



Republika ng Pilipinas
Department of Agriculture
Pambansang Pangasiwaan ng Patubig
(NATIONAL IRRIGATION ADMINISTRATION)
Lungsod ng Quezon



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MC. NO. 23 s. 2010

MEMORANDUM CIRCULAR

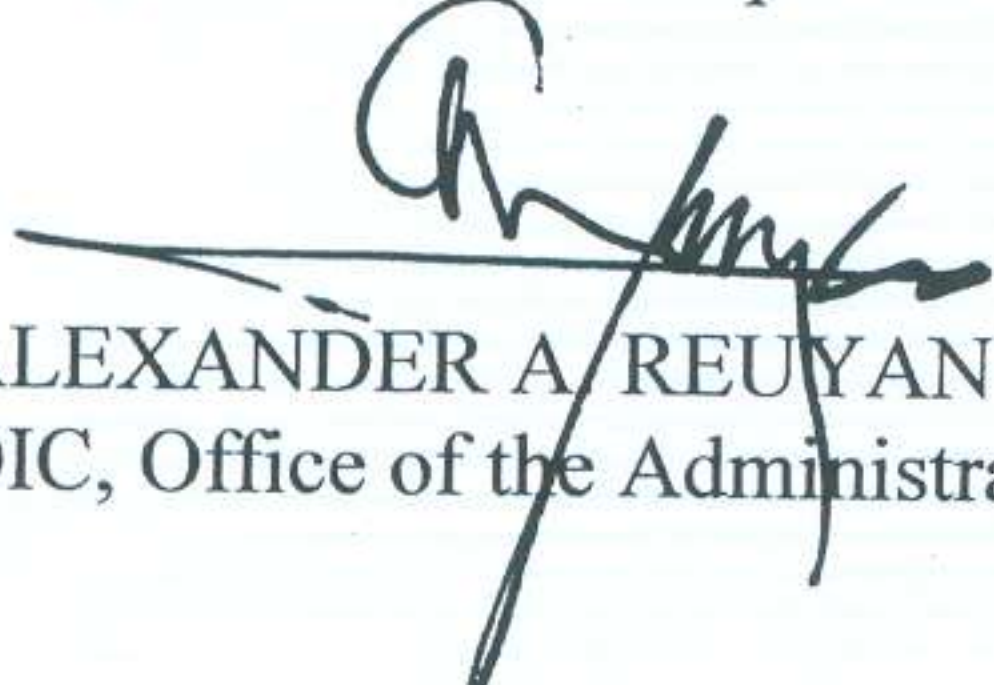
TO : THE ACTING SENIOR DEPUTY ADMINISTRATOR, ACTING
DEPUTY ADMINISTRATORS, DEPARTMENT MANAGERS,
PROJECT MANAGERS, REGIONAL IRRIGATION MANAGERS,
OPERATIONS MANAGERS, DIVISION MANAGERS AND
ALL OTHERS CONCERNED

SUBJECT : AMENDMENTS TO MC 18 s. 2009, ESTIMATING
GUIDELINES FOR THE DERIVATION OF UNIT
COSTS ON IRRIGATION AND RELATED CIVIL WORKS

The attached amended Estimating Guidelines for the Derivation of Unit Costs on Irrigation and Related Civil Works is hereby re-issued to be used by all concerned in the preparation of unit costs derivations (UCD) for all activities covered by every Program of Work for the Budget Year. The UCD shall be submitted to the Office of the Deputy Administrator for Engineering and Operations, Attention: The Department concerned, for review and approval.

This supersedes the Estimating Guidelines for the Derivation of Unit Costs on Irrigation and Related Works as contained in Memorandum Circular No. 18, s. 2009.

For guidance and compliance.


