



**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**

PETERONGAN FLYOVER

VOLUME IV DRAWINGS

**CONTRACT PACKAGE III
(PETERONGAN - TANGGULANGIN)**

DECEMBER 2006



KATAHIRA & ENGINEERS INTERNATIONAL

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JAPAN INTERNATIONAL
COOPERATION AGENCY






DIRECTORATE GENERAL OF HIGHWAY
MINISTRY OF PUBLIC WORKS
REPUBLIC OF INDONESIA

GENERAL

KEI KATAHIRA & ENGINEERS INTERNATIONAL




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	Name	R. UENO	Name	T. OKUMURA	Name	M. KIUCHI		DETAILED DESIGN STUDY OF NORTH JAVA CORRIDOR FLYOVER PROJECT PETERONGAN FLYOVER - CONTRACT PACKAGE 3 (PETERONGAN - TANGGULANGIN) EAST JAVA PROVINCE		NTS	INDEX OF DRAWINGS 2 OF 3	PGE-002
	Sign		Sign		Sign			SHEET NO. :				
	Date		Date		Date			02 / 18				
APPROVED BY		Ir. HERRY VAZA M.Eng.Sc		Sign								
				NIP. : 110038400								

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	Name: R. UENO	Name: T. OKUMURA	Name: M. KIUCHI		APPROVED BY	Ir. HERRY VAZA M,Eng.Sc	NTS	DETAILED DESIGN STUDY OF NORTH JAVA CORRIDOR FLYOVER PROJECT PETERONGAN FLYOVER - CONTRACT PACKAGE 3 (PETERONGAN - TANGGULANGIN) EAST JAVA PROVINCE	INDEX OF DRAWINGS 3 OF 3	PGE-003
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OVERHEAD SIGN TRUSS STRUCTURAL FRAME DETAILS 2 OF 2	PTR-016	16 / 24						
STANDARD TRAFFIC MANAGEMENT SIGNS DURING CONSTRUCTION	PTR-017	17 / 24						
STANDARD TRAFFIC MANAGEMENT SAFETY DEVICE DETAILS	PTR-018	18 / 24						
STANDARD SIGN BOARD PANEL	PTR-019	19 / 24						
STAGES OF CONSTRUCTION	PTR-020	20 / 24						
TYPICAL BORED PILING METHODOLOGY	PTR-021	21 / 24						
TYPICAL INSTALLATION OF GIRDER	PTR-022	22 / 24						
TYPICAL TRAFFIC MANAGEMENT LAYOUT 1 OF 2	PTR-023	23 / 24						
TYPICAL TRAFFIC MANAGEMENT LAYOUT 2 OF 2	PTR-024	24 / 24						
UTILITIES								
PUBLIC UTILITIES ABOVE GROUND 1 OF 6	PUT-001	01 / 13						
PUBLIC UTILITIES ABOVE GROUND 2 OF 6	PUT-002	02 / 13						
PUBLIC UTILITIES ABOVE GROUND 3 OF 6	PUT-003	03 / 13						
PUBLIC UTILITIES ABOVE GROUND 4 OF 6	PUT-004	04 / 13						
PUBLIC UTILITIES ABOVE GROUND 5 OF 6	PUT-005	05 / 13						
PUBLIC UTILITIES ABOVE GROUND 6 OF 6	PUT-006	06 / 13						
PUBLIC UTILITIES UNDER GROUND 1 OF 6	PUT-007	07 / 13						
PUBLIC UTILITIES UNDER GROUND 2 OF 6	PUT-008	08 / 13						
PUBLIC UTILITIES UNDER GROUND 3 OF 6	PUT-009	09 / 13						
PUBLIC UTILITIES UNDER GROUND 4 OF 6	PUT-010	10 / 13						
PUBLIC UTILITIES UNDER GROUND 5 OF 6	PUT-011	11 / 13						
PUBLIC UTILITIES UNDER GROUND 6 OF 6	PUT-012	12 / 13						
STANDARD DETAILS OF RELOCATION & PROTECTION UTILITY UNDER GROUND	PUT-013	13 / 13						
ROAD LIGHTING								
ABBREVIATIONS AND LEGEND	PRL-001	01 / 13						
ROAD LIGHTING PLAN OF FLYOVER	PRL-002	02 / 13						
ROAD LIGHTING PLAN OF SERVICE ROAD	PRL-003	03 / 13						
ROAD LIGHTING PLAN OF UNDER VIADUCT	PRL-004	04 / 13						
DIAGRAM PANEL OF FLYOVER 1 OF 2	PRL-005	05 / 13						
DIAGRAM PANEL OF FLYOVER 2 OF 2	PRL-006	06 / 13						
DIAGRAM PANEL OF RIGHT SERVICE ROAD	PRL-007	07 / 13						
DIAGRAM PANEL OF LEFT SERVICE ROAD	PRL-008	08 / 13						
LIGHTING PANEL	PRL-009	09 / 13						
LIGHTING POLE AT FLYOVER & PULL BOX DETAIL	PRL-010	10 / 13						
LIGHTING POLE AT SERVICE ROAD	PRL-011	11 / 13						
LIGHTING UNDER VIADUCT	PRL-012	12 / 13						
CONDUIT & CABLE INSTALATION	PRL-013	13 / 13						

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
 NIP. : 110038400

PROJECT AND LOCATION :
 DETAILED DESIGN STUDY OF
 NORTH JAVA CORRIDOR FLYOVER PROJECT
 PETERONGAN FLYOVER - CONTRACT PACKAGE 3
 (PETERONGAN - TANGGULANGIN)
 EAST JAVA PROVINCE

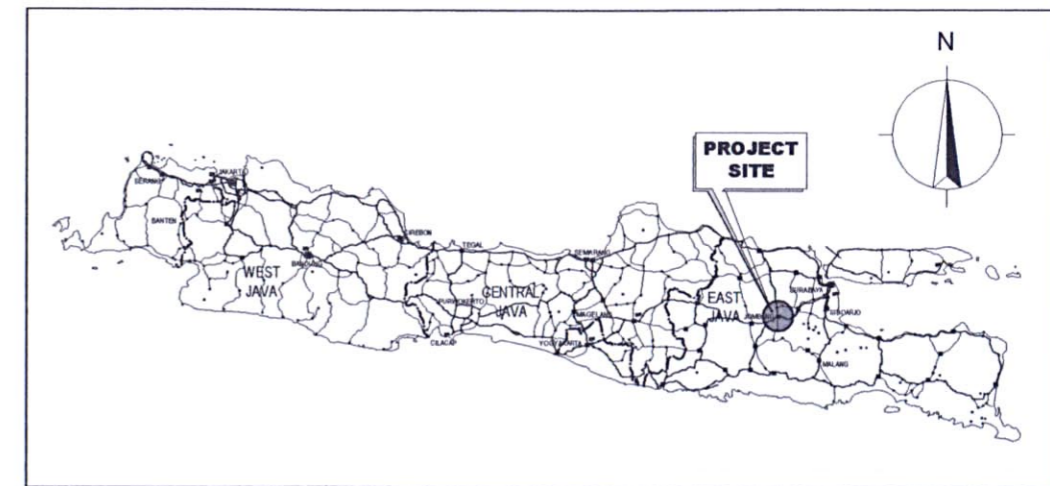
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 AS SHOWN
 FULL SIZE A3

