



**JAPAN INTERNATIONAL
COOPERATION AGENCY (JICA)**



**MINISTRY OF PUBLIC WORKS
REPUBLIC OF INDONESIA**

**DETAILED DESIGN STUDY
OF
NORTH JAVA CORRIDOR FLYOVER PROJECT
IN THE REPUBLIC OF INDONESIA**

GEBANG FLYOVER

VOLUME IV DRAWINGS

**CONTRACT PACKAGE II
(NAGREG - GEBANG)**

DECEMBER 2006



KATAHIRA & ENGINEERS INTERNATIONAL

SD

CR(5)

06-090



JAPAN INTERNATIONAL
COOPERATION AGENCY






DIRECTORATE GENERAL OF HIGHWAY
MINISTRY OF PUBLIC WORKS
REPUBLIC OF INDONESIA

GENERAL






KATAHIRA & ENGINEERS INTERNATIONAL




<div> JAPAN INTERNATIONAL COOPERATION AGENCY</div> <div> KATAHIRA & ENGINEERS INTERNATIONAL</div>	DESIGNED BY		CHECKED BY		SUBMITTED BY		<div> REPUBLIC OF INDONESIA MINISTRY OF PUBLIC WORKS DIRECTORATE GENERAL OF HIGHWAYS</div> <div>APPROVED BY Ir. HERRY VAZA M,Eng.Sc NIP. : 110038400</div>	PROJECT AND LOCATION :	SCALE :	DRAWING TITLE :	DRAWING NO. :
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	Date		Date		Date						01 / 19

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DETAIL OF GIRDER G2 P7 - P12 (2 OF 9)	GST-041	41 / 76	ARRANGEMENT OF REINFORCEMENT FOR PC GIRDER P2-P4	GCL-012	12 / 21	ABUTMENT LAYOUT & DIMENSIONS (ABUTMENT A1)	GSB-001	01 / 57
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DETAIL OF GIRDER G2 P7 - P12 (4 OF 9)	GST-043	43 / 76				PIER LAYOUT & DIMENSIONS (PIER P4 - EXP.)	GSB-003	03 / 57
DETAIL OF GIRDER G2 P7 - P12 (5 OF 9)	GST-044	44 / 76						

<div> JAPAN INTERNATIONAL COOPERATION AGENCY</div> <div> KATAHIRA & ENGINEERS INTERNATIONAL</div>	DESIGNED BY		CHECKED BY		SUBMITTED BY		<div> REPUBLIC OF INDONESIA MINISTRY OF PUBLIC WORKS DIRECTORATE GENERAL OF HIGHWAYS</div> <div>APPROVED BY Ir. HERRY VAZA M.Eng.Sc NIP. : 110038400</div>	PROJECT AND LOCATION :			SCALE :	DRAWING TITLE :	DRAWING NO. :
	Name	R. UENO	Name	T. OKUMURA	Name	M. KIUCHI		DETAILED DESIGN STUDY OF NORTH JAVA CORRIDOR FLYOVER PROJECT GEBANG FLYOVER - CONTRACT PACKAGE 2 (NAGREG - GEBANG) WEST JAVA PROVINCE			N T S	INDEX OF DRAWINGS 3 OF 3	GGE-003
	Sign		Sign		Sign								SHEET NO. :
	Date		Date		Date						FULL SIZE A3		03 / 19

INDEX OF DRAWINGS 3 OF 3														
TITLE OF DRAWING			DRAWING NO.	SHEET NO.	TITLE OF DRAWING			DRAWING NO.	SHEET NO.	TITLE OF DRAWING			DRAWING NO.	SHEET NO.
PIER LAYOUT (PIER P5 - PORTAL)			GSB-004	04 / 57	EPS WALL					PUBLIC UTILITIES UNDER GROUND 2 OF 7			GUT-009	09 / 15
PIER LAYOUT (PIER P6 - PORTAL)			GSB-005	05 / 57	NOTES FOR EPS EMBANKMENT			GEP-001	01 / 11	PUBLIC UTILITIES UNDER GROUND 3 OF 7			GUT-010	10 / 15
PIER LAYOUT (PIER P7 - EXP.)			GSB-006	06 / 57	PLAN & ELEVATIONS OF EPS EMBANKMENT (ABUTMENT A1) 1 OF 2			GEP-002	02 / 11	PUBLIC UTILITIES UNDER GROUND 4 OF 7			GUT-011	11 / 15
PIER LAYOUT (PIER P8, P9, P10, P11 - FIXED)			GSB-007	07 / 57	PLAN & ELEVATIONS OF EPS EMBANKMENT (ABUTMENT A1) 2 OF 2			GEP-003	03 / 11	PUBLIC UTILITIES UNDER GROUND 5 OF 7			GUT-012	12 / 15
PIER LAYOUT & DIMENSIONS (PIERS P12 - EXP.)			GSB-008	08 / 57	SECTION & DETAILS OF EPS WALL & STUBWALL AT ABUTMENT A1 SIDE			GEP-004	04 / 11	PUBLIC UTILITIES UNDER GROUND 6 OF 7			GUT-013	13 / 15
ABUTMENT LAYOUT & DIMENSIONS (ABUTMENT A2)			GSB-009	09 / 57	PLAN & ELEVATIONS OF EPS EMBANKMENT (ABUTMENT A2) 1 OF 2			GEP-005	05 / 11	PUBLIC UTILITIES UNDER GROUND 7 OF 7			GUT-014	14 / 15
					PLAN & ELEVATIONS OF EPS EMBANKMENT (ABUTMENT A2) 2 OF 2			GEP-006	06 / 11	STANDARD DETAILS OF RELOCATION & PROTECTION UTILITY UNDER GROUND			GUT-015	15 / 15
					SECTION & DETAILS OF EPS WALL & STUBWALL AT ABUTMENT A2 SIDE			GEP-007	07 / 11					
					TYPICAL DETAILS			GEP-008	08 / 11					
					ISOMETRIC VIEWS			GEP-009	09 / 11					
					STUBWALL LAYOUT & REINFORCEMENT DETAILS (ABUTMENT A1 SIDE)			GEP-010	10 / 11					
					STUBWALL LAYOUT & REINFORCEMENT DETAILS (ABUTMENT A2 SIDE)			GEP-011	11 / 11					
REINFORCEMENT					TRAFFIC CONTROL									
REINFORCEMENT OF COLUMN, ABUTMENT A1 (1 OF 2)			GSB-010	10 / 57	TRAFFIC SIGNS AND ROAD MARKINGS LAYOUT (FLYOVER) 1 OF 2			GTR-001	01 / 26	ROAD LIGHTING				
REINFORCEMENT OF COLUMN, ABUTMENT A1 (2 OF 2)			GSB-011	11 / 57	TRAFFIC SIGNS AND ROAD MARKINGS LAYOUT (FLYOVER) 2 OF 2			GTR-002	02 / 26	ABBREVIATIONS AND LEGEND			GRL-001	01 / 12
REINFORCEMENT OF COLUM, ABUTMENT A2 (1 OF 2)			GSB-012	12 / 57	TRAFFIC SIGNS AND ROAD MARKINGS LAYOUT (AT-GRADE) 1 OF 2			GTR-003	03 / 26	ROAD LIGHTING PLAN OF FLYOVER			GRL-002	02 / 12
REINFORCEMENT OF COLUMN, ABUTMENT A2 (2 OF 2)			GSB-013	13 / 57	TRAFFIC SIGNS AND ROAD MARKINGS LAYOUT (AT-GRADE) 2 OF 2			GTR-004	04 / 26	ROAD LIGHTING PLAN OF SERVICE ROAD			GRL-003	03 / 12
REINFORCEMENT OF FOOTING, ABUTMENT A1 & A2 (1 OF 2)			GSB-014	14 / 57	TRAFFIC SIGNS AND ROAD MARKINGS LAYOUT (AT-GRADE) 2 OF 2			GTR-005	05 / 26	ROAD LIGHTING PLAN OF UNDER VIADUCT			GRL-004	04 / 12
REINFORCEMENT OF FOOTING, ABUTMENT A1 & A2 (1 OF 2)			GSB-015	15 / 57	TRAFFIC SIGNAL LIGHT			GTR-006	06 / 26	DIAGRAM PANEL OF FLYOVER			GRL-005	05 / 12
PIER COLUMN REINFORCEMENT (PIER P1, P13)			GSB-016	16 / 57	STANDARD PAVEMENT MARKINGS DETAIL 1 OF 2			GTR-007	07 / 26	DIAGRAM PANEL OF RIGHT SERVICE ROAD			GRL-006	06 / 12
PIER COLUMN REINFORCEMENT (PIER P2, P14 & P15)			GSB-017	17 / 57	STANDARD PAVEMENT MARKINGS DETAIL 2 OF 2			GTR-008	08 / 26	DIAGRAM PANEL OF LEFT SERVICE ROAD			GRL-007	07 / 12
PIER COLUMN REINFORCEMENT (PIER P3)			GSB-018	18 / 57	CHEVRON MARKING DETAILS (FLYOVER APPROACHES)			GTR-009	09 / 26	LIGHTING PANEL			GRL-008	08 / 12
PIER COLUMN REINFORCEMENT (PIER P4 & P12 - EXP.)			GSB-019	19 / 57	STANDARD TRAFFIC SIGNS 1 OF 4			GTR-010	10 / 26	LIGHTING POLE AT FLYOVER & PULL BOX DETAIL			GRL-009	09 / 12
PIER COLUMN REINFORCEMENT (PIER P7 - EXP.)			GSB-020	20 / 57	STANDARD TRAFFIC SIGNS 2 OF 4			GTR-011	11 / 26	LIGHTING POLE AT SERVICE ROAD			GRL-010	10 / 12
SCHEDULE OF REINFORCED CONCRETE COLUMN			GSB-021	21 / 57	STANDARD TRAFFIC SIGNS 3 OF 4			GTR-012	12 / 26	LIGHTING UNDER VIADUCT			GRL-011	11 / 12
PIER COPING REINFORCEMENT (PIER P4 - EXP.) 1 OF 4			GSB-022	22 / 57	STANDARD TRAFFIC SIGNS 4 OF 4			GTR-013	13 / 26	CONDUIT & CABLE INSTALATION			GRL-012	12 / 12
PIER COPING REINFORCEMENT (PIER P4 - EXP.) 2 OF 4			GSB-023	23 / 57	OVERHEAD GUIDE SIGNS			GTR-014	14 / 26					
PIER COPING REINFORCEMENT (PIER P4 - EXP.) 3 OF 4			GSB-024	24 / 57	ROAD SIGNS AND MOUNTING DETAILS			GTR-015	15 / 26					
PIER COPING REINFORCEMENT (PIER P4 - EXP.) 4 OF 4			GSB-025	25 / 57	OVERHEAD SIGN TRUSS STRUCTURAL FRAME DETAILS 1 OF 2			GTR-016	16 / 26					
PIER COPING REINFORCEMENT (PIER P7 - EXP.) 1 OF 4			GSB-026	26 / 57	OVERHEAD SIGN TRUSS STRUCTURAL FRAME DETAILS 2 OF 2			GTR-017	17 / 26					
PIER COPING REINFORCEMENT (PIER P7 - EXP.) 2 OF 4			GSB-027	27 / 57	CONTROL PANEL FOR TRAFFIC SIGNAL			GTR-018	18 / 26					
PIER COPING REINFORCEMENT (PIER P7 - EXP.) 3 OF 4			GSB-028	28 / 57	TYPICAL DETAIL OF VEHICULAR AND PEDESTRIAN SIGNAL LIGHT			GTR-019	19 / 26					
PIER COPING REINFORCEMENT (PIER P7 - EXP.) 4 OF 4			GSB-029	29 / 57	STANDARD TRAFFIC MANAGEMENT SIGNS DURING CONSTRUCTION			GTR-020	20 / 26					
PIER COPING REINFORCEMENT (PIER P12 - EXP.) 1 OF 4			GSB-030	30 / 57	STANDARD TRAFFIC MANAGEMENT SAFETY DEVICE DETAILS			GTR-021	21 / 26					
PIER COPING REINFORCEMENT (PIER P12 - EXP.) 2 OF 4			GSB-031	31 / 57	STANDARD SIGN BOARD PANEL			GTR-022	22 / 26					
PIER COPING REINFORCEMENT (PIER P12 - EXP.) 3 OF 4			GSB-032	32 / 57	STAGES OF CONSTRUCTION			GTR-023	23 / 26					
PIER COPING REINFORCEMENT (PIER P12 - EXP.) 4 OF 4			GSB-033	33 / 57	TYPICAL BORED PILING METHODOLOGY			GTR-024	24 / 26					
SCHEDULE OF RISER REINF. AND ANCHOR BAR PIER P4 & P12 (1 OF 2)			GSB-034	34 / 57	TYPICAL INSTALLATION OF GIRDER			GTR-025	25 / 26					
SCHEDULE OF RISER REINF. AND ANCHOR BAR PIER P4 & P12 (2 OF 2)			GSB-035	35 / 57	TYPICAL TRAFFIC MANAGEMENT LAYOUT 1 OF 2			GTR-026	26 / 26					
SCHEDULE OF RISER REINF. AND ANCHOR BAR PIER P7 (1 OF 2)			GSB-036	36 / 56	TYPICAL TRAFFIC MANAGEMENT LAYOUT 2 OF 2									
SCHEDULE OF RISER REINF. AND ANCHOR BAR PIER P7 (2OF 2)			GSB-037	37 / 57										
CONCRETE BARRIER REINFORCEMENT AT PIER COPING (P4, P7, P12 - EXP.)			GSB-038	38 / 57	UTILITIES									
COMPOSITE COLUMN CASING DETAILS (PIER P5, P6)			GSB-039	39 / 57	PUBLIC UTILITIES ABOVE GROUND 1 OF 7			GUT-001	01 / 15					
COMPOSITE COLUMN CASING DETAILS (PIER P8)			GSB-040	40 / 57	PUBLIC UTILITIES ABOVE GROUND 2 OF 7			GUT-002	02 / 15					
COMPOSITE COLUMN CASING DETAILS (PIER P9, P10 & P11)			GSB-041	41 / 57	PUBLIC UTILITIES ABOVE GROUND 3 OF 7			GUT-003	03 / 15					
COMPOSITE COLUMN SOCKET TYPE CONNECTION (PIER P5, P6)			GSB-042	42 / 57	PUBLIC UTILITIES ABOVE GROUND 4 OF 7			GUT-004	04 / 15					
COMPOSITE COLUMN SOCKET TYPE CONNECTION (PIER P8)			GSB-043	43 / 57	PUBLIC UTILITIES ABOVE GROUND 5 OF 7			GUT-005	05 / 15					
COMPOSITE COLUMN SOCKET TYPE CONNECTION (PIER P9, P10 & P11)			GSB-044	44 / 57	PUBLIC UTILITIES ABOVE GROUND 6 OF 7			GUT-006	06 / 15					
BORED PILE REINFORCEMENT DETAILS (PIER P1)			GSB-045	45 / 57	PUBLIC UTILITIES ABOVE GROUND 7 OF 7			GUT-007	07 / 15					
BORED PILE REINFORCEMENT DETAILS (PIER P2, P3, P13)			GSB-046	46 / 57	PUBLIC UTILITIES UNDER GROUND 1 OF 7			GUT-008	08 / 15					
BORED PILE REINFORCEMENT DETAILS (PIER P4 & P12)			GSB-047	47 / 57										
BORED PILE REINFORCEMENT DETAILS (PIER P5 & P6)			GSB-048	48 / 57										
BORED PILE REINFORCEMENT DETAILS (PIER P7)			GSB-049	49 / 57										
BORED PILE REINFORCEMENT DETAILS (PIER P8)			GSB-050	50 / 57										
BORED PILE REINFORCEMENT DETAILS (PIER P9, P10 & P11)			GSB-051	51 / 57										
BORED PILE REINFORCEMENT DETAILS (PIER P14 & P15)			GSB-052	52 / 57										
BORED PILE REINFORCEMENT DETAILS FOR ABUTMENT A1 (Ø1800mm)			GSB-053	53 / 57										
BORED PILE REINFORCEMENT DETAILS FOR ABUTMENT A2 (Ø1800mm)			GSB-054	54 / 57										
SCHEDULE OF BORED PILE			GSB-055	55 / 57										
TYPICAL APPROACH SLAB DETAILS OF ABUTMENT A1 & A2			GSB-056	56 / 57										
SOIL IMPROVEMENT			GSB-057	57 / 57										



