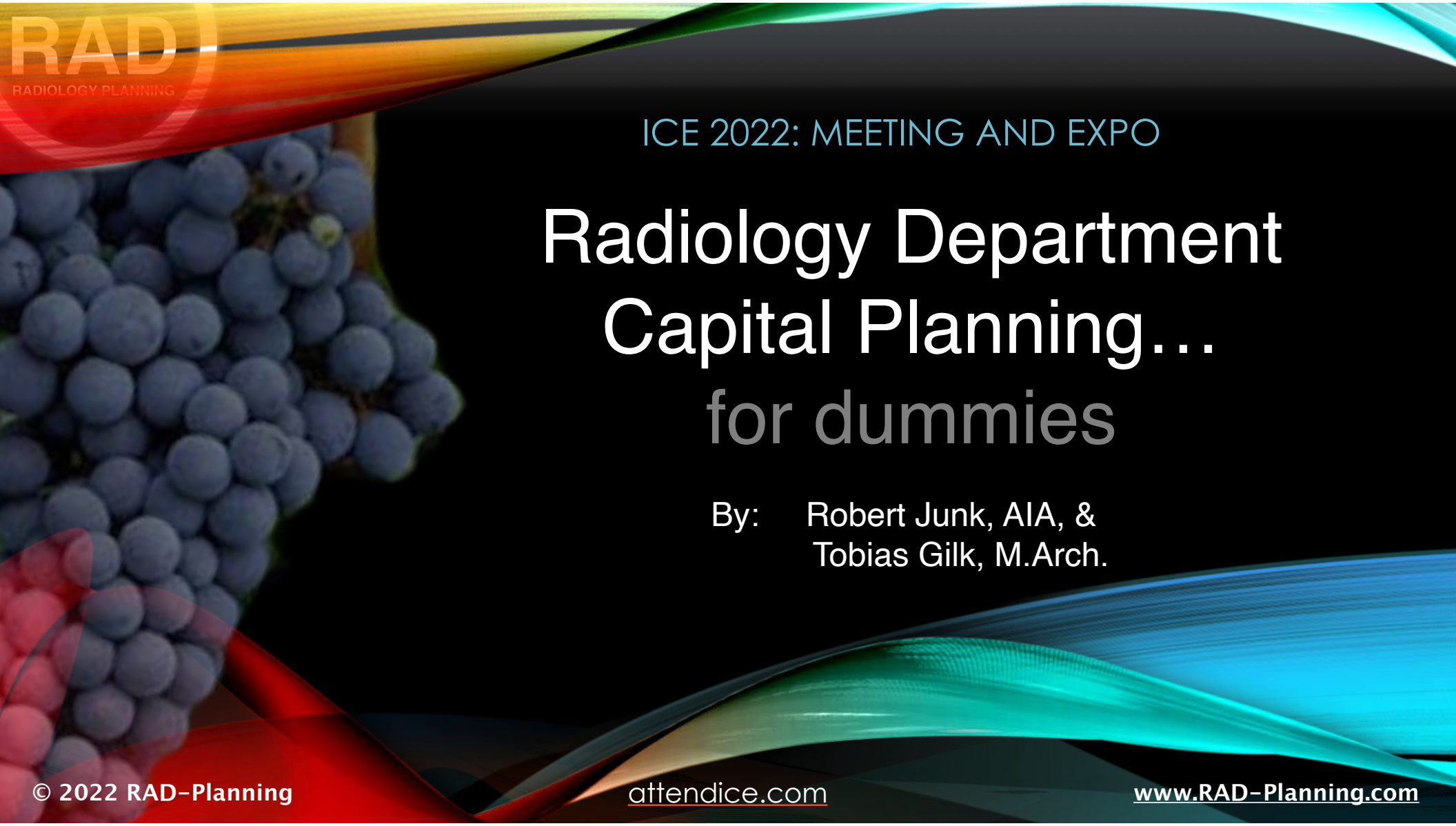


ICE 2022: MEETING AND EXPO

Radiology Department Capital Planning…

for dummies

By: Robert Junk, AIA, &
Tobias Gilk, M.Arch.

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Robert Junk, AIA

- Founder / President of RAD-Planning.
- 34 Years as a Healthcare / Radiology Design Professional
- Principal In Charge: VA Imaging Services Design Guide Rewrite
- Speaker at AHRA Since 2002



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Tobias Gilk, MRSO, MRSE

- 20 years of professional experience in healthcare, specializing in medical imaging.
- Senior VP of RAD-Planning.
- Founder of Gilk Radiology Consultants
- Member of HGRC, ACR MRI Safety Committee, ABMRS Board



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Housekeeping

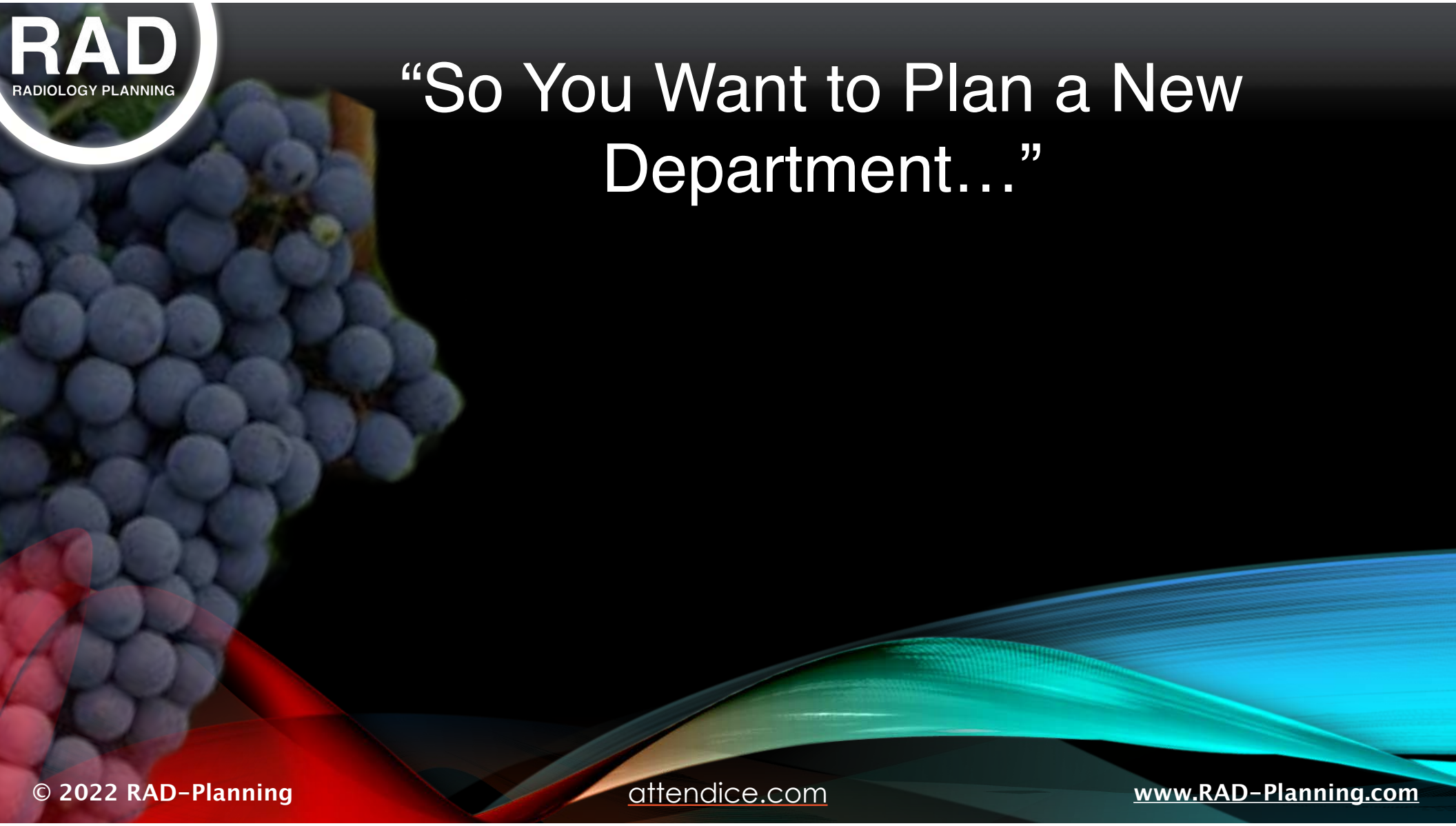
- MRI Suite Peer Review Raffle
  (Drop Your Business Card At The Door)

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Rules of the Road

- If you have a question, ask.
- If you disagree, say so.
- If you want to share any of this, do.

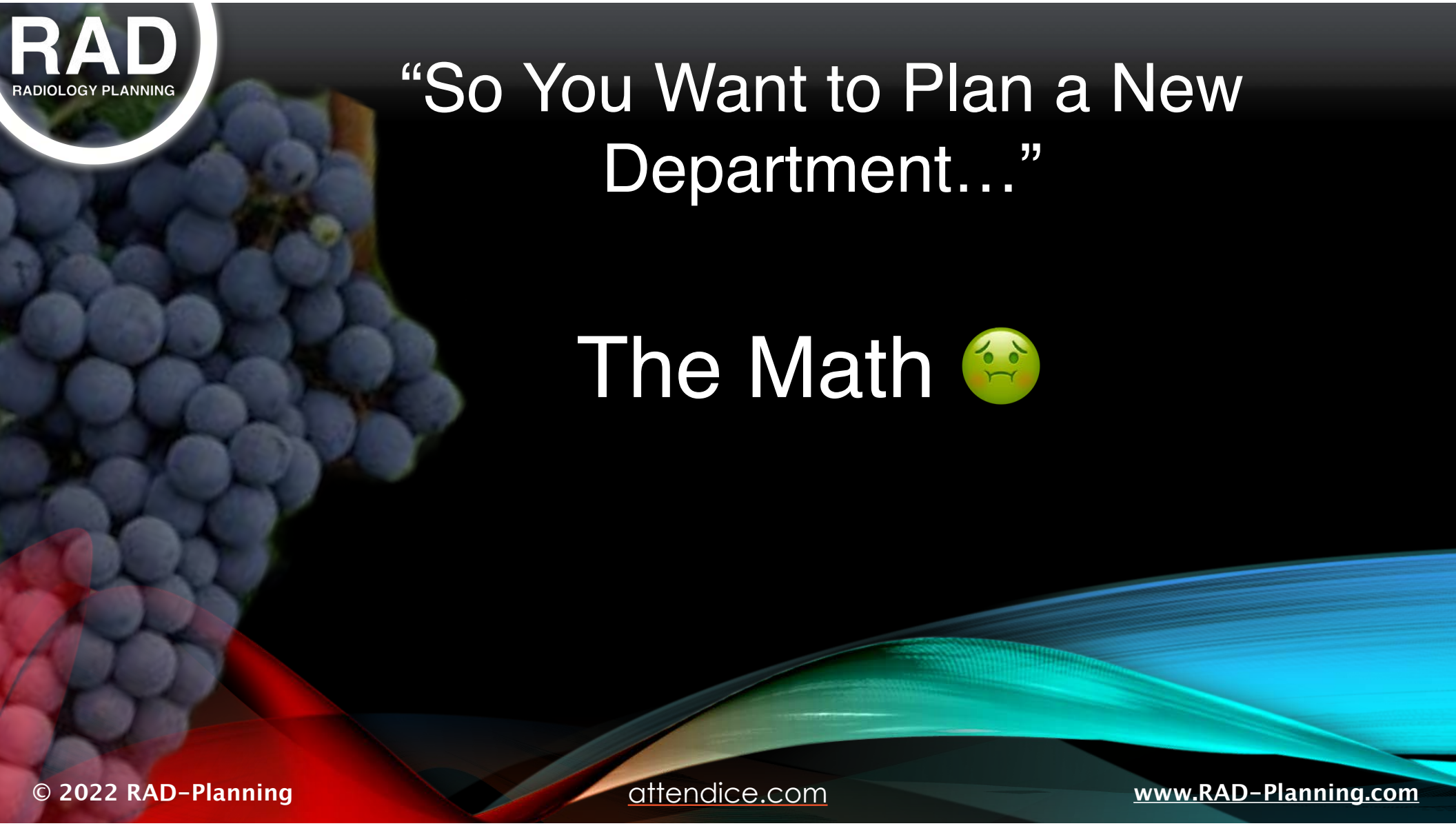
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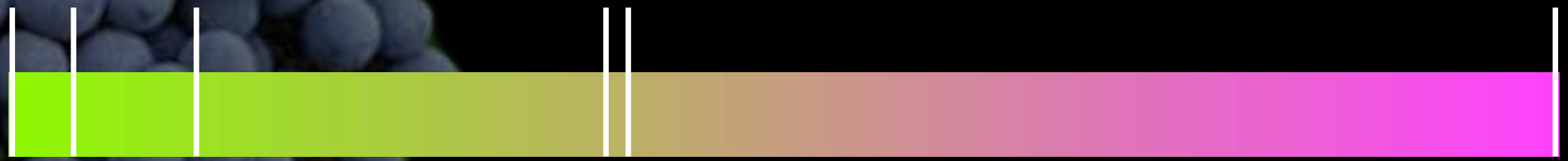
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"So You Want to Plan a New Department…"
The Math 🤢
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The Math

