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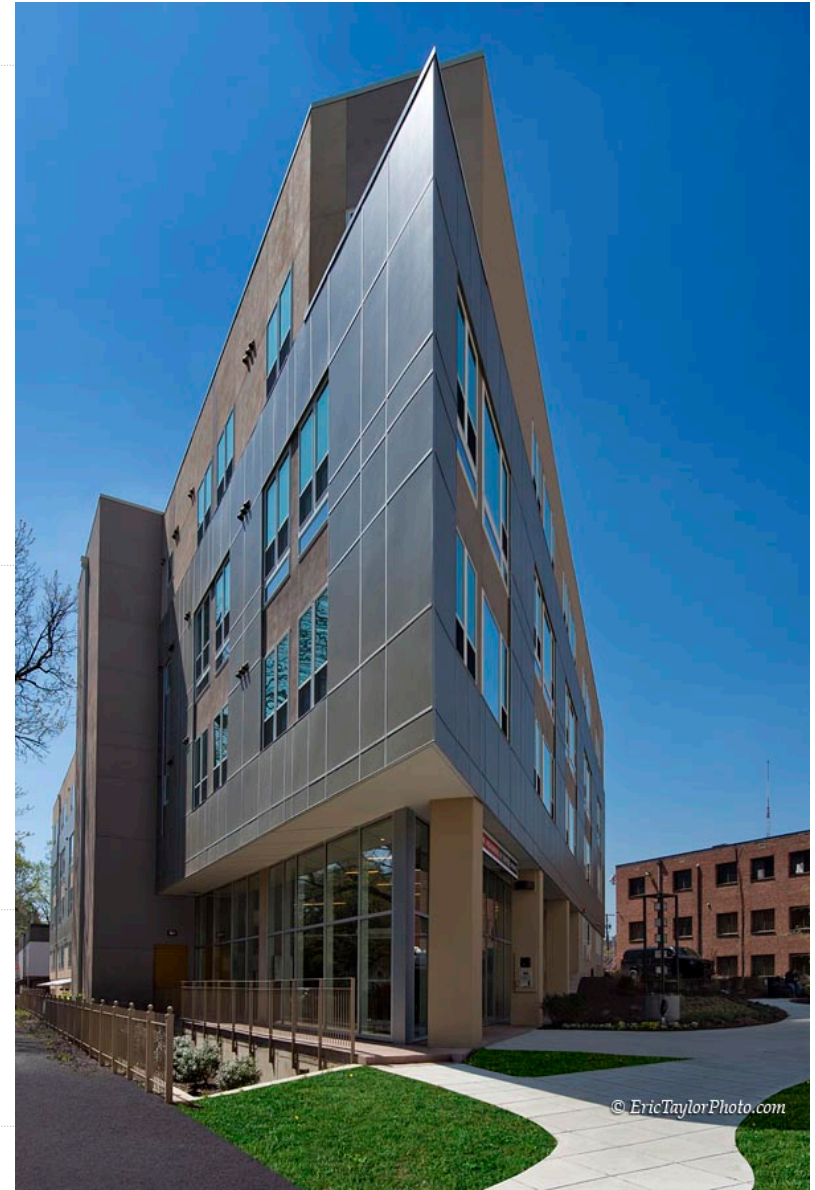
# HAND – COST CONTAINMENT STRATEGIES IN AFFORDABLE HOUSING

## FULL SERVICE

- Architecture
- Sustainability
- Master Planning
- Visioning
- Historic Preservation
- Interior Design
- Graphic Design
- Forensic/Testing

## TEAM APPROACH

- Ownership throughout project lifecycle
- Success for all team members
  - Team goals
  - Neighborhood/stakeholders input
  - Funding and budget
  - Context



# HAND – COST CONTAINMENT STRATEGIES IN AFFORDABLE HOUSING

## DIVERSITY OF PROJECTS

- Multi-family
- Mixed-use
- Mixed-income
- Environmentally sensitive
- Community outreach
- Socially responsible
- Educational
- Community/institutional
- Design conscious urban place makers
- Historic renovation
- Adaptive reuse

*Over \$3.5 Billion/80,000  
Multi Family Housing Units  
Successfully Completed*



*Diverse Contextual Design  
Over 150 Design Awards*



# HAND – COST CONTAINMENT STRATEGIES IN AFFORDABLE HOUSING

## PRE-DESIGN/PROGRAMMING

### THOUGHTFUL PROCESS/INTELLIGENT PROBLEM SOLVING

- Team-based decision making - benefits to all involved
- Creating shared design values and goals
- Pick low-hanging fruit
- Ask for more and you will get it!

