



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**

BALARAJA FLYOVER

VOLUME IV DRAWINGS

**CONTRACT PACKAGE I
(MERAK - BALARAJA)**

DECEMBER 2006



KATAHIRA & ENGINEERS INTERNATIONAL



JAPAN INTERNATIONAL
COOPERATION AGENCY



DIRECTORATE GENERAL OF HIGHWAY
MINISTRY OF PUBLIC WORKS
REPUBLIC OF INDONESIA

GENERAL

 **KEI** KATAHIRA & ENGINEERS INTERNATIONAL

 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 : DETAILED DESIGN STUDY OF NORTH JAVA CORRIDOR FLYOVER PROJECT BALARAJA FLYOVER - CONTRACT PACKAGE 1 (MERAK - BALARAJA) BANTEN PROVINCE	SCALE :	DRAWING TITLE :	DRAWING NO. :	
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	Sign	Sign	Sign			Sign	FULL SIZE A3	1 OF 3	SHEET NO. :
	Date	Date	Date			Date			01 / 18




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	Name	R. UENO	Name			T. OKUMURA	Name	M. KIUCHI	N T S	INDEX OF DRAWINGS	BGE-002
	Sign		Sign				Sign		FULL SIZE A3	2 OF 3	SHEET NO. :
	Date		Date				Date				02 / 18
APPROVED BY Ir. HERRY VAZA M,Eng.Sc NIP. : 110038400											

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ARRANGEMENT OF REINFORCEMENT FOR PC GIRDER P6-P8	BCR-011	11 / 22	PIER COLUMN REINFORCEMENT (PIER P7)	BSB-021	21 / 44	ROAD SIGNS AND MOUNTING DETAILS	BTR-014	14 / 26
ARRANGEMENT OF REINFORCEMENT FOR PC GIRDER P8-A2	BCR-012	12 / 22	PIER COLUMN REINFORCEMENT (PIER P8)	BSB-022	22 / 44			
ARRANGEMENT OF REINFORCEMENT FOR PC GIRDER P6-A2 (1 OF 2)	BCR-013	13 / 22	SCHEDULE OF REINFORCED CONCRETE COLUMN	BSB-023	23 / 44			
ARRANGEMENT OF REINFORCEMENT FOR PC GIRDER P6-A2 (2 OF 2)	BCR-014	14 / 22	PIER COPING REINFORCEMENT (PIER P3 EXP.) 1 OF 4	BSB-024	24 / 44			
			PIER COPING REINFORCEMENT (PIER P3 EXP.) 2 OF 4	BSB-025	25 / 44			
			PIER COPING REINFORCEMENT (PIER P3 EXP.) 3 OF 4	BSB-026	26 / 44			
			PIER COPING REINFORCEMENT (PIER P3 EXP.) 4 OF 4	BSB-027	27 / 44			

 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	Name	Name		APPROVED BY	DETAILED DESIGN STUDY OF NORTH JAVA CORRIDOR FLYOVER PROJECT BALARAJA FLYOVER - CONTRACT PACKAGE 1 (MERAK - BALARAJA) BANTEN PROVINCE	N T S FULL SIZE A3	INDEX OF DRAWINGS 3 OF 3	BGE-003
	Sign	Sign	Sign		Ir. HERRY VAZA M,Eng.Sc				SHEET NO. :
	Date	Date	Date		NIP. : 110038400				03 / 18

