

File ACT/007/013 #5

Incoming

0070013

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**KAISER
STEEL**

KAISER STEEL CORPORATION
SUNNYSIDE COAL MINES
SUNNYSIDE, UTAH 84539
TELEPHONE 801-888-4421

March 28, 1985

RECEIVED

MAR 29 1985

Dr Dianne Neilson, Ph.D.
Division of Oil, Gas & Mining
355 West North Temple
3 Triad Center, Suite 350
Salt Lake City, Utah 84180-1203

DIVISION OF OIL
& MINING

RE: Board of Oil, Gas and Mining
Order No. 5, September 28, 1984
regarding Geneva Mine/Horse Canyon
Mine

Dear Dr. Neilson:

In response to the Board of Oil, Gas and Mining Order No. 5, dated September 28, 1984, Kaiser Steel Corporation is submitting fourteen copies (14) of a revised reclamation bond for the Geneva Mine under the permanent program as required by state law. The submittal uses the mining and reclamation plan submitted by the United States Steel Corporation as the basis for these new bond calculations. All previous bond calculations made by United States Steel Corporation are replaced by this submittal.

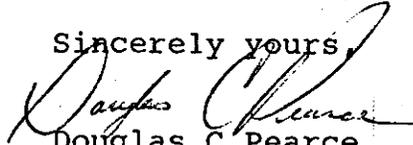
Changes have not been made in the reclamation plan because of the lack of seasonal opportunity to obtain additional field data. Unit costs for labor, materials, and rental rates were taken from the Rental Rate Blue Book and the Means Building Construction Cost Data, 1984. The final reclamation cost is estimated to be \$684,997.51, or \$13,700 per acre.

Kaiser Steel Corporation plans to use the Geneva Mine to access the Federal Coal Leases south of the present mine. Field studies will be undertaken in the summer of 1985 to obtain baseline data for soil, vegetation, and wildlife resources. After the field data are reduced and engineering studies are completed, a revised permit application will be submitted to the Division.

It is anticipated that this application will be submitted to the Division in the fall of 1986.

All the help and cooperation given by the Division staff in the preparation of this document is greatly appreciated.

Sincerely yours,

A handwritten signature in cursive script, appearing to read "Douglas C Pearce".

Douglas C Pearce
Mine Engineer

Attachment A

Reclamation Calculations

Swell Factors

Reinforced Concrete

The swell factor for handling rough quarry stone is 1.75(4). This corresponds to 5.7% solid and 43% voids. Reinforced concrete will break in larger blockier pieces than stone. About 40% voids were assumed, which corresponds to a swell factor of 2.5.

$$\frac{1}{0.4} = 2.5$$

Brick

The swell factor for rock is 1.6 - 1.7 (3). Brick will break in generally smaller pieces than will rock. Therefore, a swell factor of 1.5 was used.

Earth Excavation

The swell factor for a mixture of 75% earth and 25% rock is 1.25(3). Therefore 1.3 was used.

Earth Cover Over Concrete

The estimated percentage of voids in crushed material(5) is as follows:

	<u>Coarse - Subsoil</u>	<u>Fine - Subsoil</u>
Rammed	46	43
Compacted	49	45

Rammed

Average percent voids = $46 + 43 / 2 = 44.5$
Average percent solids = $100 - 44.5 = 55.5$
Swell factor = $1 / .555 = 1.80$

Compacted

Average percent voids = $49 + 45 / 2 = 47$
Average percent solids = $100 - 47 = 53$
Swell factor = $1 / 0.53 = 1.89$

Use 1.82 as a ratio for placing soil over concrete rubble. The required soil volume was calculated by assuming a 2.0 ft minimum cover which was expanded by 1.82 over all concrete disposal areas. This factor assumes that all voids in the concrete disposal area will be filled with soil to a depth of 4 feet.

The swell factors used in calculating the reclamation costs are conservative and should result in higher estimated costs.

