NEXT STEPSin the Decarbonization Journey

The Built Environment has made strides towards delivering sustainable buildings over the past 25 years. Learn about the Next Steps in this Journey towards Decarbonization with an emphasis on building systems. Hear about opportunities for improved outcomes during design, construction and operation of buildings.

Speaker:

Sachin Anand







PROJECT PROCESS

DESIGN

CONSTRUCTION & PERFORMANCE

Massing Studies

Radiation Studies

Daylighting Analysis

Paasive Systems Modeling

Building System Options

Whole Building Energy Modeling

ANALYSIS / DESIGN

Building Envelope Optimization

Thermal Comfort Analysis

Indoor Air Quality Analysis

Renewable Energy Options

Energy Storage Options

Building System Automation

Net Zero Pre-certification

Capital Cost Optimization

Constructability

Building System Sizing & Design

Space Coordination

ANALYSIS / DESIGN

Building System Design

System Sizing Verification

Energy Metering Design

Building Automation Design

Net Zero Performance Verification

ANALYSIS / DESIGN / CONSTRUCTION

Integrated Construction
Administration

System Start Up Review

Operator Training

Occupant Training

ANALYSIS / CONSTRUCTION / OCCUPANY

System Data Trending

Realtime System Optimization

Performance Verification

Thermal Comfort Optimization

Net Zero Certification

Systems Troubleshooting

ANALYSIS / CONSTRUCTION / OCCUPANY

PERFORMANCE PERIOD

PROGRAMMING

CONCEPT DESIGN SCHEMATIC DESIGN

DESIGN DEVELOPMENT CONSTRUCTION DOCUMENTS

CONSTRUCTION

OCCUPANCY

CLOSE

NET ZERO

COMMISSIONING - BECx, Cx, MBCx







CHALLENGES TO THE PROJECT PROCESS

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Radiation Studies

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OCCUPANCY

CLOSE OUT

NET **ZERO**

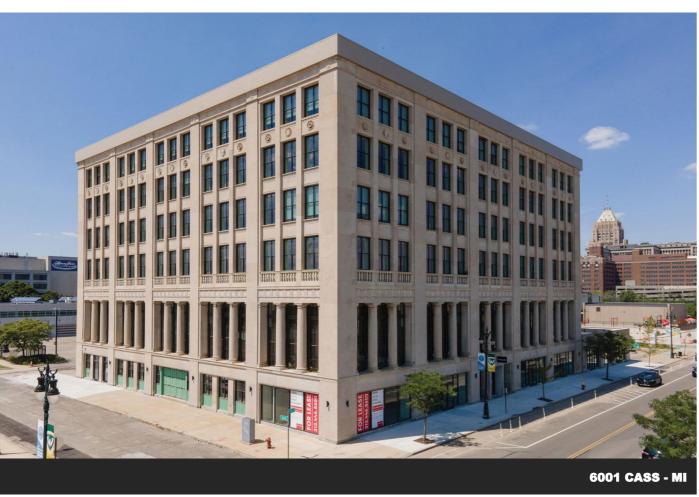
COMMISSIONING - BECX, CX, MBCX

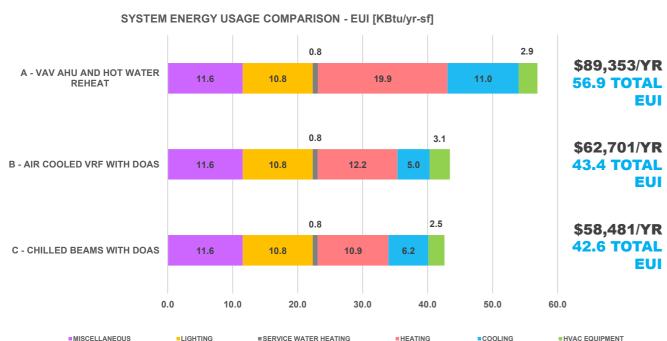




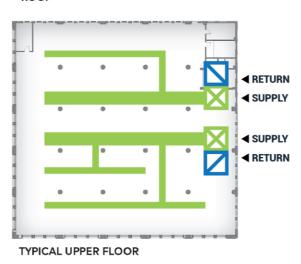


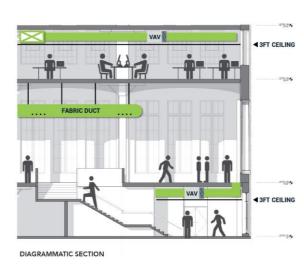
CHALLENGE 1: INTEGRATED DESIGN & ANALYSIS



