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Morrisville, Pennsylvania, USA



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There are numerous economic and political risks associated with working in the international arena that need to be considered, evaluated and estimated. Some of the topics to consider in building facilities outside an organizations domestic market include some or all of the following points below:

- The overall US unemployment rate for 2012 is forecast to be in the 8.5% to 9.2% range, which does not bode well for consumer spending and new construction activities.

- Latin America is poised to grow more than the USA and Western Europe in 2012, there will be lots of construction related opportunities in Brazil, Colombia, Uruguay, Peru, Chile and Argentina, as the expanding and prosperous middle class call for better housing, schools, infrastructure and services.

- The massive 8.9-magnitude earthquake and tsunami that hit northeast Japan in May 2011 will cost between \$200 to \$400 billion to repair.

- China is now the world's largest infrastructure market and now boasts the second largest economy.

- Uncertainties remain as oil and raw material prices increase relentlessly and then decrease just as dramatically i.e. copper, steel, glass and lumber. It is difficult to forecast these costs as we move into 2012. Will oil head back up to \$140 again, or will head south, below \$30 a barrel? Saudi Arabia has "off the record" stated that it would like to see oil in the \$70 - \$80 a barrel range.

- The fate of the Euro is a major problem as we transition into 2012. Public debt is a major headache for "Euroland" governments, public spending is expected to be reduced in 2012. With the price of gold reaching \$1,750 an ounce, it is difficult to forecast future exchange rates.

- China is experiencing significant wage demands anywhere between 10% and 25% per annum. Will these rising wages relegate China as the worlds

manufacturing # 1 ranking? Will Vietnam, Indonesia and India move up the table and become the most sought after location in 2012?

- Prices for diesel fuel, structural steel, cement, plywood / lumber and gypsum-wallboard products are forecast to rise by 2% - 4% in 2012.

- The Chinese - Japanese squabble over small offshore islands could be an indication of bad news and future tensions in the world.

- Asia in 2012 is expected to play a leading role in steering the global economy to a new course for international expansion.

- Nearly all nations will begin to experience engineering and construction related growth (perhaps somewhat modest) within the next 1 to 2 years in say 2012 and 2013.

- In the middle East (Saudi Arabia, Iraq, Kuwait and Qatar) have announced that \$100 to \$250 billion will be invested in oil, gas and petro-chemical projects in the next five years; this will translate to

numerous EPC opportunities for global construction companies.

- Eastern Europe, countries such as Poland, Romania, Latvia, the Czech Republic, Ukraine, Hungary, Bulgaria, Russia, Serbia and Slovakia are starting to see an uptick in industrial construction activity as some US - Fortune 500 or Western European manufacturing companies are starting to invest in these countries again. Construction costs (wages and construction materials) are on average 25% - 33% cheaper in these countries compared to the USA or Western Europe. The citizens of these countries are future consumers and are pleased to see investment in their country.

- Uncertainty over whether several Euro zone nations will be able to come through the Euro sovereign debt crisis, this and the US continuing political gridlock is fueling another potential global recession as we move into 2012.

- The US construction industry is facing a pro-

longed construction downturn in 2012, the Obama administrations economic stimulus spending is more than 90% spent, this does not bode well for the housing / commercial construction market in 2012.

- Construction costs in many countries have fallen by as much as 5% - 10% or have remained flat in the last two years, due to the financial crisis. Prices in 2012 are starting to move slowly upwards again as the worst of the financial crisis is behind us.

- The USA construction unemployment rate

improved marginally to 13.4% to 13.7% in January 2012, a big improvement from a year ago, where unemployment in the construction sector was north of 18%. Construction costs in the USA are forecast to rise by 2.5% to 3% in 2012.

- The leading obstacles and challenges facing the US construction industry in 2012 are as follows: The credit crisis / banking meltdown, the slowdown in the housing market, weaker consumer spending, and the uncertainty of energy costs.

- The US dollar continues to weaken against all of its major trading partners, is this a Government engineered plan to increase exports?

- Three emerging countries China, India and Brazil will experience significant growth in 2012. The 30 OECD developed countries, will experience sluggish growth in 2012. The # 1 question is will these three countries, China, India and Brazil be the "engine" (that the USA use to be) that pulls the rest of the world into more prosperous times?

- It appears that the Euro crisis has intensified as we move into 2012: Italy, Spain, Portugal, Greece and Ireland all face government austerity spending measures for at least the next 3 to 5 years. Slow growth will translate to fewer construction opportunities.

- Will interest / activity in Tidal / Hydro, Fuel Cell Technology, Nuclear, Geothermal, Solar (Photovoltaic) Wind Power continue in 2012? Will the US energy crisis be put on hold with the recent major shale gas finds in Pennsylvania and New York? It is forecast that these huge gas discoveries could satisfy the USA's gas needs for the next twenty five years. Will there be a mini boom in pipeline gas gathering facilities in this region in the next five years?

- Brazil is moving forward almost recession free and with an Olympics coming up in 2016; the future of the Brazilian construction industry looks very bright.

- The so-called Arab Spring has reshaped the lives of millions in the Middle East and North Africa, Egypt, Libya, Tunisia, Syria and Bahrain: will this turmoil result in future major construction projects? Only time will tell.

- In the USA, Canada and Western Europe oil refiners face an unsure future with the global recession. This together with declining product demand and low profit margins, many refiners are revisiting and putting on "hold"

their short term (1-3 years) CAPEX plans.

- India's long term prospects and growth potential appear to be very strong in the next decade or two, more so than China, whose work age population is forecast to shrink due to the one child one family government policy.

- The US construction market related to automobiles, housing, and lodging will remain flat in 2012 and 2013.

- Global Oil & Gas Engineering and Construction projects have "bucked" the trend, these CAPEX projects are driven by S.E. Asia demographics. Look for these projects to be reasonably profuse in 2012, the vast majority of these CAPEX projects will be in the Middle East, China, India and Latin America.

Three emerging countries China, India and Brazil will experience significant growth in 2012. The 30 OECD developed countries, will experience sluggish growth in 2012. The # 1 question is will these three countries, China, India and Brazil be the "engine" (that the USA use to be) that pulls the rest of the world into more prosperous times?

est for the next 5 years; the second largest is the (27 member European Union) if you consider this marketplace as a single state federation. By the year 2015, just three years from now, it would appear that China will be primed to overtake the USA to become the worlds number one construction market, with India and Brazil coming on strong. Some advice to young engineers / construction professionals joining the construction industry, learn to speak and write Chinese, and possibly one of the Indian dialects, Portuguese would be another language that would be worth learning. To recap some of the above, and to drive home some key points that need to be painstaking thought out and planned for when estimating an international construction projects are as follows:

1. Consult with someone who has local knowledge / experience of working in the specific country, discuss plans with local government officials; ascertain the legal requirements of establishing a business in the country.

