

JOHN PAUL JONES ARENA

CHARLOTTESVILLE, VIRGINIA



FINAL DESIGN PRESENTATION

LOGAN BROWN
LIGHTING/ELECTRICAL OPTION
APRIL 28, 2009

JOHN PAUL JONES ARENA

CHARLOTTESVILLE, VIRGINIA

- ONE.** **Project Overview**
- TWO.** **Lighting Depth:**
Academic Center / Reading Room
- THREE.** Athletic Dining Room
- FOUR.** West Façade & Entry Lobby
- FIVE.** **Electrical Depth:**
Energy Efficient Transformer Analysis
- SIX.** **Structural Breadth:**
Effects of a Green Roof System
- SEVEN.** **Closing Remarks**

FINAL DESIGN PRESENTATION: ORDER OF TOPICS

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PRIMARY PROJECT TEAM:

Owner: The University of Virginia
Architect: VMDO Architects P.C.
Assoc. Architect: Ellerbe Becket
General Contractor: Barton Malow
Civil Engineer: Patton Harris Rust & Associates P.C.
Structural Engineer: Ellerbe Becket
MEP Engineer: Ellerbe Becket
Arena Signage: Workshop Design LLC

LOCATION:

The University of Virginia
295 Massie Road
Charlottesville, VA 22903

SIZE:

365,000 Square Feet

COST:

\$129.8 Million (Overall Cost)

PROJECT TIMETABLE:

May 2003 – August 2006

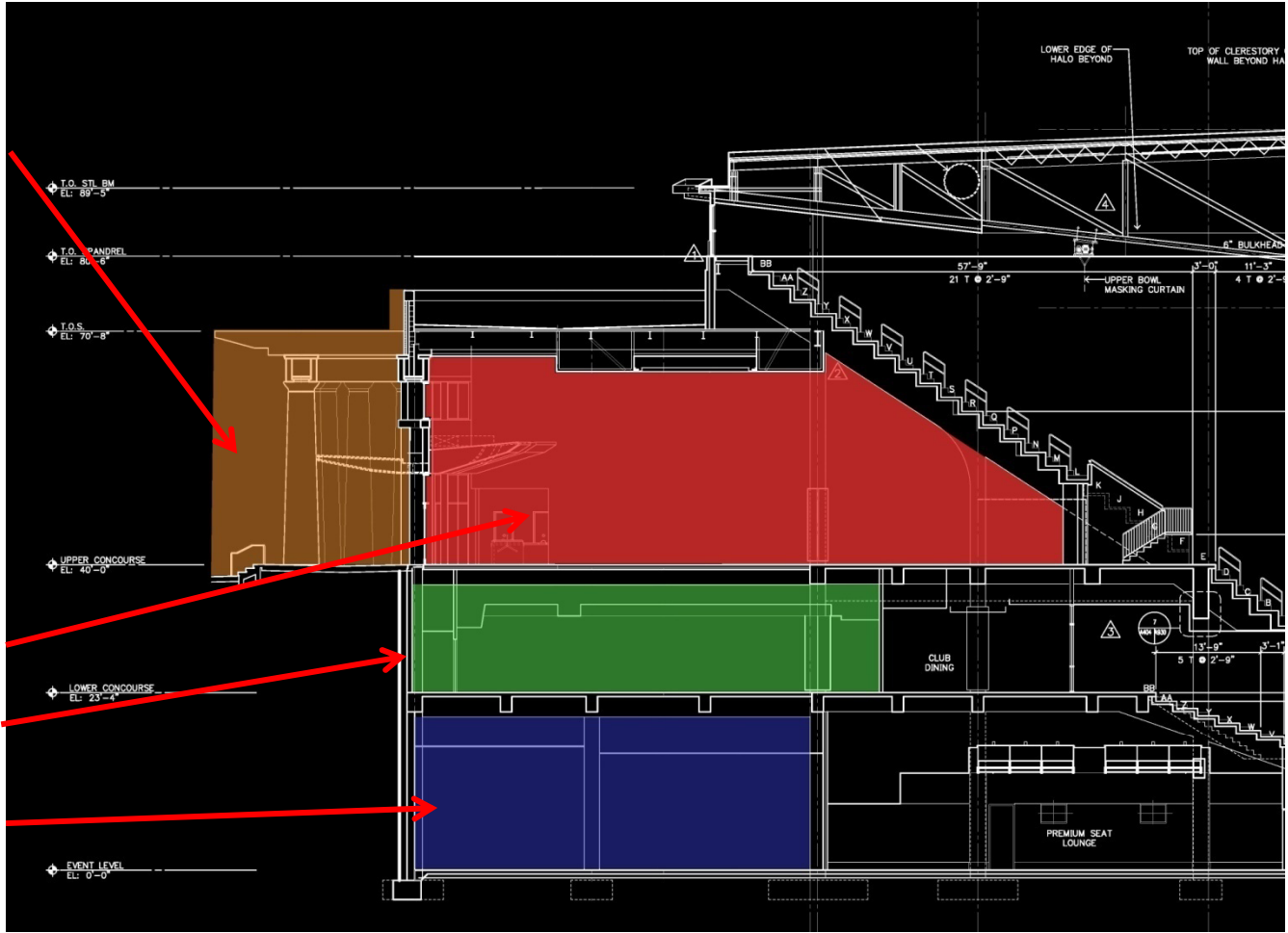
PRIMARY FUNCTIONS:

16,000 Seat Arena
Team Store
Hall of Fame Museum
Concessions
Team Training Facilities
Educational Spaces