DRAWING TITLE :
 LOCATION / VICINITY MAP

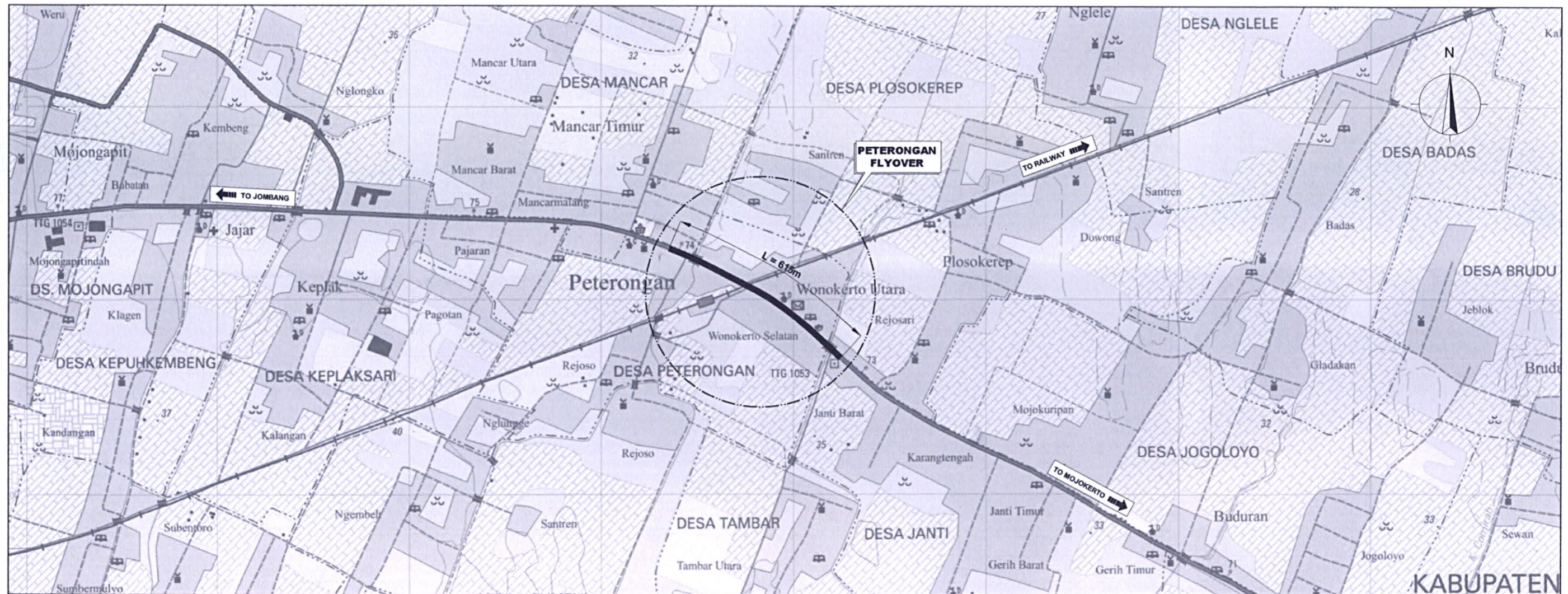
DRAWING NO :
 PGE-004
 SHEET NO :
 04 / 18



2 INDONESIA MAP
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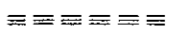






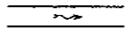
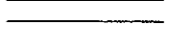


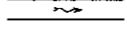
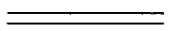


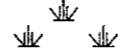
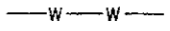


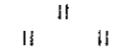
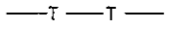



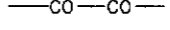



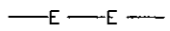



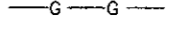


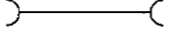
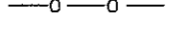


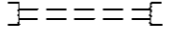



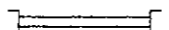



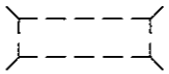



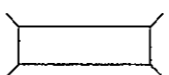




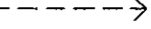
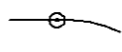


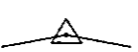

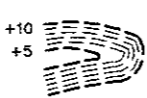
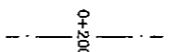



3 JAVA ISLAND MAP
 NOT TO SCALE



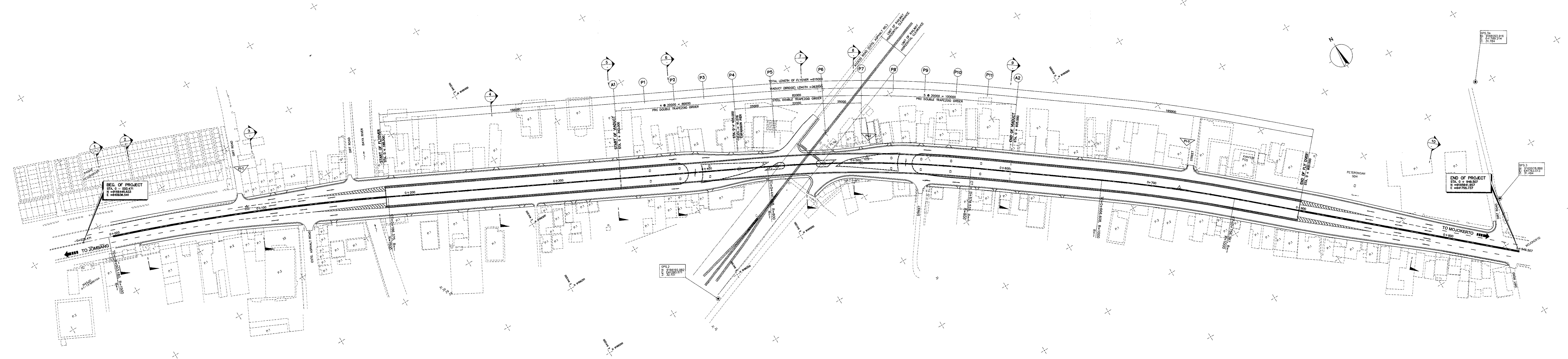
1 LOCATION / VICINITY MAP
 SCALE 1:20000

NOTATION AND LEGEND

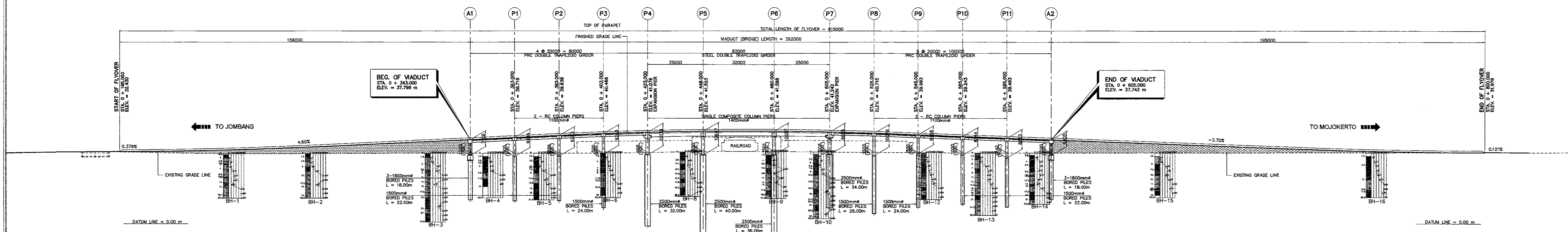
	PERMANENT BUILDING (1 FLOOR)		BANK		RIVER		RETAINING WALL
	PERMANENT BUILDING (2 FLOORS)		WAREHOUSE		POND (WATER)		RAILWAY
	PERMANENT BUILDING (3 FLOORS)		HOSPITAL/CLINIC		MAIN ROAD		MAIN ROAD
	SEMI PERMANENT BUILDING		HOTEL		ROAD		ROAD
	TEMPORARY		FACTORY		SWAMP		WATER SUPPLY
	SHED (BANGSAL)		FIRE STATION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

