



Rider  
Levett  
Bucknall

RIDERS  
DIGEST  
2017

USA  
EDITION

# Riders Digest

USA 2017

This document serves as a summary of cost information and related data on the construction industry.

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## **RIDERS DIGEST**

While the information in this publication is believed to be correct, no responsibility is accepted for its accuracy. Persons desiring to utilize any information appearing in this publication should verify its applicability to their specific circumstances.

Cost information in this publication is indicative and for general guidance only and is based on rates ruling at January 2017.

## **ACKNOWLEDGEMENTS**

WHERE INFORMATION IS REQUIRED ON A SPECIFIC PROJECT, IT IS ESSENTIAL THAT PROFESSIONAL ADVICE IS OBTAINED.

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# RIDERS | 2017 DIGEST |

## FOREWORD

Welcome to the 2017 edition of the Riders Digest, a compendium of USA cost data and related information as well as international cost data.

Rider Levett Bucknall is an international property and construction consultancy firm with over 120 offices worldwide. By integrating local knowledge and expertise with global understanding, we provide our clients with professional advice that is second to none.

Our corporate culture and vision are focused on integrity, innovation, teamwork and client satisfaction. Our combined experience enables us to provide intelligent and responsible business and project solutions that optimize resources, maximize performance and enhance value throughout a project's life. Our goal is to make sure our clients and their projects succeed.

Rider Levett Bucknall is well known for its cost research through a variety of publications, such as our Quarterly Cost Reports, International Cost Reports, White Papers and area-specific market studies. This commitment to research and innovation has given us an edge on the most up-to-date construction industry market knowledge.

I hope that you find our cost data and related information both informative and useful in your business.

Julian Anderson  
President  
Rider Levett Bucknall, North America

## **INTERNATIONAL CONSTRUCTION**

Construction Costs	1
RLB Construction Bid Price Index	16
Construction Market Activity	20





## EAST ROCK COMMUNITY MAGNET SCHOOL NEW HAVEN, CONNECTICUT

Designed by Newman Architects, East Rock Community Magnet School serves over 550 students in a new 77,600 square foot building located in New Haven, Connecticut.

Situated on a hillside, the unique landscape allowed for multiple entrances across two separate levels. Sustainable elements were implemented which include a planted roof that enhances science classes among students as well as providing a natural environment. A custom designed variable refrigerant flow heating and air system was created to minimize floor to floor height in the building, which in turn, reduced the building's volume and mass as well as energy and construction costs in comparison to a standard school design.

The building includes a gymnasium, cafeteria, music and art rooms, science labs and a special education component and was designed to achieve an Energy Star rating. The project has received both an AIA-Connecticut Design Award and an AIA New England Citation for Excellence in Architecture.

Rider Levett Bucknall provided construction cost estimating services to the project.

## CONSTRUCTION COSTS

The costs stated in this section represent hard construction costs and reflect the standards and specifications normal to that country or region. Variation in costs may be experienced for factors such as site conditions, climatic conditions, standards of specification, market conditions, etc. Costs for associated site development work such as site formation, utilities, paving, parking and landscaping are excluded.

Figures also exclude furniture, fittings and equipment (FF&E) with the exception of figures for Hong Kong, China and Singapore, which do include FF&E in hotel costs.

All project soft costs such as land acquisition, design and engineering fees, entitlements, permitting and financing are excluded. No allowance has been included to cover possible changes in construction costs between the date of this publication and any future date.

Figures on the following pages are stated in construction costs per gross square foot in local currency. For your convenience, local currency exchange rates to USD(\$) at 1 December 2016 are provided in the table below.

CURRENCY	EXCHANGE RATE TO USD	
Australian Dollar	AUD	0.7232
British Pound	GBP	1.2352
Chinese Yuan	CNY	0.1440
Hong Kong Dollar	HKD	0.1288
Indonesian Rupiah	IDR	0.0001
South-Korean Won	KRW	0.0008
Malaysian Ringgit	MYR	0.2232
New Zealand Dollar	NZD	0.6902
Philippine Peso	PHP	0.0200
Qatari Rial	QAR	0.2746
Saudi Riyal	SAR	0.2666
Singapore Dollar	SGD	0.6919
United Arab Emirates Dirham	AED	0.2723
Vietnamese Dong	VND	0.0000

**NORTH AMERICA & CARIBBEAN**

LOCATION	CURRENCY	OFFICES						RETAIL SHOPPING						HOTELS					
		PRIME		SECONDARY		CENTER		STRIP		5 STAR		3 STAR							
		LOW	HIGH	LOW	HIGH	LOW	HIGH	LOW	HIGH	LOW	HIGH	LOW	HIGH	LOW	HIGH				
<b>NORTH AMERICA &amp; CARIBBEAN</b>																			
Anguilla	USD	165	270	135	215	130	245	110	215	270	435	195	270	195	270				
Antigua & Barbuda	USD	210	330	175	295	150	270	140	260	290	530	235	295	235	295				
Bahamas	USD	230	415	215	305	150	265	140	220	255	655	140	455	140	455				
Barbados	USD	210	350	190	300	160	250	140	220	240	400	160	250	160	250				
Bermuda	USD	330	440	305	415	275	350	240	320	330	440	275	330	275	330				
Boston	USD	275	450	180	275	150	250	100	150	350	500	225	350	225	350				
British Virgin Islands	USD	270	280	235	345	195	325	165	215	435	595	270	380	270	380				
Cayman Islands	USD	265	390	245	360	255	360	225	310	275	360	235	330	235	330				
Chicago	USD	230	360	140	200	130	210	105	130	290	450	190	240	190	240				
Cuba	USD	300	420	270	390	300	420	215	285	270	420	215	300	215	300				
Denver	USD	160	255	115	175	90	145	70	135	200	310	150	185	150	185				
Dominica	USD	180	195	145	205	180	180	145	180	240	310	190	240	190	240				
Dominican Republic	USD	115	185	90	150	90	140	80	125	175	345	115	230	115	230				
Grenada	USD	265	350	230	290	210	290	185	255	255	350	230	290	230	290				

LOCATION	CURRENCY	OFFICES						RETAIL SHOPPING						HOTELS					
		PRIME		SECONDARY		CENTER		STRIP		5 STAR		3 STAR							
		LOW	HIGH	LOW	HIGH	LOW	HIGH	LOW	HIGH	LOW	HIGH	LOW	HIGH	LOW	HIGH				
<b>NORTH AMERICA &amp; CARIBBEAN</b>																			
Guadeloupe	USD	245	280	180	260	150	225	175	230	325	445	245	300						
Haiti	USD	175	235	115	175	95	155	85	140	175	260	95	155						
Honolulu	USD	285	530	245	400	210	495	175	435	515	745	325	545						
Jamaica	USD	175	200	130	150	130	180	100	150	230	350	150	200						
Las Vegas	USD	140	295	105	190	115	480	65	145	350	500	150	300						
Los Angeles	USD	210	315	145	220	130	295	105	170	315	470	210	290						
Martinique	USD	245	285	180	260	155	230	175	230	325	445	245	300						
Montserrat	USD	170	285	140	225	135	255	115	255	285	455	205	285						
Netherlands Antilles	USD	240	305	175	275	165	240	165	240	220	435	140	220						
New York	USD	350	550	275	375	250	400	150	250	375	550	275	375						
Phoenix	USD	160	275	110	175	110	170	75	130	275	475	150	250						
Portland	USD	180	250	130	180	140	240	120	180	190	275	150	190						
Peurto Rico	USD	175	280	145	240	140	230	125	195	260	390	185	260						
San Francisco	USD	200	350	180	275	195	325	225	325	300	500	250	350						

## NORTH AMERICA &amp; CARIBBEAN

LOCATION	CURRENCY	OFFICES						RETAIL SHOPPING						HOTELS					
		PRIME			SECONDARY			CENTER		STRIP		5 STAR		3 STAR					
		LOW	HIGH	LOW	HIGH	LOW	HIGH	LOW	HIGH	LOW	HIGH	LOW	HIGH	LOW	HIGH				
NORTH AMERICA & CARIBBEAN																			
Seattle	USD	190	235	130	185	130	265	110	155	215	315	160	210						
St. Kitts & Nevis	USD	245	330	190	275	190	245	110	165	355	440	220	275						
St. Lucia	USD	230	330	190	255	165	230	175	230	310	465	230	285						
St. Vincent & The Grenadines	USD	205	315	150	220	130	195	155	195	305	380	205	265						
Trinidad & Tobago	USD	170	180	135	195	115	170	135	170	225	295	180	225						
Turks & Caicos Islands	USD	220	385	195	305	165	275	110	165	275	385	165	240						
U.S. Virgin Islands	USD	275	435	195	380	165	380	165	220	245	325	165	240						
Washington D.C.	USD	250	400	175	275	125	250	100	150	325	475	225	325						

LOCATION	CURRENCY	PARKING						INDUSTRIAL		RESIDENTIAL	
		MULTI-STORY		BASEMENT		WAREHOUSE		MULTI-STORY			
		LOW	HIGH	LOW	HIGH	LOW	HIGH	LOW	HIGH		
NORTH AMERICA & CARIBBEAN											
Anguilla	USD	NP	NP	NP	NP	65	130	165	325		
Antigua & Barbuda	USD	NP	NP	NP	NP	95	175	175	330		
Bahamas	USD	NP	NP	NP	NP	130	210	130	425		
Barbados	USD	NP	NP	NP	NP	65	185	280	400		
Bermuda	USD	NP	NP	NP	NP	220	280	285	440		
Boston	USD	70	100	90	150	100	175	175	300		
British Virgin Islands	USD	NP	NP	NP	NP	105	205	195	305		
Cayman Islands	USD	NP	NP	NP	NP	175	275	210	340		
Chicago	USD	65	110	90	140	100	130	130	210		
Cuba	USD	NP	NP	NP	NP	155	215	NP	NP		
Denver	USD	50	70	90	120	90	150	85	190		
Dominica	USD	NP	NP	NP	NP	145	215	180	250		
Dominican Republic	USD	NP	NP	NP	NP	60	85	75	175		
Grenada	USD	NP	NP	NP	NP	155	210	175	325		

## NORTH AMERICA &amp; CARIBBEAN

LOCATION	CURRENCY	PARKING				INDUSTRIAL		RESIDENTIAL	
		MULTI-STORY		BASEMENT		WAREHOUSE		MULTI-STORY	
		LOW	HIGH	LOW	HIGH	LOW	HIGH	LOW	HIGH
<b>NORTH AMERICA &amp; CARIBBEAN</b>									
(NP) Not Published									
Guadeloupe	USD	NP	NP	NP	NP	110	175	230	325
Haiti	USD	NP	NP	NP	NP	35	70	95	175
Honolulu	USD	100	145	140	265	145	225	195	445
Jamaica	USD	NP	NP	NP	NP	80	140	150	300
Las Vegas	USD	50	85	60	150	50	100	70	405
Los Angeles	USD	100	120	115	165	100	170	160	260
Martinique	USD	NP	NP	NP	NP	110	175	230	325
Montserrat	USD	NP	NP	NP	NP	70	135	170	340
Netherlands Antilles	USD	NP	NP	NP	NP	110	165	165	325
New York	USD	90	150	125	200	115	200	200	375
Phoenix	USD	40	65	60	100	55	100	90	185
Portland	USD	85	105	110	150	90	150	150	240
Puerto Rico	USD	NP	NP	NP	NP	90	160	155	280
San Francisco	USD	100	130	165	190	140	190	280	425

LOCATION	CURRENCY	PARKING				INDUSTRIAL		RESIDENTIAL	
		MULTI-STORY		BASEMENT		WAREHOUSE		MULTI-STORY	
		LOW	HIGH	LOW	HIGH	LOW	HIGH	LOW	HIGH
<b>NORTH AMERICA &amp; CARIBBEAN</b>									
Seattle	USD	80	100	100	145	90	125	140	250
St. Kitts & Nevis	USD	NP	NP	NP	NP	85	130	165	275
St. Lucia	USD	NP	NP	NP	NP	90	190	220	385
St. Vincent & The Grenadines	USD	NP	NP	NP	NP	75	165	195	275
Trinidad & Tobago	USD	NP	NP	NP	NP	75	105	135	240
Turks & Caicos Islands	USD	NP	NP	NP	NP	110	265	130	275
U.S. Virgin Islands	USD	NP	NP	NP	NP	110	165	195	380
Washington D.C.	USD	65	100	80	125	90	150	175	300

(NP) Not Published



### ASIA

LOCATION	CURRENCY	OFFICES						RETAIL SHOPPING						HOTELS					
		PRIME		SECONDARY		CENTER		STRIP		5 STAR		3 STAR							
		LOW	HIGH	LOW	HIGH	LOW	HIGH	LOW	HIGH	LOW	HIGH	LOW	HIGH						
Beijing	RMB	700	1155	660	995	770	1180	685	1065	1200	1580	890	1145						
Chengdu	RMB	640	925	720	1045	465	685	450	705	1080	1385	910	1020						
Guangzhou	RMB	660	1055	610	920	755	1070	650	975	1190	1535	880	1070						
Ho Chi Minh City	VND ('000)	2230	3195	1895	2380	1795	2390	NP	NP	2890	3540	2175	2815						
Hong Kong	\$HKD	2125	3170	1810	2460	2135	2715	1820	2370	3315	4050	2730	3160						
Jakarta	Rp ('000)	895	1225	620	985	605	790	NP	NP	1270	1620	965	1105						
Kuala Lumpur	RINGGIT	230	420	120	280	195	325	NP	NP	465	650	230	325						
Macau	MOP	1690	2435	1485	2090	1850	2275	1570	2005	2845	3495	2285	2640						
Manila	PHP	3015	4115	2435	3315	2555	2940	1935	2170	4970	5725	4010	4540						
Seoul	KRW ('000)	210	270	160	195	140	205	120	180	280	420	180	230						
Shanghai	RMB	675	1070	605	920	705	1115	625	1020	1170	1540	865	1115						
Shenzhen	RMB	650	1045	600	910	690	1065	610	935	1125	1470	845	1070						
Singapore	SGD	250	370	195	280	205	315	NP	NP	400	520	305	345						

