Redefining the Engineering Design Process

ASHE™ REGION 6

Speakers for Today's Adventure

Jeff Harris, PE

Director of Engineering
HGA Architects and Engineers
JWHarris@hga.com

Matthew Mikolainis, PE

Senior Project Manager
HGA Architects and Engineers
MMikolainis@hga.com

Cathy Hall, LC, EDAC

Senior Lighting Designer
HGA Architects and Engineers
CHall@hga.com

Jill Imig, PE, EDAC

Senior Plumbing Engineer
Mechanical Department Leader
HGA Architects and Engineers
JImig@hga.com

ASHE™ REGION 6

Learning Objectives

- Describe successful methods for evaluating and recommending engineering systems
- Understand how an A3 communicates options, analysis, and recommendations
- Recognize the value of continuous budget verification incorporated in component team design process
- Take away "lessons learned" from recent healthcare projects

ASHE™ REGION 6

Trends in Healthcare Engineering Design

- Compressed schedules
- Greater requirements for MEP Systems
- Cost constraints
- Supply chain issues
- Pandemic proofing

ASHE™ REGION 6

Design Process & Tools

BIM “One Model”

OPR

Target Value Design

Integration Events

Component Teams

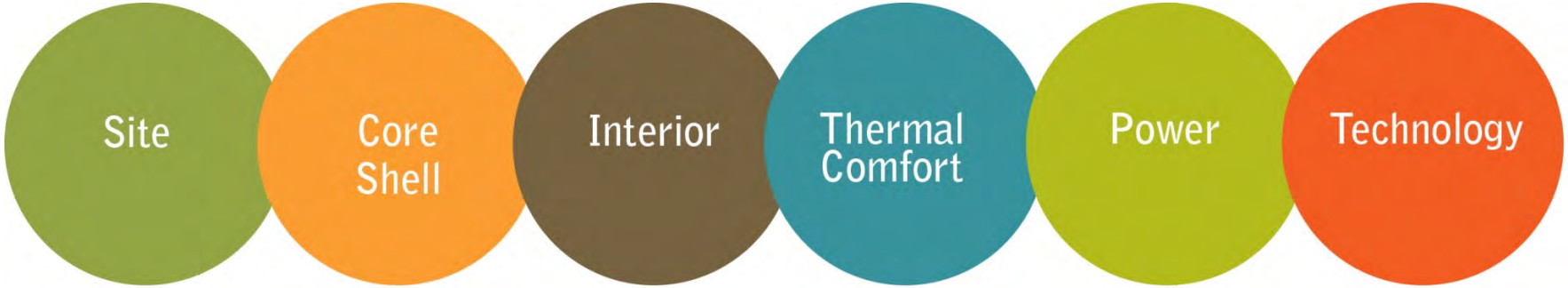
Continuous Estimating

Set Logs

A3s

ASHE REGION 6

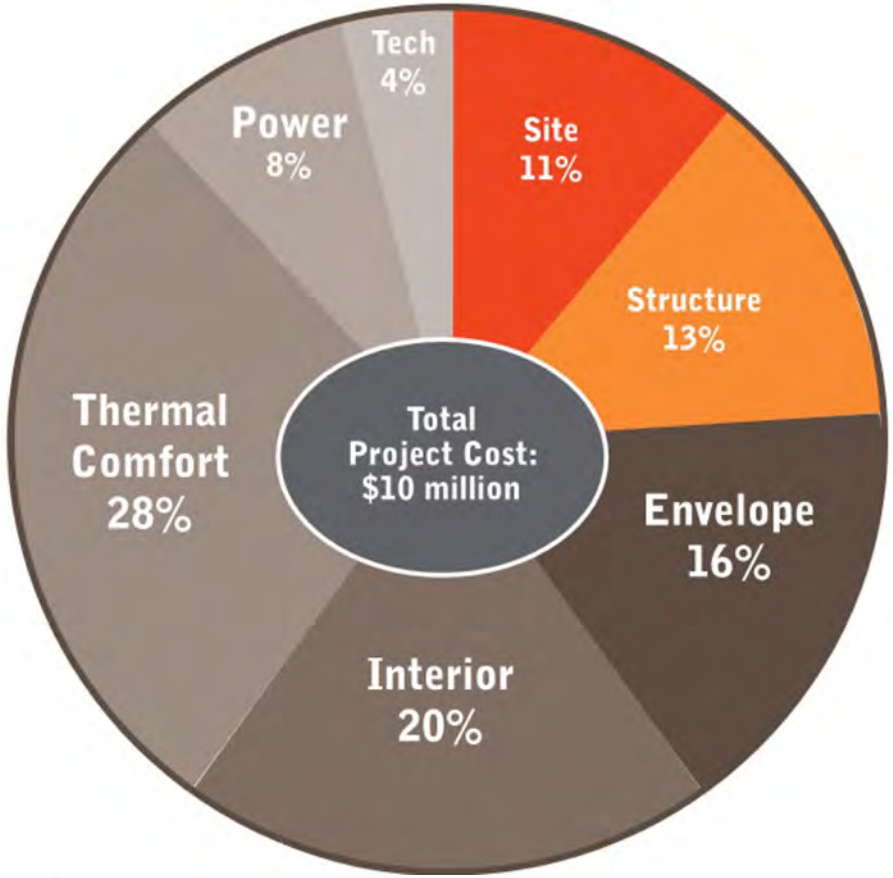
Component Teams



Site	Core Shell	Interior	Thermal Comfort	Power	Technology
Leader: Civil Engineer	**Leader:** Proj. Designer	**Leader:** Proj. Designer	**Leader:** Sr. Engineer	**Leader:** Sr. Engineer	**Leader:** Sr. Engineer
Team: Owner's Representative	**Team:** Owner's Representative	**Team:** Owner's Representative	**Team:** Owner's Representative	**Team:** Owner's Representative	**Team:** Owner's Representative
Project Designer	Project Architect	Project Architect	Mech. Engineer	Electrical Engineer	Electrical Engineer
Project Architects	Architects	Architects	Electrical Engineer	Mech. Engineer	Mech. Engineer
Mech. Engineer	Mech. Engineer	Medical Planners	Project Architect	Project Architect	Project Architect
Elec. Engineer	Structural Engineer	Interior Designers	Structural Engineer	Project Designer	Project Designer
Construction Mgr.	Construction Mgr.	Mech. Engineer	Srvcs. Technical Grp.	Interior Designer	Interior Designer
		Electrical Engineer	Construction Mgr.	Srvcs. Technical Grp.	Srvcs. Technical Grp.
		Construction Mgr.		Construction Mgr.	Construction Mgr.

