

### P100 2021

The Facilities
Standards for the
Public Buildings
Service

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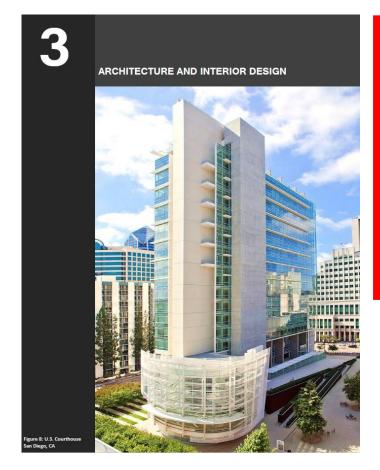






**FACILITIES STANDARDS** FOR THE PUBLIC BUILDINGS SERVICE

October 2021





### Jane Schuster

Workplace Strategist Center for Workplace Strategy



### INTERIOR DESIGN TECHNICAL COMMITTEE

Jane Schuster - CO Kevin Kelly - CO Liz Kahn - R3 Laurie Fox - R8 Stacey Fong - R9





#### P100 (2021) Change Requests





#### Interiors: Today's Focus

3.4 Interior Performance Table

Glazing
Flooring
Coatings
Wall Covering
Acoustical Ceilings

3.5 Interior Construction & Interior Finishes Performance Attributes

Construction Products and Materials Interior Finishes and Materials Acoustics

3.7 Workplace Performance Requirements

**3.8** Workplace Performance Attributes



# 3.4InteriorPerformanceTable

	Durability
Baseline	Compliance to W-101 (2011)
Tier 1	Compliance to W-101 (2011)
Tier 2	Compliance to W-101 (2011)
Tier 3	Compliance to W-101 (2011)
M&V	Manufacturer Provided Specifications
Plans & Specs	N/A
Calculations & Analysis	W 101 Physical Test Requirements
References	19 202 thy main that may be marked
Basis of Design	Describe durability requirements.
Construction Verification	Verify compliance through product submittal information.
construction verification	Maintenance
Baseline	Scrubbability - 300 cycles/ min Washability - 100 cycles/ min
Tier 1	Scrubbability - 300 cycles/ min Washability - 100 cycles/ min
Tier 2	Scrubbability - 300 cycles/ min Washability - 100 cycles/ min
Tier 3	Scrubbability - 300 cycles/ min Washability - 100 cycles/ min
M&V	Manufacturer Provided Specifications
Plans & Specs	ASTM F 793
Calculations & Analysis	W 101 Physical Test Requirements
References	
Basis of Design	Describe maintenance requirements.
Construction Verification	Verify compliance through product submittal information.
	Environmental – Wall Covering
1000000	Comply with IgCC-2018 Section 901.4.1.4.3 (9.4.1.4.3) Third-Party Multi-attribute Certification - NSF/ANSI 342 for
Baseline	wall covering products.
	Comply with IeCC-2018 Section 901.4.1.4.3 (9.4.1.4.3) Third-Party Multi-attribute Certification - NSF/ANSI 342 for
Tier 1	wall covering products.
	Comply with IgCC-2018 Section 901.4.1.4.3 (9.4.1.4.3) Third-Party Multi-attribute Certification - NSF/ANSI 342 for
Tier 2	wall covering products.
Tier 3	Comply with IgCC-2018 Section 901.4.1.4.3 (9.4.1.4.3) Third-Party Multi-attribute Certification - NSF/ANSI 342 for
lier 5	wall covering products.
M&V	Provide 3rd Party NSF/ANSI 342 Certificate; Recycled content must be calculated in terms of total product weight
Plans & Specs	N/A
Calculations & Analysis	W 101 Physical Test Requirements
References	
Basis of Design	Document the percent recycled content.
Construction Verification	Verify compliance through product submittal information and manufacturer certification.
	Environmental – Ceiling and Wall Assemblies
Baseline	Comply with IgCC-2018 Section 801.4.2.6 (8.4.2.6) Ceiling and Wall Assemblies and Systems.
Tier 1	Comply with IgCC-2018 Section 801.4.2.6 (8.4.2.6) Ceiling and Wall Assemblies and Systems.
Tier 2	Comply with IgCC-2018 Section 801.4.2.6 (8.4.2.6) Ceiling and Wall Assemblies and Systems and GREENGUARD Go



