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Section 0 Executive Summary

Section 1 Strategy and Objectives

Section 2 FM BIM Execution Plan (FM BEP)

M (AEC + CxA) in order to satisfy expectations and project requirements. This is

FAMIS. Through the establishment of BIM for FM requirem
deliverables (digitally formatted) that support operations
purpose in standardization is to facilitate and produce a re

the FM Data while ensuring that configuration control is maintained for revisions and changes over the lifecycle of the project. Thus, team members are expected to provide the same type of project information they normally produce for use at specific points in the project lifecycle. These are outlined along with the specific details of the role of FM Data Integrator in other sections of the specifications. The BIM Execution Plan (BEP) will outline and document the project specific processes to be employed and will provide a mechanism for owner review and approval of the FM Data process via submittals for review and approval by the FDI. In this manner, additional services are not expected from the project delivery team members because SHSU is not asking for new deliverables but rather, the same information in a modified format in advance of contracting and work production to eliminate the occurrence of rework.

Description of Existing Infrastructure and other Operational Interfaces

SHSU currently uses FAMIS 2 as its computerized maintenance management system (CMMS), but will soon be transitioning to FAMIS 360. FAMIS supports the import of COBie (Construction Operations Building Information Exchange) data, which is an industry recognized open standard data format. COBie is one "tool" that is used in this process to organize and format the FM Data for use. The data structure (ex, Asset Groups) from FAMIS will help guide the assembly of COBie data at SHSU. These data structure rules have guided and informed the development of these requirements, and when followed correctly, will ensure project teams have built the COBie data-set in a manner that is consistent with SHSU CMMS requirements and data structures.

SHSU currently uses 3D models as a tool in facilities management. By requiring project teams to coordinate and share building models, allowance is made for immediate and future needs of the university. Therefore, all 3D Facilities Models (i.e., models from the AE (design intent) and the CM (as-built)) shall be provided in an acceptable format (see the FM data specifications) and not in any other proprietary or subscription based software. Additional requirements can be found in the FM data specifications.

As the construction industry and technology advances, SHSU will make incremental changes to the BIM for FM requirements over time. The current specifications represent the first generation of FM Data specifications and changes are expected to be accepted and processed that will integrate future technologies and workflow changes over time. However, these must be evaluated by SHSU for adoption from the industry and integrated into the project delivery strategy and handover requirements in light of how SHSU does FM work and how they want to receive and process project information (data), documents, and models.

Explanation of SHSU Expectations

The FM data specifications developed for and applied to this project are an evolving guideline for capturing BIM data at SHSU. However, a specific set of requirements does apply to this contract per the identified Exhibit. With]

Thus, these requirements are likely to be modified over time as more operating experience is gained in the use of FM Data and associated documents.

The FM Data Integrator shall also assess each project teams' ability to perform the scope of the BIM and FM data

Section 2 - BIM Execution Plan (BEP)

The objective of this section is to provide a project specific plan on how the BIM for FM requirements and deliverables will be accomplished. Each membe

2. BIM Use Staffing: [for each BIM & FM use selected, identify the team within the organization(s) who will staff and perform that use and estimate the personal time required. This helps the owner understand the level of effort (i.e., staffing plan) expected by the team members in delivery of the requirements.

BIM for FM Use	Organization	Number of Total Staff for Use	Estimated Worker Hours	Location(s)	Lead Contact
COBie					
Field Coordinated Model					
FM Model					

3. BIM for FM Delivery Schedule of Information Exchanges for Submi

3. Accuracy and Tolerances:
    a. *Note: At*

2. Attach documents intended for use in guiding coordination efforts. Guidelines should be at a minimum to the detail of BIM Forum MEP Spatial Coordination Requirements for BIM and have 1inch and above conduit modeled.

Section K: Update of the BEP

1. Provide Plan for revising BIM Execution Plan at each stage.

It is expected that the Design & Construction team provide additional documents (as needed) to coordinate BIM uses not detailed in this document. Those documents can be attached as Appendix to this document.

Attachments to Section 2 – BIM Execution Plan (BEP)

Exhibit 2.A - Grading Fields and Procedures

1. Explanation

The Facilities Data Integrator (FDI), shall provide ongoing evaluation (i.e., grading) of BIM for FM deliverables. The following provides an example of what aspects of the data deliverable shall be considered when grading. Also provided are methodologies, though not strictly required to be followed, for grading purposes.

Much of the successful grading is dependent upon a clear schedule being created during the BIM Execution Plan

2. Required Data Categories

At the beginning of the project, the owner will determine the data categories that should be imported to their CMMS. Those categories will allow the data to be consistently sorted and categorized in the owner's CMMS across multiple projects. The "Required Categories" section of the grading standard will measure how many of the owner's specified categories have been included in the data set. Example: Are the project AHU's, VAV's, and major shut-off valves present within COBie? This specific part of the review does not confirm that the ten AHU's in the project have all been incorporated into COBie; rather, that AHU's are being collected, in general.)