ABBREVIATIONS

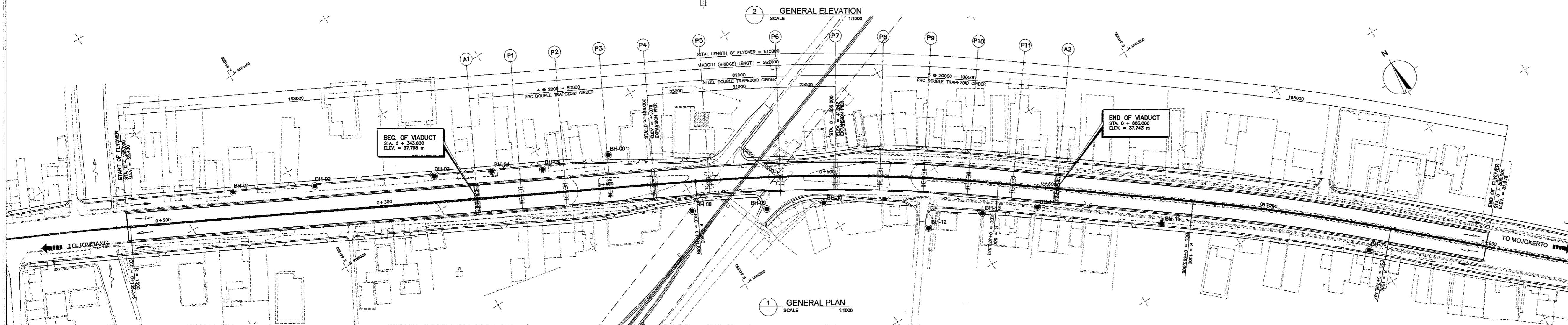
A	A PARAMETER OF CLOTHOID CURVE e AMPERE ABUT ABUTMENT A.C ASPHALTIC CONCRETE A.D AVERAGE DEPTH ADD. ADDITIONAL A.D.T. AVERAGE DAILY TRAFFIC ALIGN ALIGNMENT AHD. AHEAD ALT. ALTERNATE APPR. APPROACH APPROX APPROXIMATE ASPH ASPHALT AVE AVERAGE AZ. AZIMUTH	B	b WIDTH b' BOTTOM WIDTH b'' WIDENING B/B BACK TO BACK B BASE COURSE BC BOX CULVERT BEG BEGINNING BIT BITUMINOUS BK BACK ℓ BASELINE BLDGS BUILDINGS BLVD BOULEVARD B.M BENCH MARK BOT. BOTTOM BR. BRIDGE BP. BEGINNING POINT BRG. BEARING B.S BACK SLOPE B.S.T BITUMINOUS SURFACE TREATMENT B.T.C BEGINNING TRANSITION CURVE B.V.C.S. BEGINNING OF VERTICAL CURVE SPIRAL	C	C CUT (C) COMPUTED C/C CENTRE TO CENTRE CA.C.P CORRUGATED ALUM CULVERT PIPE C.A.P.A. CORRUGATED ALUM PIPE ARCH CEM. CEMETERY C.F.P CORNER FENCE POST C.I.P CAST IRON PIPE ℓ CENTER LINE CLASSIF CLASSIFICATION CLR. CLEARANCE CM CENTIMETER C.M.C.P. CORRUGATED METAL CULVERT PIPE C.M.P.A CORRUGATED METAL PIPE ARCH COMB. COMBINE COMP. COMPACTED CONC. CONCRETE CONT CONTACTOR CORP. CORPORATION CORR. CORRUGATED C.R CRUSHED ROCK C.S CIRCLE TO SPIRAL, CURVE SPIRAL CULV. CULVERT CU.M CUBIC METER X-SECTION CROSS SECTION	D	D DIAMETER, ϕ DEFORMED REBAR INNER DIAMETER (PIPE) DEGREE OF CURVE DD DECK DRAIN Do OUTER DIAMETER d DISTANCE DMH DRAINAGE MANHOLE Δ DEFLECTION ANGLE OR CENTRAL ANGLE AT ANY P.I Δ_t FIELD ANGLE Δ_C DEFLECTION ANGLE OR CIRCULAR ARC OF LENGTH L _c DET. DETAIL DF. DRIFT D.H.V DESIGN HOUR VOLUME DIA., ϕ DIAMETER DIM DIMENSION DIST DISTRICT D.I DROP INLET D.S.W DWARF STONE WALL D.B.S.T DOUBLE BITUMINOUS SURFACE TREATMENT DWG. DRAWING	E	E EXTERNAL DISTANCE OF CIRCULAR CURVE E_s EXTERNAL DISTANCE OF SPIRAL - CIRCLE - SPIRAL E_v MIDDLE ORDINATE VERTICAL CURVE e SUPERELEVATION CURVE e_{max} MAX. SUPERELEVATION RATE EL ELEVATION EMB EMBANKMENT EP END POINT E.P.S.D EROSION PROTECTION TO SIDE DRAIN EST ESTATE E.T.C. END TRANSITION CURVE E.V.C.S. END OF VERTICAL CURVE SPIRAL E'WKS EARTH WORKS EXC EXCAVATION EXP EXPANSION EXIST EXISTING EXT EXTERIOR EXN EXTEND	F	F FILL F.C FULL CROWN FDN FOUNDATION F.D.P FULL DEPTH PAVEMENT F.G FINISH GRADE FL FLOOR F L FLOW LINE FR FRAME FT FOOT (FEET) FWD. FORWARD	G	G GARAGE G.F GUARD FENCE GL GROUND LEVEL G.R GUARD RAIL GOVT. GOVERNMENT	H	H.C HALF CROWN HDWL HEADWALL HORIZ HORIZONTAL H.P HIGH POINT H.R HAND RAIL HT HEIGHT H.W.L HIGH WATER LEVEL H.W.Y HIGHWAY HZ FREQUENSY	I	Δ OR I INTERSECTION ANGLE INL INLET INT. INTERIOR INTERS INTERSECTION INV INVERT	J	JT. JOINT	K	KG. KILOGRAM KM. KILOMETER KPH/kph KILOMETER PER HOUR KWH KILO WATT HOUR	L	LAB LABORATORY L OR LC LENGTH OF CIRCULAR CURVE L' LENGTH OF CIRCULAR CURVE IN SPIRALED CURVE L_n M LINEAR METER L_s LENGTH OF SPIRAL LL LENGTH OF LEFT OFFSET LP LIGHTING PANEL LR LENGTH OF RIGHT OFFSET Lt LENGTH OF TRANSITION L_v V.C LENGTH OF VERTICAL CURVE LONG LONGITUDINAL L.S LEVELING SECTION L.S.D LINE SIDE DRAIN LT LEFT LTH LENGTH