ALEXANDER A. REUYAN
OIC, Office of the Administrator

Date: 19 March 2010

AMENDED ESTIMATING GUIDELINES

(MC No. 23, s. 2010)

I. MECHANIZED ASPECT

A. Clearing & Grubbing : Dozer

HORSEPOWER	Capability : SQ.M./HR.				
	DENSE OF VEGETATION (NO. OF TREES/HAS.)				
	0 – 50	51 – 100	101 – 200	201 – 250	251 & >
120	360	250	190	160	130
140	420	290	220	185	150
160	480	330	255	210	170
180	540	375	285	240	195
200	600	420	310	265	215

B. Excavation : Common Materials

B.1 Crane

Tonnages	Cap., cum/hr (Bank Volume)		
	Canal	Structure	Creek
15	15	10	10
20	20	15	15
25	25	20	20
30	30	25	25

B.2 Dozer

Horsepower	Cap., cum/hr (Bank Volume)	
	Canal	Structure
120	30	15
140	35	20
160	40	25
180	45	30
200	50	35

B.3 Backhoe

Bucket cu.m.	Cap., cum/hr (Bank Volume)		
	Canal	Structure	Creek
0.50	20	15	15
0.75	30	20	20
1.00	40	30	30
1.25	50	40	40
1.50	60	45	45

C. Quarrying : Dozer

Horsepower	Cap., cum/hr (Bank Volume)		
	Common	Aggregate	Cbl/Bldr
140	55	60	27
160	60	65	29
180	65	70	31
200	70	75	33

D. Loading : Wheel Loader

Bucket cu.m	Cap., cum/hr (Bank Volume)		
	Common	Aggregate	Cbl/Bldr
1.00	50	55	35
1.50	75	80	55
2.00	100	110	75
2.50	125	135	90
3.00	150	165	110

E. Spreading :

Dozer Horse power	Common Capability Cum/hr	Grader Horse power	Aggregate Capability Cum/hr
90	75	80 – 100	70
140	90	100 – 125	80
160	110	125 – 150	100
180	130	150 - 175	110

F. Side Borrow (Com. Mat.) : Dozer

Horsepower	Capability, cum/hr. Compacted Volume
140	35
160	40
180	45
200	50

G. Structure Backfill w/ Spreading & Compaction - Dozer

Horse Power	Capability: cum/hr. Compacted Volume
140	50
160	70
180	80
200	90

H. Embankment Compaction - Self-propelled Compactor

Tons	Capability: cum/hr. Compacted Volume	
	Tamping Foot Drum	Vibratory Drum
10	80	60
12	90	70
15	120	90

I. Total Time for Loading and Spot & Maneuver Using Loader with 1.00 cum bucket

Dump Truck: cu.m. Compacted Volume	Common Materials	Road Surfacing Materials	Cobbles / Boulders
4.00	7 min.	7 min.	10 min.
6.00	9 min.	9 min.	12 min.
8.00	11 min.	11 min.	15 min.
10.00	13 min.	13 min.	18 min.

J. Average Speed of Dump Truck

Type of Road	With Load	Without Load
Good maintained concrete/asphalt	35 kph	45 kph
Poor maintained concrete/asphalt	25 kph	35 kph
Good maintained gravel road	30 kph	35 kph
Poor maintained gravel road	20 kph	25 kph

K. Concrete Demolition

One (1) Compressor, 160 cfm & two (2) Jackhammer

Type of Work	Capability
Massive concrete	8.00 cum/day
Slab and Wall	12.00 cum/day

L. Driving of Piles

Type of Pile	Crane	Capability
Steel Piles	Crane, 25 tons with 2 tons drop hammer	8.00 lm/hr
Thick Concrete Piles	Crane, 25 tons with 7,500 kgs pile hammer	2.00 lm/hr
Thin Concrete Piles	Crane, 25 tons with 7,500 kgs pile hammer	4.00 lm/hr

M. Concreting

Type of Concrete	Equipment Crew	Capability
Class A	1 unit, 30-ton Crane;	40 cum/day
Class B	2 units, 4-cum Transit Mixer;	64 cum/day
Canal Lining	1 unit, 10-cum Portable Batching Plant;	64 cum/day
Rubble Masonry	1 unit, Concrete Vibrator (for Class A, Class B and Rubble Masonry)	64 cum/day
Lean Concrete		64 cum/day