FINAL DESIGN PRESENTATION: PROJECT OVERVIEW

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EXTERIOR FACADE



LOBBY

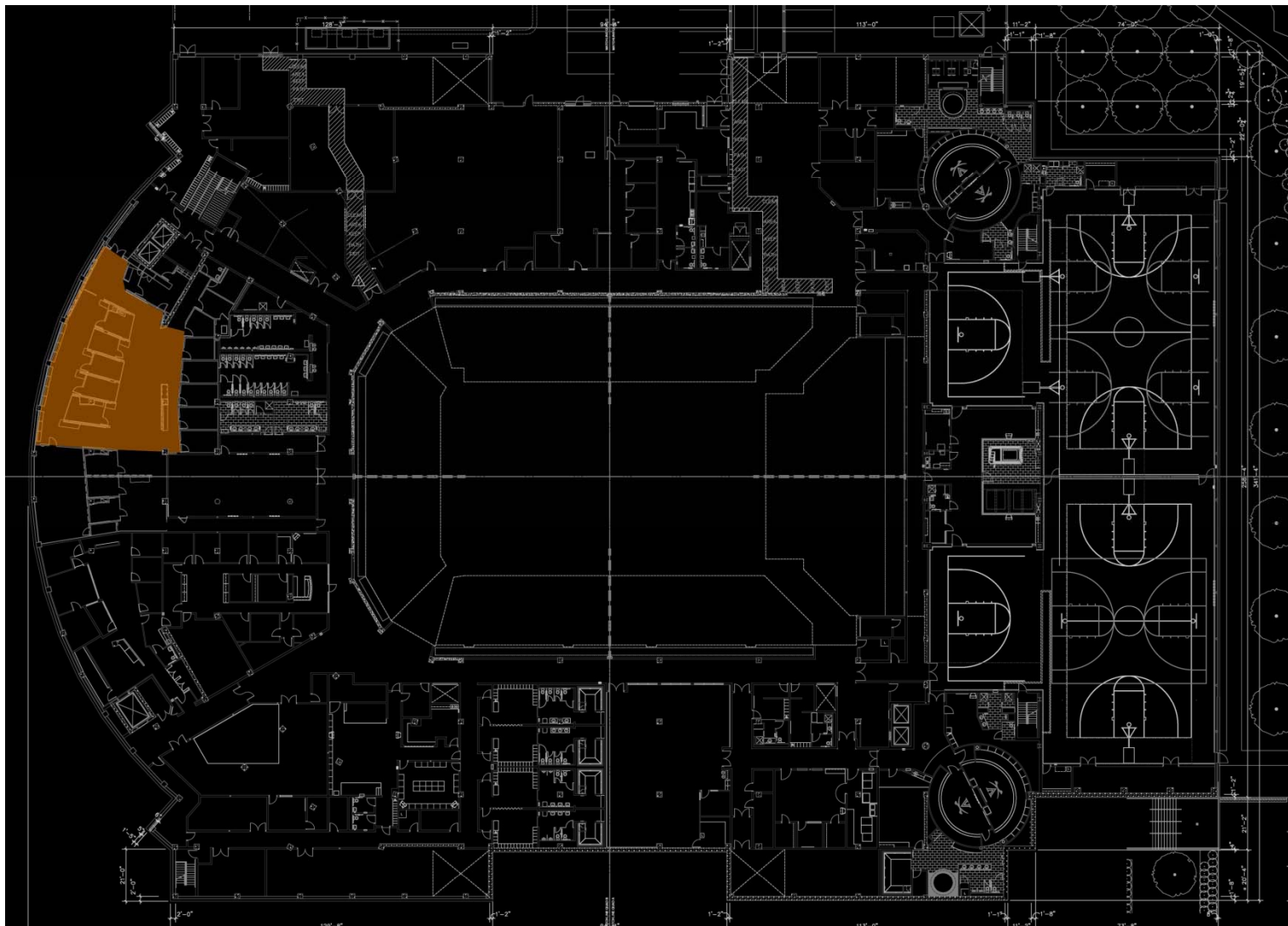
DINING ROOM

ACADEMIC CENTER

FINAL DESIGN PRESENTATION: PROJECT OVERVIEW

ACADEMIC CENTER

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FINAL DESIGN PRESENTATION: PLAN VIEW

ONE.

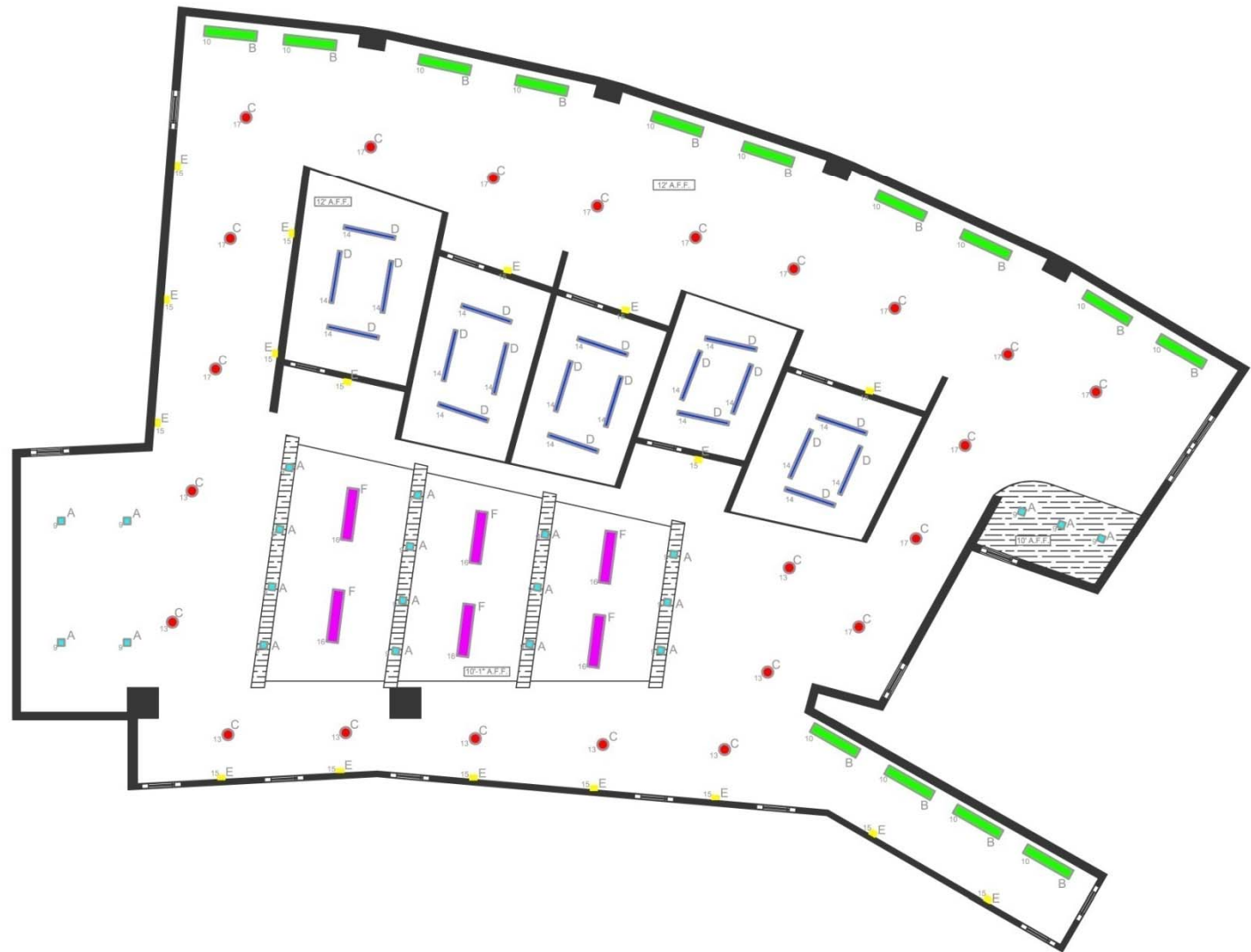
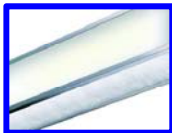
Create a relaxed and open environment

TWO.

Uniform and proper light distribution
on task plane

THREE.

