

CITY OF KEY WEST
 TASK ORDER No. 4 – DESIGN SERVICES
 RICHARD A. HEYMAN ENVIRONMENTAL PROTECTION FACILITY
 DEEP WELL INJECTION PUMP

BACKGROUND

The City of Key West (CITY) has decided to install an additional deep well injection pump at the Richard A. Heyman Environmental Protection Facility (RAHEPF). RAHEPF is currently equipped with two 500hp deep well injection pumps. The City desires to install a third pump that will handle majority of the average flows with the ultimate goal of achieving energy savings. The existing layout was designed with adequate space to the addition of a third pump. All design documents associated with this Task Order will be submitted as part of Task Order No. 1 – Aeration System Upgrade.

SCOPE OF SERVICES

Scope of services to be provided under this task are as described in Attachment A.

BUDGET

Tasks as described in Attachment A would have the following lump sum fees:

TASK SERIES	LUMP SUM FEES
Deep Well Injection Pump Design	\$76,067
Deep Well Injection Pump Site Visit	\$7,846
Deep Well Injection Pump HVAC Design	\$23,658
Deep Well Injection Pump – Establish Pump Curves for Existing Pumps	\$8,709
Deep Well Injection Pump – Electrical Upgrades	\$6,196
Deep Well Injection Pump – I&C Upgrades	\$5,410
LUMP SUM TOTAL	\$127,886

CITY OF KEY WEST

BLACK & VEATCH CORPORATION

By: _____

By: _____

By: _____

By: Rafael E. Frias III, P.E

(Print Name)

(Print Name)

Title: _____

Title: Associate Vice President

Date: _____

Date: _____

BLACK & VEATCH **TREND NOTIFICATION EVALUATION SHEET** **BV PN 199322** **1**

CLIENT City of Key West **TREND NUMBER**
PROJECT Richard A. Heyman Environmental Protection Facility - Deep Well Injection Pump **REVISION NUMBER**

TREND NAME	DATE INITIATED	INITIATED BY	DATE NOTIFIED	STATUS (A, D, P, or W)	TOTAL TREND COST			
					Trend Eval.	Engineering Cost	Construction Cost	Total Cost
Deep Well Injection Pump Design	12/11/18	City of Key West	12/11/18	P	\$ -	\$ 76,067	\$ -	\$ 76,067

TREND DATA

DESCRIPTION OF TREND	Overall Construction Cost:			Cost
	<p>The City currently has two 500 hp deep well injection pumps with space for a future 3rd pump. Based on an assessment by Jacobs, the City would like B&V to design a smaller pump as the third pump that will handle 80-90% of average flows to save energy.</p> <p>This design will include a BODR and Level 3 and Level 4 design documents. The BODR will be added to the BODR that B&V is currently preparing for the blower project and will not be a stand-alone report. The Level 3 and Level 4 drawings will be included in the drawing set for the blower project.</p> <p>Base Assumptions: The facilities consist of outdoor pumps with a 3 position for the new pump. A electrical building is masonry construction with a flat roof housing supporting electrical and I&C equipment. The electrical building is air conditioned. Pumps are not AFD driven. It is assumed that B&V will receive the evaluation report prepared by Jacobs, copies of the pump curves and all drawings for the existing pumps. It is assumed that B&V will evaluate the existing HVAC system to confirm that the system is sufficient but no HVAC design is needed. It is assumed that existing electrical is sufficiently sized for new pump.</p>	<p>Total Construction Cost \$ -</p>		
	Design Engineering Cost:			Cost
	Hours	Rate		Cost
	Senior Project Manager	6	\$ 205.00	\$ 1,230
	Engineering Manager	12	\$ 175.00	\$ 2,100
	Technical Specialist - Process Mechanical	47	\$ 205.00	\$ 9,635
	Project Engineer - Process Mechanical	99	\$ 142.00	\$ 14,058
	Senior Engineer - Electrical	55	\$ 158.00	\$ 8,690
	Senior Engineer - I&C	74	\$ 158.00	\$ 11,692
	Senior Engineering Technician	95	\$ 126.00	\$ 11,970
	Senior Engineer - Building Mechanical	9	\$ 158.00	\$ 1,422
	Senior Tech. Specialist - Hydrogeologist (Well Permitting)	30	\$ 225.00	\$ 6,750
	Project Engineer - Civil (Well Permitting)	30	\$ 142.00	\$ 4,260
	Project Engineer - Civil	30	\$ 142.00	\$ 4,260
	Total Engineering Cost			\$ 76,067
	Trend Eval. Engineering Cost			Cost
	Total Trend Eval. Engineering Cost			\$ -

