

VA



U.S. Department
of Veterans Affairs

Office of Construction & Facilities Management

SEPS+BIM

Space and Equipment Planning System
+
Building Information Modeling

3-28-2015

1

SEPS+BIM

Space and Equipment Planning System

+

Building Information Modeling

3-15-2015

Image: US Department of Veterans Affairs Logo

VA



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SEPS+BIM

A New Process for Using
BIM and SEPS Together
for Facility Planning and Design

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2

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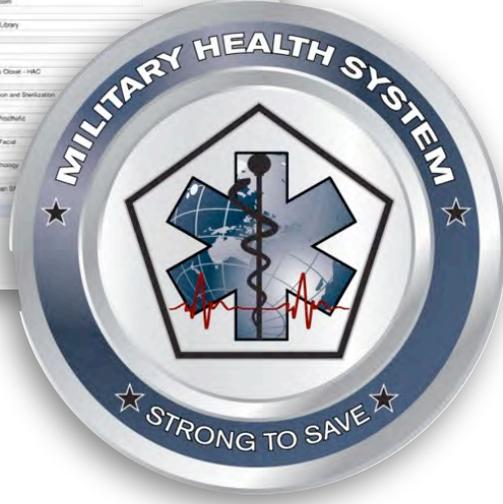


Image: VA and DoD DHA Logos with thumbnails of the SEPS Interface.

To make sure that our nation's veterans are being provided the right healthcare, at the right time and in the right place, VA and the Defense Health Agency have developed a software tool to assist in planning the facilities they require.



Welcome to the Space and Equipment Planning System (SEPS)

You are accessing a U.S. Government (USG) Information System (IS) that is provided for USG-authorized use only. By using this IS (which includes any device attached to this IS), you consent to the following conditions:

- The USG routinely intercepts and monitors communications on this IS for purposes including, but not limited to, penetration testing, COMSEC monitoring, network operations and defense, personnel misconduct (PM), law enforcement (LE), and counterintelligence (CI) investigations.
- At any time, the USG may inspect and seize data stored on this IS.
- Communications using, or data stored on, this IS are not private, are subject to routine monitoring, interception, and search, and may be disclosed or used for any USG-authorized purpose.
- This IS includes security measures (e.g., authentication and access controls) to protect USG interests—not for your personal benefit or privacy.
- Notwithstanding the above, using this IS does not constitute consent to PM, LE or CI investigative searching or monitoring of the content of privileged communications, or work product, related to personal representation or services by attorneys, psychotherapists, or clergy, and their assistants. Such communications and work product are private and confidential. See User Agreement for details.

I Agree

Image: Log in screen to the Space and Equipment Planning System

This software is called SEPS, the Space and Equipment Planning System. When VA determines that a new construction project is necessary, VA planners work with the medical staff to determine key requirements for the facility.

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SEPS - Project Administration [Project Builder]

Project: SEPS CLINIC IN LOS ANGELES (NEW)
 CLINIC: DENTAL SERVICE (222)
 Department: DENTAL SERVICE (222)

General | Input Data Worksheet | Program for Design (PFD) | Contents | Documents | Permissions

1 of 1

Status	Question
Answered	1. Is a Panoramic / Cephalometric x-ray authorized? (M)
Answered	2. Is a Computerized Tomography (CT) Cone-Beam Room authorized? (M)
Answered	3. Is a Picture Archiving and Communication System (PACS) authorized? (M)
Answered	4. Is a Tele-health Room in the Dental Treatment Patient Area authorized? (M)
New	5. Is a Dental Surgery Suite authorized? (M)
New	6. Is a General Purpose Laboratory authorized? (M)
New	7. Is a Porcelain / Ceramics Laboratory authorized? (M)
New	8. Is a Maxillo-facial Laboratory authorized? (M)

Criteria Dept Name	Criteria FA Name	Room Code	Room Type Name	Criteria Room Name
POLYTRAUMA REHABILITATION CENTER (111)	INPATIENT / OUTPATIENT UNITS: RECEPTION AREAS	LD001	LOBBY, SEATING AREA	Lobby
POLYTRAUMA REHABILITATION CENTER (111)	INPATIENT / OUTPATIENT UNITS: RECEPTION AREAS	RECP1	RECEPTION	Reception
POLYTRAUMA REHABILITATION CENTER (111)	INPATIENT / OUTPATIENT UNITS: RECEPTION AREAS	TLT01	TOILET	Toilet, Visitor
POLYTRAUMA REHABILITATION CENTER (111)	INPATIENT / OUTPATIENT UNITS: RECEPTION AREAS	BX001	EXCHANGE, VENDING (EQUIPPED BY OTHERS)	Vending Area
POLYTRAUMA REHABILITATION CENTER (111)	INPATIENT UNIT: PATIENT AREAS	WR001	WAITING	Sub-Waiting
POLYTRAUMA REHABILITATION CENTER (111)	INPATIENT UNIT: PATIENT AREAS	BRP11	Bedroom, PRC, 1 Bed	Patient Room, One Bed
POLYTRAUMA REHABILITATION CENTER (111)	INPATIENT UNIT: PATIENT AREAS	TLT52	TOILET/SHOWER, INPATIENT	Bathroom, Patient
POLYTRAUMA REHABILITATION CENTER (111)	INPATIENT UNIT: PATIENT AREAS	TLT52	TOILET/SHOWER, INPATIENT	Bathroom, Patient, Shower Litter
POLYTRAUMA REHABILITATION CENTER (111)	INPATIENT UNIT: PATIENT AREAS	BRP12	Bedroom, PRC, Isolation, 1 Bed	Isolation Patient Room, One-Bed
POLYTRAUMA REHABILITATION CENTER (111)	INPATIENT UNIT: PATIENT AREAS	TLT52	TOILET/SHOWER, INPATIENT	Isolation Bathroom, Patient
POLYTRAUMA REHABILITATION CENTER (111)	INPATIENT UNIT: PATIENT AREAS	BRAK1	ANTEROOM, ISOLATION, NEGATIVE PRESSURE	Isolation, Anteroom
POLYTRAUMA REHABILITATION CENTER (111)	FOOD SERVICE, CAFETERIA DINING			