Required categories of data are determined at project setup according to the specifications and correspond to the different tabs in the COBie format standard. The grade will be assigned according to the number of categories completed in the appropriate tabs. Only categories in compliance with the specifications will count towards the number of scheduled categories required per month.

$$\text{عي} = \frac{\text{عدد الفئات المطلوبة المكتملة في علامات التبويب المناسبة}}{\text{عدد الفئات المطلوبة المكتملة في علامات التبويب المناسبة + عدد الفئات المطلوبة غير المكتملة في علامات التبويب المناسبة}}$$

3. Required Fields

At the beginning of the project, the owner will determine, with the help of the FDI, the data points of information that should be imported to their CMMS for each category, as described above. Those project data points will provide the O&M personnel the right information to efficiently and successfully steward the building for it's useful life. The "Required Fields" section of the grading standard will measure whether or not the owner's specified data points have been included in the data set. Example: If the project's AHU's, VAV's, & Shut-off valves are present within COBie, then are their data fields populated to match the current data schedule requirements? This specific part of the review does not confirm that any AHU's in the project have been incorporated into COBie; rather, that if AHU's are being collected, that their required data fields (model #, serial #, belt size, etc.) are being populated.)

A schedule will be created that depicts the required amount of data points for each category in each tab at specified intervals. Only cells in a populated row will count for or against the grade given. This grade is not intended to simply measure the quantity of cells filled, rather to compare the amount of cells actually populated with those that should be populated.

$$\text{عي} = \frac{\text{عدد الخلايا المطلوبة المكتملة في علامات التبويب المناسبة}}{\text{عدد الخلايا المطلوبة المكتملة في علامات التبويب المناسبة + عدد الخلايا المطلوبة غير المكتملة في علامات التبويب المناسبة}}$$

4. Quantity

At the beginning of the project the owner, with the assistance of the FDI, will conceptually estimate the number of rows of information per tab that will be in the final COBie spr

It is necessary that all information entered into COBie accurately reflects the field conditions. If data accuracy is inconsistent, O&M objectives will be frustrated and the deliver

SHSU - SAMPLE PROJECT SCHEDULE

		Month 1	Month 2	Month 3	Month 4	Month 5	Month 6	Month 7	Month 8	Month 9	Month 10	Month 11	Month 12	Month 13	Month 14	Month 15	Month 16
		Dec-13	Jan-14	Feb-14	Mar-14	Apr-14	May-14	Jun-14	Jul-14	Aug-14	Sep-14	Oct-14	Nov-14	Dec-14	Jan-14	Feb-15	Mar-15
Required Categories	8	2				4	6	7	7	8	8	8					
Required Fields/Columns	14	14				14	14	14	14	14	14	14					
Proposed Quantity (Rows)	*300*	10				25	40	50	60	75	90	105					
Required Categories	1	1															
Required Fields/Columns	5	5															
Proposed Quantity (Rows)	1	1															
Required Categories	3	3															
Required Fields/Columns	6	6															
Proposed Quantity (Rows)	*4*	4															
Required Categories	65	65															
Required Fields/Columns	10	10															
Proposed Quantity (Rows)	*100*	100															
Required Categories	5		2	3	5												
Required Fields/Columns	6		6	6	6												
Proposed Quantity (Rows)	*50*		20	30	50												
Required Categories	80		20	40	80	5	10	16	32	48	64	80					
Required Fields/Columns	17		6	6	6	17	17	17	17	17	17	17					
Proposed Quantity (Rows)	*100*		25	50	100	5	10	20	40	60	80	100					
Required Categories	100		25	50	100	20	5	10	20	40	60	80	100	100	100	100	
Required Fields/Columns	12		7	7	7	5	3	4	5	6	7	8	9	10	11	12	
Proposed Quantity (Rows)	*1500*		375	750	1500	300	75	150	300	600	900	1200	1500	1500	1500	1500	
Required Categories	20		5	10	20												
Required Fields/Columns	6		6	6	6												
Proposed Quantity (Rows)	*25*		5	15	25												
Required Categories	100												20	40	60	80	100
Required Fields/Columns	13												13	13	13	13	13
Proposed Quantity (Rows)	*200*												40	80	120	160	200
													PM -->				
Required Categories	10		1	1	1	2	2	2	2	2	2	3	4	5	6	8	10
Required Fields/Columns	10		10	10	10	10	10	10	10	10	10	10	10	10	10	10	10
Proposed Quantity (Rows)	*1200*		20	40	100	130	160	190	220	250	280	380	500	650	800	1000	1200
														O&M -->		Cx -->	
Required Categories	400								40	80	120	160	200	240	280	340	400
Required Fields/Columns	8								8	8	8	8	8	8	8	8	8
Proposed Quantity (Rows)	*500*								50	100	150	200	250	300	350	425	500
Required Categories	1														1	1	
Required Fields/Columns	9														9	9	
Proposed Quantity (Rows)	*50*														25	50	

Exhibit 2.C – Close-Out Procedures

End User Review & Acceptance

Test imports of the COBie data and documents may be performed leading up to final acceptance and review. However, once the COBie file has been successfully test imported into _COMPMS_, the Facilities Data Integrator (FDI) shall notify the Owner. The Owner then shall notify each end user to review assets identified as belonging to their respective department (organization). Areas of particular interest in review shall include those items that are shared between multiple end users/departments; ex: large Utility Water Valves should be reviewed by both Facilities Plumbing and Utilities Water Distribution.