ASHE™ REGION 6

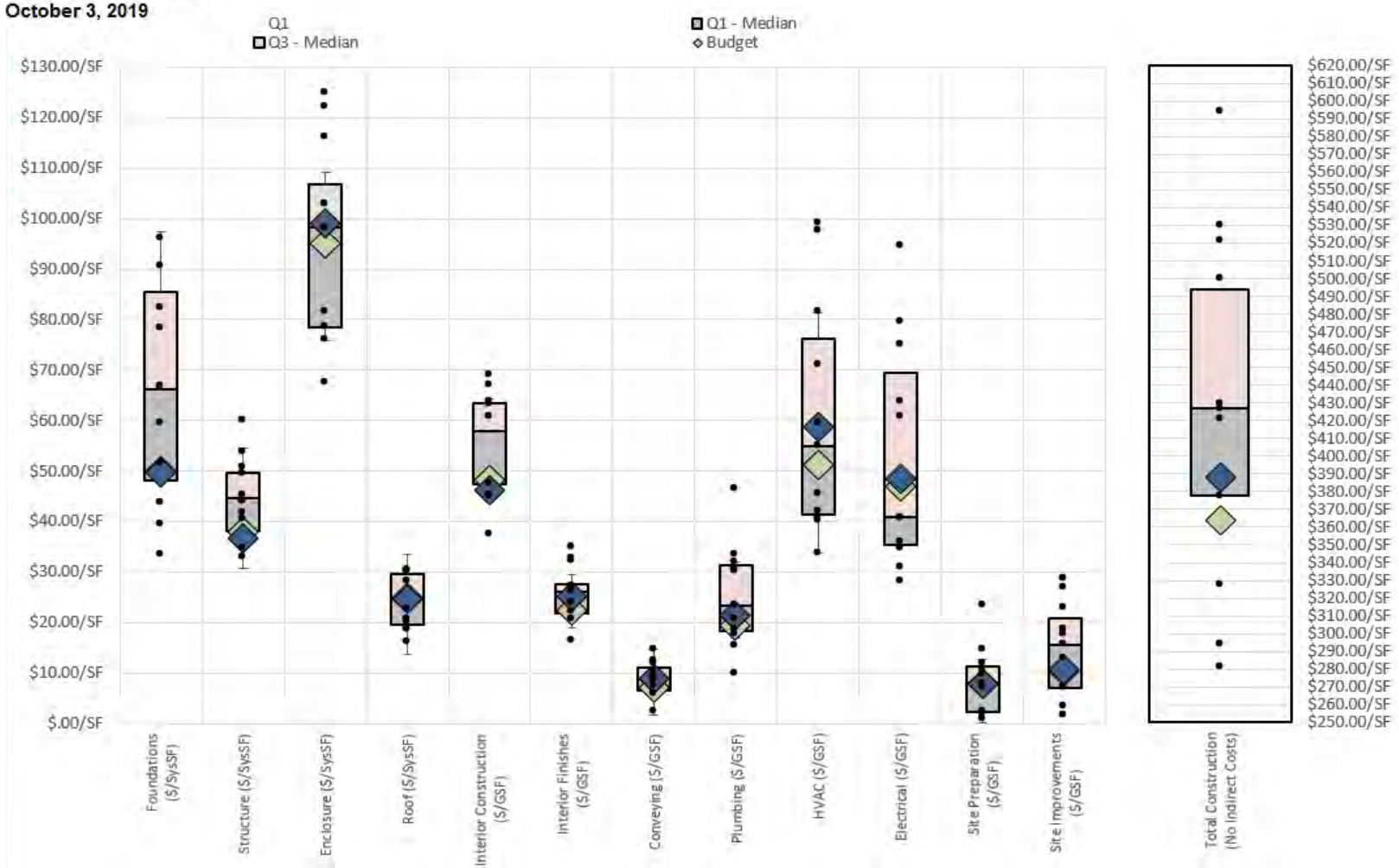
Target Value Design



ASHE™
REGION 6

Box Whisker - MOB

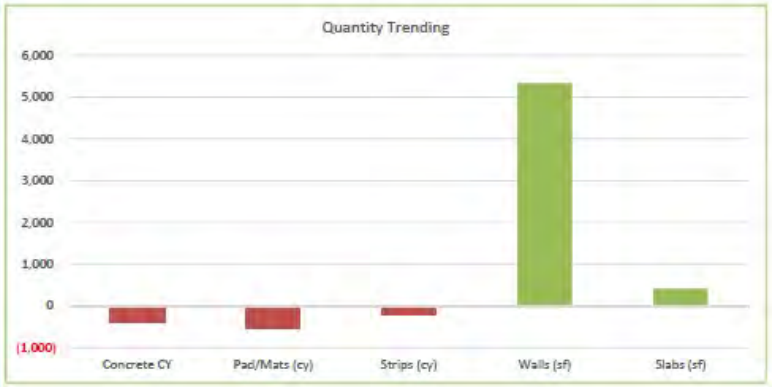
October 3, 2019



ASHE™ REGION 6

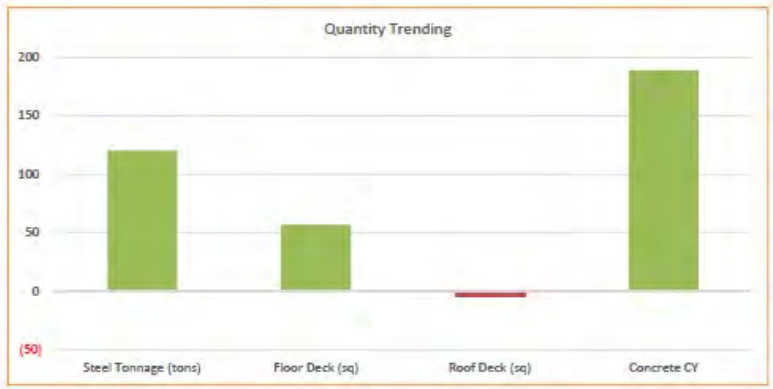
FOUNDATIONS

	Allow Budget	Trending	Delta	Impact
Foundation SF	131,988	131,988	0	$33,428
Perimeter LF	2,733	2,733	0	-
Concrete CY	7,077	7,456	(379)	($42,958)
Pad/Mats (cy)	2,291	2,838	(547)	($160,126)
Strips (cy)	866	1,055	(189)	($74,228)
Walls (sf)	32,931	27,594	5,337	$283,754
Slabs (sf)	143,466	143,056	411	$4,801
			Total:	$44,671



STRUCTURE

	Allow Budget	Trending	Delta	Impact
Structure SF	327,318	327,318	0	$0
Steel Tonnage (tons)	2,479	2,358	120	$307,878
Floor Deck (sq)	3,232	3,175	57	$10,065
Roof Deck (sq)	41	44	(4)	($539)
Concrete CY	6,485	6,296	189	$51,858
			0	
			0	
			Total:	$369,262



ENCLOSURE

	Allow Budget	Trending	Delta	Impact
Enclosure SF	137,285	131,153	6,132	$31,991
Precast/Stone/Brick (sf)	54,530	58,625	(4,095)	$85,038
Metal Panels (sf)	23,803	9,178	14,625	$892,112
Screenwall (sf)	10,040	6,464	3,576	$106,048
Curtainwall (sf)	41,898	50,579	(8,681)	($1,039,566)
Misc. (sf)	7,014	6,307	707	$49,311
Doors (ea)	31	21	10	$81,650
			Total:	$206,583

ASHE™ REGION 6

Quote # C0-1830 - THEDACARE ORTHOPEDIC HOSPITAL Date: 12/15/2020 Page 2

Qty	Type	Mfg	Description	Unit Price	Extd.Price
8	DS4	INTS	GD4DR-L7-35-D101-FL	$206.00	$1,648.00
8	DS4	INTS	IRD402HZ-SF-SL	$37.00	$296.00
8	DS4	INTS	I400	$5.50	$44.00
4	DS5	INTS	GD4DR-L3-35-D101-FL	$196.00	$784.00
4	DS5	INTS	IRD402HZ-SF-SL	$37.00	$148.00
4	DS5	INTS	I400	$5.50	$22.00
599	DU1	INTS	GD4DR-L2-35-D101-WF	$196.00	$117,404.00

