FEASIBILITY OF UNDERGROUNDING

A PORTION OF THE

MIGUEL-MISSION 230 kV #2 TRANSMISSION LINE PROJECT

PROPOSED BY SAN DIEGO GAS & ELECTRIC COMPANY

February 26, 2004

CAI Commonwealth Associates, Inc.
engineers • consultants • construction managers

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INTRODUCTION

San Diego Gas and Electric Company (SDG&E) has proposed the construction of a new 230 kV overhead transmission line between the Miguel and Mission substations. The project, known as the Miguel-Mission 230 kV #2 Project, would include the construction of 35 miles of new transmission line along an existing SDG&E transmission corridor. An existing double-circuit transmission line consisting of one 69 kV circuit and one 138 kV circuit would be rebuilt to consist of one 230 kV circuit and one future 230 kV circuit. The existing 69/138 kV double-circuit transmission line would be reconstructed along the edge of the existing right-of-way. Figures B-7, B-8a, B-8b and B-12, located in the supporting documentation section of this report, provide an overview of the proposed project.

Commonwealth Associates, Inc. (CAI) was asked to review the feasibility of undergrounding a portion of the overhead transmission line at two locations. The first area reviewed is located in Jamacha Valley and is approximately 3.5 miles in length. A map of the proposed underground transmission line route is located in the supporting documentation and is identified as Alternative 1-1. Photos of the proposed route are also located in the supporting documentation.

The second area reviewed is located in the city of Santee and is approximately 1.4 miles in length. A map of the proposed transmission line route with photos is located in the supporting documentation section of this report.

SITE INSPECTION

Two sites were visually inspected to assess the feasibility of constructing an underground transmission line in Jamacha Valley and in the city of Santee. Some locations around the San Diego area have an undulating topography that make it difficult and expensive to construct underground transmission lines. However, both locations visited appeared relatively straightforward, and photos are provided in the supporting documentation for reference.

It should be noted that constructing an underground transmission line inside the existing SDG&E right-of-way routed through the city of Santee was considered, but it was not deemed to be a suitable route based on environmental concerns. The preferred route through the city of Santee would utilize city streets as shown in Alternative 1-2 in the supporting documentation.

Most underground transmission lines are routed through congested, urban cities that are cluttered with below-grade utilities that have been installed over many years. The combination of below-grade utilities, heavy traffic and tight work spaces tends to hamper construction and thus increase costs. However, the proposed underground transmission line would be routed through newer residential areas, which should facilitate underground construction. As a result, no major problems were found during the site investigation, and installing an underground transmission line at both locations appeared quite feasible.

UNDERGROUND CABLE TECHNOLOGY

Insulated cables at the 69, 138 and 230 kV voltages may take the form of self-contained, fluid-filled (SCFF) cables; high-pressure, fluid-filled (HPFF) pipe-type cables; high-pressure, gas-filled (HPGF) pipe-type cables; or a solid dielectric cable. SCFF cables are typically installed in long submarine applications but are rarely applied to land routes in the United States.

Fluid-filled and gas-filled cables consist of three cables pulled into a single metallic pipe. The interior void between the cables and inside pipe wall are filled with either oil or nitrogen gas pressurized to approximately 200 psi. This type of cable system is extremely reliable and rarely fails, but there is an environmental concern about an oil discharge if a leak should occur. Environmental concerns, cost and maintenance issues tend to suggest that there are better alternatives for this application.

Thirty years ago, HPFF, HPGF and SCFF tended to be the cables of choice in the 69 to 230 kV voltage range. However, during the last fifteen years, solid dielectric cables have become the preferred type of cable installed in the United States at voltages up to 169 kV, and that limit has now been pushed to 230 kV in the past five years. Solid dielectric cables operating at voltages of 345 kV and above have been successfully installed, primarily overseas, but there is still some concern about the reliability of splice and termination accessories at the elevated voltages. As a result, a solid dielectric insulated cable is recommended for this application based on a maximum nominal operating voltage of 230 kV.

INSTALLATION

Solid dielectric cables can be direct buried or installed in concrete-encased duct banks. Concern over public safety and security issues have caused most US utilities to avoid direct buried installations. Duct banks consisting of concrete-encased conduits, as shown in Figure 1, are common and typical for 69, 138 and 230 kV cable installations. Power cables at 69 kV and above are normally constructed as single conductor cable assemblies so that a single, three-phase circuit will require three single-phase cables. As a result, a double-circuit installation normally consists of nine conduits with a single conductor power cable installed in six of the nine positions. One conduit may be reserved for grounding, control or communication cables, and two conduits are designated as spares for future use.

A single-circuit duct bank, also shown in Figure 1, typically consists of four or more conduits with three conduits containing a single power cable, one spare conduit for future use and one or more conduits for grounding, control or communication cables.

After duct banks are installed, power cables will be pulled into the duct banks. However, cables in the 69 to 230 kV voltage range will be limited in the distance they can pulled to avoid damaging the cable. This limitation requires splicing manholes to be installed at intervals of approximately 2,000 feet along the underground transmission line. A typical splicing manhole is shown in Figure 2.

The transition from underground to overhead requires one or more structures to provide space for insulated cable terminators, surge arresters and a dead-end for the overhead transmission line. An example of a single tubular pole used to transition an underground transmission line to three vertically oriented overhead transmission line conductors is shown in Figure 3.

OPTIONS

Two options were considered for each of the two underground transmission lines. The first option considered constructing a single-circuit 230 kV underground transmission line with future conduits and splicing manholes installed to accommodate the addition of a future 230 kV circuit. This option would allow the existing 69 and 138 kV circuits to remain in place with no rebuilding necessary.

The second option considered the possibility of reconstructing the existing 69/138 kV position to a double-circuit 230 kV position as originally proposed but constructing the new 69/138 kV circuits underground rather than overhead.

COST

CAI contacted two cable manufacturers during the week of February 15, 2004, to assess current lead times and cable prices. Exhibit C documents the price quotations and establishes unit prices for budgeting an underground transmission line project. Note that the estimating price is based on averaging the two price quotations received, and then marking up the resulting average by 15% for contractor's overhead and profit. This approach assumes that a contractor will furnish the cable and cable accessories.

