PART 1 - GENERAL

1.1 SUMMARY

A. Description:

1. This section specifies the standards that the Contractor shall follow for their scope of work related to Facilities Management Data (FM Data) Requirements. This section also includes information related to documents that are required for operation and maintenance support functions.

2. This section does not negate any other section that requires Commissioning or Operations & Maintenance Data.

3. Part 3 includes information about owner provided tools for managing the facilities management data and documents.

B. Related Sections:

1. Section 01 70 00 - Contract Close-out

2. Section 01 91 00 - General Commissioning Requirements

PART 2 - PRODUCTS

2.1 SUBMITTALS

A. Facility Equipment Information

1. **Content:** The Contractor will provide facilities information, that is:

a. Contact Information (email, company name, website, phone number) per the following:
   i. general contractor(s)
   ii. sub-contractors installing products from 'equipment information' section
   iii. manufacturers providing equipment from 'equipment information' section
   iv. Example: info@trane.com, Trane, trane.com, 999.999.9999

b. Space Information (Provided by Architect):
   i. room number, room name, floor number, ceiling height, associated floor plans (Mechanical ductwork and piping, Plumbing, Electrical power)

      1. ex: M107, Main Mechanical Room, 01, 16', M-102A, M202-A, P-102A, E-102A
      2. The drawings to be cross-referenced shall be the original contracted (awarded) drawings. If "as-builts" are produced at the end of the project, the updated drawings can be substituted for the original drawings.

c. Equipment Information: (for list of expected equipment types, see Table 01 - Required Equipment)

Note: Equipment Types are typical categories of assets with common characteristics and attributes that match equipment groups in the owner's operational systems. Effort has been made to align the information requested during construction to the format and content of the operational systems that will receive the information after turn-over to operations. Table 01 is a master list of equipment (or asset) types that Operations requires to the extent that this equipment is part of the final construction scope of work (new and renovation).

i. Construction Start Data (Provided by Architect): equipment name (from plans), equipment location (room number), equipment description, asset type

1. ex: AHU-1, M107, Air Handler, AHU

2. This is information that can be assembled from the initial set of construction documents. This is the first building block of the FM requirements that can be initiated prior to the development of submittals and their approvals.

ii. Submittal Data:

1. General: installer, manufacturer, model, approximate cost, expected life, warranty duration, associated approved submittal

a. ex: HVAC Installers, Trane, C1000, $125,000, 30 years, 5 years, 23 00 10 - Air Handlers.pdf

b. This is information that will be added to the FM data once submittals are approved and specific equipment information has been determined.

2. Parent (Provided by Architect): Identify parent (upstream) component equipment as applicable and seen in Table 02 – Equipment Attributes. Parent / child relationships between equipment are critical to operational effectiveness after transition to operations. This information is used in the operational systems by the owner's facilities management organization.

a. ELEC: this should indicate the electrical panel feeding power to the component (asset / piece of equipment).

i. Example: for AHU-1, the electrical parent is Panel N1L1 (AHU-1 is powered from Panel N1L1)

b. HVAC: This shall indicate the mechanical equipment connections to the component (asset / piece of equipment)
   i. Example: for AHU-1, the parent is "N/A"
   ii. Example: for VAV-1, the parent is "AHU-1"

3. Support Locations (Provided by Architect): Support locations are the spaces (room numbers) that are impacted by (or supported by) equipment. This information could be limited to one room or multiple rooms. This information aids the operation team after transition to operations by knowing what spaces are affected by equipment that needs to be isolated (shut down) for various reasons.

4. Specific Attributes: For list of applicable attributes, see Table 02-Equipment Attributes. Equipment attributes vary by equipment type (asset type).

   a. Example: filter size - 36"x36"x2", filter type - pleated, max CFM - 50,000

   b. Examples of possible attributes are:
      i. voltage, amperage, horsepower, RPMs, GPMs, BTUs, heating & cooling capacity, filter type, filter size (oil, water, air)
      ii. Attributes vary by equipment type and can be difficult to manage in XLS files alone. The tool that is available aids greatly in keeping this information organized and structured correctly. Further, the tool has been pre-configured to match the requirements of this specification.

iii. Install Data: serial number, barcode, name plate photo, equipment photo

1. Example: 100045312, 5023321, AHU1-nameplate.jpg, AHU1.jpg

2. This information can only be gathered once the equipment has been properly installed in the field. Photos should be taken of the equipment in the final installed condition (not in-process condition).

iv. Close-Out Data: associated commissioning report, associated O&M document, associated warranty document

1. ex: CX-AHU1.pdf, OM-AHU1.pdf, Warranty-AHUs.pdf

d. Referenced Documents:

i. Associated electronic files of referenced documents from 'equipment information'

ii. File names of electronic files shall match what is referenced in appropriate fields for document name. When the web-based tool is used this will be accomplished during the upload process.