### COST - BUDGET - IMPACT

- Know the funding program and its requirement
- Identify budget and update continuously
- Focus on well-thought design solutions
- Don't settle for the quick and the easy

*Our goals are your goals*

- *Budget control without giving up scope*
- *Good, well-thought out designs empower residents and neighborhoods*



# HAND – COST CONTAINMENT STRATEGIES IN AFFORDABLE HOUSING

## PRE-DESIGN/PROGRAMMING

### SUSTAINABILITY

- Know the sustainable program(s) you are operating under
- All-Hands Sustainable Goals Charette
- Prepare checklists and team goals
- Continuously update throughout project

### LIFE CYCLE COST ANALYSIS

- First cost vs. on-going cost – a strong argument
  - Monthly and ongoing costs
  - Utilities
  - Operations
  - Maintenance
  - Longevity
  - Impact on Proforma
  - Impact on Residents
- Energy modeling as a decision tool

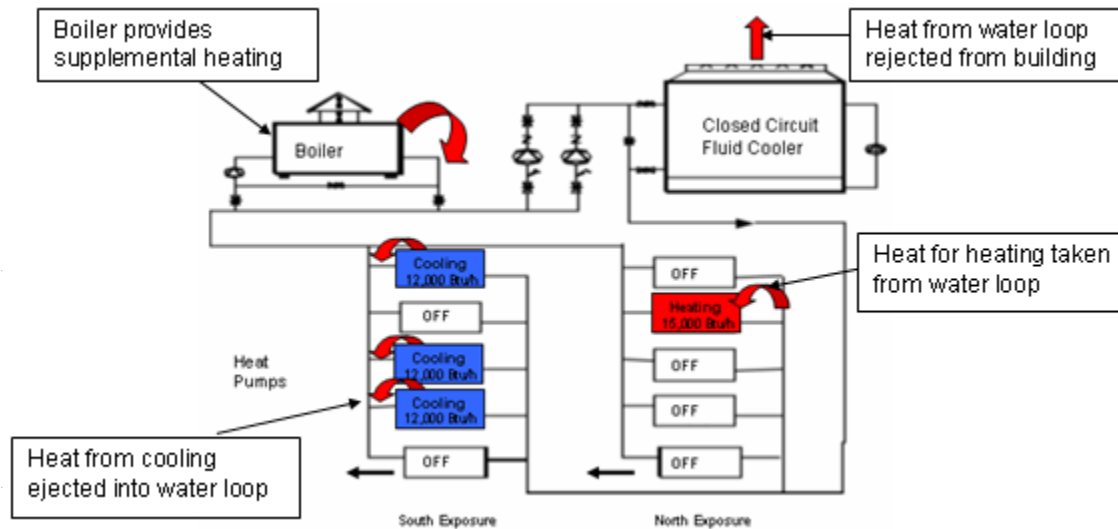


# HAND – COST CONTAINMENT STRATEGIES IN AFFORDABLE HOUSING

## PRE-DESIGN/PROGRAMMING – CASE STUDY

### SELECTING THE RIGHT MECHANICAL \_ SUSTAINABLE LIFE CYCLE COST ANALYSIS

- Selection the right consultants who do the right analysis can save major cost
- SIR Analysis led to PTAC's with all electric strip heat
- New consultant looked at Life Cycle Cost Analysis as well as energy usage and first and ongoing costs
- Got much better system
- Added \$2 Million in construction costs into proforma by using the more expensive first cost but less expensive life cycle cost system