L.F LEFT FORWARD	M	M METER M LINEAR METER M M, m/m METER PER METER MAINT MAINTENANCE MAX MAXIMUM MCB MINIATURE CIRCUIT BREAKER M.D MAXIMUM DEPTH MN MANHOLE MPa Mega Pascal MIN MINIMUM M.O MIDDLE ORDINATE MOD MODIFIED MON MONUMENT M.R METER RADIAL MSW MORTAR STONE WORK	N	N NEW N.C NORMAL CROWN N.E NORTH EAST NO. NUMBER N.S.D NEW SIDE DRAIN NTS NOT TO SCALE N.W NORTH WEST N.W.L NORMAL WATER LEVEL N.W.R NO WORK REQUIRED	O	OUTL. OUTLET	P	% PERCENT PART PARTIAL PAVMT PAVEMENT P.C POINT OF CURVATURE PC PRESTRESSED CONCRETE P/C PRE-CAST P.C. CONC PORTLAND CEMENT CONCRETE P.C.C POINT OF COMPOUND CURVE P.C.T POINT OF COMMON TANGENCY P.D PRIVATE DRIVE P.I POINT OF INTERSECTION P.JU PENERANGAN JALAN UMUM (PUBLIC ROAD LIGHTING) ℓ OR ϕ PLATE P.L PROPERTY LINE P.O.C POINT ON CURVE P.O.T POINT ON TANGEN P.P POWER POLE P.R.C POINT ON REVERSE CURVE PREST PRESTRESSED PROGJ PROJECTION PROP PROPOSED P.T POINT OF TANGENCY PVC POINT OF VERTICAL CURVATURE P.V.I POINT OF VERTICAL INTERSECTION P.V.R.C POINT OF VERTICAL REVERSE CURVATURE P.V.T POINT OF VERTICAL TANGENCY	R	R RADIUS OF CURVE RCSC REINFORCED CONCRETE SLAB CULVERT RCBC REINFORCED CONCRETE BOX CULVERT R.C.P REINFORCED CONCRETE PIPE R.C.P.A REINFORCED CONCRETE PIPE ARCH RD ROAD ROWY ROADWAY REINF REINFORCING OR REINFORCEMENT REL RELOCATED REPL REPLACED REQ'D REQUIRED RES RESIDENTIAL RES'D RE-EXCAVATED SIDE DRAIN REST RESTAURANT R.H RIGHT HAND ROD RUN OF DRAIN ROW,R/W RIGHT OF WAY R.P REFERENCE POINT R.R RAILROAD RT RIGHT R.F RIGHT FORWARD RLWY RAILWAY REROD RE-EXCAVATED ROD	S	S SLOPE SALV SALVAGE S.C SPIRAL TO CIRCLE, SPIRAL -- CURVE SCH SCHOOL SCN HIGH PRESSURE SODIUM LAMP S.C.S SPIRAL CURVE SPIRAL S.E SOUTH EAST SECT SECTION SEP SEPTIC TANK S.D SIDE DITCH S.G SUBGRADE SH SHOULDER SHR SHRINKAGE SL SLOOPIING SO SOUTH SP SPECIAL S.P.S STRUCTURAL PLATE ARCH SPECS SPECIFICATIONS S.P.P STRUCTURAL PLATE PIPE S.P.P.A STRUCTURAL PLATE PIPE ARCH SQ SQUARE SQM SQUARE METERS S.S SERVICE STATION SS SPIRAL - SPIRAL S.ST SINGLE SURFACE TREATMENT S.T SPIRAL OF TANGENT STA STATION STD STANDARD STIRR STIRRUP STR STRUCTURAL SUBD SUBDIVISION SUM SUMATRA SURF. SURFACE SW SIDEWALK S.W SOUTH WEST SYMM SYMMETRICAL	T	T TANGENT LENGTH OF CURVE TAN TANGENT T.B.M TEMPORARY BENCH MARK TC TANGENT CURVE Θ THETA ANGLE, CENTRAL ANGLE OF SPIRAL TEM TEMPORARY THK THICKNESS T.K.P TRAVERSE CONTROL POINT T.L TRANSIT LINE T.S TANGENT SPIRAL T_s TANGENT LENGTH OF SPIRALED CURVE T.T TRANSMISSION TOWER TYP TYPICAL	U	U URBAN	V	V VOLTAGE VA VOLT AMPERE VAR VARIES V.VEL VELOCITY V.C VERTICAL CURVE VERT VERTICAL	W	W WELL, WATT W.B WATER BOUND MACADAM WD WOOD WGT WEIGHT WH WAREHOUSE W/O WITHOUT W.R WORK REQUIRED W.S WATER SERVICE W.T WATER POWER W.W WING WALL 1R NUMBER OF GROUP PHASE.R 2S NUMBER OF GROUP PHASE.S 3T NUMBER OF GROUP PHASE.T
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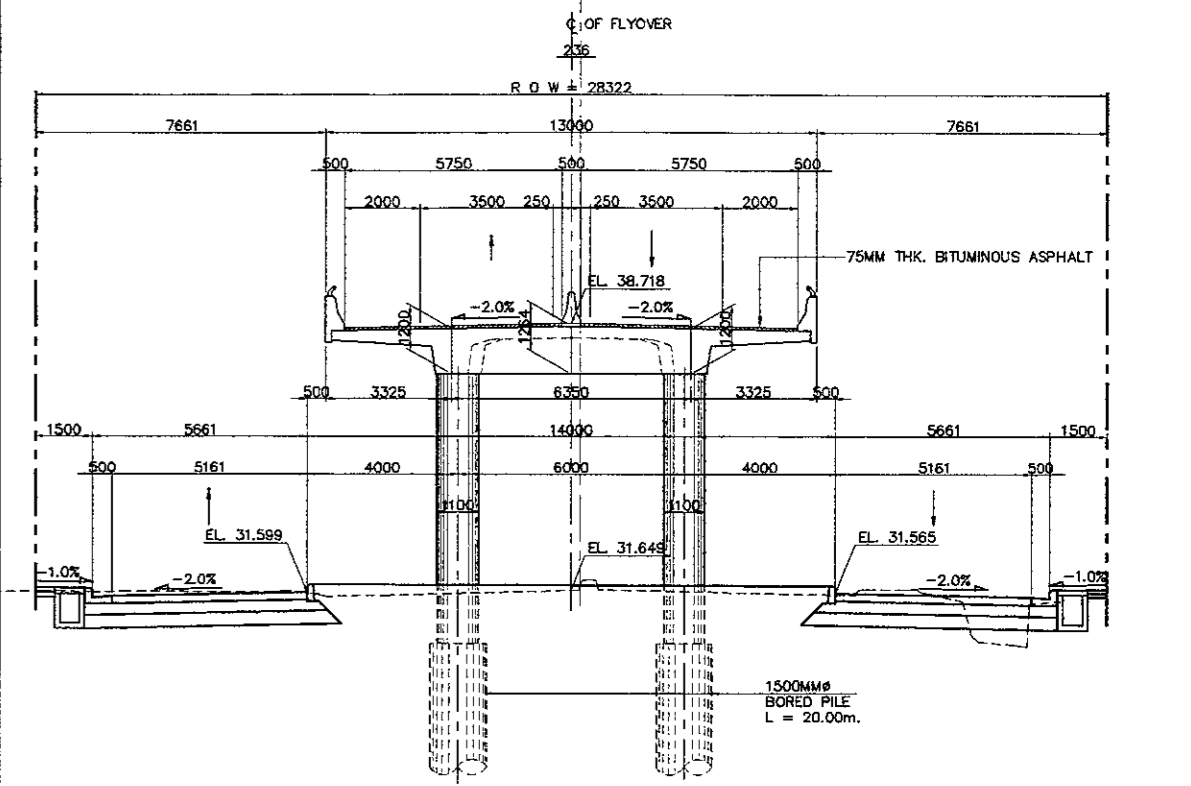
2 GENERAL DEVELOPMENT PLAN
SCALE 1:1000



