DOUBLE LIFT CONFIGURATION

DRAWING LIST

15/05/2003

x			Rev.	Title

TASK 2

D2-	0	-301	B	Design Levels

TASK 4

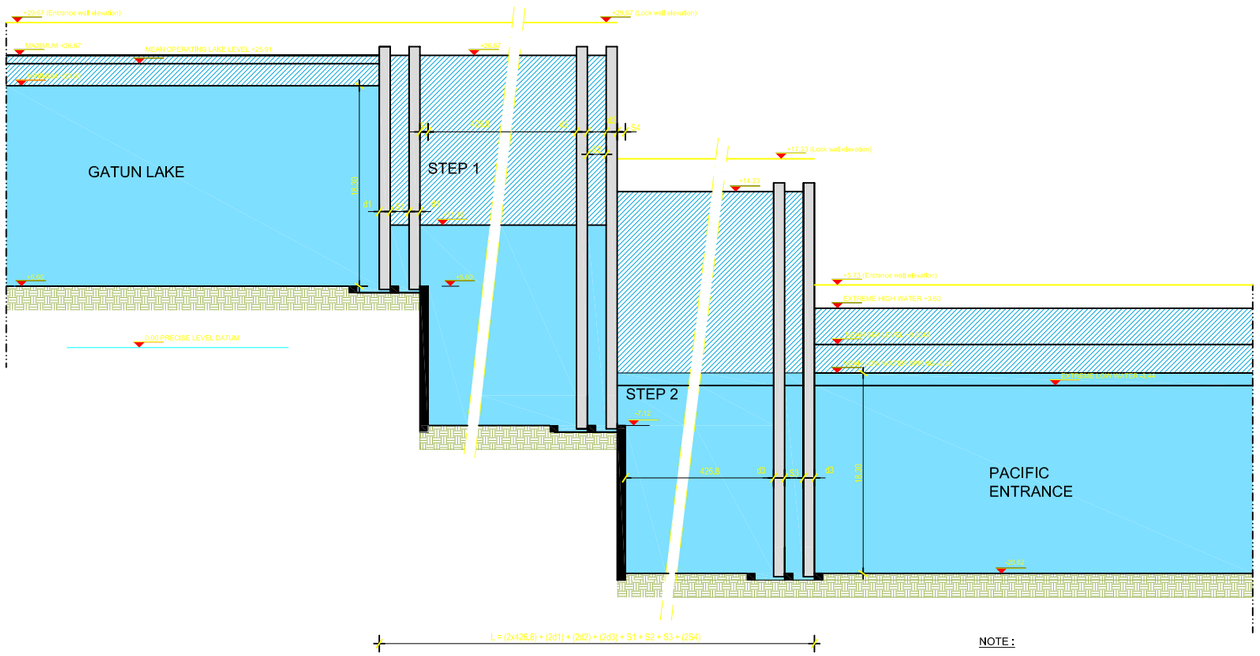
				LAY-OUT
D4-	A	-301	A	General plan view
		-302	A	Lock Alignment: Geotechnical Situation
		-303	A	Lock Alignment: Nautical Access
		-304	A	Canal and lock implantation
				Lock Walls
D4-	B	-301	D	Eastern and Western Lock Walls + Entrance Walls : longitudinal view
		-302	D	Plan view on entrance Gatun Lake side
		-303	D	Plan view on Lock Chamber 1
		-304	D	Plan view on Lock Chamber 2
		-305	D	Plan view on entrance Pacific side
		-306	A	Cross-Sections Lock Walls
		-307	C	Lock head 1 : plan view
		-308	C	Lock head 1 : longitudinal section
		-309	C	Lock head 1 : cross section
		-310	C	Lock head 2 : plan view
		-311	C	Lock head 2 : longitudinal section
		-312	C	Lock head 2 : cross section
		-313	C	Lock head 3 : plan view
		-314	C	Lock head 3 : longitudinal section
		-315	C	Lock head 3 : cross section
		-316	A	WSB filling and emptying system : structural design
				Lock operating GATES
D4-	D	-301	A	Rolling Gate D1:general layout
		-302	B	Rolling Gate D2:general layout
		-303	B	Rolling Gate D3:general layout
		-304	B	Maintenance support wagon ; maintenance and (dis-)mounting maneuvers
		-305	A	Support rolling wagons

DOUBLE LIFT CONFIGURATION

DRAWING LIST

15/05/2003

				Operating Machinery
D4-	F	-302	A	Control system architecture: final configuration
				Electrical power and power requirements
D4-	H	-304	A	High voltage one-line diagram-alternative 1
		-306	A	High voltage one-line diagram-alternative 2
				Entrance walls
D4-	I	-301	A	Cross sections entrance walls
				Construction
D4-	L	-301	A	Construction plan



NOTE :

* WATER LEVELS AND SILL LEVELS ARE CALCULATED FOR MEAN LOW WATER SPRING -2.32 PLD

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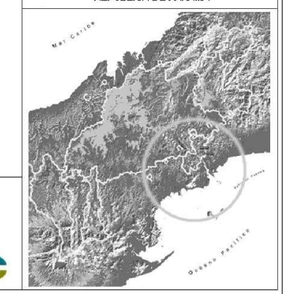
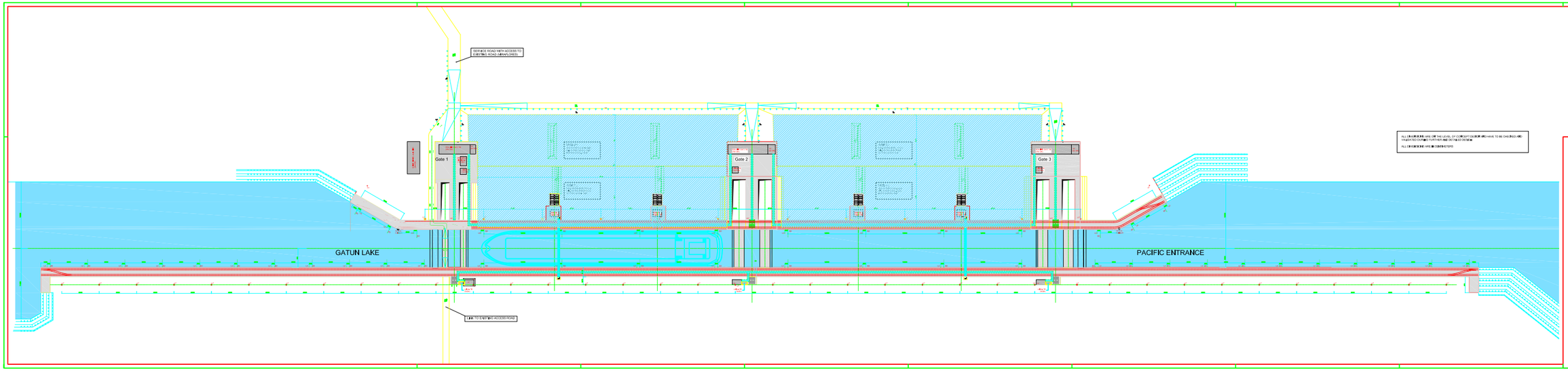


Diseño Conceptual de las Esclusas Post Panamax
Concept Design of New Lock Structure

DOUBLE LIFT CONFIGURATION
DESIGN LEVELS

REV.	DATE	DESCRIPTION	DRAWN	CHECKED	APPROVED
F					
E					
D					
C					
B	15/05/03	FINAL REPORT	BME	JDR	JDR
A	27/02/03	MODIFIED LEVELS	BME	JDR	JDR
--	10/02/03	FIRST EDITION	SBT	BME	JDR

Contract	Scale:	Drawing n°:	Rev.:	Folio
SAA-97462	1/250	D2- 0 - 301	B	1 / 1



ALL DRAWINGS ARE ON THE LEVEL OF CONCEPT DESIGN AND HAVE TO BE CHECKED AND UNDERSTOOD FURTHER AND DETAILED REVIEW.

ALL DRAWINGS ARE IN DEMETERS

Legend

LD: Ladder
BD: Bollard
LP: Lighting Pole
CB: Control Building
TB: Technical Building
HV: High Voltage building
VC1: Valve Chamber on culvert
VC2: Valve Chamber water saving basins
Cable Duct
Traffic Direction
Rail Tracks

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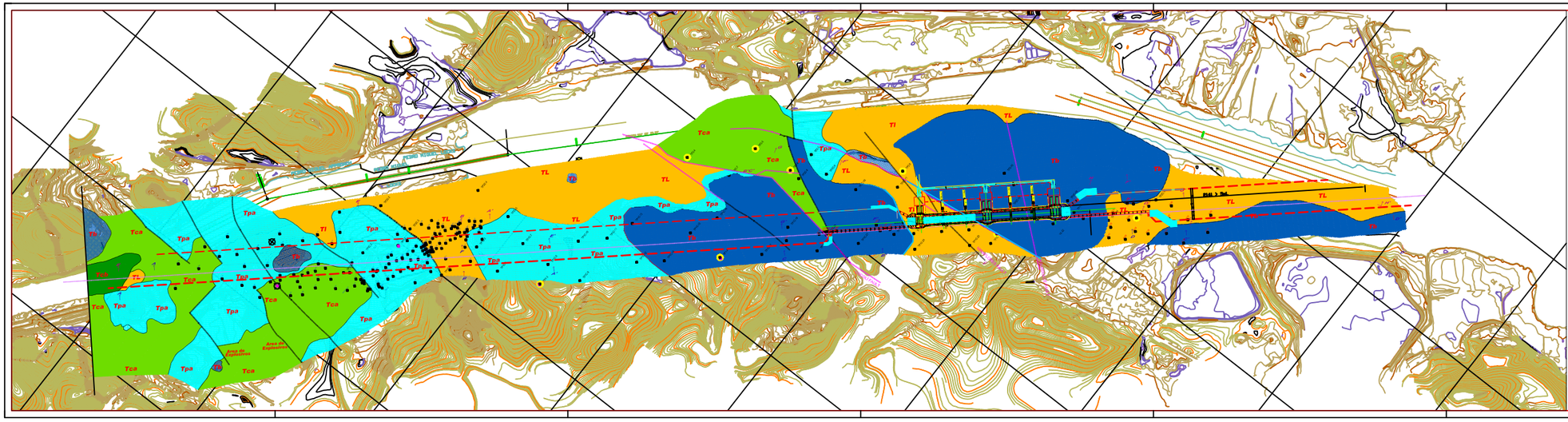
Concept Design of New Lock Structure

