



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**

**NAGREG FLYOVER**

**VOLUME IV DRAWINGS**

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

DECEMBER 2006



**KATAHIRA & ENGINEERS INTERNATIONAL**

SD

CR(5)

06-090



JAPAN INTERNATIONAL  
COOPERATION AGENCY



DIRECTORATE GENERAL OF HIGHWAY  
MINISTRY OF PUBLIC WORKS  
REPUBLIC OF INDONESIA

**GENERAL**

**KEI** KATAHIRA & ENGINEERS INTERNATIONAL

JICA JAPAN INTERNATIONAL COOPERATION AGENCY KATAHIRA & ENGINEERS INTERNATIONAL		DESIGNED BY Name: R. UENO Sign: _____ Date: _____	CHECKED BY Name: T. OKUMURA Sign: _____ Date: _____	SUBMITTED BY Name: M. KIUCHI Sign: _____ Date: _____	 REPUBLIC OF INDONESIA MINISTRY OF PUBLIC WORKS DIRECTORATE GENERAL OF HIGHWAYS  APPROVED BY: Ir. HERRY VAZA M,Eng.Sc NIP. : 110038400 Sign: _____ Date: _____	PROJECT AND LOCATION : DETAILED DESIGN STUDY OF NORTH JAVA CORRIDOR FLYOVER PROJECT NAGREG FLYOVER - CONTRACT PACKAGE 2 (NAGREG - GEBANG) WEST JAVA PROVINCE	SCALE :  N T S  FULL SIZE A3	DRAWING TITLE :  INDEX OF DRAWINGS 1 OF 3	DRAWING NO : NGE-001  SHEET NO : 01 / 19
---	--	--	--	---	--	---	--	--	--

## INDEX OF DRAWINGS 1 OF 3

TITLE OF DRAWING	DRAWING NO.	SHEET NO.	TITLE OF DRAWING	DRAWING NO.	SHEET NO.	TITLE OF DRAWING	DRAWING NO.	SHEET NO.
<b>GENERAL</b>								
INDEX OF DRAWINGS 1 OF 3	NGE-001	01 / 19	CROSS SECTION (STA. 0 + 240.00 TO STA. 0 + 300.00) 4 OF 13	NRD-032	32 / 65	DETAILS OF DRAINAGE MORTAL STONE WORK TYPE I, II, III & BOX CULVERT	NDG-016	16 / 20
INDEX OF DRAWINGS 2 OF 3	NGE-002	02 / 19	CROSS SECTION (STA. 0 + 320.00 TO STA. 0 + 380.00) 5 OF 13	NRD-033	33 / 65	TRENCHING AND BEDDING DETAILS FOR CUT AREA	NDG-017	17 / 20
INDEX OF DRAWINGS 3 OF 3	NGE-003	03 / 19	CROSS SECTION (STA. 0 + 400.00 TO STA. 0 + 460.00) 6 OF 13	NRD-034	34 / 65	DETAILS OF EXTENSION RC PIPE	NDG-018	18 / 20
LOCATION/VICINITY MAP	NGE-004	04 / 19	CROSS SECTION (STA. 0 + 480.00 TO STA. 0 + 540.00) 7 OF 13	NRD-035	35 / 65	PLAN AND FRONT VIEW DETAIL OF BOX CULVERT	NDG-019	19 / 20
NOTATION AND LEGEND	NGE-005	05 / 19	CROSS SECTION (STA. 0 + 560.00 TO STA. 0 + 620.00) 8 OF 13	NRD-036	36 / 65	REINFORCED CONCRETE BOX CULVERT	NDG-020	20 / 20
ABBREVIATIONS	NGE-006	06 / 19	CROSS SECTION (STA. 0 + 640.00 TO STA. 0 + 700.00) 9 OF 13	NRD-037	37 / 65	<b>VIADUCT</b>		
GENERAL DEVELOPMENT PLAN	NGE-007	07 / 19	CROSS SECTION (STA. 0 + 720.00 TO STA. 0 + 780.00) 10 OF 13	NRD-038	38 / 65	DRAINAGE SCHEDULE AT FLYOVER	NDV-001	01 / 36
FLYOVER GENERAL PLAN AND ELEVATION AND SECTION	NGE-008	08 / 19	CROSS SECTION (STA. 0 + 800.00 TO STA. 0 + 860.00) 11 OF 13	NRD-036	39 / 65	DRAINAGE SCHEDULE UNDER FLYOVER	NDV-002	02 / 36
GENERAL NOTES - ROADS AND DRAINAGE	NGE-009	09 / 19	CROSS SECTION (STA. 0 + 880.00 TO STA. 0 + 940.00) 12 OF 13	NRD-040	40 / 65	DRAINAGE LAYOUT PLAN AND ELEVATION AT VIADUCT 1 OF 5	NDV-003	03 / 36
GENERAL NOTES FOR STRUCTURES 1 OF 3	NGE-010	10 / 19	CROSS SECTION (STA. 0 + 960.00 TO STA. 1 + 020.00) 13 OF 13	NRD-041	41 / 65	DRAINAGE LAYOUT PLAN AND ELEVATION AT VIADUCT 2 OF 5	NDV-004	04 / 36
GENERAL NOTES FOR STRUCTURES 2 OF 3	NGE-011	11 / 19	CROSS SECTION AT ABUTMENT & PIER LOCATION 1 OF 6	NRD-042	42 / 65	DRAINAGE LAYOUT PLAN AND ELEVATION AT VIADUCT 3 OF 5	NDV-005	05 / 36
GENERAL NOTES FOR STRUCTURES 3 OF 3	NGE-012	12 / 19	CROSS SECTION AT ABUTMENT & PIER LOCATION 2 OF 6	NRD-043	43 / 65	DRAINAGE LAYOUT PLAN AND ELEVATION AT VIADUCT 4 OF 5	NDV-006	06 / 36
TOPOGRAPHIC SURVEY CONTROL NETWORK GPS, TRAVERSE, BM	NGE-013	13 / 19	CROSS SECTION AT ABUTMENT & PIER LOCATION 3 OF 6	NRD-044	44 / 65	DRAINAGE LAYOUT PLAN AND ELEVATION AT VIADUCT 5 OF 5	NDV-007	07 / 36
TOPOGRAPHIC PLAN 1 OF 4	NGE-014	14 / 19	CROSS SECTION AT ABUTMENT & PIER LOCATION 4 OF 6	NRD-045	45 / 65	DRAINAGE LAYOUT PLAN UNDER VIADUCT AT GRADE LEVEL 1 OF 2	NDV-008	08 / 36
TOPOGRAPHIC PLAN 2 OF 4	NGE-015	15 / 19	CROSS SECTION AT ABUTMENT & PIER LOCATION 5 OF 6	NRD-046	46 / 65	DRAINAGE LAYOUT PLAN UNDER VIADUCT AT GRADE LEVEL 2 OF 2	NDV-009	09 / 36
TOPOGRAPHIC PLAN 3 OF 4	NGE-016	16 / 19	CROSS SECTION AT ABUTMENT & PIER LOCATION 6 OF 6	NRD-047	47 / 65	ABUTMENT AND PIER SECTIONS SHOWING DOWNSPOUT PIPE 1 OF 11	NDV-010	10 / 36
TOPOGRAPHIC PLAN 4 OF 4	NGE-017	17 / 19	RIGHT-OF-WAY PLAN 1 OF 4	NRD-048	48 / 65	ABUTMENT AND PIER SECTIONS SHOWING DOWNSPOUT PIPE 2 OF 11	NDV-011	11 / 36
SUMMARY OF QUANTITIES 1 OF 2	NGE-018	18 / 19	RIGHT-OF-WAY PLAN 2 OF 4	NRD-049	49 / 65	ABUTMENT AND PIER SECTIONS SHOWING DOWNSPOUT PIPE 3 OF 11	NDV-012	12 / 36
SUMMARY OF QUANTITIES 2 OF 2	NGE-019	19 / 19	RIGHT-OF-WAY PLAN 3 OF 4	NRD-050	50 / 65	ABUTMENT AND PIER SECTIONS SHOWING DOWNSPOUT PIPE 4 OF 11	NDV-013	13 / 36
			RIGHT-OF-WAY PLAN 4 OF 4	NRD-051	51 / 65	ABUTMENT AND PIER SECTIONS SHOWING DOWNSPOUT PIPE 5 OF 11	NDV-014	14 / 36
<b>ROADS</b>			GEOMETRIC DESIGN STANDARD 1 OF 3	NRD-052	52 / 65	ABUTMENT AND PIER SECTIONS SHOWING DOWNSPOUT PIPE 6 OF 11	NDV-015	15 / 36