2. **Deliverable Format:** The Contractor will provide facilities information, per the following:

a. Contact, spatial, and equipment information shall be provided in spreadsheet format. For an example of spreadsheet deliverable, see Table 03 - Example Data Format.

b. Referenced documents shall be provided in electronic format and organized per the following:

i. Parent folder named by building number and year of substantial completion. (ex: 1416-2013)
ii. Sub folders named by document type (Submittals, O&Ms, Cx, Drawings, As-Builts, Warranties)
iii. For an example of a spreadsheet formatted document deliverable, see Table 04 - Reference Document Example

3. **Schedule for Data Development:**

The Contractor will provide equipment information throughout the project as the information becomes available and approved for use. As seen in a previous section (equipment information), each set of fields are named to indicate the expected phase the data is to be provided. They include: 1) construction start, 2) submittal, 3) install, and 4) close-out.

The first set of fields will be those data points that are provided by the Architect at construction start. The second set of fields will be those data points that are to be provided by the Contractor during the submittals stage. The third set of fields will be those data points that are to be provided by the Contractor during the install / inspection stage. The last (fourth) set of fields will be those data points that are to be provided by the Contractor during the close-out stage.

Reasonable milestone dates for each of the four data deliverable phases shall be provided by the Contractor for approval by the Owner at construction, such as the completion of all submittals. The intent is for the Contractor to make reasonable progress on the FM Data deliverables over the duration of the construction effort and not to defer the effort until the final months of the project. The entirety of the final data is to be completed within two weeks after substantial completion.

4. **Final Deliverable**: The Contractor shall provide hard copies (includes electronic files) of final deliverables to the owner within two (2) weeks of the substantial completion date. Deliverable data shall match what is within the web-based tool (the source), and shall be in spreadsheet format

(XLS) exported from that web-based tool. Format of deliverables, content, and schedule are addressed in other parts of this specification section.

End of this section contains all tables.

Table 01 - Required Equipment List

Table 02 - Equipment Attributes

Table 03 - Example Data Format

Note – The intent of Table 03 is to show an example of what the "hard copy" or objective deliverable would constitute for Contractor to Owner transmittal. When a web-based tool is used to organize and compile the data and documents, it is also required to have a final set of deliverables that can be transmitted to the Owner.

Table 04 - Reference Document Example

PART 3 - EXECUTION

3.1 Process

A. Web-Based Tool for use

The information in this specification section is presented in tables (originated in XLS format). However, some critical aspects of the FM Data have relationships that are best managed in a relational database tool (and format). Therefore, a tool (a web-based software) is available to facilitate and simplify the organization of the required data and documents specified by the narrative and tables included herein. The web-based tool provides a means by which the complexities of the requirement can be more readily achieved, managed, verified, and handed over to the Owner during transition to operations and construction contract close-out. The web-based tool has been pre-configured to match the data requirements of the specification in advance for use by the construction team. That is, pick lists within the tool match the specification requirements, which provides for a measure of build in quality assurance and data validation. The tool also allows for delegation of trade-specific roles to sub-contractors by the Contractor (if so elected by the Contractor). The web based tool provides a consistent platform by which the Owner's project manager and the Owner's designated facilities management organization can review progress of data and documents across multiple projects that are in-process. The web-based tool also affords the project team and the Owner the production of a consistent deliverable for transition to operations actions across a wide-variety of projects and Contractors.

B. Submission & Review of facilities information

a. The Contractor shall provide the completed data fields at the end of each major phase of construction as indicated in the schedule section above and per the related milestone dates.

b. Data shall be submitted (made available) to owner at agreed upon milestone dates for review purposes. The owner will review data for accuracy with documents and field conditions by various means.
c. Following review at various stages, the owner will provide the contractor with an issue report. Issue reports will contain any discovered deviations from field conditions or inaccuracies of facilities data. Any identified deviations from field conditions (issues) will require the contractor correct and resubmit the data within two (2) weeks of receiving the issue report.

C. Tools:

a. The Contractor shall maintain the facilities management data within a data management tool, such as O&M Logger, and be approved by the owner's operation and maintenance organization. The facilities data tool shall be capable of validating that naming standards from this specification are followed during data collection. Also, the facilities data tool shall provide constant access to the Owner for on-going review, comment, and export to spreadsheet format. The facilities data tool shall also allow for access of project information on mobile platforms in the field for data collection and field review purposes.

Table 01 - Required Equipment List

Note 1: This list (table) includes required equipment that can also be called an "Equipment Type Matrix" because the list is organized by "Asset Types".

Note 2: "Serialized" Assets are assets that will have an individual instance by piece of equipment and will be tracked individually. Example: AHU or Chiller. "Group" Assets are assets that will be handled as a "group" and not tracked individually. Example: Interior Lights

