

University of California San Diego

# TRANSITION TO OPERATIONS and BIM GUIDELINES

Version 2.0: March 7, 2022

## CAD PACKAGE

# UC San Diego

## Credits and Acknowledgements

A team within the UC San Diego Capital Program Management (CPM) developed these Guidelines with the support of an external consultant, VueOps. Input and needs were gathered from three facilities operations and maintenance groups within the University: Campus FM, Housing, Dining, and Hospitality (HDH), and the Medical Center. Additional needs by Campus Planning were also incorporated into this Guidelines.

### Capital Program Management

---

Michael Roush, FAIA ..... Program Manager, Business Enterprise

### Facilities and Services Information Management

---

Kirk Belles ..... Principal Administrative Analyst

Diana Henderson..... Space Analyst

### Campus FM

---

Jason Kayne ..... Director, Facilities Management

Aaron Smith ..... Facilities Assessment Program Manager

Wendy Schiefer ..... Assistant Director, Work Management

Richard Cota..... Assistant Director, Building Operations

Jose Moret..... Assistant Director, Building Operations

### Housing Dining Hospitality (HDH)

---

Ron Joyce ..... Director, IT Services

Scott Hostler ..... Senior Superintendent

Aaron Mahn ..... Senior Superintendent

Cleveland Freeman ..... Superintendent

Justin Haley ..... Information Systems Analyst

### Medical Center

---

Clay South..... Facilities Technical Support Analyst

### VueOps

---

Aaron Peterson ..... Director

Sean Doolan..... Senior Manager

Arundhati Ghosh, PhD ..... Senior Manager

# UC San Diego

## Contents

1.	Transition-to-Operations (T2O) Program Overview .....	4
1.1	Intent.....	4
1.2	T2O and BIM Guidelines Applicability .....	5
1.3	Organizational Roles.....	7
1.4	University T2O and BIM Goals.....	9
1.6	Ownership.....	9
2.	Facility Data Requirements for Project Execution .....	10
2.1	Facility Data Introduction and Planning.....	10
2.2	Facility Data Collection.....	23
3.	Technology and Collaboration Guidelines for Project Execution.....	27
3.3	Technology Requirements.....	27
3.5	Project Collaboration and Meetings.....	27
3.6	University Naming Standards .....	28
4.	Definitions .....	29
	Attachment 1 – File Naming Conventions .....	31
	Attachment 2 – Space ID Guidelines .....	32
	Attachment 3 – University Facility Data Specification (FDS) and Data Collection Template .....	37
	Attachment 4 – Deliverables Schedule .....	44
	Attachment 6 – CAD Standards .....	46
	Attachment 6.1 – CAD Layer Assignment Guidance.....	50

## 1. Transition-to-Operations (T2O) Program Overview

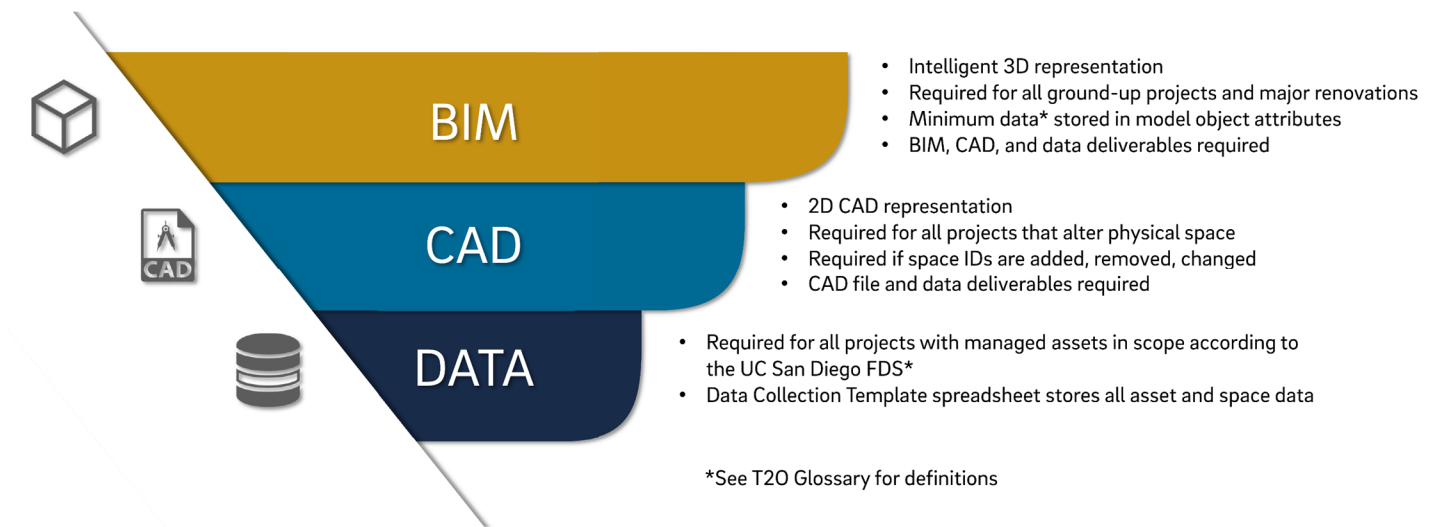
### 1.1 Intent

The T2O and BIM Guidelines are part of an initiative for the University of California San Diego (“UC San Diego” or “University”) to develop standards for data-centric processes and the application of BIM that impact the facility life cycle for design, construction, and operations activities. This document is meant to describe the goals of the University for delivering quality data into the University’s life cycle management systems (“LCM”), e.g., Computerized Maintenance Management System (“CMMS”), space management, Geographic Information System (“GIS”), and the University’s Facility Information Management (“FIM”) system. Beyond goals, the Guidelines define the baseline expectations for facility data delivery and BIM practices, protocols, and modeling quality with a specific focus on managed assets critical to the life cycle management process based on industry best practices and the current capabilities of available software applications. The University expects consultants, contractors, and the entire project team to be committed to the delivery of facility data, regardless of project size or delivery method. The use and delivery of CAD and/or BIM as primary design, documentation, coordination, collaboration, and visualization tools should also be implemented for larger and more complex projects.

For purposes of these Guidelines, “digital data” is defined as information, including communications, drawings, specifications, and designs, created or stored for a project in digital form, including those developed by the project team, and the University and its consultants, for use in preparation of two-dimensional (2D) printed hard-copy construction documents using Computer Aided Design (CAD) and Building Information Modeling (BIM) software, three-dimensional (3D) model deliverables, and facility data deliverables as specified by the UC San Diego Facility Data Specification (FDS). Digital data will be used for planning, design, construction, commissioning, turnover, and operations and maintenance purposes.



## 1.2 T2O and BIM Guidelines Applicability



Asset and location (space) data sits at the foundation of all T2O and BIM design and construction projects at the University. Every project regardless of size or complexity requires the project team to analyze the project scope against the “managed assets” type list found within the Facility Data Specification (FDS). If the scope of the project involves the removal, modification, or installation of “managed assets”, the project team will be required to follow the **Data Requirements** package. The data requirements consist of the submission of two spreadsheets or tables: one containing a full list of rooms (spaces) involved in the project and another containing a full list of managed assets in the project. Both tables contain additional columns of data, or “attributes”, which are described in **Attachment 3 – University Facility Data Specification**. The master asset table is commonly aggregated from multiple discipline-specific asset tables which are submitted with increasing amounts of attribute data over the life of the project. See **Table 1.2** for a summary of the required planning and data deliverable submissions contained in the Data Requirements package.

All projects impacting space including addition, demolition, consolidation, reconfiguration, renaming or renumbering of spaces will require a minimum of 2D CAD for design documentation of all involved design disciplines. Project teams are required to use the **CAD Requirements** package which incorporates all deliverables from the Data Requirements package with additional CAD deliverables. The CAD files required for submission are for the architectural floorplans at 100% CD (or equivalent design issuance) and all discipline CAD files for the record set submission. Regardless of whether the CAD files are exported from a BIM application or they are created directly in AutoCAD® software, the Project Team should follow the **Attachment 6 – CAD Standards** and **Attachment 6.1 – CAD Layer Assignment Guidance** when preparing the CAD files. Additionally, the project architect should follow the

**Attachment 2 – Space ID Guidelines** when designing and numbering spaces. The Space ID Guidelines require review submissions throughout the project to ensure adequate review and approval of the space ID scheme by the University.

Any questions as to the applicability of this Guidelines to a project or the comprehensiveness of the Guidelines should be directed to UC San Diego Capital Program Management. Table 1.2 summarizes the main required deliverables that are relevant to each requirements package

	Plan Deliverable		Project Timing	Data Package	CAD Package	BIM Package
	Data Deliverable					
Facility Data Deliverables Required						
Deliverable Name		Related Requirement Doc				
Maintenance Responsibility Documentation		Sec 2.1.g	Design 100% CD	●	●	●
Project-Specific FDS		Sec 2.1.g, Att. 3	Design 100% CD	●	●	●
Facility Data Deliverables Schedule		Sec 2.1.g, Appx A2	Design 100% SD	●	●	●
Data Submissions (Data Drops) - Asset Tables (.XLSX)		Att. 3	Multiple <sup>1</sup>	●	●	●
Data Submissions (Data Drops) - Location Table (.XLSX)		Att. 3	Design 100% CD	●	●	●
Consolidated Asset and Location Table(s) (.XLSX)		Sec 2.2e, Att. 3	Closeout	●	●	●
CAD Deliverables						
Deliverable Name		Related Requirement Doc				
Space ID Review - Arch floorplans (.PDF)		Att. 2	Design 100% SD		●	●
Space ID Review and Space Management Full 100% CD Drawing Set (.PDF)		Att. 2, Att. 6	Design 100% CD		●	●
Space Management Floorplans (.DWG)		Att.1, Att. 6	Design 100% CD		●	●
Space Management Floorplans (.DWG)		Att.1, Att. 6	Closeout		●	●
Record Drawing Full Set (.PDF)		Att. 6	Closeout		●	●
Record Drawings Full Set (.DWG)		Att. 1, Att. 6, Att. 6.1	Closeout		●	●

Table 1.2 Summary table of requirements package definitions

Project closeout submittals including O&M manuals, as-built drawings and product data, warranty documentation, photos, spares and attic stock, service maintenance agreements, and other miscellaneous submittals are critical digital data for the efficient operation and maintenance of University facilities. See the UCSD Division 1 Specifications (**01 77 00 Closeout Procedures** and **01 78 00 Closeout Submittals**) for requirements on closeout submittals.

This Guidelines document uses intentional graphics to highlight 1) when there is a deliverable related to a section and 2) when a deliverable requires a specific and University-provided format or template be used by the responsible party. The graphics are as follows:



## 1.3 Organizational Roles

The University understands the need for intentional organizational roles to ensure the successful implementation of T2O practices at the project level. On the University side, the focus is on specification, oversight, and validation of data delivery, while on the project consultant and contractor side, the focus is on planning and collection of project data.

The term “**project team**” will be used to refer to the collection of contracted firms involved in the planning, design, construction, commissioning, and turnover of the Project inclusive of the following: the Architect, General Contractor, and all University consultants providing input to deliver a project, including trade partners and third-party consultants preparing information intended to become part of the Contract Documents.

Data submission tables are divided according to discipline and trade. Project team members responsible for data submissions will be referred to as “**data authors**”. Data submissions occur cumulatively over the project lifecycle in a sequence of data drops and may be worked on by one or multiple project team firms. Data authors for each data submission should be identified through the facility data deliverables schedule and the Authors worksheet of the Data Collection Template.

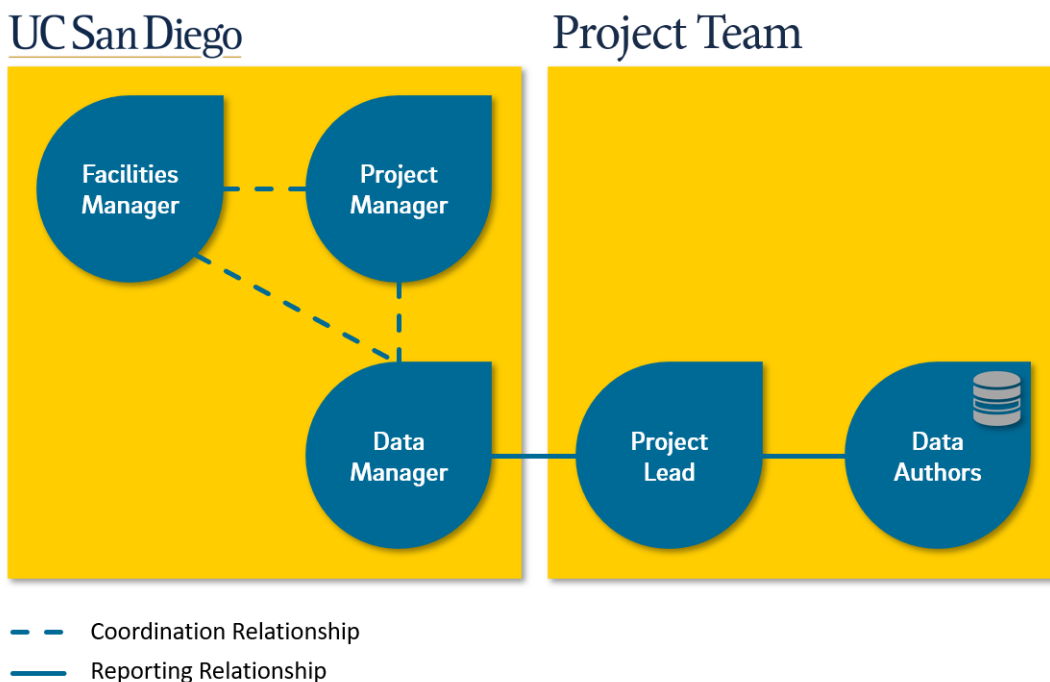
Facility data submission contents are determined by the **Attachment 3 – University FDS**. For information on data submission planning, responsibility, and timing, see **Section 2 Facility Data Requirements for Project Execution**.

At the discretion of each project team firm, the **data author** function is a role that may be filled by one or more project team member(s) with another primary function within the project team and need not be on their own a full-time, dedicated position.

The project team will designate one representative to coordinate data and model submissions, track submission dates for all project team submissions, and hold data and model authors accountable for meeting their deliverable requirements. This representative will be referred to as the “**Project Team Lead**”. The project team lead is typically the construction manager or general contractor, however, the Team may designate any project team member to act in this role.

The University will have multiple stakeholders involved in the specification, oversight, and management of the T2O work. The University will appoint a representative or a team of representatives who will support the University Project Manager in facilitating the implementation of the Guidelines at the project level. The term “**data manager**” will be used to refer to this representative throughout this document. This University representative will be identified at the project outset by the University Project Manager. The data manager will oversee and guide the facility data collection process, help clarify facility data requirements as it relates to the project by liaising with the required University facilities groups, and review and comment on CAD submissions (if applicable). The data manager will coordinate the scheduling of T2O deliverables with the project team lead and will perform quality control checks for each set of data submissions.

The University may also involve a facilities management representative, referred to as “**facilities manager**” or “**Owner (FM)**”, to provide guidance on facility data needs. The facilities manager will work closely with the data manager to resolve any questions and clarifications on facility data requirements that arise from the project team if they are not answered by this Guidelines document.



**Figure 1.3.1** Project roles summary diagram.

## 1.4 University T2O and BIM Goals

### a. Create and maintain world-class facilities

In alignment with UC San Diego's vision to grow leaders to drive innovation, the University is committed to creating and maintaining world-class facilities for their students, faculty, and the community at-large. UC San Diego acknowledges that managing world-class facilities starts with a strategy to plan, design, specify, construct, commission, operate and maintain its' assets and asset data in a standardized and structured manner. Efficiently transitioning digital design and construction data to facilities LCM systems are critical elements to achieving this goal.

### b. Achieve day one operational readiness by implementing a facilities information strategy to support the overall goal for efficient turnover of digital data to facilities operations systems.