(NP) Not Published

LOCATION	CURRENCY	PARKING				INDUSTRIAL		RESIDENTIAL	
		MULTI-STORY		BASEMENT		WAREHOUSE		MULTI-STORY	
		LOW	HIGH	LOW	HIGH	LOW	HIGH	LOW	HIGH
<b>ASIA</b>									
Beijing	RMB	205	280	345	605	400	505	370	565
Chengdu	RMB	190	260	340	555	325	400	325	505
Guangzhou	RMB	190	275	340	585	380	470	350	520
Ho Chi Minh City	VND ('000)	820	1215	1670	2275	555	845	1430	2165
Hong Kong	\$HKD	830	985	1710	2340	1405	1765	1995	3455
Jakarta	Rp ('000)	320	415	415	575	430	530	595	930
Kuala Lumpur	RINGGIT	75	110	130	295	95	165	175	420
Macau	MOP	NP	NP	985	1245	NP	NP	1275	2025
Manila	PHP	1365	1570	1495	1720	1615	1910	2530	4500
Seoul	KRW ('000)	60	75	75	100	105	130	135	195
Shanghai	RMB	190	275	360	595	360	470	335	535
Shenzhen	RMB	190	270	345	585	360	450	335	510
Singapore	SGD	65	130	140	210	100	150	185	295

(NP) Not Published

### EUROPE

LOCATION	CURRENCY	OFFICES				RETAIL SHOPPING				HOTELS			
		PRIME		SECONDARY		CENTER		STRIP		5 STAR		3 STAR	
		LOW	HIGH	LOW	HIGH	LOW	HIGH	LOW	HIGH	LOW	HIGH	LOW	HIGH
Berlin	EUR	125	165	90	105	105	135	80	95	185	255	125	165
Birmingham	GBP	165	235	135	240	255	355	80	150	195	280	120	185
Bristol	GBP	185	240	150	225	255	355	80	155	210	280	120	165
Dublin	EUR	165	185	150	165	175	195	95	110	185	205	125	135
London	GBP	230	300	190	295	305	430	100	185	245	325	165	210
Madrid	EUR	85	140	75	105	175	240	130	175	180	240	125	165
Manchester	GBP	185	240	160	235	255	360	80	155	15	270	125	165
Moscow	EUR	140	185	120	150	10	195	110	140	260	325	160	205
Oslo	EUR	265	345	205	265	165	215	135	175	365	475	275	360
Sheffield	EUR	170	225	145	230	250	350	80	150	190	260	115	155

LOCATION	CURRENCY	PARKING				INDUSTRIAL		RESIDENTIAL	
		MULTI-STORY		BASEMENT		WAREHOUSE		MULTI-STORY	
		LOW	HIGH	LOW	HIGH	LOW	HIGH	LOW	HIGH
EUROPE (NP) Not Published									
Berlin	EUR	45	65	75	95	35	70	90	130
Birmingham	GBP	35	65	60	130	35	50	140	205
Bristol	GBP	40	75	80	135	35	60	160	225
Dublin	EUR	35	45	55	95	35	50	130	150
London	GBP	40	80	105	170	45	75	195	270
Madrid	EUR	65	85	75	110	55	75	65	95
Manchester	GBP	30	60	80	135	35	60	155	220
Moscow	EUR	40	50	75	95	45	55	110	140
Oslo	EUR	65	80	85	110	145	190	225	295
Sheffield	EUR	30	60	60	130	35	65	150	215

MIDDLE EAST

LOCATION	CURRENCY	OFFICES						RETAIL SHOPPING						HOTELS					
		PRIME		SECONDARY		CENTER		STRIP		5 STAR		3 STAR							
		LOW	HIGH	LOW	HIGH	LOW	HIGH	LOW	HIGH	LOW	HIGH	LOW	HIGH						
MIDDLE EAST		(NP) Not Published																	
Abu Dhabi	AED	540	650	435	615	380	605			835	1115	555	790						
Dubai	AED	540	650	435	615	380	605			835	1160	555	790						
Riyadh	SAR	455	705	465	635	440	575	310	440	770	940	555	695						
Doha	QAR	605	790	565	760	490	605			1070	1345	695	790						

LOCATION	CURRENCY	PARKING				INDUSTRIAL		RESIDENTIAL	
		MULTI-STORY		BASEMENT		WAREHOUSE		MULTI-STORY	
		LOW	HIGH	LOW	HIGH	LOW	HIGH	LOW	HIGH
MIDDLE EAST									
Abu Dhabi	AED	165	335	265	420	140	250	420	605
Dubai	AED	215	335	290	420	170	270	420	605
Riyadh	SAR	85	115	210	265	310	375	425	895
Doha	QAR			255	420			605	725

(NP) Not Published

OCEANIA

LOCATION	CURRENCY	OFFICES				RETAIL SHOPPING				HOTELS			
		PRIME		SECONDARY		CENTER		STRIP		5 STAR		3 STAR	
		LOW	HIGH	LOW	HIGH	LOW	HIGH	LOW	HIGH	LOW	HIGH	LOW	HIGH
OCEANIA													(NP) Not Published
Adelaide	AUD	240	360	195	300	145	275	120	170	330	415	235	320
Auckland	NZD	315	420	240	395	230	260	130	165	420	510	355	400
Brisbane	AUD	240	370	185	280	215	290	100	150	370	510	260	370
Canberra	AUD	305	395	245	310	210	295	110	185	375	460	270	380
Christchurch	NZD	335	420	255	395	230	260	130	165	420	510	355	400
Darwin	AUD	290	385	225	355	160	240	115	195	335	415	265	330
Gold Coast	AUD	230	370	175	280	200	290	100	150	315	510	240	370
Melbourne	AUD	285	355	220	275	190	285	100	145	365	475	290	330
Perth	AUD	295	445	240	345	215	260	95	240	335	410	245	340
Sydney	AUD	315	450	235	335	175	365	135	175	395	520	275	350
Wellington	NZD	290	420	250	415	240	260	130	165	420	510	355	400

LOCATION	CURRENCY	PARKING				INDUSTRIAL		RESIDENTIAL	
		MULTI-STORY		BASEMENT		WAREHOUSE		MULTI-STORY	
		LOW	HIGH	LOW	HIGH	LOW	HIGH	LOW	HIGH
OCEANIA									
Adelaide	AUD	55	85	125	180	60	100	210	330
Auckland	NZD	70	95	185	230	65	90	280	370
Brisbane	AUD	65	100	150	195	55	100	185	295
Canberra	AUD	70	95	95	135	65	100	255	365
Christchurch	NZD	80	125	165	205	65	100	280	370
Darwin	AUD	70	115	110	140	75	130	185	245
Gold Coast	AUD	65	100	140	190	55	100	165	295
Melbourne	AUD	60	100	105	135	50	105	210	330
Perth	AUD	70	95	170	290	50	95	205	355
Sydney	AUD	70	100	100	155	65	00	230	425
Wellington	NZD	75	100	185	230	70	95	295	370

(NP) Not Published



**RLB CONSTRUCTION BID PRICE INDEX  
(ANNUAL % CHANGE)**

LOCATION	2013	2014	2015
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**NORTH AMERICA**

Boston	6.1	5.0	3.5
Chicago	4.7	4.9	4.1
Denver	1.7	2.5	3.6
Honolulu	7.7	13.3	11.2
Las Vegas	0.9	3.6	4.4
Los Angeles	1.8	4.9	5.2
New York	7.3	5.0	3.4
Phoenix	2.5	3.7	3.7
Portland	1.7	6.0	4.6
San Francisco	1.8	6.1	9.4
Seattle	3.5	4.5	4.9
Washington, DC	6.5	5.0	4.4

**AFRICA**

Cape Town	NP	5.0	6.0
Johannesburg	NP	8.3	7.2
Pretoria	NP	8.3	7.2

**ASIA**

Beijing	1.0	2.0	(1.0)
Chengdu	NP	1.1	0.3
Guangzhou	4.1	3.0	(3.0)
Hong Kong	9.0	8.2	4.3
Macau	9.3	10.4	3.5
Seoul	2.4	(0.5)	1.3
Shanghai	2.0	(4.4)	(0.0)
Shenzhen	3.0	1.5	(0.7)
Singapore	4.5	1.5	1.5

(F) Forecast  
(NP) Not Published

2016 (F)	2017 (F)	2018 (F)	2019 (F)
----------	----------	----------	----------

## NORTH AMERICA

4.8	4.1	4.1	4.1
4.6	4.1	4.1	4.1
3.8	4.1	4.1	4.1
4.0	4.0	4.1	4.1
5.9	4.6	4.1	4.1
5.4	4.1	4.1	4.1
4.6	4.1	4.1	4.1
4.4	4.3	4.1	4.1
4.6	4.1	4.1	4.1
4.3	4.1	4.1	4.8
4.6	4.1	4.1	4.1
4.3	4.1	4.1	4.1

## AFRICA

7.0	8.0	4.8	4.8
7.5	8.0	4.8	4.8
7.5	8.0	4.8	4.8

## ASIA

0.5	2.0	2.0	2.0
(1.1)	0.0	0.4	0.4
1.0	2.0	2.0	2.0
3.4	3.0	3.0	3.0
2.0	3.0	3.0	3.0
1.3	1.7	1.8	1.9
(0.0)	2.0	2.0	2.0
1.0	2.0	2.0	2.0
NP	NP	NP	NP

## RLB CONSTRUCTION BID PRICE INDEX (ANNUAL % CHANGE)

LOCATION	2013	2014	2015
----------	------	------	------

### EUROPE

Berlin	NP	1.8	2.2
Bristol	6.3	7.1	4.5
Budapest	NP	NP	2.5
Dublin	4.0	5.0	7.0
London	3.4	5.0	5.9
Madrid	NP	0.0	(0.0)
Manchester	6.3	7.1	4.0
Warsaw	NP	(0.8)	0.7

### MIDDLE EAST

Abu Dhabi	3.2	3.3	4.7
Doha	3.2	4.5	5.0
Dubai	3.2	3.7	4.6
Riyadh	4.4	5.0	4.8

### OCEANIA

Adelaide	0.9	0.6	0.8
Auckland	0.8	4.1	5.1
Brisbane	(1.9)	5.1	5.9
Canberra	2.2	1.6	2.0
Christchurch	5.1	6.0	6.0
Darwin	3.0	1.8	1.0
Gold Coast	0.0	4.1	4.0
Melbourne	0.2	1.5	2.0
Perth	1.1	0.8	0.7
Sydney	2.0	3.0	4.5
Townsville	1.3	2.0	3.0
Wellington	2.0	3.4	3.0

(F) Forecast  
(NP) Not Published

2016 (F)	2017 (F)	2018 (F)	2019 (F)
----------	----------	----------	----------

## EUROPE

2.0	2.0	2.0	2.0
5.0	5.0	5.5	4.8
3.0	3.3	2.5	NP
4.0	8.0	8.0	NP
3.5	3.5	3.5	3.7
0.1	0.8	0.1	0.1
5.0	5.0	5.5	4.8
3.2	3.2	1.2	NP

## MIDDLE EAST

5.7	6.1	7.3	7.3
5.5	6.0	7.0	NP
3.0	3.5	3.5	3.5
5.0	5.0	5.0	5.0

## OCEANIA

2.0	3.0	3.5	3.5
5.6	4.6	3.0	3.0
7.9	4.0	4.0	4.0
2.2	3.0	3.0	3.0
4.0	4.0	4.0	3.5
1.5	2.0	2.0	2.5
6.0	5.0	4.0	3.0
2.0	3.0	3.0	3.0
2.1	3.0	3.0	3.0
4.8	4.0	3.5	3.5
3.0	4.0	4.0	4.0
3.0	3.0	3.0	3.0

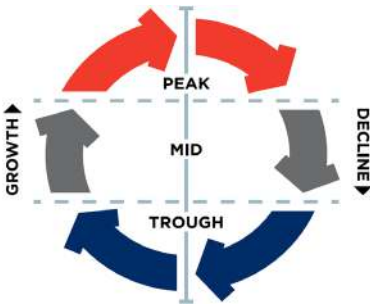
**CONSTRUCTION MARKET ACTIVITY**

The construction market activity model, located to the right, illustrates the different growth and decline zones in a theoretical construction industry business cycle. The tabulation in the preceding and following pages provides an overview of the relative growth/decline of each development sector in various cities. Each city has its own business cycle in the context of its own economy and as such the performance of each development sector is not strictly comparable between cities. Information is current as of December 2016.