#### **Updated Performance Tables**

#### **Updated** -

#### Previous -

Attribute	Baseline	* Tier 1 High Performance	** Tier 2 High Performance	★★★ Tier 3 High Performance	Measurement & Verification	Plans & Specs	Calculations & Analysis	Design	Construction
3.5.1.9 Metal Stud Parti	1.9 Metal Stud Partitions								
Construction	3-5/8" x min. 25 ga. metal studs @ 24" o.c., 5/8" gyssum board, with Greenguard Gold certification, each side (max. deffection L/240)	3-5/8" x min. 25 ga. metal studs @ 16" o.c., 5/8" gypsum board, with Greenguard Gold certification, each side (max. deflection L/360)	3-5/8" x min. 16 ga. light gage metal framing studs gi 16" o.c. 2 layers 5/8" gyssum board, , with Greenguard Gold certification, 9 ga. wire- meth between studs and gyssum each side (max. deflection L/160)	N/A	N/A	ASTM C 645, ASTM C 1396, Greenguard Gold	N/A	Describe partition construction. Document environmental testing requirements for gypsum board	Verify compliance through design submittals, shop drawings and product submittal information.
Durability (Impact Resistance)	Standard	Standard	High	N/A	N/A	N/A	N/A	Describe impact resistance requirement, when applicable.	Verify compliance through product submittal information.
Height	Deck to Ceiling	Deck to Slab or Deck Above	Deck to Slab or Deck Above	N/A	N/A	N/A		Describe partition height requirements.	Verify compliance through design submittals.
Acoustics	STC 40	STC 45	STC 50	N/A	N/A	ASTM E 90	N/A	Document partition assembly STC rating.	Wenty STC ratings through product submittals during construction for compliance.
Security	No Rating	No Rating	SCIF	N/A	N/A.	N/A	Required for FE and BR ratings	Document security requirement.	Verify compliance through design submittals and shop drawings

#### Note:

Acoustic performance relocation

	Construction
Baseline	3-5/8" x min. 25 ga. metal studs @ 24" o.c., 5/8" gypsum board, with Greenguard Gold certification, each side (maddeflection L/240)
Tier 1	3-5/8" x min. 25 ga. metal studs @ 24" o.c., 5/8" gypsum board, with Greenguard Gold certification, each side (man deflection L/240)
Tier 2	3-5/8" x min. 16 ga. light gage metal framing studs @ 16" o.c., 2 layers 5/8" gypsum board, with Greenguard Gold certification, 9 ga. wire mesh between studs and gypsum each side (max. deflection L/360)
Tier 3	N/A
M & V	N/A
Plans & Specs	ASTM C 645, ASTM C 1396,
Calculations & Analysis	N/A
References	
Basis of Design	Describe partition construction.
Construction Verification	Verify compliance through design submittals, shop drawings and product submittal information.
	Durability (Impact Resistance)
Baseline	Standard
Tier 1	Standard
Tier 2	High
Tier 3	N/A
M & V	N/A
Plans & Specs	N/A
Calculations & Analysis	N/A
References	
Basis of Design	Describe impact resistance requirement, when applicable.
Construction Verification	Verify compliance through product submittal information.
	Height
Baseline	Deck to Ceiling with plenum barrier
Tier 1	Deck to Slab or Deck to Ceiling with plenum barrier or Deck to Deck Above
Tier 2	Deck to Slab or Deck Above



