COMPASS
INTERNATIONAL INC.

2018
Global Construction Costs Yearbook
18TH EDITION

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COMPASS INTERNATIONAL INC.

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PREFACE

The 2018 Global Construction Costs Yearbook is a practical reference handbook for construction professionals faced with the challenges of forecasting, estimating and controlling the costs of international construction CAPEX projects. This edition now provides data on 101 countries. It provides current and detailed answers to questions that are likely to arise when establishing construction budgets in an international context. The estimating process is in many ways similar for the various parties involved: owners, government agencies, architectural and engineering firms, construction managers, contractors, subcontractors, suppliers, vendors, and capital equipment providers-although on occasion there are elements of unique concern to one of those parties. This book will be of assistance to all construction professionals involved in estimating, either in North America or overseas. There would not be a need for this book if construction professionals had at their disposal a comprehensive international data source giving costs that reflect current market conditions. This book offers that data, together with a wealth of information on a variety of international construction topics that will allow the construction professional to compile accurate and timely estimates. This book covers all of the main categories of international construction, including:

- Process / Industrial / Manufacturing / Mining type projects.
- Civil-engineering construction / Roads / Bridges / Tunnel type projects.
- Commercial / Residential / Hotels / School type projects.
- Institutional / Governmental / Military type projects.
- Repair and upgrade work related type projects.

This book is divided into three sections. Section I provides a basic introduction to global construction. Section II gives in-depth reviews of construction cost-related subjects for 101 countries. Section III provides the reader with additional reference materials, as well as the benefits of international contracting problems of staffing overseas, international estimating, bidding, contracting methods and a listing of places of where to locate additional cost related data. It is Compass International's intent to continue to add to and improve this book in the coming years. We invite your comments and ask for observations and data that could be incorporated into future editions.

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The 2018 Global Construction Costs Yearbook is the product of twenty plus years of research and effort. It now provides front end / conceptual estimating data specific to 101 countries around the world. We would like to thank the construction professionals around the world that have provided data and encouragement, and the A/E and CM firms, vendors, contractors in North America and overseas that provided us with data and information that were used to compile this publication.

The book's data is based on Compass International's construction cost library, now 25 years old, and data obtained from various International Development Banks and Agencies, EU Commission Reports, Various Country National Libraries and Bibliotheques from around the world, Various Government Information Agencies, Global Quasi-Governance Organizations, Various Government Trade Promotion Departments / Labor Departments, numerous trade magazines, hourly and annual salary rates from US / Overseas labor unions, professional society articles, an assortment of newspaper / magazine articles, various almanacs / directories / reference books, internet data and, of course, return data and benchmarks from a variety of completed and proposed international projects. The cost models and man hour data tables have also been augmented and enhanced by a number of personal estimating libraries and data collected from various proposals and contractor bids. This information has been audited, added to, expanded upon in some situations, modified and calibrated with latest currency, productivity and escalation values, refined and aligned to today's engineering, procurement and construction installation methods and applications.

We invite comments from readers of this data source and we would very much like to use any international construction cost relevant data provided to us in future editions. We thank you for your comments and continued patronage.

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Introduction to Global Construction

The continuing transfer of economic supremacy from West to East is picking up the pace as we move into 2018. Just look at the growing list of Chinese, South Korean (the new Japan), Indian and other Asian-based EPC firms winning global construction projects. In this year (i.e. 2018) five of the top 10 global contractors will be Chinese. We are certainly in a changing world; to better understand this, in 2010, 25% of global construction was in emerging countries and 75% was in developed countries. This situation is forecast to be completely reversed by the year 2020.

