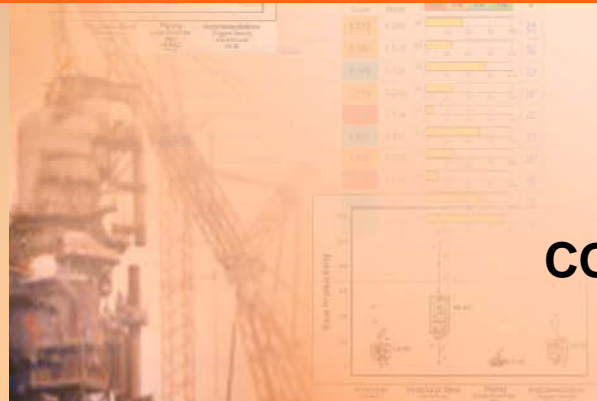




Construction Owners Association of Alberta (COAA)

Data & Reports: An Update

COAA Alberta Major Projects Benchmarking Program



COAA Best Practices XV Conference

May 16-17, 2007



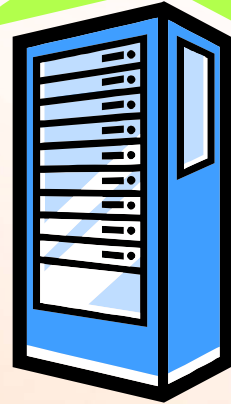
COAA/CII Benchmarking System



Remote Data Entry



Database



Project Reports



Alberta Report



Total Projects Submitted & In Progress

(as of May 8, 2007)

Project Type	Total
Oil Sands SAGD	8
Oil Sands Upgrading	9
Natural Gas Processing	5
Oil Sands Mining/Extraction	4
Heavy Industrial	2
Cogeneration	1
Oil Refining	1
Pipeline	1
Total	31



Projects Submitted

(as of May 8, 2007)

Project Type	Total
Oil Sands SAGD	4
Oil Sands Upgrading	1
Natural Gas Processing	1
Pipeline	1
Grand Total	7





COAA Questionnaire

General	Performance	Engineering Productivity	Construction Productivity	Practices	Closeout
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COAA Questionnaire

General	Performance	Engineering Productivity	Construction Productivity	Practices	Closeout
<u>General Project Information</u>					
<u>Engineering Standards and Specifications</u>					
<u>Project Scope</u>					
<u>Project Participation</u>					
<u>% Union Workforce</u>					



COAA Questionnaire

Percent Submitting Data*



General	Performance	Engineering Productivity	Construction Productivity	Practices	Closeout
<u>General Project Information</u>	100%				
<u>Engineering Standards and Specifications</u>	100%				
<u>Project Scope</u>	100%				
<u>Project Participation</u>	100%				
<u>% Union Workforce</u>	100%				

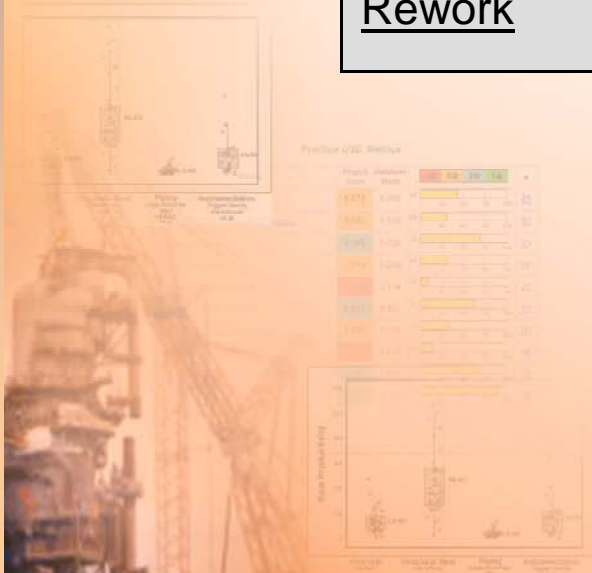
* Of Projects Currently Submitted





COAA Questionnaire

General	Performance	Engineering Productivity	Construction Productivity	Practices	Closeout
	<u>Cost</u>				
	<u>Schedule</u>				
	<u>Changes</u>				
	<u>Rework</u>				