DOUBLE LIFT CONFIGURATION
General Plan View

Contract	Scale	Drawing n°:	Rev.	Page
000-CP000	1/1000	D4– A – 301	A	1 / 1



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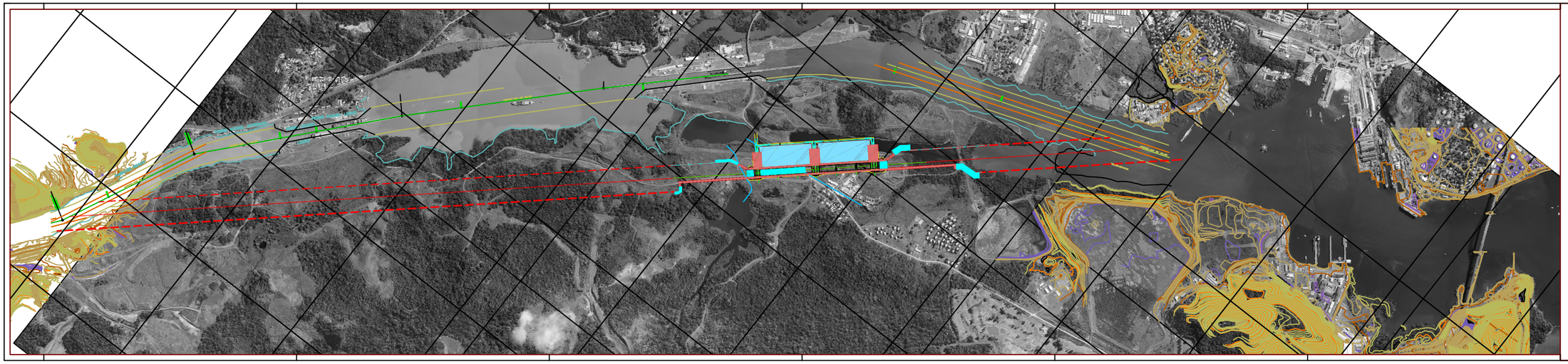
Concept Design of New Lock Structure

DOUBLE LIFT CONFIGURATION
LOCK ALIGNMENT P1F
GEOTECHNICAL SITUATION

Rev.	Description	Drawn	Checked	Approved
A	ISSUED FOR REVIEW	JDE	JDE	JDE
B	ISSUED FOR REVIEW	JDE	JDE	JDE

Contract	Scale:	Drawing n°:	Rev.:	Folio
SW-97462	1/10000	D4– A – 302	A	1 / 1



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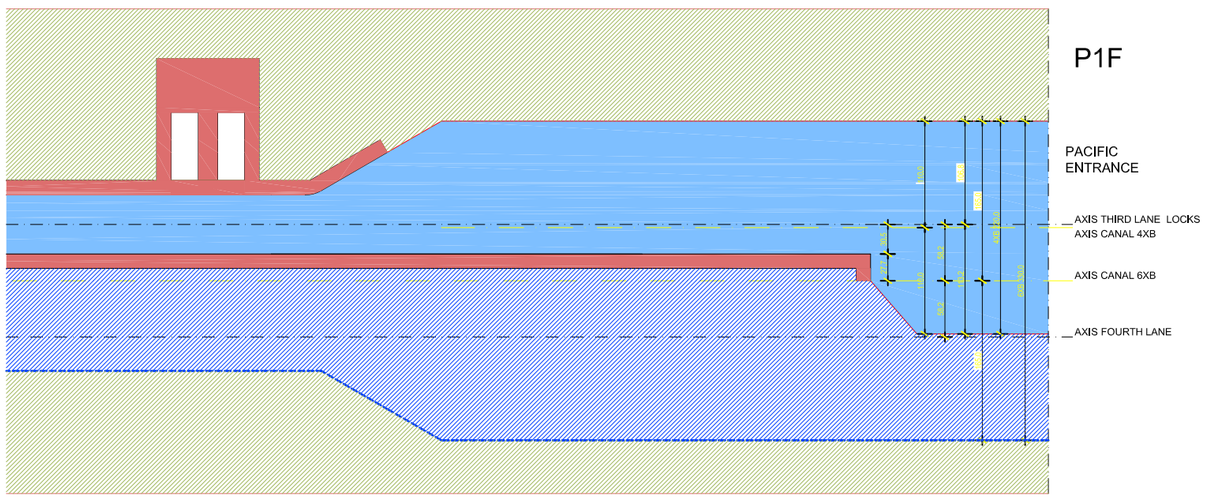
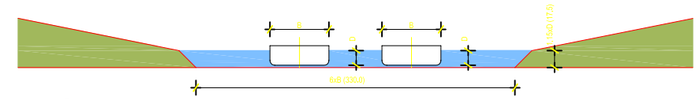
Concept Design of New Lock Structure

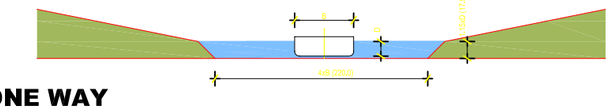
DOUBLE LIFT CONFIGURATION
LOCK ALIGNMENT P1F
NAUTICAL ACCESS

Contract	Scale	Drawing n°:	Rev.:	Folio
SAA-67482	1/10000	D4- A - 303	A	1 / 1





TWO WAY



ONE WAY

ALL DIMENSIONS ARE ON THE LEVEL OF CONCEPT DESIGN AND HAVE TO BE CHECKED AND VALIDATED DURING FURTHER AND DETAILED DESIGN

ALL DIMENSIONS ARE IN METERS

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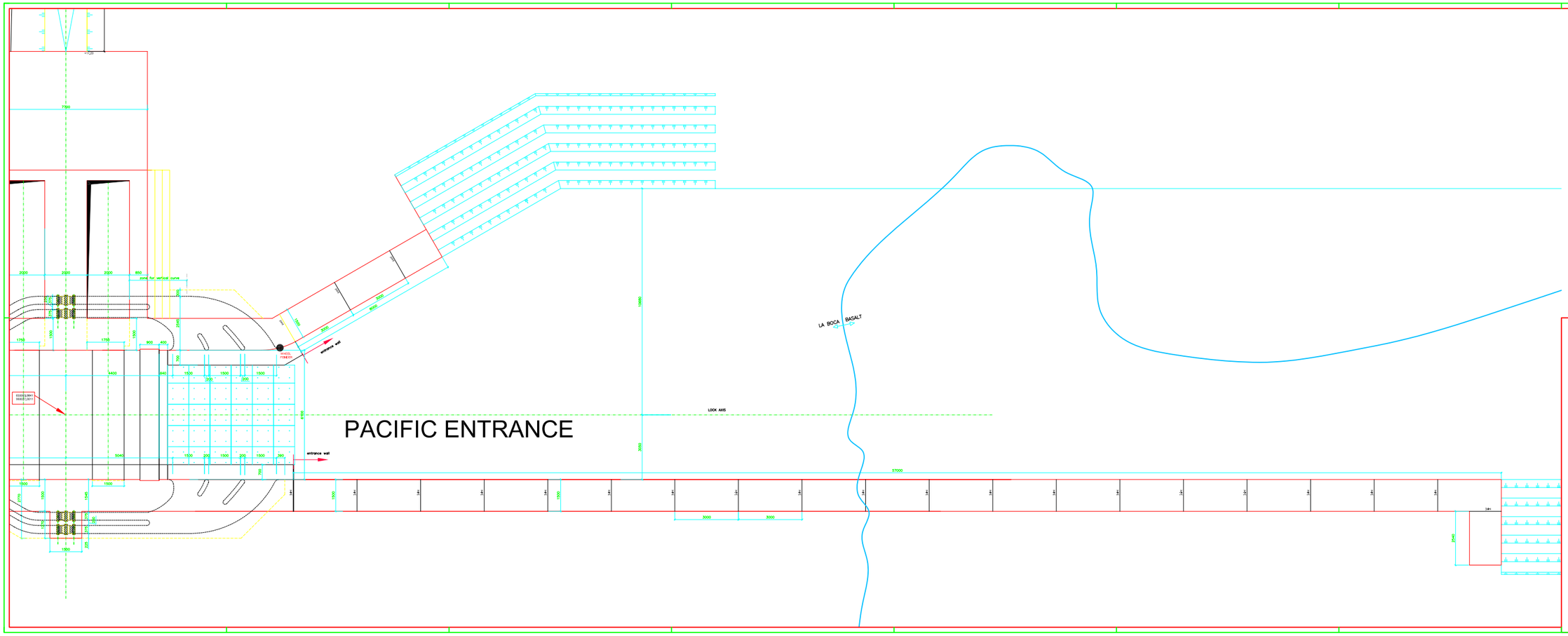
Concept Design of New Lock Structure

DOUBLE LIFT CONFIGURATION
CANAL AND LOCK IMPLANTATION

REV.	DATE	DESCRIPTION	DRAWN	CHECKED	APPROVED
F					
E					
D					
C					
B					
A	15/05/03	FINAL REPORT	BME	JOR	JOR
–	05/03/03	FIRST EDITION	FVH	BME	JOR

Contract	Scale:	Drawing n°:	Rev.:	Folio
SAA-97462	1/250	D4 – A – 304	A	1/1



ALL DIMENSIONS ARE ON THE LEVEL OF CONCEPT DESIGN AND HAVE TO BE CHECKED AND VALIDATED DURING FURTHER AND DETAILED DESIGN