Exhibits A and B provide costs for constructing underground transmission lines in Jamacha Valley and in the city of Santee for both options described above. The results of the cost estimates are as follows:

Jamacha Valley Underground Transmission Line Cost:

Alt 1-1A: One 230 kV ckt with provisions for one future 230 kV ckt	$ 12,310,000
Alt 1-1B: One 69 kV and one 138 kV circuit	$ 14,560,000

City of Santee Underground Transmission Line Cost:

Alt 1-2A: One 230 kV ckt with provisions for one future 230 kV ckt	$ 6,105,000
Alt 1-2B: One 69 kV and one 138 kV circuit	$ 7,520,000

In both cases, constructing a new 230 kV underground transmission line will cost less than building one 69 kV transmission line and one 138 kV transmission line by approximately 15 to 18%. Note that these costs include only the underground transmission line costs and do not consider the costs of the overhead transmission line. For example, if the new 230 kV underground transmission line is constructed, the existing 69 and 138 kV circuits can remain in

place and no reconstruction costs will be required to convert the existing positions to 230 kV. As a result, constructing a new 230 kV underground transmission line would be preferable to constructing one 69 and one 138 kV circuit based on cost considerations.

SCHEDULE

Exhibit D was prepared to convey a typical project schedule for the Jamacha Valley route. This portion of the proposed underground transmission line would require about 13 to 14 months to construct from the time a procurement package was started until the line would be ready to energize. Note that the 69/138 kV cable option requires about one additional month over the equivalent 230 kV cable case. This is primarily due to the additional cable pulling, splicing and terminating activities that would occur because the quantity of 69/138 kV cable is double that of the 230 kV cable case. Also note that disruption to traffic would occur during the installation of ducts under city streets, and this activity would last about five to six months.

Exhibit E was prepared to convey a typical project schedule for the City of Santee route. This route would require about 12 to 13 months to construct from the time a procurement package was started until the line would be ready to energize. This is only slightly less than the Jamacha Valley route because material lead times will delay the installation of the cable and accessories. This could be improved with expedited material deliveries, but the price of the material would likely be adversely impacted. As before, the 69/138 kV cable option requires an additional month to construct over the 230 kV case. Disruption to traffic in city streets should be limited to approximately three months.

Lead times for cable and accessories are documented in Exhibit F.

EMF

Counter to popular belief, higher magnetic fields may actually occur directly over an underground transmission line than directly under an overhead transmission line. This occurs because a person standing directly over an underground transmission line is much closer to the underground line than they would be to the overhead line. However, the magnetic field will decay much more rapidly in underground transmission lines than overhead transmission lines as the horizontal distance away from the line increases. As a result, underground transmission lines generally have lower EMF levels than overhead transmission lines.

In this case, the current and power flow direction for each of the existing and proposed circuits have not been established so CAI is unable to comment on the EMF impact of the proposed underground transmission lines.

CONCLUSIONS AND RECOMMENDATIONS

It is feasible and relatively straightforward to construct an underground transmission line at the locations considered in Jamacha Valley and the City of Santee. The new underground transmission line may consist of one 69 kV circuit and one 138 kV circuit or one 230 kV circuit with provisions for a future 230 kV circuit.

EXHIBIT A
CONCEPTUAL COST ESTIMATE
JAMACHA VALLEY UNDERGROUND ROUTE OPTIONS
MIGUEL - MISSION 230 KV # 2 PROJECT

February 20, 2004

ALTERNATIVE 1-1A: ONE 230 KV CIRCUIT WITH PROVISIONS FOR SECOND 230 KV CIRCUIT

ITEM	DESCRIPTION	QUANTITY	UNIT PRICE		COST		
			MATERIAL	LABOR	MATERIAL	LABOR	TOTAL
1	Surveying	3.5 miles		$ 35,000.00	$ -	$ 122,500	$ 122,500
2	Geotechnical borings & thermal resistivity testing	3.5 miles		10,000.00	-	35,000	35,000
3	Engineering	1 lot		200,000.00	-	200,000	200,000
4	Permitting	1 lot		80,000.00	-	80,000	80,000
5	Construction mobilization	1 lot		100,000.00	-	100,000	100,000
6	Duct bank, 3 x 3, 6" PVC, under roadways	17,100 feet	$ 86.00	80.00	1,470,600	1,368,000	2,838,600
7	Duct bank, 3 x 3, 6" PVC, not under roadways	1,200 feet	72.00	63.00	86,400	75,600	162,000
8	230 kV manhole (Includes 8 future ckt manholes)	18 each	35,000.00	10,000.00	630,000	180,000	810,000
9	230 kV transition pole with fdn and accessories	2 each	100,000.00	50,000.00	200,000	100,000	300,000
10	230 kV insulated cable, 1/C	57,600 feet	38.50	25.00	2,217,600	1,440,000	3,657,600
11	230 kV terminators, 1/C	6 each	23,100.00	35,000.00	138,600	210,000	348,600
12	230 kV splices, 1/C	24 each	13,800.00	25,000.00	331,200	600,000	931,200
13	Final testing, cleanup and misc	1 lot	55,600.00	88,900.00	55,600	88,900	144,500
14	Subtotal: Engineering and Construction				**$ 5,130,000**	**$ 4,600,000**	**$ 9,730,000**
15	Utility project/construction management fee	15%					1,460,000
16	Subtotal						**$ 11,190,000**
17	Contingency	10%					1,120,000
TOTAL							**$ 12,310,000**

