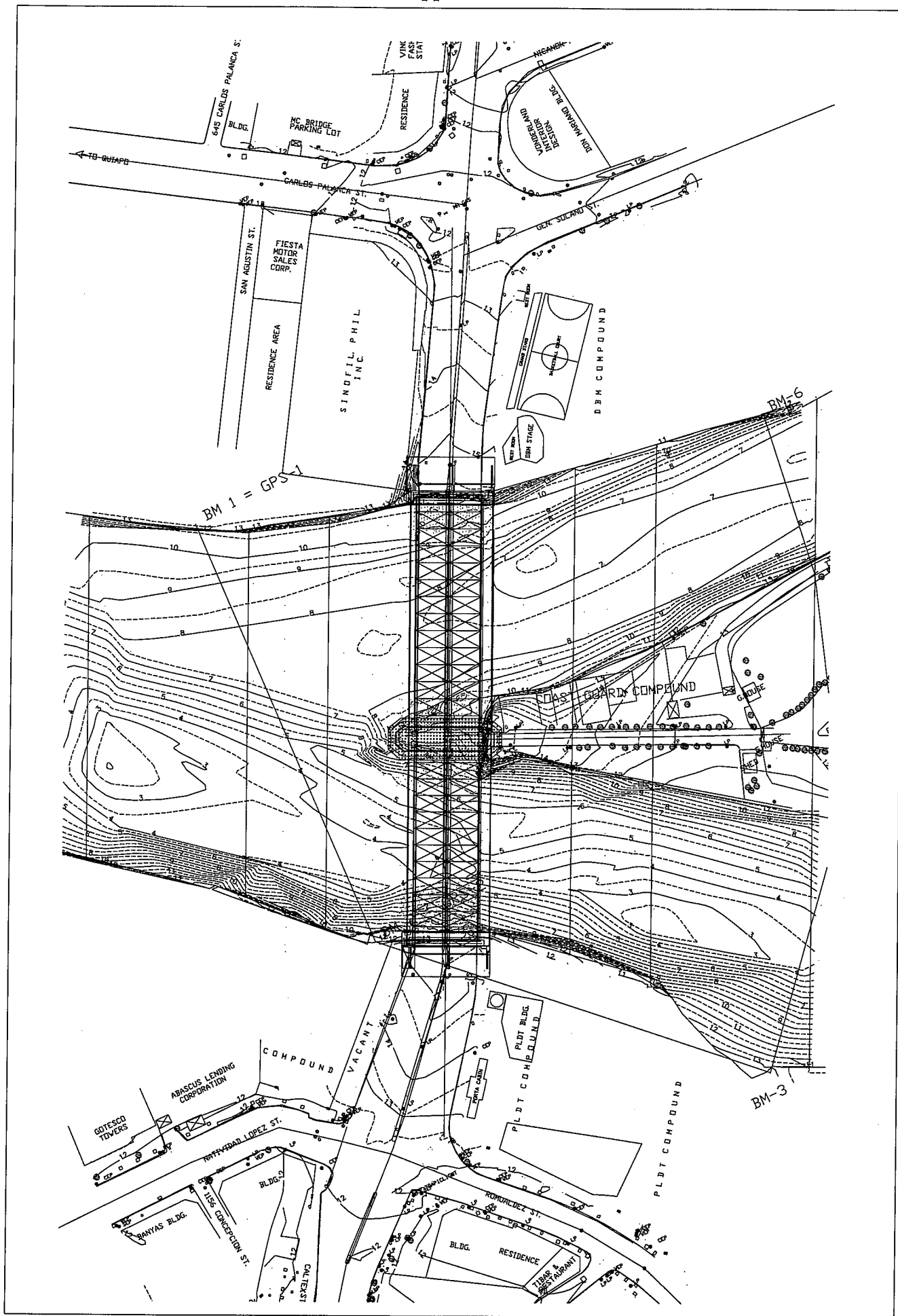


PART III

FEASIBILITY STUDY ON AYALA BRIDGE IMPROVEMENT PLAN

CHAPTER 13

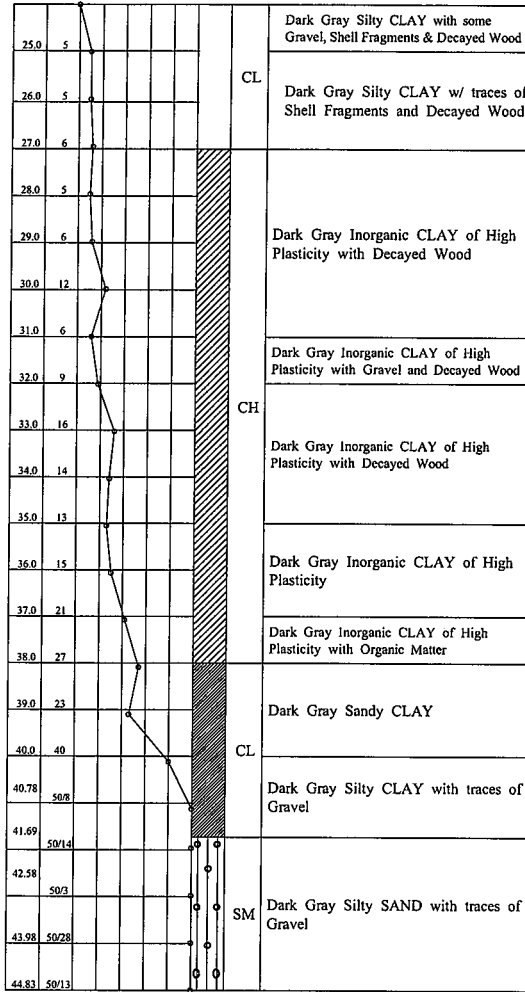
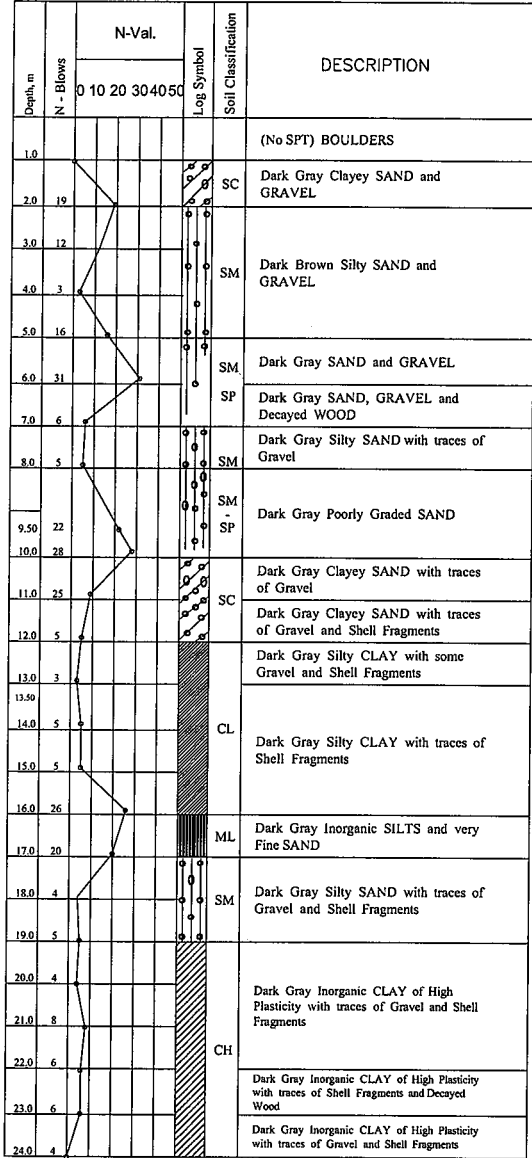
DETAILED BRIDGE SURVEY AND ASSESSMENT



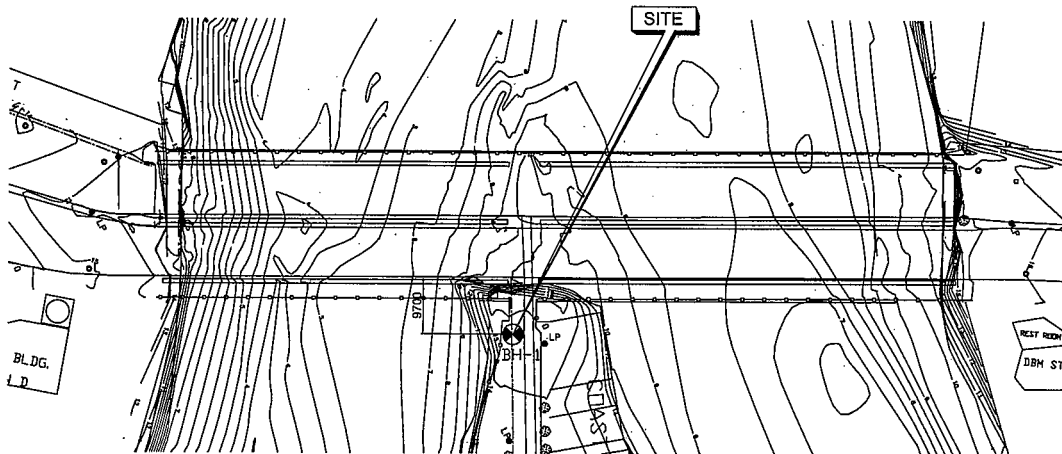
TOPOGRAPHIC SURVEY

Appendix 13.3.2-1

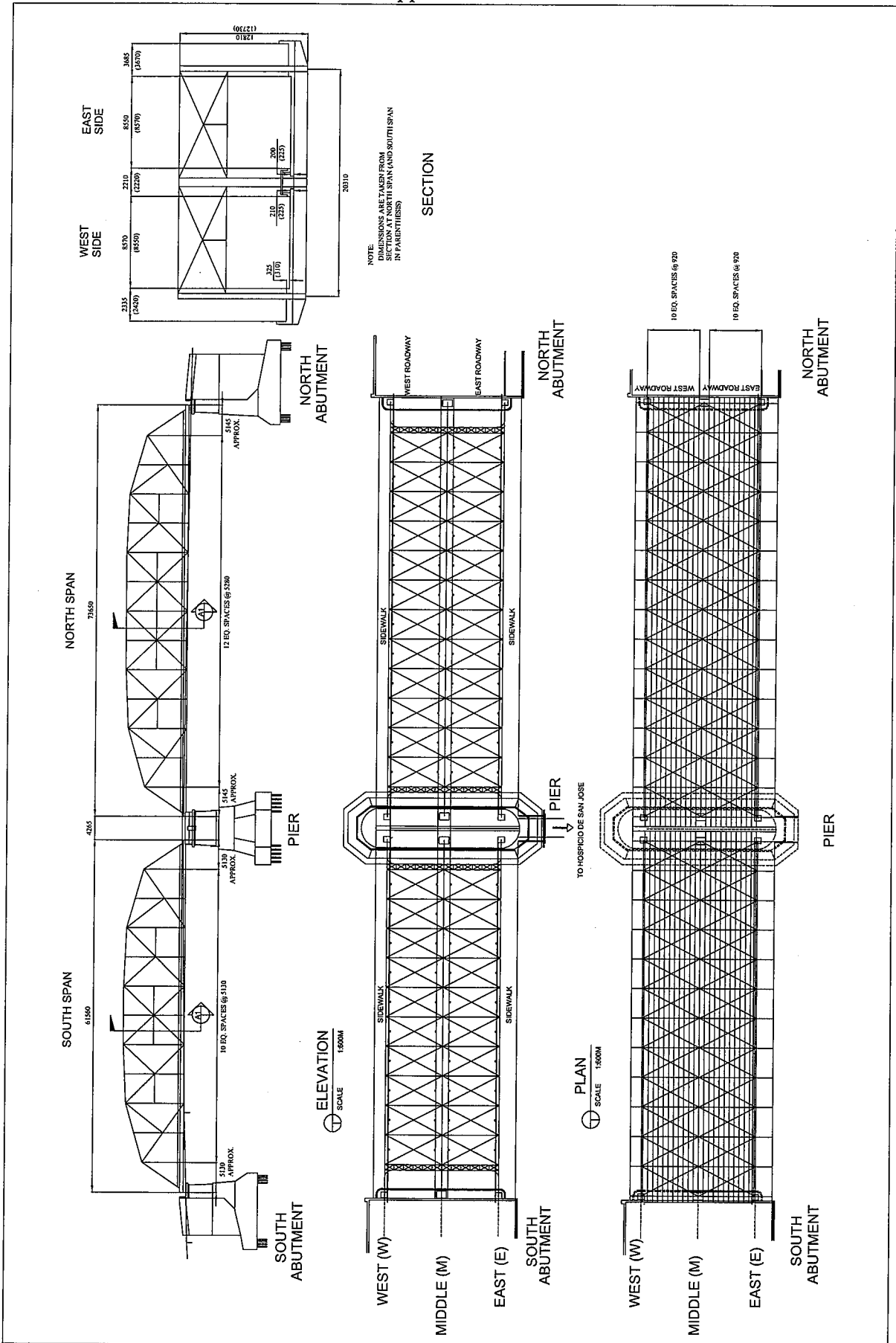
BOREHOLES NO.1
ELEV. = APPROX. 15.00m



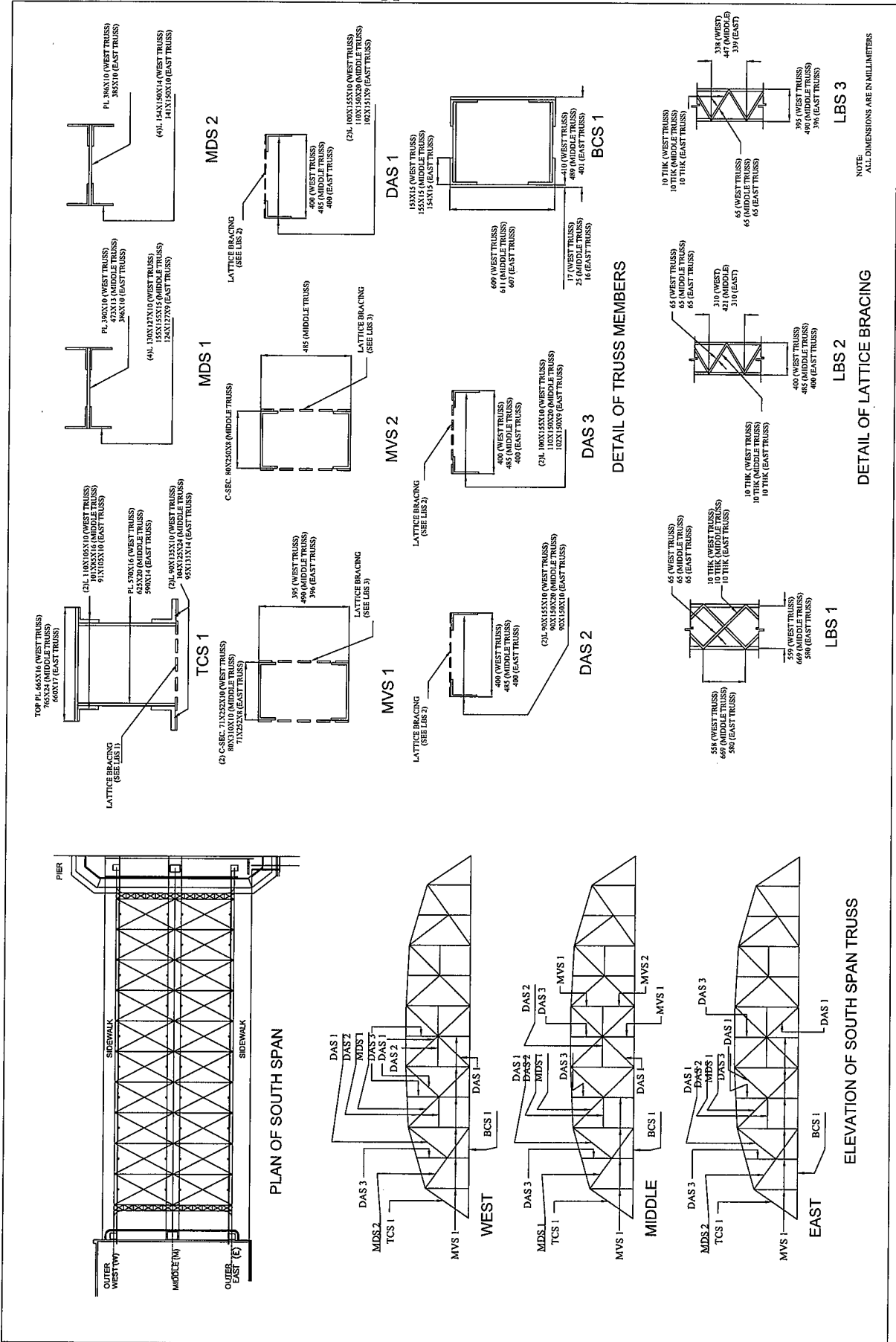
NOTE:
BOREHOLE LOG BASED ON
EXPLOR-TEST CORPORATION
DRILLING ON NOVEMBER 24-28, 2002.



GEOTECHNICAL SURVEY AT AYALA BRIDGE (BOREHOLE LOG)

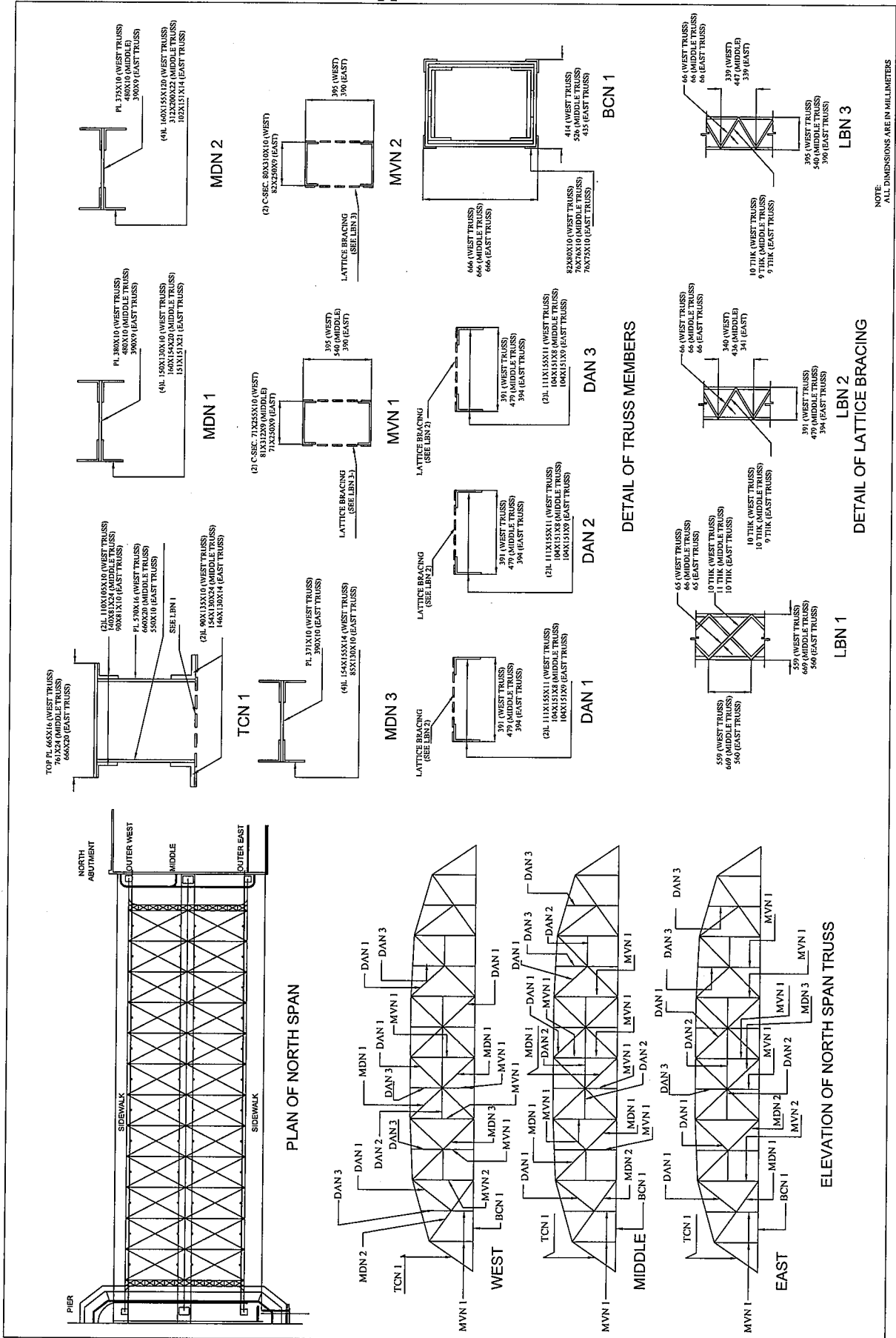


GENERAL ELEVATION, PLAN, REFLECTED PLAN AND DECK BRACING



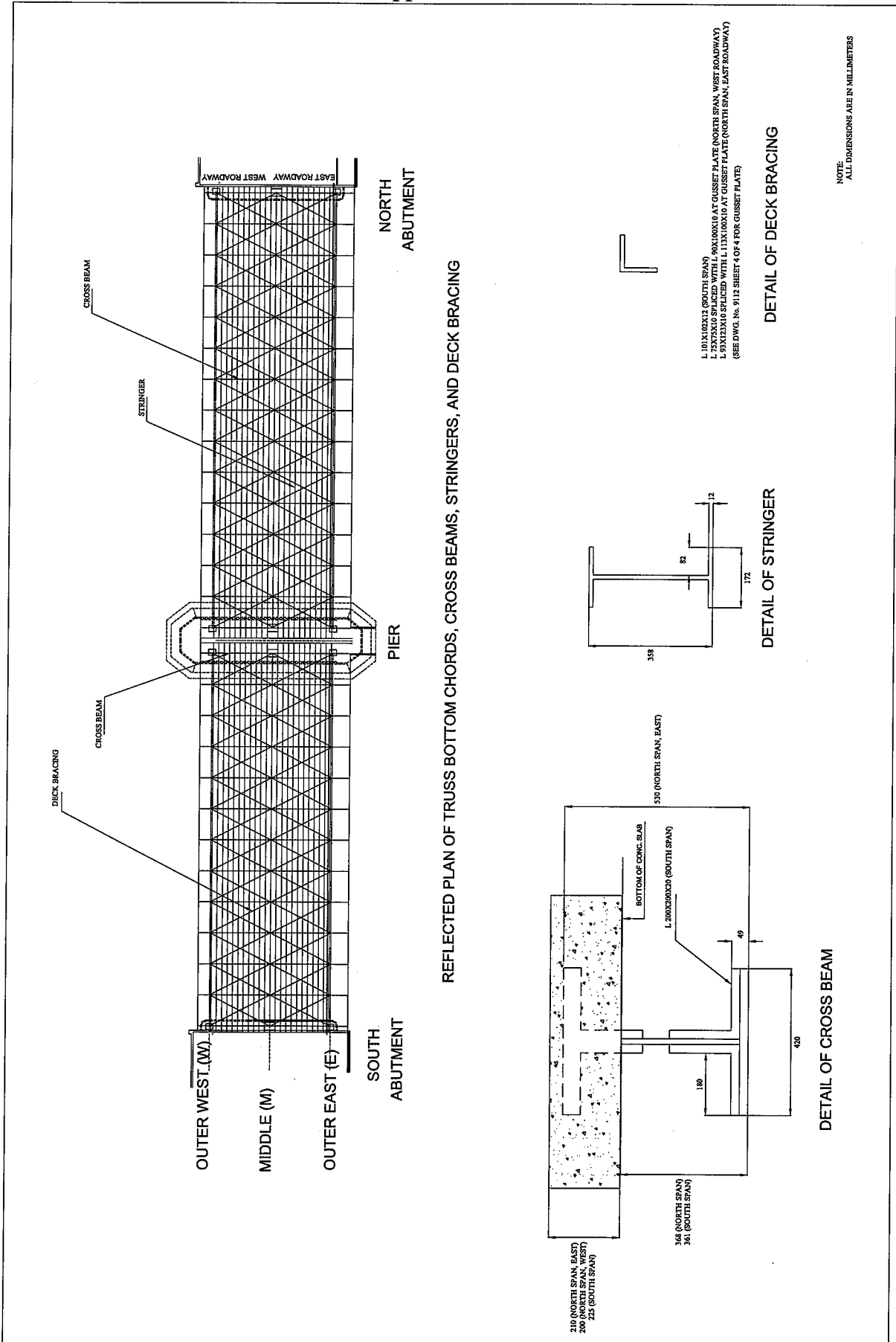
VERIFICATION OF SHAPE AND DIMENSION (SOUTH SPAN TRUSS)

