Architecture: A Tradition

The Reintegration Of Historical Building Techniques For Architecutral Adaptation And Preservation

Former Hamm's Brewery
St. Paul, Minnesota

Theoretical Premise

Set Against The Backdrop Of The Community In St. Paul Minnesota, The Once Renowned "Hamm's Brewery" Sat Idle And Unused. For Over 100 Years, This Facility Was An Anchor That Served The Area, And Was A Fixture That Was Synonymous With Beer. With Its Untimely Closing In 1997, This Prominent Brewery Declined. With Several Structures That Once Dotted The Land Demolished, Only Two Leave Behind A Flat Grade And A Distant Memory.

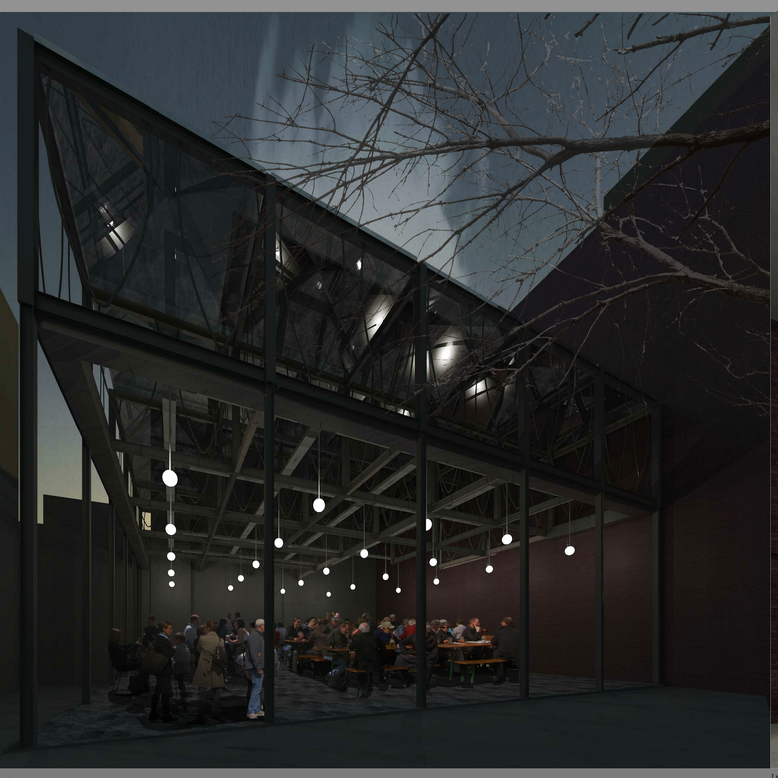
Recent Activity Begun To Spring Forth From The Area, With A Resurgence Of New Businesses That Occupy The Old Walls. "Adaptive Reuse" Is Becoming Increasingly Popular As People Look To The Past, For The Future. By Reusing An Old Structure, Adaptive Reuse Projects Can Revitalize A Neighborhood By Reanimating A Former Symbol Back Into The Fabric Of The Community. With This Thesis Project "Architecture: A Tradition", I Reintegrate Old Construction And Detail Techniques Back Into The Project As An Investigation Of our Philosophical Views Of the Past.

With Respects To nietzsche And Fellow Colleague Stephen Wischer, Our Perception To The Past Is A Triad Of "Romantic", "Monumental", And "Critical" Ideals. Each Have Their Benefits, But Also And More Importantly, Their Shortcomings. The "Romantic" Looks To The Past As Preservation, Not Wanting To Change The Former And To Keep It The Way It Always Was. This Unfortunately Hampers Culture As It Refuses To Change Or Allow New Ideas And Influence For The Continuation Of A Society. Architecture Runs Into This Problem With "Historic Districts". Regulations Set By Particular Zoning Laws Discourage Reuse As These Buildings Must Be Restored To Their Original Order.

The "Monumental" View Prides Man's Achievements, And Overlooks Their Follies. Much Can Relate Today As Sectors Of Our Built World Use Only One Type Of Relatively New Technology "Wood Platform Framing". This Created Vast Areas Of Marginal Housing That Do Not Use Creativity Or Expression, And In Fact "Dumb Down" A Workforce In Skill, With A Population To Believe This Is The Best Way Of Creating A Home. The Last View Of The Past Is "Critical" As It Accepts Both Its Promise And Destitute.