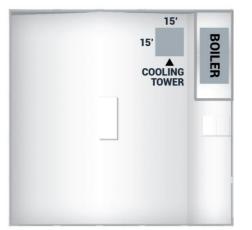


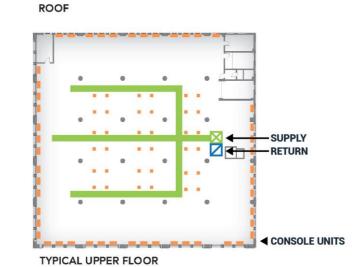
VAV 40' B 40' B 10' ROOF

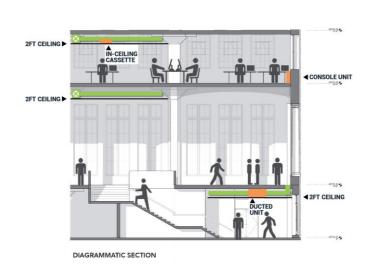




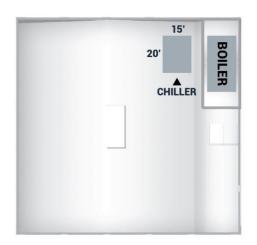
WATER COOLED VRF



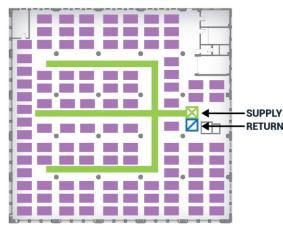




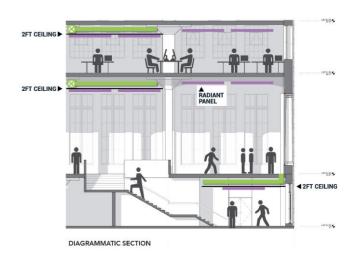
RADIANT



ROOF



TYPICAL UPPER FLOOR









CHALLENGE 1: INTEGRATED DESIGN & ANALYSIS









What's Working?

- Tools and Computing Power
- **Data Visualization**

What's Not Working?

Siloing between Analysis/Modeling and Design

Opportunities

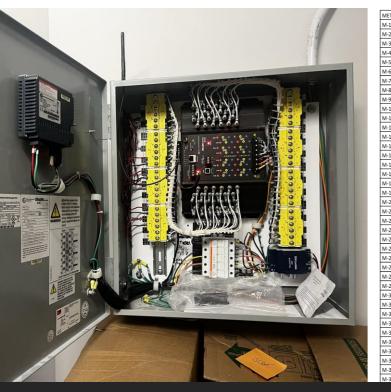
- Designer led Analysis
- **Cross Training**







