Port of Salalah, Oman

QC Structure Inspection

Official Report

Project No.: SLV05

Crane No.: QC09

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Date: 2018-08-10

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1. Project introduction and Crane Information

1.1 Introduction

As requested by Port of Salalah (Hereinafter refer to" PoS"), CES dispatched 3 guys' team to PoS to carry out the specialized structure inspection which purpose of this survey is to identify the structure condition" as is", and aiming at increasing the reliability of the Quay Crane (Hereinafter refer to" QC"), delivering an engineering consultancy service, to evaluate the equipment condition in terms of structure, mechanical and safety aspects through NDT inspections for its QC.

The inspections described in this report do not over-ride local statutory requirements which in all instances must take precedence. Any inspection/s shall be carried out in accordance with locally applicable codes.

Due to the limitation and narrow time frame for the condition survey, only specified areas have been inspected, these areas are locations indicative of stress force locations.

This report, as well as other appendix, such as QC structural inspection deficiency finding list, QC structural crack repair QA report, will be submitted as one package of final official version, which was reviewed and approved after an internal quality control requirement within CES. Any reports or lists that already shared or submitted to PoS, will be applied as a temporary reference version, any conflicts with this version is subject to the official one.

This report, as well as QC structural inspection deficiency finding list, QC structural crack repair QA report, will be submitted in PDF by hard copy.

1.2 Crane Information

Items	Date
Manufacturer of crane	**ZPMC**
Year of construction	**31/May/2000**
Location	**Port of Salalah**
Crane No	**QC09**
Last Structure Inspection date	**2017**
Approx. Running Cycles/Running hours	**29108 hours**
Date of inspection	**August/2018**

2. Inspection Overview

2.1 General Overview

The inspection of the crane will be performed according to the inspection sheets given in the following pages, and the sketches are shown in this report were designed based on the typical ZPMC crane. Any deviation that not listed in below will be adjusted and descripted.

In this report, the information will be given on what is to be inspected, what the inspection methods will be and what is to be tagged (criticality matrix) of each checking points. Any other details or descriptions should refer to the QC structural inspection deficiency finding list.

As part of the report, the DFL (Deficiency Finding List, Appendix I) will be provided in separate documents with location identifications of the details to be inspected, and reference number of DFL to be stated on the inspection sheet.

2.2 General scope of inspection

- Structure and weld inspection NDT inspection
- HS bolts connection inspection
- Coating and paint inspection
- Other mechanical inspection that relevant to safety risk

2.3 Inspection methods

The following inspection methods were adopted during the structural inspections:

- VT: Visual Testing
- UT: Ultrasonic testing
- MT: Magnetic particle testing
- RT: Ring testing

2.4 About the NDT (MT)

About the NDT inspection standards requirement			
Acceptance standards	ANSI/AWS D 1.1 (Clause 6)	Operation standards	ASTM E709
Inspection procedure	JX/TM.MT08	Inspection time	On-line detection
Inspection Percentage	100%	Condition before inspection	Gridded
Visual inspection condition	1250 Lux	Temperature	25-35 C
***Specification for NDT Instrument ***			
Instrument Model	PAIKE-B-310S	Instrument Serial No.	108823

Conjugate type	Electromagnetic conjugate	Elevating power	≥45N
Conjugate methods	Continuous	Sensitivities block	A_1-30/100
Contrast model	WCP 712	Magnetic suspension model	Black INK Ardrox800/3
Contrasting methods	Painting	Steel ruler	MZ-8
Remarks:			

2.5 Applicable inspection Access

To ensure access to most of the locations that listed in this inspection sheets, below access was applied:

- Platforms and walkways equipped on the cranes
- Man-lift (to these locations that can reached-28 meters)
- Platform by forklift
- Rope access (VT backup)

2.6 Crane Component Criticality and actions code definition

2.6.1 Definition of Crane Parts Criticality

General classification of the members into FCM and NFCM members is further divided into the categories of criticality as following:

A	All FCM (Fracture Critical Members) members which failure may result in total collapse of the crane however there is redundancy in load transferring members at the location
B	NFCM (Non- Fracture Critical Members) which failure will not result in collapse of the crane but can result in high damage
C	NFCM (Non- Fracture Critical Members) which failure will not result in collapse of the crane and failure is less likely to occur than other members; can result in high damage

2.6.2 The FCM/NFCM Components and Criticality definition

Ref Nr	Part Name	FCM / NFCM
1	A-frame Forestay connections	FCM
2	A-frame Backstay connections	FCM
3	A-frame	FCM
4	Backstay link	FCM
5	Backstay link Girder connection	FCM
6	Inner Forestay complete	FCM
7	Outer Forestay complete	FCM

8	Backstay Pipes	FCM
9	Backstay pipe Girder connection	FCM
10	A-frame support pipes	FCM
11	Boom Hinge	FCM
12	Girder	FCM
13	Boom	FCM
14	Backstay support	FCM
15	LS TGSB	FCM
16	WS TGSB	FCM
17	Head block and Spreader	FCM
18	LS Legs	NFCM
19	WS Legs	NFCM
20	Sill Beam	NFCM
21	Portal Braces	NFCM
22	Portal Beam	NFCM
23	Back reach	NFCM
24	Outreach	NFCM
25	Trolley	NFCM
26	Boom transverse bracing	NFCM
27	Link Beam Outreach	NFCM
28	Link Beam Mid-Boom	NFCM
29	Machinery House Supports	NFCM
30	Gantry Equalizers	NFCM

2.6.3 Reading of Abbreviations 2 – Location code

A-frame	AF	Including the top parts of forestay bar and back stay bar; APEX
A frame bracing pipe	AFB	A- frame support pipe of both water side and landside
Forestay bar	FS	Including outer forestay, inner forestay, forestay midline,
Back stay	BS	Including backstay support
Trolley girder	TG	Including part of back stay bar, back-reach
Boom	BM	Including part of forestay bar, link beam mid boom and link beam
Trolley girder support beam	TGSB	Including the connection with girder, A frame bracing, and leg
Fixed tie links	FL	Including the bracing pipe and gusset plate
Portal beam	PB	Including the connection with leg
Leg	LG	Including the connection with sill beam
Sill beam	SB	Including the connection between sill beam and gantry adaptor
Gantry	GA	Including the equalizer beam and bogie
Trolley frame	TF	Including the trolley frame and cabin
Trolley rail	TR	Including the trolley rail and trolley rail support
Machinery hose	M-house	Including the bolts

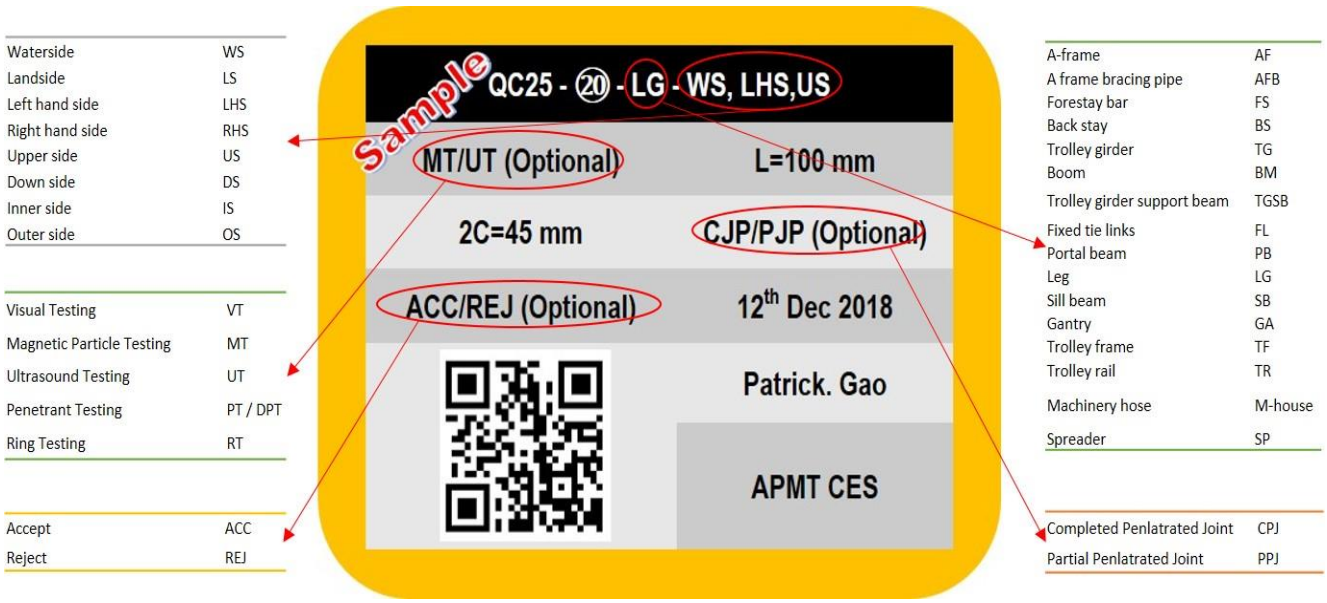
Spreader	SP	Including the spreader and head block

2.6.4 Reading of Abbreviations 2 –Direction code

Waterside	WS
Landside	LS
Left hand side	LHS
Right hand side	RHS
Upper side	US
Down side	DS
Inner side	IS
Outer side	OS

2.6.5 Marking of defects on crane

As only these identified defects will be reported in the DFL, therefore the below marking will be defined nearby the inspection locations to easier understand the links on-site during the further repair activities.



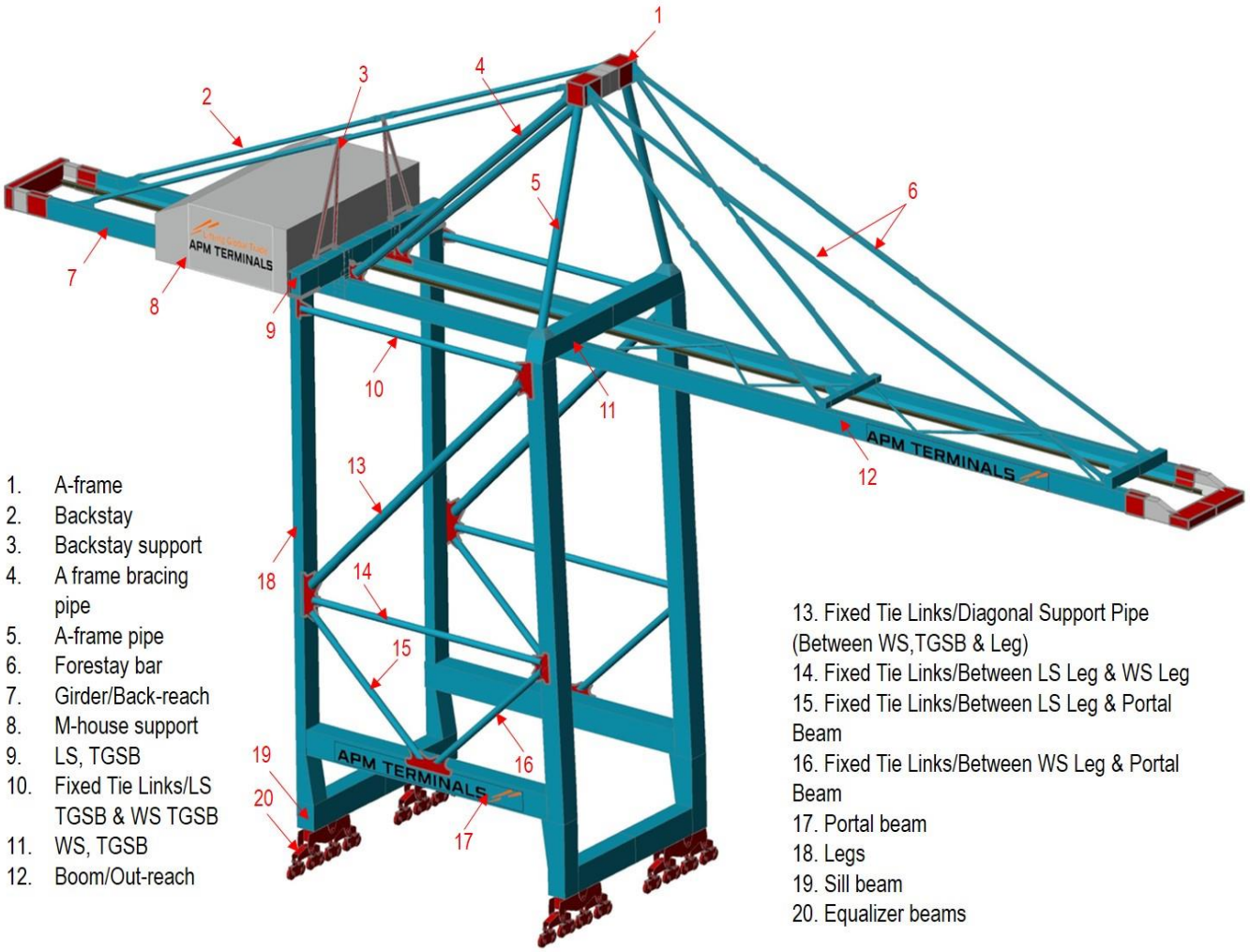
3. The sketches and crane components naming

3.1 The sketches and inspection conduct symbol

The sketches in this report indicating inspection locations are the reference for Inspection sheets to be filled in by person(s) performing the job on site, which inspection conduct symbol as following will be applied in the inspection sheet.