2 - RECEPTION AREA			
JSN	Content Item	Agency	Qty
1 - WR001 - Waiting			
AS076	Dispenser, Hand Sanitizer, Free Standing	VA	1
AS210	Bracket, Television, Wall Mounted, w/Adjust Arm	VA	1
AS220	Bracket, Television, Wall Backing	VA	1
A6046	Artwork, Decorative, With Frame	VA	1
F0206	Chair, Side, Bariatric, With Arms	VA	1
F0305	Chair, Waiting Room, Single	VA	3
F2300	Rack, Magazine, Wall Mounted	VA	1
F2310	Rack, Pamphlet, Wall Mounted	VA	1
F3200	Clock, Battery, 12" Diameter	VA	1
M0515	Television, Plasma	VA	1
2 - PLAY1 - Playroom			
JSN	Content Item	Agency	Qty
A1010	Telecommunication Outlet	VA	1
AS210	Bracket, Television, Wall Mounted, w/Adjust Arm	VA	1
AS220	Bracket, Television, Wall Backing	VA	1
A6046	Artwork, Decorative, With Frame	VA	2
F0215	Chair, Child's	VA	4
F0305	Chair, Waiting Room, Single	VA	2
F0760	Table, Child's	VA	1
F2000	Basket, Wastepaper, Round, Metal	VA	1
F2045	Furniture, Playroom, Assorted	VA	1
F3200	Clock, Battery, 12" Diameter	VA	1
M0515	Television, Plasma	VA	1
3 - RECP1 - Reception			
JSN	Content Item	Agency	Qty
A1010	Telecommunication Outlet	VA	2
A1015	Telephone, Desk, Multiple Line	VA	2
A6105	Counter, Reception Control, Built-In	VA	1
F0275	Chair, Swivel, High Back	VA	1

Image: Images of export files from SEPS for rooms and equipment

These requirements are entered into SEPS. SEPS then calculates the appropriate net square footage for each new room. A list of all the room names and the required square footages is provided in the Program for Design. SEPS also provides the Project Room Contents for each room, which is a list of the equipment and furnishings which belong in each room.

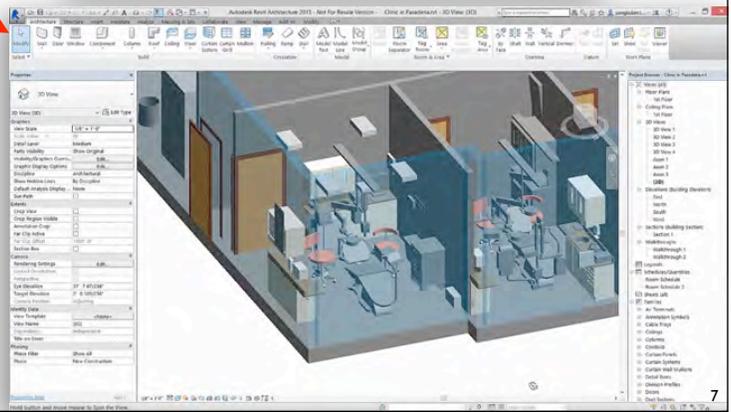
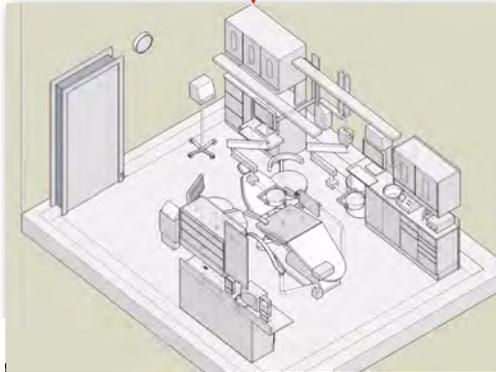
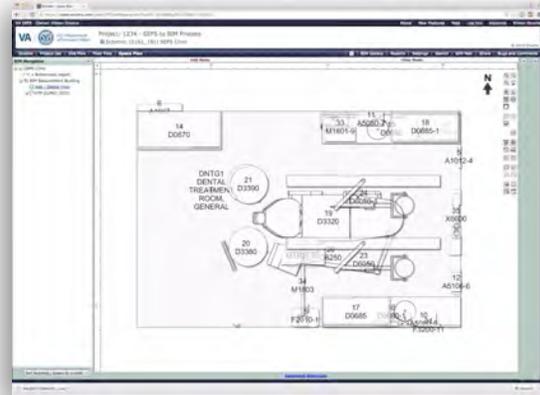
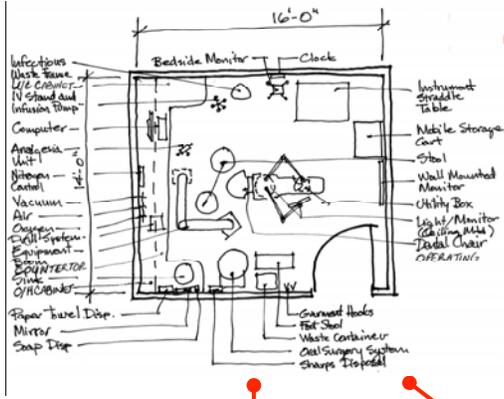


Image: Hand sketch of exam room and the same room in BIM in 2D and 3D views.

By moving away from static documents to conveying information in an intelligent 3D modeling format, errors that can occur between the requirements and their conversion to the graphic formats are greatly reduced. This means that all key stakeholders will be able to communicate and manage the project more efficiently and effectively.



