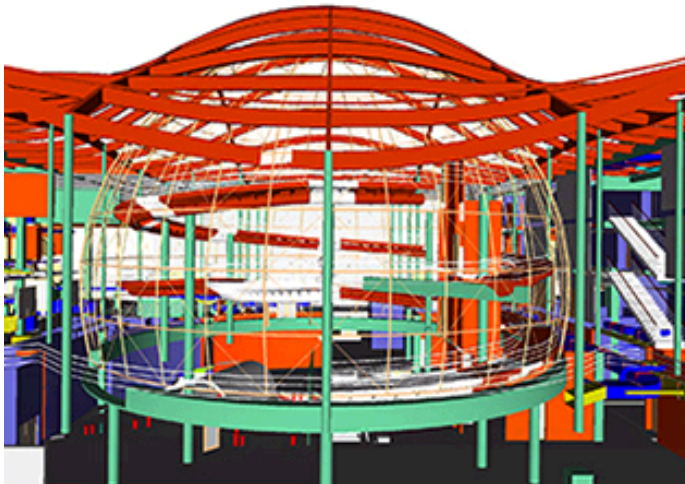
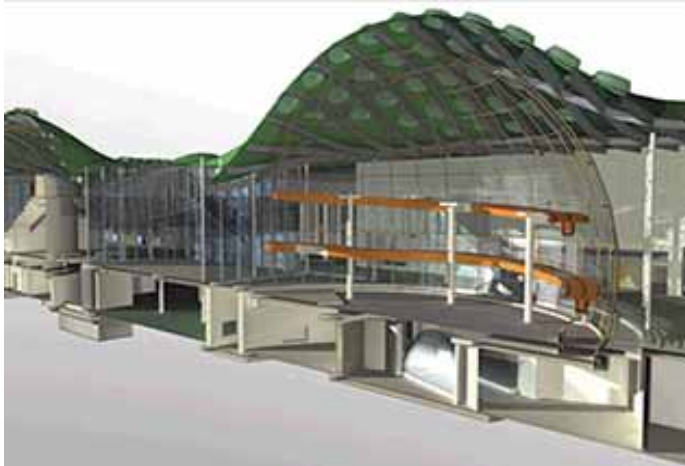


DELIVERING GREEN: The Role of the GC in the Built Environment

By Megan E. White, LEED AP+

Sustainability Manager

mwhite@webcor.com



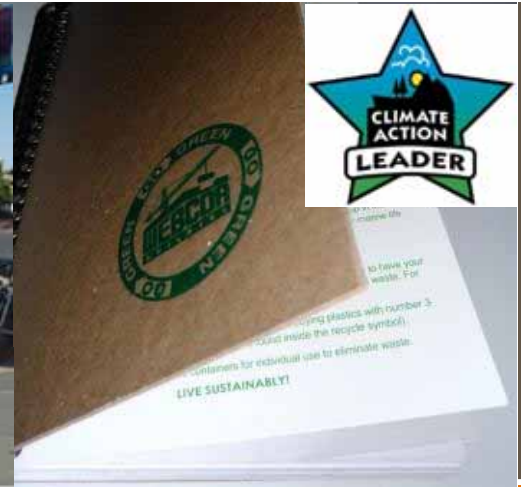
#1 Green Builder

ENR Magazine 2008-2012

(by % of Revenue)







San Francisco
Green Building
Task Force
Member



WEBCOR LEED PROJECTS



Letterman Digital Arts Center

LEED NC 2.0 – Certified Gold



California Academy of Sciences

LEED NC 2.1 – Certified Platinum



SF General Hospital

LEED NC 2.2 – Seeking Gold Certification



SFPUC

LEED NC 3.0 – Seeking Platinum Certification



Cal Memorial Stadium

LEED NC 3.0 – Seeking Gold Certification



One Rincon Hill Phase II

LEED NC 3.0 – Seeking Silver Certification



Avant Housing: 260 5th St & 900 Folsom St

LEED NC 3.0 (Master Site): Seeking Gold Certification x2



Guam Naval Hospital

LEED NC 3.0 – Seeking Silver Certification



Moscone Convention Center

LEED EBOM 2.0 – Seeking Gold Certification



Transbay Transit Center

LEED NC 3.0 – Seeking Gold Certification



The Results...

122	Webcor LEED Accredited Professionals
-----	--------------------------------------

Total # of Webcor LEED Projects that have been completed and/or under contract

42	# of Projects
15,608,219.00	Total GSF of LEED Projects
\$5,204,130,000	Total Budget of LEED Projects

LEED Certification levels (breakdown by percentage of Webcor's projects):

4	10%	Platinum
19	45%	Gold
14	33%	Silver
5	12%	Certified

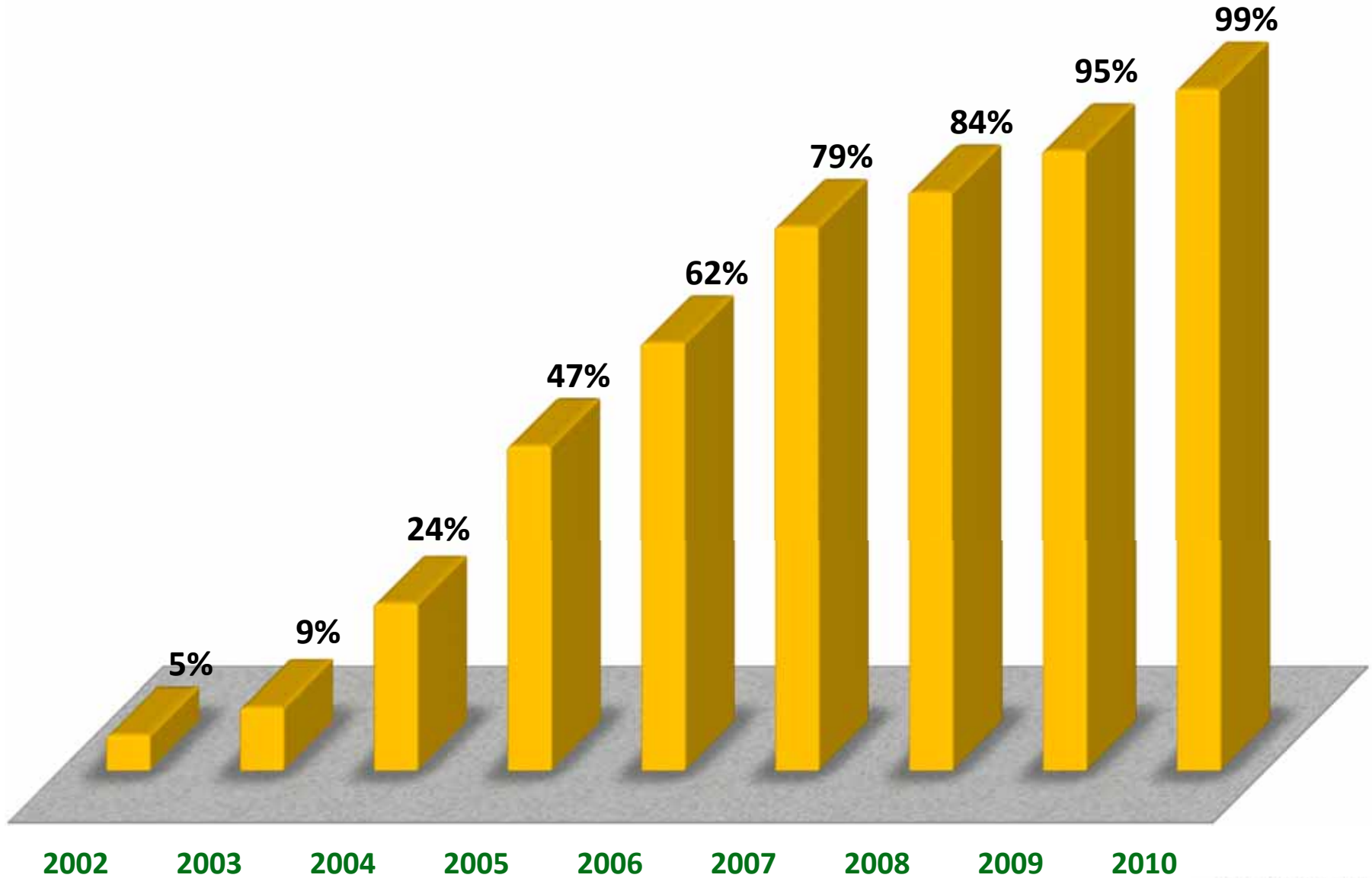
LEED rating programs within the USGBC family as represented at Webcor:

30	71%	LEED for New Construction
4	10%	LEED for Core & Shell
2	5%	LEED for Commercial Interiors
5	12%	LEED for Existing Buildings
1	2%	LEED for Healthcare
-	0%	LEED for Neighborhood Development



ENR Magazine's - #1 GREEN BUILDER

% of Webcor Revenue from LEED projects



TRACKING PERFORMANCE ON PROJECTS

WEBCOR'S PROJECTS	2000	2005	2010
# of LEED Certified Projects	0	2	10
# of LEED Registered Projects	0	3	36
% of LEED Projects	0	30%	99%
Construction Waste Management Diversion Rate	0%	75%	95%
Energy Savings beyond Code	0%	15%	30%
Water Savings beyond Code	0%	20%	40%



EVERY PROJECT, EVERY CREDIT, EVERY TIME!!!

Incorporates other fun, green facts (i.e. total LEED hotel keys)

Catered to the Project Type

		High Density Residential & Hotel Projects													
		1	1	1	1	1	1	1	1	1	1	1	1	1	
Total Buildings		1	1	1	1	1	1	1	1	1	1	1	1	1	
Hotel Keys		295	0	1001	0	305	0	0	0	0	0	0	0	0	
Units		485	193	26	271	518	146	226	165	420	203	285	280	280	
Total Square Feet		417,800	650,000	1,600,000	894,000	970,000	913,385	101,800	290,607	1,024,438	645,600	432,210	407,108		
Construction Value		\$300,000,000	\$175,000,000	\$457,000,000	\$143,900,000	\$187,400,000	\$250,000,000	\$56,000,000	\$84,548,662	\$261,877,000	\$250,000,000	\$212,000,000	\$88,000,000		
LEED Credit Requirements		Grand Avenue Los Angeles, CA NC v2.2	CJL Palo Alto NC v2.1	LA Live Los Angeles, CA NC v2.2	Concerto Los Angeles, CA NC v2.1	W Hotel @ H & V Hollywood, CA NC v2.1	Century Los Angeles, CA NC v2.2	UCSD Health Sciences Housing San Diego, CA NC v2.2	One Hawthorne San Francisco, CA NC v2.2	Mirabella SF Bay Foster City NC v2.2	55th Street Village San Diego NC v2.2	300 Spear Phase 2 San Francisco NC v2.2	Avalon Mission Bay Phase III San Francisco NC v2.2	Webcor Credit Frequency	
WAP	Credit	Sustainable Sites													
	SS 1.0	Construction Activity Pollution Prevention												100%	
	SS 1.1	Site Selection												100%	
	SS 2.0	Development Density & Community Connectivity												100%	
	SS 3.0	Brownfield Redevelopment												100%	
	SS 4.1	Alternative Transportation: Public Transportation Access												100%	
	SS 4.2	Alternative Transportation: Bicycle Storage & Changing Rooms												91%	
	SS 4.3	Alternative Transportation: Low Speed & Fuel Efficient Vehicles												73%	
	SS 4.4	Alternative Transportation: Parking Capacity												82%	
	SS 5.1	Site Development: Paved or Resurfaced												10%	
	SS 5.2	Site Development: Maximize Open Space												30%	
	SS 5.3	Stormwater Design: Quality Control												30%	
	SS 5.4	Stormwater Design: Quantity Control												65%	
	SS 7.1	Heat Island Effect: Non-roof												91%	
	SS 7.2	Heat Island Effect: Roof												73%	
	SS 8.0	Light Pollution Reduction												27%	
WAP	Credit	Water Efficiency													
	WE 1.1	Water Efficient Landscaping: Reduce by 50%												64%	
	WE 1.2	Water Efficient Landscaping: No-Potable Water Use or No Irrigation												9%	
	WE 2.0	Innovative Wastewater Technologies												0%	
	WE 3.1	Water Reduction: 30% Reduction												91%	
	WE 3.2	Water Reduction: 30% Reduction												36%	

List of LEED Projects

List of LEED Credits

Achieve LEED Point?
Yes, Maybe, No

Webcor Credit Frequency
→ Defines "Webcor Advantage Points"

CONSTRUCTION WASTE MANAGEMENT

	Project Name	Level	Location	Waste Division %	GSF	Waste Calc
1	Sanborn Academy	Platinum	San Francisco	92.2%	401,750.00	376,443.76
2	FFPU	Platinum	San Francisco	85.0%	271,000.00	263,150.00
3	350 Mission	Platinum	San Francisco	95.0%	422,500.00	401,375.00
4	Miami Science Museum	Platinum	Miami, FL	90.0%	250,000.00	225,000.00
5	260 Homer	Gold	Palo Alto	99.6%	96,517.00	96,130.93
6	eBay #17	Gold	San Jose	89.9%	186,000.00	164,052.00
7	Letterman Digital Arts Center	Gold	San Francisco	92.1%	1,570,000.00	1,445,970.00
8	Symantec Corporate Campus	Gold	Culver City	79.1%	1,115,642.00	882,472.82
9	820 Ramona	Gold	Palo Alto	99.5%	50,000.00	49,750.00
10	SunPower TI	Gold	San Jose	79.1%	225,000.00	177,975.00
11	SF General Hospital	Gold	San Francisco	91.5%	448,000.00	409,920.00
12	LBNL bldg #74	Gold	Berkeley	91.7%	45,000.00	41,265.00
13	California Memorial Stadium	Gold	Berkeley	92.6%	413,289.00	382,705.61
14	LBNL bldg #25/33	Gold	Berkeley	92.3%	42,995.00	39,684.39
15	Guam Navel Hospital	Gold	Guam	50.0%	300,000.00	150,000.00
16	SF MOMA Expansion	Gold	San Francisco	75.0%	225,000.00	168,750.00
17	41 Area - Camp Pendleton	Gold	San Diego	92.2%	482,944.00	445,274.37
18	5th and Folsom Condos	Gold	San Francisco	78.9%	588,509.00	464,333.60
19	UCSD Resident Housing	Silver	San Diego	96.1%	230,000.00	221,030.00
20	525 Almanor	Silver	Sunnyvale	99.8%	166,300.00	165,967.40
21	The Century	Silver	LA	76.2%	913,385.00	695,999.37
22	Campus for Jewish Life	Silver	Palo Alto	92.6%	650,000.00	601,900.00
23	W Hotel	Silver	Hollywood	76.8%	970,000.00	744,960.00
24	LA Live	Silver	LA	77.9%	1,600,000.00	1,246,400.00
25	Oracle Bldg H Campus	Silver	Pleasanton	78.0%	181,000.00	141,180.00
26	Transbay Transit Center	Silver	San Francisco	85.0%	1,315,914.00	1,118,526.90
27	The Wetherly	Silver	LA	75.0%	250,000.00	187,500.00
28	333 Harrison	Silver	San Francisco	78.0%	326,000.00	254,280.00
29	Rancho Bernardo bldg D	Silver	San Diego	82.0%	83,400.00	68,388.00
30	2001 Market	Silver	San Francisco	90.0%	187,400.00	168,660.00
31	One Rincon Hill Phase II	Silver	San Francisco	95.0%	500,000.00	475,000.00
32	Avalon Mission Bay Phase III	Certified	San Francisco	87.2%	407,106.00	354,996.43
33	Concerto	Certified	LA	77.1%	894,000.00	689,274.00
34	Webcor Alameda Office	Certified	Oakland	90.1%	32,850.00	29,597.85
35	Moscone Renovation	Certified	San Francisco	82.5%	750,000.00	618,750.00
Total					16,604,929.00	13,966,662.43