Creation of room zones to account
for occupancy issues



ACADEMIC CENTER

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FINAL DESIGN PRESENTATION: RENDERINGS

ACADEMIC CENTER

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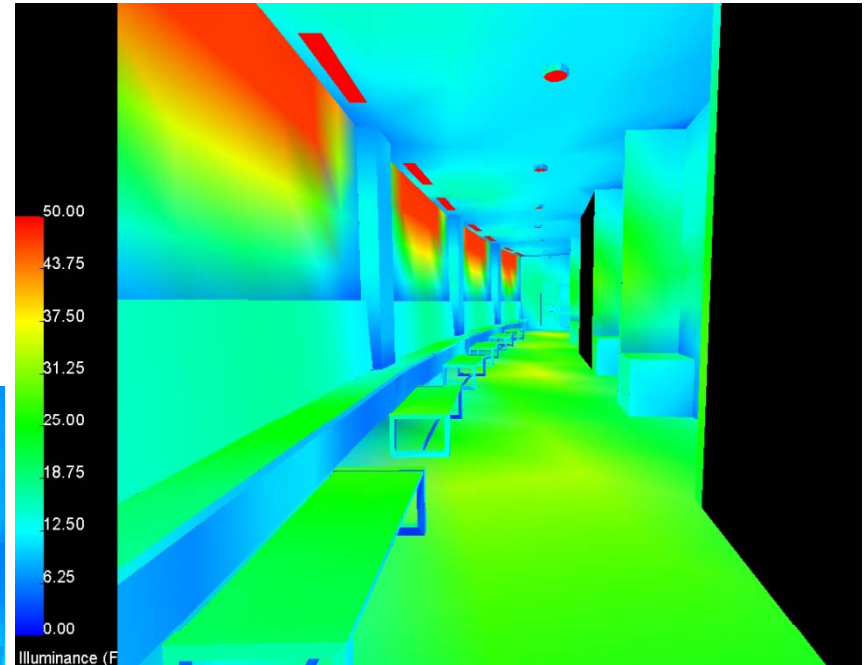
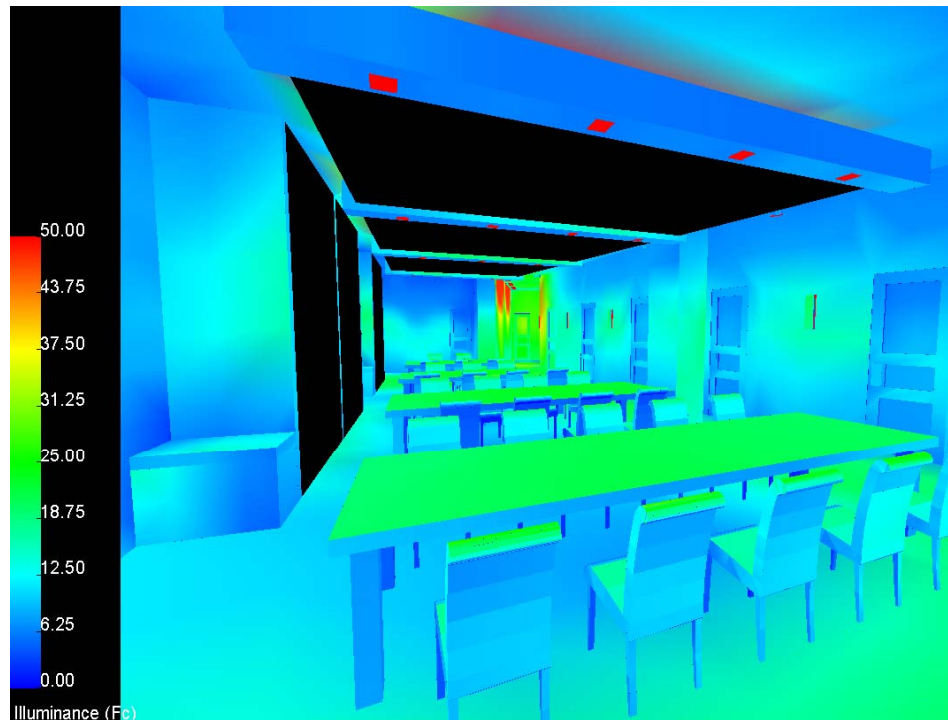


FINAL DESIGN PRESENTATION: RENDERINGS

ACADEMIC CENTER

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	Academic Center Illuminance Data (fc)	
	Work Tables	Meeting Room Tables
Average	28.94	28.59
Max	34.8	42.7
Min	21.3	12.1
Avg/Min	1.36	2.36
Max/Min	1.63	3.53

