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Questions

Joseph Podwats
construction management option
2008-2009

Ingleside at King Farm
Rockville, Maryland



Thesis Presentation

LEEDing Senior Living

Ingleside at King Farm
ROCKVILLE, MARYLAND

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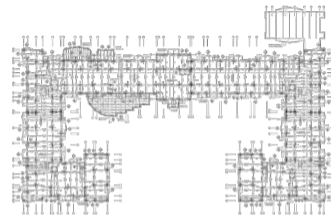
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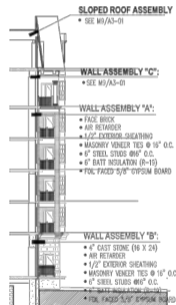
Questions

Background Info for Technical Discussion

Construction Waste Management Goals Not Defined

Separation of Trash from Recyclables Not Defined

Landfill Waste Diversion Goals Not Defined



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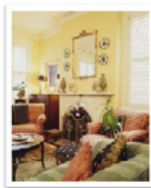
Existing Conditions & General Project Info



250 ILU's
35 ALU's
45 SNU's
Underground Garage



**\$101.9 Million
Project Cost**



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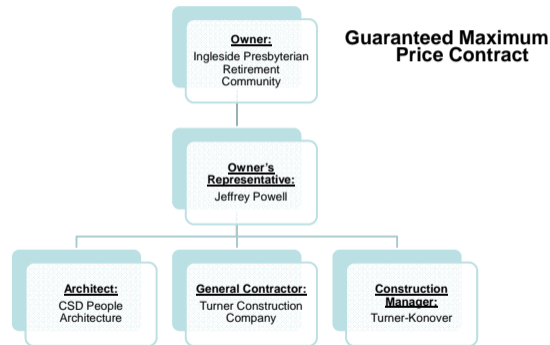
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Project Delivery Method & Contract



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5/2007



8/2007



11/2007



7/2008



12/2008



2/2009



3/2009

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Thermal Performance

- Eliminating thermal bridging
- Improving total wall assembly R-Value

Constructability

- Clearly identify primary enclosure systems and assemblies
- Clearly identify exterior moisture control systems and assemblies (insulation and caulking)
- Offer dynamic solution that could be implemented late in the game

Building Enclosure

- Early enclosure

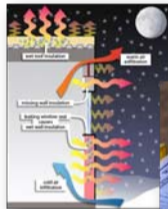
Architecture

- Can use specified interior/exterior finishes

Construction Waste Management

- Contributes to on site waste reduction

Building Envelope



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Estimated Construction Waste

- Primary focus on residencies
- Assumed no waste management
- Adjusted based on NAHB report
- Tonnage / volume estimated per LEED requirements

Local Infrastructure & Community

- Assumed local infrastructure and community organizations in place

Buy In

- Assumed 100% participation
- Assumed 50% to 75% reduction achievable

Construction Waste Management



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Estimated Permanent Occupancy

- Primary focus on residences ("Units Method")
- No vacant living units

Estimated Water Usage & Collection

- 70 gallons per day per person
- Collection from roof area only

Water Efficient Fixtures

- Same manufacturers as specified wherever possible

Native Flora Fauna per MD NPS

- Maintain Curb Appeal
- Assumed to be non invasive
- Assumed to be more water efficient

Rainwater Harvesting System

- Assumed to be code compliant
- Doesn't include civil cost savings

Water Efficiency

NO VACANCY



LEED for Evaluation Criteria

KOHLER.
DELTA
FAUCET COMPANY



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Background of Existing Exterior Wall



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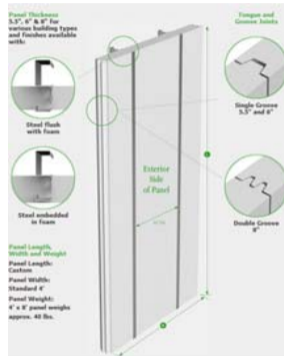
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Proposed Alternates



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Cost & Schedule Comparison



Current Wall System:

• \$665,997



kama-EEBS System:

• \$1,428,518 → 2.1 times current

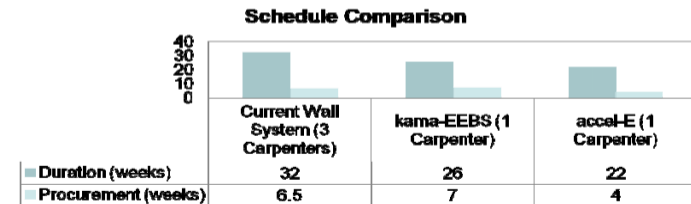
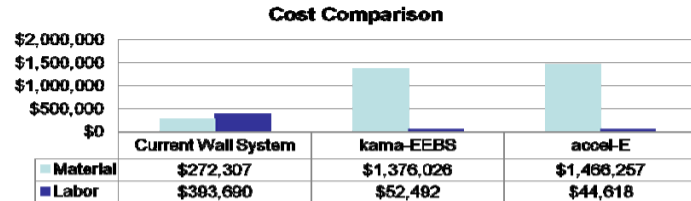


Accel-E System:

• \$1,510,875 → 2.2 times current

Material Cost Per SF of Wall

- Current Wall System \$1.79.
- kama-EEBs Wall System \$6.10
- accel-E Wall System \$6.50



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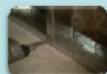
Questions

Constructability Comparison



Current Wall System:

- Systems Not Clearly Identified



kama-EEBS Wall System:

- Primary Enclosure Systems & Assemblies
- Secondary Enclosure Elements
 - Trims
 - Lintels
- Exterior Moisture Control Systems
 - Water Proofing
 - Damp Proofing
 - Weeps
 - Caulking
- Thermal Control Systems & Assemblies
 - Insulation
 - Caulking



accel-E Wall System:

- Primary Enclosure Systems & Assemblies
- Secondary Enclosure Elements
 - Trims
 - Lintels
- Exterior Moisture Control Systems
 - Water Proofing
 - Damp Proofing
 - Weeps
 - Caulking
- Thermal Control Systems & Assemblies
 - Insulation
 - Caulking



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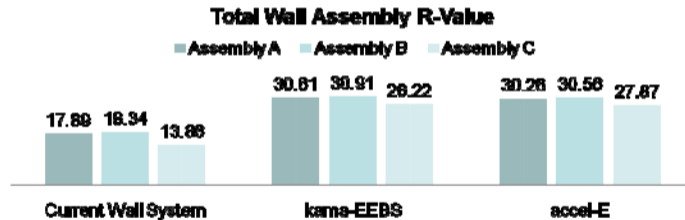
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Energy Efficiency & LEED Evaluation



3	2	5
---	---	---

Credit 1

Optimize Energy Performance

1 to 10

Credit 1.1 10.5% New Buildings / 3.5% Existing Building Renovations 1

Credit 1.2 14% New Buildings / 7% Existing Building Renovations 2

--> Credit 1.3 17.5% New Buildings / 10.5% Existing Building Renovations 3

1	0	0
---	---	---

Credit 4.1

Low-Emitting Materials, Adhesives & Sealants

1

1	0	0
---	---	---

Credit 7.1

Thermal Comfort, Design

1

0	1	0
---	---	---

Credit 2.1

Construction Waste Management, Divert 50% from Disposal

1

0	1	0
---	---	---

Credit 2.2

Construction Waste Management, Divert 75% from Disposal

1



1	0	0
---	---	---

Credit 7.1

Thermal Comfort, Design

1

0	1	0
---	---	---

Credit 2.1

Construction Waste Management, Divert 50% from Disposal

1

0	1	0
---	---	---

Credit 2.2

Construction Waste Management, Divert 75% from Disposal

1

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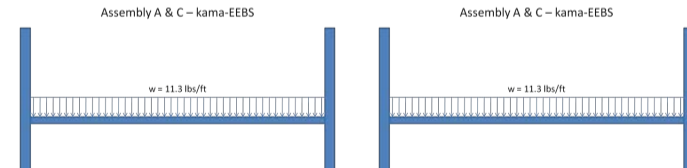
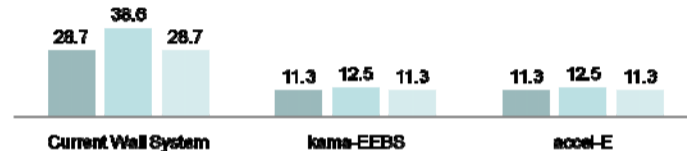
Questions