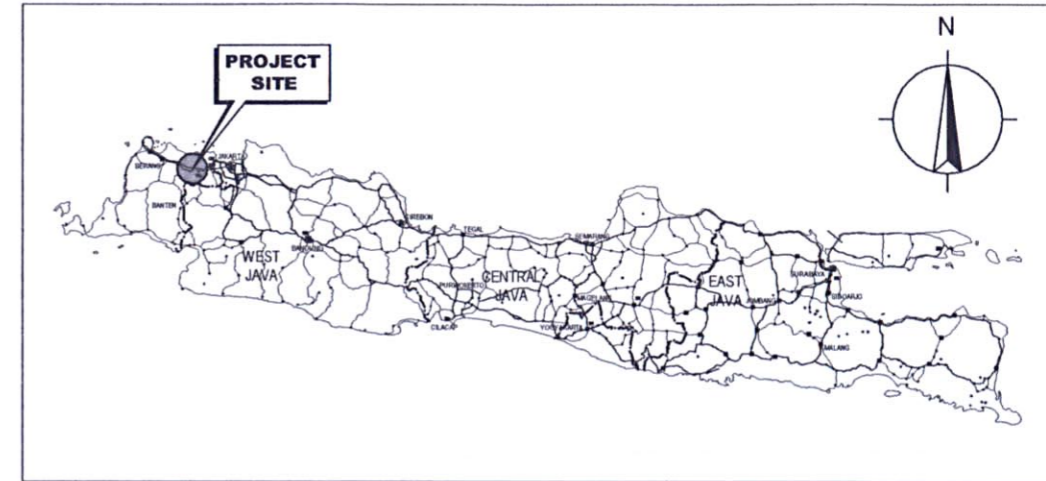
INDEX OF DRAWINGS 3 OF 3

TITLE OF DRAWING	DRAWING NO.	SHEET NO.	TITLE OF DRAWING	DRAWING NO.	SHEET NO.	TITLE OF DRAWING	DRAWING NO.	SHEET NO.
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OVERHEAD SIGN TRUSS STRUCTURAL FRAME DETAILS 2 OF 2	BTR-016	16 / 26						
CONTROL PANEL FOR TRAFFIC SIGNAL	BTR-017	17 / 26						
TYPICAL DETAIL OF VEHICULAR AND PEDESTRIAN SIGNAL LIGHT	BTR-018	18 / 26						
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STANDARD TRAFFIC MANAGEMENT SAFETY DEVICE DETAILS	BTR-020	20 / 26						
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TYPICAL BORED PILING METHODOLOGY	BTR-023	23 / 26						
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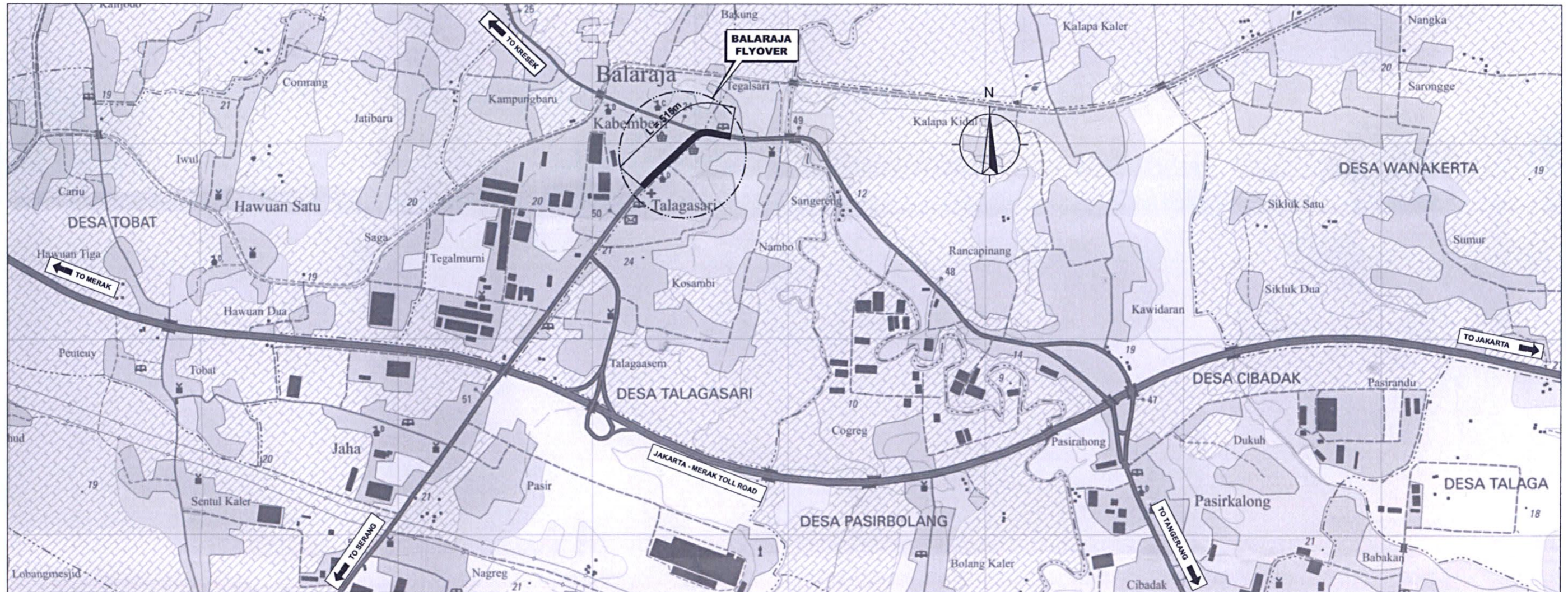
DESIGNED BY	CHECKED BY	SUBMITTED BY
Name R. UENO	Name T. OKUMURA	Name M. KIUCHI
Sign	Sign	Sign
Date	Date	Date



2 INDONESIA MAP
 NOT TO SCALE



3 JAVA ISLAND MAP
 NOT TO SCALE




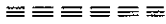










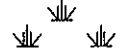
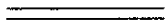


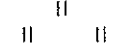
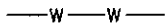



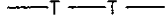



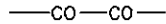


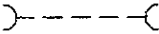



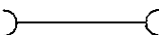
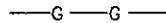


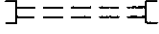
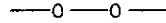


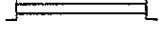



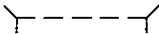



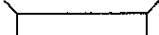



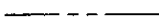



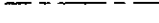
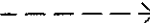
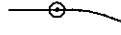
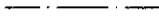
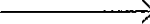

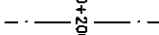




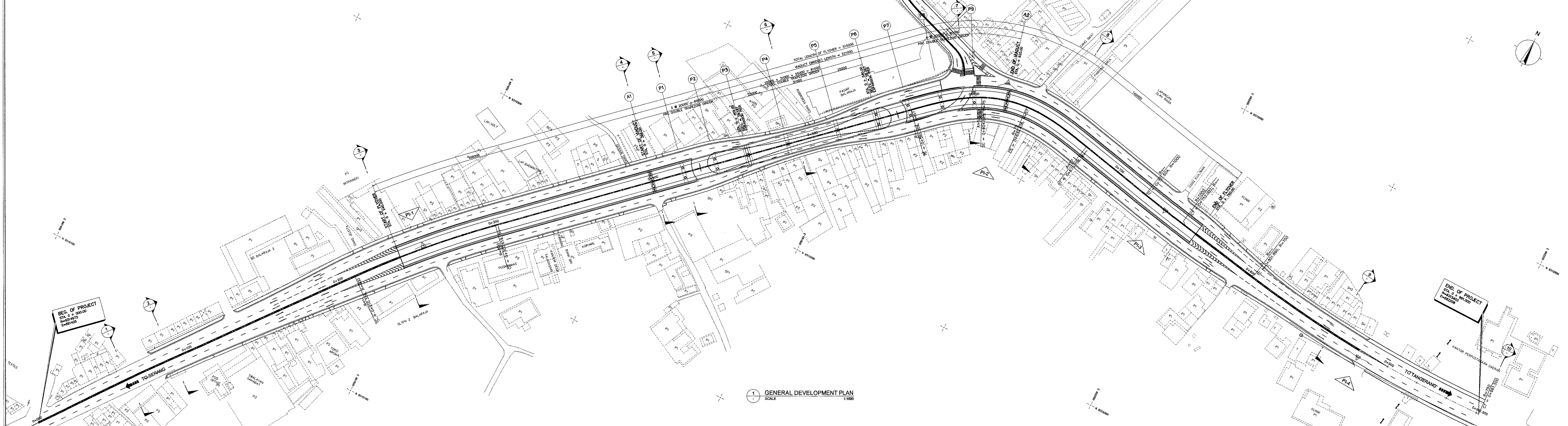
1 LOCATION / VICINITY MAP
 SCALE 1:20,000