#### **Wood Framed Interior Lights**

#### Tier 3:

Removed Teak and Rosewood

#### Now matches types of wood in Tier 1 & 2

- Sustainability
- Avoidance on imported exotic woods
- Threatened species

	Construction
Baseline	Field fabricated and finished. Painted birch, poplar, or clear softwood. AWI Custom grade.
Tier 1	Shop fabricated with field applied clear or tinted stain. Oak, maple, cherry, walnut, or similar hardwood. AWI custor grade.
Tier 2	Shop fabricated and finished with clear or tinted stain. Oak, maple, cherry, walnut, or similar hardwood. AWI premium grade.
Tier 3	Shop fabricated and finished with clear or tinted stain. Oak, maple, cherry, walnut, or similar hardwood. WI premium grade.
M & V	N/A
Plans & Specs	N/A
Calculations & Analysis	N/A
References	
Basis of Design	Describe construction of wood framed interior lights.
Construction Verification	Verify through mockup, shop drawing submittal and product submittal information.



#### **Broadloom / Carpet Tile**

#### **Baseline Only:**

#### **Durability:**

- CRI Model Specification for TARR
  - Selection based on foot traffic
  - Increase product selections
  - Decreased overall costs

#### CRI Updates:

- Follows industry standards
- Updated with innovations

Broadloom/Carpet Tile						
	Durability					
Baseline	Refer to CRI Model Specification for TARR Recommendation.					
Tier 1						
Tier 2	X					
Tier 3						
M & V						
Plans & Specs	NSF/ANSI 140 and reference IgCC					
Calculations & Analysis						
References						
Basis of Design	TARR classification => 3.0 TARR Moderate/Heavy Private Offices, Training, Conference, Courtrooms =>3.5 TARR Severe Open Office, Cafeteria, Corridors, Lobbies					
Construction Verification	Verify compliance through mockup and product submittal information.					





#### Resilient Flooring

#### **Environmental Updates:**

#### **GREENGUARD Gold**

- Added to VCT, Sheet Vinyl, Rubber Tile, Linoleum
  - Most utilized product emission certification
  - Stringent pass/fail criteria
- Already utilized throughout P100
- Cost for certification and/or emissions testing

Environmental			
Baseline	Comply with IgCC-2018 Section 901.4.1.4.3 (9.4.1.4.3) Third-Party Multi-attribute Certification. NSF-332 Silver and GREENGUARD Gold		
Tier 1	Comply with IgCC-2018 Section 901.4.1.4.3 (9.4.1.4.3) Third-Party Multi-attribute Certification. NSF-332 Gold and GREENGUARD Gold		
Tier 2	Comply with IgCC-2018 Section 901.4.1.4.3 (9.4.1.4.3) Third-Party Multi-attribute Certification. NSF-332 Platinum and GREENGUARD Gold		
Tier 3	Comply with IgCC-2018 Section 901.4.1.4.3 (9.4.1.4.3) Third-Party Multi-attribute Certification. Cradle to Cradle Bronze and GREENGUARD Gold		





#### Luxury Vinyl Tile & Plank

#### **New Section!**

LVT → Mimics tile

LVP -> Mimics hardwood

- + Low cost compared to stone/wood
- + Low maintenance
- + Comfort
- + Water-resistant
- + Durable
- + Easy to install
- Emit VOCs after installation





#### Interior Architectural Coatings (Paint)

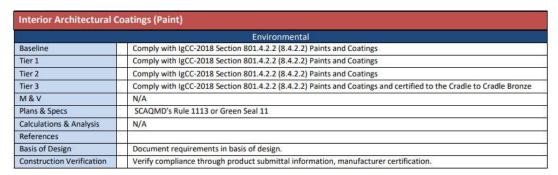
#### **Environmental Updates:**

#### Removed VOC level requirement

#### Replaced with IgCC-2018 compliance

- Section 801.4.2.2 Paints & Coatings
  - Specifically names products/applications
  - References Green Seal 11 (durability)
  - Comprehensive requirements for paint emissions