ALL DIMENSIONS ARE IN CENTIMETERS

THE STRUCTURE IS SHOWN FOR ALIGNMENT P1F

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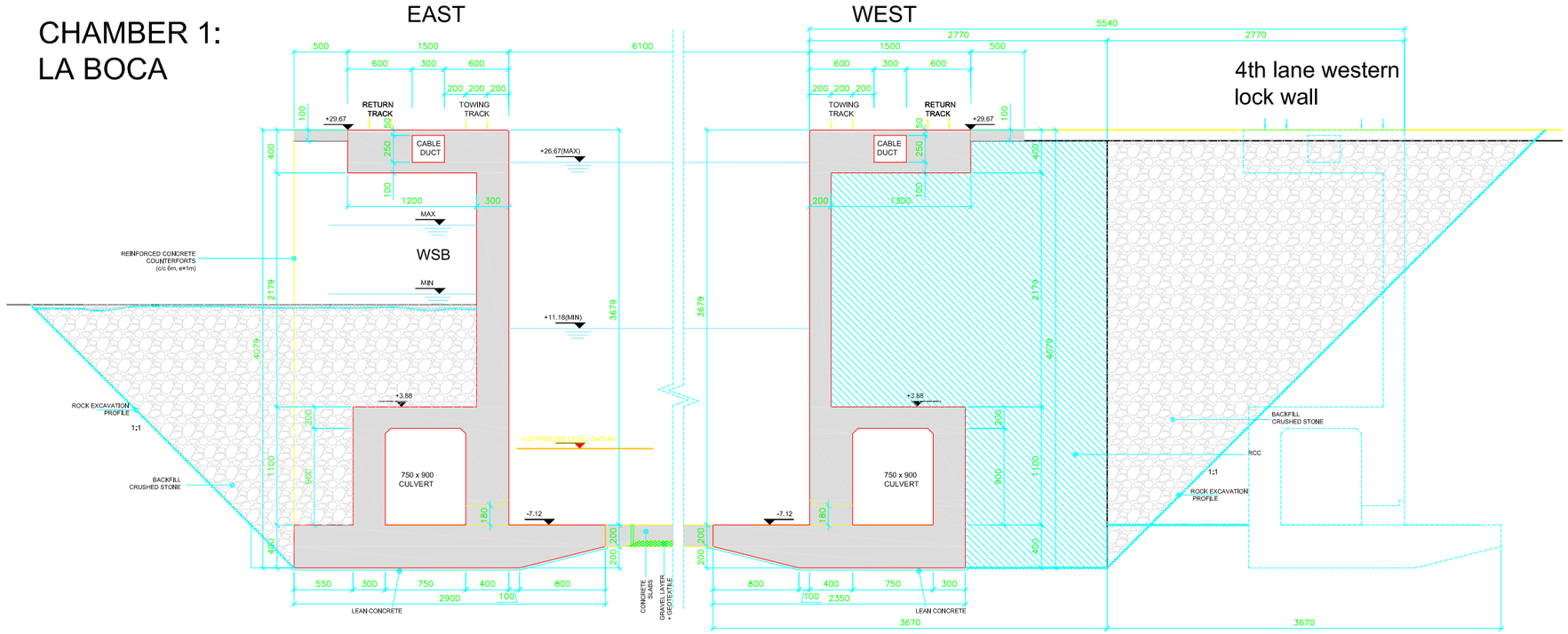
Diseño Conceptual de las Esclusas Post Panamax
Concept Design of New Lock Structure

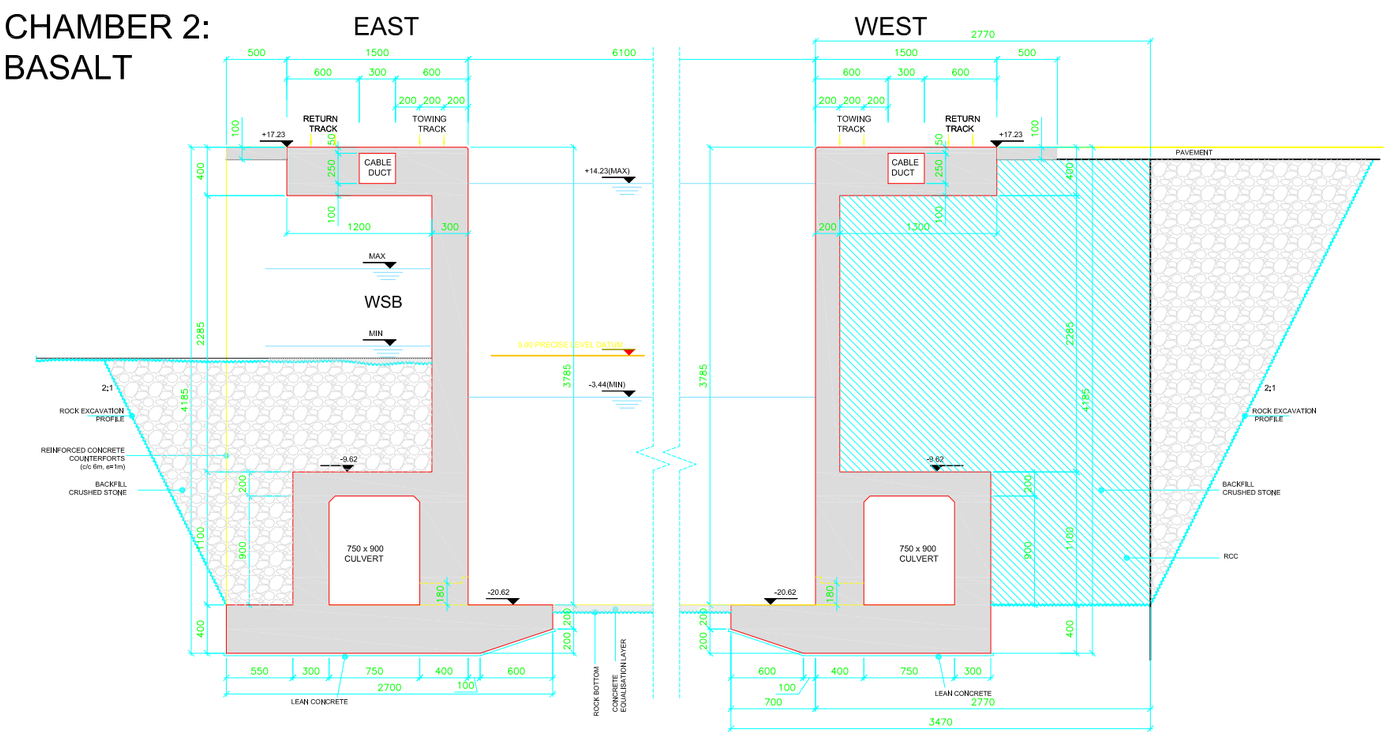
DOUBLE LIFT CONFIGURATION
ENTRANCE PACIFIC SIDE : PLAN VIEW

Contract	Scale	Drawing n°:	Rev.	Folio
SM-07402	1/500	D4- B - 305	0	1 / 1

CHAMBER 1: LA BOCA



CHAMBER 2: BASALT



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ALL DIMENSIONS ARE IN CENTIMETERS

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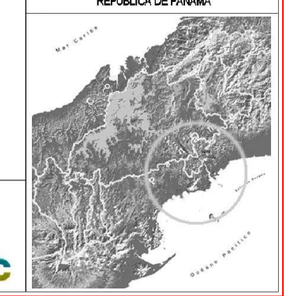
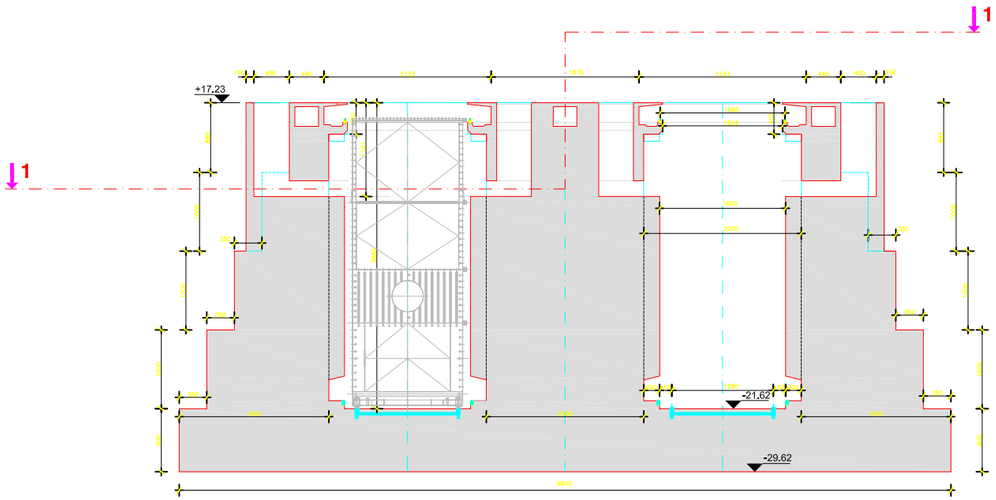


Diseño Conceptual de las Esclusas Post Panamax
Concept Design of New Lock Structure

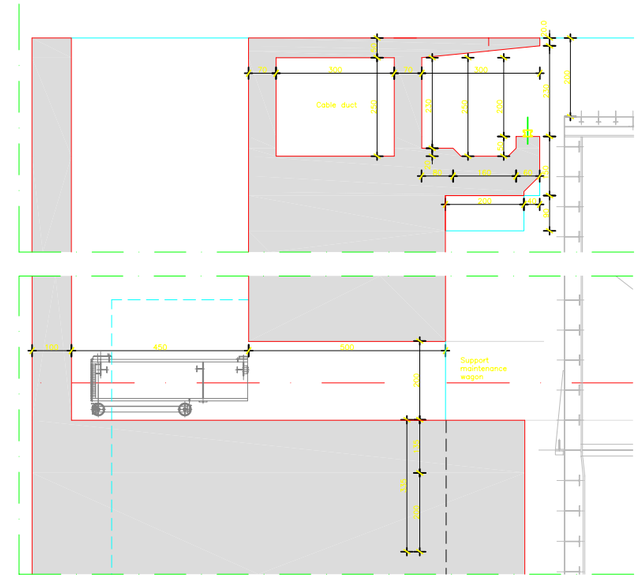
DOUBLE LIFT CONFIGURATION
Cross-sections Lock Walls

REV.	DATE	DESCRIPTION	DRAWN	CHECKED	APPROVED
F					
E					
D					
C					
B					
A	15/05/03	FINAL REPORT	BME	JDR	JDR
–	17/03/03	FIRST EDITION	BME	JDR	JDR

