



## **ADAPTIVE REUSE LECTURE – AIA LECTURE 7/11/09**

### **Introduction**

#### **Existing Analysis**

- Critical For all Disciplines
  - ◆ Architect
  - ◆ Structural Engineer
  - ◆ MEP Engineers
  - ◆ Civil Engineers
- Hazardous materials Assessment
- Review Existing Construction
  - ◆ Understand How Building was Constructed
  - ◆ If Decay, What are the Causes?
    - Settlement
    - Climatic
    - Magnitude of the Decay
- Building System Analysis
  - ◆ Structural
    - Settlement
    - Is it stabilized?
  - ◆ Mechanical/Plumbing
    - Existing Mechanical System
    - Existing water and Sewer lines
      - Will Additional Taps be required given change of use
    - Septic Systems (Active or Abandoned)
    - Gas Piping - Size
  - ◆ Electrical
    - Service Size/Metering
      - Wire Size Versus Meter Size
    - Type of Wiring
  - ◆ Elevator
    - Condition
    - Size Meets Gurney requirements
    - Keep versus Replace

## ADAPTIVE REUSE AND RENOVATION LECTURE

- ◆ Building Envelope
  - Existing Windows
    - Historic Aspects
    - Energy Efficiency
    - Old Curtainwall – Transite
      - Often contains Friable Asbestos
      - Can be encapsulated if you anchor to structure (not the panels)
  - Roofing System
    - Parapet Flashing/Roof Flashing
    - Reroofing Required?
  - Existing Insulation
- ◆ Include Design Options in Analysis
- Site Analysis and Considerations
  - ◆ One of the most overlooked aspects in an Adaptive Reuse Project
  - ◆ Always ask who will be addressing site issues on the project
    - Have a civil engineer that understands the situation.
  - ◆ Existing Infrastructure/History of Site
    - Left Foundations
    - Abandoned Water Lines
  - ◆ Flood Zones/Soil Conditions
  - ◆ Change of Use Zoning Requirements
  - ◆ Existing Utilities
  - ◆ Restrictive Covenants/Easements
  - ◆ Historic Designation
  - ◆ Open Building Permits
- Potential Future Uses
  - ◆ Code Review needs to address all Potential Uses
  - ◆ Restaurants
    - Exhaust Hoods
- Existing Drawings
  - ◆ Do not Rely on Existing Drawings
  - ◆ Measure Existing Building
    - People working on the project document
    - Not a measuring Service
  - ◆ Photo Documentation
    - Extensive
    - Save Time and Money



# ADAPTIVE REUSE AND RENOVATION LECTURE

## Feasibility Studies

- Assists the client in making an educated decision
- Provides the client with Options
- What is Included
  - ◆ Existing Analysis (See Above)
  - ◆ Market Analysis/Market Demand
    - What are the Marketable Uses for a project
    - Design Begins at understanding the market
  - ◆ Full Code Analysis of Options
  - ◆ Design Options/Concepts
  - ◆ Conceptual Estimating
- Assists with Marketing Efforts for Client
- Economic Development Groups use to market Developers

## Identify Design Challenges/Finding Opportunities

- Shape and Configuration/Building Landlocked
  - ◆ Reorientation of the Building
  - ◆ May Require Public/Private Partnerships
- Building Size
  - ◆ Reduce Building Size
  - ◆ Break Up into Smaller Tenants
  - ◆ Create New Open areas
  - ◆ Larger building users
    - Schools
    - Government Offices
  - ◆ May Require Public/Private Partnerships
- Un-utilized Basements
  - ◆ Modify Access to Lower floors
  - ◆ Work with City to solve Challenge
  - ◆ May Require Public/Private Partnerships
- Building Age – Historic Versus Non-Historic
- Existing occupants to remain during Construction
  - ◆ Phasing Plans as part of the Design process
  - ◆ Coordination with contractor before construction begins
  - ◆ Scheduling and short term moves
  - ◆ Work this out with Building officials



# ADAPTIVE REUSE AND RENOVATION LECTURE

## Code Logic Considerations

- Look at the Project in Detail from every code available
  - ◆ IBC (Or State Building Code) New Construction
  - ◆ IBC (Or State Building Code) Chapter 34 – Existing Buildings
  - ◆ Rehabilitation Code (In Some States)
  - ◆ Original Building Code (In Some States)
- Involvement of Building Reviewers Early in the Design Process

## Building Reviewer Involvement

- Develop Code Strategy Before any Meetings
- Keep a running List of Code Related Questions
- Have Multiple Meetings (Some municipality charge for this service)
- Invite Engineers to Meeting
  - ◆ Final Meeting engineers are required to be present
- Notes During Meetings included in Permit Submittal
  - ◆ Reminds Reviewers of Discussions
- Include Health Department if Applicable
- Building Reviewer Meetings
  - ◆ First Meeting
    - Review Code Strategy
    - Review Life Safety Plans
  - ◆ Second Meeting (If needed)
    - Review Code and Design Changes
    - Involve Engineers as needed
  - ◆ Final Meeting
    - Require all of the Design Team to be Present
    - 90% Construction Documents
    - Brief description then separate by discipline
    - Require all Team members to take notes

