

JAPAN INTERNATIONAL COOPERATION AGENCY(JICA)

DEPARTMENT OF PUBLIC WORKS AND HIGHWAYS
REPUBLIC OF THE PHILIPPINES

**THE STUDY ON ROAD NETWORK IMPROVEMENT
FOR DEVELOPMENT OF REGIONAL GROWTH CENTERS
IN THE REPUBLIC OF THE PHILIPPINES**

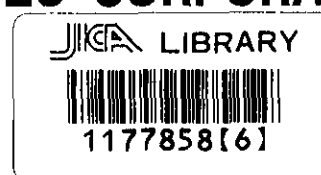
VOLUME-6

**PRELIMINARY DESIGN DRAWINGS
METRO CAGAYAN DE ORO**

**WESTERN COASTAL ROAD
7th BRIDGE AND ACCESS ROAD
J.R. BORJA EXTENSION ROAD
WEST DIVERSION ROAD**

October 2004

**KATAHIRA & ENGINEERS INTERNATIONAL
ALMEC CORPORATION**



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**WESTERN COASTAL ROAD
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J.R. BORJA EXTENSION ROAD
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KATAHIRA & ENGINEERS INTERNATIONAL

in association with

ALMEC CORPORATION

GENERAL

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CAGAYAN DE ORO
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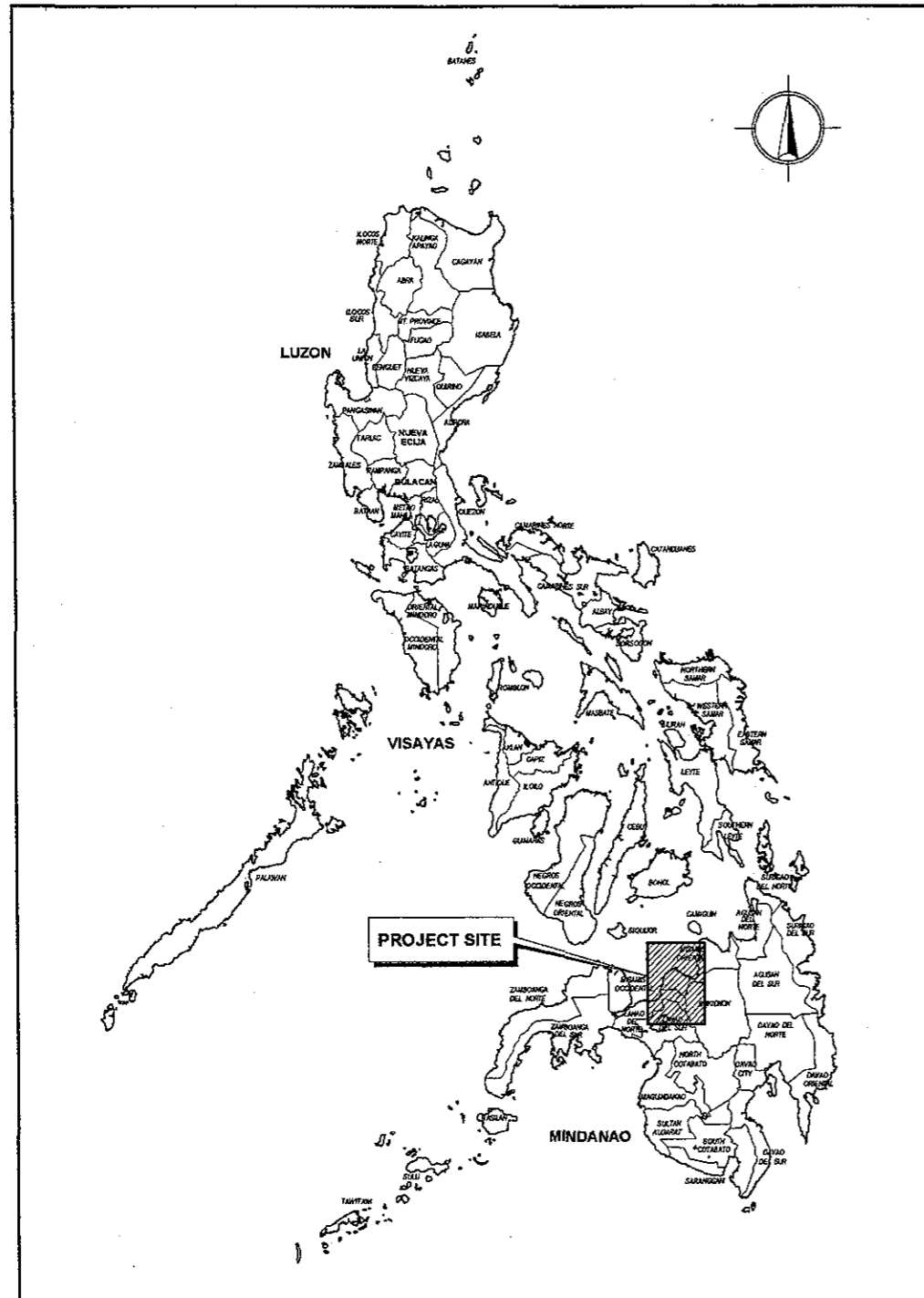
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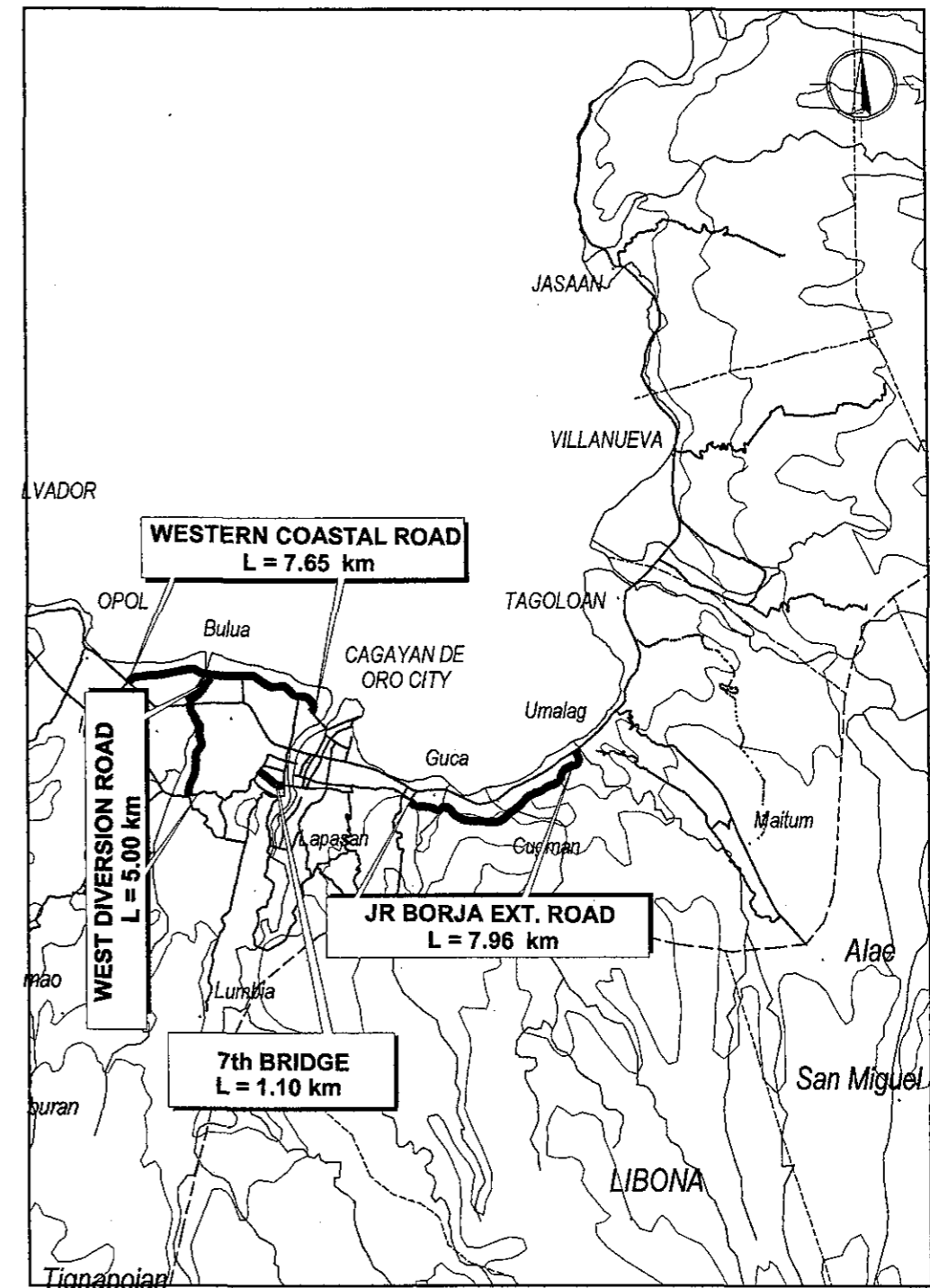
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METRO CAGAYAN DE ORO
KEY MAP & VICINITY MAP