2. Visit country and perform a survey of construction / engineering practices, collect relevant data on wage rates, material costs, productivity standards, import duties values and any other related data specific to future construction work in that particular country.

3. Consider different cultural / religion issues, work hours, hiring practices, visa requirements, and legal obligations, banking regulations, local insurance requirements and the sophistication or lack of it of local engineering practices / computer – communication systems.

4. Consider the current construction activity-taking place in the specific country is the market booming (like it is currently is in China – where USA / Western European companies can expect to pay a premium for building facilities), or is construction activity slow.

5. Consider any government grants, incentives, tax breaks, tax holidays that could impact the CA-

PEX cost of the future facility.

6. Audit and perform due diligence of historical country “cost data”, don’t accept any published data, personal data as verbatim, do your homework.

7. Consider the impact to the construction sequence of long lead imported major equipment items that could take possibly twelve to eighteen months to be delivered to the construction site (piping systems, structural steel, floors may need to be completed out of sequence to allow the long lead item to be shoe horned into the almost completed facility).

8. Consider the use of modules and pre-assemblies were it makes sense.

The engineering, procurement and construction (EPC) of an overseas “process / manufacturing

By the year 2015, just three years from now, it would appear that China will be primed to overtake the USA to become the worlds number one construction market, with India and Brazil coming on strong.

/ pharmaceutical” facility have many demanding questions and problematical impediments to overcome. These include cultural differences between the foreign country and the “business” practices adopted in North America / Western Europe. The successful Estimator / Project Manager must be patient, persevering and self confident as he or she organizes the (EPC) estimating effort,

nothing can be taken for granted or assumed when working, in say, second or third world countries. The normal (EPC) practices that occur in North America / Western Europe are unfamiliar to construction professionals in some of these less sophisticated countries. One of the main challenges of executing (EPC) projects in second or third world countries is the all encompassing topic of the submission requirements / issuing of government and local permits – (a word of warning: this can be a long and protracted effort, that needs to be carefully planned) and sometimes the logistics and bureaucratic red tape and subsequent inspections that is required, the numerous approvals (by governmental agencies and local districts), inspections and numerous fees are unfortunately the standard practice in some second or third world

Largest Global Detailed Design and Construction Firms BY ALPHABETICAL ORDER

NAME	NAME
AECOM / Maunsell / Cansult, USA	Jacobs Engineering Group Inc, USA
Aker Solutions, Norway	JGC Corp, Japan
AMEC, UK	K-BR, USA
ARCADIS, Holland	Kajima Corp, Japan
ARUP, UK	Laing O'Rourke, UK
Atkins, UK	Larsen & Toubro, India
Balfour Beatty, UK	Louis Berger, USA
Bechtel, USA	Lurgi, Germany
Bilfinger & Berger, Germany	KBR, USA
Black & Veatch, USA	Maeda Corp, Japan
Bouygues Construction, France	Mott MacDonald / Hatch, UK & Canada
Bovis Lend Lease, Australia	MWH, USA
CB&I, USA	Odebrecht, Brazil
CEGELEC, France	OHL, Spain
CH2M HILL USA	Parsons Brinckerhoff, USA
CDI, USA	PCL Construction Enterprises, USA
China State Construction Eng, China	Royal BAM Group, Holland
China National Overseas Corp, China	SAMSUNG Construction, South Korea
Chiyoda Corp, Japan	Saipem, Italy
Consolidated Constructors, Greece	Skanska, Sweden
Costain, UK	Sisk J, Ireland
CTCI, Taiwan	SMEC, Australia
Daelim, South Korea	Snamprogetti, Italy
Dragados, Spain	SNC-Lavalin, Canada
ENKA Construction, Turkey	STRABAG, Austria
F.C.C. Spain	Taylor Woodrow, UK
Ferrovial, Spain	Techint, Italy
Fluor Corp, USA	TECHNIP, France
Foster Wheeler Corp, USA	Toyo Engineering, Japan
Fugro N.V., Holland	URS / Austin Engineering / Washington International Group, USA
Grupo ACS Actividades de Construcción y Servicios, Spain	VINCI Construction Grands Projets, France
Hatch Group, Canada	Worley Parsons Services Pty Ltd, Australia
HOCHTIEF, Germany	YIT Group, Finland
Hyundai, South Korea	Zhejiang Construction Invest, China

countries, understanding of this requirement can be helpful to the Estimator / Project Manager.

The above chart is a listing (alphabetically not in size / annual turnover and home country) of some of the 60+ largest Detailed Design, Procurement and Construction firms operating around the world. These firms operate in the Americas, Europe, Asia,

Africa and Australia and New Zealand, they have the ability to complete all types of engineering, procurement and construction activities of complex refinery, process, manufacturing civil, transportation and general building type facilities.

Angola

DATA TABLE

1	Capital: Luanda 1,800,000
2	Area: 1,250,000 sq km
3	Population: 15.80 million
4	GDP \$124 billion
5	GDP per Head: \$6,400
6	Inflation Rate: 9% - 12%
7	VAT / GST: 10%
8	Freight: 8.5 – 11.5 / 35 days
9	Exchange Rate: 93.32 Kwanza
10	Government / Import duties: http://www.angola.org . Refer to website on general notes page 62, note 10.
11	A/E Billing rate: \$9 - \$18
12	Skilled Worker rate: \$4 - \$7.50
13	Ditto # 12 offshore rate: \$45 - \$70
14	Unskilled worker rate: \$2 - \$5
15	Local Engineering Productivity: 1.25 – 1.50
16	Worker Productivity: 2.00 – 3.00
17	Location Factor: 0.92 - 0.97
18	Local Bulk Material Factor: 0.80 - 0.87
19	SF / \$ Unit Cost: \$25 - \$40
20	Construction Equipment / Rental Factor: 0.80-0.85

ADDITIONAL DATA

- Major Cities: Namibe, Lobito, Soyo, Porto Amboin.
- Time: + 6 EST
- Government website:
<http://www.angola-portal.ao>
- Electricity: 220 v 50 Hz
- Telephone code: 244
- Major Sea Ports: Lobito, Soyo, Luanda.

Angola is a major exporter of oil to Western Europe, North America and China. Higher oil production and oil selling in the \$75 - \$90 a barrel range will be good for the Angolan economy in 2012. The GDP is forecast to be in the 5% - 6% range. There appears to be many significant oil related projects in the pipeline.