This review exercise will ensure that all assets are accepted and are being maintained after handover. This also provides the owner's personnel an opportunity to become familiar with the new assets being added to their stewardship and to establish preventive maintenance (PM) procedures and/or to apply standing PM's to these newly uploaded assets.

Following notification to the owner, each end user shall have thirty (30) calendar days to review assets and schedule a meeting with the Facilities Data Integrator (FDI) and Owner to address any concerns and/or issues related to the Owner for how end u any) will be resolved.

Owner Review and Acceptance

Following End User Review and Acceptance, the Owner is responsible to review and provide final comments for the Facilities Data Integrator to address with AEC team. If no comments have been received by the Owner within thirty (30) calendar days of end user acceptance AND completion of final punch list items, Owner acceptance shall be granted to the FDI. This process should generally follow overall project substantial and final completion to ensure that all team members remain engaged in the FM data process.

AEC Team Final Handover

Per the BIM Execution Plan, regularly scheduled COBie data and document submissions will be reviewed and reported on by the Facilities Data Integrator at the agreed upon review intervals.

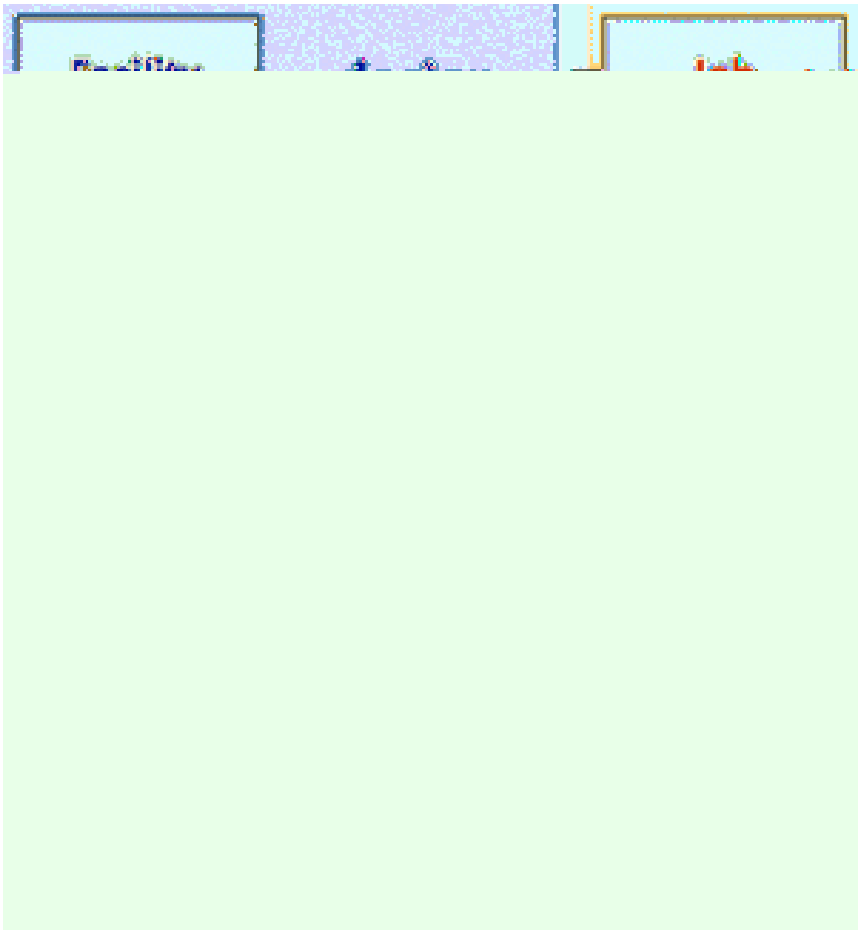
At the final scheduled COBie report, the Facilities Data Integrator shall provide the AEC team and Owner a final punch list to address all outsta

Section 3 - FM Data Specification

Note: This document must be carried out in alignment with other sections of the SHSU BIM & FM Guidelines and Specifications. Furthermore, a Responsibility Assignment Matrix (RAM) for each

worksheet and what constitutes that data set (or content). Also included is a final section for "lesson's learned" which mostly incorporates lessons learned from FAMIS use/import. **Also, please see important notes at the end of this document.**

Each worksheet has a series of column fields (A, B, C, etc) like a normal Excel spreadsheet. This specification will work through each "tab" and each "column" to define the data content for the COBie deliverable.



Section 3 - FM Data Specification

Tab 1: Contact (Provider)

The contacts in COBie represent, but are not limited to, the following personnel on the project. The other parties that get listed in Tab 1 are the "Providers". Typically, contacts are personnel who are responsible for originating data in COBie. Providers are people/companies who have provided labor and/or material to build the project. Providers will be discussed in Tab 6 (Types) in more detail.

- Authors of COBie information (data) (includes architects, engineers, other)
- Product manufacturers (vendors)
- Warranty guarantors
- Spare parts providers
- Prime contractors / subcontractors
- Project management staff
- Commissioning agents
- Test and Balance engineers (TAB)
- Construction materials testing companies (CMT)
- Other testing agencies (HiPOT, etc.)
- Utility service providers (power, water, communication, gas, etc.)
- Owner's Space Management Agent
- Owner's Facility Management Agent
- Owner's CMMS Management Agent
- Other key owner contacts needed for support in authoring COBie data
- Other project contacts and providers

Note: Division of responsibility for this project.

