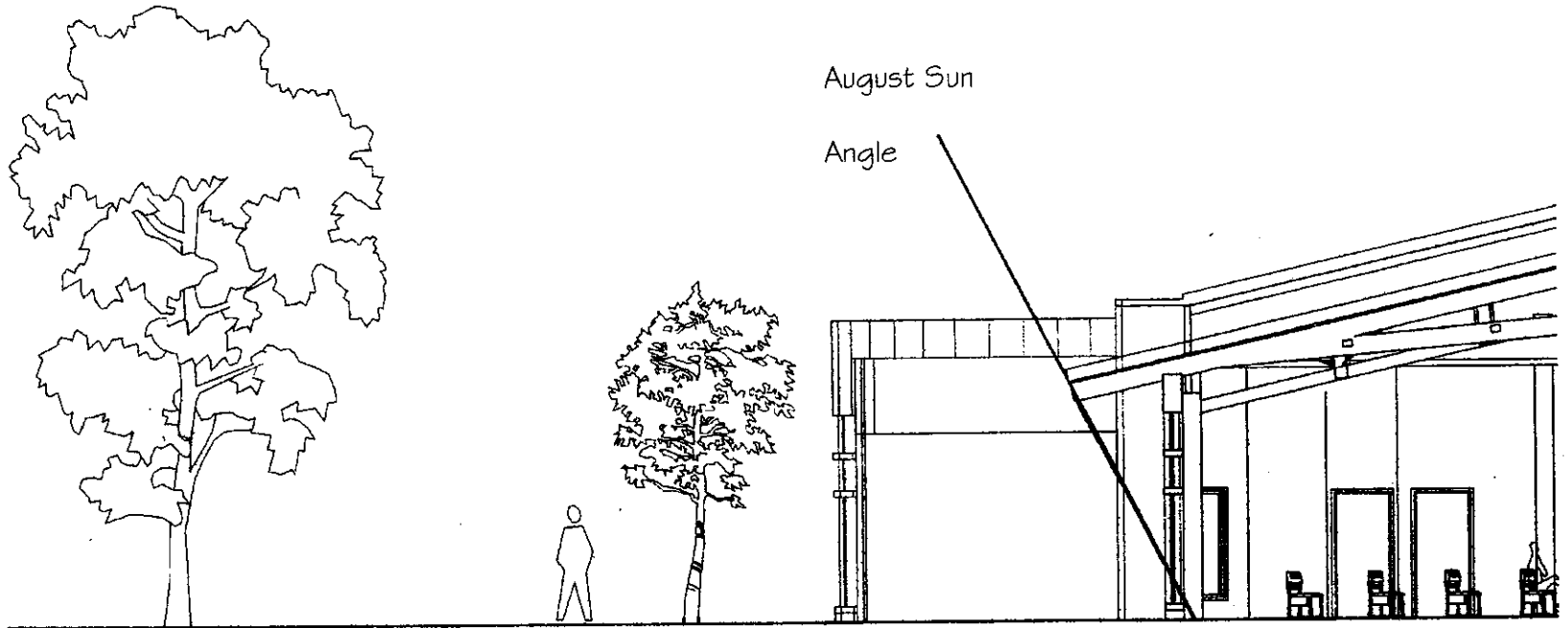
Section



Building Section- Looking West

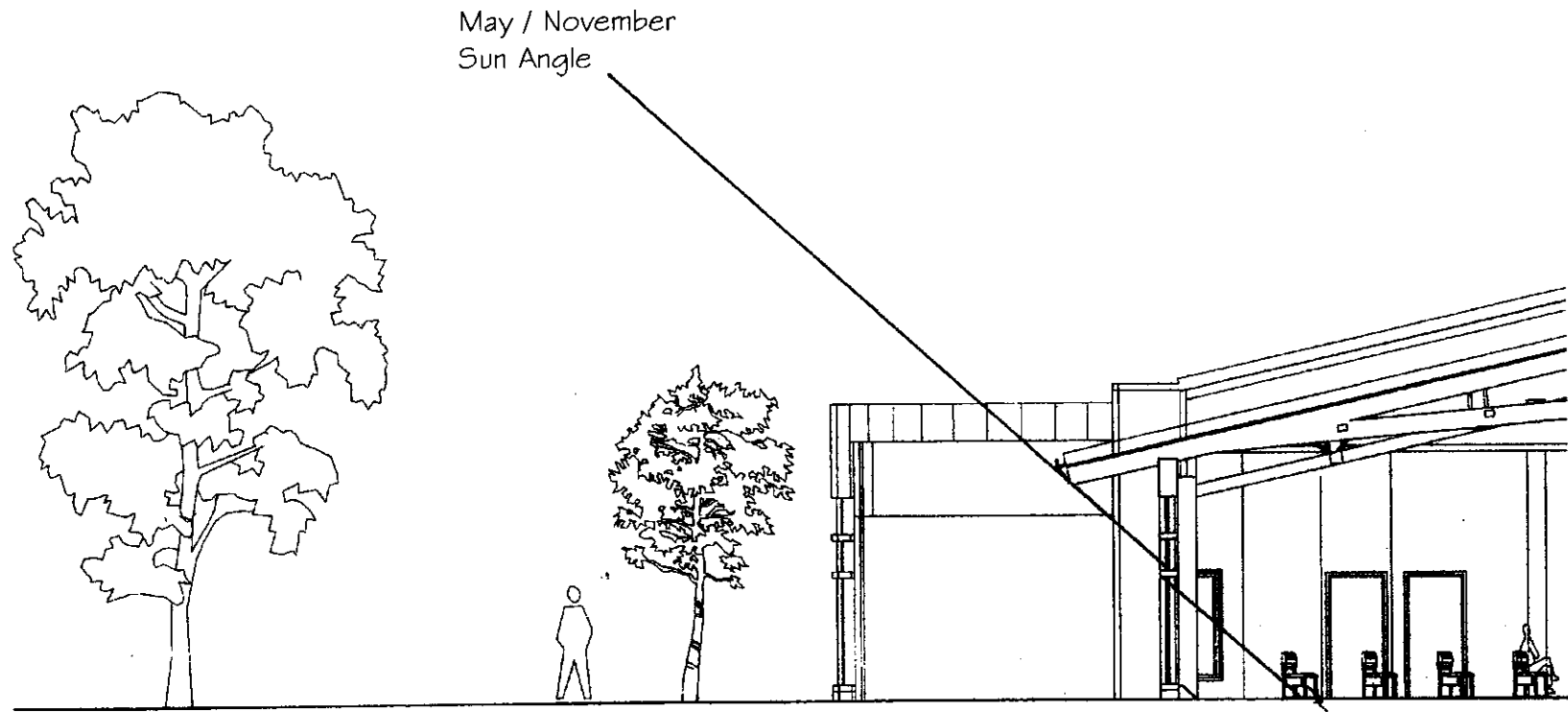
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Sun-Shade Intensities on South Facing Curtain Wall



