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King County Data Center - SDC 52 01

D Millar, Sazan group, OIRM project team

PRELIMINARY COMMENTS on Sabey Design Development submittal dated 11/14/2007 and Basis of Design Narrative - Not dated

Review #	Drawing No. OR Spec Section and Page No.	Review Comments	Reviewer Initials	Reply by:	Reply	Issue Date:	Person Responsible to Make Change
1	General	Coordinate Drawings across disciplines. Ensure backgrounds and equipment are consistent & compatible	DM	Callison	Will coordinate w/Callison	Replies by Sabey King Co Feedback	3/17/08
2	General	Show how NOC and Printer Room can be converted to future server pods.	DM	Sabey	Additional design work/cost/time. Is this an authorization to proceed? Will coordinate w/Callison	Replies by Sabey	3/21/08
3	Architectural	Provide interior construction and finish details.	DM	Callison	Yes, as laid out in Oct DD set.	Feedback to Sabey Reply	3/26/08
4	Architectural	Does the TI budget include work associated with office space TI?	DM	Sabey	Agreed	Agreed	Agreed
5	Electrical	Provide major component product submittals; Uninterrupted Power Supply, Static Transfer switches, StarLine power distribution	DM	Veca	Agreed	Agreed	Agreed
6	Electrical	Confirm that MGE cabinet dimensions include space for harmonic filtering within the cabinet.	RG	Veca	Harmonic filtering is included in the MGE modules	Agreed	Agreed
7	Electrical	Verify mech equip is not connected to Tech Bus	RG	Veca	There are not separate IT and mechanical buses. Each bus has UPS modules and mechanical equipment.	Agreed	Agreed
8	Communications	Cabinets 4, 9, & Network cabinet mislabeled. Verify all labeling is correct.	RG	Sabey/Cochrane	Pending KC final Comm recommendations. Sabey to work w/Cochrane on redesign.	Agreed	Agreed
9	Communications	Verify station cables shall occupy the bottom 2/3 of the VisiPatch field with the space left for future VisiPatch units at the right 1/3.	RG	Sabey/Cochrane	Pending KC final Comm recommendations. Sabey to work w/Cochrane on redesign.	Agreed	Agreed
10	Communications	Identify punchdown and patch panel field color codes; show labeling scheme	RG	Sabey/Cochrane	Pending KC final Comm recommendations. Sabey to work w/Cochrane on redesign.	Agreed	Agreed
11	Communications	Show 200-pair copper backbone	RG	Sabey/Cochrane	Pending KC final Comm recommendations. Sabey to work w/Cochrane on redesign.	Agreed	Agreed
12	Communications	Telecommunications cabling associated with the data center shall not be routed through spaces accessible by the public or by other tenants of the building. Route cables enclosed in conduit or other secure pathways. Any maintenance access doors, pull boxes, or splice boxes shall be equipped with a lock	RG	Sabey/Cochrane	Small additional price for locking junction boxes. The MPOE and Telco rooms, through which some of this cabling is routed, are secure spaces with cameras and access control. There are a relatively small number of people, including landlord staff, landlord security, and a few carrier and tenant personnel, who have access to these rooms.	Agreed	Agreed
13	Electrical	Vertical wire managers shall be Panduit.	RG	Sabey/Cochrane	Pending KC final Comm recommendations. Sabey to work w/Cochrane on redesign.	Agreed	Agreed
14	Electrical	Show horizontal wire managers	RG	Sabey/Cochrane	Pending KC final Comm recommendations. Sabey to work w/Cochrane on redesign.	Agreed	Agreed
15	Electrical	Identify material; i.e., copper wire, galvanized sheet metal, etc.	RG	Sabey/Cochrane	Pending KC final Comm recommendations. Sabey to work w/Cochrane on redesign.	Agreed	Agreed
16	Electrical	Provide fire alarm design drawings	DM	Sabey/Veca	Pending KC final Security design. Sabey to work w/Veca on opening placement.	Agreed	Agreed

