Borrego Solar Wind Project - 411 Reynolds Road, Glen, NY
Turbine Construction Costs
April 7, 2022

Item 1- Turbine Assembly and Construction Costs

A - Mobilization to Site

1)	Mobilize 350 Ton Crane	Rate=	$ 20,000	each
	Add: Travel Mileage (40%)		$ 8,000	each
	Add: Assembly/Knockdown			
	Rate= $ 80 per hour			
			$ 80	per hour
		multiplied by:	6	men
		multiplied by:	8	hours per man
			$ 3,840	
		350 Ton Crane Subtotal:	$ 31,840	
2)	Mobilize Second Crane 100 ton	Rate=	$ 17,500	each
	Add: Travel Mileage (40%)		$ 7,000	each
	Add: Assembly/Knockdown			
	Rate= $ 80 per hour			
			$ 80	per hour
		multiplied by:	4	men
		multiplied by:	8	hours per man
			$ 2,560	
		Secondary Crane Subtotal:	$ 27,060	
3)	Mobilize Additional Equipment (Loader, Excavator, Service Trucks)	Rate=	$ 20,000	Lump Sum
	Add: Travel Mileage (40%)		$ 8,000	Lump Sum
	Add: AssemblY			
	Rate= $ 80 per hour			
			$ 80	per hour
		multiplied by:	3	men
		multiplied by:	8	hours per man
			$ 1,920	
		Additional Equipment Subtotal:	$ 29,920	

TOTAL COST MOBILIZATION - ITEM A	$88,820.00
USE	**$88,900.00**

B - Installation/Construction of Turbine

1) **Equipment**

a) Lift/ Erection Crane

350 Ton Crane - 200 ft Boom & Jib Extension
Rate adjusted to include operator and oiler
Rate= $ 7,500 crew & equipment per day

	$	7,500	per day

Erect Turbine Structure - 394 feet or 20 sections
Install 1.5 sections per day or 14 days
Install Nacell and Hub use 5 days
Install Blades use 5 days
Total 24 days per turbine

multiplied by:		24	days
Total Cost	$	180,000	

Operating Costs
Rate= $ 212 per hour (adjusted)

	$	212	per hour
multiplied by:		192	hours
Total Cost	$	40,704	

Crane 1 Subtotal:	$	220,704	

b) Secondary Crane

100 Ton Crane - 60 ft Boom
Rate adjusted to include operator
Rate= $ 5,700 crew & equipment per day

	$	5,700	per day
multiplied by:		24	days
	$	136,800	

Operating Costs
Rate= $ 113 per hour (adjusted)

	$	113	per hour
multiplied by:		192	hours
	$	21,696	

Crane 2 Subtotal:	$	158,496	

c) Front End Loader

Front end loader
Rate adjusted to include operator
Rate= $ 1,930 crew & equipment per day

	$	1,930	per day
multiplied by:		24	days
	$	46,320	

Operating Costs
Rate= $ 113 per hour (adjusted)

	$	113	per hour
multiplied by:		192	hours
	$	21,696	

Front End Loader Subtotal:	$	68,016

d) Excavator

Excavator
Rate adjusted to include operator
Rate= $ 2,350 crew & equipment per day

	$	2,350	per day
multiplied by:		24	days
	$	56,400	

Operating Costs
Rate= $ 113 per hour (adjusted)

	$	113	per hour
multiplied by:		192	hours
	$	21,696	

Front End Loader Subtotal:	$	78,096

e) Miscellaneous Equipment and Service Vehicles
Use $1,000 per day

	$	1,000	per day
multiplied by:		24	days
	$	24,000	

Miscellaneous Equipment Subtotal:	$	24,000

TOTAL COST EQUIPMENT	$549,312.00
USE	**$549,400.00**

2) **Labor**

a) Foremen

Rate= $ 72 per hour

	$	72	per hour
multiplied by:		1	foremen
multiplied by:		192	hours per foreman
	$	13,824	

b) Ironworkers

Rate= $ 72 per hour

	$	72	per hour
multiplied by:		4	ironworkers
multiplied by:		192	hours per ironworker
	$	55,296	

c) Laborers

Rate= $ 64 per hour

	$	64	per hour
multiplied by:		4	laborers
multiplied by:		192	hours per laborer
	$	49,152	