U.S. Embassy

Rua Houari Boumediene
#32 Luanda Angola
Tel: (244) 222-641-000



Argentina

FACTS IN BRIEF

Official name: Argentine Republic
Currency: Pesos
Population: 40,800,000 (2011 est.)
GDP: \$260 billion (2011)
Population growth: 0.90% (2006 est.)
GDP per Head: \$13,400 (2011)
Capital: Buenos Aires 14,000,000
Exports: \$45 billion f.o.b. (2008 est.)
Language: Spanish
Imports: \$30 billion f.o.b. (2008 est.)
Area: 2,766,900 km ²
Weights/measures: Metric
Type of government: Federal republic
Chief products: Beef, Minerals, cereals, timber,
Life expectancy: Male: 72.5 years Female: 80.1 years
Unemployment: 9%

ECONOMIC FORECAST

Minerals of all kinds, timber and farm products: Argentina has a young well-educated labor market; it is one of the top five economies in South America. Economic growth is sluggish; the country is recuperating from the global financial crisis. Construction activity will be down from previous years. High unemployment at between 8% and 9%, inflation at 8% to 11% will remain as major challenges in 2012. GDP is forecast to be in the 4% to 5% range in 2012.

ARCHITECTURAL / ENGINEERING RATES

The rates that follow are "all in" hourly job rates for various construction professionals and are appropriate for 2012. They include employees' salaries, workers; compensation insurance, social security payments, health insurance premiums, unemployment insurance, vacation and holiday payments, establishment charges, overhead, mark-ups, and profit. The rates shown are for the Buenos Aires area and reflect individuals with at least 10 years experience.



Argentina

ARCHITECTURAL/ENGINEERING RATES

SKILL	LOW US \$	HIGH US \$
Architect	29	60
Mechanical engineer	29	60
Electrical engineer	32	63
Designer	24	46
Site manager	27	52

(does not include temporary living allowance)

• *NOTE: the above professional construction hourly bill out rates are appropriate for residential / light commercial construction facilities. For individuals working in the process / chemical / refinery construction sector use the following rates:*

SKILL	LOW US \$	HIGH US \$
Senior Project Manager (20 years experiences)	42	88
Mechanical engineer (15 years experiences)	32	67
E&I engineer (15 years experiences)	32	77
Designer	26	52

ENGINEERING PRODUCTIVITY / DESIGN WORK

The following figures show a range of productivity values: (1) Washington, DC (2) Houston Texas, and (3) Buenos Aires, Argentina. The productivity factors are compared against a U.S. basis of 1.00 – Washington DC, engineering labor working on producing the necessary design deliverables for a midsize petro-chemical / manufacturing facility (say \$10 – \$50 million).

REF. #	LOCATION	PRODUCTIVITY VALUE
1	Washington, DC	1.00
2	Houston, TX	0.95
3	Buenos Aires, Argentina	1.15 – 1.25

CONSTRUCTION LABOR HOURLY RATES

The following are “selling rates” for skilled and unskilled construction workers; these are the hourly billing rates that a contractor would charge an owner. The rates include base wage rate, insurance, fringes, burdens, holidays, small tools, and training levies, plus all applicable overhead and profit. They have been adjusted to reflect 2012 rates.

	LOW US \$	HIGH US \$
Skilled worker	13.00	20.00
Unskilled worker	9.00	14.50

APPROXIMATE COST OF BUILDINGS/FACILITIES

The following square-meter and square-foot values include all materials, labor, plant, general conditions, overhead, and profit. Excluded from the costs are owners’ costs such as furniture, equipment, land purchase, design fees, and major items outside the facility’s footprint. These values have been adjusted to reflect 2012 pricing levels.

TYPE OF FACILITY		LOW US \$	HIGH US \$
Warehouse / Distribution Facility	SF	34	67
Ditto	M2	364	726
Factory / Industrial Bldg	SF	36	83
Ditto	M2	386	893
Office / Admin Bldg	SF	46	122
Ditto	M2	496	1,317

LOCATION FACTOR

• For chemical/process/manufacturing construction projects with a high content of imported engineered equipment and construction materials: **0.94**

• For buildings/facilities/civil-type construction projects with high content of locally produced engineered equipment and construction materials: **0.90**

If the above project is for a “first of its kind” building / facility (first construction effort in country will experience a steep learning curve) add 0.03 – 0.05 points to above. If company has built or has operating facilities / operating companies already in country use above values.

CONSTRUCTION LABOR PRODUCTIVITY

- **Good:** 1.20
- **Average:** 1.45
- **Bad:** 1.75

CONSTRUCTION EQUIPMENT

CONSTRUCTION EQUIPMENT / PLANT HIRE RENTAL*	USA COST PER 8 HOUR DAY	ARGENTINA COST PER 8 HOUR DAY
Backhoe - F.E. Loader (JCB or similar)	\$223.70	
Bulldozer 50kW	\$491.04	
F.E. Loader 2.5 CY/2 M3	\$363.48	
Hydraulic Crane 20 Ton lifting capacity	\$671.08	
Bobcat mini F.E. loader	\$247.70	
Welding machine diesel 200 A	\$111.66	
COST PER DAY	\$2,108.66	DISCOUNT USA VALUES BY 75 – 80%

* excludes driver, includes routine maintenance, excludes fuel, includes mob/de-mob costs

INFLATION

- **2006:** 8.9%
- **2007:** 7.5%
- **2008:** 8.5%
- **2009:** 9.0%
- **2010:** 8.5%
- **2011:** 8.0%
- **2012:** 11.0%

TAXES/TARIFFS IMPORT DUTIES

The value-added tax (VAT) rate is 21% or 10.5% it depends on the item being imported into Argentina; the duty is based on the sum of the CIF value. Argentina is a member of Mercosur (as well as its neighbors Brazil, Uruguay and Paraguay), Mercosur the 4th largest free trade area in the world. For additional tariff information go to infoleg.mecon.gov.ar Argentina implemented the MERCOSUR Common Nomenclature, which is aligned with the Harmonized System of Nomenclature and is utilized for tariff classification, import duties can range from 5 – 20%. Argentina’s Government website is www.argentina.gov.ar

CURRENCY EXCHANGE RATES

The following were the exchange rates for the Argentina Peso on August 3rd, 2011:

EURO:	UK POUND:	US DOLLAR:
5.93	6.81	4.15

Argentina DATA TABLE

1.	Local Bulk Material Factor vs. USA Gulf Coast (Houston = 1.00): 0.87 – 0.95
2.	Major Cities: La Plata, Santa Fe, Cordoba, Rosario,
3.	Major Sea Ports: La Plata, Rosario, Buenos Aires
4.	Government website: www.argentina.ar
5.	Government Statistics Office: www.indec.mecon.ar
6.	Electricity: 220 v 50 Hz
7.	Freight from USA: 7.5% – 10.5% of Major Equipment or material cost / 20 - 25 days

ADDITIONAL INFORMATION CONTRACTORS / A-E FIRMS / CONTACTS:

SCA (Sociedad Central de Arquitectos)
Montevideo 938, Buenos Aires CP 1019 ABT
Argentina
Telephone (54) 11 48132375
www.socearq.org

Argentina Camera of the Construction

Av. Stroll Columbus 823 (1063)/
Buenos Aires, Argentina.
Tel.: 4361-8778
Email: to cac@camarco.org.ar
http://www.camarco.org.ar

Centro Argentino de Ingenieros

Sede del CAI: Cerrito 1250
(C1010AAZ)
Buenos Aires, Argentina
Buenos Tel-Fax: (54) (11)4811-4133 4812-
0440/3223

Consejo Asesor de Empresas Consultoras

Buenos Aires, Argentina

Time: Argentina is two hours ahead of Eastern Standard Time (EST).