**Acoustical Ceilings** 

#### Removed Attributes:

- Privacy Index
- Sound Masking
- Reverberation Time
- Scratch Resistance

#### Maintenance:

Removed ASTM D2486

#### Environmental

Baseline recycled content increase





**3.5** Interior Construction & Interior Finishes Performance **Attributes** 







### Construction Products



### Materials and Finish Materials



Solid Core Wood Doors

May include vision panels - but features cannot change their level of performance

**Hollow Metal Doors** 

May include vision panels - but features cannot change their level of performance

Glazed Aluminum Doors

Typically fully glazed.
For interior use.
Do not have a fire rating.
Not bullet resistant or forced entry protected



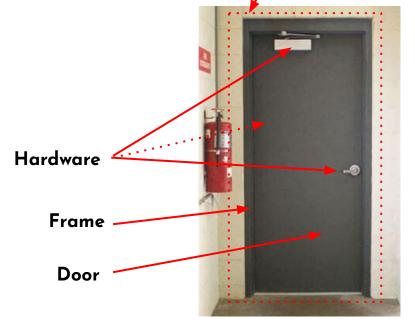
Construction Products:
Fire Rated Doors

#### **Door Assembly**

- Doorway
- Door
- Frame
- Hardware

#### Rated Door Types

- Flush
- Solid Core Wood
- Hollow Metal



Doorway



# Construction Products: Types of Door Cores

Solid Core Wood Doors				
	Construction			
Baseline	Bonded stave core; AWI Custom Grade; 5-ply; Field applied paint			
Tier 1	Bonded particle board core; AWI Custom Grade; 5-ply; Hardwood veneer; Field applied finish			
Tier 2	Bonded structural composite core; AWI Premium Grade; 5-ply; Factory finish			
Tier 3	Bonded structural composite core; AWI Premium Grade; 5-ply; Factory finish			
M & V	N/A			
Plans & Specs	WDMA I.S-1. A; AWI Architectural Woodwork Quality Standards			
Calculations & Analysis	N/A			



## Construction Products: Types of Door Cores



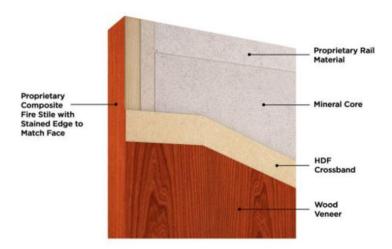
Bonded Stave Core Bonded Particle
Board Core

Bonded Structural Composite Lumber Core (SCL)





# Construction Products: Types of Door Cores



Mineral Core



# Construction Products: Interior Glazing

**Wood Framed Lights** 

No fire rating available

Hollow Metal Framed Lights

May be fire rated if dimensions comply

**Aluminum Framed Lights** 

No fire rating available



Hollow Metal Framed Light





**Metal Stud Partitions** 

Metal stud construction with aypsum board

**Masonry Partitions** 

Concrete masonry wall with metal furring and gypsum board

**Demountable Partitions** 

Prefabricated assembly designed to be installed and relocated

**Operable Partitions** 

Wall partitions that move on a track system



Metal stud partition



#### **Demountable Partitions**

#### Why select a demountable wall?

- Quick install, less waste
- Coordination between trades is simplified
- May contribute to LEED credits.
- Most importantly: Workplace change is constant















Construction Products



Materials and Finish Materials

# Interior Finishes: Interior Coatings (aka: paint)

#### Specify Low VOCs for all Tiers

Comply with IgCC-2018 Section 801.4.2.2 (8.4.2.2)

SCAQMD 1113 or GreenSeal 11









## Interior Finishes: Type II Wallcovering

#### **Durability Attributes of Type II**

- Washability
- Scrubbability
- Abrasion Resistance
- Breaking Strength
- Crocking
- Stain Resistance
- Tear Resistance

#### 20-28 oz per linear yard



Steiner Tunnel Test Apparatus



"A designer has a duty to create timeless design. To be timeless you have to think really far into the future, not next year, not in two years but in 20 years minimum."