Total Labor Cost	$	118,272

TOTAL COST LABOR	$118,272.00
USE	**$118,300.00**

3) **Material and Turbine Cost**

Material and Tubine Costs were provided by Borrego	$3,750,000.00

TOTAL TURBINE AND ERECTION COSTS	$4,417,700.00
USE	**$4,417,700.00**

Item 2- Demobilization Costs

A - Demobilize Equipment from Site

1)	Demobilize 350 Ton Crane	Rate=	$ 20,000	each
	Add: Travel Mileage (40%)		$ 8,000	each
	Add: Assembly/Knockdown			
	Rate= $ 80 per hour			
			$ 80	per hour
		multiplied by:	4	men
		multiplied by:	8	hours per man
			$ 2,560	
	350 Ton Crane Subtotal:		$ 30,560	
2)	Demoobilize Second Crane 100 T	Rate=	$ 17,500	each
	Add: Travel Mileage (40%)		$ 7,000	each
	Add: Assembly/Knockdown			
	Rate= $ 80 per hour			
			$ 80	per hour
		multiplied by:	3	men
		multiplied by:	8	hours per man
			$ 1,920	
	Secondary Crane Subtotal:		$ 26,420	
3)	Demobilize Additional Equipment	Rate=	$ 20,000	Lump Sum
	(Loader, Excavator, Service Trucks)			
	Add: Travel Mileage (40%)		$ 8,000	Lump Sum
	Add: AssemblY			
	Rate= $ 80 per hour			
			$ 80	per hour
		multiplied by:	3	men
		multiplied by:	8	hours per man
			$ 1,920	
	Additional Equipment Subtotal:		$ 29,920	

TOTAL COST DEMOBILIZATION - ITEM A	$86,900.00
USE	**$86,900.00**

Borrego Solar Wind Project - 411 Reynolds Road, Glen, NY
Turbine Construction Costs
April 7, 2022

Construction Cost Summary

	Item Description		Total Cost
1	Mobilization to Site	$	88,900.00
2	Installation/Construction of Turbine	$	4,417,700.00
3	Foundation Construction	$	901,500.00
4	Excavation, Grading and Construction of Access Roads	$	133,200.00
5	Electrical System and Interconnection	$	295,000.00
6	Demobilization	$	86,900.00
	TOTAL CONSTRUCTION COST	$	5,923,200.00
	USE	**$**	**5,925,000.00**

Borrego Solar Wind Project - 411 Reynolds Road, Glen, NY
Foundation Construction Costs
April 7, 2020

A - Mobilization to Site

1) Mobilize 1-1/2 CY Excavator
Mobilization is included under Turbine Construction

2) Mobilize 2 1/2 CY Front end loader
Mobilization is included under Turbine Construction

3) Mobilize Additional Equipment
Mobilization is included under Turbine Construction

B - Foundation Construction

1) Excavation

Calculations based on production of 50 CY per day per excavator
Volume of excavation required for foundation = 565 CY
565 CY / 50 CY per day = 11.3 days Use 12 days

1-1/2 CY Excavator
Rate adjusted to include 1 operator

Rate= $ 2,350.00 per day		$ 2,350.00	per day
	multiplied by:	12	days
		$ 28,200.00	

Operating Cost

Rate= $ 113.00 per hour		$ 113.00	per hr
	multiplied by:	96	hours
		$ 10,848.00	

2-1/2 CY Front End Loader
Rate adjusted to include 1 operator

Rate= $ 1,930.00 per day		$ 1,930.00	per day
	multiplied by:	12	days
		$ 23,160.00	

Operating Cost

Rate= $ 113.00 per hour		$ 113.00	per hr
	multiplied by:	96	hours
		$ 10,848.00	

Total Equipment Cost	$ 73,056.00

2) Off-Site Material Disposal

a) Excavator and front end loader costs included in above calculations

b) Trucking Costs for Material Disposal

14 CY Dump Truck- 20 Miles Round Trip, 3 loads/day each truck
1 truck = 4 loads in 8 hour period
Labor Crew = 1 truck driver
Rate= $ 160.00 per hr operating

565 CY of excavation required for foundation construction. Assume
90% of excess materials to be trucked off-site and disposed of
565 CY x 0.90 = 509 CY for disposal

509 CY / 14 CY per load = 37 truck loads
37 truck loads / 3 loads per day = 13 days or 104 hours

Cost:	$ 160.00	per hr operating		$ 160.00	per hr
			multiplied by:	104	hours
				$ 16,640.00	

Total Disposal Cost	$ 16,640.00

3) Concrete Foundation Construction

Calculated on Cubic Yard Dimensions
Cubic yard price includes materials, installation, labor, reinforcement, formwork, finishing, curing and associated work