LOCATION	HOUSES	APARTMENTS	OFFICES
----------	--------	------------	---------

**NORTH AMERICA & CARIBBEAN**

Anguilla	▼	▼	▼
Antigua & Barbuda	▼	▼	▼
Bahamas	▲	▲	▲
Barbados	▲	▲	▲
Bermuda	▲	▲	▼
Boston	▼	▲	▲
British Virgin Islands	▼	▼	▼
Cayman Islands	▲	▼	▼
Chicago	▲	▲	▲
Cuba	▼	▼	▼
Denver	▲	▲	▲
Dominica	▼	▼	▼
Dominican Republic	▼	▼	▼
Grenada	▼	▼	▼
Guadaloupe	▲	▲	▼
Haiti	▲	▲	▲



INDUSTRIAL	RETAIL	HOTEL	CIVIL
------------	--------	-------	-------

NORTH AMERICA & CARIBBEAN

▼	▼	▲	▲
▼	▼	▼	▼
▲	▲	▲	▲
▲	▲	▼	▲
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▼	▼	▼	▼
▲	▲	▲	▲

CONSTRUCTION MARKET ACTIVITY

LOCATION	HOUSES	APARTMENTS	OFFICES
NORTH AMERICA & CARIBBEAN			
Honolulu	▲	▲	▲
Jamaica	▲	▲	▲
Las Vegas	▲	▲	▼
Los Angeles	▲	▲	▲
Martinique	▲	▲	▼
Montserrat	▼	▼	▼
Netherlands Antilles	▲	▲	▼
New York	▲	▲	▲
Phoenix	▲	▲	▲
Portland	▲	▲	▲
Puerto Rico	▲	▲	▼
San Francisco	▲	▲	▲
Seattle	▲	▲	▲
St. Kitts and Nevis	▲	▼	▼
St. Lucia	▲	▼	▲
St. Vincent and the Grenadines	▲	▲	▼
Trinidad and Tobago	▲	▼	▼
Turks and Caicos Islands	▲	▼	▼
U.S. Virgin Islands	▲	▼	▼
Washington	▲	▲	▲

INDUSTRIAL	RETAIL	HOTEL	CIVIL
------------	--------	-------	-------

NORTH AMERICA & CARIBBEAN

▲	▲	▲	▲
▲	▲	▲	▲
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▼	▲	▲	▲



CONSTRUCTION MARKET ACTIVITY

LOCATION	HOUSES	APARTMENTS	OFFICES
AFRICA			
Cape Town	▲	▲	▼
Johannesburg	▲	▲	▼
Maputo	▲	▲	▲
Port Louis	▲	▲	▲
Pretoria	▲	▲	▼
ASIA			
Beijing	▼	▼	▼
Chengdu	▼	▼	▼
Guangzhou	▼	▲	▲
Ho Chi Minh City	▲	▲	▲
Hong Kong	▼	▼	▼
Jakarta	▼	▼	▲
Kuala Lumpur	▲	▲	▼
Macau	▼	▼	▼
Manila	▲	▲	▲
Seoul	▲	▲	▲
Shanghai	▼	▲	▲
Shenzhen	▼	▲	▲
Singapore	▼	▼	▼

INDUSTRIAL	RETAIL	HOTEL	CIVIL
------------	--------	-------	-------

## AFRICA

▲	▼	▲	▼
▲	▼	▲	▲
▲	▲	▲	▲
▼	▲	▲	▼
▲	▼	▲	▲

## ASIA

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▼	▼	▲	▲
▼	▼	▼	▲

CONSTRUCTION MARKET ACTIVITY

LOCATION	HOUSES	APARTMENTS	OFFICES
EUROPE			
Berlin	▲	▲	▼
Birmingham	▼	▲	▲
Dublin	▲	▲	▲
London	▲	▲	▲
Madrid	▲	▲	▼
Manchester	▲	▲	▲
Milan	▼	▼	▼
Moscow	▼	▼	▼
Paris	▲	▲	▲
Sheffield	▲	▼	▲

MIDDLE EAST			
Abu Dhabi	▲	▼	▼
Doha	▲	▲	▼
Dubai	▼	▼	▼
Riyadh	▲	▲	▲

INDUSTRIAL	RETAIL	HOTEL	CIVIL
------------	--------	-------	-------

## EUROPE

▼	▲	▲	▼
▲	▲	▲	▲
▲	▲	▲	▲
▲	▲	▲	▲
▼	▲	▲	▼
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▲	▲	▲	▼
▼	▼	▼	▼
▲	▲	▼	▲
▼	▲	▼	▲

## MIDDLE EAST

▼	▲	▼	▼
▲	▲	▲	▲
▼	▼	▼	▲
▲	▲	▲	▲

CONSTRUCTION MARKET ACTIVITY

LOCATION	HOUSES	APARTMENTS	OFFICES
OCEANIA			
Adelaide	▲	▲	▼
Auckland	▲	▲	▲
Brisbane	▲	▲	▼
Canberra	▲	▲	▲
Christchurch	▼	▲	▲
Darwin	▲	▼	▼
Gold Coast	▲	▲	▼
Melbourne	▲	▲	▲
Perth	▼	▼	▼
Sydney	▲	▲	▲
Townsville	▼	▼	▼
Wellington	▲	▲	▲

INDUSTRIAL	RETAIL	HOTEL	CIVIL
OCEANIA			
▲	▲	▲	▲
▲	▲	▲	▲
▲	▲	▲	▼
▼	▼	▼	▼
▲	▲	▲	▲
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▲	▲	▲	▼
▼	▼	▲	▲
▼	▲	NP	▲
▲	▲	▲	▲



## USA CONSTRUCTION

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## HAWAII MEDICAL SERVICE ASSOCIATION KEAAU BUILDING

KEAAU, HAWAII

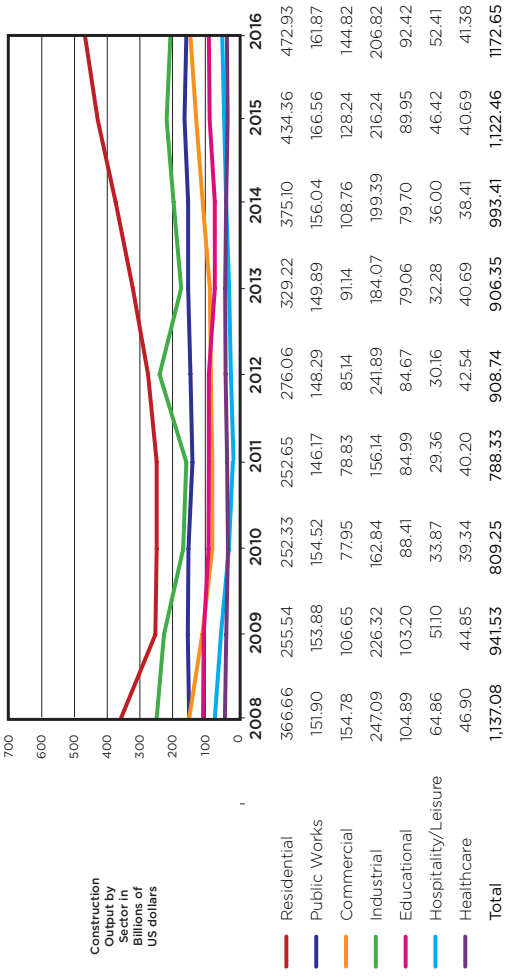
Founded in 1938, the Hawaii Medical Service Association (HMSA) is a nonprofit independent licensee of the Blue Cross and Blue Shield Association.

HMSA opened a new 20,000 SF facility, housing administrative staff and a call center, which sits on a two-acre parcel of land in the town of Kea'au, on the Big Island. The building's design is reminiscent of the plantation era, complete with gabled roofs, ample overhang, and breezeways.

Rider Levett Bucknall teamed with architectural firm, Ferraro Choi & Associates, to provide cost estimating services.

Photo courtesy of Andrea Brizzi Photography.

CONSTRUCTION OUTPUT BY SECTOR



\*Forecast based on seasonally adjusted annual figures as of November 30, 2016

Sources: U.S. Census Bureau

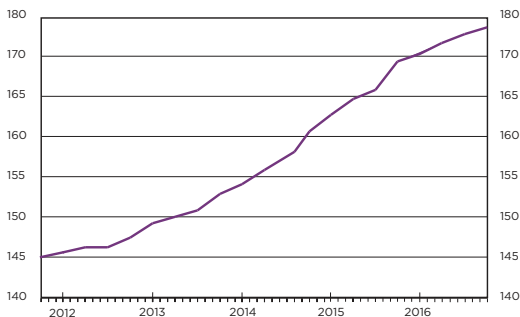
## INFLATION INDEX COMPARISON

The chart below shows the relative differences in inflation between the cost of general goods and services (represented by the U.S. Bureau of Labor Statistics' Consumer Price Index), the cost of construction materials and labor (represented by Engineering News-Record's Building Cost Index) and the bid cost of construction (represented by Rider Levett Bucknall's National Construction Cost Index).



## NATIONAL CONSTRUCTION COST INDEX

The National Construction Cost Index shows how construction costs have changed each quarter since October 2011.

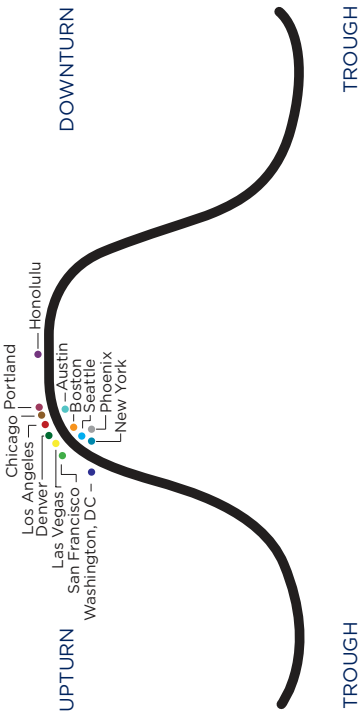


QUARTER	COST INDEX
October 2011	145.29
January 2012	145.73
April 2012	146.35
July 2012	146.67
October 2012	147.74
January 2013	149.19
April 2013	150.75
July 2013	151.89
October 2013	153.09
January 2014	154.56
April 2014	156.33
July 2014	158.48
October 2014	161.11
January 2015	162.98
April 2015	164.96
July 2015	166.85
October 2015	169.05
January 2016	171.38
April 2016	173.84
July 2016	176.48
October 2016	178.34

## CONSTRUCTION ACTIVITY CYCLE

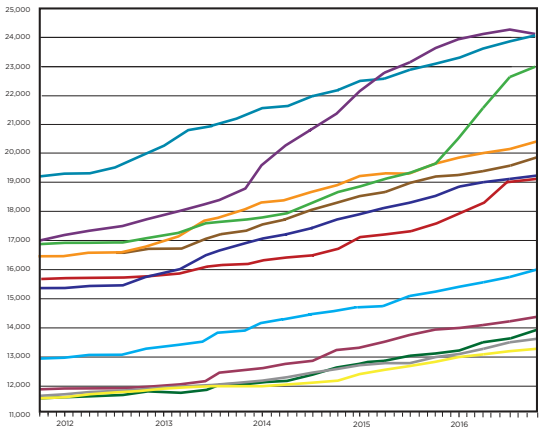
The chart below depicts the position of each city in a theoretical construction industry business cycle. The aim of the chart is to provide an overview of the relative performance of each city in the context of its own economy.

Each city has its own industry business cycle, and as such, the city cycles are not directly comparable with each other. As the amplitude and frequency of the cycle(s) are not expressed in this chart, there is no direct parameter of extent of the cycle or of its time period.



## COMPARATIVE COST INDEX

The Comparative Cost Index tracks the bid cost of construction in each city, which includes, in addition to costs of labor and materials, general contractor and subcontractor overhead costs and fees (profit). The index also includes sales and use taxes that standard construction contracts attract.



City	October 2015	October 2016	% Change
Boston	19,638	20,489	4.33%
Chicago	19,250	19,809	2.90%
Denver	13,150	13,932	5.95%
Honolulu	23,690	24,181	2.07%
Las Vegas	12,844	13,342	3.88%
Los Angeles	17,617	19,225	9.13%
New York	23,136	24,101	4.17%
Phoenix	13,080	13,578	3.80%
Portland	13,859	14,469	4.40%
San Francisco	19,645	23,005	17.10%
Seattle	15,299	15,972	4.40%
Washington, DC	18,568	19,376	4.35%

## INPUTS TO CONSTRUCTION COSTS

### LABOR

Labor used in direct construction activities.

### MATERIALS

Materials which are incorporated into the completed project as well as temporary materials (such as plywood used in formwork).

### EQUIPMENT

Equipment used in the construction process such as pumps, generators, material hoists, cranes and the like.

### SUBCONTRACTORS

Construction work undertaken for the general contractor by sub-contractors (including tiered subcontractors).

### BONDS

Guarantees extended by a third party to the owner of a building under construction that the building will be satisfactorily completed (performance bonds) and/or that payment to subcontractors and suppliers will be made (payment bonds).

### INSURANCE

Insurances including builder's risk insurance, general liability insurance, automobile liability insurance, professional liability insurance (for any work performed on a design/build basis), subcontractor default insurance (sub-guard) and the like.

### TAXES

Taxes levied on the whole of construction or on construction labor and/or materials.

## GENERAL CONTRACTOR OVERHEAD & PROFIT

There are two types of overhead costs; on-site (often referred to as General Conditions or General Requirements) and off-site (often referred to as Home Office Overhead). Profit is the fee charged by the general contractor for undertaking the project and is sometimes referred to as 'profit and risk'.