ALTERNATIVE 1-1B: ONE 138 KV CIRCUIT AND ONE 69 KV CIRCUIT

ITEM	DESCRIPTION	QUANTITY	UNIT PRICE		COST		
			MATERIAL	LABOR	MATERIAL	LABOR	TOTAL
1	Surveying	3.5 miles		$ 35,000.00	$ -	$ 122,500	$ 122,500
2	Geotechnical borings & thermal resistivity testing	3.5 miles		10,000.00	-	35,000	35,000
3	Engineering	1 lot		210,000.00	-	210,000	210,000
4	Permitting	1 lot		100,000.00	-	100,000	100,000
5	Construction mobilization	1 lot		213,300	-	213,300	213,300
6	Duct bank, 3 x 3, 6" PVC, under roadways	17,100 feet	86.00	80.00	1,470,600	1,368,000	2,838,600
7	Duct bank, 3 x 3, 6" PVC, not under roadways	1,200 feet	72.00	63.00	86,400	75,600	162,000
8	138 kV Manhole	10 each	30,000.00	9,000.00	300,000	90,000	390,000
9	69 kV Manhole	10 each	25,000.00	8,000.00	250,000	80,000	330,000
10	138 kV transition pole with fdn and accessories	2 each	50,000.00	30,000.00	100,000	60,000	160,000
11	69 kV transition pole with fdn and accessories	2 each	40,000.00	25,000.00	80,000	50,000	130,000
12	138 kV insulated cable, 1/C	57,600 feet	33.60	20.00	1,935,360	1,152,000	3,087,360
13	69 kV insulated cable, 1/C	57,600 feet	24.50	15.00	1,411,200	864,000	2,275,200
14	138 kV terminators, 1/C	6 each	11,750.00	18,000.00	70,500	108,000	178,500
15	69 kV terminators, 1/C	6 each	6,850.00	12,000.00	41,100	72,000	113,100
16	138 kV splices, 1/C	24 each	10,850.00	15,000.00	260,400	360,000	620,400
17	69 kV splices, 1/C	24 each	5,900.00	10,000.00	141,600	240,000	381,600
18	Final testing, cleanup and misc	1 lot	62,840.00	99,600.00	62,840	99,600	162,440
19	Subtotal: Engineering and Construction				**$ 6,210,000**	**$ 5,300,000**	**$ 11,510,000**
20	Utility project/construction management fee	15%					1,730,000
21	Subtotal						**$ 13,240,000**
22	Contingency	10%					1,320,000
TOTAL							**$ 14,560,000**

Notes:
1. 230 kV case includes duct bank and splicing manholes to accommodate a future 230 kV circuit.
2. Manhole spacing assumed to be approximately 2,000 feet.
3. Construction costs are based on a single design, furnish, install and test contract. Pricing can be reduced by approximately 10 - 15% if the major components and construction contracts are separated into individual contracts.
4. Escalation beyond December 31, 2005 is not included.
5. Accrued interest during construction is not included.
6. Labor costs are based on prevailing wage for the San Diego area.
7. Mitigation of historical, cultural and environmental contamination costs are not included

EXHIBIT B
CONCEPTUAL COST ESTIMATE
CITY OF SANTEE UNDERGROUND OPTIONS
MIGUEL-MISSION 230 KV # 2 PROJECT

February 20, 2004

ALTERNATIVE 1-2A: ONE 230 KV CIRCUIT WITH PROVISIONS FOR SECOND 230 KV CIRCUIT

ITEM	DESCRIPTION	QUANTITY	UNIT PRICE		COST		
			MATERIAL	LABOR	MATERIAL	LABOR	TOTAL
1	Surveying	1.5 miles		$ 35,000.00	$ -	$ 52,500	$ 52,500
2	Geotechnical borings & thermal resistivity testing	1.5 miles		10,000.00	-	15,000	15,000
3	Engineering	1 lot		150,000.00	-	150,000	150,000
4	Permitting	1 lot		60,000.00	-	60,000	60,000
5	Right-of-way acquisition, 30' width	1,600 ft	150.00	10.00	240,000	16,000	256,000
6	Construction mobilization	1 lot		100,000.00	-	100,000	100,000
7	Duct bank, 3 x 3, 6" PVC, under roadways	6,000 feet	86.00	80.00	516,000	480,000	996,000
8	Duct bank, 3 x 3, 6" PVC, not under roadways	1,600 feet	72.00	63.00	115,200	100,800	216,000
9	230 kV manhole (Includes 3 future ckt manholes)	8 each	35,000.00	10,000.00	280,000	80,000	360,000
10	230 kV transition pole with fdn and accessories	2 each	100,000.00	50,000.00	200,000	100,000	300,000
11	230 kV insulated cable, 1/C	24,000 feet	38.50	25.00	924,000	600,000	1,524,000
12	230 kV terminators, 1/C	6 each	23,100.00	35,000.00	138,600	210,000	348,600
13	230 kV splices, 1/C	9 each	13,800.00	25,000.00	124,200	225,000	349,200
14	Final testing, cleanup and misc	1 lot	42,000.00	60,700.00	42,000	60,700	102,700
15	Subtotal: Engineering and Construction				**$ 2,580,000**	**$ 2,250,000**	**$ 4,830,000**
16	Utility project/construction management fee	15%					720,000
17	Subtotal						**$ 5,550,000**
18	Project contingency	10%					555,000
TOTAL							**$ 6,105,000**