ROADWAY PLAN ( FLYOVER ) 1 OF 4	NRD-001	01 / 65	GEOMETRIC DESIGN STANDARD 2 OF 3	NRD-053	53 / 65	ABUTMENT AND PIER SECTIONS SHOWING DOWNSPOUT PIPE 7 OF 11	NDV-016	16 / 36
ROADWAY PLAN ( FLYOVER ) 2 OF 4	NRD-002	02 / 65	GEOMETRIC DESIGN STANDARD 3 OF 3	NRD-054	54 / 65	ABUTMENT AND PIER SECTIONS SHOWING DOWNSPOUT PIPE 8 OF 11	NDV-017	17 / 36
ROADWAY PLAN ( FLYOVER ) 3 OF 4	NRD-003	03 / 65	STANDARD ROADWAY SUPERELEVATION	NRD-055	55 / 65	ABUTMENT AND PIER SECTIONS SHOWING DOWNSPOUT PIPE 9 OF 11	NDV-018	18 / 36
ROADWAY PLAN ( FLYOVER ) 4 OF 4	NRD-004	04 / 65	STANDARD THREE-LEG & FOUR-LEG INTERSECTIONS	NRD-056	56 / 65	ABUTMENT AND PIER SECTIONS SHOWING DOWNSPOUT PIPE 10 OF 11	NDV-019	19 / 36
PROFILE OF FLYOVER 1 OF 2	NRD-005	05 / 65	STANDARD ASPHALT PAVEMENT	NRD-057	57 / 65	ABUTMENT AND PIER SECTIONS SHOWING DOWNSPOUT PIPE 11 OF 11	NDV-020	20 / 36
PROFILE OF FLYOVER 2 OF 2	NRD-006	06 / 65	STANDARD PAVEMENT FOR RAILROAD CROSSING	NRD-058	58 / 65	DRAINAGE CATCH BASIN DETAILS	NDV-021	21 / 36
ROADWAY PLAN ( AT GRADE ) 1 OF 4	NRD-007	07 / 65	STANDARD COMBINATION CONCRETE CURB AND GUTTER	NRD-059	59 / 65	DRAINAGE DETAILS OF MANHOLE TYPE VII	NDV-022	22 / 36
ROADWAY PLAN ( AT GRADE ) 2 OF 4	NRD-008	08 / 65	STANDARD PUBLIC & PRIVATE ENTRANCE	NRD-060	60 / 65	DRAINAGE DETAILS OF MANHOLE TYPE VIII	NDV-023	23 / 36
ROADWAY PLAN ( AT GRADE ) 3 OF 4	NRD-009	09 / 65	STANDARD CONCRETE BARRIER AND MEDIAN IN FILL DETAILS	NRD-061	61 / 65	STEEL GRATING DETAILS OF MANHOLE TYPE VIII	NDV-024	24 / 36
ROADWAY PLAN ( AT GRADE ) 4 OF 4	NRD-010	10 / 65	STANDARD BRC FENCE AND STONE MASONRY RETAINING WALL	NRD-062	62 / 65	DRAINAGE MISCELLANEOUS VIADUCT DETAILS	NDV-025	25 / 36
PROFILE OF MAIN ROAD & RIGHT SERVICE ROAD 1 OF 2	NRD-011	11 / 65	STANDARD CURB - CUT RAMP DETAILS	NRD-063	63 / 65	PLAN AND ELEVATION OF VIADUCT ALONG APPROACH 1 OF 9	NDV-026	26 / 36
PROFILE OF MAIN ROAD & RIGHT SERVICE ROAD 2 OF 2	NRD-012	12 / 65	STANDARD COLUMN PROTECTION DETAILS	NRD-064	64 / 65	PLAN AND ELEVATION OF VIADUCT ALONG APPROACH 2 OF 9	NDV-027	27 / 36
PROFILE OF MAIN ROAD & LEFT SERVICE ROAD 1 OF 2	NRD-013	13 / 65	RAILWAY CROSSING DETAILS	NRD-065	65 / 65	PLAN AND ELEVATION OF VIADUCT ALONG APPROACH 3 OF 9	NDV-028	28 / 36
PROFILE OF MAIN ROAD & LEFT SERVICE ROAD 2 OF 2	NRD-014	14 / 65	<b>DRAINAGE</b>			PLAN AND ELEVATION OF VIADUCT ALONG APPROACH 4 OF 9	NDV-029	29 / 36
TYPICAL ROAD CROSS SECTION 1 OF 5	NRD-015	15 / 65	AT - GRADE LEVEL			PLAN AND ELEVATION OF VIADUCT ALONG APPROACH 5 OF 9	NDV-030	30 / 36
TYPICAL ROAD CROSS SECTION 2 OF 5	NRD-016	16 / 65				PLAN AND ELEVATION OF VIADUCT ALONG APPROACH 6 OF 9	NDV-031	31 / 36
TYPICAL ROAD CROSS SECTION 3 OF 5	NRD-017	17 / 65	DRAINAGE SCHEDULE AT GRADE RIGHT AND LEFT	NDG-001	01 / 20	PLAN AND ELEVATION OF VIADUCT ALONG APPROACH 7 OF 9	NDV-032	32 / 36
TYPICAL ROAD CROSS SECTION 4 OF 5	NRD-018	18 / 65	DRAINAGE SYSTEM LAYOUT PLAN 1 OF 4	NDG-002	02 / 20	PLAN AND ELEVATION OF VIADUCT ALONG APPROACH 8 OF 9	NDV-033	33 / 36
TYPICAL ROAD CROSS SECTION 5 OF 5	NRD-019	19 / 65	DRAINAGE SYSTEM LAYOUT PLAN 2 OF 4	NDG-003	03 / 20	PLAN AND ELEVATION OF VIADUCT ALONG APPROACH 9 OF 9	NDV-034	34 / 36
ALIGNMENT LAYOUT AND CURVE ELEMENTS	NRD-020	20 / 65	DRAINAGE SYSTEM LAYOUT PLAN 3 OF 4	NDG-004	04 / 20	TYPICAL DETAILS OF DECK DRAIN	NDV-035	35 / 36
GEOMETRIC LAYOUT PLAN AT INTERSECTION	NRD-021	21 / 65	DRAINAGE SYSTEM LAYOUT PLAN 4 OF 4	NDG-005	05 / 20	TYPICAL DETAILS OF DECK DRAIN AND DS-5 AT APPROACH	NDV-036	36 / 36
DETAILED CONSTRUCTION LAYOUT PLAN 1 OF 7	NRD-022	22 / 65		NDG-006	06 / 20	<b>STRUCTURES</b>		
DETAILED CONSTRUCTION LAYOUT PLAN 2 OF 7	NRD-023	23 / 65	DRAINAGE PROFILE, RIGHT SERVICE ROAD 1 OF 2	NDG-007	07 / 20	<b>STEEL SUPERSTRUCTURE</b>		
DETAILED CONSTRUCTION LAYOUT PLAN 3 OF 7	NRD-024	24 / 65	DRAINAGE PROFILE, RIGHT SERVICE ROAD 2 OF 2	NDG-008	08 / 20	GENERAL DIMENSION OF STEEL SUPERSTRUCTURE (1 OF 3)	NST-001	01 / 46
DETAILED CONSTRUCTION LAYOUT PLAN 4 OF 7	NRD-025	25 / 65	DRAINAGE PROFILE, LEFT SERVICE ROAD 1 OF 2	NDG-009	09 / 20	GENERAL DIMENSION OF STEEL SUPERSTRUCTURE (2 OF 3)	NST-002	02 / 46
DETAILED CONSTRUCTION LAYOUT PLAN 5 OF 7	NRD-026	26 / 65	DRAINAGE PROFILE, LEFT SERVICE ROAD 2 OF 2	NDG-010	10 / 20	GENERAL DIMENSION OF STEEL SUPERSTRUCTURE (3 OF 3)	NST-003	03 / 46
DETAILED CONSTRUCTION LAYOUT PLAN 6 OF 7	NRD-027	27 / 65	STANDARD REINFORCED CONCRETE PIPE CULVERTS	NDG-011	11 / 20			
DETAILED CONSTRUCTION LAYOUT PLAN 7 OF 7	NRD-028	28 / 65	STANDARD CURB INLET AND MANHOLE (I, II) 1 OF 3	NDG-012	12 / 20			
CROSS SECTION (STA. 0 + 000.00 TO STA. 0 + 060.00) 1 OF 13	NRD-029	29 / 65	STANDARD CURB INLET AND MANHOLE (III, IV) 2 OF 3	NDG-013	13 / 20			
CROSS SECTION (STA. 0 + 080.00 TO STA. 0 + 140.00) 2 OF 13	NRD-030	30 / 65	STANDARD CURB INLET AND MANHOLE (V, VI) 3 OF 3	NDG-014	14 / 20			
CROSS SECTION (STA. 0 + 160.00 TO STA. 0 + 220.00) 3 OF 13	NRD-031	31 / 65	DETAILS OF CURB INLET & COVER MANHOLE	NDG-015	15 / 20			
			DETAILS OF DRAINAGE DITCHES DS-1, DS-2, DS-3, DS-3A, DS-4 & DS-4A					