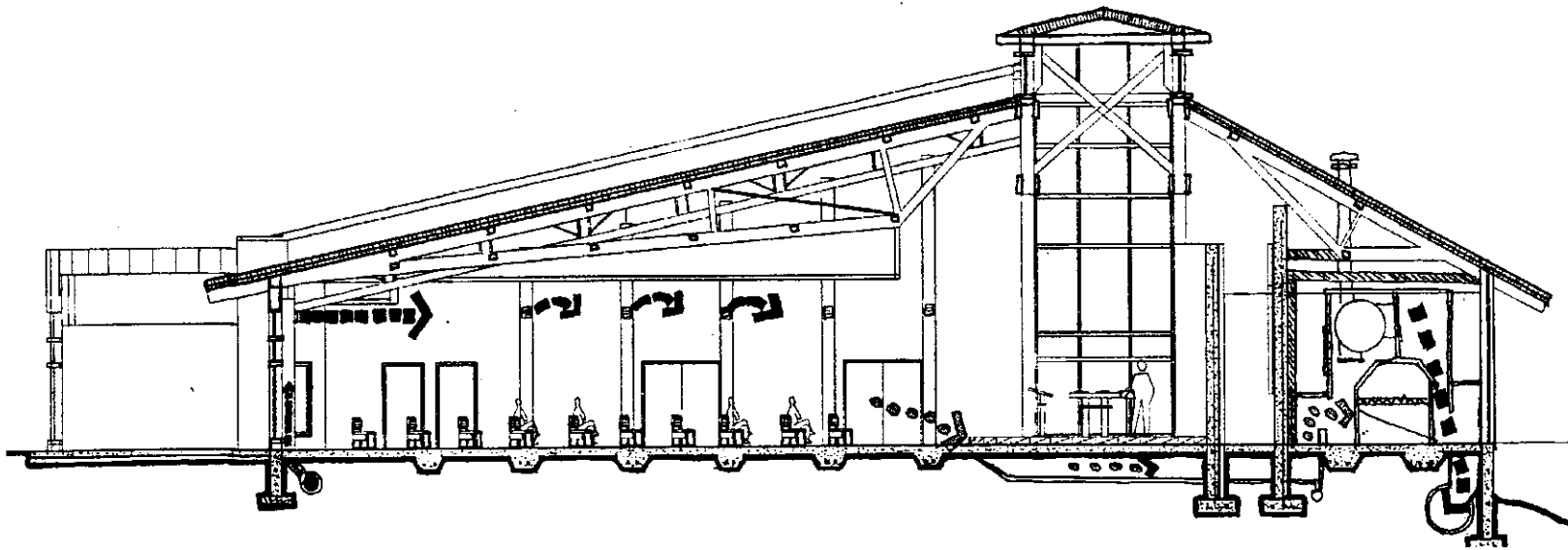
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Sun-Shade Intensities on South Facing Curtain Wall