DEMOLITION AND DISPOSAL

Brick Buildings and Structures		
Volume (c.f.)	609,511.20	
Unit Cost ⁽³⁾		0.16
Demolition Cost Including Disposal		
(609,071.20 x 0.16)		97,521.79
Concrete Buildings and Structures		
Volume (c.f.)	758,404.12	
Unit Cost ⁽¹⁾		0.21
Demolition Cost Including Disposal		
(758,404.12 x 0.21)		159,264.87
Steel Buildings and Structures		
Volume (c.f.)	506,537.10	
Unit Costs ⁽²⁾		0.15
Demolition Costs Including Disposal		
(506,537.10 x 0.15)		75,980.57
Mine Fans and Substation Transformers*		
Railroad Tracks		
Length of Track (ft.)	13,070.00	
Unit Removal Costs ⁽⁶⁾		11.65
Removal Costs		
(13,070.00 x 11.65)		152,265.50
Total Demolition and Disposal		<u>485,032.73</u>

*The cost of equipment removal is the responsibility of the owner or lien holder.

EARTH WORK

Tipple

Excavation Prior to Demolition		
Volume (BCY)		1,560.00
Volume (LCY = BCY x 1.3)		2,028.00
Use Cat 225 Excavator		
Capacity , 54" Bucket Width (CY)	1.62	
Bucket Fill Factor	0.90	
Average Bucket Payload (1.62 x 0.90)	1.46	
Cycle Time (Cat Performance Book p. 88)		
Load Bucket	6.0	
Swing Loaded	5.0	
Dump Bucket	2.0	
Swing Empty	4.0	
Total Cycle	17.0 Seconds	
Production Rate		
(.833 job eff.)		257.54
Total Time for Excavation		
(2,028 / 257.54)		7.90
Cost of Backfilling and Grading		
Rental Rate and Operating Cost (18)	128.30	
(128.30 x 7.90)		1,013.57
Labor Cost (23)	29.25	
(29.25 x 7.90)		231.08
Subtotal Excavating		<u>1,244.65</u>
Grading		
Volume (BCY)	2,045.00	
Volume (LCY = BCY x 1.3)	2,658.50	
Volume of Material from Demolition	2,028.00	
Total Volume	4,686.50	
Unit Dozing Cost, 150' push (11)	0.75	
Grading		
(4,687 x 0.75)		
Subtotal Grading		<u>3,514.88</u>
Total Tipple		<u>4,759.53</u>

Sewage Disposal Plant

Excavation Prior to Demolition		
Volume (BCY)		157.00
Volume (LCY = BCY x 1.3)		204.10
Production Rate , 225 Cat		257.54
Time Required for Excavation		
(204 / 257.54)		0.79
Rental Rate(18)		128.30
Excavation		
(128.30 x 0.79)		
Subtotal Excavation		<u>101.36</u>
Labor Costs		
(29.25 x 0.79)		
Subtotal Labor		<u>23.11</u>
Total Excavation Cost		<u>124.47</u>
Grading		
Volume (BCY)		309.00
Volume (LCY = BCY x 1.3)		401.70
Unit Dozing Cost, 75' push(11)		0.75
Grading		
(401 x 0.75)		
Subtotal Grading		<u>301.28</u>
Total Sewage Disposal Plant Cost		<u>434.27</u>
Water Tanks		
Capacity 400,000 gal.		
(7.48 gal/cf 400,000)		53,485.94
Unit Demolishing Cost Steel(2)		0.15
Demolishing		
(53,475.94 x .15)		
Subtotal Steel Demolishing		<u>8,021.39</u>
Volume Concrete		
((17.5) ² x 3.1415 x 1)		962.11
Unit Demolishing Cost Concrete(1)		
Demolishing		0.21
(962.11 x 0.21)		
Subtotal Concrete Demolishing		<u>202.04</u>