APPROVED BY

Ir. HERRY VAZA M,Eng.Sc
NIP. : 110038400

Sign

Date

PROJECT AND LOCATION :

DETAILED DESIGN STUDY OF
NORTH JAVA CORRIDOR FLYOVER PROJECT
GEBANG FLYOVER - CONTRACT PACKAGE 2
(NAGREG - GEBANG)
WEST JAVA PROVINCE

SCALE :

AS SHOWN

FULL SIZE A3

DRAWING TITLE :

LOCATION / VICINITY MAP

DRAWING NO. :

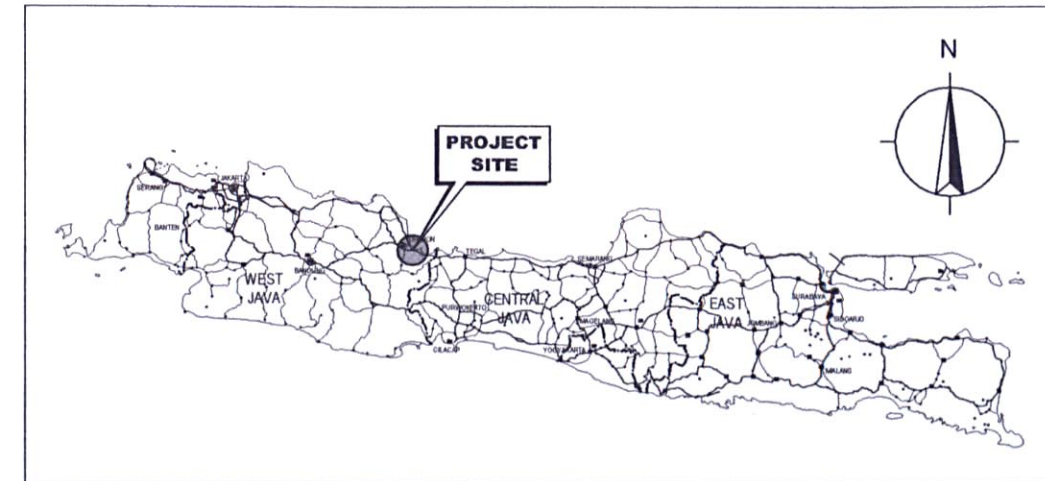
GGE-004

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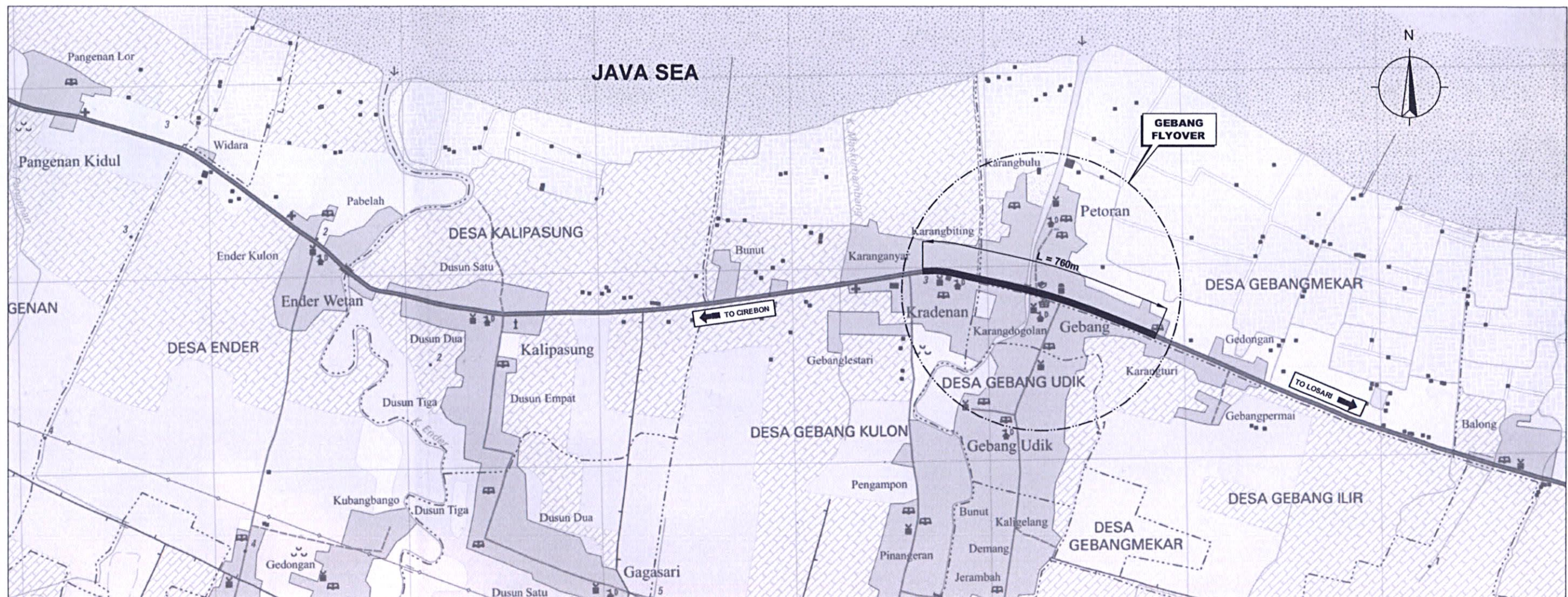
04 / 19



2 INDONESIA MAP
NOT TO SCALE




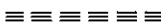






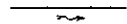























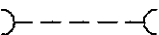



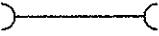



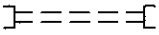



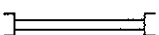



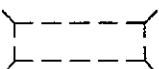



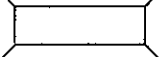
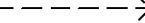


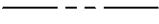
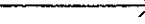
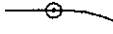


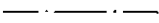

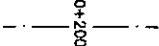






3 JAVA ISLAND MAP
NOT TO SCALE



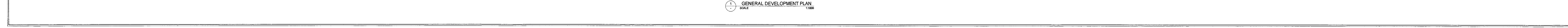
1 LOCATION / VICINITY MAP
SCALE 1:20000

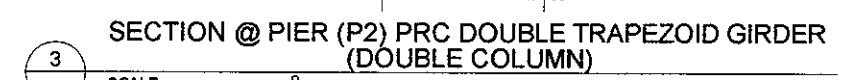
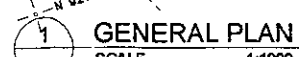
NOTATION AND LEGEND




	PERMANENT BUILDING (1 FLOOR)		BANK		RIVER		RETAINING WALL
	PERMANENT BUILDING (2 FLOORS)		WAREHOUSE		POND (WATER)		RAILWAY
	PERMANENT BUILDING (3 FLOORS)		HOSPITAL/CLINIC		DRAINAGE		MAIN ROAD
	SEMI PERMANENT BUILDING		HOTEL		SWAMP		ROAD
	TEMPORARY		FACTORY		WATER SUPPLY		TELEPHONE LINE
	SHED (BANGSAL)		FIRE STATION		RICE FIELD		CABLE OPTIC LINE
	STALL (KIOS)		POST OFFICE		WASTED LAND		ELECTRICAL LINE
	GOVERNMENT OFFICE		MARKET		MONUMENT		GAS LINE
	SCHOOL		GASOLINE STATION		EXISTING ROP		OIL LINE
	MOSQUE		TELEPHONE POLE		DESIGN ROP		BORE HOLE NO. 10
	CHURCH		ELECTRICAL POLE		EXISTING BOX CULVERT		SOUNDING NO.4 (DCP TEST)
	TEMPLE		POWER HOUSE		DESIGN BOX CULVERT		DRAINAGE CATCH BASIN
	ISLAMIC CEMETERY		GPS STATION		EXISTING BRIDGE		DRAINAGE MANHOLE
	CHRISTIAN CEMETERY		BENCH MARK		DESIGN BRIDGE		EXISTING DRAINAGE LINE
	CHINESE CEMETERY		TRAVERSE POINT		ROW		NEW DRAINAGE LINE
			TS, SC, CS, ST OR TC, CT OF HORIZONTAL CURVE		MATCH LINE		
			POINT INTERSECTION OF VERTICAL CURVE		CENTER LINE		
			CONTOURS		STATION NUMBER		
			STREAM				

<div></div> <div>JAPAN INTERNATIONAL COOPERATION AGENCY</div> <div> KATAHIRA & ENGINEERS INTERNATIONAL</div>		DESIGNED BY		CHECKED BY		SUBMITTED BY		<div></div> <div>REPUBLIC OF INDONESIA MINISTRY OF PUBLIC WORKS DIRECTORATE GENERAL OF HIGHWAYS</div> <div>APPROVED BY</div> <div>Ir. HERRY VAZA M,Eng.Sc NIP. : 110038400</div>		PROJECT AND LOCATION :		SCALE :	DRAWING TITLE :		DRAWING NO :
		Name	R. UENO	Name	T. OKUMURA	Name	M. KIUCHI			DETAILED DESIGN STUDY OF NORTH JAVA CORRIDOR FLYOVER PROJECT GEBANG FLYOVER - CONTRACT PACKAGE 2 (NAGREG - GEBANG) WEST JAVA PROVINCE		NTS	ABBREVIATIONS		GGE-006
		Sign		Sign		Sign				SHEET NO :					
		Date		Date		Date				FULL SIZE A3	06 / 19				

ABBREVIATIONS																			
A				D				K				R				T			
A				D				K				R				T			
•				DD				LAB				RCSC				TAN			
ABUT				Do				L OR LC				RCBC				T.S.M			
A.C				d				L'				R.C.P				TC			
A.D				DMH				Ln M				R.C.P.A				Θ			
ADD.				Δ				LS				RD				TEM			
A.D.T.				Δ				LL				RDWY				THK			
ALIGN				Δc				LP				REINF				T.K.P			
AHD.				DET.				LR				REL				T.L			
ALT.				DF.				Lt				REPL				T.S			
APPR.				D.H.V				Lv, V.C				REQ'D				Ts			
APPROX				DIA.φ				LONG				RES				T.T			
ASPH				DIM				L.S				RES'D				TYP			
AVE				DIST				L.S.D				REST				U			
AZ.				D.J				LT				R.H				V			
				D.S.W				LTH				ROD				VA			
				DWG.				LF				ROW,R/W				VAR			
												R.P				V.VEL			
												R.R				V.C			
												RT				VERT			
												R.F				W			
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	Name	R. UENO	Name	T. OKUMURA	Name	M. KIUCHI		DETAILED DESIGN STUDY OF NORTH JAVA CORRIDOR FLYOVER PROJECT GEBANG FLYOVER - CONTRACT PACKAGE 2 (NAGREG - GEBANG) WEST JAVA PROVINCE		NTS	GENERAL NOTES ROADS AND DRAINAGE	GGE-009		
	Sign		Sign		Sign			APPROVED BY	Ir. HERRY VAZA M,Eng.Sc NIP. : 110038400			Sign	Date	SHEET NO :
	Date		Date		Date									Date

GENERAL NOTES ROADS AND DRAINAGE

1. DESIGN STANDARDS / SPECIFICATIONS

1.1. ALL GEOMETRIC AND PAVEMENT DESIGN STANDARDS SHALL COMPLY WITH THE VALUES PRESCRIBED IN:

- STANDARD SPECIFICATION FOR URBAN ROADS, RSNI T-14-2004
- STANDARD SPECIFICATIONS FOR GEOMETRIC DESIGN OF URBAN ROAD, BINA MARGA, 1992.
- A POLICY ON GEOMETRIC DESIGN OF HIGHWAYS AND STREETS, 2004 EDITION OF THE AMERICAN ASSOCIATION OF STATE HIGHWAYS AND TRANSPORTATION OFFICIALS (AASHTO).
- ROADS STRUCTURE ORDINANCE JAPAN ROAD ASSOCIATION (JRA), 2004 EDITION
- GUIDE FOR DESIGN OF PAVEMENT STRUCTURES, (AASHTO), 1993.