26	DS5	4	4" LED DOWNLIGHT - WOOD	TECH	E4R-F-LO-835-40-D-010-277-E4S-F25-BOX	320	1280
27	DU1	605	4" LED DOWNLIGHT	GOTHAM	EVO4-35/10-AR-WD-LSS-MVOLT-GZ10	122	73810
28	DU1-W	8	4" LED DOWNLIGHT - WET LISTED	GOTHAM	EVO4-35/10-AR-WD-LSS-MVOLT-GZ10	122	976
29	DU2	196	4" LED DOWNLIGHT	GOTHAM	EVO4-35/15-AR-MWD-LSS-MVOLT-GZ10	122	23912
30	DU2-W	49	4" LED DOWNLIGHT - WET LISTED	GOTHAM	EVO4-35/15-AR-MWD-LSS-MVOLT-GZ10	122	5978
31	DU4	170	4" LED SQUARE DOWNLIGHT	GOTHAM	EVO4SQ 35/20 AR LSS MVOLT GZ10	122	20740
32	DU5	9	6" LED DOWNLIGHT - MRI	NEW STAR	DLM6-MR- HA-L4-A/A-3-UN-DM	402	3618
33	DU7	1	4" LED DOWNLIGHT	GOTHAM	EVO4-35/25-AR-MWD-LSS-MVOLT-GZ10	122	122
34	DU8	21	4" LED SQUARE DOWNLIGHT	GOTHAM	EVO4SQ 35/10 AR LSS MVOLT GZ10	122	2562

WORK: Fixtures Notes: Enter Values only in Green Cells

Distributer

DESCRIPTION	TOTALS Qty.	CTA $ Quote $	CTA Total $ 603,194.85	WML $ Quote $	WML Total $2,100,810.73	MLS $ Quote $	MLS Total $1,462,203.96	SPEC	SPEC Total $1,956,960.67	HGA $ Quote $	HGA Total $1,718,558.00	chosen BUY	Total $1,524,042.67
			$ -		$ -		$ -		$ -		$ -		$ -
			$ -		$ -		$ -		$ -		$ -		$ -
			$ -		$ -		$ -		$ -		$ -		$ -
			$ -		$ -		$ -		$ -		$ -		$ -
			$ -		$ -		$ -		$ -		$ -		$ -
			$ -		$ -		$ -		$ -		$ -		$ -
LL3	226		$ -	1004.21	$ 226,951.46	678.95	$ 153,442.70	1004.21	$ 226,951.46	750.00	$ 169,500.00	678.95	$ 153,442.70
LL3E	44		$ -	1220.00	$ 53,680.00	878.95	$ 38,673.80	1220.00	$ 53,680.00	800.00	$ 35,200.00	878.95	$ 38,673.80
LL4	52		$ -	924.21	$ 48,058.92	652.63	$ 33,936.76	924.21	$ 48,058.92	400.00	$ 20,800.00	200.00	$ 10,400.00
LL5	4		$ -	550.53	$ 2,202.12	631.58	$ 2,526.32	550.53	$ 2,202.12	150.00	$ 600.00	550.53	$ 2,202.12
LL7	7		$ -	523.16	$ 3,662.12	605.26	$ 4,236.82	523.16	$ 3,662.12	400.00	$ 2,800.00	523.16	$ 3,662.12
LL8	5		$ -	2281.05	$ 11,405.25	1473.68	$ 7,368.40	1473.68	$ 7,368.40		$ -	1473.68	$ 7,368.40
ML1	97	130.53	$ 12,661.41	93.68	$ 9,086.96	143.13	$ 13,883.61	130.53	$ 12,661.41	140.00	$ 13,580.00	93.68	$ 9,086.96
ML2	598	98.95	$ 59,172.10	88.42	$ 52,875.16	86.32	$ 51,619.36	98.95	$ 59,172.10	100.00	$ 59,800.00	86.32	$ 51,619.36
ML3	6	125.26	$ 751.56	104.21	$ 625.26	109.45	$ 656.70	125.26	$ 751.56	140.00	$ 840.00	104.21	$ 625.26
ML4	56	141.05	$ 7,898.80	125.26	$ 7,014.56	119.99	$ 6,719.44	141.05	$ 7,898.80	140.00	$ 7,840.00	119.99	$ 6,719.44
ML5	28	162.11	$ 4,539.08	167.37	$ 4,686.36	143.13	$ 4,007.64	162.11	$ 4,539.08	140.00	$ 3,920.00	143.13	$ 4,007.64
ML6	72	104.21	$ 7,503.12	93.68	$ 6,744.96	86.32	$ 6,215.04	104.21	$ 7,503.12	100.00	$ 7,200.00	86.32	$ 6,215.04
ML7	111	368.42	$ 40,894.62	88.42	$ 9,814.62	131.55	$ 14,602.05	368.42	$ 40,894.62		$ -	368.42	$ 40,894.62
NL2	16		$ -	89.47	$ 1,431.52	104.21	$ 1,667.36	89.47	$ 1,431.52	300.00	$ 4,800.00	89.47	$ 1,431.52
RL1	157	715.79	$ 112,379.03	747.37	$ 117,337.09	286.32	$ 44,952.24	715.79	$ 112,379.03	600.00	$ 94,200.00	286.32	$ 44,952.24
RL3	29		$ -	962.11	$ 27,901.19	605.26	$ 17,552.54	962.11	$ 27,901.19	600.00	$ 17,400.00	962.00	$ 27,898.00
RL4	42		$ -	610.53	$ 25,642.26	410.53	$ 17,242.26	610.53	$ 25,642.26	600.00	$ 25,200.00	610.00	$ 25,620.00
T1	8	1531.56	$ 12,252.48	414.59	$ 3,316.72		$ -	1531.56	$ 12,252.48	2100.00	$ 16,800.00	414.59	$ 3,316.72
UL1	103		$ -	76.63	$ 7,892.89	126.32	$ 13,010.96	76.63	$ 7,892.89	100.00	$ 10,300.00	76.63	$ 7,892.89
UL2	3		$ -	231.58	$ 694.74	178.95	$ 536.85	231.58	$ 694.74	186.00	$ 558.00	178.95	$ 536.85
UL3	10		$ -	64.21	$ 642.10	105.26	$ 1,052.60	64.21	$ 642.10	100.00	$ 1,000.00	64.21	$ 642.10
WL1	13		$ -	354.74	$ 4,611.62	426.32	$ 5,542.16	426.32	$ 5,542.16	400.00	$ 5,200.00	354.74	$ 4,611.62
YL1	50	456.72	$ 22,836.00	480.16	$ 24,008.00	315.79	$ 15,789.50	456.72	$ 22,836.00		$ -	315.79	$ 15,789.50
YM1	17	309.94	$ 5,268.98	1014.74	$ 17,250.58	457.89	$ 7,784.13	309.94	$ 5,268.98		$ -	309.94	$ 5,268.98
			$ -		$ -		$ -		$ -		$ -		$ -
CL6 1651' total	1		$ -	38237.16	$ 38,237.16	65901.04	$ 65,901.04	38237.16	$ 38,237.16	126000.00	$ 126,000.00	38237.16	$ 38,237.16
CL7 130' total	1		$ -	3010.80	$ 3,010.80	5189.06	$ 5,189.06	3010.80	$ 3,010.80		$ -	3010.80	$ 3,010.80