Asset Type (Note 1)	Comments	Type	System
DOOR POSITION SWITCH	One Per Building	Group	ACCESS
EXT RDR		serialized	ACCESS
EXTERIOR DOORS, KEYED		serialized	ACCESS
INT RDR		serialized	ACCESS
LOCK	One Per Building	Group	ACCESS
LOCKBOX		serialized	ACCESS
OPENER		serialized	ACCESS
SPECIAL ACTION DOORS		serialized	ACCESS
MANHOLE		serialized	ALL
METER		serialized	ALL
TANKS		serialized	ALL
CABINET		serialized	ARCHITECTURAL
CEILINGS	One Per Building	Group	ARCHITECTURAL
EXT WALLS	One Per Building	Group	ARCHITECTURAL
FIXED PARTITIONS		serialized	ARCHITECTURAL
FIXED SEATING	One Per Building	Group	ARCHITECTURAL
FLOORS	One Per Building	Group	ARCHITECTURAL
INT WALLS	One Per Building	Group	ARCHITECTURAL
MISC ARCHITECTURAL		serialized	ARCHITECTURAL
OPERABLE PARTITIONS		serialized	ARCHITECTURAL
ROOF		serialized	ARCHITECTURAL
WINDOW COVERING	One Per Building	Group	ARCHITECTURAL
WINDOWS	One Per Building	Group	ARCHITECTURAL
ELEVATOR		serialized	CONVEYING
HOISTS & CRANES		serialized	CONVEYING
LIFTS		serialized	CONVEYING
ESCAPE PPE		serialized	EH&S
FIRST AID DEVICES		serialized	EH&S
SPILL EQUIPMENT		serialized	EH&S
AUTOMATIC TRANSFER SWITCH		serialized	ELEC
BATTERY SYSTEMS		serialized	ELEC
BUILDING GROUNDING SYSTEMS	One Per Building	Group	ELEC
DP	DISTRIBUTION PANEL	serialized	ELEC
EQUIPMENT DISCONNECTS	One Per Building	Group	ELEC
EXIT LIGHT	One Per Building	Group	ELEC
EXTERIOR LIGHT FIXTURES	One Per Building	Group	ELEC
GENERATOR		serialized	ELEC
HV SWITCH		serialized	ELEC
INTERIOR LIGHT FIXTURES	One Per Building	Group	ELEC
LC	LOAD CENTER	serialized	ELEC
LIGHTING CONTROL EQUIPMENT		serialized	ELEC

Asset Type (Note 1)	Comments	Type	System
LIGHTNING PROTECTION	One Per Building	Group	ELEC
MCC	MOTOR CONTROL CENTER	serialized	ELEC
MDP	MAIN DISTRIBUTION PANEL	serialized	ELEC
MOTOR		serialized	ELEC
PKL LIGHT	One Per Building	Group	ELEC
POWER EQUIPMENT		serialized	ELEC
PULL BOX	SITE DUCT BANK PULLS	serialized	ELEC
SOLAR/PV EQUIPMENT	One Per Building	Group	ELEC
SURGE PROTECTORS		serialized	ELEC
UPS SYSTEM		serialized	ELEC
XFMR	TRANSFORMER	serialized	ELEC
DEFIBRILLATOR		serialized	EMERGENCY
EMG LIGHT	One Per Building	Group	EMERGENCY
EMG PHONE		serialized	EMERGENCY
EYEWASH		serialized	EMERGENCY
FIRST AID		serialized	EMERGENCY
FUME HOOD		serialized	EMERGENCY
MISC EMERGENCY EQUIPMENT		serialized	EMERGENCY
SF SHOWER		serialized	EMERGENCY
ANNUNCIATORS		serialized	FIRE ALARM
DAMPERS		serialized	FIRE ALARM
FIRE ALARM DEVICES	INDICATING DEVICES	serialized	FIRE ALARM
FIRE ALARM PANEL		serialized	FIRE ALARM
FIRE INITIATING DEVICES		serialized	FIRE ALARM
FIRE DEPARTMENT CONNECTIONS		serialized	FIRE SUPPRESSION
FIRE EXTINGUISHERS		serialized	FIRE SUPPRESSION
FIRE HYDRANTS		serialized	FIRE SUPPRESSION
FIRE SUPPRESSION SYSTEM	One Per Building	Group	FIRE SUPPRESSION
SPRINKLERS	One Per Building	Group	FIRE SUPPRESSION
APPLIANCE		serialized	FOOD SERVICE
COLD TABLE		serialized	FOOD SERVICE
CONVEYER		serialized	FOOD SERVICE
COOK TOP		serialized	FOOD SERVICE
COOLER		serialized	FOOD SERVICE
FREEZER		serialized	FOOD SERVICE
ICE MAKER		serialized	FOOD SERVICE
MISC		serialized	FOOD SERVICE
OVEN		serialized	FOOD SERVICE
VENT HOOD		serialized	FOOD SERVICE
WASH STATIONS		serialized	FOOD SERVICE
AHU		serialized	HVAC
AIR VALVE		serialized	HVAC
ATU	AIR TERMINAL UNIT	serialized	HVAC
BOILERS		serialized	HVAC
CHILLERS		serialized	HVAC
COMPRESSORS		serialized	HVAC
CONTROL DEVICES		serialized	HVAC
CONTROLLER		serialized	HVAC
COOLING TOWER		serialized	HVAC
DHUM	DEHUMIDIFIER	serialized	HVAC
DXU	DIRECT EXPANSION UNIT	serialized	HVAC