## PRE-DESIGN/PROGRAMMING

### UNDERSTAND COMPARATIVE CONSTRUCTION COST

#### Wood Stud/Light Gauge Metal (Max 4-5 Stories)

- Open Web Wood Joist \$115 - 145
- Hambro \$145 - 185
- Add Concrete Podium (add 1-2 Stories) \$195 - 215

#### Bearing Steel Stud (Max 7-8 Stories)

- Concrete Plank \$130 - 165
- Hambro \$140 - 180
- Epicor / Infinity \$140 - 175
- Over Concrete Plinth (add 1-2 Stories) \$205 - 245

#### Masonry Bearing Wall (Max 8 Stories)

- Wood Truss \$135 - 150
- Concrete Plank \$135 - 155
- Hambro \$145 - 165
- Bar Joist \$145 - 165

#### Concrete Frame (6 Stories and Above)

- Cast in Place \$230 - 280
- Post Tensioned \$240 - 300

- *Correct system selection for market and product is key*
- *Know the cost limits of your funding program*
- *Know when wage scales come into play*
- *Costs vary dramatically due to various factors*
  - *Project size*
  - *Site conditions*
  - *Local markets*
  - *Economic climate*
  - *Selection of right system for Your project*

# HAND – COST CONTAINMENT STRATEGIES IN AFFORDABLE HOUSING

## PRE-DESIGN/PROGRAMMING

### KNOW CURRENT JURISDICTIONAL NOFA MAXIMUM CONSTRUCTION COSTS

#### DISTRICT OF COLUMBIA – MAXIMUM CONSTRUCTION COST PER SQUARE FOOT (3/16)

Type of Building	New Construction	Substantial Rehabilitation	Moderate Rehabilitation
Townhouse	\$170	\$135	\$95
Gardens Apts/Condo	\$165	\$115	\$90
Elevator Bldgs. (<_ 5 Stories)	\$200	\$135	\$120
High-Rise Bldgs. (6+Stories)	\$255	\$155	\$135

#### MD CDA– MAXIMUM CONSTRUCTION COST PER SQUARE FOOT (9/16)

Type of Building	New Construction	Rehabilitation
Cottage, Semi-Detached, Town	\$159	\$164
Gardens Apts	\$134	\$102
Non Elev./Elev. (<_4 Stories)	\$145	\$119
Elev. Bldgs. (5+Stories)	\$159	\$124



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## PRE-DESIGN/PROGRAMMING

### KNOW CURRENT JURISDICTIONAL NOFA MAXIMUM CONSTRUCTION COSTS

#### VHDA– MAXIMUM TOTAL DEVELOPMENT COST **NOT PER SQUARE FOOT BASED** (11/16)

##### New Construction

Inner Northern Virginia (Arlington County, Fairfax County, Alexandria City, Fairfax City & Falls Church City): New Construction/Adaptive Reuse - \$390,136 + (up to) \$43,349 per unit for underground or structured parking (TDC)

Prince William County, Loudoun County, & Fauquier County: New Construction/Adaptive Reuse - \$289,816 + (up to) \$43,349 per unit for underground or structured parking (TDC)

Balance of State: New Construction/Adaptive Reuse - \$216,743 + (up to) \$43,349 per unit for underground or structured parking (TDC)

##### Rehabilitation

Inner Northern Virginia (Arlington County, Fairfax County, Alexandria City, Fairfax City & Falls Church City): Acquisition/Rehabilitation - \$340,595 (TDC)

Prince William County, Loudoun County, & Fauquier County: Acquisition/Rehabilitation - \$204,357 (TDC)

Balance of State: Acquisition/Rehabilitation - \$167,201 (TDC)