The University aims to specify and incrementally collect and validate data to meet their goals for operational readiness on Day 1 of occupancy. Prior to project closeout, the validated facility data set will be transferred into the relevant LCM systems to support operations and maintenance functions. To meet this objective, it is important that the guidelines presented in this document be followed. Housing Dining Hospitality (HDH), UC San Diego Facilities Management (FM), and UC San Diego Health will be the primary users of the project digital data. Digital data will be translated from the project team deliverables into file formats that are compatible with CMMS applications. Digital data will also be used to update the University's GIS dataset (ArcGIS) and space management system (Tririga). Additional departments may express interest in working with project digital data on specific University projects and may provide additional model or data requirements to the project that are not contained in the Guidelines.

Transfer of information between project digital data deliverables and LCM software will be tested by the University data manager at milestone intervals planned with the Project Team Lead to validate the deliverables (Section 2 of this Guide). Incremental data collection and transfer of project digital data to LCM systems will be one of several ways the University will assess and validate acceptability of deliverables from the Project Team over the project lifecycle.

## 1.6 Ownership

The University has ownership and all rights to all digital data including all models and facility data created or developed by consultants, subconsultants, contractors, subcontractors, and vendors in relation to a project under which this Guideline or portion of this Guideline applies to. The University may make use of this data following any deliverable.

In contributing content to data deliverables or models, model authors, and data authors do not convey any ownership right in the content provided or in the software used to generate the content. Unless otherwise granted in a separate license, any subsequent model or data authors and model users right to use, modify, or further transmit the model(s) or data is specifically limited to the design, construction, and turnover of the Project, and nothing contained in this Guideline conveys any other right to use the model(s) or data for another purpose.

## 2. Facility Data Requirements for Project Execution

The next section discusses what is expected of project teams through the facility data planning and collection activities.

### 2.1 Facility Data Introduction and Planning

The University's goal to achieve day one operational readiness of its' facilities post-construction provides the motivation to develop practices to efficiently transfer project digital data from design and construction to the University's LCM systems. During design and construction, project teams collect a wealth of facility data that is incredibly valuable to the University's facility operations and maintenance processes.

#### a. What is an asset?

The University aims to collect facility data in a structured format as documented in the facility data specification (FDS). The University defines an in-scope managed asset that falls within the governance of the FDS, referred to as “**managed asset**”, as any installed item that physically resides within or servicing a facility and fulfills any of the following:

- a. Requires routine maintenance or has a preventive maintenance schedule
- b. Has attributes a facility engineer would need to reference in performing a work order
- c. Is not consumable or otherwise replaced on a predetermined schedule
- d. Identified as an asset category by a UC San Diego Facilities group as requiring asset data

Due to the changing nature of building technology, there may be cases where new types of equipment or systems are in a project that do not exist in the FDS. Any assets in a project not specified in the FDS as a managed asset category but falling within the above criteria should be brought to the attention of the data manager. The data manager will work with the facilities manager to determine if the assets are in-scope and the required facility data to be collected.

#### b. What is the Facility Data Specification?

*The Facility Data Specification (FDS) is a document describing the University information requirements for managed assets. It documents the asset attributes project teams must collect and submit for each asset category on capital projects.*

See **Attachment 3** for the full UC San Diego facility data specification. An accompanying “**UCSD FDS and Data Collection Template**” spreadsheet is also available as a working version of the FDS.

The asset categories of interest for facilities maintenance are listed in the FDS format. The format is a spreadsheet that utilizes the **OmniClass™ Description** to normalize the naming of the asset categories, (1) in the figure below. Project teams work using varying language and vocabulary and the FDS format requires Teams to create a project-specific mapping in the (2) “**Asset Category Project Name**” column, so

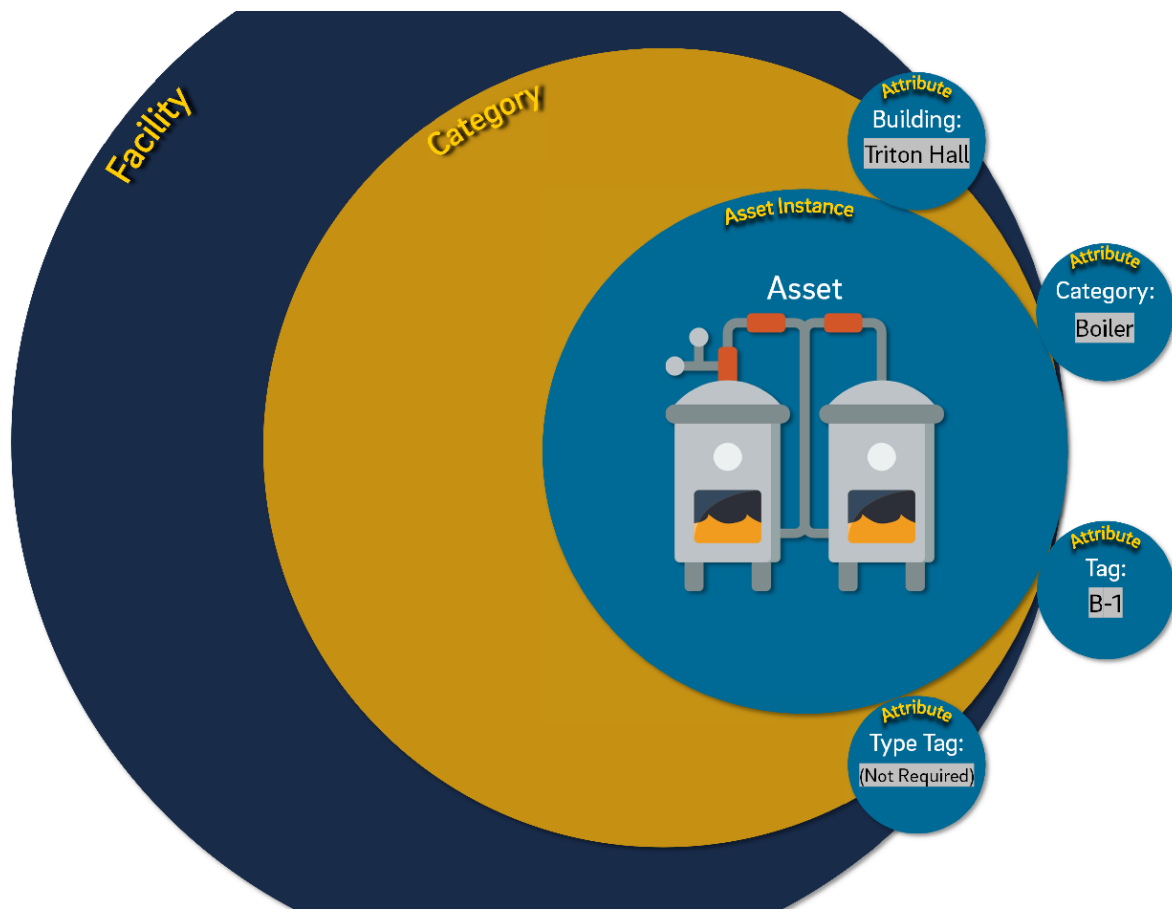
the project team can work using the terminology of their choosing. The term “**category**” is used to refer to this project team asset type name and what is entered in the asset table deliverables. The FDS also indicates data requirements related to the asset categories such as the preferred tag format (Column I), which facilities group requires the asset category (column J), and if certain additional attributes are required for submission, such as serial number or barcodes (columns M through P).

System	Product class	OmniClass number	OmniClass name	Assigned Author	Asset category project name	Notes	UCSD tag format	UCSD required by	Unique	Area serving	Serial	Barcode FM	Barcode MC	Barcode HDH
36	D20 Plumbing	23-27 17 00 Pumps	23-27 17 04 Drainage Pumps			stormwater drainage pump		AI						
37	D20 Plumbing	23-27 17 00 Pumps	23-27 17 13 Centrifugal Pumps					AI						
38	D20 Plumbing	23-27 17 00 Pumps	23-27 17 13 Centrifugal Pumps					AI						
39	D20 Plumbing	23-27 17 00 Pumps	23-27 17 35 Sewage Ejectors			sanitary sewage pump		AI						
40	D20 Plumbing	23-27 23 00 Heat Exchangers	23-27 23 00 Heat Exchangers	Frontline Plumbing		Heat Exchangers		AI						
41	D20 Plumbing	23-27 23 00 Heat Exchangers	23-27 23 15 Shell and Tube Heat Exchangers					AI						
42	D20 Plumbing	23-27 27 00 Pressure Reducing Stations	23-27 27 00 Pressure Reducing Stations	Frontline Plumbing				AI						
43	D20 Plumbing	23-27 29 00 Tanks and Storage Structures	23-27 29 19 Tanks	XVZ Mechanical		Domestic Water Tank		MC						
44	D20 Plumbing	23-27 29 00 Tanks and Storage Structures	23-27 29 02 Gas System Tank					FM						
45	D20 Plumbing	23-27 29 00 Tanks and Storage Structures	23-27 29 04 Gray Water Tanks					FM						
46	D20 Plumbing	23-27 29 00 Tanks and Storage Structures	23-27 29 05 Potable Water Storage Tanks	Frontline Plumbing				AI						
47	D20 Plumbing	23-27 29 00 Tanks and Storage Structures	23-27 29 06 Sanitary Tanks					FM/HDH						
48	D20 Plumbing	23-27 29 00 Tanks and Storage Structures	23-27 29 08 Domestic water expansion tank (plumbing)	XVZ Mechanical				AI						
49	D20 Plumbing	23-27 31 00 Valves	23-27 31 00 Valves	Frontline Plumbing				FM/MC						
50	D20 Plumbing	23-27 31 00 Valves	23-27 31 00 Valves					FM/MC						
51	D20 Plumbing	23-27 31 00 Valves	23-27 31 11 Backflow Preventers					AI						
52	D20 Plumbing	23-27 31 00 Valves	23-27 31 11 Backflow Preventers					AI						
53	D20 HVAC	23-27 23 00 Heat Exchangers	23-27 23 13 Plate and Frame ...exchangers					AI						
54	D20 HVAC	23-27 29 00 Tanks and Storage Structures	23-27 29 19 Tanks					FM/HDH						
55	D20 HVAC	23-27 29 00 Tanks and Storage Structures	23-27 29 19 Tanks					AI						
56	D20 HVAC	23-27 29 00 Tanks and Storage Structures	23-27 29 07 Domestic water expansion tank (hvac)	XVZ Mechanical				FM/MC						
57	D20 HVAC	23-27 31 00 Valves	23-27 31 00 Valves					AI						
58	D20 HVAC	23-27 33 00 Valve Actuators	23-27 33 11 Electrical Valve Actuators					FM/HDH						
59	D20 HVAC	23-27 35 00 Liquid Treatment Components	23-27 35 06 Liquid Separators (hvac)					FM						
60	D20 HVAC	23-27 37 00 Gas Treatment Components	23-27 37 27 Air Filters			Air Separators		FM/HDH						
61	D20 HVAC	23-27 37 00 Gas Treatment Components	23-27 37 27 Air Filters					AI						
62	D20 HVAC	23-27 31 00 Commercial Boilers	23-27 31 00 Commercial Boilers					AI						
63	D20 HVAC	23-27 31 00 Commercial Boilers	23-27 31 13 Condensing Boilers					AI						

**Figure 2.1.1** Excerpt of the University FDS highlighting the asset category names using OmniClass™ and the mapped project-specific asset category names. See the “UCSD FDS and Data Collection Template” Excel file for full FDS.

### c. What is facility data?

Every unique asset and location (space) requires collection of a set of attributes. Each managed asset is grouped into its general functional grouping (**category**). All assets within or serving a facility belong to that facility. The category that an asset belongs to, and the managing facilities department for the asset, will determine the other attributes that must be collected.



**Figure 2.1.2 Facility data concept with Facility-Category-Asset hierarchy.** Not all required attributes are shown for visual simplification.

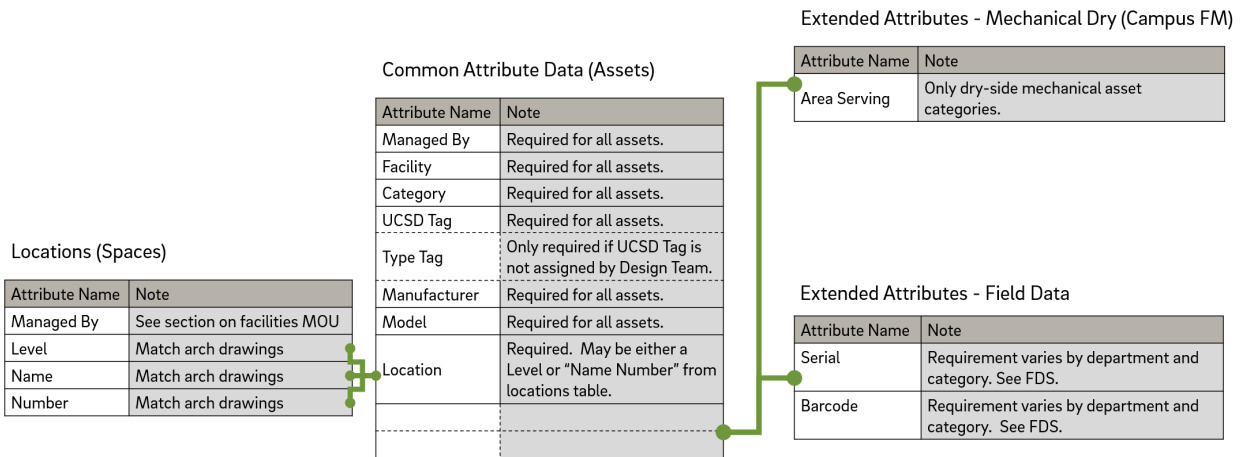
Facility data is collected for all instances of managed assets and locations. Facility data are the attributes that describe various design, dimensional, functional, performance, and business characteristics about each managed asset.

The figure below lists the full scope of possible attributes for any specific managed asset and location at UC San Diego including the “**common attribute data**”, required for **all** managed assets, and the category-dependent “**extended attributes**”. The **University FDS** lists the extended attributes that must be collected by project teams on a category basis.

In addition to asset data, the project team must also assemble a table of locations or spaces. The locations table is a master list of spaces within the project facility. The full location list of spaces is created as an input for the asset data since asset “**Location**” must exactly match a “**Level**” or space “**Name Number**” location attribute value.

The compilation of all project location and asset data comprises the “**facility data**”.





**Figure 2.1.3** Facility Data requirements for project teams including location and asset data.

**Note:** There are some exceptions for “Field Data”. HDH requires barcode numbers for all asset categories, but no serial number for some. See FDS worksheet for specific cases where this occurs.

#### d. Who is the data for?



Facility data is collected for each facilities department; HDH, Campus FM, and UC San Diego Health (Med Center). The FDS column J (left) indicates if one or more of these departments requires asset data to be collected for each listed asset category.

UCSD required by

- All
- All
- All
- All
- All
- All
- MC
- FM,HDH
- FM
- FM,HDH
- All
- FM,HDH
- All
- FM,MC
- FM,MC
- All





The data will be received from each data author and compiled across all data drops and trades/disciplines for the facility by the Project Team Lead or delegated responsible party. The data manager is responsible for taking compiled data deliverables and formatting into the necessary Maximo or other CMMS format(s). Both asset and location (space) data are needed to setup the work order structure and maintenance schedules for managed assets so the facilities can be operated efficiently and with minimal interruption to users and occupants.

Note that each facilities department has their own list of required categories. Some categories may require serial numbers and barcodes for one department while another department may not require them. See the **Attachment 3 -**

**University Facility Data Specification** for a comprehensive list of all differences between department facility data requirements.