Capital Project Timeline

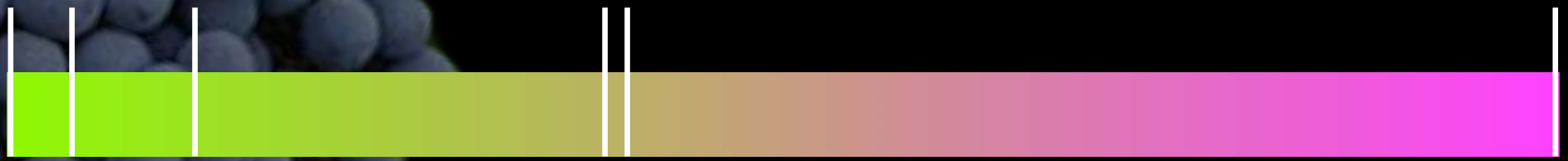


Need Identified

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Capital Project Timeline

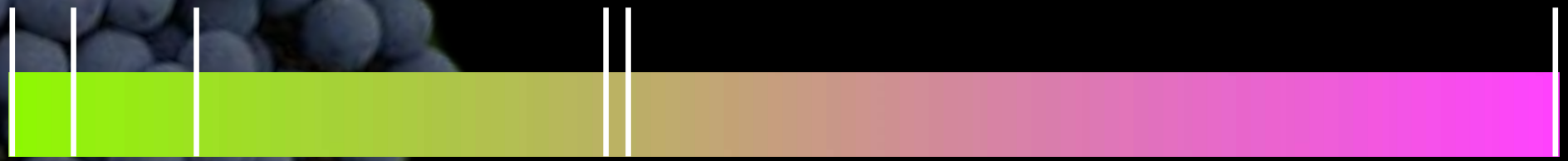


Budget Process Begun

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Capital Project Timeline

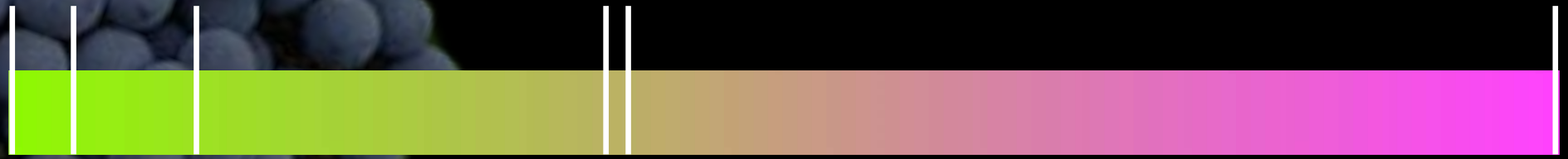


Budget Approved, Begin Design
& Equip Selection

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Capital Project Timeline



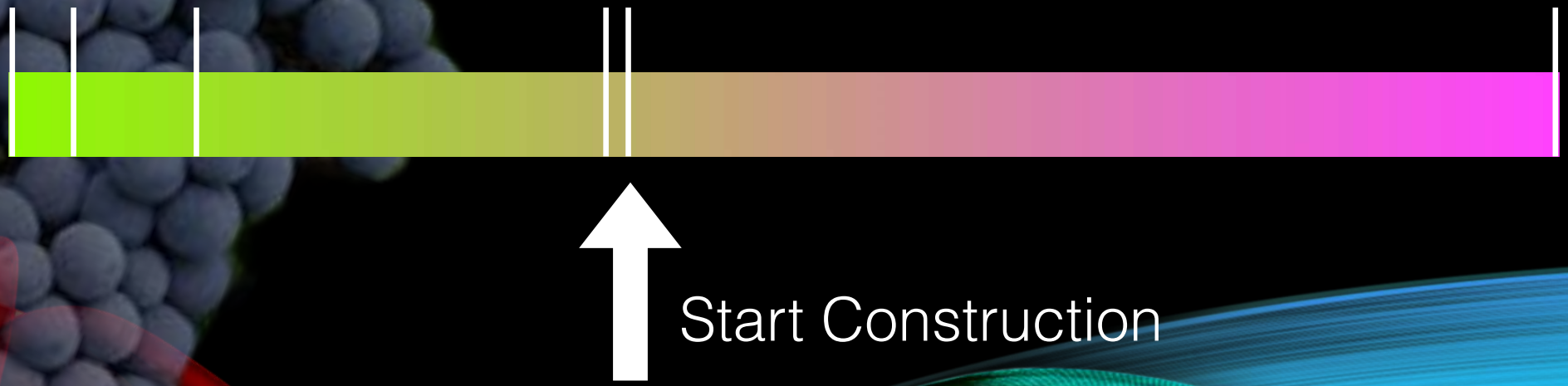
Design Completed. Find Builder.
Purchase Equipment.

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Capital Project Timeline



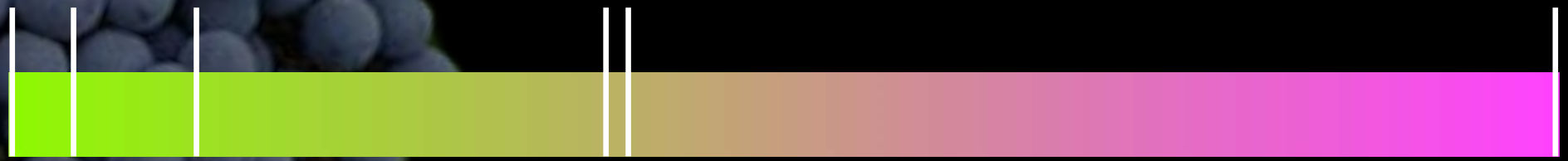
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Capital Project Timeline

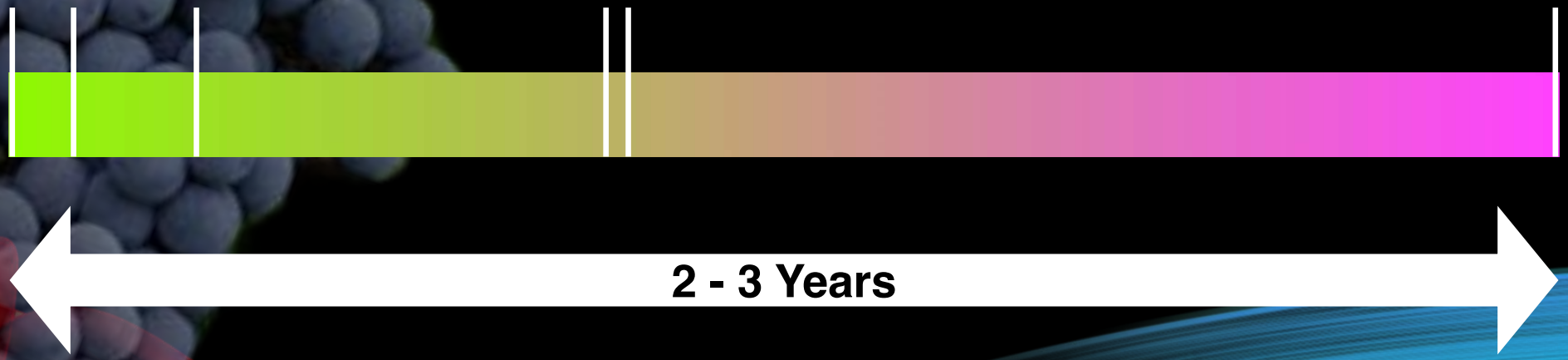


Construction Complete.
Install Equipment.