EFFECT ON SCHEDULE:	EFFECT ON PROJECT COST:	TAKE ACTION INDICATED:
NONE (X)	NO CHANGE ()	CANCEL ()
ADD TO ()	ADD TO (X)	INCL. IN PROJECT ()
DELETE FROM ()	DELETE FROM ()	OTHER ()
		DISCUSS w/ CLIENT (X)

TYPE OF COST OPINION PREPARED (X) NONE () PRELIMINARY () DETAILED

IMPACT TO FOLLOWING TYPES OF WORK
 AN "X" OR NOTE BESIDE ANY OF THE FOLLOWING DESIGN GROUPS INDICATES THAT WORK SCOPE WILL BE EFFECTED BY THIS CHANGE NOTICE.

CIVIL	_____	ELECTRICAL	_____
SITework	_____	CONTROL SYS	_____
ESTIMATING	_____	STRUCTURAL	_____
SPECS.	_____	ARCHITECTURAL	_____
MECH-HVAC	_____	PROCESS	_____
MECH-PROC	_____	SCHEDULING	_____

ROUTING AND DISTRIBUTION:

TITLE /DISICPL	NAME	ROUTING	TITLE /DISICPL	NAME	ROUTING	TITLE /DISICPL	NAME	ROUTING
PROJ. MGR	Isabel Botero	X	STRUCTURAL			PUMPS		
ENG. MGR	Olena Lytvyn	X	ELECTRICAL			PROCESS		
			INSTRUMENTATION			GEOTECHNICAL		
			MECHANICAL (Process)			ESTIMATING		

ATTACHMENTS: **REFERENCES:**

LEGEND FOR STATUS
 A - APPROVED ; D - DISAPPROVED ; P - PENDING ; W - WITHDRAWN

CLIENT City of Key West **TREND NUMBER**
PROJECT Richard A. Heyman Environmental Protection Facility - Deep Well Injection Pump **REVISION NUMBER**

TREND NAME	DATE	INITIATED	DATE	STATUS	TOTAL TREND COST			
	INITIATED	BY	NOTIFIED	(A, D, P, or W)	Trend Eval.	Engineering Cost	Construction Cost	Total Cost
Deep Well Injection Pump Design Site Visit	12/11/18	City of Key West	12/11/18	P	\$ -	\$ 7,846	\$ -	\$ 7,846

TREND DATA

<p>DESCRIPTION OF TREND</p> <p>Site visit to confirm/evaluate existing conditions for new Deep Well Injection Pump.</p>	<p><u>Overall Construction Cost:</u> <u>Cost</u></p> <p style="text-align: right;">Total Construction Cost \$ -</p> <p><u>Design Engineering Cost:</u></p> <table style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th></th> <th style="text-align: center;"><u>Hours</u></th> <th style="text-align: center;"><u>Rate</u></th> <th style="text-align: center;"><u>Cost</u></th> </tr> </thead> <tbody> <tr> <td>Senior Project Manager</td> <td style="text-align: center;">2</td> <td style="text-align: right;">\$ 205.00</td> <td style="text-align: right;">\$ 410</td> </tr> <tr> <td>Engineering Manager</td> <td style="text-align: center;">2</td> <td style="text-align: right;">\$ 175.00</td> <td style="text-align: right;">\$ 350</td> </tr> <tr> <td>Senior Engineer - Electrical</td> <td style="text-align: center;">24</td> <td style="text-align: right;">\$ 158.00</td> <td style="text-align: right;">\$ 3,792</td> </tr> <tr> <td>Project Engineer - Civil</td> <td style="text-align: center;">12</td> <td style="text-align: right;">\$ 142.00</td> <td style="text-align: right;">\$ 1,704</td> </tr> <tr> <td>Travel expenses</td> <td></td> <td></td> <td style="text-align: right;">\$ 1,590</td> </tr> <tr> <td colspan="3" style="text-align: right;">Total Engineering Cost</td> <td style="text-align: right;">\$ 7,846</td> </tr> </tbody> </table> <p><u>Trend Eval. Engineering Cost</u> <u>Cost</u></p> <p style="text-align: right;">Total Trend Eval. Engineering Cost \$ -</p>		<u>Hours</u>	<u>Rate</u>	<u>Cost</u>	Senior Project Manager	2	\$ 205.00	\$ 410	Engineering Manager	2	\$ 175.00	\$ 350	Senior Engineer - Electrical	24	\$ 158.00	\$ 3,792	Project Engineer - Civil	12	\$ 142.00	\$ 1,704	Travel expenses			\$ 1,590	Total Engineering Cost			\$ 7,846
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DELETE FROM ()	DELETE FROM ()	OTHER ()
		DISCUSS w/ CLIENT (X)