Appendix 13.3.1-3



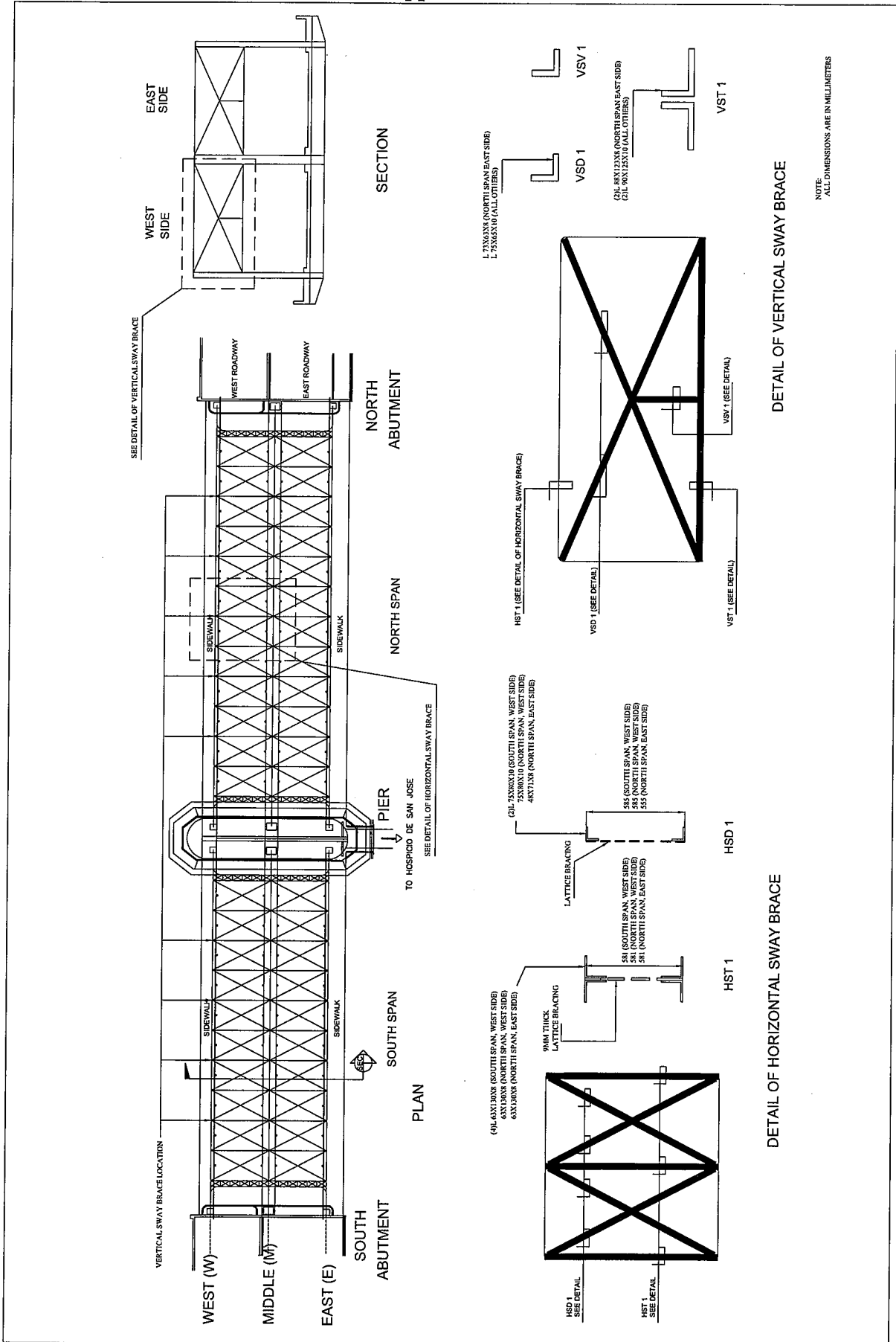
NOTE: ALL DIMENSIONS ARE IN MILLIMETERS

VERIFICATION OF SHAPE AND DIMENSION (NORTH SPAN TRUSS)



VERIFICATION OF SHAPE AND DIMENSION OF CROSS BEAM, STRINGER AND DECK BRACING

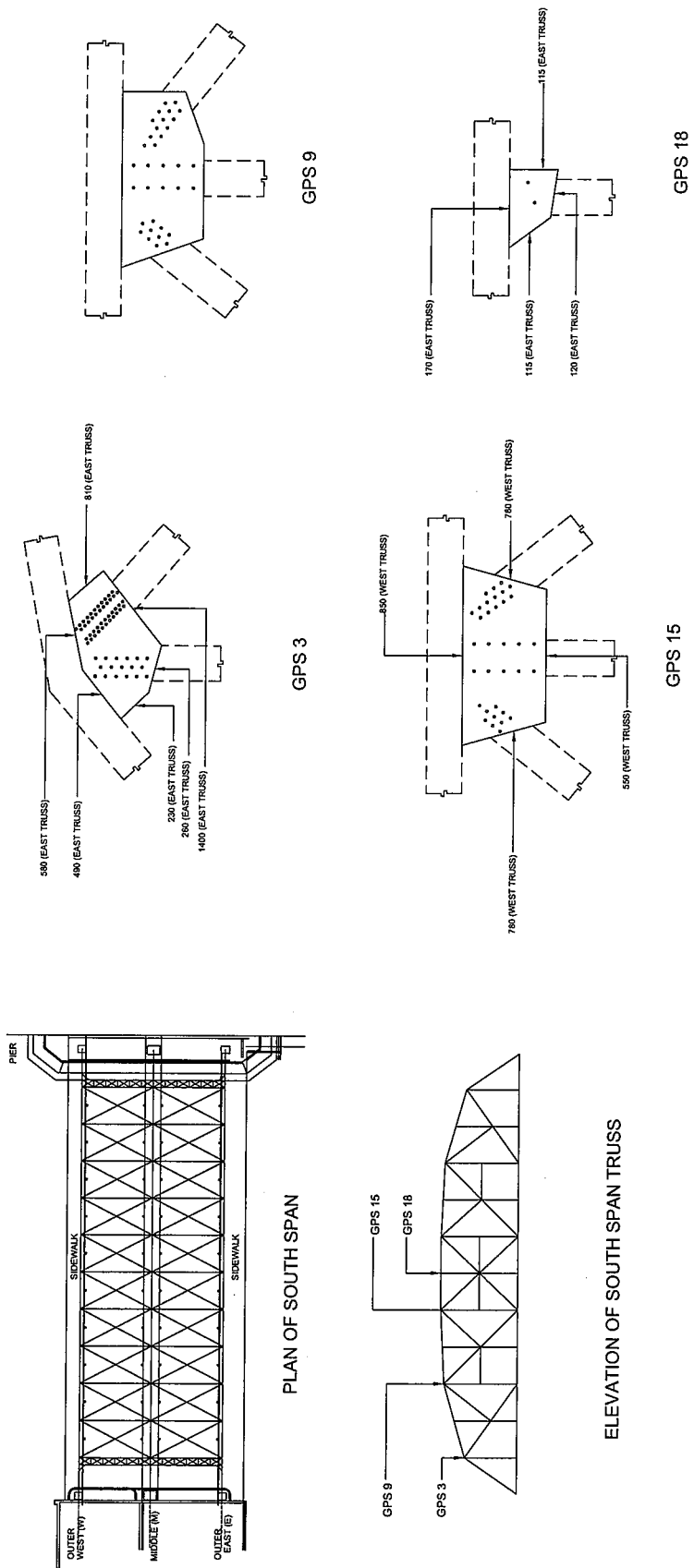
Appendix 13.3.1-5



NOTE: ALL DIMENSIONS ARE IN MILLIMETERS

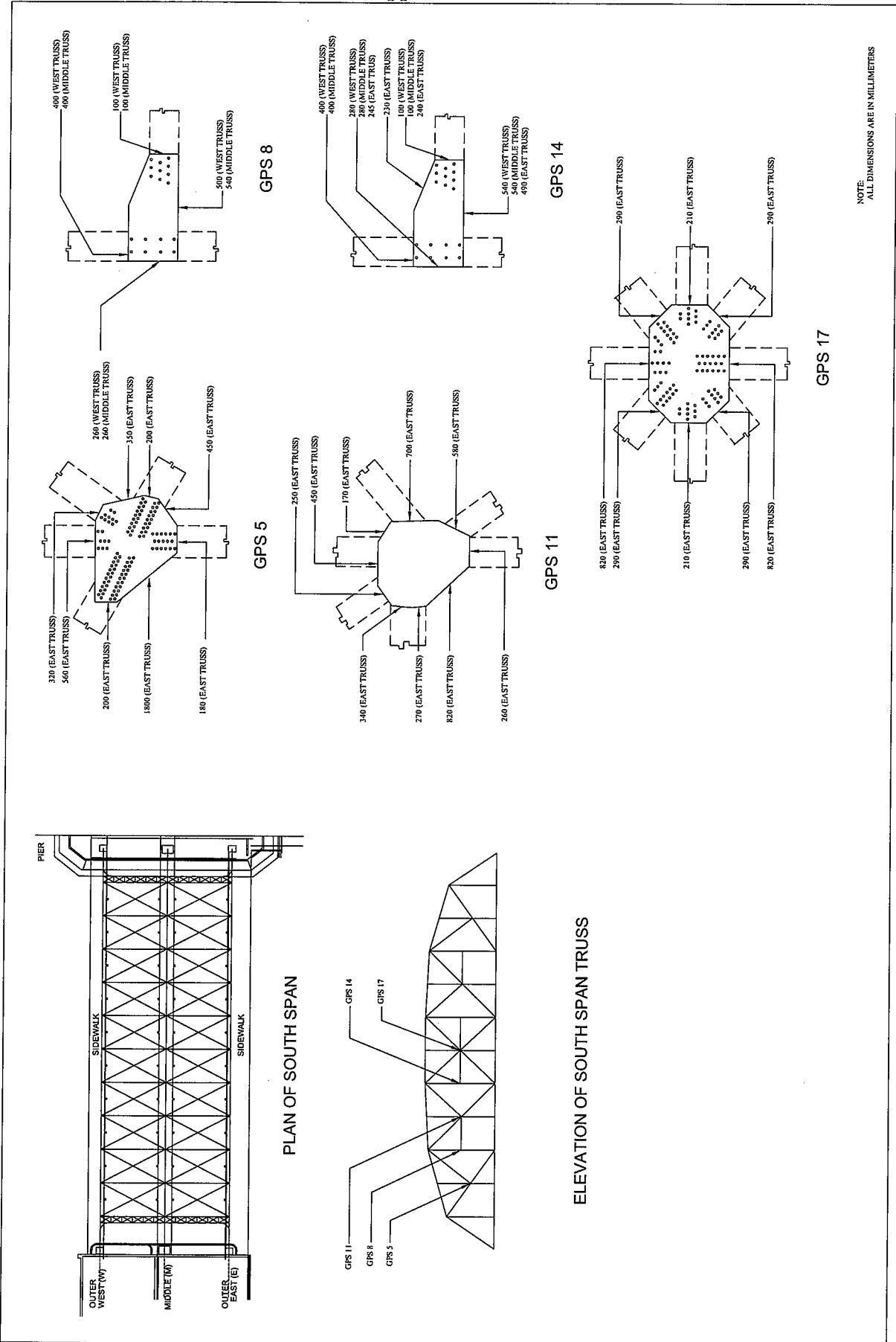
VERIFICATION OF SHAPE AND DIMENSION (SWAY BRACE)

Appendix 13.3.1-6



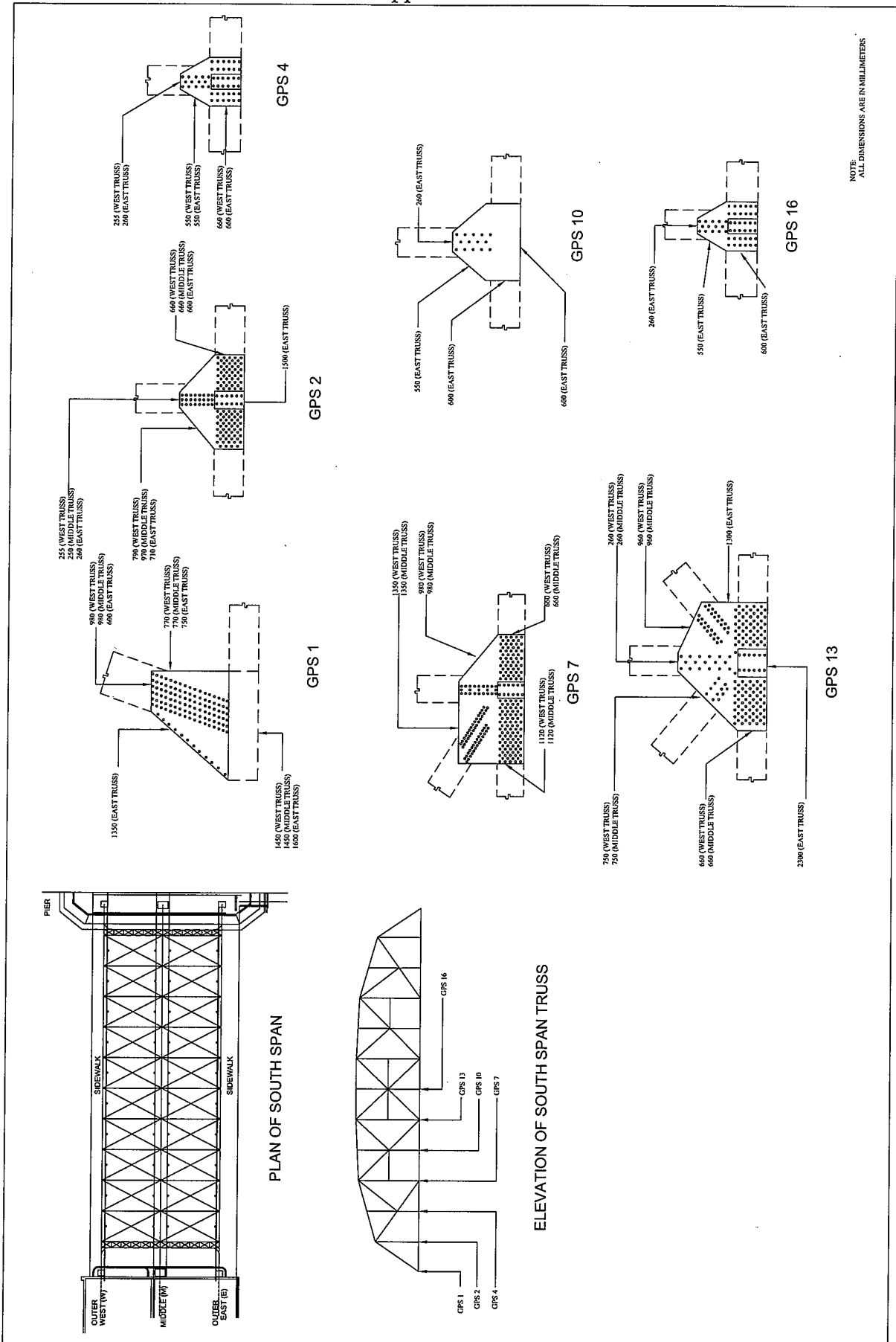
VERIFICATION OF SHAPE AND DIMENSION OF SOUTH SPAN TRUSS GUSSET PLATES AT TOP CHORD

Appendix 13.3.1-7



NOTE:
ALL DIMENSIONS ARE IN MILLIMETERS

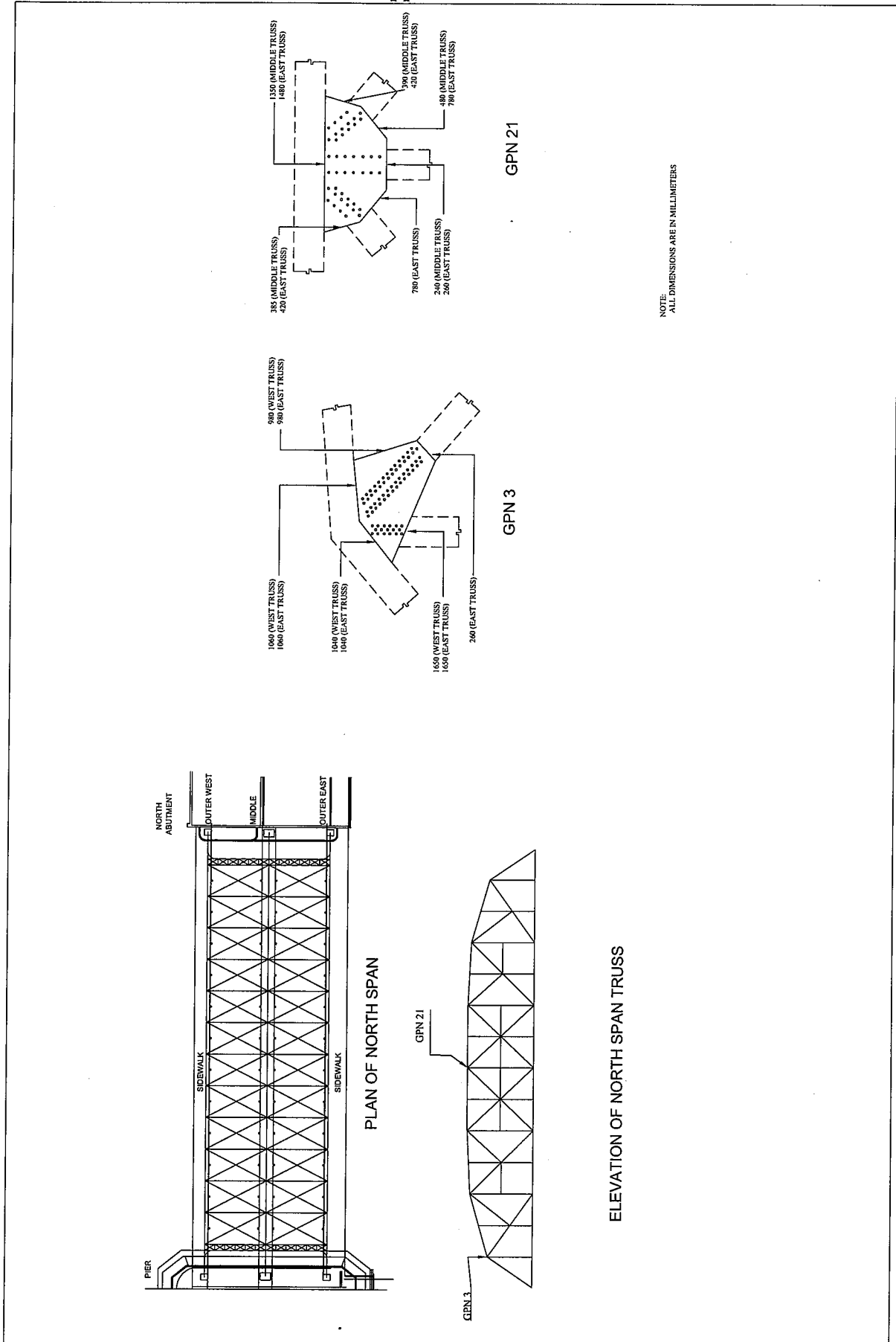
VERIFICATION OF SHAPE AND DIMENSION OF SOUTH SPAN TRUSS GUSSET PLATES AT MID-HEIGHT



NOTE: ALL DIMENSIONS ARE IN MILLIMETERS

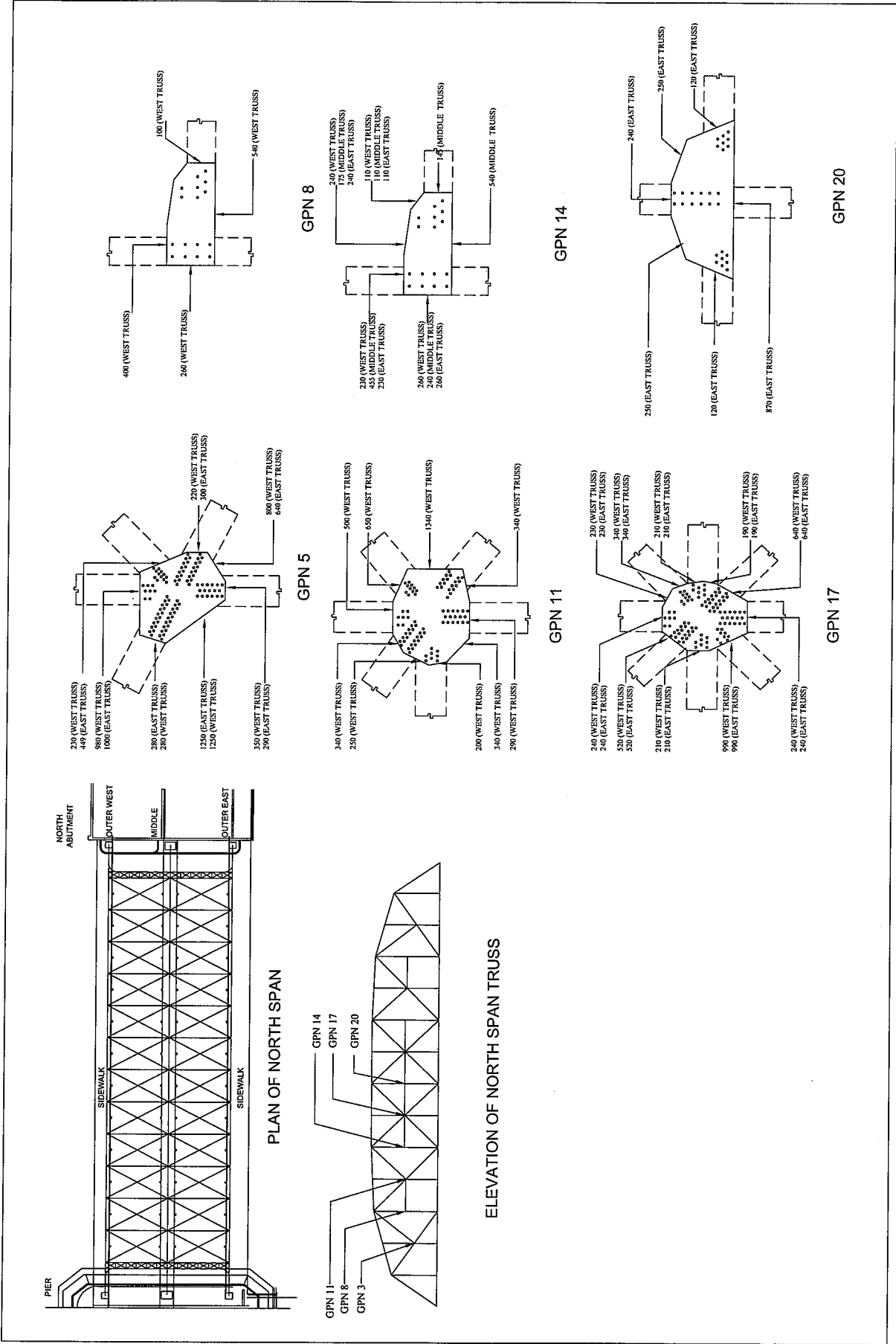
VERIFICATION OF SHAPE AND DIMENSION OF SOUTH SPAN TRUSS GUSSET PLATES AT BOTTOM CHORD