SEPS - Project Administration [Reports]

All Reports ▾

- Program for Design
- Program for Design (Excel)
- Program for Design Summary
- Project Input Data Worksheet (Excel)
- Project Rooms
- Project Net to Gross Factors Summary
- Project User-Defined Room Types (Excel)
- Project vs. Criteria Report (Excel)
- Project Space Comparison (Excel)
- Project Change History (Excel)
- Project Room Contents
- Project Contents List (Excel)
- Project Contents Cost Summary
- Project Contents Logistical Costs
- Project Contents Quantity Listing
- Project Contents Location Listing
- Project User-Defined Content Ty
- Project BIM Export (Excel)
- Project PACES Export (XML)

Project Building NTG Factor	Project Department Name	Project Department NTG Factor	Project Room Name	Room Code	Area	Default Area
1.35	DENTAL SERVICE (222)	1.55	Toilet, Patient	TLTU1	50	60
1.35	DENTAL SERVICE (222)	1.55	Instrument Preparation and Sterilization	DNCS2	80	145
1.35	DENTAL SERVICE (222)	1.55	X-Ray Film Processing	DNXF1	80	60
1.35	DENTAL SERVICE (222)	1.55	Housekeeping Aides Closet - HAC	JANC1	40	40
1.35	DENTAL SERVICE (222)	1.55	Linen Room and Clean SPD Cart	LCCL1	80	10
1.35	DENTAL SERVICE (222)	1.55	Soiled SPD Cart Holding	LCSL1	75	100
1.35	DENTAL SERVICE (222)	1.55	Storage	SRS01	80	100
1.35	DENTAL SERVICE (222)	1.55	Conference Room / Library	CRA01	300	250
1.35	DENTAL SERVICE (222)	1.55	Office, Assistant Chief	OFC01	120	200
1.35	DENTAL SERVICE (222)	1.55	Office, Assistant Chief	OFC01	120	200

Export Project

➔

Image: Export user interface from SEPS that generates the BIM Excel file.

Here's how the SEPS-BIM process works when a design team begins the layout for a new Dental Clinic. The VA planner, working with the medical staff, defines the requirements for the clinic. The VA planner enters the requirements into SEPS which calculates the necessary space and equipment to support the delivery of healthcare. The planner then exports these requirements by choosing the BIM Excel export button in SEPS.



Project Building NTG Factor	Project Department Name	Project Department NTG Factor	Project Room Name	Room Code	Area	Default Area
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1.35	DENTAL SERVICE (222)	1.55	Instrument Preparation and Sterilization	DNCS2	80	145
1.35	DENTAL SERVICE (222)	1.55	X-Ray Film Processing	DNXF1	80	60
1.35	DENTAL SERVICE (222)	1.55	Housekeeping Aides Closet - HAC	JANCL1	40	40
1.35	DENTAL SERVICE (222)	1.55	Linen Room and Clean SPD Cart	LCCL1	80	10
1.35	DENTAL SERVICE (222)	1.55	Soiled SPD Cart Holding	LCSL1	75	100
1.35	DENTAL SERVICE (222)	1.55	Storage	SR501	80	10
1.35	DENTAL SERVICE (222)	1.55	Conference Room / Library	CRA01	300	250
1.35	DENTAL SERVICE (222)	1.55	Office, Assistant Chief	OFC01	120	200
1.35	DENTAL SERVICE (222)	1.55	Office, Assistant Chief	OFC01	120	200



Image: SEPS Export sample and 2D and 3D views of BIM created from SEPS data.

The design team takes the Excel file and imports it into BIM software. In a matter of minutes, BIM integrates all of the data and visual elements as the basis for the new design, such as this example for a new Dental Clinic.

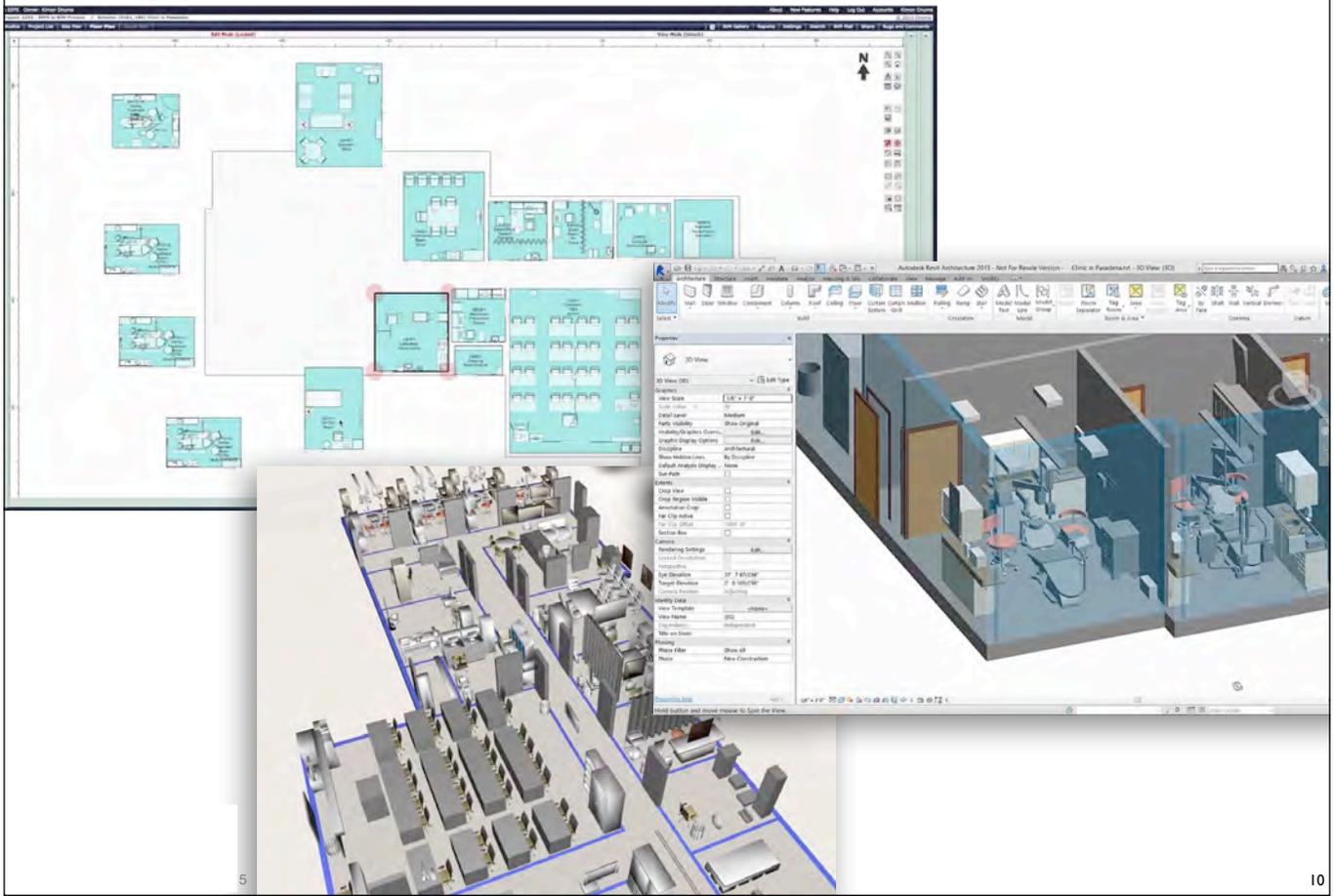


Image: BIM with room and equipment layout that is used by designers to resolve the SEPS program requirement data.