## SUPPLY & DEMAND (WHAT THE MARKET WILL BEAR)

The sum of the above costs are not always what the project will cost the owner (or the entity for whom the project is being constructed). In a weak market the contact sum may be significantly less than the figured costs (such as zero figuring for home office overhead and profit) but in a booming market may be well above the figured costs (when prices are increased to take advantage of the buoyant market).



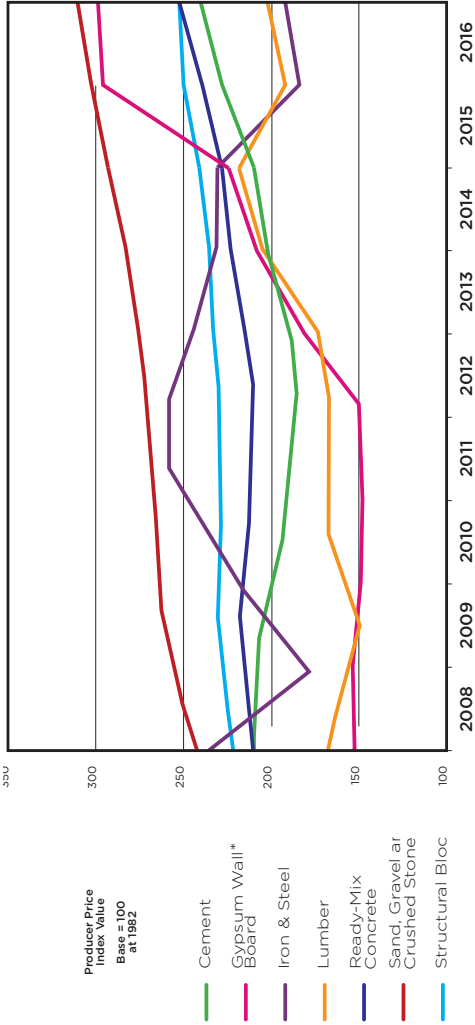
## MECHANICAL COMPARATIVE LABOR INDEX

The Comparative Labor Index shows the relative cost of construction labor among the markets listed as of December 2016, using labor wage costs in Phoenix, Arizona as a baseline.

COMPARATIVE LABOR INDEX	
146	Boston, MA
87	Calgary, AB
144	Chicago, IL
95	Cincinnati, OH
85	Columbus, OH
98	Denver, CO
126	Honolulu, HI
65	Houston, TX
121	Las Vegas, NV
134	Los Angeles, CA
49	Miami, FL
121	Minneapolis, MN
77	Nashville, TN
155	New York, NY
100	Phoenix, AZ
114	Portland, OR
122	San Francisco, CA
145	Seattle, WA
114	Washington, DC

Source: Davis-Bacon Wage Determinations at December 2016

MATERIALS PRICE INDEX



\*For Gypsum Wall Board only, Base = 100 at 1994 Average year-to-date as of December 2016 Source: Bureau of Labor Statistics

## DESIGN & CONSTRUCTION REGULATIONS

This section contains information of use and interest to those practicing in the architecture, engineering and construction disciplines in the United States.

### INTERNATIONAL BUILDING CODE®

Adopted by most of the United States, the International Building Code® (IBC) is a model building code to address the design and installation of building systems through minimum requirements that safeguard public health and safety and emphasize building performance. When originally released in 2000, the IBC consolidated regional codes for energy conservation, fuel gas, mechanical, plumbing, private sewage disposal, property maintenance, zoning, and fire protection.

### INTERNATIONAL RESIDENTIAL CODE®

The International Residential Code® (IRC) is a comprehensive, stand-alone residential code that creates minimum regulations for one- and two-family dwellings of three stories or less. It brings together all building, plumbing, mechanical, fuel gas, energy and electrical provisions for one- and two-family residences. The IRC also provides a prescriptive approach (i.e. a set of measures) and a performance approach (i.e. energy modeling) for determining compliance.

### NATIONAL ELECTRIC CODE®

The National Electrical Code® (NEC), or NFPA 70, is a United States standard for the safe installation of electrical wiring and equipment. It is part of the National Fire Codes series published by the National Fire Protection Association, Inc. (NFPA). While the NEC is not itself a U.S. law, NEC use is commonly mandated by state or local law.

## **DAVIS-BACON ACT OF 1931**

Requires all contractors and subcontractors performing work on federal or District of Columbia construction contracts or federally assisted contracts in excess of \$2,000 to pay their laborers and mechanics not less than the prevailing wage rates and fringe benefits for corresponding classes of laborers and mechanics employed on similar projects in the area.

## **COPELAND ACT (COPELAND ANTI-KICKBACK ACT)**

Prohibits contractors from coercing or otherwise requiring their employees to return any part of the compensation they earned under Federal contracts.

## **FAIR LABOR STANDARDS ACT OF 1938 (FLSA)**

Establishes minimum wage, overtime pay, record-keeping, and child labor standards affecting full-time and part-time workers in the private sector and in Federal, State, and local governments.

## **OCCUPATIONAL SAFETY AND HEALTH ACT OF 1970**

Protects workers from safety and health hazards in the workplace. Also prohibits employers from retaliating against employees for exercising their rights under the Act. Enforcement and administration of the Act in states under federal jurisdiction is handled primarily by U.S. Occupational Safety and Health Administration.

## **CONTRACT WORK HOURS AND SAFETY STANDARDS ACT**

Requires all contractors and subcontractors on federal service contracts and federal and federally assisted construction contracts over \$100,000 to pay laborers and mechanics employed in the performance of the contracts 1.5 times their basic rate of pay for all hours worked over 40 in a work week. This Act also prohibits unsanitary, hazardous, or dangerous working conditions on Federal construction projects.

## DESIGN & CONSTRUCTION REGULATIONS

### MILLER ACT

Requires all contractors and subcontractors on federal service contracts and federally assisted construction contracts over \$100,000 to furnish a payment bond as security for the protection of those supplying labor and/or materials. Failure by a contractor to pay suppliers and subcontractors gives such suppliers and subcontractors the right to sue the contractor in U.S. District Court in the name of the United States. Other payment protections may be provided for contracts between \$30,000 and \$100,000.

### AMERICANS WITH DISABILITIES ACT OF 1990 (ADA)

A wide-ranging civil rights law that prohibits, under certain circumstances, discrimination based on disability with provisions for employment, public entities and public transportation, public accommodations and commercial facilities, and telecommunications. Under Titles II and III of the Act, all construction, modification or alterations must be fully compliant with the Americans With Disabilities Act Accessibility Guidelines (ADAAG), a document detailing scoping and technical requirements for accessibility to buildings and facilities by individuals with disabilities.

### IMMIGRATION REFORM AND CONTROL ACT OF 1986

Amends and repeals sections of the Immigration and Nationality Act (INA) requires legalization of undocumented aliens who had been continuously unlawfully present since 1982, legalization of certain agricultural workers, penalizes employers who knowingly hire undocumented workers, and increased enforcement at U.S. borders in order to control and deter illegal immigration to the United States.

## BROOKS ACT OF 1972

Requires the Federal government to select architecture and engineering firms based upon their competency, qualifications and experience rather than by price.

## EXECUTIVE ORDER 13502

In 2009, President Obama issued an Executive Order entitled “Use of Project Labor Agreements for Federal Construction Projects” to encourage agencies to use Project Labor Agreements (PLAs) on federal construction projects with a total cost to the government of \$25 million or more.

As defined by the Order, PLAs are pre-hire collective bargaining agreements that govern wages, benefits, work rules, and other terms and conditions of employment for specific projects.

The Executive Order allows federal agencies to consider the use of PLAs where the agreements will “advance the federal government’s interest in achieving economy and efficiency in federal procurement” and “be consistent with law.”

The Order encourages the use of PLAs in large scale projects, but does not mandate them. Under the Order, the federal government cannot currently compel a contractor to enter into an agreement with any particular labor organization or owner. The Order does not explicitly exclude non-union contractors from competition.

*Sources: International Code Council®, National Fire Protection Association, Inc., Ed.gov/open/plan/recovery-gov, U.S. General Services Administration, U.S. Government Printing Office, U.S. Department of Homeland Security, U.S. Department of Justice and U.S. Department of Labor.*

## LIST OF U.S. GOVERNMENT ENTITIES

ORGANIZATION	WEBSITE ADDRESS
Bureau of Economic Analysis	<a href="http://www.bea.gov">www.bea.gov</a>
Bureau of Labor Statistics	<a href="http://www.bls.gov">www.bls.gov</a>
Bureau of Land Management	<a href="http://www.blm.gov">www.blm.gov</a>
Bureau of Overseas Building Operations	<a href="http://www.state.gov/obo">www.state.gov/obo</a>
Congressional Budget Office	<a href="http://www.cbo.gov">www.cbo.gov</a>
Environmental Protection Agency	<a href="http://www.epa.gov">www.epa.gov</a>
FedBizOpps	<a href="http://www.fbo.gov">www.fbo.gov</a>
FedConnect	<a href="http://www.fedconnect.net">www.fedconnect.net</a>
Federal Acquisition Regulation (FAR)	<a href="http://www.acquisition.gov">www.acquisition.gov</a>
Federal Highway Administration	<a href="http://www.fhwa.dot.gov">www.fhwa.dot.gov</a>
Federal Trade Commission	<a href="http://www.ftc.gov">www.ftc.gov</a>
FedWorld.gov	<a href="http://fedworld.ntis.gov">fedworld.ntis.gov</a>
Indian Health Service	<a href="http://www.ihs.gov">www.ihs.gov</a>
National Park Service	<a href="http://www.nps.gov">www.nps.gov</a>
National Resources Conservation Service	<a href="http://www.nrcs.usda.gov">www.nrcs.usda.gov</a>
Naval Facilities Engineering Command	<a href="http://www.navy.mil/local/navfachq/">www.navy.mil/local/navfachq/</a>
Occupational Safety & Health Administration	<a href="http://www.osha.gov">www.osha.gov</a>
Recovery.gov	<a href="http://www.ed.gov/open/plan/recovery-gov">www.ed.gov/open/plan/recovery-gov</a>
System for Award Management	<a href="http://www.sam.gov">www.sam.gov</a>

ORGANIZATION	WEBSITE ADDRESS
The White House	<a href="http://www.whitehouse.gov">www.whitehouse.gov</a>
USA.gov	<a href="http://www.usa.gov">www.usa.gov</a>
U.S. Army Corps of Engineers	<a href="http://www.usace.army.mil">www.usace.army.mil</a>
U.S. Bureau of Reclamation	<a href="http://www.usbr.gov">www.usbr.gov</a>
U.S. Census Bureau	<a href="http://www.census.gov">www.census.gov</a>
U.S. Department of Commerce	<a href="http://www.commerce.gov">www.commerce.gov</a>
U.S. Department of Defense	<a href="http://www.defense.gov">www.defense.gov</a>
U.S. Department of Energy	<a href="http://www.energy.gov">www.energy.gov</a>
U.S. Department of Housing & Urban Development	<a href="http://www.hud.gov">www.hud.gov</a>
U.S. Department of Labor	<a href="http://www.dol.gov">www.dol.gov</a>
U.S. Department of the Interior	<a href="http://www.doi.gov">www.doi.gov</a>
U.S. Department of the Treasury	<a href="http://www.treasury.gov">www.treasury.gov</a>
U.S. Department of Transportation	<a href="http://www.dot.gov">www.dot.gov</a>
U.S. Department of Veterans Affairs	<a href="http://www.va.gov">www.va.gov</a>
U.S. Fish & Wildlife Service	<a href="http://www.fws.gov">www.fws.gov</a>
U.S. General Services Administration	<a href="http://www.gsa.gov">www.gsa.gov</a>
U.S. Geological Survey	<a href="http://www.usgs.gov">www.usgs.gov</a>
U.S. Securities & Exchange Commission	<a href="http://www.sec.gov">www.sec.gov</a>
U.S. Small Business Administration	<a href="http://www.sba.gov">www.sba.gov</a>



## LIST OF INDUSTRY ASSOCIATIONS

ORGANIZATION	WEBSITE ADDRESS
Airport Consultants Council	<a href="http://www.acconline.org">www.acconline.org</a>
American Bar Association Forum on the Construction Industry	<a href="http://www.americanbar.org">www.americanbar.org</a>
American Institute of Architects	<a href="http://www.aia.org">www.aia.org</a>
American Road & Transportation Builders Association	<a href="http://www.artba.org">www.artba.org</a>
American Society for Healthcare Engineering	<a href="http://www.ashe.org">www.ashe.org</a>
American Society of Landscape Architects	<a href="http://www.asla.org">www.asla.org</a>
American Society of Professional Estimators	<a href="http://www.aspenational.org">www.aspenational.org</a>
American Subcontractors Association	<a href="http://www.asaonline.com">www.asaonline.com</a>
Associated Builders & Contractors	<a href="http://www.abc.org">www.abc.org</a>
Associated General Contractors of America	<a href="http://www.agc.org">www.agc.org</a>
Association for the Advancement of Cost Engineering International	<a href="http://www.aacei.org">www.aacei.org</a>
Building Owners & Managers Association	<a href="http://www.boma.org">www.boma.org</a>
Construction Management Association of America	<a href="http://www.cmaanet.org">www.cmaanet.org</a>
Construction Owners Association of America	<a href="http://www.coaa.org">www.coaa.org</a>
Construction Specifications Institute	<a href="http://www.csinet.org">www.csinet.org</a>
Design-Build Institute of America	<a href="http://www.dbia.org">www.dbia.org</a>