Appendix 13.3.1-9

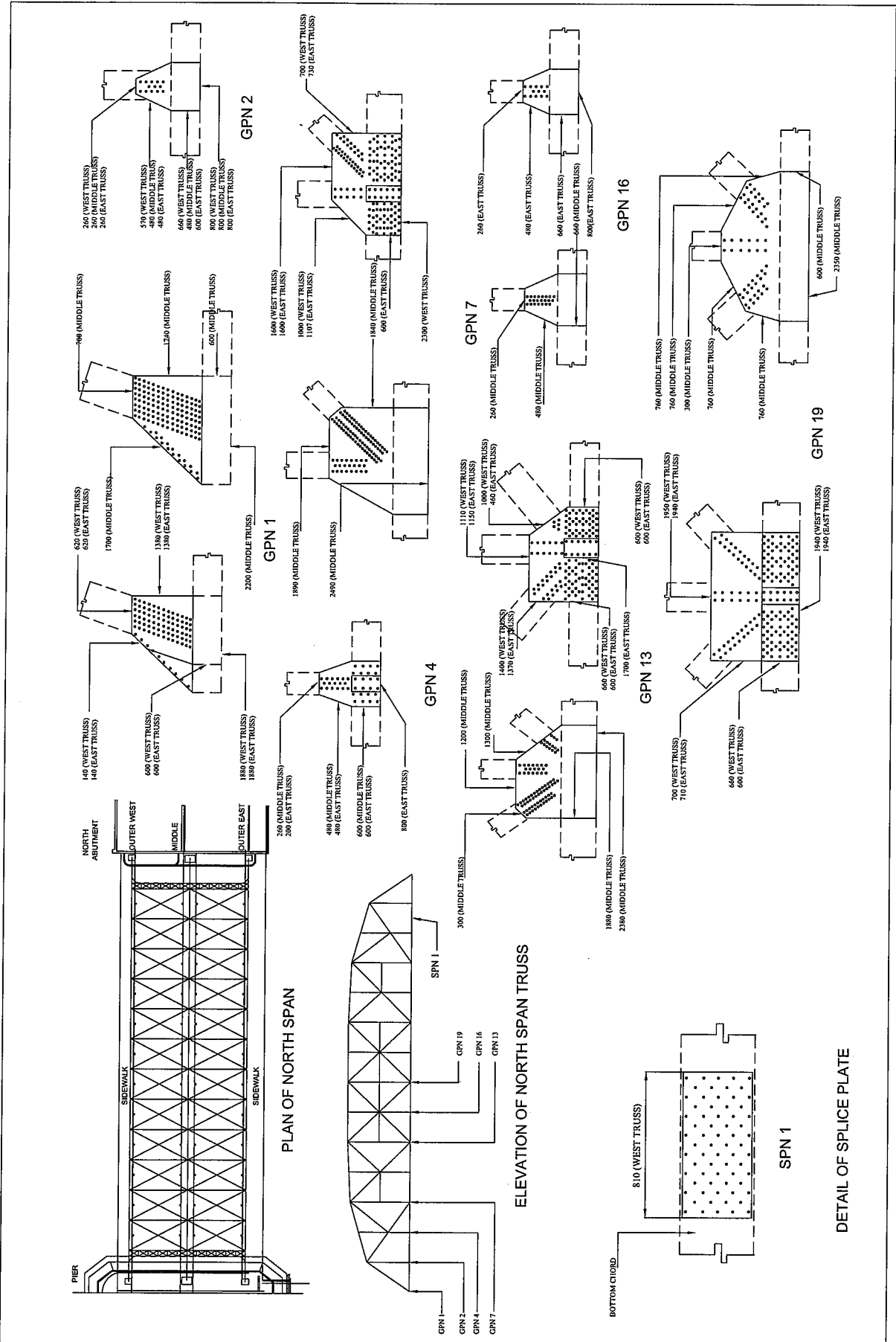


NOTE: ALL DIMENSIONS ARE IN MILLIMETERS

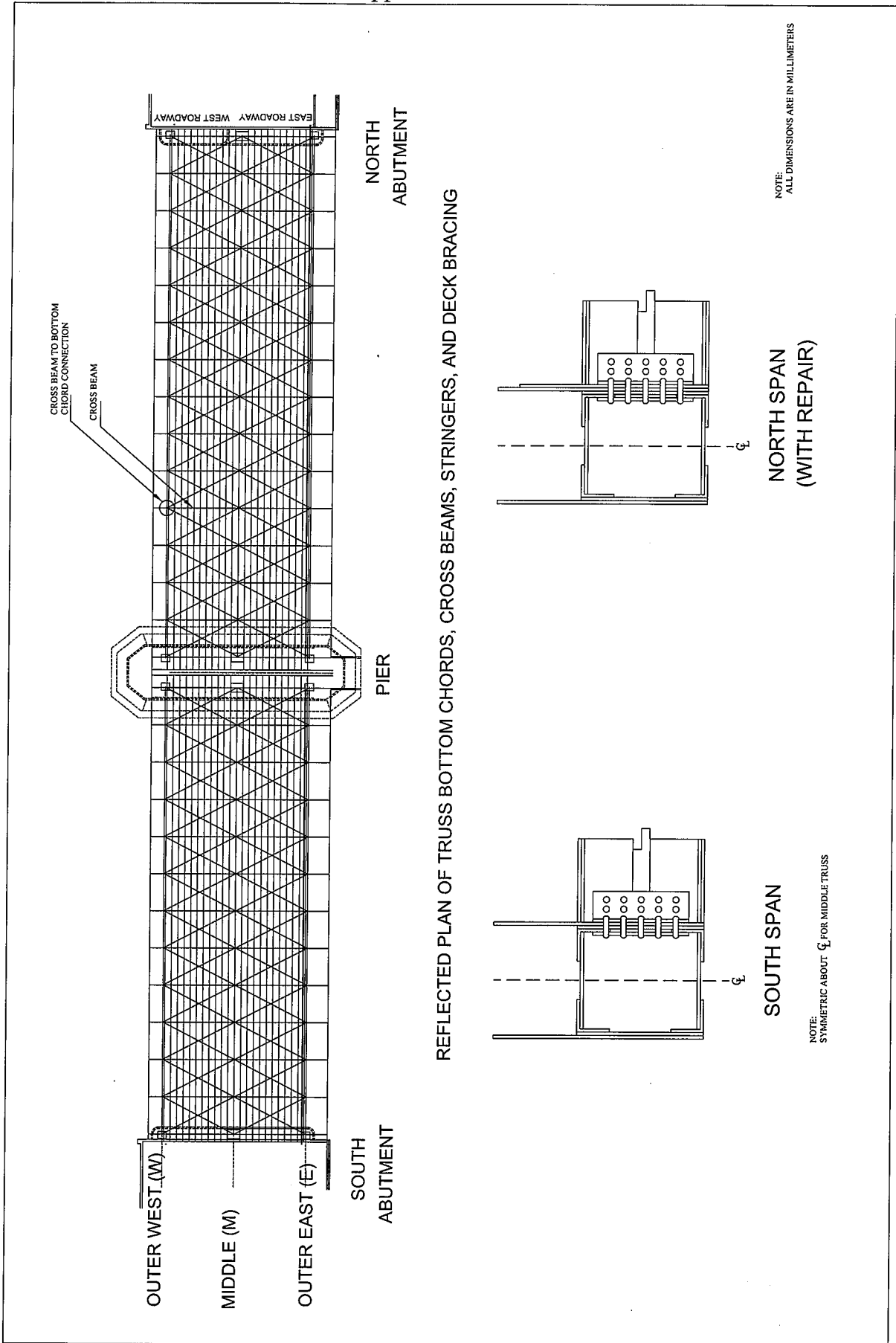
VERIFICATION OF SHAPE AND DIMENSION OF NORTH SPAN TRUSS GUSSET PLATES AT TOP CHORD



VERIFICATION OF SHAPE AND DIMENSION OF NORTH SPAN TRUSS GUSSET PLATES AT MID-HEIGHT



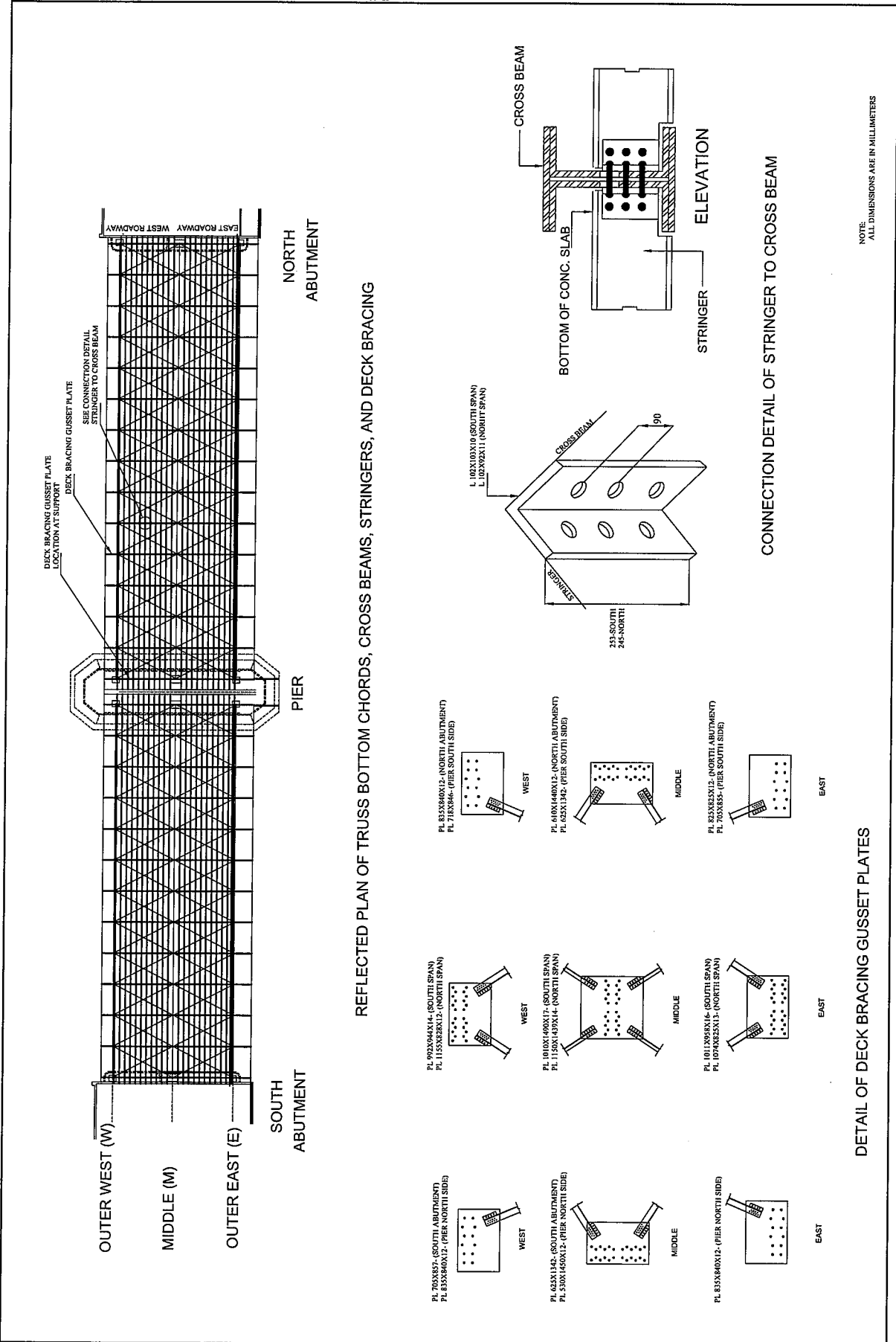
NORTH SPAN TRUSS GUSSET PLATES AND SPLICE PLATE AT BOTTOM CHORD



NOTE: ALL DIMENSIONS ARE IN MILLIMETERS

NOTE: SYMMETRIC ABOUT ξ FOR MIDDLE TRUSS

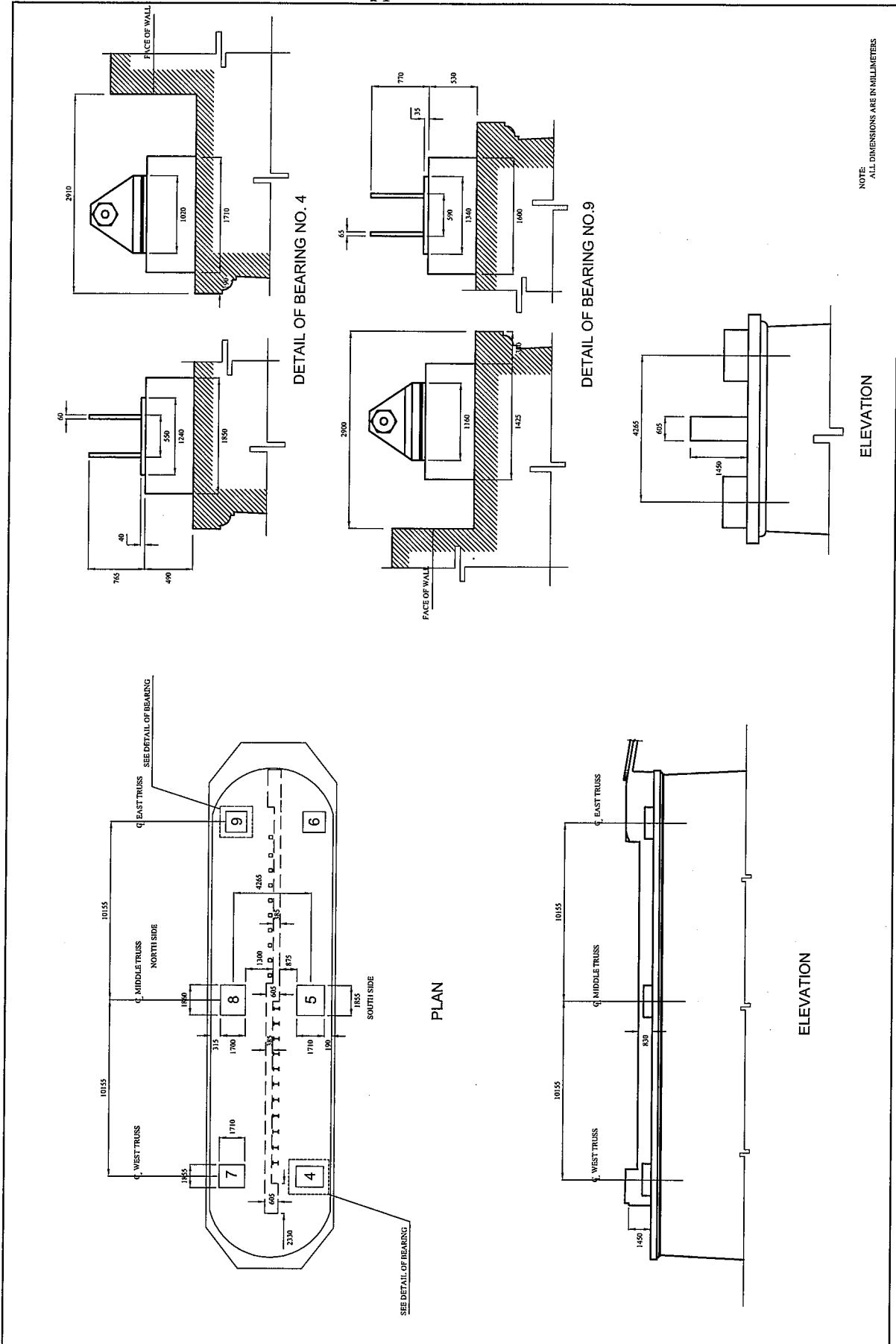
CONNECTION OF CROSS BEAM TO BOTTOM CHORD



NOTE: ALL DIMENSIONS ARE IN MILLIMETERS

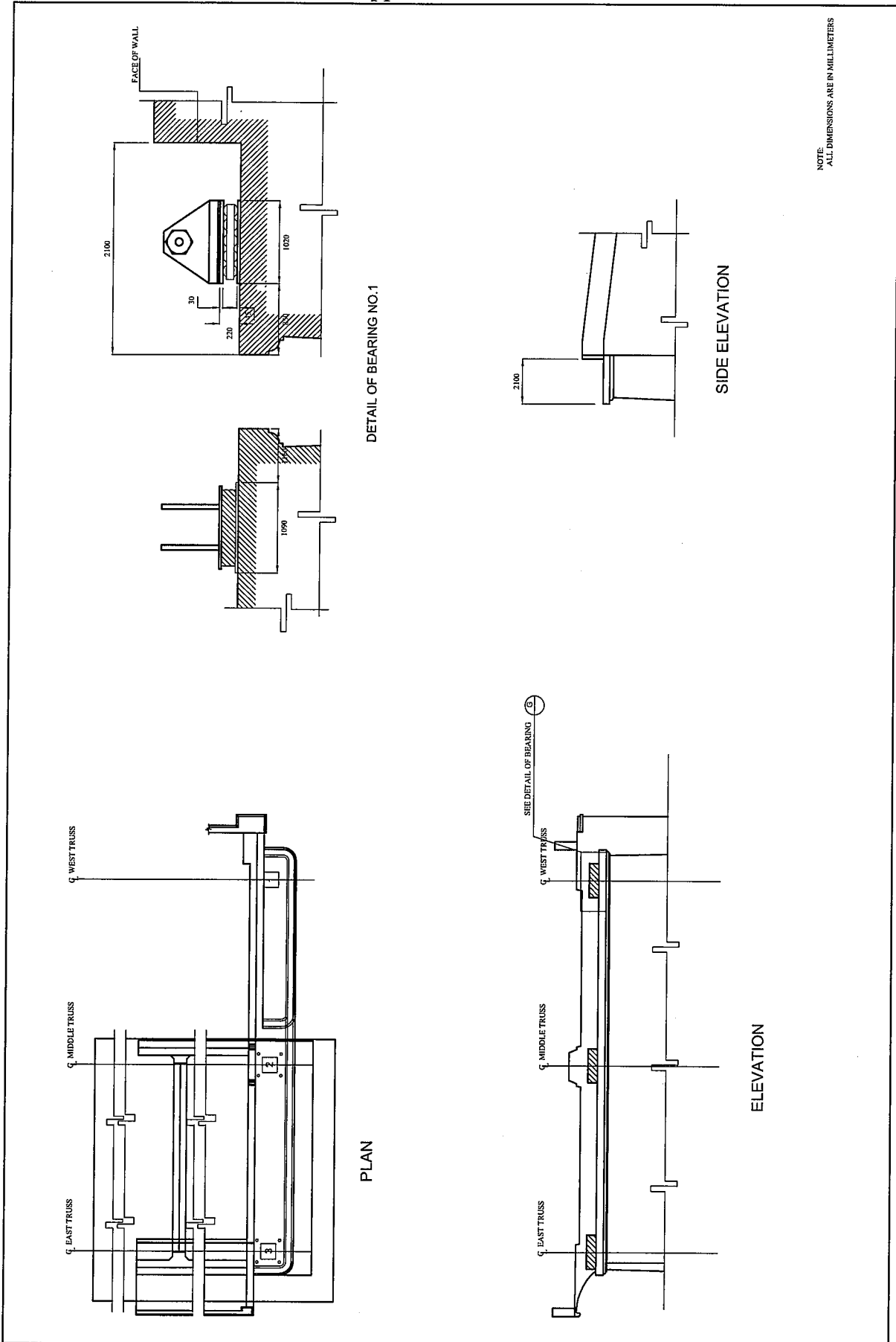
DECK BRACING GUSSET PLATES AND CONNECTION OF STRINGER TO CROSS BEAM

Appendix 13.3.1-14



NOTE
ALL DIMENSIONS ARE IN MILLIMETERS

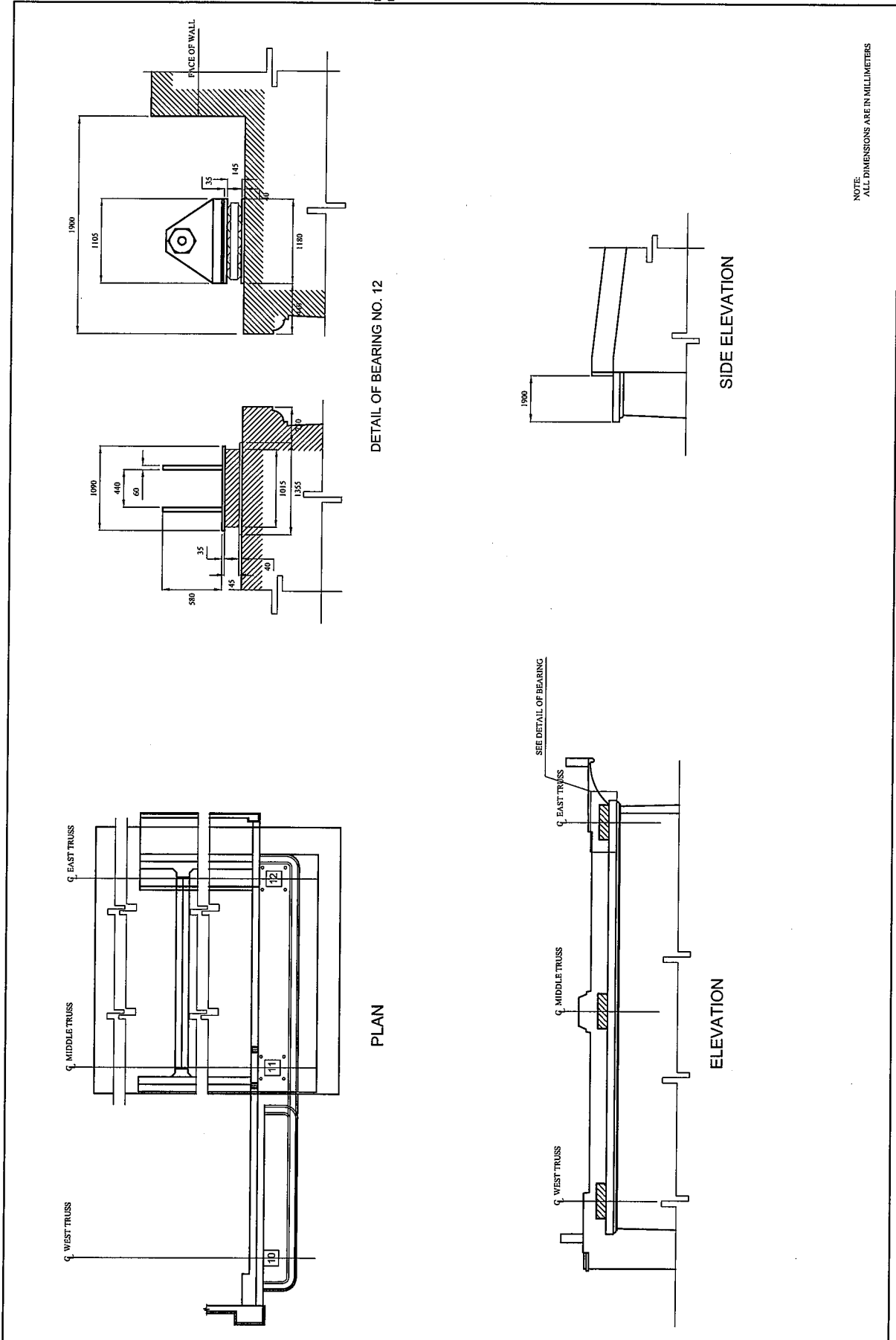
VERIFICATION OF SHAPE AND DIMENSION OF PIER