Telephone: The access code for Argentina is (54).
The city codes are as follows:

- Buenos Aires (11)
- Cordoba (351)
- General Sa (925)
- La Plata (121)
- Parana (43)
- Salta (87)
- San Miguel (81)
- Santa Fe (342)

Names/Addresses:

U S Embassy in Argentina
Avda Columbia 4300
APO / FPO
Unit 4334
Buenos Aires, Argentina
Telephone 54 – 11 5777-4533
Fax 54-11-5777-4240

Argentina Embassy
1600 New Hampshire Ave N.W.
Washington DC 20009, USA
Telephone (202) 238 6400
Fax (202) 332 3171

Armenia**DATA TABLE**

1	Capital: Yerevan 1,470,000
2	Area: 31,500 sq km
3	Population: 3.40 million
4	GDP \$18 billion
5	GDP per Head: \$5,600
6	Inflation Rate: 4% - 6%
7	VAT / GST: 20%
8	Freight: 8.5 – 11.5 / 33 days
9	Exchange Rate: 374 AD
10	Government / Import duties website: http://www.gov.am
11	A/E Billing rate: \$13 - \$29
12	Skilled Worker rate: \$6 - \$12
13	Ditto # 12 offshore rate: N/A
14	Unskilled worker rate: \$4 - \$7
15	Local Engineering Productivity: 1.25 – 1.65
16	Worker Productivity: 1.50 – 1.90
17	Location Factor: 0.90 - 0.94
18	Local Bulk Material Factor: 0.85 – 0.90
19	SF / \$ Unit Cost: \$30 - \$45
20	Construction Equipment / Rental Factor: 0.80-0.90

ADDITIONAL DATA

1. Major Cities: Kapan, Hrazdan, Gyumri.
2. Time: + 8 EST
3. Local freight: 2% - 3% of material / equipment purchase price.
4. Government website: <http://www.president.am>
5. Import duties: Refer to website mentioned on summary page, note 10:
6. Electricity: 220 v 50 Hz
7. Telephone code: 374
8. Major Sea Ports: Armenia is landlocked; goods are shipped through Turkey and Georgia.

The Armenian construction industry is forecast to see nominal growth in 2012 / 2013, construction prices will move up slightly by 3% - 4.5% in 2012. For government information: <http://www.privatization.am>; <http://www.minenergy.am>

Armenian International Contractors Association

1 Charents Street
Yerevan, Armenia
Telephone (374) 1 57 5994

Union of Architects of Armenia

Armenia, 0019, Yerevan, Marshal Baghramyan Ave., House 17
Telephone (374-10)561506
www.spyur.am/archunion.htm



Finland

DATA TABLE

1	Capital: Helsinki 670,000
2	Area: 337,730 sq km
3	Population: 5.40 million
4	GDP \$190 billion
5	GDP per Head: \$37,000
6	Inflation Rate: 1.5% - 3.5%
7	VAT / GST: 23%
8	Freight: 8.5 - 11.5 / 24 days
9	Exchange Rate: 0.70 Euro's
10	Import duties: 2% - 30% (Aver 5%) Refer to website above on previous information page 62, note 10.
11	A/E Billing rate: \$85 - \$125
12	Skilled Worker rate: \$49 - \$68
13	Ditto # 12 offshore rate: N/A
14	Unskilled worker rate: \$28 - \$42
15	Local Engineering Productivity: 1.10
16	Worker Productivity: 1.10 - 1.15
17	Location Factor: 1.08 - 1.12
18	Local Bulk Material Factor: 1.00 - 1.07
19	SF / \$ Unit Cost: \$80 - \$100
20	Construction Equipment / Rental Factor: 1.05 - 1.10

ADDITIONAL DATA

- Type of Government: Republic
- Major Cities: Espoo, Tampere, Turku.
- Population: 5.35 million
- Time: + 7 EST
- Local freight: 2% - 3% of material / equipment purchase price.
- Government website:
<http://www.vn.fi/etusivu/fi.jsp>
<http://web.eduskunta.fi>
- Import duties: Refer to www.tulli.fi
- Electricity: 230 v - 50 Hz
- Telephone code: 358
- Major Sea Ports: Helsinki, Kotka, Vaasa.

The Finnish economy / construction sector has bounced back; look for slow but steady growth in 2012.

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20FI-00330, Helsinki (Helsingfors)
FINLAND (SUOMI)
Telephone: +358 (9) 4243 3311



France

FACTS IN BRIEF

Official name: French Republic
Life expectancy: Male 77.7 years, female 84.6 years
Population: 61.50 million (est. 2011)
Currency: Euro
Population growth: 0.25% per year
Exports: \$417 billion (2007)
Capital: Paris 2,450,000
Imports: \$441 billion (2007)
Language: French
Weights / measures: Metric
Area: 543,980 km ²
Chief products: Capital goods, steel, chemicals, automobiles, textiles wine, aircraft, ships electronics
Highest elevation: Mount Blanc 4,8807 m
GDP: \$2,650 billion (2010)
Type of government: Republic
GDP per Head: \$35,850 (2012)



GENERAL BACKGROUND

LOCATION

France is located in Western Europe between the Atlantic Ocean and the Mediterranean Sea. France's neighbors are Spain in the southwest, Monaco in the southeast, Italy, Switzerland and Germany in the east, and Luxembourg and Belgium in the north.

LAND

France is the largest European country. It comprises 95 metropolitan departments. The island of Corsica is located 150 kilometers to the southeast in the Mediterranean Sea. A wide plain covers over half the country. The Massif Central is a high region in the center of the country. To the east are the Alps. The Pyrenees in the south forms the border with Spain. Lowland plains are found along the Atlantic coastline.

The Seine River flows eastward northwest in the English Channel. The Loire River and the Garonne River flow into the Atlantic Ocean. The Rhone River flows south into the Mediterranean Sea. The Rhine River flows north and forms part of the French border with Germany. France is approximately twice the size of the state of Colorado.

CLIMATE

The greater part of France has a maritime climate, with cool winters and warm to mild summers. The southern French coastal region has a Mediterranean-type climate, with warm, dry summers and mild, wet winters. The most significant seasonal variations in temperature occur in the eastern, alpine area. Paris averages 380F/30C in January and 650F/190C in July. Rainfall averages 24-inches/610 mm per year.