This Dental Clinic BIM Excel file downloaded from SEPS has hundreds of pieces of equipment that are now displayed as 3D models. The design team and the VA are assured that the information being used to create the design is now the same as the SEPS export.

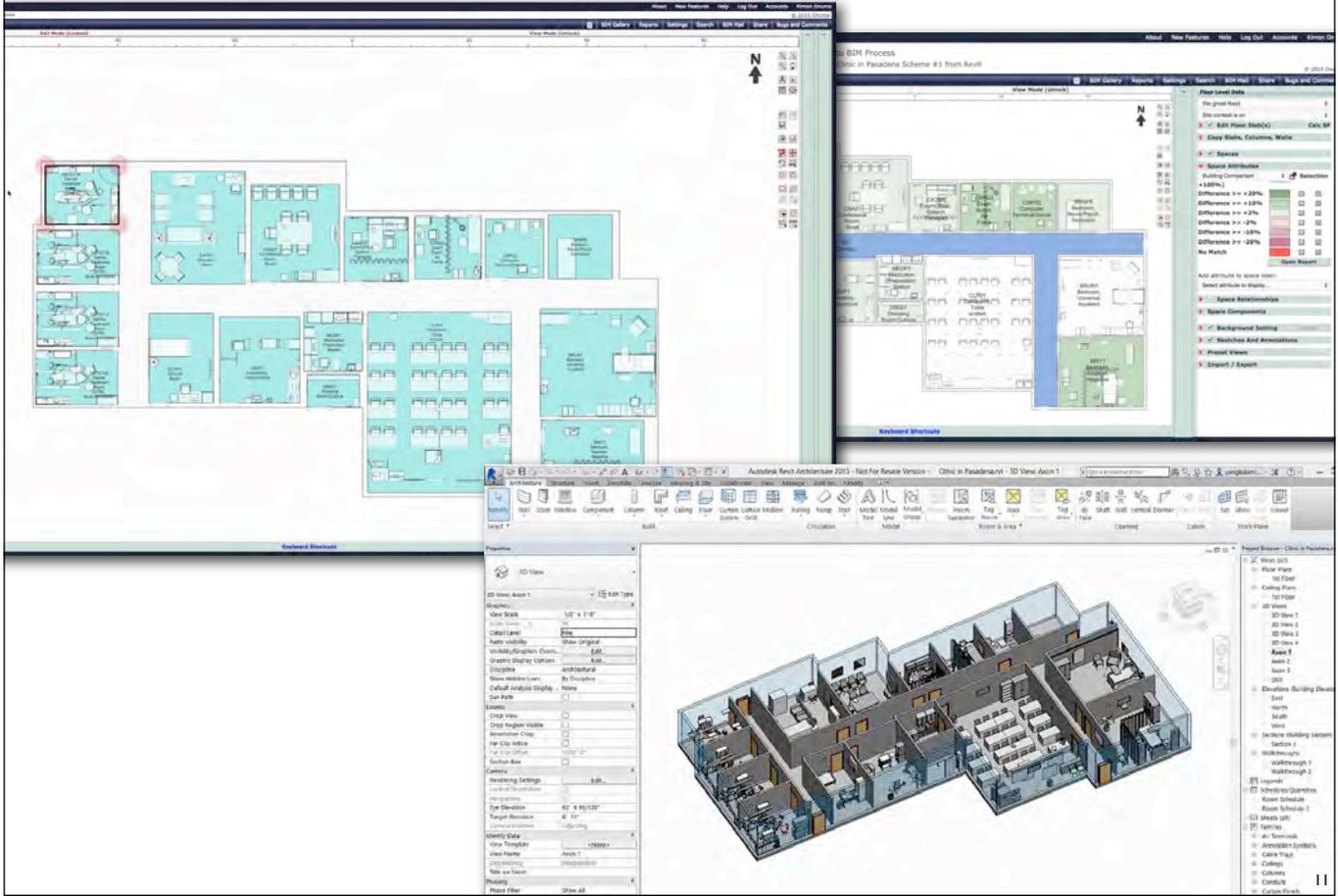


Image: The resolved floor plans in 2d and 3d using BIM.

Once the information is in BIM, the design team can edit, arrange, track, communicate and report on the space and equipment as needed.

Tracking Program for Design

VA HEALTH CARE SYSTEM		Department Area Summary (NSF GSF)				
Clinical Expansion for Mental Health		Space Program				
Department Name	Department Number	Approved SEPS		DD2 110228		
		Total NSF	Factor	Total DGSF	Total NSF	Total DGSF
001 Mental Health Clinic	260	37,430	1.40	52,402	43,238	64,139
002 Substance Abuse Clinic Gold Team	202	8,660	1.40	12,124	8,199	12,526
003 Veterans Recovery Center (PRRC)	261	6,785	1.45	9,838	5,351	7,545
004 Lobby	244	1,530	1.20	1,836	4,058	7,765
005 Domiciliary 40 Beds	312	18,748	1.55	29,059	20,902	32,521
006 SARRTP 40 Beds	312	18,748	1.55	29,059	21,962	32,112
007 PR RTP 40 Beds	312	18,628	1.55	28,873	21,130	33,264
008 OTEC KTEC	270	6,969	1.35	9,408	6,675	8,092
009 MH Administration	254	15,590	1.30	20,267	10,260	15,016
010 Psychology Service	272	1,730	1.40	2,422	0	0
011 Social Work Service	282	0	1.30	0	0	0
012 Methadone Clinic	202	2,970	1.40	4,158	3,451	5,496
013 Satellite Pharmacy		870	1.30	1,131	1,181	1,474
014 Cafe		750	1.20	900	1,497	1,947
015 Service Dock		550	1.20	660	275	1,065
SUM OF DEPARTMENTAL DGSF TOTALS		139,958		202,139	148,179	222,962