84.1%



ENERGY PERFORMANCE



	Project Name	Level	Location	Energy Savings	GSF	Energy Calc
1	California Academy of Science	Platinum	San Francisco	31.4%	409,178.00	128481.892
2	SFPUC	Platinum	San Francisco	55.5%	277,000.00	153735
3	350 Mission	Platinum	San Francisco	35.0%	422,500.00	147875
4	Miami Science Museum	Platinum	Miami, FL	20.0%	250,000.00	50000
5	260 Homer	Gold	Palo Alto	15.0%	96,517.00	14477.55
6	eBay #17	Gold	San Jose	15.0%	186,000.00	27900
7	Letterman Digital Arts Center	Gold	San Francisco	16.0%	1,570,000.00	251200
8	Symantec Corporate Campus	Gold	Culver City	21.0%	1,115,642.00	234284.82
9	820 Ramona	Gold	Palo Alto	15.0%	50,000.00	7500
10	SunPower TI	Gold	San Jose	18.1%	225,000.00	40725
11	SF General Hospital	Gold	San Francisco	22.4%	448,000.00	100352
12	LBNL bldg #74	Gold	Berkeley	21.2%	45,000.00	9540
13	California Memorial Stadium	Gold	Berkeley	18.3%	413,289.00	75631.887
14	LBNL bldg #25/33	Gold	Berkeley	22.4%	42,995.00	9630.88
15	Guam Navel Hospital	Gold	Guam	15.0%	300,000.00	45000
16	SF MOMA Expansion	Gold	San Francisco	16.0%	225,000.00	36000
17	41 Area - Camp Pendleton	Gold	San Diego	23.0%	482,944.00	111077.12
18	5th and Folsom Condos	Gold	San Francisco	16.0%	588,509.00	94161.44
19	UCSD Resident Housing	Silver	San Diego	26.0%	230,000.00	59800
20	525 Almanor	Silver	Sunnyvale	16.0%	166,300.00	26608
21	The Century	Silver	LA	14.0%	913,385.00	127873.9
22	Campus for Jewish Life	Silver	Palo Alto	22.4%	650,000.00	145600
23	W Hotel	Silver	Hollywood	19.4%	970,000.00	188180
24	LA Live	Silver	LA	18.7%	1,600,000.00	299200
25	Oracle Bldg H Campus	Silver	Pleasanton	21.7%	181,000.00	39277
26	Transbay Transit Center	Silver	San Francisco	26.0%	1,315,914.00	342137.64
27	The Wetherly	Silver	LA	18.0%	250,000.00	45000
28	333 Harrison	Silver	San Francisco	16.0%	326,000.00	52160
29	Rancho Bernardo bldg D	Silver	San Diego	10.1%	83,400.00	8423.4
30	2001 Market	Silver	San Francisco	17.0%	187,400.00	31858
31	One Rincon Hill Phase II	Silver	San Francisco	19.0%	500,000.00	95000
32	Avalon Mission Bay Phase III	Certified	San Francisco	18.9%	407,106.00	76943.034
33	Concerto	Certified	LA	17.3%	894,000.00	154662
34	Webcor Alameda Office	Certified	Oakland	16.9%	32,850.00	5551.65
35	Moscone Renovation	Certified	San Francisco	21.8%	750,000.00	163500
Total					16,604,929.00	3399347.213
					20.5%	

	Project Name	Level	Location	Water Savings	GSF	Water Calc
1	California Academy of Sciences	Platinum	San Francisco	33%	409,178.00	135028.74
2	SFUC	Platinum	San Francisco	52%	277,000.00	144040
3	Avalon Mission	Platinum	San Francisco	36%	422,000.00	194350
4	Village Science Museum	Platinum	Miami, FL	41%	250,000.00	105000
5	260 Homer	Gold	Palo Alto	36%	96,517.00	34746.12
6	eBay #17	Gold	San Jose	33%	186,000.00	61360
7	Letterman Digital Arts Center	Gold	San Francisco	31%	1,570,000.00	486700
8	Symantec Corporate Campus	Gold	Culver City	28%	1,115,642.00	312379.76
9	820 Ramona	Gold	Palo Alto	36%	50,000.00	18000
10	SunPower TI	Gold	San Jose	36%	225,000.00	81000
11	SF General Hospital	Gold	San Francisco	32%	448,000.00	143360
12	LBNL bldg #74	Gold	Berkeley	33%	45,000.00	14850
13	California Memorial Stadium	Gold	Berkeley	38%	413,289.00	157049.82
14	LBNL bldg #25/33	Gold	Berkeley	34%	42,995.00	14618.3
15	Guam Navel Hospital	Gold	Guam	30%	300,000.00	90000
16	SF MOMA Expansion	Gold	San Francisco	41%	225,000.00	92250
17	41 Area - Camp Pendleton	Gold	San Diego	32%	482,944.00	154542.08
18	5th and Folsom Condos	Gold	San Francisco	41%	588,509.00	241288.69
19	UCSD Resident Housing	Silver	San Diego	37%	230,000.00	85100
20	525 Almanor	Silver	Sunnyvale	31%	166,300.00	51553
21	The Century	Silver	LA	29%	913,385.00	264881.65
22	Campus for Jewish Life	Silver	Palo Alto	31%	650,000.00	201500
23	W Hotel	Silver	Hollywood	28%	970,000.00	271600
24	LA Live	Silver	LA	29%	1,600,000.00	464000
25	Oracle Bldg H Campus	Silver	Pleasanton	26%	181,000.00	47060
26	Transbay Transit Center	Silver	San Francisco	46%	1,315,914.00	605320.44
27	The Wetherly	Silver	LA	31%	250,000.00	77500
28	333 Harrison	Silver	San Francisco	26%	326,000.00	84760
29	Rancho Bernardo bldg D	Silver	San Diego	35%	83,400.00	29190
30	2001 Market	Silver	San Francisco	42%	187,400.00	78708
31	One Rincon Hill Phase II	Silver	San Francisco	42%	500,000.00	210000
32	Avalon Mission Bay Phase III	Certified	San Francisco	31%	407,106.00	126202.86
33	Concerto	Certified	LA	27%	894,000.00	241380
34	Webcor Alameda Office	Certified	Oakland	41%	32,850.00	13468.5
35	Moscone Renovation	Certified	San Francisco	33%	750,000.00	247500
Total					16,604,929.00	5580308
					33.6%	

WATER EFFICIENCY



GREEN MATERIALS

- Recycled content
- Regional materials
- Rapidly renewable
- FSC Wood
- Reuse/ Salvaged
- Chemical/Toxicity
- Carbon Footprint
- Water Footprint





LEED “Contractor” Credits

LEED CONTRACTOR CREDITS

- **SSp1: SWPPP/Erosion Sedimentation Control**
- **SSc5: Site Disturbance (Protect & Restore Habitat)**
- **EAp1/EAc3: Commissioning**
- **MRc2: Construction Waste Management**
- **IEQc3: IAQ Management**

Materials Credits:

- **MRc4: Recycled Content**
- **MRc5: Regional Materials**
- **MRc7: FSC Certified Wood**
- **IEQc4.1: Low Emitting Materials – Adhesives & Sealants**
- **IEQc4.2: Low Emitting Materials – Paints and Coatings**
- **IEQc4.3: Low Emitting Materials – Flooring Systems**
- **IEQc4.4: Low Emitting Materials – Agrifiber and Composite Woods**