COAA Questionnaire

Percent Submitting Data*



General	Performance	Engineering Productivity	Construction Productivity	Practices	Closeout
	<u>Cost</u>	100%			
	<u>Schedule</u>	100%			
	<u>Changes</u>	100%			
	<u>Rework</u>	86%			

* Of Projects Currently Submitted





COAA Questionnaire

General	Performance	Engineering Productivity	Construction Productivity	Practices	Closeout
		<u>Concrete</u>			
		<u>Structural Steel</u>			
		<u>Electrical</u>			
		<u>Piping</u>			
		<u>Instrumentation</u>			
		<u>Equipment</u>			



COAA Questionnaire

Percent Submitting Data*



General	Performance	Engineering Productivity	Construction Productivity	Practices	Closeout
		<u>Concrete</u>	33%		
		<u>Structural Steel</u>	100%		
		<u>Electrical</u>	86%		
		<u>Piping</u>	100%		
		<u>Instrumentation</u>	86%		
		<u>Equipment</u>	86%		

* Of Projects Currently Submitted





COAA Questionnaire

General	Performance	Engineering Productivity	Construction Productivity	Practices	Closeout
			<u>Concrete</u>		
			<u>Structural Steel</u>		
			<u>Electrical</u>		
			<u>Piping</u>		
			<u>Instrumentation</u>		
			<u>Equipment</u>		
			<u>Insulation</u>		
			<u>Offsite Modules</u>		
			<u>Scaffolding</u>		



COAA Questionnaire

Percent Submitting Data*



General	Performance	Engineering Productivity	Construction Productivity	Practices	Closeout
			<u>Concrete</u>	33% 17%	
			<u>Structural Steel</u>	100% 83%	
			<u>Electrical</u>	100% 83%	
			<u>Piping</u>	86% 67%	
			<u>Instrumentation</u>	86% 67%	
			<u>Equipment</u>	86% 67%	
			<u>Insulation</u>	100% 83%	
			<u>Offsite Modules</u>	50% 33%	
			<u>Scaffolding</u>	100% 83%	

%|% Est. Productivity | Actual Productivity

* Of Projects Currently Submitted





COAA Questionnaire

General	Performance	Engineering Productivity	Construction Productivity	Practices	Closeout
				<u>CII Best Practices</u> <u>Front End Planning</u> <ul style="list-style-type: none">• Proj. Definition Rating Index. <u>Project Risk Assessment</u> <u>Team Building</u> <u>Alignment</u> <u>Design for Maintainability</u> <u>Constructability</u> <u>Materials Management</u> <u>Other...</u>	
				<u>COAA – WorkFace Planning?</u>	



COAA Questionnaire

Percent Submitting Data*



General	Performance	Engineering Productivity	Construction Productivity	Practices	Closeout
				<u>CII Best Practices</u> <u>Front End Planning</u> • Proj. Definition Rating Index. <u>Project Risk Assessment</u> <u>Team Building</u> <u>Alignment</u> <u>Design for Maintainability</u> <u>Constructability</u> <u>Materials Management</u> <u>Other...</u>	100%
				<u>COAA – Workface Planning?</u>	

* Of Projects Currently Submitted





COAA Questionnaire

General	Performance	Engineering Productivity	Construction Productivity	Practices	Closeout
					<u>Achieving Facility Capacity</u>
					<u>Work-Hrs & Accidents</u>
					<u>Project Impacts</u>
					<u>Workforce Conditions</u>



COAA Questionnaire Percent Submitting Data*



General	Performance	Engineering Productivity	Construction Productivity	Practices	Closeout
				100%	<u>Achieving Facility Capacity</u>
				86%	<u>Work-Hrs & Accidents</u>
				100%	<u>Project Impacts</u>
				86%	<u>Workforce Conditions</u>