Volume Redwood Tank Base		
$((6.0)^2 \times 3.1215 \times 1)$	113.10	
Unit Demolishing Cost Redwood Base		
Demolishing ⁽⁴⁾		
(113.97×0.16)		
Subtotal Demolishing		<u>18.24</u>
Subtotal Demolishing and Disposal		<u>8,241.67</u>
Move Borrow Material		
Borrow Volume (BCY)	66.7	
Volume (LCY = BCY x 1.3)	86.71	
Unit Haul Cost ⁽¹⁵⁾	3.36	
Unit Loading Cost ⁽⁷⁾	0.83	
Unit Ripping Cost ⁽⁸⁾	0.23	
Total Unit Cost (\$ / cy)	4.42	
Moving Borrow		
(86.71×4.42)		
Subtotal Borrow		<u>383.26</u>
Total Water Tanks		<u>8,624.93</u>
Road Junction Refuse Pile		
Provide 8 Inch Soil Cover		
Area to be Covered (acres)	1.96	
Volume (cy)	2,118.63	
Haul Distance, two way (miles)	5.30	
Haulage Unit Costs ⁽¹⁷⁾	9.90	
Ripping Unit Costs ⁽¹⁾		
	0.23	
Loading Unit Costs ⁽⁷⁾	0.83	
Dozing Unit Costs ⁽¹⁰⁾	0.34	
Total Unit Cost (dollars/yd ³)	11.30	
Soil Covering		
$(2,118.63 \times 11.30)$		
Total Road Junction Refuse Pile		<u>23,940.52</u>
South Fan and Standby Area		
Excavation		
Volume (BCY)	190.00	
Volume (LCY = BCY x 1.3)	247.00	
Use Cat 225		
Productivity Rate (LCY/hr)	257.54	
Time Required Excavation		
$(247 / 257.54)$	0.96	
Unit Rental Cost ⁽¹⁸⁾	128.30	
Unit Labor Cost ⁽²³⁾	29.25	
Total Unit Cost	157.55	
Excavation		
(0.96×157.55)		
Subtotal Excavation		<u>151.25</u>

Haul Borrow Material		
Volume (BCY)	737.00	
Volume (LCY = BCY x 1.3)	958.00	
Haulage Distance two way (miles)	2.38	
Unit Haulage Cost ⁽¹⁵⁾	3.36	
Unit Ripping Cost ⁽⁸⁾	0.23	
Total Unit Cost	3.59	
Haul Borrow		
(958.00 x 3.59)		
Subtotal Haul Borrow		<u>3,439.22</u>

Grading		
Volume (BCY)	2,067.00	
Volume (LCY = BCY x 1.3)	2,687.10	
Volume of material excavated prior to demolition	247.00	
Volume of borrow material	958.00	
Total volume to be graded	3,892.10	
Dozing distance (ft)	50.00	
Dozing distance (ft)	150.00	
Unit ripping Costs ⁽⁸⁾	0.23	
Ripping		
(2,687.10 x 0.23)		
Subtotal Ripping		<u>618.03</u>
Unit Dozing Costs ⁽¹⁰⁾	0.34	
Dozing		
(1,205 x 0.34)		
Subtotal Dozing		<u>409.70</u>
Unit Dozing Costs ⁽¹¹⁾	0.75	
Dozing		
(2,687.10 x 0.75)		
Subtotal Grading		<u>2,015.33</u>
Total South Fan and Standby Area		<u>6,482.26</u>

North Fan Area		
Backfilling and Grading		
Excavation Prior to Demolition		
Volume (BCY)	65.00	
Volume (LCY = BCY x 1.3)	85.50	
Use CAT 225 Excavator		
Production Rate	257.54	
Excavation time		
(84.50 / 257.54)	0.33	
Unit Rental Cost ⁽¹⁸⁾	128.30	
Unit Labor Cost ⁽²³⁾	29.25	
Total Unit Cost	157.55	
Excavation		
(157.55 x 0.33)		
Subtotal Excavation		<u>51.99</u>

Haul Borrow Material		
Volume (BCY)	378.00	
Volume (LCY = BCY x 1.3)	491.40	
Haul Distance two way (miles)	2.76	
Unit Haulage Cost ⁽¹⁶⁾	2.69	
Unit Ripping Cost ⁽⁸⁾	0.23	
Unit Loading Cost ⁽⁷⁾	0.83	
Total Unit Cost	3.75	
Haul Borrow		
(491.40 x 3.75)		
Subtotal Haul Borrow		<u>1,842.75</u>
 Grading		
Volume (LCY)	463.00	
Dozing Distance (ft)	50.00	
Unit Dozing Cost ⁽¹⁰⁾	0.34	
Grading		
(463 x 0.34)		
Subtotal Grading		<u>157.42</u>
 Total North Fan		<u>2,052.16</u>
 Main Yard		
Excavation Prior to Demolition		
Volume (BCY)	3,602.00	
Volume (LCY = BCY x 1.3)	4,682.26	
Use CAT 225 Excavator		
Production Rate	257.54	
Excavation Time		
(4,682.60 / 257.54)	18.18	
Unit Rental Cost ⁽¹⁸⁾	128.30	
Unit Labor Cost ⁽²³⁾	29.25	
Total Unit Cost	157.55	
Excavation		
(157.55 x 18.18)		
Subtotal Main Yard		<u>2,864.26</u>
 Reservoir Area		
Grading		
Volume (BCY)	1,760.00	
Volume (LCY = BCY x 1.3)	2,288.00	
Dozing Distance (ft)	300.00	
Unit Dozing Cost ⁽¹²⁾	1.35	
Dozing		
(2,288 x 1.35)		
Subtotal Reservoir		<u>3,088.80</u>