Tools | Owner's Project Requirements (OPR)

ASHE REGION 6

Tools | Owner's Project Requirements (OPR)

Introduction Section

STANDARDS

Published Facility Standard	YES	NO	Date
Sustainable Standards	☐	☒	
Energy Conservation Standards	☐	☒	
Emergency Management Plan	☐	☒	
Facility Design Standards *(to be provided)*	☒	☐	
Technology/AV Standards *(and security)*	☒	☐	
Control Standards	☐	☒	
Finish Standard (to be provided)	☒	☐	

Published Industry Standards	YES	NO	Edition
International Building Code (IBC)	☒	☐	2015
International Mechanical Code (IMC) *and WI SPS chapters*	☒	☐	2015
International Fuel Gas Code (IFGC) *and WI SPS chapters*	☒	☐	2015
NFPA 70 - National Electric Code (NEC)	☒	☐	2017
Plumbing Code (WI SPS chapters 352 through 387)	☒	☐	latest
Illumination Engineering Society Handbook	☒	☐	10th
ADA Standards for Accessible Design	☒	☐	2010

Renewable Power Sources	Further Discussion	YES	NO
Green Power Purchase Options	☐	☐	☒
Solar Photovoltaics	☒	☐	☐
Wind Turbines	☐	☐	☒

SCOPE DELINEATION

Systems	Owner Delegated	HGA Design Provided	Notes
Back-up fuel system	☐	☒	
A/V	☐	☒	
Security	☐	☒	
Access Control	☐	☒	
Low Voltage Systems Cabling	☐	☒	
Low Voltage Equipment	☐	☒	
CTV	☐	☒	
Irrigation System	☐	☒	
Chemical Systems	☐	☒	

ASHE™ REGION 6

Tools | Owner's Project Requirements (OPR)

Mechanical Section

OUTDOOR DESIGN CONDITIONS

Location	Cooling Season Conditions (WB/DB)	Heating Season Condition (DB)
Green Bay, WI (2017 ASHRAE Handbook - Fundamentals) WMO 726450 (Austin Straubel Intl)	88°F DB and 73.7°F WB	-7.9°F DB
WI Comm SPS 363 Table 363.0302 (Brown County, WI)	87°F DB and 75°F WB	-15°F DB

PRESSURE RELATIONSHIPS/MONITORING/CONTROL

Listed relationship based from FGI 2014, this table is used to validate the device capability used for local or BAS monitoring or control. Check boxes represent what will be provided in the design.

Room Type or Description	Relationship (Inches WC)	Pressure (POS/NEG)	Local Monitor	BAS Monitor	BAS Control ONLY
Operating Room/Delivery room	0.01"	POS	☒	☒	☐
Class "A" Procedure Room	0.01"	POS	☒	☒	☐
Endoscopy	0.01"	POS	☒	☐	☐
Trauma Room	0.01"	POS	☒	☐	☐
Catheterization	0.01"	POS	☒	☐	☐
Endoscopy	NR	POS	☒	☐	☐
Endoscopy Equipment Cleaning	NR	NEG	☑	☑ NO	☐
ED/Radiology Waiting	NR	NEG	☐	☐	☐ NO
Pharmacy IV Mix	0.02"	POS	☒	☒	☐

TEMPERATURE AND RELATIVE HUMIDITY REQUIREMENTS

Listed temperatures and relative humidity's based from FGI 2014, this table is used to validate the baseline and recognize user and facility expectations.

Room Type or Description	Cooling Design Maximum		Heating Design Minimum	
	Temp.°F	Relative Humidity %Rh	Temp.°F	Relative Humidity %Rh
Class "B", "C" Operating Suite	60	55	75	20 30
Procedure Rooms/Endoscopy/ Bronchoscopy	68	60 55	75	20 30
Treatment/Intensive Care/Critical Care	70	60 55	75	30
Radiology	72	60 55	78	NA
All patient care areas not listed	70	60 55	75	NA
Laboratory	70	50	75	30
Pharmacy IV Mix/ANTE/HD	68	NA ?	75	NA ?
CSP Decontam	60	60 55	65	30
CSP Sterile Supply	68	70 ?	73	NA
CSP Clean Workroom	60	60 55	73	30
Office Spaces or Staff Breakroom	70	60 55	72	25

A3 to review 60/55 equipment options for the operating rooms

SYSTEM SPECIFICS

Listed items below are included unless check box is used

Air Handling Unit Specifics	Further Review	NO
Direct Drive Supply/Return Fans with VFDs (no belts)	Y ☐	☐
Array fans for Supply/Return (each fan independent VFD)	Y ☐	☐
Electronic Com Motor (ECM) for Supply/Return fan Array	☒	☐
Redundancy on Supply Fans/Return Fans (N-1)	☒	☐
AHU sizing 120% of actual load required	Y ☐	☐
Operating Room Cooling Redundancy	☒	☒
Cooling Coil maximum velocity 500 FPM	☒	☐
Air Stream Disinfection (UV lights)	☒	☐
Air Steam Disinfection (Needlepoint Ionization)	☒	☐

ASHE™ REGION 6

Tools | Owner's Project Requirements (OPR)

Electrical Section

System	No Preference	Manufacturer
Electrical Distribution	SQ.D preferred	Square D / Schneider Electrical, Eaton, GE
Emergency Standby Generator		Cummins, Caterpillar, **Kohler**
Lighting		Cooper, Acuity, Signify, Kenall, Axis
Lighting Control		Watt Stopper, nLight, Crestron, Douglas
Lamps		Sylvania, Osram
Wiring Devices		Hubbell, Leviton, Pass & Seymour, Legrand
Fire Alarm		Simplex, Notifier, Rauland

Incoming Service Redundancy	A3	YES	NO
Single Utility Feed - *A single service feed routed from utility owned substation*	☐	☒	☐
Redundant Utility Feed – *Two service feeds from two separate utility owned substations – Research looped feed and redundant source feed – tbd. further review is necessary*	☒	☐	☐
• Automatic Transfer – cost dependent on design – tbd. further review is neccessary	☒	☐	☐
• Manual Transfer – if primary, automatic would be desired – tbd. further review is necessary	☒	☒	☐
Load Shedding requirements only upon one generator failure. Transfer switches can be programmed to drop off in reverse order.	☐	☒	☐

Branch of Power	N	LS	CR	EQ	UPS	Notes
Telecommunication MDP	☒	☐	☒	☐	☐	
Telecommunication Branch Closets	☒	☐	☒	☐	☐	
Electrical spaces	☒	☐	☐	☒	☐	
Mechanical spaces	☒	☐	☐	☒	☐	
Imaging Equipment						
1. CT	☒	☐	☐	☐	☐	Review with Staff for emergency power needs
2. General Radiology	☒	☐	☐	☐	☐	
3. MRI	☒	☐	☐	☐	☐	
4. Ultrasound	☒	☐	☐	☐	☐	
5. Mobile Imaging Connection	☒	☐	☐	☐	☐	

UPS Requirements	YES	NO	Notes
Individual equipment standalone UPS per equipment requirements	☐	☐	MDF needs tbd? • Rack mounted UPS units for IDF's provided by IT • Batteries not desired in OR 2x4's • Review for a separate UPS just for the OR's • Separate inverters for OR's (Review with staff including booms; review what was done at Marinette; Marinette has two sets of bug eyes per room in an