NOTE: ALL DIMENSIONS ARE IN MILLIMETERS

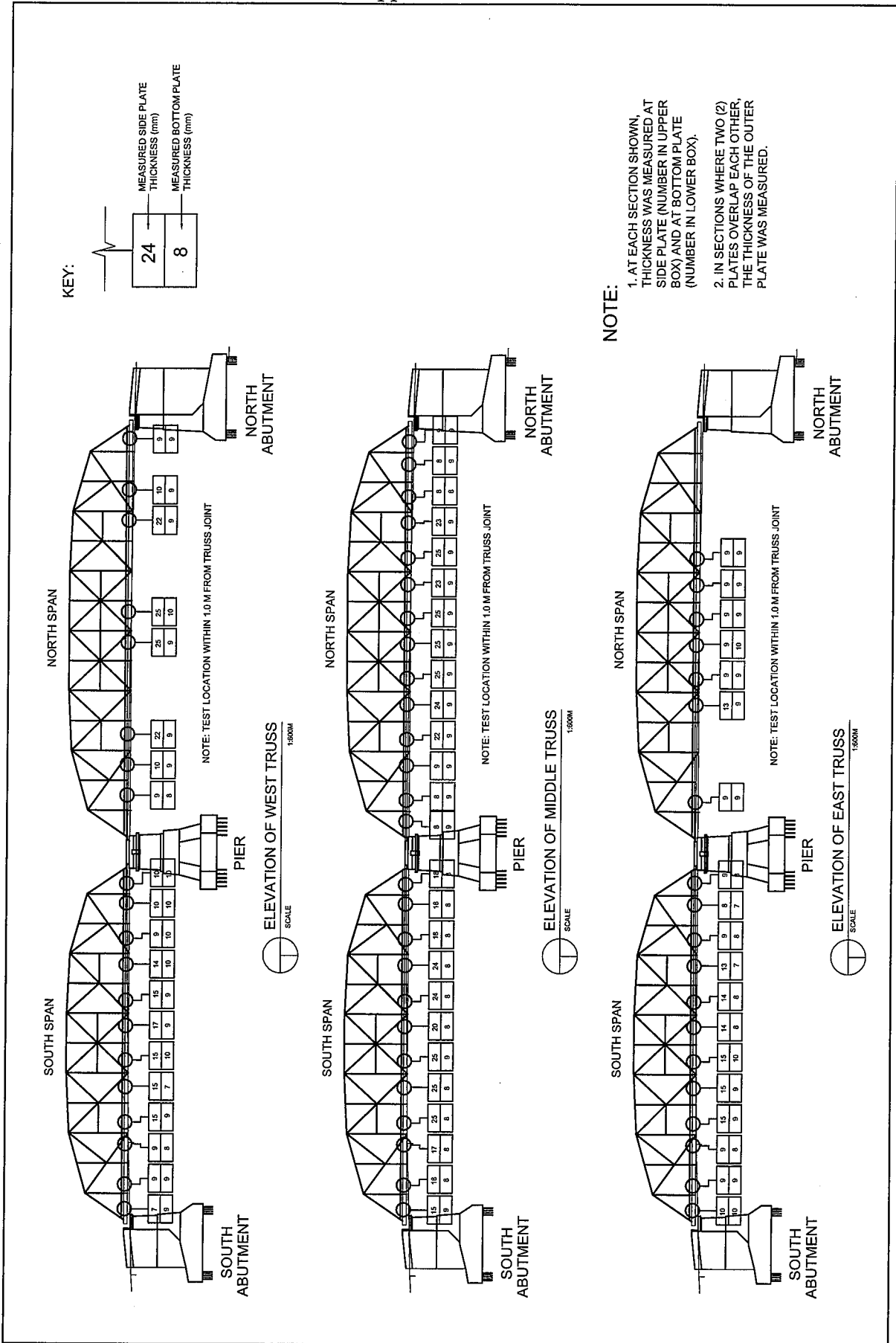
VERIFICATION OF SHAPE AND DIMENSION OF SOUTH ABUTMENT

Appendix 13.3.1-16



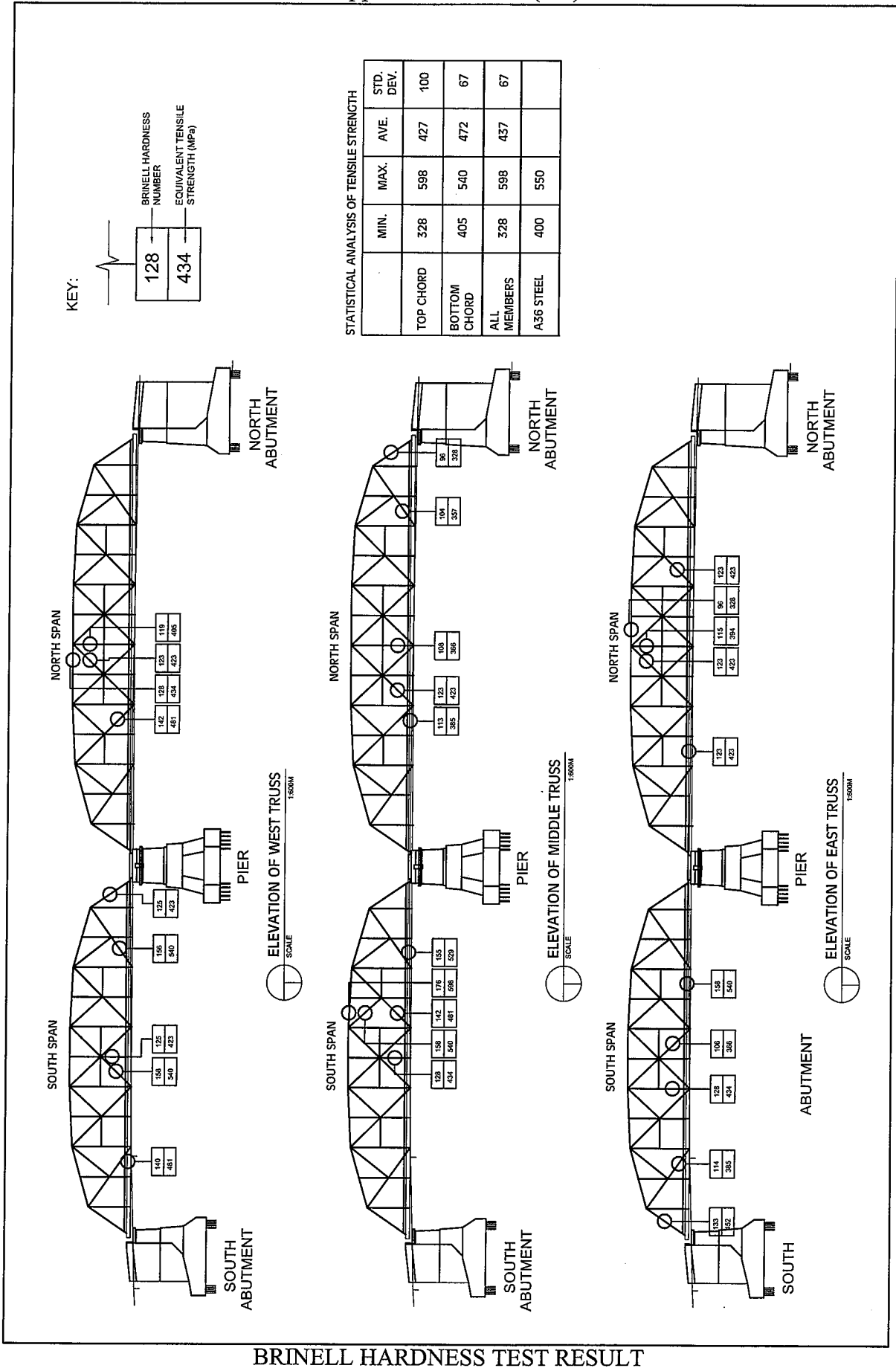
NOTE
ALL DIMENSIONS ARE IN MILLIMETERS

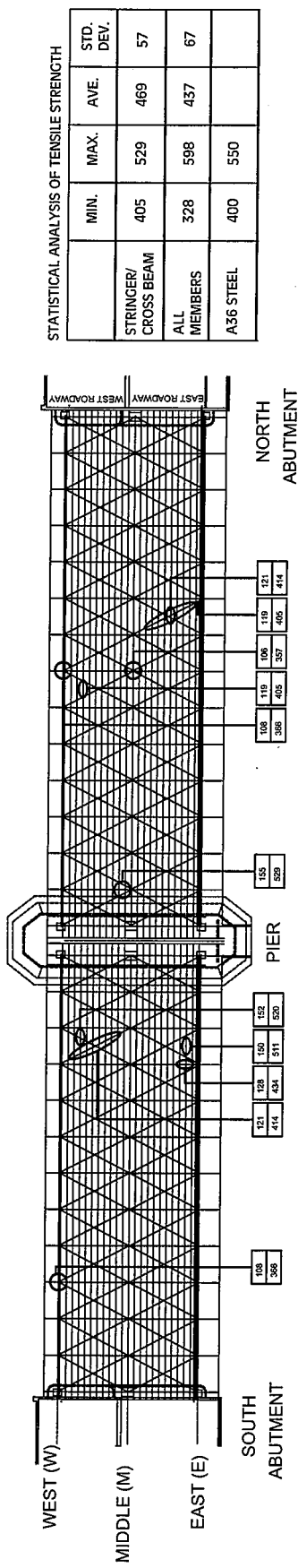
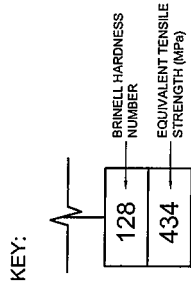
VERIFICATION OF SHAPE AND DIMENSION OF NORTH ABUTMENT



ULTRASONIC THICKNESS GAUGING RESULTS

Appendix 13.3.3-2 (1/2)



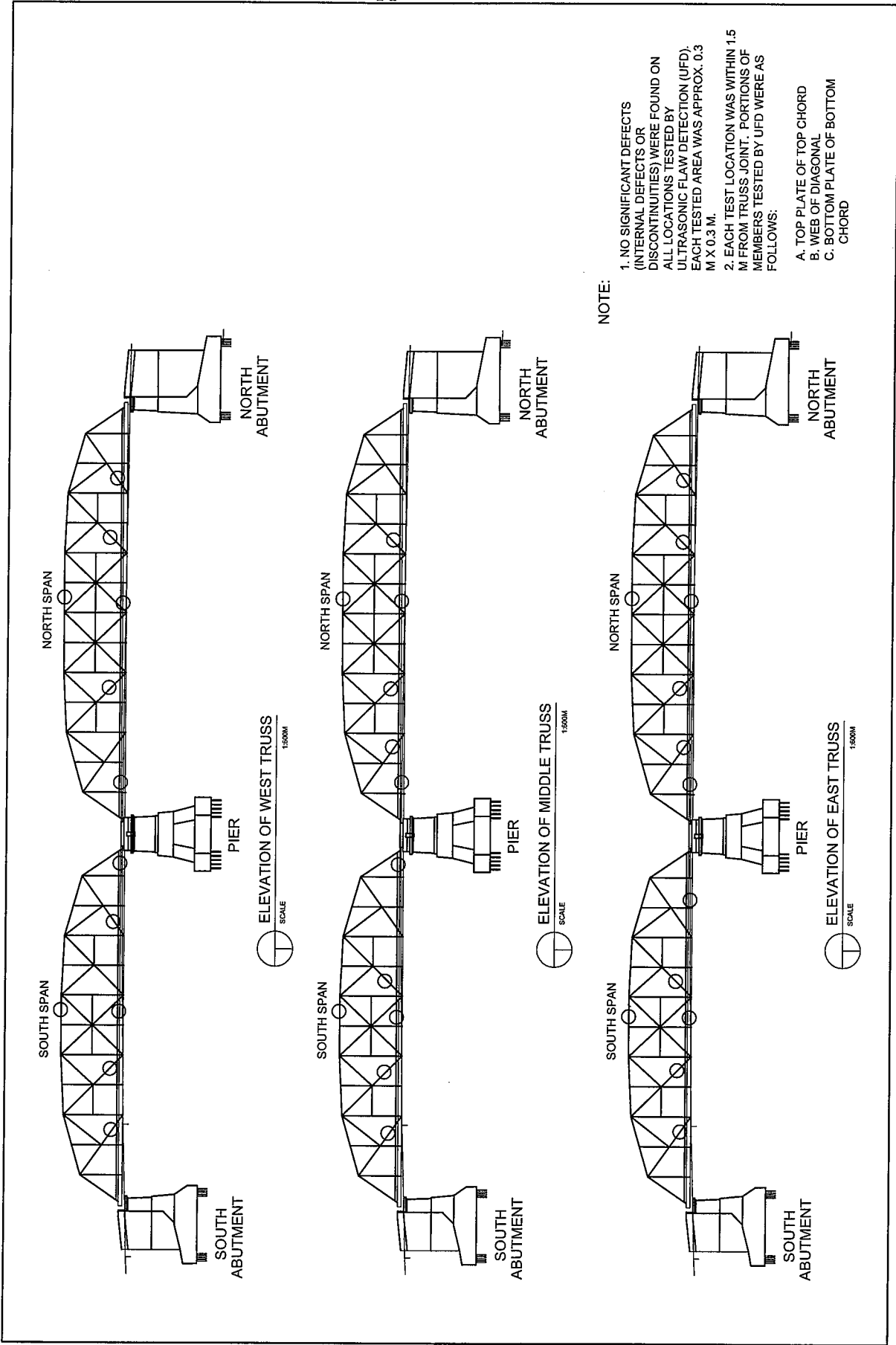


STATISTICAL ANALYSIS OF TENSILE STRENGTH

	MIN.	MAX.	AVE.	STD. DEV.
STRINGER/ CROSS BEAM	405	529	469	57
ALL MEMBERS	328	598	437	67
A36 STEEL	400	550		

REFLECTED PLAN OF TRUSS BOTTOM CHORDS, CROSS BEAMS, STRINGERS, AND DECK BRACING
SCALE 1:5000

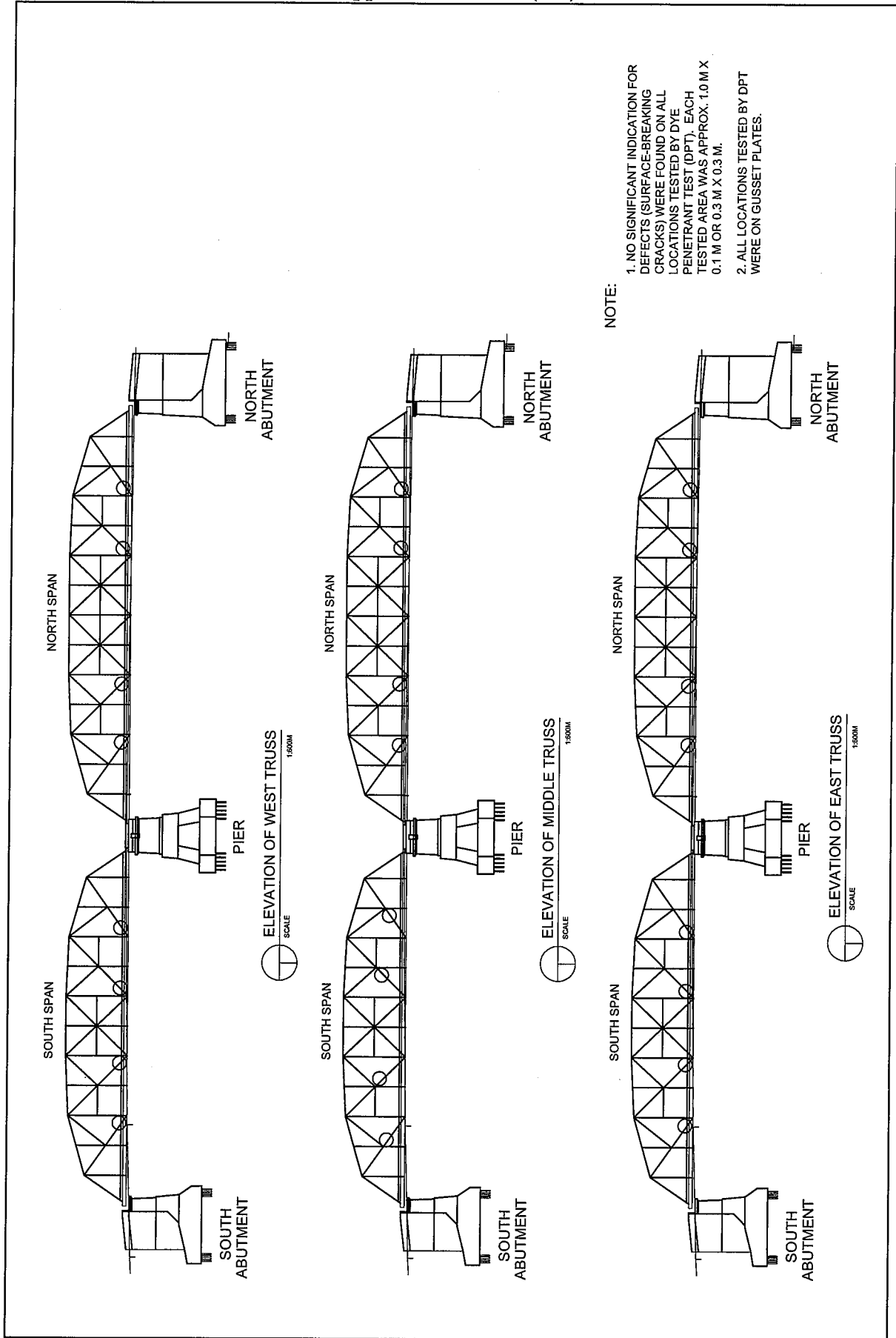
BRINELL HARDNESS TEST RESULT



NOTE:

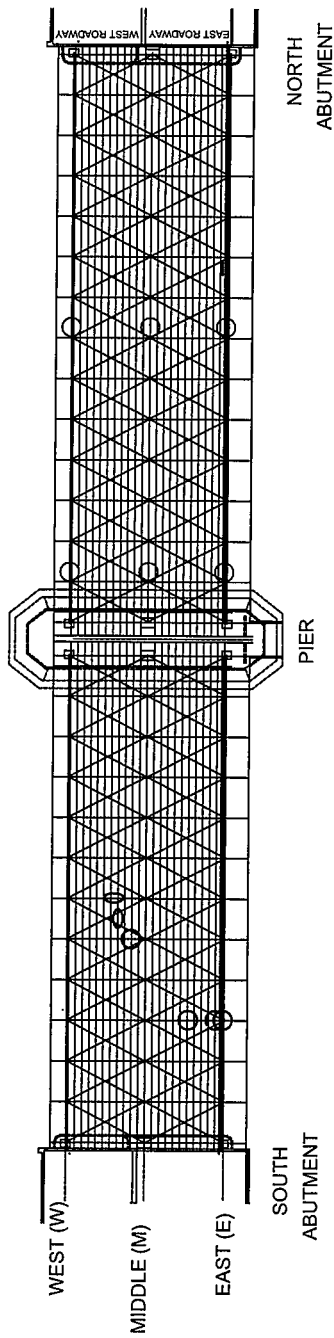
1. NO SIGNIFICANT DEFECTS (INTERNAL DEFECTS OR DISCONTINUITIES) WERE FOUND ON ALL LOCATIONS TESTED BY ULTRASONIC FLAW DETECTION (UFD). EACH TESTED AREA WAS APPROX. 0.3 M X 0.3 M.
2. EACH TEST LOCATION WAS WITHIN 1.5 M FROM TRUSS JOINT. PORTIONS OF MEMBERS TESTED BY UFD WERE AS FOLLOWS:
 - A. TOP PLATE OF TOP CHORD
 - B. WEB OF DIAGONAL
 - C. BOTTOM PLATE OF BOTTOM CHORD

ULTRASONIC FLAW DETECTION TEST RESULT



DYE PENETRANT TEST RESULT

Appendix 13.3.3-4(2/2)

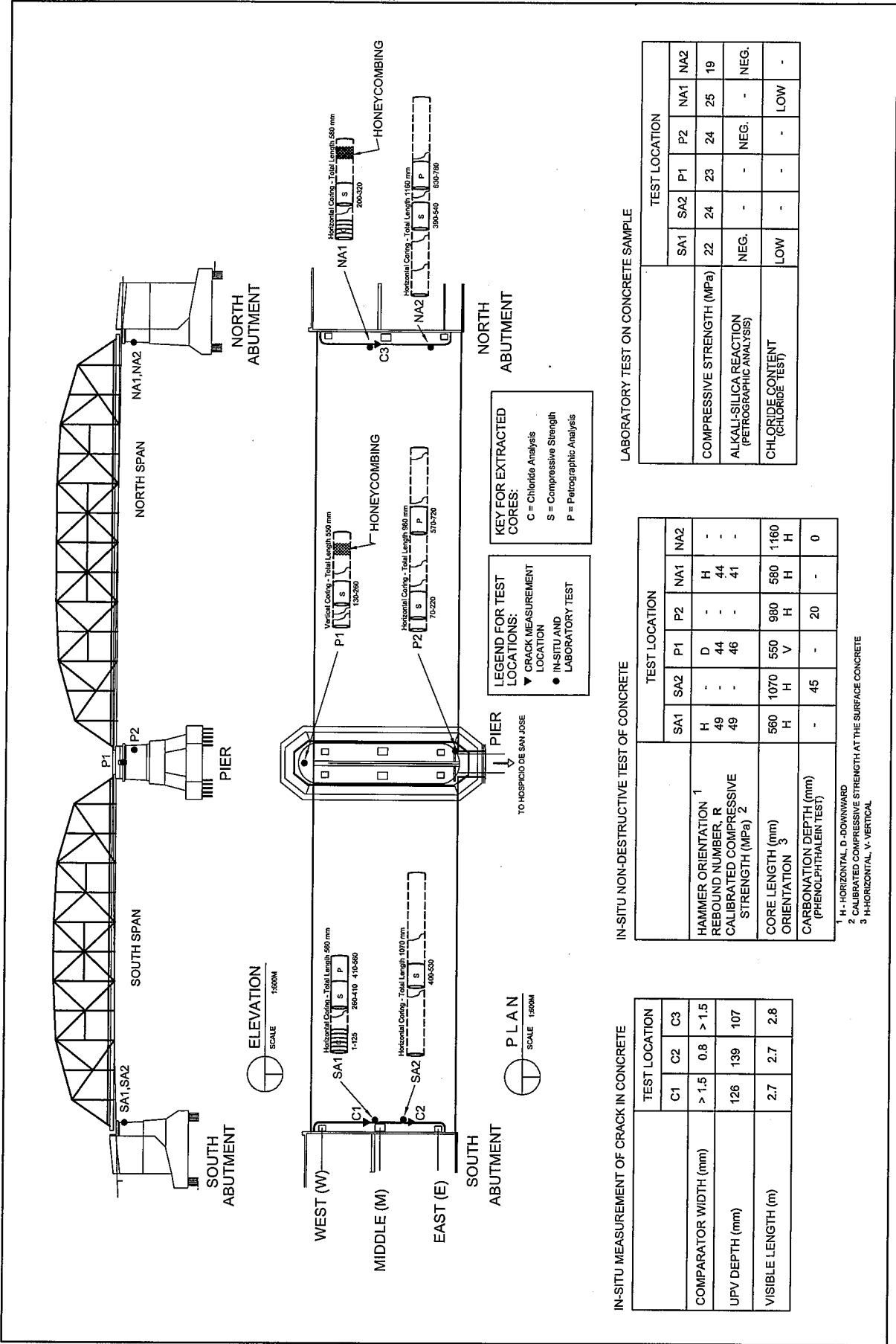


REFLECTED PLAN OF TRUSS BOTTOM CHORDS, CROSS BEAMS, STRINGERS, AND DECK BRACING
SCALE 1:500M

NOTE:

1. NO SIGNIFICANT INDICATION FOR DEFECTS (SURFACE-BREAKING CRACKS) WERE FOUND ON ALL LOCATIONS TESTED BY DYE PENETRANT TEST (DPT). EACH TESTED AREA WAS APPROX. 1.0 X 0.1 M OR 0.3 X 0.3 M.
2. PORTIONS TESTED BY DPT WERE AS FOLLOWS:
 - A. GUSSET PLATE
 - B. BOTTOM FLANGE OF CROSS BEAM

DYE PENETRANT TEST RESULT



SCHMIDT REBOUND HAMMER TEST RESULT

IN-SITU MEASUREMENT OF CRACK IN CONCRETE

	TEST LOCATION		
	C1	C2	C3
COMPARATOR WIDTH (mm)	> 1.5	0.8	> 1.5
UPV DEPTH (mm)	126	139	107
VISIBLE LENGTH (m)	2.7	2.7	2.8

IN-SITU NON-DESTRUCTIVE TEST OF CONCRETE

	TEST LOCATION					
	SA1	SA2	P1	P2	NA1	NA2
HAMMER ORIENTATION ¹	H	-	D	-	H	-
REBOUND NUMBER, R	49	-	44	-	44	-
CALIBRATED COMPRESSIVE STRENGTH (MPa) ²	49	-	46	-	41	-
CORE LENGTH (mm)	560	1070	550	980	560	1160
ORIENTATION ³	H	H	V	H	H	H
CARBONATION DEPTH (mm) (PHENOLPHTHALEIN TEST)	-	45	-	20	-	0

¹ H - HORIZONTAL, D - DOWNWARD
² CALIBRATED COMPRESSIVE STRENGTH AT THE SURFACE CONCRETE
³ H - HORIZONTAL, V - VERTICAL

LABORATORY TEST ON CONCRETE SAMPLE

	TEST LOCATION					
	SA1	SA2	P1	P2	NA1	NA2
COMPRESSIVE STRENGTH (MPa)	22	24	23	24	25	19
ALKALI-SILICA REACTION (PETROGRAPHIC ANALYSIS)	NEG.	-	-	NEG.	-	NEG.
CHLORIDE CONTENT (CHLORIDE TEST)	LOW	-	-	-	LOW	-

Appendix 13.4.2-2 (1/7)
Summary of Properties at South Span Members

Member or Joint			Section Properties						Material Properties	
Description	Type	ID	$A_{gross,DL}$ (m ²)	$A_{gross,LL}$ (m ²)	I_{11} (m ⁴)	c_1^1 (m)	I_{22} (m ⁴)	c_2^1 (m)	E_s (MPa)	f_y (MPa)
Bottom Chord	BCS1A-West	M101-103	0.033756	0.033756	0.002059	0.3045	0.000915	0.205	200000	228
Bottom Chord	BCS1A-West	M103-106	0.033756	0.033756	0.002059	0.3045	0.000915	0.205	200000	228
Bottom Chord	BCS1A-West	M106-109	0.033756	0.033756	0.002059	0.3045	0.000915	0.205	200000	228
Bottom Chord	BCS1B-West	M109-112	0.04203	0.04203	0.002302	0.3045	0.000915	0.205	200000	228
Bottom Chord	BCS1B-West	M112-115	0.04203	0.04203	0.002302	0.3045	0.000915	0.205	200000	228
Bottom Chord	BCS1B-West	M115-118	0.04203	0.04203	0.002302	0.3045	0.000915	0.205	200000	228
Bottom Chord	BCS1B-West	M118-121	0.04203	0.04203	0.002302	0.3045	0.000915	0.205	200000	228
Bottom Chord	BCS1B-West	M121-124	0.04203	0.04203	0.002302	0.3045	0.000915	0.205	200000	228
Bottom Chord	BCS1B-West	M124-127	0.04203	0.04203	0.002302	0.3045	0.000915	0.205	200000	228
Bottom Chord	BCS1C-West	M127-130	0.03684	0.03684	0.001003	0.3045	0.000915	0.205	200000	228
Bottom Chord	BCS1C-West	M130-132	0.03684	0.03684	0.001003	0.3045	0.000915	0.205	200000	228
Bottom Chord	BCS1C-West	M132-133	0.03684	0.03684	0.001003	0.3045	0.000915	0.205	200000	228
Bottom Chord	BCS1A-Middle	M201-203	0.045274	0.045274	0.002453	0.3055	0.001894	0.24445	200000	228
Bottom Chord	BCS1A-Middle	M203-206	0.045274	0.045274	0.002453	0.3055	0.001894	0.24445	200000	228
Bottom Chord	BCS1A-Middle	M206-209	0.045274	0.045274	0.002453	0.3055	0.001894	0.24445	200000	228
Bottom Chord	BCS1B-Middle	M209-212	0.053604	0.053604	0.0027	0.3055	0.001894	0.24445	200000	228
Bottom Chord	BCS1B-Middle	M212-215	0.053604	0.053604	0.0027	0.3055	0.001894	0.24445	200000	228
Bottom Chord	BCS1B-Middle	M215-218	0.053604	0.053604	0.0027	0.3055	0.001894	0.24445	200000	228
Bottom Chord	BCS1B-Middle	M218-221	0.053604	0.053604	0.0027	0.3055	0.001894	0.24445	200000	228
Bottom Chord	BCS1B-Middle	M221-224	0.053604	0.053604	0.0027	0.3055	0.001894	0.24445	200000	228
Bottom Chord	BCS1B-Middle	M224-227	0.053604	0.053604	0.0027	0.3055	0.001894	0.24445	200000	228
Bottom Chord	BCS1C-Middle	M227-230	0.046464	0.046464	0.00195	0.3055	0.001894	0.24445	200000	228
Bottom Chord	BCS1C-Middle	M230-232	0.046464	0.046464	0.00195	0.3055	0.001894	0.24445	200000	228
Bottom Chord	BCS1C-Middle	M232-233	0.046464	0.046464	0.00195	0.3055	0.001894	0.24445	200000	228
Bottom Chord	BCS1A-East	M301-303	0.03486	0.03486	0.002071	0.3035	0.000908	0.2005	200000	228
Bottom Chord	BCS1A-East	M303-306	0.03486	0.03486	0.002071	0.3035	0.000908	0.2005	200000	228
Bottom Chord	BCS1A-East	M306-309	0.03486	0.03486	0.002071	0.3035	0.000908	0.2005	200000	228
Bottom Chord	BCS1B-East	M309-312	0.040064	0.040064	0.002189	0.3035	0.000908	0.2005	200000	228
Bottom Chord	BCS1B-East	M312-315	0.040064	0.040064	0.002189	0.3035	0.000908	0.2005	200000	228
Bottom Chord	BCS1B-East	M315-318	0.040064	0.040064	0.002189	0.3035	0.000908	0.2005	200000	228
Bottom Chord	BCS1B-East	M318-321	0.040064	0.040064	0.002189	0.3035	0.000908	0.2005	200000	228
Bottom Chord	BCS1B-East	M321-324	0.040064	0.040064	0.002189	0.3035	0.000908	0.2005	200000	228
Bottom Chord	BCS1B-East	M324-327	0.040064	0.040064	0.002189	0.3035	0.000908	0.2005	200000	228
Bottom Chord	BCS1C-East	M327-330	0.034154	0.034154	0.0009	0.3035	0.000908	0.2005	200000	228
Bottom Chord	BCS1C-East	M330-332	0.034154	0.034154	0.0009	0.3035	0.000908	0.2005	200000	228
Bottom Chord	BCS1C-East	M332-333	0.034154	0.034154	0.0009	0.3035	0.000908	0.2005	200000	228
Top Chord	TCS1-West	M101-102	0.03728	0.03728					200000	228
Top Chord	TCS1-West	M102-104	0.03728	0.03728					200000	228
Top Chord	TCS1-West	M104-107	0.03728	0.03728					200000	228
Top Chord	TCS1-West	M107-110	0.03728	0.03728					200000	228
Top Chord	TCS1-West	M110-113	0.03728	0.03728					200000	228
Top Chord	TCS1-West	M113-116	0.03728	0.03728					200000	228
Top Chord	TCS1-West	M116-119	0.03728	0.03728					200000	228
Top Chord	TCS1-West	M119-122	0.03728	0.03728					200000	228
Top Chord	TCS1-West	M122-125	0.03728	0.03728					200000	228
Top Chord	TCS1-West	M125-128	0.03728	0.03728					200000	228
Top Chord	TCS1-West	M128-131	0.03728	0.03728					200000	228
Top Chord	TCS1-West	M131-133	0.03728	0.03728					200000	228
Top Chord	TCS1-Middle	M201-202	0.05864	0.05864					200000	228

Note: See Appendix 13.4.2-3 for the identification of members.