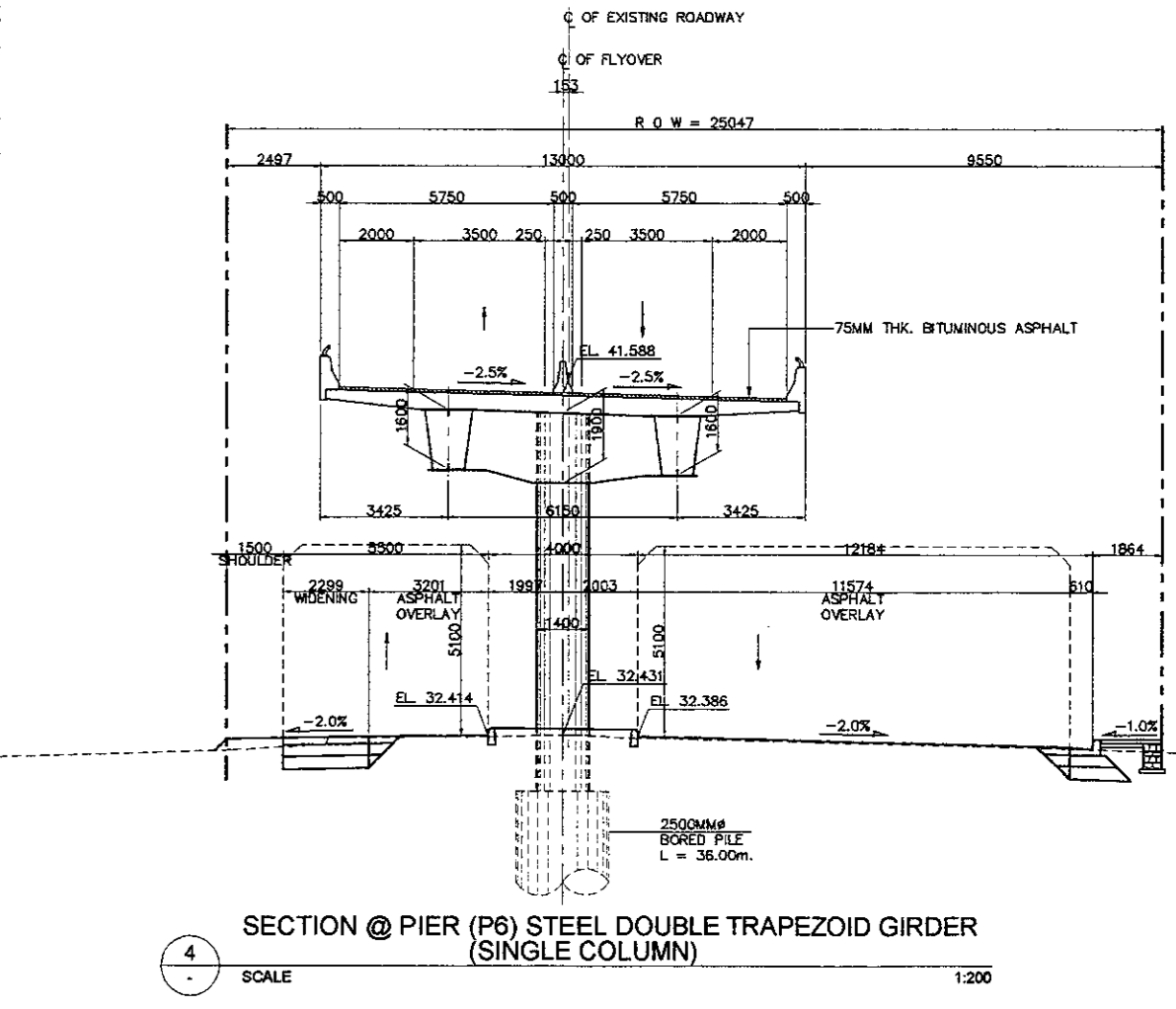
2 GENERAL ELEVATION
 SCALE 1:1000






1 GENERAL PLAN
 SCALE 1:1000



3 SECTION @ PIER (P1) PRC DOUBLE TRAPEZOID GIRDER (DOUBLE COLUMN)
 SCALE 1:200



4 SECTION @ PIER (P6) STEEL DOUBLE TRAPEZOID GIRDER (SINGLE COLUMN)
 SCALE 1:200

 JAPAN INTERNATIONAL COOPERATION AGENCY  KATAHIRA & ENGINEERS INTERNATIONAL	DESIGNED BY	CHECKED BY	SUBMITTED BY	 REPUBLIC OF INDONESIA MINISTRY OF PUBLIC WORKS DIRECTORATE GENERAL OF HIGHWAYS	PROJECT AND LOCATION :	SCALE :	DRAWING TITLE :	DRAWING NO. :	
	Name R. UENO	Name T. OKUMURA	Name M. KIUCHI		APPROVED BY	Ir. HERRY VAZA M,Eng.Sc	NTS	GENERAL NOTES ROADS AND DRAINAGE	PGE-009
	Sign	Sign	Sign		Sign	Date	FULL SIZE A3		SHEET NO. :

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. PETERONGAN FLYOVER HAS THE FOLLOWING MAJOR CONTROL POINTS USED IN THE DESIGN OF HORIZONTAL AND VERTICAL ALIGNMENT:
- EXISTING RAILWAY CROSSING
 - RIGHT - OF - WAY OF PT.KAI RAILWAY
 - EXISTING RAILWAY GRADIENT
 - EXISTING BRIDGE
 - EXISTING ROADWAY WIDTH
 - EXISTING BIRD HOUSES
 - ADJACENT BUILT - UP AREAS

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, UNBLOCKING 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.

 JAPAN INTERNATIONAL COOPERATION AGENCY KATAHIRA & ENGINEERS INTERNATIONAL	DESIGNED BY	CHECKED BY	SUBMITTED BY	 REPUBLIC OF INDONESIA MINISTRY OF PUBLIC WORKS DIRECTORATE GENERAL OF HIGHWAYS	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 PETERONGAN FLYOVER - CONTRACT PACKAGE 3 (PETERONGAN - TANGGULANGIN) EAST JAVA PROVINCE	NOT TO SCALE	GENERAL NOTES FOR STRUCTURES (1 OF 3)	PGE-010
	Sign: _____	Sign: _____	Sign: _____					
Date: _____	Date: _____	Date: _____	APPROVED BY	Ir. HERRY VAZA M,Eng.Sc NIP. : 110038400	FULL SIZE A3			

GENERAL NOTES FOR STRUCTURES (1)

GENERAL

- IN THE INTERPRETATION OF DRAWINGS, INDICATED DIMENSIONS SHALL GOVERN ALL DIMENSIONS. DISTANCES AND SIZES SHALL NOT BE SCALED FOR CONSTRUCTION PURPOSES.
- ELEVATIONS, STATIONS AND COORDINATES ARE SHOWN IN METERS, OTHER DIMENSIONS AND MEMBER SIZES ARE IN MILIMETERS 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/mm ²)	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/mm ²)	TENSILE STRENGTH (N/mm ²)	DESIGNATION	YIELD POINT (N/mm ²)	TENSILE STRENGTH (N/mm ²)
G 3101			A 36	250	400 - 500
SS 400	215 - 245	400 - 510			
G 3106			A 242	290 - 340	≥ 430
SM 400	215 - 245	400 - 510	A 440	290 - 340	430 - 480
SM 490	295 - 325	490 - 610	A 441	290 - 340	430 - 480
SM 490 Y	325 - 365	490 - 610	A 588	290 - 340	430 - 480
SM 520	325 - 365	520 - 640	A 572	410 - 450	510 - 550
SM 570	420 - 460	570 - 720			
G 3114			A 514	620 - 690	690 - 900
SMA 400W	215 - 245	400 - 540			
SMA 490W	325 - 365	490 - 610			
SMA 570W	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/mm ²)	BRAKING STRENGTH (Kg/mm ²)	APPLICATION STANDARD	
					JIS	ASTM
PC WIRE SWPR 1A	PC PILE	∅ 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		∅ 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

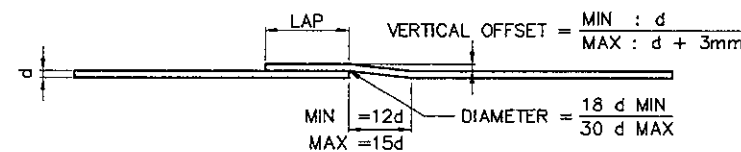
BASIC DEVELOPMENT FOR REBAR

DEVELOPMENT LENGTH/SPLICE 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 SPLICED.
- THE MAXIMUM SPACING OF THE TRANSVERSE REINFORCEMENT OVER THE LENGTH OF THE SPLICE 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 SPLICED 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.

 JAPAN INTERNATIONAL COOPERATION AGENCY  KATAHIRA & ENGINEERS INTERNATIONAL	DESIGNED BY	CHECKED BY	SUBMITTED BY	 REPUBLIC OF INDONESIA MINISTRY OF PUBLIC WORKS DIRECTORATE GENERAL OF HIGHWAYS	PROJECT AND LOCATION :	SCALE :	DRAWING TITLE :	DRAWING NO :		
	Name A. GOURLEY	Name T. OKUMURA	Name M. KIUCHI		APPROVED BY	Ir. HERRY VAZA M,Eng.Sc NIP. : 110038400	DETAILED DESIGN STUDY OF NORTH JAVA CORRIDOR FLYOVER PROJECT PETERONGAN FLYOVER - CONTRACT PACKAGE 3 (PETERONGAN - TANGGULANGIN) EAST JAVA PROVINCE	NOT TO SCALE	GENERAL NOTES FOR STRUCTURES (3 OF 3)	PGE-012
	Sign	Sign	Sign							Sign

GENERAL NOTES FOR STRUCTURES (3)

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.