- Phillip Starck

### Kevin Kelly

Senior Architect Center for Workplace Strategy



### 3.5.3 Acoustics



#### **SOUND MATTERS**

How to achieve acoustic comfort in the contemporary office

Produced by GSA Public Buildings Service

December 2011

RT 1	PART 2
nat Is Acoustical Comfort?	A Closer Look at the Where and How of Acoustic Mitigation
ny Is It So Important?4	WHAT: Behavior Works-The Human Element of Acoustics
w To Deliver It?4	WHERE: Zoning and Designing Workplace Neighborhoods
e Current Situation - What Research is Telling Us6	HOW: Technical Tips for Physical Acoustic Mitigation
e Challenge - Why Acoustics is More Important Than Ever	Special Conditions & New Acoustical Treatments
e Solution - Checklist for Success	Talk Like an Acoustician (or at least understand them) – A Short Glossary
	Putting it all Together: Costs
	References41
	Acknowledgements



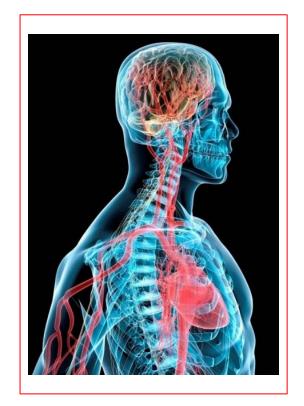
### Why Acoustics Matter

#### Mental & Behavioral Effects

- Increased aggressiveness
- Decreased problem solving
- Comprehension problems

#### **Clinical Manifestations**

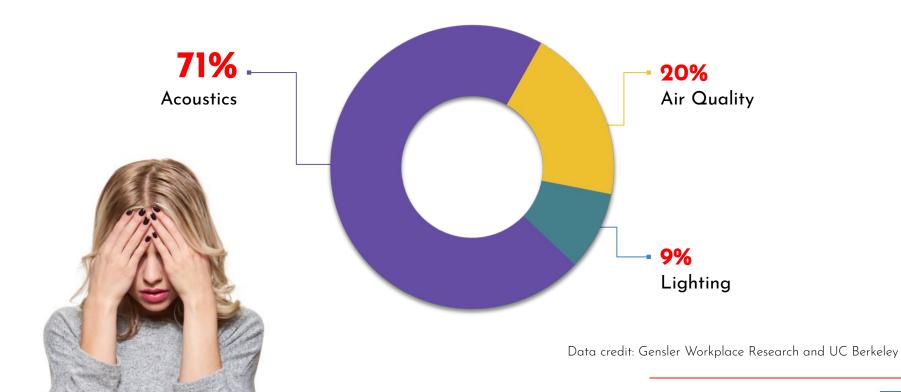
- Elevated blood pressure
- Fatigue
- Ulcers
- Heart attacks







#### **Top Workplace Complaints**



#### **Key Concepts for Acoustics**



Provide areas for private conversations.



#### **Background Sound**

Background sound masks distracting noises but is not distracting.



#### **Absorption**

Finishes absorb sound and control reverberation.



Limited external environmental noise.



#### **Acoustic Terminology**

Sound Transmission Class (STC)

Measurement for the effectiveness of construction materials to reduce sound transmission between rooms.

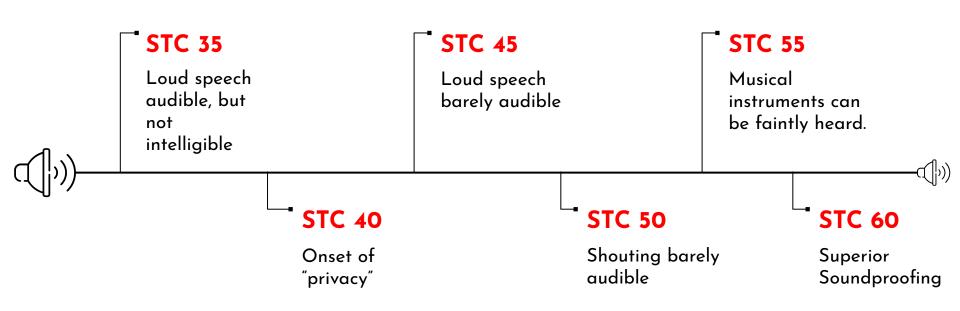
Noise Isolation Class (NIC)

Field measurement of the room to room noise reduction. Noise Reduction Coefficient (NRC)

Rating of how much an acoustic product can absorb.