## e. Planning Facility Data Delivery

Facility data is delivered through use of the **University Data Collection Template**. The Template is a Microsoft Excel spreadsheet that has two functional components:

-   1) an FDS worksheet that allows the Team to review data requirements and identify project asset categories and responsible data authors
-   2) asset and location tables that standardize the input of facility data by each data author

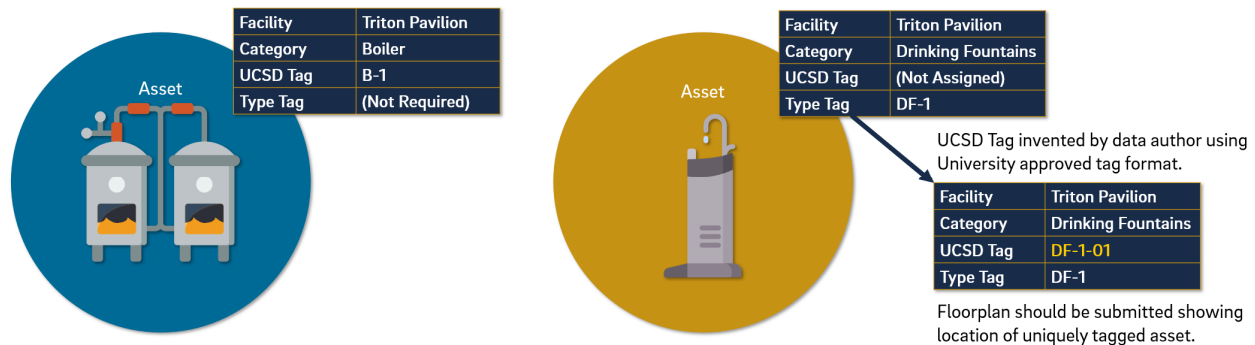
The Data Collection Template can be found combined with the FDS in the spreadsheet working file “**UCSD FDS and Data Collection Template**”. One spreadsheet file should be prepared per facility in the case of projects with multiple facilities. Data authors typically submit one data collection template file for each data drop.

### Assets Table

Asset data is submitted by data authors incrementally to allow for adequate review and cycle time by the data manager if there are questions that arise from the project team. These incremental submissions are referred to as “**data drops**”. Each data drop is further segmented by trade or discipline, so the relevant data author is preparing only the facility data for the scope that has been assigned to them. Each data drop should be timed in alignment with a project task that releases data for incorporation into the asset and location tables.

**Data drop one** is commonly prepared after design has been completed (100% CD’s or equivalent). This timing is recommended to allow for the full design intent to develop including asset tag values and location. Most assets are assigned a unique tag value by the design team and the data author should enter the tag as it appears on drawings and schedules. Some assets only receive a “type tag”, such as drinking fountains and light fixtures. In these cases, the data author should enter the type tag value in the asset table and discuss with the data manager and project team lead the unique tag format to be applied. The unique tag should incorporate the type tag as a prefix if possible. The data author may choose to assign unique tags at data drop one or may wait until data drop two.

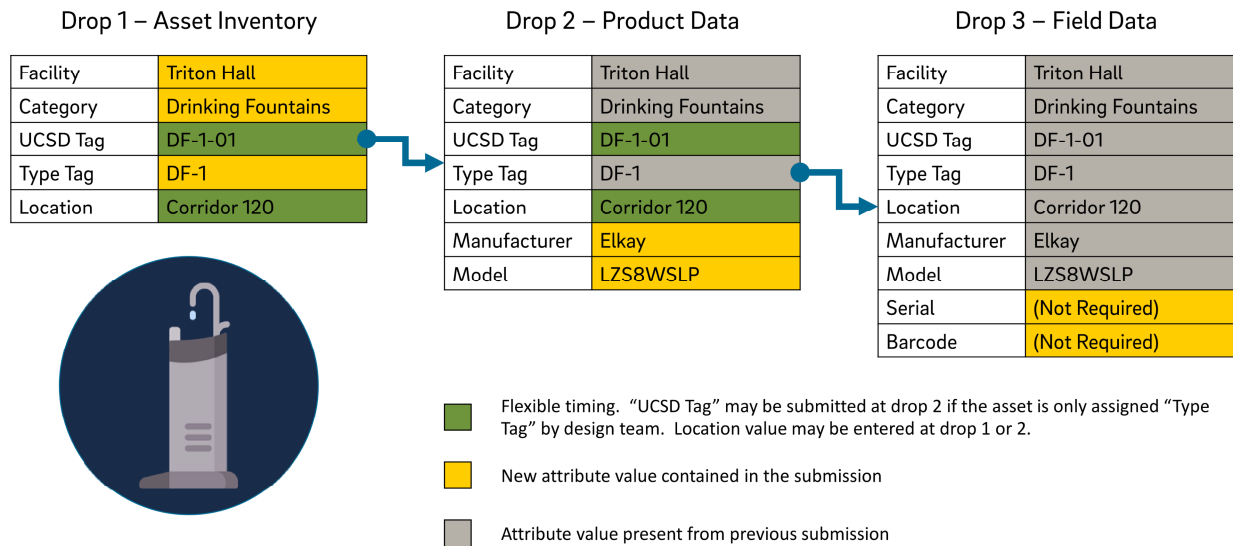
Once unique tag (UCSD Tag) values are assigned to assets that only received type tags from the design team, the data author should either incorporate the unique tags into the design drawings or provide a marked-up PDF plan showing the specific location of these assets with their unique tags along with the asset table deliverable.



**Figure 2.1.4** Some assets are given unique tags by the design team and some are only given type tags. Assets with type tags must be assigned a unique tag by the data author, and location marked up on drawings or incorporated back into design.

**Data drop two** is recommended to be timed in alignment with the end of the product data submittals phase for the related trade. Drop two should incorporate only approved product data by the data author. As a result, it is recommended the deliverable be prepared after the last anticipated round of resubmissions and approvals for that trade. If a data author has a large window of time for all product data submittals in their scope, they should plan a phased submission for drop two with the project team lead. Location is typically entered at data drop two but may be entered later if a BIM-enabled process is used to associate locations to assets.

**Data drop three** is typically timed to align with the availability of asset data related to commissioning activity. Serial numbers may either be extracted from startup reports, if they exist for the asset in question, or they may need to be taken from placards affixed to the physical asset. Barcode values are the barcode numbers taken from barcode labels that are provided by the facilities group responsible for maintenance of the specific asset. Barcode labels are typically applied during the commissioning process prior to project closeout.



**Figure 2.1.5** Asset data submission timing occurs sequentially at different data drops. The above diagram shows example facility data over three data drops for one drinking fountain asset.

The project team lead and data manager should decide if all data drops for a given set of assets should be delivered by one data author or if a handoff between two or more authors is required, due to factors such as timing of trade onboarding and if there is any trade BIM process involved.

## Locations Table

Location (space) data is submitted by the project architect around the 100% CD or equivalent design issuance. It is important for the Project Team Lead to obtain the locations table prior to the entering of location values in the assets table. The locations table format in the **Data Collection Template** should be used by the data author providing this information.

The locations table submission should coincide with the Space Management review process that occurs at 100% CDs. See **Attachment 2 Space ID Guidelines** and **Attachment 6 CAD Standards** for more information on space-related design deliverables and review. The outcomes from the space ID review process should be reflected in the locations table. Facility space “**Name**” and “**Number**” in the locations table should match room names and numbers as shown on architectural floorplans, unless otherwise discussed and agreed upon with UC San Diego Space Management and Planning. In some cases, it may be preferable to use signage room numbers if they differ from numbers shown on architectural floorplans.

The Project Team Lead should ensure that the Data Collection Template starting file provided to data authors contains the reviewed and approved list of locations prior to the data drop where authors are expected to submit location values in the assets table. The list of locations should be entered in the Locations worksheet in the Template spreadsheet file.

For projects involving existing facilities with existing space, the University Project Manager should obtain records of space management floorplans and space numbers (identifiers) from Space Management and Planning at the start of the project to provide to the Project Team. The data author assigned responsibility for the locations table should incorporate existing spaces into the table if space numbers will change due to the project or when space numbers will remain, but new managed assets will be installed in the existing space. The data manager should work with the facilities manager(s) to ensure alignment of space names and numbers between records already established in the CMMS and the project locations table.

## f. Facility Data Source and Formatting Requirements

Attribute values for facility data must be entered with specific data types to be accepted for use by University LCM systems. **Table 2.1.6** and **2.1.7** lists the constraints around facility data values that may be entered into asset and location tables for each attribute and the expected source of the asset data.

### **Free Text Attributes**

Attributes with a data type of “text” may be any free text value except for those that have parenthetical qualifiers. The “Facility” attribute may be any free text value, however, the value must be approved by the University and be the same for all assets within the same facility. The “Tag” attribute may be any free text value as shown on design documents and the value must be unique (not repeated) for assets within the same category.

### **Constrained Attributes**

Attributes with a data type of “picklist” must match the list of values that they are derived from. For example, the “Category” attribute must match the project-specific asset category list from the project-specific FDS (see University FDS).

The “Barcode” attribute is always a number and must match the barcode label number applied to the physical asset. Each managing department has their own barcoding system and will supply barcode labels through coordination with the data manager.

Attribute Name	Data Type	Attribute Description and Data Source
UCSD Managing Department (Managed By)	Picklist	HDH, FM, MC, or a combination of the three. FM group at the University having maintenance responsibility. See FDS for differing data requirements for each department.
Facility ("UCSD HDH Description" or "UCSD FM Description")	Text (Fixed)	Facility name. Decided by UC San Diego. Same value for all assets within each facility. These attributes are entered on the <b>"UCSD Facility Codes"</b> worksheet.
Asset Category Project Name	Picklist	Term used to refer to asset or equipment type from project design documents (drawings, equipment schedules, or specifications). Entered in the FDS worksheet which links to the dropdown on the Assets sheet.
UCSD Tag	Text (Unique)	Unique asset identifier value as defined on design docs. If no unique tag is assigned, data manager to prescribe a pattern for data authors to implement, incorporating type tag.
Type Tag	Text	Non-unique asset identifier defined on design docs for assets of the same type (e.g., light fixtures, fire extinguishers). Only required if "UCSD Tag" is not defined by design team.
Location	Picklist	From architectural floor plans. Value may either be a Level or the concatenation of space "Name Number" from locations table.
Manufacturer	Text	Manufacturer company name from approved product data submittals.
Model	Text	Model number for the product from approved product data submittals.
Serial	Text	Asset serial number from startup reports or physical placards. A unique identifier for an installed product generated by the product manufacturer. Extended attribute (not required for all assets).
Barcode (**)	Number	Barcode number matching HDH, FM, or Med Center barcode label values. Extended attribute (not required for all assets).
Area Serving	Text	From single-line, riser diagram, or design plans. Location or list of locations (level or space "Name Number" from locations table) that the asset provides its service to, for mechanical dry-side assets only. Extended attribute (not required for all assets).

**Table 2.1.6 Asset data type and source.**







**\*\* is a placeholder for either "FM", "MC", or "HDH" barcode. See Data Collection Template.**

Attribute Name	Data Type	Attribute Description and Data Source
Managed By	Picklist	HDH, FM, MC, or a combination of the three. FM group at the University having primary maintenance responsibility for the space.
Level	Text	From architectural floor plans. See Space ID Guidelines for level numbering convention. Format with the word "Level" followed by the level number.
Name	Text	Space name in capital case as they appear on architectural floor plans record documents.
Number	Text	Space number as they appear on signage. If no signage, use architectural floor plan space number. Ensure this column is formatted as text in Data Collection Template to avoid formatting errors.

**Table 2.1.7 Location data type and source.**

## g. Project Startup Planning Tasks

There are four main facility data planning tasks that should be completed by the project team before the start of data collection. These tasks are:

- 1) Determine and document maintenance responsibility (UCSD managing department)
-   2) Create the project-specific FDS
-   3) Document the data authors to data drops assignments
-   4) Create the facility data deliverables schedule

### Determine Maintenance Responsibility

Since each facilities group has their own unique list of required asset categories, the first step for a Team is to identify through the University Project Manager which facilities group the project will be turned over to for operations and maintenance. Most projects have only one involved facilities group, however, some have multiple groups involved.

For projects involving multiple facilities groups, the University project manager may work with representatives from each facilities group to describe in a narrative format, the responsibility breakdown for each group. This narrative may be organized by building or system and include marked up or colorized floorplans to communicate physical boundaries of responsibility. This package of documentation should be considered by the Project Team when determining if assets within spaces and systems managed by each facilities group will be required or not in the facility data deliverables.

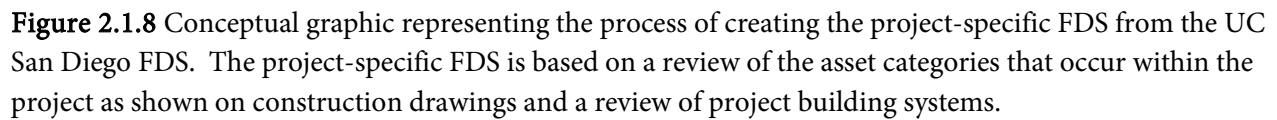
Prior to developing the project-specific FDS, the University FDS should be filtered by the asset categories that are of interest for the project according to the facilities groups who will be maintaining the facilities.

### Create the Project-Specific FDS



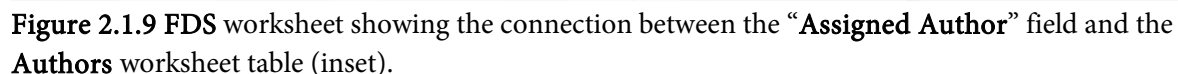
After the FDS category list has been filtered according to the managing facilities group(s), the project team will need to identify the managed asset categories that fall within the scope of their project. The **UC San Diego Facility Data Specification** (FDS) contains all possible asset categories that are currently being maintained by each facilities group. The Project Team must cull down this master list to a “project-specific” FDS using a mapping process which is setup in the FDS spreadsheet. See the **Readme** section of the **Facility Data Specification and Data Collection Template** worksheet for instructions on creation of the project-specific FDS.





University Format  
Deliverable

Note the “**Assigned Author**” column list pulls from a drop-down of project data authors entered in the “**Authors**” worksheet, which should be populated first.





## Create the facility data deliverables schedule



The Project Team Lead should populate the facility data deliverables schedule spreadsheet, which can be found in the Guidelines companion working documents (“UCSD Deliverables Schedules”). The deliverables schedule is a master list of all facility data submissions including planning deliverables and data drop submissions. Items one through five below should be planned at the start of the project and completed no later than end of design (100% CD or equivalent).

- 1) **Project milestone descriptions** (row 3). Create additional columns if more milestones need to be added.
- 2) **Project milestone dates** (row 4). Enter dates or estimated dates for the completion of design issuances and the start of construction-related milestones.
- 3) **Responsible Party** (column C). Pick from drop-down the responsible data author. To modify the data author list, update the pick-list values in “**Lookup**” worksheet. The list of authors should match the same list in the project-specific FDS.
- 4) **Planned Date** (column varies). Enter the planned date for the submission.
- 5) **Tool** (column D). Enter the tool or platform where the team will submit the deliverable.
- 6) **Actual Date** (column varies). Enter the actual date the file was submitted after completion.

Names of data authors can be entered generically (e.g., specialties contractor) if company names are not yet known. When buy-out is complete, the Project Team Lead should update data author names in the deliverables schedule and ensure the file is made available to all data authors. If additional rows are required to further break down data drops or to track resubmissions, the Project Team Lead may add rows as needed. If additional columns for more phases or milestones are needed, the Project Team Lead may add columns.

As data drop files are submitted, the Project Team Lead should track submission dates in the “**Actual**” columns. The facility data deliverables schedule should be stored in a location where the University project manager and data manager can always review the most recent version.