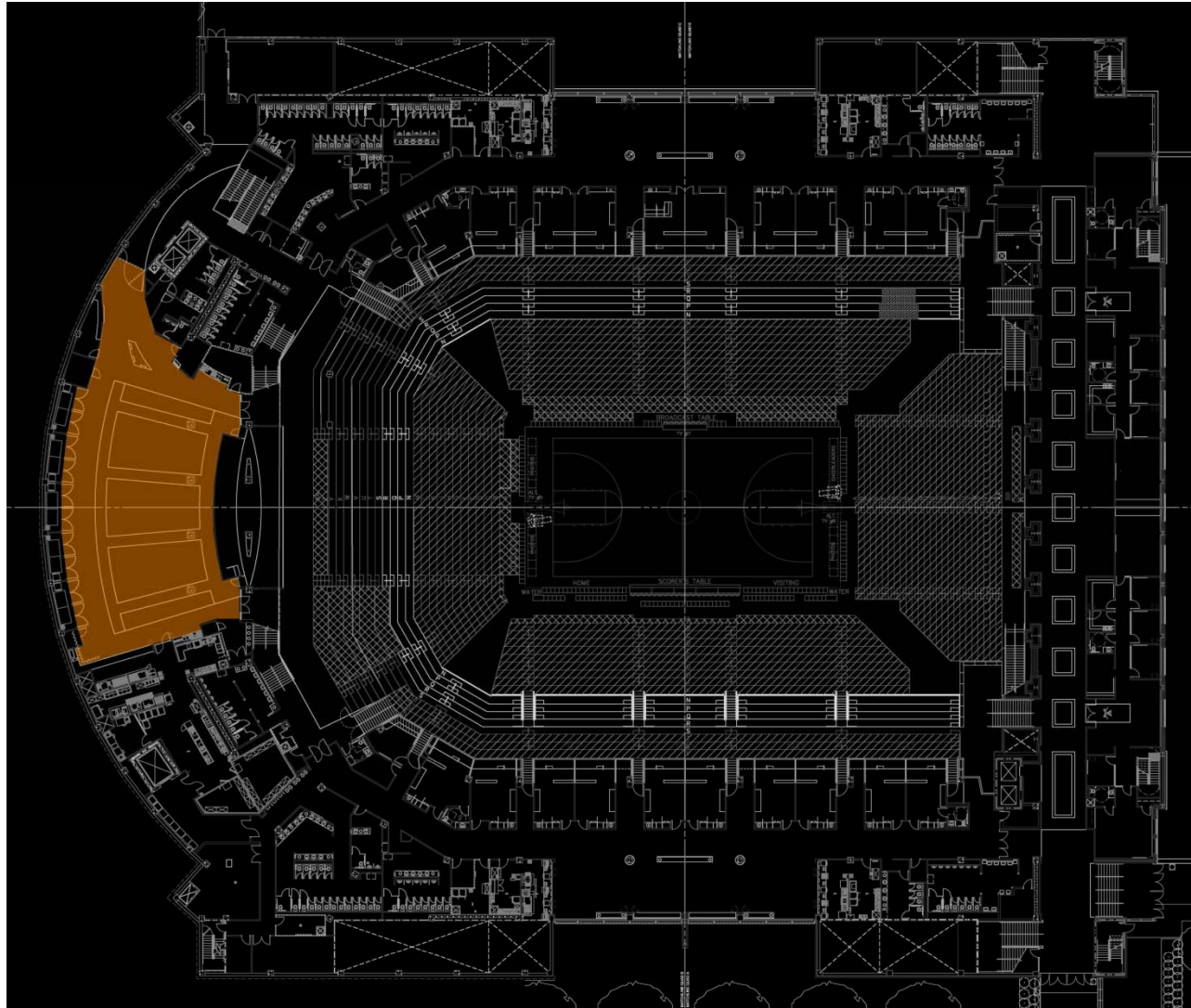


FINAL DESIGN PRESENTATION: PSEUDO COLOR RENDERINGS

DINING ROOM

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FINAL DESIGN PRESENTATION: PLAN VIEW

ONE.

Emphasize the ceiling heights as architectural features

TWO.

Create a spacious & professional environment

THREE.

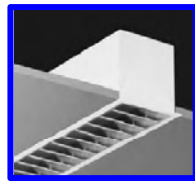
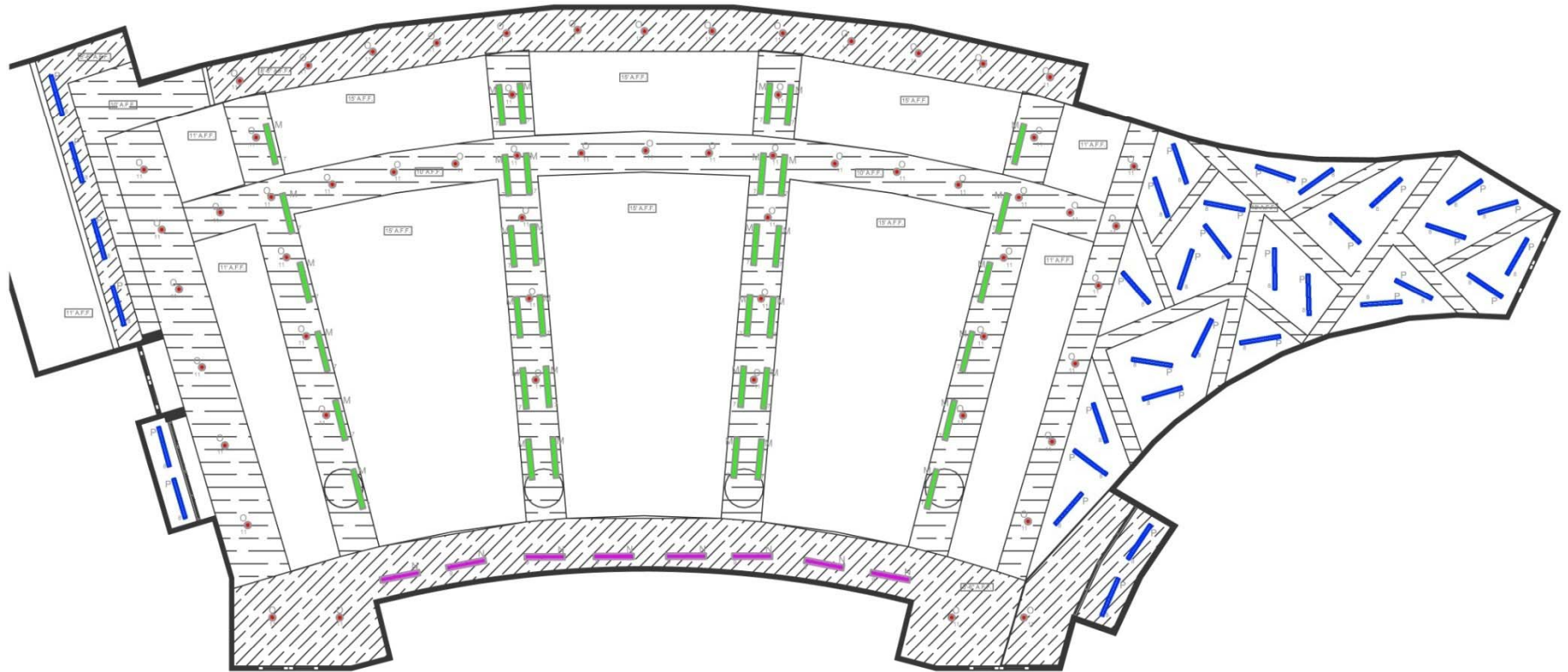
Use of a visual hierarchy throughout the space

FOUR.

Controls to allow for video projection

DINING ROOM

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FINAL DESIGN PRESENTATION: LIGHTING PLAN

DINING ROOM

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FINAL DESIGN PRESENTATION: RENDERINGS

ACADEMIC CENTER

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FINAL DESIGN PRESENTATION: RENDERINGS