ORGANIZATION	WEBSITE ADDRESS
International Association of Venue Managers	<a href="http://www.iavm.org">www.iavm.org</a>
International Code Council	<a href="http://www.iccsafe.org">www.iccsafe.org</a>
International Construction Information Society	<a href="http://www.icis.org">www.icis.org</a>
International Council of Shopping Centers	<a href="http://www.icsc.org">www.icsc.org</a>
International Facility Management Association	<a href="http://www.ifma.org">www.ifma.org</a>
NAIOP Commercial Real Estate Development Association	<a href="http://www.naiop.org">www.naiop.org</a>
National Association of Home Builders	<a href="http://www.nahb.com">www.nahb.com</a>
National Association of Women in Construction	<a href="http://www.nawic.org">www.nawic.org</a>
National Indian Gaming Association	<a href="http://www.indiangaming.org">www.indiangaming.org</a>
National Mining Association	<a href="http://www.nma.org">www.nma.org</a>
Royal Institution of Chartered Surveyors	<a href="http://www.rics.org">www.rics.org</a>
SAVE International	<a href="http://www.value-eng.org">www.value-eng.org</a>
Society for College & University Planning	<a href="http://www.scup.org">www.scup.org</a>
Society for Marketing Professional Services	<a href="http://www.smps.org">www.smps.org</a>
Society for Mining, Metallurgy & Exploration	<a href="http://www.smenet.org">www.smenet.org</a>
Society of American Military Engineers	<a href="http://www.same.org">www.same.org</a>
U.S. Green Building Council	<a href="http://www.usgbc.org">www.usgbc.org</a>
Urban Land Institute	<a href="http://www.uli.org">www.uli.org</a>

## LEADERSHIP IN ENERGY & ENVIRONMENTAL DESIGN

Leadership in Energy and Environmental Design (LEED) is a voluntary green building certification system which recognizes that a building or community was designed and built using strategies aimed at improving performance across the following sustainability metrics: energy savings, water efficiency, CO<sub>2</sub> emissions reduction, improved indoor environmental quality, and stewardship of resources and sensitivity to their impacts.

Developed by the U.S. Green Building Council (USGBC), LEED provides building owners and operators with a concise framework for identifying and implementing practical and measurable green building design, construction, operations and maintenance solutions.

### HOW LEED WORKS

LEED can be applied to any building type and any building life cycle phase. It promotes a whole-building approach to sustainability by recognizing performance in key areas:

- Sustainable Sites
- Water Efficiency
- Energy & Atmosphere
- Materials & Resources
- Indoor Environmental Quality

LEED points are awarded on a 100-point scale, and credits are weighted to reflect their potential environmental impacts. Additionally, 10 bonus credits are available, six of which are awarded for innovation in design and four of which address regionally specific environmental issues.

LEED Certification is achievable in one of five current rating systems: Building Design and Construction; Interior Design and Construction; Building Operations and Maintenance; Neighborhood Development and Homes, each with a distinct weighting system.

	New Const.*	Core & Shell	Schools	Retail	Data Centers	Warehouse & Dist. Centers	Hospitality	Healthcare
Location & Transportation	16	20	15	16	16	16	16	9
Sustainable Sites	10	11	12	10	10	10	10	9
Water Efficiency	11	11	12	12	11	11	11	11
Energy & Atmosphere	33	33	31	33	33	33	33	35
Materials & Resources	13	14	13	13	13	13	13	19
Indoor Environmental Quality	16	10	16	15	16	16	16	16
Innovation in Design	6	6	6	6	6	6	6	6
Regional Priority	4	4	4	4	4	4	4	4
<b>Total Possible</b>	<b>110</b>	<b>110</b>	<b>110</b>	<b>110</b>	<b>110</b>	<b>110</b>	<b>110</b>	<b>110</b>

\* For Retail New Construction and Retail Commercial Interiors, points requirements match New Construction / Commercial Interiors, respectively.

A project must satisfy all prerequisites and earn a minimum number of points to be certified at one of four levels.

<b>LEED CERTIFICATION SCORING</b> (out of a possible 100 points + 10 bonus points)	
Certified	40+ points
Silver	50+ points
Gold	60+ points
Platinum	80+ points

## LEADERSHIP IN ENERGY & ENVIRONMENTAL DESIGN

### ELIGIBILITY

Building types that are eligible for certification include - but are not limited to - offices, retail and service establishments, institutional buildings (e.g., libraries, schools, museums and religious institutions), hotels and residential buildings of four or more habitable stories.

### WHO USES LEED?

Architects, real estate professionals, facility managers, engineers, interior designers, landscape architects, construction managers, lenders and government officials all use LEED to help transform the built environment to sustainability.

Many U.S. state and local governments are adopting LEED for public-owned and public-funded buildings; there are LEED initiatives in federal agencies, including the Departments of Defense, Agriculture, Energy, and State; and LEED projects are in countries worldwide, including Canada, Brazil, Mexico and India.

### BENEFITS

There are both environmental and financial benefits to earning LEED certification.

LEED-certified buildings are designed to:

- Lower operating costs and increase asset value
- Reduce waste sent to landfills
- Conserve energy and water
- Be healthier and safer for occupants
- Reduce harmful greenhouse gas emissions
- Qualify for tax rebates, zoning allowances and other incentives in hundreds of cities
- Demonstrate an owner's commitment to environmental stewardship and social responsibility

## PROCUREMENT OPTIONS

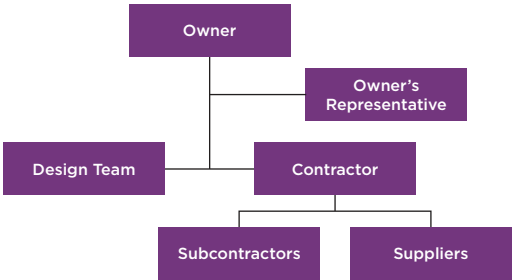
Selecting the best procurement method for a project is fundamental to its success, and will affect its cost, schedule, quality and team relationships throughout the project's development. Procurement strategies should be considered fully at the earliest opportunity and should be weighed with regards to owner and project requirements. Rider Levett Bucknall can advise on an appropriate route to best meet these requirements.

Descriptions of some of the more common procurement routes - along with advantages and concerns to consider before utilizing - are on the following pages.

Rider Levett Bucknall is also well versed in implementing projects using Integrated Project Delivery and other collaborative practices. Through these proactive strategies, owners can align the interests of the project team to operate in a more efficient and effective manner, delivering a superior project and ultimately increasing value for the owner.

## PROCUREMENT OPTIONS

### DESIGN-BID-BUILD



### KEY FEATURES

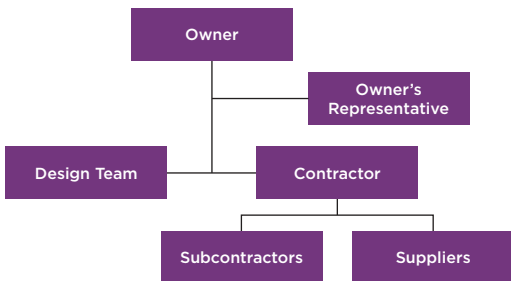
- Owner contracts with design team first, then with construction team after design is complete
- Design fully complete prior to contractor bidding
- Construction starts after design and bidding processes are complete

ADVANTAGES	CONCERNS / RISKS
<ul style="list-style-type: none"> <li>• Best potential for competitive construction bidding (lowest price)</li> <li>• Contractor familiarity with process</li> <li>• Accommodates owner input throughout design process</li> <li>• Facilitates check and balance process between design and construction</li> </ul>	<ul style="list-style-type: none"> <li>• Construction starts only after design and bidding is complete</li> <li>• Design and construction related decisions must be made early</li> <li>• No contractor input to design process</li> <li>• Competitive bidding creates higher risk for change orders and litigation</li> <li>• No team-oriented approach</li> </ul>

### SEQUENCE



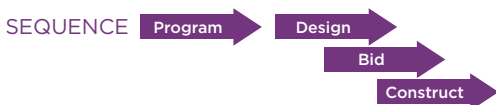
## CONSTRUCTION MANAGER AT-RISK



### KEY FEATURES

- Owner contracts with design team and construction team concurrently at beginning of design process
- Contractor provides cost and constructability input throughout design process
- Contractor provides guaranteed maximum price (GMP) based on partial design
- Construction can start prior to design completion

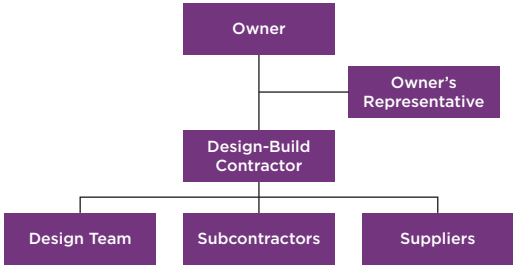
ADVANTAGES	CONCERNS / RISKS
<ul style="list-style-type: none"> <li>• Early construction start facilitates expedited schedule (fast track)</li> <li>• Contractor advice informs design, typically generates more efficient design</li> <li>• Accommodates owner input through design</li> <li>• Facilitates check and balance process between design and construction</li> <li>• Pricing and cost control performed during preconstruction</li> </ul>	<ul style="list-style-type: none"> <li>• Limited competitive bidding</li> <li>• Added cost of contractor participation in design process</li> <li>• Timing and assumptions of GMP contract must be closely managed</li> <li>• Contingencies must be closely monitored and managed</li> </ul>





## PROCUREMENT OPTIONS

### DESIGN-BUILD

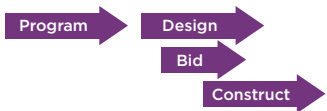


### KEY FEATURES

- Owner executes one contract with integrated design/construction team based on program requirements
- Design/construction team executes full design, bidding and construction process based on requirements
- Construction typically starts before design completion

ADVANTAGES	CONCERNS / RISKS
<ul style="list-style-type: none"> <li>• Single point of responsibility and risk for design and construction</li> <li>• Early construction start facilitates expedited schedule</li> <li>• Contractor can integrate design with construction for more efficient schedule</li> <li>• Cost certainty at outset (for work included in requirements document)</li> </ul>	<ul style="list-style-type: none"> <li>• Owner input in design process is limited; owner requirements must be clearly outlined and communicated before start of process</li> <li>• Limited competitive bidding</li> <li>• Integrated contract eliminates check and balances between design and construction</li> <li>• Quality of end product must be closely monitored</li> </ul>

### SEQUENCE



## ESTIMATING DATA

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## UNIVERSITY OF ILLINOIS AT CHICAGO- MILE SQUARE HEALTH CENTER

CHICAGO, ILLINOIS

The University of Illinois at Chicago Mile Square Health Center is a six-story 121,750 square foot medical office building with five occupied floors and a mechanical penthouse. The first two floors are to be occupied by the Mile Square Health Center, and the upper three floors shelled and designed to specifications. The site is a 2.1-acre twin-parcel on the near West side of Chicago adjacent to the University of Illinois Medical/Health Sciences Campus. With poor soil conditions and a high water table, deep foundations were utilized in this project.

Rider Levett Bucknall provided construction cost estimating services during the design document and construction document phase of this project.

## MECHANICAL & ELECTRICAL COSTS

The costs stated in this section reflect the standards and specifications normal to that region. Variation in costs may be experienced for factors such as site conditions, climatic conditions, standards of specification, market conditions, etc.

All costs are stated in USD(\$) per square foot, based on rates at December 2015.