TYPE OF COST OPINION PREPARED (X) NONE () PRELIMINARY () DETAILED

IMPACT TO FOLLOWING TYPES OF WORK
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CIVIL _____ SITEWORK _____ ESTIMATING _____ SPECS. _____ MECH-HVAC _____ MECH-PROC _____	ELECTRICAL _____ CONTROL SYS _____ STRUCTURAL _____ ARCHITECTURAL _____ PROCESS _____ SCHEDULING _____
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ROUTING AND DISTRIBUTION:

TITLE /DISICPL	NAME	ROUTING	TITLE /DISICPL	NAME	ROUTING	TITLE /DISICPL	NAME	ROUTING
PROJ. MGR	Isabel Botero	X	STRUCTURAL			PUMPS		
ENG. MGR	Olena Lytvyn	X	ELECTRICAL			PROCESS		
			INSTRUMENTATION			GEOTECHNICAL		
			MECHANICAL (Process)			ESTIMATING		

ATTACHMENTS: **REFERENCES:**

LEGEND FOR STATUS
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CLIENT City of Key West **TREND NUMBER**
PROJECT Richard A. Heyman Environmental Protection Facility - Deep Well Injection Pump **REVISION NUMBER**

TREND NAME	DATE	INITIATED	DATE	STATUS	TOTAL TREND COST			
	INITIATED	BY	NOTIFIED	(A, D, P, or W)	Trend Eval.	Engineering Cost	Construction Cost	Total Cost
Deep Well Injection Pump Design HVAC Design	12/11/18	City of Key West	12/11/18	P	\$ -	\$ 23,658	\$ -	\$ 23,658