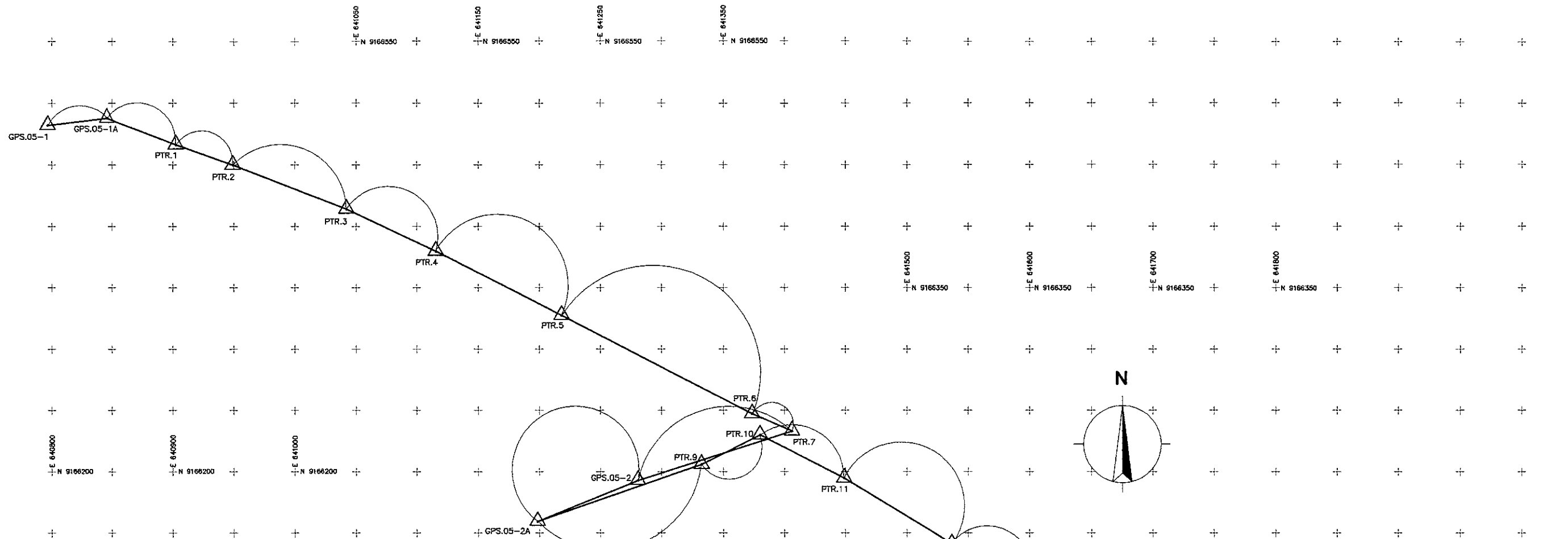
SYMBOL AND INFORMATION FOR STEEL STRUCTURE DRAWINGS
WELDING SYMBOL

- | | |
|---|-----------------|
|  | SQUARE |
|  | FILLET |
|  | SINGLE V |
|  | DOUBLE V |
|  | BEVEL |
|  | WELD ALL AROUND |
|  | WELD ALL AROUND |

16) QUANTITIES

THE QUANTITIES FOR BRIDGE AND STRUCTURES SHOWN ON THE DRAWINGS ARE APPROXIMATELY AND FOR REFERENCE PURPOSES ONLY. ANY DISCREPANCY BETWEEN THESE ESTIMATED QUANTITIES AND THE FINALLY ACCEPTED QUANTITIES SHALL NOT BE A REASON FOR CLAIMS OR DISPUTE.

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

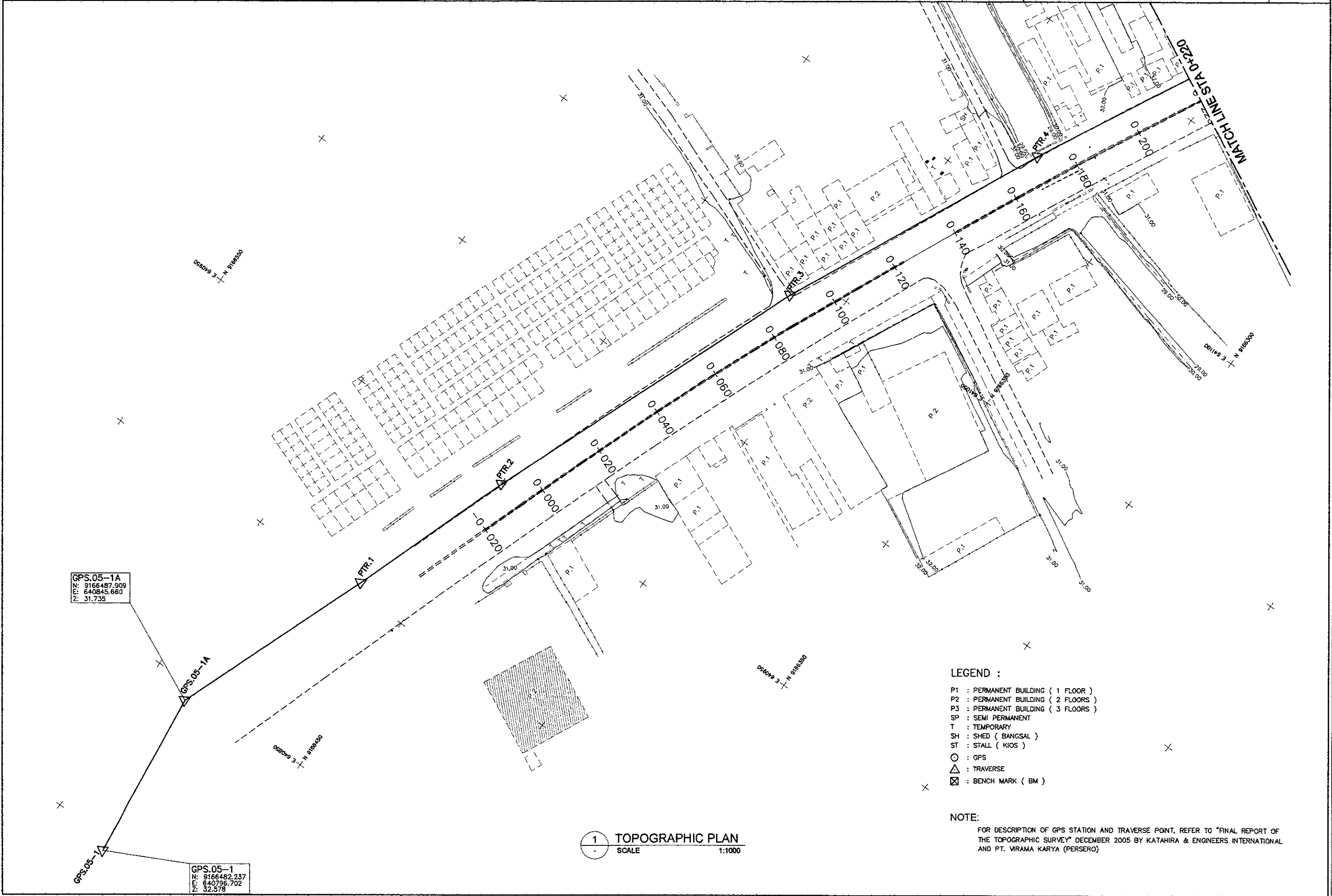


NO.	NORTHINGS	EASTINGS	AZIMUTH	DISTANCE	ELEVATION
GPS.05-1	9166482.2367	640796.7015			32.578
GPS.05-1A	9166487.9086	640845.6596	83°23'29"	49.29	31.736
PTR. 1	9166466.2987	640902.7224	110°44'31"	61.02	31.386
PTR. 2	9166449.8622	640949.5044	109°21'33"	49.59	31.270
PTR. 3	9166414.0650	641042.2271	111°06'35"	99.39	31.150
PTR. 4	9166379.6667	641115.8414	115°02'44"	81.25	32.329
PTR. 5	9166327.4320	641218.5561	116°57'19"	115.23	31.515
PTR. 6	9166247.0670	641373.8255	117°21'55"	174.83	32.309
PTR. 7	9166233.1156	641406.4046	113°10'54"	35.44	32.168
GPS.05-2	9166192.882	641280.8712	252°13'45"	131.82	32.101
GPS.05-2A	9166159.425	641198.6695	247°51'11"	88.75	32.599
PTR. 9	9166205.9659	641332.6081	70°50'19"	141.79	31.694
PTR. 10	9166229.7376	641380.1182	63°25'07"	53.13	32.332
PTR. 11	9166194.629	641449.2538	297°33'39"	59.57	32.119
PTR. 12	9166141.1461	641536.6972	116°55'22"	77.54	31.700
PTR. 13	9166096.7884	641593.7861	121°27'04"	102.50	31.969
PTR. 14	9166026.2140	641675.5122	127°50'50"	72.30	31.999
PTR. 15	9165956.8817	641752.0099	130°48'43"	107.98	32.535
GPS.05-3	9165978.8845	641763.0117	132°11'13"	103.24	31.494
GPS.05-3A	9166053.9156	641789.2140	26°33'56"	24.60	31.784
NBM TTG			19°15'00"	79.47	