DRAWING NO.
G-3



1 KEY MAP
G3



2 VICINITY MAP
G3

LEGEND & SYMBOLS

PROJECT ROAD		RIPRAP	
SERVICE OR FRONTAGE ROAD ALONG BYPASS		EMBANKMENT	
CONTOUR		EXCAVATION	
RIGHT-OF-WAY LIMIT		SECTION IN WATER	
POINT OF INTERSECTION		SECTION IN EARTH	
POINT OF INTERSECTION NO.		SECTION IN CONCRETE	
℄ OF PROJECT ROAD		SECTION IN GRAVEL	
FINISHED GRADE ON PROFILE		SOFT BED MATERIALS TO BE EXCAVATED	
ORIGINAL GROUND		NORTH SIGN	
BRIDGE		LINE SYMMETRY	
SINGLE RC PIPE CULVERT		SECTION TARGET	
DOUBLE RC PIPE CULVERT		ELEVATION TARGET	
BOX CULVERT		TITLE TARGET	
DIRECTION OF FLOW		SUB-TITLE TARGET	
RETAINING WALL (MASONRY)		DETAIL REF TARGET	
RETAINING WALL (CONCRETE)		STATION GRID	

ABBREVIATIONS

PCCP	PORTLAND CEMENT CONCRETE PAVEMENT	MO	MIDDLE ORDINATE
AC	ASPHALT CONCRETE PAVEMENT	g	GRADE IN PERCENT
GRA	GRAVEL	BM	BENCH MARK
PI	POINT OF HORIZONTAL INTERSECTION	TBM	TEMPORARY BENCH MARK
I	EXTERNAL ANGLE	MFL	MAXIMUM FLOOD LEVEL
D	DEGREE OF CURVE	OWL	ORDINARY WATER LEVEL
R	RADIUS OF CIRCULAR CURVE	DFL	DESIGN FLOW LEVEL
T	LENGTH OF TANGENCY	AZIM	AZIMUTH
Lc	LENGTH OF CIRCULAR CURVE	DIST	DISTANCE
E	EXTERNAL DISTANCE	e	SUPERELEVATION RATE IN %
PC	BEGINNING OF CIRCULAR CURVE	V	DESIGN SPEED IN KPH
PT	END OF CIRCULAR CURVE	EQ	EQUATION
PVI	POINT OF VERTICAL INTERSECTION	BK	BACK STATION
PVC	POINT OF VERTICAL CURVATURE	AH	AHEAD STATION
PVT	POINT OF VERTICAL TANGENCY	VERT	VERTICAL
LVC	LENGTH OF VERTICAL CURVE	HOR	HORIZONTAL
φ	DIAMETER	ELEV	ELEVATION
		℄	CENTER LINE

WESTERN COASTAL ROAD - SUMMARY OF QUANTITIES

THE STUDY ON ROAD NETWORK IMPROVEMENT
FOR DEVELOPMENT OF REGIONAL GROWTH CENTERS

SCALE :

NTS

CAGAYAN DE ORO
WESTERN COASTAL ROAD
SUMMARY OF QUANTITIES

DRAWING NO.

G-5(1)