ASHE™ REGION 6

Tools | Owner's Project Requirements (OPR)

Plumbing Section

Redundancy Requirements

What are the expectations of redundancy for the Plumbing Systems

PLUMBING REDUNDANCY APPROACH	NONE	N+1	Evaluate
Domestic Water Booster Pump	☐	☐	☒
Domestic Water Heating Equipment	☐	☒	☐

Booster Pump (if applicable)

Detailed Description	YES	NO	Evaluate
Pumps Sized for 50% of load	☐	☐	☒
Pumps Sized for 33% of load	☐	☐	☒
Pumps Sizing other	☐	☐	☐
Variable Speed	☒	☐	☐
Expansion Tank	☒	☐	☐
Connect to BAS	☒	☐	☐
Emergency Power	☐	☐	☒

Domestic Water System

Detailed Description	YES	NO	Evaluate
Copper	☒	☐	☐
Pro-press Fittings	☒	☐	☐
Soldered Only	☐	☒	☐
Stainless Steel – first 40 feet at chlorine injection sites	☒	☐	☐
Victaulic Fittings	☐	☒	☐
Welded Only	☒	☐	☐
PEX	☐	☒	☐

Oxygen System

Detailed Description	YES	NO	Evaluate
Cylinder Manifold	☐	☒	☐
Bulk on Site	☒	☐	☐
Sized to accommodate all future phases – size for 1 and 2, space for phase 3	☐	☐	☐

Medical Gas Alarm Systems

Detailed Description	YES	NO	Evaluate
Area Alarm Panels Monitored on BAS	☒	☐	☐
Master Alarm Panel Monitored on BAS	☒	☐	☐

ASHE™ REGION 6

Tools | Set Logs

					Evaluation Criteria		
	Description	Energy Cost	Capital Cost	Flexibility	Redundancy	Space Needed	Maintenance
	Heating Systems						
Opt A	Steam Boilers with Heat Exchangers  	0	0	0	0	0	+
Opt B	**Gas Fired Condensing Water Boilers** 	+	0	+	+	+	0
Opt C	Electric Heating 	--	+	0	--	+	--

ASHE™ REGION 6

Tools | A3

THOUGHT SIDE

A3. E1	TITLE: EMERGENCY CAPACITY	TEAM: E&I AUTHOR: KMB

1. Current State – The campus will require a new emergency distribution system due to the need for a new CUP.

2. Reason for Action – To determine what level of redundancy is desired/required for generator back up of the campus.
   - Bullet 2.1 – Provide redundancy and resiliency to the electrical system.
   - Bullet 2.2- To achieve the desired protocol during a power outage.
   - Bullet 2.3 – Create an "automated" procedure during an outage.
   - Bullet 2.4 – Provide N+1 redundancy to cover code required loads of a concurrent outage of the utility and a generator.
   - Bullet 2.5 – Create an infrastructure capable of accommodating future needs/growth.

3. Target State – Appropriate Redundancy,
   - Bullet 3.1; Patient Safety
   - Bullet 3.2; Patient Safety and additional provisions
   - Bullet 3.3; Patient safety, additional provisions and additional functional comforts.
   - Bullet 3.4; No change in function or work process in the event of a power outage (being mindful that the secondary source is now the only source of power).

ACTION SIDE

4. Research Brainstorm Box – The availability of emergency power should be based upon reliability of the utility source, the desired resiliency of the system, the overall intent of the facility in the event of a natural disaster, and the configuration of the CUP.
   - Bullet 4.1- How reliable is the utility? With the new Central Plant utilizing dual utility feeders how big is the concern of an outage.
   - Bullet 4.2- What is the facility's role in the event of a catastrophic event in the area- Level 1 Trauma Center.
   - Bullet 4.3- If a heat recovery option is selected for the CUP does this offset the first cost for additional generators?
   - Bullet 4.4- Is a selective choice of redundancy more appropriate for a better ROI to insure both patient safety and maintaining standard operations?
   - Bullet 4.5 – Can a modular infrastructure suit the needs of the desired option?

5. Implementation Plan - Options:
   - Option 2.1; Code Required Minimum
     - Life Safety (egress, fire alarm, med gas)
     - Critical Branch (direct patient care)
     - Equipment Loads (building systems)
   - Option 2.2; Standard of Care
     - Code Required Minimum
     - Additional Critical Branch Loads
     - Minimal additional EQ branch loads
   - Option 2.3; Best Practice
     - Standard of Care
     - Additional Critical Branch Loads required for effective hospital operation
     - Select "Optional" Loads
     - All heating and cooling on Emergency power, Kitchen, BAS, "Full limited operation"
     - Loads necessary to keep critical functions operating in a disaster.
     - Select loads in new MOB which support Level 1 Trauma center functions.
   - Option 2.4; Island Power
     - All loads

OPTION			
2.1	Code Minimum	Meets Code – (Worst Building you can legally build)	Building cannot continue to be occupied for extended duration.
2.2	Standard of Care	Meets Code and allows for minimal function of facility.	Building function and protocol would need to be revised during an outage.
2.3	Best Practices	Addresses patient care needs and select building functions.	Could occupy facility but some systems would not function.
2.4	Island Power	All building loads would function*.	Most expensive option

- Additional Comments:
  - Rammelkamp will need new generators by the time project is completed.
  - CCP current has on site generators
  - Consider sizing distribution and allowing physical space to add additional buildings and/or facility loads.

CURRENT STATE:

- The schematic basis of design carried (4) medical gas zones per each patient floor of the tower.

REASON FOR ACTION:

- The most current location and quantity of the med/surg, ICU and acuity adaptable rooms is requiring a discussion to determine the best way to zone the floor plan.

TARGET CONDITION:

- A medical gas zoning scheme that allows for current state and future state flexibility while maintaining a cost effective and easily maintainable solution.

ANALYSIS:

- The current scheme for bed aggregation is showing different programs for the rooms in the center of the wings to flex between multiple occupancy types.

Option 1 - Four Zones per Typical Patient Floor (included in SD pricing)

Pros:
- Floor is divided into four quadrants.

Cons:
- Zoning crosses over the smoke compartments.
- Zoning does not account for the flex rooms in the center of the floor plate.

Option 2 – Five Zones per Typical Patient Floor (+$494,010.00 for 12 floors)

Pros:
- Zoning allows for the natural zoning of the flex rooms.
- Zoning is divided up by the smoke compartments.

Cons:
- Additional pipeline components to maintain and test annually.

Option 3 – Three Zones per Typical Patient Floor (+$352,638.00 for 12 floors)

Pros:
- Zoning allows for the natural zoning of the flex rooms.
- Zoning is divided up by the smoke compartments.

Cons:
- One ZVB per smoke compartment places the valve in a potentially hard to find location.

RECOMMENDATIONS:

DISCUSSION:

DECISION:

On the March 9, 2022 meeting with UMPC, CJL, HGA, and the contracting team it was agreed upon to proceed with the basis of design, Option #1.