Asset Type (Note 1)	Comments	Type	System
ERU		serialized	HVAC
FAN		serialized	HVAC
FCU		serialized	HVAC
FILTERS	One Per Building	Group	HVAC
GRILLS	One Per Building	Group	HVAC
HEAT EXCHANGERS		serialized	HVAC
HEATERS		serialized	HVAC
HUMIDIFIER		serialized	HVAC
OAHU	OUTSIDE AIR HANDLING UNIT	serialized	HVAC
PKG UNIT		serialized	HVAC
PUMP		serialized	HVAC
SENSORS		serialized	HVAC
SEPERATORS		serialized	HVAC
STRAINER		serialized	HVAC
UNIT HEATER		serialized	HVAC
VFD	VARIABLE FAN DRIVE	serialized	HVAC
WATER VALVES		serialized	HVAC
HAND BOXES		serialized	IRRIGATION
IRRIGATION SYSTEM	One Per Building	Group	IRRIGATION
CLEAN OUT	One Per Building	Group	PLUMB
DISPOSAL		serialized	PLUMB
DRAIN	One Per Building	Group	PLUMB
FAUCETS	One Per Building	Group	PLUMB
FLUSH VALVES	one per building	Group	PLUMB
PURIFIERS		serialized	PLUMB
RPZ	PRESSURE REDUCING VALVE	serialized	PLUMB
SINKS	One Per Building	Group	PLUMB
TRAPS		serialized	PLUMB
URINALS	One Per Building	Group	PLUMB
WATER CLOSET	One Per Building	Group	PLUMB
WATER FOUNTAIN		serialized	PLUMB
WATER HEATER		serialized	PLUMB
ANIMAL EQUIPMENT		serialized	RESEARCH
BIO HAZARD EQUIPMENT		serialized	RESEARCH
INCUBATORS		serialized	RESEARCH
LAB EQUIPMENT		serialized	RESEARCH
LAB STERILIZER		serialized	RESEARCH
RESEARCH EQUIPMENT		serialized	RESEARCH
SECURITY CAMERAS		serialized	RESEARCH
SECURITY PANEL		serialized	RESEARCH
BOLLARDS	One Per Building	Group	SITE
LIGHTING POLES	One Per Building	Group	SITE
SIGN	One Per Building	Group	SITE
TRAFFIC CONTROL	One Per Building	Group	SITE
WASTE EQUIPMENT		serialized	SITE

Table 02 - Equipment Attributes

System	Asset Type	Attributes
ACCESS	LOCKBOX	location
ACCESS	LOCKBOX	asset number
ACCESS	Special Action Doors	Door Type
ALL	MANHOLE	GPS coordinate
ALL	METER	meter type
ALL	METER	remote reading
ALL	METER	reading ranges
ALL	METER	temp range
ALL	METER	Instrumentation tag number
ALL	Tanks	capacity*
ALL	Tanks	tank volume
ALL	Tanks	max system temp
ALL	Tanks	max system pressure
ARCHITECTURAL	Cabinet	paint finish
ARCHITECTURAL	Cabinet	color
ARCHITECTURAL	Cabinet	hardware type
ARCHITECTURAL	Cabinet	part number
ARCHITECTURAL	Fixed Partitions	color
ARCHITECTURAL	Misc Architectural	any associated finishes
ARCHITECTURAL	Operable Partitions	color
CONVEYING	ELEVATOR	power*
CONVEYING	ELEVATOR	electrical panel name*
CONVEYING	ELEVATOR	weight limit
CONVEYING	ELEVATOR	speed
CONVEYING	ELEVATOR	src hp rating
CONVEYING	ELEVATOR	mg motor power
CONVEYING	ELEVATOR	starting amps
CONVEYING	ELEVATOR	accelerating amps
CONVEYING	Hoists & Cranes	power*
CONVEYING	Hoists & Cranes	electrical panel name*
CONVEYING	Hoists & Cranes	weight limit
CONVEYING	Hoists & Cranes	speed
CONVEYING	Hoists & Cranes	src hp rating
CONVEYING	Hoists & Cranes	mg motor power
CONVEYING	Hoists & Cranes	starting amps
CONVEYING	Hoists & Cranes	accelerating amps
CONVEYING	Lifts	power*
CONVEYING	Lifts	electrical panel name*
CONVEYING	Lifts	weight limit
ELEC	Automatic Transfer Switch	power*
ELEC	Automatic Transfer Switch	electrical panel name*
ELEC	Automatic Transfer Switch	capacity*
ELEC	Battery Systems	power*
ELEC	Battery Systems	electrical panel name*
ELEC	Battery Systems	capacity*
ELEC	Battery Systems	supply voltage
ELEC	Battery Systems	supply voltage offset
ELEC	DP	power*
ELEC	DP	electrical panel name*