TREND DATA

<p>DESCRIPTION OF TREND</p> <p>Complete HVAC design for new Deep Well Injection Pump. Design assumes HVAC will be needed for pump enclosure and electrical room.</p>	<p><u>Overall Construction Cost:</u> <u>Cost</u></p> <p style="text-align: right;">Total Construction Cost \$ -</p> <p><u>Design Engineering Cost:</u></p> <table style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th></th> <th style="text-align: center;"><u>Hours</u></th> <th style="text-align: center;"><u>Rate</u></th> <th style="text-align: center;"><u>Cost</u></th> </tr> </thead> <tbody> <tr> <td>Senior Project Manager</td> <td style="text-align: center;">2</td> <td style="text-align: center;">\$ 205.00</td> <td style="text-align: center;">\$ 410</td> </tr> <tr> <td>Engineering Manager</td> <td style="text-align: center;">6</td> <td style="text-align: center;">\$ 175.00</td> <td style="text-align: center;">\$ 1,050</td> </tr> <tr> <td>Senior Engineer - Electrical</td> <td style="text-align: center;">16</td> <td style="text-align: center;">\$ 158.00</td> <td style="text-align: center;">\$ 2,528</td> </tr> <tr> <td>Senior Engineering Technician</td> <td style="text-align: center;">42</td> <td style="text-align: center;">\$ 126.00</td> <td style="text-align: center;">\$ 5,292</td> </tr> <tr> <td>Senior Engineer - Building Mechanical</td> <td style="text-align: center;">91</td> <td style="text-align: center;">\$ 158.00</td> <td style="text-align: center;">\$ 14,378</td> </tr> <tr> <td colspan="3" style="text-align: right;">Total Engineering Cost</td> <td style="text-align: center;">\$ 23,658</td> </tr> </tbody> </table> <p><u>Trend Eval. Engineering Cost</u> <u>Cost</u></p> <p style="text-align: right;">Total Trend Eval. Engineering Cost \$ -</p>		<u>Hours</u>	<u>Rate</u>	<u>Cost</u>	Senior Project Manager	2	\$ 205.00	\$ 410	Engineering Manager	6	\$ 175.00	\$ 1,050	Senior Engineer - Electrical	16	\$ 158.00	\$ 2,528	Senior Engineering Technician	42	\$ 126.00	\$ 5,292	Senior Engineer - Building Mechanical	91	\$ 158.00	\$ 14,378	Total Engineering Cost			\$ 23,658
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NONE (X)	NO CHANGE ()	CANCEL ()
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DELETE FROM ()	DELETE FROM ()	OTHER ()
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TYPE OF COST OPINION PREPARED (X) NONE () PRELIMINARY () DETAILED

IMPACT TO FOLLOWING TYPES OF WORK
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CIVIL _____	ELECTRICAL _____
SITWORK _____	CONTROL SYS _____
ESTIMATING _____	STRUCTURAL _____
SPECS. _____	ARCHITECTURAL _____
MECH-HVAC _____	PROCESS _____
MECH-PROC _____	SCHEDULING _____

ROUTING AND DISTRIBUTION:

TITLE /DISICPL	NAME	ROUTING	TITLE /DISICPL	NAME	ROUTING	TITLE /DISICPL	NAME	ROUTING
PROJ. MGR	Isabel Botero	X	STRUCTURAL			PUMPS		
ENG. MGR	Olena Lytvyn	X	ELECTRICAL			PROCESS		
			INSTRUMENTATION			GEOTECHNICAL		
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CLIENT City of Key West **TREND NUMBER**
PROJECT Richard A. Heyman Environmental Protection Facility - Deep Well Injection Pump **REVISION NUMBER**

TREND NAME	DATE	INITIATED	DATE	STATUS	TOTAL TREND COST			
	INITIATED	BY	NOTIFIED	(A, D, P, or W)	Trend Eval.	Engineering Cost	Construction Cost	Total Cost
Deep Well Injection Pump Design Establish Pumps Curves for Existing Pumps	12/11/18	City of Key West	12/11/18	P	\$ -	\$ 8,709	\$ -	\$ 8,709

TREND DATA

<p>DESCRIPTION OF TREND</p> <p>Site visit to evaluate existing deep well injection pumps to establish pump curves</p>	<p><u>Overall Construction Cost:</u> <u>Cost</u></p> <p style="text-align: right;">Total Construction Cost \$ -</p> <p><u>Design Engineering Cost:</u></p> <table style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th></th> <th style="text-align: center;"><u>Hours</u></th> <th style="text-align: center;"><u>Rate</u></th> <th style="text-align: center;"><u>Cost</u></th> </tr> </thead> <tbody> <tr> <td>Senior Project Manager</td> <td style="text-align: center;">2</td> <td style="text-align: right;">\$ 205.00</td> <td style="text-align: right;">\$ 410</td> </tr> <tr> <td>Engineering Manager</td> <td style="text-align: center;">4</td> <td style="text-align: right;">\$ 175.00</td> <td style="text-align: right;">\$ 700</td> </tr> <tr> <td>Technical Specialist - Process Mechanical</td> <td style="text-align: center;">21</td> <td style="text-align: right;">\$ 205.00</td> <td style="text-align: right;">\$ 4,305</td> </tr> <tr> <td>Project Engineer - Civil</td> <td style="text-align: center;">12</td> <td style="text-align: right;">\$ 142.00</td> <td style="text-align: right;">\$ 1,704</td> </tr> <tr> <td>Travel expenses</td> <td></td> <td></td> <td style="text-align: right;">\$ 1,590</td> </tr> <tr> <td colspan="3" style="text-align: right;">Total Engineering Cost</td> <td style="text-align: right;">\$ 8,709</td> </tr> </tbody> </table> <p><u>Trend Eval. Engineering Cost</u> <u>Cost</u></p> <p style="text-align: right;">Total Trend Eval. Engineering Cost \$ -</p>		<u>Hours</u>	<u>Rate</u>	<u>Cost</u>	Senior Project Manager	2	\$ 205.00	\$ 410	Engineering Manager	4	\$ 175.00	\$ 700	Technical Specialist - Process Mechanical	21	\$ 205.00	\$ 4,305	Project Engineer - Civil	12	\$ 142.00	\$ 1,704	Travel expenses			\$ 1,590	Total Engineering Cost			\$ 8,709
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NONE (X)	NO CHANGE ()	CANCEL ()
ADD TO ()	ADD TO (X)	INCL. IN PROJECT ()
DELETE FROM ()	DELETE FROM ()	OTHER ()
		DISCUSS w/ CLIENT (X)