- Owner shall provide all contacts that are under the direct management of SHSU PDC, such as the architect, engineers, testing labs, commissioning agents, and other third party contacts, inclusive of utility providers (Electric, Gas, etc.).
- Owner to provide to Contractor current contact lists for vendors, contractors, & manufactures. Contractor to match case perfectly with COBie contacts
- Contractor to send FDI a list of project contacts that are duplicates of current Owner manufacturers, contractors, or vendors, yet with different contact information. FDI to prompt owner to decide if contact should be duplicated or if a new contact should be created.
- The contractor shall enter all contacts and providers (of labor and materials) that are under the management of their firm and subcontractors / vendors. These are also inclusive of "providers" for warranty (labor and materials) items.
- Owner shall provide all contacts they deem appropriate that are not covered by the above two entries.

Column A (yellow): Email
Enter the contact's e-mail address. This is the "primary key" for contacts. Where a specific person was not available, the company's email address or URL was provided (http://www.example.com/html).

Column B (orange): CreatedBy
The individual who created the data (or provided the information) will have their e-mail address appear here. The data is colored orange in XLS because it is an established key.

Column C (yellow): Created On
This is a date-time stamp for when the data was created.

Column D (yellow): Category
This is the category (or project "role") of the contact (or provider). This correlates to FAMIS "vendor codes".

Categorize the list of Contacts as follows:

- Contractor
- Architect
- Engineer
- Consultant
- Manufacturer
- Supplier

Column E (yellow): Company
This is the name of the company that the contact (or provider) works for during the project.

Note: Use Owner provided vendor names for manufacturers/suppliers and contractor codes for contractors.

Column F (yellow): Phone
Enter the contact's phone number or a main company phone number. Format in the United States shall be 123-456-7890. For international phone numbers, include the international exchange, as applicable, before the local number.

Column H (purple): ExtObject
This is a reference column for BIM data that is "automatically created" in another authoring tool (software). This would be the "external object name", if present.

Column I (purple): ExtIdentifier
This is a reference column for BIM data that is "automatically created" in another authoring tool (software). This would be the "external object identifier", if present.

Column J (green): Department
Enter a department code or name (description), as applicable, for the contact (provider). If contact is a contractor, provide contractor company name in this field.

Column K (green): Organization Code
Enter an organizational code or name (description), as applicable, for the contact (provider).

Column L (green): Given Name
This is the first name of the contact (provider).

Column M (green): Family Name
This is the last name of the contact (provider).

Column N (green): Street
Enter the contact's street address or business address, as applicable.

Column O (green):

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Section 3 - FM Data Specification

Column I (yellow): VolumeUnits
Units of measure applied to all worksheets.

Note: Use “cubicfeet” for this project.

Column J (yellow): CurrencyUnits
Units of measure applied to all worksheets.

Note: Use “dollars” for this project.

Column K (yellow): AreaMeasurement
This is the area measurement standard applied on the project spaces. It could be ANSI/BOMA or a client specific measuring procedure required by the institution / owner.

Note: Enter “SHSU Defined” for this project as the measurement methodology is specifically defined by the institution for reporting purposes.

Inside wall to inside wall is the standard measurement technique at SHSU.

Column L (purple): ExtSystem
This is a reference column for BIM data that is “automatically created” in another authoring tool (software).

Column M (purple): ExtObject
This is a reference column for BIM data that is “automatically created” in another authoring tool (software).

Column N (purple): ExtIdentifier
This is a reference column for BIM data that is “automatically created” in another authoring tool (software).

Column O (purple): ExtSiteObject
This is a reference column for BIM data that is “automatically created” in another authoring tool (software).

Column P (purple): ExtSiteIdentifier
This is a reference column for BIM data that is “automatically created” in another authoring tool (software).

Column Q (purple): ExtFacilityObject
This is a reference column for BIM data that is “automatically created” in another authoring tool (software).

Column R (purple): ExtFacilityIdentifier
This is a reference column for BIM data that is "automatically created" in another authoring tool (software).

Column S (green): Description
Provide an extended description of the facility. This correlates to FAMIS "building description" and shall be specified by the Owner.

Column T (green): Project Description
Provide an extended description of project.

Column U (green): Site Description
Provide an extended description of the site of the project.

Note: Use campus name as default.

Column V (green): Phase
Provide the phase number of project. Ex: Phase 1

Tab 3: Floor

The floor worksheet is associated with floors within a specific facility. Floors can be vertical floors (ground, 1, 2, 3, other, etc.) as named by the designer. Floors can also include basements, crawl spaces, roofs, and site areas outside of the buildings when these areas have assigned Components (See Tab 7). Floors are horizontal planes that include specific "spaces" (see Tab 4 for Spaces).

Column A (yellow): Name
This is a unique "floor" name for the facility and the primary key for all floors. Floors correlate to FAMIS "floor ID". Confirm the list of "floor IDs" (below) with Owner's CMMS Manager.