Item No.	Description	Unit	Quantity	Item No.	Description	Unit	Quantity
PART C - EARTHWORK							
100(1)	Clearing and Grubbing	ha.	25.0	502(10)c2	Reinforced Concrete Headwall, Box Culvert 2-3.0m x 3.0m	ea.	2.0
103(2)a	Bridge Excavation, Common (AWL)	m3	29,885.0	502(3)a1	Catch Basin for RCPC 1- Ø610	ea.	480.0
103(2)b	Bridge Excavation, Common (BWL)	m3	1,730.0	502(3)b1	Catch Basin for RCPC 1- Ø910	ea.	33.0
104(1)a	Embankment from Excavation	m3	969.0	502(3)b2	Catch Basin for RCPC 2- Ø910	ea.	6.0
104(1)b	Embankment from Borrow	m3	259,935.0	502(3)c2	Catch Basin for RCPC 2- Ø1070	ea.	9.0
104(1)c	Selected Borrow for Backfilling	m3	1,642.0	504(5)	Grouted Riprap, Class "A"	m3	3,817.0
105(1)	Subgrade Preparation (Common Material)	m2	2,457.0	505(3)	Gravity Type Retaining Wall(H=1.0~3.0m)	m	5,778.0
				506	Loose Boulder Apron 300mm Ø min., S.G=2.65	m3	126.0
PART D - SUBBASE AND BASE COURSE							
		m3	43,431.0	507	Steel Sheet Pile (85x400x8mm), Furnished and Driven	m	593.0
200	Aggregate Subbase Course			510	Rubble Concrete Slope Protection, t = 350mm	m3	145.0
				511(a)	Concrete Side Ditch (0.5 x 0.5)	m	200.0
PART E - SURFACE COURSE							
311(1)a	PCC Pavement(Plain) (t=0.10m)	m2	23,715.0				
311(1)d	PCC Pavement(Plain) (t=0.25m)	m2	156,349.0				
311(2)	PCC Pavement(Reinforced) for Approach Slab, t=300mm	m2	190.0				
PART F - BRIDGE CONSTRUCTION							
400(16)a	Cast-in-Place Concrete Bored Piles, Ø 1000mm	m	680.0	600(1)a	Concrete Curb, Type A (200x450mm)	m	5,987.0
400(16)c	Cast-in-Place Concrete Bored Piles, Ø 1500mm	m	348.0	600(3)a	Combination Concrete Curb & Gutter/Side Strip, Type A (675x364mm)	m	26,836.0
401	Concrete Railings	m	216.0	603(3)a	Metal Guardrail	m	200.0
404(1)	Reinforcing Steel, Grade 40 (Fy=275Mpa)	kg	6,895.0	610	Sodding	m2	40,201.0
404(2)	Reinforcing Steel, Grade 60 (Fy=415Mpa)	kg	468,960.0	SPL620(1)	Traffic Signal (3-leg intersection)	ea.	3.0
405(1)	Structural Concrete Class"A1" for Substructure (fc=24Mpa)	m3	1,511.0	SPL620(2)	Traffic Signal (4-leg intersection)	ea.	1.0
405(2)	Structural Concrete Class"A2" for Superstructure (fc=24Mpa)	m3	881.0				
405(3)	Structural Concrete Class"A3" for Others (fc=21Mpa)	m3	49.0				
405(6)	Structural Concrete "Lean Concrete" (fc=17 Mpa)	m3	46.0				
406(1)l	Prestressed Concrete Girder, AASHTO Type IV-A, L=36m	ea	33.0				
407(1)c	Elastomeric Bearing Pad, 625x400x60 (Duro 60)	ea	22.0				
407(2)	Expansion Joint, 50mm Gap	m	36.0				
407(4)	Metal Drain (Ø150mm G.I. Drain Pipe)	m	48.0				
PART G - DRAINAGE AND SLOPE PROTECTION STRUCTURES							
500(1)a	Reinforced Concrete Pipe Culvert, 610mm Ø (Extra. Str.)	m	16,660.0				
500(1)b	Reinforced Concrete Pipe Culvert, 910mm Ø (Extra. Str.)	m	449.0				
500(1)c	Reinforced Concrete Pipe Culvert, 1070mm Ø (Extra. Str.)	m	156.0				
500(3)a2	Reinforced Concrete Box Culvert 2-1.5m x 1.5m	m	100.0				
500(3)b1	Reinforced Concrete Box Culvert 1-2.4m x 2.4m	m	26.0				
500(3)b2	Reinforced Concrete Box Culvert 2-2.4m x 2.4m	m	109.0				
500(3)b3	Reinforced Concrete Box Culvert 3-2.4m x 2.4m	m	27.0				
500(3)c2	Reinforced Concrete Box Culvert 2-3.0m x 3.0m	m	24.0				
502(2)b1	Reinforced Concrete Headwall, 1-910mm Ø RCPC	ea.	26.0				
502(2)b2	Reinforced Concrete Headwall, 2-910mm Ø RCPC	ea.	4.0				
502(2)c2	Reinforced Concrete Headwall, 2-1070mm Ø RCPC	ea.	6.0				
502(10)a2	Reinforced Concrete Headwall, Box Culvert 2-1.5m x 1.5m	ea.	8.0				
502(10)b1	Reinforced Concrete Headwall, Box Culvert 1-2.4m x 2.4m	ea.	2.0				
502(10)b2	Reinforced Concrete Headwall, Box Culvert 2-2.4m x 2.4m	ea.	8.0				
502(10)b3	Reinforced Concrete Headwall, Box Culvert 3-2.4m x 2.4m	ea.	2.0				

7TH BRIDGE - SUMMARY OF QUANTITIES

THE STUDY ON ROAD NETWORK IMPROVEMENT
FOR DEVELOPMENT OF REGIONAL GROWTH CENTERS

SCALE :

NTS

CAGAYAN DE ORO
7TH BRIDGE & ACCESS ROAD
SUMMARY OF QUANTITIES

DRAWING NO.

G-5(2)