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

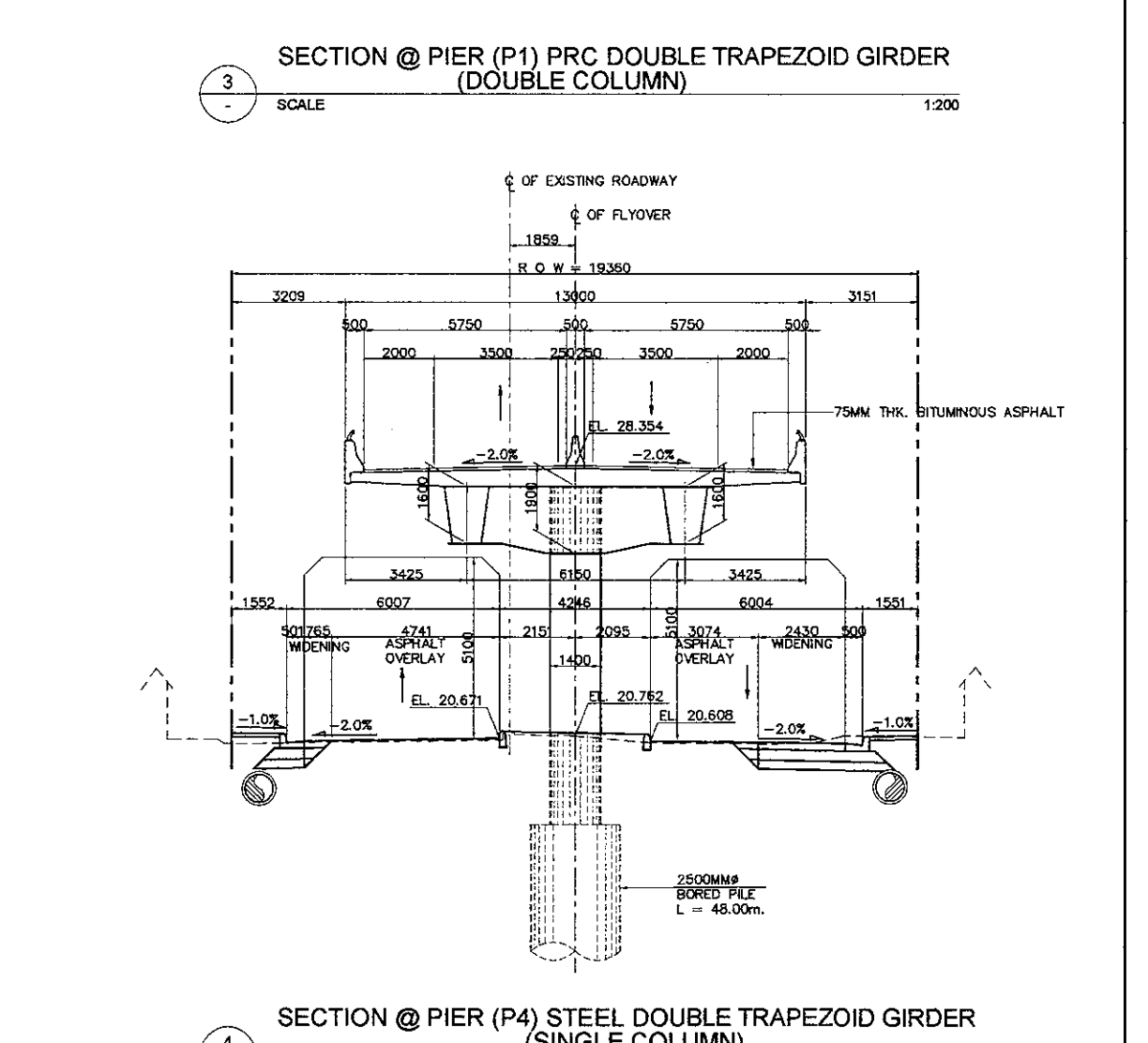
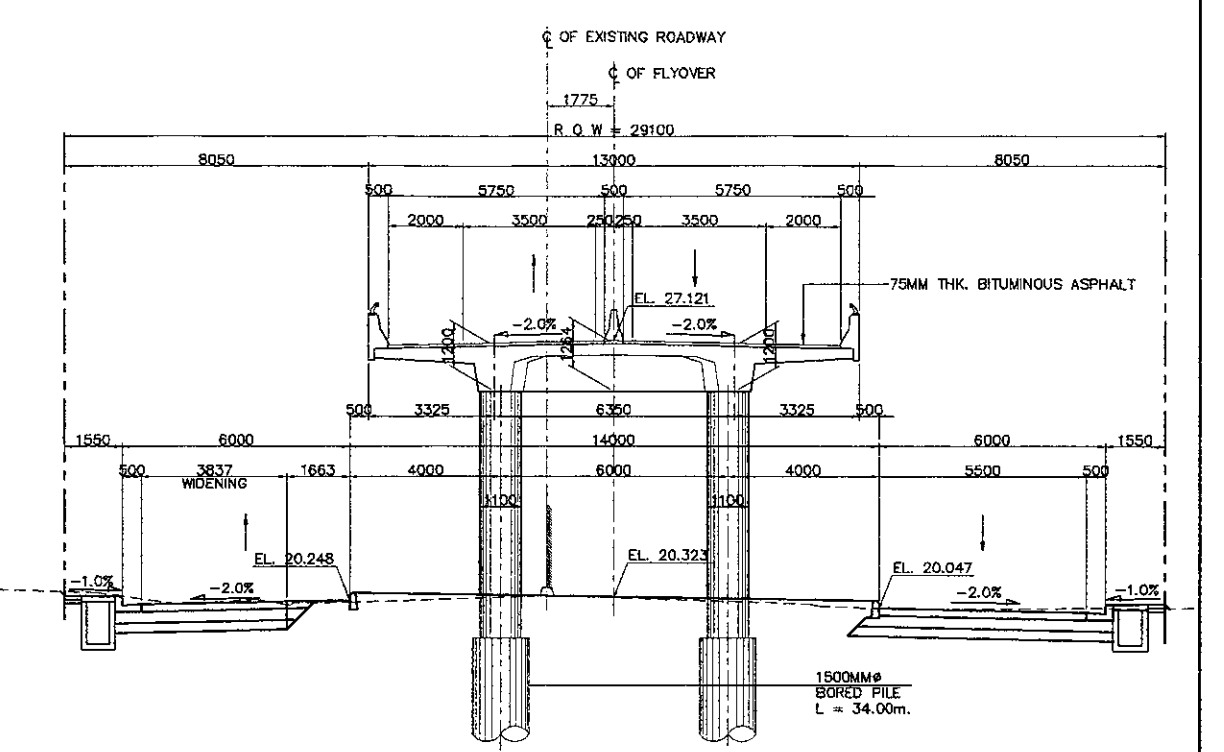
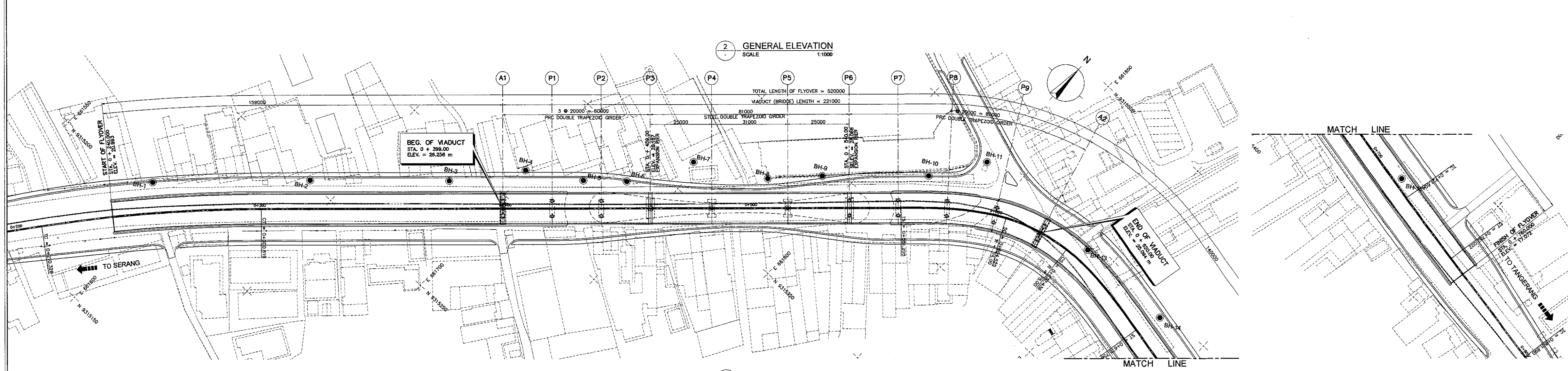
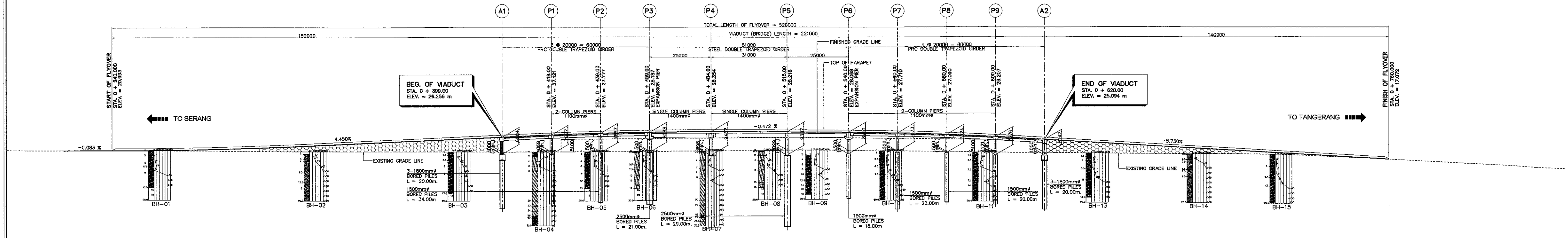
APPROVED BY	
Ir. HERRY VAZA M,Eng.Sc	Sign
NIP. : 110038400	Date