SSp1: Construction Activity Pollution Prevention



SSp1: Construction Activity Pollution Prevention



SSp1: Construction Activity Pollution Prevention



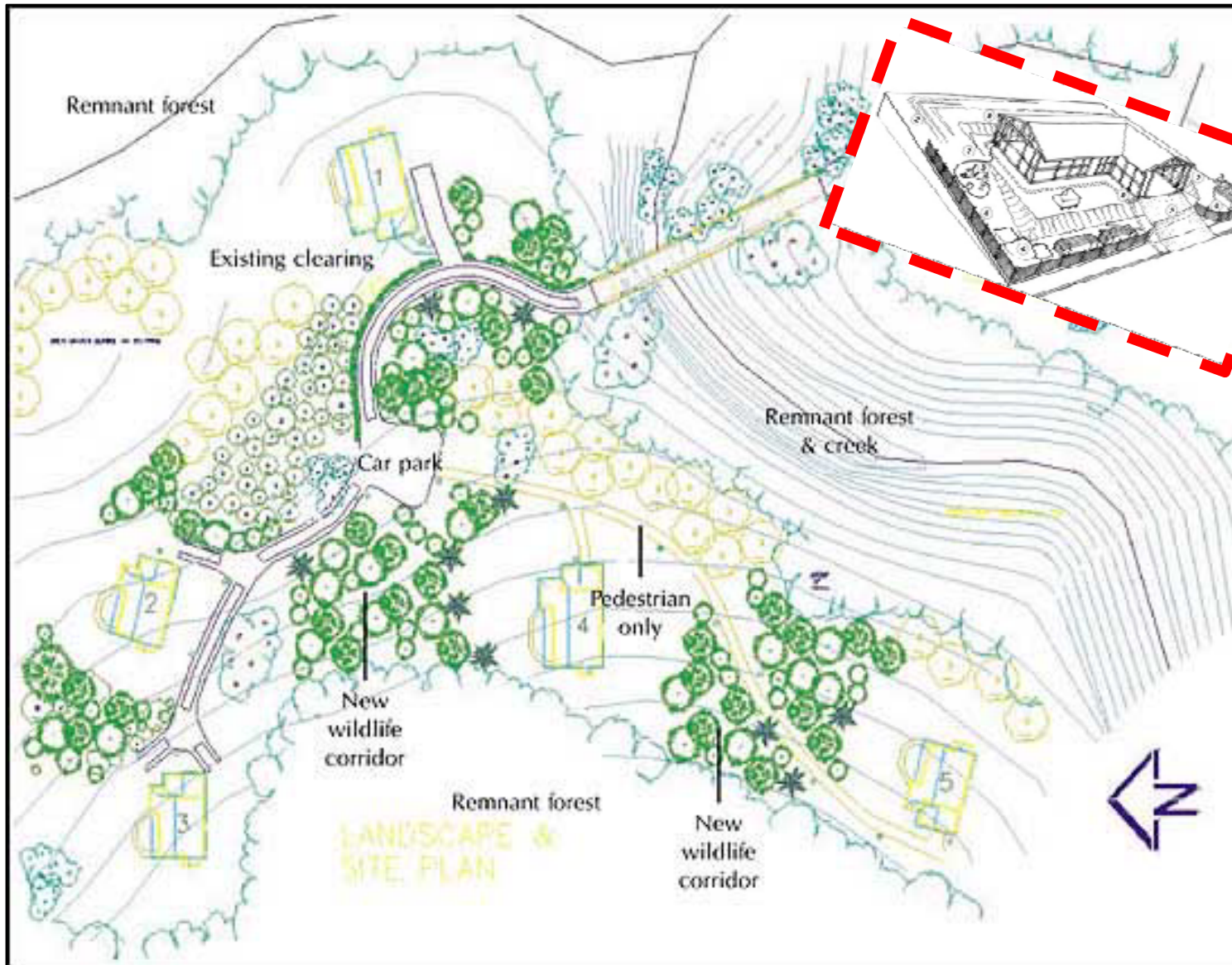
SSp1: Construction Activity Pollution Prevention



SSp1: Construction Activity Pollution Prevention



SSc5: Site Disturbance



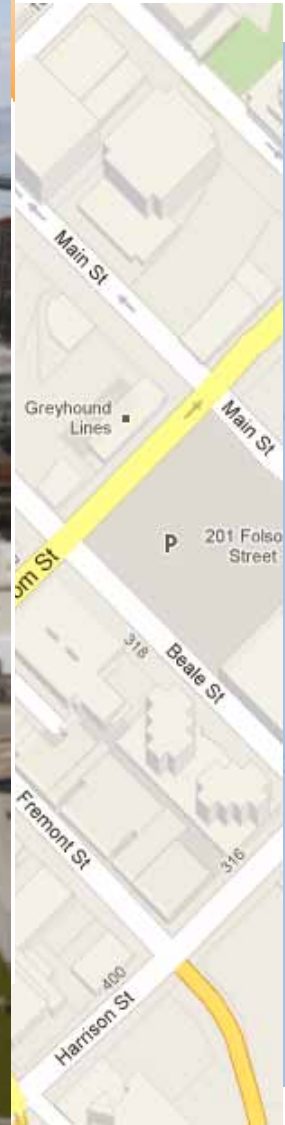
SSc5: Site Disturbance – Site Logistics



Trans Distu



Site itat



EAp1/EAc3: Commissioning



MRc2: Waste Management



MRc2: Waste Management



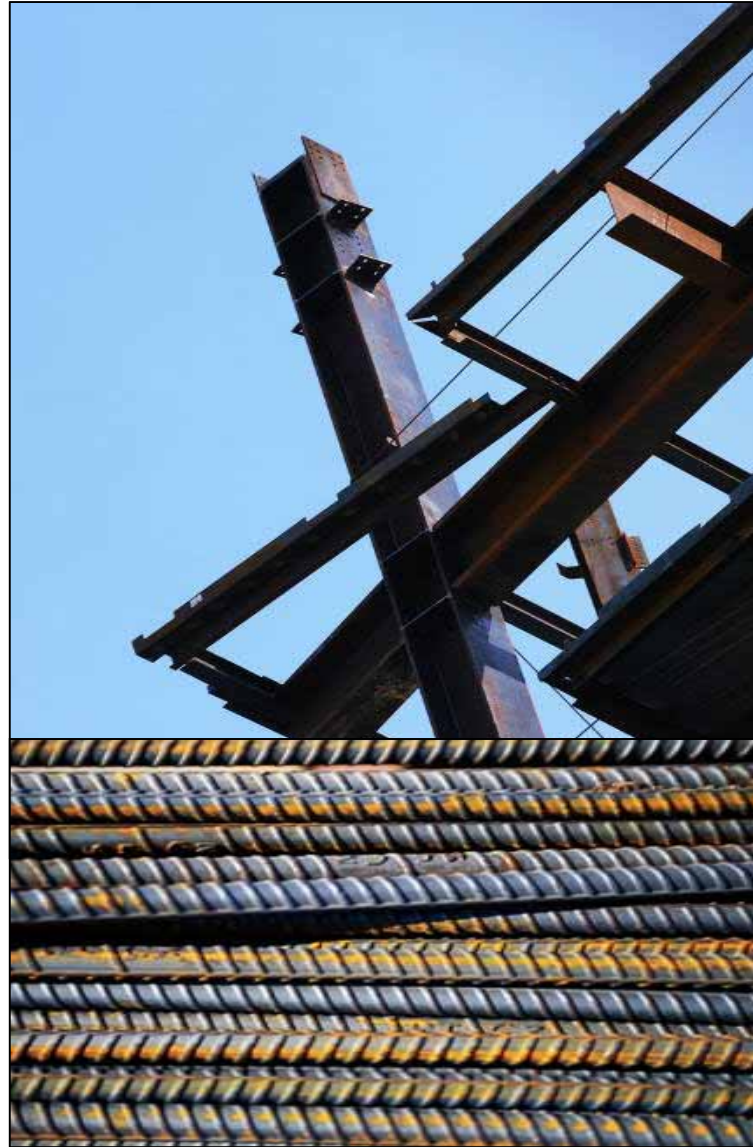
IEQc3: IAQ Management during Construction