Floor numbers are two characters in length. Zero fill the first position of the Floor field for floors less than 10 (01, 02, etc.). A basement should be coded as '00'. Sub-basements should be coded with an 'S' in the first position and the sub-basement number in the second position (S1, S2, etc.). Mezzanines should be coded with an 'M' in the first position and the mezzanine number in the second position (M1, M2, etc.) See illustration:

Column B (orange): CreatedBy

The individual who created the data (or provided the information) will have their e-mail address appear here. The data is colored orange because it is a previously establ atio

Provide an extended description of the floor, per the Owners approval.

Column I (green): Elevation
Provide height above established project datum.

Note: The project datum shall be taken as Elevation 0'-0" at the ground level (LEVEL 1).

Column J (green): Height
Provide floor to floor height, as applicable. Provide the floor to floor heights as listed on construction drawings.

Tab 4: Space

The space worksheet includes the project's space name. Spaces are cross-referenced to floors from Tab 3. Space data also includes the following: space function, floor identification, area measurement, and the owner's room number (final way finding nomenclature), if different from the contract document space naming protocol.

Column A (yellow): Name
This is a unique "space" name for the area and the primary key for all spaces. Space name correlate to FAMIS "location code".

Note: For this project, this field will be the room numbers indicated on the final way finding. For exterior spaces, provide location in reference to the building name (ex: 999-South, 999-East, 999-North, 999-West)

Note: The current maximum number of allowable characters for a space name is 15. Also, commas "," are not allowed in space names.

Column B (orange): CreatedBy
The individual who created the data (or provided the information) will have their e-mail address appear here. The data is colored orange because it is a previously established key.

Column C (yellow): CreatedOn
This is a date-time stamp for when the data was created.

Column D (yellow): Category
This is the category of the space. Answer the question: What kind of space is it?

Space Category correlates to FAMIS "location type" and shall be selected from list obtained from Owner's Space Management department. Categories shall be verified with Owner's Space Management department once they are input.

Section 3 - FM Data Specification

Section 3 - FM Data Specification

Provide usable height in each space per the measuring standards identified on Tab 2 for Facilities. This unit of measure is “feet”. Use decimal format (i.e., 10 feet 6 inches of height would be 10.5, and 8 feet 4 inches of height would be 8.33). This is a mandatory Owner specified field unless removed from the project execution plan by the FDI with the Owner’s permission.

Column L (green): GrossArea

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Column A (yellow): Name
Provide zone names. Within COBie, zones are specific to the corresponding facility and should not correspond to areas in other facilities. Zone should read per the following example below:

Name	Description
Mechanical Rooms (866)	Zone Type (Building Number)
AHU-1 (Support Locations-866)	Parent Asset (Support Locations-Building Number)

Note: Spaces that should not be included in space reporting, and are outside of original space inventory provided to FDI, should be flagged in a zone named "Non Occupancy"

Note: Space Name correlates with FAMIS "Zone Code" and allows a maximum of 15 characters.

Maximum number of characters = 15

Column B (orange): CreatedBy
The individual who created the data (or provided the information) will have their e-mail address appear here. The data is colored orange because it is a previously established key.

Column C (yellow): CreatedOn
This is a date-time stamp for when the data was created.

Column D (yellow): Category
Provide category code for the named zone from the following list: Mechanical, Electrical, HVAC Support.

Note: Space Category correlates with FAMIS "Zone Type" and allows a maximum character count of 15.

Column E (orange): SpaceNames
Assign spaces to each named zone, as applicable. Given that multiple zones will (could) exist and that spaces will be associated with each zone, a space may be assigned to multiple zones. Data in XLS format will be spaces separated by commas, thus representing one unique n 6 seE \ sssug t

M M ¯ Pr vid ₴ dbE sse ' E E

Column H (purple): ExtIdentifier
This is a reference column for BIM data that is "automatically created" in another authoring tool (software).

Column I (green): Description COBie2.4 update
This is a description of the Zone and should read per the following list: Mechanical Room Zone, Electrical Room Zone, HVAC Support Locations.

Tab 6: Type (and Warranty)

The type worksheet categorizes components (see Tab 7) and includes warranty information.

Column A (yellow): Name
Provide a name for the "type" of component that serves as the primary key for all types.

See Exhibit 3c: Asset Type Matrix for required types.

Note: One limiting factor for types in the COBie 2 format is that Column H is for a "model number". Therefore, at a minimum for project planning purposes, types would need to be created for each model number within a family of components (like AHU's). Example: If there are three (3) different models of AHU's, then there would need to be three (3) unique "types" of AHU's to correspond.

Note: Create Types that may have families of components with same model numbers. We will not be able to create a unique Type by model number in all instances. However, refer to the notes in Column H below for more details. In some case (ex., doors and other assets shown as one per building in Exhibit 3c: Asset Type Matrix) it may not be advantageous to create a unique type by model number. In the case of doors, a consolidated Type (i.e., Arch-Doors-00001) can be created to house door submittal docum

001	
Fire-Check Valve-001	2” – 12” Fire Water Check Valves
Plumb-Ball Valve-003	½” – 2” Bronze Ball Valves
Mech-Single Duct VAV-010	Single Duct Variable Air Volume Fans
Elec-Transformer-001	Low Voltage Energy Efficient, TP1 Dry-Type Transformer
Fire-Fire Detector-001	HFP-11 FireFinder Detector

Note: See Component section for additional Type naming.