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		RICE FIELD		WATER SUPPLY
	SHED (BANGSAL)		FIRE STATION		WASTED LAND		TELEPHONE LINE
	STALL (KIOS)		POST OFFICE		MONUMENT		CABLE OPTIC LINE
	GOVERNMENT OFFICE		MARKET		EXISTING RCP		ELECTRICAL LINE
	SCHOOL		GASOLINE STATION		DESIGN RCP		GAS LINE
	MOSQUE		TELEPHONE POLE		EXISTING BOX CULVERT		OIL LINE
	CHURCH		ELECTRICAL POLE		DESIGN BOX CULVERT		BH - 10 BORE HOLE NO. 10
	TEMPLE		POWER HOUSE		EXISTING BRIDGE		S - 4 SOUNDING NO.4 (DCP TEST)
	ISLAMIC CEMETERY		GPS STATION		DESIGN BRIDGE		DC DRAINAGE CATCH BASIN
	CHRISTIAN CEMETERY		BENCH MARK		ROW		DMH DRAINAGE MANHOLE
	CHINESE CEMETERY		TRAVERSE POINT		MATCH LINE		EXISTING DRAINAGE LINE
			TS, SC, CS, ST OR TC, CT OF HORIZONTAL CURVE		CENTER LINE		NEW DRAINAGE LINE
			POINT INTERSECTION OF VERTICAL CURVE		STATION NUMBER		
			+10 +5 CONTOURS				
			STREAM				



1 GENERAL DEVELOPMENT PLAN
 SCALE 1:1000



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 BALARAJA FLYOVER - CONTRACT PACKAGE 1 (MERAK - BALARAJA) BANTEN PROVINCE

SCALE :
NTS
FULL SIZE A3

DRAWING TITLE :
GENERAL NOTES ROADS AND DRAINAGE

DRAWING NO. :
BGE-009
SHEET NO. :
09 / 18

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. BALARAJA FLYOVER HAS THE FOLLOWING MAJOR CONTROL POINTS USED IN THE DESIGN OF HORIZONTAL AND VERTICAL ALIGNMENT:
 - EXISTING ROAD WIDTH AND GRADIENT
 - EXISTING ROAD RIGHT - OF - WAY
 - BUILT - UP STRUCTURES NEAR INTERSECTION

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.

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 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/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	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					
SM 520	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	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 CONTACT 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 CONTACT 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

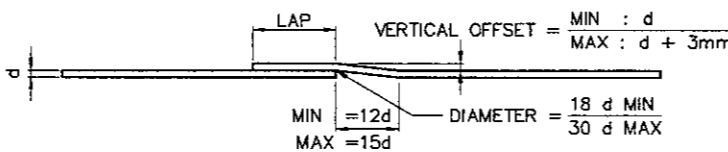
BASIC DEVELOPMENT FOR REBAR

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 SPICED.
- 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.

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

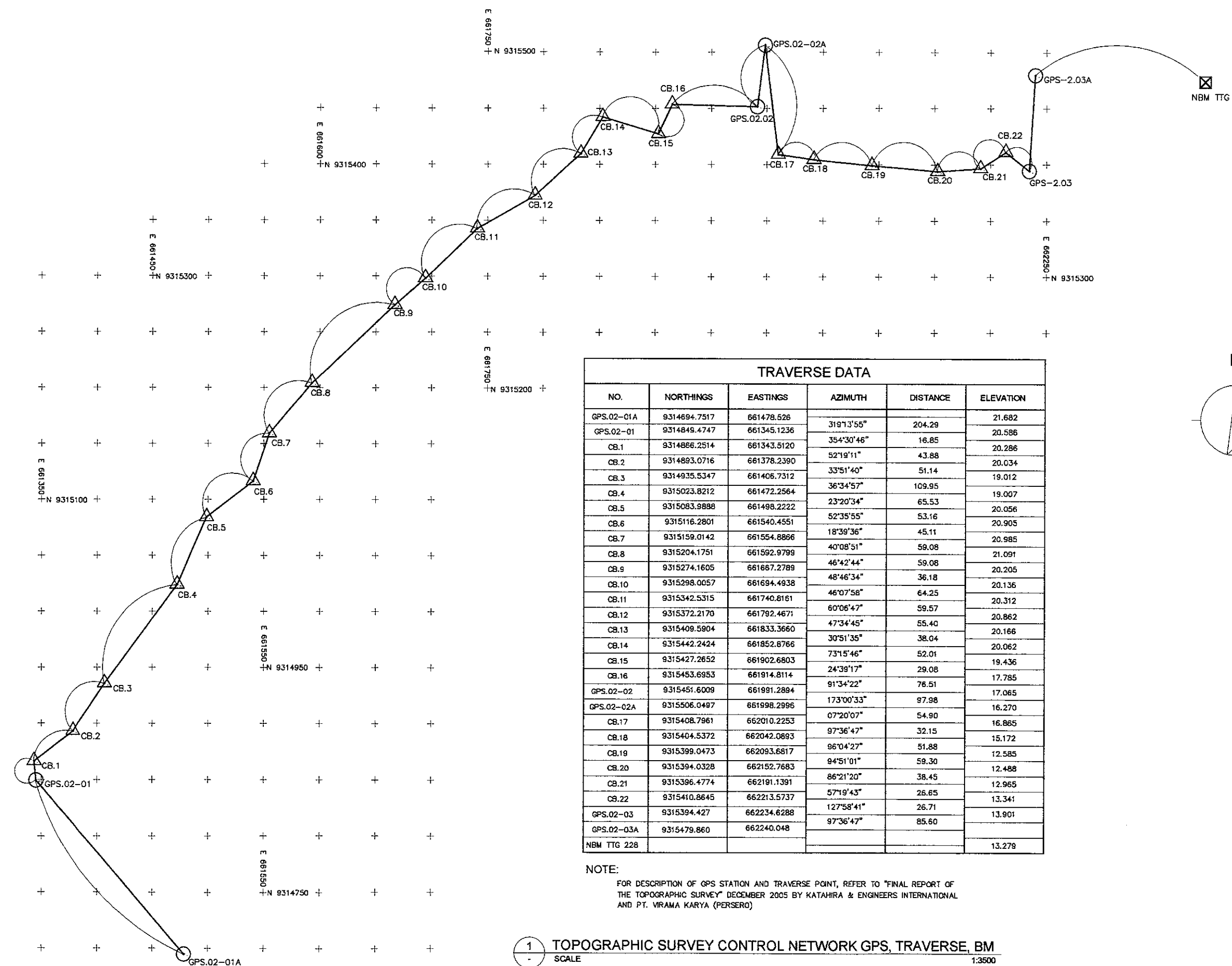
- (1) THE CONTRACTOR SHALL PREPARE AND SUBMIT SHOP DRAWINGS FOR ALL STRUCTURAL STEEL WORKS. THESE SHOP DRAWINGS SHALL BE APPROVED BY THE ENGINEER BEFORE ANY FABRICATION COMMENCES.
- (2) CONSTRUCTION OF STRUCTURAL STEEL
 - WELDING REQUIREMENTS SHALL IN ALL RESPECT CONFORM TO THE GENERAL SPECIFICATIONS 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