TYPE OF COST OPINION PREPARED (X) NONE () PRELIMINARY () DETAILED

IMPACT TO FOLLOWING TYPES OF WORK
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CIVIL _____	ELECTRICAL _____
SITework _____	CONTROL SYS _____
ESTIMATING _____	STRUCTURAL _____
SPECS. _____	ARCHITECTURAL _____
MECH-HVAC _____	PROCESS _____
MECH-PROC _____	SCHEDULING _____

ROUTING AND DISTRIBUTION:

TITLE /DISICPL	NAME	ROUTING	TITLE /DISICPL	NAME	ROUTING	TITLE /DISICPL	NAME	ROUTING
PROJ. MGR	Isabel Botero	X	STRUCTURAL			PUMPS		
ENG. MGR	Olena Lytvyn	X	ELECTRICAL			PROCESS		
			INSTRUMENTATION			GEOTECHNICAL		
			MECHANICAL (Process)			ESTIMATING		

ATTACHMENTS: **REFERENCES:**

LEGEND FOR STATUS
 A - APPROVED ; D - DISAPPROVED ; P - PENDING ; W - WITHDRAWN

CLIENT City of Key West **TREND NUMBER**
PROJECT Richard A. Heyman Environmental Protection Facility - Deep Well Injection Pump **REVISION NUMBER**

TREND NAME	DATE	INITIATED	DATE	STATUS	TOTAL TREND COST			
	INITIATED	BY	NOTIFIED	(A, D, P, or W)	Trend Eval.	Engineering Cost	Construction Cost	Total Cost
Deep Well Injection Pump Design Electrical Upgrades	12/11/18	City of Key West	12/11/18	P	\$ -	\$ 6,196	\$ -	\$ 6,196

TREND DATA

DESCRIPTION OF TREND Design of electrical upgrades necessary due to addition of new pump, including AFDs.	<u>Overall Construction Cost:</u>			<u>Cost</u>
				Total Construction Cost \$ -
	<u>Design Engineering Cost:</u>			
		<u>Hours</u>	<u>Rate</u>	<u>Cost</u>
	Senior Project Manager	2	\$ 205.00	\$ 410
Engineering Manager	6	\$ 175.00	\$ 1,050	
Senior Engineer - Electrical	22	\$ 158.00	\$ 3,476	
Senior Engineering Technician	10	\$ 126.00	\$ 1,260	
			Total Engineering Cost \$ 6,196	
	<u>Trend Eval. Engineering Cost</u>			<u>Cost</u>
				Total Trend Eval. Engineering Cost \$ -

EFFECT ON SCHEDULE:	EFFECT ON PROJECT COST:	TAKE ACTION INDICATED:
NONE (X)	NO CHANGE ()	CANCEL ()
ADD TO ()	ADD TO (X)	INCL. IN PROJECT ()
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MECH-PROC _____	SCHEDULING _____