Column B (orange): CreatedBy
The individual who created the data (or provided the information) will have their e-mail address appear here. The data is colored orange because it is a previously established key.

Column C (yellow): CreatedOn
This is a date-time stamp for when the data was created.

Column D (yellow): Category
This is the category of the type. Answer the question: What kind of product is it? Categories correlate to FAMIS “Asset Groups” and should be chosen from Exhibit 3c: Asset Type Matrix obtained by Owner CMMS Manager.

Note: COBie Type Categories selected and entered from the Exhibit 3c: Asset Type Matrix will be verified by Owner and corrections made, as directed. Also, where the Asset Type Matrix appears to be missing an critical Asset Type þ E מ r ⌞ Ŏ ` Ч ╓ ų Ч ◘ F Ṗ

Note: Pick “fixed” or “moveable”.

Column G (orange): Manufacturer
Product (type) manufacturer selected from the Contacts (Providers) (see Tab 1). The data is colored orange because it is a previously established key.

Note: This field corresponds to the “provider” of the product and is different from Contacts although the providers are listed in the Contacts tab of COBie. Providers are directly related to business entities that have supplied labor and/or materials that will be subject to Warranty terms.

Column H (yellow): ModelNumber
Provide product (type) model number

Note: Warranty start dates correspond with substantial completion per phased turnover, unless directed otherwise by available documents or owner.

Column M (yellow): WarrantyDurationUnit
Provide the warranty duration unit of measure that will apply to warranty durations listed in Column J (parts) and Column L (labor).

Note: Duration unit shall be in "year". Warranty Log provided by Owner.

Column N (purple): ExtSystem
This is a reference column for BIM data that is "automatically created" in another authoring tool (software).

Column O (purple): ExtObject
This is a reference column for BIM data that is "automatically created" in another authoring tool (software).

Column P (purple): ExtIdentifier
This is a reference column for BIM data that is "automatically created" in another authoring tool (software).

Column Q (green): ReplacementCost
Provide the replacement cost for the type of product.

Column R (green): ExpectedLife
Provide the expected service life for the product (type) in units of time per Column S.

Column S (green): DurationUnit

Designate the expected life units of measure.

Note: Duration unit shall be in "year" or "months".

Column T (green): WarrantyDescription
Provide warranty description where there are special warranties for the product. For example; if there is a 5 year warranty for a water heater's tank, and a standard 1 year warranty for all other components of the water heater, include these details in the warranty description field. Actual warranty documents will be attached to the corresponding type, when available. Otherwise, leave this field blank.

Tab 7: Component (and Installation)

Section 3 - FM Data Specification

The component worksheet is used to document the “scheduled” items that originate during the design process and related to specific locations (spaces) in the facility. There are additional pieces of component data added during the construction process as detailed in the following section (i.e., serial numbers, installation dates, and asset numbers). Because components are those pieces of equipment that are scheduled and/or located on the drawings, equipment accessories (those pieces of equipment that are located on components, yet with unique model numbers & serial numbers) not seen on the drawings are not incorporated into the COBie file, unless specifically mentioned in the latest Asset Type Matrix as seen in Exhibit 3C. For example

Section 3 - FM Data

Provide the component warranty start date. This date shall be taken as the Substantial Completion date, unless directed otherwise by available documents or owner.

Column M (green): TagNumber
Provide the component tag number (i.e., brass tags, name tags, security/fire points, etc.) assigned and attached during construction and/or operations, as applicable.

Column N (green): BarCode
Provide component bar codes, as applicable.

Column O (green): AssetIdentifier
Provide specific identification numbers or names, as applicable.

Tab 8: System

The system worksheet defines the building systems that are built g ◦ ˊ r cod ή M Ų

Tab 9: Spare

The spare worksheet organizes facility information related to items such as parts suppliers, replacement parts ordering, required lubricants, supplier ordering information, and others.

Column A (yellow): Name
Provide a unique name for each spare record.

Column B (orange): CreatedBy
The individual who created the data (or provided the information) will have their e-mail address appear here. The data is colored orange in XLS because it is a previously established key.

Column C (yellow): CreatedOn
This is a date-time stamp for when the data was created.

Column D (yellow): Category
This is the category of the spare parts and will include items like part, part set, lubricant, spare, spare set, other.

Column E (orange): TypeName
What product (type) requires these spare items? The data is colored orange in XLS because it is a previously established key.

Column F (yellow): Suppliers
Provide list of suppliers who can provide the subject spares. Provide e-mail address for supplier.

Column G (purple): ExtSystem
This is a reference column for BIM data that is “automatically created” in another authoring tool (software).

Column H (purple): ExtObject
This is a reference column for BIM data that is “automatically created” in another authoring tool (software).

Column I (purple): ExtIdentifier
This is a reference column for BIM data that is “automatically created” in another authoring tool (software).

Column J (green): Description
Provide a free form description, as needed, to supplement the line item entry.

Column K (green): SetNumber
Provide set number, as available, for ordering purposes.

Column L (green): PartNumber
Provide part number, as available, for ordering purposes.

Tab 10: Resource

The resource worksheet organizes information related to labor, materials, tools, and training for the purpose of O&M support.

Column A (yellow): Name
Provide a unique name for each resource record.