ALTERNATIVE 1-2B: ONE 138 KV CIRCUIT AND ONE 69 KV CIRCUIT

ITEM	DESCRIPTION	QUANTITY	UNIT PRICE		COST		
			MATERIAL	LABOR	MATERIAL	LABOR	TOTAL
1	Surveying	1.5 miles		$ 35,000.00	$ -	$ 52,500	$ 52,500
2	Geotechnical borings & thermal resistivity testing	1.5 miles		10,000.00	-	15,000	15,000
3	Engineering	1 lot		175,000.00	-	175,000	175,000
4	Permitting	1 lot		60,000.00	-	60,000	60,000
5	Right-of-way acquisition, 30' width	1,600 ft	150.00	10.00	240,000	16,000	256,000
6	Construction mobilization	1 lot		100,000	-	100,000	100,000
7	Duct bank, 3 x 3, 6" PVC, under roadways	6,200 feet	86.00	80.00	533,200	496,000	1,029,200
8	Duct bank, 3 x 3, 6" PVC, not under roadways	1,600 feet	72.00	63.00	115,200	100,800	216,000
9	138 kV Manhole	6 each	30,000.00	9,000.00	180,000	54,000	234,000
10	69 kV Manhole	5 each	25,000.00	8,000.00	125,000	40,000	165,000
11	138 kV transition pole with fdn and accessories	4 each	50,000.00	30,000.00	200,000	120,000	320,000
12	69 kV transition pole with fdn and accessories	2 each	40,000.00	25,000.00	80,000	50,000	130,000
13	138 kV insulated cable, 1/C	25,200 feet	33.60	20.00	846,720	504,000	1,350,720
14	69 kV insulated cable, 1/C	24,000 feet	24.50	15.00	588,000	360,000	948,000
15	138 kV terminators, 1/C	12 each	11,750.00	18,000.00	141,000	216,000	357,000
16	69 kV terminators, 1/C	6 each	6,850.00	12,000.00	41,100	72,000	113,100
17	138 kV splices, 1/C	6 each	10,850.00	15,000.00	65,100	90,000	155,100
18	69 kV splices, 1/C	9 each	5,900.00	10,000.00	53,100	90,000	143,100
19	Final testing, cleanup and misc	1 lot	51,580.00	78,700.00	51,580	78,700	130,280
20	Subtotal: Engineering and Construction				**$ 3,260,000**	**$ 2,690,000**	**$ 5,950,000**
21	Utility project/construction management fee	15%					890,000
22	Subtotal						**$ 6,840,000**
23	Contingency	10%					680,000
TOTAL							**$ 7,520,000**

Notes:
1. 230 kV case includes duct banks and splicing manholes to accommodate a future 230 kV circuit.
2. Manhole spacing assumed to be approximately 2,000 feet.
3. Construction costs are based on a single design, furnish, install and test contract. Pricing can be reduced by approximately 10 - 15% if the major components and construction contracts are separated into individual contracts.
4. Escalation beyond December 31, 2005 is not included.
5. Accrued interest during construction is not included.
6. Labor costs are based on prevailing wage for the San Diego area.
7. Mitigation of historical, cultural and environmental contamination costs are not included

EXHIBIT C
PRICE QUOTATIONS
69/138/230 KV INSULATED CONDUCTORS AND ACCESSORIES
MIGUEL-MISSION 230 KV # 2 PROJECT
February 20, 2004

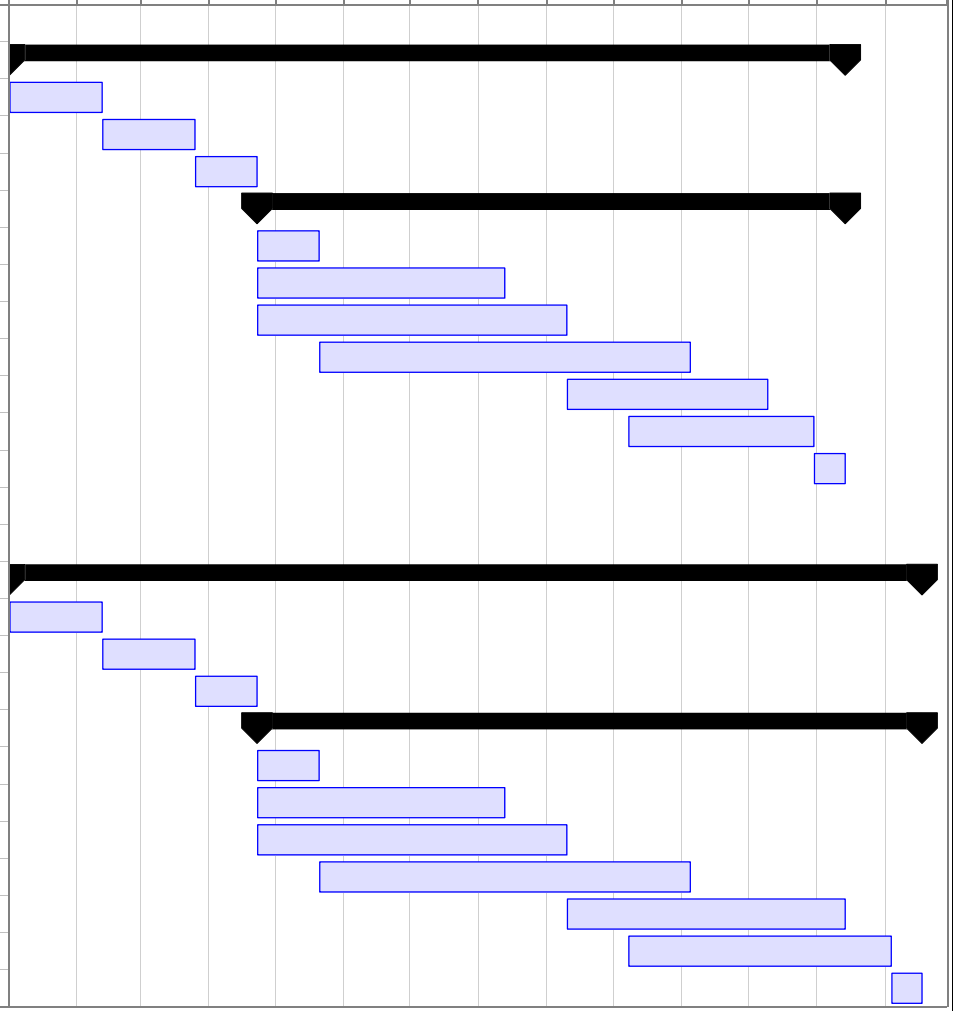
ITEM	DESCRIPTION	UNIT PRICE BUDGET QUOTATION (See Note 1)		ESTIMATING PRICE (See Note 2)	PRICING UNIT
		VENDOR 1	VENDOR 2		
1	230 kV cable, 2000 kcmil copper conductor, 920 mils of XLPE insulation with a metallic sheath and overall PE jacket, and equipped with an optical fiber cable for temperature monitoring.	$30.00	$37.00	$38.50	1/C feet
2	230 kV cable terminator kit, porcelain, single conductor, with standoff insulators & NEMA 4-hole pad.	$16,000.00	$24,200.00	$23,100.00	1/C terminator
3	230 kV cable splicing kit, single conductor	-	$12,000.00	$13,800.00	1/C splice
4	138 kV cable, 2000 kcmil copper conductor, 800 mils of XLPE insulation with a metallic sheath and overall PE jacket.	$26.00	$32.40	$33.60	1/C feet
5	138 kV cable terminator kit, porcelain, single conductor, with standoff insulators & NEMA 4-hole pad	$9,000.00	$11,400.00	$11,750.00	1/C terminator
6	138 kV cable splicing kit, single conductor	$7,500.00	$11,400.00	$10,850.00	1/C splice
7	69 kV cable, 1250 kcmil copper conductor, 650 mils of XLPE insulation with metallic shield and overall PE jacket.	$18.00	$24.70	$24.50	1/C feet
8	69 kV cable terminator kit, porcelain, single conductor, with standoff insulators & NEMA 4-hole pad	$6,500.00	$5,400.00	$6,000.00	1/C terminator
9	69 kV cable splicing kit, single conductor	$4,500.00	$5,700.00	$5,900.00	1/C splice
10	Submersible link box for cross bonding cable shield at cable splices	$5,600.00	$2,800.00	$4,830.00	each
11	Structure mounted link box for grounding cable shield at terminators	$2,800.00	$2,200.00	$2,875.00	each