¹ Distance to local horizontal neutral axis is measured from topmost fiber.

Appendix 13.4.2-2 (2/7)
Summary of Properties at South Span Members

Member or Joint			Section Properties					Material Properties		
Description	Type	ID	$A_{gross,DL}$ (m ²)	$A_{gross,LL}$ (m ²)	I_{11} (m ⁴)	c_1^1 (m)	I_{22} (m ⁴)	c_2^1 (m)	E_s (MPa)	f_y (MPa)
Top Chord	TCSI-Middle	M202-204	0.05864	0.05864					200000	228
Top Chord	TCSI-Middle	M204-207	0.05864	0.05864					200000	228
Top Chord	TCSI-Middle	M207-210	0.05864	0.05864					200000	228
Top Chord	TCSI-Middle	M210-213	0.05864	0.05864					200000	228
Top Chord	TCSI-Middle	M213-216	0.05864	0.05864					200000	228
Top Chord	TCSI-Middle	M216-219	0.05864	0.05864					200000	228
Top Chord	TCSI-Middle	M219-222	0.05864	0.05864					200000	228
Top Chord	TCSI-Middle	M222-225	0.05864	0.05864					200000	228
Top Chord	TCSI-Middle	M225-228	0.05864	0.05864					200000	228
Top Chord	TCSI-Middle	M228-231	0.05864	0.05864					200000	228
Top Chord	TCSI-Middle	M231-233	0.05864	0.05864					200000	228
Top Chord	TCSI-East	M301-302	0.037396	0.037396					200000	228
Top Chord	TCSI-East	M302-304	0.037396	0.037396					200000	228
Top Chord	TCSI-East	M304-307	0.037396	0.037396					200000	228
Top Chord	TCSI-East	M307-310	0.037396	0.037396					200000	228
Top Chord	TCSI-East	M310-313	0.037396	0.037396					200000	228
Top Chord	TCSI-East	M313-316	0.037396	0.037396					200000	228
Top Chord	TCSI-East	M316-319	0.037396	0.037396					200000	228
Top Chord	TCSI-East	M319-322	0.037396	0.037396					200000	228
Top Chord	TCSI-East	M322-325	0.037396	0.037396					200000	228
Top Chord	TCSI-East	M325-328	0.037396	0.037396					200000	228
Top Chord	TCSI-East	M328-331	0.037396	0.037396					200000	228
Top Chord	TCSI-East	M331-333	0.037396	0.037396					200000	228
Main Diagonal	MDS1-West	M107-111	0.01378	0.01378					200000	228
Main Diagonal	MDS1-West	M111-115	0.01378	0.01378					200000	228
Main Diagonal	MDS1-West	M121-123	0.01378	0.01378					200000	228
Main Diagonal	MDS1-West	M123-125	0.01378	0.01378					200000	228
Main Diagonal	MDS2-West	M102-105	0.0201	0.0201					200000	228
Main Diagonal	MDS2-West	M105-109	0.0201	0.0201					200000	228
Main Diagonal	MDS2-West	M127-129	0.0201	0.0201					200000	228
Main Diagonal	MDS2-West	M129-131	0.0201	0.0201					200000	228
Main Diagonal	MDS1-Middle	M202-205	0.023849	0.023849					200000	228
Main Diagonal	MDS1-Middle	M205-209	0.023849	0.023849					200000	228
Main Diagonal	MDS1-Middle	M207-211	0.023849	0.023849					200000	228
Main Diagonal	MDS1-Middle	M211-215	0.023849	0.023849					200000	228
Main Diagonal	MDS1-Middle	M221-223	0.023849	0.023849					200000	228
Main Diagonal	MDS1-Middle	M223-225	0.023849	0.023849					200000	228
Main Diagonal	MDS1-Middle	M227-229	0.023849	0.023849					200000	228
Main Diagonal	MDS1-Middle	M229-231	0.023849	0.023849					200000	228
Main Diagonal	MDS1-East	M307-311	0.012572	0.012572					200000	228
Main Diagonal	MDS1-East	M311-315	0.012572	0.012572					200000	228
Main Diagonal	MDS1-East	M321-323	0.012572	0.012572					200000	228
Main Diagonal	MDS1-East	M323-325	0.012572	0.012572					200000	228
Main Diagonal	MDS2-East	M302-305	0.01509	0.01509					200000	228
Main Diagonal	MDS2-East	M305-309	0.01509	0.01509					200000	228
Main Diagonal	MDS2-East	M327-329	0.01509	0.01509					200000	228
Main Diagonal	MDS2-East	M329-331	0.01509	0.01509					200000	228

Note: See Appendix 13.4.2-3 for the identification of members.

¹ Distance to local horizontal neutral axis is measured from topmost fiber.

Appendix 13.4.2-2 (3/7)
Summary of Properties at South Span Members

Member or Joint			Section Properties						Material Properties	
Description	Type	ID	$A_{gross,DL}$ (m ²)	$A_{gross,LL}$ (m ²)	I_{11} (m ⁴)	c_1^1 (m)	I_{22} (m ⁴)	c_2^1 (m)	E_s (MPa)	f_y (MPa)
Main Vertical	MVSI-West	M102-103	0.03728	0.03728					200000	228
Main Vertical	MVSI-West	M105-106	0.03728	0.03728					200000	228
Main Vertical	MVSI-West	M107-108	0.03728	0.03728					200000	228
Main Vertical	MVSI-West	M108-109	0.03728	0.03728					200000	228
Main Vertical	MVSI-West	M111-112	0.03728	0.03728					200000	228
Main Vertical	MVSI-West	M113-114	0.03728	0.03728					200000	228
Main Vertical	MVSI-West	M114-115	0.03728	0.03728					200000	228
Main Vertical	MVSI-West	M117-118	0.03728	0.03728					200000	228
Main Vertical	MVSI-West	M119-120	0.03728	0.03728					200000	228
Main Vertical	MVSI-West	M120-121	0.03728	0.03728					200000	228
Main Vertical	MVSI-West	M123-124	0.03728	0.03728					200000	228
Main Vertical	MVSI-West	M125-126	0.03728	0.03728					200000	228
Main Vertical	MVSI-West	M126-127	0.03728	0.03728					200000	228
Main Vertical	MVSI-West	M129-130	0.03728	0.03728					200000	228
Main Vertical	MVSI-West	M131-132	0.03728	0.03728					200000	228
Main Vertical	MVSI-Middle	M202-203	0.05864	0.05864					200000	228
Main Vertical	MVSI-Middle	M205-206	0.05864	0.05864					200000	228
Main Vertical	MVSI-Middle	M207-208	0.05864	0.05864					200000	228
Main Vertical	MVSI-Middle	M208-209	0.05864	0.05864					200000	228
Main Vertical	MVSI-Middle	M211-212	0.05864	0.05864					200000	228
Main Vertical	MVSI-Middle	M213-214	0.05864	0.05864					200000	228
Main Vertical	MVSI-Middle	M217-218	0.05864	0.05864					200000	228
Main Vertical	MVSI-Middle	M219-220	0.05864	0.05864					200000	228
Main Vertical	MVSI-Middle	M223-224	0.05864	0.05864					200000	228
Main Vertical	MVSI-Middle	M225-226	0.05864	0.05864					200000	228
Main Vertical	MVSI-Middle	M226-227	0.05864	0.05864					200000	228
Main Vertical	MVSI-Middle	M229-230	0.05864	0.05864					200000	228
Main Vertical	MVSI-Middle	M231-232	0.05864	0.05864					200000	228
Main Vertical	MVSI-Middle	M214-215	0.05864	0.05864					200000	228
Main Vertical	MVSI-Middle	M220-221	0.05864	0.05864					200000	228
Main Vertical	MVSI-East	M302-303	0.037396	0.037396					200000	228
Main Vertical	MVSI-East	M305-306	0.037396	0.037396					200000	228
Main Vertical	MVSI-East	M307-308	0.037396	0.037396					200000	228
Main Vertical	MVSI-East	M308-309	0.037396	0.037396					200000	228
Main Vertical	MVSI-East	M311-312	0.037396	0.037396					200000	228
Main Vertical	MVSI-East	M313-314	0.037396	0.037396					200000	228
Main Vertical	MVSI-East	M314-315	0.037396	0.037396					200000	228
Main Vertical	MVSI-East	M317-318	0.037396	0.037396					200000	228
Main Vertical	MVSI-East	M319-320	0.037396	0.037396					200000	228
Main Vertical	MVSI-East	M320-321	0.037396	0.037396					200000	228
Main Vertical	MVSI-East	M323-324	0.037396	0.037396					200000	228
Main Vertical	MVSI-East	M325-326	0.037396	0.037396					200000	228
Main Vertical	MVSI-East	M326-327	0.037396	0.037396					200000	228
Main Vertical	MVSI-East	M329-330	0.037396	0.037396					200000	228
Main Vertical	MVSI-East	M331-332	0.037396	0.037396					200000	228

Note: See Appendix 13.4.2-3 for the identification of members.

¹ Distance to local horizontal neutral axis is measured from topmost fiber.

Appendix 13.4.2-2 (4/7)
Summary of Properties at North Span Members

Member or Joint			Section Properties						Material Properties	
Description	Type	ID	$A_{gross,DL}$ (m ²)	$A_{gross,LL}$ (m ²)	I_{11} (m ⁴)	c_1^1 (m)	I_{22} (m ⁴)	c_2^1 (m)	E_s (MPa)	f_y (MPa)
Bottom Chord	BCNIC-West	M134-136	0.036452	0.036452	0.002278	0.314	0.000925	0.197	200000	228
Bottom Chord	BCNIC-West	M136-139	0.036452	0.036452	0.002278	0.314	0.000925	0.197	200000	228
Bottom Chord	BCNIC-West	M139-142	0.036452	0.036452	0.002278	0.314	0.000925	0.197	200000	228
Bottom Chord	BCN1B-West	M142-145	0.036452	0.036452	0.002812	0.314	0.000925	0.197	200000	228
Bottom Chord	BCN1B-West	M145-148	0.036452	0.036452	0.002812	0.314	0.000925	0.197	200000	228
Bottom Chord	BCN1B-West	M148-151	0.036452	0.036452	0.002812	0.314	0.000925	0.197	200000	228
Bottom Chord	BCN1B-West	M151-154	0.036452	0.036452	0.002812	0.314	0.001414	0.197	200000	228
Bottom Chord	BCN1B-West	M154-157	0.036452	0.036452	0.002812	0.314	0.001414	0.197	200000	228
Bottom Chord	BCN1B-West	M157-160	0.036452	0.036452	0.002812	0.314	0.001414	0.197	200000	228
Bottom Chord	BCN1B-West	M160-163	0.036452	0.036452	0.002812	0.314	0.001414	0.197	200000	228
Bottom Chord	BCN1B-West	M163-166	0.036452	0.036452	0.002812	0.314	0.001414	0.197	200000	228
Bottom Chord	BCN1A-West	M166-169	0.036452	0.036452	0.002278	0.314	0.000925	0.197	200000	228
Bottom Chord	BCN1A-West	M169-171	0.036452	0.036452	0.002278	0.314	0.000925	0.197	200000	228
Bottom Chord	BCN1A-West	M171-172	0.036452	0.036452	0.002278	0.314	0.000925	0.197	200000	228
Bottom Chord	BCNIC-Middle	M234-236	0.037596	0.022596	0.001666	0.333	0.001053	0.263	200000	228
Bottom Chord	BCNIC-Middle	M236-239	0.037596	0.022596	0.001666	0.333	0.001053	0.263	200000	228
Bottom Chord	BCNIC-Middle	M239-242	0.037596	0.022596	0.001666	0.333	0.001053	0.263	200000	228
Bottom Chord	BCN1B-Middle	M242-245	0.055548	0.040536	0.00232	0.333	0.002014	0.237786	200000	228
Bottom Chord	BCN1B-Middle	M245-248	0.055548	0.040536	0.00232	0.333	0.002014	0.237786	200000	228
Bottom Chord	BCN1B-Middle	M248-251	0.055548	0.040536	0.00232	0.333	0.002014	0.237786	200000	228
Bottom Chord	BCN1B-Middle	M251-254	0.055548	0.040536	0.00232	0.333	0.002014	0.237786	200000	228
Bottom Chord	BCN1B-Middle	M254-257	0.055548	0.040536	0.00232	0.333	0.002014	0.237786	200000	228
Bottom Chord	BCN1B-Middle	M257-260	0.055548	0.040536	0.00232	0.333	0.002014	0.237786	200000	228
Bottom Chord	BCN1B-Middle	M260-263	0.055548	0.040536	0.00232	0.333	0.002014	0.237786	200000	228
Bottom Chord	BCN1B-Middle	M263-266	0.055548	0.040536	0.00232	0.333	0.002014	0.237786	200000	228
Bottom Chord	BCN1A-Middle	M266-269	0.038468	0.02358	0.001763	0.333	0.001073	0.263	200000	228
Bottom Chord	BCN1A-Middle	M269-271	0.038468	0.02358	0.001763	0.333	0.001073	0.263	200000	228
Bottom Chord	BCN1A-Middle	M271-272	0.038468	0.02358	0.001763	0.333	0.001073	0.263	200000	228
Bottom Chord	BCN1C-East	M334-336	0.03614	0.02236	0.001555	0.333	0.000731	0.2175	200000	228
Bottom Chord	BCN1C-East	M336-339	0.03614	0.02236	0.001555	0.333	0.000731	0.2175	200000	228
Bottom Chord	BCN1C-East	M339-342	0.03614	0.02236	0.001555	0.333	0.000731	0.2175	200000	228
Bottom Chord	BCN1CC-East	M342-345	0.053332	0.0337	0.00193	0.333	0.001162	0.2175	200000	228
Bottom Chord	BCN1B-East	M345-348	0.05391	0.034462	0.002005	0.333	0.001171	0.2175	200000	228
Bottom Chord	BCN1B-East	M348-351	0.05391	0.034462	0.002005	0.333	0.001171	0.2175	200000	228
Bottom Chord	BCN1B-East	M351-354	0.05391	0.034462	0.002005	0.333	0.001171	0.2175	200000	228
Bottom Chord	BCN1B-East	M354-357	0.05391	0.034462	0.002005	0.333	0.001171	0.2175	200000	228
Bottom Chord	BCN1B-East	M357-360	0.05391	0.034462	0.002005	0.333	0.001171	0.2175	200000	228
Bottom Chord	BCN1B-East	M360-363	0.05391	0.034462	0.002005	0.333	0.001171	0.2175	200000	228
Bottom Chord	BCN1B-East	M363-366	0.05391	0.034462	0.002005	0.333	0.001171	0.2175	200000	228
Bottom Chord	BCN1B-East	M366-369	0.03614	0.02236	0.001555	0.333	0.000731	0.2175	200000	228
Bottom Chord	BCN1B-East	M369-371	0.03614	0.02236	0.001555	0.333	0.000731	0.2175	200000	228
Bottom Chord	BCN1B-East	M371-372	0.03614	0.02236	0.001555	0.333	0.000731	0.2175	200000	228
Main Diagonal	MDN1-West	M146-150	0.0146	0.0146					200000	228
Main Diagonal	MDN1-West	M150-154	0.0146	0.0146					200000	228
Main Diagonal	MDN1-West	M156-154	0.0146	0.0146					200000	228
Main Diagonal	MDN1-West	M156-158	0.0146	0.0146					200000	228
Main Diagonal	MDN2-West	M135-138	0.02735	0.02735					200000	228
Main Diagonal	MDN2-West	M138-142	0.02735	0.02735					200000	228
Main Diagonal	MDN2-West	M166-168	0.02735	0.02735					200000	228

Note: See Appendix 13.4.2-3 for the identification of members.

¹ Distance to local horizontal neutral axis is measured from topmost fiber.

Appendix 13.4.2-2 (5/7)
Summary of Properties at North Span Members

Member or Joint			Section Properties						Material Properties	
Description	Type	ID	$A_{gross,DL}$ (m ²)	$A_{gross,LL}$ (m ²)	I_{11} (m ⁴)	c_1^1 (m)	I_{22} (m ⁴)	c_2^1 (m)	E_s (MPa)	f_y (MPa)
Main Diagonal	MDN2-West	M168-170	0.02735	0.02735					200000	228
Main Diagonal	MDN3-West	M140-144	0.02042	0.02042					200000	228
Main Diagonal	MDN3-West	M144-148	0.02042	0.02042					200000	228
Main Diagonal	MDN3-West	M160-162	0.02042	0.02042					200000	228
Main Diagonal	MDN3-West	M162-164	0.02042	0.02042					200000	228
Main Diagonal	MDN1-Middle	M246-250	0.02832	0.02832					200000	228
Main Diagonal	MDN1-Middle	M250-254	0.02832	0.02832					200000	228
Main Diagonal	MDN1-Middle	M256-254	0.02832	0.02832					200000	228
Main Diagonal	MDN1-Middle	M256-258	0.02832	0.02832					200000	228
Main Diagonal	MDN1-Middle	M240-244	0.02832	0.02832					200000	228
Main Diagonal	MDN1-Middle	M244-248	0.02832	0.02832					200000	228
Main Diagonal	MDN1-Middle	M262-260	0.02832	0.02832					200000	228
Main Diagonal	MDN1-Middle	M262-264	0.02832	0.02832					200000	228
Main Diagonal	MDN2-Middle	M235-238	0.04792	0.04792					200000	228
Main Diagonal	MDN2-Middle	M238-242	0.04792	0.04792					200000	228
Main Diagonal	MDN2-Middle	M266-268	0.04792	0.04792					200000	228
Main Diagonal	MDN2-Middle	M268-270	0.04792	0.04792					200000	228
Main Diagonal	MDN1-East	M335-338	0.027114	0.027114					200000	228
Main Diagonal	MDN1-East	M338-342	0.027114	0.027114					200000	228
Main Diagonal	MDN1-East	M366-368	0.027114	0.027114					200000	228
Main Diagonal	MDN1-East	M368-370	0.027114	0.027114					200000	228
Main Diagonal	MDN2-East	M340-344	0.016894	0.016894					200000	228
Main Diagonal	MDN2-East	M344-348	0.016894	0.016894					200000	228
Main Diagonal	MDN2-East	M360-362	0.016894	0.016894					200000	228
Main Diagonal	MDN2-East	M362-364	0.016894	0.016894					200000	228
Main Diagonal	MDN3-East	M346-350	0.0121	0.0121					200000	228
Main Diagonal	MDN3-East	M350-354	0.0121	0.0121					200000	228
Main Diagonal	MDN3-East	M354-356	0.0121	0.0121					200000	228
Main Diagonal	MDN3-East	M356-358	0.0121	0.0121					200000	228
Main Vertical	MVN1-West	M136-135	0.00754	0.00754					200000	228
Main Vertical	MVN1-West	M139-138	0.00754	0.00754					200000	228
Main Vertical	MVN1-West	M145-144	0.00754	0.00754					200000	228
Main Vertical	MVN1-West	M147-146	0.00754	0.00754					200000	228
Main Vertical	MVN1-West	M148-147	0.00754	0.00754					200000	228
Main Vertical	MVN1-West	M151-150	0.00754	0.00754					200000	228
Main Vertical	MVN1-West	M153-152	0.00754	0.00754					200000	228
Main Vertical	MVN1-West	M154-153	0.00754	0.00754					200000	228
Main Vertical	MVN1-West	M157-156	0.00754	0.00754					200000	228
Main Vertical	MVN1-West	M159-158	0.00754	0.00754					200000	228
Main Vertical	MVN1-West	M160-159	0.00754	0.00754					200000	228
Main Vertical	MVN1-West	M163-162	0.00754	0.00754					200000	228
Main Vertical	MVN1-West	M169-168	0.00754	0.00754					200000	228
Main Vertical	MVN1-West	M171-170	0.00754	0.00754					200000	228
Main Vertical	MVN2-West	M164-165	0.00754	0.00754					200000	228
Main Vertical	MVN2-West	M165-166	0.00900	0.00900					200000	228
Main Vertical	MVN2-West	M141-142	0.00900	0.00900					200000	228
Main Vertical	MVN2-West	M140-141	0.00900	0.00900					200000	228
Main Vertical	MVN1-Middle	M236-235	0.008208	0.008208					200000	228
Main Vertical	MVN1-Middle	M239-238	0.008208	0.008208					200000	228

Note: See Appendix 13.4.2-3 for the identification of members.

¹ Distance to local horizontal neutral axis is measured from topmost fiber.

Appendix 13.4.2-2 (6/7)
Summary of Properties at North Span Members

Member or Joint			Section Properties						Material Properties	
Description	Type	ID	$A_{gross,DL}$ (m ²)	$A_{gross,LL}$ (m ²)	I_{11} (m ⁴)	c_1^1 (m)	I_{22} (m ⁴)	c_2^1 (m)	E_s (MPa)	f_y (MPa)
Main Vertical	MVNI-Middle	M245-244	0.008208	0.008208					200000	228
Main Vertical	MVNI-Middle	M247-246	0.008208	0.008208					200000	228
Main Vertical	MVNI-Middle	M248-247	0.008208	0.008208					200000	228
Main Vertical	MVNI-Middle	M251-250	0.008208	0.008208					200000	228
Main Vertical	MVNI-Middle	M253-252	0.008208	0.008208					200000	228
Main Vertical	MVNI-Middle	M254-253	0.008208	0.008208					200000	228
Main Vertical	MVNI-Middle	M257-256	0.008208	0.008208					200000	228
Main Vertical	MVNI-Middle	M259-258	0.008208	0.008208					200000	228
Main Vertical	MVNI-Middle	M260-259	0.008208	0.008208					200000	228
Main Vertical	MVNI-Middle	M263-262	0.008208	0.008208					200000	228
Main Vertical	MVNI-Middle	M269-268	0.008208	0.008208					200000	228
Main Vertical	MVNI-Middle	M271-270	0.008208	0.008208					200000	228
Main Vertical	MVNI-Middle	M241-242	0.008208	0.008208					200000	228
Main Vertical	MVNI-Middle	M240-241	0.008208	0.008208					200000	228
Main Vertical	MVNI-Middle	M265-266	0.008208	0.008208					200000	228
Main Vertical	MVNI-Middle	M264-265	0.008208	0.008208					200000	228
Main Vertical	MVNI-East	M336-335	0.006732	0.006732					200000	228
Main Vertical	MVNI-East	M339-338	0.006732	0.006732					200000	228
Main Vertical	MVNI-East	M345-344	0.006732	0.006732					200000	228
Main Vertical	MVNI-East	M347-346	0.006732	0.006732					200000	228
Main Vertical	MVNI-East	M348-347	0.006732	0.006732					200000	228
Main Vertical	MVNI-East	M351-350	0.006732	0.006732					200000	228
Main Vertical	MVNI-East	M353-352	0.006732	0.006732					200000	228
Main Vertical	MVNI-East	M354-353	0.006732	0.006732					200000	228
Main Vertical	MVNI-East	M357-356	0.006732	0.006732					200000	228
Main Vertical	MVNI-East	M359-358	0.006732	0.006732					200000	228
Main Vertical	MVNI-East	M360-359	0.006732	0.006732					200000	228
Main Vertical	MVNI-East	M363-362	0.006732	0.006732					200000	228
Main Vertical	MVNI-East	M369-368	0.006732	0.006732					200000	228
Main Vertical	MVNI-East	M371-370	0.006732	0.006732					200000	228
Main Vertical	MVN2-East	M365-366	0.00713	0.00713					200000	228
Main Vertical	MVN2-East	M364-365	0.00713	0.00713					200000	228
Main Vertical	MVN2-East	M341-342	0.00713	0.00713					200000	228
Main Vertical	MVN2-East	M340-341	0.00713	0.00713					200000	228
Top Chord	TCNI-West	M134-135	0.037283	0.03728					200000	228
Top Chord	TCNI-West	M135-137	0.037283	0.03728					200000	228
Top Chord	TCNI-West	M137-140	0.037283	0.03728					200000	228
Top Chord	TCNI-West	M140-143	0.037283	0.03728					200000	228
Top Chord	TCNI-West	M143-146	0.037283	0.03728					200000	228
Top Chord	TCNI-West	M146-149	0.037283	0.03728					200000	228
Top Chord	TCNI-West	M149-152	0.03728	0.03728					200000	228
Top Chord	TCNI-West	M152-155	0.03728	0.03728					200000	228
Top Chord	TCNI-West	M155-158	0.03728	0.03728					200000	228
Top Chord	TCNI-West	M158-161	0.03728	0.03728					200000	228
Top Chord	TCNI-West	M161-164	0.03728	0.03728					200000	228
Top Chord	TCNI-West	M164-167	0.03728	0.03728					200000	228
Top Chord	TCNI-West	M167-170	0.03728	0.03728					200000	228
Top Chord	TCNI-West	M170-172	0.03728	0.03728					200000	228
Top Chord	TCNI-Middle	M234-235	0.0666	0.0666					200000	228

Note: See Appendix 13.4.2-3 for the identification of members.