- "√" — No indication
- "X" — Defect found
- "--" — Not checked
- "/" — Not applicable

3.2 Naming of the components



1. A-frame
2. Backstay
3. Backstay support
4. A frame bracing pipe
5. A-frame pipe
6. Forestay bar
7. Girder/Back-reach
8. M-house support
9. LS, TGSB
10. Fixed Tie Links/LS TGSB & WS TGSB
11. WS, TGSB
12. Boom/Out-reach

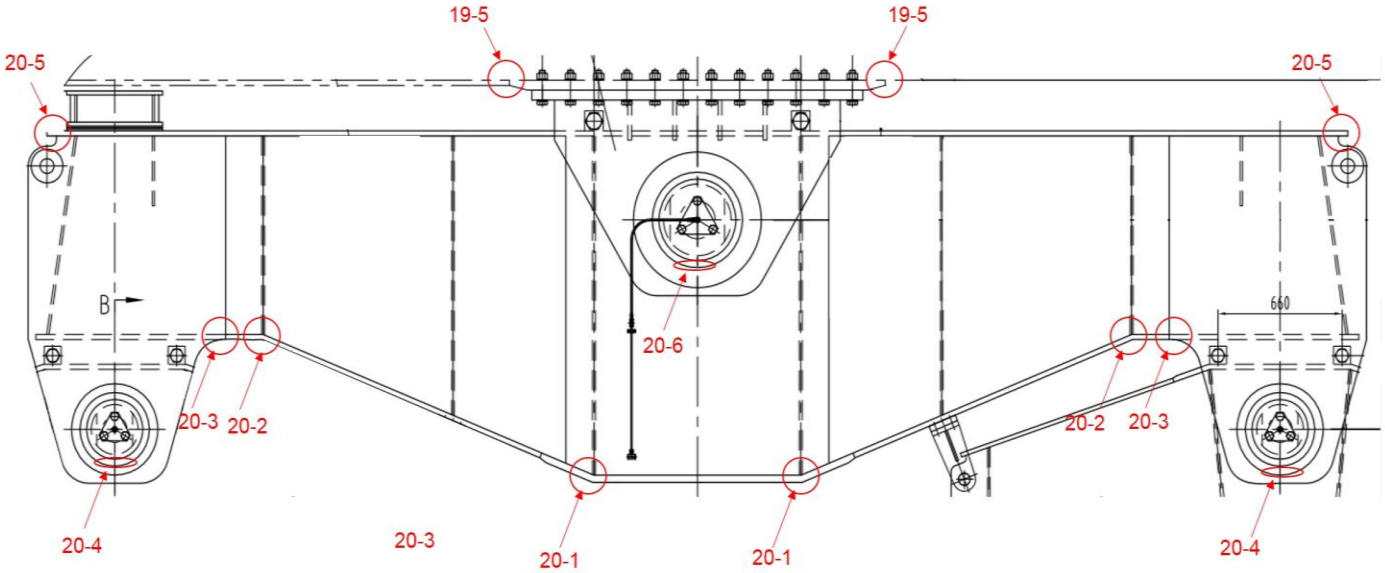
13. Fixed Tie Links/Diagonal Support Pipe (Between WS,TGSB & Leg)
14. Fixed Tie Links/Between LS Leg & WS Leg
15. Fixed Tie Links/Between LS Leg & Portal Beam
16. Fixed Tie Links/Between WS Leg & Portal Beam
17. Portal beam
18. Legs
19. Sill beam
20. Equalizer beams

Ship to Shore Crane (Quay Crane)

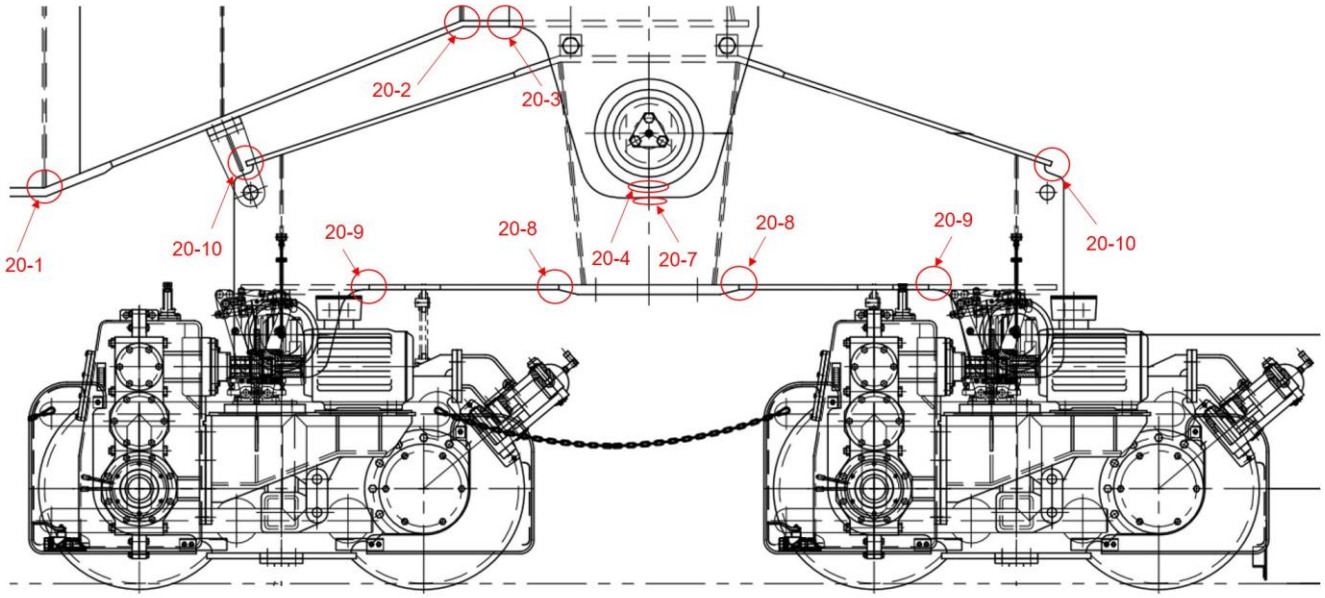
4. The Inspection

4.1 Gantry

- Main equalizer beam
- Middle equalizer beam
- Adapter support
- Bogie



Gantry- Equalizer Beam & Adapter

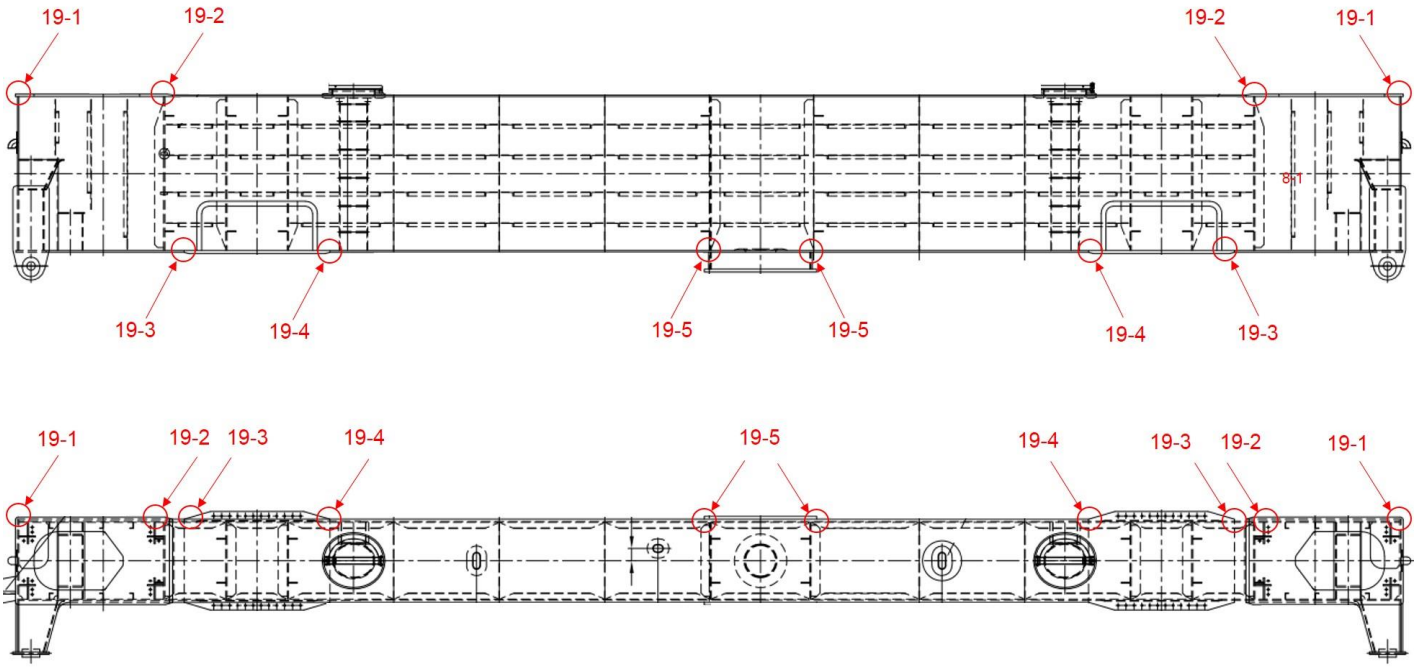


Gantry- Middle Equalizer Beam & Bogie

S/N	Description	Details of Inspection							
		Location	FCM/NFCM	VT	MT	UT	Defects findings	Ref Nr/DFL	Remarks
1	Thick plate welding of equalizer -1	LS,LHS	NFCM	√	√	--	/	/	20-1
2	Thick plate welding of equalizer -2	LS,LHS	NFCM	√	/	/	/	/	20-2
3	Thick plate welding of equalizer -3	LS,LHS	NFCM	√	/	/	/	/	20-3
4	Shaft support plate welding	LS,LHS	NFCM	√	/	/	/	/	20-4
5	Welding of equalizer	LS,LHS	NFCM	√	/	/	/	/	20-5
6-1	Shaft support plate welding	LS,LHS	NFCM	√	X	--	2C=35mm	Item 17	20-6
6-2	Shaft support plate welding	LS,LHS	NFCM	√	√	--	/	/	20-6
7	Shaft support plate welding	LS,LHS	NFCM	√	/	/	/	/	20-7
8	Thick plate welding of equalizer -1	LS,LHS	NFCM	√	/	/	/	/	20-8
9	Thick plate welding of equalizer -2	LS,LHS	NFCM	√	/	/	/	/	20-9
10	Welding of equalizer	LS,LHS	NFCM	√	/	/	/	/	20-10
11	Thick plate welding of equalizer -1	LS,RHS	NFCM	√	√	--	/	/	20-1
12	Thick plate welding of equalizer -2	LS,RHS	NFCM	√	X	--	1C=15mm	Item 01	20-2
13	Thick plate welding of equalizer -3	LS,RHS	NFCM	√	√	√	/	/	20-3
14	Shaft support plate welding	LS,RHS	NFCM	√	√	--	/	/	20-4
15	Welding of equalizer	LS,RHS	NFCM	√	/	/	/	/	20-5
16	Shaft support plate welding	LS,RHS	NFCM	√	√	--	/	/	20-6
17	Shaft support plate welding	LS,RHS	NFCM	√	/	/	/	/	20-7
18	Thick plate welding of equalizer -1	LS,RHS	NFCM	√	/	/	/	/	20-8
19-1	Thick plate welding of equalizer -2	LS,RHS	NFCM	√	√	--	/	/	20-9
19-2	Thick plate welding of equalizer -2	LS,RHS	NFCM	√	√	√	/	/	20-9
20-1	Welding of equalizer	LS,RHS	NFCM	√	√	--	/	/	20-10
20-2	Welding of equalizer	LS,RHS	NFCM	√	√	--	/	/	20-10
21	Thick plate welding of equalizer -1	WS,LHS	NFCM	√	/	/	/	/	20-1
22	Thick plate welding of equalizer -2	WS,LHS	NFCM	√	√	--	/	/	20-2
23	Thick plate welding of equalizer -3	WS,LHS	NFCM	√	/	/	/	/	20-3
24	Shaft support plate welding	WS,LHS	NFCM	√	/	/	/	/	20-4

25	Welding of equalizer	WS,LHS	NFCM	√	/	/	/	/	20-5
26	Shaft support plate welding	WS,LHS	NFCM	√	√	--	/	/	20-6
27	Shaft support plate welding	WS,LHS	NFCM	√	/	/	/	/	20-7
28	Thick plate welding of equalizer -1	WS,LHS	NFCM	√	/	/	/	/	20-8
29	Thick plate welding of equalizer -2	WS,LHS	NFCM	√	/	/	/	/	20-9
30	Welding of equalizer	WS,LHS	NFCM	√	/	/	/	/	20-10
31	Thick plate welding of equalizer -1	WS,RHS	NFCM	√	/	/	/	/	20-1
32	Thick plate welding of equalizer -2	WS,RHS	NFCM	√	/	/	/	/	20-2
33	Thick plate welding of equalizer -3	WS,RHS	NFCM	√	/	/	/	/	20-3
34	Shaft support plate welding	WS,RHS	NFCM	√	/	/	/	/	20-4
35	Welding of equalizer	WS,RHS	NFCM	√	/	/	/	/	20-5
36	Shaft support plate welding	WS,RHS	NFCM	√	/	/	/	/	20-6
37	Shaft support plate welding	WS,RHS	NFCM	√	/	/	/	/	20-7
38	Thick plate welding of equalizer -1	WS,RHS	NFCM	√	/	/	/	/	20-8
39	Thick plate welding of equalizer -2	WS,RHS	NFCM	√	/	/	/	/	20-9
40	Welding of equalizer	WS,RHS	NFCM	√	/	/	/	/	20-10
41	Welds of adapter	LS,RHS	NFCM	√	√	--	/	/	N.A
42	Adapter support bolts	N.A	N.A	√	/	/	/	/	N.A
43	Equalizer beam adjustment bolts	N.A	N.A	√	/	/	/	/	N.A

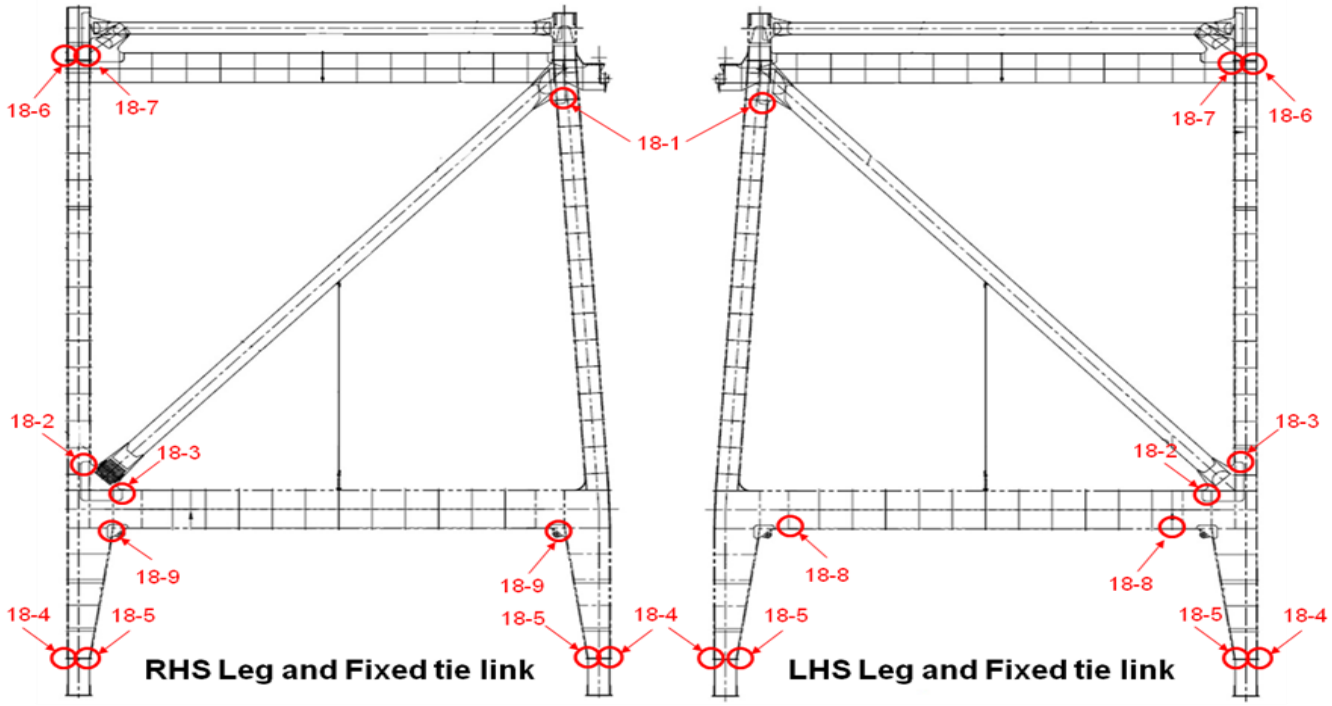
4.2 Sill Beams



LS & WS Sill Beams

S/N	Description	Details of Inspection							
		Location	FCM/NFCM	VT	MT	UT	Defects findings	Ref Nr/DFL	Remarks
1	Assembly weld with Leg -1	LS,LHS,OS	FCM	√	/	/	/	/	19-1
2	Assembly weld with Leg -2	LS,LHS,OS	FCM	√	/	/	/	/	19-2
3	Thick plate welding of Sill beam -1	LS,LHS,OS	NFCM	√	√	--	/	/	19-3
4	Thick plate welding of Sill beam -2	LS,LHS,OS	NFCM	√	√	--	/	/	19-4
5	Weld with anchor	LS,LHS,OS	NFCM	√	/	/	/	/	19-5
6	Assembly weld with Leg -1	LS,LHS,IS	FCM	√	/	/	/	/	19-1
7	Assembly weld with Leg -2	LS,LHS,IS	FCM	√	√	--	/	/	19-2
8	Thick plate welding of Sill beam -1	LS,LHS,IS	NFCM	√	X	--	1C=300mm	Item 18	19-3
9	Thick plate welding of Sill beam -2	LS,LHS,IS	NFCM	√	√	--	/	/	19-4
10	Weld with anchor	LS,LHS,IS	NFCM	√	/	/	/	/	19-5
11	Assembly weld with Leg -1	LS,RHS,OS	FCM	√	/	/	/	/	19-1
12	Assembly weld with Leg -2	LS,RHS,OS	FCM	√	√	--	/	/	19-2
13	Thick plate welding of Sill beam -1	LS,RHS,OS	NFCM	√	√	√	/	/	19-3
14	Thick plate welding of Sill beam -2	LS,RHS,OS	NFCM	√	√	√	/	/	19-4