Notes:

1. Vendor pricing collected from cable manufacturers during the week of February 15, 2004. Prices do not include escalation.
2. The unit prices established above for estimating purposes are based on the average price quoted plus 15% for contractors overhead and project. This assumes that a contractor will furnish the cable and accessories.

EXHIBIT D
TYPICAL SCHEDULE IN MONTHS
JAMACHA VALLEY UNDERGROUND ROUTE OPTIONS
MIGUEL-MISSION 230 kV # 2 PROJECT

WBS	Task Name	Duration	Company
1000	**JAMACHA VALLEY - 230 KV UNDERGROUND OPTION**	**270 days**	
1100	Prepare Turnkey Specification	30 days	SDGE
1200	Prepare Quotation	30 days	Contractor
1300	Evaluate & Award Contract	20 days	SDGE
1400	**Construction**	**190 days**	
1410	Mobilization	20 days	Contractor
1420	Surveying & engineering	80 days	Contractor
1430	Cable fabrication & delivery	100 days	Contractor
1440	Duct bank & manhole installation (18,300 feet)	120 days	Contractor
1450	Cable installation (27 pulls)	65 days	Contractor
1460	Cable splicing, terminating & testing	60 days	Contractor
1470	Final cleanup & demobilization	10 days	Contractor
2000	**JAMACHA VALLEY - 69/138KV UNDERGROUND OPTION**	**295 days**	
2100	Prepare Turnkey Specification	30 days	SDGE
2200	Prepare Quotation	30 days	Contractor
2300	Evaluate & Award Contract	20 days	SDGE
2400	**Construction**	**215 days**	
2410	Mobilization	20 days	Contractor
2420	Surveying & engineering	80 days	Contractor
2430	Cable fabrication & delivery	100 days	Contractor
2440	Duct bank & manhole installation (18,300 feet)	120 days	Contractor
2450	Cable installation (54 pulls)	90 days	Contractor
2460	Cable splicing, terminating & testing	85 days	Contractor
2470	Final cleanup & demobilization	10 days	Contractor

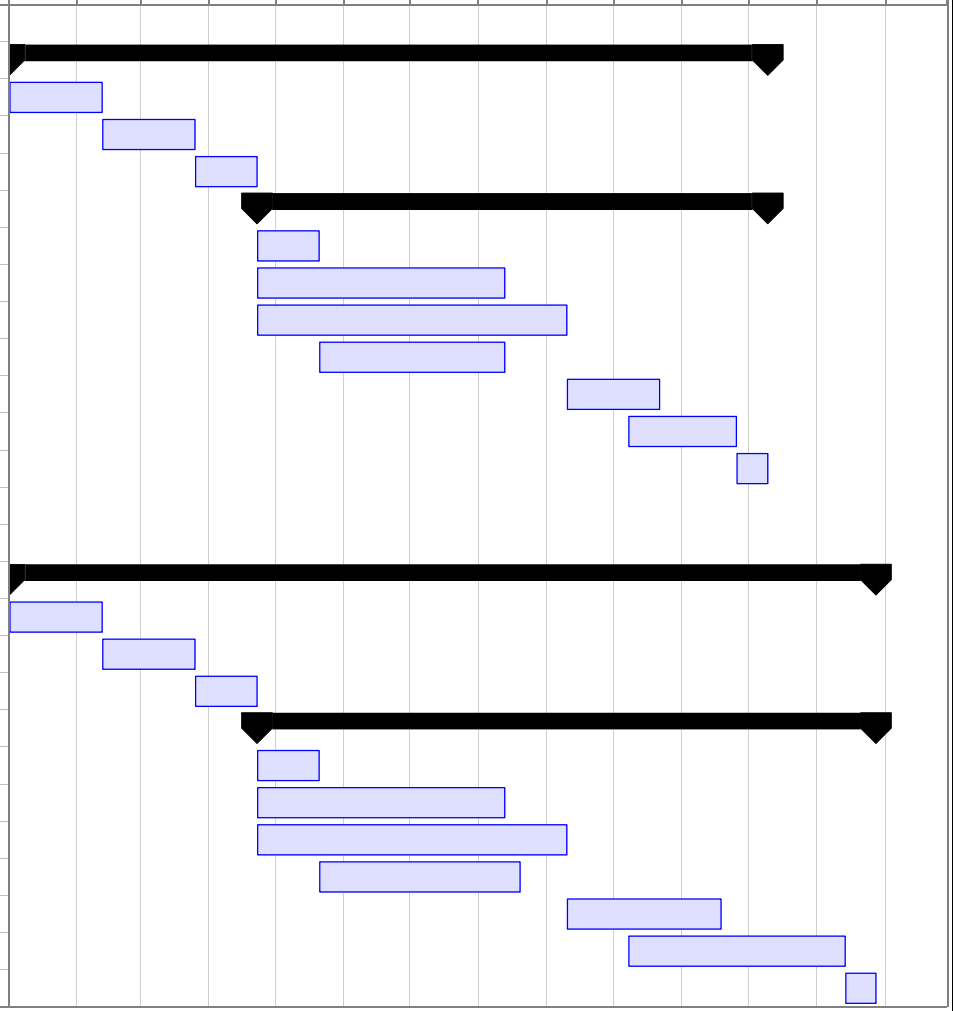


Project: Jamacha Valley
Date: 2/24/04

Task
Split
Progress
Milestone
Summary
Project Summary
External Tasks
External Milestone
Deadline