* Of Projects Currently Submitted



General	Performance	Engineering Productivity	Construction Productivity	Practices	Closeout
100% General Info & Characteristics	100% Cost	33% Concrete	33% 17% Concrete	CII Best Practices - Front End Planning 100% : Proj. Definition Rating Index 33% - Project Risk Assessment 100% - Team Building 100% - Alignment 100% - Design for Maintainability 100% - Constructability 100% - Materials Management 100% - Other.....	100% Achieving Facility Capacity
100% Engineering Standards and Deliverables	100% Schedule	100% Structural Steel	100% 83% Structural Steel		86% Work-hours and Accidents
100% Project Scope	100% Changes	86% Electrical	100% 83% Electrical		100% Project Impacts
100% Project Functions & Contract Types	86% Rework	100% Piping	86% 67% Piping		86% Workforce Conditions
100% % Union Workforce		86% Instrumentation	86% 67% Instrumentation		
		86% Equipment	86% 67% Equipment		
			100% 83% Insulation		
			50% 33% Modules Installation		
			100% 83% Scaffolding		
			100% 83% Const. Wk-hrs		
				COAA- Workforce Planning?	

Percentage of Projects that Submitted Data

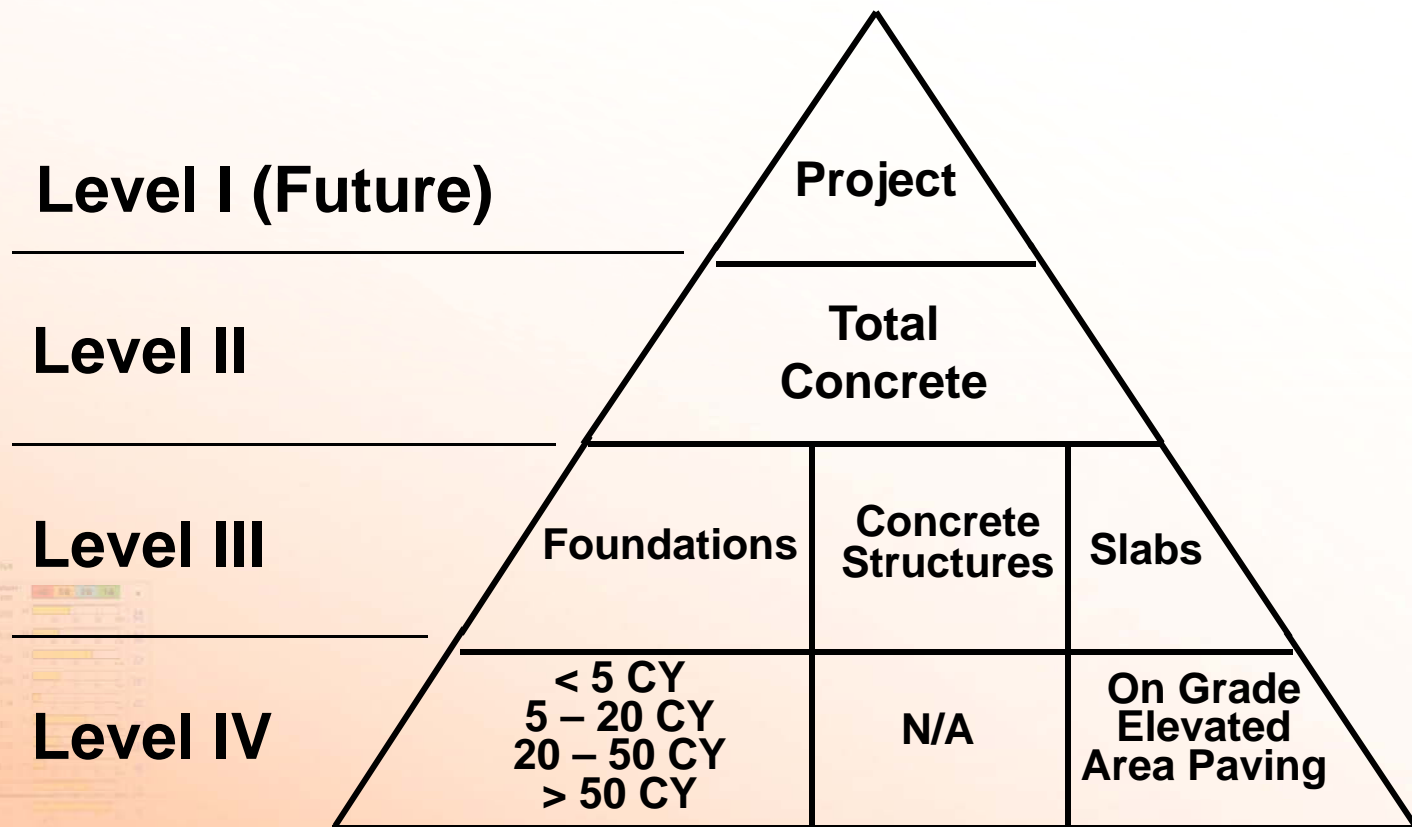
%| % Est. Productivity | Actual Productivity