II. MANUAL ASPECT

A. Excavation

A.1 Common Materials

Type of Work	Capability: cum/day/man Bank Volume Depth of Excavation in Meter		
	<1.50m	1.6m-2.5m	>2.6m
Farmditch	3.00	2.50	2.00
Canal	2.50	2.00	1.75
Structures	2.00	1.75	1.50

A.2 Slightly Hard Materials (indurated)

Type of Work	Capability: cum/day/man Bank Volume
Canal	1.00
Structure	0.75

B. Loading Capabilities of five (5) Laborers

Sand and Gravel	Common	Cobbles	Boulders	Cement	R.S. Bars	Lumber	Plywood
cum/hr	cum/hr	cum/hr	cum/hr	bags/hr	kgs/hr	bdf/hr	pcs/hr
4.00	5.00	3.50	3.00	300.00	6,000.00	4,000.00	250.00

C. Unloading Capabilities of five (5) Laborers

Sand and Gravel	Common	Cobbles	Boulders	Cement	R.S. Bars	Lumber	Plywood
cum/hr	cum/hr	cum/hr	cum/hr	bags/hr	kgs/hr	bdf/hr	pcs/hr
6.00	8.00	5.00	4.00	300.00	7,000.00	4,000.00	250.00

D. Cut, Bend and Placing of R.S. Bars

One Steelman, One Bar Cutter & One Laborer	80.00 kgs/day
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E. Laying of Materials

Cobbles	2.00 cum/day/man
Boulders	1.50 cum/day/man

F. Rubble Masonry: Concreting

Crew	Capability
1-Fman, 2-Masons, 1-Operator & 8-Laborers w/ 1-bagger Mixer	5 cum/day

G. Quarrying

Aggregates	Cobbles	Boulders
3.50 cum/day/m	2.50 cum/day/m	2.00 cum/day/m

H. Demolition of Concrete

Slab and Wall	0.50 cum/day/man
Massive Concrete	0.20 cum/day/man

I. Screening of Aggregates

Gravel	4.00 cum/day/man
Sand	6.00 cum/day/man

J. Manual Backfill, Common Material

Capability	3.00 cum/day/man
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K. Spreading of Aggregates

Capability	5.00 cum/day/man
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J.1. Manual Compaction

Capability	5.00 cum/day/man
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L. Grouted Riprap: Concreting

Crew	Capability
1-Fman, 2-Masons, 1-L.E. Oper & 8-Laborers w/ 1-bagger Mixer	3.50 cum/day

M. Laying of C.H. Blocks

Crew	Capability, sqm/day	
1-Mason & 2-Laborers	Fence	Building
4 inches	14.00	10.00
6 inches	10.00	8.00

N. Concrete Lining

Crew	Capability
1-Fman, 2-Masons, 1-L.E. Oper & 8-Laborers w/ 1-bagger Mixer	4.50 cum/day

O. Installation of Steel Gates

Crew	Capability
1-Mason & 5-Laborers	Assy./day
16 x 16 to 24 x 24	2.00
24 x 24 & above	1.00

P. Concreting

P.1 Fabrication, Placing & Dismantling of Form

Crew	Type	Capability cum/day
2-Carpenters, 4-Laborers	Class A	3.50
1-Carpenter, 1-Laborer	Canal Lining	4.50
2-Carpenters, 4-Laborers	Class B	5.00

P.2 Concreting and Curing

P.2a Concreting with one-bagger Mixer

Crew	Type	Capability cum/day
1 - Foreman 1 - L.E. Operator 8 - Laborers 2 - Masons	Class A	3.50
	Class B	5.00
	Canal Lining	4.50
	Lean Concrete	4.50
	Rubble Masonry	5.00
	Grouted Riprap	3.50

P.2b Concreting with 2 units, 4 cum Transit Mixer; 1 unit, 30-ton Crane; 1 unit, 10 cum P.B. Plant; & 1 unit, Conc. Vibrator