EXHIBIT E
TYPICAL SCHEDULE IN MONTHS
CITY OF SANTEE UNDERGROUND ROUTE OPTIONS
MIGUEL-MISSION 230 kV # 2 PROJECT

WBS	Task Name	Duration	Company
1000	**CITY OF SANTEE - 230 KV UNDERGROUND OPTION**	**245 days**	
1100	Prepare Turnkey Specification	30 days	SDGE
1200	Prepare Quotation	30 days	Contractor
1300	Evaluate & Award Contract	20 days	SDGE
1400	**Construction**	**165 days**	
1410	Mobilization	20 days	Contractor
1420	Surveying & engineering	80 days	Contractor
1430	Cable fabrication & delivery	100 days	Contractor
1440	Duct bank & manhole installation (7,600 feet)	60 days	Contractor
1450	Cable installation (12 pulls)	30 days	Contractor
1460	Cable splicing, terminating & testing	35 days	Contractor
1470	Final cleanup & demobilization	10 days	Contractor
2000	**CITY OF SANTEE- 69/138KV UNDERGROUND OPTION**	**280 days**	
2100	Prepare Turnkey Specification	30 days	SDGE
2200	Prepare Quotation	30 days	Contractor
2300	Evaluate & Award Contract	20 days	SDGE
2400	**Construction**	**200 days**	
2410	Mobilization	20 days	Contractor
2420	Surveying & engineering	80 days	Contractor
2430	Cable fabrication & delivery	100 days	Contractor
2440	Duct bank & manhole installation (7,800 feet)	65 days	Contractor
2450	Cable installation (24 pulls)	50 days	Contractor
2460	Cable splicing, terminating & testing	70 days	Contractor
2470	Final cleanup & demobilization	10 days	Contractor



Project: City of Santee
Date: 2/24/04

Task
Split
Progress
Milestone
Summary
Project Summary
External Tasks
External Milestone
Deadline

EXHIBIT F
EQUIPMENT LEAD TIME QUOTATIONS
69/138/230 KV INSULATED CONDUCTORS AND ACCESSORIES
MIGUEL-MISSION 230 KV # 2 PROJECT
February 20, 2004

ITEM	DESCRIPTION	LEAD TIME QUOTED IN WEEKS (See Note 1)		LEAD TIME IN WEEKS FOR PLANNING PURPOSES (See Note 2)
		VENDOR 1	VENDOR 2	
1	230 kV cable, 2000 kcmil copper conductor, 920 mils of XLPE insulation with a metallic sheath and overall PE jacket, and equipped with an optical fiber cable for temperature monitoring.	18 - 20	12	20
2	230 kV cable terminator kit, porcelain, single conductor, with standoff insulators & NEMA 4-hole pad.	24 - 26	16	26
3	230 kV cable splicing kit, single conductor	-	16	16
4	138 kV cable, 2000 kcmil copper conductor, 800 mils of XLPE insulation with a metallic sheath and overall PE jacket.	18 - 20	12	20
5	138 kV cable terminator kit, porcelain, single conductor, with standoff insulators & NEMA 4-hole pad	24 - 26	16	26
6	138 kV cable splicing kit, single conductor	14 - 16	16	16
7	69 kV cable, 1250 kcmil copper conductor, 650 mils of XLPE insulation with metallic shield and overall PE jacket.	18 - 20	12	20
8	69 kV cable terminator kit, porcelain, single conductor, with standoff insulators & NEMA 4-hole pad	24 - 26	16	26
9	69 kV cable splicing kit, single conductor	14 - 16	16	16
10	Submersible link box for cross bonding cable shield at cable splices	14 - 16	12	16
11	Structure mounted link box for grounding cable shield at terminators	14 - 16	12	16

Notes:

1. Lead times collected from cable manufacturers during the week of February 15, 2004.
2. The maximum lead time quoted by cable manufacturers is used for planning and scheduling purposes to minimize the possibility of paying premium prices to achieve expedited material deliveries.