	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T
				100% SD		100% DD		100% CD		Product Data Submittals Phase 1		Product Data Submittals Phase 2		Startup Reports		Commissioning		Substantial Completion	
				Planned	Actual	Planned	Actual	Planned	Actual	Planned	Actual	Planned	Actual	Planned	Actual	Planned	Actual	Planned	Actual
3																			
4																			
5																			
6	Facility Data Plan	Project Team Lead																	
7	Project-Specific FDS	Project Team Lead																	
8	Facility Data Deliverables Schedule	Project Team Lead																	
9	Locations Table	Architect																	
10	Data Drop 1 - *Enter Data Author Here*	*Enter Data Author Here*																	
11	Data Drop 1 - *Enter Data Author Here*	*Enter Data Author Here*																	
12	Data Drop 1 - *Enter Data Author Here*	*Enter Data Author Here*																	
13	Data Drop 2 - *Enter Data Author Here*	*Enter Data Author Here*																	
14	Data Drop 2 - *Enter Data Author Here*	*Enter Data Author Here*																	
15	Data Drop 2 - *Enter Data Author Here*	*Enter Data Author Here*																	
16	Data Drop 2 - *Enter Data Author Here*	*Enter Data Author Here*																	
17	Data Drop 2 - *Enter Data Author Here*	*Enter Data Author Here*																	
18	Data Drop 2 - *Enter Data Author Here*	*Enter Data Author Here*																	
19	Data Drop 3 - *Enter Data Author Here*	*Enter Data Author Here*																	
20	Data Drop 3 - *Enter Data Author Here*	*Enter Data Author Here*																	
21	Data Drop 3 - *Enter Data Author Here*	*Enter Data Author Here*																	
22	Data Drop 3 - *Enter Data Author Here*	*Enter Data Author Here*																	
23	Data Drop 4 - Barcode *Enter Data Author Here*	*Enter Data Author Here*																	
24	HDH Maximo Asset Table	*Enter Data Author Here*																	
25	HDH Maximo Location Table	*Enter Data Author Here*																	
26	FM Maximo Asset Table	*Enter Data Author Here*																	
27	FM Maximo Location Table	*Enter Data Author Here*																	

**Fig 2.1.10 Facility data deliverables schedule**

The University data manager will review and approve all milestones deliverables from the Project Team

throughout the project according to the planned dates and will notify the data authors if deliverables are satisfactory or need to be revised and resubmitted.

The Project Team must establish meetings and other supporting communication strategies to sufficiently collect and deliver the facility data deliverables as required by this Guideline and the FDS.

## h. Project Collaboration and Meetings

In addition to the facility data planning tasks, Project Teams should also hold meetings to review planning and data collection deliverables. The intent of the review meetings is to provide a forum for discussion for more complex questions related to the facility data requirements as they apply to the specific project and to drive accountability within the Team to complete planning tasks according to the schedule. The Project Stage column lists a general timeframe for when the meeting should occur, however, the Team should plan specific dates for these meetings as part of the overall planning effort. The data manager and project team lead should be co-leading the meetings. Data authors relevant to the meeting agenda should also be invited.

MEETING TYPE	GOALS	PROJECT STAGE	FREQUENCY
FDS Planning – Design Phase	<ul style="list-style-type: none"> <li>• Review project-specific FDS</li> <li>• Review any input/questions for facilities</li> </ul>	Construction Documents	Once
FDS Planning – Construction Phase	<ul style="list-style-type: none"> <li>• Decide responsibility for asset inventory (drop 1) by trade/discipline</li> <li>• Review facility data deliverables schedule</li> <li>• Decide barcoding responsibility</li> <li>• Review any input/questions for facilities</li> </ul>	Preconstruction	Once
Data Deliverable Checks	<ul style="list-style-type: none"> <li>• Data manager review and clarify any issues with any data drop or locations table for each data author</li> </ul>	Design/Construction	Each Data Milestone (if required)
Barcode Planning	<ul style="list-style-type: none"> <li>• Review scope for assets requiring barcode labels</li> <li>• Walk through process, tools, timing, deliverables</li> </ul>	Pre-Commissioning	Once

## 2.2 Facility Data Collection

### a. Prerequisite tasks

Prior to collecting facility data, the Project Team Lead should guide the data authors through the planning tasks described in **Section 2.1.g**. In addition, the Project Team Lead should ensure data authors and the data manager understand how to access, submit, and review deliverables using the planned tools or platform for submission.

### b. Platform for deliverables submission

Facility data deliverables should be collected using a web-based, digital document management or project management system, determined by the Project Team Lead, with input from the data authors and approved by the University project manager. The tool or platform may be in use by the Team for other functions, such as submittal workflow, or general document management. The platform must be capable of tracking file upload/transfer date, version of file, and username associated with the submitted files. The platform must have a method to track status of review or, at minimum, be able to create a folder structure to facilitate a review process. The project team should identify the platform for data deliverables submission in the **facility data deliverables schedule**.

### c. Roles and Responsibilities

The project team should understand their role and the related roles (Owner, Data Manager, Project Team Lead, and Data Authors) when planning and delivering facility data. Roles are defined in Section 1.3 of this Guideline and the role tasks and responsibilities are discussed throughout Section 2.

### d. Data Collection Template

The project team should use the **Data Collection Template** to store and submit location and asset data.

### Locations Table

The Template locations table format requires the data author to indicate the following for all functional spaces (rooms) within the facility:

- 1) **Name**
- 2) **Number**
- 3) **Level** (building level the space resides on)
- 4) **UCSD Managing department** (facilities group with maintenance responsibility)

The data author should work with the University PM and data manager to include any additional rooms where managed assets are located if they are not shown on architectural floorplans, such as exterior equipment yards. All spaces containing managed assets should have location attributes as shown in the numbered list above.

Room numbers (space ID) and Level naming conventions should conform to the requirements specified in the **Attachment 2 – Space ID Guidelines**. The “**Location**” column in the locations table template is

calculated by formula and should equal the concatenation of the space name and number.

For projects involving existing spaces, such as tenant improvement and renovation, only spaces with managed assets need to be entered in the locations table for spaces where the space number (identifier) will remain the same. If space numbers will change, the responsible data author should enter the space in the locations table whether the space contains a managed asset or not.

Location	UCSD managing department	Name	Number	Level
Main Dining Room MO0101A	HDH	Main Dining Room	MO0101A	BLDG 5 - LVL 1
Main Dining Room MO0101B	HDH	Main Dining Room	MO0101B	BLDG 5 - LVL 1
Kitchen Prep MO0102	FM,HDH	Kitchen Prep	MO0102	BLDG 5 - LVL 1
Office MO0103	HDH	Office	MO0103	BLDG 5 - LVL 1
Office MO0103A	HDH	Office	MO0103A	BLDG 5 - LVL 1
Changing Room MO0104	HDH	Changing Room	MO0104	BLDG 5 - LVL 1
Custodial MO0105	HDH	Custodial	MO0105	BLDG 5 - LVL 1
Employee Restroom MO0106	HDH	Employee Restroom	MO0106	BLDG 5 - LVL 1
Restroom Vestibule MO0107	HDH	Restroom Vestibule	MO0107	BLDG 5 - LVL 1
Womens Restroom MO0108	HDH	Womens Restroom	MO0108	BLDG 5 - LVL 1
GIRR MO0109	HDH	GIRR	MO0109	BLDG 5 - LVL 1
Mens Restroom MO0110	HDH	Mens Restroom	MO0110	BLDG 5 - LVL 1
Pre-function Space Small Lecture Halls MO0111	FM	Pre-function Space Small Lecture Halls	MO0111	BLDG 5 - LVL 1
Sound Lock Corridor MO0112	FM	Sound Lock Corridor	MO0112	BLDG 5 - LVL 1
Small Lecture Hall 1 MO0113	FM	Small Lecture Hall 1	MO0113	BLDG 5 - LVL 1
Projector Booth MO0113A	FM	Projector Booth	MO0113A	BLDG 5 - LVL 1
Exit Corridor MO0113B	FM	Exit Corridor	MO0113B	BLDG 5 - LVL 1
Sound & Light Lock MO0113C	FM	Sound & Light Lock	MO0113C	BLDG 5 - LVL 1
Small Lecture Hall 2 MO0114	FM	Small Lecture Hall 2	MO0114	BLDG 5 - LVL 1
Projector Booth MO0114A	FM	Projector Booth	MO0114A	BLDG 5 - LVL 1
Sound & Light Lock MO0114B	FM	Sound & Light Lock	MO0114B	BLDG 5 - LVL 1
Circulation MO0115-CR	HDH	Circulation	MO0115-CR	BLDG 5 - LVL 1
Reception MO0116	HDH	Reception	MO0116	BLDG 5 - LVL 1
Office MO0117	HDH	Office	MO0117	BLDG 5 - LVL 1
Office MO0118	HDH	Office	MO0118	BLDG 5 - LVL 1
Project Planning MO0119	HDH	Project Planning	MO0119	BLDG 5 - LVL 1
Office MO0120	HDH	Office	MO0120	BLDG 5 - LVL 1
Office MO0121	HDH	Office	MO0121	BLDG 5 - LVL 1
Office MO0122	HDH	Office	MO0122	BLDG 5 - LVL 1
Office MO0123	HDH	Office	MO0123	BLDG 5 - LVL 1

**Figure 2.2.1** Example locations table format within the Data Collection Template.

## Assets Table

The Template asset table format requires the data author to indicate the asset data for each managed asset as defined in the University FDS and discussed in Section 2.1. The asset table format does not associate attributes to data drops. It is the responsibility of the project team and data authors to plan which attributes will be collected and delivered at specified data drops. In the graphic below, for convenience, the University has highlighted in red the attributes typically submitted at **drop one**, in purple the attributes typically submitted at **drop two**, and in green the attributes typically submitted in **drop three**.

Trade	Company name	Asset category project name	Manufacturer	Model	Type tag	department	Level	Location	Area serving	Sequential or tag numb	UCSO tag	Installed asset	Serial number	Barcode FM	Barcode MC	Barcode HDH
Architect@ucsd.edu	Ace Architecture	Automatic Door Controls and Operators	Stanley	MAGIC-FORCE	FM		BLDD 5 - LVL 1	Pre-function Space Small			ADD-X301004A					
Architect@ucsd.edu	Ace Architecture	Automatic Door Controls and Operators	Stanley	MAGIC-FORCE	FM		BLDD 5 - LVL 1	Pre-function Space Small			ADD-X301004H-1					
Architect@ucsd.edu	Ace Architecture	Automatic Door Controls and Operators	Stanley	MAGIC-FORCE	FM		BLDD 5 - LVL 1	Pre-function Space Small			ADD-X301004H-2					
Architect@ucsd.edu	Ace Architecture	Drinking Fountain With Coolers	Ray	L2STLGRWLSK	HGH		BLDD 5 - LVL 1	Main Dining Room			DF-5-1-1					
Architect@ucsd.edu	Ace Architecture	Drinking Fountain With Coolers	Ray	L2STLGRWLSK	HGH		BLDD 5 - LVL 1	Restroom Vestibule			DF-5-1-2					
Architect@ucsd.edu	Ace Architecture	Drinking Fountain With Coolers	Ray	L2STLGRWLSK	HGH		BLDD 5 - LVL 2	Open Art Studio M02007			DF-5-1-3					
Architect@ucsd.edu	Ace Architecture	Drinking Fountain With Coolers	Ray	L2STLGRWLSK	HGH		BLDD 5 - LVL 1	Men M02021			DF-5-1-4					
Architect@ucsd.edu	Ace Architecture	Drinking Fountain With Coolers	Ray	L2STLGRWLSK	HGH		BLDD 5 - LVL B1	Circulation M08120-CR			DF-5-1-5					
Architect@ucsd.edu	Ace Architecture	Fire Extinguishers	Cosmic 10E	Cosmic 10E	FM		BLDD 5 - LVL 1	Pre-function Space Small			FEC-101					
Architect@ucsd.edu	Ace Architecture	Fire Extinguishers	Cosmic 10E	Cosmic 10E	FM		BLDD 5 - LVL 1	Sound Lock Corridor			FEC-102					
Architect@ucsd.edu	Ace Architecture	Fire Extinguishers	Cosmic 10E	Cosmic 10E	FM		BLDD 5 - LVL 1	Pre-function Space Small			FEC-103					
Architect@ucsd.edu	Ace Architecture	Hydraulic Elevators	Mitsubishi Electric	ISH-C-H1	HGH		BLDD 5 - LVL B1	Elevator 5-C MODEL V5-C			ELEVATOR 5-C					
Architect@ucsd.edu	Ace Architecture	Hydraulic Elevators	Mitsubishi Electric	ISH-C-H1	HGH		BLDD 5 - LVL B1	Elevator 5-D MODEL V5-D			ELEVATOR 5-D					
Architect@ucsd.edu	Ace Architecture	Hydraulic Elevators	Mitsubishi Electric	ISH-M-L2	HGH		BLDD 5 - LVL B1	Elevator 5-E MODEL V5-E			ELEVATOR 5-E					
Architect@ucsd.edu	Ace Architecture	Laboratory Fume Hoods	by Design Vendor	ZL1N L48 SMR 3000LM-F5	HGH		BLDD 5 - LVL 2	Jewelry M02009			PH-01					
Architect@ucsd.edu	Ace Architecture	Metal Doors	Commercial Door Manufacturing	HUMA B61	FM		BLDD 5 - LVL 1	Pre-function Space Small			X301004A					
Architect@ucsd.edu	Ace Architecture	Metal Doors	Commercial Door Manufacturing	HUMA B61	FM		BLDD 5 - LVL 1	Pre-function Space Small			X301004B					
Architect@ucsd.edu	Ace Architecture	Metal Doors	Commercial Door Manufacturing	HUMA B61	FM		BLDD 5 - LVL 1	Pre-function Space Small			X301004C					
Architect@ucsd.edu	Ace Architecture	Metal Doors	Commercial Door Manufacturing	HUMA B61	FM		BLDD 5 - LVL 1	Pre-function Space Small			X301004H					
Architect@ucsd.edu	Ace Architecture	Traction Elevators	Mitsubishi Electric		HGH		BLDD 5 - LVL B1	Elevator 5-A MODEL V5-A			ELEVATOR 5-A					
Architect@ucsd.edu	Ace Architecture	Traction Elevators	Mitsubishi Electric		HGH		BLDD 5 - LVL B1	Elevator 5-B MODEL V5-B			ELEVATOR 5-B					

Figure 2.2.2 Example assets table format within the Data Collection Template.

## e. Data Collection Progression – Data Drops and Final Submission

Project team lead with data authors defined in the **Facility Data Deliverables Schedule** should determine the full schedule of data drops and responsible data authors. After each drop is submitted, the data manager will review and comment, if required, on any errors, omissions, or other revisions needed. Data authors are expected to review data manager markups and revise and resubmit data drop tables as needed.

The Project Team Lead is accountable for ensuring all data authors submit their respective asset table deliverables and any resubmissions by data authors to address corrections or clarifications requested by the data manager.

After a data deliverable has been approved by the data manager, the Project Team Lead should ensure the approved file is made available to subsequent data authors for the same scope of assets to use as a starting point for the subsequent data drop. At the end of the project, the Project Team Lead should compile and consolidate all approved data from each author and data drop into one assets table deliverable per facility for review and approval by the Data Manager.

## Change Management

If attribute data in submitted and approved data drops change as a result of design or construction changes, the last data author submitting a data drop deliverable for the impacted assets is expected to revise and resubmit the asset table to reflect the change. The data author may wait to batch submit the revised deliverable file if many changes are expected that impact multiple assets within their scope.

Data authors should be attuned to and have a plan for handling the following scenarios that potentially change facility data deliverables:

- 1) Design changes that affect spaces (locations)
- 2) Design changes or substitutions that affect product data (manufacturer, model)
- 3) Design changes that add or remove managed assets
- 4) Assets change location (space) after trade models have been signed off for coordination

## Barcoding

Asset categories requiring barcode labels are identified in the University FDS.

The project team may decide to assign full responsibility of all barcode labeling and collection of barcode numbers to multiple data authors or to an individual project team member, such as the commissioning agent. The project team lead should plan the process and tools necessary to efficiently track barcode label numbers in the field and to associate them with their related managed assets. The project team member performing barcode labeling (“**barcoder**”) will position labels on assets in a manner that the barcode is visible and accessible to a facility engineer performing maintenance on the asset in the final facility condition.

It is recommended that the barcoder use a mobile device with barcode scanning capability to ensure accuracy of data entered from the field into the asset table. It is also highly recommended for the barcoder to maintain digital photo documentation of the barcode labels application to assets. The data manager and University project manager will facilitate obtaining barcode labels from the facilities group(s) having maintenance responsibility.