15	Weld with anchor	LS,RHS,OS	NFCM	√	/	/	/	/	19-5
16	Assembly weld with Leg -1	LS,RHS,IS	FCM	√	/	/	/	/	19-1
17	Assembly weld with Leg -2	LS,RHS,IS	FCM	√	√	--	/	/	19-2
18-1	Thick plate welding of Sill beam -1	LS,RHS,IS	NFCM	√	√	--	/	/	19-3
18-2	Thick plate welding of Sill beam -1	LS,RHS,IS	NFCM	√	√	--	/	/	19-3
19	Thick plate welding of Sill beam -2	LS,RHS,IS	NFCM	√	/	/	/	/	19-4
20	Weld with anchor	LS,RHS,IS	NFCM	√	√	--	/	/	19-5
21	Assembly weld with Leg -1	WS,LHS,OS	FCM	√	/	/	/	/	19-1
22	Assembly weld with Leg -2	WS,LHS,OS	FCM	√	/	/	/	/	19-2
23	Thick plate welding of Sill beam -1	WS,LHS,OS	NFCM	√	/	/	/	/	19-3
24	Thick plate welding of Sill beam -2	WS,LHS,OS	NFCM	√	/	/	/	/	19-4
25	Weld with anchor	WS,LHS,OS	NFCM	√	/	/	/	/	19-5
26	Assembly weld with Leg -1	WS,LHS,IS	FCM	√	/	/	/	/	19-1
27	Assembly weld with Leg -2	WS,LHS,IS	FCM	√	/	/	/	/	19-2
28	Thick plate welding of Sill beam -1	WS,LHS,IS	NFCM	√	/	/	/	/	19-3
29	Thick plate welding of Sill beam -2	WS,LHS,IS	NFCM	√	/	/	/	/	19-4
30	Weld with anchor	WS,LHS,IS	NFCM	√	/	/	/	/	19-5
31	Assembly weld with Leg -1	WS,RHS,OS	FCM	√	/	/	/	/	19-1
32	Assembly weld with Leg -2	WS,RHS,OS	FCM	√	/	/	/	/	19-2
33	Thick plate welding of Sill beam -1	WS,RHS,OS	NFCM	√	√	--	/	/	19-3
34	Thick plate welding of Sill beam -2	WS,RHS,OS	NFCM	√	/	/	/	/	19-4
35	Weld with anchor	WS,RHS,OS	NFCM	√	/	/	/	/	19-5
36	Assembly weld with Leg -1	WS,RHS,IS	FCM	√	/	/	/	/	19-1
37	Assembly weld with Leg -2	WS,RHS,IS	FCM	√	/	/	/	/	19-2
38	Thick plate welding of Sill beam -1	WS,RHS,IS	NFCM	√	/	/	/	/	19-3
39	Thick plate welding of Sill beam -2	WS,RHS,IS	NFCM	√	/	/	/	/	19-4
40	Weld with anchor	WS,RHS,IS	NFCM	√	/	/	/	/	19-5
41	Structure & paint inspection inside	N.A	N.A	√	/	/	/	/	N.A
42	Structure connection bolts with leg	N.A	N.A	√	/	/	/	/	N.A

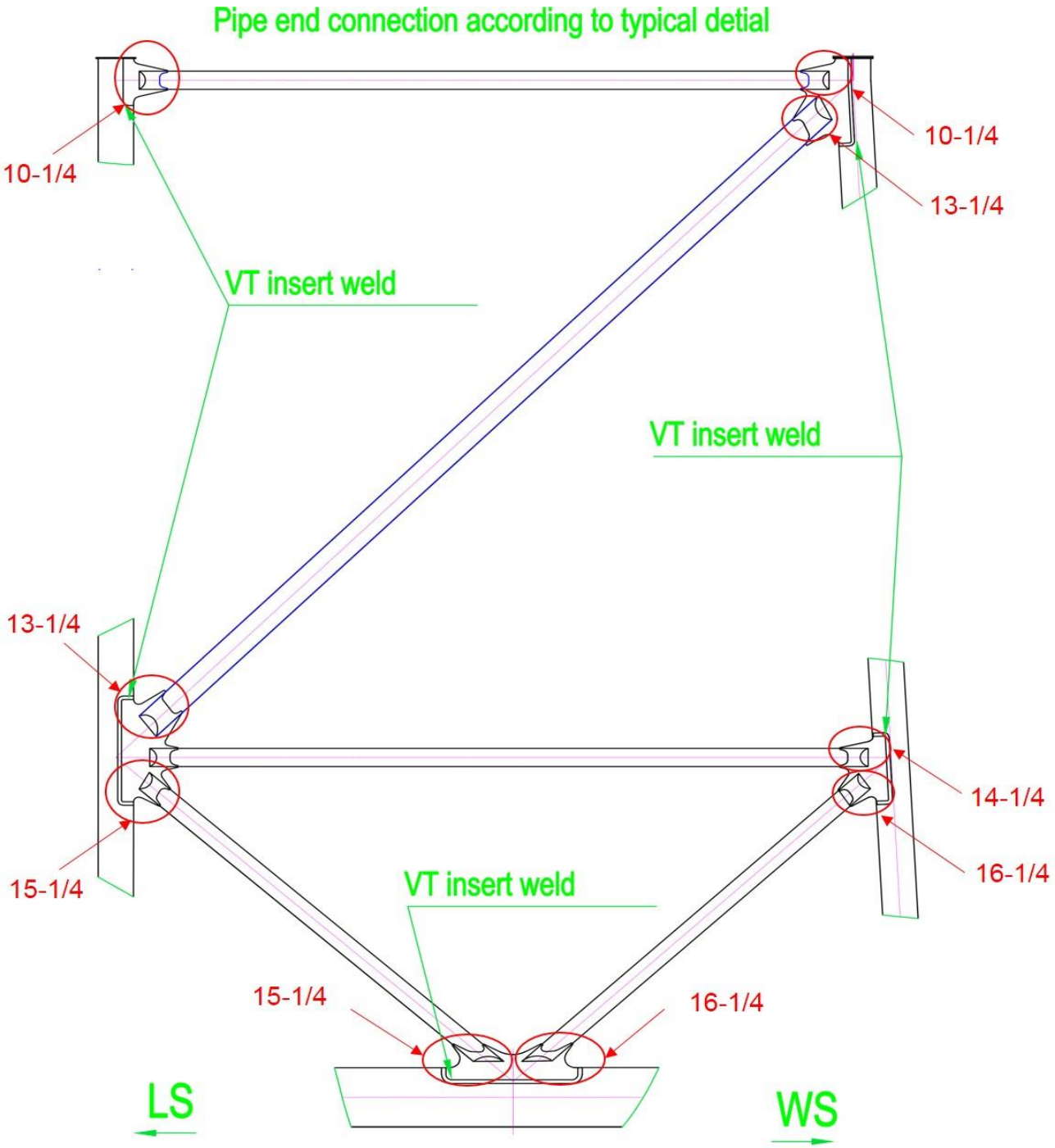


4.3 Legs

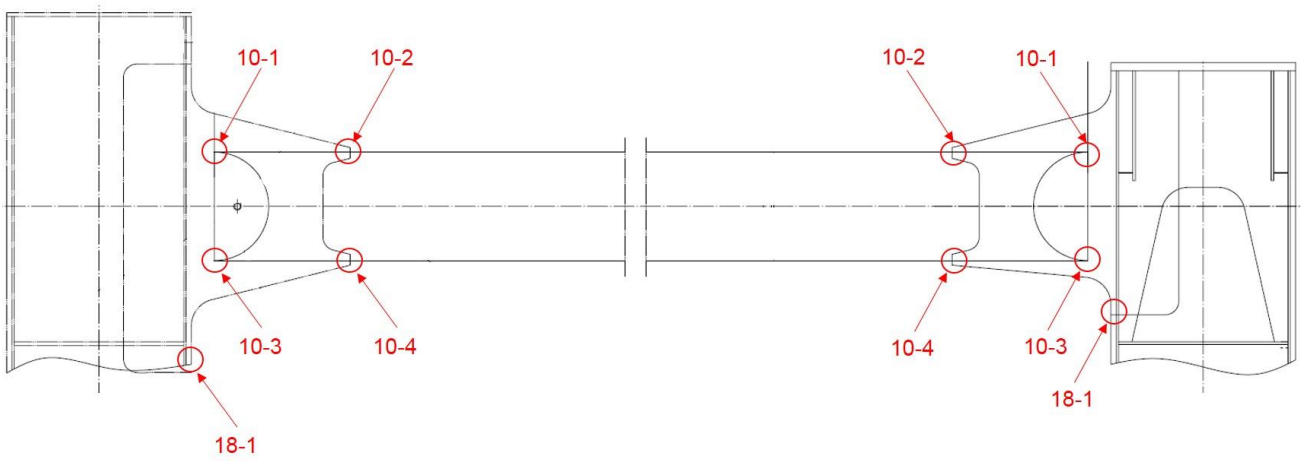
S/N	Description	Details of Inspection							
		Location	FCM/NFCM	VT	MT	UT	Defects findings	Ref Nr/DFL	Remarks
1	Assembly welds with WS. TGSB	WS,LHS	NFCM	√	/	/	/	/	18-1
2	Thick plate weld of fixed tie link	LS,LHS	NFCM	√	/	/	/	/	18-2
3-1	Thick plate weld of fixed tie link	LS,LHS	NFCM	√	√	--	/	/	18-3
3-2	Thick plate weld of fixed tie link	LS,LHS	NFCM	√	√	--	/	/	18-3
4	Assembly weld with Sill beam	LS,LHS	FCM	√	/	/	/	/	18-4
5	Assembly weld with Sill beam	LS,LHS	FCM	√	/	/	/	/	18-5
6	Assembly weld with LS. TGSB	LS,LHS	FCM	√	/	/	/	/	18-6
7	Assembly weld with LS. TGSB	LS,LHS	FCM	√	√	√	/	/	18-7
8	Assembly weld with portal beam	LS,LHS	NFCM	√	/	/	/	/	18-8
9	Assembly weld with lower flange	N.A	N.A	/	/	/	/	/	18-9
10	Assembly welds with WS. TGSB	WS,RHS	NFCM	√	√	√	/	/	18-1
11	Thick plate weld of fixed tie link	LS,RHS	NFCM	√	/	/	/	/	18-2
12	Thick plate weld of fixed tie link	LS,RHS	NFCM	√	/	/	/	/	18-3

13	Assembly weld with Sill beam	LS,RHS	FCM	√	/	/	/	/	18-4
14	Assembly weld with Sill beam	LS,RHS	FCM	√	√	√	/	/	18-5
15	Assembly weld with LS. TGSB	LS,RHS	FCM	√	/	/	/	/	18-6
16-1	Assembly weld with LS. TGSB	LS,RHS	FCM	√	X	--	1C=10mm	Item 09	18-7
16-2	Assembly weld with LS. TGSB	LS,RHS	FCM	√	√	√	/	/	18-7
16-3	Assembly weld with LS. TGSB	LS,RHS	FCM	√	√	√	/	/	18-7
17	Assembly weld with portal beam	LS,RHS	NFCM	√	/	/	/	/	18-8
18	Assembly weld with lower flange	N.A	N.A	/	/	/	/	/	18-9
19	Assembly weld with WS. TGSB	WS,LHS	NFCM	√	/	/	/	/	18-1
20	Thick plate weld of fixed tie link	WS,LHS	NFCM	√	/	/	/	/	18-2
21	Thick plate weld of fixed tie link	WS,LHS	NFCM	√	/	/	/	/	18-3
22	Assembly weld with Sill beam	WS,LHS	FCM	√	/	/	/	/	18-4
23	Assembly weld with Sill beam	WS,LHS	FCM	√	/	/	/	/	18-5
24	Assembly weld with LS. TGSB	WS,LHS	FCM	√	√	√	/	/	18-6
25	Assembly weld with LS. TGSB	WS,LHS	FCM	√	√	--	/	/	18-7
26	Assembly weld with portal beam	WS,LHS	NFCM	√	/	/	/	/	18-8
27	Assembly weld with lower flange	N.A	N.A	/	/	/	/	/	18-9
28	Assembly weld with WS. TGSB	WS,RHS	NFCM	√	/	/	/	/	18-1
29	Thick plate weld of fixed tie link	WS,RHS	NFCM	√	/	/	/	/	18-2
30	Thick plate weld of fixed tie link	WS,RHS	NFCM	√	/	/	/	/	18-3
31	Assembly weld with Sill beam	WS,RHS	FCM	√	/	/	/	/	18-4
32	Assembly weld with Sill beam	WS,RHS	FCM	√	/	/	/	/	18-5
33	Assembly weld with WS. TGSB	WS,RHS	FCM	√	√	√	/	/	18-6
34	Assembly weld with WS. TGSB	WS,RHS	FCM	√	/	/	/	/	18-7
35	Assembly weld with portal beam	WS,RHS	NFCM	√	/	/	/	/	18-8
36	Assembly weld with lower flange	N.A	N.A	/	/	/	/	/	18-9
37	Structure connection bolts of Leg	N.A	N.A	√	/	/	/	/	N.A
38	Structure & paint inspection inside	N.A	N.A	√	/	/	/	/	N.A