Building Support and Vertical Circulation	
Entry Vestibule	
Main Entry	
Recreation Therapy	
VRC	
Vertical Circulation	
Elevators (Clinic Public) 4 Cabs	
Elevators (Clinic Service) 2 Cabs	
Elevators (Residential Public) 2 Cabs	
Elevators (Residential Public) 2 Cabs	
Elevators (Residential Service) 2 Cabs	
Exit Stair 1	
Exit Stair 2	
Exit Stair 4 (Exterior)	
Exit Stair 5 (Exterior)	
Exit Stair 6 (Exterior)	
Exit Stair 7 (Exterior)	
Exit Stair 8	
Exit Stair 9	
Exit Stair 10	
Electrical Support	
Electrical Room (Level 1)	
Electrical Room (Level 2)	

The image shows a screenshot of a BIM software interface. The main window displays a floor plan with a yellow highlighted area. The software interface includes a toolbar at the top, a project browser on the right, and a properties panel on the left. The project browser shows a hierarchy of elements including 'Floor Plan', 'Room Schedule', and 'Room Properties'. The highlighted area in the floor plan appears to be a specific room or zone.

Image: Reports tracking the program requirements in a spreadsheet and a sample BIM with a report that compares the program requirement to the resolved plan.

The SEPS Program for Design and the Project Room Contents can be tracked through the project development. This gives the design team and the VA the ability to audit the work guiding the design and technical decisions, and leading to better outcomes for the VA and less rework for the design team. VA management can also engage more quickly when adjustments are necessary. When the design no longer matches one to one the original specifications, the differences are clearly identifiable.



Image: SEPS program data of multiple rooms in 3D BIM on an iPad.

SEPS-BIM also enhances communication. Because the information is now in an electronic format, SEPS-BIM is mobile friendly and can be displayed on mobile devices.



Image: SEPS program data for a dental exam room in a 3D BIM view on an iPad.

Collaboration between the design team and stakeholders who may not understand 2D plans is much easier when displayed through 3D views of the new space.



Project Building NTG Factor	Project Department Name	Project Department NTG Factor	Project Functional Area Name	Project Room Name	Room Code	Criteria Room Name	Criteria VA Name	Omiclass Code	Area	Occ	Room Type Name	Default Area	Default Occ	Celling Height	Door Width	Floor Load
1.35	DENTAL SERVICE (222)	1.55	PATIENT AREAS	Operator, General Treatment	DNTG1	Operator, General Treatment	Operator, General Treatment	13-51 64 27	120	0	Dental Treatment Room, General	125	0	102	36	60
1.35	DENTAL SERVICE (222)	1.55	PATIENT AREAS	Operator, General Treatment	DNTG1	Operator, General Treatment	Operator, General Treatment	13-51 64 27	120	0	Dental Treatment Room, General	125	0	102	36	60
1.35	DENTAL SERVICE (222)	1.55	PATIENT AREAS	Operator, General Treatment	DNTG1	Operator, General Treatment	Operator, General Treatment	13-51 64 27	120	0	Dental Treatment Room, General	125	0	102	36	60
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Image: SEPS program data in a spreadsheet alongside a 3D BIM with equipment and spaces.

While SEPS-BIM enhances the work of design, it is also valuable in creating and updating the criteria. Because healthcare is an evolving, dynamic process, VA continuously updates SEPS to reflect new ways of delivering healthcare. VA does this by hiring subject matter experts as update consultants, to bring the technical and space planning criteria up to current medical practice.