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28	A-109 & E-7.25	Provide a 4"x4" fiber duct system to be designed and installed on top of the entire cable tray system designed for the 2nd floor KC DC area and have proper downspout modules installed to provide access to all the zone cabinets on the floor as well as the equipment racks in MDF area. Same ADC 4x4 FiberGuide Fiber Management System installed by Sabey for the Carrier area of Building 2 shall be acceptable to KC. The design of the fiber duct system and materials for KC Data Center shall be subject to KC's approval.	HS	Vece/ Callison	Add Alternate pricing to be provided. Add to drawings.	Replies by Sabey King Co Feedback Replies by Sabey	3/15/08 3/17/08 3/21/08 3/26/08	Agreed	
29	E-5.4 & E-3.25	The KC Office area on 1st floor needs to be on the same back up power system for DC.	HS	Vece	Add Alternate pricing to be provided. The original scope allowed for a certain number of outlets in the office area that would be on UPS power from the DC. If the whole office it to be on UPS power (except the lights and HVAC)	Accepted Office area on backup generator power. Not additional UPS		Agreed	
30	E-7.25	provide (1) 24SM and (1) 24MM fiber and a 50 pr. copper cables between MDF and the IDF closet in the KC Office area on 1st floor in the (2) 4 inch conduit links specified above.	HS	Sabey/ Cochran	Pending KC final Comm recommendations. Sabey to work w/Cochran on redesign.	Accepted		Agreed	
31	E 3.11	Provide additional jacks in the Production Engineering Office Area	CB	Sabey/ Cochran	Pending KC final Comm recommendations. Sabey to work w/Cochran on redesign.	Accepted Include in NTE price		Agreed	
32	E 7.25	What is the raceway from server area through vestibule through the women's bathroom to what? (IDF room?)	CB	Vece	4" conduit to the building Tele/Comm room on Level	Accepted		Agreed	
33	A 802	Verify A1 window is designed for wheelchair visibility	CB	Callison	Will coordinate w/Callison	Include this cost in NTE price. Provide in 100% submittal		Agreed	
34		Many documents (text, drawings) cover the same issues and systems. Some contradict others. Provide order of precedence of documentation.	CB	Sabey/ Callison	Will coordinate w/Callison	Include this cost in NTE price. Provide in 100% submittal		Agreed	
35		Provide cable tray sizes	CB	Callison	Will coordinate w/Callison	Include this cost in NTE price. Provide in 100% submittal		Agreed	
36	A 700	Change blackboard to Whiteboard	CB	Callison	Will coordinate w/Callison	Include this cost in NTE price. Provide in 100% submittal		Agreed	
37	A 102	Provide exiting plans	CB	Callison	Will coordinate w/Callison	Include this cost in NTE price. Provide in 100% submittal		Agreed	
38		Provide separate 4" fiber tray inside data center	CB/RRK	Vece/ Callison	Add Alternate pricing to be provided. Add to drawings.	Include this cost in NTE price. Provide in 100% submittal		Agreed	
39		MDF racks need to be seismically braced to the wall	CB/RRK	Vece	Agreed	Include this cost in NTE price. Provide in 100% submittal		Agreed	
40		Using STS not PDUs. Drawings are incorrect and incomplete. Correct drawings	CB/RRK	Vece		Include this cost in NTE price. Provide in 100% submittal		Agreed	
41		No security plan. Check with Dan Kenoyer. Indicate cameras & card key access on plans	CB/RRK	Sabey/Vec a	Pending KC final Security design. Sabey to work w/Veca on opening placement.	accepted		Agreed	
42	Communications	Cable proposal is incomplete and inconsistent with previously issued cable topology description. Revise cable proposal per Essential Performance Requirements	CB	Sabey/ Cochran	Pending KC final Comm recommendations. Sabey to work w/Cochran on redesign.	accepted		Agreed	
43	KCDQDD	Sabey responses to KC feedback 032608							5/20/08 5:54 PM