## PRE-DESIGN/PROGRAMMING – CASE STUDY

### THE AVENUE – SELECTING THE PROPER CONSTRUCTION TYPE

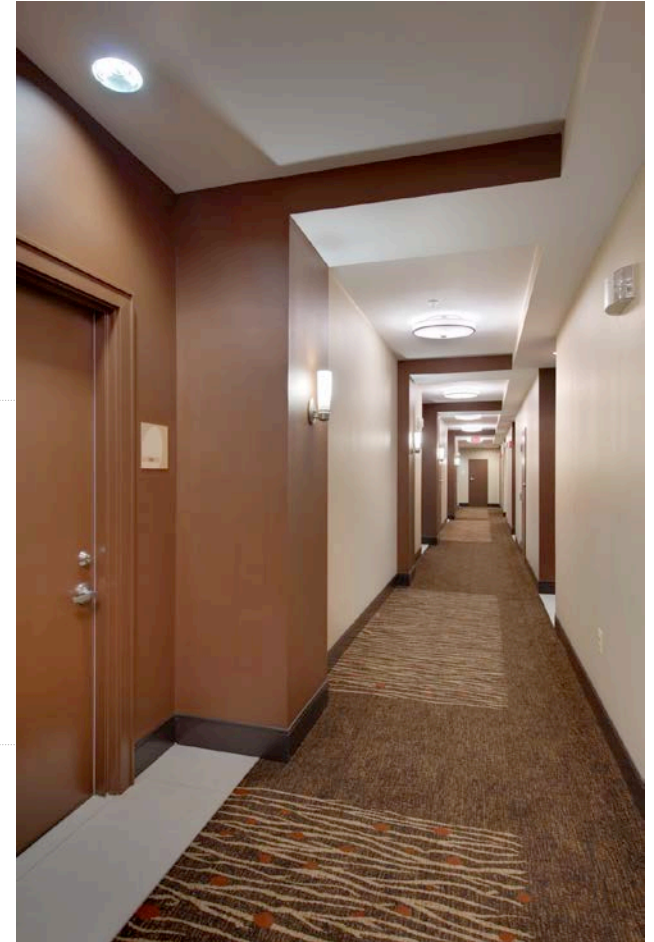
- Used bearing steel stud and precast concrete plank construction
- 8” thick floor ceiling system achieved a full story and 18 units more vs similar building just blocks away that used 24” deep Hambro system - lost over 12’ of available height
- Built at a lower price per square foot than the other building



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## PRE-DESIGN/PROGRAMMING – CASE STUDY

### THE AVENUE – SELECTING THE PROPER CONSTRUCTION MATERIALS



*A 100% affordable award winning building maximized allowable density achieving lower development costs and success for all!*

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## SCHEMATIC DESIGN

### CONCEPT OF SQUARE FOOTAGE VS AMENITIES

- Square footage costs **BUT** kitchen and baths per square foot cost more
- Urban trend smaller units more amenities
- Suburban trend larger units result lower amenities
- Impacted by local funding regulations
- W+A's perceived value concept
- Resident and market acceptance
- All parties meet regularly updating scope and budgets
- Sign off on design and cost
- Build in cost contingencies



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## SCHEMATIC DESIGN – CASE STUDY

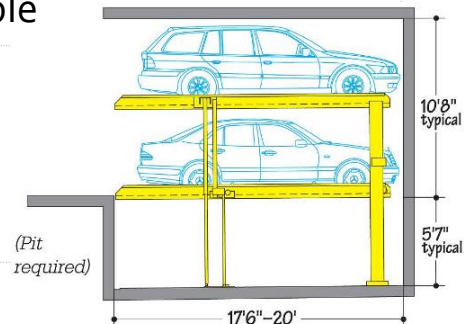
### TECHNICAL INNOVATION - COST SAVINGS

- Automated structured parking
- Driven by site specifics and constraints
  - \$17,000 - \$35,000 / space
- Needs to be team decision early on

### CONSIDERATIONS

- Typically in podium or below grade situations
- Site constraints, size, geotechnical, Etc.
- Operations and maintenance costs
- Educate residents
- Various levels available

## REDUCTION IN SHEETING SHORING, EXCAVATION COSTS AND RESULTANT TIME SAVINGS



## SCHEMATIC DESIGN – CASE STUDY

### NCBA Estates Major Renovation

- Changing from central system to new individual systems without resident displacement/relocation costs!