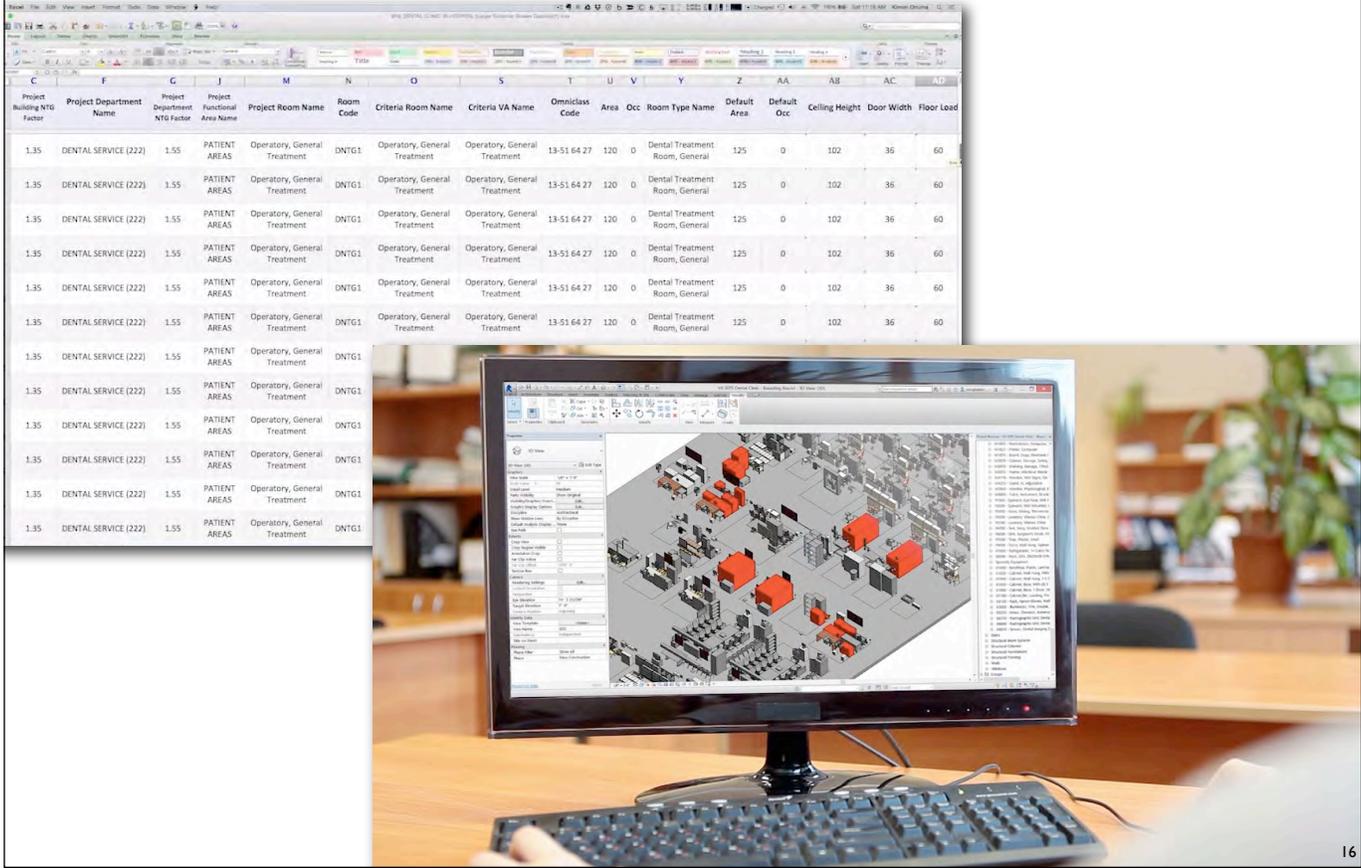
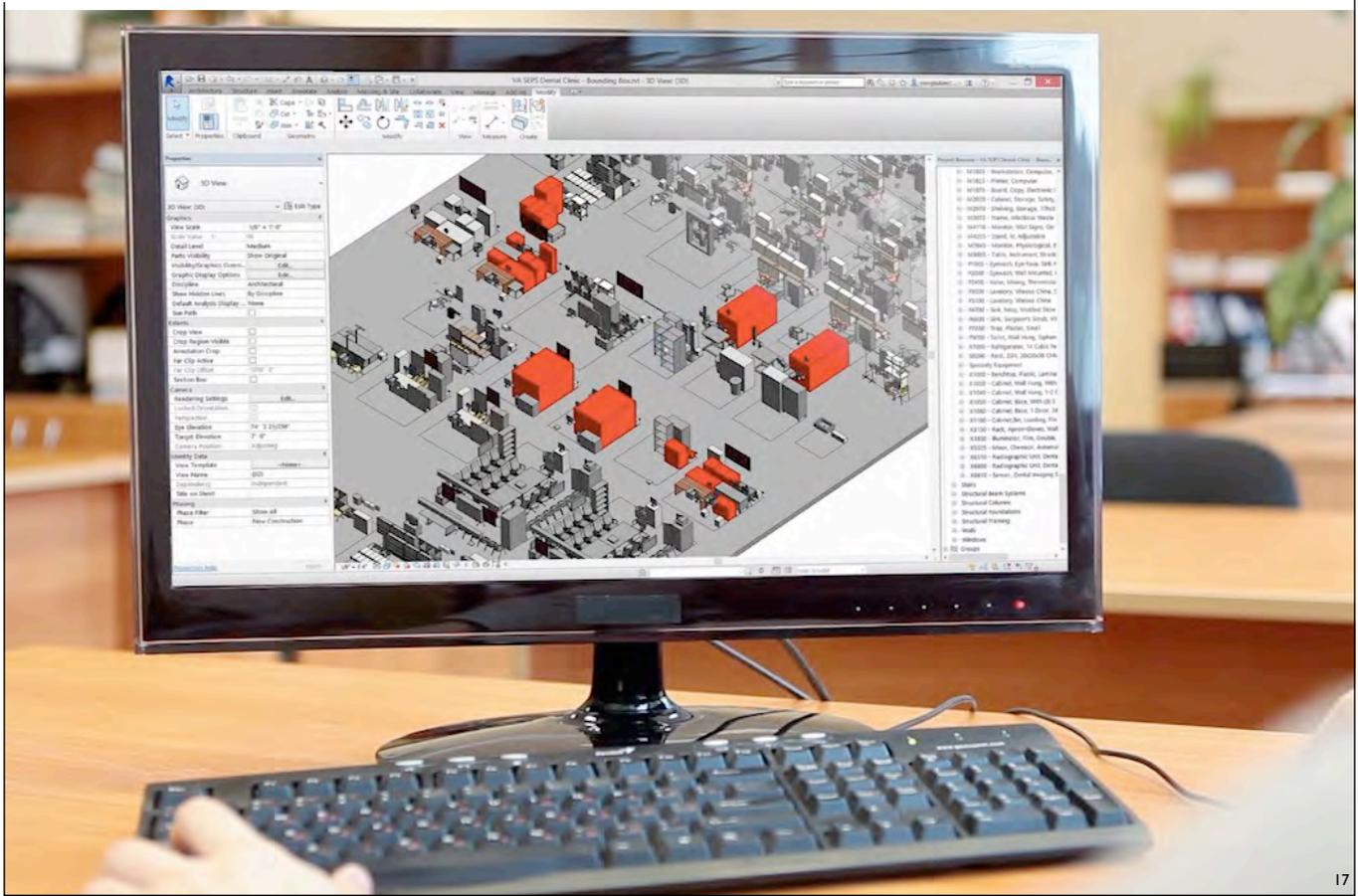


Image: SEPS program data alongside a sample of BIM with equipment shown on a desktop computer.

When VA hires an architectural consulting firm to update criteria for a specific medical department, either VA will provide, or the architectural firm will obtain, two files. One is a SEPS derived excel file for the room equipment and the second a BIM file which contains a generic room with its preliminary equipment. The update consultants in turn will import the file into BIM and search for equipment that hasn't been defined. In this example showing the update of the Dental Clinic criteria, the BIM software generates bounding boxes in red for equipment that are undefined and need to be updated.

Updating Criteria and Equipment in BIM



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Image: A BIM with equipment and spaces, and bounding box equipment in red on a desktop computer.