<b>JAPAN INTERNATIONAL COOPERATION AGENCY</b> <b>KATAHIRA &amp; ENGINEERS INTERNATIONAL</b>	DESIGNED BY	CHECKED BY	SUBMITTED BY	<b>REPUBLIC OF INDONESIA</b> <b>MINISTRY OF PUBLIC WORKS</b> <b>DIRECTORATE GENERAL OF HIGHWAYS</b>	PROJECT AND LOCATION :	SCALE :	DRAWING TITLE :	DRAWING NO. :	
	Name R. UENO	Name T. OKUMURA	Name M. KIUCHI		APPROVED BY <b>Ir. HERRY VAZA M,Eng.Sc</b> NIP. : 110038400	DETAILED DESIGN STUDY OF NORTH JAVA CORRIDOR FLYOVER PROJECT NAGREG FLYOVER - CONTRACT PACKAGE 2 ( NAGREG - GEBANG ) WEST JAVA PROVINCE	N T S  FULL SIZE A3	INDEX OF DRAWINGS 2 OF 3	NGE-002
	Sign	Sign	Sign						SHEET NO. :
	Date	Date	Date						02 / 19

## INDEX OF DRAWINGS 2 OF 3

TITLE OF DRAWING	DRAWING NO.	SHEET NO.	TITLE OF DRAWING	DRAWING NO.	SHEET NO.	TITLE OF DRAWING	DRAWING NO.	SHEET NO.
						<b>SUBSTRUCTURES</b>		
						<b>ABUTMENT AND PIER LAYOUT &amp; DIMENSIONS</b>		
COORDINATES AND ELEVATION (1 OF 2)	NST-004	04 / 46	ARRANGEMENT OF PC CABLES A1-P2	NCL-007	07 / 22	ABUTMENT LAYOUT & DIMENSIONS (ABUTMENT A1)	NSB-001	01 / 44
COORDINATES AND ELEVATION (2 OF 2)	NST-005	05 / 46	ARRANGEMENT OF PC CABLES P2-P4	NCL-008	08 / 22	PIER LAYOUT (PIER P1, P2 - FIXED)	NSB-002	02 / 44
TABLE OF QUANTITIES	NST-006	06 / 46	ARRANGEMENT OF PC CABLES A1-P4	NCL-009	09 / 22	PIER LAYOUT (PIER P3 - FIXED)	NSB-003	03 / 44
BLOCK WEIGHT OF GIRDER	NST-007	07 / 46	PC CABLES SCHEDULE A1-P4	NCL-010	10 / 22	PIER LAYOUT (PIER P4 - EXP.)	NSB-004	04 / 44
SECTIONAL DIMENSION OF GIRDER G1 (1 OF 2)	NST-008	08 / 46	TYPICAL DETAIL OF CROSS SECTION REINFORCEMENT A1-P4	NCL-011	11 / 22	PIER LAYOUT (PIER P5 - FIXED)	NSB-005	05 / 44
SECTIONAL DIMENSION OF GIRDER G1 (2 OF 2)	NST-009	09 / 46	ARRANGEMENT OF REINFORCEMENT FOR PC GIRDER A1-P2	NCL-012	12 / 22	PIER LAYOUT (PIER P6 - PORTAL)	NSB-006	06 / 44
SECTIONAL DIMENSION OF GIRDER G2 (1 OF 2)	NST-010	10 / 46	ARRANGEMENT OF REINFORCEMENT FOR PC GIRDER P2-P4	NCL-013	13 / 22	PIER LAYOUT (PIER P7 - FIXED)	NSB-007	07 / 44
SECTIONAL DIMENSION OF GIRDER G2 (2 OF 2)	NST-011	11 / 46	ARRANGEMENT OF REINFORCEMENT FOR PC GIRDER A1-P4 (1 OF 2)	NCL-014	14 / 22	PIER LAYOUT (PIER P8 - EXP.)	NSB-008	08 / 44
SECTIONAL DIMENSION OF GIRDER P5	NST-012	12 / 46	ARRANGEMENT OF REINFORCEMENT FOR PC GIRDER A1-P4 (2 OF 2)	NCL-015	15 / 22	PIER LAYOUT (PIER P9 - FIXED)	NSB-009	09 / 44
SECTIONAL DIMENSION OF GIRDER P6	NST-013	13 / 46	REINFORCEMENT SCHEDULE FOR PC GIRDER A1-P4 (1 OF 3)	NCL-016	16 / 22	ABUTMENT LAYOUT & DIMENSIONS (ABUTMENT A2)	NSB-010	10 / 44
SECTIONAL DIMENSION OF GIRDER P7	NST-014	14 / 46	REINFORCEMENT SCHEDULE FOR PC GIRDER A1-P4 (2 OF 3)	NCL-017	17 / 22			
DETAIL OF GIRDER G1 (1 OF 7)	NST-015	15 / 46	REINFORCEMENT SCHEDULE FOR PC GIRDER A1-P4 (3 OF 3)	NCL-018	18 / 22	<b>REINFORCEMENT</b>		
DETAIL OF GIRDER G1 (2 OF 7)	NST-016	16 / 46	ARRANGEMENT OF REINFORCEMENT FOR CROSS BEAMS P1, P2, P3	NCL-019	19 / 22	REINFORCEMENT OF COLUMN, ABUTMENT A1 (1 OF 2)	NSB-011	11 / 44
DETAIL OF GIRDER G1 (3 OF 7)	NST-017	17 / 46	ARRANGEMENT OF REINFORCEMENT FOR CROSS BEAMS A1	NCL-020	20 / 22	REINFORCEMENT OF COLUMN, ABUTMENT A1 (2 OF 2)	NSB-012	12 / 44
DETAIL OF GIRDER G1 (4 OF 7)	NST-018	18 / 46	ARRANGEMENT OF REINFORCEMENT FOR CROSS BEAMS P4	NCL-021	21 / 22	REINFORCEMENT OF COLUMN, ABUTMENT A2 (1 OF 2)	NSB-013	13 / 44
DETAIL OF GIRDER G1 (5 OF 7)	NST-019	19 / 46	ARRANGEMENT OF REINFORCEMENT FOR ANCHORAGES A1-P4	NCL-022	22 / 22	REINFORCEMENT OF COLUMN, ABUTMENT A2 (2 OF 2)	NSB-014	14 / 44
DETAIL OF GIRDER G1 (6 OF 7)	NST-020	20 / 46	<b>PC-RIGHT SIDE ( 2 SPAN,P8-A2)</b>			REINFORCEMENT OF FOOTING, ABUTMENT A1 & A2 (1 OF 2)	NSB-015	15 / 44
DETAIL OF GIRDER G1 (7 OF 7)	NST-021	21 / 46	COORDINATES AND ELEVATIONS FOR PC GIRDER P8-A2	NCR-001	01 / 18	REINFORCEMENT OF FOOTING, ABUTMENT A1 & A2 (2 OF 2)	NSB-016	16 / 44
DETAIL OF GIRDER G2 (1 OF 7)	NST-022	22 / 46	DIMENSION PLAN OF PC SUPERSTRUCTURE P8-A2	NCR-002	02 / 18	PIER COLUMN REINFORCEMENT (PIER P1)	NSB-017	17 / 44
DETAIL OF GIRDER G2 (2 OF 7)	NST-023	23 / 46	TYPICAL CROSS SECTION P8-A2 (1 OF 2)	NCR-003	03 / 18	PIER COLUMN REINFORCEMENT (PIER P2)	NSB-018	18 / 44
DETAIL OF GIRDER G2 (3 OF 7)	NST-024	24 / 46	TYPICAL CROSS SECTION P8-A2 (2 OF 2)	NCR-004	04 / 18	PIER COLUMN REINFORCEMENT (PIER P3)	NSB-019	19 / 44
DETAIL OF GIRDER G2 (4 OF 7)	NST-025	25 / 46	ARRANGEMENT OF PC CABLES P8-A2 (1 OF 2)	NCR-005	05 / 18	PIER COLUMN REINFORCEMENT (PIER P9)	NSB-020	20 / 44
DETAIL OF GIRDER G2 (5 OF 7)	NST-026	26 / 46	ARRANGEMENT OF PC CABLES P8-A2 (2 OF 2)			SCHEDULE OF REINFORCED CONCRETE COLUMN	NSB-021	21 / 44
DETAIL OF GIRDER G2 (6 OF 7)	NST-027	27 / 46	ARRANGEMENT OF PC CABLES P8-A2 (2 OF 2)	NCR-006	06 / 18	PIER COPING REINFORCEMENT (PIER P4 - EXP.) 1 OF 4	NSB-022	22 / 44
DETAIL OF GIRDER G2 (7 OF 7)	NST-028	28 / 46	PC CABLES SCHEDULE P8-A2	NCR-007	07 / 18	PIER COPING REINFORCEMENT (PIER P4 - EXP.) 2 OF 4	NSB-023	23 / 44
INTERMEDIATE CROSS BEAM AND DIAPHRAGM	NST-029	29 / 46	TYPICAL DETAIL OF CROSS SECTION REINFORCEMENT P8-A2	NCR-008	08 / 18	PIER COPING REINFORCEMENT (PIER P4 - EXP.) 3 OF 4	NSB-024	24 / 44
END SUPPORT CROSS BEAM AND DIAPHRAGM S1 <S2>	NST-030	30 / 46	ARRANGEMENT OF REINFORCEMENT FOR PC GIRDER P8-A2 (1 OF 3)	NCR-009	09 / 18	PIER COPING REINFORCEMENT (PIER P4 - EXP.) 4 OF 4	NSB-025	25 / 44
DEAD LOAD CHAMBER DIAGRAM	NST-031	31 / 46	ARRANGEMENT OF REINFORCEMENT FOR PC GIRDER P8-A2 (2 OF 3)	NCR-010	10 / 18	PIER COPING REINFORCEMENT (PIER P8 - EXP.) 1 OF 4	NSB-026	26 / 44
DETAIL OF GIRDER P5 (1 OF 2)	NST-032	32 / 46	ARRANGEMENT OF REINFORCEMENT FOR PC GIRDER P8-A2 (3 OF 3)	NCR-011	11 / 18	PIER COPING REINFORCEMENT (PIER P8 - EXP.) 2 OF 4	NSB-027	27 / 44
DETAIL OF GIRDER P5 (2 OF 2)	NST-033	33 / 46	REINFORCEMENT SCHEDULE FOR PC GIRDER P8-A2 (1 OF 3)	NCR-012	12 / 18	PIER COPING REINFORCEMENT (PIER P8 - EXP.) 3 OF 4	NSB-028	28 / 44
DETAIL OF GIRDER P6 (1 OF 4)	NST-034	34 / 46	REINFORCEMENT SCHEDULE FOR PC GIRDER P8-A2 (2 OF 3)	NCR-013	13 / 18	PIER COPING REINFORCEMENT (PIER P8 - EXP.) 4 OF 4	NSB-029	29 / 44
DETAIL OF GIRDER P6 (2 OF 4)	NST-035	35 / 46	REINFORCEMENT SCHEDULE FOR PC GIRDER P8-A2 (3 OF 3)	NCR-014	14 / 18	SCHEDULE OF RISER REINF. AND ANCHOR BAR PIER P4 & P8 (1 OF 2)	NSB-030	30 / 44
DETAIL OF GIRDER P6 (3 OF 4)	NST-036	36 / 46	ARRANGEMENT OF REINFORCEMENT FOR CROSS BEAMS P9	NCR-015	15 / 18	SCHEDULE OF RISER REINF. AND ANCHOR BAR PIER P4 & P8 (2 OF 2)	NSB-031	31 / 44
DETAIL OF GIRDER P6 (4 OF 4)	NST-037	37 / 46	ARRANGEMENT OF REINFORCEMENT FOR CROSS BEAMS A2	NCR-016	16 / 18	CONCRETE BARRIER REINF. AT PIER COPING P4, P8 (EXP)	NSB-032	32 / 44
DETAIL OF GIRDER P7 (1 OF 2)	NST-038	38 / 46	ARRANGEMENT OF REINFORCEMENT FOR CROSS BEAMS P8	NCR-017	17 / 18	COMPOSITE COLUMN CASING DETAILS (PIER P4 & P8)	NSB-033	33 / 44
DETAIL OF GIRDER P7 (2 OF 2)	NST-036	36 / 46	ARRANGEMENT OF REINFORCEMENT FOR ANCHORAGES P8-A2	NCR-018	18 / 18	COMPOSITE COLUMN CASING DETAILS (PIER P5 & P7)	NSB-034	34 / 44
DETAIL OF GIRDER ACCESSORIES	NST-040	40 / 46	<b>MISCELLANEOUS</b>			COMPOSITE COLUMN CASING DETAILS (PIER P6)	NSB-035	35 / 44
DECK SLAB ARRANGEMENT OF PC CABLES P4-P8	NST-041	41 / 46	QUANTITIES SUMMARY FOR SUPERSTRUCTURE	NSM-001	01 / 13	COMPOSITE COLUMN SOCKET TYPE CONNECTION (PIER P4, P6, P8)	NSB-036	36 / 44
DECK SLAB REINFORCEMENT ARRANGEMENT OF PC CABLES P4-P8 (1 OF 3)	NST-042	42 / 46	EXPANSION JOINT LAY OUT PLAN	NSM-002	02 / 13	COMPOSITE COLUMN SOCKET TYPE CONNECTION (PIER P5, P7)	NSB-037	37 / 44
DECK SLAB REINFORCEMENT ARRANGEMENT OF PC CABLES P4-P8 (2 OF 3)	NST-043	43 / 46	DETAIL OF EXPANSION JOINT	NSM-003	03 / 13	BORED PILE REINFORCEMENT DETAILS (PIER P1, P3, P9)	NSB-038	38 / 44
DECK SLAB REINFORCEMENT ARRANGEMENT OF PC CABLES P4-P8 (3 OF 3)	NST-044	44 / 46	BEARING LAYOUT PLAN	NSM-004	04 / 13	BORED PILE REINFORCEMENT DETAILS (PIER P2)	NSB-036	36 / 44
DECK SLAB REINFORCEMENT SCHEDULE P4 - P8 (1 OF 2)	NST-045	45 / 46	ARRANGEMENT OF BEARING, STOPPER AND RESTRAINER	NSM-005	05 / 13	BORED PILE REINFORCEMENT DETAILS (PIER P4, P6, P8)	NSB-040	40 / 44
DECK SLAB REINFORCEMENT SCHEDULE P4 - P8 (2 OF 2)	NST-046	46 / 46	DETAIL OF BEARING TYPE - A3	NSM-006	06 / 13	BORED PILE REINFORCEMENT DETAILS (PIER P5, P7)	NSB-041	41 / 44
<b>CONCRETE SUPERSTRUCTURE</b>			DETAIL OF BEARING TYPE - B1	NSM-007	07 / 13	BORED PILE REINFORCEMENT DETAILS (ABUTMENT A1 & A2)	NSB-042	42 / 44
<b>PC-LEFT SIDE ( 4 SPAN,A1-P4)</b>			DETAIL OF BEARING TYPE - C2	NSM-008	08 / 13	SCHEDULE OF BORED PILE	NSB-043	43 / 44
COORDINATES AND ELEVATIONS FOR PC GIRDER A1-P4	NCL-001	01 / 22	DETAIL OF BEARING TYPE - C3	NSM-009	09 / 13	APPROACH SLAB DETAILS OF ABUTMENT A1 & A2	NSB-044	44 / 44
SUMMARY OF QUANTITIES FOR PC SUPERSTRUCTURE A1-P4, P8-A2	NCL-002	02 / 22	DETAIL OF STOPPER	NSM-010	10 / 13	<b>MSE WALL</b>		
DIMENSION PLAN OF PC SUPERSTRUCTURE A1-P2	NCL-003	03 / 22	DETAIL OF RESTRAINER TYPE 3	NSM-011	11 / 13	NOTES FOR MECHANICALLY STABILIZED EARTH WALL	NMS-001	01 / 16
DIMENSION PLAN OF PC SUPERSTRUCTURE P2-P4	NCL-004	04 / 22	DETAIL OF PARAPET AND MEDIAN	NSM-012	12 / 13	PLAN & PROFILE MSE WALL AT APPROACH ROAD ABUTMENT A1 SIDE 1 OF 4	NMS-002	02 / 16
TYPICAL CROSS SECTION A1-P4 (1 OF 2)	NCL-005	05 / 22	SAFETY FENCE	NSM-013	13 / 13	PLAN & PROFILE MSE WALL AT APPROACH ROAD ABUTMENT A1 SIDE 2 OF 4	NMS-003	03 / 16
TYPICAL CROSS SECTION A1-P4 (2 OF 2)	NCL-006	06 / 22						

<b>JICA</b> JAPAN INTERNATIONAL COOPERATION AGENCY <b>KATAHIRA &amp; ENGINEERS</b> 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 NIP. : 110038400		N T S	<b>INDEX OF DRAWINGS</b> <b>3 OF 3</b>	DRAWING NO. :
	Sign		Sign		Sign								SHEET NO. :
	Date		Date		Date								03 / 19
								FULL SIZE A3					