### f. Data Translation and Delivery to Facilities

The Data Manager is responsible for translating asset and location data from the consolidated asset tables in the Data Collection Template format into the required CMMS file formats for each of the facilities groups.

### g. Data Collection – Data Quality

Data authors should ensure that facility data submitted in asset and location tables comply with formatting requirements as described in **Section 2.1.f – Facility Data Source and Formatting Requirements**. Data authors should ensure that no typos exist in attribute values in their facility data deliverables and repetitious attribute values such as “Manufacturer” and “Level” have the same case and spelling across multiple assets and locations that share values.

At each facility data deliverable milestone, according to the facility data deliverables schedule, the data manager will conduct facility data quality checks. The University will maintain facility data quality checking procedures, both manual and automated, and may require the project team to make use of software tools or add-ins to conduct periodic checking of data to be delivered to the University over the course of the project. The University will provide feedback to the project team if revisions and resubmissions to the facility data deliverables are needed based on the outcome of data quality checks.

## 3. Technology and Collaboration Guidelines for Project Execution

The next section discusses what is expected of an individual project team through the use of CAD, supporting meetings, and the relevant naming conventions to use throughout these Guidelines, related attachments, and appendices.

### 3.3 Technology Requirements

Projects requiring 2D CAD deliverables are required to use the software listed in the table below. CAD software should be a version agreed upon by the project team with approval from the University Project Manager. Upgrades to newer versions of software should be planned for and agreed upon by all affected project team members prior to implementation in the project. As a general rule, UC San Diego expects all project team members to work in software applications no older than two versions prior to the latest commercially available version.

Project Function	Discipline/Role	Software
Design Authoring	Architecture	AutoCAD®
Design Authoring	MEP	AutoCAD®
Design Authoring	Structure	AutoCAD®
Design Authoring	Civil	AutoCAD®
Design Authoring	Landscape	AutoCAD®
3D Coordination	CM, All Trades	AutoCAD®
Record Drawings	All	AutoCAD®
As-Built Drawings	All	AutoCAD®
Asset Management	UC San Diego Facilities Mgmt.	IBM Maximo® and/or TMA Systems***
Space Management	UC San Diego Space Mgmt.	IBM Tririga***

\*\* Shown for reference. Digital data conveyed in model deliverables or tabularly will be transferred to these systems by the University.

### 3.5 Project Collaboration and Meetings

The University expects the Project Team to collaborate throughout the design and construction process to develop high quality, coordinated, and constructible designs. To facilitate this collaboration the Project Team should conduct design and trade coordination review meetings according to the table below, at a minimum. At the beginning of design, the design team should communicate to the University Project Manager the number, frequency, and timing of design coordination meetings, and denote all required attendees. After the CM-GC is on-boarded, the CM-GC should communicate to the University Project Manager their plan for and timing of trade coordination sessions and required attendees.



A minimum meeting schedule is provided below. The project schedule should incorporate the below meeting types as needed to accomplish the goals of each project.

MEETING TYPE	PACKAGE	PROJECT STAGE	FREQUENCY (MINIMUM)
Design Coordination/QC	CAD	SD/DD/Bidding	Once per Stage
Design Coordination/QC	CAD	CD	Monthly
Trade Coordination/QC	CAD	Construction	Monthly

## 3.6 University Naming Standards

The following table of attachments should be referenced by the design team when creating and entering design and construction information for the listed topics in the left column. Naming standards should be implemented into project documentation starting with the phase noted in the “Project Phase Implemented” column.

Naming Standard Addressed	Project Phase Implemented	Relevant Attachment
File Naming for PDF drawings, 2D CAD files, and model files.	Schematic Design	Attachment 1 – File Naming Conventions
Space identifiers (room numbers)	Design Development	Attachment 2 – Space ID Guidelines
CAD Layering for Space Management Floorplans	Record Drawings	Attachment 6.1 – CAD Layer Assignment Guidance



## 4. Definitions

### A

#### As-Built Documents

As-Built Documents are the collection of paper drawings or electronic drawings that typically reside in the contractor's onsite trailer that contain mark-ups, annotations, and comments about changes that have been made to the contract documents during the construction phase.

### C

#### CMMS (Computerized Maintenance Management System)

A software that centralizes maintenance information and facilitates the processes of maintenance operations. It helps optimize the utilization and availability of physical equipment like machinery, communications, plant infrastructures, and other assets. CMMS have a database and a data model that organizes information about the assets a maintenance organization is charged with maintaining, as well as the equipment, materials, and other resources to do so.

### D

#### Design Team

The Design Team is considered to be the Architect and all of the consultants that provide design services for a project. These design services can be rendered at any time during the project.

### DWG

DWG is the native AutoCAD® file format. It is a widely used file format for exchanging drawing information and 3D information to different programs. While not a database file type, it still has many uses for exchanging information.

### F

#### Facility Data Manager

Project team member responsible for collecting and submitting facility data for their firm's scope as required by the University Facility Data Specification.

#### Facility Data Specification (FDS)

Document describing the University information requirements for managed assets. Lists the attributes required to be submitted according to asset class by the project team on capital projects.

### L

#### Lifecycle management systems (LCM)

Suite of software applications and tools that make up the University's management suite for facilities maintenance and operations including CMMS (Computerized Maintenance and Management System), space management, GIS, among others.

## M

### (IBM) Maximo

A web-based computerized maintenance management system (CMMS) and enterprise asset management solution. Maximo provides inventory and asset management, predictive and preventive maintenance, analytic reporting, and work order management in one application suite. Maximo is the CMMS used by Housing, Dining, and Hospitality, Campus FM, and the Med Center at UC San Diego.

## N

### Navisworks®

Navisworks® software is an application that allows viewing and aggregation of multiple model formats. This ability to view these files allows Navisworks® software to simulate the interaction between model files from different design disciplines or trade contractors. That includes collision detection, 4D construction sequencing, and coordination.

## R

### Record Drawing

The production of Record Drawings is the capturing of the As-Built Document's annotation, comments, and mark-ups in a drawing format only. This does not typically include the updating of any models.

## S

### Shop Drawing(s)

Shop Drawings are produced from the coordinated models of each trade and include all dimension and labeling. Submitted for approval by the Project team. These drawings are then used in the field for fabrication and erection.

## T

### TMA

TMA or webTMA is a computerized maintenance management system used to manage campus physical assets and streamline operations for facility services. TMA allows users to setup and manage facilities, buildings, technicians, and vehicles. Users can produce schedules, book facilities and assets, assign dates for repairs and maintenance, and perform inventory checks. TMA is one of the CMMS' in use by the UC San Diego Medical Center.

### (IBM) Tririga

An integrated workplace management solution (IWMS) developed by IBM. Enables users to perform space planning and optimization functions and allows occupants to make service requests and book rooms.

## Attachment 1 – File Naming Conventions

### 2D PDF

The format for PDF files for drawing sets should follow the naming convention below. PDF drawing sets should be submitted as a singular PDF file for each discipline and each volume (if applicable).

**Format of File:** AAAA- B-C.ext

**Example:** 5171-Hillcrest Redevelopment-Architectural Volume I.pdf

SIGNIFIER AREA	SIGNIFIER DESCRIPTION	VALUE	VALUE DESCRIPTION
			*Example values shown below. Not intended as complete list of values.
AAAA-B-C.ext	<b>Project Identifier</b>		Four-digit project number assigned by UC San Diego CPM
	Example:	5171	
AAAA-B-C.ext	<b>Project Name</b>		Project name commonly used by the Project Team
	Example:	Hillcrest Redevelopment	
AAAA-B-C.ext	<b>Discipline</b>		Discipline description and volume description (if applicable)
	Example:	Architectural Volume I	

### 2D CAD (.dwg)

2D CAD file (.dwg) deliverables have no specific file naming requirement, however, file authors should incorporate sheet numbers into the file name.



University of California San Diego

# UCSD Space ID Guidelines

Version 1.0: May 16, 2019

## 1. Space ID Guidelines Overview

To better leverage common facilities information across departmental functions, these space ID guidelines are applied to the entire campus for space and asset management activities. These activities involve planning, analysis, maintenance, operations, and especially first responder wayfinding throughout UC San Diego. These guidelines apply to all spaces where the University has a need to understand its operational footprint or maintains physical assets.

All accessible spaces at UC San Diego related to a building enclosure must have space identifiers (space numbers) assigned according to established guidelines and in consultation with Campus Planning. Space boundaries must be defined by discrete, individual polylines or similar bounding objects within graphic models such as BIM, CAD, GIS, photo-mesh model, etc.

- Initial room uses will be confirmed by Campus Space Planning for initial load.
- Boundaries, room separation, and/or polylines are measured paint to paint, not centerlines.

These space identification guidelines will most often be applied for new design-construction projects. For existing buildings with spaces not conforming to this guideline, project teams may use ID's that fit within the existing buildings naming and numbering pattern.

## 2. Coordination of Space ID Guidelines

Representatives from the three areas below must coordinate, review and agree on the final numbering outcome for all construction activity that modifies space geometry (usually walls, windows, and doors, but may include exterior areas such as parking or tennis courts):

- A. The architectural and/or engineering design consultant (A/E)
- B. The UC San Diego project manager (PM) or contact, usually from
  - a. Capital Program Management for most major projects
  - b. Facilities Management for most campus renovations
  - c. Facilities Engineering for Healthcare (Med Center) projects
  - d. Facilities Management for Housing, Dining, and Hospitality (HDH)
  - e. Real Estate for most lease Tenant Improvements (TIs).
- C. Campus Planning

(B) and/or (C) will confirm the final plan with the intended post-construction/renovation occupant(s) of the space. For all projects, review of space numbering and adherence to the numbering standard is mandatory. Space ID milestones are tied to the following project milestones:

- **100% Schematic Design** – Preliminary validation. Campus Planning will engage with a preliminary review of space IDs and Bluebeam comment process.
- **100% Construction Documents** – Final validation and sign-off.

## 3. Non-Building Spaces

A non-building space ID framework is under development. There is a need to locate assets not enclosed by a facility. Further details on this topic are forthcoming.

## 4. Floor and Space ID - Syntax and Assignment

1. Room numbers/space IDs should not exceed seven alphanumeric characters in total, including below grade prefixes, to allow prorating (subdividing) space allocations.
  - a. Space IDs must be unique within each building, with only one number per space.
  - b. The leading characters indicate the floor (such as 1, 2, 14, 15, P1, L3, etc)

Intermediate or mezzanine levels will be designated with an alphabetic character after the floor level below the intermediate level. For example, a floor between floors 3 and 4 will be designated “3A.”

- i. Numbered levels below grade prefixed with L or P, will increase with depth away from the ground plane. For example, descending below grade: L1, L2, L3, etc.
    - ii. In the case of additions to an existing building, the new structure’s floor nomenclature should match the existing floor nomenclature.
  - c. The remaining 5 characters indicate the space. Use the least possible number of characters to indicate unique spaces for a floor. For example, 99 spaces would entail 2 characters plus the floor prefix.
2. **Subspaces** - Spaces typically include all rooms and corridors within a building, but are also individuated further in at least two cases:
  - a. **Lab bench spaces** – Lab benches will have poly-lined subdivisions and space ids as needed by the managing department.
  - b. **Open office workstations** – all cubicles and bench work points must have an individual, non-overlapping boundary or polyline and a unique space id, using centerlines delineated by furniture or similar features.
    - i. The architect/designer shall provide an initial list and layout for open office areas.
    - ii. Typically, final open office designs will be provided by furniture vendors, and may be omitted from final room/space IDs provided by the architect/designer
    - iii. In cases of smaller renovations, or when the furniture design will not be provided by another vendor, the designer shall provide the IDs.
3. In order to keep numbers available for later use, openings in the numbering scheme should be left where future rooms or renovations are most likely to occur.
  - a. For example, for rooms 12 feet or longer, presume the possibility they may be subdivided at a later date. Leave room for number expansion (plus the floor prefix) when numbering.

1120 (8’)	1122 (8’)	1128 (24’)	1130 (8’)
-----------	-----------	------------	-----------

## 5. Sequence logic within building, floor, and suite

1. Begin numbering sequences at the main entrance of a floor or suite. If the entrance opens into the middle of a long hallway with many rooms, start numbering at the end of the hallway closest to the entrance. The main entrance may be located at any level but should be the predominant public entrance to the building.
2. Numbering sequences should follow consistent logical patterns throughout the building. Sequence path variations are discouraged but permitted when necessary due to building geometry.
  - a. Preferred sequences within a floor are:
    - i. Circular, moving clockwise or counterclockwise,
    - ii. Ascending (such as along a corridor) and either alternating evens and odds or following a sequence up one side and returning on the other.
  - b. Examples
    - i. Alternate even and odd on opposite sides of a corridor
    - ii. Numbers increase clockwise or counterclockwise from the main entrance
3. “Stack” rooms in multi-floor buildings both above and below where the geometry is similar.
  - a. For example, 101, 201, and 301, etc., might be vertically aligned if in the same corner of the building.
4. When renovating an area on a floor, and not the whole floor, number uniformity on the floor shall be maintained. If this means that a room not within the renovation area is re-numbered, the cost of signage is rolled into the contingency costs of the renovation project.




## Attachment 3 – University Facility Data Specification (FDS) and Data Collection Template

Includes the following files with noted worksheets:

UCSD FDS and Data Collection Template v2.01.xlsx

- Readme
- Facility Data Specification
- Authors
- Locations
- Assets

Facility	
Name	Mosaic
Select the building name here	
Address	La Jolla, CA
Enter the building address here	
Building description	New campus of six buildings over a podium with garage. The Mosaic building houses residences, a student cafeteria, and workshops and classrooms.
Enter brief a description of the building here	
Building image	
Insert an image for the building here	

The Data Collection Template is used to provide facility data from design and construction projects. The Template is the primary method project teams should use to submit facility data required according to the Facility Data Specification (FDS). Each project team, represented by the Project Team Lead, should plan and agree upon the required facility data, how, and when it will be submitted with the University PM and Data Manager. Each project team should develop a facility data deliverables schedule with review by the data manager. The deliverables schedule will lay out the timing of when completed Templates are due by each data author. See the T20/BIM Guidelines for more details on facility data deliverables.

The process of developing project data using the Template is organized in three sections:

- ① The "UCSD Facility Codes" table needs to be filled out by the data manager with the facilities group(s) involved in the project as the first step. The values entered in the UCSD Facility Codes table must be entered exactly since they directly transfer into Maximo. The "Facility" and "Project" tables capture general information after that.
- ② The "Facility Data Specification" and "Authors" tables require data be entered before data collection can begin. The "Custom project values for data entry" section of the "Facility Data Specification" needs to be completed by the Project Team with approval by the Data Manager before the next steps of inputting project data. The Project Team Lead should review the project design and list all "Asset category project name" values next to the appropriate Omniclass row to indicate that the asset category is found in the project. "Assigned authors" with the data drop they are responsible for are pulled into the Facility Data Specification sheet from the "Authors" sheet. Project team lead should ensure the "Authors" table is filled in with the Company Name, Data author name, Author email, and Data Drop so the author can be assigned to their respective asset categories in the FDS sheet.
- ③ Data Collection: The "Locations" table must be populated with all of the space (room) names, numbers, levels, and the FM department that manages them ("UCSD Managing Department"). Populating the locations table is ideally performed at the end of the design process when space names and numbers have been fixed. The "Assets" table references multiple data fields input from the previous steps which is why it is important to complete sections ① and ② before proceeding with adding data in the "Assets" table. The "location" attribute in the "Assets" table also pulls from the list of locations in the "Locations" table, if they are present. If all steps are followed in sequence, the "Assets" table serves as an effective support tool for Teams to interpret the UCSD facility data requirements.

For additional instructions, refer to the "Notes" next to the tables on each worksheet and the following field descriptions for additional details. Do not leave the attribute blank on the form, as this will indicate an omission of information.

Assets worksheet data entry information. If there is no value for an attribute that is required, then use "NA" to denote "not applicable".

#### Assets Table Field name (Not in Table below) Description

**Data author (email)**

Choose your email from the dropdown list. To enter additional rows, copy-paste into the next available row or right-click on the table and choose "Add row".