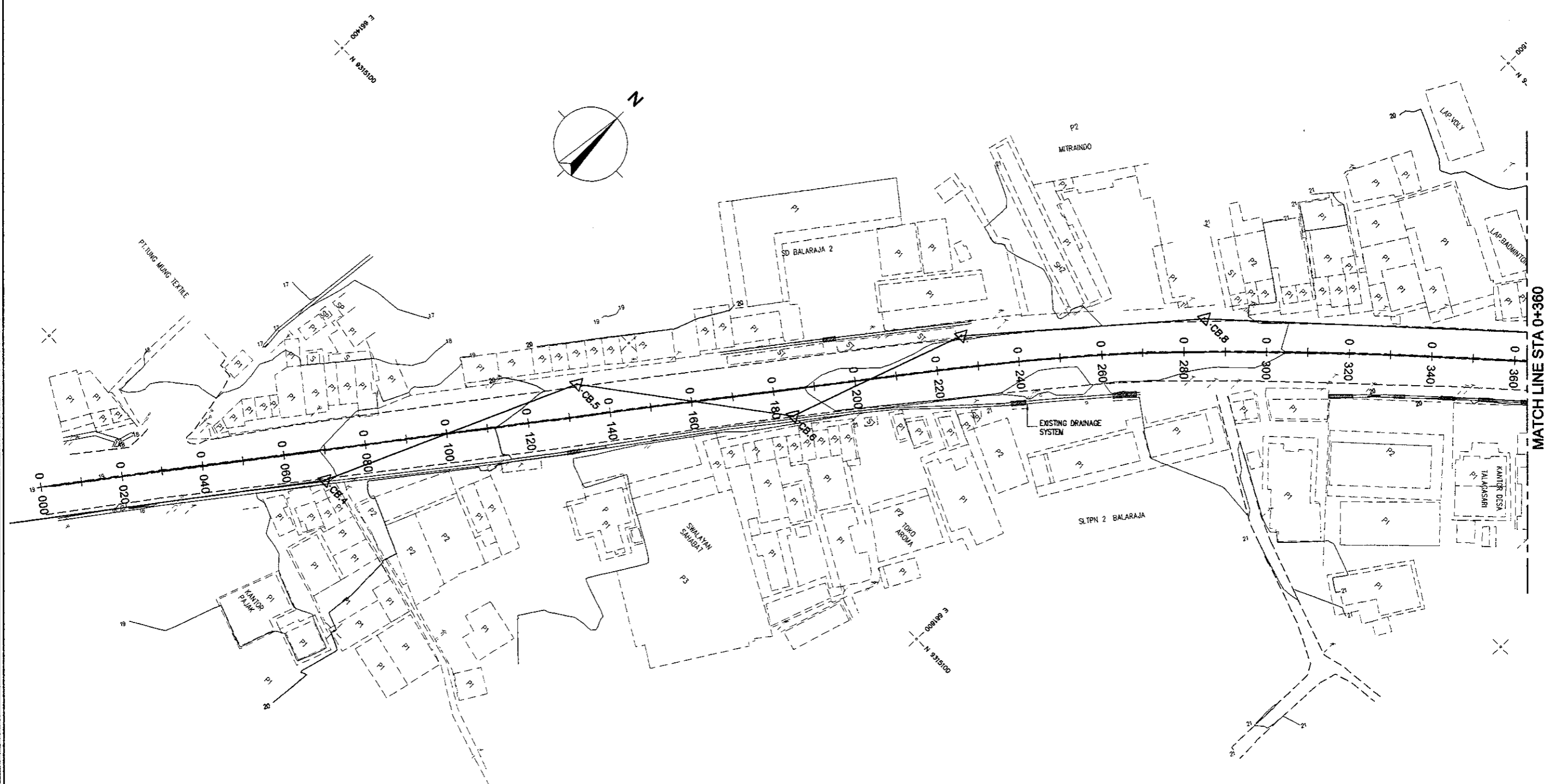
THE QUANTITIES FOR BRIDGE AND STRUCTURES SHOWN ON THE DRAWINGS ARE APPROXIMATELY AND FOR REFERENCE PURPOSES ONLY. ANY DISCREPANCY BETWEEN THESE ESTIMATED QUANTITIES AND THE FINALLY ACCEPTED QUANTITIES SHALL NOT BE A REASON FOR CLAIMS OR DISPUTE.



NO.	NORTHINGS	EASTINGS	AZIMUTH	DISTANCE	ELEVATION
GPS.02-01A	9314694.7517	661478.526			21.682
GPS.02-01	9314849.4747	661345.1236	319°13'55"	204.29	20.586
CB.1	9314866.2514	661343.5120	354°30'46"	16.85	20.286
CB.2	9314893.0716	661378.2390	52°19'11"	43.88	20.034
CB.3	9314935.5347	661406.7312	33°51'40"	51.14	19.012
CB.4	9315023.8212	661472.2564	36°34'57"	109.95	19.007
CB.5	9315083.9888	661498.2222	23°20'34"	65.53	20.056
CB.6	9315116.2801	661540.4551	52°35'55"	53.16	20.905
CB.7	9315159.0142	661554.8866	18°39'36"	45.11	20.985
CB.8	9315204.1751	661592.9799	40°08'51"	59.08	21.091
CB.9	9315274.1605	661667.2789	46°42'44"	59.08	20.205
CB.10	9315298.0057	661694.4938	48°46'34"	36.18	20.136
CB.11	9315342.5315	661740.8161	46°07'58"	64.25	20.312
CB.12	9315372.2170	661792.4671	60°06'47"	59.57	20.862
CB.13	9315409.5904	661833.3660	47°34'45"	55.40	20.166
CB.14	9315442.2424	661852.6766	30°51'35"	38.04	20.062
CB.15	9315427.2652	661902.6803	73°15'46"	52.01	19.436
CB.16	9315453.6953	661914.8114	24°39'17"	29.08	17.785
GPS.02-02	9315451.6009	661991.2894	91°34'22"	76.51	17.065
GPS.02-02A	9315506.0497	661998.2996	173°00'33"	97.98	16.270
CB.17	9315408.7961	662010.2253	07°20'07"	54.90	16.865
CB.18	9315404.5372	662042.0893	97°36'47"	32.15	15.172
CB.19	9315399.0473	662093.6817	96°04'27"	51.88	12.585
CB.20	9315394.0328	662152.7683	94°51'01"	59.30	12.488
CB.21	9315396.4774	662191.1391	86°21'20"	38.45	12.965
CB.22	9315410.8645	662213.5737	57°19'43"	26.65	13.341
GPS.02-03	9315394.427	662234.6288	127°58'41"	26.71	13.901
GPS.02-03A	9315479.860	662240.048	97°36'47"	85.60	
NBM TTG 228					13.279