System	Asset Type	Attributes
ELEC	DP	capacity*
ELEC	DP	main bus current
ELEC	DP	aic rating
ELEC	GENERATOR	power*
ELEC	GENERATOR	electrical panel name*
ELEC	GENERATOR	capacity*
ELEC	GENERATOR	electric generator efficiency
ELEC	GENERATOR	gfci capable
ELEC	GENERATOR	number of sources
ELEC	GENERATOR	maximum power output
ELEC	GENERATOR	start current factor
ELEC	GENERATOR	fuel type
ELEC	GENERATOR	fuel storage
ELEC	GENERATOR	fuel capacity
ELEC	GENERATOR	operating rpm limits
ELEC	GENERATOR	engine cooling type
ELEC	GENERATOR	engine size
ELEC	GENERATOR	number of batteries
ELEC	GENERATOR	battery capacity
ELEC	HV SWITCH	power*
ELEC	LC	power*
ELEC	LC	electrical panel name*
ELEC	LC	capacity*
ELEC	LC	main bus current
ELEC	LC	aic rating
ELEC	Lighting Control Equipment	power*
ELEC	Lighting Control Equipment	electrical panel name*
ELEC	MCC	power*
ELEC	MCC	electrical panel name*
ELEC	MCC	capacity*
ELEC	MCC	operating weight
ELEC	MCC	type of support
ELEC	MCC	horizontal bus current
ELEC	MCC	vertical bus current
ELEC	MCC	short circuit interrupting rating (KAIC)
ELEC	MCC	minimum bus bracing (KAIC)
ELEC	MDP	power*
ELEC	MDP	electrical panel name*
ELEC	MDP	capacity*
ELEC	MDP	operating weight
ELEC	MDP	type of support
ELEC	MDP	horizontal bus current
ELEC	MDP	vertical bus current
ELEC	MDP	short circuit interrupting rating (KAIC)
ELEC	MDP	minimum bus bracing (KAIC)
ELEC	MOTOR	power*
ELEC	MOTOR	electrical panel name*
ELEC	MOTOR	capacity*
ELEC	MOTOR	HP
ELEC	MOTOR	efficiency
ELEC	MOTOR	drive line (horizontal, etc.)

System	Asset Type	Attributes
ELEC	MOTOR	break horse power in bhp
ELEC	Power Equipment	power*
ELEC	Power Equipment	electrical panel name*
ELEC	Power Equipment	capacity*
ELEC	PULL BOX	location in space (ex: south wall, near parking lot)
ELEC	PULL BOX	power*
ELEC	Solar/PV Equipment	power*
ELEC	Solar/PV Equipment	electrical panel name*
ELEC	Solar/PV Equipment	capacity*
ELEC	Solar/PV Equipment	cell type
ELEC	Solar/PV Equipment	power tolerance
ELEC	Solar/PV Equipment	number of cells
ELEC	Surge Protectors	power*
ELEC	Surge Protectors	electrical panel name*
ELEC	Surge Protectors	max allowed voltage drop
ELEC	Surge Protectors	net impendence
ELEC	UPS System	power*
ELEC	UPS System	electrical panel name*
ELEC	UPS System	supply voltage
ELEC	UPS System	supply voltage offset
ELEC	UPS System	connected conductor function
ELEC	XFMR	power*
ELEC	XFMR	electrical panel name*
EMERGENCY	Defibrillator	location in space (ex: south wall, near bathrooms)
EMERGENCY	EMG PHONE	location in space (ex: south wall, near parking lot)
EMERGENCY	FIRST AID	location in space (ex: south wall, near bathrooms)
EMERGENCY	FUME HOOD	power*
EMERGENCY	FUME HOOD	electrical panel name*
EMERGENCY	FUME HOOD	capacity*
EMERGENCY	FUME HOOD	maximum air flow rate
EMERGENCY	FUME HOOD	temperature range
EMERGENCY	FUME HOOD	maximum working pressure
EMERGENCY	FUME HOOD	temperature rating
EMERGENCY	FUME HOOD	nominal air flow rate
EMERGENCY	FUME HOOD	open pressure drop
EMERGENCY	FUME HOOD	leakage fully closed
EMERGENCY	SF SHOWER	temper water
EMERGENCY	SF SHOWER	flow rate
FIRE ALARM	Dampers	capacity*
FIRE ALARM	Dampers	maximum air flow rate
FIRE ALARM	Dampers	nominal air flow rate
FIRE ALARM	Dampers	open pressure drop
FIRE ALARM	Dampers	leakage fully closed
FIRE ALARM	Dampers	IP address
FIRE ALARM	Dampers	BAS address
FIRE ALARM	Dampers	Parent DDC Panel Name
FIRE ALARM	Fire Alarm Panel	power*
FIRE ALARM	Fire Alarm Panel	electrical panel name*
FIRE SUPPRESSION	Fire Hydrants	PSI
FIRE SUPPRESSION	Fire Hydrants	GPM
FIRE SUPPRESSION	Fire Hydrants	line tap size

System	Asset Type	Attributes
FIRE SUPPRESSION	Fire Hydrants	GPS coordinates
FOOD SERVICE	COOLER	power*
FOOD SERVICE	COOLER	electrical panel name*
FOOD SERVICE	COOLER	capacity*
FOOD SERVICE	COOLER	compressor oil type
FOOD SERVICE	COOLER	refrigerant type
FOOD SERVICE	COOLER	compressor type
FOOD SERVICE	FREEZER	power*
FOOD SERVICE	FREEZER	electrical panel name*
FOOD SERVICE	FREEZER	capacity*
FOOD SERVICE	FREEZER	compressor oil type
FOOD SERVICE	FREEZER	refrigerant type
FOOD SERVICE	FREEZER	compressor type
FOOD SERVICE	ICE MAKER	power*
FOOD SERVICE	ICE MAKER	electrical panel name*
FOOD SERVICE	ICE MAKER	capacity*
FOOD SERVICE	ICE MAKER	compressor oil type
FOOD SERVICE	ICE MAKER	refrigerant type
FOOD SERVICE	ICE MAKER	compressor type
HVAC	AHU	power*
HVAC	AHU	electrical panel name*
HVAC	AHU	capacity*
HVAC	AHU	air filter type
HVAC	AHU	return fan capacity
HVAC	AHU	supply fan capacity
HVAC	AHU	fan ext pressure drop
HVAC	AHU	chilled water rate
HVAC	AHU	coil flow
HVAC	AHU	coil velocity
HVAC	AHU	coil capacity
HVAC	AHU	coil pressure drop
HVAC	AHU	entering air temp db/wb
HVAC	AHU	leaving air temp db/wb
HVAC	AHU	entering water temp
HVAC	AHU	leaving water temp
HVAC	Air Valve	capacity*
HVAC	Air Valve	maximum operating pressure
HVAC	Air Valve	valve operation
HVAC	Air Valve	type of valve
HVAC	Air Valve	location in space
HVAC	ATU	power*
HVAC	ATU	electrical panel name*
HVAC	ATU	capacity*
HVAC	ATU	air flow min
HVAC	ATU	air flow max
HVAC	ATU	pressure drop
HVAC	Boilers	power*
HVAC	Boilers	electrical panel name*
HVAC	Boilers	capacity*
HVAC	Boilers	energy source
HVAC	Boilers	partial load efficiency curves