**Company name**

Calculated value based on data author picking a value in "Data author (email)" field.

**Notes**

Describe any unique conditions or exceptions.

Attribute Name	Data Type	Attribute Description and Data Source	Additional Note
UCSD Managing Department	Picklist	HDH, FM, MC, or a combination of the three. FM group at the University having maintenance responsibility. See FDS for differing data requirements for each department.	The "UCSD Required By" field in the "Facility Data Specification" worksheet indicates if the managing department tracks the asset category for any "UCSD managing department" assignment in the "Locations" worksheet indicates which FM department will manage the space, which may inform asset maintenance responsibility.
Facility ("UCSD HDH Description" or "UCSD FM Description")	Text (Fixed)	Facility name. Decided by UC San Diego. Same value for all assets within each facility. These attributes are entered on the "UCSD Facility Codes" worksheet.	
Asset Category Project Name	Picklist	Term used to refer to asset or equipment type from project design documents (drawings, equipment schedules, or specifications). Entered in the FDS worksheet which links to the dropdown on the Assets sheet.	
UCSD Tag	Text (Unique)	Unique asset identifier value as defined on design docs. If no unique tag is assigned, data manager to prescribe a pattern for data authors to implement, incorporating type tag.	Dropdown values are filtered by "Company Name"
Type Tag	Text	Non-unique asset identifier defined on design docs for assets of the same type (e.g. light fixtures, fire extinguishers). Only required if "UCSD Tag" is not defined by design team.	
Location	Picklist	From architectural floor plans. Value may either be a Level or the concatenation of space "Name Number" from locations table.	
Manufacturer	Text	Manufacturer company name from approved product data submittals.	Add department-specific barcode if the cell is non-shaded.
Model	Text	Model number for the product from approved product data submittals.	
Serial	Text	Asset serial number from startup reports or physical placards. A unique identifier for an installed product generated by the product manufacturer. Extended attribute (not required for all assets).	
Barcode (**)	Number	Barcode number matching HDH, FM, or Med Center barcode label values. Extended attribute (not required for all assets).	
Area Serving	Text	From single-line, riser diagram, or design plans. Location or list of locations (level or space "Name Number" from locations table) that the asset provides its service to, for mechanical dry-side assets only. Extended attribute (not required for all assets).	

Table 2.1.6 Asset data type and source.

\*\* is a placeholder for either FM, MC, or HDH

Table 2.1.6 from T20/BIM Guidelines main document

Classification				Custom project values for data entry				Extended Attributes							
System	Product class	OmniClass number	OmniClass name	LOD Matrix	Assigned Author	Asset category project name	Notes	UCSD required by	Unique	Area serving	Serial	Barcode FM	Barcode MC	Barcode HDH	
B20 EXTERIOR VERTICAL ENCLOSURES	23-17 11 00: Doors	23.17.11.00	Doors	23.17.11.00: Doors			Main entrance doors only, not all exterior doors	FM,MC	<input checked="" type="checkbox"/>	-	-	-	<input checked="" type="checkbox"/>	-	
B20 EXTERIOR VERTICAL ENCLOSURES	23-17 11 00: Doors	23.17.11.13.25	Overhead Metal Doors	23.17.11.13.25: Overhead Metal Doors				FM,MC	<input checked="" type="checkbox"/>	-	-	-	-	<input checked="" type="checkbox"/>	-
B20 EXTERIOR VERTICAL ENCLOSURES	23-17 11 00: Doors	23.17.11.23.15	Folding All Glass Doors and Grilles	23.17.11.23.15: Folding All Glass Doors and Grilles				FM,MC	<input checked="" type="checkbox"/>	-	-	-	-	<input checked="" type="checkbox"/>	-
B30 EXTERIOR HORIZONTAL ENCLOSURES	23-13 39 00: Roof Coverings, Claddings, Linings	23.13.39.00	Roof Coverings, Claddings, Linings	23.13.39.00: Roof Coverings, Claddings, Linings				MC	-	-	-	-	-	<input checked="" type="checkbox"/>	-
B30 EXTERIOR HORIZONTAL ENCLOSURES	23-13 39 00: Roof Coverings, Claddings, Linings	23.13.39.31	Roof Membranes	23.13.39.31: Roof Membranes				FM,HDH	-	-	-	-	-	<input checked="" type="checkbox"/>	
C10 INTERIOR CONSTRUCTION	23-17 11 00: Doors	23.15.11.17	Operable Partitions	23.15.11.17: Operable Partitions				FM	<input checked="" type="checkbox"/>	-	-	-	-	-	
C10 INTERIOR CONSTRUCTION	23-17 11 00: Doors	23.17.11.00	Doors	23.17.11.00: Doors				MC	<input checked="" type="checkbox"/>	-	-	-	<input checked="" type="checkbox"/>	-	
C10 INTERIOR CONSTRUCTION	23-17 19 00: Hardware for Openings	23.17.19.11.31	Automatic Door Controls and Operators	23.17.19.11.31: Automatic Door Controls and Operators			ADA panel/pedestal, only at main entrance doors	FM,MC	<input checked="" type="checkbox"/>	-	-	-	<input checked="" type="checkbox"/>	-	
C10 INTERIOR CONSTRUCTION	23-17 21 00: Protection of Openings	23.17.21.15	Fire and Smoke Shutters and Curtains	23.17.21.15: Fire and Smoke Shutters and Curtains				FM	<input checked="" type="checkbox"/>	-	-	-	-	<input checked="" type="checkbox"/>	-
C10 INTERIOR CONSTRUCTION	23-19 31 00: Room Units	23.19.31.19.13.04	Cold Room	23.19.31.19.13.04: Cold Room				FM,HDH	<input checked="" type="checkbox"/>	-	-	-	-	-	<input checked="" type="checkbox"/>
C10 INTERIOR CONSTRUCTION	23-19 31 00: Room Units	23.19.31.19.13.06	Warm Room	23.19.31.19.13.06: Warm Room				FM	<input checked="" type="checkbox"/>	-	-	-	-	-	-
C20 INTERIOR FINISHES	23-21 19 00: Casework	23.21.19.15.15.11	Hospital Specialty Casework	23.21.19.15.15.11: Hospital Specialty Casework				HDH	<input checked="" type="checkbox"/>	-	-	-	-	<input checked="" type="checkbox"/>	
C20 INTERIOR FINISHES	23-15 19 00: Ceiling Coverings, Claddings, and Linings	23.15.19.15.11	Ceiling Tiles	23.15.19.15.11: Ceiling Tiles				MC	-	-	-	-	<input checked="" type="checkbox"/>	-	
D10 Conveying	23-23 11 00: Vertical Transportation Equipment	23.23.11.11	Elevators	23.23.11.11: Elevators				All	<input checked="" type="checkbox"/>	-	-	-	-	<input checked="" type="checkbox"/>	
D10 Conveying	23-23 11 00: Vertical Transportation Equipment	23.23.11.11.11.11	Freight Traction Elevators	23.23.11.11.11.11: Freight Traction Elevators				FM,HDH	<input checked="" type="checkbox"/>	-	-	-	-	<input checked="" type="checkbox"/>	
D10 Conveying	23-23 11 00: Vertical Transportation Equipment	23.23.11.11.11.13	Passenger Traction Elevators	23.23.11.11.11.13: Passenger Traction Elevators				FM,HDH	<input checked="" type="checkbox"/>	-	-	-	-	<input checked="" type="checkbox"/>	
D10 Conveying	23-23 11 00: Vertical Transportation Equipment	23.23.11.11.11.15	Residential Traction Elevators	23.23.11.11.11.15: Residential Traction Elevators				FM,HDH	<input checked="" type="checkbox"/>	-	-	-	-	<input checked="" type="checkbox"/>	
D10 Conveying	23-23 11 00: Vertical Transportation Equipment	23.23.11.11.11.17	Service Traction Elevators	23.23.11.11.11.17: Service Traction Elevators				FM,HDH	<input checked="" type="checkbox"/>	-	-	-	-	<input checked="" type="checkbox"/>	
D10 Conveying	23-23 11 00: Vertical Transportation Equipment	23.23.11.11.13.11	Freight Hydraulic Elevators	23.23.11.11.13.11: Freight Hydraulic Elevators				FM,HDH	<input checked="" type="checkbox"/>	-	-	-	-	<input checked="" type="checkbox"/>	
D10 Conveying	23-23 11 00: Vertical Transportation Equipment	23.23.11.11.13.13	Passenger Hydraulic Elevators	23.23.11.11.13.13: Passenger Hydraulic Elevators				FM,HDH	<input checked="" type="checkbox"/>	-	-	-	-	<input checked="" type="checkbox"/>	
D10 Conveying	23-23 11 00: Vertical Transportation Equipment	23.23.11.11.13.15	Residential Hydraulic Elevators	23.23.11.11.13.15: Residential Hydraulic Elevators				FM,HDH	<input checked="" type="checkbox"/>	-	-	-	-	<input checked="" type="checkbox"/>	
D10 Conveying	23-23 11 00: Vertical Transportation Equipment	23.23.11.11.13.17	Service Hydraulic Elevators	23.23.11.11.13.17: Service Hydraulic Elevators				FM,HDH	<input checked="" type="checkbox"/>	-	-	-	-	<input checked="" type="checkbox"/>	
D10 Conveying	23-23 11 00: Vertical Transportation Equipment	23.23.11.11.21	Elevator Equipment and Controls	23.23.11.11.21: Elevator Equipment and Controls				FM,HDH	<input checked="" type="checkbox"/>	-	-	-	-	<input checked="" type="checkbox"/>	
D10 Conveying	23-23 13 00: Lifting Equipment	23.23.13.11.25	Wheel Chair Lifts	23.23.13.11.25: Wheel Chair Lifts				FM	<input checked="" type="checkbox"/>	-	-	-	-	-	
D10 Conveying	23-23 23 00: Loading Dock Equipment	23.23.23.00	Loading Dock Equipment	23.23.23.00: Loading Dock Equipment				FM	<input checked="" type="checkbox"/>	-	-	-	-	-	
D20 Plumbing	23-13 41 00: Roof Specialties and Accessories	23.13.41.39	Roof Drains	23.13.41.39: Roof Drains				FM	<input checked="" type="checkbox"/>	-	-	-	-	-	
D20 Plumbing	23-13 41 00: Roof Specialties and Accessories	23.13.41.39	Roof Drains	23.13.41.39: Roof Drains				FM	<input checked="" type="checkbox"/>	-	-	-	-	-	
D20 Plumbing	23-27 11 00: Gas Instrument and Controls	23.27.11.04	Gas Meters	23.27.11.04: Gas Meters				FM	<input checked="" type="checkbox"/>	-	-	-	-	-	
D20 Plumbing	23-27 17 00: Pumps	23.27.17.00	Pumps	23.27.17.00: Pumps			Duplex Pumps	All	<input checked="" type="checkbox"/>	-	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
D20 Plumbing	23-27 17 00: Pumps	23.27.17.02	Vacuum Pumps	23.27.17.02: Vacuum Pumps				FM,MC	<input checked="" type="checkbox"/>	-	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	-
D20 Plumbing	23-27 17 00: Pumps	23.27.17.04	Drainage Pumps	23.27.17.04: Drainage Pumps				All	<input checked="" type="checkbox"/>	-	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
D20 Plumbing	23-27 17 00: Pumps	23.27.17.13	Centrifugal Pumps	23.27.17.13: Centrifugal Pumps				All	<input checked="" type="checkbox"/>	-	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
D20 Plumbing	23-27 17 00: Pumps	23.27.17.35	Sewage Ejectors	23.27.17.35: Sewage Ejectors				All	<input checked="" type="checkbox"/>	-	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
D20 Plumbing	23-27 21 00: Compressors	23.27.21.04	Air Compressors	23.27.21.04: Air Compressors				All	<input checked="" type="checkbox"/>	-	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
D20 Plumbing	23-27 23 00: Heat Exchangers	23.27.23.00	Heat Exchangers	23.27.23.00: Heat Exchangers				All	<input checked="" type="checkbox"/>	-	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
D20 Plumbing	23-27 23 00: Heat Exchangers	23.27.23.13	Plate and Frame Heat Exchangers	23.27.23.13: Plate and Frame Heat Exchangers				All	<input checked="" type="checkbox"/>	-	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
D20 Plumbing	23-27 23 00: Heat Exchangers	23.27.23.15	Shell and Tube Heat Exchangers	23.27.23.15: Shell and Tube Heat Exchangers				All	<input checked="" type="checkbox"/>	-	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
D20 Plumbing	23-27 27 00: Pressure Reducing Stations	23.27.27.00	Pressure Reducing Stations	23.27.27.00: Pressure Reducing Stations				MC	<input checked="" type="checkbox"/>	-	-	-	<input checked="" type="checkbox"/>	-	
D20 Plumbing	23-27 29 00: Tanks and Storage Structures	23.27.29.19	Tanks	23.27.29.19: Tanks			Receiver Tank	FM,HDH	<input checked="" type="checkbox"/>	-	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	-	<input checked="" type="checkbox"/>	
D20 Plumbing	23-27 29 00: Tanks and Storage Structures	23.27.29.19.02	Gas System Tank	23.27.29.19.02: Gas System Tank				FM	<input checked="" type="checkbox"/>	-	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	-	-	
D20 Plumbing	23-27 29 00: Tanks and Storage Structures	23.27.29.19.04	Gray Water Tanks	23.27.29.19.04: Gray Water Tanks			Storage Tank	FM,HDH	<input checked="" type="checkbox"/>	-	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	-	<input checked="" type="checkbox"/>	
D20 Plumbing	23-27 29 00: Tanks and Storage Structures	23.27.29.19.05	Potable Water Storage Tanks	23.27.29.19.05: Potable Water Storage Tanks				All	<input checked="" type="checkbox"/>	-	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
D20 Plumbing	23-27 29 00: Tanks and Storage Structures	23.27.29.19.06	Sanitary Tanks	23.27.29.19.06: Sanitary Tanks				FM,HDH	<input checked="" type="checkbox"/>	-	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
D20 Plumbing	23-27 29 00: Tanks and Storage Structures	23.27.29.19.08	Expansion Tanks (plumbing)	23.27.29.19.08: Expansion Tanks (plumbing)			Expansion Tank	All	<input checked="" type="checkbox"/>	-	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
D20 Plumbing	23-27 31 00: Valves	23.27.31.00	Valves	23.27.31.00: Valves				FM,MC	<input checked="" type="checkbox"/>	-	-	-	<input checked="" type="checkbox"/>	-	
D20 Plumbing	23-27 31 00: Valves	23.27.31.00	Valves	23.27.31.00: Valves				FM,MC	<input checked="" type="checkbox"/>	-	-	-	<input checked="" type="checkbox"/>	-	
D20 Plumbing	23-27 31 00: Valves	23.27.31.00	Valves	23.27.31.00: Valves				FM,MC	<input checked="" type="checkbox"/>	-	-	-	<input checked="" type="checkbox"/>	-	
D20 Plumbing	23-27 31 00: Valves	23.27.31.11	Backflow Preventors	23.27.31.11: Backflow Preventors				All	<input checked="" type="checkbox"/>	-	-	-	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
D20 Plumbing	23-27 31 00: Valves	23.27.31.29	Mixing Valves	23.27.31.29: Mixing Valves				FM,MC	<input checked="" type="checkbox"/>	-	-	-	<input checked="" type="checkbox"/>	-	
D20 Plumbing	23-27 33 00: Valve Actuators	23.27.33.11	Electrical Valve Actuators	23.27.33.11: Electrical Valve Actuators				FM,HDH	<input checked="" type="checkbox"/>	-	-	-	-	<input checked="" type="checkbox"/>	
D20 Plumbing	23-27 37 00: Liquid Traps	23.27.37.11	Grease Traps	23.27.37.11: Grease Traps				MC	<input checked="" type="checkbox"/>	-	-	-	<input checked="" type="checkbox"/>	-	
D20 Plumbing	23-27 37 00: Liquid Traps	23.27.37.15	Steam Traps	23.27.37.15: Steam Traps				MC	<input checked="" type="checkbox"/>	-	-	-	<input checked="" type="checkbox"/>	-	
D20 Plumbing	23-27 55 00: Liquid Treatment Components	23.27.55.11	Liquid Filters	23.27.55.11: Liquid Filters				MC	<input checked="" type="checkbox"/>	-	-	-	<input checked="" type="checkbox"/>	-	
D20 Plumbing	23-27 55 00: Liquid Treatment Components	23.27.55.27.11	Water Softeners	23.27.55.27.11: Water Softeners				FM,MC	<input checked="" type="checkbox"/>	-	-	-	<input checked="" type="checkbox"/>	-	
D20 Plumbing	23-27 55 00: Liquid Treatment Components	23.27.55.38	Liquid Separators (plumbing)	23.27.55.38: Liquid Separators (plumbing)</											