Item No.	Description	Unit	Quantity	Item No.	Description	Unit	Quantity
PART C - EARTHWORK							
100(1)	Clearing and Grubbing	ha.	2.0				
102(1)	Unsuitable Excavation	m3	6,398.0	SPL512(2)	RC L-Type Retaining Wall(H=3.0~5.0m)	m	165.0
103(2)a	Bridge Excavation, Common (AWL)	m3	1,697.0				
103(2)b	Bridge Excavation, Common (BWL)	m3	5,596.0				
104(1)a	Embankment from Excavation	m3	4,886.0	600(1)c	Concrete Curb for Edge of Sidewalk(200x500)	m	1,256.0
104(1)b	Embankment from Borrow	m3	12,901.0	600(3)a	Combination Concrete Curb & Gutter/Side Strip, Type A (675x364mm)	m	76.0
104(1)c	Selected Borrow for Backfilling	m3	2,966.0	603(3)a	Metal Guardrail	m	1,038.0
105(1)	Subgrade Preparation (Common Material)	m2	2,602.0	SPL620(1)	Traffic Signal (3-leg intersection)	ea.	1.0
				SPL620(2)	Traffic Signal (4-leg intersection)	ea.	1.0
PART D - SUBBASE AND BASE COURSE							
200	Aggregate Subbase Course	m3	4,672.0				
PART E - SURFACE COURSE							
311(1)a	PCC Pavement(Plain) (t=0.10m)	m2	2,913.0				
311(1)d	PCC Pavement(Plain) (t=0.25m)	m2	13,678.0				
311(2)	PCC Pavement(Reinforced) for Approach Slab, t=300mm	m2	90.0				
PART F - BRIDGE CONSTRUCTION							
400(16)a	Cast-in-Place Concrete Bored Piles, Ø 1000mm	m	216.0				
400(16)c	Cast-in-Place Concrete Bored Piles, Ø 1500mm	m	706.0				
401	Concrete Railings	m	588.0				
404(1)	Reinforcing Steel, Grade 40 (Fy=275Mpa)	kg	18,769.0				
404(2)	Reinforcing Steel, Grade 60 (Fy=415Mpa)	kg	885,081.0				
405(1)	Structural Concrete Class"A1" for Substructure (fc=24Mpa)	m3	2,908.0				
405(2)	Structural Concrete Class"A2" for Superstructure (fc=24Mpa)	m3	1,423.0				
405(3)	Structural Concrete Class"A3" for Others (fc=21Mpa)	m3	134.0				
405(6)	Structural Concrete "Lean Concrete" (fc=17 Mpa)	m3	85.0				
406(1)j	Prestressed Concrete Girder, AASHTO Type VI, L=36m	ea	20.0				
406(1)n	Prestressed Concrete Girder, AASHTO Type IV, L=25m	ea	30.0				
407(1)b	Elastomeric Bearing Pad, 500×350×60 (Duro 60)	ea	20.0				
407(1)c	Elastomeric Bearing Pad, 625×400×60 (Duro 60)	ea	10.0				
407(2)	Expansion Joint, 50mm Gap	m	32.0				
407(4)	Metal Drain (Ø 150mm G.I. Drain Pipe)	m	200.0				
PART G - DRAINAGE AND SLOPE PROTECTION STRUCTURES							
500(1)a	Reinforced Concrete Pipe Culvert, 610mm Ø (Extra. Str.)	m	16.0				
500(3)c2	Reinforced Concrete Box Culvert 2-3.0m x 3.0m	m	19.0				
502(10)c2	Reinforced Concrete Headwall, Box Culvert 2-3.0m x 3.0m	ea.	2.0				
502(3)a1	Catch Basin for RCPC 1- Ø610	ea.	4.0				
504(5)	Grouted Riprap, Class "A"	m3	1,243.0				
505(3)	Gravity Type Retaining Wall(H=1.0~3.0m)	m	210.0				
506	Loose Boulder Apron 300mm Ø min., S.G=2.65	m3	48.0				
507	Steel Sheet Pile (85×400×8mm), Furnished and Driven	m	2,154.0				
509	Gabions	m3	61.0				
510	Rubble Concrete Slope Protection, t = 350mm	m3	93.0				
511(a)	Concrete Side Ditch (0.5 x 0.5)	m	660.0				
SPL512(1)	Slope Protection for Cut	m2	1,297.0				

J.R. BORJA EXTENSION ROAD - SUMMARY OF QUANTITIES

THE STUDY ON ROAD NETWORK IMPROVEMENT
FOR DEVELOPMENT OF REGIONAL GROWTH CENTERS

SCALE :
NTS

CAGAYAN DE ORO
J.R. BORJA EXTENSION ROAD
SUMMARY OF QUANTITIES

DRAWING NO.
G-5(3)

