

## TECHNICAL SPECIFICATION

For 53' x 8'-6 3/8" x 9'6 1/2" Refrigerated Container

Weather-resistant Steel (CORTEN A or equivalent) Frame / Aluminum Clad

Extruded Aluminum Cross-member & Top and bottom rail & Floor

Polypropylene-FRP side & roof & door lining & sub-floor/ Composite scuff Liner

Specification No. S-A53-05-972A

Drawing No. A53-05GD-972A

Issue Date: Dec, 31, 2014

Revised Date: July, 01, 2015

Design: Henry

Check: ZHC

Approve: Jim

Installed machinery:	CARRIER land-carriage type	
Standards:	AAR-M930-08	
Max. gross weight:	30,480 kgs	67,200 lbs.
<b>Unit weight=730kg, Tank weight(aluminum)=50kg, Fuel (120GAL) =378kg</b>		
<b>Tare weight (excl. Unit.Tank.Fuel): approx.</b>	<b>4,750 kgs</b>	<b>10,470 lbs.</b>
Tare weight (Incl. Unit)	5,480 kgs	12,080 lbs.
Tare weight (Incl. Unit, fuel tank & fuel)	5,910 kgs	13,030 lbs.
<b>Max payload</b>	<b>24,570 kgs</b>	<b>54,170 lbs</b>
Stacking test load (no offset):	22,860 kgs	50,400 lbs.
Floor Rating:	8,160 kgs	18,000 lbs.
Heat leakage rate:	58 kcal/ hr. x °C (127.6B.T.U/hr. °F) incl. unit, 283 K MWT	
Internal length:	15,203 0/-10mm	49'-10 35/64"
Internal width:	2,480 +0/-10 mm	8'-1 5/8"
Internal height:	2,579 0/-10 mm	8'- 5 1/2"
Interior cube:	97.2m <sup>3</sup>	3433 CU.FT

The tare weight and heat leakage value will be verified after prototype weigh and test.

### 1. GENERAL

#### 1.1 OPERATIONAL ENVIRONMENT

The container is to be designed and manufactured for the carriage of refrigerated (frozen, chilled) foodstuffs and general cargo by land (on road or rail) and will range from -50°C (-60F Deg) to +50°C (120F Deg) without effect on the strength of basic structure. A mechanical refrigeration unit (THERMO KING or CARRIER land-carriage type) of a "one piece picture frame type" will be fitted to the front mounting frame.

#### 1.2 REGULATIONS AND STANDARDS

##### 1.2.1 ISO/TC-104

668 Dimensions and ratings (1993 edition)

6346 Coding, identification and marking (the third edition 1995)

1496/2 Specification and testing thermal containers (1996 edition)

1161 Specification of corner fittings (1990 edition/ Cor.1.: 1990)

##### 1.2.2 AAR - Standard M-930-2008.

##### 1.2.3 Timber Component Treatment and Certificate

There will be no exposed timber in the construction.

### 1.3 HANDLING

The container will be constructed to be capable of being handled as wide top pick position (96 3/8" aperture centers) or side pin lift with proper handling equipment without permanent deformation which will render them unsuitable for use under the following conditions:

Lifting, full or empty, at top 40 foot intermediate fittings by means of spreaders fitted with hooks, shackles or Twist lock (any 40ft position).

Lifting empty by the side two at a time by an "Elme" style side pick.

### 1.4 TRANSPORTATION

The container will be constructed to be suitable for transportation in normal operating conditions and in the following modes:

Road: On flat bed or skeleton chassis, secured by twist locks or equivalent ones at bottom corner fittings.

Rail: a) On the flat cars of special container cars secured by twist locks or equivalent ones at the bottom corner fittings.

b) Two (2) high stacked at the 40' intermediate frames.

### 1.5 STACKING CAPABILITY

The container is designed to be capable of two (2) high loaded double stacking for rail car service and three (3) high loaded stacking for terminal operation with 40 foot ISO type containers as well as other domestic containers.

## **Construction**

### **1. Container Frame**

End frames made from folded and welded sections of high-tensile weather-resistant steel (CORTEN A or equivalent), welded to the upper and lower corner castings.

The front frame is equipped with a protection frame (would be painted) to accommodate the reefer unit.