NOTE:
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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	

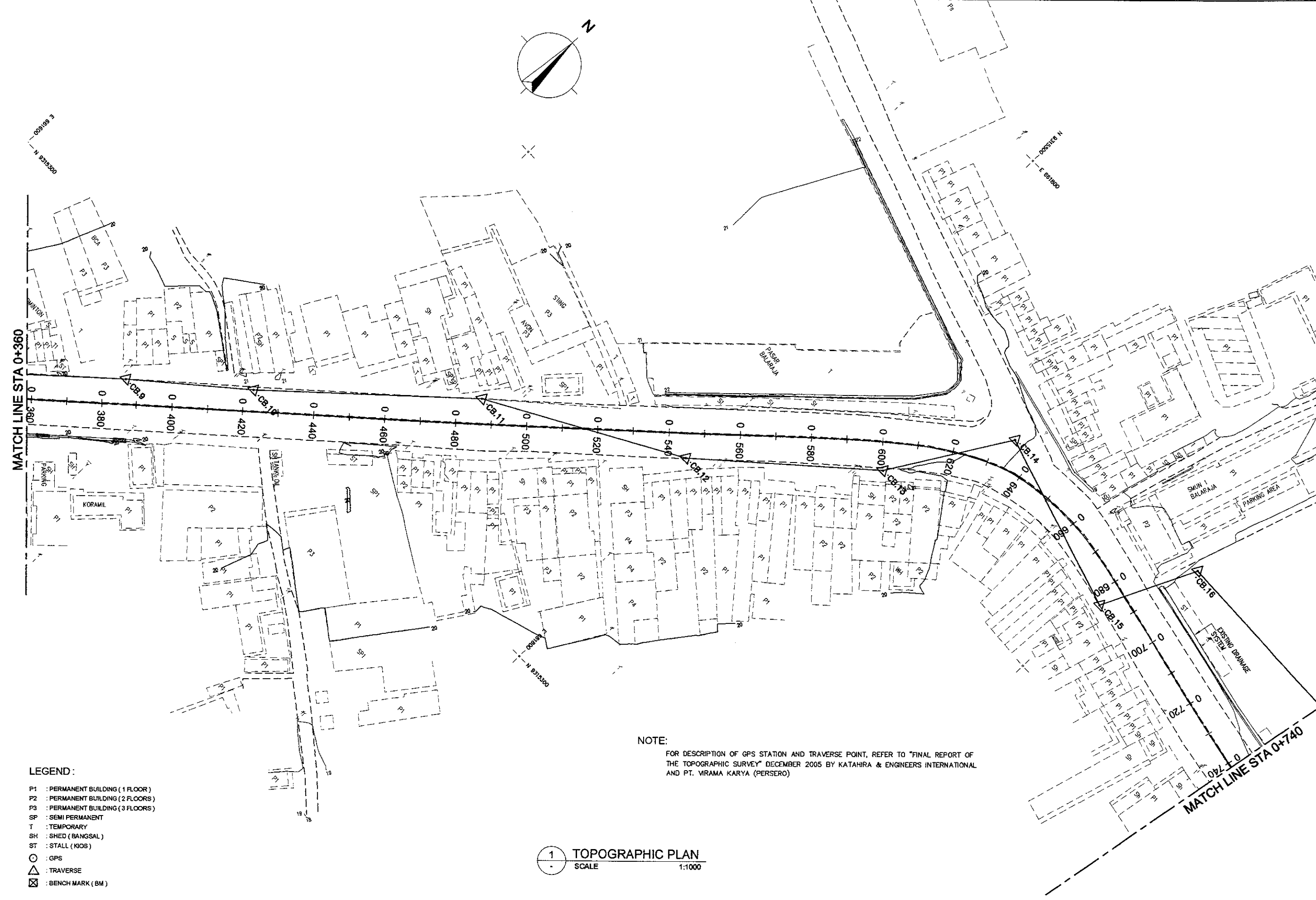


- LEGEND :**
- P1 : PERMANENT BUILDING (1 FLOOR)
 - P2 : PERMANENT BUILDING (2 FLOORS)
 - P3 : PERMANENT BUILDING (3 FLOORS)
 - SP : SEMI PERMANENT
 - T : TEMPORARY
 - SH : SHED (BANGSAL)
 - ST : STALL (KIOS)
 - : GPS
 - △ : TRAVERSE
 - ⊗ : BENCH MARK (BM)