Process| Integration Events

IS A HOLISTIC APPROACH
ROOTED IN INTERDISCIPLINARY
EMPATHY

ASHE™
REGION 6

Process| Integration Events

INTEGRATION EVENTS

ASHE REGION 6

ASHE™ REGION 6

Item

1. Introductions/ Attendance – 15 min
2. Bluebeam Session Overview – 15 min
   - Teams are expected to populate the Revit model with all applicable elements in the spaces being integrated on prior to the PDF print of the Bluebeam session. There is no expectation to be fully coordinated with other trades, we will do this together as needed in the integration session.
   - Bluebeam Sessions will be printed and sent out prior to the Integration Sessions.
   - If you have comments or questions to be asked in the Integration session, feel free to populate the notes in the Bluebeam session in the appropriate color as noted below prior to the meeting.
   - Discipline color code filters:
     - **Red**: Electrical / Lighting / Technology/ Low Voltage
     - **Blue**: Plumbing
     - **Orange**: Medical Equipment
     - **Green**: Mechanical
     - **Magenta**: Planning/Design
   - These filters will also be applied to the PDF prints from the Revit model to ease coordination efforts. The colors are applied as best as possible to the different disciplines; some Revit families prevent graphic overrides, but most items for coordination are colored accordingly.
   - The team will be expected to have the Bluebeam session open during the integration meeting and following along in real time. Everyone will be responsible for their own markups in the appropriate color as the discussions occur. This helps us speed things along as well as accountability for the work to be done.

ASHE™ REGION 6

Item

- As we go through each room on the agenda, we will review items in this order:
  - Notation Plans
  - Reflected Ceiling Plans
  - Elevations
- With each drawing review, we will do our best to hit each discipline in this order:
  - Planning Intent Review
  - Design Intent Review
  - Discipline Reviews
    - Lighting
    - Mechanical
    - Electrical
    - Low Voltage
    - Plumbing & Fire Protection
    - Medical Equipment

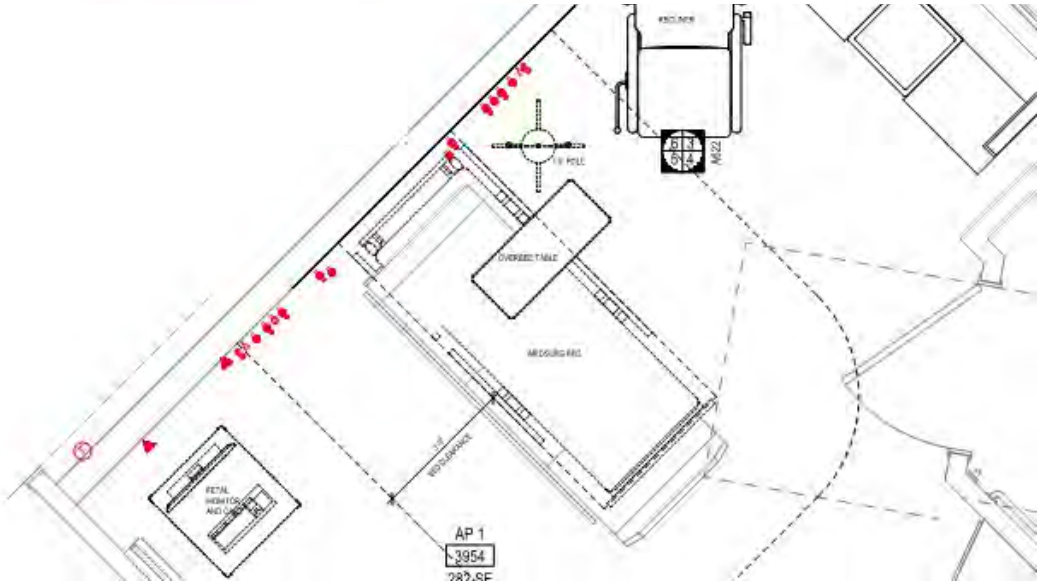
3. Spaces to be Reviewed – 3 hours

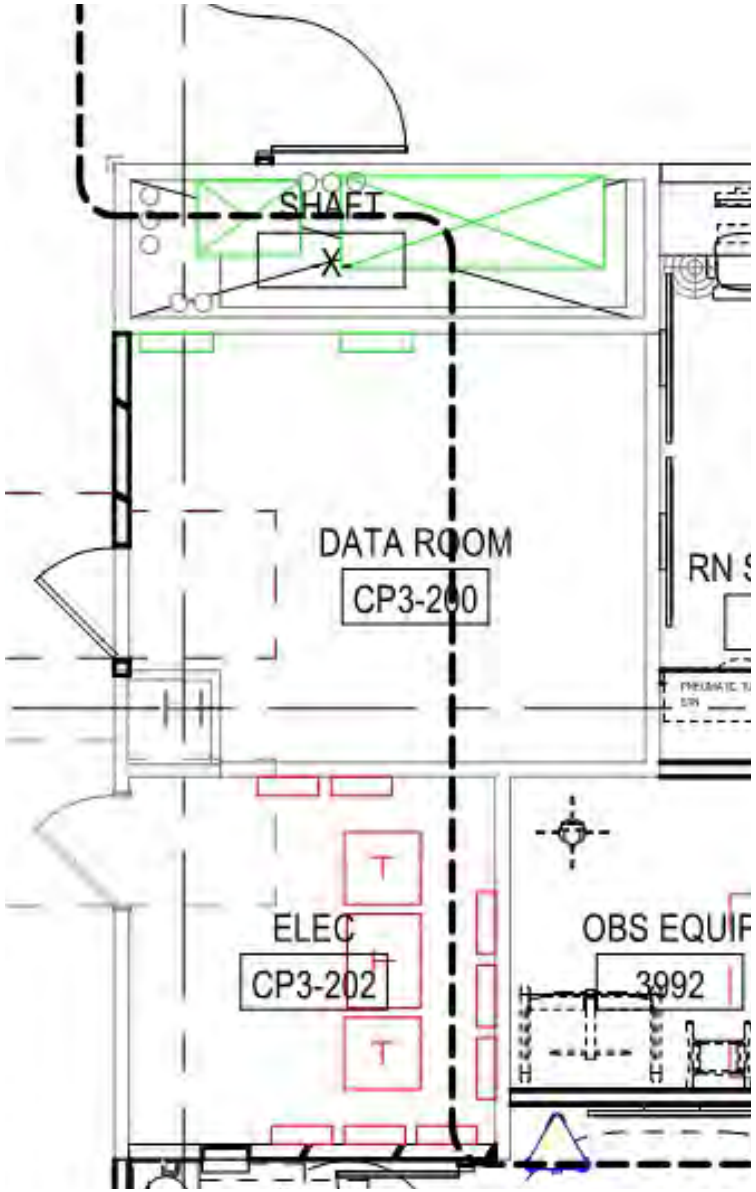
   4th Floor CCP Renovation Areas:
   - Typical Observation Room & Toilet
   - New Ante-Partum Room (Re-purpose discussion)
   - Nursery
     - Typical CCN Nursery Bay
     - Wellbaby Nursery
     - Shared WB & CCN Support
   - Prep/ Recovery Room
   - Support Areas:
     - Nurse Stations (PTS, Patient Monitoring, Infant Security)
     - Lactation
     - Meds/ Nourish/ Clean
   - Staff Areas:
     - Locker Room/ Shower
     - Break Room