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HVAC Diagram

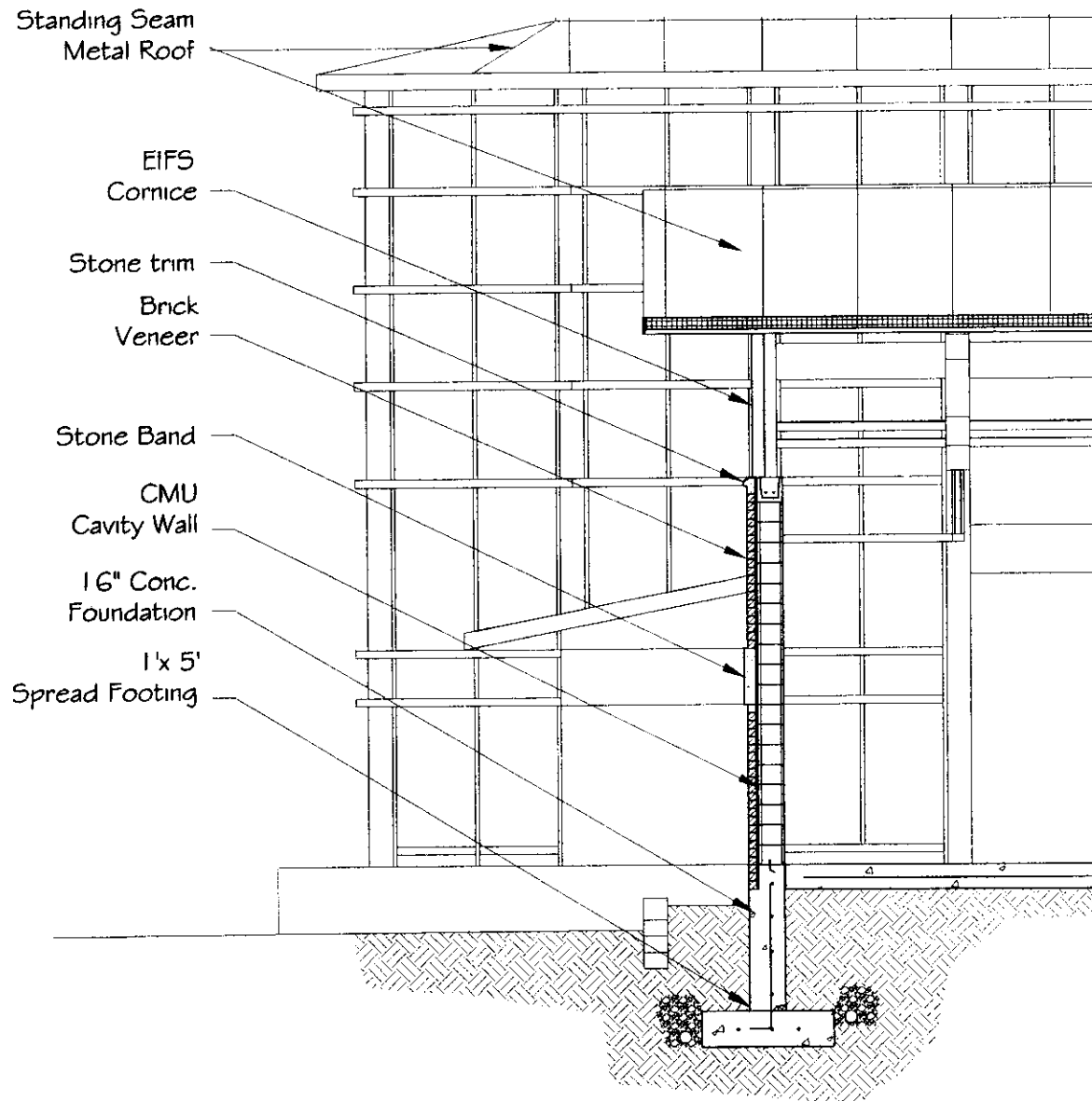


(2)-4 ton Air units
Hot/Chilled Water

-Multiple Supply in False column chase
-Single Return under Altar

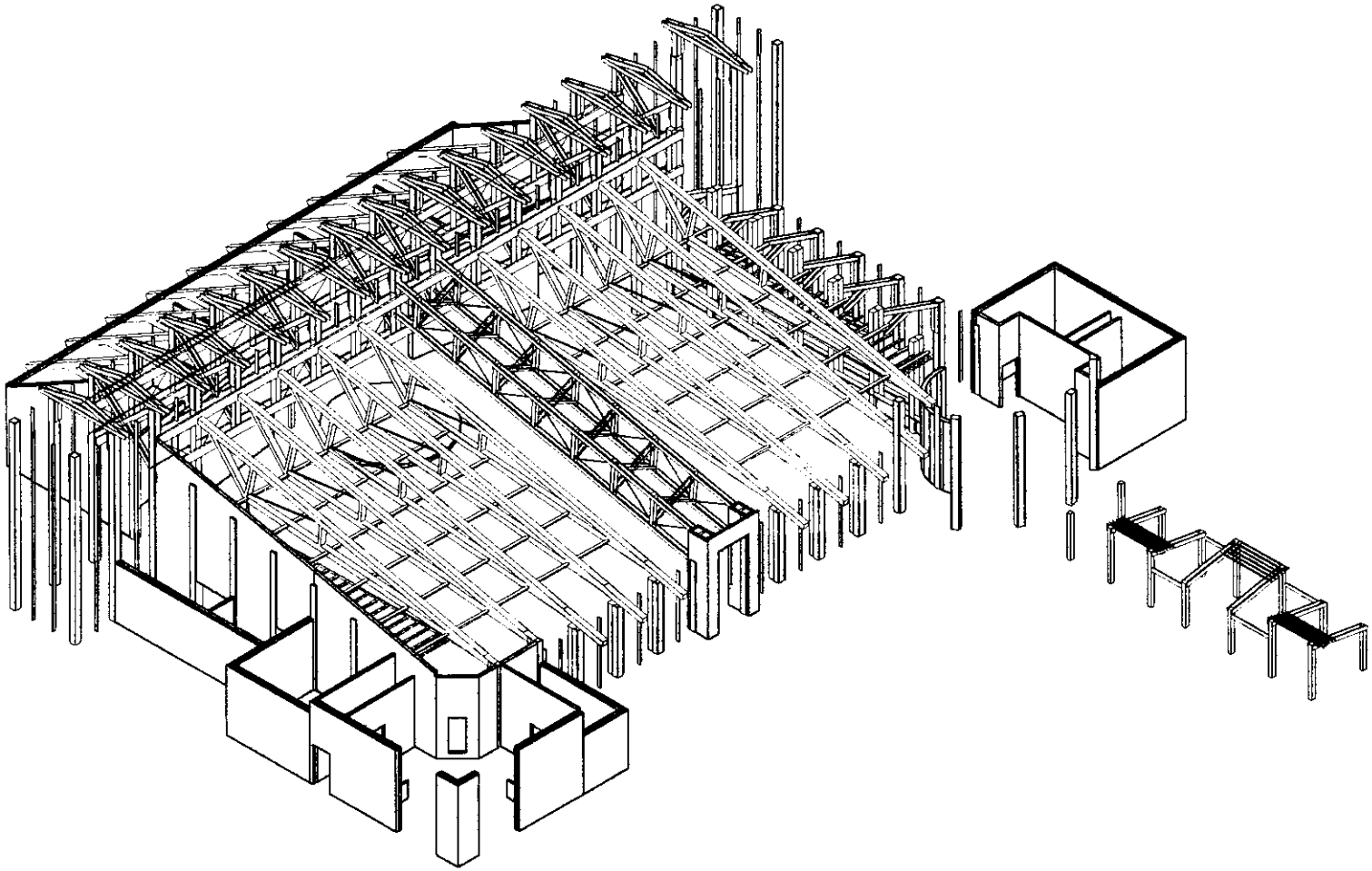
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Wall Section