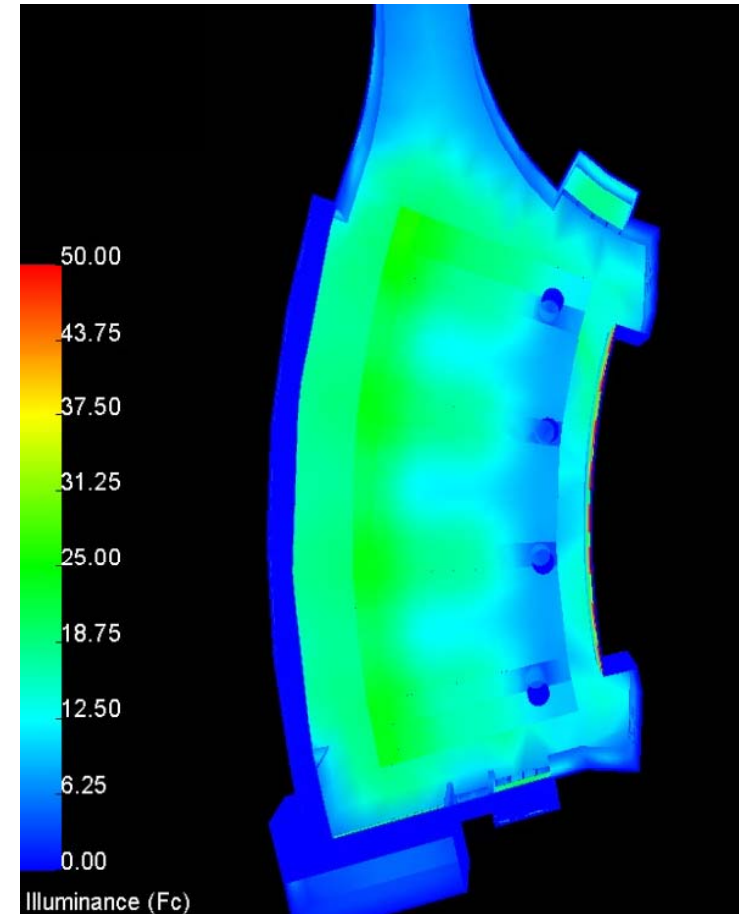
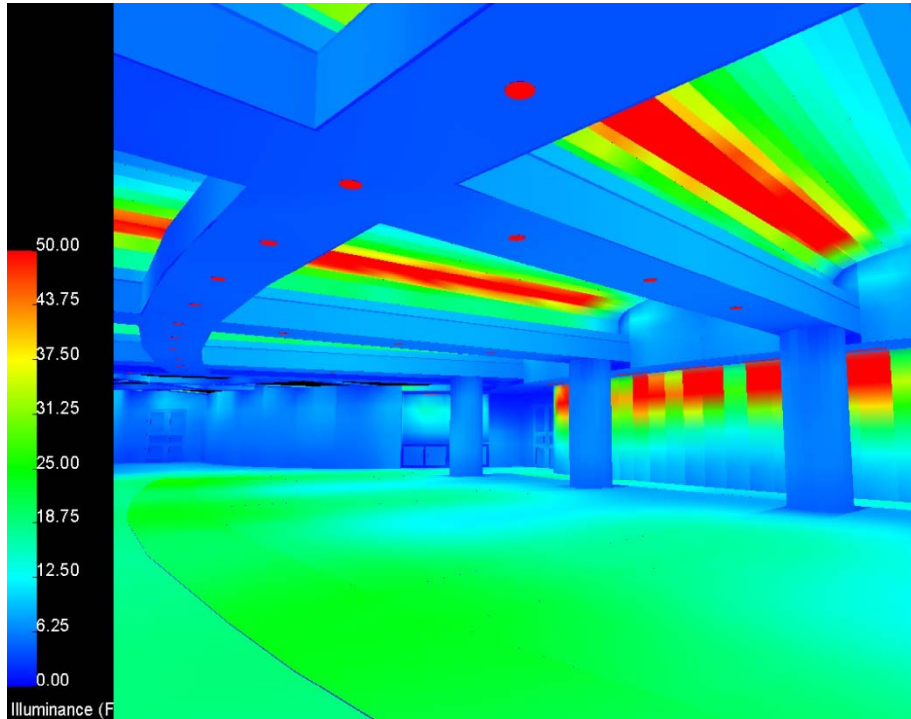
ACADEMIC CENTER

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FINAL DESIGN PRESENTATION: RENDERINGS

	Dining Room Illuminance Data (fc)	
	Main Floor	Center of Room Tables
Average	15.80	13.79
Max	30.00	28.50
Min	5.90	7.00
Avg/Min	2.68	1.97
Max/Min	5.08	4.07



ONE.

Match the historic theme of campus

TWO.

Clean and minimal lunimaire appearance

THREE.

Use of light to create visual depth
and hierarchy

FOUR.

Accent major features while providing
enough luminance for tasks

FAÇADE & ENTRY

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FINAL DESIGN PRESENTATION: RENDERINGS



FAÇADE & ENTRY

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FINAL DESIGN PRESENTATION: RENDERINGS

ONE.

Reduction in annual energy costs

TWO.

Relatively short payback period

THREE.

More efficient, Energy-Star
compliant building

TRANSFORMER ANALYSIS

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Project Transformers		RS Means Cost	Total	Powersmith Cost (+25%)
Quantity	kVA			
5	15	\$1,825.00	\$9,125.00	\$11,406.25
10	30	\$2,125.00	\$21,250.00	\$26,562.50
0	45	-	-	-
4	75	\$3,850.00	\$15,400.00	\$19,250.00
0	112.5	-	-	-
5	150	\$6,675.00	\$33,375.00	\$41,718.75
8	225	\$9,050.00	\$72,400.00	\$90,500.00
3	300	\$11,400.00	\$34,200.00	\$42,750.00
1	500	\$18,900.00	\$18,900.00	\$23,625.00
1	750	\$33,200.00	\$33,200.00	\$41,500.00
0	1000	-	-	-
2	1500	\$35,000.00	\$70,000.00	\$87,500.00
2	2000	\$40,000.00	\$80,000.00	\$100,000.00
1	2500	\$45,000.00	\$45,000.00	\$56,250.00
1	4160	\$60,000.00	\$60,000.00	\$75,000.00
43	-	-	\$492,850.00	\$616,062.50

Operating Hours /Day	12	Nameplate Efficiency (Normal Hours)	95%
Operating Days / Year	365	Existing Efficiency (Outside Normal Hours)	91%
Load During Normal Hours	40%	A/C System Performance	1.2
Load Outside Normal Hours	15%	Powersmith Efficiency (Normal Hours)	98.8%
KWh Rate	\$0.04	Powersmith Efficiency (Outside Normal Hours)	98.4%
Demand Rate	\$12.00		

FINAL DESIGN PRESENTATION: COST STUDY & ASSUMPTIONS

TRANSFORMER ANALYSIS

JOHN PAUL JONES ARENA CHARLOTTESVILLE, VIRGINIA

Comparison	Status Quo	Powersmiths	
Annual Cost of Feeding Building Load	\$2,949,244.83	\$2,949,244.83	
Annual Cost of Transformer Losses	\$212,902.52	\$37,899.56	
Annual Cost of Associated A/C	\$120,768.30	\$12,920.31	Reduction
Annual Estimated Electrical Bill	\$3,282,915.65	\$3,000,064.70	8.62%

	Annual Cost	Life Cycle Operating Cost / Savings	
		20 years	32 years
Status Quo Transformers	\$333,670.82	\$12,052,932.32	\$27,495,359.15
Powersmiths Transformers	\$50,819.87	\$1,835,726.70	\$4,187,691.73
SAVINGS	\$282,850.95	\$10,217,205.62	\$23,307,667.43

Peak kW reduction (normal op hours)	556.6 kW
Annual kWh reduction	3,823,927.7 kWh
Reduction in Air Conditioning Load (on peak)	117.9 tons
PAYBACK PERIOD	.436 years

ONE.