4.4 Fixed tie links and pipe connections



Fixed tie link connection system



Fixed Tie Link - LS.TGSB & WS.TGSB

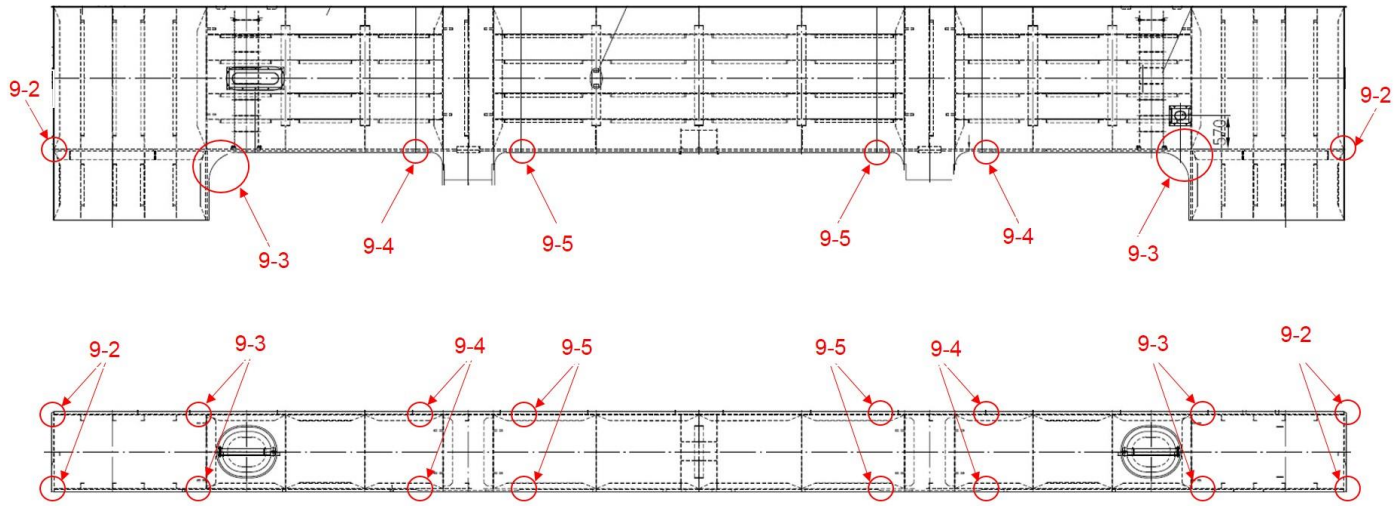
S/N	Description	Details of Inspection							
		Location	FCM/NFCM	VT	MT	UT	Defects findings	Ref Nr/DFL	Remarks
1	Gusset plate weld with pipe	LS,LHS	NFCM	√	/	/	/	/	10-1
2	Seal/cover plate weld with pipe	LS,LHS	NFCM	√	/	/	/	/	10-2
3	Gusset plate weld with pipe	LS,LHS	NFCM	√	/	/	/	/	10-3
4	Seal/cover plate weld with pipe	LS,LHS	NFCM	√	/	/	/	/	10-4
5	Gusset plate weld with pipe	LS,RHS	NFCM	√	√	--	/	/	10-1
6	Seal/cover plate weld with pipe	LS,RHS	NFCM	√	/	/	/	/	10-2
7	Gusset plate weld with pipe	LS,RHS	NFCM	√	/	/	/	/	10-3
8	Seal/cover plate weld with pipe	LS,RHS	NFCM	√	/	/	/	/	10-4
9	Gusset plate weld with pipe	WS,LHS	NFCM	√	/	/	/	/	10-1
10	Seal/cover plate weld with pipe	WS,LHS	NFCM	√	/	/	/	/	10-2
11	Gusset plate weld with pipe	WS,LHS	NFCM	√	/	/	/	/	10-3
12	Seal/cover plate weld with pipe	WS,LHS	NFCM	√	/	/	/	/	10-4
13	Gusset plate weld with pipe	WS,RHS	NFCM	√	/	/	/	/	10-1
14	Seal/cover plate weld with pipe	WS,RHS	NFCM	√	/	/	/	/	10-2
15	Gusset plate weld with pipe	WS,RHS	NFCM	√	/	/	/	/	10-3
16	Seal/cover plate weld with pipe	WS,RHS	NFCM	√	/	/	/	/	10-4
17	Gusset plate weld with pipe	LHS	NFCM	√	√	--	/	/	13-1
18	Seal/cover plate weld with pipe	LHS	NFCM	√	/	/	/	/	13-2

19	Gusset plate weld with pipe	LHS	NFCM	√	/	/	/	/	13-3
20	Seal/cover plate weld with pipe	LHS	NFCM	√	/	/	/	/	13-4
21	Gusset plate weld with pipe	RHS	NFCM	√	√	--	/	/	13-1
22	Seal/cover plate weld with pipe	RHS	NFCM	√	/	/	/	/	13-2
23	Gusset plate weld with pipe	RHS	NFCM	√	/	/	/	/	13-3
24	Seal/cover plate weld with pipe	RHS	NFCM	√	/	/	/	/	13-4
25	Gusset plate weld with pipe	LHS	NFCM	√	/	/	/	/	14-1
26	Seal/cover plate weld with pipe	LHS	NFCM	√	/	/	/	/	14-2
27	Gusset plate weld with pipe	LHS	NFCM	√	/	/	/	/	14-3
28	Seal/cover plate weld with pipe	LHS	NFCM	√	/	/	/	/	14-4
29	Gusset plate weld with pipe	RHS	NFCM	√	/	/	/	/	14-1
30	Seal/cover plate weld with pipe	RHS	NFCM	√	/	/	/	/	14-2
31	Gusset plate weld with pipe	RHS	NFCM	√	/	/	/	/	14-3
32	Seal/cover plate weld with pipe	RHS	NFCM	√	/	/	/	/	14-4
33	Gusset plate weld with pipe	LHS	NFCM	√	√	--	/	/	15-1
34	Seal/cover plate weld with pipe	LHS	NFCM	√	√	--	/	/	15-2
35	Gusset plate weld with pipe	LHS	NFCM	√	/	/	/	/	15-3
36	Seal/cover plate weld with pipe	LHS	NFCM	√	/	/	/	/	15-4
37-1	Gusset plate weld with pipe	RHS	NFCM	√	X	--	3C=120mm	Item 03	15-1
37-2	Gusset plate weld with pipe	RHS	NFCM	√	√	--	/	/	15-1
38	Seal/cover plate weld with pipe	RHS	NFCM	√	/	/	/	/	15-2
39	Gusset plate weld with pipe	RHS	NFCM	√	/	/	/	/	15-3
40	Seal/cover plate weld with pipe	RHS	NFCM	√	/	/	/	/	15-4
41-1	Gusset plate weld with pipe	LHS	NFCM	√	√	--	/	/	16-1
41-2	Gusset plate weld with pipe	LHS	NFCM	√	√	--	/	/	16-1
42	Seal/cover plate weld with pipe	LHS	NFCM	√	/	/	/	/	16-2
43	Gusset plate weld with pipe	LHS	NFCM	√	/	/	/	/	16-3
44	Seal/cover plate weld with pipe	LHS	NFCM	√	/	/	/	/	16-4
45-1	Gusset plate weld with pipe	RHS	NFCM	√	X	--	1C=10mm	Item 02	16-1
45-2	Gusset plate weld with pipe	RHS	NFCM	√	√	--	/	/	16-1

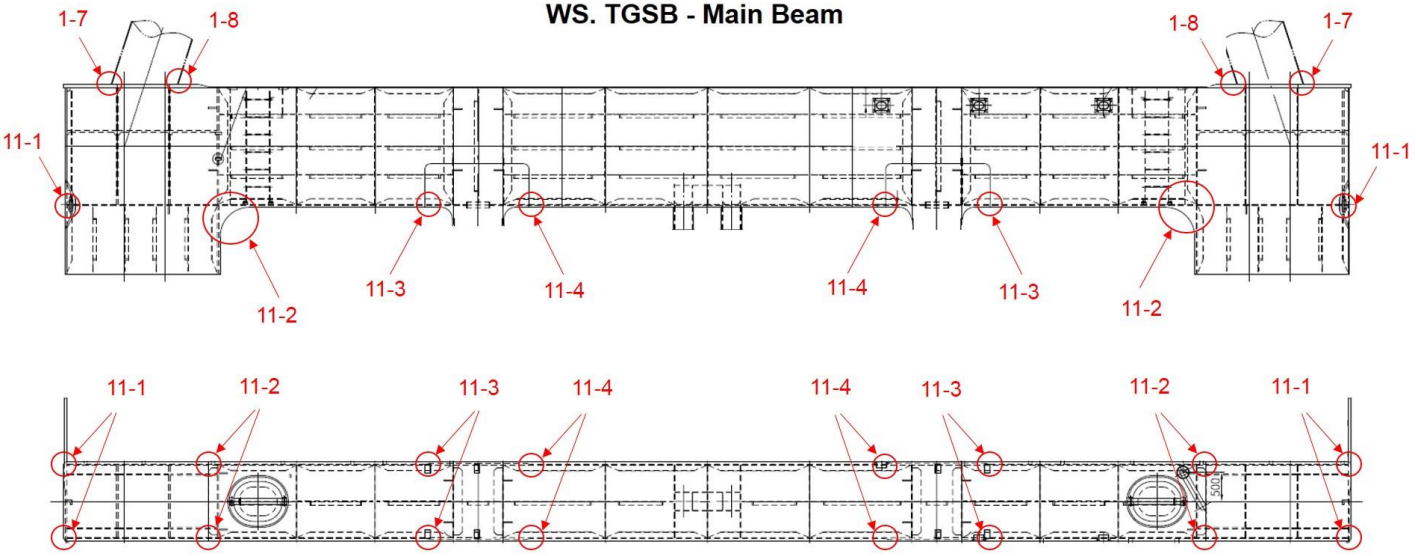
46	Seal/cover plate weld with pipe	RHS	NFCM	√	√	--	/	/	16-2
47	Gusset plate weld with pipe	RHS	NFCM	√	/	/	/	/	16-3
48	Seal/cover plate weld with pipe	RHS	NFCM	√	/	/	/	/	16-4
49	Structure connection bolts	N.A	N.A	√	/	/	/	/	N.A

4.5 TGSB

LS.TGSB – Main Beam



WS. TGSB - Main Beam

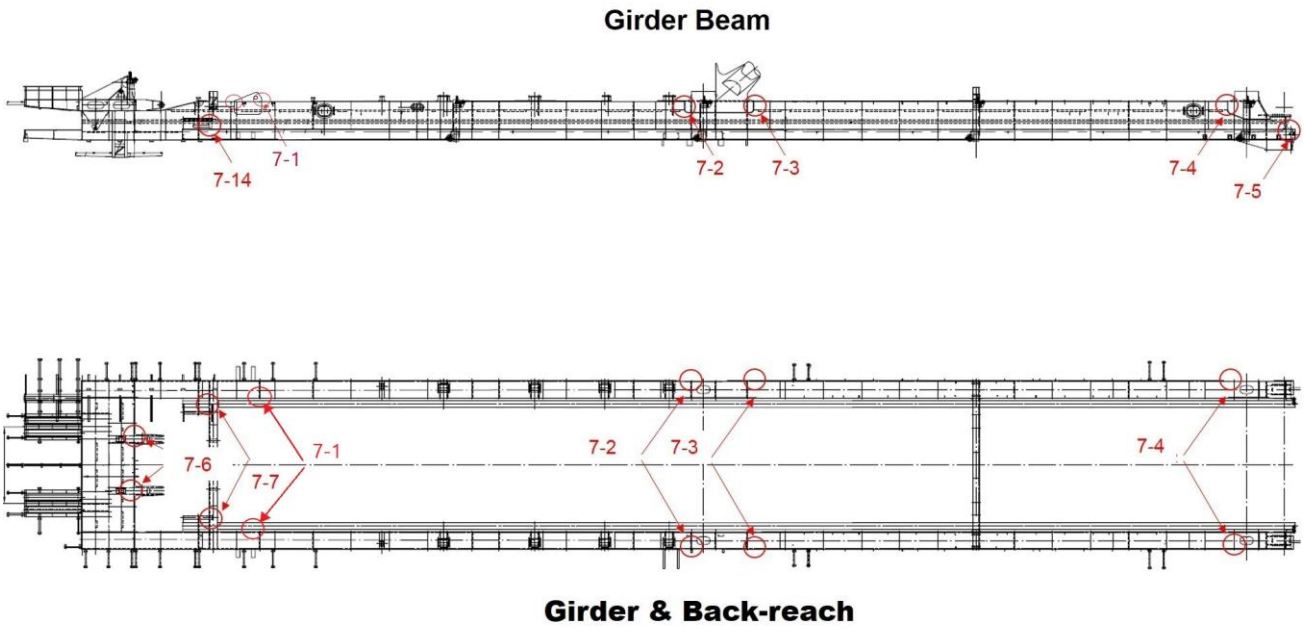


S/N	Description	Details of Inspection							
		Location	FCM/NFCM	VT	MT	UT	Defects findings	Ref Nr/DFL	Remarks
1	TGSB main weld	LS,RHS	FCM	√	√	--	/	/	9-1
2	TGSB main weld	LS,LHS	FCM	√	/	/	/	/	9-1
3	Assembly weld with Leg	LS,LHS,OS	FCM	√	/	/	/	/	9-2
4	Thick to thin plate weld	LS,LHS,OS	FCM	√	√	--	/	/	9-3
5	Assembly weld with girder	LS,LHS,OS	FCM	√	/	/	/	/	9-4
6	Assembly weld with girder	LS,LHS,OS	FCM	√	/	/	/	/	9-5
7	Assembly weld with Leg	LS,LHS,IS	FCM	√	/	/	/	/	9-2
8	Thick to thin plate weld	LS,LHS,IS	FCM	√	√	√	/	/	9-3
9	Assembly weld with girder	LS,LHS,IS	FCM	√	/	/	/	/	9-4
10	Assembly weld with girder	LS,LHS,IS	FCM	√	/	/	/	/	9-5
11	Assembly weld with Leg	LS,RHS,OS	FCM	√	√	--	/	/	9-2
12	Thick to thin plate weld	LS,RHS,OS	FCM	√	/	/	/	/	9-3
13	Assembly weld with girder	LS,RHS,OS	FCM	√	√	--	/	/	9-4
14	Assembly weld with girder	LS,RHS,OS	FCM	√	/	/	/	/	9-5
15	Assembly weld with Leg	LS,RHS,IS	FCM	√	√	√	/	/	9-2
16	Thick to thin plate weld	LS,RHS,IS	FCM	√	√	√	/	/	9-3
17	Assembly weld with girder	LS,RHS,IS	FCM	√	/	/	/	/	9-4
18	Assembly weld with girder	LS,RHS,IS	FCM	√	/	/	/	/	9-5
19	Assembly weld with Leg	WS,LHS,OS	FCM	√	/	/	/	/	9-2
20	Thick to thin plate weld	WS,LHS,OS	FCM	√	/	/	/	/	9-3
21	Assembly weld with girder	WS,LHS,OS	FCM	√	/	/	/	/	9-4
22	Assembly weld with girder	WS,LHS,OS	FCM	√	/	/	/	/	9-5
23	Assembly weld with Leg	WS,LHS,IS	FCM	√	/	/	/	/	9-2
24	Thick to thin plate weld	WS,LHS,IS	FCM	√	/	/	/	/	9-3
25	Assembly weld with girder	WS,LHS,IS	FCM	√	/	/	/	/	9-4
26	Assembly weld with girder	WS,LHS,IS	FCM	√	/	/	/	/	9-5
27	Assembly weld with Leg	WS,RHS,OS	FCM	√	/	/	/	/	9-2
28	Thick to thin plate weld	WS,RHS,OS	FCM	√	/	/	/	/	9-3