System	Asset Type	Attributes
HVAC	Boilers	outlet temperature range
HVAC	Boilers	nominal energy consumption
HVAC	Boilers	nominal efficiency
HVAC	Boilers	heat output
HVAC	Boilers	pressure rating
HVAC	Boilers	normal operating pressure set point
HVAC	Boilers	maximum allowable pressure
HVAC	Boilers	maximum boiler temperature
HVAC	Boilers	boiler design temperature
HVAC	Boilers	water storage capacity
HVAC	Boilers	type of boiler
HVAC	Boilers	number of passes
HVAC	Chillers	power*
HVAC	Chillers	electrical panel name*
HVAC	Chillers	capacity*
HVAC	Chillers	chiller cooling capacity
HVAC	Chillers	chilled water inlet/outlet temp
HVAC	Chillers	chilled water flow rate
HVAC	Chillers	chilled water pressure drop
HVAC	Chillers	cooling water inlet/outlet temp
HVAC	Chillers	cooling water flow rate
HVAC	Chillers	cooling water pressure drop
HVAC	Chillers	hot water inlet/outlet temp
HVAC	Chillers	hot water flow rate
HVAC	Chillers	hot water pressure drop
HVAC	Compressors	power*
HVAC	Compressors	electrical panel name*
HVAC	Compressors	capacity*
HVAC	Compressors	has hot gas bypass
HVAC	Compressors	ideal capacity
HVAC	Compressors	nominal capacity
HVAC	Compressors	max pressure
HVAC	Compressors	compressor type
HVAC	Control Devices	IP address
HVAC	Control Devices	BAS address
HVAC	Control Devices	Parent DDC Panel Name
HVAC	CONTROLLER	analog inputs
HVAC	CONTROLLER	digital inputs
HVAC	CONTROLLER	IP address
HVAC	CONTROLLER	BAS address
HVAC	CONTROLLER	Parent DDC Panel Name
HVAC	Cooling Tower	power*
HVAC	Cooling Tower	electrical panel name*
HVAC	Cooling Tower	capacity*
HVAC	Cooling Tower	nominal capacity
HVAC	Cooling Tower	flow arrangement
HVAC	Cooling Tower	capacity control
HVAC	Cooling Tower	control strategy
HVAC	Cooling Tower	number of cells
HVAC	Cooling Tower	basin reserve volume
HVAC	Cooling Tower	lift elevation difference

System	Asset Type	Attributes
HVAC	Cooling Tower	operation temperature range
HVAC	Cooling Tower	ambient design dry bulb temp
HVAC	Cooling Tower	ambient design wet bulb temp
HVAC	Dampers	capacity*
HVAC	Dampers	maximum air flow rate
HVAC	Dampers	nominal air flow rate
HVAC	Dampers	open pressure drop
HVAC	Dampers	leakage fully closed
HVAC	Dampers	IP address
HVAC	Dampers	BAS address
HVAC	Dampers	Parent DDC Panel Name
HVAC	DHUM	power*
HVAC	DHUM	electrical panel name*
HVAC	DHUM	capacity*
HVAC	DHUM	nominal moisture gain
HVAC	DHUM	internal control
HVAC	DHUM	water requirement
HVAC	DHUM	saturation efficiency curve air pressure drop curve
HVAC	ERU	power*
HVAC	ERU	electrical panel name*
HVAC	ERU	capacity*
HVAC	ERU	supply fan ext. static pressure
HVAC	ERU	supply fan max hp
HVAC	ERU	exhaust fan ext static pressure
HVAC	ERU	exhaust fan total hp
HVAC	ERU	cfm range
HVAC	ERU	weight
HVAC	FAN	power*
HVAC	FAN	electrical panel name*
HVAC	FAN	capacity*
HVAC	FAN	air flow - maximum
HVAC	FAN	nominal pressure drop
HVAC	FAN	efficiency rating
HVAC	FAN	belt type
HVAC	FAN	drive line (horizontal, etc.)
HVAC	FAN	interlock
HVAC	FAN	pressure
HVAC	FCU	power*
HVAC	FCU	electrical panel name*
HVAC	FCU	capacity*
HVAC	FCU	exit static pressure
HVAC	FCU	entering air temp db/wb
HVAC	FCU	leaving air temp db/wb
HVAC	FCU	entering water temp
HVAC	FCU	leaving water temp
HVAC	FCU	total capacity
HVAC	FCU	sensible capacity
HVAC	FCU	chilled water flow
HVAC	FCU	cooling coil delta P
HVAC	FCU	fan motor hp
HVAC	FCU	filter type