Now that the dust is beginning to settle after the recent global financial crisis, the # 1 economy ranking the USA has held for more than a century looks more and more under threat as we move into 2018. They say that the 19th century was the British and French's century, the 20th century was the American century, well, it appears that the 21st century will be the Chinese and Indian century, with the USA still being a major player, but perhaps not as powerful as it use to be. Every day we see this possibility gaining more credence, the old adage go "west young man", should now read "go east or south young man or woman" (to be politically correct). City expansion or urban sprawl is the number one trend that will drive global construction activity and costs. More than one billion people will migrate from rural areas to major cities in the next 10 years; these "growth" cities are in China, India, Indonesia, Nigeria, Brazil, South Africa and other

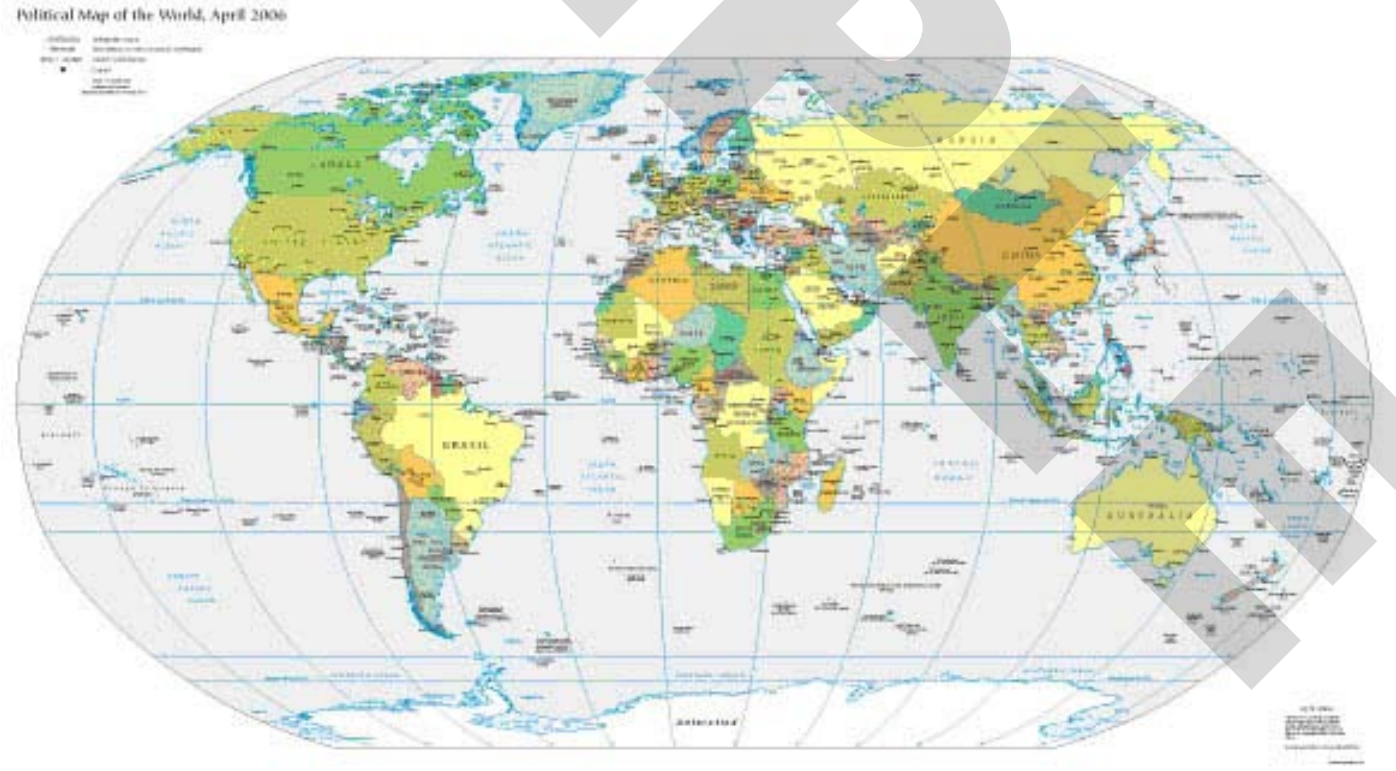


Table 22

ORDER OF MAGNITUDE PERCENTAGES

REF NO	DESCRIPTION	MATERIAL %	LABOR %	C.E.%	TOTAL %
1	Gen Conditions / Preliminaries – Super / PM / Field office & supplies	20	70	10	100
1	Gen Conditions / Preliminaries – Scaffolding / Barricades / Traffic Control	10	70	20	100
1	General Conditions / Preliminaries - Equipment Rental / Plant Hire	10	20	70	100
2	Site Construction - Demolition (including hazardous materials)	10	60	30	100
2	Piling – Driven - Bored - Timber – Concrete – Pre-Cast	55	35	20	100
2	Site Construction - Earthworks / Fill / Hardcore / Eng Fill	25	30	45	100
2	Site Construction – U/G Utilities (Water / Gas / Sewer)	50	35	15	100
2	Site Construction - Paving / Stone base (Concrete- Tarmac)	55	25	20	100
2	Site Construction - Landscaping / Irrigation / Fencing	65	25	10	100
3	Concrete - Cast in place	55	30	15	100