Highwall Near Transfer House

Grading

Volume (BCY)	11,195.00
Volume (LCY = BCY x 1.3)	14,553.50
Dozing Distance (ft)	150.00
Unit Dozing Cost (11)	0.75
Dozing (0.75 x 14,553.50)	
Subtotal Highwall Near Transfer House	<u>10,915.13</u>

Highwall Near Garage

Grading

Volume (BCY)	13,555.00
Volume (LCY = BCY x 1.3)	17,621.50
Dozing Distance (ft)	300.00
Unit Dozing Cost (12)	1.35
Dozing (17,621.50 x 1.35)	
Subtotal Highwall Near Garage	<u>23,789.03</u>

Track

Grading

Volume (BCY)	2,195.00
Volume (LCY = BCY x 1.3)	2,853.50
Dozing Distance (ft)	400.00
Unit Dozing Cost (11)	0.75
Dozing (2,853.50 x 0.75)	
Subtotal Track	<u>2,140.13</u>

Black Top

Demolition and Removal

Surface Area (ft sq)	29,600.00
Thickness (ft)	0.33
Dozing Distance (ft)	300.00
Unit Ripping and Dozing Costs (9)	1.08
Ripping and Dozing (29,600 x 0.33 / 27 x 1.08)	
Subtotal Ripping and Dozing	<u>390.72</u>

Grand Total Earthwork

89,467.07

Portal Seals

Calculation of Unit Sealing Cost

Construct Seal Using South Fan as Basis		
Portal Area (ft sq)	159.41	
Unit Sealing Cost(22)	4.36	
(159.41 x 4.36)		695.03
Backfill Entry and Cover Seal		
Use 1 cy Load Haul Dump		
Cycle Time		
Load Haul Time	0.15	
Empty Haul Time	0.10	
Basic	0.40	
Total Time	0.65	
Efficiency (1 / .833)	0.78	
Bucket Fill Factor		
(1 cy x 0.75)	0.75	
Cycles/hour		
(60 / 0.78)	76.92	
CY/Hr		
(76.92 x 0.75)	57.69	
Total Fill		
Concrete (cy)	160.91	
Earth Fill (cy)	229.29	
Total Fill (cy)	390.20	
Backfilling Time (hr)		
(390.20 / 57.69)	6.76	
Travel Time (hr)	1.00	
Total Time	7.76	
Unit Rental Cost(20)	76.75	
(76.75 x 7.76)	595.58	
Unit Labor Cost (23)	27.55	
(27.55 x 7.76)	213.79	
Unit Operating Cost(20)	13.80	
(13.80 x 7.76)	107.09	
Total Backfilling Costs		916.46
Total Backfilling and Sealing Cost		<u>1,611.49</u>
Unit Backfilling and Sealing Costs		
(1,611.49 / 159.41)	10.11	

Sealing Costs per Portal by Area (ft sq)	
South Fan	159.41
North Fan	158.66
Main Intake (south)	210.00
Manway	125.00
Carlson Portals	300.00
Woodard Portals	324.00
Lila Canyon Portal	158.00
Total Area to Seal (ft sq)	14,35.07

Total Sealing and Backfilling Costs (Total Area x 10.10)	<u>14,508.56</u>
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Sedimentation Ponds

Enlarge Ponds 1,3, and 4
Pond 1

Volume to Move (BCY)	1,650.00	
Volume (LCY = BCY x 1.3)	2,145.00	
Dozing Distance (ft)	50.00	
Unit Dozing Cost (10)	0.34	
Dozing (2,145 x 0.34)		
Dozing Costs		729.30
Unit Compacting Costs (21)		0.99
Compacting (0.99 x 2,145.00)		
Compacting Costs		2,123.55