Levels of Detail

Construction Example for Concrete



Project Reports



Project Reports



Key Reports

- Confidential
- Online
- Available After Entry

COMPANY CONFIDENTIAL A01001
Performance Metrics in CRMS

Cost Performance							
Metric	Project Score	Database Mean	Target	30	20	10	n
Project Cost Growth	0.036	-0.040					33
Detail Cost Growth	0.038	-0.092					34
Project Budget Factor	0.966	0.929					34
Detail Budget Factor	0.924	0.897					34
Detail Design Cost Growth	0.018	0.018					33
Procurement Cost Growth	-0.029	-0.123					33
Construction Cost Growth	-0.091	0.028					33

Phase Cost Factors					
Metric	Project Score	Database Mean	Median	Percent Spending More Money	n
Pre-Project/Planning Phase Cost Factor	0.068	0.063	0.063		38
Detail Design Phase Cost Factor	0.188	0.190	0.184		19
Procurement Phase Cost Factor	0.425	0.295	0.280		38
Construction Phase Cost Factor	0.334	0.448	0.405		38
Startup Phase Cost Factor	N/A	DB	DB	N/A	N/A

Schedule Performance							
Metric	Project Score	Database Mean	Target	30	20	10	n
Project Schedule Growth	-0.128	0.071					31
Detail Schedule Growth	0.128	0.132					24


Schedule Performance					
Metric	Project Score	Database Mean	Median	Percent Doing Less	n
% Design Complete at Execution	60%	22%	12%		13
% Design Complete at Construction Start	80%	77%	58%		13
% Mobilization	66%	60%	40%		15

Page 2 of 12



Key Reports

- The Confidential Key Report
- Is a “tool for self analysis”.
- Assesses your performance against the database.
- Is pre-programmed to compare with similar projects.
- Can assist you in identifying performance problems.
- Can help you locate sources of problems.
- Will be available online during and after data entry.

 COMPANY CONFIDENTIAL A01001
Performance Metric NORMS

Cost Performance							
Metric	Project Score	Database Mean	DB	3Q	2Q	1Q	n
Project Cost Growth	0.038	-0.040	94	95	96	97	35
Delta Cost Growth	0.036	0.092	94	95	96	97	36
Project Budget Factor	0.395	0.929	94	95	96	97	36
Delta Budget Factor	0.024	0.097	94	95	96	97	36
Detail Design Cost Growth	0.015	0.018	94	95	96	97	33
Procurement Cost Growth	0.104	-0.103	94	95	96	97	33
Construction Cost Growth	-0.091	0.028	94	95	96	97	33