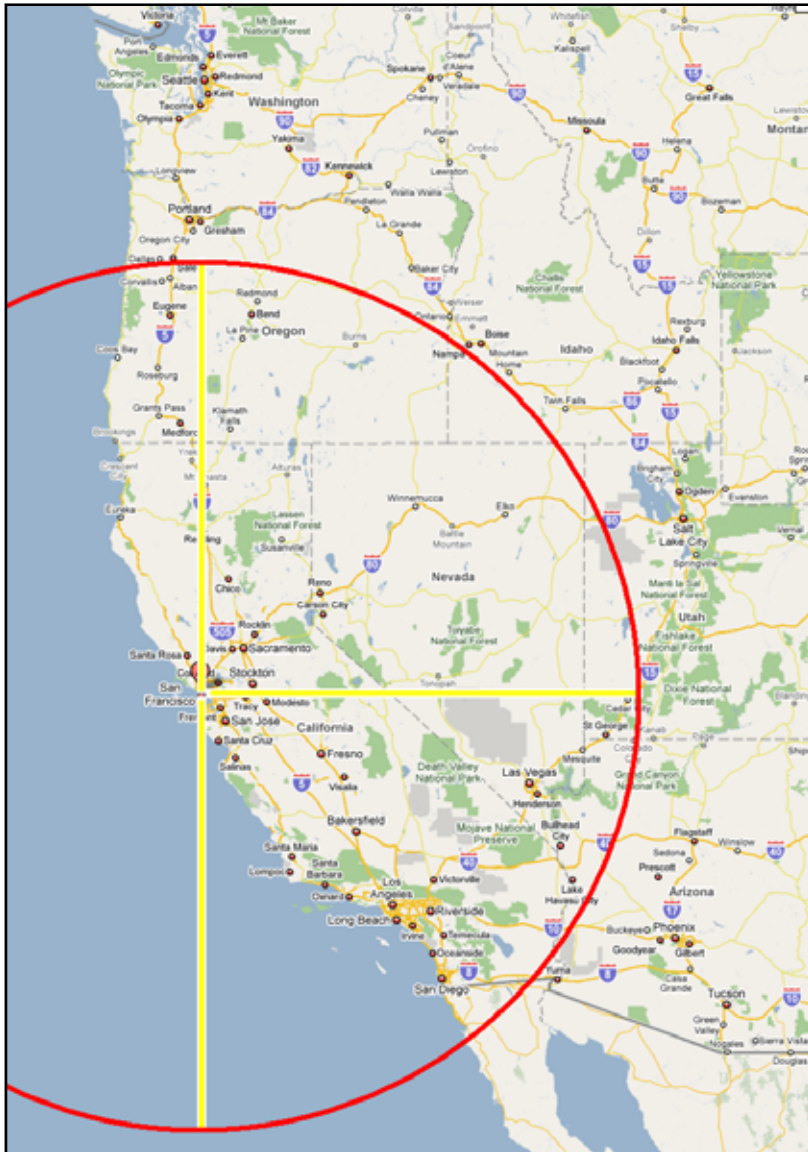
picture was taken from one of the Senior Residence unit's bathroom.

MRc4: Recycled Content

Increase demand for products with recycled content, thereby reducing the impacts associated with the extraction and processing of virgin materials.



MRc5: Regional Materials



Building materials or products extracted, harvested, or recovered, as well as manufactured within **500 miles** of project site.

MRc7: FSC Certified Wood

Encourage environmentally responsible forest management through programs like the Forest Stewardship Council that uses principles and Criteria for wood building components.



Beyond LEED



Beyond LEED =

- New Technologies – Innovation!
- Net Zero Designs
 - Living Building Challenge
 - AIA 2030 Challenge
- Supply Chain Carbon Accounting/ LCA

SELECTING BETTER SYSTEMS!

GETTING TO BETTER BUILDING PERFORMANCE...

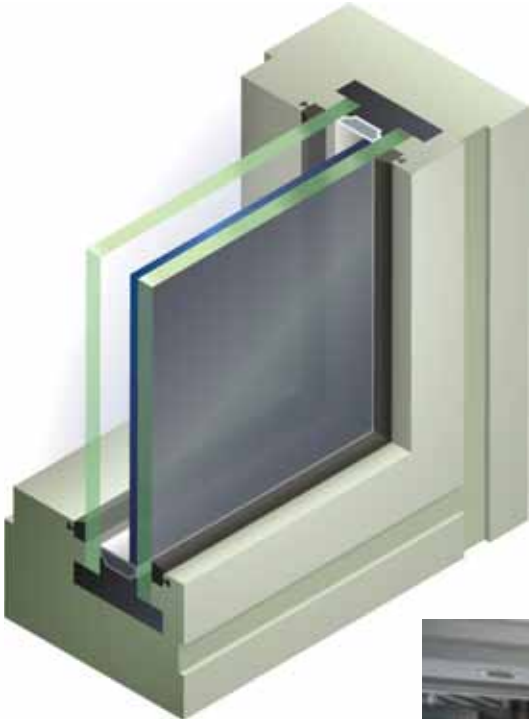
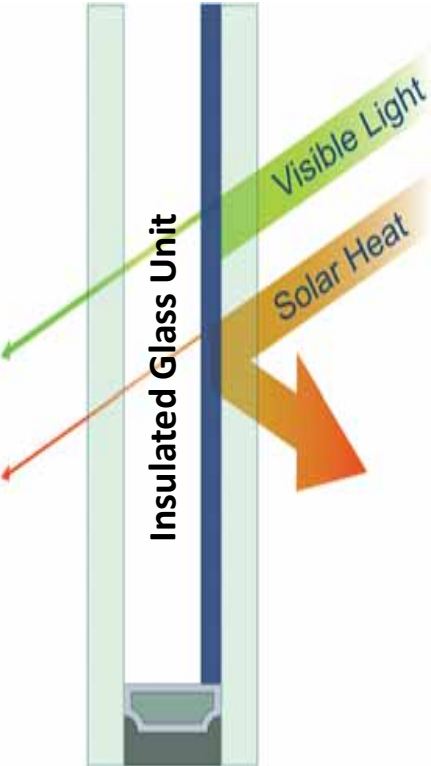
ALL ABOUT THE ENVELOPE!



PROBLEMS WITH GLASS



DYNAMIC GLASS



INTEGRATED PROCESS DESIGN (IPD) NET ZERO ENERGY & WATER PERFORMANCE



LIVING
BUILDING
CHALLENGE™
2.0

Supply Chain Carbon = Embodied Carbon = Carbon Footprinting Materials



WEBCOR
CONSULTING GROUP

Material Choice

How do you compare Apples to Oranges???

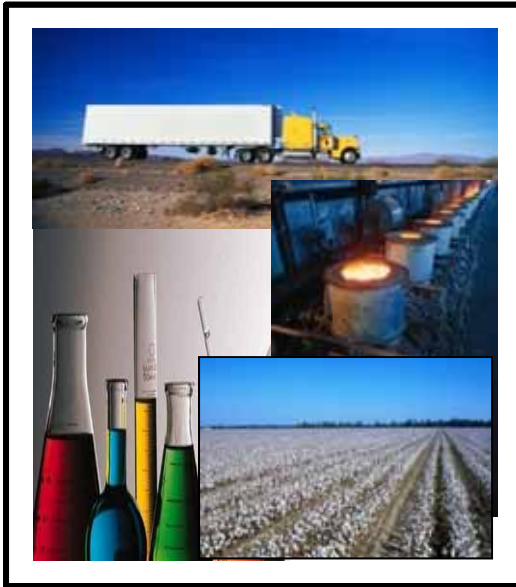
“GREENNESS”