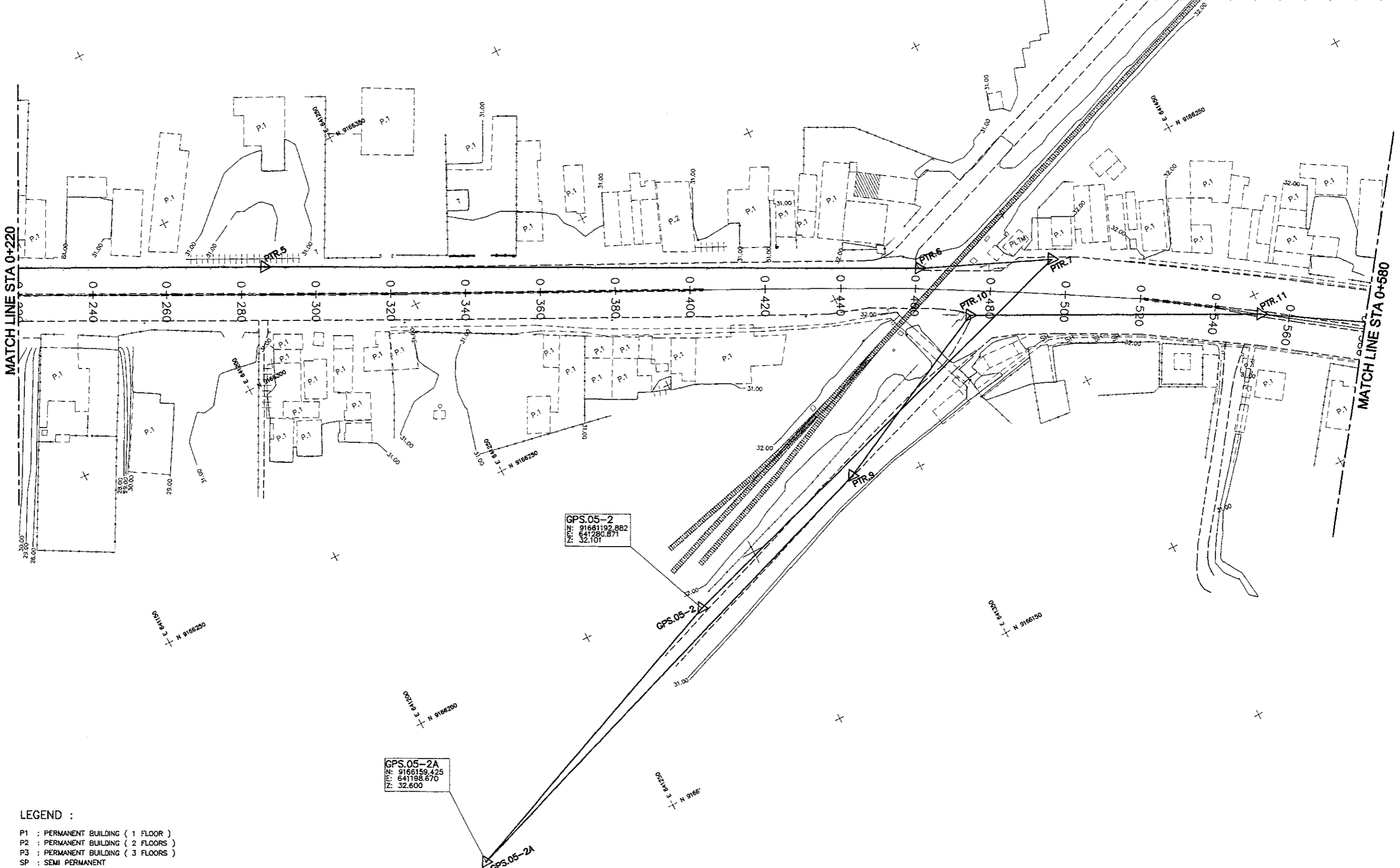
NOTE:
 FOR DESCRIPTION OF GPS STATION AND TRAVERSE POINT, REFER TO "FINAL REPORT OF THE TOPOGRAPHIC SURVEY" DECEMBER 2005 BY KATAHIRA & ENGINEERS INTERNATIONAL AND PT. VIRAMA KARYA (PERSERO)

LEGEND :
 ○ : GPS
 △ : TRAVERSE
 ⊠ : BENCHMARK (BM)

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



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



- 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
 NIP. : 110038400

PROJECT AND LOCATION :
 DETAILED DESIGN STUDY OF
 NORTH JAVA CORRIDOR FLYOVER PROJECT
 PETERONGAN FLYOVER - CONTRACT PACKAGE 3
 (PETERONGAN - TANGGULANGIN)
 EAST JAVA PROVINCE

SCALE :
 1 : 1000
 FULL SIZE A3

DRAWING TITLE :
 TOPOGRAPHIC PLAN
 (3 OF 3)

DRAWING NO :
 PGE-016
 SHEET NO :
 16 / 18



GPS.05-3A
 N: 9166053.916
 E: 641869.214
 Z: 31.784

GPS.05-3
 N: 9165978.888
 E: 641863.013
 Z: 31.484

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	

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	120.00	
2.2(1)	Mortared Stonework for drainage channel	Cu.M	21.10	
2.3(1)	Reinforced Concrete Pipe Culvert Inn.Dim. 40 cm Type A	Ln.M		
2.3(2)	Reinforced Concrete Pipe Culvert Inn.Dim. 40 cm Type B	Ln.M		
2.3(3)	Reinforced Concrete Pipe Culvert Inn.Dim. 60 cm Type A	Ln.M	10.00	
2.3(4)	Reinforced Concrete Pipe Culvert Inn.Dim. 60 cm Type B	Ln.M	66.30	
2.3(5)	Reinforced Concrete Pipe Culvert Inn.Dim. 80 cm Type A	Ln.M	456.70	
2.3(6)	Reinforced Concrete Pipe Culvert Inn.Dim. 80 cm Type B	Ln.M	0.00	
2.3(7)	Reinforced Concrete Pipe Culvert Inn.Dim. 100 cm Type A	Ln.M		
2.3(8)	Reinforced Concrete Pipe Culvert Inn.Dim. 100 cm Type B	Ln.M		
2.9(9)a	Manhole Type I	Each	53.00	
2.9(9)b	Manhole Type II	Each	0.00	
2.9(9)c	Manhole Type III	Each	17.00	
2.9(9)d	Manhole Type IV	Each	1.00	
2.9(9)e	Manhole Type V	Each	6.00	
2.9(9)f	Manhole Type VI	Each	8.00	
2.9(9)g	Manhole Type VII	Each	18.00	
2.9(9)h	Manhole Type VIII	Each		
2.9(9)i	Manhole Type IX	Each		
2.9(9)j	Manhole Type X	Each		
2.9(10)	Catch Basin Type I	Each	14.00	
2.3(12)a	U - Ditch, DS - 1	Each	133.60	
2.3(12)b	U - Ditch, DS - 2	Ln.M	0.00	
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	1161.17	
2.3(12)f	U - Ditch, DS - 4 A	Ln.M		
2.3(12)g	U - Ditch, DS - 5	Ln.M	300.00	
2.3(13)	Drain Pipe Dia 150 mm	Ln.M		
2.3(14)	Drain Pipe Dia 200 mm	Ln.M	212.69	
2.3(15)	Drain Pipe Dia 250 mm	Ln.M	191.60	
2.3(16)	Deck Drain Type I	Each		
2.3(17)	Deck Drain Type II	Each	39.00	
2.3(18)	Steel Gutter drain screen	Ln.M		
2.3(19)	Outer Ditch Elevated	Ln.M		
2.3(21)	Box culvert	Ln.M	33.10	
DIVISION 3 - EARTHWORKS				
3.1(1)	Clearing and Grubbing	Sq.M	8532.29	
3.1(2)	Selected Tree Removal Diameter 200 mm - 300 mm	Each	26.00	
3.1(3)	Selected Tree Removal Diameter > 300 mm	Each	6.00	
3.2(1)	Common Excavation	Cu.M	5377.43	
3.2(2)	Excavation of Existing Pavement	Cu.M	276.41	
3.2(3)	Structure Excavation to a depth not exceeding 2 m	Cu.M	525.87	
3.2(4)	Structure Excavation to a depth greater than 2 m but not exceeding 4 m	Cu.M	89.23	
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	10225.37	
3.3(2)	Structural Backfill	Cu.M	150.00	
3.3(3)	Permeable Backfill	Cu.M	180.00	
SS 3.3	Soil Cement Improvement	Cu.M		
3.3(4)	Lightweight Embankment	Cu.M		
3.3(6)	Intermediate Concrete Slab	Sq.M		
3.4(1)	Sub Grade Preparation	Sq.M	13093.85	
SS 3.4 (1)	Mechanical Stabilized Earthwall and Accessories	Sq.M	2071.77	
SS 3.4 (2)	Retaining Wall for Lightweight Embankment	Sq.M		