Crew	Type	Capability cum/day
1-Foreman 8-Laborers 2-Masons	Class A	40.00
	Class B	64.00
	Canal Lining	48.00
	Lean Concrete	48.00
	Rubble Masonry	64.00

Q. Concrete Hollow Block

Q.1. Plastering of C.H. Block

Crew	Capability, sqm/day
1- Mason & 1-Laborer	12.00

R. Reinforced Concrete Pipes

Crew	Diameter		Capability: pcs./day	
	Inches	Centimeter	Fabrication	Installation
1 - Foreman 1 - Mason 1 - Carpenter/ Steelman 12 - Laborers w/ 1-bagger Mixer	12	30	15	16
	18	46	11	14
	24	61	9	12
	30	76	6	10
	36	91	5	8
	48	122	3	6

S. Surveying

C R E W	C A P A B I L I T I E S						
	Profile		Cross - section		Topo		
	Old	New	Old	New	Plain	L. Shrubby	H. Shrubby
1-Geodetic Engr. 1-Instrumentation 1-Survey Aide 6-Laborers	5km/day	2km/day	3km/day	1.5km/day	15has/day	8has/day	3has/day

T. Computation and Plotting

C R E W	C A P A B I L I T I E S		
	Contour	Profile	Cross-section
1 - Asst. Engineer	8 has/day	8 km/day	4 km/day

III. MATERIAL ASPECT

A. Materials for Concrete

Class / Strength	Max Aggr.	Cement	Sand	Gravel	Boulder
	mm	bag/cum	cum/cum	cum/cum	cum/cum
Concrete Class "A" 211 kg/sqcm	37.50	9.00	0.45	0.90	-
Concrete Class "A" 170 kg/sqcm	50.00	7.00	0.50	1.00	-
Canal Lining 170 kg/sqcm	25.00	7.50	0.48	0.96	-
Rubble Masonry w/ 211 kg/sqcm conc. binder	-	4.50	0.225	0.45	0.95
Grouted Riprap	-	4.20	0.35	0.05	1.00
Plain Riprap	-	-	-	0.10	1.00
Lean Concrete with 70 kg/sqcm	37.50	5.00	0.50	1.00	-
Gravel Blanket	-	-	0.45	0.80	-
Filter Drain	-	-	0.65	0.45	-

B. Other Materials for Concrete

Class / Strength	Lumber	½ Plywood	Tire Wire	CW Nails
	bdf/cum	pcs/cum	% of RSB	kgs/cum
Bridge/Flume with Class "A", 211 kg/sqcm	30.00	1.50	1.20	2.50
Siphon/Box Culvert with Class "A", 211 kg/sqcm	25.00	1.25	1.20	2.00
Other Structures with Class "A", 211 kg/sqcm	25.00	1.25	1.20	2.00
Rubble Masonry with 211 kg/sqcm conc. binder	5.00	0.25	-	0.25
Canal Lining with Class "B", 170 kg/sqcm	5.00	-	-	0.25
Concrete Pavement with Class "A", 211 kg/sqcm	5.00	-	-	0.25
Dam with Class "A", 211 kg/sqcm	15.00	0.50	1.20	1.25

C. Materials for Fabrication of Reinforced concrete Pipes

Diameter		FABRICATION						
Inches	Centimeter	Cement	Sand	Gravel	GI Sheet	Lumber	RS Bar	CW Nails
		bag/pc	cum/pc	cum/pc	L.F./pc	bdf/pc	kgs/pc	kgs/pc
12	30	0.58	0.02	0.05	0.12	0.24	5.28	0.10
18	46	1.22	0.05	0.10	0.19	0.36	7.72	0.20
24	61	1.82	0.08	0.15	0.24	0.48	9.77	0.30
30	76	2.52	0.11	0.21	0.30	0.60	23.22	0.40
36	91	3.33	0.14	0.28	0.34	0.72	50.43	0.50
42	122	4.28	0.18	0.36	0.40	0.84	60.84	0.60