PEOPLE

France has one of the world's most homogeneous populations. French people have strong nationalistic feelings towards their country. French is the common language, with Breton, Flemish, Basque, Italian, and some German dialects spoken in certain

border locations. Over 90% of the French population is Roman Catholic, the remaining 10% being made up of Protestant, Jews, and Muslims. France's population is basically evenly distributed throughout the country. The area near the Spanish border, however, is sparsely inhabited.

POPULATION

France's total population in 2011 was estimated to be 61,500,000. Slightly less than 75% of the population lives in urban areas. France's population density is 111 persons per square kilometer.

LARGEST CITIES

The largest cities in France, with their populations as of 2011, are:

- **Paris:** 2,500,000
- **Lyon:** 900,000
- **Marseilles:** 970,000
- **Lille:** 770,000
- **Bordeaux:** 670,000
- **Toulouse:** 575,000
- **Nice:** 485,000

HISTORY

Gaul, the ancient Celtic country occupying the area of present-day France, was conquered by Julius Caesar in 58-61 BC; The Romans occupied and ruled France for approximately 500 years.

The French monarchy was overthrown by the French Revolution (1789-93) and was succeeded by the First Republic, which was in turn followed by the First Empire under the rule of Napoleon Bonaparte (1804-15). A monarchy, the House of Bourbon was then established (1814-48), followed by the Second Republic (1848-52), the Second Empire, led by Napoleon III (1852-70), the Third Republic (1871-1946), the Fourth Republic (1946-58), and Fifth Republic, under the leadership of Charles de Gaulle (1958 to the present day).

France was a major world power from the sixteenth through the eighteenth century. France controlled huge territories in North America, Africa, the

Middle East, and the Pacific. The nation suffered great losses in manpower and resources in The First World War, when Germany invaded and controlled its northern regions. In 1940, France was once more invaded by Germany; the Allies liberated it in 1945. Since the Second World War, France has prospered and maintained its position as a major world power.

GOVERNMENT

The president of France is elected for a seven-year period by a national general election. The president appoints the prime minister, who in turn selects a cabinet and is responsible to parliament. The president has the right to dissolve the National Assembly or to request parliament for a review of the law. The parliament consists of two houses, the upper or Senate and the lower house, the National Assembly.

ECONOMY

France is at this time, one of the top five western industrialized economies. It has substantial agricultural assets, a large and sophisticated industrial base, and an abundantly skilled labor force. Vibrant service sector accounts for a progressively larger contribute to of economic sector. France has one of the worlds most developed and sophisticated economies. It has a significant and modern industrial manufacturing base together with large agricultural resources. The GDP in 2012 is forecast to be \$2.30 trillion, with a national product per capital of \$35,850. GDP growth is expected to be in the 1.5% - 1.8% range in 2012 and beyond; however, the high levels of unemployment are unlikely to fall significantly. France's major trading partners are Germany, Italy, Spain, the U.S., the United Kingdom, Belgium, and Holland.

COMMUNICATIONS

- **Highways:** There are approximately 1,000,000 miles / 1,600,000 km of highways and roads.
- **Railways:** There are approximately 23,000 mile / 37,000 km of rail track currently being utilized.
- **Telephones:** France has approximately 45 mil-

lion telephones in service.

GENERAL POLITICAL – ECONOMIC / CONSTRUCTION INDUSTRY FORECAST

The recent strikes / riots related to the raising of the retirement age from 60 to 62 seems to have receded as we move into 2012, although this situation appears to be resolved. The French economy and construction sector are forecast to starting “inching” upwards again in 2012, after the disastrous last two years. GDP growth should be in the 1.5% to 1.8% range, unemployment will stay in the 8.5% - 9% for most of 2012.

France is one of Europe's largest economies has endured low growth and high unemployment levels for the last five years. Although the November 2005 riots have faded from the main news, there still appears to be pent up feelings between the rioters and the Government (the police). The expansion of the European Union (EU) to 27 member states could have a major impact on France, cheap labor from less developed member states, could cause social problems as we move into 2012. Major political and social issues that will dominate French politics in 2012 will be:

- The fate of the Euro and how the French government manages the huge European debt crisis is a big “dark” cloud hovering over the French economy as we move into 2012.
- France will continue to experience high unemployment in 2012.
- Oil prices ranging in the \$75 - \$90 + barrel although high will be helpful to the French economy if only to stabilize energy prices.
- Government pensions and how to pay for them will be a major problem facing the French Government in 2012; the recent strikes about raising the retirement age is an example of this.

The French construction industry historically represents 6% - 7% of the GDP. This means that in 2012 construction expenditures will be in the range US\$150 to 170 billion. This would make the French construction market approximately 12% - 15%

size of the U.S. domestic construction market. The French construction market is one of the largest in the world, currently ranked 6th. In 2011, the total French workforce was approximately 29,000,000. Of this, slightly less than 1,900,000 were employed within the French construction industry. This equals just over 6.7% of the total workforce. The number of residential construction permits issued for construction in 2008 was approximately 425,000 which were 15% less than 2007, residential and commercial construction will continue to decline in 2012.

The French Ministry of Labor estimates that slightly more than 8% of the French workforce in the private sector is unionized compared to almost 25% of the public sector workforce. The main unions are Confederation Generale du Travail (CGT) and Force Ouvriere (FO). The Standard workweek in the construction industry is 37.50 hours spread over a five-day period.

Some of France's largest A/E design firms are:

- Technip-Colflexip
- Vinci Group
- EEG Simecsol
- Egis
- Sofremines
- SBM
- Coyne et Bellier

Some of France's largest EPC contractors are:

- Bouygues
- Prezioso Technilor Group
- SGE Group
- Soletanche Bachy
- GTM-Entrepose
- Technip
- Eiffage
- TSO

Low inflation and tax cuts will perk up consumer confidence somewhat in 2012. The economic prospect for 2012 is for continued slow growth after the devastating last three years. France's transportation infrastructure is among the most sophisticated in the world, gaining from advanced technology and

extraordinary investment by the government. The three main entry points for airfreight are the Orly and Charles de Gaulle airports in Paris and Lyon's Saint-Exupery airport. France has twelve major seaports, many of which are equipped for container ships. There is also an extensive highway and river-transport system and a state-owned rail network that is among the most wide-ranging and technologically advanced in the world. Do not expect much new capital investment in France in 2012, except for repairs and upgrades to low cost housing projects around most of France's major cities and some major highways and some new nuclear power stations.

The French Government is endeavoring to rebalance its budget and it appears that significant cuts in public spending will take place in 2012, this will slowdown public construction work opportunities.

Over 200,000 EPC construction-related organizations operate in the French domestic construction market. The French term enterprise generale is the equivalent of the English "general contractor".