Item No.	Description	Unit	Quantity	Item No.	Description	Unit	Quantity
PART C - EARTHWORK				PART G - DRAINAGE AND SLOPE PROTECTION STRUCTURES			
100(1)	CLEARING AND GRUBBING	ha.	27.23	500(1)a	REINFORCED CONCRETE PIPE CULVERT, 610mmØ (EXTRA. STR.)	m	6,664.00
102(2)b	SURPLUS COMMON EXCAVATION WITH BIG BOULDERS	m ³	107,425.00	500(1)b	REINFORCED CONCRETE PIPE CULVERT, 910mmØ (EXTRA. STR.)	m	496.00
103(2)a	BRIDGE EXCAVATION, COMMON (AWL)	m ³	39,163.10	500(1)c	REINFORCED CONCRETE PIPE CULVERT, 1070mmØ (EXTRA. STR.)	m	81.00
103(2)b	BRIDGE EXCAVATION, COMMON (BWL)	m ³	7,266.00	500(1)d	REINFORCED CONCRETE PIPE CULVERT, 1220mmØ (EXTRA. STR.)	m	282.00
104(1)a	EMBANKMENT FROM EXCAVATION	m ³	239,670.00	500(3)b1	REINFORCED CONCRETE BOX CULVERT 1-2.4m X 2.4m	m	25.00
104(1)c	SELECTED BORROW FOR BACKFILLING	m ³	2,470.00	500(3)b2	REINFORCED CONCRETE BOX CULVERT 2-2.4m X 2.4m	m	76.00
105(1)	SUBGRADE PREPARATION (COMMON MATERIAL)	m ²	66,995.00	500(3)b3	REINFORCED CONCRETE BOX CULVERT 3-2.4m X 2.4m	m	26.00
				500(3)c3	REINFORCED CONCRETE BOX CULVERT 3-3.0m X 3.0m	m	30.00
				501(4)	SUBSURFACE DRAIN, TYPE SSD(G/P)-B	m	6,044.00
				501(5)	FILTER LAYER	m ³	800.00
PART D - SUBBASE AND BASE COURSE							
200	AGGREGATE SUBBASE COURSE	m ³	61,460.00	502(2)b1	REINFORCED CONCRETE HEADWALL, 1-910mmØ RCPC	ea.	28.00
				502(2)b2	REINFORCED CONCRETE HEADWALL, 2-910mmØ RCPC	ea.	6.00
				502(2)c1	REINFORCED CONCRETE HEADWALL, 1-1070mmØ RCPC	ea.	2.00
				502(2)c2	REINFORCED CONCRETE HEADWALL, 2-1070mmØ RCPC	ea.	2.00
PART E - SURFACE COURSE							
311(1)a	PCC PAVEMENT(PLAIN) (t=0.10m)	m ²	19,340.00	502(2)d1	REINFORCED CONCRETE HEADWALL, 1-1220mmØ RCPC	ea.	4.00
311(1)b	PCC PAVEMENT(PLAIN) (t=0.20m)	m ²	1,275.00	502(2)d2	REINFORCED CONCRETE HEADWALL, 2-1220mmØ RCPC	ea.	8.00
311(1)d	PCC PAVEMENT(PLAIN) (t=0.25m)	m ²	150,230.00	502(10)b1	REINFORCED CONCRETE HEADWALL, BOX CULVERT 1-2.4m X 2.4m	ea.	2.00
311(2)	PCC PAVEMENT(REINFORCED) FOR APPROACH SLAB, t=300mm	m ²	1,174.00	502(10)b2	REINFORCED CONCRETE HEADWALL, BOX CULVERT 2-2.4m X 2.4m	ea.	6.00
				502(10)b3	REINFORCED CONCRETE HEADWALL, BOX CULVERT 3-2.4m X 2.4m	ea.	2.00
				502(10)c3	REINFORCED CONCRETE HEADWALL, BOX CULVERT 3-3.0m X 3.0m	ea.	2.00
PART F - BRIDGE CONSTRUCTION							
400(16)a	CAST-IN-PLACE CONCRETE BORED PILES, Ø1000mm	m	2,632.00	502(3)a1	CATCH BASIN FOR RCPC 1-Ø610	ea.	271.00
400(16)b	CAST-IN-PLACE CONCRETE BORED PILES, Ø1200mm	m	3,004.00	502(3)b1	CATCH BASIN FOR RCPC 1-Ø910	ea.	9.00
401	CONCRETE RAILINGS	m	1,448.00	502(3)b2	CATCH BASIN FOR RCPC 2-Ø910	ea.	2.00
404(1)	REINFORCING STEEL, GRADE 40(fy=275MPa)	kg	66,162.00	502(3)c1	CATCH BASIN FOR RCPC 1-Ø1070	ea.	2.00
404(2)	REINFORCING STEEL, GRADE 60 (fy=415MPa)	kg	4,472,229.00	502(3)c2	CATCH BASIN FOR RCPC 2-Ø1070	ea.	2.00
404(3)	PRESTRESSING STEEL, GRADE 270 (fu=1860MPa)	kg	35,461.00	502(3)d1	CATCH BASIN FOR RCPC 1-Ø1220	ea.	4.00
405(1)	STRUCTURAL CONC. CLASS"A1" FOR SUBSTRUCTURE (fc=24MPa)	m ³	14,681.00	502(3)d2	CATCH BASIN FOR RCPC 2-Ø1220	ea.	4.00
405(2)	STRUCTURAL CONC. CLASS"A2" FOR SUPERSTRUCTURE (fc=24MPa)	m ³	5,465.00	504(5)	GROUTED RIPRAP, CLASS "A"	m ³	4,763.00
405(3)	STRUCTURAL CONC. CLASS"A3" FOR OTHERS (fc=21MPa)	m ³	580.00	505(1)	STONE MASONRY	m ³	490.00
405(4)	STRUCTURAL CONC. CLASS"A4" FOR OTHERS (fc=41MPa)	m ³	1,290.00	505(3)	GRAVITY-TYPE RETAINING WALL(H=1.0-3.0m)	m	2,990.00
405(5)	SEAL CONCRETE	m ³	665.00	506	LOOSE BOULDER APRON 300mmØ MIN., S.G.=2.65	m ³	859.00
405(6)	STRUCTURAL CONCRETE "LEAN CONCRETE" (fc=17 MPa)	m ³	541.00	507	STEEL SHEET PILE (85 X 400 X 8mm), FURNISHED AND DRIVEN	m	250.00
406(1)b	PRESTRESSED CONCRETE GIRDER, AASHTO TYPE IV-B, L=22m	ea	18.00	510	RUBBLE CONCRETE SLOPE PROTECTION, t= 350mm	m ³	2,185.00
406(1)c	PRESTRESSED CONCRETE GIRDER, AASHTO TYPE IV-B, L=25m	ea	54.00	511(a)	CONCRETE SIDE DITCH (0.5 X 0.5)	m	5,161.00
406(1)d	PRESTRESSED CONCRETE GIRDER, AASHTO TYPE IV-B, L=26m	ea	9.00	511(b)	CONCRETE SIDE DITCH (1.0 X 0.5)	m	180.00
406(1)g	PRESTRESSED CONCRETE GIRDER, AASHTO TYPE V, L=30m	ea	99.00	511(c)	CONCRETE SIDE DITCH (2.0 X 1.5)	m	203.00
406(1)m	PRESTRESSED CONCRETE GIRDER, AASHTO TYPE IV-B, L=19m	ea	30.00	SPL512(1)	SLOPE PROTECTION FOR CUT	m ²	22,850.00
407(1)a	ELASTOMERIC BEARING PAD, 400x350x60 (DURO 60)	ea	28.00	SPL512(2)	R.C. L-TYPE RETAINING WALL (H=3.0 - 5.0m)	m	720.00
407(1)b	ELASTOMERIC BEARING PAD, 500x350x60 (DURO 60)	ea	96.00				
407(1)c	ELASTOMERIC BEARING PAD, 625x400x60 (DURO 60)	ea	54.00	PART H - MISCELLANEOUS STRUCTURES			
407(2)	EXPANSION JOINT, ±50mm MOVEMENT	m	306.00	600(1)a	CONCRETE CURB, TYPE A (200X450mm)	m	14,340.00
407(4)	METAL DRAIN (Ø150mm G.I. DRAIN PIPE)	m	443.00	600(1)c	CONCRETE CURB FOR EDGE OF SIDEWALK (200X500mm)	m	3,410.00
408	CHAIN LINK RAILING	m	84.00	600(3)a	COMB. CONC. CURB & GUTTER/SIDE STRIP, TYPE A (675X364mm)	m	10,470.00
				603(3)a	METAL GUARDRAIL	m	2,835.00
				610	SODDING	m ²	26,990.00
				SPL620(1)	TRAFFIC SIGNAL (3-LEG INTERSECTION)	ea.	4.00
				SPL620(2)	TRAFFIC SIGNAL (4-LEG INTERSECTION)	ea.	1.00
				SPL620(3)	OTHER MISCELLANEOUS (ROAD SIGNS,PAVEMENT STUD,ETC)	km	7.70

J.R. BORJA EXTENSION ROAD (PACKAGE-1) - SUMMARY OF QUANTITIES

THE STUDY ON ROAD NETWORK IMPROVEMENT
FOR DEVELOPMENT OF REGIONAL GROWTH CENTERS

SCALE :

NTS

CAGAYAN DE ORO
J.R. BORJA EXTENSION ROAD
SUMMARY OF QUANTITIES

DRAWING NO.

G-5(4)