By Being Critical, One's Judgement Is Not Clouded Into A Narrow Paradigm, But The Whole Picture. As We Return To My Project, These Former Techniques Educate A Workforce While Improving The Skill Or Craft Using Modern Tools. Juxtaposed With Current Technologies, The Old And New Can Coincide And Influence Each Other, Creating A Stronger Bond Between The Past And Present As It is "Critical" In Educating A Workforce Of Constructors, But Also The Public With Our Constructed Past.

Most Importantly This Has Special Meaning To Architects And Our Relation To Our Past As It Retraces Our Linneage. We Too Were Once "Master Builders", Heavily Involved In Both Design And Construction. Although The Current Organization Of The Construction Process Is A Network Of Subcontractors And Specialized Labor, The Extreme Numbers Tend To Muddy The Waters At Times With Inadequate Communication Between Architect And Builder. Lately There is a Resurgance In Architects Becoming Actively Involved In Building With "Design-Build" Firms, With Responsibilities In Not Design and Construction Documentation, But Manage Building Directly Through Their Own Appointed Workforce, With The Conjunction Of A Specialized Workforce, The Gap Between Architect And Builders Can Begin To Close.



Courtyard: This Shared Space Is The Lynch-pin For The Site And Surrounding Areas. As A Collaborate Effort Between The School And Adjacent Businesses, Its A Gathering Place To Be Used For Receptions, Parties, And For The Local Brewery As A Beer Garden. A Covered Entrance Tunnel Allows Direct Access To The Site Rolled Curtain System Hides In Drop-Boxes Located In The Soffit Between Columns. When Activated Enclose The Space, While Infrared Heaters Located In The Structural Framing Provide Heat.

Construction Technique
(Courtyard Framing)

Interior Entrance: The Inspiration For The Entire Project Is Inspired By My Parts. The Exchange Between Old And New Acts Upon Each other Because The Two Coexist (For "New" To Transpire, You Must Have "Old" Also). This Lineage, Or "Lines" Develop, Tracing Between Past and Present. This Sculptural Interplay Is First Seen When Entering The Facility.

Construction Technique
(Vestibule)

"Compound Twist" Iron Rod Suspensions

Heating Equal Size Diameters of Flat And Rod Iron. The Two Peices Are Twisted Together With Crucible Tongs, Or Wrench, And Cooled With Water To Retain Shape. Further Segments Are Reheated, and the Process Repeats Itself until completed.

"Pitch Faced" Stone Slab Inlay

The Stone Inlay Uses A Hammered Finish From Cut Slabs Of Tile To Give A Rough Surface Known as "Pitched" Or "Rock Faced". The Face is Then Sawn Off Mechanically, And The Process Is Repeated, Creating A Series Of Tiles For Inlay.

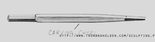
http://www.stone-replaced(cutting&dressing)elements_of_masonry.htm

Wood And Zinc "Ring" Soffit

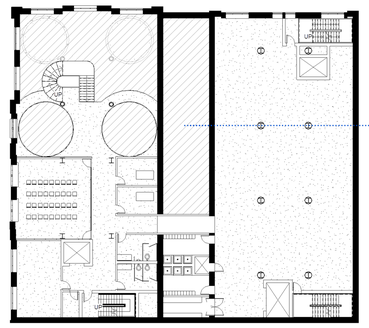
A Drop Soffit Created From Steel Framing is Encased In A Wood Veneer. Inside The Interior, Hammered Zinc Panels Are Attached, With A Pattern Derived From The Side Panels Of The Original Staircase Inside The Brewery. A "Repousse" Hammer is Used With Punches To Create The Pattern.

Carved Building Entrance Stone Trim

Windows are Treated With Stone Veneer Trim With Decorative Rosettes. These Are Produced By Drawing the Pattern On the Peice. Removing Material To Provide Negative Space, And Repeated for More Intricate Details.