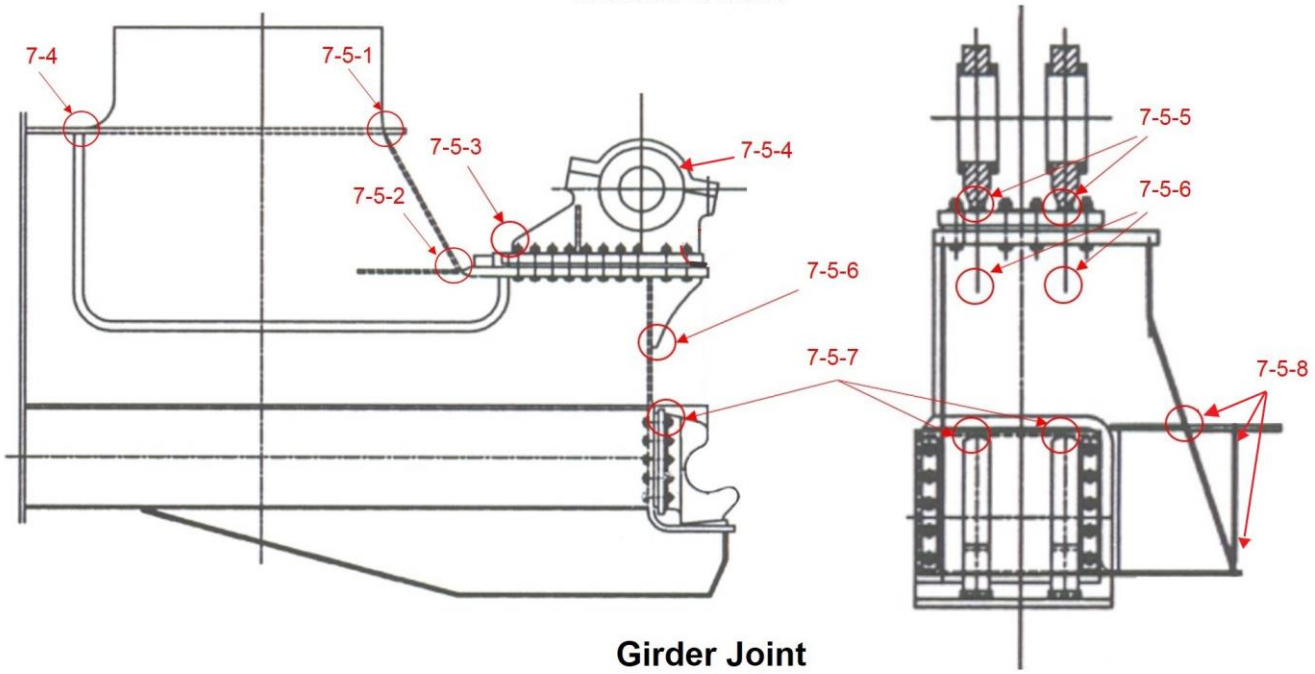
29	Assembly weld with girder	WS,RHS,OS	FCM	√	/	/	/	/	9-4
30	Assembly weld with girder	WS,RHS,OS	FCM	√	/	/	/	/	9-5
31	Assembly weld with Leg	WS,RHS,IS	FCM	√	/	/	/	/	9-2
32	Thick to thin plate weld	WS,RHS,IS	FCM	√	/	/	/	/	9-3
33	Assembly weld with girder	WS,RHS,IS	FCM	√	/	/	/	/	9-4
34	Assembly weld with girder	WS,RHS,IS	FCM	√	/	/	/	/	9-5
35	Assembly weld with Leg	LS,LHS,OS	FCM	√	/	/	/	/	11-1
36	Thick to thin plate weld	LS,LHS,OS	FCM	√	/	/	/	/	11-2
37	Assembly weld with girder	LS,LHS,OS	FCM	√	/	/	/	/	11-3
38	Assembly weld with girder	LS,LHS,OS	FCM	√	/	/	/	/	11-4
39	Assembly weld with Leg	LS, LHS,IS	FCM	√	/	/	/	/	11-1
40	Thick to thin plate weld	LS, LHS,IS	FCM	√	/	/	/	/	11-2
41	Assembly weld with girder	LS, LHS,IS	FCM	√	/	/	/	/	11-3
42	Assembly weld with girder	LS, LHS,IS	FCM	√	/	/	/	/	11-4
43	Assembly weld with Leg	LS,RHS,OS	FCM	√	/	/	/	/	11-1
44	Thick to thin plate weld	LS,RHS,OS	FCM	√	/	/	/	/	11-2
45	Assembly weld with girder	LS,RHS,OS	FCM	√	/	/	/	/	11-3
46	Assembly weld with girder	LS,RHS,OS	FCM	√	/	/	/	/	11-4
47	Assembly weld with Leg	LS,RHS,IS	FCM	√	√	--	/	/	11-1
48	Thick to thin plate weld	LS,RHS,IS	FCM	√	/	/	/	/	11-2
49	Assembly weld with girder	LS,RHS,IS	FCM	√	/	/	/	/	11-3
50	Assembly weld with girder	LS,RHS,IS	FCM	√	/	/	/	/	11-4
51	Assembly weld with Leg	WS,LHS,OS	FCM	√	/	/	/	/	11-1
52	Thick to thin plate weld	WS,LHS,OS	FCM	√	/	/	/	/	11-2
53	Assembly weld with girder	WS,LHS,OS	FCM	√	/	/	/	/	11-3
54	Assembly weld with girder	WS,LHS,OS	FCM	√	/	/	/	/	11-4
55	Assembly weld with Leg	WS,LHS,IS	FCM	√	√	√	/	/	11-1
56	Thick to thin plate weld	WS,LHS,IS	FCM	√	/	/	/	/	11-2
57	Assembly weld with girder	WS,LHS,IS	FCM	√	/	/	/	/	11-3
58	Assembly weld with girder	WS,LHS,IS	FCM	√	/	/	/	/	11-4

59	Assembly weld with Leg	WS,RHS,OS	FCM	√	√	--	/	/	11-1
60	Thick to thin plate weld	WS,RHS,OS	FCM	√	√	√	/	/	11-2
61	Assembly weld with girder	WS,RHS,OS	FCM	√	√	--	/	/	11-3
62	Assembly weld with girder	WS,RHS,OS	FCM	√	/	/	/	/	11-4
63	Assembly weld with Leg	WS,RHS,IS	FCM	√	/	/	/	/	11-1
64	Thick to thin plate weld	WS,RHS,IS	FCM	√	√	√	/	/	11-2
65-1	Assembly weld with girder	WS,RHS,IS	FCM	√	√	--	/	/	11-3
65-2	Assembly weld with girder	WS,RHS,IS	FCM	√	√	--	/	/	11-3
66	Assembly weld with girder	WS,RHS,IS	FCM	√	√	--	/	/	11-4
67	Structure & paint inspection inside	N.A	N.A	√	/	/	/	/	N.A
68	Structure connection bolts	N.A	N.A	√	/	/	/	/	N.A

4.6 Girder & Back-reach



Girder Joint



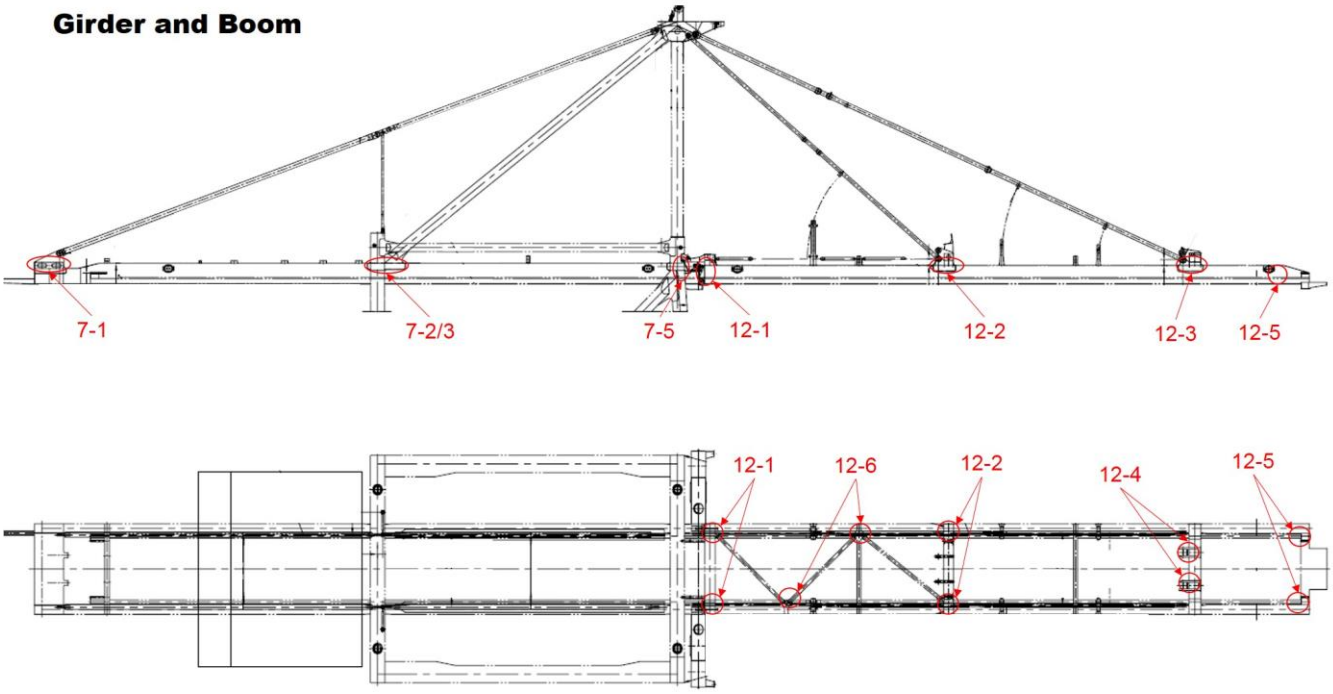
Girder Joint

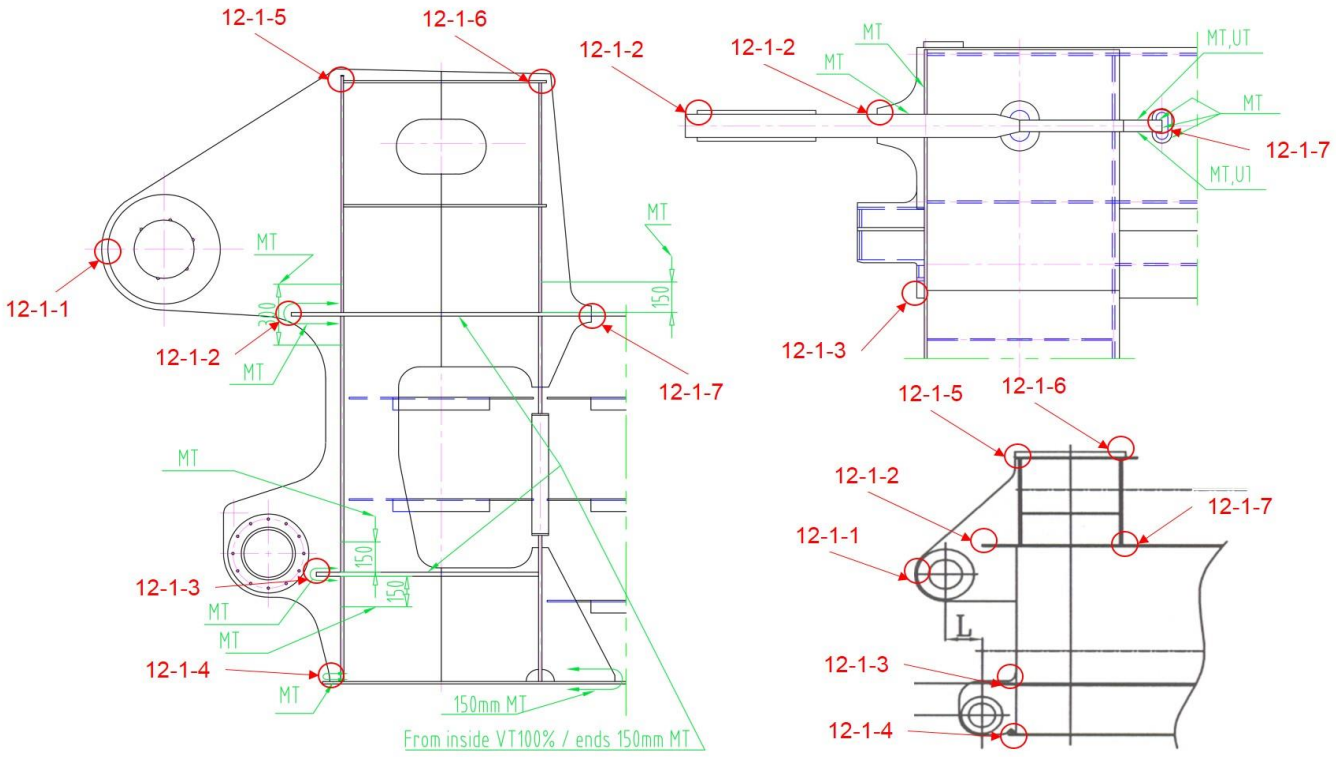
S/N	Description	Details of Inspection							
		Location	FCM/NFCM	VT	MT	UT	Defects findings	Ref Nr/DFL	Remarks
1	Thick to thin plate weld	LHS	FCM	√	√	√	/	/	7-1
2	Thick to thin plate weld	LHS	FCM	√	/	/	/	/	7-2
3	Thick to thin plate weld	LHS	FCM	√	X	--	1C=30mm	Item 14	7-3
4	Thick to thin plate weld	LHS	FCM	√	/	/	/	/	7-4
5	Thick to thin plate weld	RHS	FCM	√	√	√	/	/	7-1
6	Thick to thin plate weld	RHS	FCM	√	√	√	/	/	7-2
7	Thick to thin plate weld	RHS	FCM	√	√	√	/	/	7-3
8-1	Thick to thin plate weld	RHS	FCM	√	√	--	/	/	7-4
8-2	Thick to thin plate weld	RHS	FCM	√	√	√	/	/	7-4
8-3	Thick to thin plate weld	RHS	FCM	√	√	√	/	/	7-4
9	Connection weld with TGSB	LHS	FCM	√	/	/	/	/	7-5-1
10	Connection weld with Joint	LHS	FCM	√	/	/	/	/	7-5-2
11	Boom joint shaft support weld	LHS	FCM	√	/	/	/	/	7-5-3
12	Boom joint shaft support weld	LHS	FCM	√	/	/	/	/	7-5-4
13	Boom joint shaft support weld	LHS	NFCM	√	/	/	/	/	7-5-5

14	Boom joint shaft support weld	LHS	NFCM	√	/	/	/	/	7-5-6
15	Boom joint bearing support weld	LHS	NFCM	√	/	/	/	/	7-5-7
16	End weld of rail support	LHS	FCM	√	/	/	/	/	7-5-8
17	Connection weld with TGSB	RHS	FCM	√	/	/	/	/	7-5-1
18	Connection weld with Joint	RHS	FCM	√	√	--	/	/	7-5-2
19	Boom joint shaft support weld	RHS	FCM	√	√	--	/	/	7-5-3
20	Boom joint shaft support weld	RHS	FCM	√	/	/	/	/	7-5-4
21	Boom joint shaft support weld	RHS	NFCM	√	/	/	/	/	7-5-5
22	Boom joint shaft support weld	RHS	NFCM	√	/	/	/	/	7-5-6
23	Boom joint bearing support weld	RHS	NFCM	√	/	/	/	/	7-5-7
24	End weld of rail support	RHS	FCM	√	/	/	/	/	7-5-8
25	Trolley pulley support weld	LHS	NFCM	√	/	/	/	/	7-6
26	Trolley stopper	LHS	NFCM	√	/	/	/	/	7-7
27	Trolley pulley support weld	RHS	NFCM	√	/	/	/	/	7-6
28	Trolley stopper	RHS	NFCM	√	/	/	/	/	7-7
29-1	Horizontal weld bracing to girder	LS,LHS	NFCM	√	X	--	1C=20mm	Item 07	N.A
29-2	Horizontal weld bracing to girder	LS,LHS	NFCM	√	X	--	2C=15mm	Item 08	N.A
29-3	Horizontal weld bracing to girder	LS,LHS	NFCM	√	X	--	1C=15mm	Item 16	N.A
29-4	Horizontal weld bracing to girder	LS,LHS	NFCM	√	√	--	/	/	N.A
29-5	Horizontal weld bracing to girder	LS,LHS	NFCM	√	√	--	/	/	N.A
30-1	Horizontal weld bracing to girder	LS,RHS	NFCM	√	√	--	/	/	N.A
30-2	Horizontal weld bracing to girder	LS,RHS	NFCM	√	√	--	/	/	N.A
31-1	Horizontal weld bracing to girder	WS,LHS	NFCM	√	X	--	1C=220mm	Item 05	N.A
31-2	Horizontal weld bracing to girder	WS,LHS	NFCM	√	X	--	1C=15mm	Item 06	N.A
31-3	Horizontal weld bracing to girder	WS,LHS	NFCM	√	X	--	1C=5mm	Item 15	N.A
31-4	Horizontal weld bracing to girder	WS,LHS	NFCM	√	√	--	/	/	N.A
31-5	Horizontal weld bracing to girder	WS,LHS	NFCM	√	√	--	/	/	N.A
32-1	Horizontal weld bracing to girder	WS,RHS	NFCM	√	X	--	1C=10mm	Item 04	N.A
32-2	Horizontal weld bracing to girder	WS,RHS	NFCM	√	√	--	/	/	N.A
32-3	Horizontal weld bracing to girder	WS,RHS	NFCM	√	√	--	/	/	N.A