3	Concrete – Rebar / Mesh Reinforcement	60	25	15	100
3	Concrete - Formwork	30	60	10	100
3	Concrete - Pre-cast (Factory Fabricated – Field Erected)	65	25	10	100
4	General Brickwork – Internal & External	50	45	5	100
4	Concrete Block / Masonry – Internal & External	50	45	5	100
4	Refractory work / Linings / Gunite	50	45	5	100
5	Structural Steel - Columns & Beams	80	10	10	100
5	Metal Handrails / Misc Metals / Gratings	80	10	10	100
5	Metal Decking	75	15	10	100
6	Woods / Plastics - Rough Carpentry / Sheathing	60	40	0	100
6	Woods / Plastics - Finish Carpentry / Millwork / Cabinets	65	35	0	100
7	Thermal / Moisture Protection / Batt Insulation – Roofing / Waterproofing	65	35	0	100
7	Thermal / Moisture Protection - Siding / Ext Walls / Flashing	65	35	0	100
8	Door - External / Internal Doors	65	35	0	100
8	Windows - External / Internal Windows	65	35	0	100
9	Facility Finishes - Internal walls – Drywall / Gypsum	60	40	0	100
9	Facility Finishes - Internal ceilings	65	35	0	100
9	Facility Finishes - Internal floors (Tile, Lino, Carpet, Wood, Vinyl)	60	40	0	100
9	Facility Finishes - Painting / Staining External and Internal	30	70	0	100
10	Specialties - Louvers / Lockers / Bldg Signs / Shelving etc	80	20	0	100
11	Equipment – Loading Dock / Library / Food Service / Lab	80	20	0	100
12	Furnishings - Furniture / Blind / Drapes / Caseworks	80	20	0	100
13	Specialty Construction - Pre-Eng Bldg / Miscl items	65	25	10	100
14	Conveying Systems - Elevators - Escalators - Hoists - walkways	65	25	10	100
15	Mechanical - Utility Equipment / AHU's etc	60	35	5	100
15	Mechanical - Plumbing / Bldg service / Utility piping / Fixtures	50	45	5	100
15	Mechanical - Process Piping incl hangars / testing	50	45	5	100
15	Mechanical - Fire Protection	50	45	5	100
15	Mechanical – HVAC / Sheet metal	55	40	5	100
15	Mechanical Steel Ducting / Flues	70	20	10	100