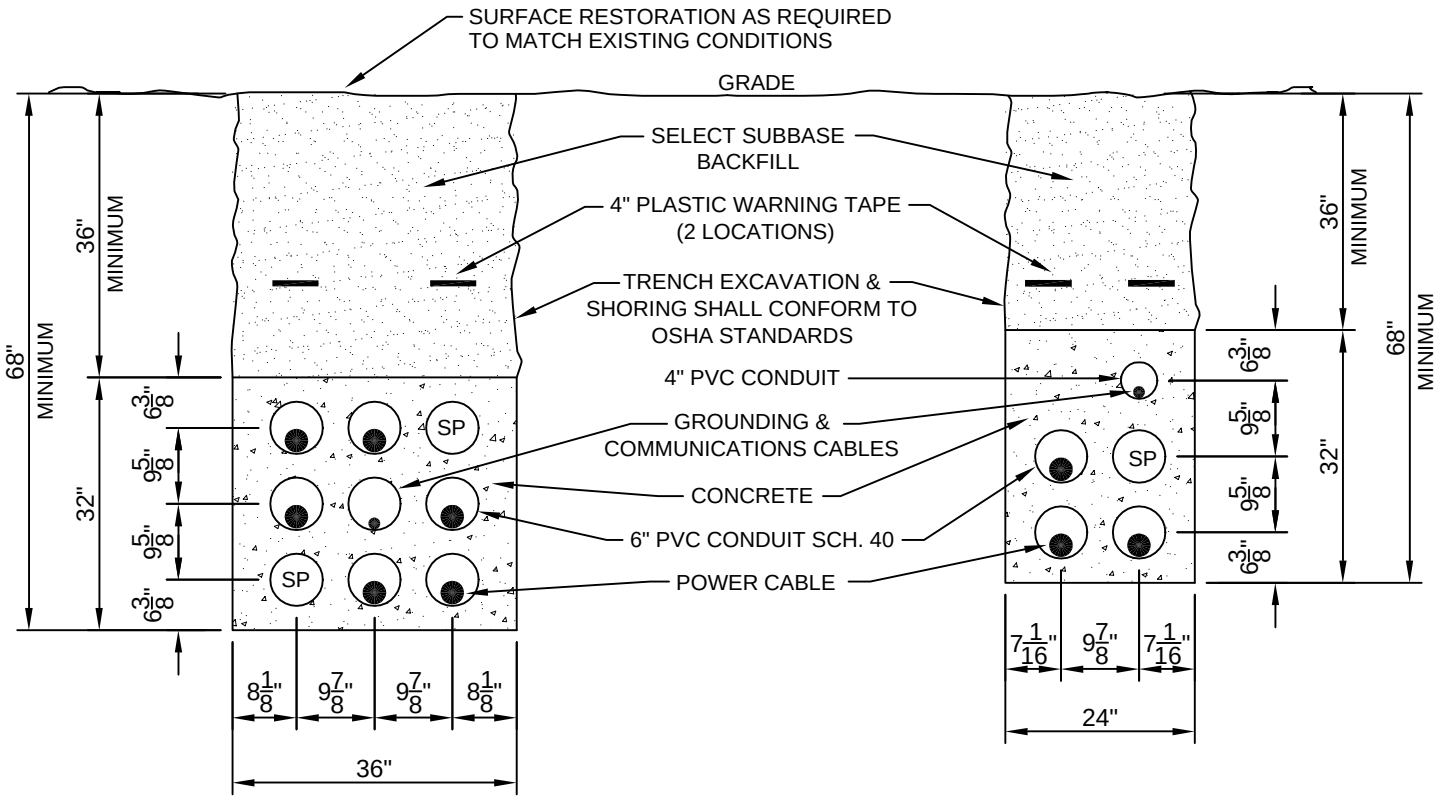


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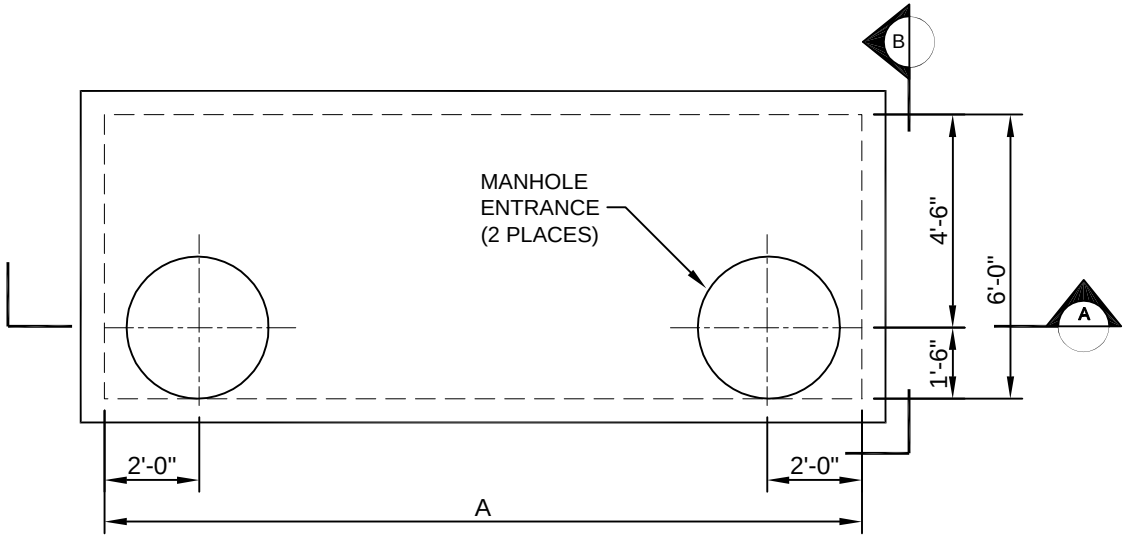
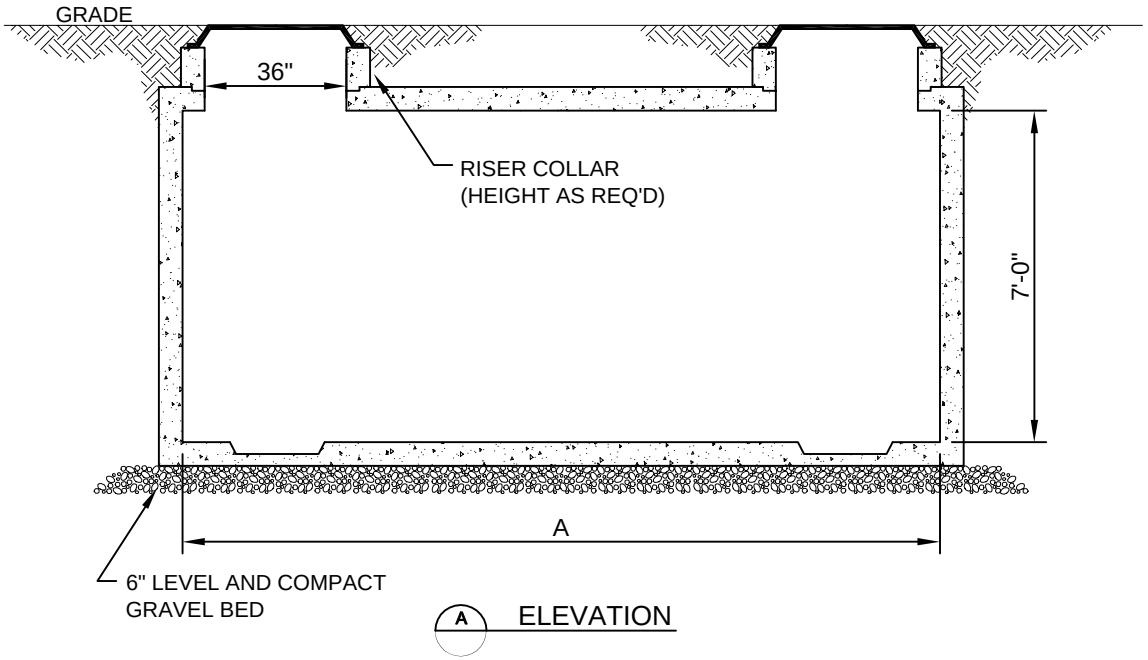
Figure 1