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54	Mechanical - M0.1	What is the anticipated temperature in the hot aisle plenums?	Sazan	McKinstry	Anticipated hot aisle plenum temperature approximately 86°-92F. Similar server equipment on other jobs indicate 20°F temperature difference is conservative, will analysis upon receipt of know tenant equipment.	Replies by Sabey King Co Feedback Replies by Sabey	No comment required	3/5/08 3/17/08 3/21/08 3/26/08
55	Mechanical - M0.1	Critical summary indicates tenant load at 91 watts/sf. This is not in accordance with King County Essential Performance Requirements. Verify 150 wsf.	Sazan	McKinstry	Direction for total tenant load was given as 1.05 MW, no criteria specified in watts/SF.	Refer to KC DC Design Criteria and EPR. Include this cost in NTE price. Submit prior to initiation of CD submittal	EPR under review. Power provided at server floor @ 150 watts/sf	
56	Mechanical - M0.1	Provide a tabulation of shared system capacities with planned future expansion and anticipated maximum capacities.	Sazan	McKinstry	Will provide, please clarify what future expansion and anticipated max capacities are desired, i.e. equipment? ductwork sizing? enclosure limits?	Question refers to 52.02 & 52.03 KCDC = 150w/sf + bldg loads	Design anticipates 150watts/sf per module.	
57	Mechanical - M0.1	There is reference to legacy equipment area. Identify the legacy area on floor plans.	Sazan	McKinstry	Will indicate	Include this cost in NTE price. Submit prior to initiation of CD design	Agreed	
58	Mechanical - M0.1	Clarify what ductwork revisions could be required in the future (see 4th paragraph, first column).	Sazan	McKinstry	Provisions for future expansion can be provided upon coordination with architect and tenant.	Include this cost in NTE price. Submit prior to initiation of CD design	Agreed. Provisions for future expansion can be provided upon coordination with architect and tenant.	
59	Mechanical - M0.1	Clarify last sentence of fifth paragraph on first column of text.	Sazan	McKinstry	Reviewing internally, will respond accordingly.	Include this cost in NTE price. Submit prior to initiation of CD design	Agreed	
60	Mechanical - M0.1	Alarm Resolution table; Condition Row 2: How would the proposed solution help the overall system (sequence of operation may clarify this)	Sazan	McKinstry	Reviewing internally, will respond accordingly.	Include this cost in NTE price. Submit prior to initiation of CD design	Agreed. Tenant and a single AHU will be isolated from other two tenants and AHUs. Rest of tenants will be handled by remaining AHUs (possibly 1 or more units depending on which tenant and AHU is isolated). VAV in units will provide correct supply air to all tenants.	
61	Mechanical - M0.1	Alarm Resolution table; Condition Row 4: Pumps do not appear to have associated redundant pumps as suggested by control notes.	Sazan	McKinstry	Reviewing internally, will respond accordingly.	Include this cost in NTE price. Submit prior to initiation of CD design	Agreed. Redundant pump is with redundant chillers. Once a pump fails then the associated chillers will be taken off line and the redundant package will start up.	
62	Mechanical - M0.1	Alarm resolution table; Condition Row 3: Why over pressurization does not shut affected air handling unit?	Sazan	McKinstry	Reviewing internally, will respond accordingly.	Include this cost in NTE price. Submit prior to initiation of CD design	Agreed. Correct, over pressurization will shut affected AHU. Will be indicated in Sequence of Operation.	