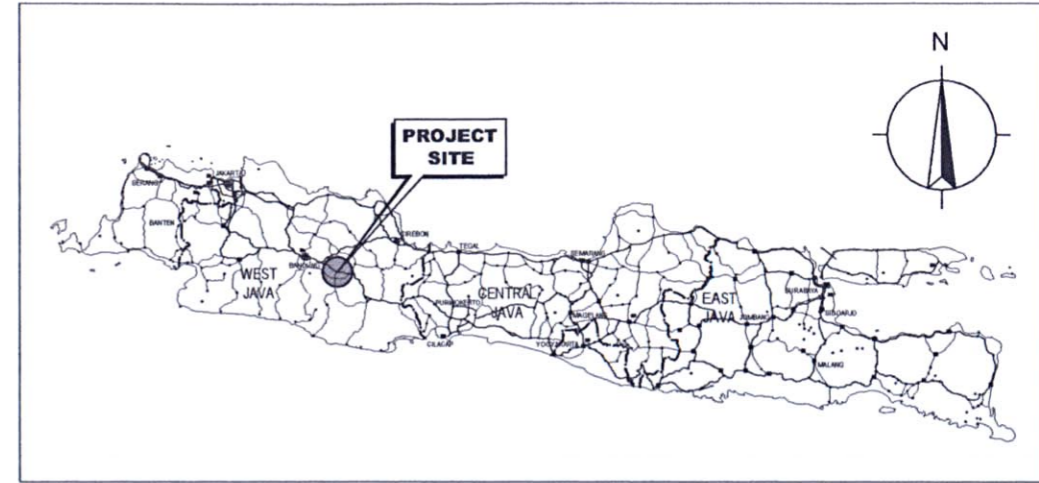
## INDEX OF DRAWINGS 3 OF 3

TITLE OF DRAWING	DRAWING NO.	SHEET NO.	TITLE OF DRAWING	DRAWING NO.	SHEET NO.	TITLE OF DRAWING	DRAWING NO.	SHEET NO.
PLAN & PROFILE MSE WALL AT APPROACH ROAD ABUTMENT A1 SIDE 3 OF 4	NMS-004	04 / 16	PUBLIC UTILITIES UNDER GROUND 5 OF 7	NUT-012	12 / 15			
PLAN & PROFILE MSE WALL AT APPROACH ROAD ABUTMENT A1 SIDE 4 OF 4	NMS-005	05 / 16	PUBLIC UTILITIES UNDER GROUND 6 OF 7	NUT-013	13 / 15			
SECTION & DETAIL OF MSE WALL ABUTMENT A1 SIDE	NMS-006	06 / 16	PUBLIC UTILITIES UNDER GROUND 7 OF 7	NUT-014	14 / 15			
SECTION OF MSE WALL AT APPROACH ROAD ABUTMENT A1 SIDE	NMS-007	07 / 16	STANDARD DETAILS OF RELOCATION & PROTECTION UTILITY UNDER GROUND	NUT-015	15 / 15			
PLAN & PROFILE OF MSE WALL AT APPROACH ROAD ABUTMENT A2 SIDE 1 OF 2	NMS-008	08 / 16						
PLAN & PROFILE OF MSE WALL AT APPROACH ROAD ABUTMENT A2 SIDE 2 OF 2	NMS-009	09 / 16	<b>ROAD LIGHTING</b>					
SECTION & DETAIL MSE WALL AT ABUTMENT A2 SIDE	NMS-010	10 / 16	ABBREVIATIONS AND LEGEND	NRL-001	01 / 13			
SECTION OF MSE WALL AT APPROACH ROAD ABUTMENT A2 SIDE	NMS-011	11 / 16	ROAD LIGHTING PLAN OF FLYOVER	NRL-002	02 / 13			
MECHANICALLY STABILIZED EARTH WALL (MISCELLANEOUS DETAILS)	NMS-012	12 / 16	ROAD LIGHTING PLAN OF SERVICE ROAD	NRL-003	03 / 13			
STUB WALL LAYOUT & REINFORCEMENT (ABUT.A1 SIDE) 1 OF 2	NMS-013	13 / 16	ROAD LIGHTING PLAN OF UNDER VIADUCT	NRL-004	04 / 13			
STUB WALL LAYOUT & REINFORCEMENT (ABUT.A1 SIDE) 2 OF 2	NMS-014	14 / 16	DIAGRAM PANEL OF FLYOVER 1 OF 2	NRL-005	05 / 13			
STUB WALL LAYOUT & REINFORCEMENT (ABUT.A2 SIDE) 1 OF 2	NMS-015	15 / 16	DIAGRAM PANEL OF FLYOVER 2 OF 2	NRL-006	06 / 13			
STUB WALL LAYOUT & REINFORCEMENT (ABUT.A2 SIDE) 2 OF 2	NMS-016	16 / 16	DIAGRAM PANEL OF RIGHT SERVICE ROAD	NRL-007	07 / 13			
			DIAGRAM PANEL OF LEFT SERVICE ROAD	NRL-008	08 / 13			
<b>TRAFFIC CONTROL</b>			LIGHTING PANEL	NRL-009	09 / 13			
TRAFFIC SIGNS AND ROAD MARKINGS LAYOUT (FLYOVER) 1 OF 2	NTR-001	01 / 24	LIGHTING POLE AT FLYOVER & PULL BOX DETAIL	NRL-010	10 / 13			
TRAFFIC SIGNS AND ROAD MARKINGS LAYOUT (FLYOVER) 2 OF 2	NTR-002	02 / 24	LIGHTING POLE AT SERVICE ROAD	NRL-011	11 / 13			
TRAFFIC SIGNS AND ROAD MARKINGS LAYOUT (AT-GRADE) 1 OF 2	NTR-003	03 / 24	LIGHTING UNDER VIADUCT	NRL-012	12 / 13			
TRAFFIC SIGNS AND ROAD MARKINGS LAYOUT (AT-GRADE) 2 OF 2	NTR-004	04 / 24	CONDUIT & CABLE INSTALLATION	NRL-013	13 / 13			
STANDARD PAVEMENT MARKINGS DETAIL 1 OF 2	NTR-005	05 / 24						
STANDARD PAVEMENT MARKINGS DETAIL 2 OF 2	NTR-006	06 / 24						
STANDARD PAVEMENT MARKINGS AT RAILROAD CROSSING	NTR-007	07 / 24						
CHEVRON MARKING DETAILS (FLYOVER APPROACHES)	NTR-008	08 / 24						
STANDARD TRAFFIC SIGNS 1 OF 4	NTR-009	09 / 24						
STANDARD TRAFFIC SIGNS 2 OF 4	NTR-010	10 / 24						
STANDARD TRAFFIC SIGNS 3 OF 4	NTR-011	11 / 24						
STANDARD TRAFFIC SIGNS 4 OF 4	NTR-012	12 / 24						
OVERHEAD GUIDE SIGNS	NTR-013	13 / 24						
ROAD SIGNS AND MOUNTING DETAILS	NTR-014	14 / 24						
OVERHEAD SIGN TRUSS STRUCTURAL FRAME DETAILS 1 OF 2	NTR-015	15 / 24						
OVERHEAD SIGN TRUSS STRUCTURAL FRAME DETAILS 2 OF 2	NTR-016	16 / 24						
STANDARD TRAFFIC MANAGEMENT SIGNS DURING CONSTRUCTION	NTR-017	17 / 24						
STANDARD TRAFFIC MANAGEMENT SAFETY DEVICE DETAILS	NTR-018	18 / 24						
STANDARD SIGN BOARD PANEL	NTR-019	19 / 24						
STAGES OF CONSTRUCTION	NTR-020	20 / 24						
TYPICAL BORED PILING METHODOLOGY	NTR-021	21 / 24						
TYPICAL INSTALLATION OF GIRDER	NTR-022	22 / 24						
TYPICAL TRAFFIC MANAGEMENT LAYOUT 1 OF 2	NTR-023	23 / 24						
TYPICAL TRAFFIC MANAGEMENT LAYOUT 2 OF 2	NTR-024	24 / 24						
<b>UTILITIES</b>								
PUBLIC UTILITIES ABOVE GROUND 1 OF 7	NUT-001	01 / 15						
PUBLIC UTILITIES ABOVE GROUND 2 OF 7	NUT-002	02 / 15						
PUBLIC UTILITIES ABOVE GROUND 3 OF 7	NUT-003	03 / 15						
PUBLIC UTILITIES ABOVE GROUND 4 OF 7	NUT-004	04 / 15						
PUBLIC UTILITIES ABOVE GROUND 5 OF 7	NUT-005	05 / 15						
PUBLIC UTILITIES ABOVE GROUND 6 OF 7	NUT-006	06 / 15						
PUBLIC UTILITIES ABOVE GROUND 7 OF 7	NUT-007	07 / 15						
PUBLIC UTILITIES UNDER GROUND 1 OF 7	NUT-008	08 / 15						
PUBLIC UTILITIES UNDER GROUND 2 OF 7	NUT-009	09 / 15						
PUBLIC UTILITIES UNDER GROUND 3 OF 7	NUT-010	10 / 15						
PUBLIC UTILITIES UNDER GROUND 4 OF 7	NUT-011	11 / 15						

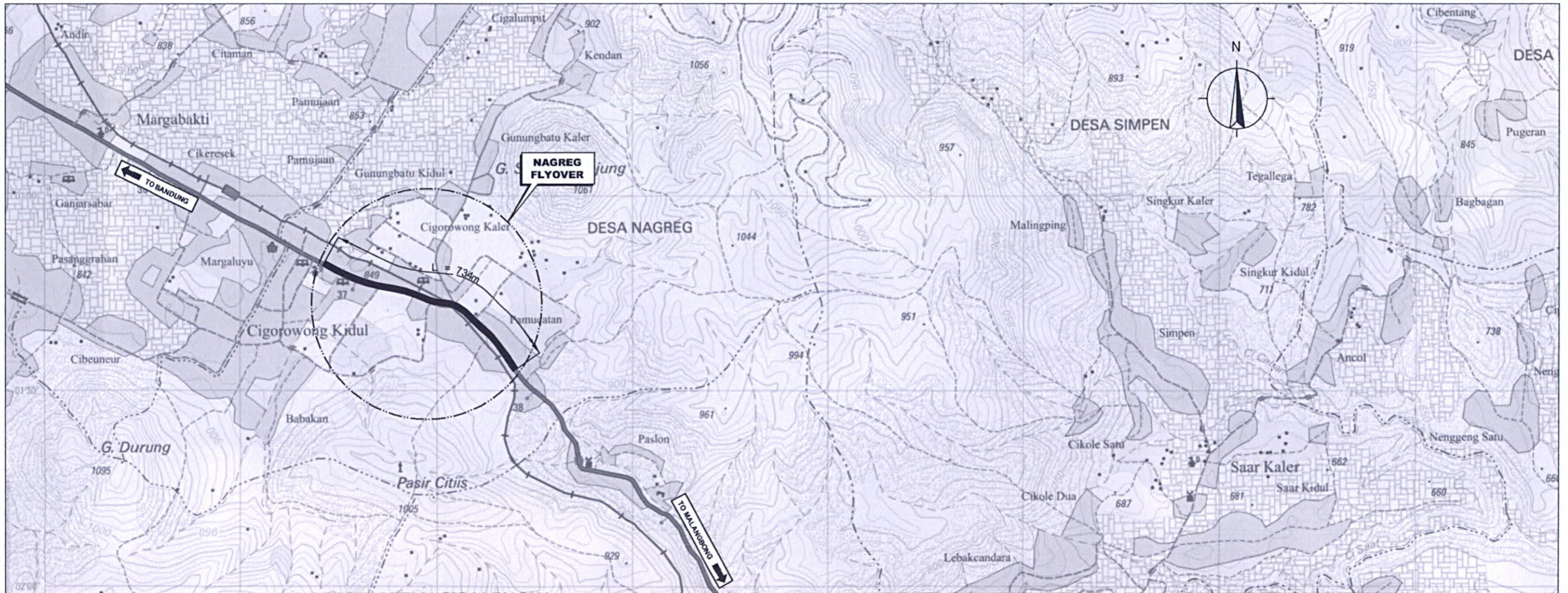
DESIGNED BY	CHECKED BY	SUBMITTED BY
Name R. UENO	Name T. OKUMURA	Name M. KIUCHI
Sign	Sign	Sign
Date	Date	Date



2 INDONESIA MAP  
 NOT TO SCALE





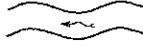
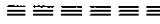







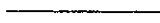


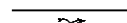




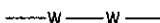


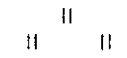



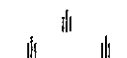
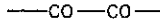






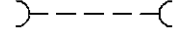




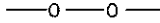


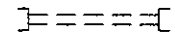
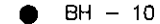


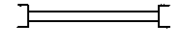
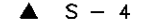


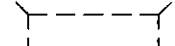



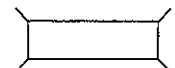



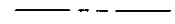
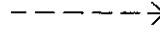

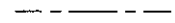
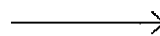

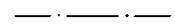

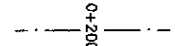

3 JAVA ISLAND MAP  
 NOT TO SCALE



1 LOCATION / VICINITY MAP  
 SCALE 1:20000

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

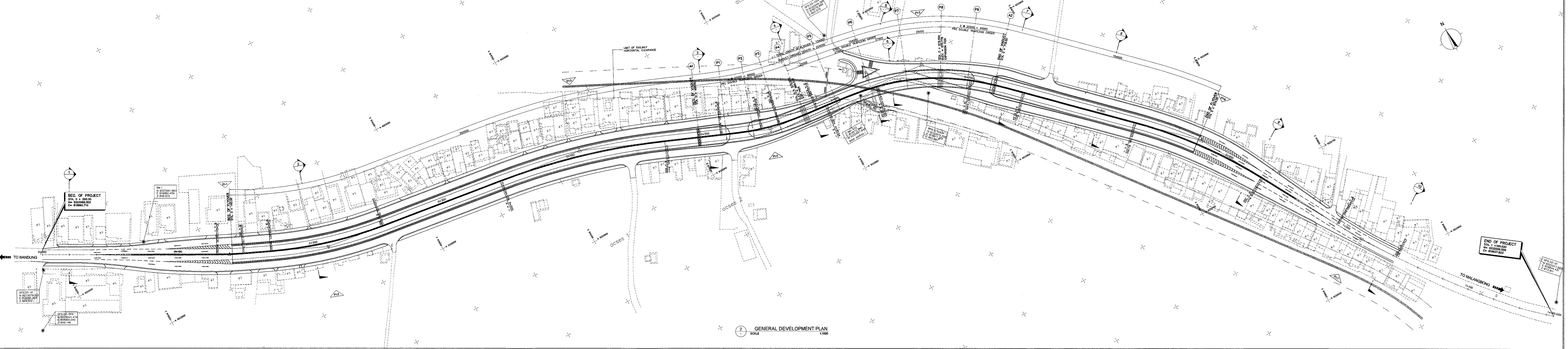
NOTATION AND LEGEND

	PERMANENT BUILDING (1 FLOOR)		BANK		RIVER		RETAINING WALL
	PERMANENT BUILDING (2 FLOORS)		WAREHOUSE		POND (WATER)		RAILWAY
	PERMANENT BUILDING (3 FLOORS)		HOSPITAL/CLINIC		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		BORE HOLE NO. 10
	TEMPLE		POWER HOUSE		DESIGN BOX CULVERT		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				