Item No.	Description	Unit	Quantity	Item No.	Description	Unit	Quantity
PART C - EARTHWORK				PART G - DRAINAGE AND SLOPE PROTECTION STRUCTURES			
100(1)	CLEARING AND GRUBBING	ha.	10.35	500(1)a	REINFORCED CONCRETE PIPE CULVERT, 610mmØ (EXTRA. STR.)	m	2,285.00
102(2)b	SURPLUS COMMON EXCAVATION WITH BIG BOULDERS	m ³	91,785.00	500(1)b	REINFORCED CONCRETE PIPE CULVERT, 910mmØ (EXTRA. STR.)	m	162.00
103(2)a	BRIDGE EXCAVATION, COMMON (AWL)	m ³	18,262.90	500(1)d	REINFORCED CONCRETE PIPE CULVERT, 1220mmØ (EXTRA. STR.)	m	124.00
103(2)b	BRIDGE EXCAVATION, COMMON (BWL)	m ³	3,536.00	500(3)b2	REINFORCED CONCRETE BOX CULVERT 2-2.4m x 2.4m	m	27.00
104(1)a	EMBANKMENT FROM EXCAVATION	m ³	102,780.00	501(4)	SUBSURFACE DRAIN, TYPE SSD(G/P)-B	m	2,671.00
104(1)c	SELECTED BORROW FOR BACKFILLING	m ³	884.00	501(5)	FILTER LAYER	m ³	725.00
105(1)	SUBGRADE PREPARATION (COMMON MATERIAL)	m ²	31,890.00	502(2)b1	REINFORCED CONCRETE HEADWALL, 1-910mmØ RCPC	ea.	12.00
				502(2)d1	REINFORCED CONCRETE HEADWALL, 1-1220mmØ RCPC	ea.	4.00
				502(2)d2	REINFORCED CONCRETE HEADWALL, 2-1220mmØ RCPC	ea.	2.00
				502(10)b2	REINFORCED CONCRETE HEADWALL, BOX CULVERT 2-2.4m x 2.4m	ea.	2.00
PART D - SUBBASE AND BASE COURSE							
200	AGGREGATE SUBBASE COURSE	m ³	21,530.00	502(3)a1	CATCH BASIN FOR RCPC 1-Ø610	ea.	94.00
				502(3)b1	CATCH BASIN FOR RCPC 1-Ø910	ea.	4.00
				502(3)c1	CATCH BASIN FOR RCPC 1-Ø1070	ea.	1.00
				502(3)d1	CATCH BASIN FOR RCPC 1-Ø1220	ea.	3.00
				502(3)d2	CATCH BASIN FOR RCPC 2-Ø1220	ea.	2.00
PART E - SURFACE COURSE							
311(1)a	PCC PAVEMENT(PLAIN) (t=0.10m)	m ²	6,710.00	504(5)	GROUTED RIPRAP, CLASS "A"	m ³	2,409.00
311(1)b	PCC PAVEMENT(PLAIN) (t=0.20m)	m ²	1,275.00	505(1)	STONE MASONRY	m ³	490.00
311(1)d	PCC PAVEMENT(PLAIN) (t=0.25m)	m ²	50,490.00	505(3)	GRAVITY-TYPE RETAINING WALL (H=1.0-3.0m)	m	340.00
311(2)	PCC PAVEMENT(REINFORCED) FOR APPROACH SLAB, t=300mm	m ²	600.00	506	LOOSE BOULDER APRON 300mmØ MIN., S.G.=2.65	m ³	429.00
				510	RUBBLE CONCRETE SLOPE PROTECTION, t= 350mm	m ³	1,155.00
				511(a)	CONCRETE SIDE DITCH (0.5 x 0.5)	m	1,891.00
PART F - BRIDGE CONSTRUCTION							
400(16)a	CAST-IN-PLACE CONCRETE BORED PILES, Ø1000mm	m	1,468.00	511(b)	CONCRETE SIDE DITCH (1.0 x 0.5)	m	180.00
400(16)b	CAST-IN-PLACE CONCRETE BORED PILES, Ø1200mm	m	2,248.00	511(c)	CONCRETE SIDE DITCH (2.0 x 1.5)	m	150.00
401	CONCRETE RAILINGS	m	978.00	SPL512(1)	SLOPE PROTECTION FOR CUT	m ²	12,160.00
404(1)	REINFORCING STEEL, GRADE 40 (fy=275MPa)	kg	31,219.00	SPL512(2)	R.C. L-TYPE RETAINING WALL (H=3.0 - 5.0m)	m	376.00
404(2)	REINFORCING STEEL, GRADE 60 (fy=415MPa)	kg	3,262,421.00				
405(1)	STRUCTURAL CONC. CLASS"A1" FOR SUBSTRUCTURE (fc=24MPa)	m ³	10,614.00				
405(2)	STRUCTURAL CONC. CLASS"A2" FOR SUPERSTRUCTURE (fc=24MPa)	m ³	4,021.00	PART H - MISCELLANEOUS STRUCTURES			
405(3)	STRUCTURAL CONC. CLASS"A3" FOR OTHERS (fc=21MPa)	m ³	230.00	600(1)a	CONCRETE CURB, TYPE A (200x450mm)	m	4,795.00
405(5)	SEAL CONCRETE	m ³	385.00	600(1)c	CONCRETE CURB FOR EDGE OF SIDEWALK (200x500mm)	m	1,750.00
405(6)	STRUCTURAL CONCRETE "LEAN CONCRETE" (fc=17 MPa)	m ³	371.00	600(3)a	COMB. CONC. CURB & GUTTER/SIDE STRIP, TYPE A (675x364mm)	m	2,555.00
406(1)c	PRESTRESSED CONCRETE GIRDER, AASHTO TYPE IV-B, L=25m	ea	54.00	603(3)a	METAL GUARDRAIL	m	1,665.00
406(1)g	PRESTRESSED CONCRETE GIRDER, AASHTO TYPE V, L=30m	ea	72.00	610	SODDING	m ²	12,570.00
406(1)m	PRESTRESSED CONCRETE GIRDER, AASHTO TYPE IV-B, L=19m	ea	30.00	SPL620(1)	TRAFFIC SIGNAL (3-LEG INTERSECTION)	ea.	1.00
407(1)a	ELASTOMERIC BEARING PAD, 400x350x60 (DURO 60)	ea	28.00	SPL620(2)	TRAFFIC SIGNAL (4-LEG INTERSECTION)	ea.	1.00
407(1)b	ELASTOMERIC BEARING PAD, 500x350x60 (DURO 60)	ea	36.00	SPL620(3)	OTHER MISCELLANEOUS (ROAD SIGNS, PAVEMENT STUD, ETC)	km	2.90
407(1)c	ELASTOMERIC BEARING PAD, 625x400x60 (DURO 60)	ea	36.00				
407(2)	EXPANSION JOINT, ±50mm MOVEMENT	m	154.00				
407(4)	METAL DRAIN (Ø150mm G.I. DRAIN PIPE)	m	311.00				
408	CHAIN LINK RAILING	m	84.00				

J.R. BORJA EXTENSION ROAD (PACKAGE-2) - SUMMARY OF QUANTITIES

THE STUDY ON ROAD NETWORK IMPROVEMENT
FOR DEVELOPMENT OF REGIONAL GROWTH CENTERS

SCALE :

NTS

CAGAYAN DE ORO
J.R. BORJA EXTENSION ROAD
SUMMARY OF QUANTITIES

DRAWING NO.