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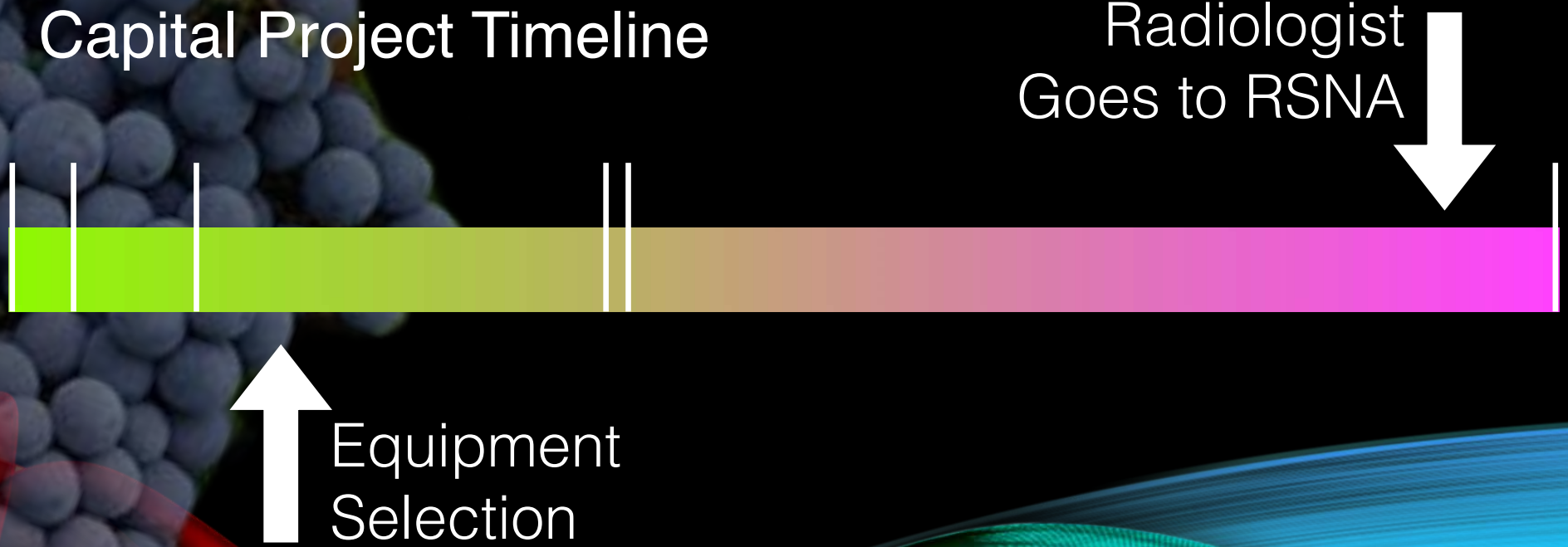
The Math

Capital Project Timeline



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Never Forget…

Operational $$$$ > Equipment $$$
Equipment $$$ > Construction $$
Construction $$ > Planning / Design $

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Never Forget…

Operational $$$$ > Equipment $$$

Equipment $$$ > Construction $$

Construction $$ > Planning / Design $

But…

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Workload Calculations

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Workload Calculations

Example:

250 operating days per year x 8 hours of operation per day ÷ (40 ÷ 60 minutes) = 3,000

3,000 annual encounters in an imaging ÷ scanning room assuming 100% utilization.

3,000 x 85% = 2,550 annual capacity

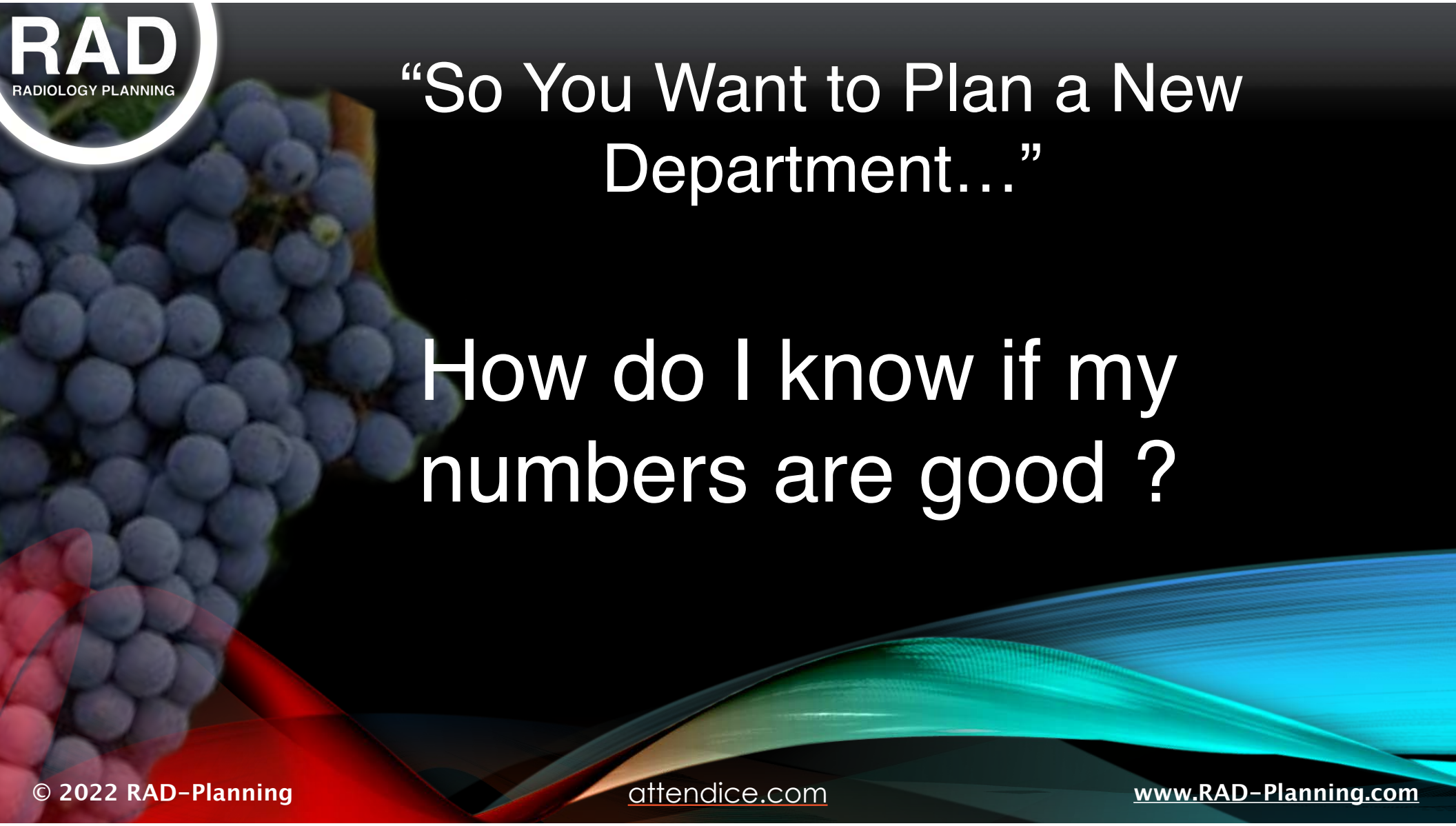
Then:

12,900 annual encounters ÷ 2,550 = 5.05 Workload-Driven Rooms

5 x 2,550 = 12,750 annual encounters

5 Workload-Driven Rooms provided

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PG-18-9 – SPACE PLANNING CRITERIA
295 – Imaging Services

October 1, 2020

TABLE 1: SCANNING / IMAGING ROOM WORKLOAD PARAMETER CALCULATION

FA	IMAGING / SCANNING ROOM	AVERAGE LENGTH OF ENCOUNTER (ALoE) (Minutes)	ANNUAL ROOM THROUGHPUT (Encounters) 100%	ANNUAL ROOM THROUGHPUT (Encounters) 85%
	General Radiology Room	15	8,000	6,800
	Chest Imaging Room	15	8,000	6,800
FA 3	Radiology / Fluoroscopy (RF) Room	30	4,000	3,400
	Multipurpose Radiology / Fluoroscopy (RF) Room	60	2,000	1,700
	Prone Breast Imaging Room	60	2,000	1,700
FA 4	Standing Breast Imaging Room	30	4,000	3,400
	ABUS Scanning Room	30	4,000	3,400
FA 5	Ultrasound Room	30	4,000	3,400
FA 6	Bone Densitometry Room	30	4,000	3,400
FA 7	CT Scanning Room	30	4,000	3,400
FA 8	MRI Scanning Room	45	2,500	2,125
	Nuclear Medicine Scanning Room	45	2,500	2,125
FA 9	SPECT/CT Scanning Room	45	2,500	2,125
	Thyroid Probe Scanning Room	30	4,000	3,400
FA 10	PET/CT Scanning Room	45	2,500	2,125
FA 11	PET/MRI Scanning Room	60	2,000	1,700

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How Many Scanners Do I Need?

	Scanners	Total Scanning Hours per Week	Average Minutes per Exam	Number of Potential Exams Year	Completed Exam Percentage	Scanners Indicated
CT						

3 👆 2 👆 1 👆 4 👆

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Can I Justify Another Scanner?

	Scanners	Total Scanning Hours per Week	Average Minutes per Exam	Number of Potential Exams Year	Completed Exam Percentage	Scanners Indicated
CT						

1 👆 3 👆 4 👆 2 👆 5 👆

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"Put Your Big Rocks In First…"

Except in Radiology we've got a TON of expensive 'little rocks'

Accurate budgeting depends on accurate equipment lists…

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"Put Yo

Except
'little ro

Accurat
lists…

PG 18-12 – IMAGING SERVICES DESIGN GUIDE
CHAPTER 295 - Class 2 CT Scanning Room, Imgng Svcs (CI086)

September 1, 2020

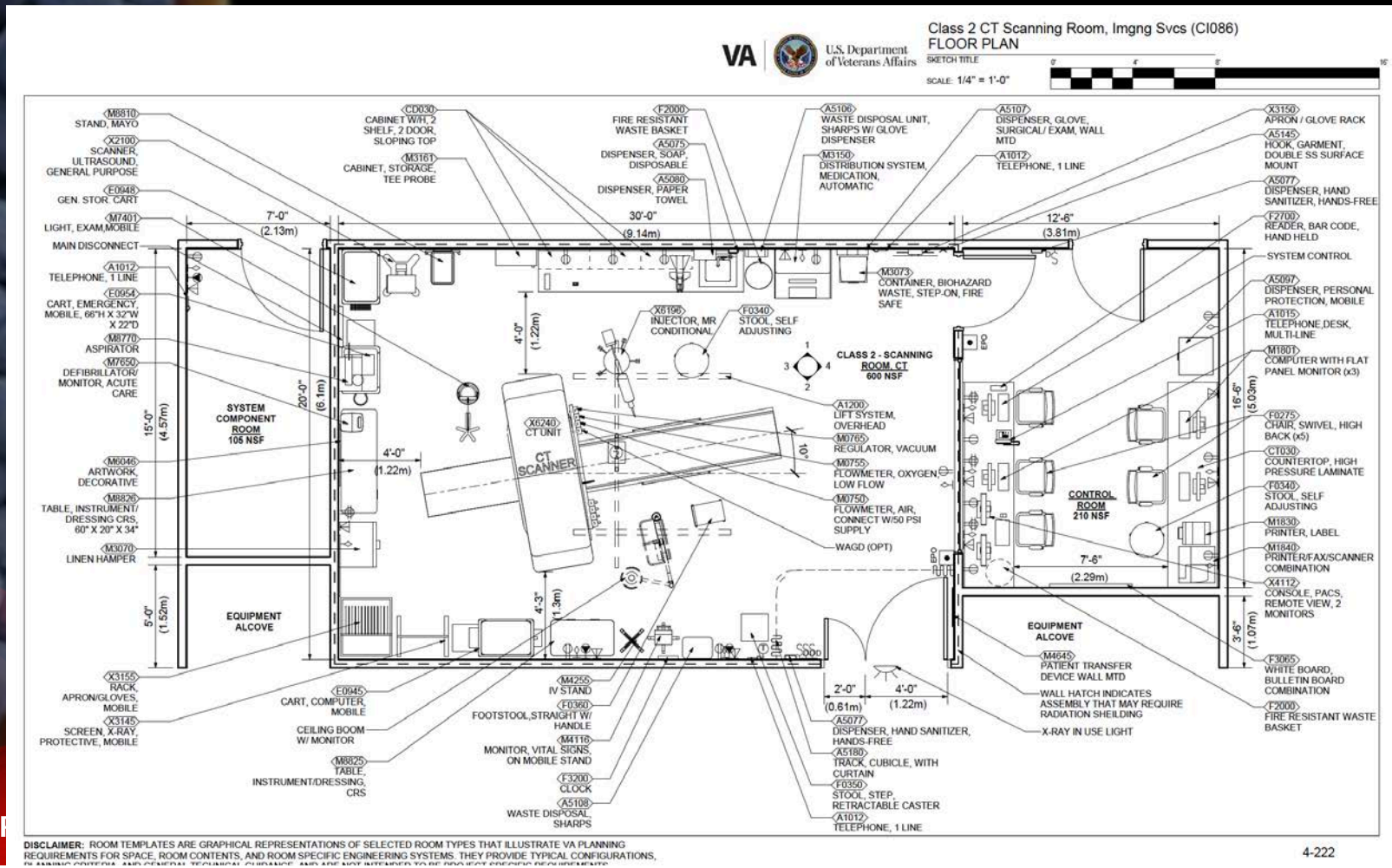
Room Contents: Class 2 CT Scanning Room, Imgng Svcs (CI086)