¹ Distance to local horizontal neutral axis is measured from topmost fiber.

Appendix 13.4.2-2 (7/7)

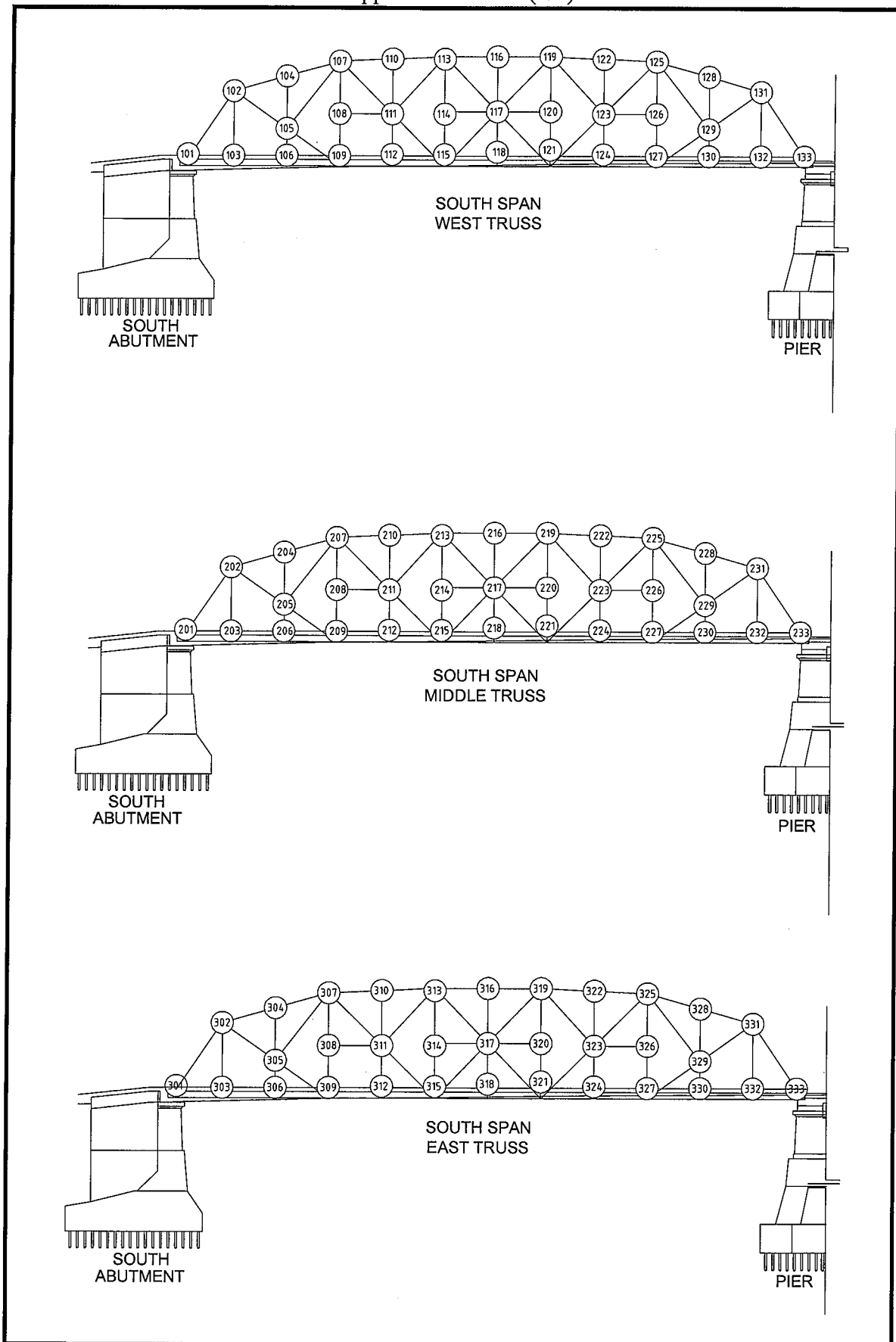
Summary of Data: South Span, West Truss, Bottom Chord Members

Member or Joint			Section Properties						Material Properties	
Description	Type	ID	$A_{gross,DL}$ (m ²)	$A_{gross,LL}$ (m ²)	I_{11} (m ⁴)	c_1^1 (m)	I_{22} (m ⁴)	c_2^1 (m)	E_s (MPa)	f_y (MPa)
Top Chord	TCN1-Middle	M235-237	0.0666	0.0666					200000	228
Top Chord	TCN1-Middle	M237-240	0.0666	0.0666					200000	228
Top Chord	TCN1-Middle	M240-243	0.0666	0.0666					200000	228
Top Chord	TCN1-Middle	M243-246	0.0666	0.0666					200000	228
Top Chord	TCN1-Middle	M246-249	0.0666	0.0666					200000	228
Top Chord	TCN1-Middle	M249-252	0.0666	0.0666					200000	228
Top Chord	TCN1-Middle	M252-255	0.0666	0.0666					200000	228
Top Chord	TCN1-Middle	M255-258	0.0666	0.0666					200000	228
Top Chord	TCN1-Middle	M258-261	0.0666	0.0666					200000	228
Top Chord	TCN1-Middle	M261-264	0.0666	0.0666					200000	228
Top Chord	TCN1-Middle	M264-267	0.0666	0.0666					200000	228
Top Chord	TCN1-Middle	M267-270	0.0666	0.0666					200000	228
Top Chord	TCN1-Middle	M270-272	0.0666	0.0666					200000	228
Top Chord	TCN1-Middle	M334-335	0.034876	0.034876					200000	228
Top Chord	TCN1-Middle	M335-337	0.034876	0.034876					200000	228
Top Chord	TCN1-Middle	M337-340	0.034876	0.034876					200000	228
Top Chord	TCN1-Middle	M340-343	0.034876	0.034876					200000	228
Top Chord	TCN1-Middle	M343-346	0.034876	0.034876					200000	228
Top Chord	TCN1-Middle	M346-349	0.034876	0.034876					200000	228
Top Chord	TCN1-Middle	M349-352	0.034876	0.034876					200000	228
Top Chord	TCN1-Middle	M352-355	0.034876	0.034876					200000	228
Top Chord	TCN1-Middle	M355-358	0.034876	0.034876					200000	228
Top Chord	TCN1-Middle	M358-361	0.034876	0.034876					200000	228
Top Chord	TCN1-Middle	M361-364	0.034876	0.034876					200000	228
Top Chord	TCN1-Middle	M364-367	0.034876	0.034876					200000	228
Top Chord	TCN1-Middle	M367-370	0.034876	0.034876					200000	228
Top Chord	TCN1-Middle	M370-372	0.034876	0.034876					200000	228

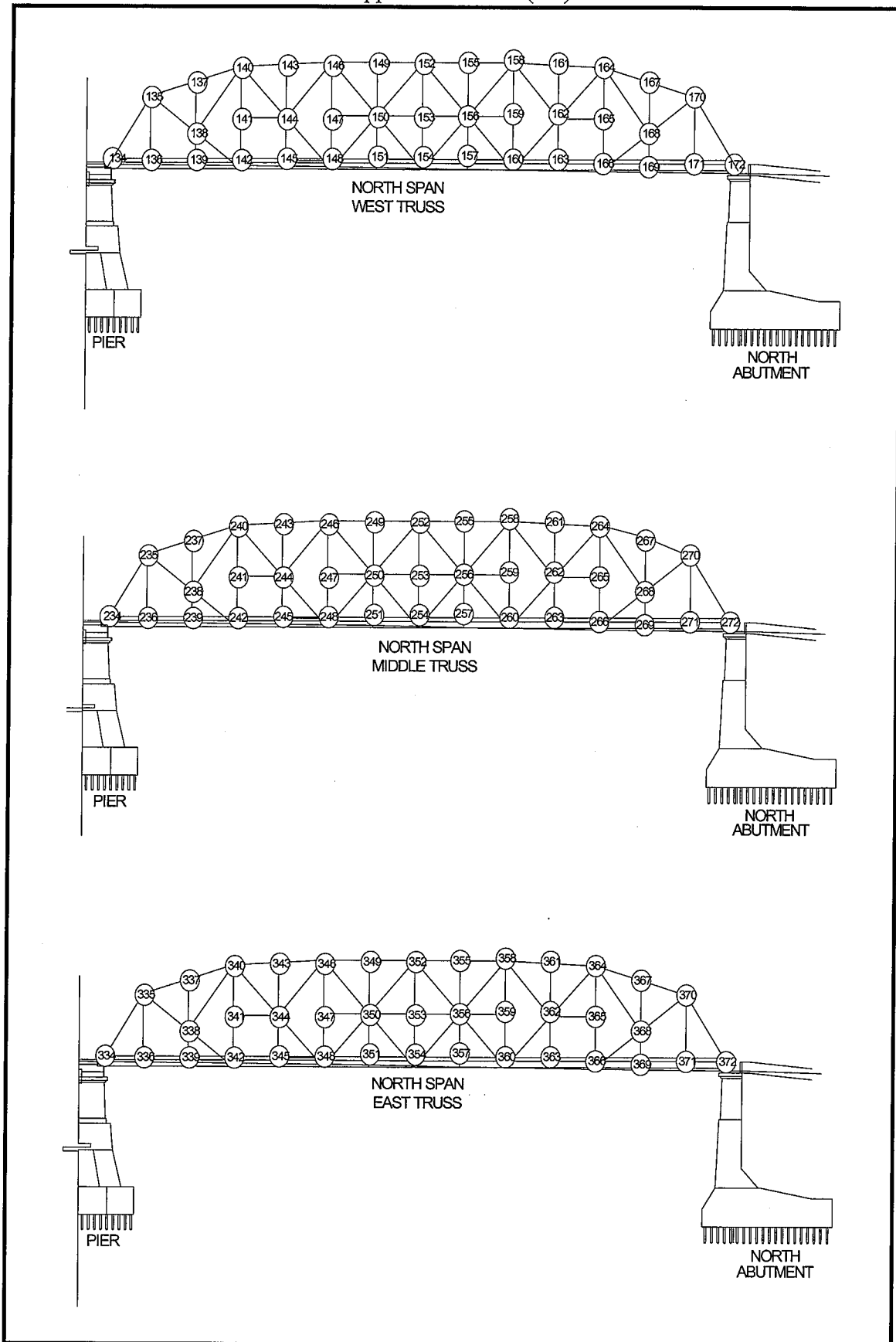
Note: See Appendix 13.4.2-3 for the identification of members.

¹ Distance to local horizontal neutral axis is measured from topmost fiber.

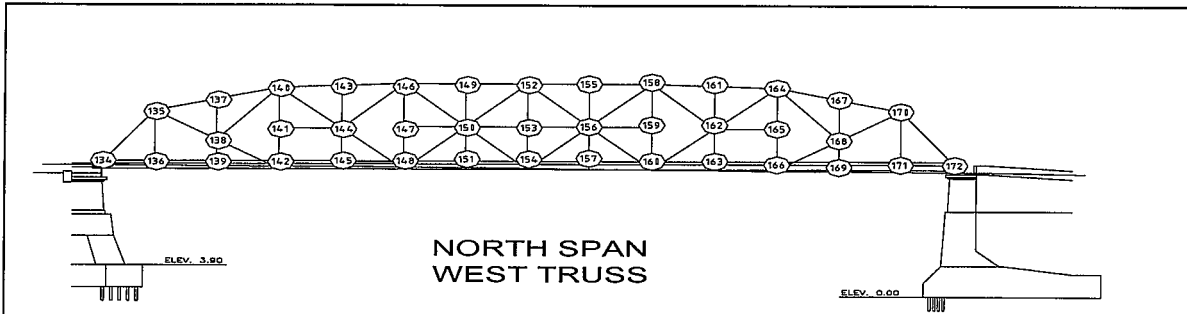
Appendix 13.4.2-3 (1/2)



Appendix 13.4.2-3 (2/2)



Appendix 13.4.3-1 (1/6)
Analysis Results for Superstructure (North Span West Truss)



North Span West Truss

Location	Member	Damage Type	Assessment of Field Inspection Results		Evaluation of In-Depth Survey				Evaluation of Survey Results	Remarks Section Loss (Percentage)
			Damage Rating	Category of Inspection Results	Inventory Rating		Operating Rating			
					Rating Factor	Equivalent Truck	Rating Factor	Equivalent Truck		
Bottom Chord	M134-136	-	OK	c	6.5	208	8.1	260		
	M136-139	-	OK	c	4.8	154	6.7	214		
	M139-142	CO	I	a	0.7	22	2.5	80		30%
	M142-145	CO	I	a	0.4	13	2.2	72		30%
	M145-148	CO	III	b	2.2	70	4.4	139		10%
	M148-151	-	OK	c	2.4	77	3.7	117		
	M151-154	CO	III	b	1.6	51	2.5	79		15%
	M154-157	CO	I	a	0.1	3	0.5	15		40%
	M157-160	CO	III	b	1.8	58	2.7	86		10%
	M160-163	-	OK	c	3.0	96	5.3	169		
	M163-166	CO	III	b	2.2	70	3.8	121		10%
	M166-169	-	OK	c	3.7	118	5.8	186		
	M169-171	CO	I	a	2.1	67	1.6	50		30%
M171-172	CO	I	a	2.1	67	2.1	66		50%	
Top Chord	M134-135	-	OK	c	2.5	80	5.2	165		
	M135-137	-	OK	c	2.3	74	4.5	144		
	M137-140	-	OK	c	2.3	74	4.5	144		
	M140-143	-	OK	c	1.3	42	2.9	94		
	M143-146	-	OK	c	1.3	42	2.9	94		
	M146-149	-	OK	c	1.2	38	2.7	85		
	M149-152	-	OK	c	1.2	38	2.7	85		
	M152-155	-	OK	c	1.2	38	2.7	85		
	M155-158	-	OK	c	1.2	38	2.7	85		
	M158-161	-	OK	c	1.3	42	2.9	94		
	M161-164	-	OK	c	1.3	42	2.9	93		
	M164-167	-	OK	c	2.2	70	4.5	143		
	M167-170	-	OK	c	2.2	70	4.4	141		
	M170-172	CO	III	b	1.3	42	5.1	162		20%
Main Vertical	M135-136	-	OK	c	2.2	70	3.4	109		
	M138-139	-	OK	c	8.2	262	12.3	394		
	M140-142	-	OK	c	3.3	106	5.6	179		
	M144-145	-	OK	c	8.2	262	12.3	394		
	M146-148	-	OK	c	7.3	234	10.8	364		
	M150-151	-	OK	c	8.1	259	12.2	390		
	M152-154	-	OK	c	12.7	406	17.7	566		
	M156-157	-	OK	c	8.1	259	12.2	390		
	M158-160	-	OK	c	7.2	230	10.6	339		
	M162-163	-	OK	c	8.2	262	12.3	394		
	M164-166	-	OK	c	3.4	109	5.6	179		
M168-169	-	OK	c	8.2	262	12.3	394			
M170-171	-	OK	c	2.2	70	3.4	109			
Main Diagonal	M135-142	-	OK	c	3.4	109	5.6	179		
	M140-148	-	OK	c	2.8	90	4.8	154		
	M146-154	-	OK	c	9.6	307	13.7	438		
	M154-158	-	OK	c	9.5	304	13.6	435		
	M160-164	-	OK	c	2.7	86	4.7	150		
M166-170	-	OK	c	3.3	106	5.6	179			

Where:

a = Carry out survey after emergency action and measure. Determine whether improvement work is required.

b = Carry out in-depth survey. Determine whether improvement work is required.

c = Survey and follow-up inspection is not required.

A = Prompt improvement work is required.

B = Prompt improvement work is not required.

1. Field inspection on joints refers only to gusset plates and rivets

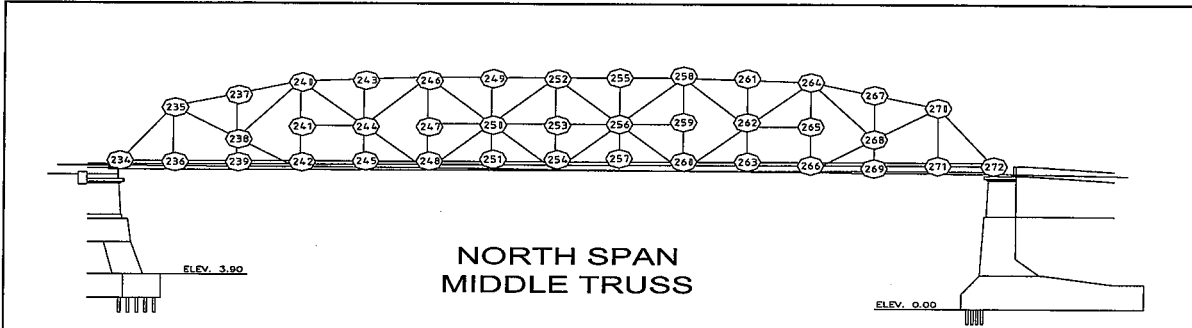
Inventory Rating Factor less than 1.0

Rating Factor, R.F. = (Cap-Deadload)/(Liveload + Impact) ----- Equivalent Truck Load MS-18 (32 tons)

Allowable Fiber Stresses for Inventory Rating = 125 Mpa, For Operating Rating = 170 Mpa

Appendix 13.4.3-1 (2/6)

Analysis Results for Superstructure (North Span Middle Truss)



North Span West Truss

Location	Member	Damage Type	Assessment of Field Inspection Results		Evaluation of In-Depth Survey				Evaluation of Survey Results	Remarks Section Loss (Percentage)
			Damage Rating	Category of Inspection Results	Inventory Rating		Operating Rating			
					Rating Factor	Equivalent Truck	Rating Factor	Equivalent Truck		
Bottom Chord	M234-236	CO	I	a	0.6	19	1.3	42		50%
	M236-239	CO	I	a	0.4	13	1.5	48		30%
	M239-242	CO	I	a	-0.6	0	0.5	16		30%
	M242-245	CO	I	a	-0.8	0	0.2	6		30%
	M245-248	CO	I	a	-0.7	0	0.4	13		30%
	M248-251	CO	I	a	-0.4	0	0.4	13		40%
	M251-254	CO	I	a	-0.6	0	0.1	3		40%
	M254-257	CO	I	a	-0.6	0	0.1	3		30%
	M257-260	CO	I	a	-0.4	0	0.4	13		30%
	M260-263	CO	I	a	-0.7	0	0.3	10		30%
	M263-266	CO	I	a	-0.9	0	0.1	3		10%
	M266-269	CO	I	a	0.2	6	1.6	51		10%
M269-271	CO	II	b	1.1	35	2.5	80		30%	
M271-272	CO	I	a	0.3	10	1.1	25			
Top Chord	M234-235	-	OK	c	3.0	96	5.4	173		
	M235-237	-	OK	c	2.7	86	4.9	157		
	M237-240	-	OK	c	2.6	83	4.9	157		
	M240-243	-	OK	c	1.5	48	3.4	109		
	M243-246	-	OK	c	1.5	48	3.4	108		
	M246-249	-	OK	c	1.2	38	3.0	96		
	M249-252	-	OK	c	1.2	38	3.0	96		
	M252-255	-	OK	c	1.2	38	3.0	95		
	M255-258	-	OK	c	1.2	38	3.0	95		
	M258-261	-	OK	c	1.5	48	3.4	109		
	M261-264	-	OK	c	1.5	48	3.4	109		
	M264-267	-	OK	c	2.7	86	4.9	157		
M267-270	-	OK	c	2.8	90	5.0	160			
M270-272	-	OK	c	3.1	99	5.5	176			
Main Vertical	M235-236	-	OK	c	1.0	32	1.9	61		
	M239-238	-	OK	c	4.4	141	7.4	237		
	M240-241	-	OK	c	0.6	19	2.0	64		
	M244-245	-	OK	c	4.5	144	7.5	240		
	M246-248	-	OK	c	2.3	74	4.0	128		
	M250-251	-	OK	c	4.2	134	7.2	230		
	M252-254	-	OK	c	23.2	742	32.2	1030		
	M256-257	-	OK	c	4.2	134	7.2	230		
	M258-260	-	OK	c	2.5	79	4.1	133		
	M262-263	-	OK	c	4.5	144	7.5	240		
	M264-266	-	OK	c	0.7	22	2.1	67		
	M268-269	-	OK	c	4.4	141	7.4	237		
M270-271	-	OK	c	1.0	32	1.9	61			
Main Diagonal	M235-242	-	OK	c	3.4	109	5.6	179		
	M240-248	-	OK	c	1.8	58	3.7	118		
	M246-254	-	OK	c	1.8	58	3.7	118		
	M254-258	-	OK	c	1.8	58	3.7	118		
	M260-264	-	OK	c	1.8	58	3.7	118		
M266-270	-	OK	c	3.3	106	5.6	179			

Where:

a = Carry out survey after emergency action and measure. Determine whether improvement work is required.

b = Carry out in-depth survey. Determine whether improvement work is required.

c = Survey and follow-up inspection is not required.

A = Prompt improvement work is required.

B = Prompt improvement work is not required.