These large contractors operate throughout France and also work in the international construction arena. There are also a number of local medium-sized contractors. The vast majority of French construction organizations are "trade contractors". These organizations, as their name implies, are specialists in one specific type of work (e.g., masonry, painting, flooring, etc.). Many of these organizations employ less than 25 individuals and tend to work in a specific area or region of the country, usually within one or two hours travel distance from their home office. Many French construction projects are built utilizing trade contractors. The task of coordinating and supervising the trade contractors is performed by either an architect, engineer, or, in recent years, a construction manager. The players / contributors in the French construction industry involve the following individuals / organizations: (1) Maitre de

l'ouvrage – The owner / client / ultimate end user of the facility; (2) Maitre d'ouvrage, the owner / client representative(s) / Clerk of the Works; (3) The Architect / Engineer – Concepteur – produces the schematic and overall basic concept, hands over the basic concept to the BET; (4) The BET - Bureaux d'Etudes Techniques (Architectural /Engineering/ Structural Engineering and MEP firm) compiles all the projects required detailed engineering / design deliverables –; (5) Pilotedu d'ordonancement - The Project Coordinator / Construction Manager and (6) The General Contractor – L'Enterprise General.

The role of the architect in France is to develop the building or facility concept (schematic design). The architect is considered more of an artist than a technical expert. Detailed design in France is often completed by a Bureau d'Etudes Techniques (B.E.T.). Many organizations can be involved in the design that is initiated by the architect. The French construction industry has a function called the maitre d'oeuvre. This individual's role is to

coordinate the construction effort, inspect the works, performs cost control, and undertakes site administration, change order control and approves invoices. The French construction industry has adopted a 10-year insurance liability program, which is underwritten by insurance companies. This program is mandatory for all owners and contractors performing construction work. The owner's insurance company usually plays a significant role in the construction process, and typically reviews and comments on both the detailed design and the construction effort. To acquire coverage from a French insurance company typically entails obtaining approval from one of two organizations: Office Public de Qualification pour la Construction des Batiments (OPQCB), the organization for general building construction, and Service de Recensement des Travaux Publics (SRETP), is for all civil engineering work.

The French Government is endeavoring to rebalance its budget and it appears that significant cuts in public spending will take place in 2012, this will slowdown public construction work opportunities.

There are numerous building codes, regulations, and rules that are utilized throughout France. These are produced and updated by national, regional, and local government department. Either local government building inspectors or private inspectors hired by the owner carries out inspection of construction work for compliance to specifications, drawings, quality considerations, and local building regulations. The responsibility for coordinating, implementing, and monitoring France's environmental laws, particularly those relating to regulated facilities such as manufacturing plants and chemical facilities, lies with the préfet who is the representative of the French government in each local department. (France consists of 95 departments.) The préfet involved in the permitting and sanctioning of regulated facilities and has authority to impose penalties in case of violations, including plant closures and fines. He or she is assisted by inspectors (inspecteurs des installations classées), many of whom are from a joint agency of the Ministry of Industry and the Ministry of Environment, called the Regional Division of Industry, Research and the Environment (Direction Régionale de l'Industrie, de la Recherche et de l'Environnement (DRIRE)). These inspectors are typically engineers; they outline the scope of work and the technical requirements for regulated facilities and monitor and audit the implementation of these facilities' applications and construction.

The French government has a long-standing policy on foreign-controlled organizations operating in France: no such organization should become a dominant player in any domestic market. This includes the construction industry. The government attaches great importance to the creation of new employment opportunities and the protection of existing jobs. Overseas investment in nationalized industries such as railways, utilities, and nuclear power is not allowed at this time. There are basically no limita-

tions or restrictions in the private industry sector and individuals may own companies from other countries.

The French government offers various incentives, grants, and tax subsidies at the national, regional, and local level to attract domestic and overseas financial investment into some of the less prosperous regions of the country. France is divided into basically four investment regions that have been given differing degrees of incentive priority. Region "A" includes the southwest, much of the central region, and Corsica. The amount of incentive decreases incrementally up to Region "D", which

include Paris. The most significant financial incentives available to potential industrial investors are a regional development grant called Prime L'Aménagement du Territoire (PAT). This program is directed by an organization called Delegations a l'Aménagement du Territoire et a Action Regionale (DATAR). This agency can provide grants to industrial investors of between 17% and 25% of the

total capital investment. Usually grants of \$10,000 per new job created, for a minimum of 20 new jobs and a minimum investment of US \$4 million, up to maximum of 25% of the capital investment cost of the building or facility, can be obtained.

In the mid-1980s three special enterprise zones were established. These are located in Dunkirk, Toulon-La-Seine, and Aubagne-La-Ciotat, all areas experiencing high unemployment rates. Business established within the first five years of the zones creation (i.e., before October 15, 1991) that meet certain rules and criteria benefit from a ten-year tax holiday and from certain other incentives. Corporate income tax on headquarters-related operations can be restricted to the headquarters operational costs and expenses plus a mark-up of 8-10%. In additions, expatriates employed in the headquarters operation may also be able to obtain favorable tax

The French government has a long-standing policy on foreign-controlled organizations operating in France: no such organization should become a dominant player in any domestic market. This includes the construction industry.

benefits.

French industry is capable of producing all construction materials and equipment that would be required on any new building or facility. The quality of French construction products is extremely high and is equal to most U.S. manufactured construction products.

CONTRACTING METHODS

Public Works / Public Procurement is carried out under the terms and conditions stipulated in CCAG / CCAP's / GPEM's (3/20020, a website www.journal-officiel-gouv.fr is a useful site to visit. The main form of contract used in France for private (and sometimes public) construction projects is the "Codes des Marchés Public." The main components of this form of contract are:

1. Acte d'engagement, or articles of agreement:
2. Cahier des clauses admin-

istrative generale, or general administration clauses (CCAG / TRAVAUX / FCS 4 # Gen Admin t & c):

3. Cahier des clauses techniques generale, or technical clauses and specifications:

There are variety of procurement choices and contractual arrangements available to public and private building or facility owners. These include:

- Trade Contracting: This option is popular and widely utilized. A number of trade contractors are selected on a competitive bid basis and an architect, engineer, or construction manager is hired to coordinate the construction effort.
- Lump sum or general contracting: This is becoming more popular and is similar to the method commonly used in North America and Great Britain. An architect or engineer produces a detailed design, and contractors bid on the bid documents utilizing in-house labor and selecting subcontractors or trade contractors for specialist items of scope. In periods of high inflation clauses are incorporated into the contract to allow contractors to recover significant

cost increases.

- Design/build, turnkey contracting: A design/build contract provides all of the services, (design, procurement, and construction) to complete the building or facility for an owner. In design/build construction the owner specifies his or her requirement (e.g., tons of material to be produced each day, number of guests staying in a proposed hotel, etc.). The owner stipulates the time the facility is required by and the quality requirements. The contractor designs, procures, and constructs the facility within the specified parameters. The owner will usually have

one contract with the contractor; the contractor typically will have a number of contracts with subcontractors and equipment suppliers.