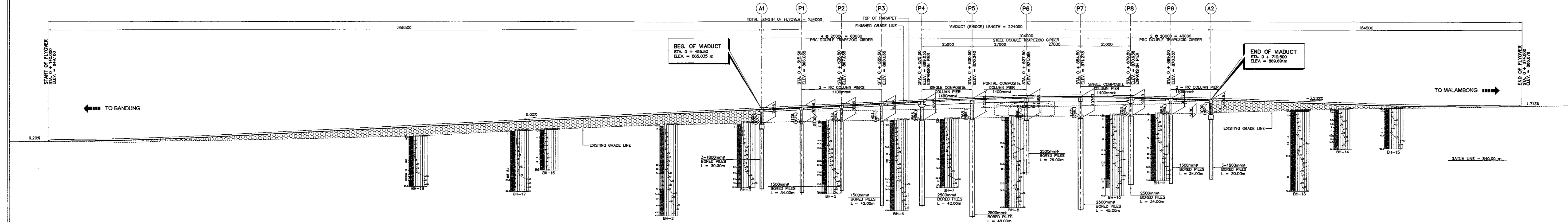




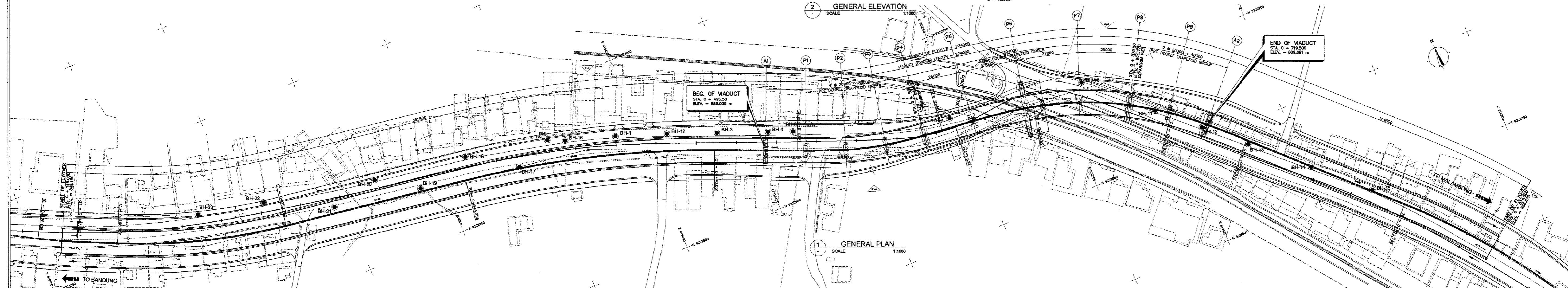
JAPAN INTERNATIONAL COOPERATION AGENCY KATAHIRA & ENGINEERS INTERNATIONAL			DESIGNED BY: R. UENO CHECKED BY: T. OKAMURA SUBMITTED BY: M. KUCHI			REPUBLIC OF INDONESIA MINISTRY OF PUBLIC WORKS DIRECTORATE GENERAL OF HIGHWAYS			PROJECT AND LOCATION: DETAILED DESIGN STUDY OF NORTH JAVA CORRIDOR FLYOVER PROJECT NAGREG FLYOVER - CONTRACT PACKAGE 2 (NAGREG - GEBANG) WEST JAVA PROVINCE		SCALE: 1 : 1000 FULL SIZE A3	DRAWING TITLE: GENERAL DEVELOPMENT PLAN	DRAWING NO.: NGE-007 SHEET NO.: 07 / 19
APPROVED BY: W. HERRY VAZA M.Eng.Sc NIP. : 110038400			APPROVED BY: [Signature] NIP. : [Blank] Date: [Blank]			APPROVED BY: [Signature] NIP. : [Blank] Date: [Blank]			APPROVED BY: [Signature] NIP. : [Blank] Date: [Blank]		APPROVED BY: [Signature] NIP. : [Blank] Date: [Blank]		



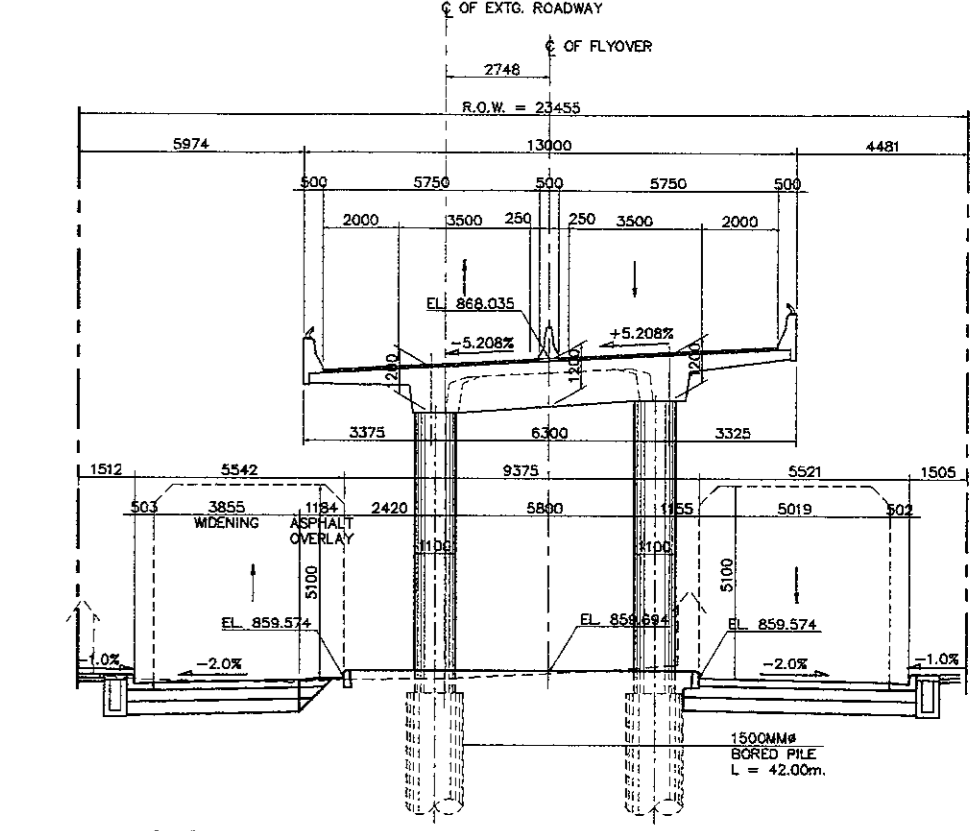
2 GENERAL DEVELOPMENT PLAN  
SCALE 1:1000



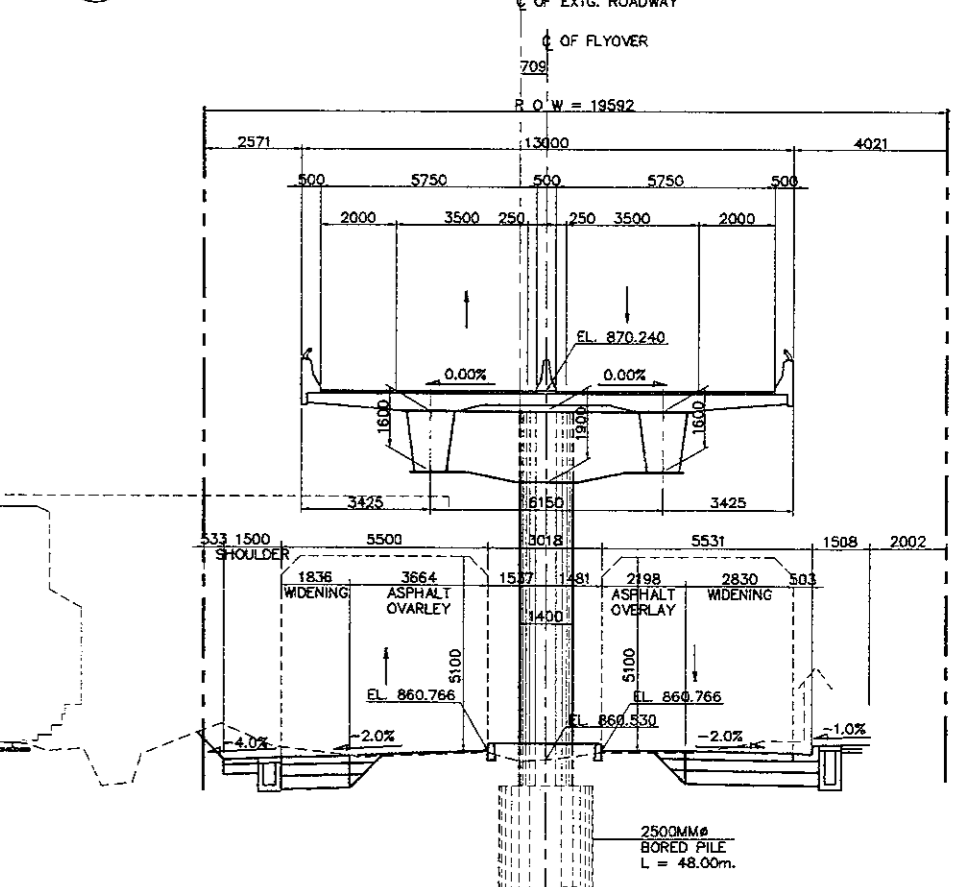
2 GENERAL ELEVATION  
SCALE 1:1000



1 GENERAL PLAN  
SCALE 1:1000



3 SECTION @ PIER (P3) PRC DOUBLE TRAPEZOID GIRDER (DOUBLE COLUMN)  
SCALE 1:200



4 SECTION @ PIER (P5) STEEL DOUBLE TRAPEZOID GIRDER (SINGLE COLUMN)  
SCALE 1:200

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

**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. NAGREG FLYOVER HAS THE FOLLOWING MAJOR CONTROL POINTS USED IN THE DESIGN OF HORIZONTAL AND VERTICAL ALIGNMENT:
- EXISTING RAILWAY CROSSING
  - EXISTING RAILWAY GRADIENT
  - EXISTING ROADWAY WIDTH
  - RIGHT - OF - WAY OF PT.KAI RAILWAY
  - LOCATION OF UNDERGROUND UTILITIES

**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 PECULIARLY TREATED WITH MUCH IMPORTANCE. IF IT NEED TO BE RELOCATED OR PROTECTED, THEN IT MUST BE DONE BEFORE THE CONSTRUCTION COMMENCE. WRITTEN APPROVAL / PERMISSION SHALL BE GIVEN TO THE CONTRACTOR BY THE UTILITIES OWNER THROUGH THE ENGINEER OR THE SUPERVISION CONSULTANT.
- 7.5. SUPPORTS FOR ABOVE GROUND UTILITIES TO BE RELOCATED/ REPLACED SHALL BE PLACED IN SUCH A WAY THAT THEY WILL NOT OBSTRUCT VEHICULAR AND PEDESTRIAN MOVEMENTS.

**8. ROAD CONNECTIONS AND PRIVATE ENTRANCES**

- 8.1. APPROACHES AND CONNECTIONS SHALL BE CONSTRUCTED BY THE CONTRACTOR AS SHOWN ON THE PLAN OR AS DIRECTED BY THE ENGINEER IN SUCH MANNER AS TO ENSURE SMOOTH CONNECTION AND RIDING QUALITY.
- 8.2. EXACT LOCATIONS OF INTERSECTION ROADS, AND PRIVATE ENTRANCES OR DRIVEWAYS WHERE ITEM 8.1 ABOVE APPLIES, SHALL BE DETERMINED IN THE FIELD BY THE ENGINEER.
- 8.3. DROP CURB AND GUTTER OR MOUNTABLE CURB AND GUTTER SHALL BE PROVIDED TO EXISTING ENTRANCES OR DRIVEWAYS AS SHOWN IN THE PLAN.
- 8.4. CURB - CUT RAMP SHALL BE PROVIDED AT SIDEWALK AND MEDIAN AS SHOWN IN THE STANDARD DRAWINGS THESE ARE INTENDED SPECIALLY FOR PEDESTRIANS WITH DISABILITY. LOCATIONS SHALL BE AS DIRECTED BY THE ENGINEER.
- 8.5. LIMIT OF CONSTRUCTION FOR ROAD CONNECTIONS AND PRIVATE ENTRANCES SHALL BE AS SHOWN IN THE DRAWING OR AS DIRECTED BY THE ENGINEER.