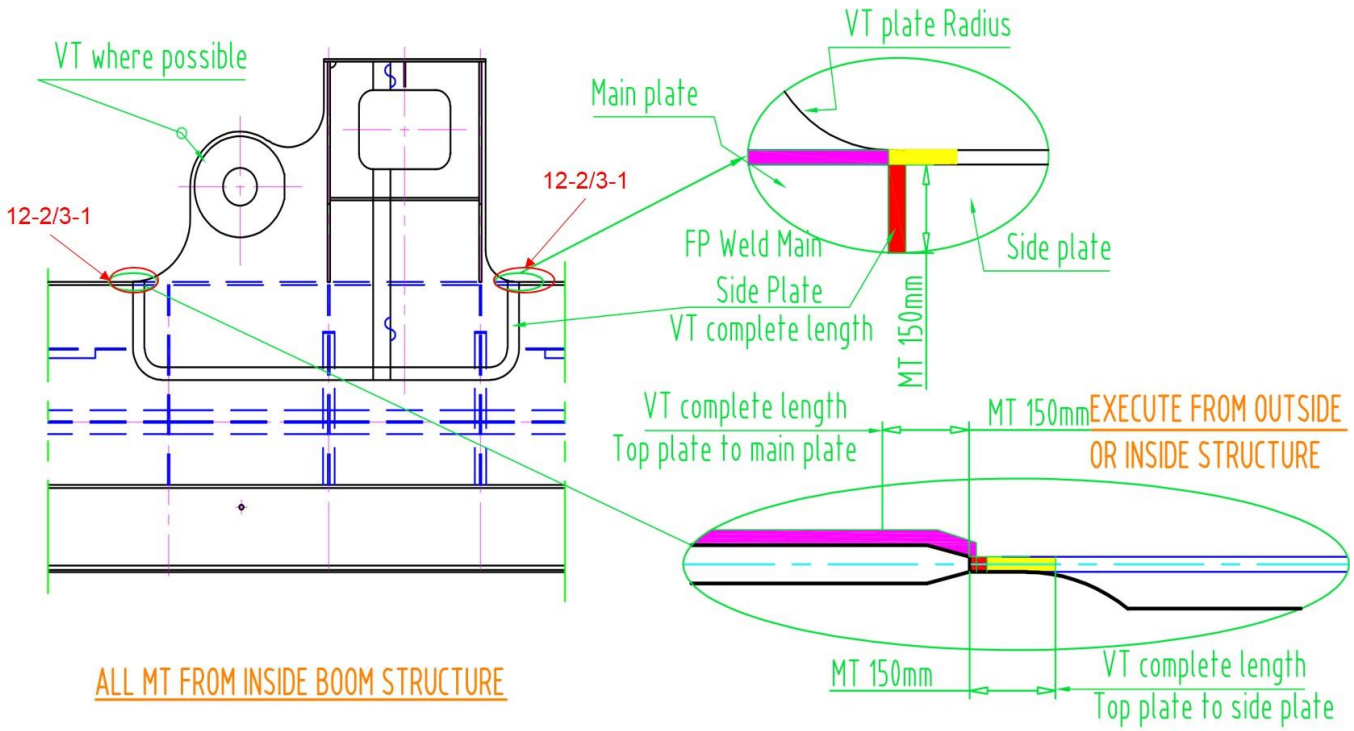
33	Butt weld of web plate	LHS	NFCM	√	√	--	/	/	N.A
34	Structure connection bolts	N.A	N.A	√	/	/	/	/	N.A
35	Structure & paint inspection inside	N.A	N.A	√	/	/	/	/	N.A

4.7 Boom & Out-reach

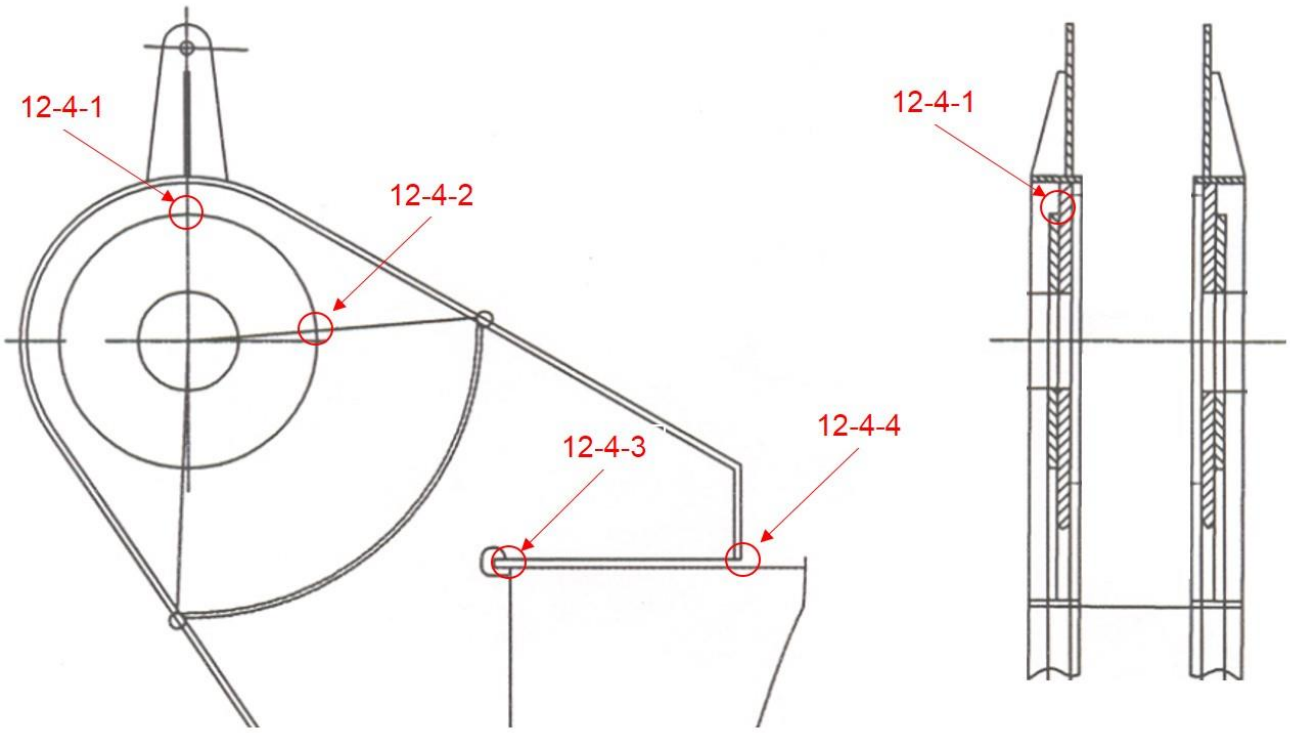




Boom Joint



Boom to Forestay connection

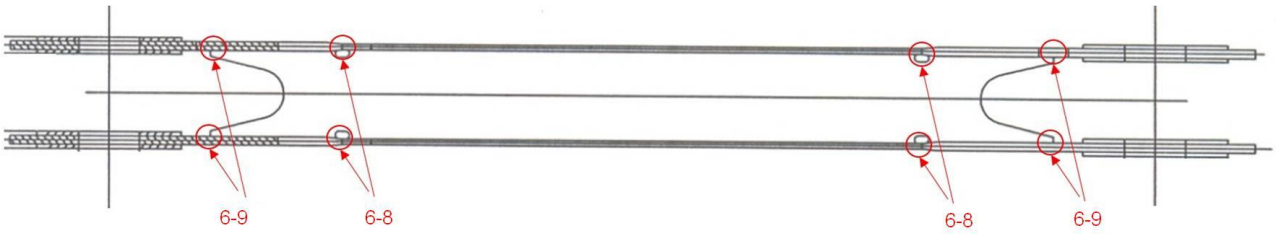


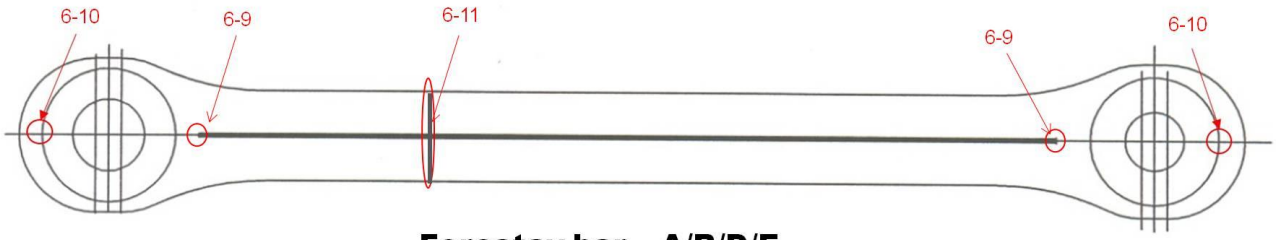
Boom pulley support

S/N	Description	Details of Inspection							
		Location	FCM/NFCM	VT	MT	UT	Defects findings	Ref Nr/DFL	Remarks
1	Boom Joint shaft weld	LHS	FCM	√	/	/	/	/	12-1-1
2	Gusset plate weld-1	LHS	FCM	√	/	/	/	/	12-1-2
3	Gusset plate weld-2	LHS	FCM	√	/	/	/	/	12-1-3
4	Gusset plate weld-3	LHS	FCM	√	/	/	/	/	12-1-4
5	Gusset plate weld with connection beam- 1	LHS	FCM	√	/	/	/	/	12-1-5
6	Gusset plate weld with connection beam- 2	LHS	FCM	√	√	--	/	/	12-1-6
7	Gusset plate weld with boom and seal plate/cover	LHS	FCM	√	/	/	/	/	12-1-7
8	Boom Joint shaft weld	RHS	FCM	√	/	/	/	/	12-1-1
9	Gusset plate weld-1	RHS	FCM	√	√	--	/	/	12-1-2
10	Gusset plate weld-2	RHS	FCM	√	√	--	/	/	12-1-3
11	Gusset plate weld-3	RHS	FCM	√	/	/	/	/	12-1-4
12	Gusset plate weld with connection beam- 1	RHS	FCM	√	/	/	/	/	12-1-5
13	Gusset plate weld with connection beam- 2	RHS	FCM	√	√	--	/	/	12-1-6

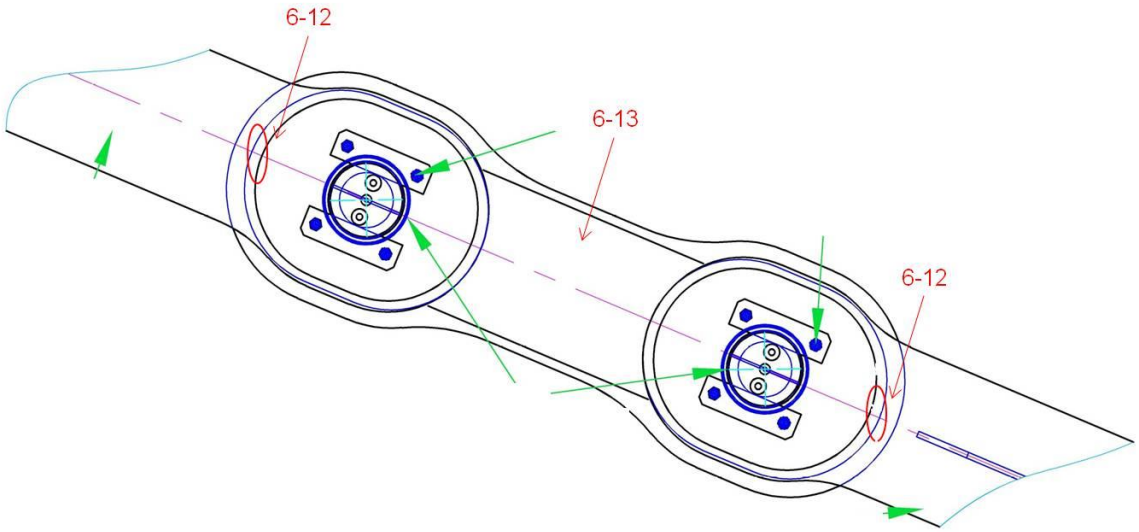
14	Gusset plate weld with boom and seal plate/cover	RHS	FCM	√	√	--	/	/	12-1-7
15	Think to thin plate weld	LHS	FCM	√	√	√	/	/	12-2-1
16	Think to thin plate weld	LHS	FCM	√	/	/	/	/	12-2-2
17	Think to thin plate weld	RHS	FCM	√	√	--	/	/	12-2-1
18	Think to thin plate weld	RHS	FCM	√	/	/	/	/	12-2-2
19	Think to thin plate weld	LHS	FCM	√	/	/	/	/	12-3-1
20	Think to thin plate weld	LHS	FCM	√	√	--	/	/	12-3-2
21	Think to thin plate weld	RHS	FCM	√	/	/	/	/	12-3-1
22	Think to thin plate weld	RHS	FCM	√	/	/	/	/	12-3-2
23	Strengthen plate weld of pulley support	LHS	FCM	√	/	/	/	/	12-4-1
24	Strengthen plate weld of pulley support	LHS	FCM	√	/	/	/	/	12-4-2
25	Weld of pulley support	LHS	FCM	√	√	--	/	/	12-4-3
26	Weld of pulley support	LHS	FCM	√	√	--	/	/	12-4-4
27	Strengthen plate weld of pulley support	RHS	FCM	√	/	/	/	/	12-4-1
28	Strengthen plate weld of pulley support	RHS	FCM	√	/	/	/	/	12-4-2
29-1	Weld of pulley support	RHS	FCM	√	√	--	/	/	12-4-3
29-2	Weld of pulley support	RHS	FCM	√	√	--	/	/	12-4-3
30	Weld of pulley support	RHS	FCM	√	√	--	/	/	12-4-4
31	Weld between rail support and end beam of boom	LHS	NFCM	√	/	/	/	/	12-5
32	Weld between rail support and end beam of boom	RHS	NFCM	√	/	/	/	/	12-5
33	Fixed tie links weld of boom	LHS	NFCM	√	/	/	/	/	12-6
34	Fixed tie links weld of boom	RHS	NFCM	√	√	--	/	/	12-6
35	Butt weld of cross tie beam	LHS	NFCM	√	√	--	/	/	N.A
36	Structure connection bolts	N.A	N.A	√	/	/	/	/	N.A
37	Structure & paint inspection inside	N.A	N.A	√	/	/	/	/	N.A