Ponds 3 and 4

Volume to Move (BCY)	1,600.00	
Volume (LCY = BCY x 1.3)	2,080.00	
Dozing Distance (ft)	50.00	
Unit Dozing Cost (10)		0.34
Dozing (2,080 x 0.34)		
Dozing Costs		707.20
Unit Compacting Costs (21)		0.99
Compacting (0.99 x 2,080)		
Compacting Costs		2,059.00

Subtotal Enlarging Costs for all Ponds	<u>5,619.05</u>
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Remove Sediment Ponds

Capacity of Ponds to Reclaim (cf)

Pond 1	8,615.00
Pond 2	12,889.00
Pond 3	8,514.00
Pond 4	7,742.00
Pond 5	2,738.00
Pond 6	8,540.00
Pond 7	4,993.00
Pond 8	2,624.00
Pond 9	3,974.00
Total Volume	60,629.00

Remove Sediment Ponds

Grading

Volume (BCF)	60,629.00
Volume (LCF = BCF x 1.3)	78,817.70
Enlarged Pond Volume (LCF)	114,075.00
Total Volume (LCF)	192,892.70
Dozing Distance (ft)	50.00
Unit Dozing Costs ⁽¹⁰⁾	0.34

Grading

(192,892.70 x 0.34 / 27)

Subtotal Ponds

2,429.02

Total Sedimentation Pond Removal

8,048.07

Revegetation Costs

Scarification

Tipple

Area to be Reclaimed (acres)	1.74
Use CAT 120 G Motor Grader	
Unit Rental Cost ⁽¹⁹⁾	88.20
Production Rate (ft/hr)	20,592.00
Scarifier Width (ft)	10.00
Total Productivity (ft sq/hr)	205,920.00
Travel Time (hr)	0.50
Time Required	
(1.74 / 205,920.00 + .5)	0.87
Scarifying	
(0.87 x 88.20)	
Subtotal Tipple	76.73

Sewage Disposal Plant	
Area to be Reclaimed (acres)	1.92
Use CAT 120 G Motor Grader	
Travel Time (hr)	0.50
Time Required	
(1.92 / 205,920.00 + .5)	0.91
Scarifying	
(.91 x 88.20)	
Subtotal Sewage Disposal Plant	<u>80.26</u>
Main Yard and South Fan	
Area to be Reclaimed (acres)	15.05
Use CAT 120 G Motor Grader	
Travel Time (hr)	0.50
Time Required	
(15.05 / 205,920.00 + .5)	3.68
Scarifying	
(3.68 x 88.20)	
Subtotal Main Yard	<u>324.58</u>
Water Tanks	
Area to be Reclaimed (acres)	0.69
Use CAT 120 G Motor Grader	
Travel Time (hr)	1.00
Time Required	
(0.69 / 205,920.00 + 1.00)	1.15
Scarifying	
(1.15 x 88.20)	
Subtotal Water Tank	<u>101.43</u>
Total Scarifying Costs	<u>583.00</u>

Reseeding

Total Area to be Seeded (acres)	50.00
Total Amount of Seed PLS/lb (\$)	8.00
Amount of Seed per Acre (lb)	14.00
Rangeland Drill Seeder, including labor, fertilizer, etc.	363.00
Unit Cost per Acre	
(14 lb/ac x \$8.00/lb + \$363.00/ac)	475.00
Seeding Costs for 50 Acres	
(50 x 475.00)	23,750.00
Allowance for Re-Seeding 1/3 of the Area Two Times	
(23,750.00 / 3)	7,916.66
Total Seeding Costs	31,666.66

Ten Year Responsibility Period

Monitoring

Erosional - 1 man day per month at \$29.25/hr (23)
10 yr x 12 mon/yr x 8 hr/day x \$29.25/hr =
\$28,080.00