Phase Cost Factors					
Metric	Project Score	Database Mean	Median	Percent Spending More	n
Pre-Project Planning Phase Cost Factor	0.066	0.053	0.053	94	35
Detail Design Phase Cost Factor	0.188	0.150	0.184	94	19
Procurement Phase Cost Factor	0.425	0.295	0.280	94	38
Construction Phase Cost Factor	0.334	0.448	0.405	94	38
Startup Phase Cost Factor	N/A	DB	DB	N/A	N/A

Schedule Performance							
Metric	Project Score	Database Mean	DB	3Q	2Q	1Q	n
Project Schedule Growth	0.126	0.071	94	95	96	97	31
Delta Schedule Growth	0.126	0.102	94	95	96	97	34

Percent Doing Less					
Metric	Project Score	Database Mean	Median	Percent Doing Less	n
% Design Complete at Sanction	69%	22%	12%	94	13
% Design Complete at Construction Start	86%	77%	83%	94	13
% Modularization	66%	50%	40%	94	15

Page 2 of 18



Sample Progress Key Report



Owner Project Key Report

Testcompany

COMPANY CONFIDENTIAL

4-May-07

Project Key Report V.2: 4-May-07



SAMPLE

Project General Information: Project Sanction

Company Name	Testco	Project Name	Grass Root
Project ID	AO1001	Project Driver	Schedule
Project Name	Test1	Project Complexity (1to 10)	8
Budgeted Cost	Project Budget	Industry Group	Heavy Industrial
	Construction Cost	Project Type	Oil Sand Upgrading
	Currency	Cost Category	> \$500MM
Planned Duration	Overall Project Duration	Project Capacity	50,000 BOE/Day
	Design-Startup	Part of a Larger Project	No
	Total Const. Work-Hours	Date of Project Sanction	
Project Location	City	Planned Completion Date	1 Sept 06
	Province	Unit of Quantity	Metric
	Country	Canada	

Notes:

- Overall Project Duration consider as start of Front End Planning to project turn over to user.
- For Project Complexity, The higher value indicates the higher level of complexity of the project.

Explanation of Notations:

- Asterisk (*) on the n value denotes a small sample of projects (10n<20)
- For phase cost & duration factors, the percentile bar indicates the percent of the projects with equal to or higher metric values. (For these metrics, low scores are not necessary better.)
- For performance & practice use metrics, the percentile bar indicates the percent of the projects for which you scored equal to or better than within the comparison data.
- Quartiles are indicated on the left of the percentile score bar; U0 indicates an Upper Outlier, L0 indicates a Lower Outlier.
- For percent design complete metrics and modularization, the percentile bar indicates the percent of the projects with equal to or lower metric values.
- For PDR, lower numbers are better and its minimum and maximum scores are 0 and 1000, respectively.
- The Appendix page contains summary information indicating the exact slice of data used for comparison in each metric.

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COMPANY CONFIDENTIAL

AO1001

Performance Metric NORMS

Cost Performance

Project	Project Score	Database Mean	4Q	3Q	2Q	1Q	n
Cost Factor	0.236	-0.040					35
Factor	0.236	0.082					36
ctor	0.365	0.929					36
ctor	0.034	0.097					36
ctor	0.015	0.018					35
ctor	-0.200	-0.123					33
ctor	-0.091	0.028					33

Phase Cost Factors

Project	Project Score	Database Mean	Median	Percent Spending More Money	n
Cost Factor	0.308	0.083	0.043		35
Factor	0.181	0.160	0.184		19
ctor	0.428	0.288	0.280		36
ctor	0.336	0.448	0.405		36
ctor	N/A	DD	DD	N/A	N/A

Schedule Performance

Project	Project Score	Database Mean	4Q	3Q	2Q	1Q	n
Factor	0.128	0.071					31
ctor	0.126	0.132					34

Project	Project Score	Database Mean	Median	Percent Doing Less	n
Factor	60%	22%	12%		13
Factor	60%	77%	85%		13
Factor	68%	60%	40%		15