G-5(5)

Item No.	Description	Unit	Quantity	Item No.	Description	Unit	Quantity
PART C - EARTHWORK				PART G - DRAINAGE AND SLOPE PROTECTION STRUCTURES			
100(1)	CLEARING AND GRUBBING	ha.	16.88	500(1)a	REINFORCED CONCRETE PIPE CULVERT, 610mmØ (EXTRA. STR.)	m	4,379.00
102(2)b	SURPLUS COMMON EXCAVATION WITH BIG BOULDERS	m ³	15,640.00	500(1)b	REINFORCED CONCRETE PIPE CULVERT, 910mmØ (EXTRA. STR.)	m	334.00
103(2)a	BRIDGE EXCAVATION, COMMON (AWL)	m ³	20,900.30	500(1)c	REINFORCED CONCRETE PIPE CULVERT, 1070mmØ (EXTRA. STR.)	m	81.00
103(2)b	BRIDGE EXCAVATION, COMMON (BWL)	m ³	3,730.00	500(1)d	REINFORCED CONCRETE PIPE CULVERT, 1220mmØ (EXTRA. STR.)	m	158.00
104(1)a	EMBANKMENT FROM EXCAVATION	m ³	136,890.00	500(3)b1	REINFORCED CONCRETE BOX CULVERT 1-2.4m x 2.4m	m	25.00
104(1)c	SELECTED BORROW FOR BACKFILLING	m ³	1,586.00	500(3)b2	REINFORCED CONCRETE BOX CULVERT 2-2.4m x 2.4m	m	49.00
105(1)	SUBGRADE PREPARATION (COMMON MATERIAL)	m ²	35,105.00	500(3)b3	REINFORCED CONCRETE BOX CULVERT 3-2.4m x 2.4m	m	26.00
				500(3)c3	REINFORCED CONCRETE BOX CULVERT 3-3.0m x 3.0m	m	30.00
				501(4)	SUBSURFACE DRAIN, TYPE SSD(G/P)-B	m	3,373.00
				501(5)	FILTER LAYER	m ³	75.00
PART D - SUBBASE AND BASE COURSE							
200	AGGREGATE SUBBASE COURSE	m ³	39,930.00	502(2)b1	REINFORCED CONCRETE HEADWALL, 1-910mmØ RCPC	ea.	16.00
				502(2)b2	REINFORCED CONCRETE HEADWALL, 2-910mmØ RCPC	ea.	6.00
				502(2)c1	REINFORCED CONCRETE HEADWALL, 1-1070mmØ RCPC	ea.	2.00
				502(2)c2	REINFORCED CONCRETE HEADWALL, 2-1070mmØ RCPC	ea.	2.00
PART E - SURFACE COURSE							
311(1)a	PCC PAVEMENT (PLAIN) (t=0.10m)	m ²	12,630.00	502(2)d2	REINFORCED CONCRETE HEADWALL, 2-1220mmØ RCPC	ea.	6.00
311(1)d	PCC PAVEMENT (PLAIN) (t=0.25m)	m ²	99,740.00	502(10)b1	REINFORCED CONCRETE HEADWALL, BOX CULVERT 1-2.4m x 2.4m	ea.	2.00
311(2)	PCC PAVEMENT (REINFORCED) FOR APPROACH SLAB, t=300mm	m ²	574.00	502(10)b2	REINFORCED CONCRETE HEADWALL, BOX CULVERT 2-2.4m x 2.4m	ea.	4.00
				502(10)b3	REINFORCED CONCRETE HEADWALL, BOX CULVERT 3-2.4m x 2.4m	ea.	2.00
				502(10)c3	REINFORCED CONCRETE HEADWALL, BOX CULVERT 3-3.0m x 3.0m	ea.	2.00
PART F - BRIDGE CONSTRUCTION							
400(16)a	CAST-IN-PLACE CONCRETE BORED PILES, Ø1000mm	m	1,164.00	502(3)a1	CATCH BASIN FOR RCPC 1-Ø610	ea.	177.00
400(16)b	CAST-IN-PLACE CONCRETE BORED PILES, Ø1200mm	m	756.00	502(3)b1	CATCH BASIN FOR RCPC 1-Ø910	ea.	5.00
401	CONCRETE RAILINGS	m	470.00	502(3)b2	CATCH BASIN FOR RCPC 2-Ø910	ea.	2.00
404(1)	REINFORCING STEEL, GRADE 40 (fy=275MPa)	kg	34,943.00	502(3)c1	CATCH BASIN FOR RCPC 1-Ø1070	ea.	1.00
404(2)	REINFORCING STEEL, GRADE 60 (fy=415MPa)	kg	1,209,808.00	502(3)c2	CATCH BASIN FOR RCPC 2-Ø1070	ea.	2.00
404(3)	PRESTRESSING STEEL, GRADE 270 (fu=1860MPa)	kg	35,461.00	502(3)d1	CATCH BASIN FOR RCPC 1-Ø1220	ea.	1.00
405(1)	STRUCTURAL CONC. CLASS "A1" FOR SUBSTRUCTURE (fc=24MPa)	m ³	4,067.00	502(3)d2	CATCH BASIN FOR RCPC 2-Ø1220	ea.	2.00
405(2)	STRUCTURAL CONC. CLASS "A2" FOR SUPERSTRUCTURE (fc=24MPa)	m ³	1,444.00	504(5)	GROUTED RIPRAP, CLASS "A"	m ³	2,354.00
405(3)	STRUCTURAL CONC. CLASS "A3" FOR OTHERS (fc=21MPa)	m ³	350.00	505(3)	GRAVITY-TYPE RETAINING WALL (H=1.0-3.0m)	m	2,650.00
405(4)	STRUCTURAL CONC. CLASS "A4" FOR OTHERS (fc=41MPa)	m ³	1,290.00	506	LOOSE BOULDER APRON 300mmØ MIN., S.G.=2.65	m ³	430.00
405(5)	SEAL CONCRETE	m ³	280.00	507	STEEL SHEET PILE (85 x 400 x 8mm), FURNISHED AND DRIVEN	m	250.00
405(6)	STRUCTURAL CONCRETE "LEAN CONCRETE" (fc=17 MPa)	m ³	170.00	510	RUBBLE CONCRETE SLOPE PROTECTION, t = 350mm	m ³	1,030.00
406(1)b	PRESTRESSED CONCRETE GIRDER, AASHTO TYPE IV-B, L=22m	ea	18.00	511(a)	CONCRETE SIDE DITCH (0.5 x 0.5)	m	3,270.00
406(1)d	PRESTRESSED CONCRETE GIRDER, AASHTO TYPE IV-B, L=26m	ea	9.00	511(c)	CONCRETE SIDE DITCH (2.0 x 1.5)	m	53.00
406(1)g	PRESTRESSED CONCRETE GIRDER, AASHTO TYPE V, L=30m	ea	27.00	SPL512(1)	SLOPE PROTECTION FOR CUT	m ²	10,690.00
407(1)b	ELASTOMERIC BEARING PAD, 500x350x60 (DURO 60)	ea	60.00	SPL512(2)	R.C. L-TYPE RETAINING WALL (H=3.0 - 5.0m)	m	344.00
407(1)c	ELASTOMERIC BEARING PAD, 625x400x60 (DURO 60)	ea	18.00				
407(2)	EXPANSION JOINT, ±50mm MOVEMENT	m	152.00	PART H - MISCELLANEOUS STRUCTURES			
407(4)	METAL DRAIN (Ø150mm G.I. DRAIN PIPE)	m	132.00	600(1)a	CONCRETE CURB, TYPE A (200x450mm)	m	9,545.00
				600(1)c	CONCRETE CURB FOR EDGE OF SIDEWALK (200x500mm)	m	1,660.00
				600(3)a	COMB. CONC. CURB & GUTTER/SIDE STRIP, TYPE A (675x364mm)	m	7,915.00
				603(3)a	METAL GUARDRAIL	m	1,170.00
				610	SODDING	m ²	14,420.00
				SPL620(1)	TRAFFIC SIGNAL (3-LEG INTERSECTION)	ea.	3.00
				SPL620(3)	OTHER MISCELLANEOUS (ROAD SIGNS, PAVEMENT STUD, ETC)	km	4.90