Hydrologic -

- 1) Sample each pond on a ten year, 24 hour storm frequency

5 ponds x 10 years x 1 storm event/pond/
10 years = 5 storm evnets

5 x \$100/sample = \$500

1 sample day = 8 x \$29.25 = \$234.00

- 2) Sample stream channel above mine and below the mine each quarter

4 x 2 x 10 years x \$100/sample = \$8,000

4 days x 10 years x 8 hr/day x \$29.25/-
hr = \$9,360.00

Subtotal - \$18,094.00

Vegetation -

- 1) 1 man day per quarter at \$29.25/hr

4 x 8hr/day x \$29.25/hr x 10 years = \$9,360.00

TOTAL MONITORING COSTS = \$55,534.00

Total Reclamation Cost Summary

Demolition and Disposal of Buildings	485,032.73
Earthwork	
Tipple Area - Backfilling and Grading	4,759.53
Demolition and Grading of Sewage Disposal Plant	425.75
Water Tanks	8,624.93
South Fan and Standby Area	6,633.53
North Fan Area	2,052.16
Road Junction Refuse Pile	23,940.52
Main Yard Area	
Earth Excavation Prior to Demolition	2,864.26
Backfilling and Grading	39,933.09
Black Top Removal	390.72
Total Earthwork	89,624.49
Portal Seals	14,508.56
Sedimentation Ponds	
Sedimentation Ponds Enlargement	5,619.05
Sedimentation Ponds Removal	2,429.02
Total Sedimentation Ponds	8,048.07
Revegetation	
Scarification	583.00
Seeding	31,666.66
Total Revegetation	32,249.66
Monitoring Costs	55,534.00
<u>Total Reclamation Cost</u>	<u>684,997.51</u>

References

(1)	Means (1)	2.3-250-0100	Concrete demolition & disposal, \$0.21
(2)	Means	2.3-250-0	Steel demolition & disposal, \$0.15
(3)	Means	2.3-250-0200	Masonry demolition & disposal, \$0.16
(4)	Means	2.1-250-0800	Wood demolition & disposal, \$0.16
(5)	Means	2.1-250-0300	Demolition, mixture of types, \$0.16
(6)	Means	2.3-250-3500	Railroad track removal, \$11.65
(7)	Means	2.3-160-1650	Loading, \$0.83
(8)	Means	2.3-370-1100	Ripping, 300 hp/cy, \$0.23
(9)	Means	2.3-370-3250	Ripping, 300 hp, 300' haul, \$1.08
(10)	Means	2.3-163-5020	Haul 50', 300 hp, common earth, \$0.34
(11)	Means	2.3-163-5220	Haul 150', 300 hp, common earth, \$0.75
(12)	Means	2.3-163-5420	Haul 300', 300 hp, common earth, \$1.35
(13)	Means	2.3-300-0310	Haul 1/4 mi round trip, \$1.36
(14)	Means	2.3-300-0320	Haul 0.5 mi round trip, 12 cy dump, \$1.57
(15)	Means	2.3-300-0100	Haul 2 mi round trip, 6 cy, \$3.36
(16)	Means	2.3-300-0450	Haul 3 mi round trip, 12 cy dump, \$2.69

(17)	Means	2.3-300-0550	Haul 10 mi round trip, 12 cy dump, \$9.90
(18)	Dataquest (2)	10-15	Excavator, CAT 255, \$128.30/hr
(19)	Dataquest	9-7	Grader, CAT 120 G Motor, \$88.20/hr
(20)	Dataquest	21-19	Bucket, Eimco 911, 1 yd, \$76.75 hourly + \$13.80 operating cost = \$90.55
(21)	Means	2.3-081-5680	Compactor, sheeps foot roller, 8" lifts, 2 passes, \$0.99
(22)	Means	4.3-270-1600	Blocks, solid 8" x 8" x 16", purchase and install, \$4.36
(23)	Means (3)	(4)	Labor Rates
			Skilled Workers \$29.25
			Ave. Helper 22.20
			Building Labor 22.40
			Equipment Operator
			Medium 29.25
			Light 27.55
			Truck Driver
			Heavy 23.20
			Light 22.90
			Wrecking 24.10

- (1) All Means references refer to the following reference unless otherwise noted.
Robert Snow Means Co., Inc. 1984. Means Site Work Cost Data. Third Annual Edition.
- (2) Dataquest Incorporated. 1984. Rental Rate Blue Book. Dataquest Inc.
- (3) Robert Snow Means Co., Inc. 1984. Means Building Construction Cost Data. 42nd Annual Edition.
- (4) A number of citations were used in obtaining these labor rates.