D. Materials for Installation of Reinforced Concrete Pipes

Diameter		INSTALLATION						
Inches	Centimeter	Cement	Sand	Gravel	GI Sheet	Lumber	Tie Wire	CW Nails
		bag/pc	cum/pc	cum/pc	L.F./pc	bdf/pc	kgs/pc	kgs/pc
12	30	0.21	0.01	0.02	-	2.00	-	0.20
18	46	0.45	0.02	0.04	3.65	2.00	0.05	0.20
24	61	0.72	0.03	0.06	4.52	3.00	0.07	0.30
30	76	0.93	0.04	0.08	5.26	3.00	0.08	0.30
36	91	1.11	0.05	0.10	6.01	4.00	0.09	0.40
42	122	1.32	0.06	0.12	6.79	4.00	0.10	0.40

E. Laying of C.H. Block

Size	Cement	Sand
	bag/sqm	cum/sqm
4 inches	0.55	0.046
6 inches	1.07	0.089

F. Plastering of C.H. Block

Size	For two (2) sides	
	Cement	Sand
	bag/sqm	cum/sqm
4 inches	0.41	0.034
6 inches	0.41	0.034

G. CHB Reinforcement

Spacing of Vertical Bars in Inches	Length of Bars in Feet per	
	Block	Sq. meter
16	0.80	10.000
24	0.55	6.875
32	0.40	5.000
Horizontal Bars		
Every 2 layers	0.72	9.000
3	0.51	6.375
4	0.44	5.500
5	0.36	4.500

H. CHB Reinforcement Tie Wire (No. 16 G.I. Wire)

Vertical Spacing	Horizontal Every after Layer	Kilos per Sq. meter
16"	2	0.0450
16"	3	0.0300
16"	4	0.0220
24"	2	0.0300
24"	3	0.0190
24"	4	0.0140
32"	2	0.0200
32"	3	0.0140
32"	4	0.0100

IV. COSTING ASPECT

A. Computation of Gross Rates for Works by Administration per Day

TOTAL RATE = BASIC RATE + FRINGE BENEFIT

G.R. = BR + COLA + AA + IA + EFSA + MA + M + CA + Other Fringe Benefit

B. Recommended Maximum Labor Rate per Day

Designation	Contract Works	Force Account Work
	International / National / Small Value	
Foreman	Use the average rate at the area	Use the average rate per designation.
Carpenter	Use the average rate at the area	
Mason	Use the average rate at the area	
Steelman	Use the average rate at the area	
Laborer	Use the latest Regional labor rate	

C. Additional Direct Cost: for Supervision Cost for Force Account Work

Add 3% of Direct Cost

- a. Labor Cost - 70% of 3% of Direct Cost
- b. Fuel Cost - 7% of 3% of Direct Cost
- c. Spare Part Cost - 15% of 3% of Direct Cost
- d. Dep. Cost/Rental Cost - 8% of 3% of Direct Cost

D. Equipment Rental

D.1 For works by Administration, use Schedule B of the latest NIA Revised Rental Rate which includes the repair and maintenance cost.

D.2 For Contract Works, use the latest Association of Carriers & Equipment Lessors (ACEL), Inc. Rental Rate.

NOTE:

1. The rate of the Operator for Contract Works is already included in the ACEL Rental Rate.
2. For estimating Contract Works, the project must use the existing average local labor rate on skilled labor and latest regional rate for laborer.
3. Never use the Agency Rate for estimating Contract Works.

E. Recommended Indirect Cost for Contract Works

Estimated Direct Cost (E.D.C.)	Indirect Cost For O C M & Profit (Max. Ranges)		% Cost for Mob. and Demob. (Max.)	Total % of Maximum Indirect Cost
	O.C.M.	Profit		
	(% of E.D.C.)			
< 1 Million	12	15	3	30
> 1 Million to 5 Million	12	15	3	30
> 5 Million to 10 Million	12	15	3	30
> 10 Million to 20 Million	10	15	SPI	25
> 20 Million to 50 Million	10	15	SPI	25
> 50 Million	10	15	SPI	25

NOTE:

- O - Overhead
- C - Contingencies
- M - Miscellaneous
- SPI - Separate Pay Item