JSN	Content Name	Acq Code	Qty	Description
A1010	Telecommunication Outlet	VV	4	Telecommunication outlet location.
A1012	Telephone, Wall Mounted, 1 Line	VV	2	Telephone, wall mounted, 1 line.
A1132	Rail, Accessory Mounting, Length As Required	VC	1	Horizontal equipment mounting rail with lock mounting devices capable of; supporting up to 75 pounds each, being repositioned, and mounting and dismounting of equipment without the use of tools (special tools may be required to unlock adapter that was previously locked to the rail). The rail must be capable of supporting medical equipment and accessories normally found in exam or patient rooms. The rail system must be capable of mounting and dismounting equipment without leaving or creating new holes in the finished surface of the wall. The rail system utilizes a series of mounting plates and adapters specific to the device being mounted to the rail. The plate and adapter rail mounting kit must be specified to match the equipment being mounted to the equipment rail.

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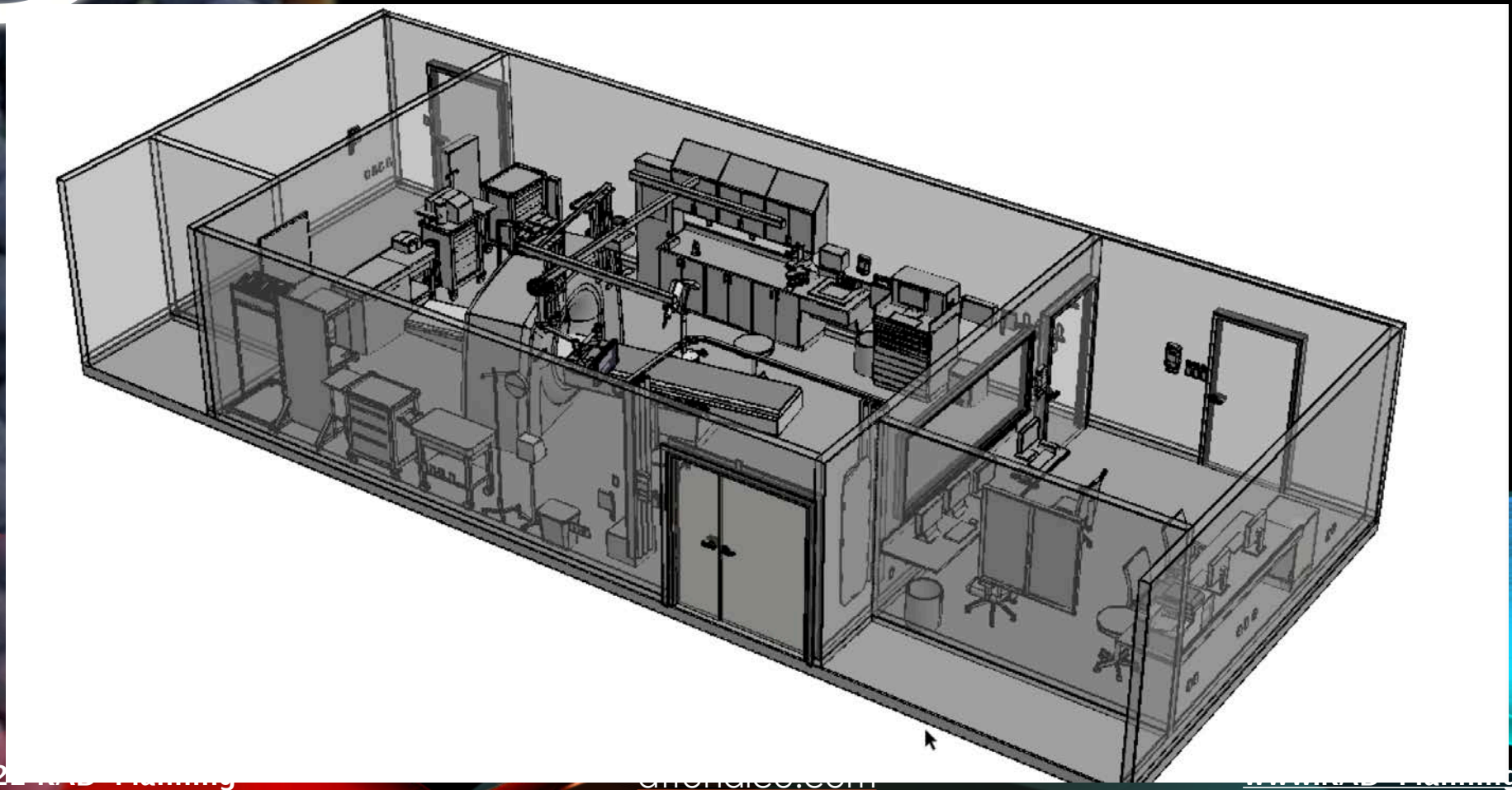
The Math



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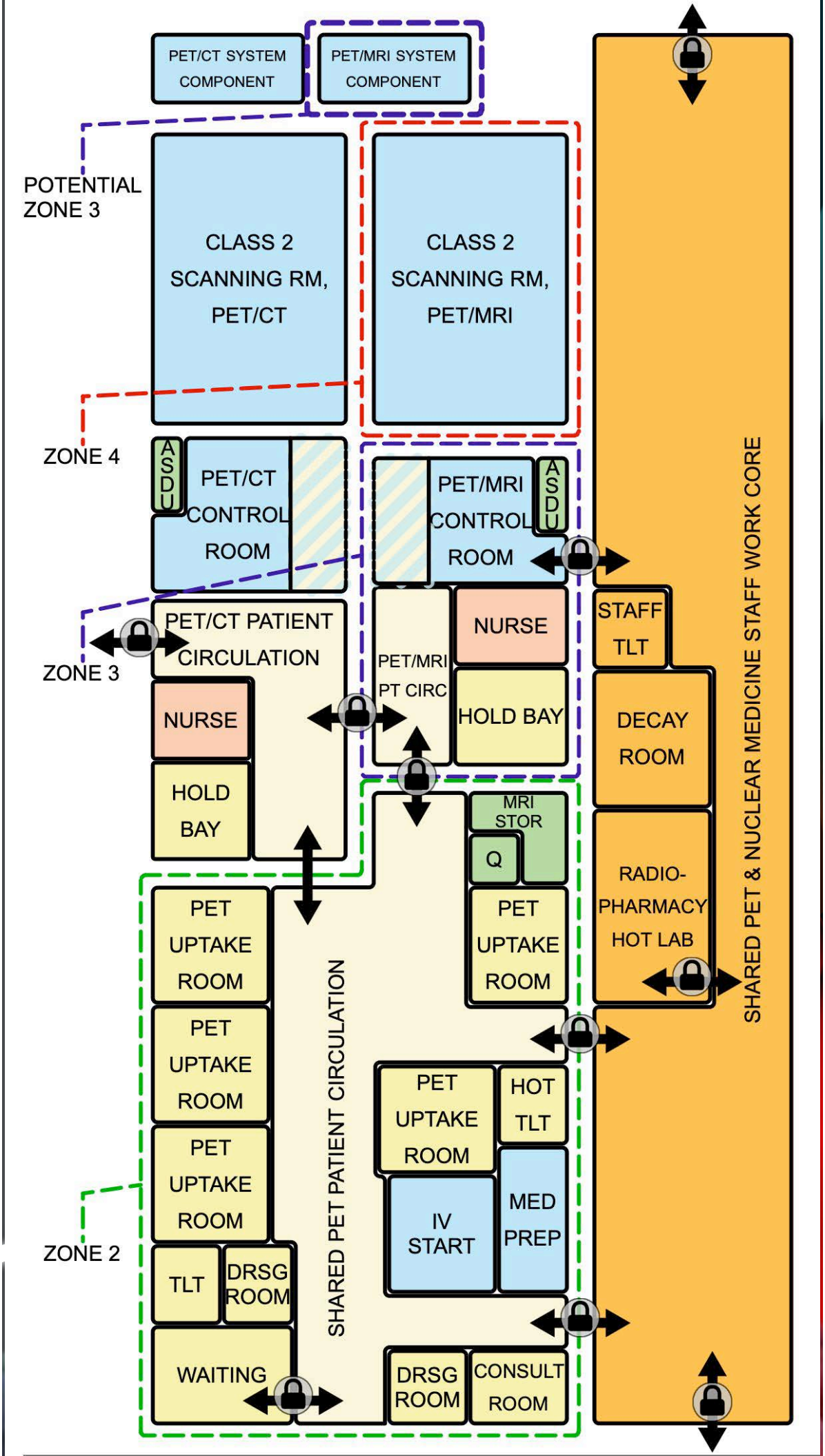
The Organizational Concepts 🤔

Before Design:

2.2.1 Public vs. Staff Core Organization

The Imaging Services documents have been developed based on the operational model of a 'front of house' patient accessible portion of the department, and a 'back of house' staff-only work core. Many of the individual imaging rooms illustrated herein are based on the concept of direct patient access to the imaging room from a patient corridor, and direct staff access to the control room / alcove from the staff work core. This concept is expanded upon in Section 3.0, FUNCTIONAL DIAGRAMS.