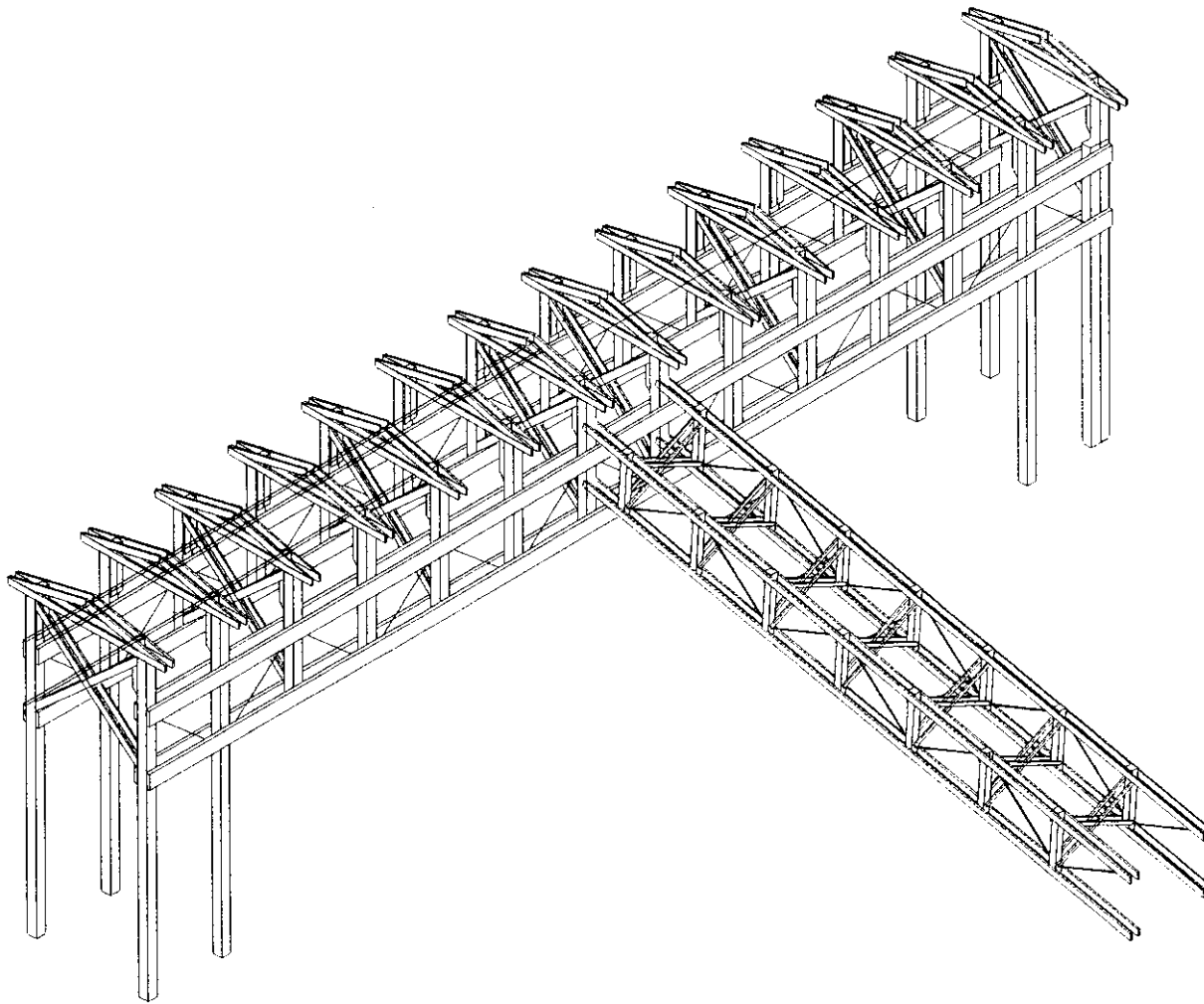
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Structure



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Axon of Integrated Box Truss



Cruciform Shaped

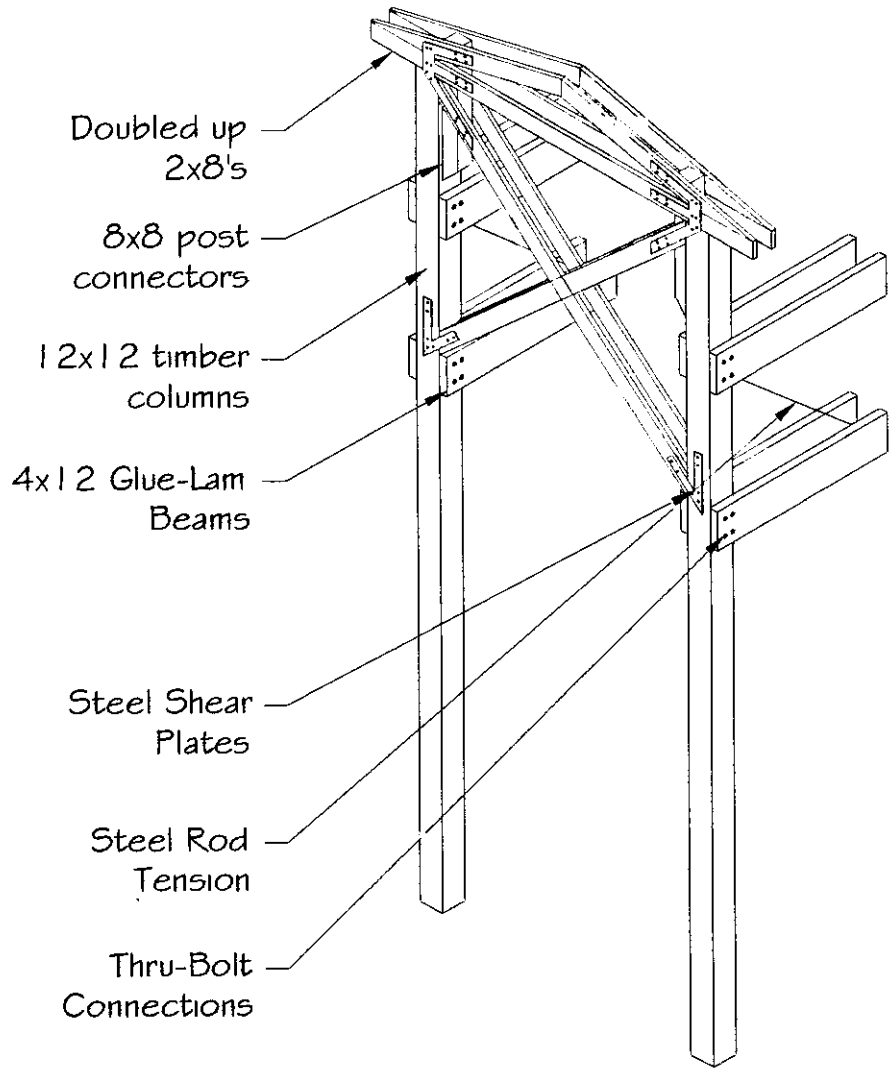
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Detail of Box Truss