1.2. ALL WORKS SHALL COMPLY WITH THE BINA MARGA STANDARD SPECIFICATIONS , AND OTHER SPECIAL PROVISIONS AND SUPPLEMENTAL SPECIFICATIONS PERTAINING TO THIS PROJECT.

2. SURVEY CONTROLS AND REFERENCES

2.1 HORIZONTAL CONTROL IS BASED THROUGH GLOBAL POSITIONING SYSTEM (GPS) ESTABLISHED BY PT. VIRAMA KARYA. LIST OF SURVEY CONTROLS ARE SHOWN IN THE SUCCEEDING SHEETS.

2.2. VERTICAL CONTROL IS REFERRED FROM "JARING KONTROL VERTIKAL NASIONAL (TITIK TINGGI GEODESI = TTD)" ESTABLISHED DATUM.

2.3. ALL CONTROLS SHALL BE VERIFIED BEFORE CONSTRUCTION, THE CONTRACTOR SHALL INVESTIGATE ALL DRAWING PLANS AND CONDUCT FIELD INVESTIGATION SURVEY TO DETERMINE ACTUAL FIELD CONDITION. THE CONTRACTOR SHALL REPORT TO THE ENGINEER IF THERE ARE DIFFERENCES BETWEEN DRAWING PLANS AND ACTUAL FIELD CONDITIONS .

3. ALIGNMENT CONTROLS AND REFERENCES

3.1. PROJECT IMPLEMENTATION OF ALL FLYOVERS SHALL BE DONE IN THREE (3) CONSTRUCTION PACKAGES:

CONTRACT PACKAGE 1 – MERAK AND BALARAJA FLYOVERS

CONTRACT PACKAGE 2 – NAGREG AND GEBANG FLYOVERS

CONTRACT PACKAGE 3 – PETERONGAN AND TANGGULANGIN FLYOVERS

3.2. GEBANG FLYOVER HAS THE FOLLOWING MAJOR CONTROL POINTS USED IN THE DESIGN OF HORIZONTAL AND VERTICAL ALIGNMENT:

- EXISTING ROADWAY GRADIENT
- EXISTING OLD AND NEW BRIDGE
- ADJACENT BUILT - UP AREAS
- EXISTING BIRD HOUSES

4. DIMENSIONS

4.1. DISTANCES AND ELEVATIONS SHOWN ON THE PLANS ARE IN MILLIMETERS (mm) AND METERS (m) UNLESS OTHERWISE SPECIFIED. OTHER UNITS OF MEASUREMENT ARE EXPRESSED IN THE MORE APPROPRIATE UNITS OF THE INTERNATIONAL SYSTEM OF UNIT (METRIC) .

4.2. CONTRACTOR SHALL CLARIFY TO THE ENGINEER ALL DIMENSIONS AND ELEVATIONS SHOWN IN THE DRAWINGS BEFORE CONSTRUCTION.

5. STATIONINGS

5.1. THE STATIONINGS OF HORIZONTAL ALIGNMENT OF THE PROJECT ROAD ARE RELATIVE TO THE CENTERLINE SHOWN ON THE PLANS.

5.2. STATIONING OF CURB INLET MANHOLE, MANHOLE, BEGINNING AND END OF FLYOVER AND OTHER STRUCTURES ARE RECKONED AT THE CENTERLINE STATIONINGS SHOWN ON THE PLANS.

5.3. ELEMENTS OF CURVE, BOTH HORIZONTAL AND VERTICAL ALIGNMENTS ARE RELATIVE TO THE ROAD CENTERLINE.

5.4. SERVICE ROADS STATIONING ARE BASED FROM DESIGN CENTERLINE OF THE ROAD/ FLYOVER.

6. ELEVATIONS AND GRADES

6.1. FINISHED GRADE ELEVATIONS SHOWN ON PROFILE SHEETS REFER TO FINISHED ROAD LEVEL SHOWN IN TYPICAL ROADWAY SECTIONS.

EXISTING GRADE LEVEL SHOWN ON PROFILE SHEETS REFER TO THE PAVEMENT ORIGINAL GROUND ALONG THE CENTERLINE OF THE PROJECT ROAD AS SHOWN IN THE TYPICAL ROADWAY SECTIONS, OR AS INDICATED IN THE PLANS.

7. REMOVAL OF EXISTING STRUCTURES AND RELOCATION OR PROTECTION OF EXISTING UTILITIES

7.1. REMOVAL OF EXISTING BUILDINGS, HOUSES, FENCES, UTILITY POLES, PUBLIC UTILITIES, ETC. WILL NOT BE THE RESPONSIBILITY OF THE CONTRACTOR; THEY WILL BE REMOVED BY THEIR RESPECTIVE OWNERS OR BY BINA MARGA PRIOR TO CONSTRUCTION.

7.2. DISPOSAL OR REPLACEMENT OF SACRED BUILDING SHALL BE APPROVED BY THE LOCAL GOVERNMENT.

7.3. PORTION OF UTILITIES, SUCH AS WATER LINES, TELEPHONE TRUNK LINES, ELECTRIC LINES, ETC., THAT MAY OBSTRUCT THE CONSTRUCTION OF THE PROJECT SHALL BE RELOCATED BY THE ENTITIES OR OWNERS CONCERNED. EXTREME PRECAUTION SHALL BE EXERCISED BY THE CONTRACTOR SO AS NOT TO DAMAGE THE EXISTING UTILITIES DURING CONSTRUCTION. ANY DAMAGE THEREOF SHALL BE ON THE ACCOUNT OF THE CONTRACTOR.

7.4. UTILITIES WHICH HAVE SPECIAL CHARACTER LIKE GAS AND OIL PIPE SHALL BE PECULIARY TREATED WITH MUCH IMPORTANCE. IF IT NEED TO BE RELOCATED OR PROTECTED, THEN IT MUST BE DONE BEFORE THE CONSTRUCTION COMMENCE. WRITTEN APPROVAL / PERMISSION SHALL BE GIVEN TO THE CONTRACTOR BY THE UTILITIES OWNER THROUGH THE ENGINEER OR THE SUPERVISION CONSULTANT.

7.5. SUPPORTS FOR ABOVE GROUND UTILITIES TO BE RELOCATED/ REPLACED SHALL BE PLACED IN SUCH A WAY THAT THEY WILL NOT OBSTRUCT VEHICULAR AND PEDESTRIAN MOVEMENTS.

8. ROAD CONNECTIONS AND PRIVATE ENTRANCES

8.1. APPROACHES AND CONNECTIONS SHALL BE CONSTRUCTED BY THE CONTRACTOR AS SHOWN ON THE PLAN OR AS DIRECTED BY THE ENGINEER IN SUCH MANNER AS TO ENSURE SMOOTH CONNECTION AND RIDING QUALITY.

8.2. EXACT LOCATIONS OF INTERSECTION ROADS, AND PRIVATE ENTRANCES OR DRIVEWAYS WHERE ITEM 8.1 ABOVE APPLIES, SHALL BE DETERMINED IN THE FIELD BY THE ENGINEER.

8.3. DROP CURB AND GUTTER OR MOUNTABLE CURB AND GUTTER SHALL BE PROVIDED TO EXISTING ENTRANCES OR DRIVEWAYS AS SHOWN IN THE PLAN.

8.4. CURB - CUT RAMP SHALL BE PROVIDED AT SIDEWALK AND MEDIAN AS SHOWN IN THE STANDARD DRAWINGS THESE ARE INTENDED SPECIALLY FOR PEDESTRIANS WITH DISABILITY. LOCATIONS SHALL BE AS DIRECTED BY THE ENGINEER.

8.5. LIMIT OF CONSTRUCTION FOR ROAD CONNECTIONS AND PRIVATE ENTRANCES SHALL BE AS SHOWN IN THE DRAWING OR AS DIRECTED BY THE ENGINEER.

9. DRAINAGE STRUCTURE

9.1. EXACT LOCATIONS, SLOPES, OUTFALLS, AND INVERT ELEVATIONS OF DRAINAGE STRUCTURES SHALL BE CHECKED IN THE FIELD BY THE ENGINEER, MINOR ADJUSTMENTS MAY BE MADE TO SUIT ACTUAL FIELD CONDITIONS UPON APPROVAL BY THE ENGINEER.

9.2. EXISTING DRAINAGE STRUCTURES THAT ARE FAULTY, BROKEN DOWN, OR NOT IN GOOD WORKING CONDITION SHALL BE DETERMINED IN THE FIELD. RECONSTRUCTION, REPAIR AND / OR REPLACEMENT OF SAME SHALL BE DIRECTED BY THE ENGINEER, AND SHALL CONFORM TO THE STANDARDS SHOWN IN THE DRAWINGS.

9.3. EXISTING DRAINAGE STRUCTURES OR PARTS THEREOF REMOVED BY THE CONTRACTOR THAT ARE STILL SERVICEABLE SHALL BE TURNED OVER TO THE GOVERNMENT AND SHALL BE DEPOSITED AT A PLACE DESIGNATED BY THE ENGINEER. EXTREME PRECAUTIONS SHALL BE EXERCISED BY THE CONTRACTOR NOT TO DAMAGE THESE MATERIALS DURING REMOVAL AND HANDLING OPERATION.

9.4. CLEANING , UNCLOGGING AND/ OR RELAYING OF REINFORCED CONCRETE PIPES, CLEANING OF CHANNELS AND DITCHES AS DIRECTED BY THE ENGINEER SHALL BE UNDERTAKEN BY THE CONTRACTOR TO ENSURE AN OPERATIONAL TEMPORARY DRAINAGE SYSTEM DURING THE CONSTRUCTION PERIOD.

9.5. LAYOUT OF EXISTING SIDE DITCH, PIPE CULVERT, AND BOX CULVERT ARE BASED FROM TOPOGRAPHIC SURVEY. EXACT LOCATION AND DEPTH SHALL BE VERIFIED IN THE FIELD PRIOR TO THE CONSTRUCTION.

9.6. ALL INVERT ELEVATIONS OF EXISTING PIPES AND BOX CULVERTS SHALL BE VERIFIED PRIOR TO CONSTRUCTION IN ORDER TO SMOOTHLY JOIN TO THE NEW DRAINAGE SYSTEM.

10. ROAD SIGN AND PAVEMENT MARKINGS




10.1. ROAD SIGNS SHALL CONFORM WITH THE " DINAS PERHUBUNGAN LALU LINTAS DAN ANGKUTAN JALAN SETEMPAT "

10.2. PAVEMENT MARKINGS OR ROAD MARKINGS SHALL CONFORM WITH THE " DINAS PERHUBUNGAN LALU LINTAS DAN ANGKUTAN JALAN SETEMPAT "

10.3. INSTALLATION OF ROAD SIGNS AND PAVEMENT MARKINGS SHALL BE APPROVED BY THE ENGINEER.

11. TRAFFIC MANAGEMENT

11.1. DURING THE CONSTRUCTION PERIOD, THE CONTRACTOR SHALL INSTALL TRAFFIC MANAGEMENT SIGN WHICH WILL PROVIDE SAFETY, CONVENIENCE, AND SMOOTH RIDING QUALITY OF MOTORISTS IN ACCORDANCE WITH THE TRAFFIC REGULATIONS. WRITTEN APPROVAL / PERMISSION SHALL BE GIVEN BY THE ENGINEER AND THE " DINAS PERHUBUNGAN LALU LINTAS & ANGKUTAN SETEMPAT " TO THE CONTRACTOR PRIOR TO IMPLEMENTATION.