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PET/CT SYSTEM COMPONENT
PET/MRI SYSTEM COMPONENT
POTENTIAL ZONE 3
CLASS 2 SCANNING RM, PET/CT
CLASS 2 SCANNING RM, PET/MRI
ZONE 4
ASDU
PET/CT CONTROL ROOM
PET/MRI CONTROL ROOM
ASDU
ZONE 3
PET/CT PATIENT CIRCULATION
PET/MRI PT CIRC
NURSE
HOLD BAY
NURSE
HOLD BAY
STAFF TLT
DECAY ROOM
MRI STOR
Q
PET UPTAKE ROOM
PET UPTAKE ROOM
RADIO-PHARMACY HOT LAB
SHARED PET & NUCLEAR MEDICINE STAFF WORK CORE
PET UPTAKE ROOM
PET UPTAKE ROOM
PET UPTAKE ROOM
HOT TLT
PET UPTAKE ROOM
IV START
MED PREP
ZONE 2
TLT
DRSG ROOM
WAITING
SHARED PET PATIENT CIRCULATION
DRSG ROOM
CONSULT ROOM

The Organizational Concepts 🤔

Acuity Classification:

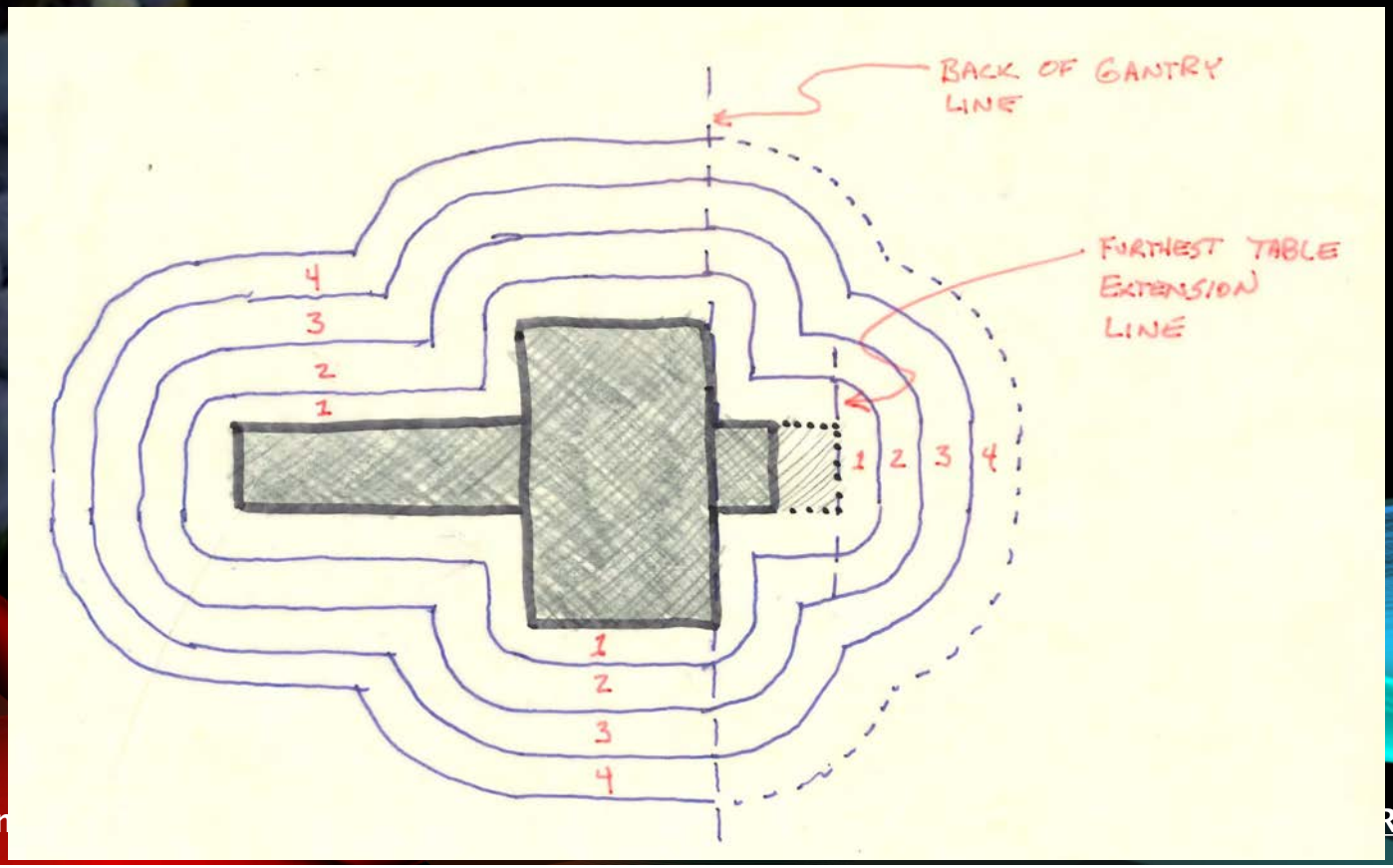
TABLE 2.3.1: Imaging Room Classification Matrix

	Level of Patient Acuity*	Level of Sedation*	Level of Intervention*
Class 1 (Diagnostic)	No Monitoring / Support Required	Minimal Sedation	IV Access, Natural Orifice Entry
Class 2 (Interventional)	Clinical Monitoring Required	Moderate Sedation / General Anesthesia	Minimally-Invasive Procedure (e.g., biopsy)
Class 3 (Intraoperative)	Active Life-Support Required	General Anesthesia	Open Surgical Procedure

*For highest level of anticipated patient care.

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The Organizational Concepts 🤔



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The Organizational Concepts 🤔

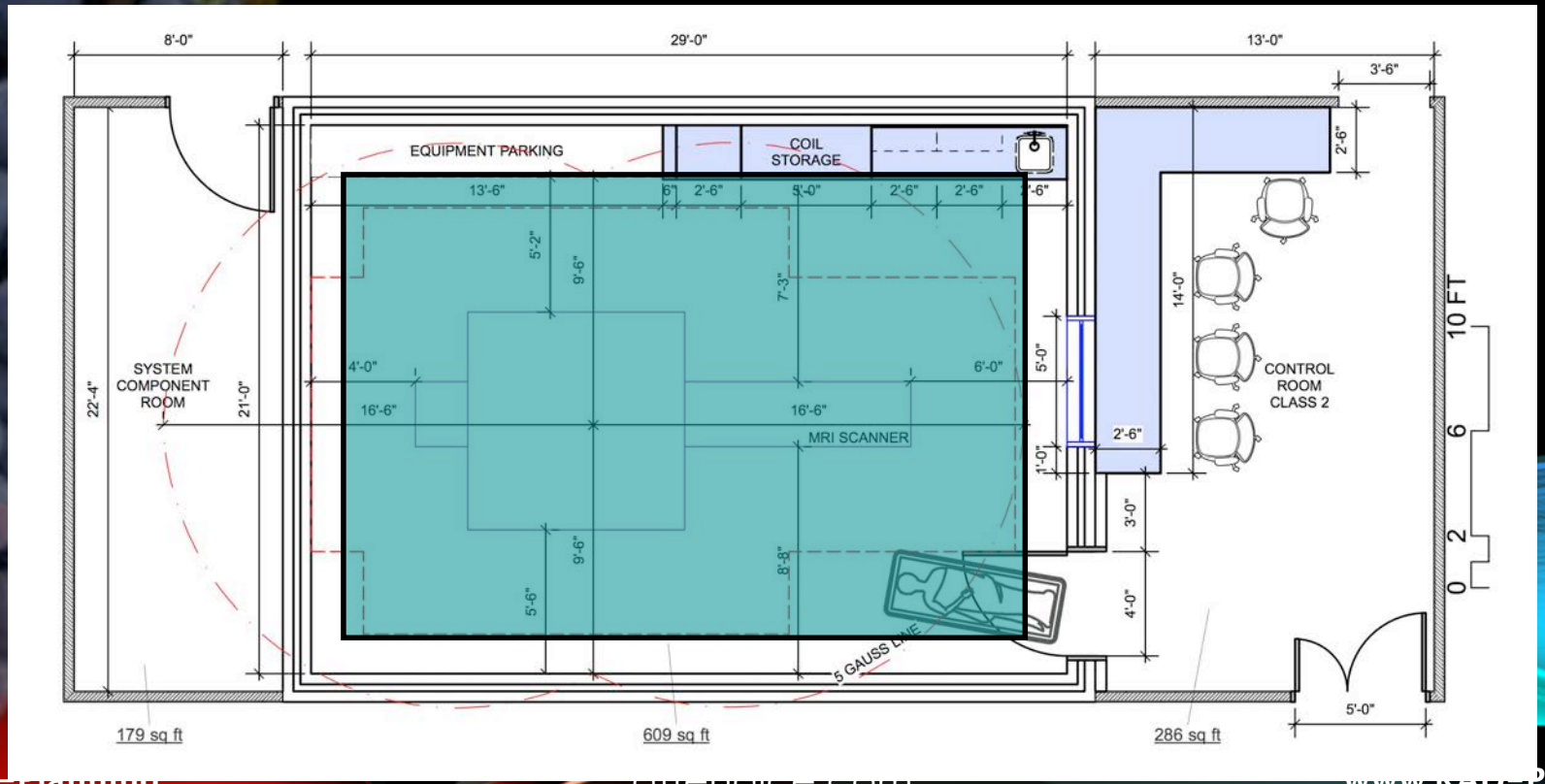
Change In Use (Same Function)

Design Rooms Anticipating Expanded Functions

- Higher Acuity Patients
- Interventional Care
- Surge Needs
- Infection Control

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The Organizational Concepts 🤔



The Organizational Concepts 🤔

Change In Use (Same Space / Different Function)

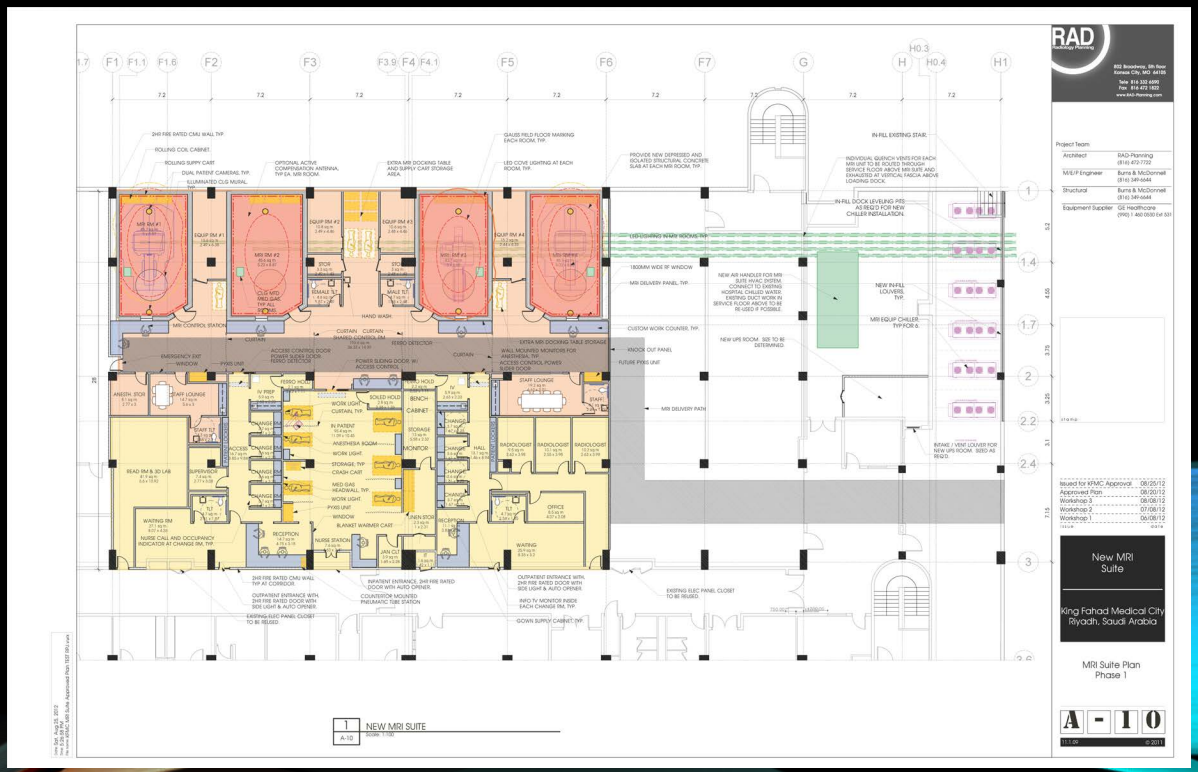
Identify Future Growth & Shrinkage.
Align Them Strategically.