Recommendation & Structural Comparison



Structural Comparison of Wall Systems

Assembly A Assembly B Assembly C



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Background of Construction Waste



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Construction Waste - Statistics

U.S. Waste Output



U.S. Raw Material Usage



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Safety, Schedule, & Site Impacts

Risk Management

- Can Lead to Insurance Claims
- Owners & Contractors Protective Liability
- Workers Compensation
- Claims Raise EMR

Morale

- Low Morale Decreases Operating Incomes
- Low Morale Adds Duration to Activities

Site Accessibility

- Can Impact Work Areas
- Can Impact Material Storage & Laydown Areas
- Can Impact Focus & Efficiency



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Waste Management Plan Benefits

- Reduced solid waste, less burden on landfills and trash removal services, promotes green economy
- Savings on tipping fees
- Promotes well-being of local community
- Improved productivity on the construction site
- Morale and operating income will be boosted
- Public image improved and awarded more bids
- Improved indoor air quality and working conditions
- Contributes to overall health of job site
- Improve site safety and cleanliness
- Can reduce or eliminate construction delays

Benefits of Waste Management



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Trash Generated & Potential Waste Saved from Landfill



536 Tons:

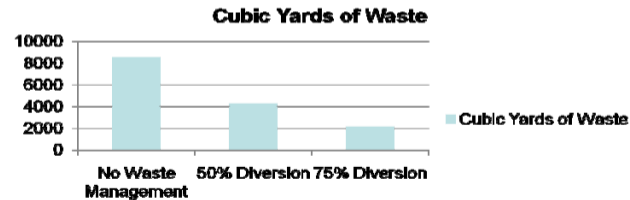
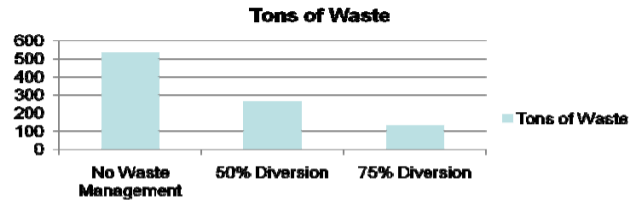
- Equivalent to 268 average U.S. vehicles



8,542 Cubic Yards:

- Equivalent to 10,629 GE refrigerators

Diversion Goal	Waste Saved from Landfill
Divert 50%	268 Tons
Divert 75%	402 Tons



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Cost Comparison & LEED Evaluation



No Waste Management:

• \$111,050



Divert 50%:

• \$564,506



Divert 75%:

• \$1,930,459

Yes		
0	1	0
0	1	0

Prereq 1

Storage & Collection of Recyclables

Credit 2.1

Construction Waste Management, Divert 50% from Disposal

Credit 2.2

Construction Waste Management, Divert 75% from Disposal

Required

1

1



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Background of Existing

Specified

Name	Cost	Photo
White Fringe Tree	\$1,050	
Borsault Rhododendron	\$160	
Silver Scrolls Coral Bells	\$1,278	



Fixture	Quantity	Water Usage
Water Closets	680	1.6 gpf
Lavatories	783	1.5 gpm
Showers	530	2.5 gpm
Urinals	2	1.0 gpf