Classification				Custom project values for data entry				Extended Attributes							
System	Product class	OmniClass number	OmniClass name	LOD Matrix		Assigned Author	Asset category project name	Notes	UCSD required by	Unique	Area serving	Serial	Barcode FM	Barcode MC	Barcode HDH
D30 HVAC	23-33 29 00: HVAC Dampers	23.33.29.24	Combination Fire Smoke Dampers	23.33.29.24:	Combination Fire Smoke Dampers			Fire Dampers	FM	☑	-	-	-	-	-
D30 HVAC	23-33 29 00: HVAC Dampers	23.33.29.25	Smoke Dampers	23.33.29.25:	Smoke Dampers				FM	☑	-	-	-	-	-
D30 HVAC	23-33 29 00: HVAC Dampers	23.33.29.37	Volume Control Dampers	23.33.29.37:	Volume Control Dampers				FM,HDH	☑	-	-	-	-	☑
D30 HVAC	23-33 31 00: Air Circulators	23.33.31.15	Exhaust Hoods	23.33.31.15:	Exhaust Hoods				FM,HDH	☑	☑	-	-	-	☑
D30 HVAC	23-33 31 00: Air Circulators	23.33.31.19	Fans	23.33.31.19:	Fans				All	☑	☑	☑	☑	☑	☑
D30 HVAC	23-33 31 00: Air Circulators	23.33.31.19	Fans	23.33.31.19:	Fans			Exhaust Fan	All	☑	☑	☑	☑	☑	☑
D30 HVAC	23-33 31 00: Air Circulators	23.33.31.19	Fans	23.33.31.19:	Fans			Supply Fan	All	☑	☑	☑	☑	☑	☑
D30 HVAC	23-33 31 00: Air Circulators	23.33.31.19	Fans	23.33.31.19:	Fans			Booster Fan	All	☑	☑	☑	☑	☑	☑
D30 HVAC	23-33 31 00: Air Circulators	23.33.31.19	Fans	23.33.31.19:	Fans			Return Fan	All	☑	☑	☑	☑	☑	☑
D30 HVAC	23-33 33 00: HVAC Fan Coil Units	23.33.33.11	Fan Coil Units	23.33.33.11:	Fan Coil Units				All	☑	☑	☑	☑	☑	☑
D30 HVAC	23-33 35 00: HVAC Coils	23.33.35.00	HVAC Coils	23.33.35.00:	HVAC Coils			Reheat coils	FM,HDH	☑	-	-	-	-	☑
D30 HVAC	23-33 37 00: Refrigerant Condensing Units	23.33.37.00	Refrigerant Condensing Units	23.33.37.00:	Refrigerant Condensing Units				FM,HDH	☑	-	-	☑	-	☑
D30 HVAC	23-33 39 00: Air Conditioning Equipment	23.33.39.11	Air Conditioners	23.33.39.11:	Air Conditioners				All	☑	-	-	☑	☑	☑
D30 HVAC	23-33 39 00: Air Conditioning Equipment	23.33.39.15	Make Up Air Units	23.33.39.15:	Make Up Air Units				FM,HDH	☑	☑	☑	☑	☑	☑
D30 HVAC	23-33 39 00: Air Conditioning Equipment	23.33.39.17	Packaged Air Conditioners	23.33.39.17:	Packaged Air Conditioners				FM,HDH	☑	☑	☑	☑	-	☑
D30 HVAC	23-33 39 00: Air Conditioning Equipment	23.33.39.19	Packaged Terminal Air Conditioning Units	23.33.39.19:	Packaged Terminal Air Conditioning Units				FM,HDH	☑	☑	☑	☑	-	☑
D30 HVAC	23-33 39 00: Air Conditioning Equipment	23.33.39.21	Split System Air Conditioning Units	23.33.39.21:	Split System Air Conditioning Units				All	☑	-	☑	☑	☑	☑
D30 HVAC	23-33 41 00: HVAC Air Terminals	23.33.41.17.11	Constant Volume Air Terminal Units	23.33.41.17.11:	Constant Volume Air Terminal Units				All	☑	☑	-	-	☑	☑
D30 HVAC	23-33 41 00: HVAC Air Terminals	23.33.41.17.13	Variable Air Volume Terminal Units	23.33.41.17.13:	Variable Air Volume Terminal Units				All	☑	☑	-	-	☑	☑
D30 HVAC	23-33 43 00: HVAC Condenser Units	23.33.43.11	Air Cooled Condenser Units	23.33.43.11:	Air Cooled Condenser Units				All	☑	-	-	-	☑	☑
D30 HVAC	23-33 43 00: HVAC Condenser Units	23.33.43.13	Evaporative Condenser Units	23.33.43.13:	Evaporative Condenser Units				All	☑	-	-	-	☑	☑
D30 HVAC	23-33 43 00: HVAC Condenser Units	23.33.43.15	Refrigeration Condenser Units	23.33.43.15:	Refrigeration Condenser Units				All	☑	-	-	-	☑	☑
D30 HVAC	23-33 43 00: HVAC Condenser Units	23.33.43.17	Water Cooled Condenser Units	23.33.43.17:	Water Cooled Condenser Units				All	☑	-	-	-	☑	☑
D30 HVAC	23-33 49 27: Ventilators	23.33.49.27.11	Gravity Ventilators	23.33.49.27.11:	Gravity Ventilators				All	☑	☑	☑	☑	☑	☑
D30 HVAC	23-35 17 00: Variable Speed Drives	23.35.17.15	Variable Frequency Drives	23.35.17.15:	Variable Frequency Drives				FM,MC	☑	-	☑	☑	☑	-
D30 HVAC	23-39 35 00: Water and Wastewater Chemical Feed Equipment	23.39.35.11.17.04	Fuel-Gas Detection and Alarm	23.39.35.11.17.04:	Fuel-Gas Detection and Alarm				FM,HDH	☑	-	-	-	-	☑
D40 Fire Protection	23-27 17 00: Pumps	23.27.17.06	Fire Pumps	23.27.17.06:	Fire Pumps				FM,HDH	☑	-	☑	☑	-	☑
D40 Fire Protection	23-29 25 00: Fire Fighting Equipment	23.29.25.16.19	Fire Hose Connectors	23.29.25.16.19:	Fire Hose Connectors				FM	☑	-	-	-	-	☑
D40 Fire Protection	23-29 25 00: Fire Fighting Equipment	23.29.25.19	Fire Extinguishers	23.29.25.19:	Fire Extinguishers				FM,MC	☑	-	-	-	☑	-
D40 Fire Protection	23-29 29 00: Fire Detection Devices	23.29.29.15	Fire Switches	23.29.29.15:	Fire Switches				MC	☑	-	-	-	☑	-
D40 Fire Protection	23-29 31 00: Fire Notification Appliances	23.29.31.13	Fire Alarm Control Panels	23.29.31.13:	Fire Alarm Control Panels				All	☑	-	-	-	☑	☑
D40 Fire Protection	23-29 33 00: Fire Suppression System Components	23.29.33.13.13	Carbon Dioxide Suppression Equipment	23.29.33.13.13:	Carbon Dioxide Suppression Equipment				FM	☑	-	-	-	-	-
D50 Electrical	23-27 15 00: Building Automation and Control	23.27.15.21	Building Lighting Controls	23.27.15.21:	Building Lighting Controls				FM	☑	-	-	-	-	-
D50 Electrical	23-35 11 00: Electrical Generators	23.35.11.00	Electrical Generators	23.35.11.00:	Electrical Generators				All	☑	-	☑	☑	☑	☑
D50 Electrical	23-35 11 00: Electrical Generators	23.35.11.15	Engine Generator Sets	23.35.11.15:	Engine Generator Sets				All	☑	-	☑	☑	☑	☑
D50 Electrical	23-35 11 00: Electrical Generators	23.35.11.17.15	Photovoltaic Collectors	23.35.11.17.15:	Photovoltaic Collectors			One asset per array	FM,HDH	☑	-	-	-	-	☑
D50 Electrical	23-35 13 00: Transformers	23.35.13.04	Low Voltage Transformers	23.35.13.04:	Low Voltage Transformers				All	☑	-	-	-	☑	☑
D50 Electrical	23-35 13 00: Transformers	23.35.13.06	Medium Voltage Transformers	23.35.13.06:	Medium Voltage Transformers				All	☑	-	-	-	☑	☑
D50 Electrical	23-35 13 00: Transformers	23.35.13.08	Substation Transformers	23.35.13.08:	Substation Transformers				All	☑	-	-	-	☑	☑
D50 Electrical	23-35 17 00: Variable Speed Drives	23.35.17.15	Variable Frequency Drives	23.35.17.15:	Variable Frequency Drives				FM,MC	☑	-	-	-	☑	-
D50 Electrical	23-35 19 00: Batteries	23.35.19.00	Batteries	23.35.19.00:	Batteries				FM,HDH	☑	-	-	-	-	☑
D50 Electrical	23-35 19 00: Batteries	23.35.19.11	Battery Racks	23.35.19.11:	Battery Racks				FM,HDH	☑	-	-	-	-	☑
D50 Electrical	23-35 23 00: Power Conditioning Equipment	23.35.23.21	Uninterrupted Power Supply (UPS) Units	23.35.23.21:	Uninterrupted Power Supply (UPS) Units				All	☑	-	-	-	☑	-
D50 Electrical	23-35 25 00: Electrical Instrumentation and Controls	23.35.25.11	Electrical Meters	23.35.25.11:	Electrical Meters				FM,HDH	☑	-	-	-	-	☑
D50 Electrical	23-35 27 00: Electrical Terminals	23.35.27.11	Electrical Receptacles	23.35.27.11:	Electrical Receptacles				MC	-	-	-	-	☑	-
D50 Electrical	23-35 29 00: Circuit Breakers	23.35.29.21	Vacuum Circuit Breakers	23.35.29.21:	Vacuum Circuit Breakers				MC	☑	-	-	-	-	-
D50 Electrical	23-35 31 00: Electrical Power Distribution Devices	23.35.31.13	Distribution Panel Boards	23.35.31.13:	Distribution Panel Boards				All	☑	-	☑	☑	☑	☑
D50 Electrical	23-35 31 00: Electrical Power Distribution Devices	23.35.31.17	Electrical Panel Boards	23.35.31.17:	Electrical Panel Boards				All	☑	-	-	-	☑	☑
D50 Electrical	23-35 31 00: Electrical Power Distribution Devices	23.35.31.23	Motor Control Centers	23.35.31.23:	Motor Control Centers				All	☑	-	-	-	☑	☑
D50 Electrical	23-35 31 00: Electrical Power Distribution Devices	23.35.31.29	Switchboards	23.35.31.29:	Switchboards				FM,HDH	☑	-	☑	☑	-	☑
D50 Electrical	23-35 31 00: Electrical Power Distribution Devices	23.35.31.29.02	Substation Switchboards	23.35.31.29.02:	Substation Switchboards				All	☑	-	☑	☑	☑	☑
D50 Electrical	23-35 31 00: Electrical Power Distribution Devices	23.35.31.31	Switchgear	23.35.31.31:	Switchgear				All	☑	-	☑	☑	☑	☑
D50 Electrical	23-35 37 00: Electrical Switches	23.35.37.11	Automatic Transfer Switches	23.35.37.11:	Automatic Transfer Switches				All	☑	-	-	-	☑	☑
D50 Electrical	23-35 43 00: Electrical Relays	23.35.43.37	Voltage Relays	23.35.43.37:	Voltage Relays				MC	☑	-	-	-	☑	-
D50 Electrical	23-35 47 00: Electrical Lighting	23.35.47.11.04	Task Lighting	23.35.47.11.04:	Task Lighting				MC	☑	-	-	-	-	-
D50 Electrical	23-35 47 13: Emergency Lighting	23.35.47.13	Emergency Lighting	23.35.47.13:	Emergency Lighting				FM,MC	☑	-	-	-	☑	-
D50 Electrical	23-35 47 15: Exit Illuminated Signs	23.35.47.15	Exit Illuminated Signs	23.35.47.15:	Exit Illuminated Signs				FM,MC	☑	-	-	-	☑	-
D90 Integrated Automation	23-27 15 00: Building Automation and Control	23.27.15.23	HVAC Controls	23.27.15.23:	HVAC Controls				FM	☑	-	-	-	-	-
E10 Equipment	23-21 21 00: Food Service Equipment and Furnishings	23.21.21.11	Commercial Food Services Cabinets	23.21.21.11:	Commercial Food Services Cabinets				HDH	☑	-	-	-	-	HDH
E10 Equipment	23-21 21 00: Food Service Equipment and Furnishings	23.21.21.11.11	Commercial Hot Cabinets	23.21.21.11.11:	Commercial Hot Cabinets				HDH	☑	-	-	-	-	☑
E10 Equipment	23-21 21 00: Food Service Equipment and Furnishings	23.21.21.13.15	Commercial Broilers	23.21.21.13.15:	Commercial Broilers				HDH	☑	-	-	-	-	☑
E10 Equipment	23-21 21 00: Food Service Equipment and Furnishings	23.21.21.13.15.15	Commercial Gas Broilers	23.21.21.13.15.15:	Commercial Gas Broilers				HDH	☑	-	-	-	-	☑
E10 Equipment	23-21 21 00: Food Service Equipment and Furnishings	23.21.21.13.17.17	Commercial Rice Cookers	23.21.21.13.17.17:	Commercial Rice Cookers				HDH	☑	-	-	-	-	☑
E10 Equipment	23-21 21 00: Food Service Equipment and Furnishings	23.21.21.13.21.11	Commercial Deep Fryers	23.21.21.13.21.11:	Commercial Deep Fryers				HDH	☑	-	-	-	-	☑
E10 Equipment	23-21 21 00: Food Service Equipment and Furnishings	23.21.21.13.25	Commercial Griddles	23.21.21.13.25:	Commercial Griddles				HDH	☑	-	-	-	-	☑
E10 Equipment	23-21 21 00: Food Service Equipment and Furnishings	23.21.21.13.27	Commercial Grills	23.21.21.13.27:	Commercial Grills				HDH	☑	-	-	-	-	☑
E10 Equipment	23-21 21 00: Food Service Equipment and Furnishings	23.21.21.13.29	Commercial Kettles	23.21.21.13.29:	Commercial Kettles				HDH	☑	-	-	-	-	☑
E10 Equipment	23-21 21 00: Food Service Equipment and Furnishings	23.21.21.13.31	Commercial Ovens	23.21.21.13.31:	Commercial Ovens				HDH	☑	-	-	-	-	☑
E10 Equipment	23-21 21 00: Food Service Equipment and Furnishings	23.21.21.13.31.13	Commercial Combination Convection Ovens	23.21.21.13.31.13:	Commercial Combination Convection Ovens				HDH	☑	-	-	-	-	☑
E10 Equipment	23-21 21 00: Food Service Equipment and Furnishings	23.21.21.13.31.15	Commercial Convection Ovens	23.21.21.13.31.15:	Commercial Convection Ovens				HDH	☑	-	-	-	-	☑
E10 Equipment	23-21 21 00: Food Service Equipment and Furnishings	23.21.21.13.35	Commercial Ranges	23.21.21.13.35:	Commercial Ranges				HDH	☑	-	-	-	-	☑
E10 Equipment	23-21 21 00: Food Service Equipment and Furnishings	23.21.21.13.39	Commercial Food Steamers	23.21.21.13.39:	Commercial Food Steamers				HDH	☑	-	-	-	-	☑
E10 Equipment	23-21 21 00: Food Service Equipment and Furnishings	23.21.21.13.41.11	Commercial Tilt Skillet	23.21.21.13.41.11:	Commercial Tilt Skillet				HDH	☑	-	-	-	-	☑
E10 Equipment	23-21 21 00: Food Service Equipment and Furnishings	23.21.21.13.45.11	Commercial Toaster Conveyors	23.21.21.13.45.11:	Commercial Toaster Conveyors				HDH	☑	-	-	-	-	☑
E10 Equipment	23-21 21 00: Food Service Equipment and Furnishings	23.21.21.15.13	Commercial Food Warmer Stations	23.21.21.15.13:	Commercial Food Warmer Stations				HDH	☑	-	-	-	-	☑
E10 Equipment	23-21 21 00: Food Service Equipment and Furnishings	23.21.21.15.17	Commercial Steam Tables	23.21.21.15.17:	Commercial Steam Tables				HDH	☑	-	-	-	-	☑
E10 Equipment	23-21 21 00: Food Service Equipment and Furnishings	23.21.21.17.11	Commercial Refrigerated Tables	23.21.21.17.11:	Commercial Refrigerated Tables				HDH	☑	-	-	-	-	☑
E10 Equipment	23-21 21 00: Food Service Equipment and Furnishings	23.21.21.19	Commercial Dishwasher Equipment	23.21.21.19:	Commercial Dishwasher Equipment				HDH	☑	-	-	-	-	☑
E10 Equipment	23-21 21 00: Food Service Equipment and Furnishings	23.21.21.19.11	Commercial Dishwashers	23.21.21.19.11:	Commercial Dishwashers				HDH	☑	-	-	-	-	☑
E10 Equipment	23-21 21 00: Food Service Equipment and Furnishings	23.21.21.21	Commercial Food Disposal Equipment	23.21.21.21:	Commercial Food Disposal Equipment				HDH	☑	-	-	-	-	☑
E10 Equipment	23-21 21 00: Food Service Equipment and Furnishings	23.21.21.21.13	Commercial Garbage Disposals	23.21.21.21.13:	Commercial Garbage Disposals				HDH	☑	-	-	-	-	☑
E10 Equipment	23-21 21 00: Food Service Equipment and Furnishings	23.21.21.21.15	Commercial Garbage Pulpers	23.21.21.21.15:	Commercial Garbage Pulpers				HDH	☑	-	-	-	-	☑
E10 Equipment	23-21 21 00: Food Service Equipment and Furnishings	23.21.21.23.11	Commercial Food Display Coolers	23.21.21.23.11:	Commercial Food Display Coolers				HDH	☑	-	-	-	-	☑
E10 Equipment	23-21 21 00: Food Service Equipment and Furnishings	23.21.21.23.11.11	Commercial Freezer Food Display Cases	23.21.21.23.11.11:	Commercial Freezer Food Display Cases				HDH	☑	-	-	-	-	☑
E10 Equipment	23-21 21 00: Food Service Equipment and Furnishings	23.21.21.23.11.15	Commercial Refrigerated Food Display Cases	23.21.21.23.11.15:	Commercial Refrigerated Food Display Cases				HDH	☑	-	-	-	-	☑
E10 Equipment	23-21 21 00: Food Service Equipment and Furnishings	23													