- Concession Contracts: This contracting option is used on major highway, bridge, and tunnel projects. The Channel tunnel was designed, procured, constructed, and operated by a concession

contractor. The concession contractor operates and maintains the facility for a stipulated period of time, say 25 years. During this period the concession contractor generates income by charging tolls to amortize the construction loans.

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- The FIDC form of contract: This form is sometimes utilized on civil engineering projects.
- Major Fortune 500 companies performing construction work in France many times will use their own standard forms of contract modified to local conditions.

- Negotiated contracts:
- Reimbursable contract (cost plus):

Like all other developed countries, France has a comprehensive set of government procurement procedures that need to be adhered to. Government procurement procedures can usually be reviewed at France's embassies or can be obtained from the relevant government agency.

To undertake construction work, either private or public in France, an organization must be able to

obtain and provide insurance coverage that includes the 10-year insurance liability program. The ability to obtain this insurance coverage in some ways acts as a prequalification for bidding on construction projects.

ARCHITECTURAL/ENGINEERING DATA

The following table shows typical percentage fees related to architectural and engineering services on new building/facilities located in France. The percentages shown are appropriate for conceptual estimating assignments and should be used only as a guide. The values shown are appropriate for a building or facility with total installed cost of US\$10 - \$50 million.

FEE STRUCTURE	UNCOMPLICATED BLDG/FACILITY	COMPLICATED SOPHISTICATED BLDG/FACILITY
Architectural Fee	3.00%	7.00%
Structural eng. Fee	0.50%	1.50%
Mechanical/electrical Eng. Fee	1.50%	3.50%
Inspection services fee*	0.50%	1.50%
Construction economist*	0.35%	0.65%
Other specialist consultants	0.65%	0.85%
Total architectural/engineering and other consulting fees, as a percentage of final cost of facility	6.50%	15.00%

NOTE:

Contractor completion or finalization of detailed design is not included in above percentage, but is typically incorporated into bid price. *A maitre d'oeuvre often performs these activities.

The above fee percentages are dependent upon building or facility type, scope of work, sophistication of specifications, durations of engineering effort, complexity of building control systems, market conditions, and HVAC requirements, quality of materials and building/facility equipment,

and owner involvement with the design effort. It should be understood that French design and procedure methods typically have the architectural and the other engineering professionals completing the detailed engineering effort at what appears to be the 50% - 75% of the drawings are issued to contractors for lump-sum bids. It is usual practice for the successful bidder together with his or her selected trade contractors to finalize and complete the detailed engineering/ design effort.

The hourly rates that follow are "all in" job rates or selling rates for various construction professionals. The rates are appropriate for 2012. The hourly rates include employee salaries, workers compensation insurance, social security payments, health insurance premiums, unemployment insurance, vacation payments, overhead costs, office facilities, utilities, supervision, and profit. The rates shown are appropriate for the Paris area and apply to individuals with a minimum of 10 years experience. The rates do not include temporary living expenses or travel costs.

- **France: in Euros US\$ 0.70 / Euro August 3rd, 2011**

French professional workers typically work 37.5 - 39 hours per week and receive 5 - 6 weeks paid vacation, they are also entitled to 9 - 11 public holidays, hours worked per year = 1,600 - 1,650.

- Experienced Engineering Professional with 10 years experience - annual salary (High) \$81,800 / 1,625 = \$50.35 x mark-up of 2.10 = \$106.00 / hour or 75 Euros

- Experienced Engineering Professional with 10 years experience - annual salary (Low) \$66,800 / 1,625 = \$41.10 x mark-up of 1.75 = \$72 / hour or 50 Euro

Note: the above professional hourly bill out rates are appropriate for residential / light commercial type construction related construction work.

For Process / Chemical / Refinery type construction work use the following rates following page.

SKILL	EURO LOW	EURO HIGH
Senior Project Manager (25 years experience)	150	185
Project Manager (10 years experience)	120	160
Mechanical Engineer (15 years experience)	110	125
Chemical Engineer (15 years experience)	110	130
C/S/A Engineer (ditto)	100	130
E&I Engineer (ditto)	125	150
Estimator / Q.S. (ditto)	85	120
Planner (5 years experience)	75	100
CAD Operator	50	65
Purchasing Agent (10 years experience)	65	100
Contracts Manager / S/C Administrator	100	120
Admin / Document Control	35	55
Construction Manager (20 years experience)	100	160

ENGINEERING PRODUCTIVITY DESIGN WORK:

The following figures show a range of productivity values: (1) Washington, DC (2) Houston Texas, and (3) Paris, France. The productivity factors are compared against a U.S. basis of 1.00 – Washington DC, engineering labor working on producing the necessary design deliverables for a midsize petro-chemical / manufacturing facility (say \$10 – \$50 million).

REF. #	LOCATION	PRODUCTIVITY VALUE
1	Washington, DC	1.00
2	Houston, TX	0.95
3	Paris, France	1.05

CONSTRUCTION LABOR HOURLY RATES

The rates shown below are 2012 “all in” selling rates for skilled and unskilled construction workers. The rates indicated are the hourly billing rates that a contractor would charge an owner or end user for work carried out on either a time and material basis or the “all in” grossed up labor rates contained in his or her bid.

Construction Labor**“ALL IN” SELLING RATES FOR SKILLED AND UNSKILLED CONSTRUCTION WORKERS**

CATEGORY	LOW	HIGH	AVERAGE
Workers compensation insurance			
Federal /state unemployment			
FICA (social security / OAP)			
Vacation / Holidays			
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)	65%	115%	75% - 95% RANGE

Construction Material Costs**MIDSIZE COMMERCIAL OR INDUSTRIAL 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 \$
Blocks (Concrete 8" x 16" x 4")	5,000	Each	1.52	7,598	1.50	7,500
Bricks (Common) 1,000	15	1,000	561	8,419	400	6,000
Bricks (Facing) 1,000	10	1,000	640	6,409	545	5,450
Cement in bags	150	Ton(M)	247	37,021	242	36,300
Conduit 2" / 50 mm rigid galvanized steel	1,000	M	19.29	19,288	19.50	19,500
Instruments 4 # 2" / 4" CV (8 #), 12 # (F/P/T) Devices	20	Each	4,105	82,105	3,725	74,500
Copper pipe 0.50" / 12 mm L	1,000	M	5.57	5,574	6.56	6,560
R M Concrete 3500 PSI / 25 MPa	350	M3	134	46,834	131.50	46,025
Sand / Stone 1.5" diameter / Imported fill / Hardcore (Average)	2,500	Ton(M)	34.24	85,590	20.90	52,250
Stainless steel 304 pipe 1" / 25 mm	1,000	M	12.02	12,019	14.90	14,900
Steel pipe A-53 2" / 50 mm diameter	1,000	M	10.86	10,857	10.17	10,170
Steel Reinforcement (not installed)	50	Ton(M)	1,464	73,212	1,050	52,500
Structural Steel (Fabricated not installed)	50	Ton(M)	1,782	89,100	2,150	107,500
Valves (Ball) 4" diameter 150 #	25	Each	685	17,120	635	15,875
TOTAL				501,145		455,030