WESTERN DIVERSION ROAD - SUMMARY OF QUANTITIES

THE STUDY ON ROAD NETWORK IMPROVEMENT
FOR DEVELOPMENT OF REGIONAL GROWTH CENTERS

SCALE :

NTS

CAGAYAN DE ORO
WESTERN DIVERSION ROAD
SUMMARY OF QUANTITIES

DRAWING NO.

G-5(6)

Item No.	Description	Unit	Quantity	Item No.	Description	Unit	Quantity
PART C - EARTHWORK							
100(1)	Clearing and Grubbing	ha.	11.0	502(10)b2	Reinforced Concrete Headwall, Box Culvert 2-2.4m x 2.4m	ea.	2.0
102(1)	Unsuitable Excavation	m3	4,046.0	502(10)c2	Reinforced Concrete Headwall, Box Culvert 2-3.0m x 3.0m	ea.	2.0
103(2)a	Bridge Excavation, Common (AWL)	m3	3,154.0	502(3)b1	Catch Basin for RCPC 1- Ø910	ea.	3.0
104(1)a	Embankment from Excavation	m3	69,179.0	504(5)	Grouted Riprap, Class "A"	m3	12.2
104(1)b	Embankment from Borrow	m3	34,496.0	506	Loose Boulder Apron 300mm Ø min., S.G=2.65	m3	187.0
104(1)c	Selected Borrow for Backfilling	m3	396.0	509	Gabions	m3	10,100.0
105(1)	Subgrade Preparation (Common Material)	m2	10,983.0	510	Rubble Concrete Slope Protection, t = 350mm	m3	345.0
				511(a)	Concrete Side Ditch (0.5 x 0.5)	m	1,410.0
PART D - SUBBASE AND BASE COURSE							
200	Aggregate Subbase Course	m3	25,210.0	SPL510(1)	Mattress with Boulder	m3	1,980.0
				SPL510(2)	Geotextile	m2	15,400.0
				SPL512(1)	Slope Protection for Cut	m2	6,259.0
PART E - SURFACE COURSE							
311(1)c	PCC Pavement(Plain) (t=0.23m)	m2	48,479.0	PART H - MISCELLANEOUS STRUCTURES			
311(2)	PCC Pavement(Reinforced) for Approach Slab, t=300mm	m2	100.0	600(3)a	Combination Concrete Curb & Gutter/Side Strip, Type A (675x364mm)	m	169.0
				603(3)a	Metal Guardrail	m	200.0
PART F - BRIDGE CONSTRUCTION							
400(16)a	Cast-in-Place Concrete Bored Piles, Ø1000mm	m	360.0	610	Sodding	m2	28,438.0
401	Concrete Railings	m	60.0	SPL620(1)	Traffic Signal (3-leg intersection)	ea.	2.0
404(1)	Reinforcing Steel, Grade 40 (Fy=275Mpa)	kg	1,916.0	SPL620(2)	Traffic Signal (4-leg intersection)	ea.	2.0
404(2)	Reinforcing Steel, Grade 60 (Fy=415Mpa)	kg	77,526.0				
405(1)	Structural Concrete Class"A1" for Substructure (f'c=24Mpa)	m3	324.0				
405(2)	Structural Concrete Class"A2" for Superstructure (f'c=24Mpa)	m3	125.0				
405(3)	Structural Concrete Class"A3" for Others (f'c=21Mpa)	m3	14.0				
405(5)	Seal Concrete	m3	423.0				
405(6)	Structural Concrete "Lean Concrete" (f'c=17 Mpa)	m3	12.0				
406(1)g	Prestressed Concrete Girder, AASHTO Type V, L=30m	ea	5.0				
407(1)c	Elastomeric Bearing Pad, 625x400x60 (Duro 60)	ea	10.0				
407(2)	Expansion Joint, 50mm Gap	m	18.0				
407(4)	Metal Drain (Ø150mm G.I. Drain Pipe)	m	17.0				
PART G - DRAINAGE AND SLOPE PROTECTION STRUCTURES							
500(1)b	Reinforced Concrete Pipe Culvert, 910mm Ø (Extra. Str.)	m	395.0				
500(1)c	Reinforced Concrete Pipe Culvert, 1070mm Ø (Extra. Str.)	m	50.0				
500(1)d	Reinforced Concrete Pipe Culvert, 1220mm Ø (Extra. Str.)	m	62.0				
500(3)a2	Reinforced Concrete Box Culvert 2-1.5m x 1.5m	m	100.0				
500(3)b1	Reinforced Concrete Box Culvert 1-2.4m x 2.4m	m	36.0				
500(3)b2	Reinforced Concrete Box Culvert 2-2.4m x 2.4m	m	13.0				
500(3)c2	Reinforced Concrete Box Culvert 2-3.0m x 3.0m	m	24.0				
501(4)	Subsurface Drain, Type SSD(G/P)-B	m	1,615.0				
502(2)b1	Reinforced Concrete Headwall, 1-910mm Ø RCPC	ea.	26.0				
502(2)b2	Reinforced Concrete Headwall, 2-910mm Ø RCPC	ea.	10.0				
502(2)c1	Reinforced Concrete Headwall, 1-1070mm Ø RCPC	ea.	2.0				
502(2)c2	Reinforced Concrete Headwall, 2-1070mm Ø RCPC	ea.	2.0				
502(2)d2	Reinforced Concrete Headwall, 2-1220mm Ø RCPC	ea.	4.0				
502(10)a2	Reinforced Concrete Headwall, Box Culvert 2-1.5m x 1.5m	ea.	8.0				
502(10)b1	Reinforced Concrete Headwall, Box Culvert 1-2.4m x 2.4m	ea.	2.0				