LOCATION	M/E INDEX	SCHOOLS								HOSPITAL	
		ELEMENTARY		HIGH SCHOOL		UNIVERSITY		GENERAL		LOW	HIGH
		LOW	HIGH	LOW	HIGH	LOW	HIGH	LOW	HIGH		
<b>NORTH AMERICA</b>											
Boston	1.56	59	81	80	120	92	144	164	248		
Calgary	1.33	51	70	68	103	78	123	141	212		
Chicago	1.49	57	78	76	115	87	138	157	236		
Denver	1.01	39	53	52	78	60	94	107	161		
Honolulu	1.87	71	98	96	144	110	173	197	297		
Las Vegas	0.99	38	52	51	76	58	91	104	157		
Los Angeles	1.40	53	73	72	108	82	130	148	223		
New York	1.83	70	95	93	141	107	169	193	290		
Phoenix	1.00	38	52	51	77	59	93	106	159		
Portland	1.07	41	56	55	83	63	99	113	170		
San Francisco	1.67	64	87	85	129	98	155	176	265		
Seattle	1.18	45	62	61	92	70	110	125	188		
Washington, DC	1.45	55	76	74	112	85	134	153	231		

MECHANICAL & ELECTRICAL COSTS

LOCATION	M/E INDEX	OFFICES - Class A						SHOPPING						HOTELS					
		PRIME		SECONDARY		CENTER		STRIP		5 STAR		3 STAR							
		LOW	HIGH	LOW	HIGH	LOW	HIGH	LOW	HIGH	LOW	HIGH	LOW	HIGH						
NORTH AMERICA																			
Boston	1.56	81	134	70	95	47	70	37	56	100	141	68	98						
Calgary	1.33	70	115	60	81	41	60	32	48	86	121	58	84						
Chicago	1.49	78	128	66	91	45	66	36	53	96	134	65	94						
Denver	1.01	53	87	45	62	31	45	24	36	65	92	44	64						
Honolulu	1.87	98	160	83	114	57	83	45	67	120	169	81	118						
Las Vegas	0.99	52	85	44	60	30	44	24	35	63	89	43	62						
Los Angeles	1.40	73	121	63	86	43	63	34	50	90	127	61	89						
New York	1.83	95	157	82	111	56	82	44	66	117	165	80	115						
Phoenix	1.00	52	86	45	61	31	45	24	36	64	90	44	63						
Portland	1.07	56	92	48	65	33	48	26	38	69	97	47	67						
San Francisco	1.67	87	143	75	102	51	75	40	60	107	151	73	105						
Seattle	1.18	62	102	53	72	36	53	28	43	76	107	52	75						
Washington, DC	1.45	76	125	65	89	44	65	35	52	93	131	63	92						

LOCATION	M/E INDEX	PARKING				INDUSTRIAL				RESIDENTIAL MULTISTORY			
		MULTI-STORY		BASEMENT		WAREHOUSE		ATTACHED OFFICE		INVESTMENT		OCCUPIED	
		LOW	HIGH	LOW	HIGH	LOW	HIGH	LOW	HIGH	LOW	HIGH	LOW	HIGH
NORTH AMERICA													
Boston	1.56	12	17	15	25	14	29	37	70	46	68	58	92
Calgary	1.33	10	15	13	22	12	25	32	60	39	58	49	78
Chicago	1.49	11	16	15	24	13	28	36	66	44	65	55	87
Denver	1.01	8	11	10	17	9	19	24	45	30	44	37	60
Honolulu	1.87	14	20	18	30	16	35	45	83	55	81	69	110
Las Vegas	0.99	8	11	10	16	9	18	24	44	29	43	37	58
Los Angeles	1.40	11	15	14	23	12	26	34	63	41	61	52	82
New York	1.83	14	20	18	30	16	34	44	82	54	80	68	107
Phoenix	1.00	8	11	10	16	9	19	24	45	29	44	37	59
Portland	1.07	8	12	10	17	9	20	26	48	31	47	40	63
San Francisco	1.67	13	18	16	27	15	31	40	75	49	73	62	98
Seattle	1.18	9	13	12	19	10	22	28	53	35	52	44	70
Washington, DC	1.45	11	16	14	24	13	27	35	65	43	63	54	85

## OFFICE BUILDING EFFICIENCIES

The efficiency of an office building is expressed as a percentage of the Net Rentable Area to the Gross Floor Area. The table below indicates that relationship to the Gross Floor Area of the whole building both with parking garages and basements included and excluded, that could be expected for an average project in the nominated category. Also shown is the efficiency of a typical floor in each category.

TYPE OF OFFICE BUILDING	EFFICIENCY (PER CENT)		
	BASEMENTS & PARKING		TYPICAL FLOOR
	INCLUDED	EXCLUDED	
<b>PRESTIGE CENTRAL BUSINESS DISTRICT (CBD)</b>			
10 to 25 Stories	63 - 68	75 - 80	85 - 90
25 to 40 Stories	58 - 63	70 - 75	80 - 85
40 to 55 Stories	53 - 58	68 - 73	75 - 80
<b>INVESTMENT CBD</b>			
Up to 10 Stories	69 - 74	81 - 85	86 - 91
10 to 25 Stories	64 - 69	76 - 81	81 - 86
25 to 40 Stories	59 - 64	71 - 76	76 - 81
<b>INVESTMENT, OTHER THAN CBD</b>			
Up to 10 Stories	70 - 75	82 - 86	87 - 92
10 to 25 Stories	65 - 70	77 - 82	82 - 87

## MECHANICAL & ELECTRICAL SERVICES

Generally mechanical and electrical space represents 5 - 7% of the Gross Floor Area of a multi-story office building.

## LABOR & MATERIAL TRADE RATIOS

The following represents the ratio of on-site labor to material for various trades and sub-trades based upon our own survey.

The figures are relevant to all works constructed by traditional practices; variations to these practices will change the ratios, i.e. on-site fabrication of items traditionally factory fabricated such as casework, metalwork items, etc.

	Labor	Material	Fixed Factor
General Conditions	40	10	50
Demolition		85	15
Excavation	32	15	53
Piling	20	50	30
Concrete	25		75
Formwork	70		30
Reinforcement	20		80
Precast concrete	20		80
Brick & Block	50		50
Stone Masonry	10		90
Asphalt Roofing	40		60
Structural Steelwork	6		94
Metalwork	20		80
Suspended Ceilings	40		60
Carpentry	45		55
Millwork	15		85
Miscellaneous Metals	25		75
Steel Deck Roofing	40		60
Built Up Roofing	30		70
Pipework Plumbing	44		56
Plumbing Fitting	25		75
Drainage	60		40
Plastering	80		20
Gypsum Board	40		60
Ceramic Tiles	55		45
Vinyl Tiles	45		55
Painting	75		25
Vinyl Wall Fabric	60		40
Paper Hanging	35		65
Carpet	10		90
Roadwork & Paving	15		85
HVAC	35		65
Elevators	25		75
Electrical	40		60
Fire Sprinklers	44		56



## ESTIMATING REINFORCEMENT RATIOS

The following ratios give an indication of the average weight of bar reinforcement in typical concrete applications. Differing structural systems, ground conditions, height of buildings, load calculations and sizes of individual elements and grid sizes may cause considerable variation to the stated ratios. For project specific ratios a structural engineer should be consulted.

ELEMENT	WEIGHT RATIO	
Caissons (belled or straight shaft)		
12" diameter	40	lbs/Lft
36" diameter	350	lbs/Lft
72" diameter	1500	lbs/Lft
Paving	3	lbs/sq ft
Cantilevered retaining walls (1 face of rebar, 1 layer)		
8" thick, 10' - 12' high	96	lbs/yd <sup>3</sup>
12" thick, 10' - 12' high	62	lbs/yd <sup>3</sup>
Continuous, stepped and sloped footings	5 - 25	lbs/Lft
	25 - 110	lbs/yd <sup>3</sup>
Grade beams	7.5 - 35	lbs/Lft
	40 - 132	lbs/yd <sup>3</sup>
Slab on-grade	1.5 - 4.75	lbs/sq ft
	90 - 165	lbs/yd <sup>3</sup>
Beams		
10' - 16'	210 - 240	lbs/yd <sup>3</sup>
20' - 26'	200 - 230	lbs/yd <sup>3</sup>
Columns	210 - 530	lbs/yd <sup>3</sup>
Supported slabs	2.25 - 6.75	lbs/sq ft
	85 - 155	lbs/yd <sup>3</sup>
Slab over metal deck	2.08 - 4.15	lbs/sq ft
	98 - 140	lbs/yd <sup>3</sup>
Pits and trenches	50 - 70	lbs/yd <sup>3</sup>
Tiltup panels	1.5	lbs/sq ft

## **PROGRESS PAYMENTS**

The tabulations on the following pages are derived from the statistical average of a series of case histories which, when used for a specific project, will give an indication of the anticipated rate of expenditure. Construction times incorporate various extensions including wet weather, industrial disputes, etc.

All data is related to the date of submission of contractor's application for payment to the owner and not actual payment which is generally one month later.

No adjustment has been made for the retained money on the assumption that most projects will substitute bonds for retainage.

**PROGRESS PAYMENTS**

Construction projects under \$5,000,000 and/or less than one year construction period to substantial completion.

CONTRACT DURATION	BUILDER'S WORK	MECHANICAL SERVICES	ELEVATORS, ETC.	ELECTRICAL SERVICES	OVERALL PROJECT
%	%	%	%	%	%
5	3.9	—		—	3.3
10	8.6	—		—	7.2
15	13.6	1.2		—	11.5
20	18.7	3.5		0.2	16.0
25	25.0	7.6		2.0	21.7
30	31.4	13.9		4.6	27.8
35	37.9	21.0		9.9	34.2
40	44.4	29.6	N	16.0	40.8
45	51.0	38.4		22.1	47.5
50	57.7	47.7	I	29.6	54.5
55	64.2	56.5		37.9	61.3
60	70.5	65.2	L	48.5	68.1
65	76.4	73.3		63.2	74.7
70	81.6	80.0		71.7	80.2
75	86.1	85.7		78.0	85.1
80	90.2	90.3		83.2	89.4
85	93.5	94.0		88.0	92.9
90	95.7	95.7		92.6	95.2
95	97.2	97.0		95.8	96.8
100	98.4	98.2		97.4	98.0

Construction projects from \$5,000,000 to \$40,000,000 and/or greater than one year but less than two years construction period to substantial completion.

CONTRACT DURATION	BUILDER'S WORK	MECHANICAL SERVICES	ELEVATORS, ETC.	ELECTRICAL SERVICES	OVERALL PROJECT
%	%	%	%	%	%
5	2.8	—	—	—	1.9
10	6.1	—	—	—	4.2
15	9.9	—	—	0.5	6.9
20	14.2	1.5	—	1.4	10.2
25	19.1	4.8	—	3.3	14.1
30	24.3	10.5	0.9	6.4	18.8
35	31.1	16.9	6.0	9.8	24.6
40	37.8	25.9	11.2	14.1	31.2
45	44.7	36.7	17.7	19.4	38.2
50	50.5	49.9	25.4	25.1	46.6
55	57.3	61.3	34.9	33.1	55.3
60	63.7	70.1	46.2	43.0	62.7
65	69.7	76.9	61.2	54.9	69.6
70	75.3	82.8	73.5	68.6	76.4
75	81.0	88.4	80.8	78.1	82.1
80	86.2	92.4	85.7	85.0	86.9
85	91.1	94.9	89.9	90.8	91.1
90	94.5	96.8	93.1	94.3	93.9
95	97.1	97.9	94.5	96.7	96.3
100	98.5	98.3	95.1	97.5	97.5

**PROGRESS PAYMENTS**

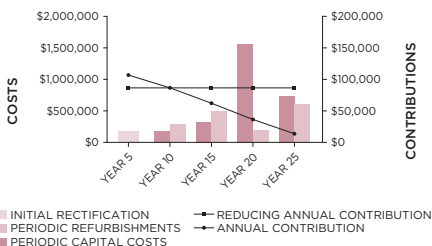
Construction projects from \$40,000,000 and/or greater than two years construction period to substantial completion.

CONTRACT DURATION	BUILDER'S WORK	MECHANICAL SERVICES	ELEVATORS, ETC.	ELECTRICAL SERVICES	OVERALL PROJECT
%	%	%	%	%	%
5	1.4	—	—	—	0.9
10	3.3	—	—	—	2.1
15	5.6	—	—	—	3.6
20	8.7	0.3	—	0.5	5.7
25	12.2	1.2	—	2.0	8.3
30	16.6	3.6	0.3	4.3	11.8
35	21.3	7.8	4.9	7.4	16.2
40	27.9	13.3	10.1	11.4	22.3
45	35.3	19.9	16.1	17.3	29.3
50	43.1	26.6	22.2	23.5	36.6
55	50.5	33.9	34.8	30.1	44.4
60	57.3	42.1	49.0	37.6	52.1
65	63.6	50.6	67.0	45.9	59.8
70	69.8	59.1	76.8	55.0	67.0
75	76.0	67.3	82.6	65.4	73.9
80	82.2	75.4	87.2	76.4	80.7
85	87.5	83.4	90.6	85.2	86.7
90	92.7	90.3	94.0	92.2	92.2
95	96.8	96.1	96.4	96.8	96.6
100	98.8	98.9	97.6	98.6	98.8

## SINKING FUNDS

A sinking fund provides a responsible and equitable method of managing future capital expenditure. Sinking funds for property address capital expenditure for repainting, recarpeting, replacement of machinery and equipment, refurbishment of common property and similar items which inevitably wear out.

### BASED ON A \$15 MILLION OFFICE BUILDING



Drawdowns can be equal annual contributions or reducing annual contributions for the specified period, as commitments are met, as graphically illustrated.

Property owners have a degree of control over when capital expenditure is committed, i.e. certain items can be deferred or brought forward.

The following sinking fund table with total capital expenditure over 25 years of \$4,350,000 reflects the benefit and sensitivity of expenditure deferral.

	YR 5	YR 10	YR 15	YR 20	YR 25
<b>SCHEDULED</b>					
x	78,779	78,779	78,779	78,779	78,779
∅	101,942	82,416	62,565	39,822	12,561
<b>TWO YEAR EXPENDITURE</b>					
x	63,978	63,978	63,978	63,978	63,978
∅	77,251	64,868	49,891	32,068	10,201
x - Annual Contribution			∅ - Reducing Annual Contribution		

## METHOD OF MEASUREMENT OF BUILDING AREAS

The following rules for measurement of building areas are extracted from the BOMA Method of Measurement (1996 Revision) which is published by the Building Owners and Managers Association International.

### GROSS BUILDING AREA

The GROSS BUILDING AREA shall mean the total constructed area of a building. The area is computed by measuring to the outside finished surface of permanent outer building walls, without any deductions. All enclosed floors of the building, including basements, garages, mechanical equipment floors, penthouses, and the like are calculated.

### FLOOR RENTABLE AREA

FLOOR RENTABLE AREA shall mean the result of subtracting from the GROSS BUILDING AREA of a floor the area of MAJOR VERTICAL PENETRATIONS on that same floor. No deductions shall be made for columns and projections necessary to the building. Spaces outside the exterior walls, such as balconies, terraces, or corridors are excluded.