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COMPANY CONFIDENTIAL

AO1001

Performance Metric NORMS (cont'd)

Phase Duration Factors

Project	Project Score	Database Mean	Median	Percent Spending More Time	n
Factor	0.327	0.367	0.313		34
Factor	0.346	0.430	0.412		36
ctor	N/A	DD	DD	N/A	N/A
ctor	0.489	0.369	0.341		36
ctor	N/A	DD	DD	N/A	N/A

Change Performance

Project	Project Score	Database Mean	4Q	3Q	2Q	1Q	n
Factor	0.205	0.075					28
ctor	N/A	DD	DD	N/A	N/A	N/A	N/A

Network Performance

Project	Project Score	Database Mean	4Q	3Q	2Q	1Q	n
Factor	N/A	DD	DD	N/A	N/A	N/A	N/A

Safety Performance

Project	Project Score	Database Mean	4Q	3Q	2Q	1Q	n
Factor (TRIF)	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Factor	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Factor	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Factor	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Factor	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Factor	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Factor	N/A	N/A	N/A	N/A	N/A	N/A	N/A

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Sample Key Report



Owner Project Key Report
 Testcompany
COMPANY CONFIDENTIAL
 4-May-07



SAMPLE

Project Key Report V.2: 4-May-07

Project General Information: Project Completion

Company Name		Testco	Project Name		Grass Root
Project ID		AO1001	Project Driver		Schedule
Project Name		Test1	Project Complexity (1 to 10)		5
Actual Cost	Total Installed Cost	\$575,000,000	Industry Group	Heavy Industrial	
	Construction Cost	\$488,000,000		Oil Sand Upgrading	
	Capacity	1CAD		> \$500MM	
Project Duration	Overall Project	260 Weeks	Project Capacity	50,000 BOE/Day	
	Detailed Eng. through Startup	210 Weeks	Project Completion Date	1 Nov. 06	
	Total Const. Work-Hours	2,600,000	Midpoint of Construction	2002	
Project Location	City	Ft. McMurray	Historical Cost Index Adjustment (2002 to 2006)	1.10	
	Province	Alberta	Unit of Quantity	Metric	
	Country	Canada			

Notes:

- Overall Project Duration consider as start of Front End Planning to project turn over to user.
- The historical cost index adjustment is the index at year of midpoint of construction/ the index at the present time.
- For Project Complexity, The higher value indicates the higher level of complexity of the project.

Explanation of Notations

- Asterisk (*) on the n value denotes a small sample of projects (10<n<20)
- For performance & practice use metrics, the percentile bar indicates the percent of the projects for which you scored equal to or better than within the comparison data.
- For phase cost & duration factors, the percentile bar indicates the percent of the projects with equal to or higher metric values. (For these metrics, low scores are not necessary better.)
- Quartiles are indicated on the left of the percentile score bar; Uo indicates an Upper Outlier, Lo indicates a Lower Outlier.
- For percent design complete metrics and modularization, the percentile bar indicates the percent of the projects with equal to or lower metric values.
- For PDR, lower numbers are better and its minimum and maximum scores are 0 and 1000, respectively.
- The Appendix page contains summary information indicating the exact slice of data used for comparison in each metric.

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COMPANY CONFIDENTIAL

AO1001

Performance Metric NORMS

Cost Performance		Project Score	Database Mean	Database Median	Percent Spending More	n
Cost Factor	0.236	-0.040				33
ctor	0.236	0.202				36
ctor	0.395	0.929				36
ctor	0.034	0.097				36
ctor	0.219	0.219				33
ctor	0.305	-0.123				33
ctor	-0.281	0.028				33

Phase Cost Factors		Project Score	Database Mean	Database Median	Percent Spending More Money	n
Cost Factor	0.305	0.083	0.083			36
ctor	0.188	-0.190	0.184			19
ctor	0.425	0.205	0.200			36
ctor	0.305	0.448	0.425			36
ctor	N/A	DO	DO			N/A