Data Authors

Data Drop and Author	Company name	Name	Email	Data Drop Responsibility
Architectural-Drop One	Architectural	First Last Architect	<a href="mailto:architect@vueops.com">architect@vueops.com</a>	Drop One
Mechanical-Drop One	Mechanical	First Last Mechanical	<a href="mailto:mechanical@vueops.com">mechanical@vueops.com</a>	Drop One
Plumbing-Drop One	Plumbing	First Last Plumber	<a href="mailto:plumber@vueops.com">plumber@vueops.com</a>	Drop One
Electrical-Drop One	Electrical	First Last Electrician	<a href="mailto:electrician@vueops.com">electrician@vueops.com</a>	Drop One
Civil-Drop One	Civil	First Last Civil	<a href="mailto:civil@vueops.com">civil@vueops.com</a>	Drop One

## Locations

[illegible]

Notes

Location: name + number, duplicates are highlighted  
Locations are sorted by level and number  
Number: duplicates are highlighted  
UCSD managing departments: HDH, FM, MC

Check that there are no duplicate Location values. Remove any duplicates to prevent issues downstream in Assets.  
Sort the Location list by Level and Number before using in Assets

[illegible]

## Attachment 4 – Deliverables Schedule

Includes the following files with noted worksheets:

UCSD Deliverables Schedules.xlsx

- Facility Data Deliverables Schedule



45



# CAD Standards

Version 3.1: March 7, 2022

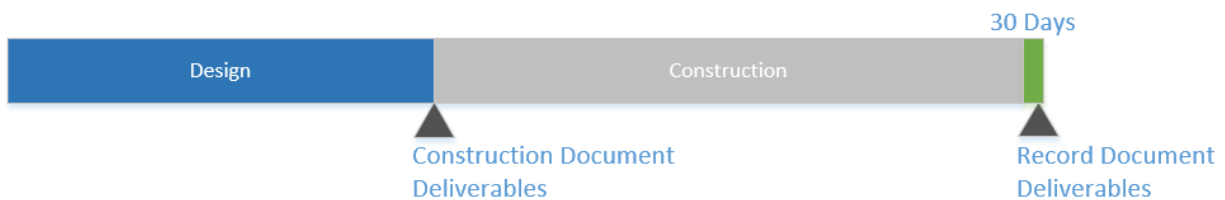
## 1. University CAD Standards

### 1.1 Summary and Intent

Two-dimensional CAD files are produced and used by the University and its business partners for a wide variety of facilities planning and management purposes throughout the building lifecycle. To this end, UC San Diego has established campus-wide standards for the creation and maintenance of CAD facility drawings. These standards are based on delivering a minimally viable product (MVP) at the appropriate points in the design and construction process to enable the efficient transition of the building to an operational state.

### 1.2 Deliverables

#### a. Timeline



#### b. Construction Document Deliverables

At the completion of Construction Documents the following deliverables shall be submitted:

- **Space Management Floorplans** - One overall architectural floor plan export (.DWG format) per floor illustrating fixed building elements (fixed casework, furniture, fixed floor or roof mounted equip, major medical equip, walls, doors, windows) and room numbers/names. See **Attachment 6.1** for additional guidance on element types to appear on space management floorplans and layer usage requirements.
  - Plans shall include an overall site plan and roof plan
  - Plans shall include one floor plan for every floor, above or below grade
  - Unique room identifiers are required, on a separate layer
  - Include closed polyline space boundaries if available
  - Include power/data locations if available
  - Unused CAD Layers shall be purged.
- **PDF equivalent of the Construction Documents**
  - File naming per T2O and BIM Guidelines **Attachment 1 – File Naming Conventions**
  - Subfolder organization shall align with the physical organization of the documents.

## c. Record Document Deliverables

Within thirty (30) days of Substantial Completion, the following deliverables shall be submitted:

- **Space Management Floorplans** - One overall architectural floor plan export (.DWG format) per floor illustrating fixed building elements (fixed casework, furniture, fixed floor or roof mounted equip, major medical equip, walls, doors, windows) and room numbers/names. See **Attachment 6.1** for additional guidance on element types to appear on space management floorplans and layer usage requirements.
  - Plans shall include an overall site plan and roof plan
  - Plans shall include one floor plan for every floor, above or below grade
  - Unique room identifiers are required, on a separate layer
  - Include closed polyline space boundaries if available
  - Include power/data locations if available
  - Unused CAD Layers shall be purged
- **DWG** equivalent of the **Record Documents** (NO LAYER CONVERSION REQUIRED)
  - One DWG per sheet
  - File naming per T2O and BIM Guidelines **Attachment 1 – File Naming Conventions**
  - Subfolder organization shall align with the physical organization of the documents
- **PDF** equivalent of the **Record Documents**
  - File naming per T2O and BIM Guidelines **Attachment 1 – File Naming Conventions**
  - Subfolder organization shall align with the physical organization of the documents.

## d. File Organization and Naming for Record Documents

Master Folder

- Master folder name shall include the UCSD project number and project name.

Subfolder organization shall consist of the following folders:

- Record Documents-PDF
- Record Documents-DWG
- Space Management Floor Plans-DWG

## Attachment 6.1 – CAD Layer Assignment Guidance

The list of element categories below indicates element types that the University anticipates may appear on floor plans that will be transmitted by the project team to the University in DWG and PDF formats at a frequency described in the CAD Standards document. These floor plan deliverables are referred to as **space management floorplans**.

The element categories indicated below list the CAD layer that building element categories should be assigned to in the DWG deliverable files. The project team member having responsibility to create and deliver the CAD files, typically the project Architect, should verify layer assignments have been set up according to this document.

The project team should review these requirements carefully at the beginning of the project to properly configure their CAD layers to avoid design rework.

### Element Categories

#### Casework

**Layer assignment:** A-FLOR-CASE

**Color ID:** 11

Casework should appear on this layer. No millwork.

#### Millwork

**Layer assignment:** A-FLOR-WDWK

**Color ID:** 11

All field-built counters and millwork. No casework.

#### Columns

**Layer assignment:** A-COLS

**Color ID:** 1

For structural column enclosures made from drywall and wall framing and for architectural representation of columns use A-COLS.

# UC San Diego

## **Curtain Wall Panels, Mullions, Curtain Wall Systems**

**Layer assignment: A-GLAZ**

**Color ID: 4**

All glazed walls should be assigned to the major layer A-GLAZ.

## **Doors**

**Layer assignment: AIA Default (A-DOOR)**

**Color ID: 6**

Include toilet partition doors. Glass doors may require a minor grouping into project implementation. Check with UCSD Planning for latest guidance for layer assignment of glass doors.

## **Electrical Fixtures**

**Layer assignment: E-POWR**

**Color ID: 1**

All electrical power devices (receptacles and outlets, etc.), excluding telecommunications devices.

## **Communication Devices**

**Layer assignment: E-DATA**

**Color ID: 4**

Telecommunication and data devices (data/network jacks, telecom outlets).

## **Floors**

**Layer assignment: AIA Default (A-FLOR)**

**Color ID: 3**

All floor finish boundaries and patterns for floor finish should map to A-FLOR.

UC San Diego is in the process of developing asset registers and layer assignment for assets in this category is subject to change and different project specific requirements. Check with UC San Diego Campus Planning for latest guidance for layer assignment of floors.

## **Furniture**

**Layer assignment:** A-FURN

**Color ID:** 8

Non-owner furnished furniture purchased as part of the project budget should be modeled for space planning purposes and assigned to the A-FURN layer.

The table below lists representative types of building components that may be found on the A-FURN layer.

Element type
Chairs
Tables
Work Surfaces
Cubicle partitions
Modular offices

## **Plumbing fixtures**

**Layer assignment:** A-FLOR-PFIX

**Color:** 3

The table below lists representative types of building components that may be found on this layer.

Element type
Sinks
Toilets
Urinals
Shower heads
Floor Sinks
Grab bars
Shower surround
Soap/Hand sanitizer dispenser
Toilet accessories
Toilet and urinal partitions
Floor Drains

## **Railings**

**Layer assignment:** AIA Default (A-FLOR-HRAL)

**Color ID:** 1

All handrails except those in bathrooms.



## Roofing

**Layer assignment:** AIA Default (A-ROOF and A-ROOF-PATT)

**Color ID:** 5

Roof cut and surface patterns will be assigned to A-ROOF-PATT. All other components of roof assigned to A-ROOF except for roof drains and parapets.

## Site

**Layer assignment:** C-SITE

**Color ID:** 127

All civil site features (sidewalks, pathways, etc.).

## Mechanical Equipment, Electrical Equipment, Specialty Equipment

**Layer assignment:** AIA Default (A-EPQM)

**Color ID:** 6

UCSD is in the process of transitioning layer standards and project teams may encounter the use of A-EQPM in CAD files received from the University. All new CAD files should follow the layer naming standard as defined in this guide.

The table below lists representative types of building components that may be found on the A-EPQM layer.

<b>Element type</b>
Mechanical equipment
Electrical panels
Electrical equipment
Medical equipment
Monitors
Waste bins
Elevators
Computers
Fume Hood
Fire Extinguisher Cabinet
Patient Bed
Examination equipment
Control panels
Kitchen equipment
Moveable and folding partitions

# UC San Diego

UC San Diego is in the process of developing asset registers and layer assignment for assets in this category is subject to change and different project specific requirements. Check with UC San Diego Campus Planning for latest guidance for layer assignment of floors.

## **Stairs**

**Layer assignment:** A-FLOR-STRS

**Color ID:** 3

## **Structural Beams**

**Layer assignment:** AIA Default (S-BEAM)

## **Walls**

**Layer assignment:** A-WALL-FULL

**Color ID:** 7

All walls, both interior and exterior, except glass, curtainwall, storefront, moveable or operable partitions, toilet partitions, and walls that are part of a furniture system, should be assigned to A-WALL.

## **Fire-Rated Walls**

UC San Diego is in the process of developing asset registers and layer assignment for assets in this category is subject to change and different project specific requirements. Check with UC San Diego Campus Planning for latest guidance for layer assignment of fire-rated wall assemblies.

## **Toilet Partitions**

**Layer assignment:** A-FLOR-TPTN

**Color ID:** 11

Subset of element category “Walls”.

## **Moveable Walls and Operable Partitions**

**Layer assignment:** A-WALL-MOVE

**Color ID:** 5

Subset of element category “Walls”.

## **Partial Height Walls and Parapets**

**Layer assignment:** A-WALL-PRHT

**Color ID:** 5

Subset of element category “Walls”.

# UC San Diego

---

## **Windows**

**Layer assignment:** AIA Default (A-GLAZ)

**Color ID:** 4

All interior and exterior glazing, glass partition, and windows will be assigned to A-GLAZ.

## **Annotation Categories**

**Text Notes (General Annotations not assigned to other layers)**

**Layer assignment:** A-ANNO

**Color ID:** 7

E.g. “Ramp”, “Stair”, “Spaces Below”, “Open to Below”

## **Dimensions**

**Layer assignment:** AIA Default (A-ANNO-DIMS)

**Color ID:** 1

Any dimensioning created on plan for the purposes of construction documentation should be assigned to A-ANNO-DIMS. No additional dimensioning should be created for the purposes of CAD deliverables.

## **Room tags**

**Layer assignment:** AIA Default (A-AREA-CAFM)

**Color ID:** 7

Room tags should contain room numbers and square footages. Construction room names are not required but may be included as a separate text annotation element.

## **Room tags (copy)**

**Layer assignment:** A-AREA-ROOM

**Color ID:** 7

Room number copy without square footages. This can be a copy of the room numbers from the A-AREA-CAFM layer.

## **Grids**

**Layer assignment:** A-GRID

**Color ID:** 8

All gridlines and bubbles.

## Other and Non-Category Based Assignments

### **Room/Space Boundary**

**Layer assignment:** A-AREA

**Color ID:** 9

Room/space boundary should appear as closed polylines in the CAD file. For open floor plan and non-partitioned space such as lab benches, each assignable space for one user should be represented by one closed polyline. Polyline should be to inside face of wall.

### **Area Boundary**

**Layer assignment:** A-AREA-EGRS, A-AREA-IGRS (copy of same linework to each layer)

**Color ID:** 0,0,255

Closed polyline representing the gross area of floor plate.

### **Building Envelope (Level Below)**

**Layer assignment:** A-FLOR-OTLN

**Color ID:** 8; **Line type:** HIDDEN2

Closed polyline around the building's exterior for level below

### **Building Envelope (Level Above)**

**Layer assignment:** A-FLOR-OVHD

**Color ID:** 122; **Line type:** HIDDEN2

Closed polyline around the building's exterior for level above including any trellis, sunshades, and other structures. Dripline of level overhead.