## Building Materials and Systems

- Once you identify the Challenges, you can make educated decisions.
- Look at the Impact of Modifying the Existing System
  - ◆ Example: Masonry Building where new drywall was added to the interior began forming mold in the cavity between the brick and new drywall. The interior air circulation dried out the small amounts of moisture getting into the interior of the building.
- Selective Demolition
  - ◆ Separate Materials for Recycling/Reuse
- Turn Construction Methods into design opportunities
  - ◆ Example: Shoring Beam as design element
- Building Envelope



## ADAPTIVE REUSE AND RENOVATION LECTURE

- ◆ Energy Performance
  - Reroofing and roof insulation
  - Windows and Doors
    - Historic Approval if Applicable
    - Energy Wise – Replacement is the best option
    - Field Finish doors where existing doors are to remain
      - Better Match that shop fabricated
- ◆ Reskinning
  - Numerous Design options
  - Understand the systems and how they act with existing systems
  - Aerated autoclaved concrete
    - Block and Panels
- ◆ Moisture Protection
  - Masonry Sealants
    - Moisture Barriers and not Vapor Barriers
    - Silane and Siloxane Water repellent products
    - Will Require maintenance and Recoating.
    - Color Change use Penetrating breathable masonry stains
      - Not Paints and Epoxy Products
  - Carefully detail all locations where flashing is required
  - Vapor Barriers
    - Often Missing, Damaged
    - Breathable floor finishes where possible
    - If bad, may have to re-construct floor
    - Surface applied systems not recommended
    - Avoid Sensitive materials – Hardwood flooring
      - 6 mil vapor Retarder
- Finishes
  - ◆ Terrazzo – Difficult to match existing
  - ◆ Ceramic Tile – Existing Tile is difficult to match, Find transition or replace
  - ◆ Ceilings
    - ACT – Inexpensive ceiling option
    - Existing Plaster Ceilings
      - Secure and Add thin Gypsum Board Ceiling
        - Not modeled ceiling
      - Heavy modeled – Expensive Trade
  - ◆ Existing walls
    - Avoid damaging or cutting into plaster walls
      - More difficult to patch
    - Keep any furred walls able to breathe where possible



## ADAPTIVE REUSE AND RENOVATION LECTURE

- Acoustics
  - ◆ Can prove to be big concern.
  - ◆ Old and Rehabilitated Schools difficult
  - ◆ Look at sound absorptive materials
    - Carpets, Ceiling Panels
    - Restaurants – Place sound absorptive material on bottom of tables
- Elevators
  - ◆ Reuse Existing Elevator
    - Reuse Shaft as a minimum if possible
    - Reuse existing hoist equipment
      - Less expensive initial cost
      - Replacement parts may require milling
      - Historic elevator Cabs
    - Freight Elevators will need to fully comply if converted into passenger elevators
    - ADA Considerations
      - Undue Burden Clause
- Plumbing
  - ◆ Water and Sewer lines and tap fees
    - Determine line sizes and design accordingly (if Possible)
    - Notify client early if additional taps/larger taps are necessary.
  - ◆ Replace galvanized Steel Pipe Drains
    - Notorious clog and rust issues
  - ◆ Gas Piping for Restaurants often upsize service
    - Will rarely want electric cooking
- Mechanical Systems
  - ◆ Exposed Ductwork – Aesthetic Considerations
  - ◆ Variable Refrigerant Flow Systems
- Electrical Systems
  - ◆ New Electrical Service – change of intensity
  - ◆ Electrical Metering
    - Separate Tenant Meters
    - House Meters
    - Available physical Space for equipment
  - ◆ Creative ways of running electrical
    - Exposed Conduit
    - Behind Baseboards in Conduit
  - ◆ Lighting
    - Large buildings, add skylights for natural lighting
    - Adds the most pop in a design



## **ADAPTIVE REUSE AND RENOVATION LECTURE**

- Sprinkler Systems
  - ◆ Historically biggest problem
  - ◆ Require Pre-Bid Meeting
  - ◆ Closely review qualifications
  - ◆ Require Pre-Construction Meeting
  - ◆ Review Shop Drawings Closely

### **During Construction**

- Close Involvement During Construction
- Similar to State or Military Projects
- Regular Site Visits with good photo documentation
- Action Plans as part of all meeting minutes
- Include contingencies (20% Schematic Design, 15% Design Development, 10% Construction Documents)
- Closely Review Contractor Qualifications
- Coordinate with Owner and Contractor salvage Requirements
  - ◆ Owners responsibility to protect unless delegated in Documents

### **Summary**

- Thorough Existing Analysis
  - ◆ Will Solve many of the challenges
- Feasibility Study will help all parties understand the project
  - ◆ Market Analysis May be the most important factor if project has not been fully realized
- Identify the Challenges and Create Opportunities
- Code Logic and Building Reviewer Involvement Early
- Given the Building Analysis, Utilize Building systems and materials that best achieve the design goals
- Be Very involved During Construction

### **Questions**