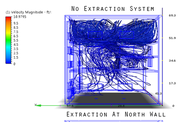


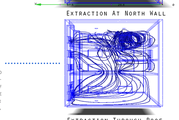
CAD Detail (www.thegreenbuilder.com/sculpting.php)

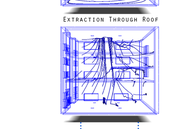


3rd Floor
Classrooms (1050 FT²)
Instructor Offices (175 FT²/Unit)
Workshop (4200 FT²)
Locker Room (540 FT²)
Tool Storage (120 FT²)

Open To Below (Mechanical)

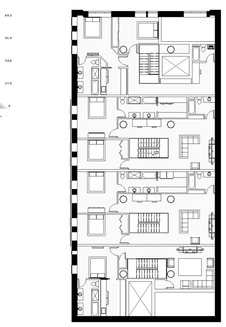




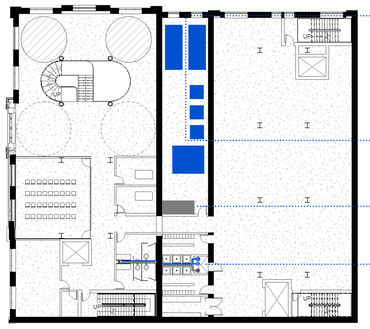


Fire Safety (Smoke Analysis)
-Using Simulation Software To Track Smoke Travel In The Vertical Atrium Space In The Event Of A Fire. Three Smoke Tests Were Run For Analysis Which Include: No System, System At North Wall, And System Through Roof.

The Data Revealed The Best Placement For Extraction Is Through The Roof. As Initial Placement For Smoke Ventilation In The North Was Ineffective. The Smoke Continued To Circulate In The Upper Floor, Not Being Able To Be Vented Properly; Even At Extraction Rates Of 50 ft³ Per Second.



6th Floor
(2nd Floor Of Units)



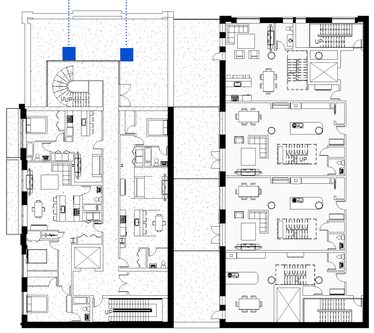
2nd Floor
Classrooms (1050 FT²)
Instructor Offices (175 FT²/Unit)
Mechanical Room (1100 FT²)
Workshop (4200 FT²)
Locker Room (540 FT²)
Exhibition (900 FT²)
Tool Storage (120 FT²)

Mechanical Room
-Centrally Located For Split Access
Occupy Unusable Space Due To Existing Structural Elements
Vaulted Space Allows Vertical Placement Of Pipes And Ducts
-Direct Access To Fresh Air

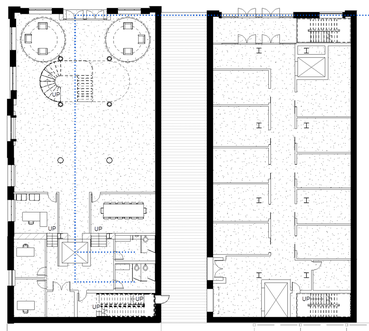
Hydronic Heating/Cooling System
Boiler
Chiller
Air Handler
Air Ducts
Pumps/Compressors

Electrical Service
-Location Of Distrubution Box
-Occupies Same Space For Central Location And Vertical Placement Of Conduit/Wires

Plumbing
-"Stacked" Design For Efficiency
- Access To Main Supply/Waste

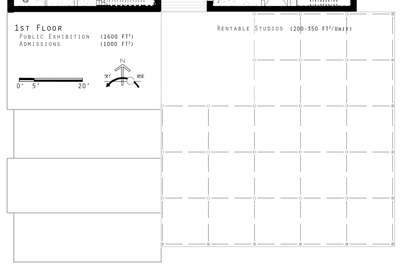


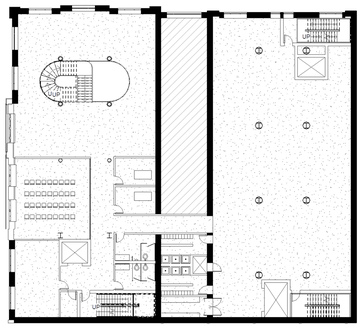
5th Floor
(3) Temp. Artisian Housing Units (520-1160 FT²/Unit)
(4) Two-Story Condo Units (1st Floor) (1640-2500 FT²/Unit)



ADA Compliant
-Ground Level Elevator
-Public Bathrooms Wheelchair Accessible

1st Floor
Public Exhibition (1600 FT²)
Admissions (1000 FT²)





4th Floor
Classrooms (1050 FT²)
Instructor Offices (175 FT²/Unit)
Workshop (4200 FT²)
Locker Room (540 FT²)
Tool Storage (120 FT²)

Building Elements

Technical College/Public Education
-Training Individuals In Both Old And New Construction Technologies, Providing Supplemental Knowledge And Skills Needed For Adaptive Reuse Projects. The Three Main Courses Of Study Will Be Stone, Wood, And Metal.