<div> JAPAN INTERNATIONAL COOPERATION AGENCY</div> <div> KATAHIRA & ENGINEERS INTERNATIONAL</div>	DESIGNED BY		CHECKED BY		SUBMITTED BY		<div> REPUBLIC OF INDONESIA MINISTRY OF PUBLIC WORKS DIRECTORATE GENERAL OF HIGHWAYS</div> <div>APPROVED BY Ir. HERRY VAZA M,Eng.Sc NIP. : 110038400</div>	PROJECT AND LOCATION :		SCALE :	DRAWING TITLE :	DRAWING NO :
	Name	A. GOURLEY	Name	T. OKUMURA	Name	M. KIUCHI		DETAILED DESIGN STUDY OF NORTH JAVA CORRIDOR FLYOVER PROJECT GEBANG FLYOVER - CONTRACT PACKAGE 2 (NAGREG - GEBANG) WEST JAVA PROVINCE		NOT TO SCALE	GENERAL NOTES FOR STRUCTURES (1 OF 3)	GGE-010
	Sign		Sign		Sign			FULL SIZE A3	SHEET NO : 10 / 19			
	Date		Date		Date							

GENERAL

1. IN THE INTERPRETATION OF DRAWINGS, INDICATED DIMENSIONS SHALL GOVERN ALL DIMENSIONS. DISTANCES AND SIZES SHALL NOT BE SCALED FOR CONSTRUCTION PURPOSES.

2. ELEVATIONS, STATIONS AND COORDINATES ARE SHOWN IN METERS, OTHER DIMENSIONS AND MEMBER SIZES ARE IN MILLIMETERS UNLESS OTHERWISE INDICATED.

DESIGN CRITERIA

1. DESIGN SPECIFICATIONS

1.1 CODES AND STANDARDS

THE NORTH JAVA CORRIDOR FLYOVER PROJECT SHALL BE DESIGNED IN ACCORDANCE WITH THE FOLLOWING DESIGN CODES AND STANDARDS.

- BRIDGE DESIGN CODE, DRAFT, VOLUME 1 AND VOLUME 2-BRIDGE MANAGEMENT SYSTEM 1992, DIREKTORAT JENDERAL BINA MARGA DEPARTEMEN PEKERJAAN UMUM.
- BRIDGE DESIGN MANUAL, DRAFT, VOLUME 1 AND VOLUME 2-BRIDGE MANAGEMENT SYSTEM 1992, DIREKTORAT JENDERAL BINA MARGA DEPARTEMEN PEKERJAAN UMUM.
- PEMBEBANAN UNTUK JEMBATAN, RSNI4. (LOADING FOR BRIDGES)
- STANDAR PERENCANAAN KETAHANAN GEMPA UNTUK JEMBATAN, SNI. (DESIGN STANDARD OF EARTHQUAKE RESISTANCE FOR BRIDGES)
- PERENCANAAN STRUKTUR BETON UNTUK JEMBATAN, RSNI (DESIGN OF CONCRETE STRUCTURE FOR BRIDGE)
- PERENCANAAN STRUKTUR BAJA UNTUK JEMBATAN, RSNI4 (DESIGN OF STEEL STRUCTURE FOR BRIDGE)
- AASHTO LRFD BRIDGE DESIGN SPECIFICATIONS, 3RD EDITION.

1.2 OTHER REFERENCE

FOR DESIGN REQUIREMENTS NOT COVERED BY THE ABOVE CODES AND STANDARDS THE FOLLOWING REFERENCES WILL BE USED AS REQUIRED:

- JAPANESE SPECIFICATIONS FOR HIGHWAY BRIDGES
- AS 5100, BRIDGE DESIGN, AUSTRALIAN STANDARD, 2004
- EN 1994 EUROCODE 4: DESIGN OF COMPOSITE STEEL AND CONCRETE STRUCTURES
- FHWA-IF-99-025, "DRILLED SHAFTS: CONSTRUCTION PROCEDURES AND DESIGN METHODS", 1999
- FHWA-NHI-00-043, "MECHANICALLY STABILIZED EARTH WALLS AND REINFORCED SOIL SLOPES, DESIGN & CONSTRUCTION GUIDELINES", 2001
- NCHRP REPORT 529, "GUIDELINES AND RECOMMENDED STANDARD FOR GEOFOAM APPLICATIONS IN HIGHWAY EMBANKMENTS", TRANSPORT RESEARCH BOARD, 2004

2. LOADING SPECIFICATIONS

THE LOADING SPECIFICATIONS TO BE USED FOR THE DESIGN OF STRUCTURES ARE THE "PEMBEBANAN UNTUK JEMBATAN, RSNI 4" (LOADING FOR BRIDGES). ACCORDING TO THE ABOVE SPECIFICATIONS, BASIC DESIGN CONDITION ARE AS FOLLOWS :

2.1 LOADING CLASSIFICATIONS

100% "D" (LANE LOADING) AND 100% "T" (TRUCK LOADING) ARE APPLIED

2.2 APPLICATION OF "D" LOADING

THE UDL MAY BE APPLIED IN BROKEN LENGTHS TO MAXIMIZE ITS EFFECTS ON CONTINUOUS BRIDGES OR UNUSUAL STRUCTURES

A SINGLE KEL PERPENDICULAR TO THE DIRECTION OF TRAFFIC SHALL BE PLACED IN ANY POSITION ALONG THE BRIDGE FOR CONTINUOUS BRIDGES, TO PRODUCE THE MAXIMUM NEGATIVE BENDING MOMENT.

2.3 DYNAMIC LOAD ALLOWANCE (IMPACT)

TO PROVIDE THE DYNAMIC STRENGTH AND VIBRATION INFLUENCE, STRESSES PRODUCED BY THE LOADING SHALL BE MULTIPLIED BY A DYNAMIC LOAD ALLOWANCE (IMPACT) COEFFICIENT. THIS IMPACT COEFFICIENT IS ONLY TO THE KNIFE EDGE LOAD (KEL). UNIFORM LOAD "D" LOADING ARE NOT APPLIED FOR IMPACT.

2.4 EARTHQUAKE FORCE

EARTHQUAKE FORCE WAS APPLIED IN ACCORDANCE WITH "PEMBEBANAN UNTUK JEMBATAN, RSNI 4 (LOADING FOR BRIDGES); STANDAR PERENCANAAN KETAHANAN GEMPA UNTUK JEMBATAN, SNI (DESIGN STANDARD OF EARTHQUAKE RESISTANCE FOR BRIDGES"

THE PEAK GROUND ACCELERATION OF BEDROCK AT EACH OF THE PROJECT FLYOVER SITES, OBTAIN FROM MAP OF SEISMIC ZONES FOR INDONESIA WITH A 500 YEAR RETURN PERIOD, IS PRESENTED IN TABLE BELOW :

SEISMIC ZONE AND PEAK GROUND ACCELERATION

NAME OF FLYOVER	SEISMIC ZONE	PEAK GROUND ACCELERATION
MERAK	2	0.46 - 0.50
BALARAJA	3	0.36 - 0.40
NAGREG	3	0.36 - 0.40
GEBANG	3	0.36 - 0.40
PETERONGAN	4	0.26 - 0.30
TANGGULANGIN	4	0.26 - 0.30

SEISMIC PERFORMANCE CATEGORY D FOR ALL FLYOVER.

2.5 THERMAL FORCES

THE AMBIENT TEMPERATURE ASSUMED FOR DESIGN IS 28°C. TEMPERATURE VARIATION IS 15°C - 45°C FOR STEEL STRUCTURE AND 15°C - 40°C FOR CONCRETE STRUCTURE.

MATERIALS FOR STRUCTURES

1. CONCRETE

THE USE OF EACH CLASS OF CONCRETE SHALL BE USE FOLLOWS UNLESS OTHERWISE SHOWN ON THE DRAWINGS OR DIRECTED BY THE ENGINEER. DESIGN STRENGTH OF CONCRETE IS SPECIFIED AS FOLLOWS :

CONCRETE CLASS	CHARACTERISTIC COMPRESSIVE STRENGTH (MPa)	APPLICATION OF STRUCTURE
A - 1	40	PRE-CAST PRE-STRESSED CONCRETE STRUCTURE
A - 2	35	CAST-IN-SITU PRE-STRESSED CONCRETE STRUCTURE
B - 1	30	DECK SLAB, PIER HEADS AND COLUMNS, DIAPHRAGMS OF P.C.I-GIRDER, ABUTMENT, FOOTING CONCRETE BARRIER
B - 2	30	CAST-IN-SITU REINFORCED CONCRETE PILES, BORED PILES
C	20	RETAINING WALL
D	15	GRAVITY TYPE RETAINING WALLS
E	8	LEVELING CONCRETE

2. REINFORCING STEEL

2.1 TYPE, DESIGNATION AND MINIMUM YIELD STRENGTH OF REINFORCING STEEL FOR CONCRETE STRUCTURE ARE SPECIFIED AS FOLLOWS :

TYPE	GRADE	YIELD POINT (N/mm²)	APPLICATION STANDARD		
			SII	JIS	BS
ROUND BARS	SR 24	240	SII 0136	G 3112	BS 4449
DEFORMED BARS	SD 40	390	SII	G 3112	BS 4449

2.2 REINFORCING STEEL SHALL BE FREE OF MILL SCALES, OIL OR ANY SUBSTANCES WHICH WILL WEAKEN THE BOND WITH CONCRETE.

3. STRUCTURAL STEEL

TYPE, DESIGNATION AND MINIMUM YIELD POINT AND TENSILE STRENGTH OF STRUCTURAL STEEL AS FOLLOWS :

JIS STANDARD			APPLICATION STANDARD		
DESIGNATION	YIELD POINT (N/mm²)	TENSILE STRENGTH (N/mm²)	DESIGNATION	YIELD POINT (N/mm²)	TENSILE STRENGTH (N/mm²)
G 3101	215 - 245	400 - 510	A 36	250	400 - 500
SS 400					
G 3106	215 - 245	400 - 510	A 242	290 - 340	≥ 430
SM 400					
SM 490	295 - 325	490 - 610	A 440	290 - 340	430 - 480
SM 490 Y	325 - 365	490 - 610	A 441	290 - 340	430 - 480
SM 520	325 - 365	520 - 640	A 588	290 - 340	430 - 480
SM 570	420 - 460	570 - 720	A 572	410 - 450	510 - 550
G 3114	215 - 245	400 - 540	A 514	620 - 690	690 - 900
SMA 400W					
SMA 490W					
SMA 570W	325 - 365	490 - 610			
	420 - 460	570 - 720			

G 3101 : ROLLED STEEL OF GENERAL STRUCTURE

JIS G 3106 : ROLLED STEEL FOR WELDED STRUCTURE

JIS G 3114 : HOT-ROLLED ATMOSPHERIC CORROSION RESISTING

4. PRESTRESSING TENDON

TYPE, DESIGNATION AND MINIMUM YIELD POINT AND TENSILE STRENGTH OF PRESTRESSING TENDON ARE SPECIFIED AS FOLLOWS :

NOTATION	UTILIZATION	NOMINAL DIAMETER (mm)	YIELD STRENGTH (Kg/mm²)	BRAKING STRENGTH (Kg/mm²)	APLICATION STANDARD	
					JIS	ASTM
PC WIRE SWPR 1A	PC PILE	Ø 7	135	155	G 3536	A 421
PC 7 WIRE STRAND SWPR 7B	PC HOLLOW CORE SLAB UNIT AND PC DOUBLE TRAPEZOID GIRDER, PC I-GIRDER	T 12.7	160	190	G3536	A 416
PC 19 WIRE STRAND SWPR 19	TRANSVERSAL CABLE FOR DECK SLAB AND DIAPHRAGM OF PC STRUCTURE	T 21.8	160	190	G 3536	A 416
PC BAR		Ø 32				

GENERAL NOTES FOR STRUCTURES (2)

CONSTRUCTION

1. SETTING OUT

THE SETTING OUT AND ELEVATIONS OF THE DIFFERENT COMPONENTS OF THE STRUCTURE SHALL BE APPROVED BY THE ENGINEER PRIOR TO THE START OF ANY CONSTRUCTION WORK.

2. REINFORCED CONCRETE

2.1 CODES AND STANDARDS

- DESIGN OF CONCRETE MIX SHALL MEET THE DESIGN CONCRETE STRENGTH GIVEN UNDER ITEM 1 OF MATERIALS.
- CONCRETE SHALL BE DEPOSITED, VIBRATED AND CURED IN ACCORDANCE WITH THE SPECIFICATIONS.
- FOR CONCRETE DEPOSITED AGAINST THE GROUND. BLINDING CONCRETE WITH A MINIMUM THICKNESS OF 100MM SHALL BE LAID FIRST BEFORE INSTALLING THE REINFORCEMENT. THIS BLINDING CONCRETE SHALL NOT BE CONSIDERED IN MEASURING THE STRUCTURAL DEPTH OF CONCRETE SECTION.
- THE CONTRACTOR SHALL SUBMIT TO THE ENGINEER FOR APPROVAL IN PLACING SEQUENCES FOR ALL CONCRETING WORKS.

2.2 REINFORCEMENT DETAILS

- THE CONTRACTOR SHALL SUBMIT TO THE ENGINEER FOR APPROVAL DETAILED SHOP DRAWINGS INDICATING THE BONDING, CUTTING, SPlicing AND INSTALLATION OF ALL REINFORCING BARS.
- BARS SHALL BE BENT, COLD BARS PARTIALLY EMBEDDED IN CONCRETE SHALL NOT BE FIELD BENT UNLESS PERMITTED BY THE ENGINEER.
- COVERING THICKNESS FOR REINFORCING BARS.