**9. DRAINAGE STRUCTURE**

- 9.1. EXACT LOCATIONS, SLOPES, OUTFALLS, AND INVERT ELEVATIONS OF DRAINAGE STRUCTURES SHALL BE CHECKED IN THE FIELD BY THE ENGINEER, MINOR ADJUSTMENTS MAY BE MADE TO SUIT ACTUAL FIELD CONDITIONS UPON APPROVAL BY THE ENGINEER.
- 9.2. EXISTING DRAINAGE STRUCTURES THAT ARE FAULTY, BROKEN DOWN, OR NOT IN GOOD WORKING CONDITION SHALL BE DETERMINED IN THE FIELD. RECONSTRUCTION, REPAIR AND / OR REPLACEMENT OF SAME SHALL BE DIRECTED BY THE ENGINEER, AND SHALL CONFORM TO THE STANDARDS SHOWN IN THE DRAWINGS.
- 9.3. EXISTING DRAINAGE STRUCTURES OR PARTS THEREOF REMOVED BY THE CONTRACTOR THAT ARE STILL SERVICEABLE SHALL BE TURNED OVER TO THE GOVERNMENT AND SHALL BE DEPOSITED AT A PLACE DESIGNATED BY THE ENGINEER. EXTREME PRECAUTIONS SHALL BE EXERCISED BY THE CONTRACTOR NOT TO DAMAGE THESE MATERIALS DURING REMOVAL AND HANDLING OPERATION.
- 9.4. CLEANING, UNCLOGGING AND/ OR RELAYING OF REINFORCED CONCRETE PIPES, CLEANING OF CHANNELS AND DITCHES AS DIRECTED BY THE ENGINEER SHALL BE UNDERTAKEN BY THE CONTRACTOR TO ENSURE AN OPERATIONAL TEMPORARY DRAINAGE SYSTEM DURING THE CONSTRUCTION PERIOD.
- 9.5. LAYOUT OF EXISTING SIDE DITCH, PIPE CULVERT, AND BOX CULVERT ARE BASED FROM TOPOGRAPHIC SURVEY. EXACT LOCATION AND DEPTH SHALL BE VERIFIED IN THE FIELD PRIOR TO THE CONSTRUCTION.
- 9.6. ALL INVERT ELEVATIONS OF EXISTING PIPES AND BOX CULVERTS SHALL BE VERIFIED PRIOR TO CONSTRUCTION IN ORDER TO SMOOTHLY JOIN TO THE NEW DRAINAGE SYSTEM.

**10. ROAD SIGN AND PAVEMENT MARKINGS**

- 10.1. ROAD SIGNS SHALL CONFORM WITH THE " DINAS PERHUBUNGAN LALU LINTAS DAN ANGKUTAN JALAN SETEMPAT "
- 10.2. PAVEMENT MARKINGS OR ROAD MARKINGS SHALL CONFORM WITH THE " DINAS PERHUBUNGAN LALU LINTAS DAN ANGKUTAN JALAN SETEMPAT "
- 10.3. INSTALLATION OF ROAD SIGNS AND PAVEMENT MARKINGS SHALL BE APPROVED BY THE ENGINEER.

**11. TRAFFIC MANAGEMENT**

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

<b>JAPAN INTERNATIONAL COOPERATION AGENCY</b> <b>KATAHIRA &amp; ENGINEERS INTERNATIONAL</b>	DESIGNED BY	CHECKED BY	SUBMITTED BY	<b>REPUBLIC OF INDONESIA</b> <b>MINISTRY OF PUBLIC WORKS</b> <b>DIRECTORATE GENERAL OF HIGHWAYS</b>	PROJECT AND LOCATION :	SCALE :	DRAWING TITLE :	DRAWING NO. :		
	Name	A. GOURLEY	Name		T. OKUMURA	Name	M. KIUCHI	NOT TO SCALE	GENERAL NOTES FOR STRUCTURES (1 OF 3)	NGE-010
	Sign		Sign			Sign				FULL SIZE A3
Date		Date		Date						
				APPROVED BY	Ir. HERRY VAZA M.Eng.Sc NIP. : 110038400					

## 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 <sup>2</sup> )	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 :

DESIGNATION	JIS STANDARD		DESIGNATION	APPLICATION STANDARD	
	YIELD POINT (N/mm <sup>2</sup> )	TENSILE STRENGTH (N/mm <sup>2</sup> )		YIELD POINT (N/mm <sup>2</sup> )	TENSILE STRENGTH (N/mm <sup>2</sup> )
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 <sup>2</sup> )	BRAKING STRENGTH (Kg/mm <sup>2</sup> )	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

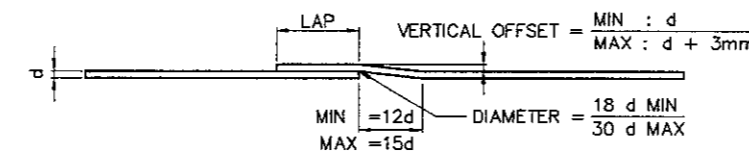
###### BASIC DEVELOPMENT FOR REBAR

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 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
----------	-----	--------------	---------	------

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

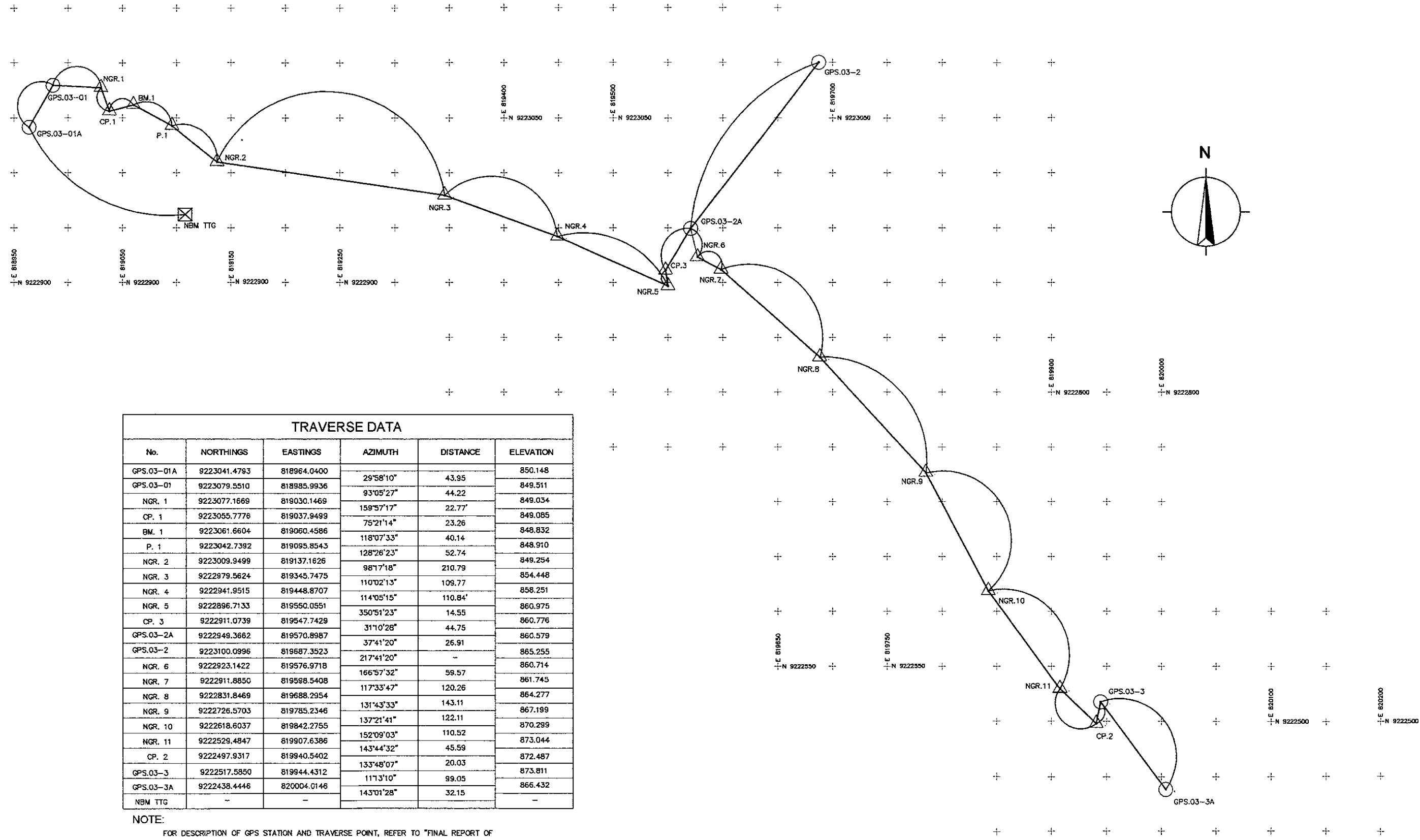
- 14) PROTECTION AND CURING OF CONCRETE
- CONCRETE SURFACES SHALL BE PROTECTED FROM HARMFUL EFFECTS OF SUN, WIND AND RUNNING WATERS AND SHALL BE KEPT DAMP FOR AT LEAST 7 DAYS.

- 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.

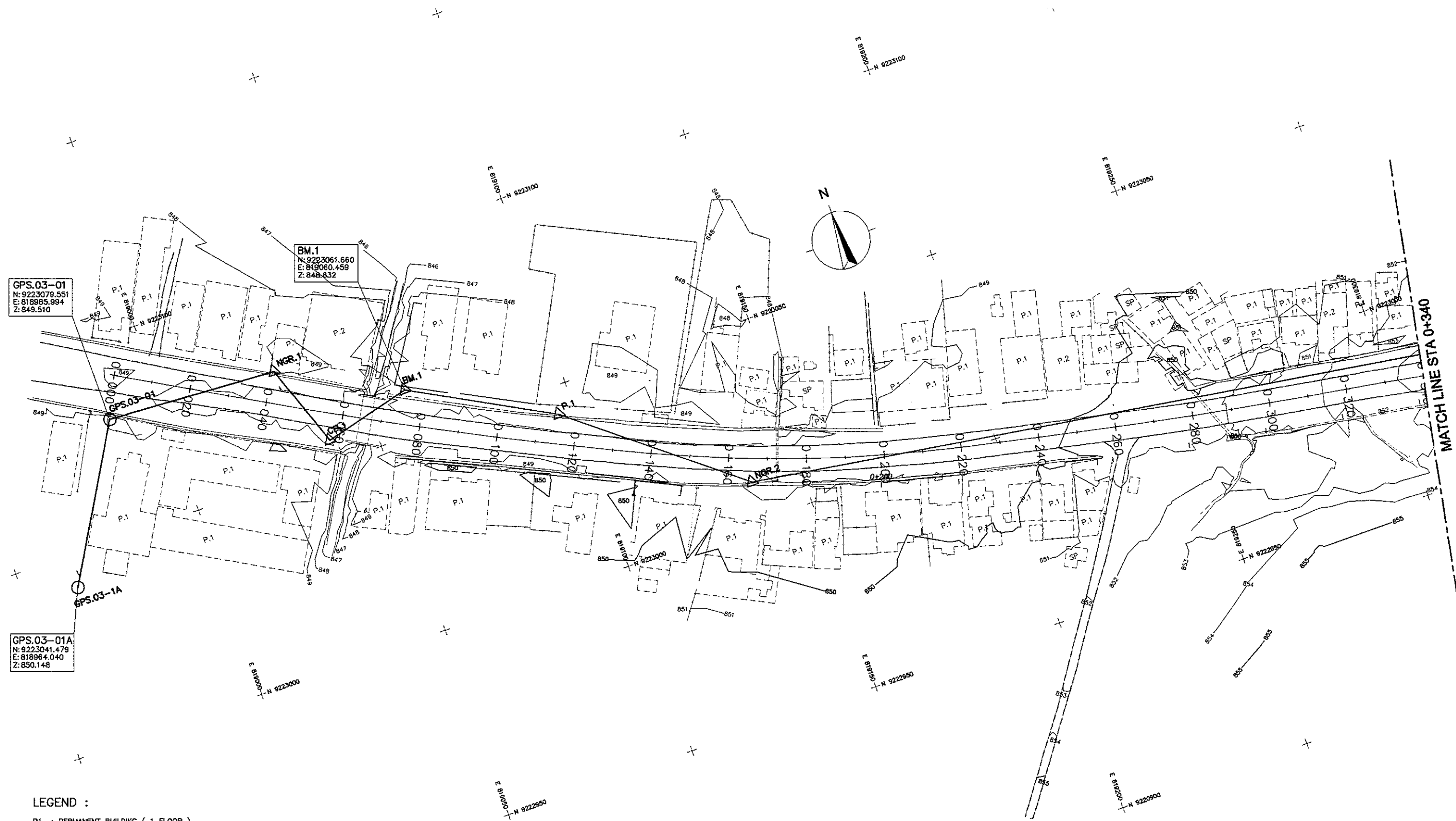


TRAVERSE DATA					
No.	NORTHINGS	EASTINGS	AZIMUTH	DISTANCE	ELEVATION
GPS.03-01A	9223041.4793	818964.0400			850.148
GPS.03-01	9223079.5510	818985.9936	29°58'10"	43.95	849.511
NGR. 1	9223077.1669	819030.1469	93°05'27"	44.22	849.034
CP. 1	9223055.7776	819037.9499	159°57'17"	22.77	849.085
BM. 1	9223061.6604	819060.4586	75°21'14"	23.26	848.832
P. 1	9223042.7392	819095.8543	118°07'33"	40.14	848.910
NGR. 2	9223009.9499	819137.1626	128°26'23"	52.74	849.254
NGR. 3	9222979.5624	819345.7475	98°17'18"	210.79	854.448
NGR. 4	9222941.9515	819448.8707	110°02'13"	109.77	858.251
NGR. 5	9222896.7133	819550.0551	114°05'15"	110.84	860.975
CP. 3	9222911.0739	819547.7429	350°51'23"	14.55	860.776
GPS.03-2A	9222949.3662	819570.8987	311°0'28"	44.75	860.579
GPS.03-2	9223100.0996	819687.3523	37°41'20"	26.91	865.255
NGR. 6	9222923.1422	819576.9718	217°41'20"	-	860.714
NGR. 7	9222911.8850	819598.5408	166°57'32"	58.57	861.745
NGR. 8	9222831.8469	819688.2954	117°33'47"	120.26	864.277
NGR. 9	9222726.5703	819785.2346	131°43'33"	143.11	867.199
NGR. 10	9222618.6037	819842.2755	137°21'41"	122.11	870.289
NGR. 11	9222529.4847	819907.6386	152°09'03"	110.52	873.044
CP. 2	9222497.9317	819940.5402	143°44'32"	45.59	872.487
GPS.03-3	9222517.5850	819944.4312	133°48'07"	20.03	873.811
GPS.03-3A	9222438.4446	820004.0146	117°3'10"	99.05	866.432
NBM TTG	-	-	143°01'28"	32.15	-