The Facility Offers Night Classes To The Public To Those Who Want To Learn Skilled Trades As Well.

Temp. Artesian Housing
-Part Of Teaching Historic Techniques Requires Additional Help. Artisans and Craftsmen Who Specialize In These Skills Routinely Visit For Extended Periods Of Times, Requiring Temp. Housing For Their Use.

Rentable Studios
-These Spaces Will Are For Local Artists For Personal Use, Making Use Of Space Deemed Unhabitable. This Area Occupies The First Floor, Sandwiched Between Entrance Corridor To Courtyard And Adjacent Building.

Housing
-Condo Units Occupy The Top Floor, Eastern Portion Of Building. This Continues The Use Of Facility And Provides A Different Typology To Immediate Area.

Public Courtyad
-As An Effort For Collaboration In The Community, The Courtyard Is Provided With Sheltering Roof And Screens For Public Use/Rental.

School Section
0 5 20'

Structure
As A Brewery, The Existing Structure Was Constructed To Carry Massive Loads Created From The Brewing Equipment. Supporting The Concrete Floor Are Steel I-Joists, 4' On Center, Tying Into Main Girders. These Members Attach To The Brick Envelope, And Are Supported By Columns, Transferring The Weight Into The Foundation Below.

The Building Envelope Is Comprised Entirely Of Brick, Structurally Supporting Its Own Weight. The Design Of The Exterior Walls Are Tapered To Prevent The Load Of The Bricks Above From Crushing The Members Below. With 3' Thick Walls At The Bottom, Their Thickness Decreases To Only 18" On Top.

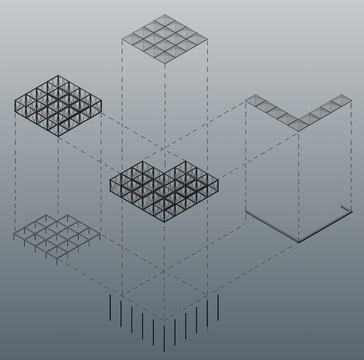
Construction Technique
(Brew Tank Holes)

From The Early Egyptians, To Present Day, Post And Lintel Construction Continues To Develope. The Ancient Builders Used Massive Columns, Carved In One Piece Of Stone Or Built From Layering Sections, Then Stacked To Form A Whole. The Massive Weight Of The Beam Would Rest On Top Of The Column.

The Extreme Weight Of The Material Required The Building Components To Be Very Large, And In Time As Techniques And Building Developed, New Components Were Introduced, Such As Column Capitals.

With The Introduction Of Cast Iron, The Column Would Attach To The Main Beam Or Girder From The Side Using Angular Plates, Securing Together The Connection With Fasteners (Bolts Or Rivets), Welds, Or The Combination Of Both.

Continuing This Tradition, The Courtyard Cover Uses Steel Post And Beam Construction, But The Addition Of A Modular Framing Component (A Structural Cube). The Units Are Fastened Together, Requiring No Inner Columns As They Are Arranged In Pyramid Form, Transferring Loads To the Outer Rim, Which Is Then Connected To Structural Columns.

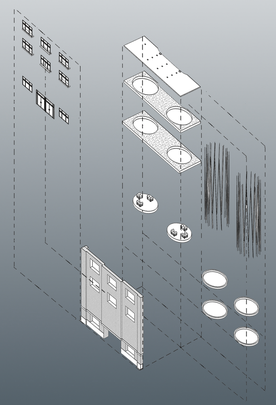


The Main Entrance To The Facility Required Enlarging The Original Entrance. A Structural Steel Header Is Positioned To Receive The Load From The Outer Brick Wall, Spanning The Opening While Allowing It To Be Enlarged.

In The Past, A Temporary Frame Would Be Built, And The Opening Would Be Enlarged By The Use Of Hand Tools (Post Maul). The Process Would Take Longer Due To The Constraints Of Manual Labor, As Well As Repairing The Jagged Edges From The Demo.