These red, undefined equipment boxes have the dimensional data associated with them but have not yet been created as 3D objects. Each piece of equipment will be evaluated by the update consultants, turned into a BIM 3-D object and reviewed.

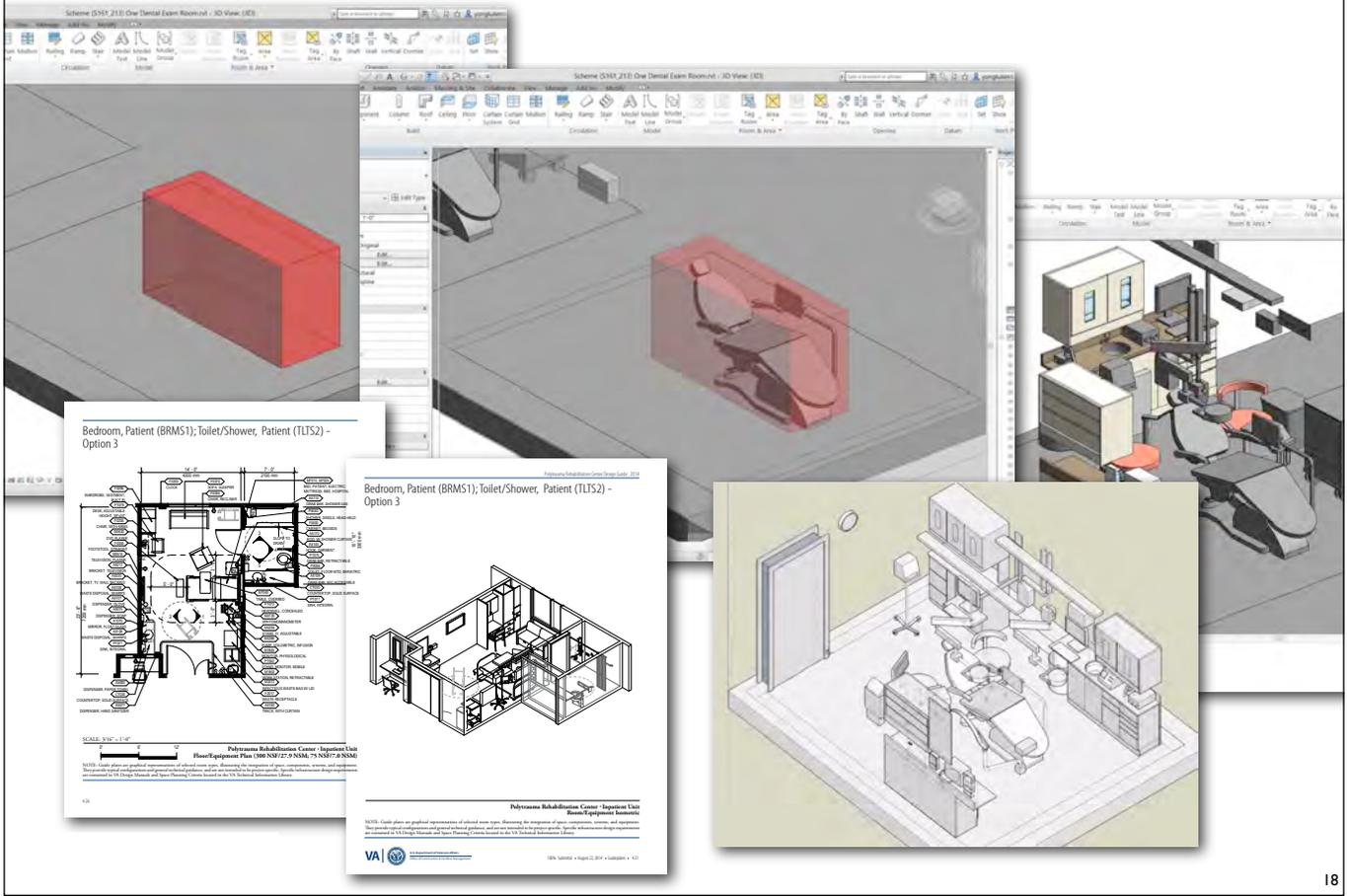


Image: BIM views in 2d and 3d of a single dental exam chair showing the progression from a bounding box into a detailed 3D object and then the use of these objects in a single room with other objects.

The final object will then be posted as a part of the criteria update that is entered into SEPS and are posted in a PDF document in to the Technical Information Library to be used by architects for future Dental Clinics designs