#	DESCRIPTION	SQUARE FEET	M2	EURO / SF	EURO / M2	TOTAL EURO / M2	% OF TOTAL
	CONTINUED						
50	Modifications to existing AHU's, utilities & FP system	22,400	2,082	7.51	80.81	168,241	1.85%
51	Bio-Reactors / Production / Packaging Equipment c/w instrumentation & Installation (14 packages / Items)	22,400	2,082	98.77	1,062.77	2,212,677	24.38%
52	MCC's Switchgear Electrical Equipment	22,400	2,082	3.78	40.67	84,681	0.93%
53	Electrical Wire / Cable	22,400	2,082	2.97	31.96	66,535	0.73%
54	Conduit / Cable tray	22,400	2,082	5.87	63.16	131,502	1.45%
55	Lighting	22,400	2,082	8.04	86.51	180,115	1.98%
56	Instrumentation installation / Integration	22,400	2,082	3.85	41.43	86,249	0.95%
57	Security / CCTV / Door cards	22,400	2,082	5.66	60.90	126,797	1.40%
58	Other Costs	22,400	2,082	5.87	63.16	131,502	1.45%
59	Contractor O/H & P	22,400	2,082	8.99	96.73	201,397	2.22%
60	H.O. Project Management & Detailed Design & Fee	22,400	2,082	27.52	296.12	616,512	6.79%
61	Construction Management & Fee	22,400	2,082	16.85	181.31	377,479	4.16%
62	**GRAND TOTAL COST EURO PER M2**		**2,082**		**4,359**	**9,075,628**	**100%**
63	**GRAND TOTAL COST EURO PER SF**	**22,400**		**405.12**		**9,075,628**	**100%**

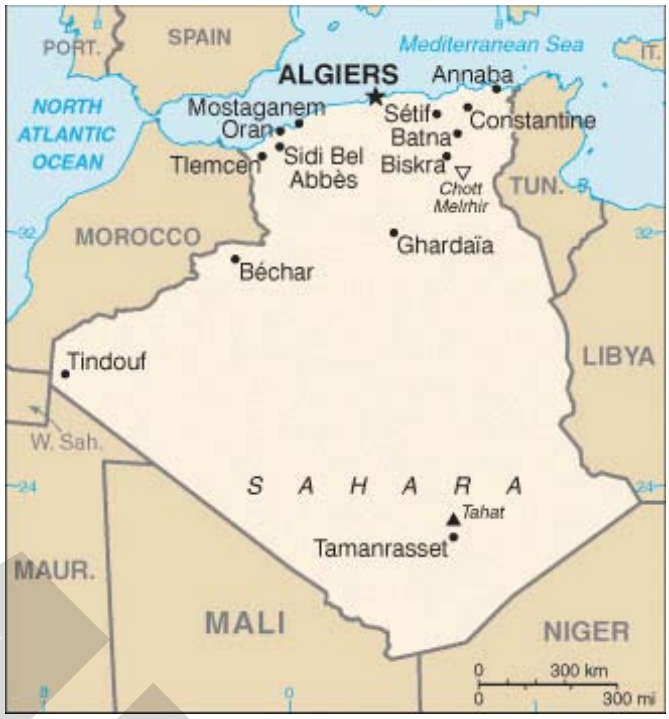
EXCLUSIONS / COMMENTS:

- Excludes initial optimization study by 3rd party consultant, $124,500:
- Minimal site work required excavation & site clearance completed in Phase 1 of project; Approx. cost $115,000:
- Phase 1 detailed design & specifications assisted in optimizing detailed design costs by 15% to 25%:
- Excludes validation services Typically rages between 2.5% to 5% of construction cost:
- Excludes temporary office accommodation for 10 # Owner Operations Staff during construction, provided by Owner:
- Land purchase, project is located on an existing 20 +/- acre campus containing more than 15 # buildings:
- Employee Parking area & lighting (parking for 20 vehicles):
- Detailed Design 26 to 30 weeks:
- Construction 60 weeks:

Algeria

DATA TABLE

1	Capital: Algiers 1,740,000
2	Area: 2,350,000 sq km
3	Population: 39.9 million
4	GDP $226.9 billion
5	GDP per Head: $8,660
6	Inflation Rate: 2.1% - 2.7%
7	VAT / GST: 19%
8	Freight: 8.5 – 11.5 / 30 days
9	Exchange Rate: 108.70 Dinar
10	Import duties: 2% - 35%. Refer to website on general notes page 64, note 10.
11	A/E Billing rate: $25- $35
12	Skilled Worker rate: $9 - $16
13	Ditto # 12 offshore rate: N/A
14	Unskilled worker rate: $6- $8
15	Local Engineering Productivity: 1.50 – 2.40
16	Worker Productivity: 1.50 – 2.25
17	Location Factor: 0.90 - 0.95
18	Local Bulk Material Factor: 0.83 - 0.89
19	SF / $ Unit Cost: $33 - $48 $355 - $516 / M2
20	Construction Equipment / Rental Factor: 0.85 – 0.90