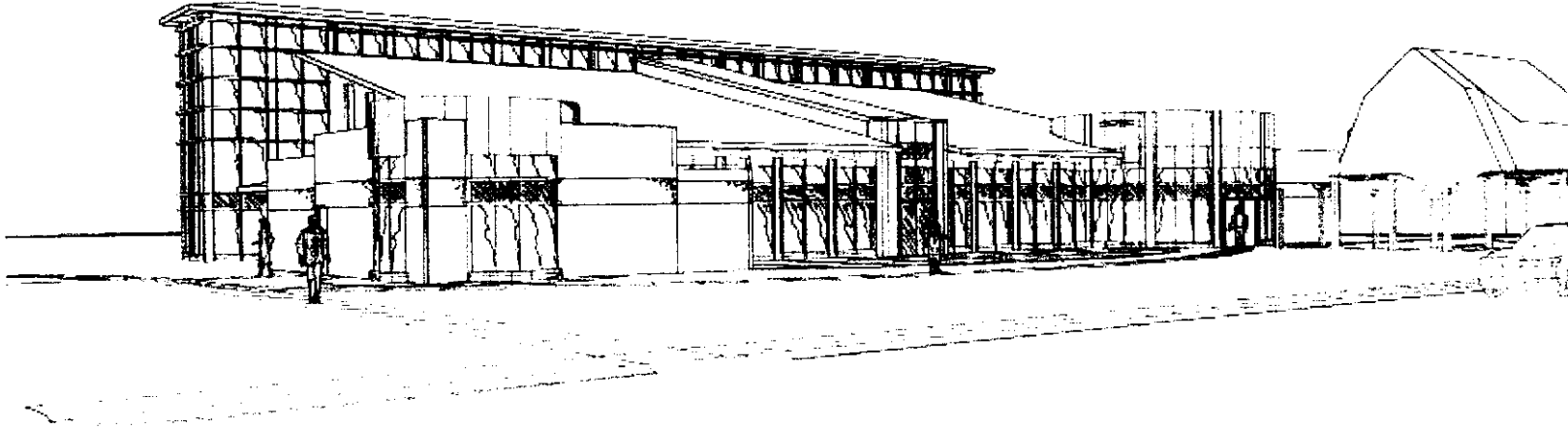
Heavy Timber Construction
with Light Framing

- Simple Geometry
- Simple Connections
- Nominal sized lumber / timber



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The Procession



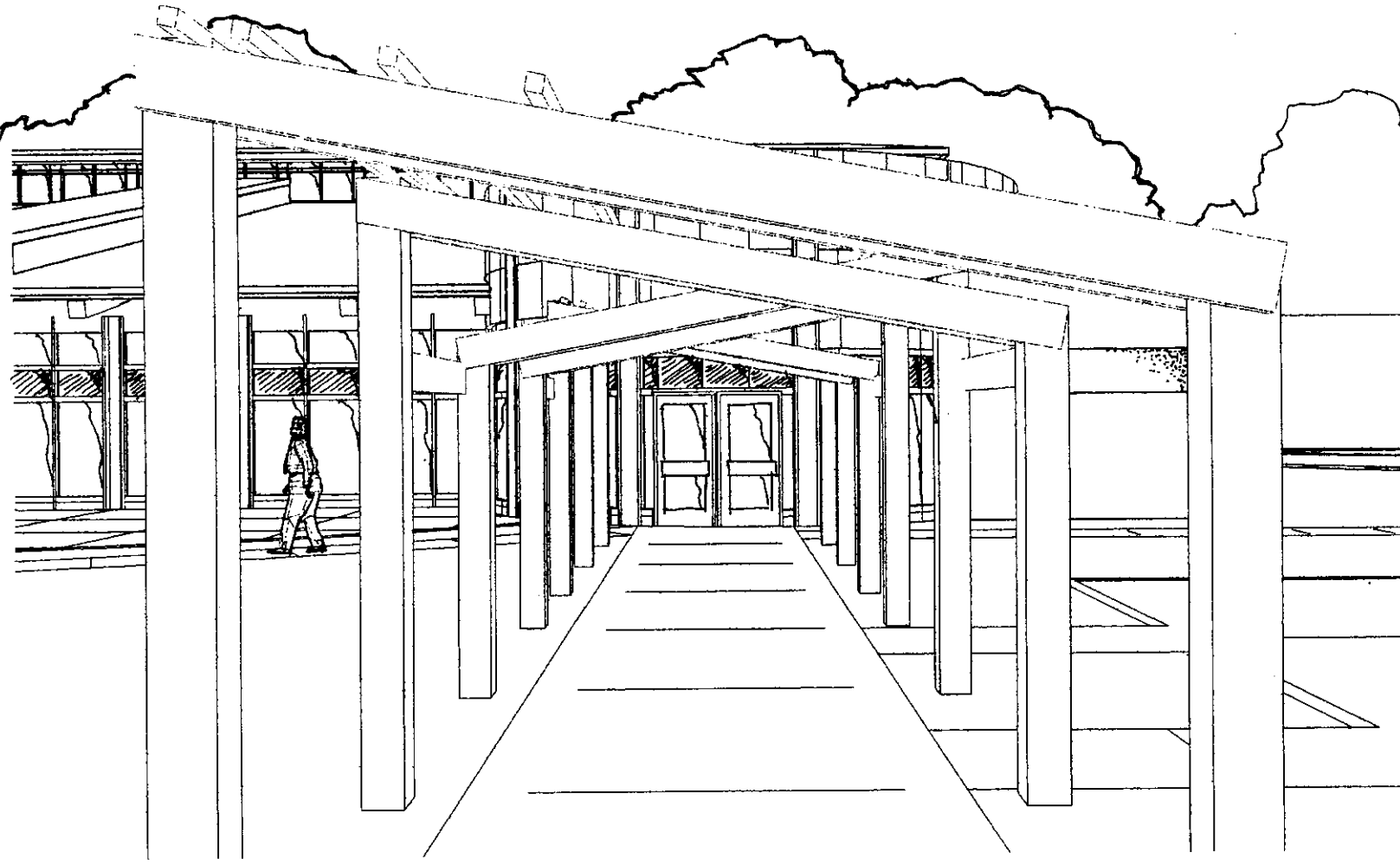
The concept of the procession through space symbolizes the series of events Jesus took in the stations of the cross.