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

- Skilled Worker (Plumber) annual salary (High) \$39,950 / 1,625 = \$24.60 x mark-up of 1.95 = \$48.00 / hour or 34 Euros
- Skilled Worker (Plumber) annual salary (Low) \$34,500 / 1,625 = \$21.20 x mark-up of 1.75 = \$37.15 / hour or 26 Euros
- Unskilled Worker (Laborers) annual salary (High) \$26,300 / 1,625 = \$16 x mark-up of 1.95 = \$31.20 / hour or 22 Euros
- Unskilled Worker (Laborers) annual salary (Low) \$21,000 / 1,625 = \$12.95 x mark-up of 1.75 = \$22.65 / hour or 16 Euros

CONSTRUCTION MATERIAL COSTS

The values indicated on the following page are a sampling of construction material costs applicable to a midsize commercial or industrial project. The data are from a number of projects in the Paris metropolitan area. The values include delivery to site. They exclude TVA or VAT tax and do not include any overhead or profit add-ons to the installing contractor. The values shown are approximate and should be utilized on that basis. Premiums of 10-20% should be added to the prices indicated for small quantities. Similar discounts can be had for sizable quantities. Costs are valid for year 2012.

Note: With the continuing weakening of the US \$, French bulk materials on average are 6% - 10% more expensive than their US equivalent. Engineered bulk items such as motor controlled valves, instrumentation devices etc; tend to be 7.5% - 10% more expensive in France than in the USA as of January 2012.

APPROXIMATE COSTS OF BUILDINGS / FACILITIES

The cost values shown on the next page include all material, labor, construction equipment, overhead, and profit. The values exclude land purchase; value added tax, parking areas, extensive landscaping, design fees, owner-provided equipment, furniture, and fixtures. The values were obtained by dividing the cost of the completed facility by the gross square meters of the buildings and facilities. They

are approximate and should only be used for budget or conceptual estimates. The high values should be used for projects located in downtown areas of major cities and for projects that utilize high-quality specifications, materials, and installation methods. The values have been adjusted to reflect 2012 pricing levels and are based on projects in the Paris area.

• **French SF / M2 Facility Unit Costs in US \$'s** (indicated in chart below)

LOCATION FACTOR

The factors shown below are used to quantify the cost differences for specific construction methods in different locations. Use of the factors involves either (1) estimating the proposed project on a U.S. basis (2) knowing the cost of a particular U.S. facility (often a Gulf Coast project is the model). The U.S. estimate is expressed as a base index of 1.00.

Costs of Building Facilities

FRENCH SF / M2 FACILITY UNIT COSTS IN US \$'S

#	TYPE OF FACILITY	SF / LOW	SF / HIGH	M2 / LOW	M2 / HIGH
1	Airport Terminal 2 – 3 Floors 400,000 - 700,000 SF	151	220	1,629	2,368
2	Apartments (Class B/C) 3 – 6 floors not public housing	157	221	1,687	2,377
3	Apartment public housing 3 – 6 floors	111	160	1,191	1,719
4	Food Production / Dairy Facility 70,000 SF	121	163	1,301	1,752
5	Hotel 3-6 floors 100,000 SF- 2 - 3 star - suburban location*	167	240	1,800	2,578
6	Manufacturing / Facility / Factory 2 Floors 75,000 SF	60	111	647	1,194
7	Office 3 Floors 45,000 SF suburban location*	170	229	1,831	2,467
8	R & D Facility(College – Basic Research) 2 Floors 65,000 SF	177	241	1,908	2,589
9	W-House Refrigerated 80% / Admin 20% / 80,000 SF	92	146	993	1,574
10	W-House/ Logistics Center 80% / Admin 20% 40,000 SF**	62	101	668	1,083

* 5 - 15 miles from city center

** excludes racking / bar coding / warehouse equipment

Location factors typically reflect disparities in construction materials and labor rates, productivity differentials, equipment costs, importation of materials and capital equipment, design costs, exchange rates, freight costs, taxes, and import duties. The purchase of land and inflation are excluded from the location factor. The following location factors are applicable for France:

- Chemical/process/manufacturing facilities (utilizing some imported equipment): **1.02**
- Building/facilities/civil projects (utilizing local materials): **0.98**

For example, if a recently completed industrial project was built in the U.S. for US \$5,000,000, the cost of a similar facility in France would be US \$5,000,000 x 1.02 = US \$5,200,000. A building or facility to be constructed in France, estimated on a U.S. basis to cost US\$10,000,000, would be budgeted at US\$9,800,000.

If the above project is for a “first of its kind” building / facility (first construction effort will initially experience a steep learning curve as it navigates through governmental / local issues) add 0.03 – 0.05 points to above location factors. If company has built or has operating facilities already in country, use above indicated location factors:

UNIT PRICES (LABOR & MATERIALS, INCLUDES O/H & PROFIT)

DESCRIPTION	UNIT	\$ COST
Excavate for foundation n/c 1.5M	M3	12-18
Reinforced concrete foundation (MPa 30) incl. rebar & formwork	M3	350-585
Block wall 9" thick	M2	70-120
PCC wall 3" thick	M2	110-190
Curtain wall / window system	M2	450-700
Single door c/w frame & hardware	No	650-850
FP system	M2	20-30
EPDM Roofing System	M2	20-30

LABOR PRODUCTIVITY

The following figures show a range of productivity values: (1) good, (2) average, and (3) poor. The productivity factors for France are figured against a U.S. value of 1.00, based on open-shop (i.e., non-union) labor working at a midsize petrochemical facility on the Texas Gulf Coast.

PRODUCTIVITY RANGE

- **Good:** 0.90
- **Average:** 1.10
- **Poor:** 1.40

Thus, using the average value of 1.10, a task that took 2,000 man-hours to complete in the U.S. would take 2,200 man-hours to perform in France.

Factors that can contribute to good productivity include good access to the work area, an experi-

Construction Equipment / Plant Hire Rental

EXCLUDES DRIVER, INCLUDES ROUTINE MAINTENANCE, EXCLUDES FUEL, INCLUDES MOB/DE-MOB COSTS

EQUIPMENT / PLANT HIRE RENTAL	USA COST PER 8 HOUR DAY	COST IN FRANCE PER 8 HOUR DAY
Backhoe -F.E. Loader (JCB or similar)	\$223.70	
Bulldozer 50kW	\$491.04	
F.E. Loader 2.5 CY/2 M3	\$363.48	
Hydraulic Crane 20 Ton lifting capacity	\$671.08	
Bobcat mini F.E. loader	\$207.70	
Welding machine diesel 200 A	\$111.66	
COST PER DAY	\$2,108.66	DISCOUNT USA VALUES BY 3 – 5.5%