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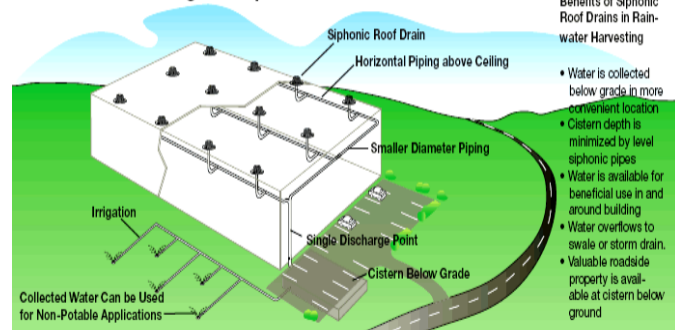
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Proposed Alternates

Rainwater Harvesting and Siphonic Roof Drains



Benefits of Siphonic Roof Drains in Rainwater Harvesting

- Water is collected below grade in more convenient location
- Cistern depth is minimized by level siphonic pipes
- Water is available for beneficial use in and around building
- Water overflows to swale or storm drain.
- Valuable roadside property is available at cistern below ground

<u>Specified</u>			<u>Proposed</u>		
Name	Cost	Photo	Name	Cost	Photo
White Fringe Tree	\$1,050		Chionanthus virginicus Fringetree	\$462	
Borsault Rhododendron	\$160		Rhododendron periclymenoides Pinxter azalea	\$256	
Silver Scrolls Coral Bells	\$1,278		Heuchera americana Alumroot	\$876	

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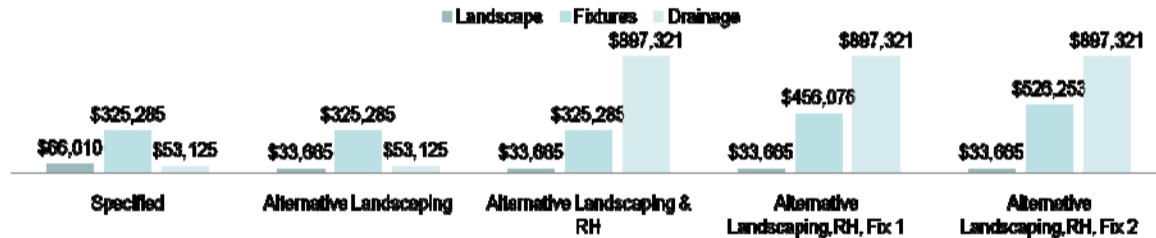
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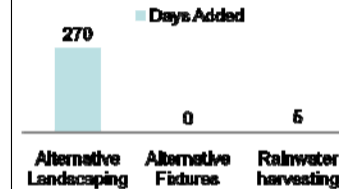
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Cost & Schedule Comparison

First Cost Comparison



Schedule Impacts



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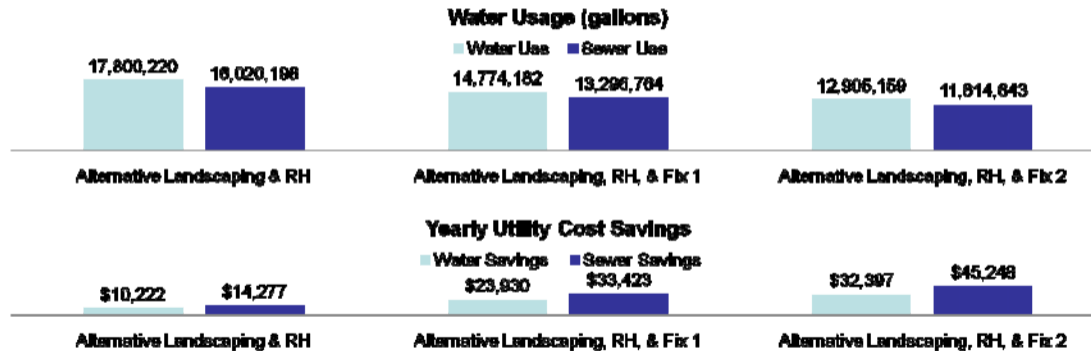
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Water Usage & Cost Savings