Contract	Scale:	Drawing n°:	Rev.:	Folio
SAA-97462	1/250	D4- B - 306	A	1 / 1

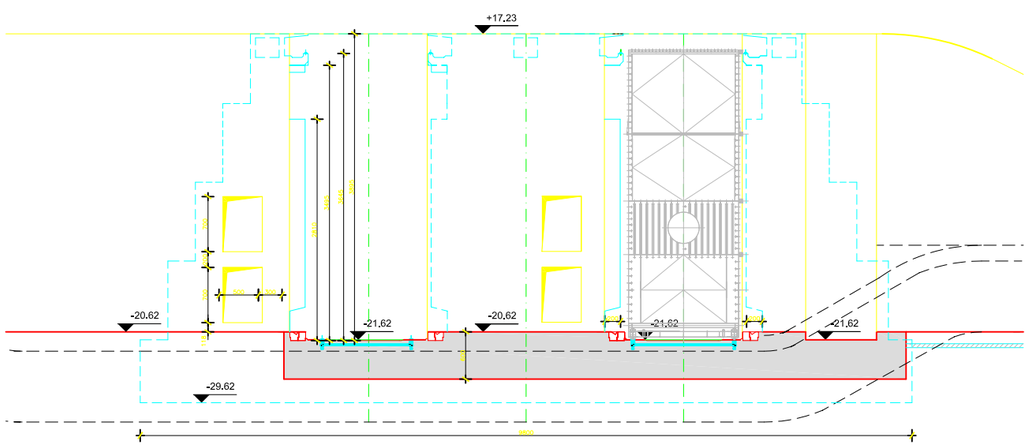


SECTION C-C

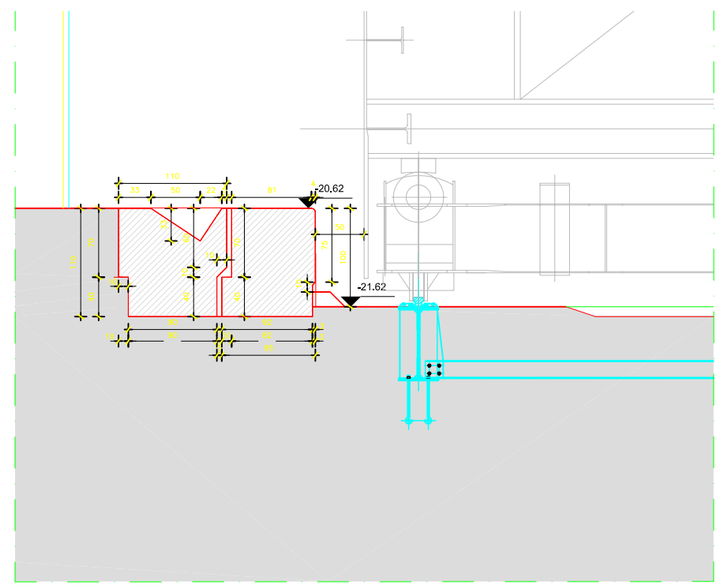


DETAIL 1-2-3

GATE 3



SECTION D-D



DETAIL RAIL FOR UNDERWAGON

All dimensions are on the level of concept design and have to be checked and validated during further and detailed design.

All dimensions are in cm.

All levels are in meter and refered to PLD.

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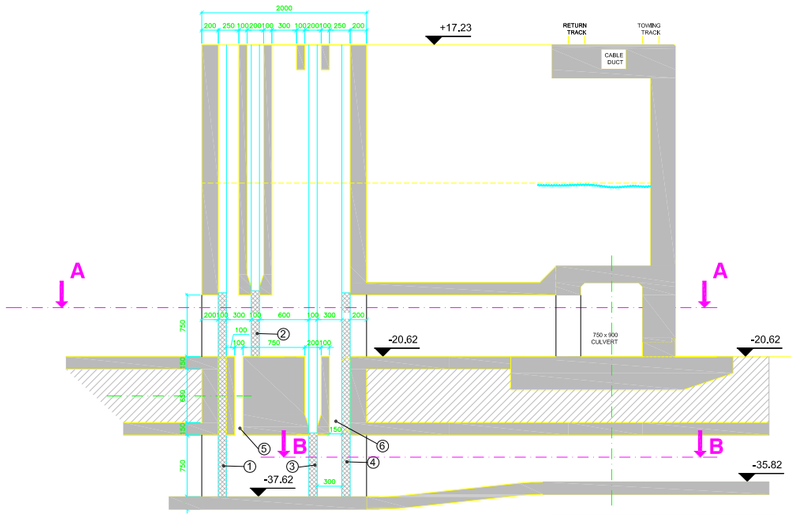
Concept Design of New Lock Structure

DOUBLE LIFT CONFIGURATION
LOCK HEAD 3
CROSS SECTION

REV.	DATE	DESCRIPTION	DRAWN	CHECKED	APPROVED
C	14.06.2011	FINAL REPORT	BME	BME	JGK
B	14.04.2011	UPDATE	BME	BME	JGK
A	04.04.2011	UPDATE DURING	JGK	BME	JGK
0	14.03.2011	FIRST ISSUE	BME	TD	MT

Contract	Scale:	Drawing n°:	Rev.:	Folio
SAA-97462	1/200	D4-B-315	C	1/1



VALVE AND BULKHEAD DIMENSIONS (shown for LC2) (1/250)

1 and 4 : MAINTENANCE BULKHEADS (each of them is composed of 3 elements on top of each other)
2 and 3 : WSB-VALVES
5 : MAINTENANCE SHAFT TO REACH THE SPACE BETWEEN BULKHEAD 1 AND VALVE 3 AT LEVEL -37.62
6 : MAINTENANCE SHAFT TO REACH THE SPACE BETWEEN BULKHEAD 3 AND VALVE 4 AT LEVEL -37.62

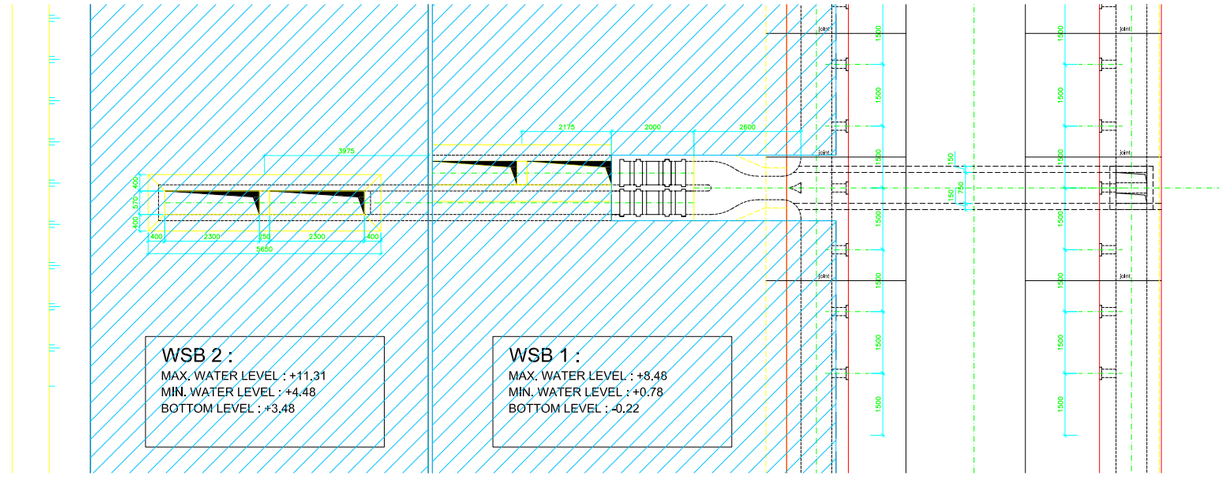
In normal operation, a WSB can be isolated from the lock chamber by closing the 2x2N4 valves (there are 2x2 conduits connecting a WSB to the lock chamber).

By keeping the 4 conduit valves in closed position, it is possible to empty one (or several) WSB by pumping. This can be done without interruption of the ship traffic through the locks. However, the hydraulic cylinders of the conduit valves are not designed to move the valves under such a head of water.

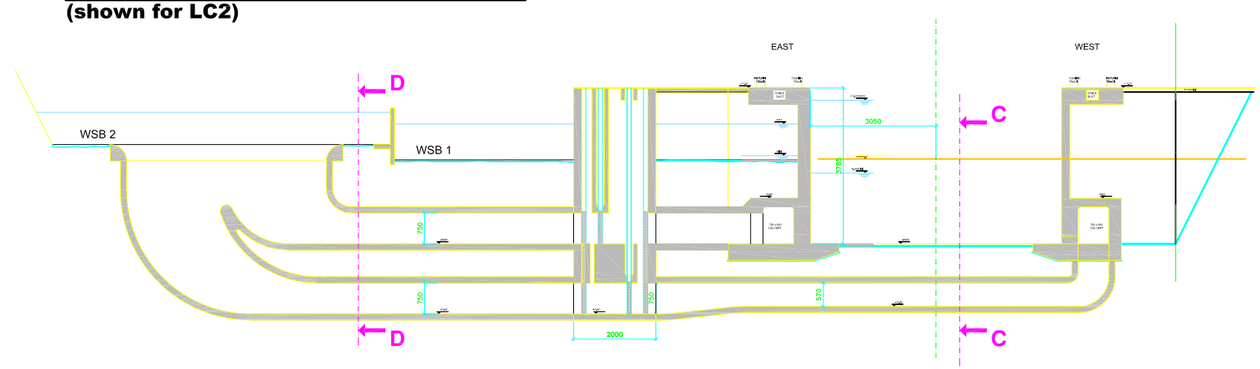
In case of trouble on one of the conduit valves, the bulkheads 1 and 4 must be lowered. Two WSB conduits have to be closed. Operation of the corresponding WSB can still go on by using the 2 remaining conduits.

During maintenance, access on both sides of the valves is possible by using bulkheads 1 and 4 after emptying of the space between them.

Conduit valves and bulkheads are equipped with rubber / PTFE seals of the upstream and downstream type.