ADDITIONAL DATA

1. Major Cities: Oran, Annaba, Constantine.
2. Time: + 6 EST
3. Government website: http://www.el-mouradia.dz
4. Import duties: http://www.douane.dz
5. Electricity: 230 v 50 Hz
6. Telephone code: 213
7. Major Sea Ports: Oran, Algiers, Annaba.
8. Government Statistics Agency: http://www.instat.gov.al

Algeria is a major oil and gas producer, its economy / construction industry is dependent on oil / gas prices. The major oil & gas organization / government agency in Algeria is Sonatrach.

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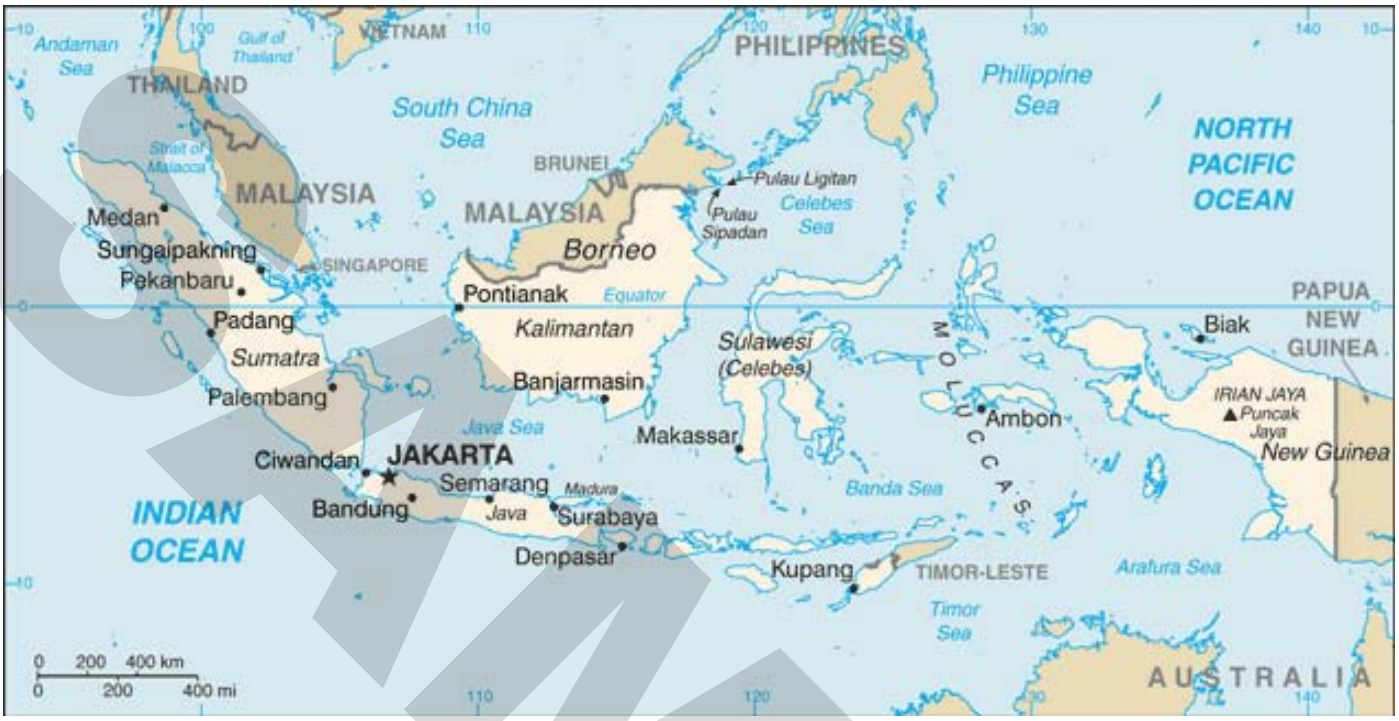