MATERIAL CHOICE

GHG Emissions Sources

Construction Materials



Scope 3: Upstream

Building/ Construction Phase



Scopes 1 & 2:
Direct & Indirect

Operating Phase



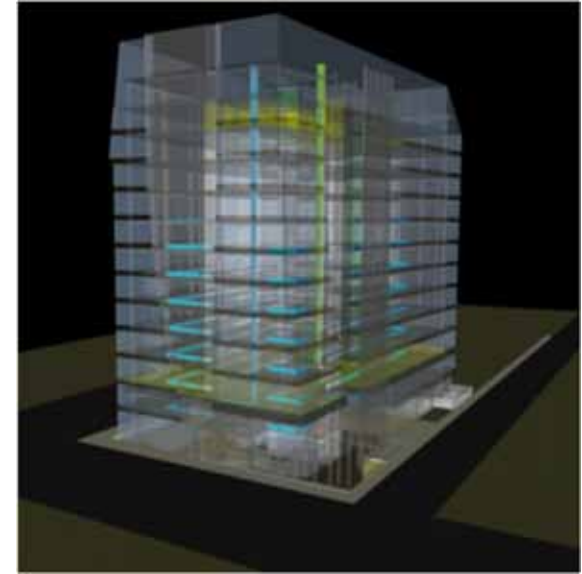
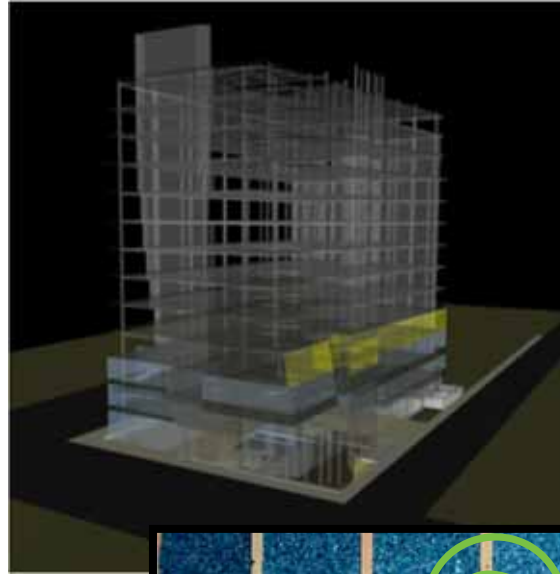
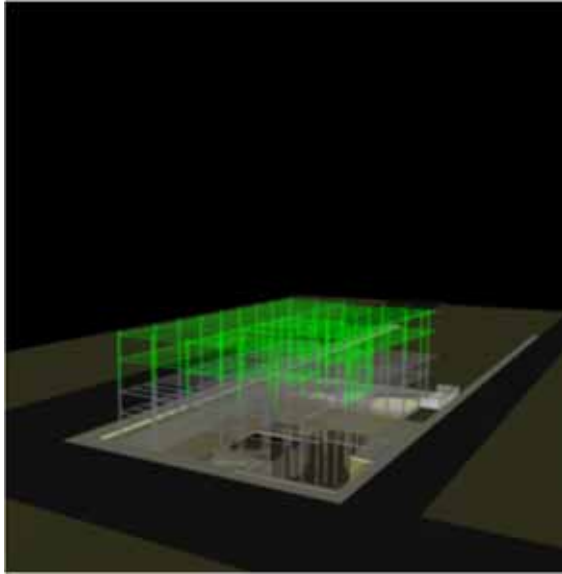
Scope 3: Downstream

Scope 1 = Direct Emissions (burning, natural gas, transportation)

Scope 2 = Indirect Emissions (electricity, utilities)

Scope 3 = Indirect Emissions (Upstream & Downstream Supply chain)

BIM Modeling + LCA → Building Carbon Footprint



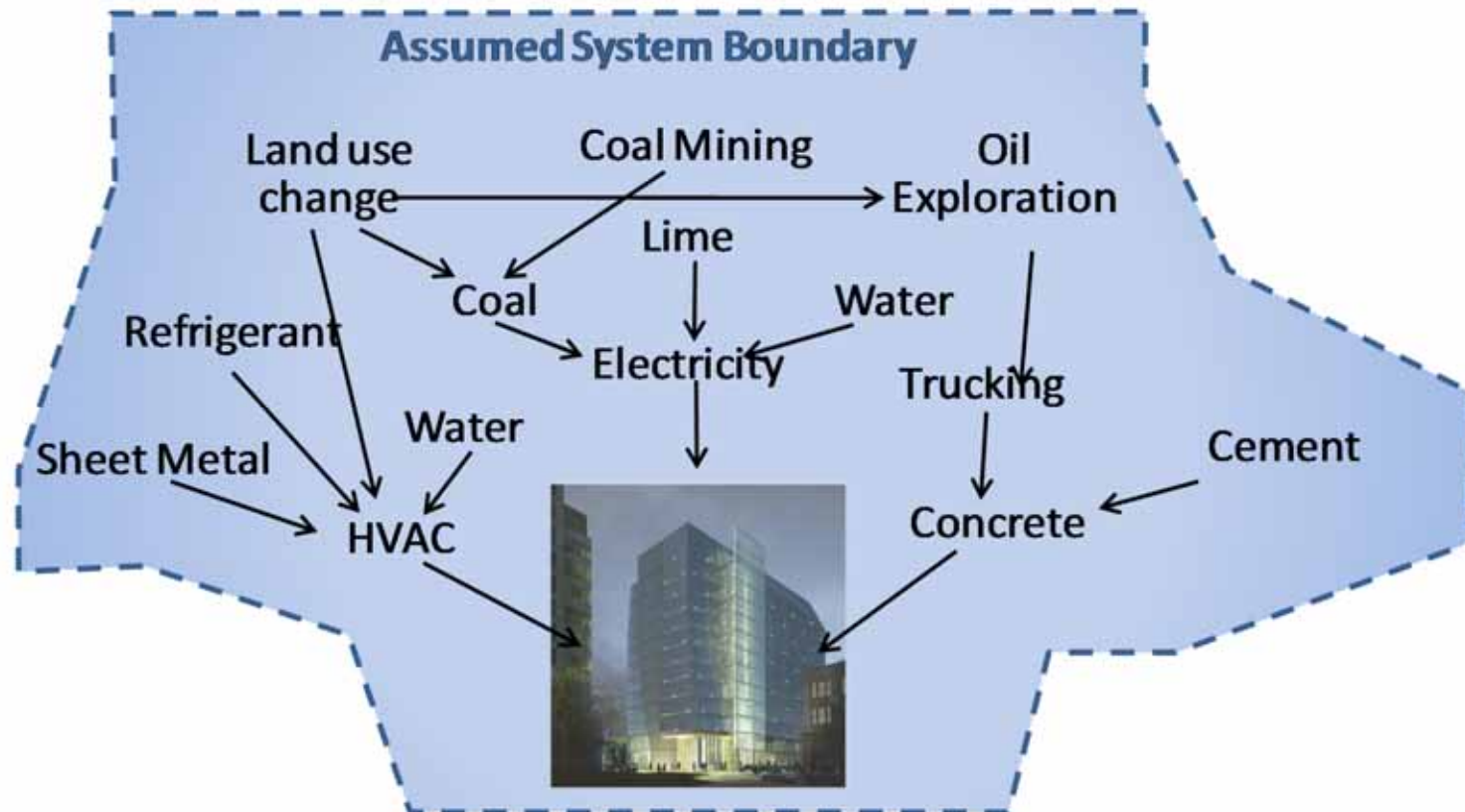
- 3D Space
- 4D Schedule/Time
- 5D Cost
- **6D Green/LEED**
- 7D Operations