### FLOOR USABLE AREA

FLOOR USABLE AREA shall be computed by measuring the area enclosed between the finished surface of the office area side of corridors and the dominant portion and/or the major vertical penetrations. No deductions shall be made for columns and projections necessary to the building. Where alcoves, recessed entrances or similar deviations from the corridor line are present, floor usable area shall be computed as if the deviation were not present.

## DEFINITIONS

### BUILDING WORKS

Building works include substructure, structure, finishes, fittings, general conditions, supervision of sub-trades and general contractor's work in connection with services.

### BUILDING SERVICES

Building services include special equipment, plumbing, fire protection, mechanical, vertical transportation, building management and electrical services.

### OFFICE BUILDINGS

Prestige offices are based on very high quality buildings for the upper range of the rental market and leading owner-occupiers including headquarters buildings for banks, insurance, mining and other major companies.

Investment offices are based on good quality buildings which are built for the middle range of the rental market.

### HOTEL

RATING	GFA/ROOM TOTAL	GFA/ROOM ACCOM.	GFA/ROOM PUBLIC
5 STAR	915-1200 SF	485-600 SF	430-600 SF
4 STAR	700-915 SF	430-485 SF	275-430 SF
3 STAR	430-700 SF	325-430 SF	115-270 SF
	GFA/UNIT TOTAL	GFA/UNIT ACCOM.	GFA/UNIT PUBLIC SPACE
ALL SUITES	700-860 SF	645-750 SF	50-110 SF

*Exclusions: Furniture, Fixtures and Equipment.*

*Note: Public space includes back-of-house areas.*

### CAR PARKS

Multi-story - Minimal external walls.

Basement - Central business district locations incur higher penalties for restricted sites and perimeter conditions.



## DEFINITIONS

### INDUSTRIAL BUILDINGS

Quality reflects a simplified type of construction suitable for light industry. Exclusions: special equipment.

### REGIONAL SHOPPING CENTERS

**Department Store:** partially finished suspended ceilings and painted walls. Exclusions: Floor finishes, store fixtures, etc.

**Supermarket:** fully finished space with utilities. Exclusions: cool rooms, store fixtures, etc.

**Malls:** fully finished space with utilities.

**Specialty shops:** partially finished with ceilings, unpainted walls, power to perimeter point. Exclusions: floor finishes, store fixtures, etc.

### SMALL SHOPS AND SHOWROOMS

Exclusions: floor finishes, plumbing (other than stub outs for cold water and drainage in each store), store fittings, etc.

### RESIDENTIAL

Multi-story condominiums reflect medium to luxury quality, air-conditioned, accommodation up to 20 stories in height.

Single-story or walk-up units reflect medium quality non air conditioned accommodation.

Note: the ratio of kitchen, laundry and bathroom areas to living areas and finishes required considerably affects the cost range.

Range given is significantly affected by the height and configuration of the building.

Exclusions: furnishings, carpet, special fixtures, washing machines, dryers, refrigerators and tenant's special requirement.





## THE PALACE HOTEL

SAN FRANCISCO, CALIFORNIA

Established in 1875, the Palace Hotel, a Luxury Collection Hotel, is an icon in San Francisco. The legendary hotel recently revealed a new look after undergoing an extensive renovation. Keeping true to preserving the integrity of the hotel, a classically inspired contemporary design complements the historic architecture. Amenities, custom created for the comfort of the savvy traveler, boast beauty and functionality.

Rider Levett Bucknall was proud to provide project management services for the 2015 transformation of the Palace Hotel. The major renovation of 556 guest rooms included the addition of three new suites. The Garden Court, a San Francisco landmark, received soft modernization. The lobby, promenade and guest reception areas were redone and the Palace Collection gift boutique was added. The hotel's sky lit indoor swimming and fitness center were remodeled - expanding the overall square footage of the workout facility. In addition, structural improvements were made to the parking garage originally built in 1925 and ADA services were upgraded throughout the hotel.

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Rider Levett Bucknall   Life	97



## FOUR SEASONS RESORT O'AHU AT KO OLINA

KAPOLEI, HAWAII

Rider Levett Bucknall provided project management services for the new Four Seasons Resort O'ahu at Ko Olina, ushering in a new era of luxury on Oahu's beautiful west coast. Dedicating nearly 16,000 hours over a one-year time frame, Rider Levett Bucknall's team of project managers helped Four Seasons achieve their project goals by managing all cost and time elements of the project. Rider Levett Bucknall's services helped minimize risk over the life of the project while maximizing profitability and project success for our client. Individual architects provided plans for specific parts of the resort, each offering a unique perspective on the project. Rider Levett Bucknall merged those views into one cohesive resort that reflects Four Seasons world class luxury brand. Features include a stunning adults-only infinity pool, super cabanas at the ocean's edge, traditional Hawaiian healing hales, and five new restaurants serving cuisines from around the globe.

The Four Seasons brand is world renowned for customer service and the Rider Levett Bucknall team fulfilled all elements securing every luxury promised to future guests. Back of house features including upgraded internet access and enhanced security allow the Four Seasons' staff to respond to guest requests within moments, fulfilling the brand promise.

## PROFESSIONAL SERVICES

Rider Levett Bucknall offers the following professional services on building and civil engineering projects including the specialist components of plumbing, mechanical, electrical, vertical transportation, fire and security systems.

## COST CONSULTANCY SERVICES

The service encompasses cost estimating, cost management, the production of bid and contract documents, the financial administration of building contracts and dispute resolution.

### Planning Stage Cost Control

- Budget report
- Elemental analysis
- Estimates
- Cost benefit studies
- Cost planning
- Cost negotiation

### Contractual Advice

- Project delivery systems
- Forms of contract
- Special contract clauses
- Bidding procedures
- Contractor suitability reports
- Design/Build & package deal contractual assessments

### Cost Control Documentation

- Bills of quantities
- Trade bills of quantities
- Provisional bills of quantities
- Simplified bills of quantities

### Bid Advice

- Assessment of bids
- Negotiation

### Construction Stage Cost Control

- Valuation of monthly progress claims
- Progressive budgetary reporting
- Change order review and negotiation
- Cost escalation calculations

## PROJECT MANAGEMENT SERVICES

### Feasibility

- Definition of client's requirements
- Review of concept design
- Budget development
- Evaluation of environmental studies
- Preliminary project scheduling
- Cash flow and market analysis
- Risk analysis and identification
- Value engineering studies
- Feasibility studies and recommendations

### Design & Development

- Consultant selection advice and contract negotiation
- Contract execution
- Prepare project scope
- Value engineering
- Confirm preliminary cost estimate and prepare cost plan
- Submit regular design status reports
- Advise on project delivery systems
- Prepare and monitor design documentation
- Manage and coordinate consultant team
- Chair regular project management meetings
- Maintain compliance with client objectives
- Negotiate with authorities as required
- Constructability review
- Provide design and feasibility reports
- Obtain client approval and sign off
- Prepare and monitor project schedule

## PROJECT MANAGEMENT SERVICES

### Documentation & Pre-Contract

- Formulate contract strategies
- Prepare conditions of contract
- Secure authority and client approvals
- Manage documentation
- Cost control of design against budget
- Check design against client's requirements
- Set up management reporting system
- Set up cost control procedures
- Prepare contract administration procedures
- Prepare project manual
- Chair project management meetings
- Prepare monthly project progress reports
- Coordinate the bid documents
- Prepare bid report with recommendations
- Formalize and execute contract
- Prepare and monitor project website

### Construction

- Monitor and report schedule performance
- Coordinate documentation for fast-tracking
- Monitor contract compliance
- Manage documentation
- Identify potential delays and take action
- Process progress payments
- Monitor, analyze and forecast cash flows
- Enforce cost control procedures
- Chair cost management meetings
- Evaluate claims and manage disputes
- Prepare monthly project progress reports
- Identify potential cost overruns
- Evaluate extension of time claims
- Monitor contractor's performance
- Coordinate FF&E and fit-out procedures
- Maintain management reporting system
- Streamline and manage time and cost
- Monitor quality control



## ADVISORY SERVICES

### Alternate Dispute Resolution

- Arbitration of construction disputes
  - Private and AAA
  - Sole and panel
- Mediator of construction disputes
- Neutral third party evaluation
- Dispute review board members

### Condition Assessments

- Due diligence pre-acquisition surveys
- Dilapidation/condition surveys

### Construction Claims

- Performance and payment bond investigations
- Analysis of outstanding change order claims
- Cost auditing
- Loss of efficiency/lost productivity analysis
- Disruption impact analysis
- Critical path analysis
- Changed conditions analysis
- Estimating reasonable value of work installed
- Construction management oversight and contract close out
- Expert Witness testimony
- Preparation or defense of
  - Requests for equitable adjustments
  - Delay claims
  - Excusable and compensable time extensions

### Construction Defects

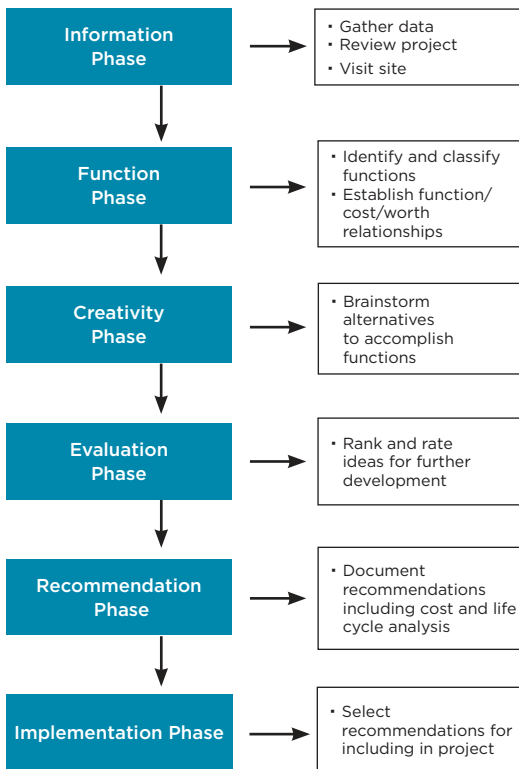
- Analysis of residential and commercial construction defects
- Standard of workmanship
- Scope and cost of repair
- Registrar of Contractors testimony
- Expert witness testimony
- Defense of plaintiff

### Construction Economic Advice

- Market analysis
- Cost research

VALUE MANAGEMENT

STEPS TO FOLLOW IN THE VALUE MANAGEMENT PROCESS



RIDER LEVETT BUCKNALL | LIFE

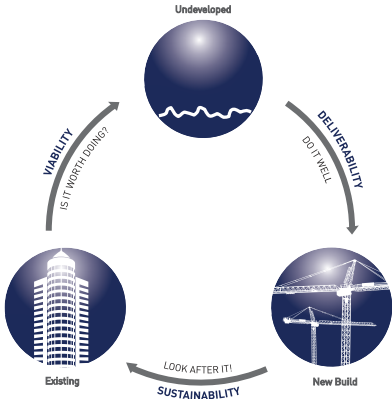


Innovative tools to help you achieve more efficient, cost conscious and environmentally sustainable results—now and into the future.

Forward-thinking organizations are taking proactive measures to use their resources wisely. Along with technological advances to improve efficiency, there has been a significant and lasting shift toward preventing waste by making better use of existing assets.

More and more organizations have a heightened interest in project solutions which maximize performance, enhance value, and minimize environmental impact. Facing limited capital resources, building owners and managers must find the right balance between initial capital cost and long-term operation and maintenance costs.

Rider Levett Bucknall|Life addresses this need by providing building owners and managers with new tools, methods, and information, allowing them to make well-informed decisions that represent their best long-term financial and sustainable interests.

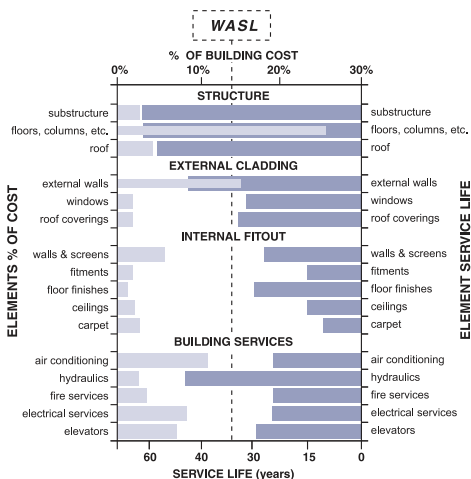


## RELIFING®

Rider Levett Bucknall's proprietary RELifing® service is a mathematically-based methodology to help building owners capture the remaining value and extend the life of their buildings after years of service.

RELifing® determines the 'useful life' of a building by analyzing the cost and service life of its various components—structure, external claddings, internal fit-out, and building systems—and then calculating the total life expectancy or Weighted Average Service Life (WASL)

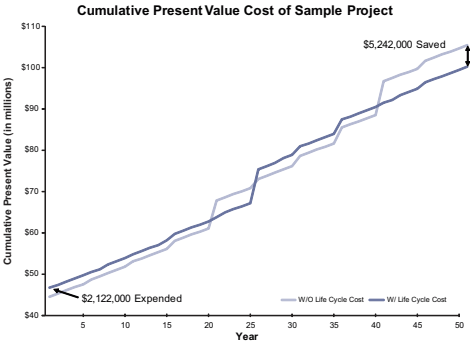
RELifing® then analyzes and prices the recommendations for maintenance, upgrades, renovation, and replacement of various building components necessary to extend the building's life expectancy to certain milestones. When this analysis is compared with the cost to build new, owners are presented with a quantitative tool to determine which investment option will make the best use of functional and financial resources.