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

LEGEND :  
 ○ : GPS  
 △ : TRAVERSE  
 ⊠ : BENCH MARK ( BM )

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



GPS.03-01  
 N: 9223078.551  
 E: 818985.994  
 Z: 849.510

BM.1  
 N: 9223061.660  
 E: 819060.459  
 Z: 848.832

GPS.03-01A  
 N: 9223041.479  
 E: 818964.040  
 Z: 850.148

**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 )

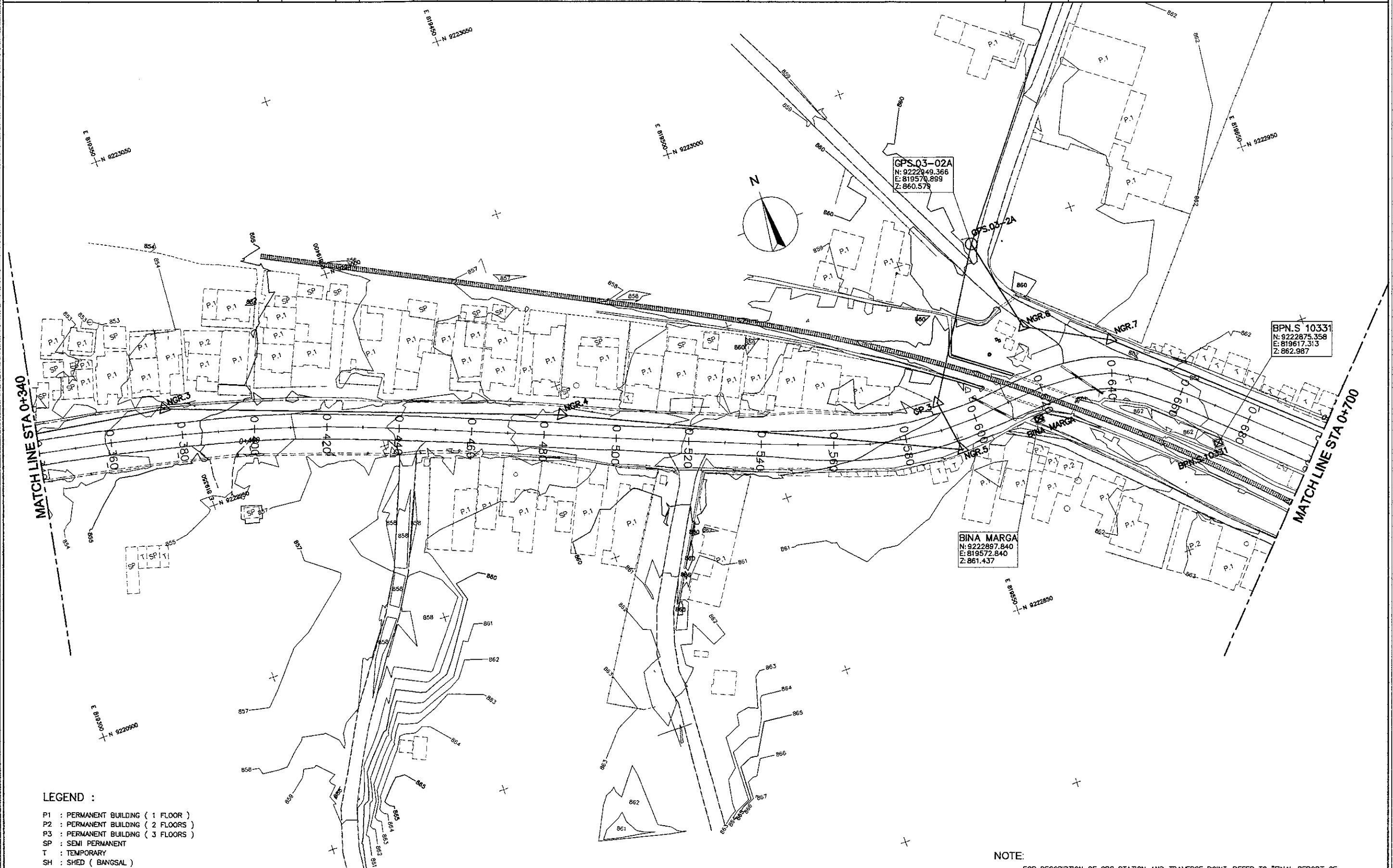
**1 TOPOGRAPHIC PLAN**  
 SCALE 1:1000

**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: _____



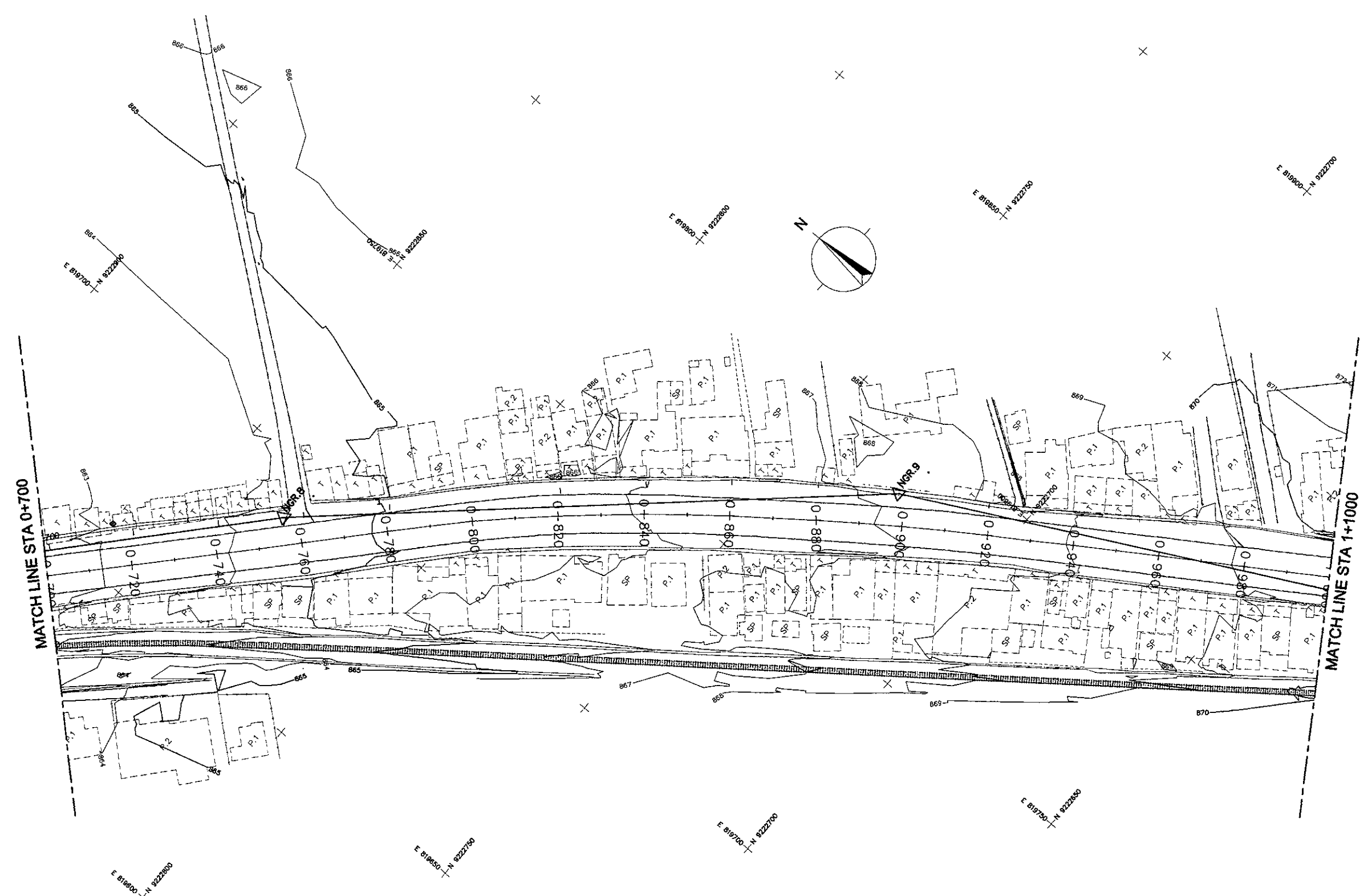
- LEGEND :**
- P1 : PERMANENT BUILDING ( 1 FLOOR )
  - P2 : PERMANENT BUILDING ( 2 FLOORS )
  - P3 : PERMANENT BUILDING ( 3 FLOORS )
  - SP : SEMI PERMANENT
  - T : TEMPORARY
  - SH : SHED ( BANGSAL )
  - ST : STALL ( KIOS )
  - : GPS
  - △ : TRAVERSE
  - ⊗ : BENCH MARK ( BM )

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



LEGEND :