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			M2.2	Mechanical - Mechanical - M2.2 If KC does not expand to expansion space and a different tenant occupies the space, how would the expansion space be air conditioned?	Sazan	McKinstry	Describe how conversion will be accommodated for minimal effort.	3/5/08	
				Mechanical - M4.0	Sazan	McKinstry	Will develop shop drawing details of installation during construction for review and comment by tenant.	3/17/08	
				Mechanical - General	Sazan	McKinstry	Load capacity accommodated for as specified by tenant. Include input and output files.	3/21/08	
				Mechanical - General	Sazan	McKinstry	Provide sink for break room.	3/26/08	
				Mechanical - General	Sazan	McKinstry	Provide fire protection and VESDA drawings.		
				Electrical - General	Sazan	Sabey	What is length of time generators can be kept operational at full load?		
				Electrical - E2(37)	Sazan	Veca	Partial 2nd Floor Power Plan: Number of STS's shown on plan does not match the One-Line E5.4. Clarify		
				Electrical - E5.4	Sazan	Veca	General: Feeder sizes not shown on the one-line diagram. Provide clarification		
				Electrical - E5.4	Sazan	Veca	27kV Switchgear MSG-2, Feeders 52-5 and 52-6: Omit the neutral conductors.		
				Electrical - E5.4	Sazan	Veca	SWBD's HDP-52A & 52B: drawings should indicate a 3-Phase, 4-Wire bus rather than the 3-Phase, 3-Wire bus. Confirm requirements.		
				Electrical - E5.4	Sazan	Veca	SWBD's HDP-52A & 52B, three leftmost circuits: Clarify the objective of the GFR sensors. Under what conditions will the circuit breakers be tripped? If power is interrupted to the HVAC equipment, what is the contingency plan for cooling the data center?		
				Electrical - E5.4	Sazan	Veca	Ensure that ground-fault relays installed in HDP-52A & 52B are selectively coordinated with the units installed at TA-52 and TB-52.		
				Electrical - E5.4	Sazan	Veca	Distribution Panels DP 52-A1, B1, C1, and D1: Provide main circuit breakers in panels that exceed six over current protective devices.		
				Electrical - E5.4	Sazan	Veca	Recommend against tripping the 4000A generator circuit breakers on ground-fault. Recommend ground-fault alarm only. Confirm.		
							Future expansion can be accommodated in existing design, TBA per coordination with owner and tenant.		
							Accepted		
							Sumit Load calculations used to size air handling units, exhaust fans, and chillers. Include input and output files.		
							Include this cost in NTE price. Submit prior to initiation of CD design		
							Include this cost in NTE price. Submit prior to initiation of CD design		
							Propose operations plan to maintain 72 hours without refueling.		
							Include this cost in NTE price. Submit prior to initiation of CD design		
							Include this cost in NTE price. Submit prior to initiation of CD design		
							No comment required		
							No comment required		
							Include this cost of contingency plan in NTE price. Submit prior to initiation of CD design		
							Include this cost in NTE price. Submit prior to initiation of CD design		
							Provide additive alternate for main breakers. Submit prior to initiation of CD design		
							Include this cost in NTE price. Submit prior to initiation of CD design		

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Review Comment #	Drawing No. OR Spec Section and Page No.	Review Comments	Reviewer Initials	Reply by:	Sabey Reply	Feedback to Sabey Reply	Sabey Comments
100	DD Narrative	verify that there will be no hot/cold spots outside the enclosed separated aisles. This includes MDF and legacy equipment areas.		McKinstry		Include this cost in NTE price. Submit prior to initiation of CD design	Agreed. New servers will be separated by hot/cold aisles. Small amount of legacy of equipment will be cooled by being located directly below supply diffuser.
101	DD Narrative	Basis of design HVAC temperatures shall meet KC performance requirements. Note that KC may elect to operate the system at higher temperatures at their discretion.		Sabey	Systems capable of meeting KC requirements, however additional savings will be realized by increasing to 72 degrees	Acceptable	Agreed. EPR under review.
102	DD Narrative	Narrative should delete exclusions identified by McKinstry and other subcontractors		Sabey	Agreed	acceptable	Agreed
103	DD Narrative	Vesda is a basic requirement. Include in Second floor areas		Veca	Vesda has been in and out of the scope depending on the meeting and who is attending. Still unclear. Can provide pricing for adding Vesda. Need clarification of scope.	Include this cost in NTE price.	Agreed
104	DD Narrative	Provide a budget allowance for Coax Backbone, KCPAN and KCWAN		Sabey/ Cochran	Pending KC final Comm recommendations. Sabey to work w/Cochran on redesign.	Acceptable	Agreed
105	DD Narrative	Allow for 48 ports per Server cabinet to Zone cabinet in lieu of 72 indicated		Sabey/ Cochran	Pending KC final Comm recommendations. Sabey to work w/Cochran on redesign.	Include this cost in NTE price. Submit prior to initiation of CD design	Agreed
106	DD Narrative	Backbone fiber needs to be single mode rather than multimode		Sabey/ Cochran	Pending KC final Comm recommendations. Sabey to work w/Cochran on redesign.	Include this cost in NTE price. Submit prior to initiation of CD design	Agreed
107	DD Narrative	Cat 5e does not meet KC standards		Sabey/ Cochran	Pending KC final Comm recommendations. Sabey to work w/Cochran on redesign.	Provide cat 6 copper cabling	Agreed
108	DD Narrative	Allow for 3.840 server communication ports for 80 server cabinets		Sabey/ Cochran	Pending KC final Comm recommendations. Sabey to work w/Cochran on redesign.	Include this cost in NTE price. Submit prior to initiation of CD design	Agreed