Foundation diameter at base 62'-0"
Foundation diameter at top of haunch 26'-0"
Foundation diameter at top pedestal 19'-0"
Foundation height at main foundation 9'-6"
Foundation height at pedestal 4'-9"

Volume of foundation truncated cone = 565 CY
Volume of pedestal = 50 CY
Total volume of concrete materials to be placed for foundation = 615 CY

Cost: 615 CY x $1,300 per CY installed = $799,500

Total Foundation Concrete Cost	$ 799,500.00

4) Additional Labor Costs Not Included Above				
Additional Laborers:				
Rate= $ 64 per hour	laborers		2	
	multiplied by:		8	hrs per day
	total days		12	days
	total hours:		192	hours
	rate:		$64	per hour
	Total	$	12,288.00	
	Total Additional Labor Costs	$	12,288.00	
TOTALFOUNDATION CONSTSRUCTION COST			$901,484.00	
	USE		**$901,500.00**	

Borrego Solar Wind Project - 411 Reynolds Road, Glen, NY
Access Road Construction Costs
April 7, 2022

Item 1- Excavation, Grading and Construction of Access Road

1) Overall length of proposed access road = 2,600 feet
Width of proposed access road = 12 feet
Total Area of Access Roads = 31,200 sf
Depth of Access Road = 13" or 1.1 feet
Total CY of materials removed to construct access roads = 1,275 CY

2) Equipment

140 H.P. Dozer
Rate adjusted to include operator and hourly operating costs
Rate = $275.00 per hour or $2,200 per day $2,200.00 per day

2-1/2 CY Front end loader
Rate adjusted to include operator and hourly operating costs
Rate = $255.00 per hour or $2,040 per day $2,040.00 per day

14 CY Dump Truck- 20 Miles Round Trip, 3 loads/day each truck
1 truck = 3 loads in 8 hour period
Labor Crew = 1 truck driver
Rate = $160.00 per operating hour

a) Costs
Excavate and grade access road, removal and disposal of excess materials
Assume 250 feet per day construction average
2,600 feet / 250 feet per day = 10.4 days Use 11 days

140 H.P. Dozer
11 days x @ $2,200 per day = $24,200

2-1/2 CY Front end loader
11 days x @ $2,040 per day = $22,440

Trucks 14 CY dump truck, 3 axle
1,275 CY of material to be trucked for disposal off site
1,275 CY / 14 CY per truck load = 91 truck loads
91 truck loads/3 loads per day = 31 days equivalent loads
31 equavilent loads /11 work days = 3 trucks per day required
3 trucks per day x 8 hours each x 11 days = 264 operating hours
264 operating hours x $160 per hour = $42,240

Equipment Subtotal	$88,880

3) Labor

Additional Laborers:	Laborers:	2	
Installation of geotextile fabric	multiplied by:	8	hrs per day
	multiplied by:	11	days
	Rate:	$ 64.00	per hr
	Labor Subtotal:	$ 11,264.00	

Labor Subtotal	$11,264

4) Materials

a) Stone/Gravel Materials

Total CY of stone materials needed for construction of access roads = 1,275 CY
Cost per CY of stone material includes purchase and trucking to site = $17 / CY

Stone materials required = 1,275 CY x $17/CY = $21,675.00

b) Geotextile Fabric

Total area of geotextile fabric required = 31,200 SF or 3,470 SY Use 3,500 SY
Cost per SY of geotextile fabric includes purchase and delivery = $1.75

Geotextile fabric required = 3,500 SY x $1.75/SY = $6,125.00

c) Culvert pipes

Assume 3 culvert crossings will need to be installed along access road
Length each 25 LF
Size 12" diameter HDPE

Culverts 3 EA x 25 LF = 75 LF x $70/LF = $5,250.00

Material Subtotal	$33,050.00

Total Access Road Construction Cost		$133,194.00
	USE	**$133,200.00**

ELECTRICAL SYSTEM AND INTERCONNECTION COSTS

Borrego Solar Wind Project - 411 Reynolds Road, Glen, NY
Electrical System and Interconnection Cost
April 7, 2022

Item 1- Electrical System and Interconnection Cost

1) Overall length of buried electrical wires and conduits USE 3,000 LF
   Additional Poles and appurtenances = 5 each

   Cost: Wire and conduits 3,000 LF x $35/LF = $105,000
   F&I poles 5 EA x $3,000 EA = $15,000