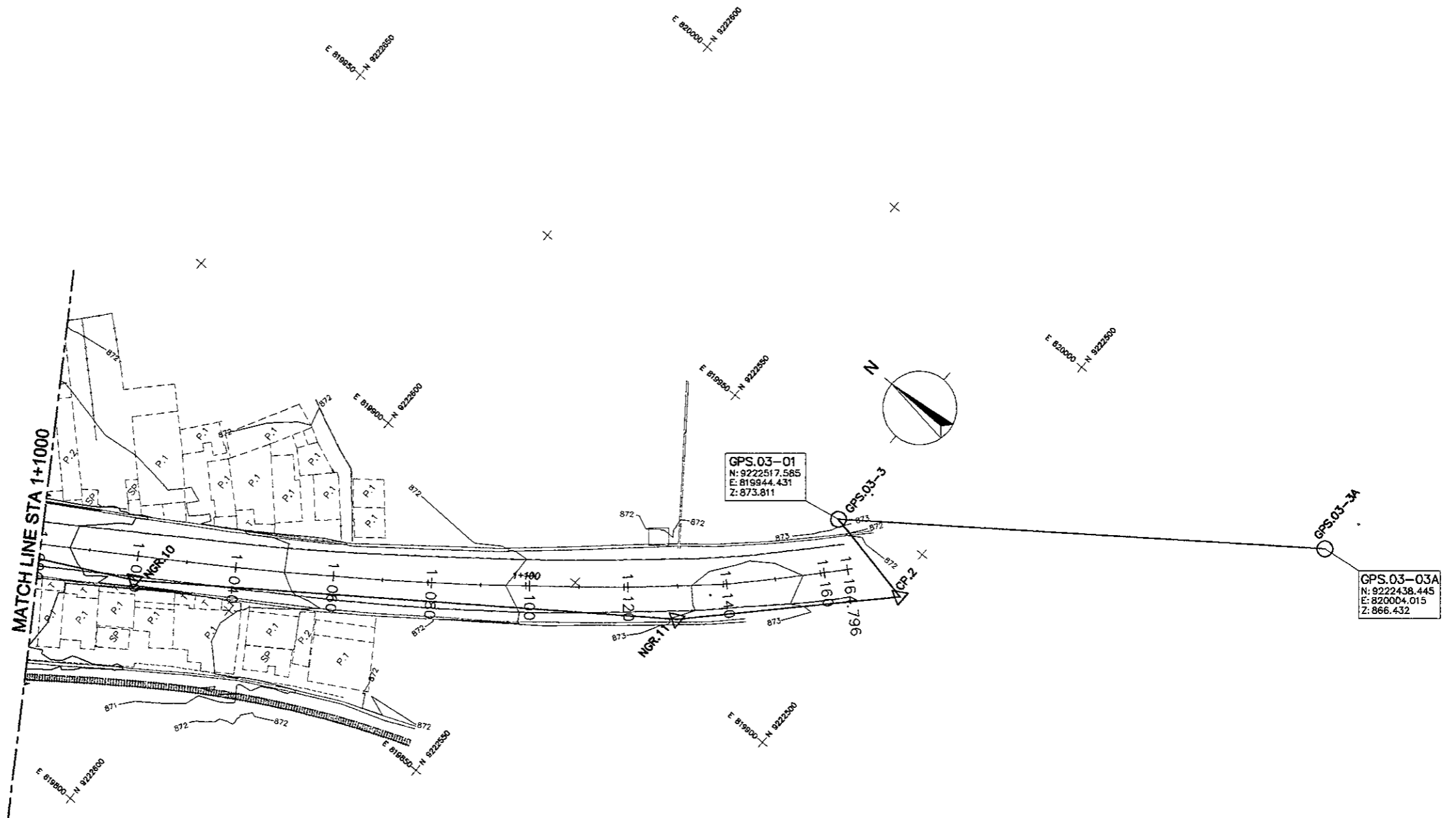
- P1 : PERMANENT BUILDING ( 1 FLOOR )
- P2 : PERMANENT BUILDING ( 2 FLOORS )
- P3 : PERMANENT BUILDING ( 3 FLOORS )
- SP : SEMI PERMANENT
- T : TEMPORARY
- SH : SHED ( BANGSAL )
- ST : STALL ( KIOS )
- ⊙ : GPS
- △ : TRAVERSE
- ⊗ : BENCH MARK ( BM )

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. MIRAMA KARYA (PERSERO)

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. MIRAMA KARYA (PERSERO)

No. PAY ITEMS	DESCRIPTION	UNIT	TOTAL QUANTITY	REMARKS
<b>DIVISION 1 - GENERAL</b>				
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	
<b>DIVISION 2 - DRAINAGE</b>				
2.1(1)	Common Excavation for drainage ditches and waterways	Cu.M	150.00	
2.2(1)	Mortared Stonework for drainage channel	Cu.M	60.67	
2.3(1)	Reinforced Concrete Pipe Culvert Inn.Dim. 40 cm Type A	Ln.M	0.00	
2.3(2)	Reinforced Concrete Pipe Culvert Inn.Dim. 40 cm Type B	Ln.M	0.00	
2.3(3)	Reinforced Concrete Pipe Culvert Inn.Dim. 60 cm Type A	Ln.M	0.00	
2.3(4)	Reinforced Concrete Pipe Culvert Inn.Dim. 60 cm Type B	Ln.M	38.90	
2.3(5)	Reinforced Concrete Pipe Culvert Inn.Dim. 80 cm Type A	Ln.M	93.00	
2.3(6)	Reinforced Concrete Pipe Culvert Inn.Dim. 80 cm Type B	Ln.M	68.20	
2.3(7)	Reinforced Concrete Pipe Culvert Inn.Dim. 100 cm Type A	Ln.M	0.00	
2.3(8)	Reinforced Concrete Pipe Culvert Inn.Dim. 100 cm Type B	Ln.M	0.00	
2.3(9)a	Manhole Type I	Each	68.00	
2.3(9)b	Manhole Type II	Each	0.00	
2.3(9)c	Manhole Type III	Each	8.00	
2.3(9)d	Manhole Type IV	Each	2.00	
2.3(9)e	Manhole Type V	Each	11.00	
2.3(9)f	Manhole Type VI	Each	1.00	
2.3(9)g	Manhole Type VII	Each	13.00	
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	7.00	
2.3(12)a	U - Ditch, DS - 1	Each	92.30	
2.3(12)b	U - Ditch, DS - 2	Ln.M	0.00	
2.3(12)c	U - Ditch, DS - 3	Ln.M	1616.90	
2.3(12)d	U - Ditch, DS - 3 A	Ln.M	12.50	
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	560.00	
2.3(13)	Drain Pipe Dia 150 mm	Ln.M	0.00	
2.3(14)	Drain Pipe Dia 200 mm	Ln.M	173.54	
2.3(15)	Drain Pipe Dia 250 mm	Ln.M	210.20	
2.3(16)	Deck Drain Type I	Each	0.00	
2.3(17)	Deck Drain Type II	Each	41.00	
2.3(18)	Steel Gutter drain screen	Ln.M	0.00	
2.3(19)	Outer Ditch Elevated	Ln.M	0.00	
2.3(20)	Extension of Existing Box Culvert	Ln.M	5.80	
<b>DIVISION 3 - EARTHWORKS</b>				
3.1(1)	Clearing and Grubbing	Sq.M	8203.85	
3.1(2)	Selected Tree Removal Diameter Ø200 mm Ø300 mm	Each	28.00	
3.1(3)	Selected Tree Removal Diameter > 300 mm	Each	11.00	
3.2(1)	Common Excavation	Cu. M	3939.42	
3.2(2)	Excavation of Existing Pavement	Cu. M	513.17	
3.2(3)	Structure Excavation to a depth not exceeding 2 m	Cu. M	1485.55	
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	15044.02	
3.3(2)	Structural Backfill	Cu. M	353.23	
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	16358.37	
SS 3.5 (1)	Mechanical Stabilized Earthwall and Accessories	Sq.M	3660.81	
SS 3.5 (2)	Retaining Wall for Lightweight Embankment	Sq.M	0.00	

No. PAY ITEMS	DESCRIPTION	UNIT	TOTAL QUANTITY	REMARKS
<b>DIVISION 4 - PAVEMENT WIDENING AND SHOULDERS</b>				
4.2(1)	Aggregate Sub Base Class B	Cu. M	126.36	
<b>DIVISION 5 GRANULAR PAVEMENT</b>				
5.1(1)	Aggregate Sub Base Class A	Cu. M	4674.95	
5.1(2)	Aggregate Sub Base Class B	Cu. M	8196.07	
<b>DIVISION 6 ASPHALT PAVEMENT</b>				
6.1(1)	Prime Coat	Litre	15535.59	
6.1(2)	Tack Coat	Litre	20416.35	
6.3(1)	Asphalt Concrete Wearing Course (AC-WC)	Ton	2130.88	
6.3(2)	Asphalt Concrete Binder Course (AC-BC)	Ton	2380.10	
6.3(3)	Asphalt Concrete Base (AC-Base)	Ton	3530.86	
<b>DIVISION 7 - STRUCTURE</b>				
7.1(1)a	Structure Concrete, Class A - (F <sub>c</sub> ' = 35 Mpa) for Post Tension Double Girder	Cu m	813.56	
7.1(1)b	Structure Concrete, Class A - (F <sub>c</sub> ' = 35 Mpa) for Steel Girder	Cu m	484.29	
7.1(2)a	Structure Concrete, Class B - (F <sub>c</sub> ' = 30 Mpa) for Pier Head	Cu m	104.54	
7.1(2)b	Structure Concrete, Class B - (F <sub>c</sub> ' = 30 Mpa) for Column	Cu m	53.75	
7.1(2)c	Structure Concrete, Class B - (F <sub>c</sub> ' = 30 Mpa) for Composite Column	Cu m	102.41	
7.1(2)d	Structure Concrete, Class B - (F <sub>c</sub> ' = 30 Mpa) for Abutment	Cu m	194.10	
7.1(3)a	Structure Concrete, Class B-1 (F <sub>c</sub> ' = 28 Mpa) for Barrier, Median	Cu m	0.00	
7.1(3)b	Structure Concrete, Class B-1 (F <sub>c</sub> ' = 28 Mpa) for Parapet Wall	Cu m	1058.77	
7.1(5)	Structure Concrete, Class C (F <sub>c</sub> ' = 24 Mpa) for Footing, Approach Slab, Retaining Wall	Cu m	829.10	
7.1(6)	Structure Concrete, Class D (F <sub>c</sub> ' = 20 Mpa)	Cu m	0.00	
7.1(8)	Structure Concrete, Class E (F <sub>c</sub> ' = 17 Mpa)	Cu m	44.71	
SS 7.1(9)	Waterproofing on Deck	SqM	2576.00	
SS 7.1(10)	Structure Casing for Bored Pile (Ribber Inner Surface L = 13 mm)	Kg	28825.20	
SS 7.1(11)	Structure Casing for Bored Pile (Erected)	Kg	28825.20	
7.2(9)	PC Strand Size 12.7 mm	Kg	17202.00	
7.2(9)a	PC Strand Size 21.8 mm	Kg	11104.40	
7.3(3)	PC Bar	Kg	1063.00	
7.3(4)	Reinforcing Steel Bars Grade 40	Kg	454087.28	
7.5(1)	Furnish and Delivery of Steel Girder	Ton	220.83	
7.5(1)a	Furnish and Delivery of Steel Coping and Portal	Ton	134.01	
7.5(3)	Erection of Steel Girder	Ton	220.83	
7.5(4)	Erection of Steel Coping and Portal	Ton	134.01	
7.6(22)	Cast In Place Concrete Bored Pile Dia 1500 mm	Ln. M	288.00	
7.6(23)	Cast In Place Concrete Bored Pile Dia 1800 mm	Ln. M	180.00	
7.6(26)	Cast In Place Concrete Bored Pile Dia 2500 mm	Ln. M	221.00	
7.6(27)	Pile Integrity Test	Each	20.00	
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	216.16	
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)d	Bridge Bearing for Steel Girder, Type - B1	Set	4.00	
7.12(2)e	Bridge Bearing for Steel Girder, Type - B2	Set	0.00	
7.12(2)f	Bridge Bearing for Steel Girder, Type - C1	Set	0.00	
7.12(2)g	Bridge Bearing for Steel Girder, Type - C2	Set	1.00	
7.12(2)h	Bridge Bearing for Steel Girder, Type - C3	Set	1.00	
7.12(2)i	Bridge Bearing for Steel Girder, Type - C4	Set	0.00	

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
7.13	Steel Bridge Railings	Ln. M	1468.80	
7.14	Bridge Name Plate	Each	2.00	
7.15.(1)	Demolition of Existing Structure Masonry	Cu m	188.88	
7.15.(2)	Demolition of Existing Structure Concrete	Cu m	161.81	
7.15.(10)	Demolition of Existing Rigid Pavement	Sq. M	0.00	
7.15.(11)	Demolition of Existing Hedge of Fence	Ln. M	167.78	
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	
<b>DIVISION 8 - MISCELLANEOUS</b>				
8.1.(1)	Solid Sodding	Sq. M	5885.44	
8.3.(1)	Vehicle Guardrail Type - A	Ln. M	0.00	
8.3.(13)	BRC Fence	Ln. M	0.00	
8.3.(16)	Guard Fence Over Railway	Ln. M	0.00	
8.4.(1)	Regulatory and Warning Sign, Type A	Each	51.00	
8.4.(2)	Regulatory and Warning Sign, Type B	Each	2.00	
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.(5)	Reflective Thermoplastic Pavement Marking	Sq. M	734.48	
8.8.(1)	Precast Concrete Curb Type A	Ln M	1341.72	
8.8.(2)	Precast Concrete Curb Type B	Ln M	2256.46	
8.8.(3)	Concrete Median Type A	Ln M	1679.52	
8.8.(4)	Concrete Median Type B	Ln M	730.00	
8.8.(5)	Concrete Sidewalk	Sq. M	1315.80	
<b>DIVISION 9 - UTILITIES</b>				
9.1.1	Street Lighting Pole, Type A ( 11 m )	Each	82.00	
9.1.2	Street Lighting Ceiling, Type A - Sort 150 watt	Each	20.00	
9.1.3	Street Lighting Ceiling, Type B - Sort 250 watt	Each	0.00	
9.1.4 (a)	Panel Type LP-PJU.FD	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	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 - 25 mm2 )	Ln M	1253.00	
9.1.9	Cable Type - 3 ( NYFGBY 4C - 10 mm2 )	Ln M	3864.00	
9.1.10	Cable Type - 5 ( NYFGBY 4C - 25 mm2 )	Ln M	1615.00	
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	