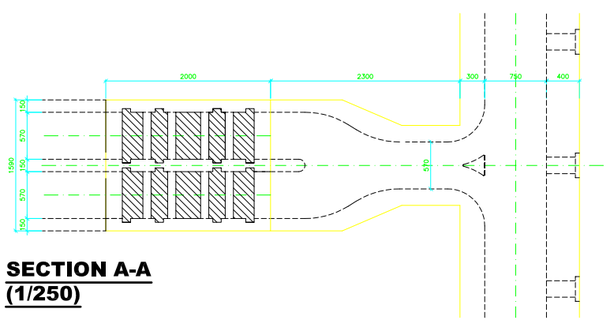


PLAN VIEW FILLING / EMPTYING SYSTEM (shown for LC2)

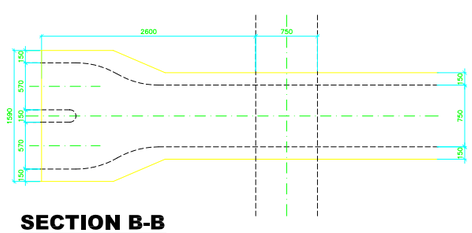


FILLING / EMPTYING SYSTEM WSB

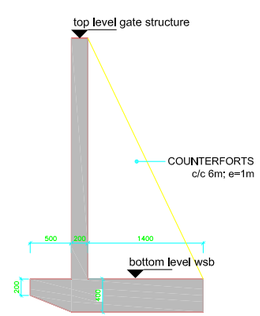
shown for WSB 2/ LOCK CHAMBER 2
same principle for other WSB



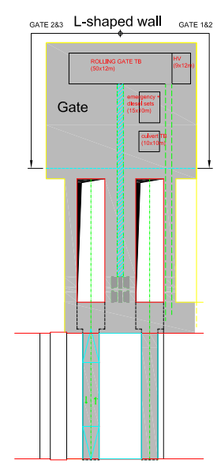
SECTION A-A (1/250)

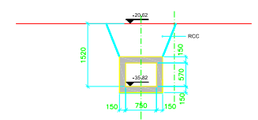


SECTION B-B (1/250)

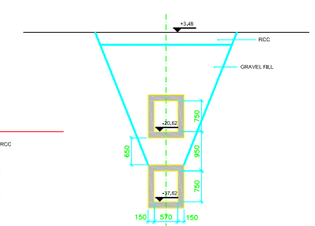


L-SHAPED WALLS BEHIND LOCK HEADS 1, 2 and 3 (1/250)





SECTION C-C (1/500)



SECTION D-D (1/500)

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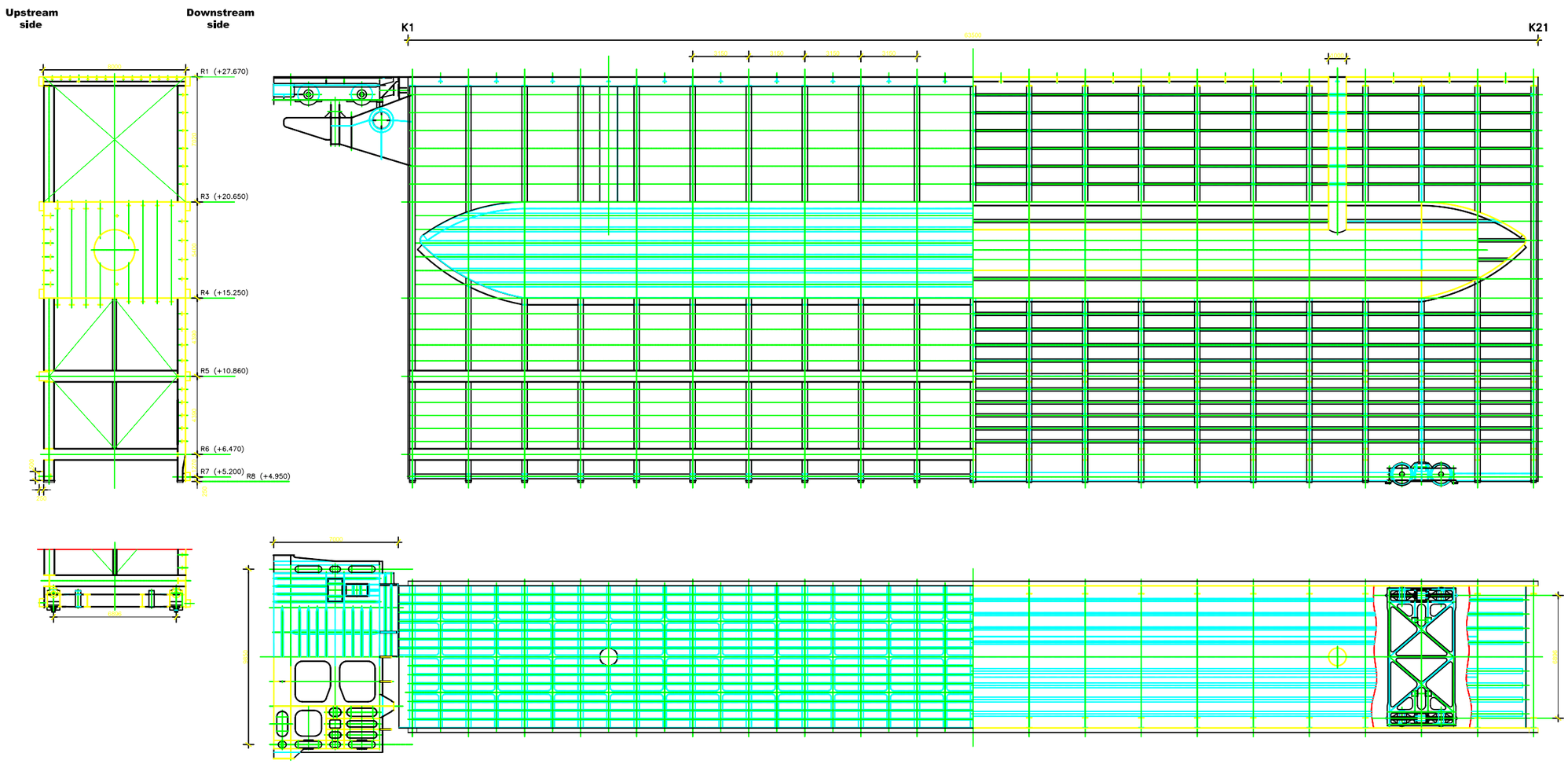
Diseño Conceptual de las Esclusas Post Panamax
Concept Design of New Lock Structure

DOUBLE LIFT CONFIGURATION
WATER SAVING BASINS - FILLING AND EMPTYING SYSTEM
STRUCTURAL DESIGN

No.	Date	Description	Drawn	Checked	Approved
2					
1					
0					
A	18/06/08	FINAL REPORT	JMC	JER	JER
—	11/04/08	FINAL DRAFT	JMC	JER	JER

Contract	Scale:	Drawing n°:	Rev.:	Folio
SAA--97462	1/250 1/500	D4– B – 316	A	1 / 1



All dimensions are on the level of concept design and have to be checked and validated during further and detailed design.

All dimensions are in mm.

All levels are in meter and refered to PLD.

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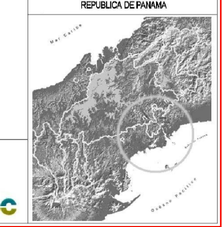
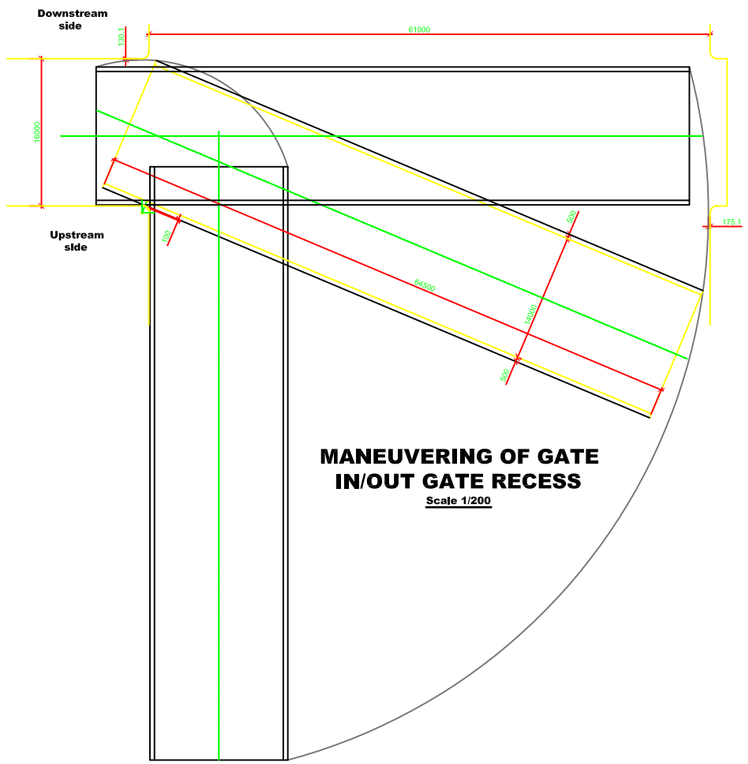


Diseño Conceptual de las Esclusas Post Panamax
Concept Design of New Lock Structure

DOUBLE LIFT CONFIGURATION
ROLLING GATE D1: GENERAL LAY OUT

REV.	DATE	DESCRIPTION	DRAWN	CHECKED	APPROVED
F					
E					
D					
C					
B					
A	13/05/03	FINAL REPORT			
—	02/04/03	FIRST EDITION			

Contract	Scale:	Drawing n°:	Rev.:	Folio
SAA-97462	1/100	D4-D-301	A	1/1



MANEUVERING OF GATE IN/OUT GATE RECESS

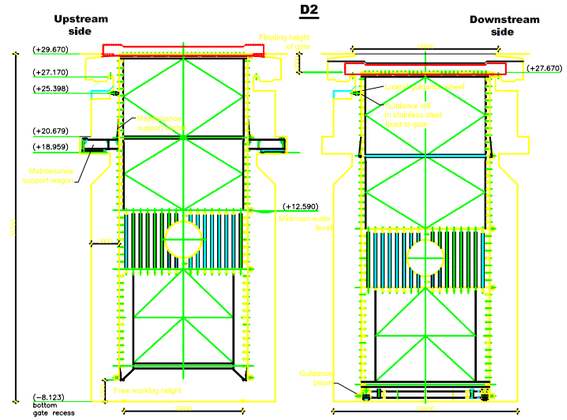
Scale 1/200

GATE HUNG UP IN GATE RECESS

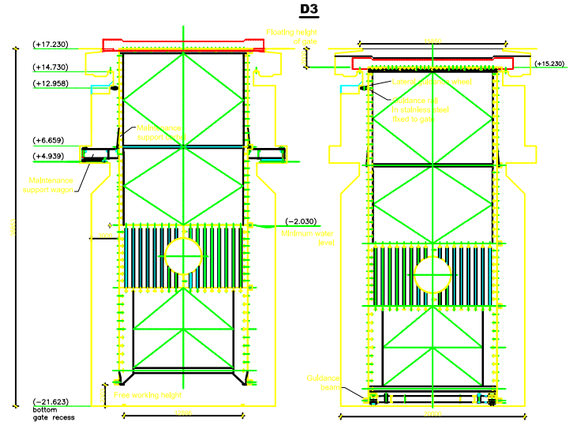
GATE IN OPERATION

Scale 1/200

D2

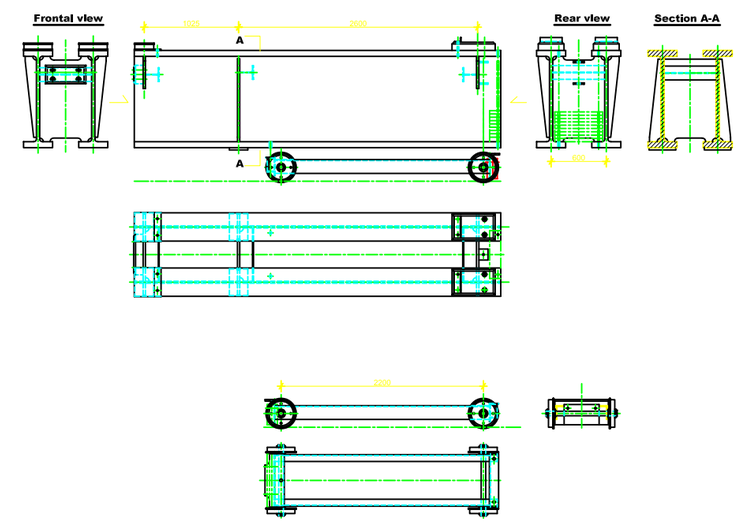


D3



MAINTENANCE SUPPORT WAGON

Scale 1/20



All dimensions are on the level of concept design and have to be checked and validated during further and detailed design.