4. Plus/Delta & Next steps – 15 min

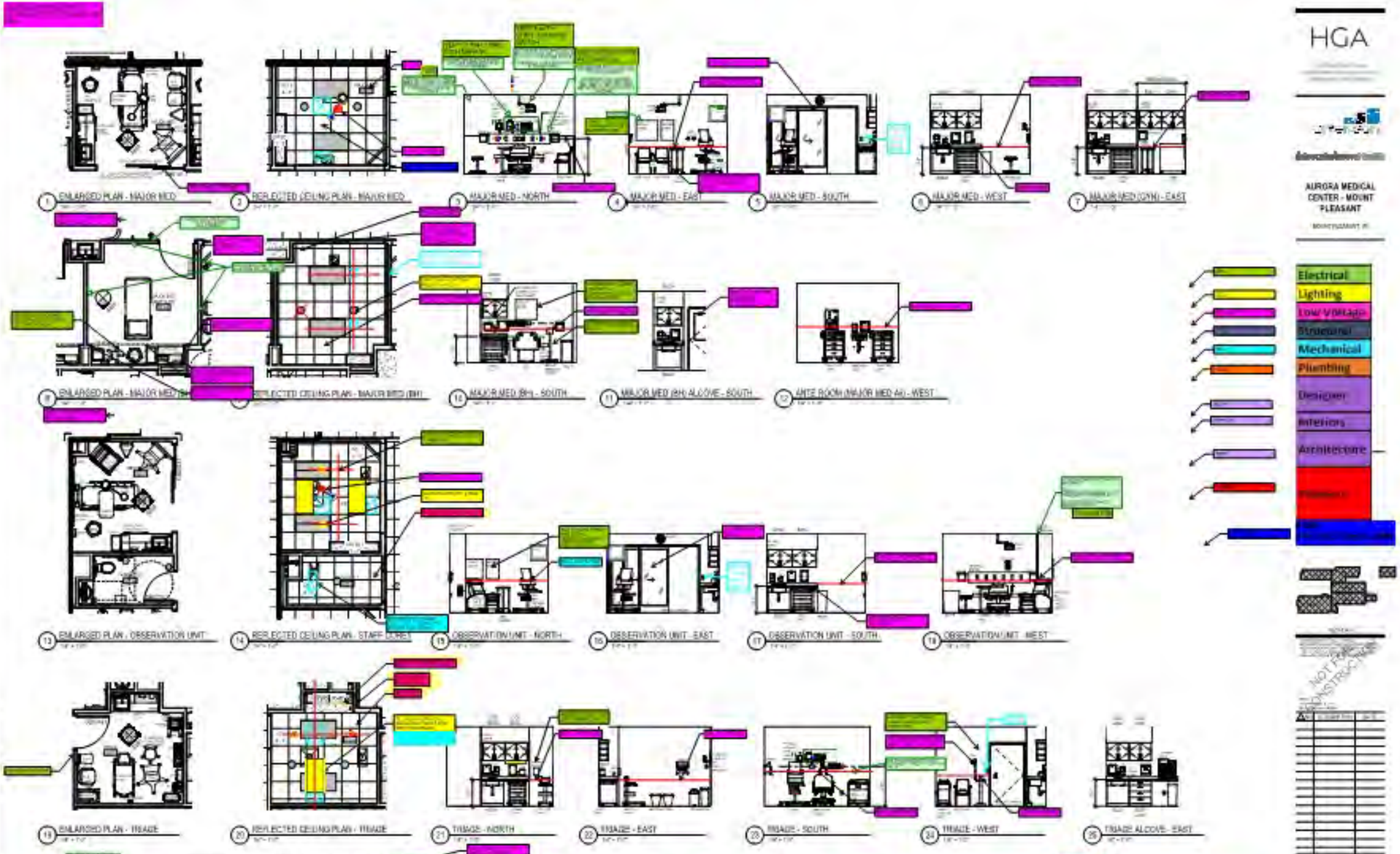
Discipline color code filters:

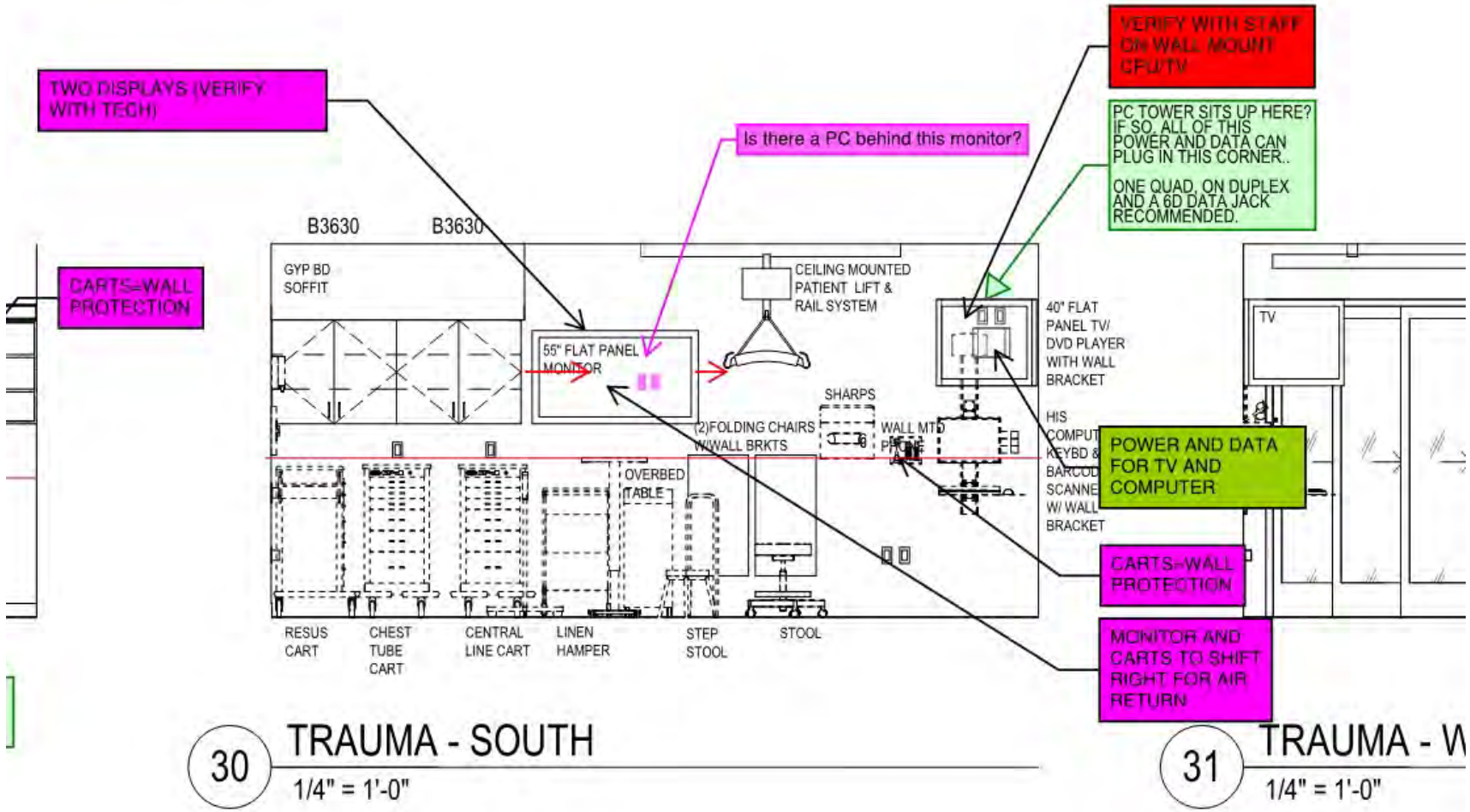
- **Red**: Electrical / Lighting / Technology/ Low Voltage
- **Blue**: Plumbing
- **Orange**: Medical Equipment
- **Green**: Mechanical
- **Magenta**: Planning/Design