Challenges to Calculating Scope 3

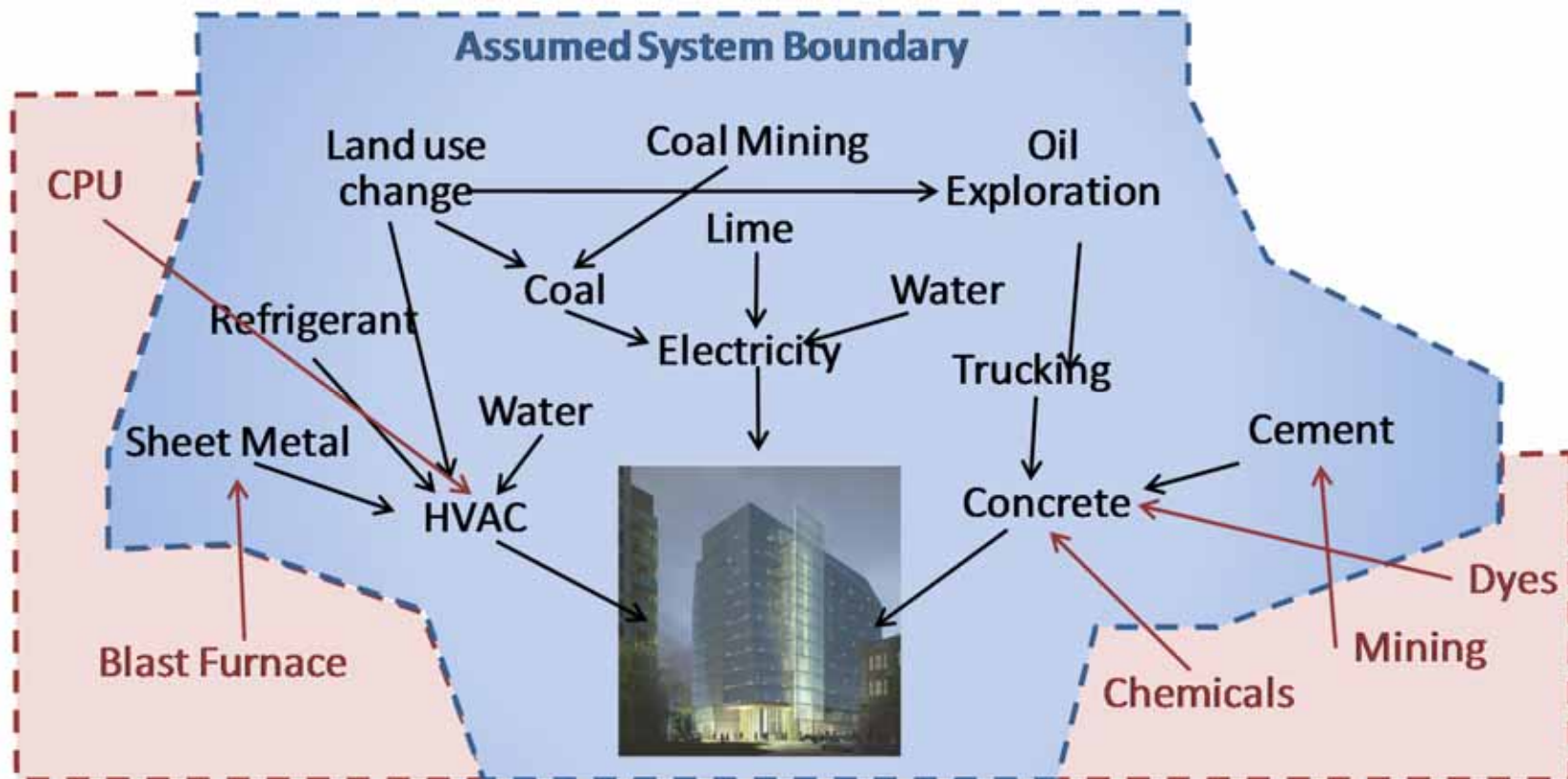
**Need for Policy/
government agency to
manage Environmental
Product Declaration (EPD)
requirements!**