2) Interconnection to existing system grid including materials $75,000

3) Interconnection with turbine site equipment and wiring $100,000

Total Cost $295,000

TOTAL ELECTRICAL SYSTEM AND INTERCONNECTION COSTS	$295,000
USE	**$295,000**

Borrego Solar Wind Project - 411 Reynolds Road, Glen, NY
Electrical System and Interconnection Cost
April 7, 2022

Costs shown are based on Federal Davis Bacon Wage Rates NY20200015
1/11/2022

1	**Equipment Operator - 350 Ton Crane**		
	Wages	$ 44.80	per hr
	Fringes	$ 25.15	
	Workmans Comp (19%)	$ 8.51	
		$ 78.46	
	Contractors OH&P (10%)	$ 7.84	
		$ 86.30	per hr
	Use:	$ 87.00	per hr
2	**Equipment Operator -100 Ton Crane**		
	Wages	$ 43.80	per hr
	Fringes	$ 25.15	
	Workmans Comp (19%)	$ 8.32	
		$ 77.27	
	Contractors OH&P (10%)	$ 7.72	
		$ 84.99	per hr
	Use:	$ 85.00	per hr
3	**Equipment Operator - All other types**		
	Wages	$ 40.80	per hr
	Fringes	$ 25.15	
	Workmans Comp (19%)	$ 7.75	
		$ 73.70	
	Contractors OH&P (10%)	$ 7.37	
		$ 81.07	per hr
	Use:	$ 82.00	per hr
4	**General Laborer**		
	Wages	$ 28.25	per hr
	Fringes	$ 23.74	
	Workmans Comp (19%)	$ 5.37	
		$ 57.36	
	Contractors OH&P (10%)	$ 5.73	

		$	63.09	per hr
	Use:	$	64.00	per hr

5	**Truck Driver**			
	Wages	$	26.50	per hr
	Fringes	$	25.56	
	Workmans Comp (19%)	$	5.04	
		$	57.10	
	Contractors OH&P (10%)	$	5.71	
		$	62.81	per hr
	Use:	$	63.00	per hr

6	**Ironworker**			
	Wages	$	30.75	per hr
	Fringes	$	28.05	
	Workmans Comp (19%)	$	5.84	
		$	64.64	
	Contractors OH&P (10%)	$	6.46	
		$	71.10	per hr
	Use:	$	72.00	per hr

7	**Superintendant/Foreman**			
	Wages	$	35.00	per hr
	Fringes	$	23.74	
	Workmans Comp (19%)	$	6.65	
		$	65.39	
	Contractors OH&P (10%)	$	6.53	
		$	71.92	per hr
	Use:	$	72.00	per hr

Costs from RS Means

Item	Description	Operating Cost Hr.	Rent/Day	Rent/Hour
015433200150	Excavator 1 CY capacity	$50.00	$955.00	$170.00
015433200200	Excavator 1 1/2 CY capacity	$65.00	$1,176.00	$212.00
015433200347	5000 ft lb breaker	$40.00	$1,440.00	$180.00
015433204200	140 HP Dozer	$40.00	$1,320.00	$205.00
015433204650	2 1/2 CY front end loader	$35.00	$995.00	$159.00
015433205300	3 axle dump truck 16 ton	$30.00	$1,040.00	$160.00
015433601200	100 ton crane 60' boom	$113.00	$5,700.00	$727.00
015433601500	350 ton 200' boom jib extension	$212.00	$7,500.00	$964.00

Trucking cost

Based on round trip of 50 miles
4 hours for each trip required

Cost for truck			$520.00	
Driver cost	$63/hr x 8 hr =		$504.00	
Operating cost	$30/hr x 8 hr =		$240.00	
			$1,264.00	per day or $158.00/hr
		use	$160 / hr	
	Cost per trip		$640.00	

Excavator costs

Cost for 1 1/2 CY excavator			$1,176.00	
Operator	$82/hr x 8 hr =		$656.00	
Operating cost	$65/hr x 8 hr =		$520.00	
Breaker	(optional) use $300/day		$2,352.00	per day or $294.00 /hr
		use	$294 / hr	

Front End Loader costs

Cost for front end loader			$995.00	
Operator	$82/hr x 8 hr =		$656.00	
Operating cost	$35/hr x 8 hr =		$280.00	
			$1,931.00	per day or $241.00/hr
		use	$241.00	

Dozer 200 HP costs

Cost for dozer			$1,320.00	
Operator	$82/hr x 8 hr =		$656.00	
Operating cost	$40/hr x 8 hr =		$320.00	
			$2,296.00	per day or $287 /hr
		use	$287 / hr	