1 TOPOGRAPHIC PLAN
 SCALE 1:1000

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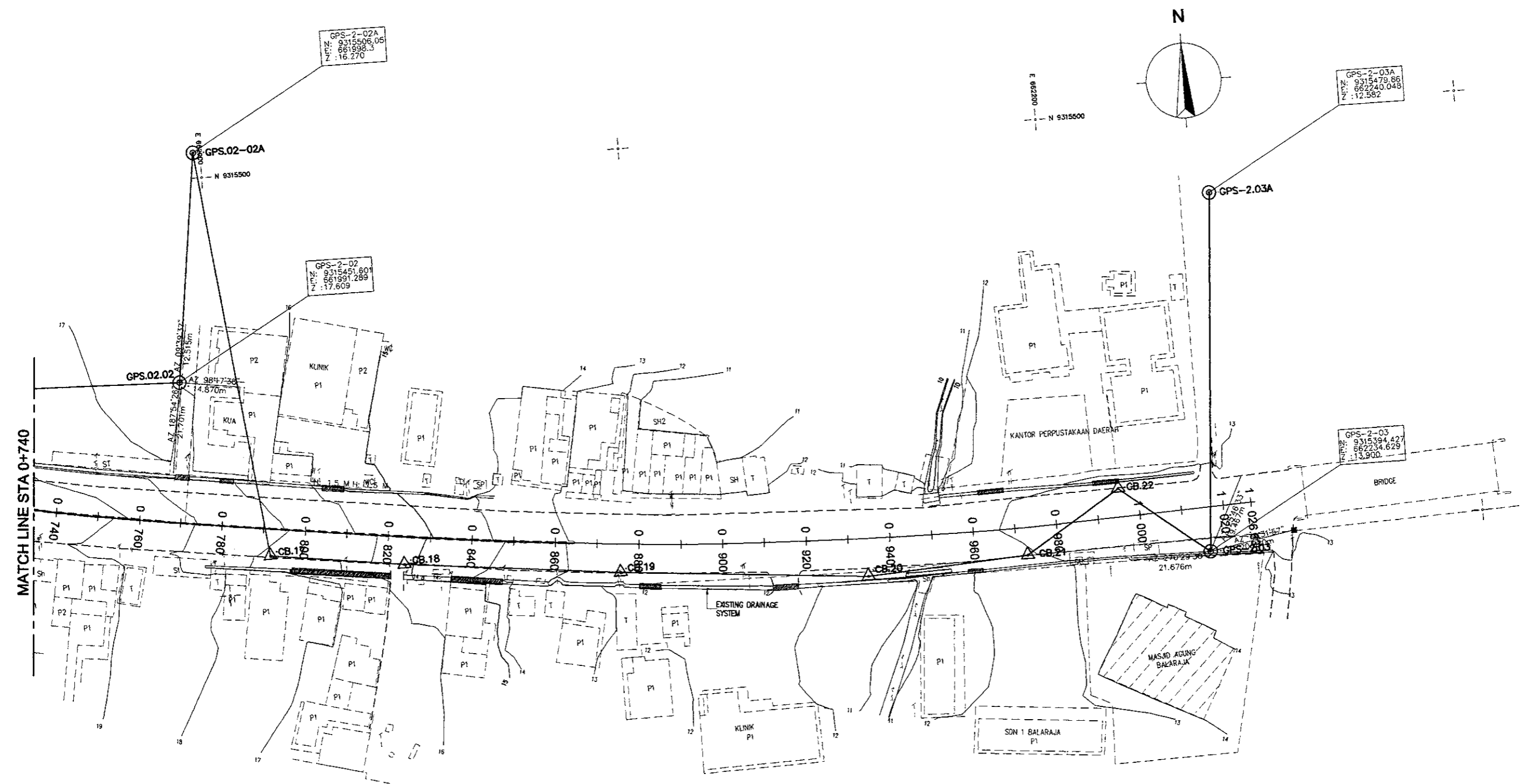
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No. PAY ITEMS	DESCRIPTION	UNIT	TOTAL QUANTITY	REMARKS
DIVISION 1 - GENERAL				
1.2	Mobilization and Demobilization	LS	1.00	
1.2(1)b	Engineer Facilities	LS	1.00	
1.8	Maintenance and Protection of Traffic	LS	1.00	
DIVISION 2 - DRAINAGE				
2.1(1)	Common Excavation for drainage ditches and waterways	Cu.M	150.00	
2.2(1)	Mortared Stonework for drainage channel	Cu.M	68.36	
2.3(1)	Reinforced Concrete Pipe Culvert Inn.Dim. 40 cm Type A	Lin.M	0.00	
2.3(2)	Reinforced Concrete Pipe Culvert Inn.Dim. 40 cm Type B	Lin.M	0.00	
2.3(3)	Reinforced Concrete Pipe Culvert Inn.Dim. 60 cm Type A	Lin.M	288.00	
2.3(4)	Reinforced Concrete Pipe Culvert Inn.Dim. 60 cm Type B	Lin.M	31.00	
2.3(5)	Reinforced Concrete Pipe Culvert Inn.Dim. 80 cm Type A	Lin.M	344.00	
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	0.00	
2.3(8)	Reinforced Concrete Pipe Culvert Inn.Dim. 100 cm Type B	Lin.M	0.00	
2.3(9)a	Manhole Type I	Each	54.00	
2.3(9)b	Manhole Type II	Each	0.00	
2.3(9)c	Manhole Type III	Each	25.00	
2.3(9)d	Manhole Type IV	Each	2.00	
2.3(9)e	Manhole Type V	Each	4.00	
2.3(9)f	Manhole Type VI	Each	8.00	
2.3(9)g	Manhole Type VII	Each	15.00	
2.3(9)h	Manhole Type VIII	Each	2.00	
2.3(9)i	Manhole Type IX	Each	0.00	
2.3(9)j	Manhole Type X	Each	0.00	
2.3(10)	Catch Basin Type I	Each	11.00	
2.3(12)a	U - Ditch, DS - 1	Each	170.70	
2.3(12)b	U - Ditch, DS - 2	Ln.M	1172.60	
2.3(12)c	U - Ditch, DS - 3	Ln.M	0.00	
2.3(12)d	U - Ditch, DS - 3 A	Ln.M	0.00	
2.3(12)e	U - Ditch, DS - 4	Ln.M	0.00	
2.3(12)f	U - Ditch, DS - 4 A	Ln.M	0.00	
2.3(12)g	U - Ditch, DS - 5	Ln.M	233.00	
2.3(13)	Drain Pipe Dia 150 mm	Ln.M	0.00	
2.3(14)	Drain Pipe Dia 200 mm	Ln.M	159.86	
2.3(15)	Drain Pipe Dia 250 mm	Ln.M	202.20	
2.3(16)	Deck Drain Type I	Each	0.00	
2.3(17)	Deck Drain Type II	Each	37.00	
2.3(18)	Steel Cutter drain screen	Ln.M	0.00	
2.3(19)	Outer Ditch Elevated	Ln.M	0.00	
DIVISION 3 - EARTHWORKS				
3.1(1)	Clearing and Grubbing	Sq.M	9241.79	
3.1(2)	Selected Tree Removal Diameter 200 mm - 2300 mm	Each	9.00	
3.1(3)	Selected Tree Removal Diameter > 300 mm	Each	7.00	
3.2(1)	Common Excavation	Cu. M	4124.11	
3.2(2)	Excavation of Existing Pavement	Cu. M	198.43	
3.2(3)	Structure Excavation to a depth not exceeding 2 m	Cu. M	597.70	
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	0.00	
3.2(7)	Rock Excavation	Cu. M	0.00	
3.3(1)	Borrow materials and common backfill	Cu. M	5787.20	
3.3(2)	Structural Backfill	Cu. M	280.81	
3.3(3)	Permeable Backfill	Cu. M	61.96	
SS 3.3	Soil Cement Improvement	Cu. M	0.00	
3.3(4)	Lightweight Embankment	Cu. M	0.00	
3.3(6)	Intermediate Concrete Slab	Sq.M	0.00	
3.4(1)	Sub Grade Preparation	Sq.M	11936.81	
SS 3.4 (1)	Mechanical Stabilized Earthwall and Accessories	Sq.M	1563.28	
SS 3.4 (2)	Retaining Wall for Lightweight Embankment	Sq.M	0.00	