VA



SEPS to BIM Training Material

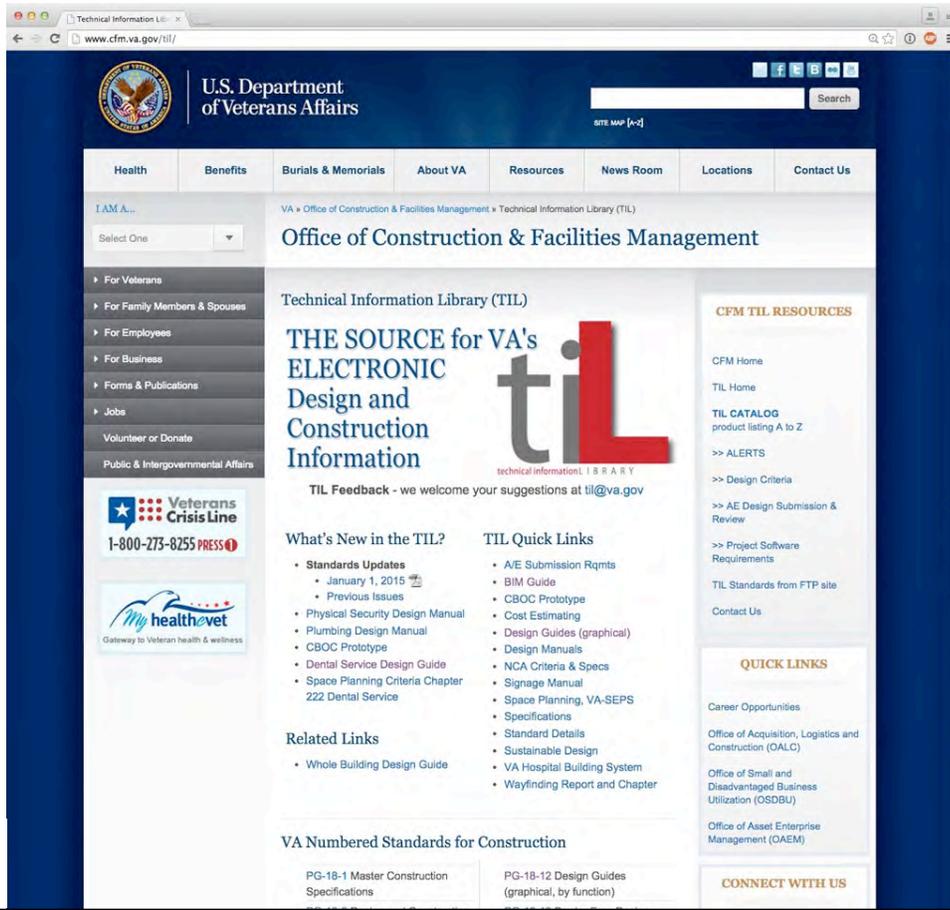


Image: Screenshot of the VA TiL web site.

To assist in incorporating SEPS-BIM into the workflow when creating new spaces, the VA is creating a web based Training Library which will be posted on the Technical Information Library. At its core is training material created to help stakeholders use these new tools effectively.

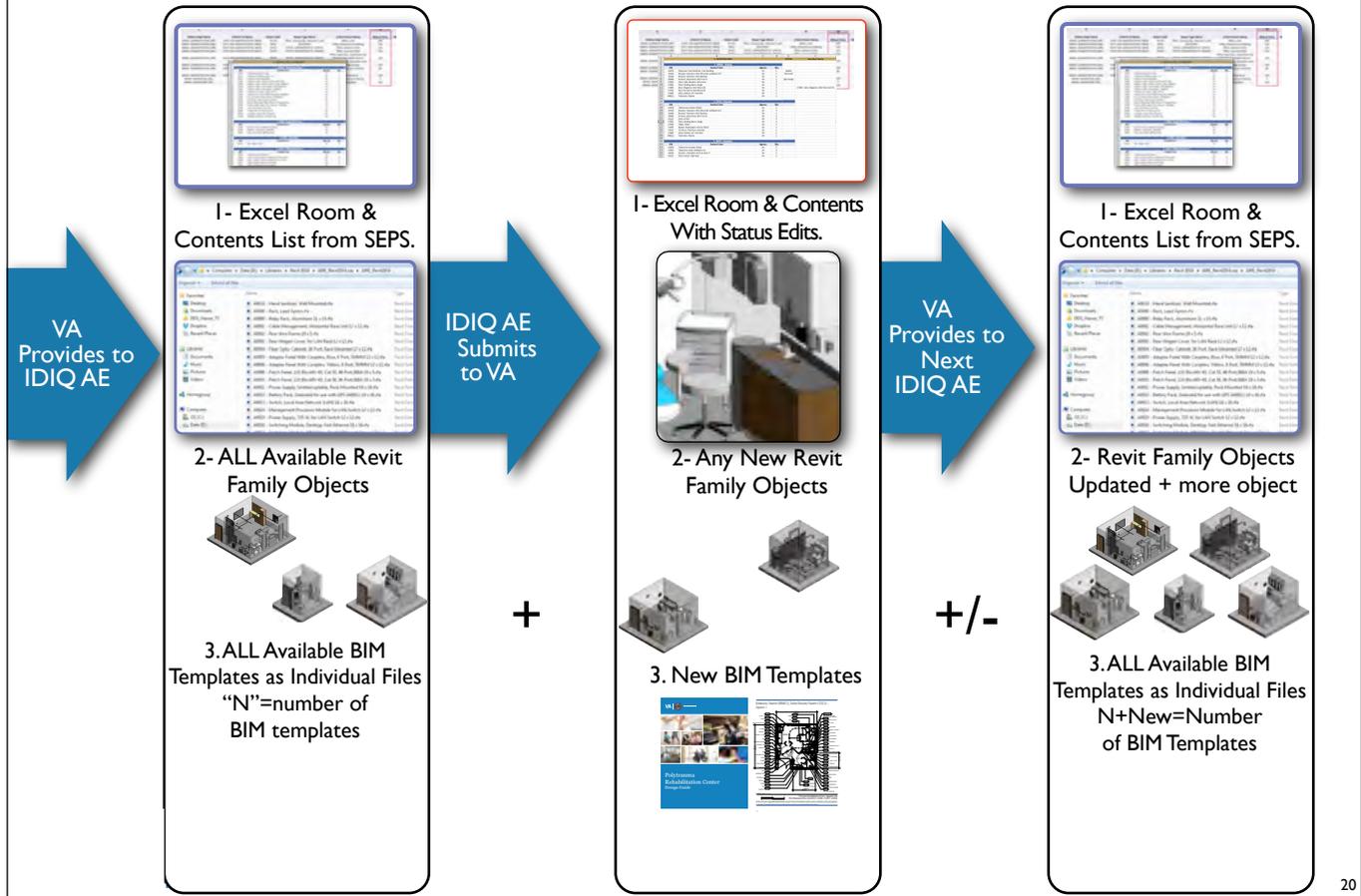


Image: Screen shots and images of the overall process for training on how to use the SEPS BIM process.

In addition, PDF Process Documents and other support material can also be downloaded for review.

In Summary

We've seen how a new Dental Clinic project can be started and exported from SEPS.

Using the SEPS-BIM process, the information was transformed into 3D and data, then used to create and manage the design for a new construction project.

We've seen how a new Dental Clinic project can be started and exported from SEPS.
Using the SEPS-BIM process, the information was transformed into 3D and data, then used to create and manage the design for a new construction project.

SUMMING UP

The SEPS-BIM integration allows the VA to leverage technology, enhance communications, and streamline our processes.

But most importantly, these improvements will also help the VA to meet our ultimate goal of providing the facilities that will house the best possible care for our Veterans.

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SEPS + BIM Template Prime Contractor:
National Institute of Building Sciences

Consultant:
ONUMA Inc.

Video Production:
BUILDING MEDIA Inc.

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