Schedule Performance		Project Score	Database Mean	Database Median	Percent Doing Less	n
	0.128	0.071				31
	0.128	0.132				34

Percent Doing Less		Project Score	Database Mean	Database Median	Percent Doing Less	n
Design	60%	22%	12%			13
Construction	60%	77%	88%			13
	66%	60%	40%			18

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COMPANY CONFIDENTIAL

AO1001

Performance Metric NORMS (cont'd)

Phase Duration Factors		Project Score	Database Mean	Database Median	Percent Spending More Time	n
ation	0.327	0.387	0.313			34
ctor	0.346	0.430	0.412			36
ctor	N/A	DO	DO			N/A
ctor	0.488	0.388	0.341			36
ctor	N/A	DO	DO			N/A

Change Performance		Project Score	Database Mean	Database Median	Percent Spending More	n
ctor	0.266	0.075				28
ctor	N/A	DO				N/A

Network Performance		Project Score	Database Mean	Database Median	Percent Spending More	n
ctor	N/A	DO				N/A

Safety Performance		Project Score	Database Mean	Database Median	Percent Spending More	n
afety (TRIF)	N/A	N/A				N/A
ctor	N/A	N/A				N/A
ctor	N/A	N/A				N/A
ctor	N/A	N/A				N/A
ctor	N/A	N/A				N/A
ctor	N/A	N/A				N/A
ctor	N/A	N/A				N/A
ctor	N/A	N/A				N/A
ctor	N/A	N/A				N/A

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Online Reports

Concrete Productivity

Metric	Wk-Hrs	Installed Quantity	Unit Rate	Database Mean	4Q 3Q 2Q 1Q	n
Foundations						
< 4 CM	10,833	1,212	8.94	17.33	1Q	13
4-15 CM	19,330	1,635	11.82	19.42	1Q	13*
16-38 CM	21,031	2,539	8.28	7.50	4Q	16*
≥ 38 CM	9,829	1,714	5.73	5.30	3Q	17*
Total Foundations (CM)	61,023	7,102	8.59	10.30	2Q	16
Total Installed Unit Cost (\$/ CM)	Actual	Estimated	Act/Est	DB Mean		
	550	430	1.28	1.10	3Q	14

- Productivity Unit Rates (Project vs. Database)
- Performance Quartiles
- Total Installed Unit Cost
- Actual vs. Estimated Productivity



Online Reports

Piping Productivity

Piping						
Metric	Wk_Hrs	Estimated Quantity	Est. Unit Rate	Database Mean	4Q 3Q 2Q 1Q	n
Carbon Steel	50,156	3,821	13.13	9.07		10
Stainless Steel	1,211	180	6.73	13.63		11
Chrome	1,117	64	17.45	28.20		10
Other Alloys	13,941	799	17.45	27.27		14
Non Metallic	N/A	N/A	N/A	N/A	N/A	N/A
Total Large Bore (ISBL)	66,425	4,863	11.40	13.50		24
Total Installed Unit Cost (\$/ LM)	Actual	Estimated	Act/Est	DB Mean		
	780	700	1.11	1.21		24
Large Bore (ISBL) Productivity Unit Rates	11.40	10.96	1.04	1.25		24

- Productivity Unit Rates (Project vs. Database)
- Performance Quartiles
- Total Installed Unit Cost
- Actual vs. Estimated Productivity



Confidentiality

- Confidentiality was a primary concern during system development.
- All data are held **strictly confidential**.
- Each benchmarking participant has a **User Profile to Log in**.
- When the user is **validated**, access to is granted.



Join Us Now!

COAA Benchmarking Associate Training

Next session: Web-based Training

→ June 20, 2007 @1pm - 5pm Mountain
Daylight Savings Time

To register, please send an e-mail to

Deborah DeGezelle [debdeg@mail.utexas.edu]





Questions?