- MINIMUM THICKNESS OF CONCRETE COVERING FOR REINFORCING STEEL BARS SHALL CONFORM TO THE TABLE BELOW COVERING THICKNESS SHALL CONFORM TO THE DESIGN DRAWINGS.
IF THE THICKNESS IS NOT INDICATED IN THE DESIGN DRAWINGS, IT SHALL BE DETERMINED IN ACCORDANCE WITH TABLE BELOW AND APPROVED BY THE ENGINEER.

MINIMUM CONCRETE COVER TO OUTERMOST REINFORCEMENT SHALL BE AS FOLLOWS :

FOR BALARAJA, NAGREG, PETERONGAN AND TANGGULANGIN FLYOVER

SURFACE IN CONTRACT WITH SOIL OR WATER	75 mm
COLUMNS	40 mm
GIRDER AND BEAM CAST-IN-SITU	35 mm
GIRDER AND BEAM PRECAST IN FACTORY	25 mm
SLABS, PARAPETS, ETC	30 mm

FOR MERAK AND GEBANG FLYOVER AT THE COASTAL AREA

SURFACE IN CONTRACT WITH SOIL OR WATER	75 mm
COLUMNS	55 mm
GIRDER AND BEAM CAST-IN-SITU	35 mm
GIRDER AND BEAM PRECAST IN FACTORY	25 mm
SLABS, PARAPETS, ETC	30 mm

- 1.5 TIMES THE MAXIMUM NOMINAL SIZE OF THE AGGREGATE.
- THE COVER IS NOT LESS THAN THE DIAMETER OF REINFORCING BARS.

4) DEVELOPMENT OF REINFORCEMENT

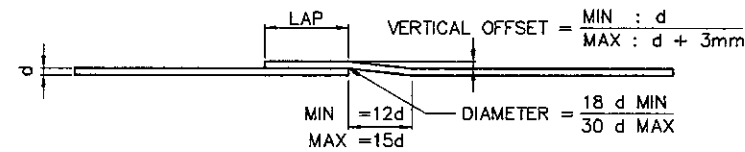
BASIC DEVELOPMENT FOR REBAR

DEVELOPMENT LENGTH/SPICE LENGTH (mm)	BAR DIAMETER db					
	10	13	16	19	25	32
BASIC DEVELOPMENT LENGTH IN TENSION	300	312	384	456	717	1174
BASIC DEVELOPMENT LENGTH IN TENSION - PLASTIC HINGE	375	390	480	570	896	1468
BASIC DEVELOPMENT LENGTH IN COMPRESSION	200	229	282	334	440	563
BASIC HOOK DEVELOPMENT LENGTH	183	237	292	347	456	584
BASIC HOOK DEVELOPMENT LENGTH - PLASTIC HINGE	228	297	365	434	571	730

5) SPLICES OF REINFORCEMENT

- WHEN PROVIDING SPLICES AT A LOCATION WHEN IT IS NOT INDICATED ON THE DRAWINGS, SUCH A LOCATION MUST BE APPROVED BY THE ENGINEER.
- LAP SPLICES SHALL BE PERMITTED ONLY WITHIN THE CENTER HALF OF COLUMN HEIGHT.
- LAP SPLICES LENGTH SHALL NOT BE LESS THAN 400MM OR 60 BAR DIAMETER, WHICHEVER IS GREATER.
- INDIVIDUAL BAR SPLICES WITHIN A BUNDLES SHALL NOT OVERLAP. ENTIRE BUNDLES SHALL NOT BE LAP SPICED.
- THE MAXIMUM SPACING OF THE TRANSVERSE REINFORCEMENT OVER THE LENGTH OF THE SPICE SHALL NOT EXCEED THE SMALLER ONE QUARTER OF THE MINIMUM MEMBER DIMENSION OR 100MM.
- FULL WELDED OR FULL MECHANICAL SPLICES MAY BE USED PROVIDED THAT NOT MORE THAN ALTERNATE BARS IN EACH LAYER OF LONGITUDINAL REINFORCEMENT ARE SPICED AT A SECTION AND THE DISTANCE BETWEEN SPLICES OF ADJACENT BARS SHALL BE GREATER THAN 600MM.
- WELDING FOR WELDED SPLICES SHALL CONFORM TO THE CURRENT EDITION OF STRUCTURAL WELDING CODE - REINFORCING STEEL OF AWS (D1.4).
A FULL -WELDED SPLICES SHALL BE REQUIRED TO DEVELOP IN TENSION, AT LEAST 125% OF THE SPECIFIED YIELD STRENGTH OF THE BAR.

5) CRANKED SPLICES



7) HOOKS AND BENDS

STANDARD HOOKS FOR LONGITUDINAL REINFORCEMENT SHALL BE AS FOLLOWS :

- 180° BEND PLUS A 4.0 db EXTENSION BUT NOT LESS THAN 65MM AT FREE END OF THE BAR.
- 90° BEND PLUS A 12.0 db EXTENSION AT THE FREE END OF THE BAR.

STANDARD HOOKS FOR TRANSVERSE REINFORCEMENT SHALL BE AS FOLLOWS :

- 16MM DIAMETER BARS AND SMALLER - 90° BEND PLUS A 6.0 db EXTENSION AT THE FREE END OF THE BAR.
- 19 TO 25MM DIAMETER BAR - 90° BEND PLUS A 12.0 db EXTENSION AT THE FREE END OF THE BAR.
- 25MM BAR AND GREATER - 135° BEND PLUS A 6.0 db EXTENSION AT THE FREE END OF THE BAR.

SEISMIC HOOKS

SEISMIC HOOKS SHALL CONSIST OF 135° BEND PLUS A 6.0 db EXTENSION, BUT NOT LESS THAN 75MM AT THE FREE END OF THE BAR.

STANDARD HOOK FOR TRANSVERSE REINFORCEMENT

BENDING ANGLE OF BARS	FIGURE	DIAMETER OF BARS	DIAMETER OF BEND OF BARS OUT TO OUT	STRAIGHT EXTENSION LENGTH	REMARKS
90°		D10 TO D16 GENERAL	6 db	6 db	
		D10 TO D16 STIRRUP AND TIES	4 db	6 db	
		D32	6 db	12 db	
135°		D10 TO D25	8 db	6 db	

STANDARD HOOK IN TENSION

BENDING ANGLE OF BARS	FIGURE	DIAMETER OF BARS	DIAMETER OF BEND OF BARS OUT TO OUT	STRAIGHT EXTENSION LENGTH	REMARKS
180°		D10 - D25	8 db	4 db OR 60 mm min	
		D29, D32, D36	10 db		
		D43, D57	12 db		
90°		D10 - D25	8 db	12 db	
		D29, D32, D36	10 db		
		D43, D57	12 db		

8) TIES

IN TIED COMPRESSION MEMBERS, ALL LONGITUDINAL BARS SHALL BE ENCLOSED BY LATERAL TIES THAT SHALL BE EQUIVALENT TO 10MM BARS FOR 32MM DIAMETER BARS OR SMALLER.




THE SPACING AT TIES SHALL NOT EXCEED THE LEAST DIMENSION OF THE MEMBER OR 300MM.

TIES SHALL BE LOCATED VERTICALLY NOT MORE THAN HALF A TIE SPACING ABOVE THE FOOTING AND NOT MORE THAN HALF A TIE SPACING BELOW THE LOWEST HORIZONTAL REINFORCEMENT IN THE SUPPORT MEMBER.

9) REBAR DESCRIPTION

BAR MARK	NO.	BAR DIAMETER	SPACING	NOTE
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FOR COLUMNS REFERENCES TO BAR SPACING IS NOT GIVEN. BAR SHALL BE PLACED TO GIVE EQUAL SPACING IN COLUMNS UNLESS NOTED OTHERWISE.

<div> JAPAN INTERNATIONAL COOPERATION AGENCY</div> <div> KATAHIRA & ENGINEERS INTERNATIONAL</div>	DESIGNED BY		CHECKED BY		SUBMITTED BY		<div> REPUBLIC OF INDONESIA MINISTRY OF PUBLIC WORKS DIRECTORATE GENERAL OF HIGHWAYS</div> <div>APPROVED BY</div> <div><div>Ir. HERRY VAZA M,Eng.Sc NIP. : 110038400</div><div>Sign</div><div>Date</div></div>	PROJECT AND LOCATION :		SCALE :	DRAWING TITLE :	DRAWING NO :
	Name	A. GOURLEY	Name	T. OKUMURA	Name	M. KIUCHI		DETAILED DESIGN STUDY OF NORTH JAVA CORRIDOR FLYOVER PROJECT GEBANG FLYOVER - CONTRACT PACKAGE 2 (NAGREG - GEBANG) WEST JAVA PROVINCE		NOT TO SCALE	GENERAL NOTES FOR STRUCTURES (3 OF 3)	GGE-012
	Sign		Sign		Sign					SHEET NO :		
	Date		Date		Date				FULL SIZE A3	12 / 19		

10) PLACEMENT AND INSPECTION

(1) MAINTAIN PROPER SPACING BETWEEN BARS, USING SPACERS, HANGERS OF BAR SUPPORT.

(2) UNLESS OTHERWISE SHOWN ON THE PLANS, THE CLEAR DISTANCE BETWEEN PARALLEL BARS IN A LAYER SHALL NOT BE LESS THAN 1.5 TIMES THE NOMINAL BAR DIAMETER OF THE BAR NOR LESS THAN 1.5 TIMES THE MAXIMUM SIZE OF COARSE AGGREGATE.

FOR MULTILAYER, THE CLEAR DISTANCE BETWEEN LAYERS SHALL NOT BE LESS THAN 25MM OR THE NOMINAL DIAMETER. THE BARS IN THE UPPER LAYER SHALL BE PLACED DIRECTLY ABOVE THOSE IN THE BOTTOM LAYER.

11) CONSTRUCTION JOINT

(1) THE POSITION AND FORM OF ANY CONSTRUCTION JOINT SHALL BE AS SHOWN ON DRAWINGS OR AS AGREED WITH THE ENGINEER.

(2) THE INTERFACE BETWEEN THE FIRST AND SECOND POUR CONCRETES SHALL BE ROUGHENED WITH AN AMPLITUDE OF 6MM MINIMUM.

12) FALSEWORK

(1) ALL FALSEWORK SHALL BE DESIGNED BY THE CONTRACTOR SUBJECT TO THE APPROVAL OF THE ENGINEER.

(2) DETAILED WORKING DRAWINGS AND SUPPORTING CALCULATIONS OF THE FALSEWORK SHALL BE FURNISHED BY THE CONTRACTOR TO THE ENGINEER FOR HIS APPROVAL.

13) FORMWORK

(1) FORMWORK SHALL BE CONSTRUCTED SUCH THAT IT WILL NOT YIELD UNDER LOAD AND SHALL BE SUCH AS TO AVOID THE FORMATION OF FINS.

(2) UNLESS OTHERWISE SHOWN ON THE PLANS, ALL EXPOSED EDGES SHALL BE CHAMFERED 20MM EXCEPT RAILINGS AND RE - ENTRANT ANGLES WHICH SHALL BE CHAMFERED AND FILLETED 13MM.

(3) STRIPPING OF FORMS AND SHORINGS SHALL BE AS APPROVED BY THE ENGINEER. THE FOLLOWING MAY BE USED AS A GUIDE :

SHORING UNDER GIRDERS, BEAM, FRAMES

14 DAYS MIN. TIME

DECK SLABS

14 DAYS

WALLS

7 DAYS

COLUMNS

7 DAYS

SIDES OF BEAMS AND ALL OTHER VERTICAL SURFACES

2 DAYS

14) PROTECTION AND CURING OF CONCRETE

CONCRETE SURFACES SHALL BE PROTECTED FROM HARMFUL EFFECTS OF SUN, WIND AND RUNNING WATERS AND SHALL BE KEPT DAMP FOR AT LEAST 7 DAYS.

15) STRUCTURAL STEEL

(1) THE CONTRACTOR SHALL PREPARE AND SUBMIT SHOP DRAWINGS FOR ALL STRUCTURAL STEEL WORKS. THESE SHOP DRAWINGS SHALL BE APPROVED BY THE ENGINEER BEFORE ANY FABRICATION COMMENCES.


(2) CONSTRUCTION OF STRUCTURAL STEEL

- WELDING REQUIREMENTS SHALL IN ALL RESPECT CONFORM TO THE GENERAL SPECIFICATIONS OF THIS PROJECT.


- THE DIAMETER OF BOLT HOLES SHALL BE 2.5MM LARGER THAN THE NOMINAL DIAMETER OF BOLT.