1. Field inspection on joints refers only to gusset plates and rivets

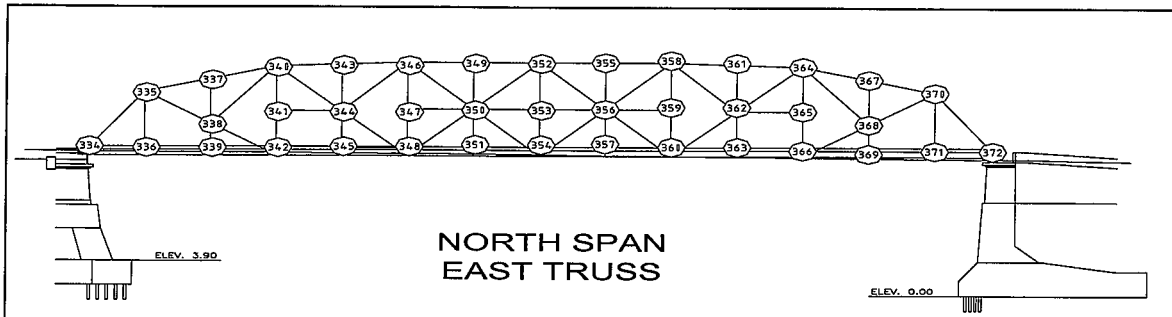
Inventory Rating Factor less than 1.0

Rating Factor, R.F. = (Cap-Deadload)/(Liveload + Impact) ----- Equivalent Truck Load MS-18 (32 tons)

Allowable Fiber Stresses for Inventory Rating = 125 Mpa. For Operating Rating = 170 Mpa

Appendix 13.4.3-1 (3/6)

Analysis Results for Superstructure (North Span East Truss)



North Span West Truss

Location	Member	Damage Type	Assessment of Field Inspection Results		Evaluation of In-Depth Survey				Evaluation of Survey Results	Remarks Section Loss (Percentage)
			Damage Rating	Category of Inspection Results	Inventory Rating		Operating Rating			
					Rating Factor	Equivalent Truck	Rating Factor	Equivalent Truck		
Bottom Chord	M334-336	-	OK	c	4.1	131	6.4	205		
	M336-339	-	OK	c	2.7	86	4.9	157		
	M339-342	CO	III	b	1.0	32	3.0	96		10%
	M342-345	CO	I	a	0.8	26	2.4	77		10%
	M345-348	-	OK	c	1.5	48	3.3	106		
	M348-351	-	OK	c	1.3	42	2.7	86		
	M351-354	CO	I	a	0.8	26	2.0	64		15%
	M354-357	-	OK	c	1.4	45	2.8	90		
	M357-360	CO	I	a	0.1	3	1.1	35		30%
	M360-363	CO	I	a	0.8	26	2.4	77		10%
	M363-366	-	OK	c	1.2	38	3.1	99		
	M366-369	CO	III	b	1.0	32	3.0	96		10%
	M369-371	-	OK	c	2.8	90	5.0	160		
M371-372	CO	I	a	0.1	3	1.1	35		30%	
Top Chord	M334-335	-	OK	c	1.8	58	3.6	115		
	M335-337	-	OK	c	1.5	48	3.3	106		
	M337-340	-	OK	c	1.5	48	3.3	106		
	M340-343	-	OK	c	0.7	22	2.2	70		
	M343-346	-	OK	c	0.7	22	2.2	70		
	M346-349	-	OK	c	0.6	19	1.9	61		
	M349-352	-	OK	c	0.5	16	1.9	61		
	M352-355	-	OK	c	0.5	16	1.9	61		
	M355-358	-	OK	c	0.5	16	1.9	61		
	M358-361	-	OK	c	0.7	22	2.2	70		
	M361-364	-	OK	c	0.7	22	2.2	70		
	M364-367	-	OK	c	1.5	48	3.2	102		
	M367-370	-	OK	c	1.5	48	3.2	102		
M370-372	-	OK	c	1.7	54	3.5	112			
Main Vertical	M335-336	-	OK	c	1.7	54	2.8	90		
	M338-339	-	OK	c	6.7	214	10.5	336		
	M340-341	-	OK	c	0.5	16	1.9	61		
	M344-345	-	OK	c	6.7	214	10.5	336		
	M346-348	-	OK	c	2.3	74	4.0	128		
	M350-351	-	OK	c	6.5	208	10.3	330		
	M352-354	-	OK	c	23.3	742	32.2	1030		
	M356-357	-	OK	c	6.5	208	10.3	330		
	M358-360	-	OK	c	2.4	77	4.1	131		
	M362-363	-	OK	c	6.7	214	10.5	336		
	M364-366	-	OK	c	0.7	22	2.1	67		
	M368-369	-	OK	c	6.7	214	10.5	336		
	M370-371	-	OK	c	1.7	54	2.8	90		
Main Diagonal	M335-342	-	OK	c	3.3	106	5.6	179		
	M340-348	-	OK	c	1.4	45	3.1	99		
	M346-354	-	OK	c	1.4	45	3.1	99		
	M354-358	-	OK	c	1.4	45	3.1	99		
	M360-364	-	OK	c	1.4	45	3.1	99		
M366-370	-	OK	c	3.3	106	5.5	176			

Where:

- a = Carry out survey after emergency action and measure. Determine whether improvement work is required.
- b = Carry out in-depth survey. Determine whether improvement work is required.
- c = Survey and follow-up inspection is not required.
- A = Prompt improvement work is required.
- B = Prompt improvement work is not required.

1. Field inspection on joints refers only to gusset plates and rivets

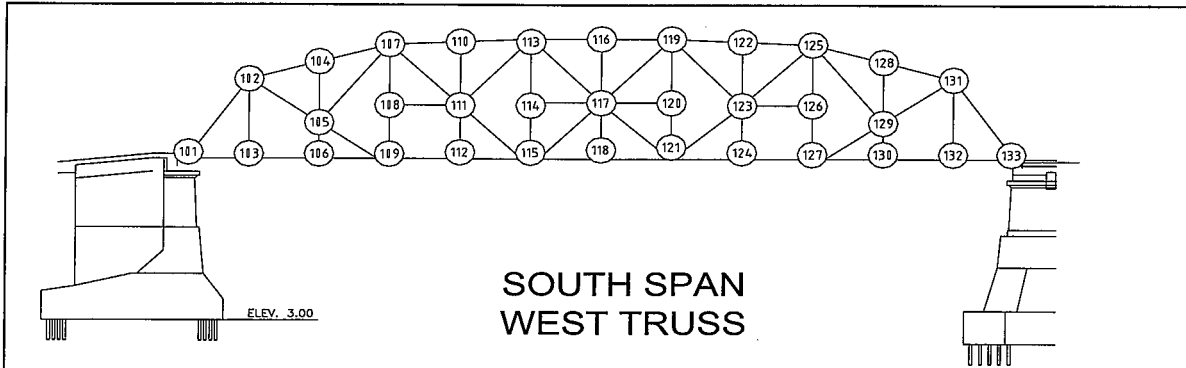
Inventory Rating Factor less than 1.0

Rating Factor, R.F = (Cap-Deadload)/(Liveload + Impact) ----- Equivalent Truck Load MS-18 (32 tons)

Allowable Fiber Stresses for Inventory Rating = 125 Mpa, For Operating Rating = 170 Mpa

Appendix 13.4.3-1 (4/6)

Analysis Results for Superstructure (South Span West Truss)



**SOUTH SPAN
WEST TRUSS**

South Span West Truss

Location	Member	Damage Type	Assessment of Field Inspection Results		Evaluation of In-Depth Survey				Evaluation of Survey Results	Remarks Section Loss (Percentage)
			Damage Rating	Category of Inspection Results	Inventory Rating		Operating Rating			
					Rating Factor	Equivalent Truck	Rating Factor	Equivalent Truck		
Bottom Chord	M101-103	CO	I	a	2.0	64	3.7	118		50%
	M103-106	CO	I	a	2.7	86	5.1	163		30%
	M106-109	CO	I	a	1.7	54	4.2	134		30%
	M109-112	CO	I	a	0.7	22	2.6	83		30%
	M112-115	CO	I	a	0.9	29	2.8	90		15%
	M115-118	CO	III	b	1.9	61	3.7	118		10%
	M118-121	CO	I	a	0.3	10	1.6	51		30%
	M121-124	CO	I	a	1.0	32	2.8	90		30%
	M124-127	CO	I	a	0.7	22	2.6	83		30%
	M127-130	CO	I	a	2.0	64	4.7	150		30%
M130-M132	CO	II	b	3.0	96	5.6	179		20%	
M132-133	CO	III	b	5.3	170	8.3	266			
Top Chord	M101-102	CO	III	b	2.2	70	4.1	131		
	M102-104	-	OK	c	3.3	106	5.5	176		
	M104-107	-	OK	c	3.3	106	5.6	179		
	M107-110	-	OK	c	2.4	77	4.4	141		
	M110-113	-	OK	c	2.4	77	4.4	141		
	M113-116	-	OK	c	2.5	80	4.5	144		
	M116-119	-	OK	c	2.5	80	4.5	144		
	M119-122	-	OK	c	2.5	80	4.4	141		
	M122-125	-	OK	c	2.5	80	4.4	141		
	M125-128	-	OK	c	3.3	106	5.6	179		
M128-131	-	OK	c	3.3	106	5.6	179			
M131-133	-	OK	c	3.5	112	5.9	189			
Main Vertical	M102-103	-	OK	c	2.1	67	3.3	106		
	M105-106	-	OK	c	8.2	262	12.3	394		
	M107-109	-	OK	c	5.2	166	8.0	262		
	M111-112	-	OK	c	8.2	262	12.3	394		
	M113-115	-	OK	c	18.7	598	26.2	838		
	M117-118	-	OK	c	2.4	77	3.6	115		
	M119-121	-	OK	c	18.8	602	26.3	842		
	M123-124	-	OK	c	8.2	262	12.3	394		
	M125-127	-	OK	c	5.3	170	8.1	259		
	M129-130	-	OK	c	8.2	262	12.3	394		
M131-132	-	OK	c	2.1	67	3.3	106			
Main Diagonal	M102-109	-	OK	c	3.4	109	5.6	179		
	M107-115	-	OK	c	2.6	83	4.5	144		
	M121-125	-	OK	c	3.4	83	4.5	144		
	M127-131	-	OK	c	2.1	109	5.7	182		

Where:

a = Carry out survey after emergency action and measure. Determine whether improvement work is required.

b = Carry out in-depth survey. Determine whether improvement work is required.

c = Survey and follow-up inspection is not required.

A = Prompt improvement work is required.

B = Prompt improvement work is not required.

1. Field inspection on joints refers only to gusset plates and rivets

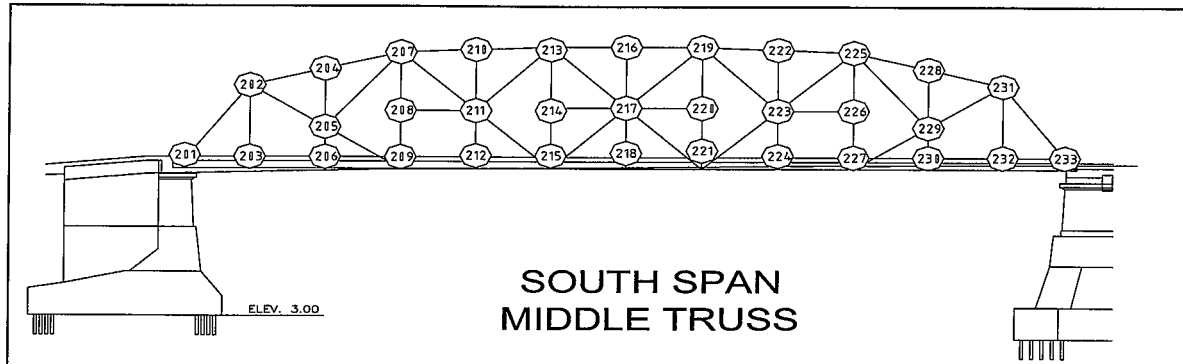
Inventory Rating Factor less than 1.0

Rating Factor, R.F = (Cap-Deadload)/(Liveload + Impact) ----- Equivalent Truck Load MS-18 (32 tons)

Allowable Fiber Stresses for Inventory Rating = 125 Mpa, For Operating Rating = 170 Mpa

Appendix 13.4.3-1 (5/6)

Analysis Results for Superstructure (South Span Middle Truss)



SOUTH SPAN MIDDLE TRUSS

South Span Middle Truss

Location	Member	Damage Type	Assessment of Field Inspection Results		Evaluation of In-Depth Survey				Evaluation of Survey Results	Remarks Section Loss (Percentage)
			Damage Rating	Category of Inspection Results	Inventory Rating		Operating Rating			
					Rating Factor	Equivalent Truck	Rating Factor	Equivalent Truck		
Bottom Chord	M201-203	CO	I	a	1.3	42	2.9	93		50%
	M203-206	CO	II	b	1.8	58	4.0	128		30%
	M206-209	CO	I	a	0.9	29	3.1	99		30%
	M209-212	CO	I	a	-0.1	0	1.6	51		30%
	M212-215	CO	I	a	0.2	6	1.9	61		30%
	M215-218	CO	I	a	-0.2	0	0.9	29		40%
	M218-221	CO	I	a	-0.1	0	1.0	32		40%
	M221-224	CO	I	a	0.2	6	1.9	61		30%
	M224-227	CO	I	a	0.0	0	1.6	51		30%
	M227-230	CO	II	b	1.0	32	3.3	106		30%
M230-232	CO	II	b	2.0	64	4.2	134		30%	
M232-233	CO	I	a	1.5	48	3.1	99		50%	
Top Chord	M201-202	-	OK	c	3.4	109	5.9	189		
	M202-204	-	OK	c	3.2	102	5.5	176		
	M204-207	-	OK	c	3.2	102	5.5	176		
	M207-210	-	OK	c	2.3	74	4.3	138		
	M210-213	-	OK	c	2.3	74	4.3	138		
	M213-216	-	OK	c	2.4	77	4.4	141		
	M216-219	-	OK	c	2.4	77	4.4	141		
	M219-222	-	OK	c	2.3	74	4.3	138		
	M222-225	-	OK	c	2.3	74	4.3	138		
	M225-228	-	OK	c	3.1	99	5.5	176		
M228-231	-	OK	c	3.1	99	5.5	176			
M231-233	-	OK	c	3.3	106	5.8	186			
Main Vertical	M202-203	-	OK	c	1.2	38	2.2	70		
	M205-206	-	OK	c	5.5	176	8.9	285		
	M207-209	-	OK	c	3.9	125	6.3	202		
	M211-212	-	OK	c	5.5	176	9.0	288		
	M213-215	-	OK	c	16.3	522	22.7	726		
	M217-218	-	OK	c	1.5	48	2.5	80		
	M219-221	-	OK	c	16.1	515	22.6	723		
	M223-224	-	OK	c	5.5	176	9.0	288		
	M225-227	-	OK	c	3.8	122	6.2	198		
	M229-230	-	OK	c	5.5	176	8.9	285		
M231-232	DE	IV	c	1.2	38	2.1	67			
Main Diagonal	M202-209	-	OK	c	1.7	54	3.4	109		
	M207-215	-	OK	c	3.0	96	5.1	163		
	M221-225	-	OK	c	3.0	96	5.1	163		
	M227-231	-	OK	c	1.6	51	3.3	106		

Where:

- a = Carry out survey after emergency action and measure. Determine whether improvement work is required.
- b = Carry out in-depth survey. Determine whether improvement work is required.
- c = Survey and follow-up inspection is not required.
- A = Prompt improvement work is required.
- B = Prompt improvement work is not required.

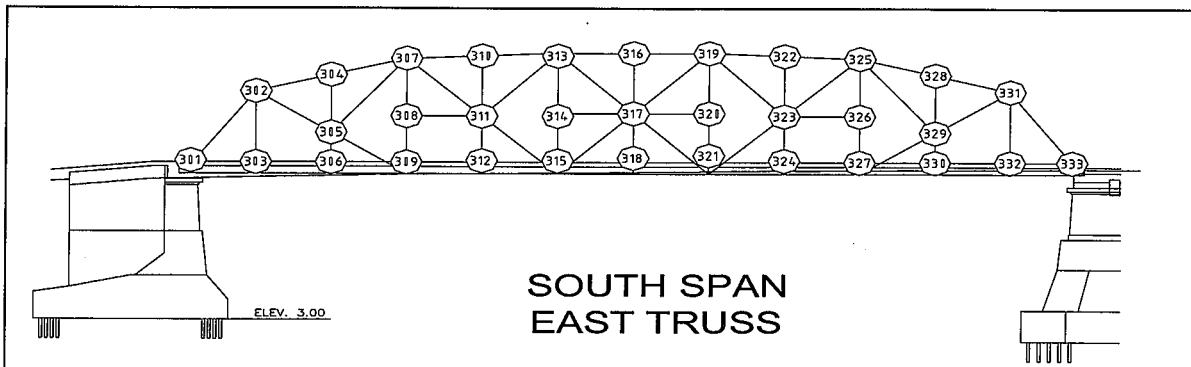
1. Field inspection on joints refers only to gusset plates and rivets

Rating Factor, R.F = (Cap-Deadload)/(Liveload + Impact) ----- Equivalent Truck Load MS-18 (32 tons)

Allowable Fiber Stresses for Inventory Rating = 125 Mpa, For Operating Rating = 170 Mpa

Appendix 13.4.3-1 (6/6)

Analysis Results for Superstructure (South Span East Truss)



South Span East Truss

Location	Member	Damage Type	Assessment of Field Inspection Results		Evaluation of In-Depth Survey				Evaluation of Survey Results	Remarks Section Loss (Percentage)
			Damage Rating	Category of Inspection Results	Inventory Rating		Operating Rating			
					Rating Factor	Equivalent Truck	Rating Factor	Equivalent Truck		
Bottom Chord	M301-303	CO	I	a	2.0	64	3.9	125		50%
	M303-306	CR	II	b	2.4	77	5.0	160		30%
	M306-309	DE	III	b	3.5	112	6.9	221		10%
	M309-312	CO	I	a	0.2	6	2.1	67		30%
	M312-315	CR	I	a	0.5	16	2.4	77		30%
	M315-318	CO	I	a	0.0	0	1.2	38		40%
	M318-321	CR	I	a	0.0	0	1.3	42		40%
	M321-324	CO	I	a	0.4	13	2.3	74		30%
	M324-327	DE	I	a	0.3	10	2.1	67		30%
	M327-330	CO	III	b	3.1	99	6.2	198		10%
M330-332	CO	III	b	4.2	134	7.3	234		10%	
M332-333	CO	I	a	1.8	58	3.5	112		50%	
Top Chord	M301-302	CO	III	b	1.9	61	3.8	122		20%
	M302-304	-	OK	c	3.1	99	5.3	170		
	M304-307	-	OK	c	3.1	99	5.4	173		
	M307-310	-	OK	c	2.3	74	4.2	134		
	M310-313	-	OK	c	2.3	74	4.2	134		
	M313-316	-	OK	c	2.3	74	4.3	138		
	M316-319	-	OK	c	2.3	74	4.3	138		
	M319-322	-	OK	c	2.3	74	4.2	134		
	M322-325	-	OK	c	2.3	74	4.2	134		
	M325-328	-	OK	c	3.1	99	5.4	173		
M328-331	-	OK	c	3.1	99	5.4	173			
M331-333	-	OK	c	3.3	106	5.7	182			
Main Vertical	M302-303	-	OK	c	1.4	45	2.3	74		
	M305-306	-	OK	c	6.0	192	9.5	304		
	M307-309	-	OK	c	3.7	118	6.1	195		
	M311-312	-	OK	c	6.1	195	9.5	304		
	M313-315	-	OK	c	15.6	499	22.0	704		
	M317-318	-	OK	c	1.7	54	2.7	86		
	M319-321	-	OK	c	15.7	502	22.1	707		
	M323-324	-		c	6.1	195	9.5	304		
	M325-327	-	OK	c	3.8	122	6.2	198		
M329-330	-	OK	c	6.0	192	9.5	304			
M331-332	-	OK	c	1.4	45	2.4	77			
Main Diagonals	M302-309	-	OK	c	1.6	51	3.3	106		
	M307-315	-	OK	c	2.0	64	3.7	118		
	M321-325	-	OK	c	2.0	64	3.7	118		
	M327-331	-	OK	c	1.6	51	3.3	106		

Where:

a = Carry out survey after emergency action and measure. Determine whether improvement work is required.

b = Carry out in-depth survey. Determine whether improvement work is required.

c = Survey and follow-up inspection is not required.

A = Prompt improvement work is required.

B = Prompt improvement work is not required.

1. Field inspection on joints refers only to gusset plates and rivets

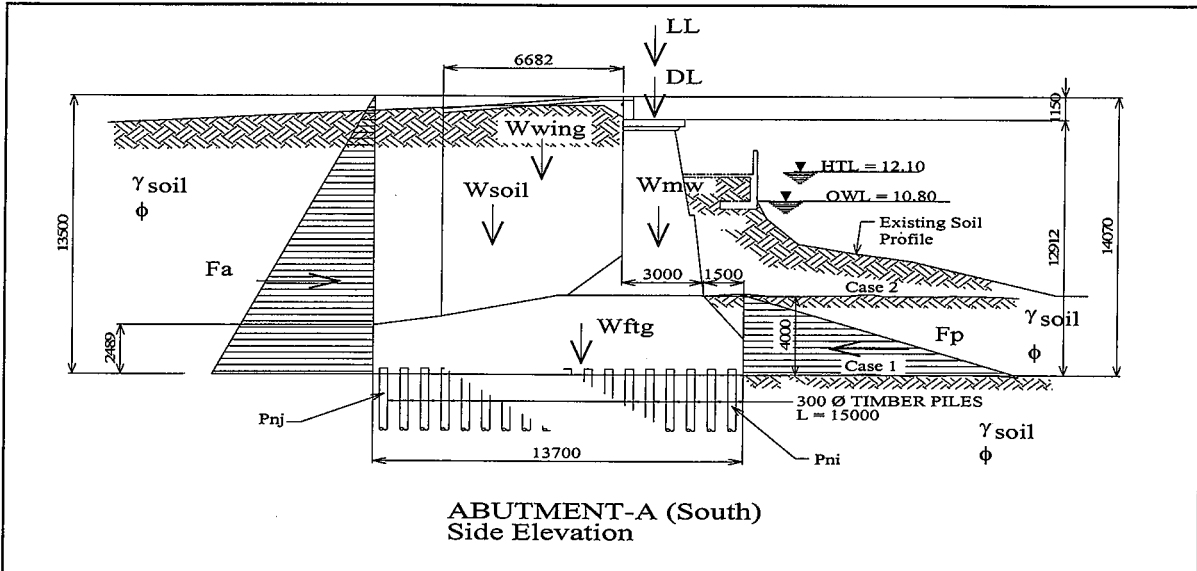
Inventory Rating Factor less than 1.0

Rating Factor, R.F = (Cap-Deadload)/(Liveload + Impact) ----- Equivalent Truck Load MS-18 (32 tons)

Allowable Fiber Stresses for Inventory Rating = 125 Mpa, For Operating Rating = 170 Mpa

Appendix 13.6.1-1 (1/6)

Capacity / Demand Ratio for ABUTMENT - A (Using the Old Code)

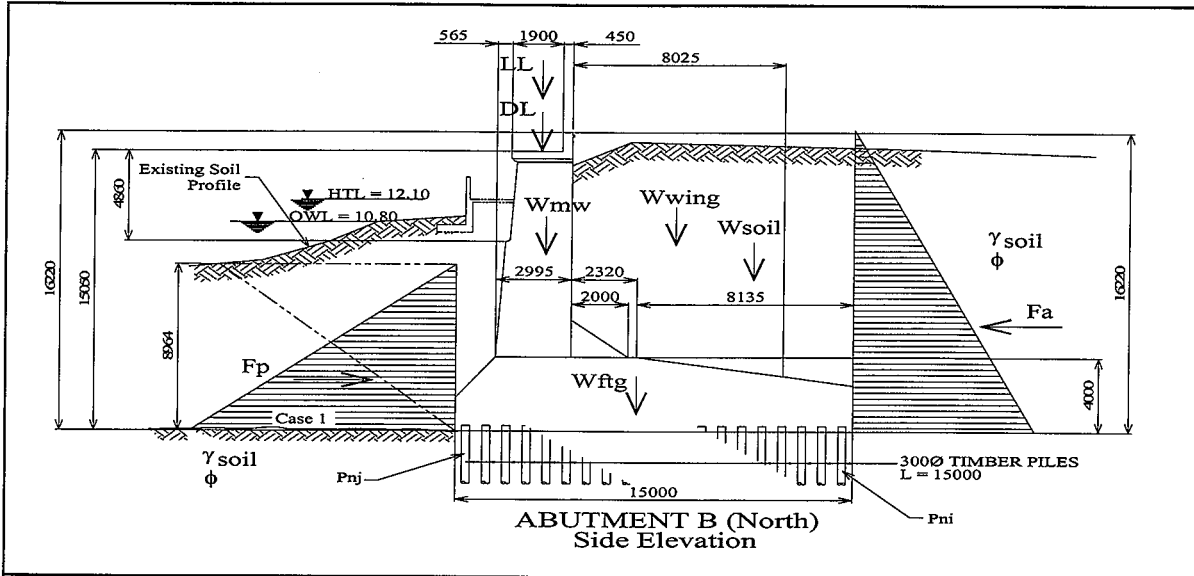


ABUTMENT-A (South)
Side Elevation

Part	DL (Ton)	EQ (Ton)	Pile Capacity		Comb1&2	Comb3	Load Combinations:				
Superstructure	776	46.50	Pni, Pnj	Pure Tension (Ton)	9.7	19.5	Comb1=DL+LL+EP+BF OWL				
Main Wall	1011	60.7		Pure Comp. (Ton)	21	31	Comb2=DL+LL+EP+BF HTL				
Footing	3158	190		Pure Bend. (Ton M)	3.5	4.7	Comb3=DL+EQ+EP+BF OWL				
Wing Wall	102	6.0		Shear (Ton)	7.9	10.6	Case 1: Soil @ Downstream Level with Bottom of Footing				
Soil	4015	341					Case 2: Soil @ Downstream Level with Actual Soil Profile				
Soil Values											
g soil	1.94	Ton/m3									
f	30	Deg									
Earth Pressure: by Rankine			Critical Pile Demand								
Fa	Comb1&2	1370	Ton	Case	1			2			
	Comb3	1361	Ton	Load Comb.	Comb1	Comb2	Comb3	Comb1	Comb2	Comb3	
Fp (Case1)	Comb1&2	0	Ton	Pni	Tension	-	-	-	-	-	
	Comb3	0	Ton		Comp	19.3	18.6	22.7	19.5	18.7	24.0
Fp (Case2)	Comb1&2	1842	Ton	Pnj	Bend	1.25	1.25	2.00	2.27	2.27	1.58
	Comb3	1530	Ton		Max Comb s Ratio	0.59	0.58	0.63	0.88	0.87	0.55
Bouyant Force				Pnj	Shear	2.06	2.06	2.86	0.82	0.82	0.65
OWL	3533	Ton	Tension		-	0.4	4.9	-	-	-	3.5
HTL	4021	Ton	Comp	-	-	-	-	-	-	-	
DL = Total Dead Load				Pni	Bend	1.25	1.25	2.00	2.27	2.27	1.52
LL = Live Load					Max Comb s Ratio	0.36	0.36	0.47	0.65	0.65	0.37
EQ = Total Seismic Load				Pnj	Shear	2.06	2.06	2.86	0.82	0.82	0.65
EP = Total Earth Pressure					Comp	1.09	1.13	1.37	1.08	1.12	1.29
Fp = Passive Soil Force				Pni	Stress	1.69	1.72	1.59	1.44	1.15	1.82
g soil = unit weight of soil					Shear	3.83	3.83	3.71	9.63	9.63	16.31
f = soil angle of friction				Pnj	Tension	-	24.25	3.98	-	-	5.57
OWL = Ordinary Water Level					Stress	2.78	2.78	2.13	1.54	1.54	2.70
HTL = High Tide Level				Shear	2.06	2.06	2.86	9.63	9.63	16.31	
Other Components				Number of Piles			666	576			
Mainwall				Capacity	Demand		Unit	C/D Ratio			
- Shear				0.36	0.11		MPa	2.40			
- Flexure				3651	3651		mm ²	1.00			
Wingwall											
- Shear				0.36	0.22		MPa	1.64			
- Flexure				4047	4047		mm ²	1.00			
Footing											
- Shear				0.36	0.14		MPa	2.57			
- Flexure				8224	8224		mm ²	1.00			