- Growth
- ‘Offloading’
- Expansion

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The Organizational Concepts 🤔

Change In Use
(Same Space /
Different Function)



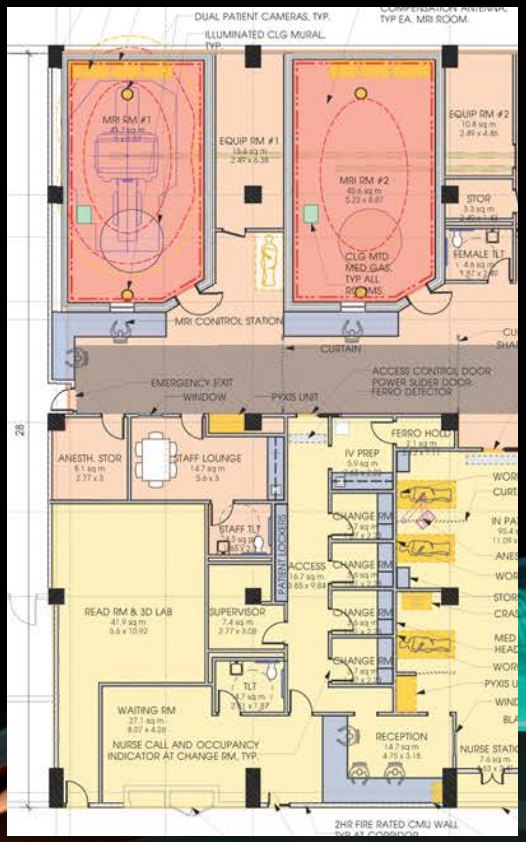
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The Organizational Concepts 🤔

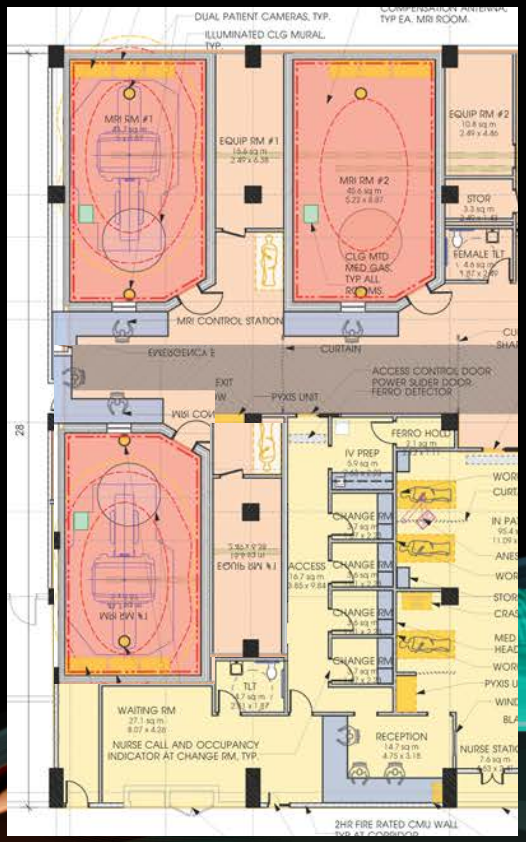
Change In Use
(Same Space /
Different Function)



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The Organizational Concepts 🤔

Change In Use
(Same Space /
Different Function)



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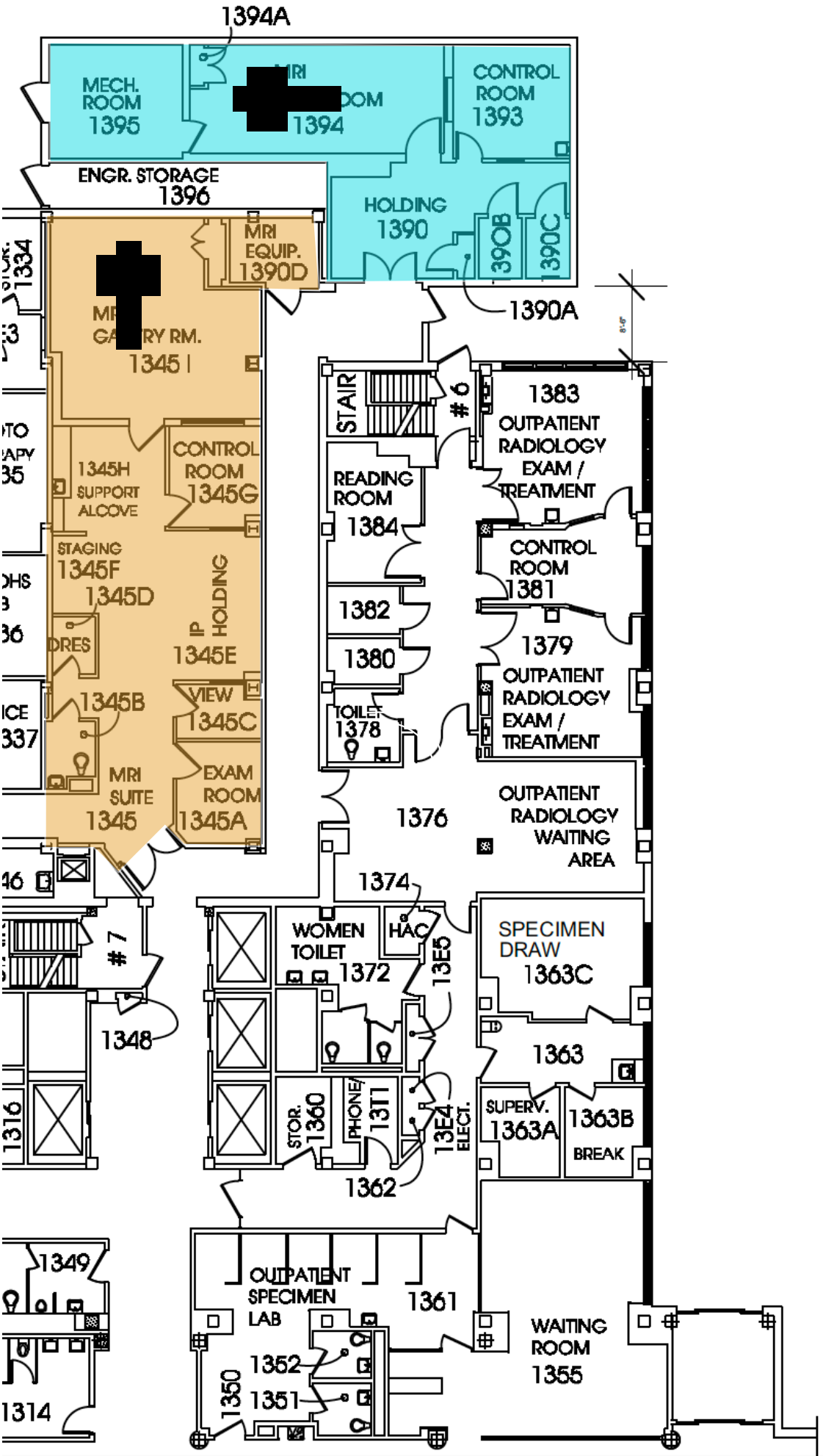
The Case Studies 😎