Column B (orange): CreatedBy
The individual who created the data (or provided the information) will have their e-mail address appear here. The data is colored orange in XLS because it is a previously established key.

Column C (yellow): CreatedOn
This is a date-time stamp for when the data was created.

Column D (yellow): Category
This is the category code for the resources, which shall be one of the following: material, tools, or training.

Column E (purple): ExtSystem
This is a reference column for BIM data that is "automatically created" in another authoring tool (software).

Column F (purple): ExtObject
This is a reference column for BIM data that is "automatically created" in another authoring tool (software).

Column G (purple): ExtIdentifier
This is a reference column for BIM data that is "automatically created" in another authoring tool (software).

Column H (yellow): Description
Provide a free form description, as needed, to supplement the line item entry.

Tab 11: Job

Section 3 - FM Data Specification

Section 3 - FM Data Specification

Section 3 - FM Data Specification

The individual who created the data (or provided the information) will have their e-mail address appear here. The data is colored orange in XLS because it is a previously established key.

Column C (yellow): CreatedOn
This is a date-time stamp for when the data was created.

Column D (yellow): Category
Provide the document category. Ask the question: What kind of document is it? Recommended categories include the following. For this project we will use these categories for these documents. Category is not a field that FAMIS will import.

Examples:
Commissioning Data = Certificates
Schedules & Drawings = Design Data
Model Viewpoints = Model

Document Examples:

- Drawings
- Product Data
- Samples
- Design Data
- D r a w i M ‘ i

Section 3 - FM Data Specification

Section 3 - FM Data Specification

Section 3 - FM Data Specification

Column H (yellow): CoordinateYaxis
This field should contain the latitudinal coordinate (in degrees) of the object being described, IF AVAILABLE

Column I (yellow): CoordinateZaxis
This field should contain the altitude (in feet above sea-level) of the object being described, IF AVAILABLE

Column J (purple): ExtSystem
This is a reference column for BIM data that is “automatically created” in another authoring tool (software).

Column K (purple): ExtIdentifier
This is a reference column for BIM data that is “automatically created” in another authoring tool (software).

Column L (purple): ExtObject
This is a reference column for BIM data that is “automatically created” in another authoring tool (software).

Tab 15: Connection

The connection worksheet will not be implemented on this project and is beyond the original intent of COBie data prod ginal intent

Column T (yellow):
Column U (yellow):
Column V (yellow):
Column W (yellow):
Column X (yellow):
Column Y (yellow):
Column Z (yellow):
Column AA (yellow):
Column BB (yellow):

Important Notes:

NOTE: All attributes (See TAB 13) referencing panel-boards and breakers should be verified prior to use. Also, during any work on equipment that contains electrical components, proper lock-out/tag-out and testing for de-energized equipment should be followed correctly. Technicians should never rely solely upon the correctness of attribute data before beginning work on equipment that has electrical power run to it.

Exhibit 3.A.1: Data Collection and Schedule		Architect will be responsiblle to provide information for all green cells indicated with "X" per Section 3 (FM Data Requirements). See below for scheduled delivery milestone.		Contractor will be responsiblle to provide information for all orange cells indicated with "X" per Section 3 (FM Data Requirements). See below for scheduled delivery milestone.			Facilities Data Integrator will be responsiblle to provide information for all purple cells indicated with "X" per Section 3 (FM Data Requirements). See below for scheduled delivery milestone.
		(35% Design) Design Development	(100% Design) Construction Document	Submittals	Install	Close Out	Handover
		Architect / Engineer	Architect / Engineer	Contractor	Contractor	Contractor	Facilities Data Integrator
		Design Team		Contruction Team, Subcontractors, & Manufacturers from Outline Approved Submittal			

		x					
		x					
		x					
		x					
		x					
		x					
		x					
		x					
		x					
			Update	Update if Necessary	Update if Necessary	Update if Necessary	
		x	x	x	x	x	
		x	x	x	x	x	
		x	x	x	x	x	
			x	x	x	x	
		x	x	x	x	x	
		x	x	x	x	x	
					x	x	
			x	x	x	x	
			x	x	x	x	
			x	x	x	x	
		Space Use Zones	Update & add HVAC Zones	Update if Necessary	Update if Necessary	Update if Necessary	
		x	x	x	x	x	
		x	x	x	x	x	
		x	x	x	x	x	
		x	x	x	x	x	
		x	x	x	x	x	
		x	x	x	x	x	
		Scheduled	Update	Update with Accepted Submittals	Update if Necessary	Update if Necessary	
		x	x	x	x	x	
		x	x	x	x	x	
		x	x	x	x	x	
		x	x	x	x	x	
		x	x	x	x	x	
				x	x	x	
				x	x	x	
				x	x	x	
				x	x	x	
				x	x	x	
				x	x	x	
				x	x	x	
				x	x	x	
				x	x	x	
				x	x	x	
			x	x	x	x	
				Update with Accepted Submittals	Update if Necessary	Update if Necessary	
			x	x	x	x	
			x	x	x	x	

			x	x	x	x	
			x	x	x	x	
			x	x	x	x	
			x	x	x	x	
					x	x	
					Special Warranty Items	x	
			x	x	Special Warranty Items	x	
					x	x	