Each new space is unique from the others and needs to be experienced in sequence to capture the effect.

The procession starts as you leave your vehicle, walking away from man's possessions.

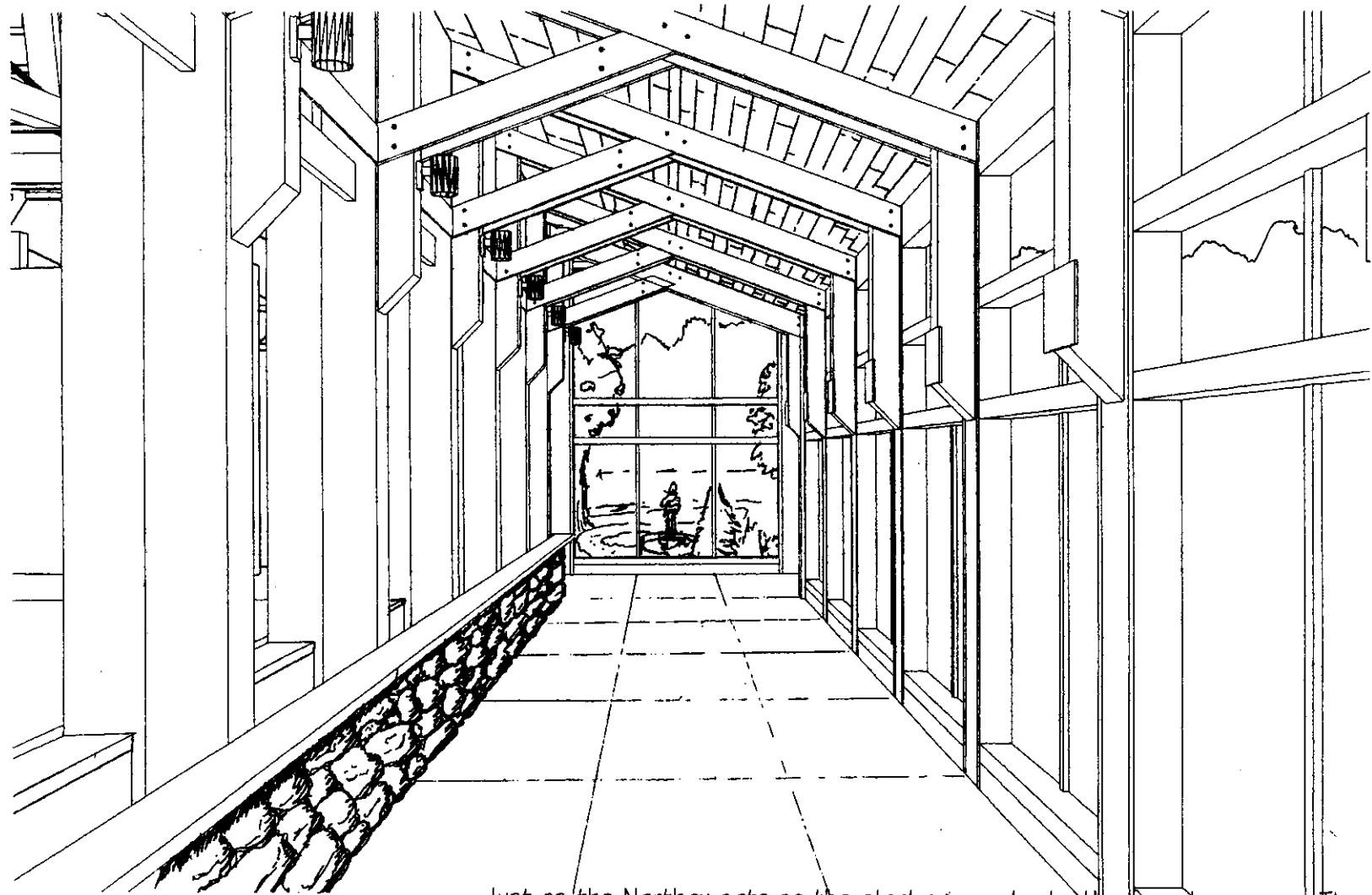
The Procession

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Exterior Colonnade

The Procession