Indonesia

FACTS IN BRIEF

Official name: Republic of Indonesia
Type of government: Republic
Population: 270 million (2018)
Life expectancy: Male 68.7 years, female 72.3 years
Population growth: 1.50% per year
Currency: Rupiah
Capital: Jakarta 11,000,000
Exports: $122 billion (2017)
Languages: Bahasa Indonesian, Dutch, local dialects
Imports: $93 billion (2017)
Area: 1,906,500 km2
Weights/measures: Metric
Highest elevation: Puncak Jaya, 5,030 m
Chief products: Agricultural products, timber products, petroleum, minerals
GDP: $1,187 billion (2018)
GDP per Head: $5,925 (2018)

GENERAL BACKGROUND

LOCATION

Indonesia is part of the Malay Archipelago and is located southeast of Malaysia and northwest of Australia. Indonesia lies on the equator. Its nearest neighbors are Malaysia to the north, Papua New Guinea to the east, and Australia to the south.

Indonesia is a large country stretching approximately 3,200 miles from east to west. The country is made up of over 13,000 islands spread along the equator. Only 6,000 of the islands are inhabited. The major islands are Sumatra, Java, Bali, Borneo, the Celebes, the Moluccas, and Irian Jaya.

A high snow-capped mountain range extends throughout the major islands of the archipelago. Indonesia has a number of active volcanoes. The highest mountain in Indonesia is Puncak Jaya, which is located on the island of Irian Jaya. Its height is 16,503 feet / 5,030 meters. Tropical rain forests cover approximately 80% of the country.

Indonesia is approximately 25% larger in area than the state of Alaska.

CLIMATE

Indonesia has an equatorial climate, one that is hot and humid but moderated by proximity to the sea. They dry season lasts form June to September, and

Construction Labor

"ALL IN" HOURLY SELLING RATES FOR SKILLED & UNSKILLED WORKERS

CATEGORY	LOW	HIGH	AVERAGE
Workers compensation insurance			
Federal /state unemployment			
Vacation / Holidays			
FICA (social security / OAP)			
BAR / Liability Insurance			
Home office support (admin, payroll, procurement / buy-out assistance, management support, estimating, rent / utilities to maintain H.O.			
Field supervision / timekeepers / warehouse men			
Temporary facilities / trailers / porta johns / office supplies			
Small tools			
Consumables, gas, welding rods etc			
Construction equipment / scaffolding (excludes heavy lift cranes)			
Maintenance of CE / fuel oil / repairs to CE			
PROFIT			
TOTAL (ADJUSTED)	**80%**	**120%**	**100%**

Construction Material Costs

MID-SIZED COMMERCIAL OR INDUSTRIAL CONSTRUCTION PROJECT

#	BULK MATERIAL	QTY	SI UNIT	LOCAL COUNTRY UNIT COST IN US $	TOTAL IN US $	USA UNIT COST IN US $ SI UNIT	TOTAL IN US $
1	Blocks (Concrete 8" x 16" x 4")	5,000	Each	1.08	5,421	1.71	8,559
2	Bricks (Common) 1,000	15	1000	469	7,032	445	6,674
3	Bricks (Facing) 1,000	10	1000	573	5,732	620	6,197
4	Cement in bags	150	Ton(M)	176	26,452	275	41,184
5	Conduit 2" / 50 mm rigid galv steel	1,000	M	22.87	22,870	22.44	22,443
6	Instruments 4 # 2" / 4" CV (8 #), 12 # (F/P/T) Devices	20	Each	5,261	105,230	4,352	87,041
7	Copper pipe 0.50" / 12 mm L	1,000	M	7.00	6,999	6.69	6,685
8	R M Concrete 3500 PSI / 25 MPa	350	M3	141	49,395	151	52,983
9	Sand / Stone 1.5" diameter / Imported fill / Hardcore (Average)	2,500	Ton(M)	23.92	59,810	24.02	60,043
10	Stainless steel 304 pipe 1" / 25 mm	1,000	M	16.99	16,989	16.58	16,577
11	Steel pipe A-53 1" / 50 mm diameter	1,000	M	13.02	13,023	12.14	12,138
12	Steel Reinforcement (not installed)	50	Ton(M)	1,359	67,958	1,228	61,384
13	Structural Steel (Fabricated not installed)	50	Ton(M)	2,727	136,362	2,468	123,419
14	Valves (Ball) 4" dia. 150 #	25	Each	758	18,961	721	18,016
	TOTAL				**542,234**		**523,342**