System	Asset Type	Attributes
HVAC	FCU	fan type
HVAC	FCU	type of fan drive
HVAC	FCU	fan size (inches)
HVAC	FCU	fan efficiency in % or pf
HVAC	FCU	static pressure in "inches"
HVAC	Heat Exchangers	electrical panel name*
HVAC	Heat Exchangers	capacity*
HVAC	Heat Exchangers	exchanger type
HVAC	Heat Exchangers	dry weight
HVAC	Heat Exchangers	fluid volume
HVAC	Heat Exchangers	max temp
HVAC	Heat Exchangers	recommended coolant
HVAC	Heaters	power*
HVAC	Heaters	capacity*
HVAC	Heaters	entering air temp db/wb
HVAC	Heaters	leaving air temp db/wb
HVAC	Heaters	electrical panel name*
HVAC	Humidifier	power*
HVAC	Humidifier	electrical panel name*
HVAC	Humidifier	capacity*
HVAC	Humidifier	nominal moisture drop
HVAC	Humidifier	internal control
HVAC	OAHU	power*
HVAC	OAHU	electrical panel name*
HVAC	OAHU	capacity*
HVAC	OAHU	air filter type
HVAC	OAHU	return fan capacity
HVAC	OAHU	supply fan capacity
HVAC	PKG UNIT	power*
HVAC	PKG UNIT	electrical panel name*
HVAC	PKG UNIT	capacity*
HVAC	PKG UNIT	nominal condensing temp
HVAC	PKG UNIT	nominal evaporating temp
HVAC	PKG UNIT	nominal heat rejection rate
HVAC	PUMP	power*
HVAC	PUMP	electrical panel name*
HVAC	PUMP	capacity*
HVAC	PUMP	feet head
HVAC	PUMP	suction pressure
HVAC	PUMP	type (end suction, inline, etc)
HVAC	PUMP	max temp
HVAC	PUMP	max pressure
HVAC	PUMP	suction size
HVAC	PUMP	discharge size
HVAC	Sensors	location in space
HVAC	Separators	capacity*
HVAC	Separators	tank volume
HVAC	Strainer	capacity*
HVAC	Strainer	tank volume
HVAC	Strainer	type
HVAC	Unit Heater	power*

System	Asset Type	Attributes
HVAC	Unit Heater	electrical panel name*
HVAC	Unit Heater	capacity*
HVAC	Unit Heater	temp rise
HVAC	VFD	power*
HVAC	VFD	electrical panel name*
HVAC	VFD	minimum output frequency
HVAC	VFD	maximum output frequency
HVAC	Water Valves	capacity*
HVAC	Water Valves	maximum operating pressure
HVAC	Water Valves	valve operation
HVAC	Water Valves	type of valve
HVAC	Water Valves	location in space
IRRIGATION	Hand Boxes	GPS coordinate
PLUMB	Disposal	location
PLUMB	Disposal	voltage
PLUMB	Disposal	electrical panel name*
PLUMB	Purifiers	filter face velocity
PLUMB	Purifiers	media surface velocity
PLUMB	Purifiers	pressure drop
PLUMB	Purifiers	particle geometric mean diameter
PLUMB	Purifiers	water filter type
PLUMB	Purifiers	location
PLUMB	RPZ	inlet pressure
PLUMB	RPZ	outlet pressure
PLUMB	RPZ	minimum capacity
PLUMB	RPZ	valve size
PLUMB	RPZ	location
PLUMB	Traps	maximum operating pressure
PLUMB	Traps	water inlet temperature range
PLUMB	Traps	flow coefficient
PLUMB	Water Fountain	fountain type
PLUMB	Water Fountain	electrical panel name*
PLUMB	Water Heater	power*
PLUMB	Water Heater	electrical panel name*
PLUMB	Water Heater	capacity*
PLUMB	Water Heater	flow rate recovery at 100˚
PLUMB	Water Heater	storage capacity
PLUMB	Water Heater	steam supply entering coil pressure
PLUMB	Water Heater	entering water temp
PLUMB	Water Heater	PSI
PLUMB	Water Heater	leaving water temp
PLUMB	Water Heater	gas
RESEARCH	Incubators	power*
RESEARCH	Incubators	electrical panel name*
RESEARCH	Incubators	capacity*
RESEARCH	Incubators	heating range
RESEARCH	Incubators	cooling range
RESEARCH	Incubators	type
RESEARCH	Incubators	compressor type
RESEARCH	Lab Sterilizer	steam temperature
RESEARCH	Lab Sterilizer	type