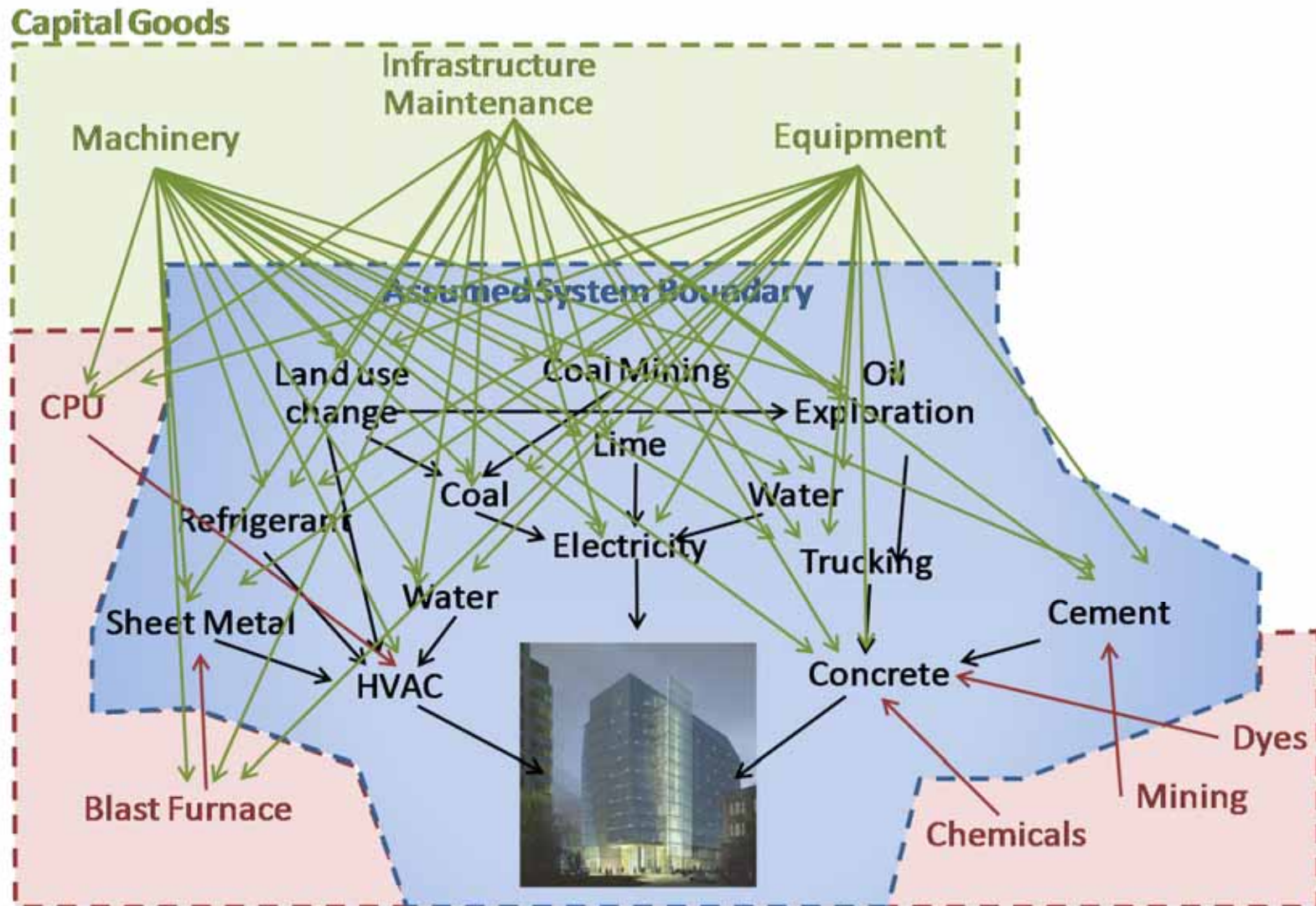
Challenges to Calculating Scope 3



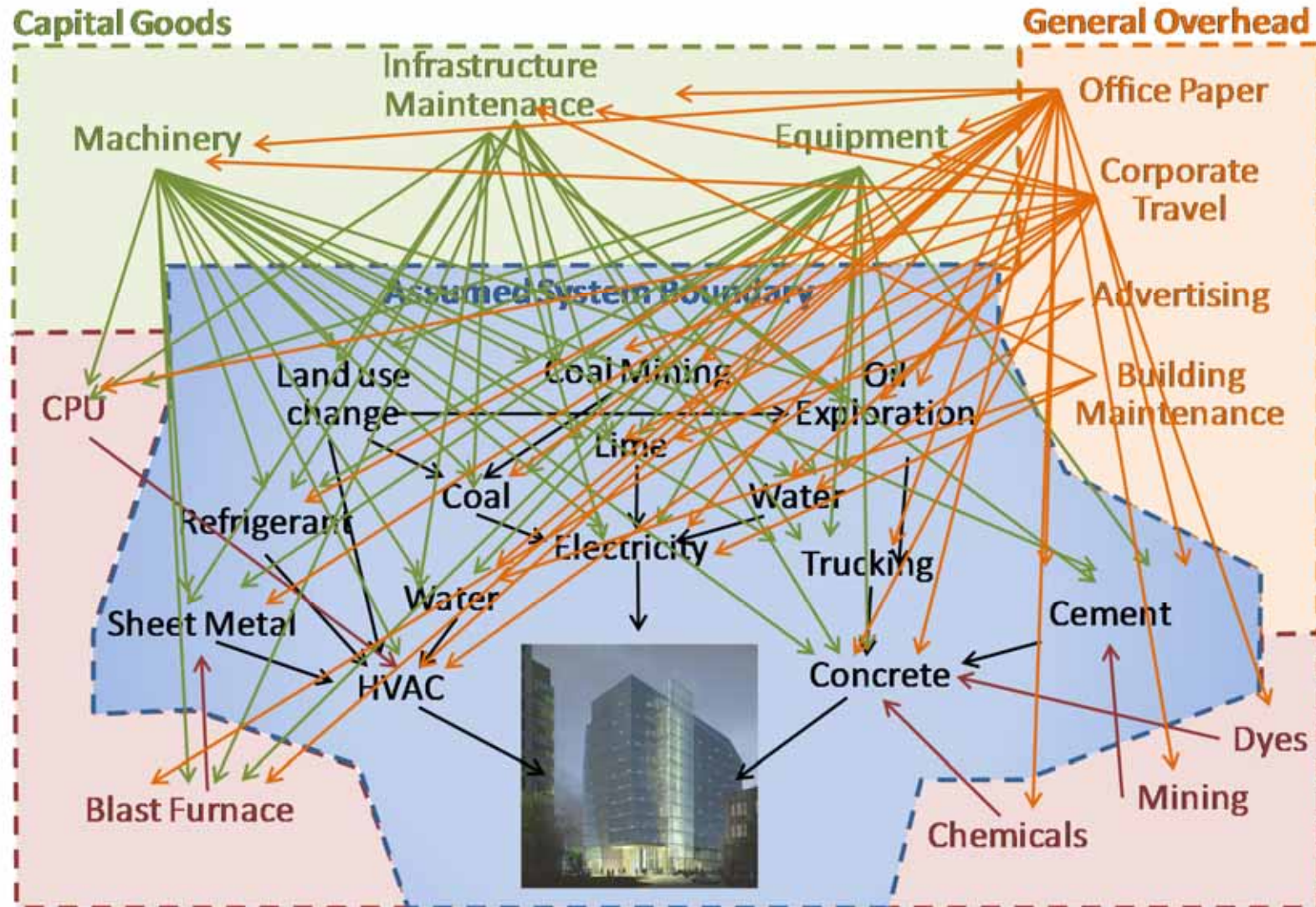
Challenges to Calculating Scope 3



Challenges to Calculating Scope 3



Challenges to Calculating Scope 3



Challenges to Measuring Carbon: Which approach is right?

Desired Results



“Bottom-Up”



Process LCA

“Top-Down”

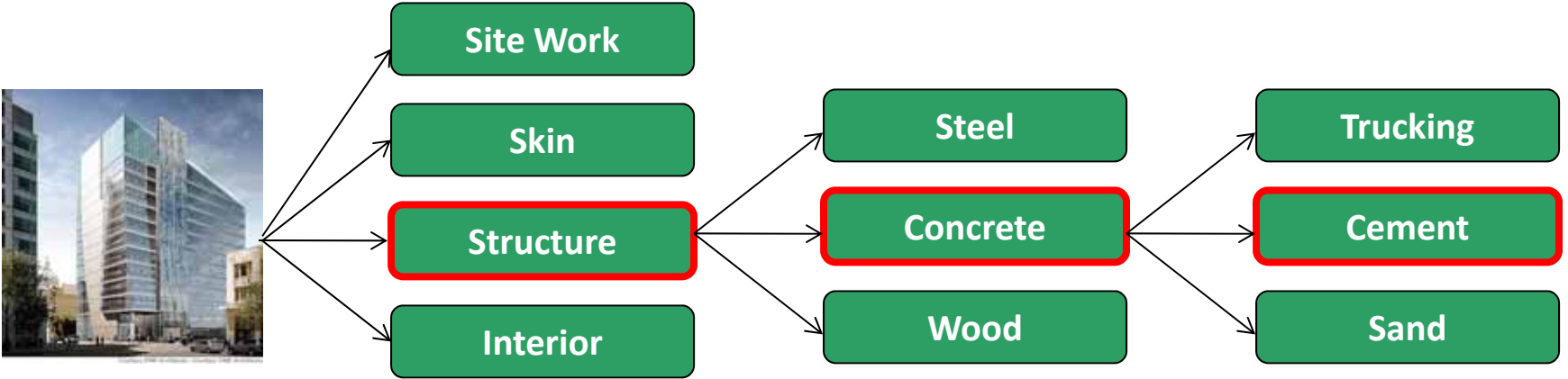


Economic Input-Output

Best Practice: Hybrid LCA



Success Story: SFPUC Building



The Product:
SFPUC

Product
Components
(Top Down
Approach)

Suppliers
(Process Bottom
Up Approach)

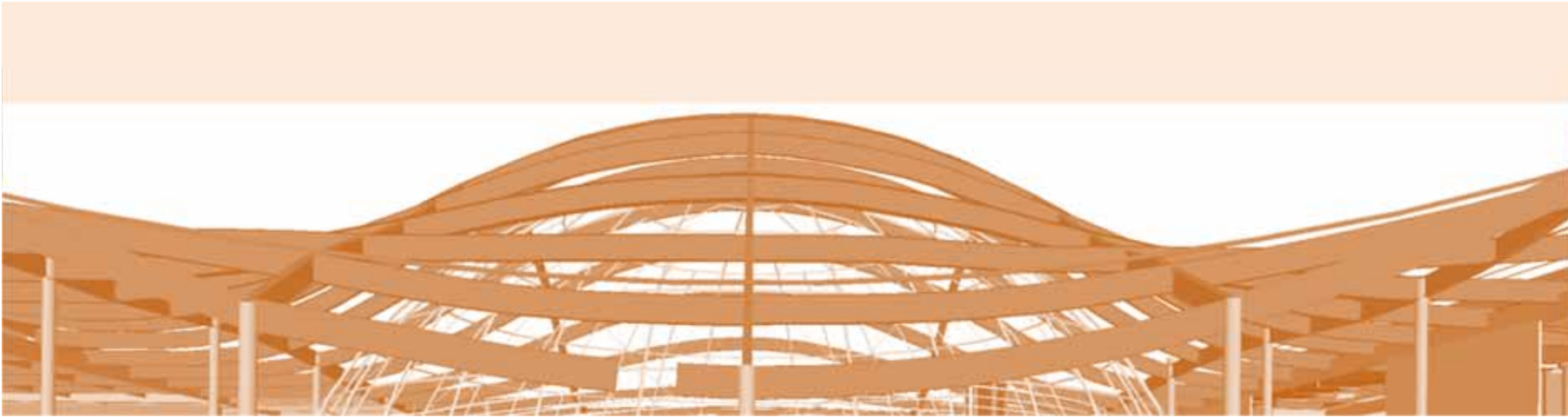
Supplier, Materials,
Tradeoffs
(Process Bottom
Up Approach)

A Success Story: SFPUC Building



**50% CO₂
Avoided!**

**40 Million tons
of CO₂
removed from
Structural
Design**



The End



Thank you!



www.webcor.com

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