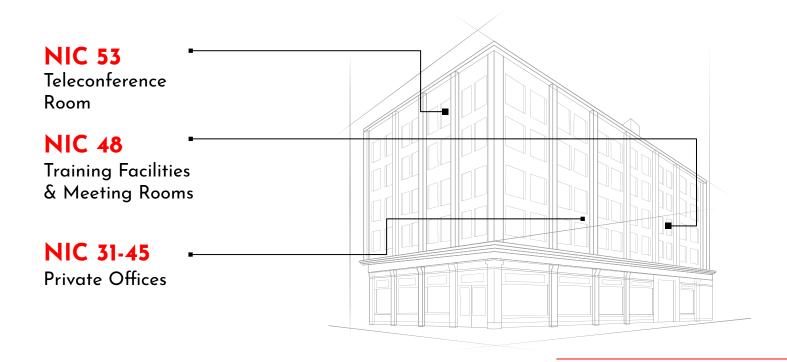


#### **Acoustical Performance**





#### Recommended NICs



#### Noise Isolation & Speech Privacy

Table 3.1b Back	ground Sou	nd, Noise Iso	lation and S	peech Privacy
-----------------	------------	---------------	--------------	---------------

Space	Performance Level	Descriptor	Mechanical Noise (RC/NC)	Electronic Sound Masking Level (dBA) <sup>1</sup>	Minimum Noise Isolation (NIC) <sup>2</sup>	Minimum Privacy (PI/SPP) <sup>3</sup>
Training rooms	Baseline	Deskbound, interactive	30 min - 35 max	n/a	48	78 SPP
Meeting rooms	Tier 1	Frequent tele/video conferencing	25 min - 30 max	n/a	53	78 SPP
	Baseline	Infrequent tele/video conferencing	30 min - 35 max	n/a	48	78 SPP
	Baseline	Less than 6 person capacity	30 min - 35 max	n/a	45	75 SPP
Private offices	Tier 1	High speech privacy	35 max	40-42	45	85 SPP
	Baseline (masking)	Normal speech privacy, deskbound, concentrative	35 max	40-42	35	75 SPP
	Baseline (no masking)	Normal speech privacy, internally mobile, interactive	35 min - 40 max	n/a	40	75 SPP
Quiet rooms	Baseline (no masking)	Individual or small group, interactive	35 min - 40 max	n/a	45	80 SPP
	Baseline (masking)	Individual or small group, concentrative	35 max	40-42	40	80 SPP



#### Sound Absorption & Reverberation

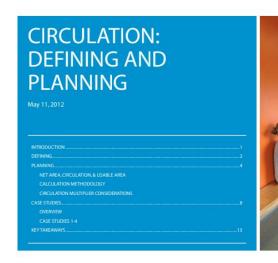
Table 3.1a Sound Absorption and Reverberatio	orption and Reverberation
--	---------------------------

Space	Performance Level	Descriptor	Ceiling (SAA/NRC) <sup>1</sup>	Walls (SAA/NRC) <sup>2</sup>	Time (Seconds) (RT60) <sup>3</sup>
Training rooms	Baseline	Deskbound, interactive	0.80/100%	0.8/25%	0.6
Meeting rooms	Tier 1	Frequent tele/video conferencing	0.90/100%	0.8/25%	0.5
	Baseline	Infrequent tele/video conferencing	0.80/100%	0.8/25%	0.6
	Baseline	Less than 6 person capacity	0.80/100%	n/a	0.6
Private offices	Tier 1	High speech privacy	0.85/100%	n/a	0.6
	Baseline (masking)	Normal speech privacy, deskbound, concentrative	0.8/100%	n/a	0.6
	Baseline (no masking)	Normal speech privacy, internally mobile, interactive	0.75/100%	n/a	0.6
Quiet rooms	Baseline (no masking)	Individual or small group, interactive	0.75/100%	n/a	0.6
	Baseline (masking)	Individual or small group, concentrative	0.75/100%	n/a	0.6
Misc. enclosed spaces	Baseline	Short occupancy, no speech privacy	0.70/100%	n/a	0.8
Open plan offices	Tier 1	High density occupancy, internally mobile or interactive	0.90/100%	0.8/25%	0.8
	Baseline	Low density occupancy, deskbound and concentrative	0.80/100%	n/a	0.8
Child care center	Baseline		0.90/100%	0.70/25%	0.5