ASHE™ REGION 6


HGA
AURORA MEDICAL CENTER - MOUNT PLEASANT
Electrical
Lighting
Low Voltage
Structural
Mechanical
Plumbing
Designer
Interiors
Architecture
1 ENLARGED PLAN - MAJOR MED
2 REFLECTED CEILING PLAN - MAJOR MED
3 MAJOR MED - NORTH
4 MAJOR MED - EAST
5 MAJOR MED - SOUTH
6 MAJOR MED - WEST
7 MAJOR MED (GYN) - EAST
8 ENLARGED PLAN - MAJOR MED (BH)
9 REFLECTED CEILING PLAN - MAJOR MED (BH)
10 MAJOR MED (BH) - SOUTH
11 MAJOR MED (BH) ALCOVE - SOUTH
12 ANTE ROOM (MAJOR MED A4) - WEST
13 ENLARGED PLAN - OBSERVATION UNIT
14 REFLECTED CEILING PLAN - STAFF DORET
15 OBSERVATION UNIT - NORTH
16 OBSERVATION UNIT - EAST
17 OBSERVATION UNIT - SOUTH
18 OBSERVATION UNIT - WEST
19 ENLARGED PLAN - TRIAGE
20 REFLECTED CEILING PLAN - TRIAGE
21 TRIAGE - NORTH
22 TRIAGE - EAST
23 TRIAGE - SOUTH
24 TRIAGE - WEST
25 TRIAGE ALCOVE - EAST



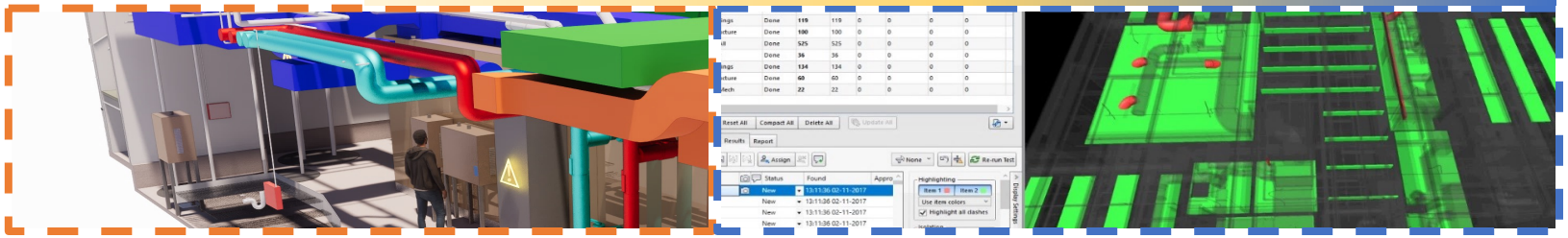
ASHE REGION 6

Process | BIM One Model

Early Design

Late Design

Construction



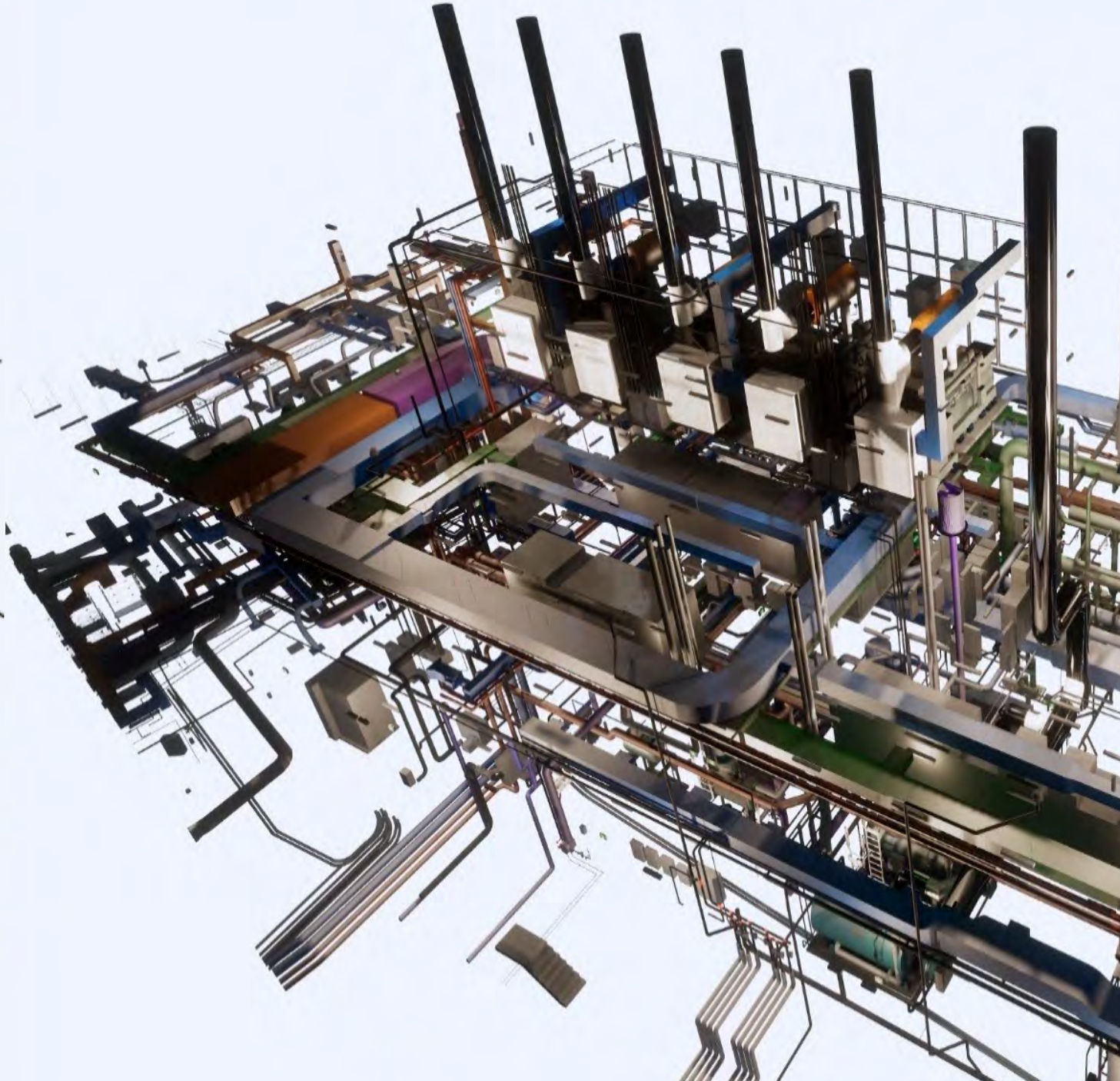
Design Team

Coming together to create a "Single Source of Truth"

Design Assist Team

ASHE REGION 6

BIM One Model



INDUSTRY AVERAGE: 9.9 RFI’s/million

RECENT COMPLETE PROJECT: 1.8 RFI’s/million

Successful Projects:

PROJECT DELIVERY BEST PRACTICES

COLLABORATION- ATTITUDE AND TOOLS

INNOVATION- PROCESS AND PRODUCT

ASHE™ REGION 6

Questions?

ASHE™ REGION 6