All dimensions are in mm.

All levels are in meter and refered to PLD.

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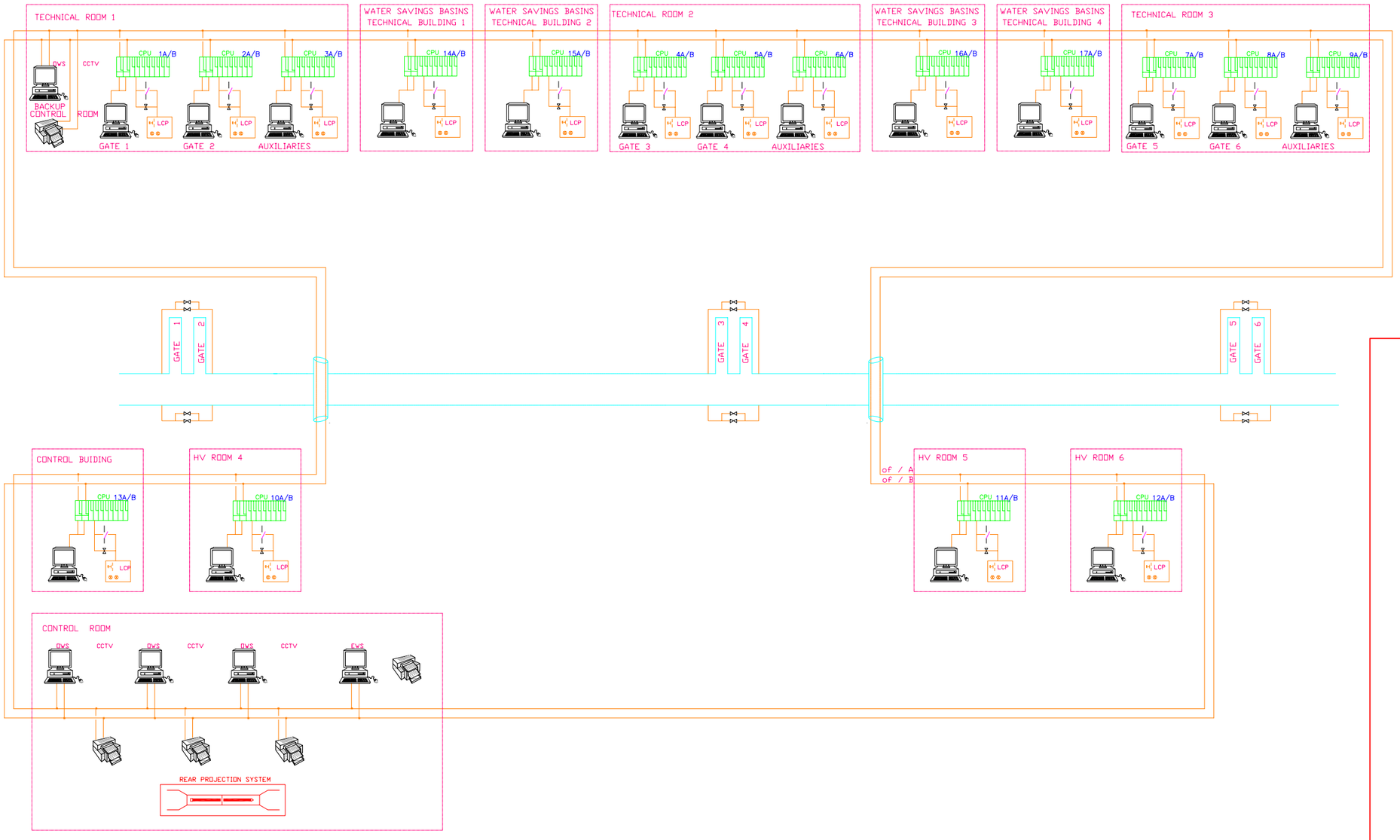
Diseño Conceptual de las Esclusas Post Panamax
Concept Design of New Lock Structure

DOUBLE LIFT CONFIGURATION
MAINTENANCE SUPPORT WAGON
MAINTENANCE AND (DIS-)MOUNTING MANEUVERS

NO.	DATE	DESCRIPTION	DRAWN.	CHECKED	APPROVED
4					
3					
2	15.12.2011	FINAL VERSION			
1	15.09.2011	MAINTENANCE SUPPORT WAGON			
0	15.04.2011	FIRST ISSUE			

Contract	Scale:	Drawing n°:	Rev.:	Folio
SAA-97462	variable	D4-D-304	B	1/1



OWS	OPERATING WORKSTATION
EWS	ENGINEERING WORKSTATION
OF	OPTICAL FIBRE (REDUNDANT : A/B)
CPU	CONTROL PROCESS UNIT (REDUNDANT : A/B)
LCP	LOCAL CONTROL PANEL (IN CASE OF DOUBLE CPU FAILURE)
	EQUIPMENT (SWITCHBOARD, VALVES, ...)

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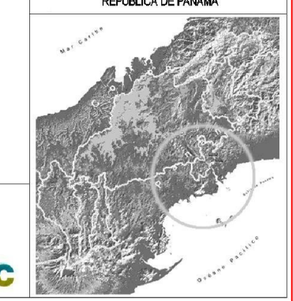
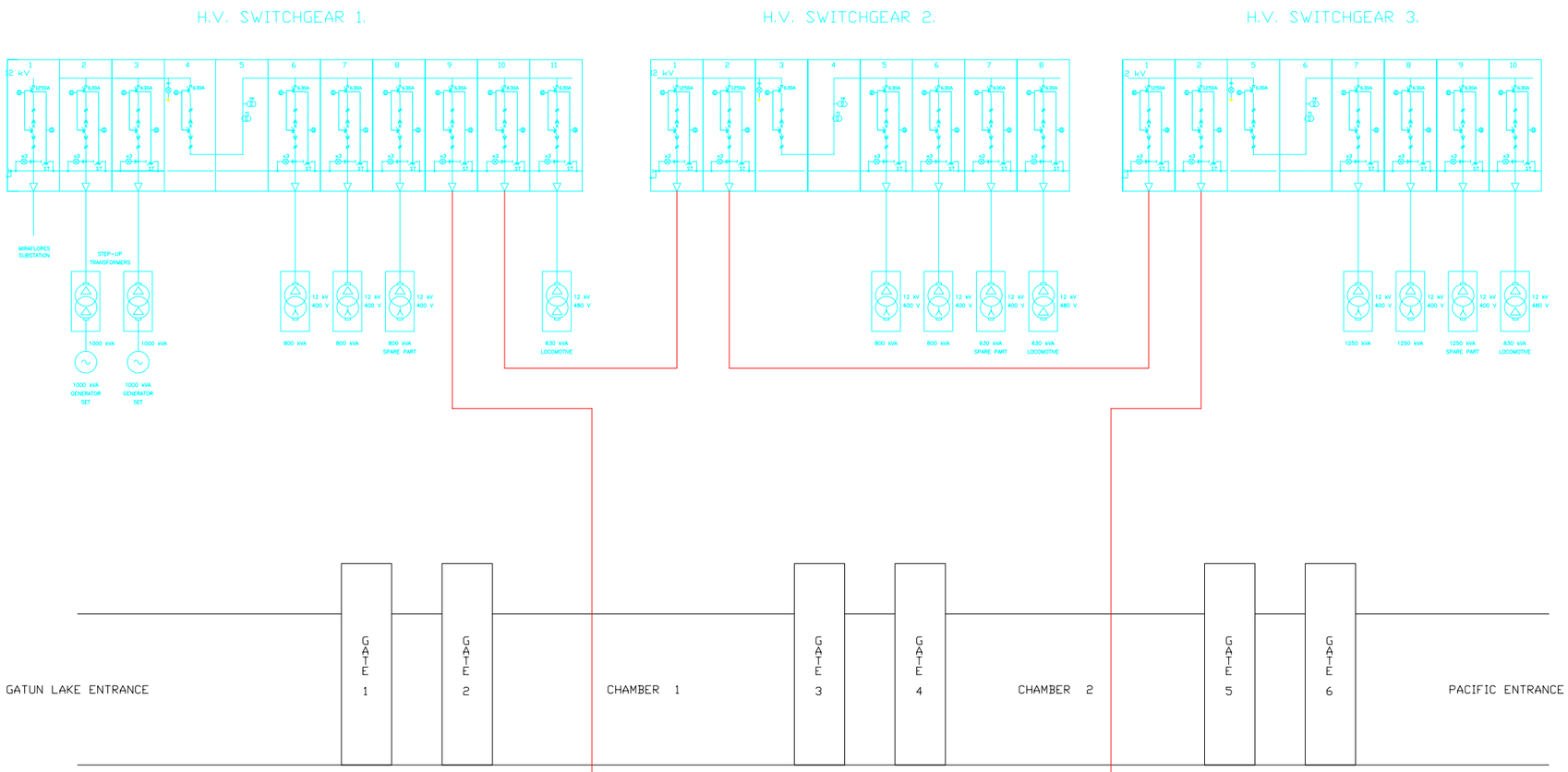