CHALLENGE 2: METERING AND CONTROLS



IETER TAG	METER TYPE	LOCATION OF METER	METER CONNECTION POINT	METERED EQUIPMENT	EQUIPMENT DESCRIPTION	LOCATION OF EQUIPMENT
l-1	MULTIPOINT METER	MAIN ELECTRICAL ROOM	LP-1	LP-AD-1	PANEL BOARD - LIGHTING	HEALTH CLINIC
1-2	MULTIPOINT METER	MAIN ELECTRICAL ROOM	MP-1	DOAS-1	DEDICATED OUTDOOR AIR SYSTEM	ROOF
1-3	MULTIPOINT METER	MAIN ELECTRICAL ROOM	MP-1	DOAS-2	DEDICATED OUTDOOR AIR SYSTEM	ROOF
1-4	MULTIPOINT METER	MAIN ELECTRICAL ROOM	MP-1	DOAS-3	DEDICATED OUTDOOR AIR SYSTEM	ROOF
1-5	MULTIPOINT METER	MAIN ELECTRICAL ROOM	MP-1	MAU-1	MAKE-UP AIR UNIT	ROOF
1-6	MULTIPOINT METER	MAIN ELECTRICAL ROOM	MP-1	MP-2	PANEL BOARD - HVAC EQUIPMENT	MAIN ELECTRICAL ROOM
1-7	MULTIPOINT METER	MAIN ELECTRICAL ROOM	MP-2	KEF-1	KITCHEN EXHAUST FAN	ROOF
l-8	MULTIPOINT METER	MAIN ELECTRICAL ROOM	MP-L-1	KEF-2	KITCHEN EXHAUST FAN	ROOF
I-9	MULTIPOINT METER	MAIN ELECTRICAL ROOM	MP-L-1	DWH-1	DOMESTIC WATER HEATER	KITCHEN
-10	MULTIPOINT METER	MAIN ELECTRICAL ROOM	MP-L-1	DWH-2	DOMESTIC WATER HEATER	KTICHEN
-11	MULTIPOINT METER	MAIN ELECTRICAL ROOM	MP-L-1	DWH-3	DOMESTIC WATER HEATER	WATER HEATERS 227
I-12	MULTIPOINT METER	CLOSET 167B	MP-L-2	KEF-3	KITCHEN EXHAUST FAN	ROOF
I-13	MULTIPOINT METER	CLOSET 167B	MP-L-2	KEF-4	KITCHEN EXHAUST FAN	ROOF
-14	MULTIPOINT METER	CLOSET 167B	MP-L-2	DWH-4	DOMESTIC WATER HEATER	K1 LEARNING ZONE 215
I-15	MULTIPOINT METER	CLOSET 167B	MP-L-2	DWH-5	DOMESTIC WATER HEATER	WATER HEATERS 224
-16	MULTIPOINT METER	MAIN ELECTRICAL ROOM	RP-1A	RP-1A CCT NO 31	EV CHARGING STATION	MAIN ELECTRICAL ROOM
-17	MULTIPOINT METER	MAIN ELECTRICAL ROOM	RP-1A	RP-1A CCT NO 33	EV CHARGING FUTURE	MAIN ELECTRICAL ROOM
-18	MULTIPOINT METER	MAIN ELECTRICAL ROOM	RP-1A	RP-1A CCT NO 35	EV CHARGING FUTURE	MAIN ELECTRICAL ROOM
-19	MULTIPOINT METER	MAIN ELECTRICAL ROOM	SWITCHBOARD MSB	C-1	CHILLER	ROOF
l-20	MULTIPOINT METER	MAIN ELECTRICAL ROOM	SWITCHBOARD MSB	LP-1	PANEL BOARD - LIGHTING	MAIN ELECTRICAL ROOM
-21	MULTIPOINT METER	MAIN ELECTRICAL ROOM	SWITCHBOARD MSB	FUTURE SOLAR PV SYSTEM	SOLAR SYSTEM	ROOF
l-22	MULTIPOINT METER	MAIN ELECTRICAL ROOM	SWITCHBOARD MSB	KP-1	PANEL BOARD - KITCHEN	KITCHEN OFFICE
l-23	MULTIPOINT METER	MAIN ELECTRICAL ROOM	SWITCHBOARD MSB	MSB	MAIN SWITCHBOARD METER	MAIN ELECTRICAL ROOM
l-24	MULTIPOINT METER	MAIN ELECTRICAL ROOM	SWITCHBOARD MSB	MP-1	PANEL BOARD	MAIN ELECTRICAL ROOM
l-25	MULTIPOINT METER	MAIN ELECTRICAL ROOM	SWITCHBOARD MSB	T-MP-1	PANEL BOARD - EQUIPMENT	MAIN ELECTRICAL ROOM
-26	MULTIPOINT METER	MAIN ELECTRICAL ROOM	SWITCHBOARD MSB	LIGHTING INVERTER	LIGHTING INVERTER	MAIN ELECTRICAL ROOM
-27	MULTIPOINT METER	MAIN ELECTRICAL ROOM	SWITCHBOARD MSB	ELEVLATOR	ELEVATOR	MAIN ELECTRICAL ROOM
1-28	MULTIPOINT METER	MAIN ELECTRICAL ROOM	SWITCHBOARD RDP	RP-1A	PANEL BOARD - RECEPTICALS	MAIN ELECTRICAL ROOM
-29	MULTIPOINT METER	MAIN ELECTRICAL ROOM	SWITCHBOARD RDP	RP-1B	PANEL BOARD - RECEPTICALS	MAIN ELECTRICAL ROOM
l-30	MULTIPOINT METER	MAIN ELECTRICAL ROOM	SWITCHBOARD RDP	RP-1C	PANEL BOARD - RECEPTICALS	MAIN ELECTRICAL ROOM
-31	MULTIPOINT METER	MAIN ELECTRICAL ROOM	SWITCHBOARD RDP	RP-1D	PANEL BOARD - RECEPTICALS	EARLY CHILDHOOD 104
l-32	MULTIPOINT METER	MAIN ELECTRICAL ROOM	SWITCHBOARD RDP	RP-1E	PANEL BOARD - RECEPTICALS	EARLY CHILDHOOD 104
l-33	MULTIPOINT METER	MAIN ELECTRICAL ROOM	SWITCHBOARD RDP	RP-2A	PANEL BOARD - RECEPTICALS	CIRCULATION 290A
I-34	MULTIPOINT METER	MAIN ELECTRICAL ROOM	SWITCHBOARD RDP	RP-2B	PANEL BOARD - RECEPTICALS	CIRCULATION 290A
l-35	MULTIPOINT METER	MAIN ELECTRICAL ROOM	SWITCHBOARD RDP	RP-2C	PANEL BOARD - RECEPTICALS	CIRCULATION 290B
l-36	MULTIPOINT METER	MAIN ELECTRICAL ROOM	SWITCHBOARD RDP	RP-2D	PANEL BOARD - RECEPTICALS	CIRCULATION 290B
I-37	MULTIPOINT METER	MAIN ELECTRICAL ROOM	SWITCHBOARD RDP	RP-2E	PANEL BOARD - RECEPTICALS	CIRCULATION 290C
I-38	MULTIPOINT METER	MAIN ELECTRICAL ROOM	SWITCHBOARD RDP	RP-2F	PANEL BOARD - RECEPTICALS	CIRCULATION 290C
1-39	MULTIPOINT METER	MAIN ELECTRICAL ROOM	SWITCHBOARD RDP	RP-AD-1	PANEL BOARD - RECEPTICALS	HEALTH CLINIC