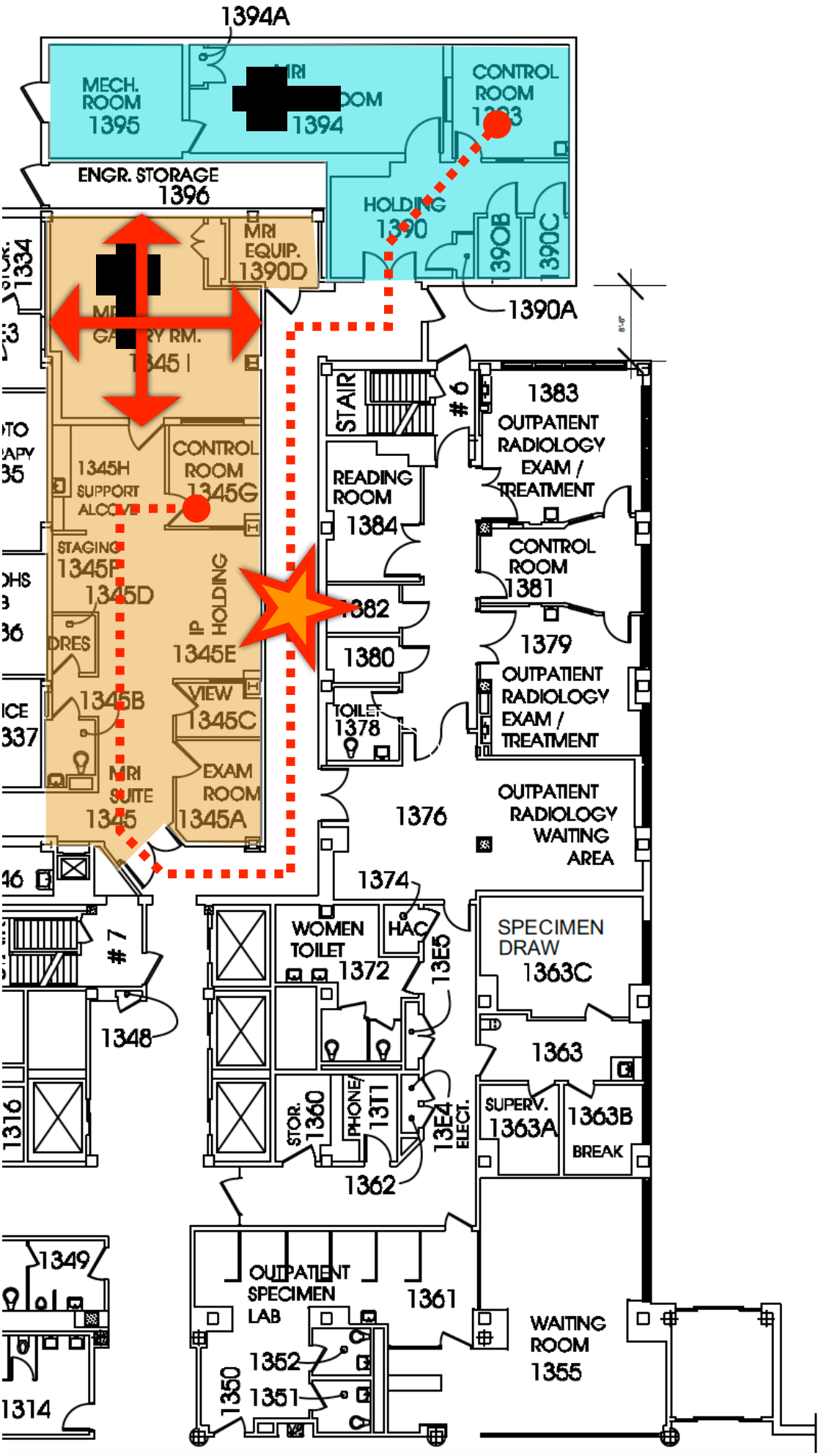
Three Case Studies

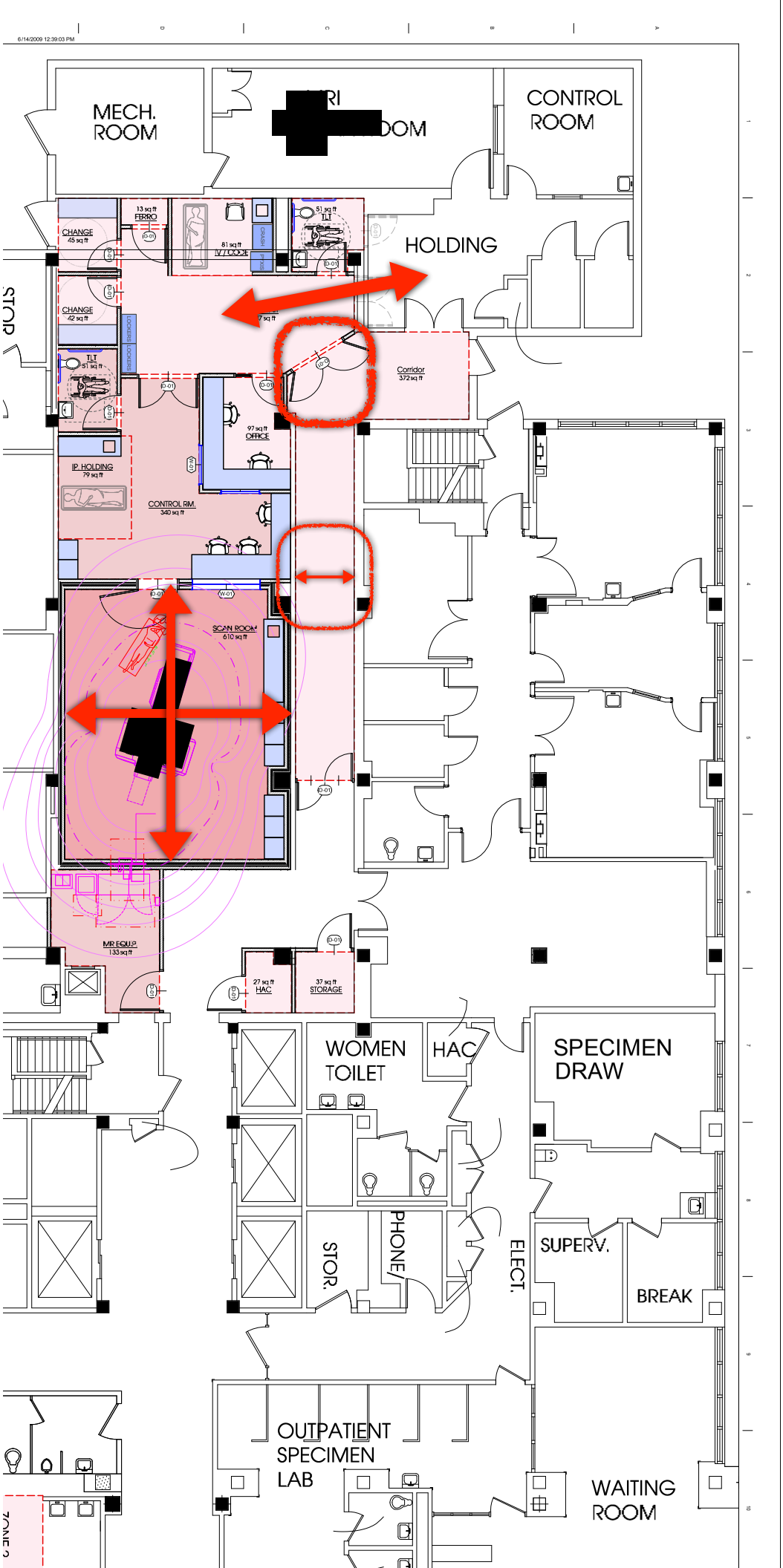
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LANDSCAPE GARDEN
LANDSCAPE GARDEN
MRI / CT ADDITION
14894 sq ft
STAFF LOUNGE
CHANGE
CHANGE
CHANGE
LOCKERS
FERRO HOLD
IV PREP
STAFF TLT
PAT TLT
EQUIP
STAFF RAD
CONSULT
FUTURE MRI
READING RM
RECEPTION
COPY ALCOVE
CHIEF/STAFF WORK ROOM
ADMIN
CONTROL ROOM
SUPPLY
NURSE
HOLD / CODE
SOILED UTL
CLEAN UTL
ADMIN
HAC
CONSULT
STRESS TEST
UPTAKE RM
UPTAKE RM
DRESS
HOT TLT
NOURISHMENT
RECEPTION
ADMIN
SUPPLIES
HOT LAB
EQUIP. ALCOVE
TELE MED
STAFF LOUNGE
ADMIN
READ RM
CONTROL RM
EQUIP
HAC
NURSE
PAT TLT
STAFF TLT
CHIEF NUCMED
CHIEF TECH
SOILED UTL
CLEAN UTL
HOLD / CODE
PO DIETARY ROOM A126
EXAM A127
EXAM ROOM A128
EXAM ROOM A129
SUPPLY ROOM A125
TOILET A133
CORRIDOR CR106
LINEN ROOM A124
EXAM ROOM
SURGERY
WAITING AREA B163
OPC LAB RECEPTION B147
LAB B148
EKG B149
PULMONARY B150
LAB B152
VESTIBULE C1-23
TELE MEDICINE B153
TOILET B154
ON-CALL ROOM B155
CORRIDOR


IMAGING STORAGE
LOCKERS
CHANGE
CHANGE
CHANGE
CHANGE
FERRO HOLD
STAFF LOUNGE
IV PREP
LANDSCAPE GARDEN
LANDSCAPE GARDEN
EQUIP
WAITING
MRI / CT ADDITION
14894 sq ft
RECEPTION
ADMIN
CONTROL ROOM
HOLD / CODE
NURSE
SOILED UTL
CLEAN UTL
ADMIN
HAC
CONSULT
STRESS TEST
UPTAKE RM
UPTAKE RM
WAITING
DRESS
66 sq ft
HOT TLT
62 sq ft
NOURISHMENT
RECEPTION
ADMIN
ADMIN
SUPPLIES
HOT LAB
STAFF LOUNGE
EQUIP
HAC
NURSE
ED TRANSPORT
PO DIETARY ROOM A126
EXAM A127
EXAM ROOM A128
EXAM ROOM A129
SUPPLY ROOM A125
TOILET A133
CORRIDOR CR106
LINEN ROOM A124
WAITING AREA B163
OPC LAB RECEPTION B147
LAB B148
EKG B149
PULMONARY B150
LAB B152
VESTIBULE C1-23
TELE-MEDICINE B153
TOILET B154
ON-CALL ROOM B155


1394A
MECH. ROOM 1395
MRI [redacted] ROOM 1394
CONTROL ROOM 1393
ENGR. STORAGE 1396
HOLDING 1390
390B
390C
1390A
MRI EQUIP. 1390D
MRI [redacted] GANTRY RM. 1345
1345H SUPPORT ALCOVE
CONTROL ROOM 1345G
STAGING 1345F
1345D
IP HOLDING 1345E
1345B
VIEW 1345C
MRI SUITE 1345
EXAM ROOM 1345A
STAIR #6
READING ROOM 1384
1383 OUTPATIENT RADIOLOGY EXAM / TREATMENT
CONTROL ROOM 1381
1382
1380
1379
TOILET 1378
OUTPATIENT RADIOLOGY EXAM / TREATMENT
1376
OUTPATIENT RADIOLOGY WAITING AREA
1374
#7
WOMEN TOILET 1372
HAC
13E5
SPECIMEN DRAW 1363C
1348
1363
STOR. 1360
PHONE 13T1
13E4 ELECT.
SUPERV. 1363A
1363B BREAK
1362
1349
OUTPATIENT SPECIMEN LAB
1361
WAITING ROOM 1355
1352
1351
1350
1314
1316


1394A
MECH. ROOM 1395
MRI [redacted] OOM 1394
CONTROL ROOM 1393
ENGR. STORAGE 1396
HOLDING 1390
390B
390C
1390A
MRI EQUIP. 1390D
MRI GALLERY RM. 1345
1345H SUPPORT ALCOVE
CONTROL ROOM 1345G
STAGING 1345F
1345D
IP HOLDING 1345E
1345B
VIEW 1345C
MRI SUITE 1345
EXAM ROOM 1345A
STAIR #6
READING ROOM 1384
1383 OUTPATIENT RADIOLOGY EXAM / TREATMENT
CONTROL ROOM 1381
1382
1380
1379 OUTPATIENT RADIOLOGY EXAM / TREATMENT
TOILET 1378
1376 OUTPATIENT RADIOLOGY WAITING AREA
1374
STAIR #7
WOMEN TOILET 1372
HAC
13E5
SPECIMEN DRAW 1363C
1348
1363
STOR. 1360
PHONE 13T1
13E4 ELECT.
SUPERV. 1363A
1363B BREAK
1362
1349
OUTPATIENT SPECIMEN LAB
1361
WAITING ROOM 1355
1352
1351
1350
1314
1316


6/14/2009 12:39:03 PM
MECH. ROOM
[redacted]
CONTROL ROOM
HOLDING
CHANGE 45 sq ft
13 sq ft FERRO
81 sq ft IV / CODE
51 sq ft TLT
CRASH
FIXER
CHANGE 42 sq ft
LOCKERS
LOCKERS
TLT 51 sq ft
7 sq ft
Corridor 372 sq ft
97 sq ft OFFICE
IP HOLDING 79 sq ft
CONTROL RM. 340 sq ft
SCAN ROOM 610 sq ft
MR EQUIP. 133 sq ft
27 sq ft HAC
37 sq ft STORAGE
WOMEN TOILET
HAC
SPECIMEN DRAW
STOR.
PHONE
ELECT.
SUPERV.
BREAK
OUTPATIENT SPECIMEN LAB
WAITING ROOM