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TITLE /DISICPL	NAME	ROUTING	TITLE /DISICPL	NAME	ROUTING	TITLE /DISICPL	NAME	ROUTING
PROJ. MGR	Isabel Botero	X	STRUCTURAL			PUMPS		
ENG. MGR	Olena Lytvyn	X	ELECTRICAL			PROCESS		
			INSTRUMENTATION			GEOTECHNICAL		
			MECHANICAL (Process)			ESTIMATING		

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CLIENT City of Key West **TREND NUMBER**
PROJECT Richard A. Heyman Environmental Protection Facility - Deep Well Injection Pump **REVISION NUMBER**

TREND NAME	DATE INITIATED	INITIATED BY	DATE NOTIFIED	STATUS (A, D, P, or W)	TOTAL TREND COST			
					Trend Eval.	Engineering Cost	Construction Cost	Total Cost
Deep Well Injection Pump Design I&C Upgrades	12/11/18	City of Key West	12/11/18	P	\$ -	\$ 5,410	\$ -	\$ 5,410

TREND DATA

DESCRIPTION OF TREND Design of I&C upgrades necessary due to addition of new pump.	Overall Construction Cost:			<u>Cost</u>
				Total Construction Cost \$ -
	Design Engineering Cost:			
		Hours	Rate	Cost
	Senior Project Manager	2	\$ 205.00	\$ 410
Engineering Manager	6	\$ 175.00	\$ 1,050	
Senior Engineer - I&C	25	\$ 158.00	\$ 3,950	
			Total Engineering Cost \$ 5,410	
Trend Eval. Engineering Cost			<u>Cost</u>	
			Total Trend Eval. Engineering Cost \$ -	

EFFECT ON SCHEDULE:	EFFECT ON PROJECT COST:	TAKE ACTION INDICATED:
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TYPE OF COST OPINION PREPARED (X) NONE () PRELIMINARY () DETAILED

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MECH-PROC _____	SCHEDULING _____

ROUTING AND DISTRIBUTION:

TITLE /DISICPL	NAME	ROUTING	TITLE /DISICPL	NAME	ROUTING	TITLE /DISICPL	NAME	ROUTING
PROJ. MGR	Isabel Botero	X	STRUCTURAL			PUMPS		
ENG. MGR	Olena Lytvyn	X	ELECTRICAL			PROCESS		
			INSTRUMENTATION			GEOTECHNICAL		
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CLIENT City of Key West **TREND NUMBER**
PROJECT Richard A. Heyman Environmental Protection Facility - Deep Well Injection Pump **REVISION NUMBER**

TREND NAME	DATE INITIATED	INITIATED BY	DATE NOTIFIED	STATUS (A, D, P, or W)	TOTAL TREND COST			
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					\$ -	\$ -	\$ -	\$ -

TREND DATA

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TYPE OF COST OPINION PREPARED (X) NONE () PRELIMINARY () DETAILED

IMPACT TO FOLLOWING TYPES OF WORK
 AN "X" OR NOTE BESIDE ANY OF THE FOLLOWING DESIGN GROUPS INDICATES THAT WORK SCOPE WILL BE EFFECTED BY THIS CHANGE NOTICE.

CIVIL _____	ELECTRICAL _____
SITWORK _____	CONTROL SYS _____
ESTIMATING _____	STRUCTURAL _____
SPECS. _____	ARCHITECTURAL _____
MECH-HVAC _____	PROCESS _____
MECH-PROC _____	SCHEDULING _____

ROUTING AND DISTRIBUTION:

TITLE /DISICPL	NAME	ROUTING	TITLE /DISICPL	NAME	ROUTING	TITLE /DISICPL	NAME	ROUTING
PROJ. MGR	Isabel Botero	X	STRUCTURAL			PUMPS		
ENG. MGR	Olena Lytvyn	X	ELECTRICAL			PROCESS		
			INSTRUMENTATION			GEOTECHNICAL		
			MECHANICAL (Process)			ESTIMATING		

ATTACHMENTS: **REFERENCES:**

LEGEND FOR STATUS
 A - APPROVED ; D - DISAPPROVED ; P - PENDING ; W - WITHDRAWN