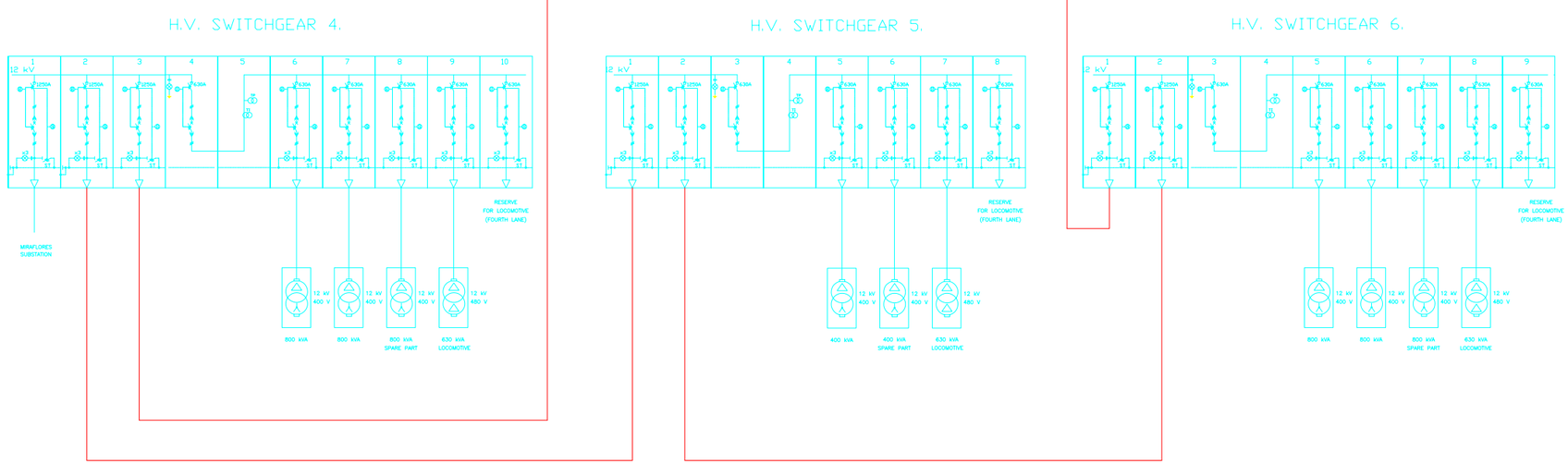
Diseño Conceptual de las Esclusas Post Panamax
Concept Design of New Lock Structure

DOUBLE LIFT CONFIGURATION
CONTROL SYSTEM ARCHITECTURE
FINAL CONFIGURATION

REV.	DATE	DESCRIPTION	DRAWN	CHECKED	APPROVED
F					
E					
D					
C					
B					
A	15/05/03	FINAL REPORT	BME	BME	JDR
–	24/03/03	FIRST EDITION	VEM	VEM	VDP

Contract	Scale:	Drawing n°:	Rev.:	Folio
SAA-97462	–	D4- F - 302	A	1 / 1





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Diseño Conceptual de las Esclusas Post Panamax
Concept Design of New Lock Structure

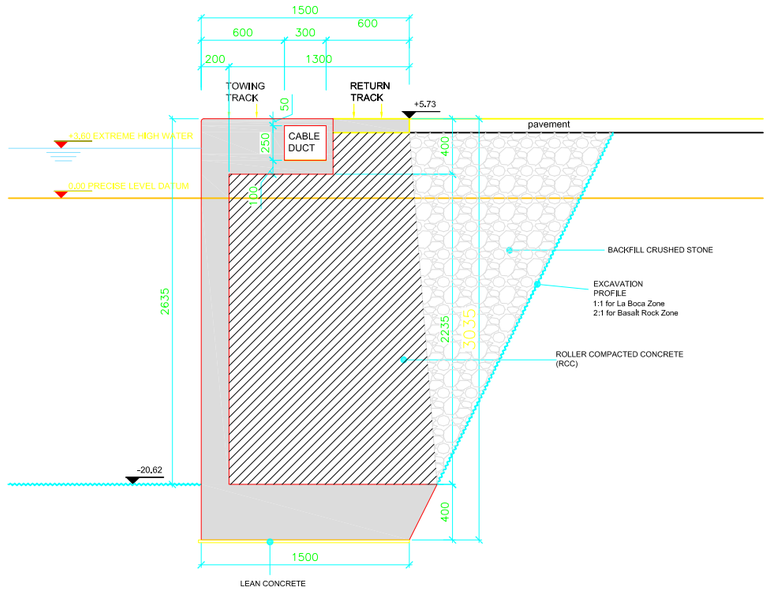
DOUBLE LIFT CONFIGURATION
HIGH VOLTAGE ONE-LINE DIAGRAM
ALTERNATIVE 1

REV.	DATE	DESCRIPTION	DRAWN	CHECKED	APPROVED
A	15/12/2006	PRELIMINARY	MSE	MSE	MSE
0	11/10/2006	FIRST ISSUE	MSE	MSE	MSE

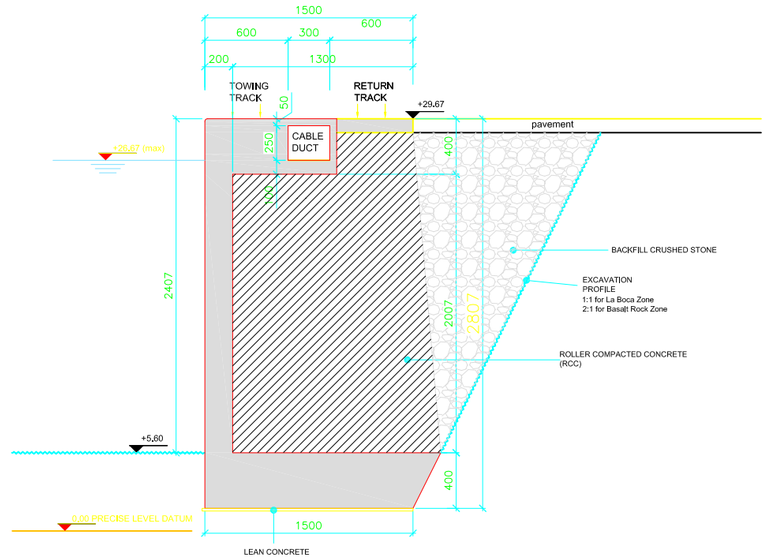
Contract	Scale:	Drawing n°:	Rev.:	Folio
SAA-97462	-	D4- H - 304	A	1 / 1

type a (RC+RCC)

Pacific entrance

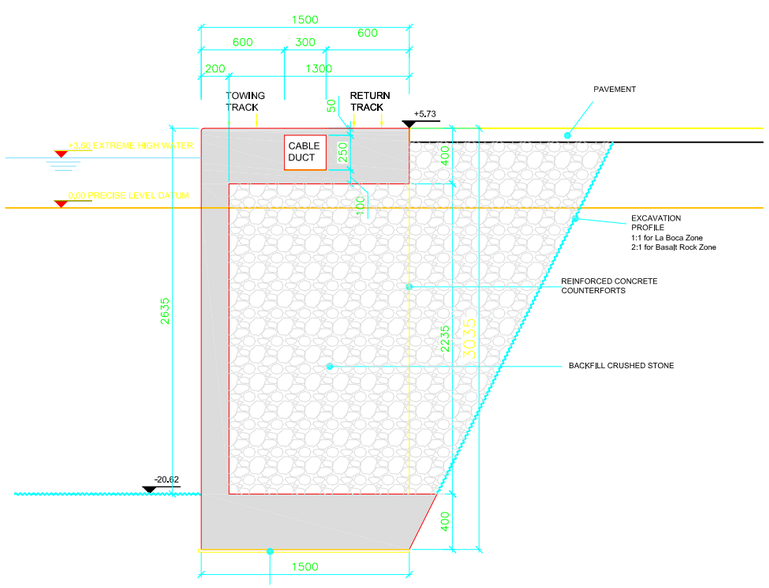


Gatun Lake side

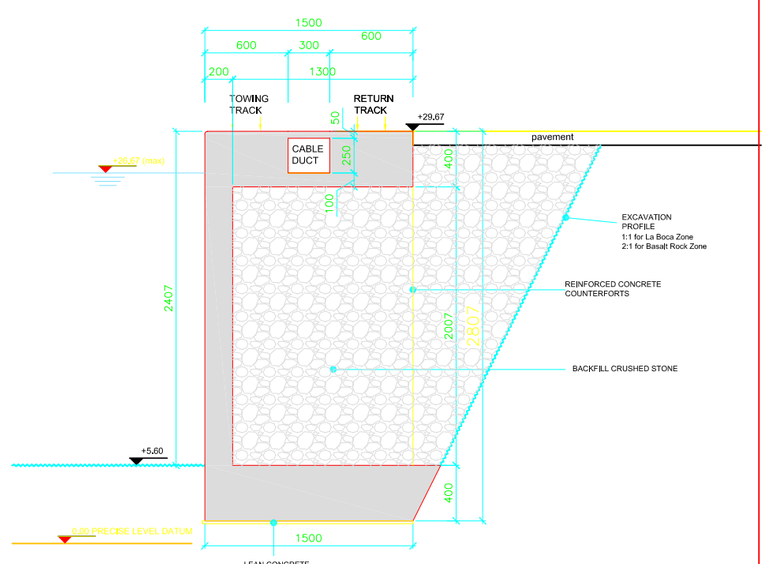


type b (RC)

Pacific entrance



Gatun Lake side



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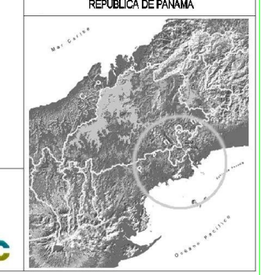

Diseño Conceptual de las Esclusas Post Panamax
Concept Design of New Lock Structure

DOUBLE LIFT CONFIGURATION
CROSS SECTIONS ENTRANCE WALLS

REV.	DATE	DESCRIPTION	DRAWN	CHECKED	APPROVED
F					
E					
D					
C					
B					
A	15/05/03	FINAL REPORT	BME	JDR	JDR
–	24/03/03	FIRST EDITION	BME	JDR	JDR