4.8 Forestay bar system

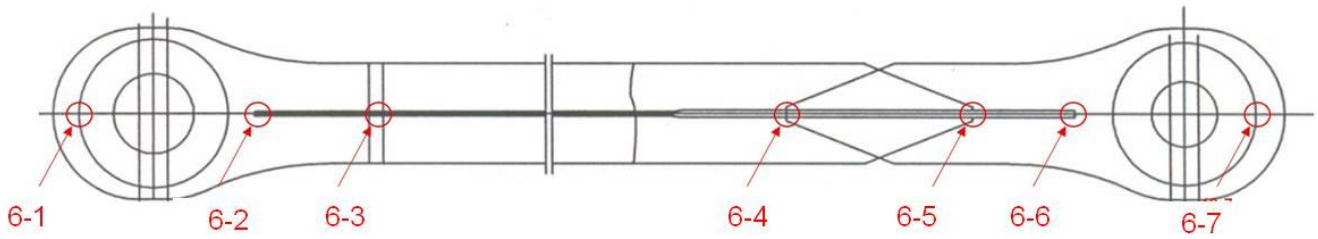


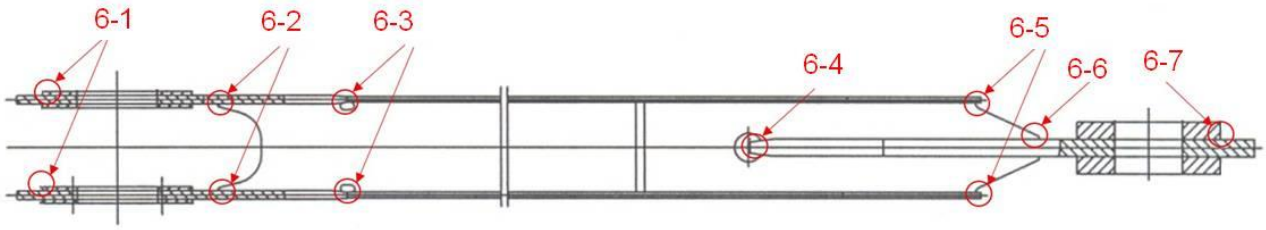


Forestay bar – A/B/D/E



Forestay bar link





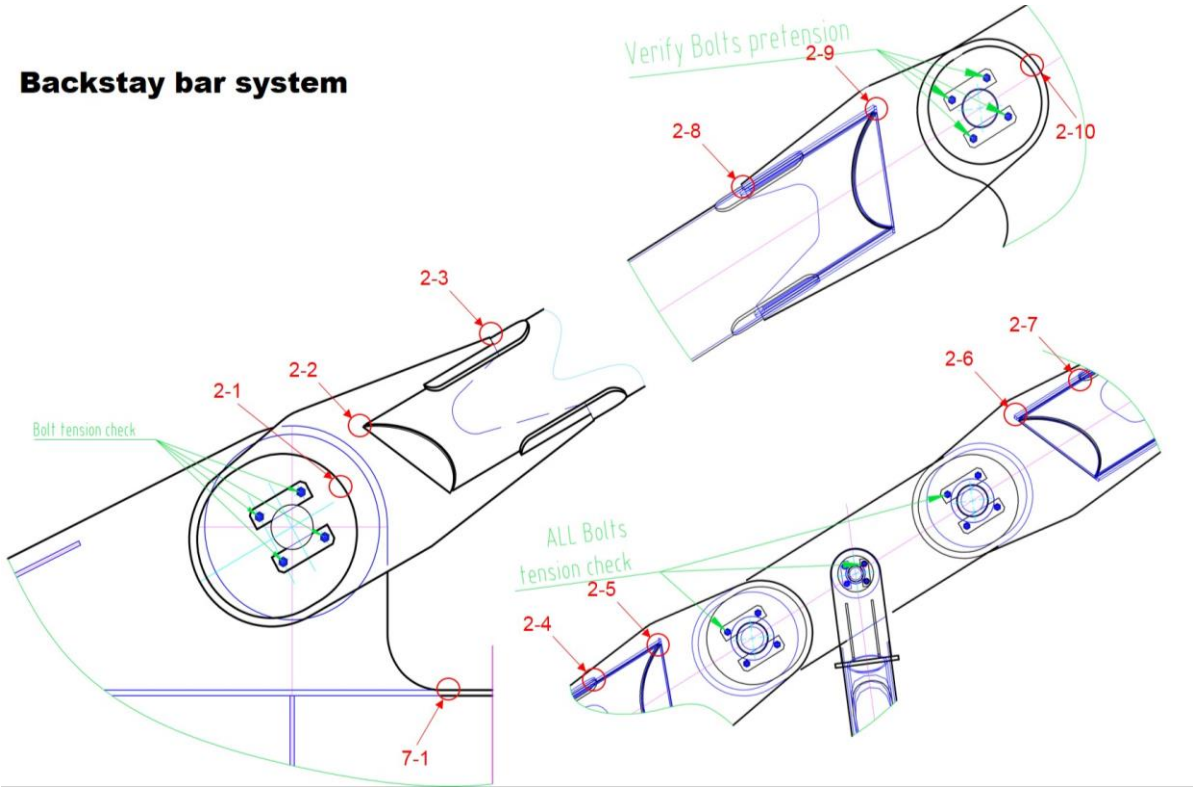
Forestay bar - C

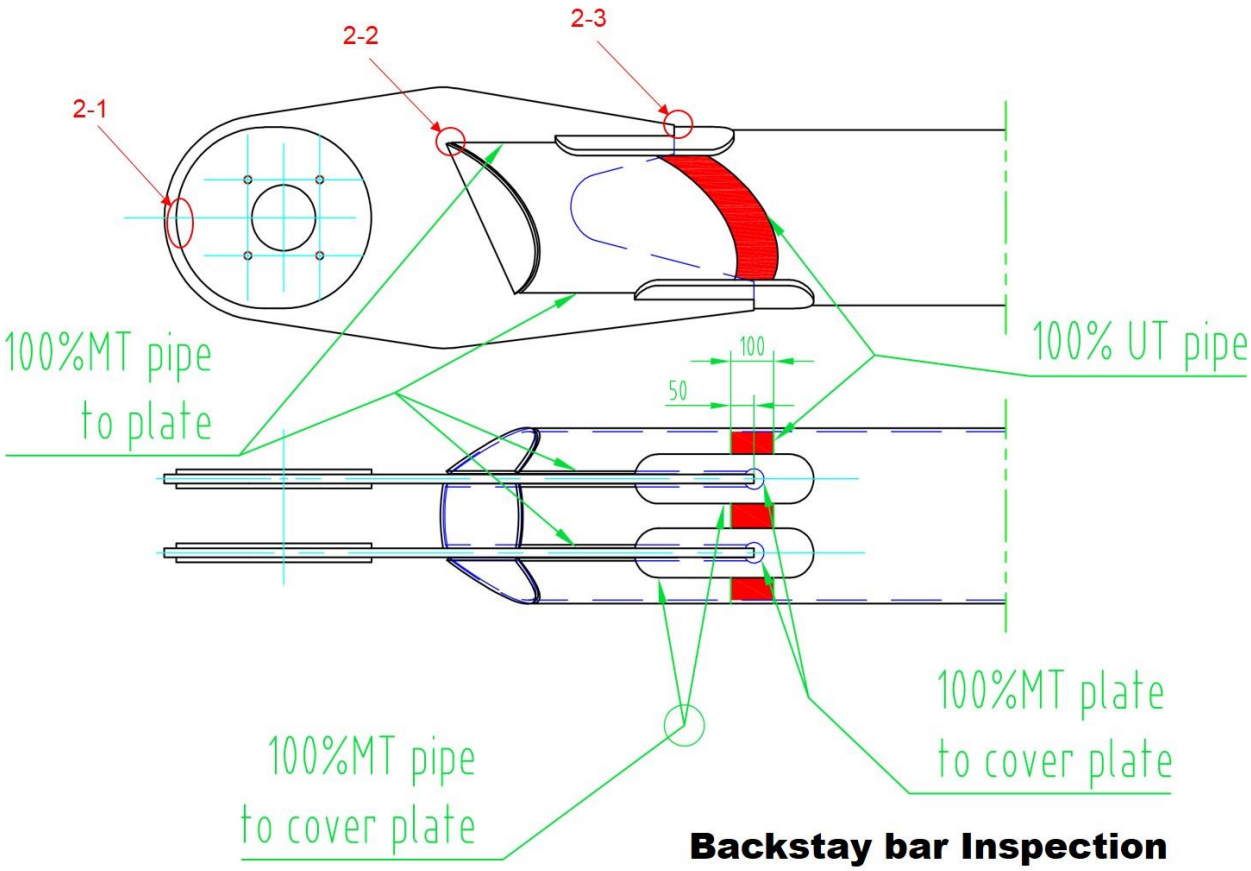
S/N	Description	Details of Inspection							
		Location	FCM/NFCM	VT	MT	UT	Defects findings	Ref Nr/DFL	Remarks
1	Strengthen plate weld	LHS	FCM	√	/	/	/	/	6-1
2	End weld of single plate	LHS	FCM	√	/	/	/	/	6-2
3	Think to thin weld	LHS	FCM	√	√	√	/	/	6-3
4	Think to thin weld	LHS	FCM	√	/	/	/	/	6-4
5	End weld of single plate	LHS	FCM	√	/	/	/	/	6-5
6	End weld of edge plate	LHS	FCM	√	/	/	/	/	6-6
7	Strengthen plate weld	LHS	FCM	√	/	/	/	/	6-7
8	Think to thin weld	LHS	FCM	√	√	√	/	/	6-8
9	End weld of single plate	LHS	FCM	√	/	/	/	/	6-9
10-1	Strengthen plate weld	LHS	FCM	√	√	--	/	/	6-10
10-2	Strengthen plate weld	LHS	FCM	√	√	--	/	/	6-10
11	Butt weld	LHS	FCM	√	√	√	/	/	6-11
12-1	Strengthen plate weld	LHS	FCM	√	√	--	/	/	6-12
12-2	Strengthen plate weld	LHS	FCM	√	√	--	/	/	6-12
13	Base metal	LHS	FCM	√	/	/	/	/	6-13
14	Strengthen plate weld	RHS	FCM	√	/	/	/	/	6-1

15	End weld of single plate	RHS	FCM	√	/	/	/	/	6-2
16-1	Think to thin weld	RHS	FCM	√	√	√	/	/	6-3
16-2	Think to thin weld	RHS	FCM	√	√	--	/	/	6-3
17	Think to thin weld	RHS	FCM	√	/	/	/	/	6-4
18	End weld of single plate	RHS	FCM	√	/	/	/	/	6-5
19	End weld of edge plate	RHS	FCM	√	/	/	/	/	6-6
20	Strengthen plate weld	RHS	FCM	√	/	/	/	/	6-7
21-1	Think to thin weld	RHS	FCM	√	√	√	/	/	6-8
21-2	Think to thin weld	RHS	FCM	√	√	√	/	/	6-8
21-3	Think to thin weld	RHS	FCM	√	√	√	/	/	6-8
22	End weld of single plate	RHS	FCM	√	/	/	/	/	6-9
23	Strengthen plate weld	RHS	FCM	√	/	/	/	/	6-10
24	Butt weld	RHS	FCM	√	√	√	/	/	6-11
25-1	Strengthen plate weld	RHS	FCM	√	√	--	/	/	6-12
25-1	Strengthen plate weld	RHS	FCM	√	√	--	/	/	6-12
26	Base metal	RHS	FCM	√	/	/	/	/	6-13
27	Strengthen plate weld	LHS	FCM	√	/	/	/	/	6-1
28	End weld of single plate	LHS	FCM	√	/	/	/	/	6-2
29	Think to thin weld	LHS	FCM	√	/	/	/	/	6-3
30	Think to thin weld	LHS	FCM	√	/	/	/	/	6-4
31	End weld of single plate	LHS	FCM	√	/	/	/	/	6-5
32	End weld of edge plate	LHS	FCM	√	/	/	/	/	6-6
33	Strengthen plate weld	LHS	FCM	√	/	/	/	/	6-7
34	Strengthen plate weld	RHS	FCM	√	/	/	/	/	6-1
35	End weld of single plate	RHS	FCM	√	/	/	/	/	6-2
36	Think to thin weld	RHS	FCM	√	/	/	/	/	6-3
37	Think to thin weld	RHS	FCM	√	√	--	/	/	6-4
38	End weld of single plate	RHS	FCM	√	/	/	/	/	6-5
39	End weld of edge plate	RHS	FCM	√	/	/	/	/	6-6
40	Strengthen plate weld	RHS	FCM	√	√	--	/	/	6-7