Recent Years Allows The Use Of Power Wet-Saws, Anchored To A Hydraulic Jack. The Saw Cuts The Opening Square And Plumb, Using Much Less Time And Labor.

To Preserve The Integrity Of The Former Brewery, The Circular Openings In The Floor Plates In The Atrium Space Will Remain, Allowing Reference To The Former Life Of The Building. Architectural Elements That Detail The Space Will Include Rod Iron, Stone Floor Inlay, And A Ring Soffit That Will House Lighting Components, Adding Intimate Lighting To The Space.

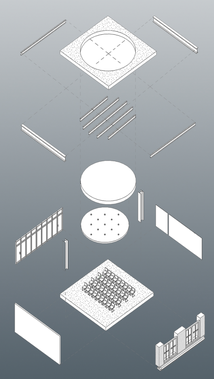


As Mentioned Beforehand, The Facility Once Served As A Brewery; Hence, The Openings Allowed Materials Such As Water, Yeast, And Hops To Be Lowered Into The Tanks. The Large Size Of These Tanks Required Two Stories Of Building Space For This One Function.

To Allow The Typology Of The Trades School To Exist, The Facility Needs To Be Altered To Allow The Building Program To Function. The Same Construction Techniques Taught At This School Will Be Used To Close Some Of The Floor Openings In The Structure.

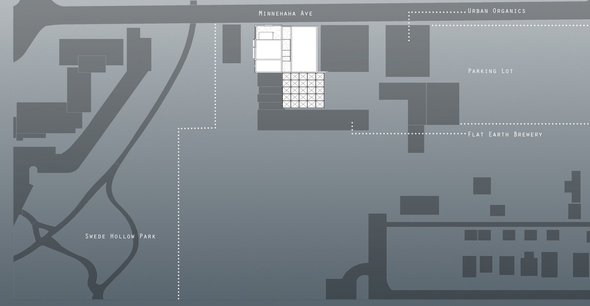
Adding Structural Members To Span The Diameter Of The Hole Can Be Achieved With The Efficient Design Of The Steel Web Joist. Because The Only Loads That Must Be Supported Are The Dead And Live Loads Of Classroom Elements, People, And The Floor Above, These Lighter Building Materials Can Be Used In Place Of Heavy Structural I-Beams That The Existing Structure Uses Extensively.

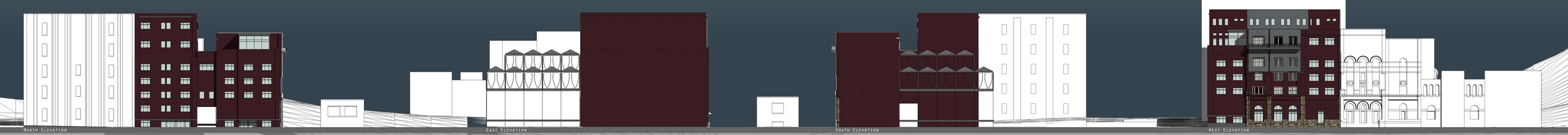
In Addition, A Dual-Drop Soffit Will Be Created, One To Trace The Outline Of The Existing Hole, Covering The Structural Members While Referencing What Once Existed. An Additional Soffit Will Be Created, Smaller In Diameter To House The Lighting And Ventilation Covers, But Also An Opportunity To Finish The Outer Rim And Face Using Both Historic And Modern Technologies. In Fact, The Entire Building Will Be A Culmination Of Both Old And New Working Together To Educate The Importance Of These Very Same Skills.



Site Info

The Location Of The Site Is Northeast Of St. Paul, Minnesota: Approximately Of. . . . . The Building Program Occupies Only A Portion Of The Former Brewery: Most Noticeably, The NW Corner. Nearby Elements Include Commercial To The West, Residential To The South, And A Park Adjacent To The Lot (West). Surrounding Landmarks Include: Frank Lloyd Wright Home, And Flat Earth Brewery.





Department Of Architecture And Landscape Architecture, NDSU
ARCH 772, Design Thesis, Spring 2013
Architecture: A Tradition: Mixed-Use: Trades School, Condo Housing, Rental Studios, Public Courtyard-(57,362 FT² Total Area)
Kris Thielen
Ganapathy Mahalingam
Photoshop CS6, Revit 2013, Sketchup 8, Autodesk CFD 360