Appendix 13.6.1-1 (2/6)

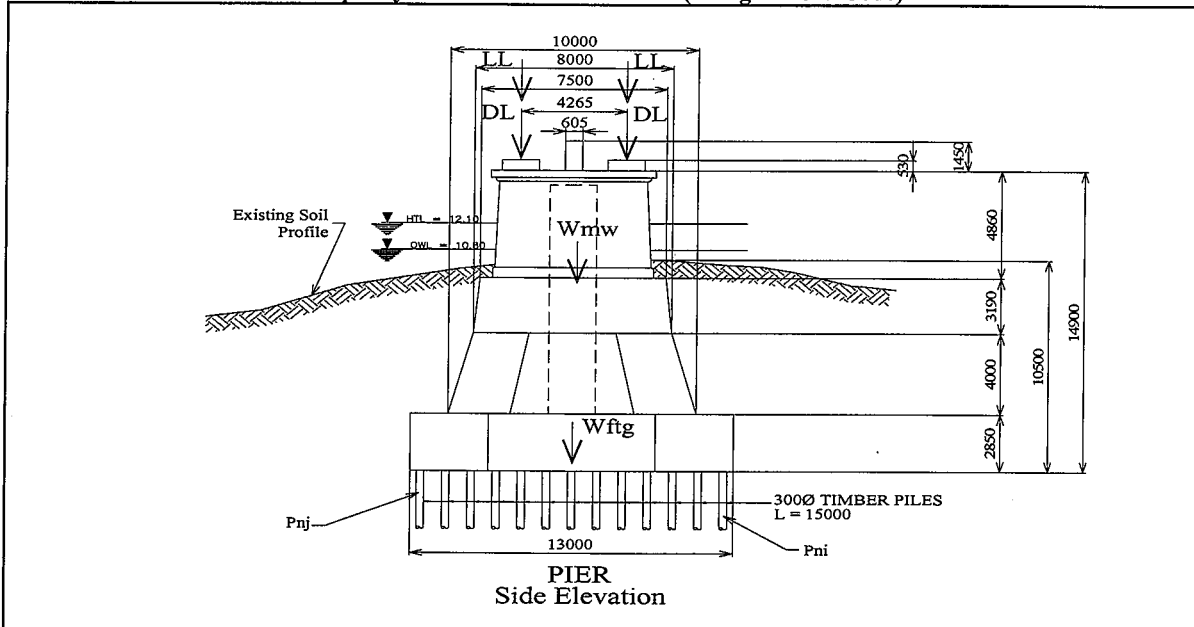
Capacity / Demand Ratio for ABUTMENT - B (Using the Old Code)



Part	DL (Ton)	EQ (Ton)	File Capacity			Load Combinations:				
Superstructure	963	58	Pni, Pnj	Pure Tension (Ton)	12.8	25.6	Comb1=DL+LL+EP+BF OWL			
Main Wall	1069	64		Pure Comp. (Ton)	24	31	Comb2=DL+LL+EP+BF HTL			
Footing	3425	206		Pure Bend. (Ton M)	3.5	4.6	Comb3=DL+EQ+EP+BF OWL			
Wing Wall	148	9		Shear (Ton)	7.9	10.6	Case 1: Soil @ Downstream			
Soil	5650	339					Level with Bottom of Footing			
Soil Values										
g soil	1.94	Ton/m ³								
f	30	Deg								
Earth Pressure: by Rankine			Critical Pile Demand							
Fa	Comb1&2	1802	Ton	Case 1			Case 2			
	Comb3	1808	Ton	Comb1	Comb2	Comb3	Comb1	Comb2	Comb3	
Fp (Case1)	Comb1&2	0	Ton	Pni Tension	-	-	-	-	-	
	Comb3	0	Ton	Pni Comp	24	23.2	28.2	22.5	21.8	27.4
Fp (Case2)	Comb1&2	1842	Ton	Pni Bend	1.37	1.37	2.1	0.14	0.15	3.48
	Comb3	1530	Ton	Pni Max Comb s Ratio	0.68	0.67	0.71	0.30	0.30	1.00
Bouyant Force										
OWL	4697	Ton	Pnj Tension	1.00	1.80	7.6	-	-	4.3	
HTL	5232	Ton	Pnj Comp	-	-	-	-	-	-	
DL = Total Dead Load										
LL = Live Load										
EQ = Total Seismic Load										
EP = Total Earth Pressure										
Fp = Passive Soil Force										
g soil = unit weight of soil										
f = soil angle of friction										
OWL = Ordinary Water Level										
HTL = High Tide Level										
Critical Pile C/D Ratio										
Pni	Comp	1.00	1.03	1.10	1.07	1.10	1.13			
	Stress	1.47	1.49	1.41	3.33	3.33	1.00			
	Shear	3.00	3.00	2.92	-	19.47	7.36			
Pnj	Tension	12.80	7.11	3.37	-	-	5.95			
	Stress	2.44	2.38	1.92	25	25	1.25			
	Shear	3.00	3.00	2.92	-	19.47	7.36			
Number of Piles			684			665				
Other Components			Capacity	Demand	Unit	C/D Ratio				
Mainwall										
- Shear			0.36	0.15	MPa	2.40				
- Flexure			6024	6024	mm ²	1.00				
Wingwall										
- Shear			0.36	0.32	MPa	1.13				
- Flexure			7015	7015	mm ²	1.00				
Footing										
- Shear			0.36	0.20	MPa	1.80				
- Flexure			13759	13795	mm ²	1.00				

Appendix 13.6.1-1 (3/6)

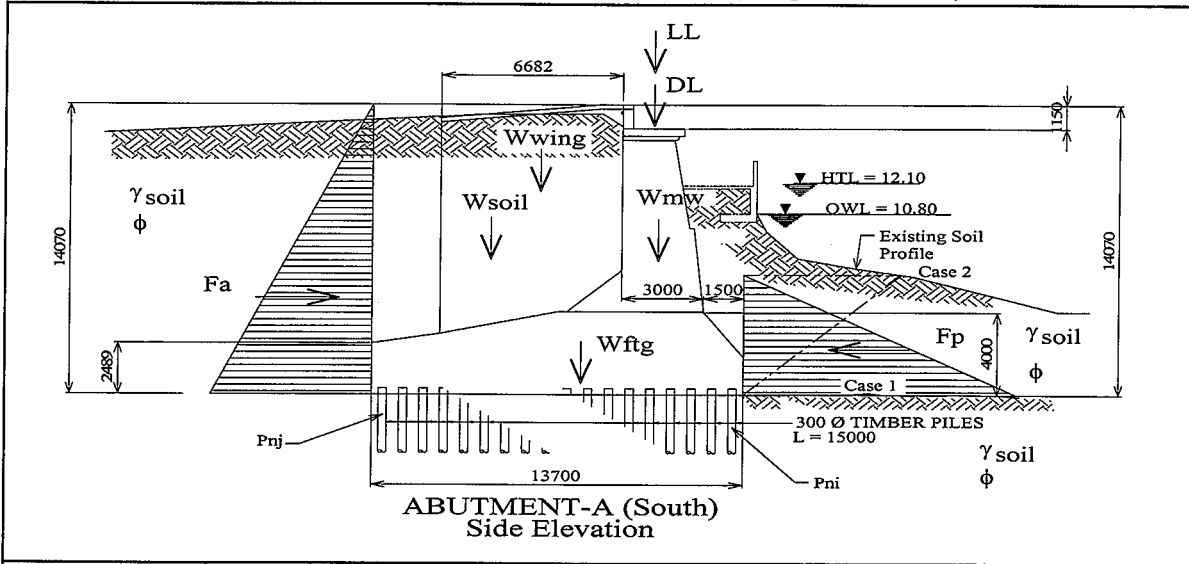
Capacity / Demand Ratio for PIER (Using the Old Code)



Part	DL (Ton)	SL (Ton)	Pile Capacity				Comb 1&2	Comb 3				
South Superstruct.	776	47	Pni, Pnj	Pure Tension (Ton)			10	19.9				
North Superstruct.	963	58		Pure Compression (Ton)			21	31				
Column	5359	322		Pure Bending (Ton M)			3.5	4.7				
Footing	3025	182		Shear (Ton)			7.9	10.6				
Lane Load + Sidewalk Liveload	425 Ton			Pile Demand								
Soil Values			Longitudinal			Transverse						
g soil	1.94	Ton/m ³	Load Comb.	Comb1	Comb2	Comb3	Comb1	Comb2	Comb3			
f	30	Deg	Pni Tension	-	-	-	-	-	-			
Bouyant Force			Pni Comp	18.53	17.73	24.09	18.5	17.70	20.30			
OWL	2710	Ton	Pni Bend	-	-	0.7	-	-	0.70			
HTL	3047	Ton	Max Comb S Ratio	0.22	0.21	0.36	0.22	0.21	0.34			
Load Combinations: Comb1=DL+LL+BF OWL Comb2=DL+LL+BF HTL Comb3=DL+EQL+BF OWL Legend: DL = Total Dead Load LL = Live Load EQL = Total Longitudinal Earthquake Load EQT = Total Transverse Earthquake Load g soil = unit weight of soil f = soil angle of friction OWL = Ordinary Water Level HTL = High Tide Level			Pnj Tension	-	-	-	-	-	-			
			Pnj Comp	-	-	-	-	-	-			
			Pnj Bend	-	-	0.7	-	-	0.70			
			Max Comb S Ratio	-	-	0.14	-	-	0.14			
			Pnj Shear	-	-	1.44	-	-	1.44			
			Pile C/D Ratio			Pni Comp	1.13	1.18	1.29	1.14	1.19	1.53
						Pni Stress	4.55	4.76	2.78	4.55	4.76	2.94
						Pni Shear	-	-	7.36	-	-	7.36
						Pnj Tension	-	-	-	-	-	-
						Pnj Stress	-	-	7.14	-	-	7.14
			Pnj Shear	-	-	7.36	-	-	7.36			
			Number of Piles	423								
Other Components			Longitudinal		Transverse		Unit	C/D Ratio		Remarks		
Column			Capacity	Demand	Capacity	Demand		Longitudinal	Transverse			
- Shear			0.41	0.02	0.41	0.02	MPa	20.50	20.50			
- Flexure			1898219	30064	6025626	32492	kN-m	53.42	185.45			
- Confinement			303912	164896	303912	238,788	mm ²	1.27	1.27			

Appendix 13.6.1-1 (4/6)

Capacity / Demand Ratio for ABUTMENT-A (Using the New Code)

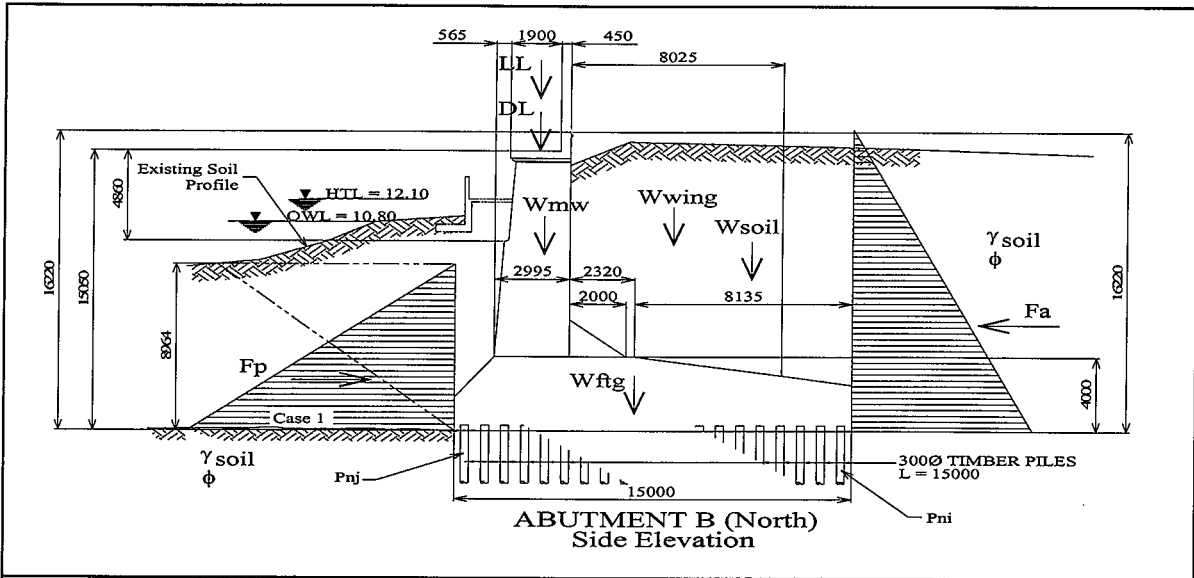


Part	DL (Ton)	EQ (Ton)	Pile Capacity	Comb1&2	Comb3	Load Combinations:					
Superstructure	776	155	Pni, Pnj	Pure Tension (Ton)	9.80	19.50	Comb1=DL+LL+EP+BF OWL				
Main Wall	1011	202		Pure Comp. (Ton)	21	31	Comb2=DL+LL+EP+BF HTL				
Footing	3158	632		Pure Bend. (Ton M)	3.5	4.7	Comb3=DL+EQ+EP+BF OWL				
Wing Wall	102	20.4		Shear (Ton)	7.9	10.6	Case 1: Soil @ Downstream				
Soil	4866	974					Level with Bottom of Footing				
Soil Values						Case 2: Soil @ Downstream					
g soil	1.94	Ton/m3				Level with Actual Soil Profile					
f	30	Deg									
Earth Pressure: by Mononobe-Okabe Eq.			Critical Pile Demand								
Fa	Comb1&2	1640	Ton	Case 1			Case 2				
	Comb3	2614	Ton	Comb1	Comb2	Comb3	Comb1	Comb2	Comb3		
Fp (Case1)	Comb1&2	0	Ton	Pni Tension	-	-	-	-	-		
	Comb3	0	Ton	Pni Comp	25.4	24.7	42.8	25.6	24.9	38.8	
Fp (Case2)	Comb1&2	232	Ton	Pni Bend	1.34	1.34	4.3	1.20	1.2	2.9	
	Comb3	1588	Ton	Pni Max Comb s Ratio	0.68	0.68	1.30	0.63	0.62	0.96	
Bouyant Force				Pni Shear	2.85	2.85	7.95	2.44	2.44	5.23	
OWL	3083	Ton		Pnj Tension	-	-	17.20	-	-	12.30	
HTL	3487	Ton		Pnj Comp	-	-	-	-	-	-	
DL = Total Dead Load				Pnj Bend	1.34	1.34	4.3	1.2	1.2	2.9	
LL = Live Load				Pnj Max Comb s Ratio	0.39	0.39	1.44	0.32	0.32	0.99	
EQ = Total Seismic Load				Pnj Shear	2.85	2.85	7.95	2.44	2.44	5.23	
EP = Total Earth Pressure				Critical Pile C/D Ratio							
Fp = Passive Soil Force				Pni	Comp	0.83	0.85	0.72	0.82	0.84	0.80
g soil = unit weight of soil					Stress	1.47	1.47	0.77	1.59	1.61	1.04
f = soil angle of friction					Shear	2.77	2.77	1.33	3.24	3.24	2.03
OWL = Ordinary Water Level				Pnj	Tension	-	-	1.13	-	-	1.47
HTL = High Tide Level					Stress	2.56	2.56	0.69	3.13	3.13	1.01
					Shear	2.77	2.77	1.33	3.24	3.24	2.03
Other Components				Number of Piles			576	576			
Mainwall				Capacity	Demand		Unit	C/D Ratio			
- Shear				2216	1678		kN	1.32			
- Flexure				6024	10062		mm ²	0.60			
Wingwall											
- Shear				414	250		kN	1.60			
- Flexure				4047	3663		mm ²	1.10			
Footing											
- Shear				3036	2418		kN	1.26			
- Flexure				13795	22625		mm ²	0.61			

Note: Number of Piles determined using case 2 of old code

Legend: - Capacity is less than the required by analysis (Needs to undergo retrofiting)

Capacity / Demand Ratio for ABUTMENT-B (Using the New Code)



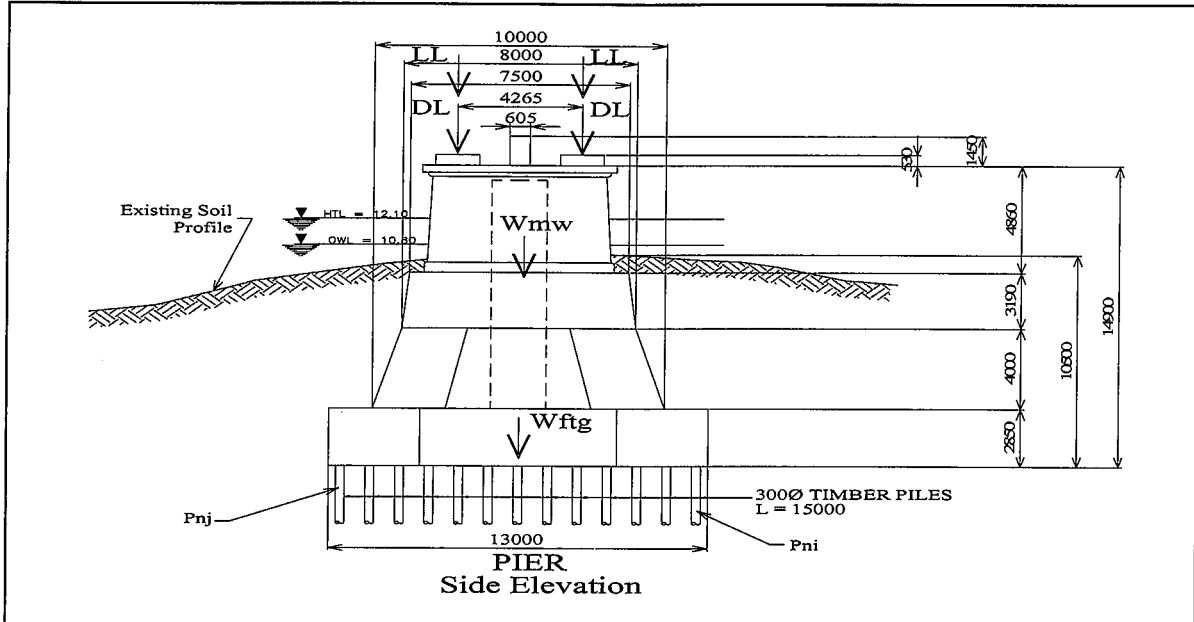
Part	DL (Ton)	EQ (Ton)	Pile Capacity		Comb1&2	Comb3	Load Combinations: Comb1=DL+LL+EP+BF OWL Comb2=DL+LL+EP+BF HTL Comb3=DL+EQ+EP+BF OWL Case 1: Soil @ Downstream Level with Bottom of Footing Case 2: Soil @ Downstream Level with Actual Soil Profile			
Superstructure	963	193	Pni, Pnj	Pure Tension (Ton)	12.8	25.6				
Main Wall	1034	207		Pure Comp. (Ton)	24	31.9				
Footing	3425	685		Pure Bend. (Ton M)	3.5	4.7				
Wing Wall	148	30		Shear (Ton)	7.9	10.6				
Soil	6903	1380								
Soil Values										
g soil	1.94	Ton/m3								
f	30	Deg								
Earth Pressure: by Mononobe-Okabe Eq.			Critical Pile Demand							
Fa	Comb1&2	2179 Ton	Case	1			2			
	Comb3	3474 Ton	Load Comb.	Comb1	Comb2	Comb3	Comb1	Comb2	Comb3	
Fp (Case1)	Comb1&2	0 Ton	Pni	Tension	-	-	-	-	-	
	Comb3	0 Ton		Comp	28.1	27.4	47.6	28.0	27.3	35.6
Fp (Case2)	Comb1&2	598 Ton		Bend	1.73	1.73	5.2	1.23	1.23	1.7
	Comb3	4085 Ton		Max Comb s Ratio	0.83	0.82	1.54	0.68	0.67	0.69
Bouyant Force				Shear	3.28	3.28	8.92	2.38	2.38	2.84
OWL		4080 Ton	Pnj	Tension	-	-	20.9	-	-	8.4
HTL		4525 Ton		Comp	-	-	-	-	-	-
DL = Total Dead Load LL = Live Load EQ = Total Seismic Load EP = Total Earth Pressure				Bend	1.73	1.73	5.2	1.23	1.23	1.7
Fp = Passive Soil Force g soil = unit weight of soil				Max Comb s Ratio	0.5	0.5	1.74	0.35	0.35	0.37
f = soil angle of friction OWL = Ordinary Water Level HTL = High Tide Level			Critical Pile C/D Ratio							
Other Components			Pni	Comp	0.85	0.88	0.67	0.86	0.88	0.90
Mainwall				Stress	1.20	1.22	0.65	1.47	1.49	1.45
- Shear		2216		Shear	2.41	2.41	1.19	3.32	3.32	3.73
- Flexure		6024	Pnj	Tension	-	-	1.22	-	-	3.05
Wingwall				Stress	2.00	2.00	0.57	2.86	2.86	2.70
- Shear		414		Shear	2.41	2.41	1.19	3.32	3.32	3.73
- Flexure		6446	Number of Piles		665			665		
Footing			Capacity	Demand	Unit	C/D Ratio				
- Shear		3036								
- Flexure		13795								

Note: Number of Piles determined using case 2 of old code

Legend: - Capacity is less than the required by analysis (Needs to undergo retrofitting)

Appendix 13.6.1-1 (6/6)

Capacity / Demand Ratio for PIER (Using the New Code)



Part		Pile Capacity				Comb 1&2	Comb 3		
DL @ South Superstruct. (Ton)	776	Pni, Pnj	Pure Tension (Ton)			19	38		
DL @ North Superstruct. (Ton)	963		Pure Compression (Ton)			24	48		
Lane Load + Sidewalk Liveload	425		Pure Bending (Ton M)			3.5	7.00		
Elastic Shear @ bottom of Footing	6329		Shear (Ton)			7.90	15.80		
Elastic Moment @ bottom of Footing	46543								
Column	5359 Ton	Pile Demand							
Footing	3025 Ton	Longitudinal			Transverse				
Soil Values		Load Comb.	Comb1	Comb2	Comb3	Comb1	Comb2	Comb3	
g soil	1.94 Ton/m ³	Pni Tension	-	-	-	-	-	-	
f	30 Deg	Pni Comp	19.72	18.92	73.5	19.72	18.92	29.96	
Bouyant Force		Pni Bend	-	-	7.08	-	-	6.58	
OWL	2710 Ton	Max Comb S Ratio	0.23	0.22	1.45	0.23	0.22	1.12	
HTL	3047 Ton	Pnj Tension	-	-	34.06	-	-	-	
Load Combinations:		Pnj Comp	-	-	-	-	-	-	
Comb1=DL+LL+BF OWL (Allowable)		Pnj Bend	-	-	7.08	-	-	6.58	
Comb2=DL+LL+BF HTL (Allowable)		Max Comb S Ratio	-	-	2.44	-	-	0.95	
Comb3=DL+EQL+BF OWL (Ultimate)		Pnj Shear	-	-	14.96	-	-	12.93	
Legend:		Pile C/D Ratio							
DL = Total Dead Load		Pni Comp	1.22	1.27	0.65	1.22	1.27	1.60	
LL = Live Load		Pni Stress	4.35	4.55	0.69	4.35	4.55	0.89	
EQL = Total Longitudinal Earthquake Load		Pni Shear	-	-	1.06	-	-	1.22	
EQT = Total Transverse Earthquake Load		Pnj Tension	-	-	1.12	-	-	-	
g soil = unit weight of soil		Pnj Stress	-	-	0.41	-	-	1.05	
f = soil angle of friction		Pnj Shear	-	-	1.06	-	-	1.22	
OWL = Ordinary Water Level		Number of Piles	423						
HTL = High Tide Level		Longitudinal		Transverse		Unit	C/D Ratio		Remarks
		Capacity	Demand	Capacity	Demand		Longitudinal	Transverse	
Other Components									
Column									
- Shear		0.78	0.19	0.78	0.17	MPa	4.11	4.59	
- Flexure		2222877	78475	7297796	28914	kN-m	28.33	252.40	
- Confinement		303912	955152	303912	672948	mm ²	0.32	0.45	

Note: For Load Combination 3 use load factor of 2 to get the Ultimate Capacity.

Legend: - Capacity is less than the required by analysis (Needs to undergo retrofitting)