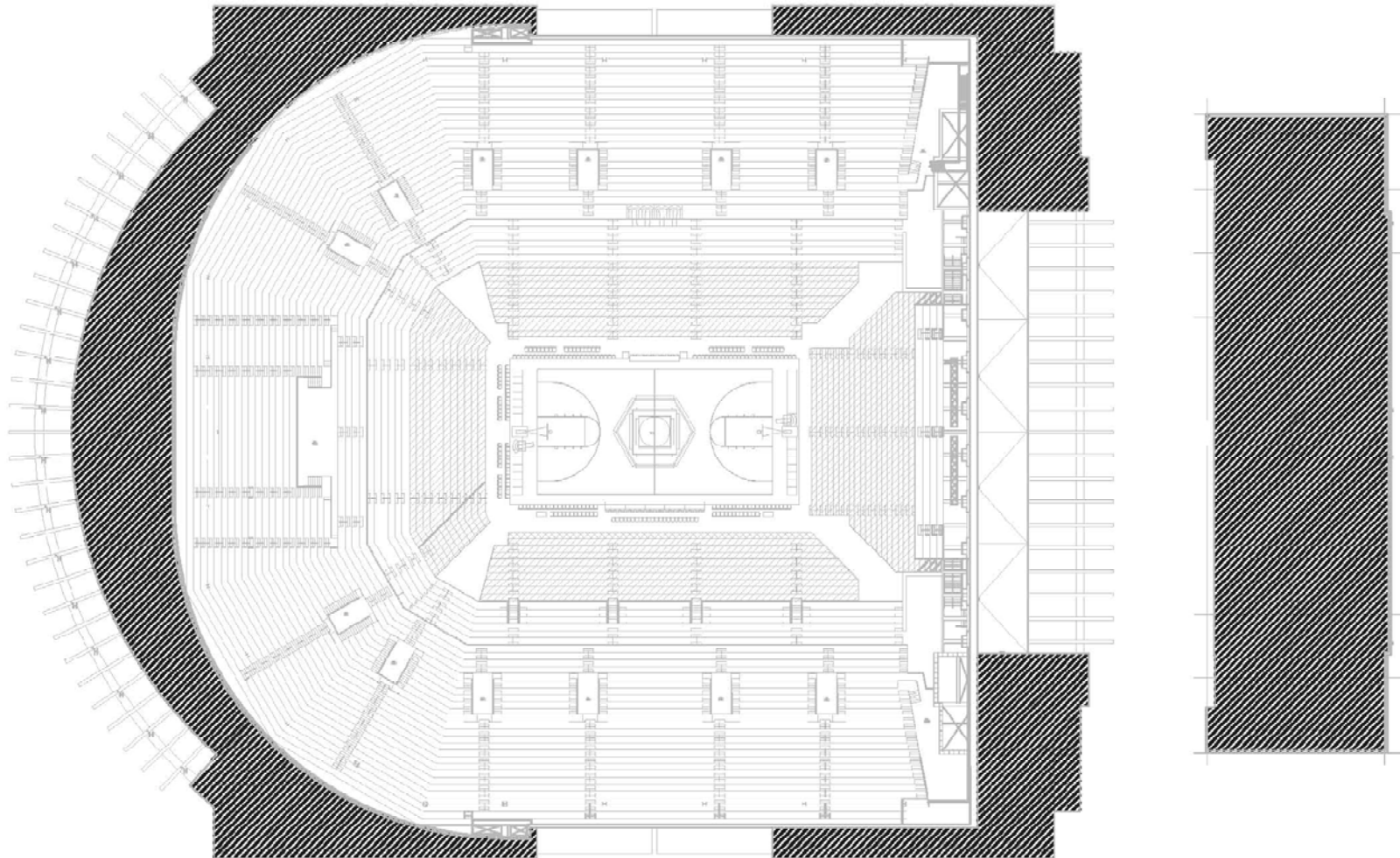
Feasibility of a Green Roof System on an athletic arena

TWO.

Limit impact on existing structural design

STRUCTURAL BREADTH

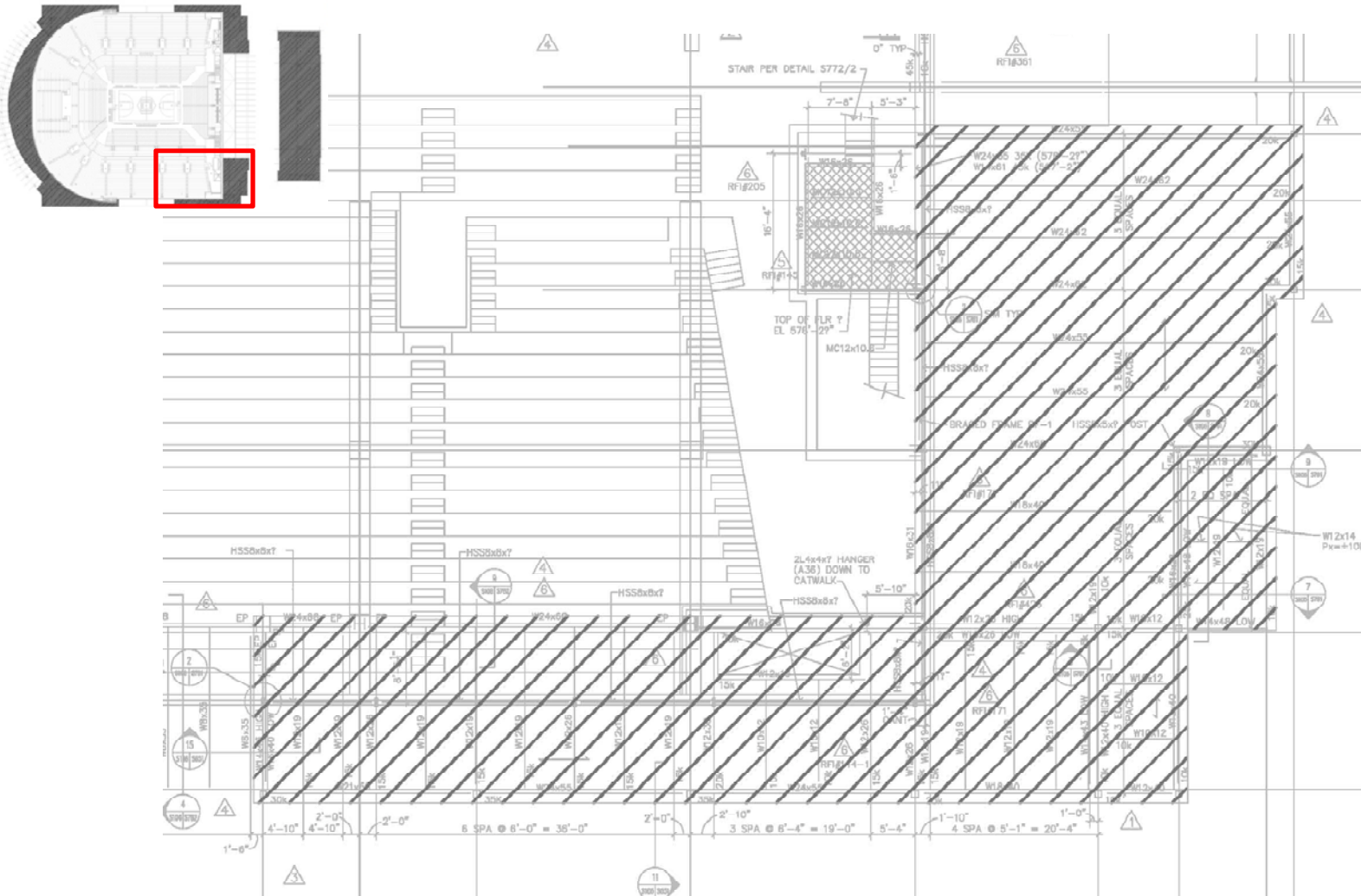
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FINAL DESIGN PRESENTATION: PROPOSED REDESIGN AREA