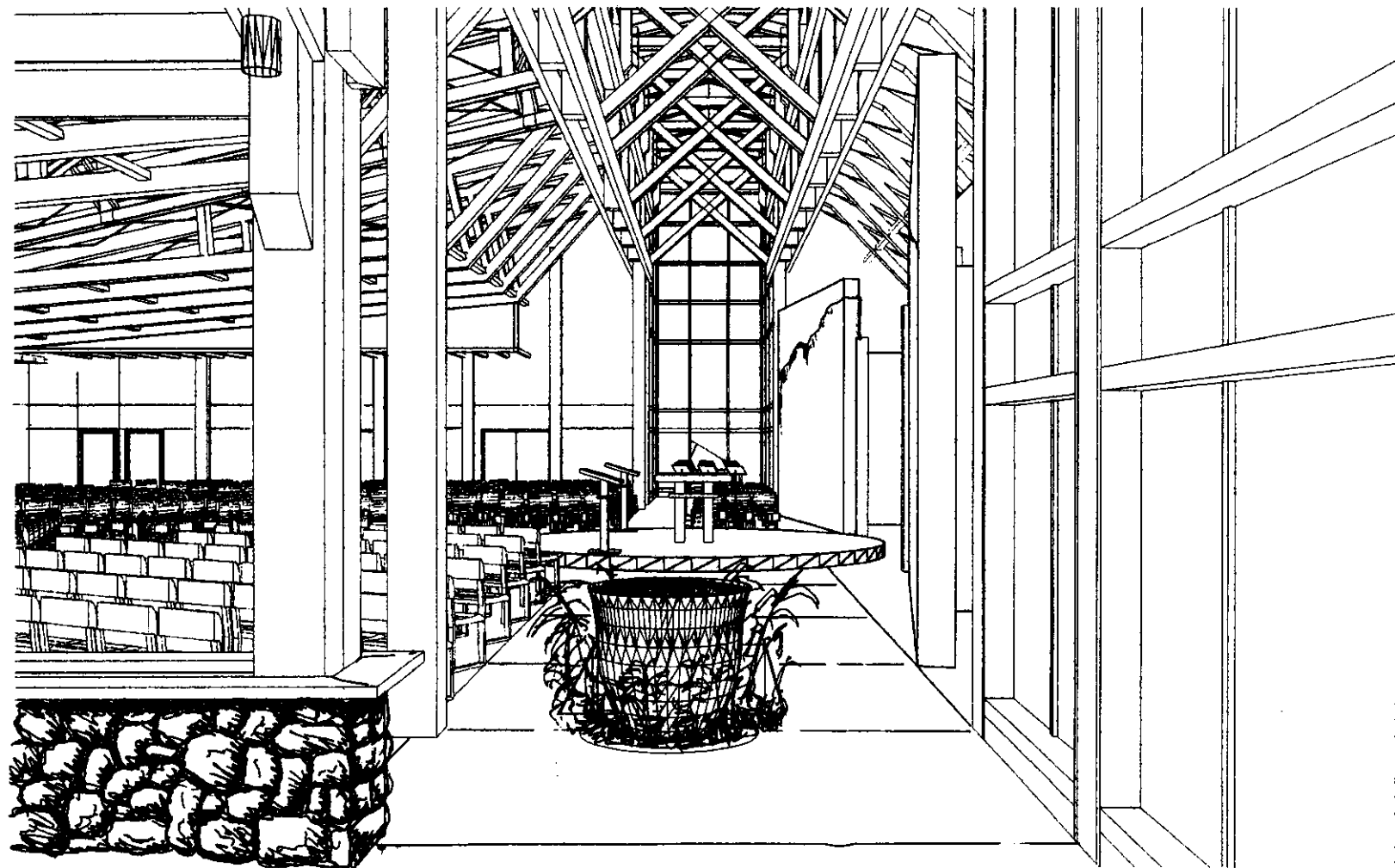


Just as the Narthex acts as the starting point into this worship space, The first seven stations of the cross act as the stepping stones into the beginning of Mass. They are located on the columns to the right. The last seven stations are exposed as you make your way back through the procession, after mass is complete.