Typical Duct Bank Construction

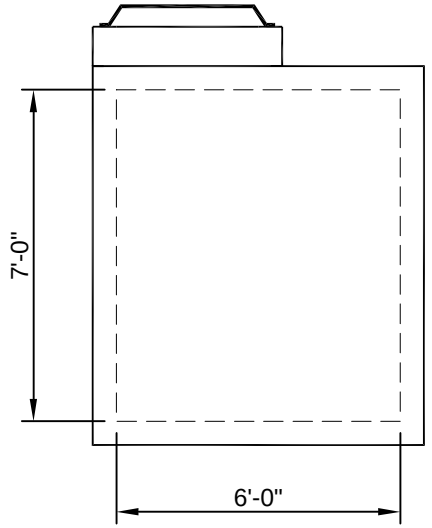


PLAN VIEW

VOLTAGE	"A" DIMENSION
69kV	16'-0"
138kV	20'-0"
230kV	24'-0"



A ELEVATION



B ELEVATION

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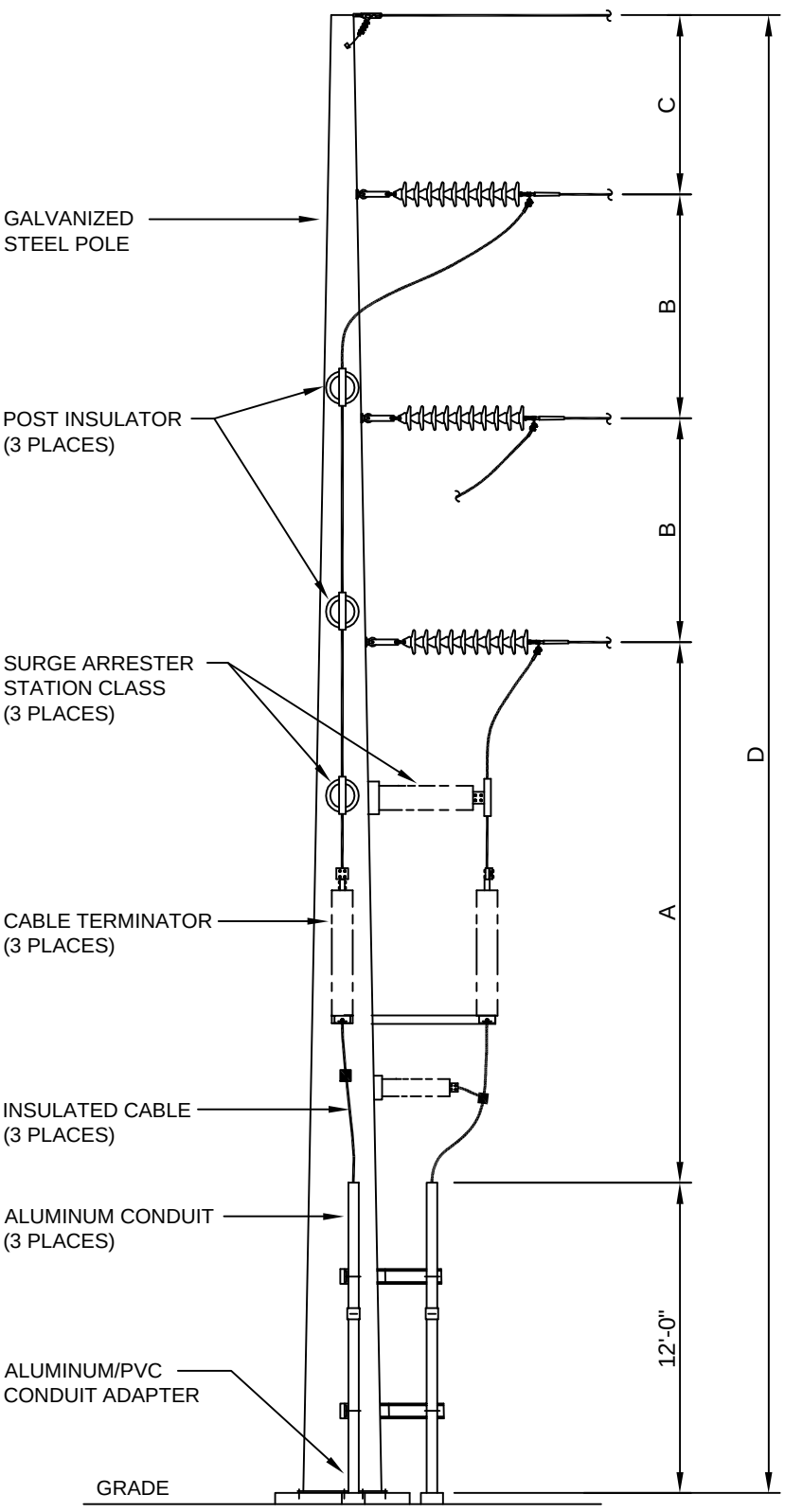
Figure 2

Typical Splicing Manhole



TYPICAL DIMENSIONS

VOLTAGE	A	B	C	D
69kV	28'-0"	7'-0"	2'-0"	56'-0"
138kV	32'-0"	10'-0"	2'-0"	66'-0"
230kV	36'-0"	18'-0"	14'-0"	98'-0"

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Figure 3

Typical Riser Structure