Table 03 - Example Data Format

Space Information - Tab						
Name	Floor	Category	SF	Ceiling Height	Description	Drawings
100	1	020 Non Assignable: Public Circulation Area, Lobby Foyer	1413.44	12	LOBBY	A105
101	1	635 General: Food Facilities Svc	3648.16	12	FOOD PREP	A105
102	1	630 General: Food Facilities	4515.73	12	DINING	A105
103	1	710 Support: Central Comp or Telecom	39.66	12	IT	A105
104	1	U10 Special Use: Unisex Public Restroom	74.87	12	UNISEX	A105
105	1	M10 Special Use: Men's Public Restroom	287.67	12	MENS	A105
106	1	W10 Special Use: Women's Public Restroom	288.68	12	WOMENS	A106
110	1	030 Non Assignable: Mech Rm	292.03	12	MECHANICAL	A106
111	1	020 Non Assignable: Elev, Stair	81.16	12	STAIR	A106
112	1	310 Office: Staff Off	81.16	12	OFFICE	A106
113	1	010 Non Assignable: Custodial Rm	257.44	12	CUSTODIAL	A106
114	1	310 Office: Staff Off	95.94	12	OFFICE	A106
115	1	310 Office: Staff Off	95.94	12	OFFICE	A106
116	1	310 Office: Staff Off	95.53	12	OFFICE	A106
117	1	310 Office: Staff Off	158.52	12	OFFICE	A106

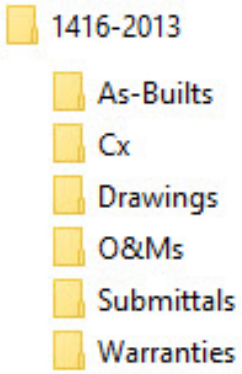
Contact Information - Tab				
Company Name	Phone	Website	Email	Description
CUMMINS POWER	123-456-7890	www.CUMMINSPOWERGENERATION.c	info@CUMMINSPOWERGENERATION.c	Generator Manufacturer
YORK	123-456-7890	www.YORK.com	info@YORK.com	Air Handler Manufacturer
JOHNSON CONTROLS	123-456-7890	www.JOHNSONCONTROLS.com	info@JOHNSONCONTROLS.com	HVAC Manufacturer
PENTAIR	123-456-7890	www.PENTAIR.com	info@PENTAIR.com	Pump Manufacturer
RECOUSA	123-456-7890	www.RECOUSA.com	info@RECOUSA.com	Water Heater Manufacturer
GENERAL ELECTRIC	123-456-7890	www.GENERALELECTRIC.com	info@GENERALELECTRIC.com	Electrical Equipment
MARATHON	123-456-7890	www.MARATHON.COM	info@MARATHON.com	Electrical Equipment Installer
TD INDUSTRIES	123-456-7890	WWW.TDINDUSTRIES.COM	info@TDINDUSTRIES.com	HVAC Installer

Table 03 - Example Data Format

Equipment			
Name	AHU-1	FPB-11	CHWP-1
Location	146	101	146
Asset Type	AHU	ATU	PUMP
Description	Air Handling Unit	Air Terminal Unit	Pump
Manufacturer	YORK	JOHNSON CONTROLS	PENTAIR
Installer	TD INDUSTRIES	TD INDUSTRIES	TD INDUSTRIES
Model	ITF-BD20	S10-48-2A	ES-6000-V
Warranty Term	5 YEARS	1 YEAR	1 YEAR
Life Expectancy	15 YEARS	5 YEARS	10 YEARS
Original Cost	$30,000	$750	$1,000
Serial	FCJ121004-01	700120-12	2122403934
Barcode	818557787731907	323127476194128	648076430374908
Submittals	23 73 14.001.0 AHU's (PD-SD) 2012-2-3.pdf	23 36 00.001.0 Air Terminal Units (PD) 2012-1-27.pdf	23 73 14.001.0 AHU's (PD-SD) 2012-2-3.pdf
O&M Files	OM-32 - HVAC-(Air Handler Unit_1).pdf	OM-Air Terminal Units.pdf	OM-Chilled Water Pumps.pdf
Cx Files	Cx-32 - HVAC-(Air Handler Unit_1).pdf	Cx-Air Terminal Units.pdf	Cx-Chilled Water Pumps.pdf
Parent	N1L1	AHU-1	N1L1
Support Locations	100, 101, 102, 103, 104, 105, 106, 110, 111, 112, 113, 114, 115, 116, 117	154, 155	
Attributes	air filter type: Pleated, capacity: 8030 CFM, chilled water rate: 50 GPM, coil capacity: 25 GPM, coil flow: 15 GPM, coil pressure drop: 30 PSI, coil velocity: 85 PSI, entering air temp db/wb: 60 F, entering water temp: 35 F, fan ext pressure drop: 25 PSI, leaving air temp db/wb: 45 F, leaving water temp: 55 F, power: 750 V, return fan capacity: 5000 CFM, supply fan capacity: 5000 CFM	power*: 32 VL, capacity*: 150 CFM, air flow min: 35 CFM, air flow max: 150 CFM, pressure drop: 25 PSI	power: 55 VL, capacity: 70 GL, feet head: 15 Ft/Head, suction pressure: 150 PSI, type (end suction, inline, etc): end suction, max temp: 135 F, max pressure: 500 PSI, suction size: 500 GPM, discharge size: 500 GPM

Table 04 - Reference Document Example

Note – the following directory format is for the electronic files that are part of the deliverable.



END OF SECTION