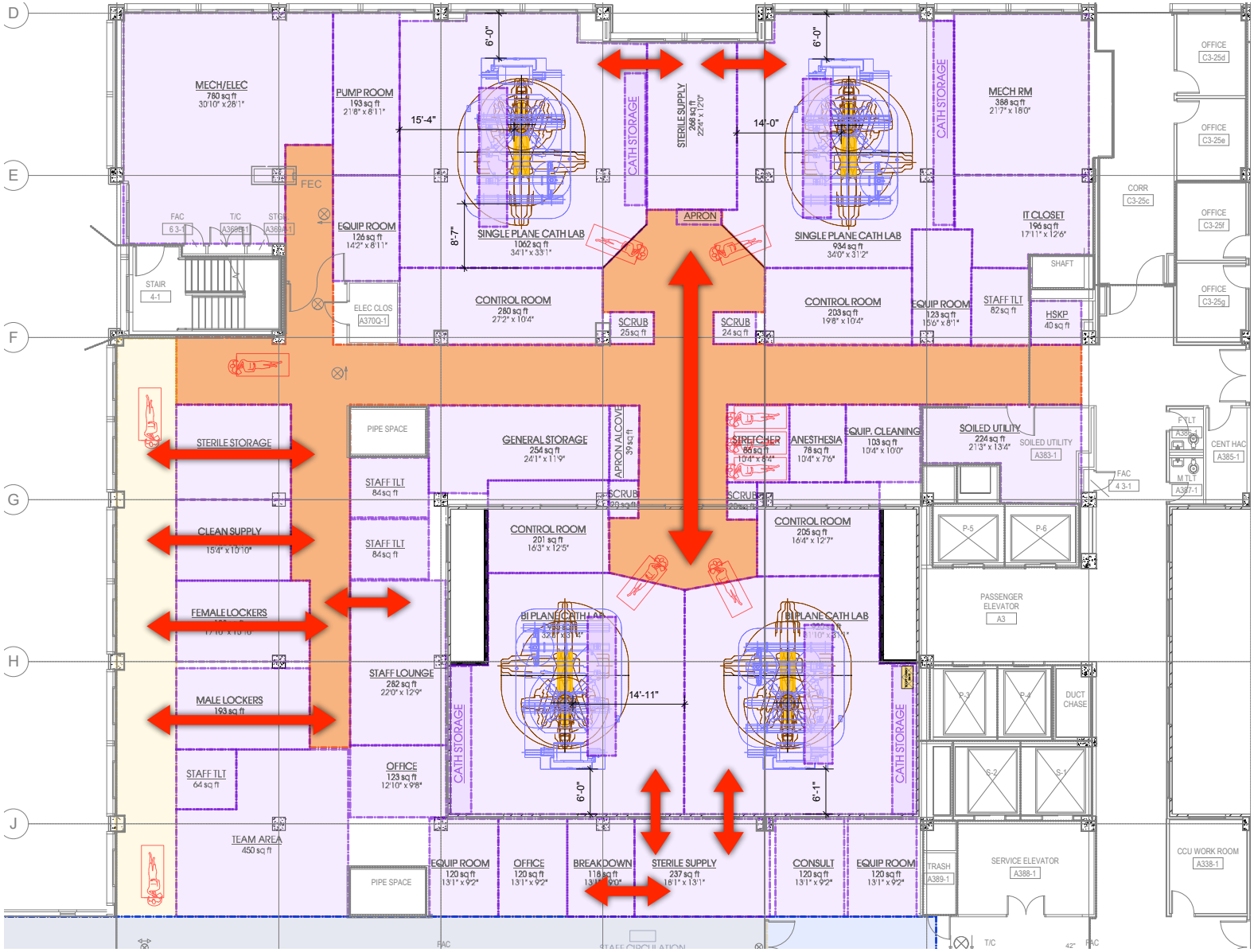
CSI-123


ISOLATION BEDROOM A370D-1
BED CUBICLE A370E-1
BED CUBICLE A370F-1
BED CUBICLE A370G-1
BED CUBICLE A370H-1
BED CUBICLE A370I-1
E/C A371A-1
CONSULT. A372-1
FAMILY WAITING ROOM A374-1
TOILET A374A-1
WOMEN'S LOCKER ROOM A375-1
SOILED UTILITY A375-1
MEN'S LOCKER ROOM A376-1
TOILET A376A-1
SHAFT
ANTE A370C-1
LINEN A370B-1
FAC 6.3-1
STOR. A369A-1
STAIR 2-1
M.I.C.U. A370-1
PAT. MED. PREP. A370B-1
CONTROL CENTER A370-1
MED. PREP/ STOR. A370C-1
SLEEP CLOS A370D-1
ANTE ROOM A370K-1
ISOLATION BEDROOM A370L-1
HALL A370J-1
EXIST. CLEAN UTILITY A369-1
CORR C3-25c
OFFICE C3-25d
OFFICE C3-25e
OFFICE C3-25f
OFFICE C3-25g
PODIATRY A302-1
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OFFICE A305-1
SOILED UTILITY A368-1
NURSES OFFICE A368-1
HALL A368C-1
STAFF LOUNGE A368E-1
CLEAN UTILITY A372-1
PIPE SPACE
HOUSEKEEPING A383-1
BED CUBICLE A370I-1
BED CUBICLE A370K-1
BED CUBICLE A370L-1
BED CUBICLE A370M-1
STOR. A381-1
SOILED UTILITY A383-1
FAC 4.3-1
CENT HAC A385-1
HEAD NURSE/ OUTPATIENT CLIN A372A-1
EXAM A313-1
M.I.U. A382-1
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P-2
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HALL A368A-1
ON CALL ROOM A381-1
STOR. A365-1
FUTURE PHARMACY A364-1
PASSENGER ELEVATOR A3
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P-4
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PATIENT BEDS A366-1
SHOWER A365-1
NURSES STATION A368A-1
S-2
S-1
HAC A359-1
BATH A347A-1
1 BED ROOM A347-1
1 BED ROOM A346-1
TLT A346A-1
SEC ROOM A345-1
HEAD NURSE A343A-1
M.I.C.U. VISITORS LOUNGE A342-1
HEAD NURSE A341-1
TRASH A388-1
SERVICE ELEVATOR A385-1
ISOLATION ROOM A358C-1
TOILET A358B-1
PIPE SPACE
CCU WORK ROOM A338-1
OFFICE A338A-1
1 BED ROOM A339-1
CARDIOLOGY E345-1
OFFICE E346-1
FAC 5.3-1
T/C A338A-1
FAC 3.3-1
2 BED ROOM A356-1
TLT A356A-1
INTERNS A349-1
OFFICE A348-1
STORAGE A345-1
OFFICE A344-1
TLT A356A-1
MED ROOM A350-1
NURSES STATION A351-1
MEDS A351C-1
RESID A352A-1
HEAD NURSE A351A-1
E/C A338B-1
E / C A351B-1
STAIR 2-1
OFFICE A337C-1
NURSES STATION A337-1
MEDICATION ROOM A337A-1
TLT A329A-1
LOCKER ROOM A331-1



1 CARDIOLOGY LAYOUT

A10.08 SCALE: 1/8" = 1'-0"


MECH/ELEC
780 sq ft
30'10" x 28'1"
PUMP ROOM
193 sq ft
21'8" x 8'11"
EQUIP ROOM
126 sq ft
14'2" x 8'11"
ELEC CLOS
A370G-1
FEC
STAIR
4-1
FAC
6 3-1
T/C
A368E-1
STEM
A368A-1
6'-0"
15'-4"
8'-7"
SINGLE PLANE CATH LAB
1062 sq ft
34'1" x 33'1"
CONTROL ROOM
280 sq ft
27'2" x 10'4"
CATH STORAGE
STERILE SUPPLY
268 sq ft
22'4" x 12'0"
SCRUB
25 sq ft
SCRUB
24 sq ft
APRON
6'-0"
14'-0"
SINGLE PLANE CATH LAB
934 sq ft
34'0" x 31'2"
CONTROL ROOM
203 sq ft
19'8" x 10'4"
CATH STORAGE
MECH RM
388 sq ft
21'7" x 18'0"
EQUIP ROOM
123 sq ft
15'6" x 8'1"
STAFF TLT
82 sq ft
IT CLOSET
196 sq ft
17'11" x 12'6"
SHAFT
HSKP
40 sq ft
OFFICE
C3-25d
OFFICE
C3-25e
CORR
C3-25c
OFFICE
C3-25f
OFFICE
C3-25g
STERILE STORAGE
CLEAN SUPPLY
15'4" x 10'10"
FEMALE LOCKERS
MALE LOCKERS
193 sq ft
STAFF TLT
64 sq ft
TEAM AREA
450 sq ft
PIPE SPACE
STAFF TLT
84 sq ft
STAFF TLT
84 sq ft
STAFF LOUNGE
282 sq ft
22'0" x 12'9"
OFFICE
123 sq ft
12'10" x 9'8"
PIPE SPACE
GENERAL STORAGE
254 sq ft
24'1" x 11'9"
APRON ALCOVE
39 sq ft
SCRUB
39 sq ft
CONTROL ROOM
201 sq ft
16'3" x 12'6"
BI PLANE CATH LAB
1220 sq ft
37'6" x 33'1"
14'-11"
6'-0"
CATH STORAGE
EQUIP ROOM
120 sq ft
13'1" x 9'2"
OFFICE
120 sq ft
13'1" x 9'2"
BREAKDOWN
118 sq ft
13'1" x 9'0"
STERILE SUPPLY
237 sq ft
18'1" x 13'1"
STRETCHER
86 sq ft
10'4" x 8'4"
ANESTHESIA
78 sq ft
10'4" x 7'6"
EQUIP. CLEANING
103 sq ft
10'4" x 10'0"
SOILED UTILITY
224 sq ft
21'3" x 13'4"
SOILED UTILITY
A383-1
SCRUB
SCRUB
CONTROL ROOM
205 sq ft
16'4" x 12'7"
BI PLANE CATH LAB
1220 sq ft
37'10" x 31'1"
6'-1"
CATH STORAGE
CONSULT
120 sq ft
13'1" x 9'2"
EQUIP ROOM
120 sq ft
13'1" x 9'2"
P-5
P-6
PASSENGER ELEVATOR
A3
P-3
P-4
DUCT CHASE
S-2
S-1
TRASH
A389-1
SERVICE ELEVATOR
A388-1
FAC
4 3-1
P-LT
A386-1
M TLT
A387-1
CENT HAC
A385-1
CCU WORK ROOM
A338-1
FAC
STAFF CIRCULATION
T/C
42"
FAC

The Organizational Concepts 🤔

Imaging Guide includes recommended:

- HVAC
- Plumbing
- Lighting & Power
- Life Safety
- Med Gas
- Structural Considerations
- Architectural Finishes

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Resources

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Resources

2020 VA Imaging Services Design Guide

- https://www.cfm.va.gov/til/dGuide/dgImaging.pdf

2020 VA Imaging Services Space Planning

- https://www.cfm.va.gov/til/space/spChapter295.pdf

AHRA Asset Management Text

- https://www.ahra.org/AHRA/Products/AHRA_Professional_Development_Series_Textbooks.aspx

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Summary

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