No. PAY ITEMS	DESCRIPTION	UNIT	TOTAL QUANTITY	REMARKS
DIVISION 4 - PAVEMENT WIDENING AND SHOULDERS				
4.2(1)	Aggregate Sub Base Class B	Cu.M	185.16	
DIVISION 5 GRANULAR PAVEMENT				
5.1(1)	Aggregate Sub Base Class A	Cu.M	3277.52	
5.1(2)	Aggregate Sub Base Class B	Cu.M	4562.60	
DIVISION 6 ASPHALT PAVEMENT				
6.1(1)	Prime Coat	Litre	10966.76	
6.1(2)	Tack Coat	Litre	17567.01	
6.3(1)	Asphalt Concrete Wearing Course (AC-WC)	Ton	2021.68	
6.3(2)	Asphalt Concrete Binder Course (AC-BC)	Ton	1788.89	
6.3(3)	Asphalt Concrete Base (AC-Base)	Ton	2474.59	
DIVISION 7 - STRUCTURE				
7.1(1)a	Structure Concrete, Class A - (F _c ' = 35 Mpa) for Post Tension Double Girder	Cu m	1201.98	
7.1(1)b	Structure Concrete, Class A - (F _c ' = 35 Mpa) for Steel Girder	Cu m	383.86	
7.1(2)a	Structure Concrete, Class B - (F _c ' = 30 Mpa) for Pier Head	Cu m	100.41	
7.1(2)b	Structure Concrete, Class B - (F _c ' = 30 Mpa) for Column	Cu m	101.85	
7.1(2)c	Structure Concrete, Class B - (F _c ' = 30 Mpa) for Composite Column	Cu m	68.40	
7.1(2)d	Structure Concrete, Class B - (F _c ' = 30 Mpa) for Abutment	Cu m	189.92	
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	809.70	
7.1(5)	Structure Concrete, Class C (F _c ' = 24 Mpa) for Footing, Approach Slab, Retaining Wall	Cu m	230.06	
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	32.94	
SS 7.1(9)	Waterproofing on Deck	SqM	3013.00	
SS 7.1(10)	Structure Casing for Bored Pile (Ribber Inner Surface t = 13 mm)	Kg	19216.80	
SS 7.1(11)	Structure Casing for Bored Pile (Erected)	Kg	19216.80	
7.2(9)	PC Strand Size 12.7 mm	Kg	26904.00	
7.2(9)a	PC Strand Size 21.8 mm	Kg	12996.73	
7.3(3)	PC Bar	Kg	1865.00	
7.3(4)	Reinforcing Steel Bars Grade 40	Kg	453099.14	
7.5(1)	Furnish and Delivery of Steel Girder	Ton	194.23	
7.5(1)a	Furnish and Delivery of Steel Coping and Portal	Ton	56.50	
7.5(3)	Erection of Steel Girder	Ton	194.23	
7.5(4)	Erection of Steel Coping and Portal	Ton	56.50	
7.6(22)	Cast in Place Concrete Bored Pile Dia 1500 mm	Ln.M	324.00	
7.6(23)	Cast in Place Concrete Bored Pile Dia 1800 mm	Ln.M	108.00	
7.6(26)	Cast in Place Concrete Bored Pile Dia 2500 mm	Ln.M	132.00	
7.6(27)	Pile Integrity Test	Each	24.00	
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	63.60	
7.9(2)	Binding Stone	Cu.M		
7.11(2)	Expansion Joint (Type A)	Ln.M	46.00	
7.11(3)	Expansion Joint (Type B)	Ln.M		
SS 7.11(4)	Restrainer Type - A	Set	2.00	
SS 7.11(5)	Restrainer Type - B	Set	2.00	
SS 7.11(6)	Stopper for Steel Girder	Set	4.00	
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	4.00	
7.12(2)c	Elastomeric Bearing Pad Type - A4	Set		
7.12(2)a	Bridge Bearing for Steel Girder, Type - B1	Set	4.00	
7.12(2)b	Bridge Bearing for Steel Girder, Type - B2	Set		
7.12(2)c	Bridge Bearing for Steel Girder, Type - C1	Set		
7.12(2)d	Bridge Bearing for Steel Girder, Type - C2	Set		
7.12(2)e	Bridge Bearing for Steel Girder, Type - C3	Set		
7.12(2)f	Bridge Bearing for Steel Girder, Type - C4	Set		



JAPAN INTERNATIONAL COOPERATION AGENCY
KATAHIRA & ENGINEERS
INTERNATIONAL

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



REPUBLIC OF INDONESIA
MINISTRY OF PUBLIC WORKS
DIRECTORATE GENERAL OF HIGHWAYS

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

PROJECT AND LOCATION :
DETAILED DESIGN STUDY OF
NORTH JAVA CORRIDOR FLYOVER PROJECT
PETERONGAN FLYOVER - CONTRACT PACKAGE 3
(PETERONGAN - TANGGULANGIN)
EAST JAVA PROVINCE

SCALE :
NTS
FULL SIZE A3

DRAWING TITLE :
SUMMARY OF QUANTITIES
2 OF 2

DRAWING NO :
PGE-018
SHEET NO :
18 / 18

No. PAY ITEMS	DESCRIPTION	UNIT	TOTAL QUANTITY	REMARKS
7.13	Steel Bridge Railings	Ln. M	1230.80	
7.14	Bridge Name Plate	Each	2.00	
7.15.(1)	Demolition of Existing Structure Masonry	Cu m	61.58	
7.15.(2)	Demolition of Existing Structure Concrete	Cu m	45.04	
7.15.(10)	Demolition of Existing Rigid Pavement	Sq. M		
7.15.(11)	Demolition of Existing Hedge of Fence	Ln. M		
7.15.(12)	Demolition of Existing Concrete Side Walk	Sq. M	1835.01	
7.15.(13)	Demolition of Existing Concrete Curb	Ln. M	1899.01	
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	2871.32	
8.3.(1)	Vehicle Guardrail Type - A	Ln. M		
8.3.(13)	BRC Fence	Ln. M		
8.3.(15)	Guard Fence Over Railway	Ln. M		
8.4.(1)	Regulatory and Warning Sign, Type A	Each	36.00	
8.4.(2)	Regulatory and Warning Sign, Type B	Each	2.00	
8.5.(17)	Overhead Sign, Type A	Each		
8.5.(18)	Overhead Sign, Type B	Each	2.00	
8.5.(19)	Overhead Sign, Type C	Each		
8.6.(6)	Reflective Thermoplastic Pavement Marking	Sq. M	850.45	
8.8.(1)	Precast Concrete Curb Type A	Ln M	2097.03	
8.8.(2)	Precast Concrete Curb Type B	Ln M	1734.37	
8.8.(3)	Concrete Median Type A	Ln M	305.02	
8.8.(4)	Concrete Median Type B	Ln M	613.63	
8.8.(5)	Concrete Sidewalk	Sq. M	1233.68	
	DIVISION 9 - UTILITIES			
9.1.1	Street Lighting Pole, Type A (11 m)	Each	68.00	
9.1.2	Street Lighting Ceiling, Type A - Sont 150 watt	Each	24.00	
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	1.00	
9.1.4 (g)	Panel Type LP-PJU.6	Each	1.00	
9.1.5 (a)	Traffic Signal Head, Type A	Each	0.00	
9.1.5 (b)	Traffic Signal Head, Type B	Each	0.00	
9.1.6	Traffic Signal Pole, Type I	Each	0.00	
9.1.7	Traffic Signal Pole, Type II	Each	0.00	
9.1.8	Cable Type - 1 (NYFGBY 2C - 2.5 mm2)	Ln M	1084.00	
9.1.9	Cable Type - 3 (NYFGBY 4C - 10 mm2)	Ln M	3008.00	
9.1.10	Cable Type - 5 (NYFGBY 4C - 25 mm2)	Ln M	2530.00	
9.1.11	Cable Type - 7 (NYFGBY 4C - 50 mm2)	Ln M	200.00	
9.1.12	Removal of Lighting Pole to stockpile	Each	0.00	
9.1.13	Removal of Lighting Signal to stockpile	Each	0.00	