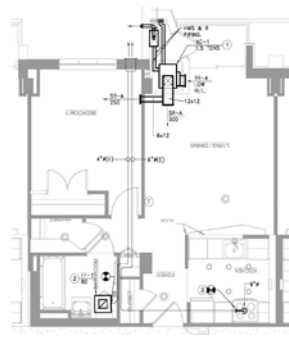
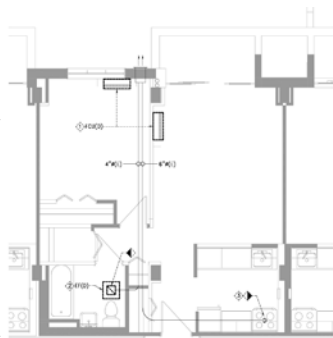
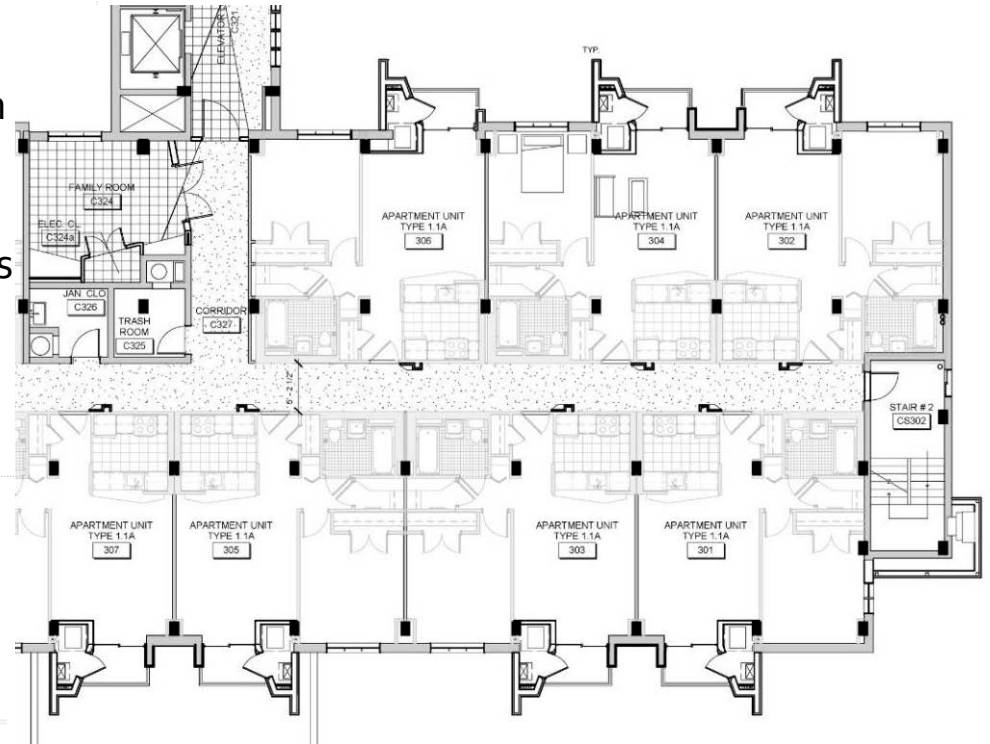


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## SCHEMATIC DESIGN – CASE STUDY