41	Structure connection bolts	N.A	N.A	√	/	/	/	/	N.A

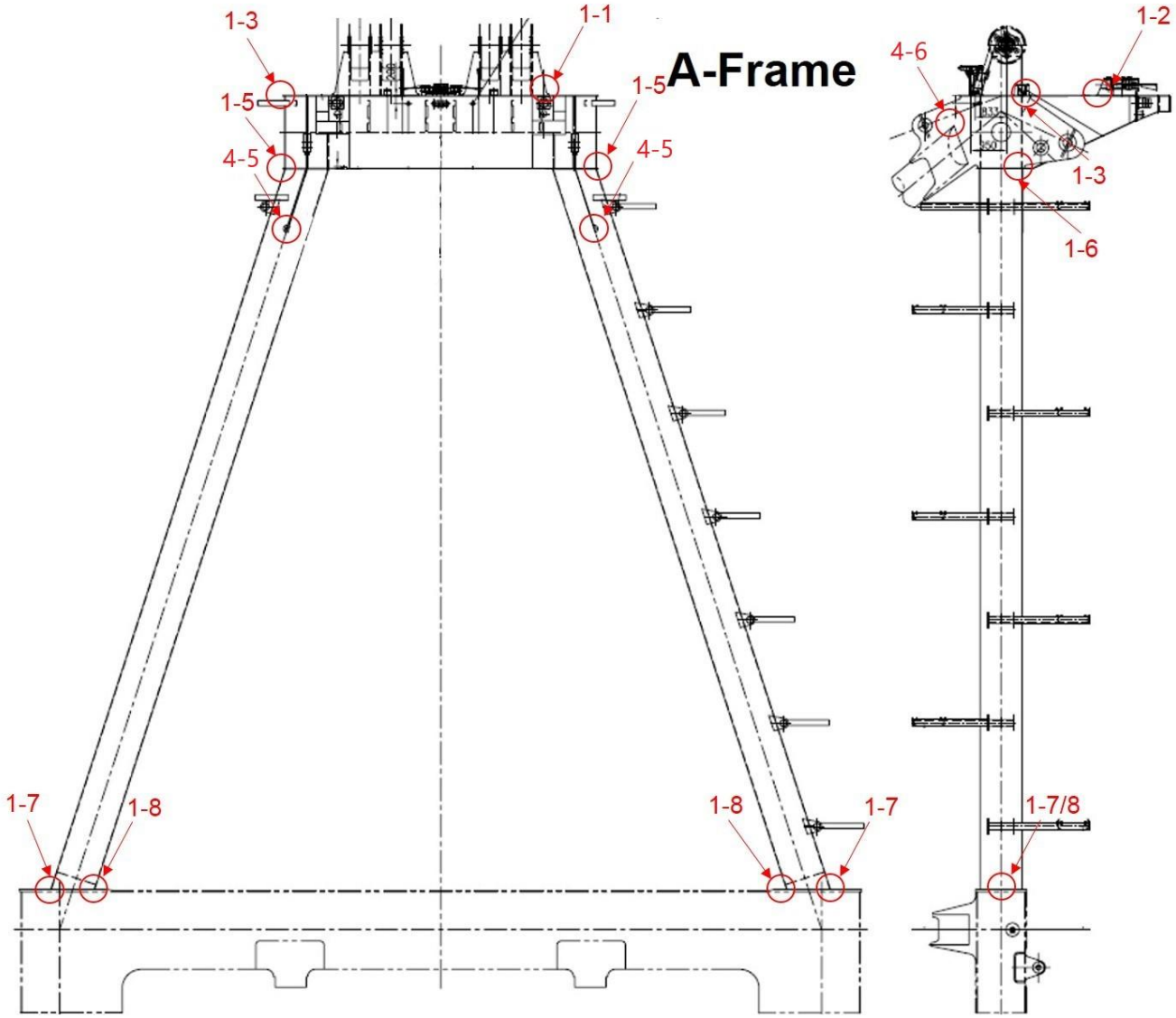
4.9 Backstay bar system



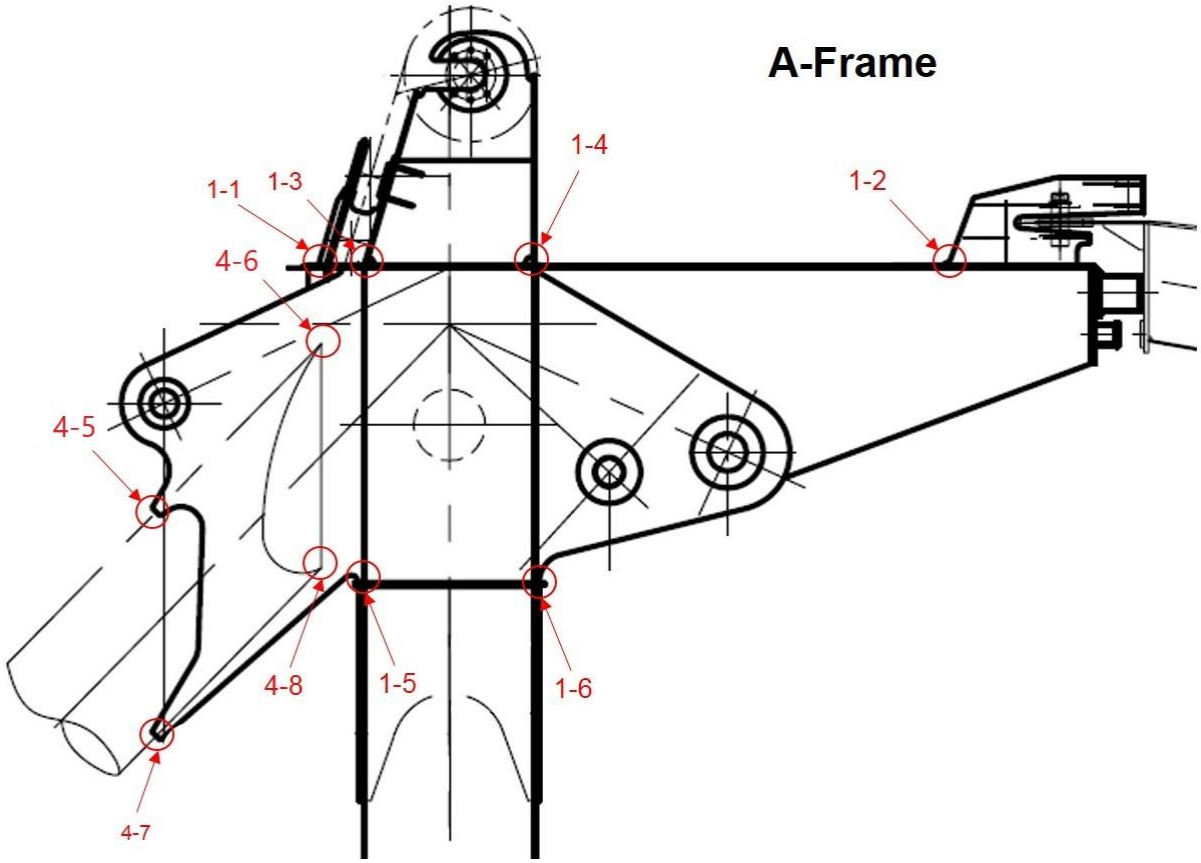


S/N	Description	Details of Inspection							
		Location	FCM/NFCM	VT	MT	UT	Defects findings	Ref Nr/DFL	Remarks
1	Strengthen plate weld	LHS	FCM	√	/	/	/	/	2-1
2	Gusset plate weld with pipe	LHS	FCM	√	√	--	/	/	2-2
3	Seal/cover plate weld with pipe	LHS	FCM	√	√	--	/	/	2-3
4	Seal/cover plate weld with pipe	LHS	FCM	√	/	/	/	/	2-4
5	Gusset plate weld with pipe	LHS	FCM	√	/	/	/	/	2-5
6	Gusset plate weld with pipe	LHS	FCM	√	√	--	/	/	2-6
7	Seal/cover plate weld with pipe	LHS	FCM	√	√	--	/	/	2-7
8	Seal/cover plate weld with pipe	LHS	FCM	√	/	/	/	/	2-8
9	Gusset plate weld with pipe	LHS	FCM	√	/	/	/	/	2-9
10	Strengthen plate weld	LHS	FCM	√	/	/	/	/	2-10
11	Strengthen plate weld	RHS	FCM	√	√	--	/	/	2-1
12	Gusset plate weld with pipe	RHS	FCM	√	√	--	/	/	2-2
13	Seal/cover plate weld with pipe	RHS	FCM	√	√	--	/	/	2-3
14	Seal/cover plate weld with pipe	RHS	FCM	√	√	--	/	/	2-4
15	Gusset plate weld with pipe	RHS	FCM	√	/	/	/	/	2-5
16	Gusset plate weld with pipe	RHS	FCM	√	/	/	/	/	2-6
17	Seal/cover plate weld with pipe	RHS	FCM	√	√	--	/	/	2-7
18	Seal/cover plate weld with pipe	RHS	FCM	√	/	/	/	/	2-8
19	Gusset plate weld with pipe	RHS	FCM	√	/	/	/	/	2-9
20	Strengthen plate weld	RHS	FCM	√	/	/	/	/	2-10
21	Strengthen plate weld of connection plate	LHS	FCM	√	/	/	/	/	N.A
22	Strengthen plate weld of connection plate	RHS	FCM	√	/	/	/	/	N.A
23	Structure connection bolts	N.A	N.A	√	/	/	/	/	N.A

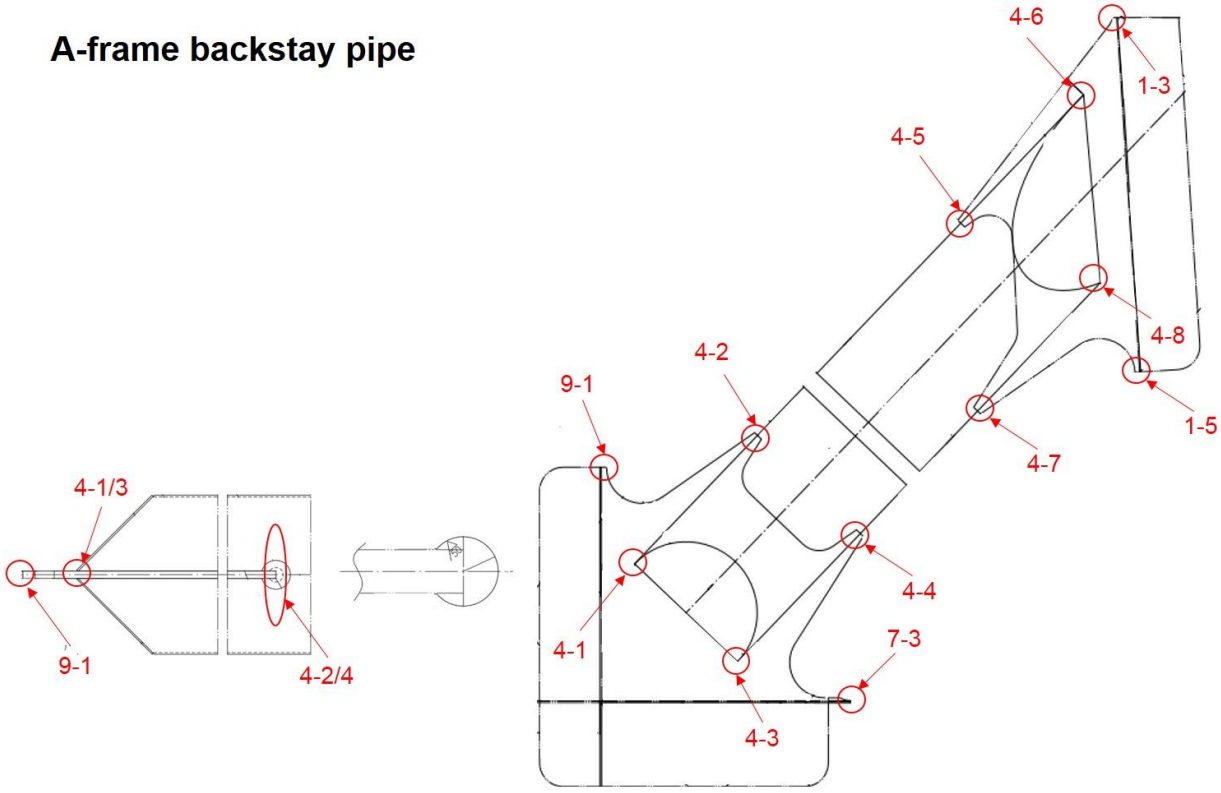
4.10 A-frame and support pipe



A-Frame



A-frame backstay pipe



S/N	Description	Details of Inspection							
		Location	FCM/NFCM	VT	MT	UT	Defects findings	Ref Nr/DFL	Remarks
1	Boom pulley support weld	LHS	NFCM	√	/	/	/	/	1-1
2	Boom hang up support weld	LHS	NFCM	√	/	/	/	/	1-2
3	Weld with stay bar gusset plate	LHS	FCM	√	√	--	/	/	1-3
4	Weld with stay bar gusset plate	LHS	FCM	√	/	/	/	/	1-4
5	Weld with A-frame pipe	LHS	FCM	√	/	/	/	/	1-5
6	Weld with A-frame pipe	LHS	FCM	√	√	--	/	/	1-6
7	Weld with WS TGSB	LHS	FCM	√	√	--	/	/	1-7
8	Weld with WS TGSB	LHS	FCM	√	√	--	/	/	1-8
9	Boom pulley support weld	RHS	NFCM	√	/	/	/	/	1-1
10	Boom hang up support weld	RHS	NFCM	√	/	/	/	/	1-2
11	Weld with stay bar gusset plate	RHS	FCM	√	√	--	/	/	1-3
12	Weld with stay bar gusset plate	RHS	FCM	√	/	/	/	/	1-4
13	Weld with A-frame pipe	RHS	FCM	√	/	/	/	/	1-5
14	Weld with A-frame pipe	RHS	FCM	√	√	√	/	/	1-6
15	Weld with WS TGSB	RHS	FCM	√	√	--	/	/	1-7
16	Weld with WS TGSB	RHS	FCM	√	√	--	/	/	1-8
17	Gusset plate weld with pipe	LHS	FCM	√	X	--	1C=50mm	Item 12	4-1
18	Seal/cover plate weld with pipe	LHS	FCM	√	√	--	/	/	4-2
19	Gusset plate weld with pipe	LHS	FCM	√	X	--	1C=80mm	Item 13	4-3
20	Seal/cover plate weld with pipe	LHS	FCM	√	√	--	/	/	4-4
21	Seal/cover plate weld with pipe	LHS	FCM	√	/	/	/	/	4-5
22	Gusset plate weld with pipe	LHS	FCM	√	/	/	/	/	4-6
23	Seal/cover plate weld with pipe	LHS	FCM	√	/	/	/	/	4-7
24	Gusset plate weld with pipe	LHS	FCM	√	/	/	/	/	4-8
25	Gusset plate weld with pipe	RHS	FCM	√	X	--	1C=80mm	Item 10	4-1
26	Seal/cover plate weld with pipe	RHS	FCM	√	X	--	1C=60mm	Item 11	4-2
27	Gusset plate weld with pipe	RHS	FCM	√	√	--	/	/	4-3
28	Seal/cover plate weld with pipe	RHS	FCM	√	/	/	/	/	4-4

29	Seal/cover plate weld with pipe	RHS	FCM	√	/	/	/	/	4-5
30	Gusset plate weld with pipe	RHS	FCM	√	√	--	/	/	4-6
31	Seal/cover plate weld with pipe	RHS	FCM	√	/	/	/	/	4-7
32	Gusset plate weld with pipe	RHS	FCM	√	/	/	/	/	4-8
33	Strengthen plate weld of gusset plate	LHS	FCM	√	/	/	/	/	N.A
34	Strengthen plate weld of gusset plate	RHS	FCM	√	/	/	/	/	N.A
35	Structure connection bolts	N.A	N.A	√	/	/	/	/	N.A

4.11 Other components and scope

Visual inspection has been conducted for both above and following components, and the results obtained from the VT have the effect on the NDT execution, which location and number of checking points already been adjusted, after the assessment from the VT result.

- Trolley rail/short rail
- Trolley frame and cabin frame
- All sheaves and pulley support
- Motor and gearbox support
- Drum and support
- Festoon system support
- TLS system support
- M-house support
- Brakes of Hoist/Trolley/Boom/Gantry
- Access stairs and platform

S/N	Description	Details of Inspection						
		Location	VT	MT	UT	Defects findings	Ref Nr/DFL	Remarks
1	Trolley rail and short rail	N.A	√	/	/	/	/	N.A
2	Trolley frame and cabin	N.A	√	/	/	/	/	N.A
3	All sheaves and pulley support	N.A	√	/	/	X	Item 25	N.A
4	Motor and gearbox support	N.A	√	/	/	/	/	N.A
5	Drum and wire rope	N.A	√	/	/	/	/	N.A
6	Festoon support	N.A	√	/	/	/	/	N.A
7	TLS system support	N.A	√	/	/	/	/	N.A
8	M-house support and bolts	N.A	√	/	/	/	/	N.A

9	Access stairs and platform	N.A	√	/	/	/	/	N.A
10	Brake of Hoist/Trolley/Boom	N.A	√	/	/	/	/	N.A
11	Wire ropes	N.A	√	/	/	/	/	N.A
12	Others if any	N.A	/	/	/	/	/	N.A

5. Conclusions and recommendations

5.1 Summary of the work load and defects

Serial No.	Inspection Date	Checking Pints and Methods		Number of defects
		MT	UT	
1	05.Aug.2018	36	4	4
2	06.Aug.2018	33	8	5
3	07.Aug.2018	33	10	5
4	08.Aug.2018	35	6	2
5	14.Aug.2018	22	4	2
Sub-total		159	32	18

- Totally 18 defects were detected during the NDT inspection, adding to a total length 1090 mm at the time of the inspection.
- These selected checking points cannot cover all the welding joint, and this report does not guarantee that the identified crack may have potential to increase after inspection.

5.2 Condition of paints

Coating state	Rating	Amount of locations	Color code
Good	Excellent		
	Good		
	Good - Fair	Gantry	
Fair	Fair	Sill beam, Boom	
	Fair - Poor	Leg, Girder	
Poor	Poor	A-frame, TGSB	
	Worst	Stair to A-frame	

6. Appendix

6.1. <<Deficiency Finding List of QC09>>

~~END OF REPORT~~