SYMBOL AND INFORMATION FOR STEEL STRUCTURE DRAWINGS


WELDING SYMBOL




SQUARE




FILLET




SINGLE V




DOUBLE V



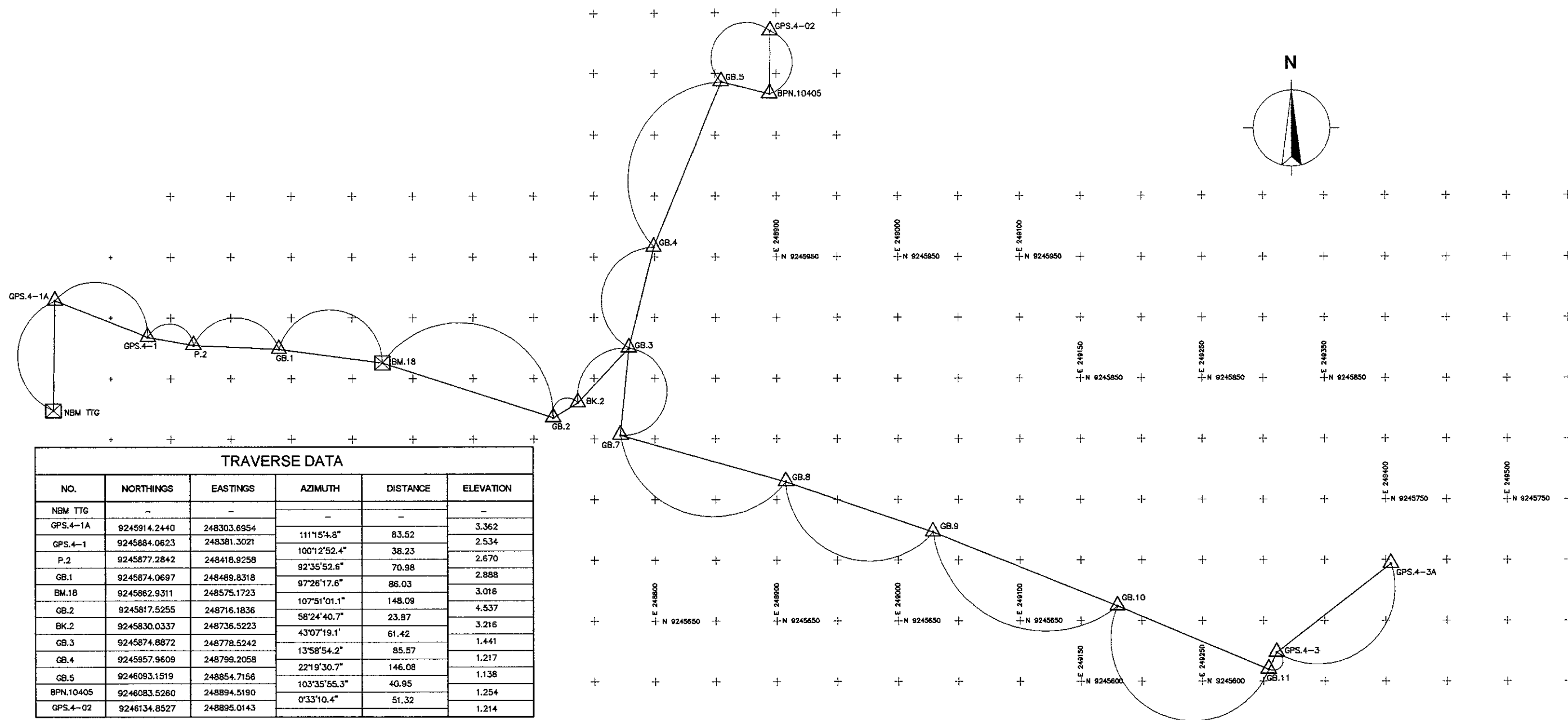
BEVEL



WELD ALL AROUND



WELD ALL AROUND



TRAVERSE DATA

NO.	NORTHINGS	EASTINGS	AZIMUTH	DISTANCE	ELEVATION
NBM TTG	-	-	-	-	-
GPS.4-1A	9245914.2440	248303.6954	111°15'4.8"	83.52	3.362
GPS.4-1	9245884.0623	248381.3021	100°12'52.4"	38.23	2.534
P.2	9245877.2842	248418.9258	92°35'52.6"	70.98	2.670
GB.1	9245874.0697	248489.8318	97°26'17.6"	86.03	2.888
BM.18	9245862.9311	248575.1723	107°51'01.1"	148.09	3.016
GB.2	9245817.5255	248716.1836	58°24'40.7"	23.87	4.537
BK.2	9245830.0337	248736.5223	43°07'19.1"	61.42	3.216
GB.3	9245874.8872	248778.5242	13°58'54.2"	85.57	1.441
GB.4	9245857.9609	248799.2058	22°19'30.7"	146.08	1.138
GB.5	9246093.1519	248854.7156	103°35'55.3"	40.95	1.254
BPN.10405	9246083.5260	248894.5190	0°33'10.4"	51.32	1.214

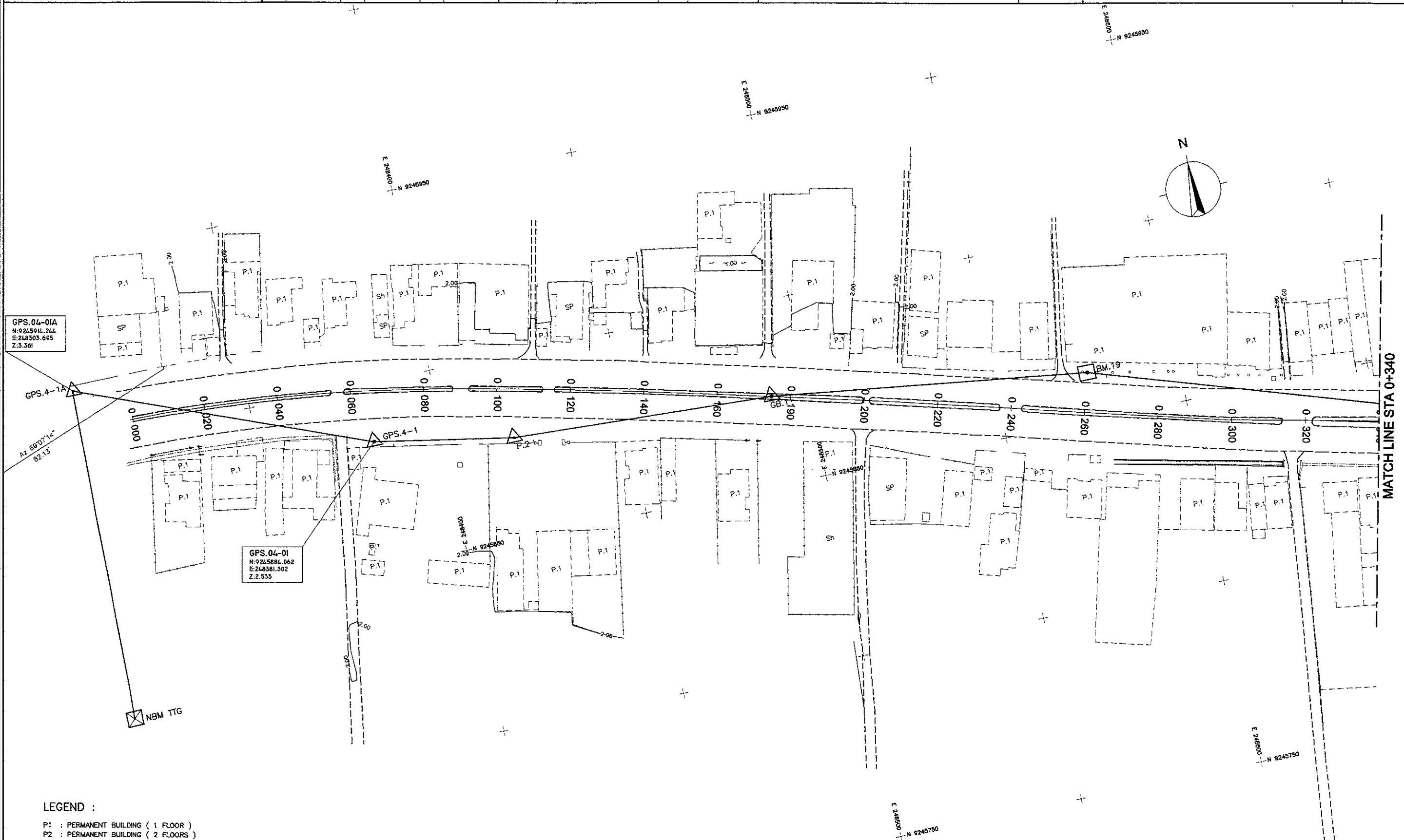
GB. 4	9245857.9609	248799.2058	193°58'47.7"	85.57	1.217
GB. 3	9245874.8872	248778.5242	185°36'51.9"	72.17	4.776
GB. 7	9245803.0652	248771.4652	105°49'37.1"	141.35	3.854
GB. 8	9245764.5125	248907.4600	108°47'53.7"	128.29	3.313
GB. 9	9245723.1710	249028.9101	112°02'15.3"	162.95	2.792
GB. 10	9245662.0290	249179.9550	112°51'21.7"	134.73	2.616
GB. 11	9245609.6964	249304.1084	24°53'48.0"	15.43	1.280
GPS.4-3	9245623.6839	249310.6009	52°06'14.9"	118.75	1.408
GPS.4-3A	9245696.6243	249404.3110			

NOTE:

FOR DESCRIPTION OF GPS STATION AND TRAVERSE POINT, REFER TO "FINAL REPORT OF THE TOPOGRAPHIC SURVEY" DECEMBER 2005 BY KATAHIRA & ENGINEERS INTERNATIONAL AND PT. VIRAMA KARYA (PERSERO)

LEGEND :

- : GPS
- △ : TRAVERSE
- ⊗ : BENCH MARK (BM)



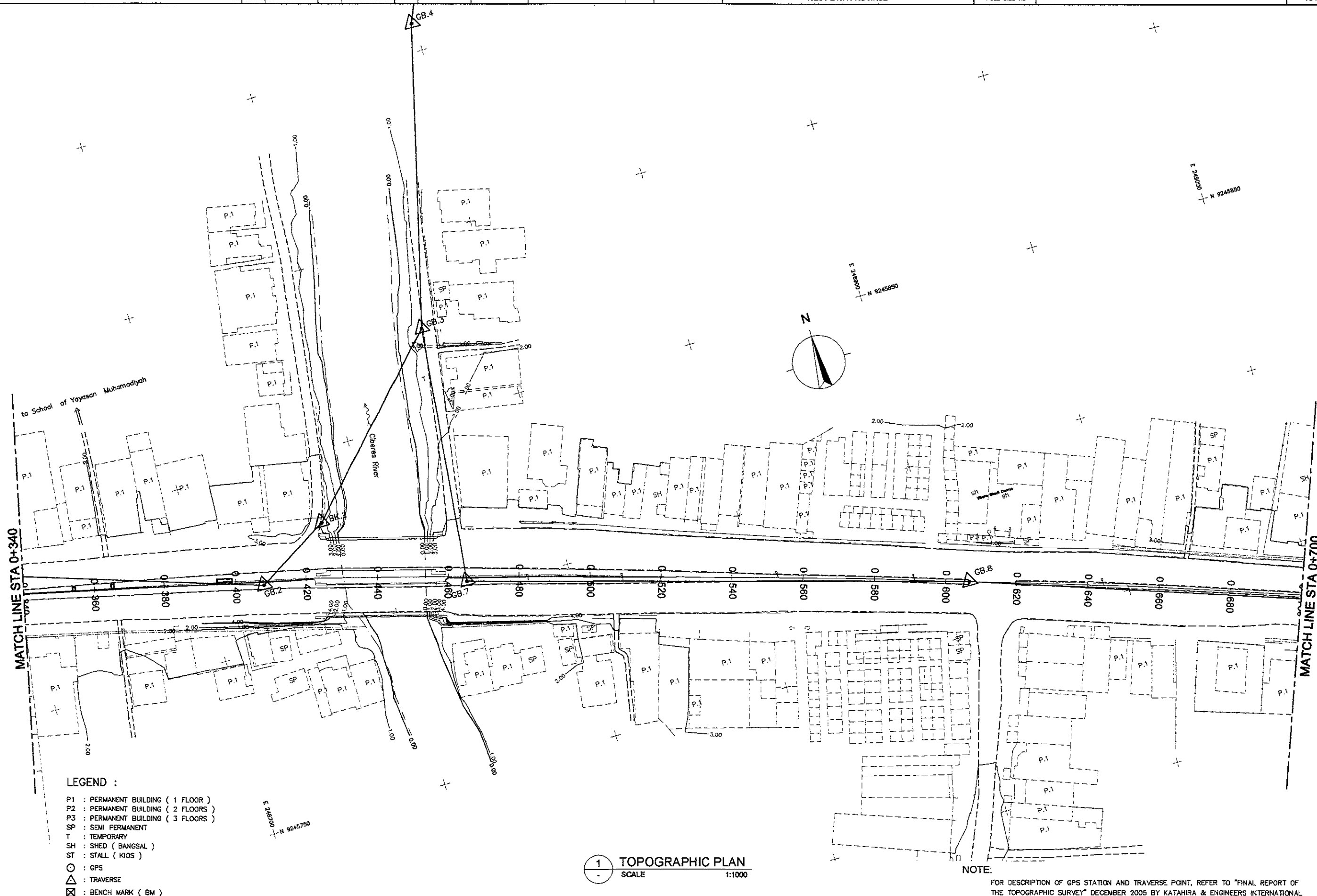
LEGEND :