			Drawings	Update & add Submittal with Approval	Update & add Model Linking	Update and add Commissioning and O&M's	Complete Model Linking
			x	x	x	x	x
			x	x	x	x	x
			x	x	x	x	x
			x	x	x	x	x
			x	x	x	x	x
			x	x	x	x	x
			x	x	x	x	x
			x	x	x	x	x
			x	x	x	x	x
					x	x	x
				Add submittal data	Update if Necessary	Update if Necessary	Reverse system & zones
				x	x	x	x
				x	x	x	x
				x	x	x	x
				x	x	x	x
				x	x	x	x
				x	x	x	x

Exhibit 3.B - [illegible]

- &ÏÒ ÕÎÉÑÕÅ ÐÒÏÊÅÃÂÔÓ ÒÅÃÏÎÃÉÌÅ ÔÈÅ & - ÒÅÑÕÉÒÅ Í ÅÎÔÓ ÁÎÄ ÕÐÄÁÔÅ ÔÈÅ & - ÒÅÑÕÉÒÅ Í ÅÎÔÓ
- 3ÅÔÕÐ ÐÒÏÊÅÃÔ ÒÅÓÐÏ ÎÓÉÂÉÌÉÔÉÅÓ ÁÎÄ ÒÏÌÅÓ ÐÅÒ / × ÎÅÒ‰Ó ÄÉÒÅÃÔÉÖÅÓ ÁÎÄ ") - ÆÏÒ & - ÒÅÑÕÉÒÅ Í ÅÎÔÓ
-)ÎÔÅÇÒÁÔÅ & - ÄÁÔÁ ÒÅÑÕÉÒÅ Í ÅÎÔÓ É ÎÔÏ ÔÈÅ ÐÒÏÊÅÃÔ ÄÅÌÉÖÅÒÙ ÐÒÏÃÅÓÓ ÆÏÒ 2&1ℎ 2&0ℎ ÁÎÄ ÏÔÈÅÒ ÃÏ ÎÔÓÁÃÔÉÎÇ ÐÒÏÃÅÓÓÅÓ ÆÏÒ ÔÈÅ ÄÅÓÉÇÎℎ ÃÏ ÎÓÔÓÕÃÔÉÏ ÎℎÃÏ Í ÉÓÓÉÏ ÎÉÎÇℎ ÁÎÄ ÏÔÈÅÒ ÔÅÁ Í Í Å Í ÂÅÒÓ
- %ÓÔÁÂÌÉÓÈ ÂÕÄÇÂÔ ÁÌÌÏÃÁÔÉÏ ÉÎ ÔÈÅ ÃÁÐÉÔÁÌ ÂÕÄÇÂÔ ÆÏÒ & - ÄÁÔÁ ÆÕÎÃÔÉÏ ÏÎ ÔÈÅ ÐÒÏÉÅÃÔ
- 2ÅÖÉÅ× ÁÎÄ ÁÓÓÅÓÓ ÐÒÏÉÅÃÔ ÔÅÁ Í Í Å Í ÂÅÒÓ ¡É‰Å‰ℎ !%# ÔÅÁ Í ÓÇ ÆÏÒ ÔÈÅÉÒ ÁÂÉÌÉÔÙ ÔÏ ÃÏ Í ÐÌÙ ×ÉÔÈ ÒÅÑÕÉÒÅ Í ÅÎÔÓ ¡ÖÉÁ 2&1 ÁÎÄ 2&0 ÁÃÔÉÖÉÔÉÅÓÇ ÁÎÄ ÔÈÅ ÒÅÖÉÅ× ÏÆ ÕÄÒÁÆÔÕ ") - %ØÅÃÕÔÉÏ 0ÌÁÎÓ‰
- /ÔÈÅÒ ÄÕÔÉÁÓ ÁÓ ÒÅÑÕÉÒÄ ÔÏ É Í ÐÌÅ Í ÅÎÔ ÔÈÅ 3(35 ") - ÁÎÄ & - ÒÅÑÕÉÒÅ Í ÅÎÔÓ ÁÎÄ ÓÐÅÃÉÆÉÃÁÔÉÏÎÓ‰

Design / Construction / Commissioning Phases

- (ÏÌÄ ËÉÃËÇÏÆÆ ÁÎÄ ÏÒÉÅÎÔÁÔÉÏÎ Í ÅÅÔÉÇÓ ÄÅÔÁÉÌÉÎÇ ") - ÆÏÒ & - ÒÅÑÕÉÒÅ Í ÅÎÔÓ‰

- %ÎÓÕÒÅ ÆÁÃÉÌÉÔÙ Í ÏÄÅÌÓ ÁÒÅ ÓÅÔÕÐ ÆÏÒ /Q - ÆÁÃÉÌÉÔÙ ÖÉÅ×ÅÒ ÁÎÄ ÉÎÔÅÇÒÁÔÉÏÎ ×ÉÈ #- -3 Í ÏÄÅÌ ÌÉÎÉÉÇ ÆÕÎÃÔÉÏÎÓ‰

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Exhibit 3.D - FM Model Criteria

A valuable part of the BIM process, models provide opportunity to improve communication during planning, design, construction, and operations. Outstanding implications exist for the use of models in facilities management;