STRUCTURAL BREADTH

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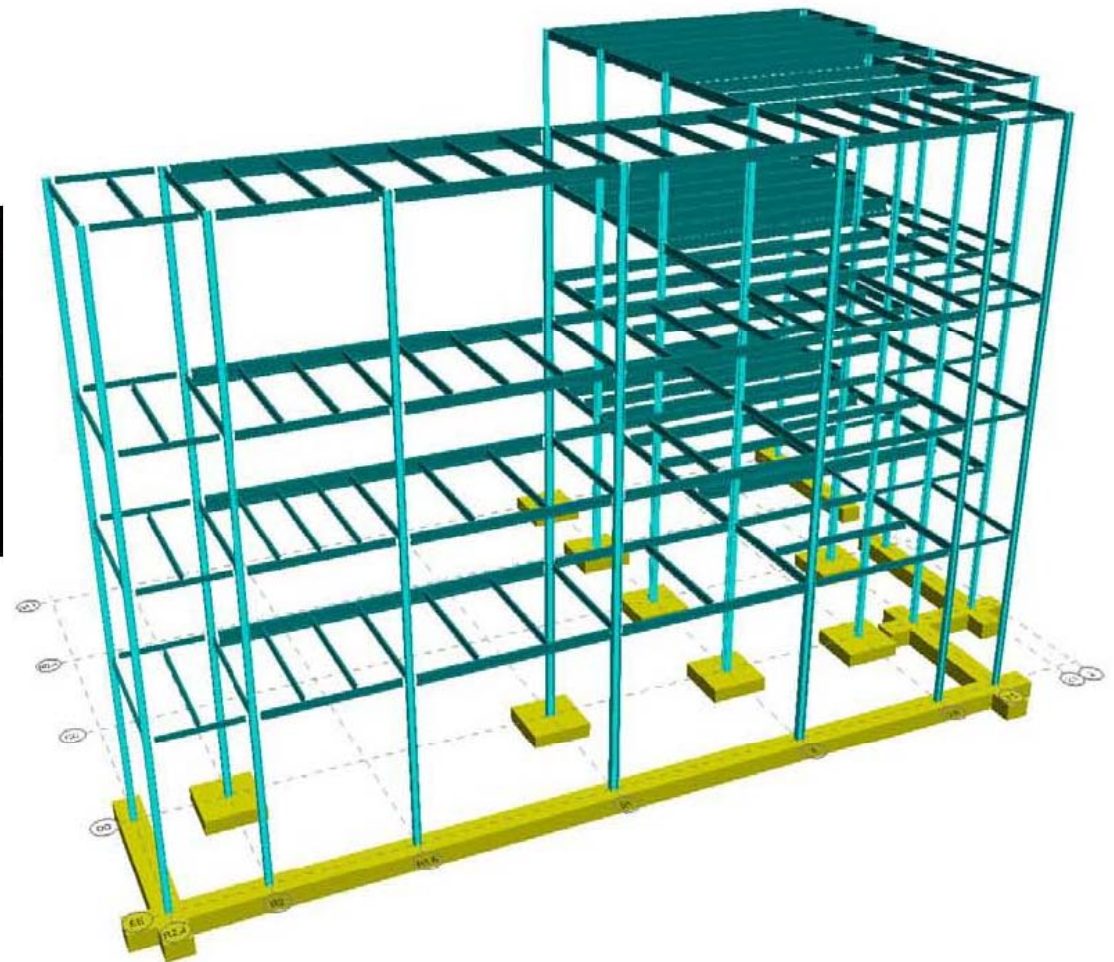


FINAL DESIGN PRESENTATION: CONCENTRATION AREA

STRUCTURAL BREADTH

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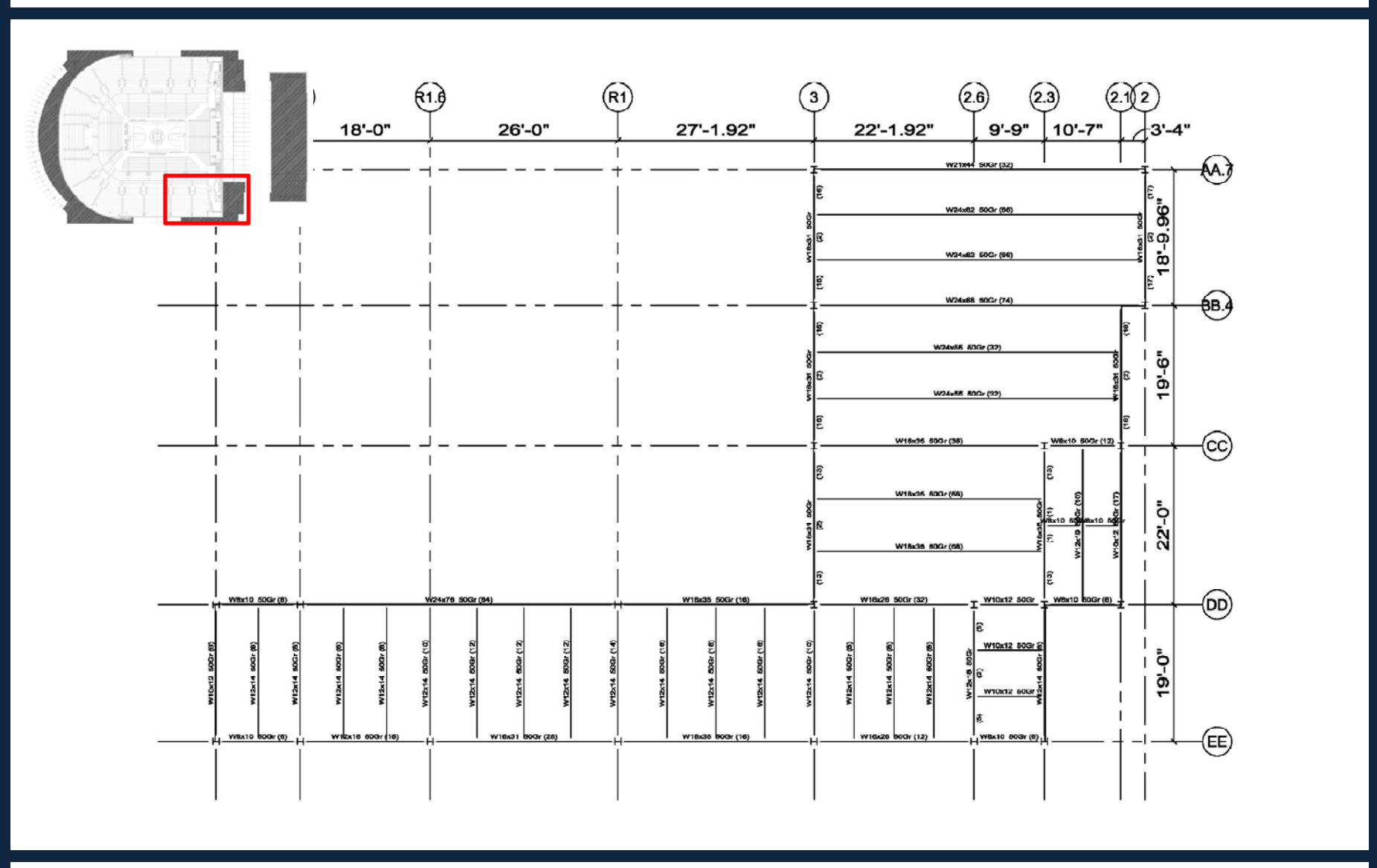
DESIGN CONSIDERATION	ASSUMPTION
Concrete (Nominal Weight)	145 psf
Live Load	100 psf
Superimposed Dead Load	25 psf
Snow Load	20 psf
Green Roof Load	54 psf
Steel Decking	ACW 3 (composite metal with 5" slab)