Narthex

D e s i g n ~ B u i l d

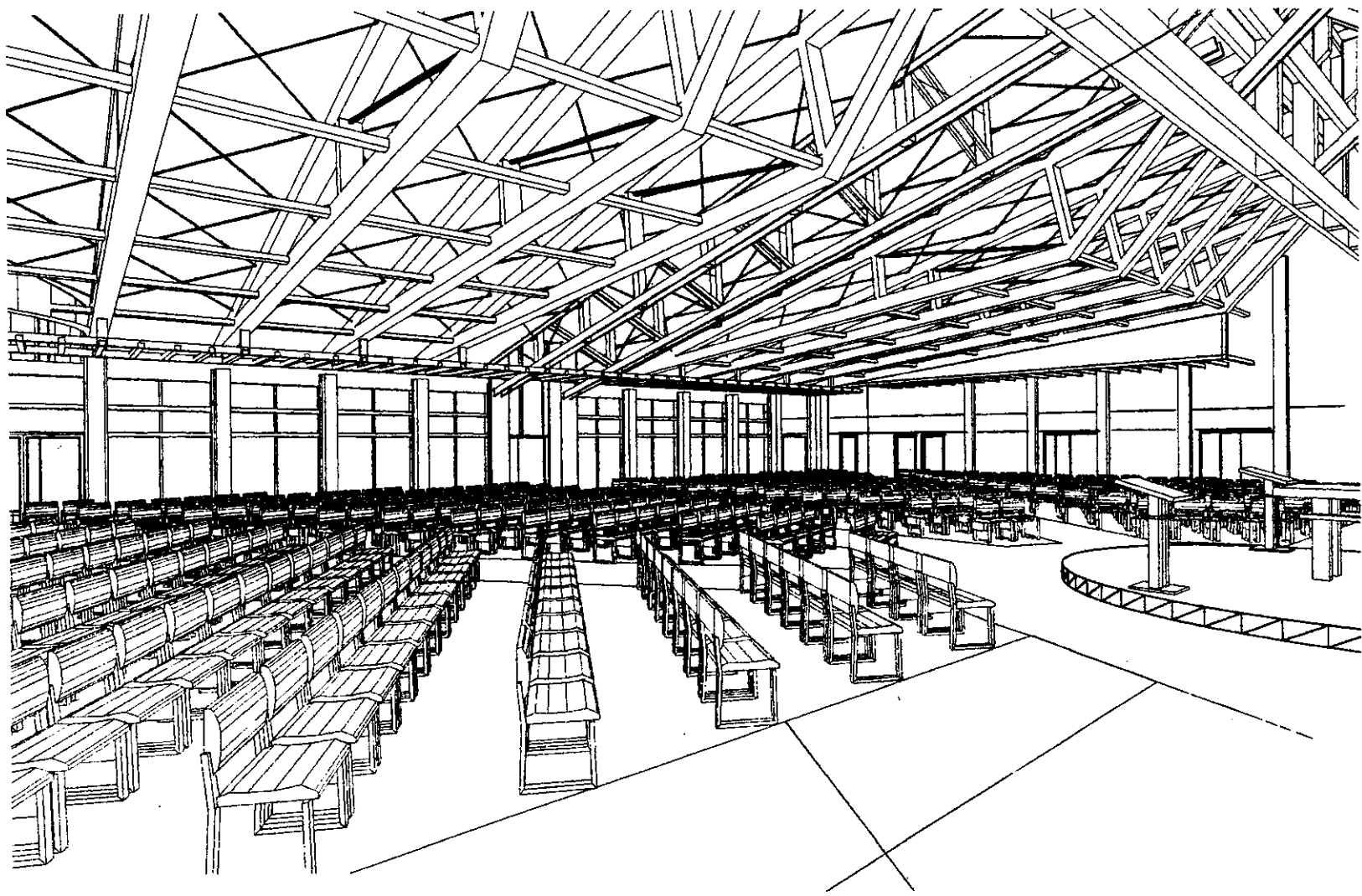
The Procession



Entry along baptismal font

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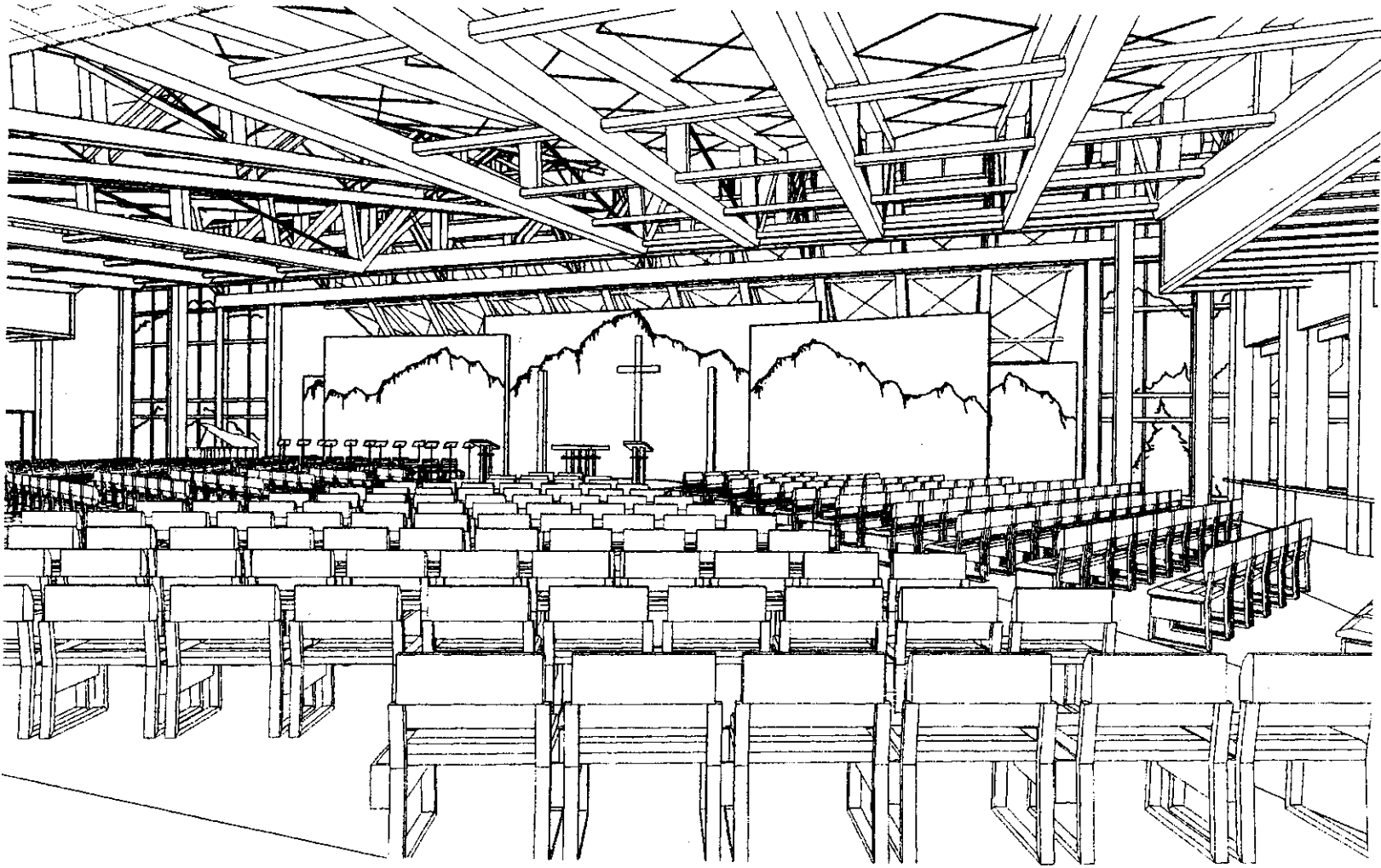
The Procession



View into worship space

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The Procession



View from rear of the church

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The End



After mass is complete, you return through the spaces and experience the last stations of the cross to remind you that prayer shouldn't end when mass is over, it is ongoing.

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