Contract	Scale:	Drawing n°:	Rev.:	Folio
SAA-97462	1/200	D4- I - 301	A	1 / 1

Area 1 (398,553.757 m2)
Project Management and Engineering Offices
Main Toilets, Showers, Changing Facilities and Clothing Storage Lockers
Main Dining Facilities
Health Office, First Aid Station, and Ambulance
Environmental Protection, Air Pollution Control and Pest Control Office
Equipment Storage Facilities - Indoor and outdoor
Temperature-controlled Storage Warehouse
Main Material and Parts Warehouse
Heavy Equipment Maintenance and Repair Shops
Light Equipment and Vehicles Maintenance and Repair Shops
Fuel Dispensing Facility
Metal and Reinforcement Steel Shops
Concrete Forms Shop
Outdoor Parking and Staging Area for Heavy and Light Construction Equipment, and Vehicles

Area 2 (82,899.436 m2)
Compresses Air Facility
Shotcrete Facilities
First Aid Station
Toolroom

Area 3 (143,258.481 m2)
Concrete Production Facility - Batching Plant
Fuel and Lubricants Dispensing Facility
Toilets, showers, changing facilities and clothing storage lockers
Dining Facilities
Field Office
Quality Control Laboratory

Area 4 (236,472.232 m2)
Toolroom
Toilets, showers, changing facilities and clothing storage lockers
Dining Facilities
Firefighting Equipment
Branch Warehouse
Auxiliary Repair Facility
Fuel Dispensing Station
First Aid Station

Area 5 (61,437.719 m2)
Aggregate Processing Plant
Fuel and Lubricants Storage Facility

Area 6 (39,449.574 m2)
Powder Magazine

Area 7 (42,508.576 m2)
Quay dock site for unloading materials

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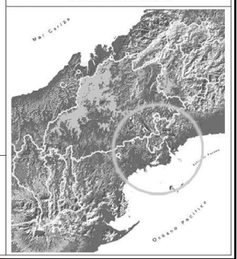
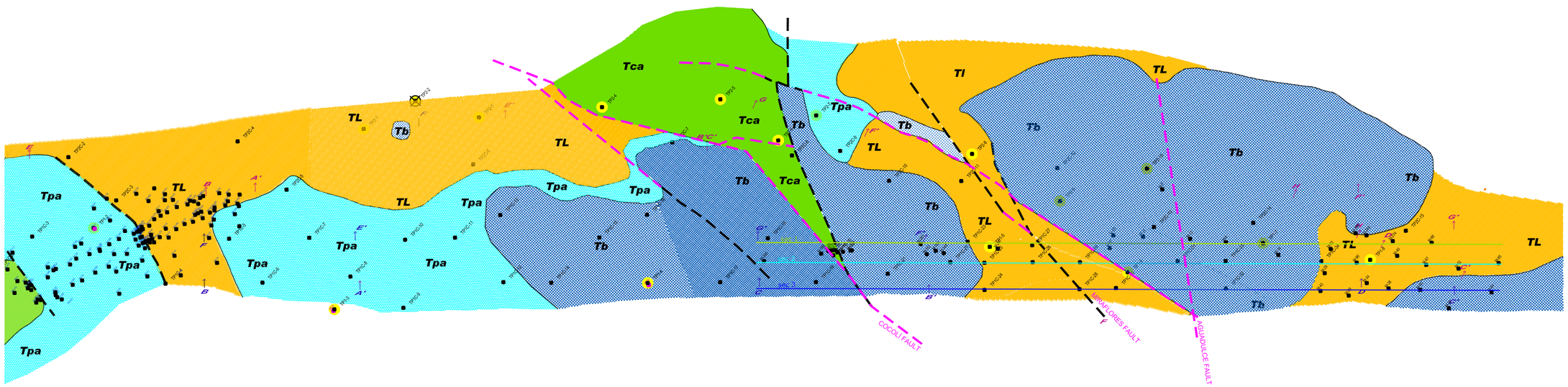


Diseño Conceptual de las Esclusas Post Panamax
Concept Design of New Lock Structure

DOUBLE LIFT CONFIGURATION
CONSTRUCTION PLAN

REV.	DATE	DESCRIPTION	DRAWN	CHECKED	APPROVED
A	10-04-03	FOR REVIEW	BMC	BMC	JMB
-	20-04-03	FOR REVIEW	BMC	MPR	FG

Contract	Scale:	Drawing n°:	Rev.:	Folio
SAA-97462	1/7500	D4- L- 301	A	1 / 1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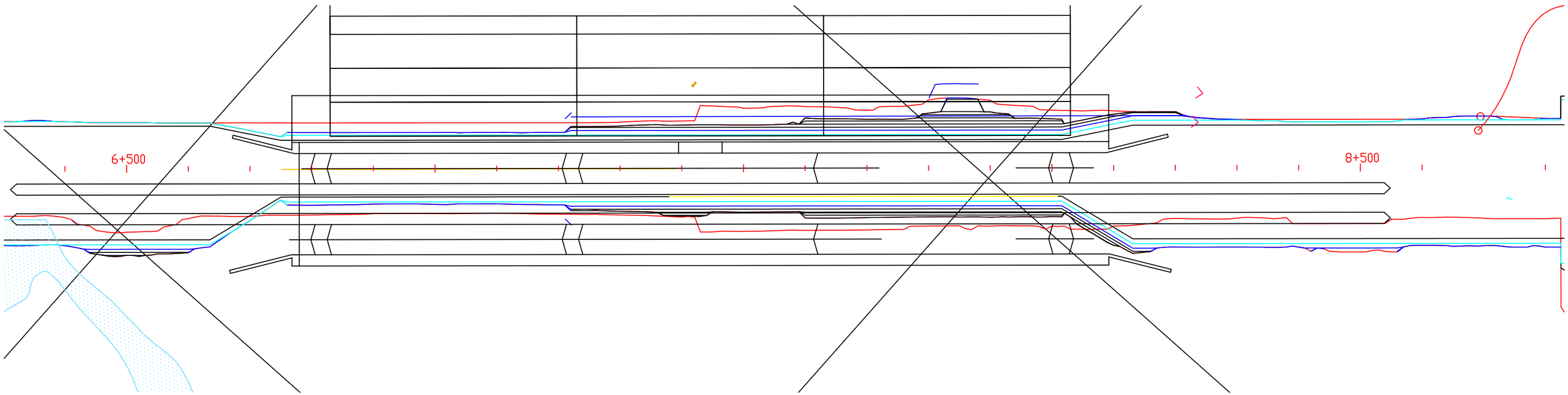
Tl
TL
Tb
Tpa
COCOLI FAULT
MARLORES FAULT
AGUADULCE FAULT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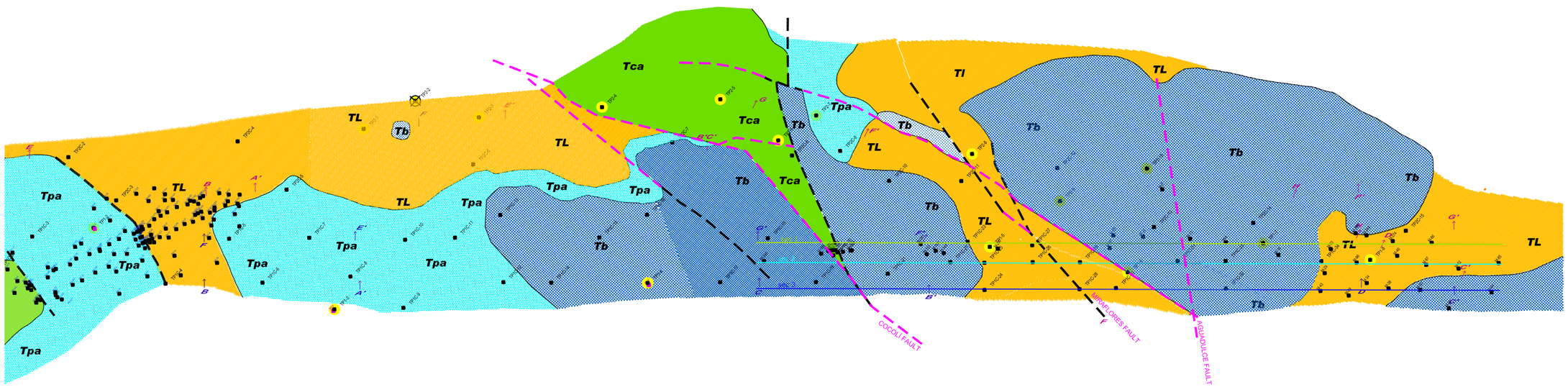
8+500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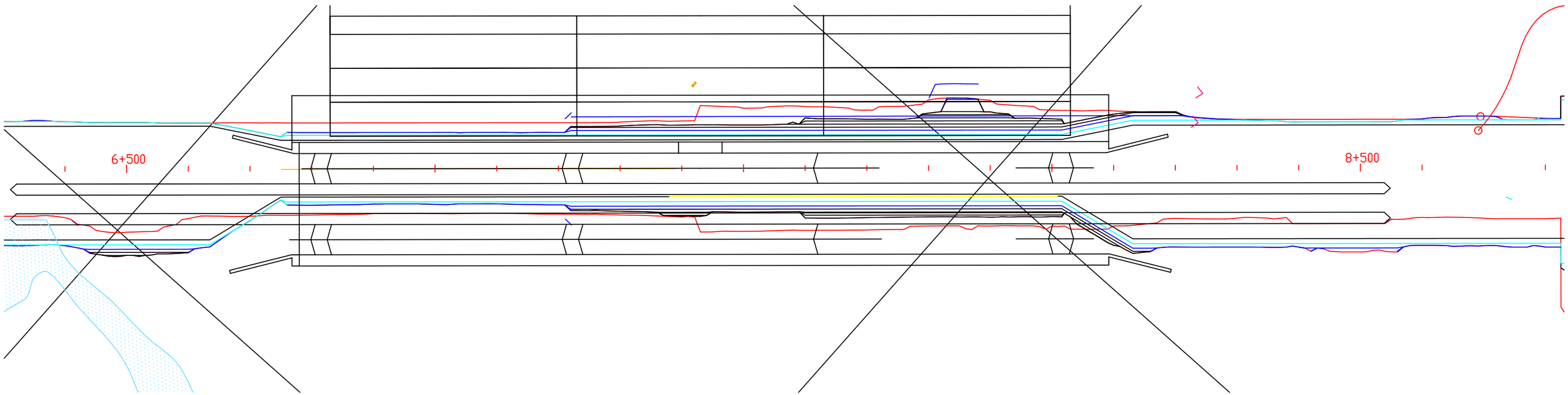
6+500
8+500