### NCBA Estates Major Renovation

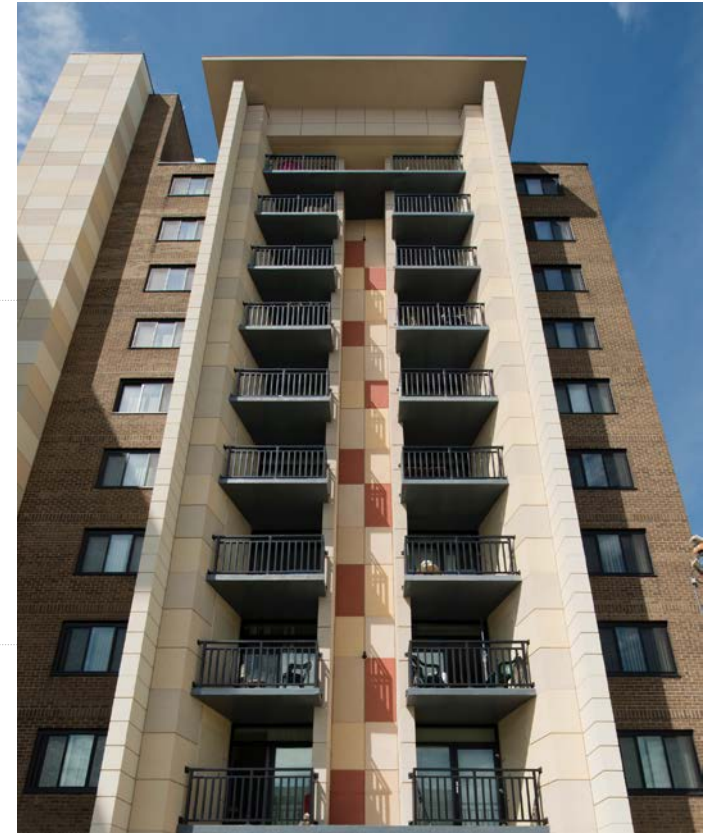
- Unique mechanical/systems fin design enhanced building appearance while incorporating all new systems
- Location of fins allowed for all systems to be fully roughed-in without disturbing residents



## SCHEMATIC DESIGN – CASE STUDY

### NCBA Estates Major Renovation

- Instantaneous hot water heaters save energy not only in hot water heating but providing heating though water coil in HVAC





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## SCHEMATIC DESIGN – CASE STUDY

### NCBA Estates Major Renovation

*W+A's goal of innovative solutions that solve a multitude of issues at once was achieved, lowering total development costs dramatically*



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## DESIGN DEVELOPMENT

### GLAZING AND SHADING DECISIONS

#### Design saves cost

- Clever design of standard window systems can save thousands over storefront and curtain walls while achieve similar design results

#### Sustainable Considerations

- Exposure/orientation
- Shading, absorbing and reflecting films
- Color and clarity
- Different decisions for different exposures

*Sustainable, Energy, First, & Long-Term Cost Considerations*



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## DESIGN DEVELOPMENT – CASE STUDY

### SKYHOUSE TOWERS EAST AND WEST

- Façade design saved \$7 million/tower
- Team-based success



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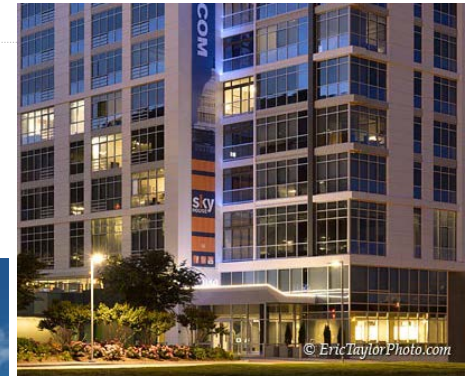
## DESIGN DEVELOPMENT - CASE STUDY SKYHOUSE TOWERS EAST AND WEST

- 3 colors of blues high glazing and 1 color of dark gray glazing define the building
- High index glass on all facades
- Glazing on south and west facades have significantly higher shading coefficient  
hierarchical banded design allowed conventional windows designed and detailed to appear as curtain wall



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## DESIGN DEVELOPMENT – CASE STUDY SKYHOUSE TOWERS EAST AND WEST



*Adaptive reuse of office building as housing is a trend to follow as the cost of acquisition and conversion are proving again and again to be no more or even less than the high acquisition/rehab costs of existing multi-family projects*



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## DESIGN DEVELOPMENT – CASE STUDY SKYHOUSE TOWERS EAST AND WEST

*Floor to ceiling interior glazing is again indistinguishable from a curtain wall system. Operable window sections were specially designed to eliminate the double thickness usually associated with window systems*