NOTE: *Metric Ton = 2,205 lb • Long Ton = 2,240 lb (L) • Short Ton = 2,000 lb (S) • Metric Tonne = 1,000 kg /2,205 lb*

REGION	US $ SQUARE FOOT PER YEAR AVERAGE COST	US $ SQUARE FOOT PER YEAR COST (RANGE – LOW)	US $ SQUARE FOOT PER YEAR COST (RANGE – HIGH)	ADDITIONAL AVERAGE COSTS PER YEAR (UTILITIES 9.3% & CLEANING SERVICES 8.2%) TOTAL 17.5% IN US $
NORTH AND SOUTH AMERICA (CONTINUED)				
Venezuela Caracas.	32.96	25.63	40.28	5.77
EUROPE				
Austria Vienna.	26.78	20.51	33.05	4.69
Austria Innsbruck.	24.72	19.48	29.95	4.33
Belgium Brussels, Prime Location.	183.33	142.52	224.14	32.08
Belgium Brussels.	86.00	66.65	105.35	15.05
Belgium Antwerp.	145.22	112.79	177.66	25.41
Bulgaria Sofia.	15.96	12.30	19.62	2.79
Croatia Zagreb.	16.99	13.33	20.66	2.97
Cyprus Nicosia / Limassol.	14.94	11.28	18.59	2.61
Czech Republic Prague.	21.63	16.41	26.86	3.79
Czech Republic Brno.	21.63	16.41	26.86	3.79
Denmark Copenhagen.	226.07	175.33	276.81	39.56
Denmark Aarhus.	166.85	129.19	204.51	29.20
Estonia Tallinn.	14.42	11.28	17.56	2.52
Finland Helsinki.	38.11	29.74	46.48	6.67
France Paris (Prime Location).	89.60	69.72	109.49	15.68
France Paris La Defense (Western Paris).	77.76	60.50	95.03	13.61
France Lyon.	40.68	31.79	49.58	7.12
France Marseille.	38.11	29.74	46.48	6.67
France Nice.	38.11	29.74	46.48	6.67
Georgia Tbilisi.	45.32	34.86	55.78	7.93
Germany Berlin.	26.26	20.51	32.02	4.60
Germany Frankfurt.	43.77	33.84	53.71	7.66
Germany Hamburg.	28.84	22.56	35.12	5.05
Germany Munich.	38.62	29.74	47.51	6.76
Germany Dusseldorf.	31.93	24.61	39.25	5.59
Greece Athens.	27.81	21.53	34.09	4.87
Hungary Budapest.	24.72	19.48	29.95	4.33
Ireland Dublin.	34.50	26.66	42.35	6.04
Ireland Dublin.	30.38	23.58	37.18	5.32
Ireland Cork.	26.78	20.51	33.05	4.69
Ireland Galway.	23.69	18.46	28.92	4.15
Italy Rome.	42.23	32.81	51.64	7.39
Italy Milan.	47.38	36.91	57.84	8.29
Italy Naples.	27.81	21.53	34.09	4.87
Italy Turin.	42.23	32.81	51.64	7.39
Italy Venice.	38.11	29.74	46.48	6.67
Kazakhstan Almaty.	64.89	50.24	79.53	11.36
Latvia Riga.	16.99	13.33	20.66	2.97