FINAL DESIGN PRESENTATION: RAM ASSUMPTIONS & MODEL

STRUCTURAL BREADTH

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FINAL DESIGN PRESENTATION: SYSTEM REDESIGN

FINAL REMARKS

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FINAL DESIGN PRESENTATION

ACKNOWLEDGEMENTS

JOHN PAUL JONES ARENA CHARLOTTESVILLE, VIRGINIA

Family & Friends

Dad
Mom
Little Broski
Bill and Connie
Nana
Gram

AE Faculty

Dr. Richard Mistrick
Dr. Kevin Houser
Professor Ted Dannerth
Professor Robert Holland
Professor Kevin Parfitt

Ellerbe Becket

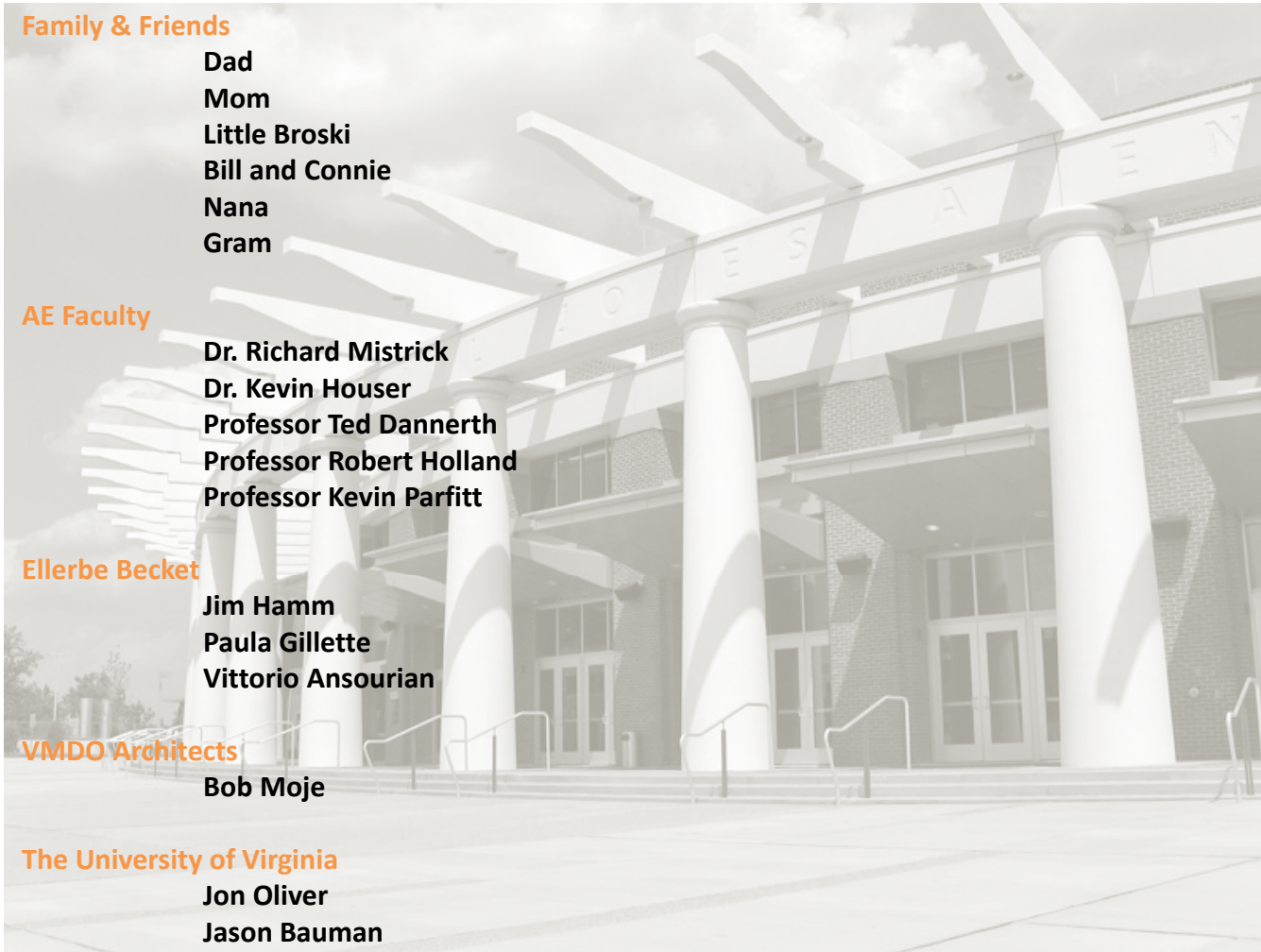
Jim Hamm
Paula Gillette
Vittorio Ansourian

VMDO Architects

Bob Moje

The University of Virginia

Jon Oliver
Jason Bauman



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QUESTIONS ?



FINAL DESIGN PRESENTATION