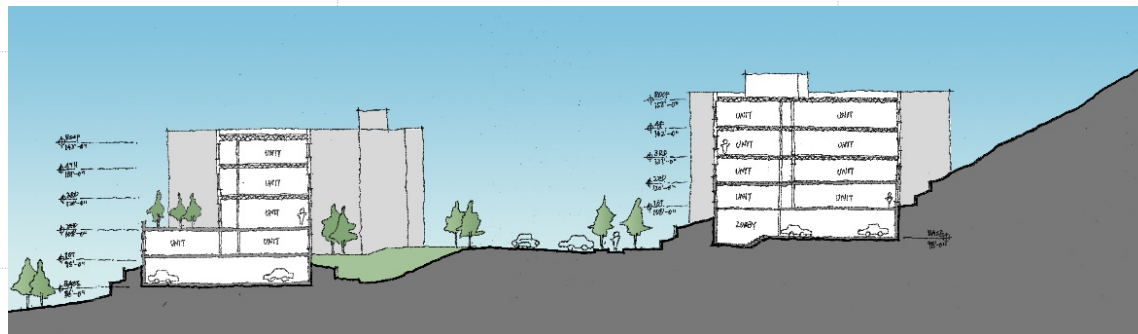


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## DESIGN DEVELOPMENT – CASE STUDY

### NORTH HILL MASTER PLANNING AND SITE DESIGN

- Under building parking become site retaining walls
- Reduced heat island
- Significant cost savings with less regrading of 110' hillside
- Major tree save of mature forest for County sponsored parkland



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## DESIGN DEVELOPMENT – CASE STUDY

### NORTH HILL MASTER PLANNING AND SITE DESIGN

*Reduced footprints = reduced storm water management, grading, retaining wall costs, increased tree save, transitional cooling*

*Clever design of garage level reduces a 5-story, high rise wage scale job to 4-story low rise definition*





## CONSTRUCTION DOCUMENT– CASE STUDY

### THE OVERLOOK AT OXON RUN–ABANDONED SHELL / COMMUNITY HIGHLIGHT

- Throughout the design and construction documentation the team continuously checked the cost/benefit of retaining a dilapidated shell or replacing it
- Testing at all phases proved the gut renovation and repair of the major skin problems was still \$2.5 million cheaper than demolition and replacement with a 2 new 4-story wood construction buildings

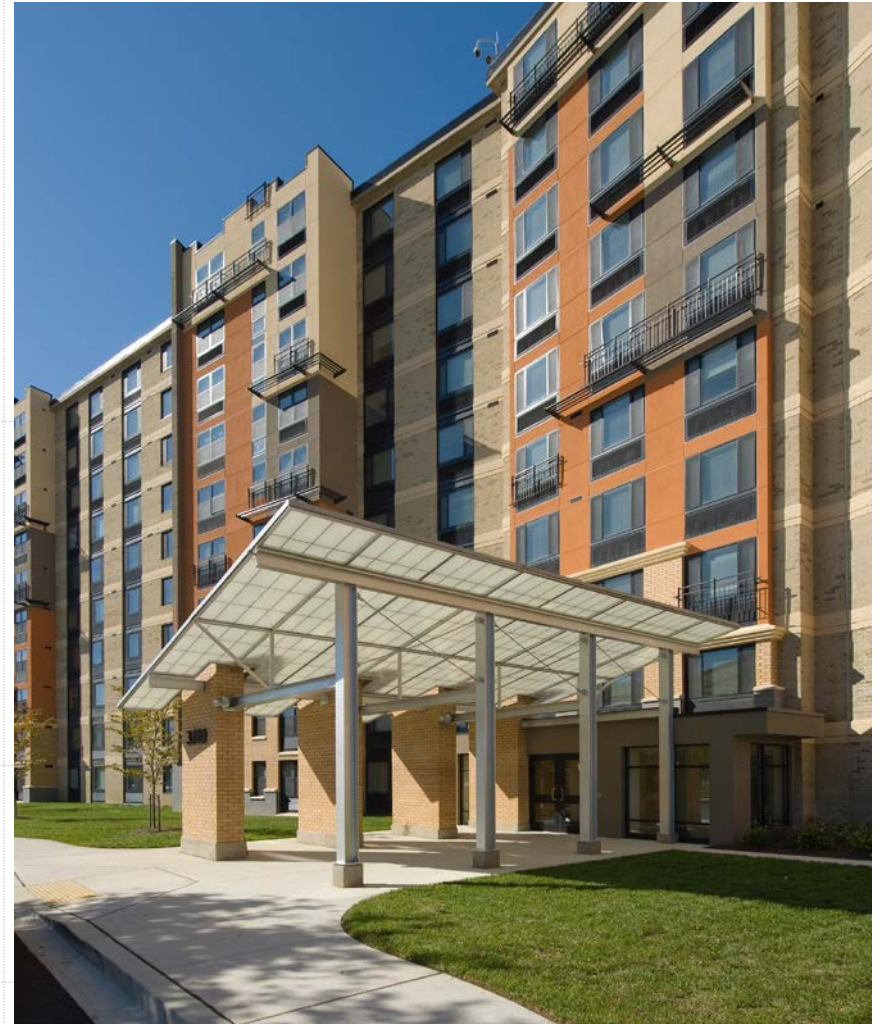
*The bane of the community was transformed with the **VISION** that this revitalized building could be accepted as new market rate in NOMA!*