- P1 : PERMANENT BUILDING (1 FLOOR)
- P2 : PERMANENT BUILDING (2 FLOORS)
- P3 : PERMANENT BUILDING (3 FLOORS)
- SP : SEMI PERMANENT
- T : TEMPORARY
- SH : SHED (BANGSAL)
- ST : STALL (KIOS)
- ⊙ : GPS
- △ : TRAVERSE
- ⊗ : BENCH MARK (BM)

1 TOPOGRAPHIC PLAN
SCALE 1:1000

NOTE:

FOR DESCRIPTION OF GPS STATION AND TRAVERSE POINT, REFER TO "FINAL REPORT OF THE TOPOGRAPHIC SURVEY" DECEMBER 2005 BY KATAHIRA & ENGINEERS INTERNATIONAL AND PT. VIRAMA KARYA (PERSERO)



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1 TOPOGRAPHIC PLAN
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DESIGNED BY	CHECKED BY	SUBMITTED BY
Name R. UENO	Name T. OKUMURA	Name M. KIUCHI
Sign	Sign	Sign
Date	Date	Date



APPROVED BY	Ir. HERRY VAZA M.Eng.Sc	Sign
NIP. : 110038400	Date	

PROJECT AND LOCATION :

DETAILED DESIGN STUDY OF
NORTH JAVA CORRIDOR FLYOVER PROJECT
GEBANG FLYOVER - CONTRACT PACKAGE 2
(NAGREG - GEBANG)
WEST JAVA PROVINCE

SCALE :

1 : 1000

FULL SIZE A3

DRAWING TITLE :

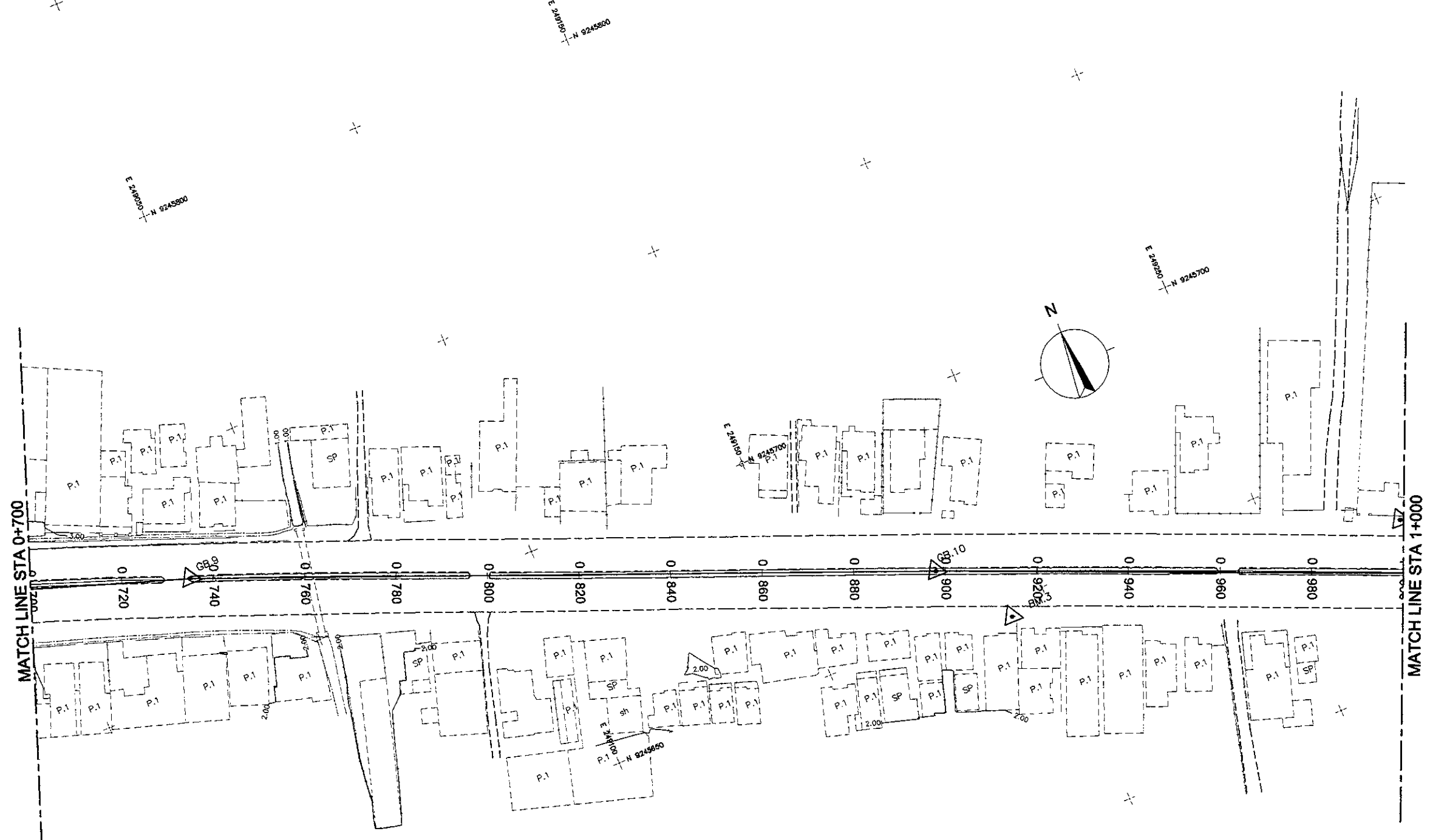
TOPOGRAPHIC PLAN
(3 OF 4)

DRAWING NO. :

GGE-016

SHEET NO. :

16 / 19



LEGEND :

- P1 : PERMANENT BUILDING (1 FLOOR)
- P2 : PERMANENT BUILDING (2 FLOORS)
- P3 : PERMANENT BUILDING (3 FLOORS)
- SP : SEMI PERMANENT
- T : TEMPORARY
- SH : SHED (BANGSAL)
- ST : STALL (KIOS)
- : GPS
- △ : TRAVERSE
- ⊗ : BENCH MARK (BM)

1 TOPOGRAPHIC PLAN
SCALE 1:1000

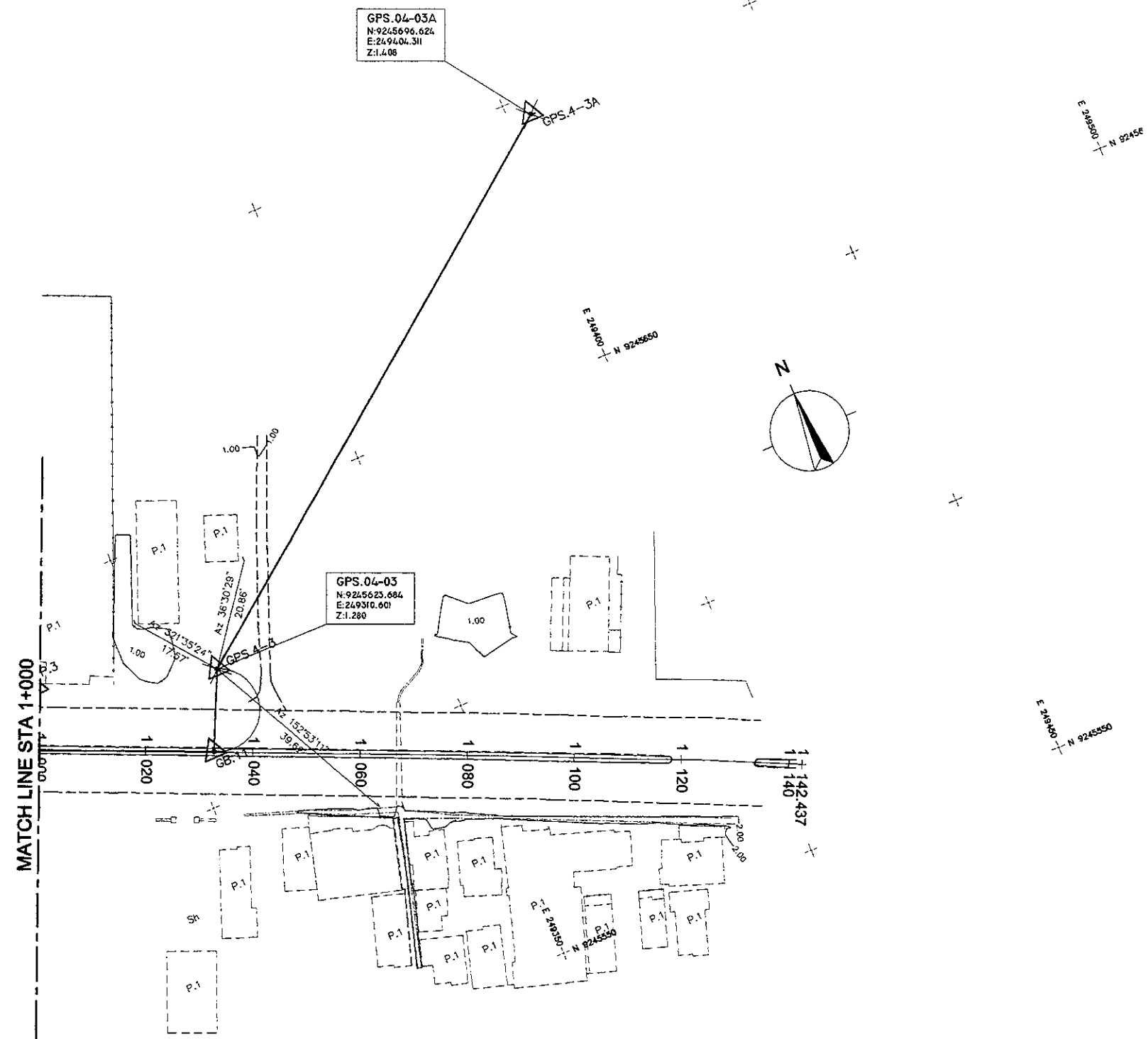
NOTE:




FOR DESCRIPTION OF GPS STATION AND TRAVERSE POINT, REFER TO "FINAL REPORT OF THE TOPOGRAPHIC SURVEY" DECEMBER 2005 BY KATAHIRA & ENGINEERS INTERNATIONAL AND PT. VIRAMA KARYA (PERSERO)

DESIGNED BY		CHECKED BY		SUBMITTED BY	
Name	R. UENO	Name	T. OKUMURA	Name	M. KIUCHI
Sign		Sign		Sign	
Date		Date		Date	






APPROVED BY	Ir. HERRY VAZA M,Eng.Sc	Sign	
	NIP. : 110038400	Date	



<div><div></div><div>JAPAN INTERNATIONAL COOPERATION AGENCY</div><div> KATAHIRA & ENGINEERS INTERNATIONAL</div></div>	DESIGNED BY		CHECKED BY		SUBMITTED BY		<div><div></div><div>REPUBLIC OF INDONESIA MINISTRY OF PUBLIC WORKS DIRECTORATE GENERAL OF HIGHWAYS</div></div>	PROJECT AND LOCATION :		SCALE :	DRAWING TITLE :	DRAWING NO :
	Name	R. UENO	Name	T. OKUMURA	Name	M. KIUCHI		DETAILED DESIGN STUDY OF NORTH JAVA CORRIDOR FLYOVER PROJECT GEBANG FLYOVER - CONTRACT PACKAGE 1 (NAGREG - GEBANG) WEST JAVA PROVINCE		NTS	SUMMARY OF QUANTITIES 1 OF 2	GGE-018
	Sign		Sign		Sign			SHEET NO :				
	Date		Date		Date			18 / 19				
				APPROVED BY		Ir. HERRY VAZA M.Eng.Sc NIP. : 110038400						