## LIFE CYCLE COST + CARBON MODELING

This service is our response to the challenges property owners face in reconciling commercial viability with efficiency, sustainability, and environmental sensitivity throughout a structure’s life cycle. Using our model, owners can develop facilities which are not only cost effective to build but operationally efficient over their life span.

Sophisticated owners recognize that the capital cost of a facility may be less significant when compared with the total cost of ownership over time. An integrated Life Cycle Cost model enables capital and life cycle characteristics of individual components, elements, and whole buildings to be modeled and forecasted over the life of a proposed facility.



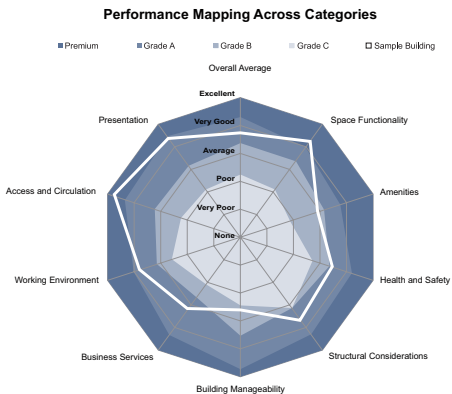
Interdependencies between variables are established and comparison of multiple options provides a frame of reference for making important long-term investment decisions. The model can also be used to calculate carbon footprint, LEED™, energy and CO<sub>2</sub> consumption, water consumption and capital allowances.

The Rider Levett Bucknall model can be used at all stages of the asset life cycle from inception, through design development and into operation.

## BUILDING QUALITY ASSESSMENT

There is a critical link between the quality of an office building and its ultimate performance as an asset. Yet, there is no prevailing rating system in place to measure a facility's relative strengths and weaknesses in relation to industry standards and tenant expectations.

Our Building Quality Assessment service addresses this need with a standardized method for quantifying and evaluating building quality based on standard criteria across a number of general categories (space functionality, amenities, building operations, etc.). The service provides a quality grade for a specific facility based on its physical characteristics and an 'apples to apples' comparative analysis against other similar structures.



The analysis highlights categories where the facility did not perform to the expected standards of quality and identifies areas where upgraded capacity or utility could be considered to enhance the grading performance of the building. This evaluation enables the optimization of the right mix of quality factors to match investor, owner, and user objectives.

## MISCELLANEOUS ITEMS

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## OREGON STATE HOSPITAL

SALEM, OREGON

Completed in 2012, the Oregon State Hospital is 630,000 square feet featuring a 620-bed facility, areas for patient housing, staff offices, counseling and treatment rooms, as well as indoor and outdoor recreation areas.

Extensive on-site special studies helped to identify the facility's condition and optimal locations for anticipated improvements. The previous facility was divided to the north and south side of Center Street. The new facility, located to the south, required substantial demolition and partial renovation to the majority of the 500,000 square feet of the on-site structures. The total cost of this project was \$334 Million.

Rider Levett Bucknall provided budget level cost planning, milestone estimates, General Contractor / Construction Manager reconciliation and Value Engineering services for the construction of replacement Oregon State Hospital facilities.

Photo courtesy of HTB



## CALCULATION FORMULAE

TO FIND	CALCULATE
Area of triangle	Base $\times$ $\frac{1}{2}$ $\times$ height
Area of circle	(radius) <sup>2</sup> $\times$ 3.1416
Area of sector of circle	Lengths of arc $\times$ $\frac{1}{2}$ $\times$ radius
Area of square, rhombus	Base $\times$ height
Area of equilateral triangle	(Side) <sup>2</sup> $\times$ 0.433
Area of trapezium	Height $\times$ $\frac{1}{2}$ $\times$ (sum of parallel sides)
Area of ellipse	Major axis $\times$ minor axis $\times$ 0.7854
Area of parabola	$\frac{2}{3}$ $\times$ base $\times$ height
Circumference of a circle	Diameter $\times$ 3.1416
Surface area of sphere	4 $\times$ (radius) <sup>2</sup> $\times$ 3.1416
Surface area of cone	(radius $\times$ slant side $\times$ 3.1416) + area of base
Volume of cylinder	Area of base $\times$ height
Volume of cube or prism	Length $\times$ breadth $\times$ depth
Volume of cone	Height $\times$ $\frac{1}{3}$ $\times$ area of base
Volume of hexagonal prism	(Side) <sup>2</sup> $\times$ height $\times$ 2.598
Volume of sphere	$\frac{4}{3}$ $\times$ (radius) <sup>3</sup> $\times$ 3.1416

## CONVERSION FACTORS

TO CONVERT	MULTIPLY BY
<b>LENGTH</b>	
Inches into centimeters	2.54
Centimeters into inches	0.394
Feet into meters	0.305
Yards into meters	0.914
Meters into feet	3.281
Feet into meters	0.305
Yards into meters	0.914
Meters into yards	1.094
Kilometers into miles	0.621
Miles into kilometers	1.609
<b>AREA</b>	
Square meters into square feet	10.764
Square feet into square meters	0.093
Square yards into square feet	9.0
Square yards into square meters	0.836
Square kilometers into square miles	0.386
Square kilometers into hectares	100.0
Square miles into square kilometers	2.59
Square miles into acres	640.0
Acres into square feet	43,560
Acres into square meters	4,046.86
Acres into hectares	0.405
Hectares into acres	2.471
<b>TEMPERATURE</b>	
Degree Celsius to Degree Fahrenheit	$(^{\circ}\text{C} \times 9/5) + 32$
Degree Fahrenheit to Degree Celsius	$(^{\circ}\text{F} - 32) \times 5/9$

## CONVERSION FACTORS

TO CONVERT	MULTIPLY BY
<b>VOLUME AND CAPACITY</b>	
Cubic feet into cubic meters	0.028
Cubic meters into cubic feet	35.315
Cubic yards into cubic meters	0.765
Cubic feet into liters	28.3168
U.S. pints into liters	0.473
U.S. quarts into liters	0.946
U.S. gallons into liters	3.785
Liters into U.S. gallons	0.264
Liters into U.S. pints	2.113
<b>POWER</b>	
Foot pounds-force/second into watts	1.356
Horsepower into watts	745.7
Kilowatts into horsepower	1.341
<b>MASS</b>	
Grams into ounces	0.035
Ounces into grams	28.350
Ounces into pounds	0.063
Ounces into kilograms	0.028
Pounds into kilograms	0.454
Kilograms into pounds	2.205
U.S. tons into metric tons	0.907
U.S. tons into pounds	2,000
Metric tons into pounds	2,204.623
Metric tons into U.S. tons	1.102
<b>FORCE</b>	
Newtons into pounds force	0.225

## CALENDAR

### JANUARY 2017

S	M	T	W	T	F	S
1	2	3	4	5	6	7
8	9	10	11	12	13	14
15	16	17	18	19	20	21
22	23	24	25	26	27	28
29	30	31				

### FEBRUARY 2017

S	M	T	W	T	F	S
			1	2	3	4
5	6	7	8	9	10	11
12	13	14	15	16	17	18
19	20	21	22	23	24	25
26	27	28				

### MARCH 2017

S	M	T	W	T	F	S
			1	2	3	4
5	6	7	8	9	10	11
12	13	14	15	16	17	18
19	20	21	22	23	24	25
26	27	28	29	30	31	

### APRIL 2017

S	M	T	W	T	F	S
						1
2	3	4	5	6	7	8
9	10	11	12	13	14	15
16	17	18	19	20	21	22
23	24	25	26	27	28	29
30						

### MAY 2017

S	M	T	W	T	F	S
	1	2	3	4	5	6
7	8	9	10	11	12	13
14	15	16	17	18	19	20
21	22	23	24	25	26	27
28	29	30	31			

### JUNE 2017

S	M	T	W	T	F	S
				1	2	3
4	5	6	7	8	9	10
11	12	13	14	15	16	17
18	19	20	21	22	23	24
25	26	27	28	29	30	

### JULY 2017

S	M	T	W	T	F	S
						1
2	3	4	5	6	7	8
9	10	11	12	13	14	15
16	17	18	19	20	21	22
23	24	25	26	27	28	29
30	31					

### AUGUST 2017

S	M	T	W	T	F	S
		1	2	3	4	5
6	7	8	9	10	11	12
13	14	15	16	17	18	19
20	21	22	23	24	25	26
27	28	29	30	31		

## CALENDAR

### SEPTEMBER 2017

S	M	T	W	T	F	S
					1	2
3	4	5	6	7	8	9
10	11	12	13	14	15	16
17	18	19	20	21	22	23
24	25	26	27	28	29	30

### OCTOBER 2017

S	M	T	W	T	F	S
1	2	3	4	5	6	7
8	9	10	11	12	13	14
15	16	17	18	19	20	21
22	23	24	25	26	27	28
29	30	31				

### NOVEMBER 2017

S	M	T	W	T	F	S
			1	2	3	4
5	6	7	8	9	10	11
12	13	14	15	16	17	18
19	20	21	22	23	24	25
26	27	28	29	30		

### DECEMBER 2017

S	M	T	W	T	F	S
					1	2
3	4	5	6	7	8	9
10	11	12	13	14	15	16
17	18	19	20	21	22	23
24	25	26	27	28	29	30
31						

### JANUARY 2018

S	M	T	W	T	F	S
	1	2	3	4	5	6
7	8	9	10	11	12	13
14	15	16	17	18	19	20
21	22	23	24	25	26	27
28	29	30	31			

### FEBRUARY 2018

S	M	T	W	T	F	S
				1	2	3
4	5	6	7	8	9	10
11	12	13	14	15	16	17
18	19	20	21	22	23	24
25	26	27	28			

### MARCH 2018

S	M	T	W	T	F	S
			1	2	3	
4	5	6	7	8	9	10
11	12	13	14	15	16	17
18	19	20	21	22	23	24
25	26	27	28	29	30	31

### APRIL 2018

S	M	T	W	T	F	S
1	2	3	4	5	6	7
8	9	10	11	12	13	14
15	16	17	18	19	20	21
22	23	24	25	26	27	28
29	30					

## IMPORTANT DATES

EVENT	DATE
New Year's Day	Sunday, January 1
Martin Luther King Day	Monday, January 16
Chinese New Year	Sunday, January 28
Ash Wednesday	Wednesday, March 1
Valentine's Day	Tuesday, February 14
Presidents' Day	Monday, February 20
Daylight Savings Starts	Sunday, March 12
Saint Patrick's Day	Friday, March 17
Passover Begins	Monday, April 10
Good Friday	Friday April 14
Easter	Sunday, April 16
Passover Ends	Tuesday, April 18
Mother's Day	Sunday, May 14
Memorial Day	Monday, May 29
Flag Day	Wednesday, June 14
Father's Day	Sunday, June 18
Canada Day	Saturday, July 1
Independence Day	Tuesday, July 4
Labor Day	Monday, September 4
Rosh Hashanah	Wednesday, September 20
Yom Kippur	Saturday, September 30
Columbus Day	Monday, October 9
Thanksgiving Day - CAN	Monday, October 9
Daylight Savings Ends	Sunday, November 5
Veteran's Day	Saturday, November 11
Thanksgiving Day - USA	Thursday, November 23
Hanukkah Begins	Saturday, December 24
Hanukkah Ends	Sunday, January 1
Christmas	Monday, December 25
Boxing Day	Tuesday, December 26

\* Beginning at sundown.

## IDD COUNTRY CODES & TIME DIFFERENCES

DESTINATION	IDD COUNTRY CODE	TIME DIFFERENCE FROM U.S. EST
Australia (Adelaide)	+61 (8)	+15:30
Australia (Brisbane)	+61 (7)	+15
Australia (Canberra)	+61 (2)	+16
Australia (Darwin)	+61 (8)	+14:30
Australia (Melbourne)	+61 (3)	+16
Australia (Perth)	+61 (8)	+13
Australia (Sydney)	+61 (2)	+16
Barbados	+1 (246)	+1
Cayman Islands	+1 (345)	+0
China (Coastal Cities)	+86	+13
France	+33	+6
Germany	+49	+6
Guam	+1 (671)	+15
Hong Kong	+852	+13
India	+91	+10:30
Indonesia (Jakarta)	+62	+12
Italy	+39	+6
Japan	+81	+14
Macau	+853	+13
Malaysia	+60	+13
Mexico (Mexico City)	+52	-1
Netherlands	+31	+6
New Zealand	+64	+18
Oman	+968	+9
Pakistan	+92	+10
Philippines	+63	+13
Qatar	+974	+8
Russia (Moscow)	+7 (495)	+8
Russia (Saint Petersburg)	+7 (812)	+8
Saudi Arabia	+966	+8
Singapore	+65	+13
South Korea	+82	+14
Spain	+34	+6
Sweden	+46	+6
Switzerland	+41	+6
Taiwan	+886	+13
Thailand	+66	+12
United Arab Emirates	+971	+9
United Kingdom	+44	+5
United States - Central	+1	-1
United States - Mountain	+1	-2
United States - Pacific	+1	-3
United States - Alaska	+1	-4
United States - Hawaii	+1	-5
Vietnam	+84	+12

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