## CONSTRUCTION DOCUMENT– CASE STUDY

### THE OVERLOOK AT OXON RUN–ABANDONED SHELL / COMMUNITY HIGHLIGHT

- Repairing and saving 90% of the existing masonry with new relieving angles/contrasting new brick banding and over 24,000 new spiral brick ties
- Enclosure of balconies added significant square footage, BY-RIGHT due to W+A Zoning investigation increasing unit count and income by over 55 units



## CONSTRUCTION ADMINISTRATION- CASE STUDY

### THE REPROGRAMMING AND RENOVATION OF MEMORIAL SENIOR APARTMENTS



- During the occupied renovation and revitalization, previously encased ground floor concrete columns were found to have significant fracturing - potentially affecting their ability to carry the building load
- Initial design-build solutions required shoring the entire height of the building to relieve the load on the columns and then making repairs
- Costs exceeded \$1.3 million EXCLUDING required relocation



## CONSTRUCTION ADMINISTRATION - CASE STUDY

### THE REPROGRAMMING AND RENOVATION OF MEMORIAL SENIOR APARTMENTS

- W+A and our structural engineer came up with an innovative solution to encase the damaged columns with new reinforcing and additional concrete
- This solution negated the shoring, saving over \$700,000 as well as precluding the need to relocate ANY residents while performing the work
- The entire team came together to innovate, design, analyze and price the creative solution, creating a win-win for all involved

*Innovative solutions saved millions in construction, delay, & relocation costs. Neighbors are surprised to see what they perceive as a "new" building.*

*This is W+A's mission: cost effective, award winning designs creating a sense of pride and home!*

Each column carries 400,000 pounds / 200 tons of weight



## CONCLUSIONS

### COST CONTAINMENT IS AN ON-GOING TEAM CONCEPT

- A strong communicative team
- Focused on great design and budget constraints throughout every phase
- Know who needs to be involved and when (Utilities, Governments, Etc.)
- Know the other stakeholders and their concerns
- They document all decisions and processes
- They continuously test decisions affecting the schedule and budget

*Cost Containment and Good Design are Achievable at Any Level. Selecting the Right Team Ensures Your Success!*



# HAND – COST CONTAINMENT STRATEGIES IN AFFORDABLE HOUSING

## CONCLUSIONS

### REMEMBER YOUR GOALS AND KEY VALUES

- Create a *home*. Residents *are* proud of their home!
- An asset to the community
- Positive and identifiable presence that influences and catalyzes change in the neighborhood
- Affordable and market rate **MUST** be indistinguishable
- Let's get rid of an ALL AFFORDABLE CONCEPT!

*Mixed-Income Communities, Developed Through a Strong, Cooperative, Iterative, Teaming Approach are the Key to a Successful and Cost Effective Future!!!*



# HAND – COST CONTAINMENT STRATEGIES IN AFFORDABLE HOUSING

A THOUGHTFUL, KNOWLEDGEABLE, COOPERATIVE TEAM  
IS THE BEST COST CONTAINMENT STRATEGY



THANK YOU!



W