No. PAY ITEMS	DESCRIPTION	UNIT	TOTAL QUANTITY	REMARKS
DIVISION 1 - GENERAL				
1.2	Mobilization and Demobilization	LS	1.00	
1.2(1)b	Engineer Facilities	LS	1.00	
1.8	Maintenance and Protection of Traffic	LS	1.00	
DIVISION 2 - DRAINAGE				
2.1(1)	Common Excavation for drainage ditches and waterways	Cu.M	150.00	
2.2(1)	Mortared Stonework for drainage channel	Cu.M	11.47	
2.3(1)	Reinforced Concrete Pipe Culvert Inn.Dim. 40 cm Type A	Lin.M		
2.3(2)	Reinforced Concrete Pipe Culvert Inn.Dim. 40 cm Type B	Lin.M		
2.3(3)	Reinforced Concrete Pipe Culvert Inn.Dim. 60 cm Type A	Lin.M	0.00	
2.3(4)	Reinforced Concrete Pipe Culvert Inn.Dim. 60 cm Type B	Lin.M	29.70	
2.3(5)	Reinforced Concrete Pipe Culvert Inn.Dim. 80 cm Type A	Lin.M	678.00	
2.3(6)	Reinforced Concrete Pipe Culvert Inn.Dim. 80 cm Type B	Lin.M	0.00	
2.3(7)	Reinforced Concrete Pipe Culvert Inn.Dim. 100 cm Type A	Lin.M		
2.3(8)	Reinforced Concrete Pipe Culvert Inn.Dim. 100 cm Type B	Lin.M		
2.9(9)a	Manhole Type I	Each	57.00	
2.9(9)b	Manhole Type II	Each		
2.9(9)c	Manhole Type III	Each	27.00	
2.9(9)d	Manhole Type IV	Each	1.00	
2.9(9)e	Manhole Type V	Each	3.00	
2.9(9)f	Manhole Type VI	Each	5.00	
2.9(9)g	Manhole Type VII	Each	15.00	
2.9(9)h	Manhole Type VIII	Each	2.00	
2.9(9)i	Manhole Type IX	Each		
2.9(9)j	Manhole Type X	Each		
2.9(10)	Catch Basin Type I	Each	15.00	
2.3(12)a	U - Ditch, DS - 1	Each	260.80	
2.3(12)b	U - Ditch, DS - 2	Ln.M		
2.3(12)c	U - Ditch, DS - 3	Ln.M		
2.3(12)d	U - Ditch, DS - 3 A	Ln.M		
2.3(12)e	U - Ditch, DS - 4	Ln.M	1140.40	
2.3(12)f	U - Ditch, DS - 4 A	Ln.M	200.00	
2.3(12)g	U - Ditch, DS - 5	Ln.M		
2.3(13)	Drain Pipe Dia 150 mm	Ln.M	15.00	
2.3(14)	Drain Pipe Dia 200 mm	Ln.M	135.20	
2.3(15)	Drain Pipe Dia 250 mm	Ln.M		
2.3(16)	Deck Drain Type I	Each	0.00	
2.3(17)	Deck Drain Type II	Each	15.00	
2.3(18)	Steel Gutter drain screen	Ln.M	80.00	
2.3(19)	Outer Ditch Elevated	Ln.M	225.00	
DIVISION 3 - EARTHWORKS				
3.1(1)	Clearing and Grubbing	Sq.M	3774.48	
3.1(2)	Selected Tree Removal Diameter Ø200 mm Ø300 mm	Each	17.00	
3.1(3)	Selected Tree Removal Diameter > 300 mm	Each	14.00	
3.2(1)	Common Excavation	Cu. M	2830.86	
3.2(2)	Excavation of Existing Pavement	Cu. M	2176.88	
3.2(3)	Structure Excavation to a depth not exceeding 2 m	Cu. M	648.64	
3.2(4)	Structure Excavation to a depth greater than 2 m but not exceeding 4 m	Cu. M	62.19	
3.2(5)	Structure Excavation to a depth greater than 4 m	Cu. M		
3.2(7)	Rock Excavation	Cu. M		
3.3(1)	Borrow materials and common backfill	Cu. M	1125.14	
3.3(2)	Structural Backfill	Cu. M		
3.3(3)	Permeable Backfill	Cu. M	59.28	
SS 3.3	Soil Cement Improvement	Cu. M	656.00	
3.3(4)	Lightweight Embankment	Cu. M	6698.96	
3.3(6)	Intermediate Concrete Slab	Sq.M	5404.37	
3.4(1)	Sub Grade Preparation	Sq.M	10922.34	
SS 3.4 (1)	Mechanical Stabilized Earthwall and Accessories	Sq.M	85.59	
SS 3.4 (2)	Retaining Wall for Lightweight Embankment	Sq.M	1576.23	

No. PAY ITEMS	DESCRIPTION	UNIT	TOTAL QUANTITY	REMARKS
DIVISION 4 - PAVEMENT WIDENING AND SHOULDERS				
4.2(1)	Aggregate Sub Base Class B	Cu. M	105.26	
DIVISION . 5 GRANULAR PAVEMENT				
5.1.(1)	Aggregate Sub Base Class A	Cu. M	3382.22	
5.1.(2)	Aggregate Sub Base Class B	Cu. M	4481.33	
DIVISION . 6 ASPHALT PAVEMENT				
6.1.(1)	Prime Coat	Lite	9005.23	
6.1.(2)	Tack Coat	Lite	17704.73	
6.3.(1)	Asphalt Concrete Wearing Course (AC-WC)	Ton	2371.21	
6.3.(2)	Asphalt Concrete Binder Course (AC-BC)	Ton	1511.06	
6.3.(3)	Asphalt Concrete Base (AC-Base)	Ton	2014.74	
DIVISION 7 - STRUCTURE				
7.1.(1)a	Structure Concrete, Class A - (F _c ' = 35 Mpa) for Post Tension Double Girder	Cu m	779.20	
7.1.(1)b	Structure Concrete, Class A - (F _c ' = 35 Mpa) for Steel Girder	Cu m	655.22	
7.1.(2)a	Structure Concrete, Class B - (F _c ' = 30 Mpa) for Pier Head	Cu m	109.66	
7.1.(2)b	Structure Concrete, Class B - (F _c ' = 30 Mpa) for Coullumn	Cu m	122.53	
7.1.(2)c	Structure Concrete, Class B - (F _c ' = 30 Mpa) for Composite Coullumn	Cu m	148.57	
7.1.(2)d	Structure Concrete, Class B - (F _c ' = 30 Mpa) for Abutment	Cu m	134.91	
7.1.(3)a	Structure Concrete, Class B-1 (F _c ' = 28 Mpa) for Barrier, Median	Cu m		
7.1.(3)b	Structure Concrete, Class B-1 (F _c ' = 28 Mpa) for Parapet, Wall	Cu m	948.73	
7.1.(5)	Structure Concrete, Class C (F _c ' = 24 Mpa) for Footing, Approach Slab, Retaining Wall	Cu m	314.89	
7.1.(6)	Structure Concrete, Class D (F _c ' = 20 Mpa)	Cu m		
7.1.(8)	Structure Concrete, Class E (F _c ' = 17 Mpa)	Cu m	42.17	
SS 7.1.(9)	Waterproofing on Deck	Sq.M	3080.00	
SS 7.1.(10)	Structure Casing for Bored Pile (Ribber inner Surface t = 13 mm)	Kg	57650.40	
SS 7.1.(11)	Structure Casing for Bored Pile (Erected)	Kg	57650.40	
7.2.(9)	PC Strand Size 12.7 mm	Kg	17925.00	
7.2.(9)a	PC Strand Size 21.8 mm	Kg	13007.90	
7.3.(3)	PC Bar	Kg	1177.00	
7.3.(4)	Reinforcing Steel Bars Grade 40	Kg	475471.57	
7.5.(1)	Furnish and Delivery of Steel Girder	Ton	427.39	
7.5.(1)a	Furnish and Delivery of Steel Coping and Portal	Ton	154.70	
7.5.(3)	Erection of Steel Girder	Ton	427.39	
7.5.(4)	Erection of Steel Coping and Portal	Ton	154.70	
7.6.(22)	Cast in Place Concrete Bored Pile Dia 1500 mm	Ln. M	428.00	
7.6.(23)	Cast in Place Concrete Bored Pile Dia 1800 mm	Ln. M	146.00	
7.6.(26)	Cast in Place Concrete Bored Pile Dia 2500 mm	Ln. M	395.00	
7.6.(27)	Pile Integrity Test	Each	27.00	
SS 7.6.(28)	Pile Dynamic Analysis (PDA) Dia 1500 mm	Each	1.00	
SS 7.6.(29)a	Pile Dynamic Analysis (PDA) Dia 1800 mm	Each	1.00	
SS 7.6.(29)b	Pile Dynamic Analysis (PDA) Dia 2500 mm	Each	1.00	
7.9.(1)	Stone masonry	Cu. M	127.28	
7.9 (2)	Blinding Stone	Cu. M		
7.11.(2)	Expansion Joint (Type A)	Ln. M	48.00	
7.11.(3)	Expansion Joint (Type B)	Ln. M		
SS 7.11.(4)	Restrainer Type - A	Set	0.00	
SS 7.11.(5)	Restrainer Type - B	Set	6.00	
SS 7.11.(6)	Stopper for Steel Girder	Set	8.00	
7.12.(2)	Elastomeric Bearing Pad Type - A1	Set		
7.12.(2)a	Elastomeric Bearing Pad Type - A2	Set		
7.12.(2)b	Elastomeric Bearing Pad Type - A3	Set	0.00	
7.12.(2)c	Elastomeric Bearing Pad Type - A4	Set	4.00	
7.12.(2)a	Bridge Bearing for Steel Girder, Type - B1	Set		
7.12.(2)b	Bridge Bearing for Steel Girder, Type - B2	Set	8.00	
7.12.(2)c	Bridge Bearing for Steel Girder, Type - C1	Set	2.00	
7.12.(2)d	Bridge Bearing for Steel Girder, Type - C2	Set	0.00	
7.12.(2)e	Bridge Bearing for Steel Girder, Type - C3	Set	2.00	
7.12.(2)f	Bridge Bearing for Steel Girder, Type - C4	Set	0.00	

<div> JAPAN INTERNATIONAL COOPERATION AGENCY</div> <div> KATAHIRA & ENGINEERS INTERNATIONAL</div>	DESIGNED BY		CHECKED BY		SUBMITTED BY		<div> REPUBLIC OF INDONESIA MINISTRY OF PUBLIC WORKS DIRECTORATE GENERAL OF HIGHWAYS</div> <div>APPROVED BY Ir. HERRY VAZA M,Eng.Sc NIP. : 110038400</div>	PROJECT AND LOCATION :		SCALE :	DRAWING TITLE :	DRAWING NO :
	Name	R. UENO	Name	T. OKUMURA	Name	M. KIUCHI		DETAILED DESIGN STUDY OF NORTH JAVA CORRIDOR FLYOVER PROJECT GEBANG FLYOVER - CONTRACT PACKAGE 1 (NAGREG - GEBANG) WEST JAVA PROVINCE		NTS	SUMMARY OF QUANTITIES 2 OF 2	GGE-019
	Sign		Sign		Sign			FULL SIZE A3	SHEET NO :			
	Date		Date		Date				19 / 19			

No. PAY ITEMS	DESCRIPTION	UNIT	TOTAL QUANTITY	REMARKS
7.13	Steel Bridge Railings	Ln. M	1581.69	
7.14	Bridge Name Plate	Each	2.00	
7.15.(1)	Demolition of Existing Structure Masonry	Cu m	63.37	
7.15.(2)	Demolition of Existing Structure Concrete	Cu m	9.25	
7.15.(10)	Demolition of Existing Rigid Pavement	Sq. M		
7.15.(11)	Demolition of Existing Hedge of Fence	Ln. M	605.97	
7.15.(12)	Demolition of Existing Concrete Side Walk	Sq. M	186.86	
7.15.(13)	Demolition of Existing Concrete Curb	Ln. M	132.16	
7.15.(7)	Demolition of Existing Bridge	Ls		
7.16.(2)	Rigid Pavement (t= 270 mm)	Sq. M		
7.17.(1)	Lean Concrete for Rigid Pavement (t= 100 mm)	Sq. M	1.00	
	DIVISION 8 - MISCELLANEOUS			
8.1.(1)	Solid Sodding	Sq. M	2502.68	
8.3.(1)	Vehicle Guardrail Type - A	Ln. M	0.00	
8.3.(13)	BRC Fence	Ln. M	77.94	
8.3.(15)	Guard Fence Over Railway	Ln. M		
8.4.(1)	Regulatory and Warning Sign,Type A	Each	25.00	
8.4.(2)	Regulatory and Warning Sign,Type B	Each	0.00	
8.5.(17)	Overhead Sign, Type A	Each	1.00	
8.5.(18)	Overhead Sign, Type B	Each	3.00	
8.5.(19)	Overhead Sign, Type C	Each		
8.6.(6)	Reflective Thermoplastic Pavement Marking	Sq. M	827.10	
8.8.(1)	Precast Concrete Curb Type A	Ln M	2087.98	
8.8.(2)	Precast Concrete Curb Type B	Ln M	2054.65	
8.8.(3)	Concrete Median Type A	Ln M		
8.8.(4)	Concrete Median Type B	Ln M		
8.8.(5)	Concrete Sidewalk	Sq. M	1112.93	
	DIVISION 9 - UTILITIES			
9.1.1	Street Lighting Pole, Type A (11 m)	Each	78.00	
9.1.2	Street Lighting Ceiling, Type A - Sont 150 watt	Each	13.00	
9.1.3	Street Lighting Ceiling, Type B - Sont 250 watt	Each	0.00	
9.1.4 (a)	Panel Type LP-PJU.FO	Each	1.00	
9.1.4 (b)	Panel Type LP-PJU.1	Each	1.00	
9.1.4 (c)	Panel Type LP-PJU.2	Each	1.00	
9.1.4 (d)	Panel Type LP-PJU.3	Each	1.00	
9.1.4 (e)	Panel Type LP-PJU.4	Each	1.00	
9.1.4 (f)	Panel Type LP-PJU.5	Each	0.00	
9.1.4 (g)	Panel Type LP-PJU.6	Each	0.00	
9.1.5 (a)	Traffic Signal Head, Type A	Each	1.00	
9.1.5 (b)	Traffic Signal Head, Type B	Each	1.00	
9.1.6	Traffic Signal Pole, Type I	Each	1.00	
9.1.7	Traffic Signal Pole, Type II	Each	1.00	
9.1.8	Cable Type - 1 (NYFGBY 2C - 2.5 mm2)	Ln M	1187.00	
9.1.9	Cable Type - 3 (NYFGBY 4C - 10 mm2)	Ln M	3148.00	
9.1.10	Cable Type - 5 (NYFGBY 4C - 25 mm2)	Ln M	330.00	
9.1.11	Cable Type - 7 (NYFGBY 4C - 50 mm2)	Ln M	200.00	
9.1.12	Removal of Lighting Pole to stockpile	Each		
9.1.13	Removal of Lighting Signal to stockpile	Each	0.00	