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LEED Evaluation

Design	LEED Credits	Points Earned
Current	SS 6.1 & SS 6.2	2
Proposed	WE 3.1	1

1	0	0	Credit 6.1	Stormwater Design, Quantity Control	1
1	0	0	Credit 6.2	Stormwater Design, Quality Control	1
1	0	0	Credit 3.1	Water Use Reduction, 20% Reduction	1

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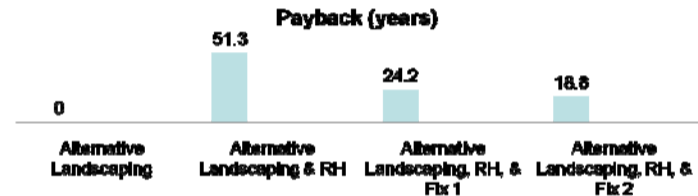
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Recommendation

Recommendation	Includes
Alternative Landscaping, RH, & Fixtures 2	Native Flora Fauna
	Rainwater Harvesting with Siphonic Roof Drains & 500,000 gallon Cistern System
	Most Water Efficient Fixtures
	Shortest Payback



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LEED Points Added to Project

- Building Envelope 3 Credits
- Construction Waste 2 Credits
- Water Efficiency 1 Credit

Total 6 Credits

Analysis	Cost Added	% Increase
Building Envelope	\$1,428,518	1.4%
Construction Waste	\$1,930,459	1.9%
Water Efficiency	\$1,457,239	1.4%
Total First Cost	\$4,816,216	4.7%

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Turner Konover
A Joint Venture



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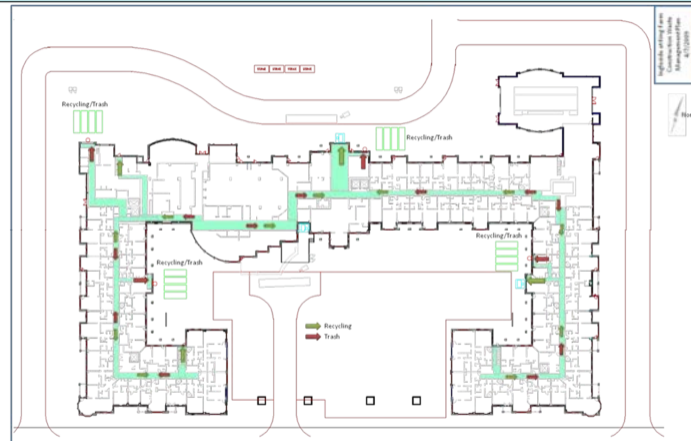
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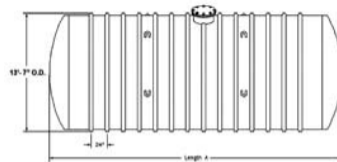
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13 Ft. Diameter Series Fiberglass Tanks



13 Ft. Diameter Fiberglass Tank			
Capacity (1)	Length (2)	Dry Weight (3)	Price (4)
50,000 *	51' 6"	14,000	See "Quick Quote" at top of this page
60,000 *	61' 6"	16,000	
75,000 *	76' 8"	20,000	
* 13' diameter tanks may not be shippable through some states due to wide and tall load restrictions.			
View Accessories for this product line			

(1) Listed capacities are nominal.

(2) Design shapes and dimensions may vary slightly.

(3) Listed weights are nominal.

(4) Price excludes additional tank appurtenances, accessories, freight, and taxes.
Prices subject to change.

Written quotes honored for thirty (30) days only.



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Underground Tank Project Estimate

You are looking for an underground tank system to store 50,000 gallons of water. Here is your [fiberglass](#) tank estimate.

12' Diameter 50,000 Gallon storage tank	Included
Accessories (Average)	Included
Shipping	Included
Total Estimated Cost	\$70,601.30

Required Deposit (Balance COD) **\$23,298.43**

Lead Time: 7 to 9 weeks

Tank Application: Rain Capture

Nearest Capital City to Site: Richmond, Virginia

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