Gensler

# 3.7 Workplace Performance Requirements

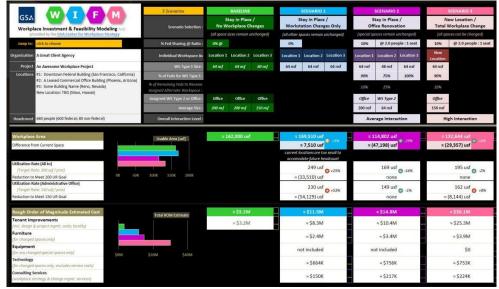




# Workplace Investment & Feasibility Tool (WIFM)

#### Excel-based tool used to:

- Investigate strategies
- Explore co-location efficiencies
- Establish ROM
- Compare scenarios
- Jump start requirements





## Total Work(place) Scorecard

Located at SFTool.gov

Online interactive tool used to:

 Benchmark and measure potential workspace improvements

Previous version was Excel-based

Updated to include health and well-being

```
Progress Summary
View Instructions
% - percent complete
I. ENGAGEMENT 4/10 Points
 1.1 Engagement 100 %
II. HEALTH, COMFORT and PERFORMANCE 34.64/50 Points
2.1 Air Quality 100 %
2.2 Thermal Comfort 100 %
2.3 Light 100 %
2.4 Acoustics 100 %
2.5 Physical and Musculoskeletal Health 100 %
III. WORKSPACE FLEXIBILITY, EQUITY, & MOBILITY 17.5/30 Points
3.1 Flexibility 100 %
3.2 Mobility & Connectivity 100 %
3.3 Equity 100 %
IV. SENSE OF PLACE 7.5/10 Points
4.1 Sense of place 100 %
V. EXTRA CREDIT 5.5/10 Points
5.1 Extra credit 100 %
69.14 / 100 total points
```



# 3.8 Workplace Performance Attributes





#### Early Engagement Pays Dividends







#### Early Engagement is Best

#### **PBS Project Lifecycle**

Identification	Initiation	Planning	Execution	Closeout	Operations
<ul> <li>Strategic         Requirements         (high level         project         outcomes)</li> <li>Client Project         Agreement</li> </ul>	<ul> <li>Functional Requirements (more refined requirements)</li> <li>early schedule and budget developed</li> </ul>	<ul> <li>Technical Requirements (incl. agency build-out requirements)</li> <li>obtain funding commitment</li> </ul>	<ul> <li>Final Requirements Package</li> <li>project award / design / construction</li> </ul>	<ul> <li>final Inspections / punchlist</li> <li>rent payments begin</li> </ul>	<ul> <li>occupancy</li> <li>continuous business relationship</li> </ul>





#### **Balanced Scorecard Approach**

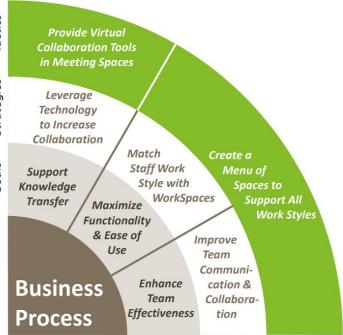




#### **Balanced Scorecard Approach**

Ensures all focus areas are considered equally







# Thanks for your attention & interest!

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