No. PAY ITEMS	DESCRIPTION	UNIT	TOTAL QUANTITY	REMARKS
DIVISION 4 - PAVEMENT WIDENING AND SHOULDERS				
4.2(1)	Aggregate Sub Base Class B	Cu. M	117.32	
DIVISION 5 GRANULAR PAVEMENT				
5.1(1)	Aggregate Sub Base Class A	Cu. M	3235.06	
5.1(2)	Aggregate Sub Base Class B	Cu. M	2980.08	
DIVISION 6 ASPHALT PAVEMENT				
6.1(1)	Prime Coat	Litre	10295.04	
6.1(2)	Tack Coat	Litre	18013.04	
6.3(1)	Asphalt Concrete Wearing Course (AC-WC)	Ton	1888.48	
6.3(2)	Asphalt Concrete Binder Course (AC-BC)	Ton	1472.03	
6.3(3)	Asphalt Concrete Base (AC-Base)	Ton	2329.12	
DIVISION 7 - STRUCTURE				
7.1(1)a	Structure Concrete, Class A - (F'c = 35 Mpa) for Post Tension Double Girder	Cu m	946.11	
7.1(1)b	Structure Concrete, Class A - (F'c = 35 Mpa) for Steel Girder	Cu m	379.08	
7.1(2)a	Structure Concrete, Class B - (F'c = 30 Mpa) for Pier Head	Cu m	98.02	
7.1(2)b	Structure Concrete, Class B - (F'c = 30 Mpa) for Column	Cu m	93.22	
7.1(2)c	Structure Concrete, Class B - (F'c = 30 Mpa) for Composite Column	Cu m	32.84	
7.1(2)d	Structure Concrete, Class B - (F'c = 30 Mpa) for Abutment	Cu m	185.06	
7.1(3)a	Structure Concrete, Class B-1 (F'c = 28 Mpa) for Barrier, Median	Cu m	0.00	
7.1(3)b	Structure Concrete, Class B-1 (F'c = 28 Mpa) for Parapet Wall	Cu m	646.00	
7.1(5)	Structure Concrete, Class C (F'c = 24 Mpa) for Footing, Approach Slab, Retaining Wall	Cu m	250.25	
7.1(6)	Structure Concrete, Class D (F'c = 20 Mpa)	Cu m	0.00	
7.1(8)	Structure Concrete, Class E (F'c = 17 Mpa)	Cu m	21.83	
SS 7.1(9)	Waterproofing on Deck	SqM	2541.50	
SS 7.1(10)	Structure Casing for Bored Pile (Ribber Inner Surface t = 13 mm)	Kg	9808.40	
SS 7.1(11)	Structure Casing for Bored Pile (Erected)	Kg	9608.40	
7.2(9)	PC Strand Size 12.7 mm	Kg	20934.00	
7.2(9)a	PC Strand Size 21.8 mm	Kg	10851.55	
7.3(3)	PC Bar	Kg	1328.00	
7.3(4)	Reinforcing Steel Bars Grade 40	Kg	390484.78	
7.5(1)	Furnish and Delivery of Steel Girder	Ton	190.25	
7.5(1)a	Furnish and Delivery of Steel Coping and Portal	Ton	54.91	
7.5(3)	Erection of Steel Girder	Ton	190.25	
7.5(4)	Erection of Steel Coping and Portal	Ton	54.91	
7.6(22)	Cast in Place Concrete Bored Pile Dia 1500 mm	Ln. M	242.00	
7.6(23)	Cast in Place Concrete Bored Pile Dia 1800 mm	Ln. M	120.00	
7.6(26)	Cast in Place Concrete Bored Pile Dia 2500 mm	Ln. M	79.00	
7.6(27)	Pile Integrity Test	Each	21.00	
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	113.11	
7.9(2)	Blinding Stone	Cu. M	0.00	
7.11(2)	Expansion Joint (Type A)	Ln. M	46.00	
7.11(3)	Expansion Joint (Type B)	Ln. M	0.00	
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	0.00	
7.12(2)a	Elastomeric Bearing Pad Type - A2	Set	0.00	
7.12(2)b	Elastomeric Bearing Pad Type - A3	Set	4.00	
7.12(2)c	Elastomeric Bearing Pad Type - A4	Set	0.00	
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	0.00	
7.12(2)c	Bridge Bearing for Steel Girder, Type - C1	Set	0.00	
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	0.00	
7.12(2)f	Bridge Bearing for Steel Girder, Type - C4	Set	0.00	

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Sign		Sign		Sign	
Date		Date		Date	

No. PAY ITEMS	DESCRIPTION	UNIT	TOTAL QUANTITY	REMARKS
7.13	Steel Bridge Railings	Ln. M	1040.80	
7.14	Bridge Name Plate	Each	2.00	
7.15.(1)	Demolition of Existing Structure Masonry	Cu m	187.83	
7.15.(2)	Demolition of Existing Structure Concrete	Cu m	387.52	
7.15.(10)	Demolition of Existing Rigid Pavement	Sq. M	0.00	
7.15.(11)	Demolition of Existing Hedge of Fence	Ln. M	259.59	
7.15.(12)	Demolition of Existing Concrete Side Walk	Sq. M	0.00	
7.15.(13)	Demolition of Existing Concrete Curb	Ln. M	0.00	
7.15.(7)	Demolition of Existing Bridge	Ls	0.00	
7.16.(2)	Rigid Pavement (t= 270 mm)	Sq. M	0.00	
7.17.(1)	Lean Concrete for Rigid Pavement (t= 100 mm)	Sq. M	0.00	
DIVISION 8 - MISCELLANEOUS				
8.1.(1)	Solid Sodding	Sq. M	1802.23	
8.3.(1)	Vehicle Guardrail Type - A	Ln. M	0.00	
8.3.(13)	BRC Fence	Ln. M	79.68	
8.3.(15)	Guard Fence Over Railway	Ln. M	0.00	
8.4.(1)	Regulatory and Warning Sign, Type A	Each	47.00	
8.4.(2)	Regulatory and Warning Sign, Type B	Each	0.00	
8.5.(17)	Overhead Sign, Type A	Each	0.00	
8.5.(18)	Overhead Sign, Type B	Each	2.00	
8.5.(19)	Overhead Sign, Type C	Each	0.00	
8.6.(6)	Reflective Thermoplastic Pavement Marking	Sq. M	916.20	
8.8.(1)	Precast Concrete Curb Type A	Ln M	1685.61	
8.8.(2)	Precast Concrete Curb Type B	Ln M	1852.33	
8.8.(3)	Concrete Median Type A	Ln M	0.00	
8.8.(4)	Concrete Median Type B	Ln M	520.00	
8.8.(5)	Concrete Sidewalk	Sq. M	960.36	
DIVISION 9 - UTILITIES				
9.1.1	Street Lighting Pole, Type A (11 m)	Each	72.00	
9.1.2	Street Lighting Ceiling, Type A - Sont 150 watt	Each	20.00	
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	0.00	
9.1.5 (a)	Traffic Signal Head, Type A	Each	2.00	
9.1.5 (b)	Traffic Signal Head, Type B	Each	2.00	
9.1.6	Traffic Signal Pole, Type I	Each	2.00	
9.1.7	Traffic Signal Pole, Type II	Each	2.00	
9.1.8	Cable Type - 1 (NYFGBY 2C - 2.5 mm2)	Ln M	1078.00	
9.1.9	Cable Type - 3 (NYFGBY 4C - 10 mm2)	Ln M	2554.00	
9.1.10	Cable Type - 5 (NYFGBY 4C - 25 mm2)	Ln M	560.00	
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	