ACADEMY FOR GLOBAL CITIZENSHIP - IL





riparanene		riourly osage	buily osage		rumaat osage
201	210 Living	0.00 kW-hr	0.00 kW-hr	0.00 kW-hr	0.00 kW-hr
201	211 Bed	0.00 kW-hr	0.00 kW-hr	3.77 kW-hr	11.02 kW-hr
203	216 Living	0.00 kW-hr	0.02 kW-hr	1.80 kW-hr	19.50 kW-hr
203	217 Bed	0.00 kW-hr	0.00 kW-hr	0.02 kW-hr	0.94 kW-hr
204	252 Living	0.03 kW-hr	0.03 kW-hr	3.71 kW-hr	25.12 kW-hr
201	253 Bed	0.00 kW-hr	0.00 kW-hr	0.00 kW-hr	0.01 kW-hr
205	223 Bed	0.00 kW-hr	0.00 kW-hr	0.00 kW-hr	0.03 kW-hr
	222 Living	0.03 kW-hr	0.03 kW-hr	3.71 kW-hr	25.12 kW-hr
206	248 Living	0.01 kW-hr	0.11 kW-hr	7.30 kW-hr	45.20 kW-hr
200	247 Bed	0.00 kW-hr	0.00 kW-hr	0.03 kW-hr	0.07 kW-hr
207	228 Living	0.02 kW-hr	0.04 kW-hr	1.04 kW-hr	6.60 kW-hr
208	239 Living	0.00 kW-hr	0.00 kW-hr	0.00 kW-hr	4.12 kW-hr
200	240 Bed	0.00 kW-hr	0.00 kW-hr	1.71 kW-hr	9.40 kW-hr
209	233 Bed	0.01 kW-hr	0.04 kW-hr	1.28 kW-hr	4.77 kW-hr
200	234 Living	0.06 kW-hr	0.24 kW-hr	13.65 kW-hr	58.94 kW-hr
	Total FCU Usage	2.94 kW-hr	12.75 kW-hr	736.26 kW-hr	4229.56 kW-hr





7 VAN BUREN - IL

What's Working?

- Technology Hardware and Software
- Visibility into Data

What Not Working?

- Install and Start Up
- Maintenance

Opportunities

- Policy
- Resources
- Training





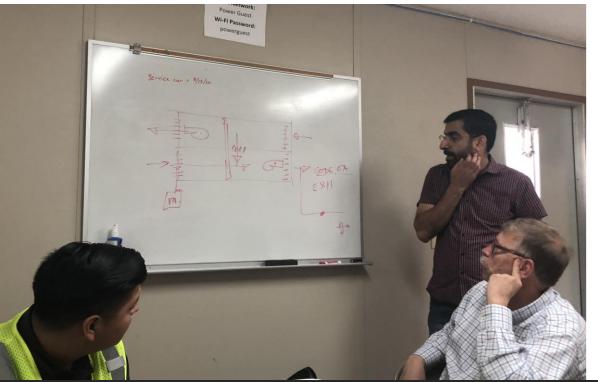


CHALLENGE 3: BUILDING TURNOVER











D KAPLAN FAMILY INSTITUTE FOR INNOVATION & TECH ENTREPRENEURSHIP, ILLINOIS INSTITUTE OF TECHNOLOGY - IL

What's Working?

- Awareness
- Improved Technology

What's Not Working?

- Building Turnover
- Lack of Resources
- Prioritize comfort complaints over efficiency

Opportunities

- Resources grants and rebates for operations
- Policy







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COMMISSIONING - BECx, Cx, MBCx

Designer led Analysis

Policy – "Energy Inspector"

OCCUPANCY

Measurement and Reporting by End Use

Training Wheels for Building Turnover