Top and bottom rail are made of extruded aluminum profile. The rails are connected to the frames by wing plates. The cross-members of floor are made of aluminum I-shaped sections connect to the bottom rails by clips and solid rivets.

The bottom frame is equipped with one piece of 6.0mm (15/64") thick pressed hat section gooseneck tunnel, 79mm (3 7/64") high and 3170mm (10' 4 51/64") in length.

All materials are of high-tensile weather-resistant steel (CORTEN A or equivalent).

### **2. Flooring**

1.0mm (3/64") thick PP-FRP over the cross-members and the gooseneck tunnel, 0.7 mm HGSS panel and 1.0mm (3/64") thick PP-FRP over the cross-member of the rear module.

Insulation of 76mm (3") in thickness polyurethane foam above the cross-members.

Top side is made of 34mm (1 11/32") Duct –duct aluminum floor reinforced by composite stringers.

### **3. Insulated side walls**

Outer cladding made of 1.2mm (3/64") thick white aluminum plate riveted to side post and connect to top side rail and bottom side rail.

Insulation of 47mm (1 27/32") in thickness polyurethane foam.

Inner linings made of T1.5mm (1/16") PP-FRP.

**5mm thick 431mm (17") high composite scuff liner will be surface mounted on the side lining.**

Scuff lining will be cut into four pieces per side, and be riveted with three screws on each post and two screws on each back plate between two posts.

#### 4. Insulated front wall

Outer cladding made of 1.2 mm (3/64") aluminum plate.

Insulation of 90mm (3 35/64") in thickness polyurethane foam.

Inner lining made of 1.0mm (3/64") aluminum plate.

#### 5. Insulated roof

Outer cladding made of 1.0mm(3/64") thick die-stamped corrugated bare aluminum panels to be butt-welded together to form one panel by automatic TIG welding reinforced by 10 pieces of hat shaped bows and riveted to top side rails both rear and intermediate headers.

Insulation of 89mm (3 1/2") in thickness polyurethane foam reinforced by posts.

Inner lining made of T1.5mm (1/16") PP-FRP.

#### 6. Insulated door

6.1 Outer panel made of a 1.2mm (3/64") aluminum sheet.

6.2 Insulation of 72mm (2 53/64") in thickness polyurethane foam.

6.3 Inner linings made of 1.5mm (1/16") PP-FRP.

6.4 Outer: E.P.D.M. "C" section double lips. Inner: E.P.D.M. "O" section.

6.5 Each door is equipped with 5 Aluminum hinges with stainless steel pins and brass bushes and with 2 hot-dip galvanized locking rods system Saejin or Haihang equivalent type, furthermore with 1 steel chain door retainer.

6.6 The door hardware is fixed with stainless steel bolts and galvanized nuts.

#### 7. Special features

The TSR made of special shape to hold the portable secure system.

One placard holder would be installed on rear door and side walls.

Two wires for two remote temperature sensors and a third wire for door sensor will be supplied.

An "E" type load lock track is installed as follows:

2- Row 16' in length from door end located approx 36" and 72" above the floor.

These E-tracks will be surface mounted on the side lining.

#### 8. Surface protection

End frames, rails and crossmembers are to be shotblasted acc. to Swedish Standard Sa 2.5.

Adhesive primer or YJ-9000 will be applied to the polyurethane contacting surfaces for good adhesion with polyurethane.

All CORTEN A & BS700 steel frame parts are to be primed with 30 microns of zinc rich primer.

All steels are to be primed with 40 microns of polyamide epoxy primer.

Top coating with 50 microns of polyurethane built **White RAL9010**. The total dry film thickness of primer and topcoat has to be 120 microns.

Bottom coated with bituminous 150 microns (only for Corten & BS700 steel parts).

Paint supplier: Kansai, KCC, Chugoku or Hempel

#### 9. Markings

All the markings are made of self-adhesive calendered vinyl film.

Owner's logo will be shown on side walls.

AAR and data plates made of 0.7mm thick stainless steel AISI 304.

## 10. Testing

This container will be tested and certified by inspectors nominated by the owner.

Proposed criteria table for general prototype

Item	Test Load and Method
10.1 Stacking (at 40' position)	22,860 kg/post(50400lbs) Offset: 38mm longitudinally 25mm laterally Internal load: R-T
10.2 Lifting from top Corner fittings (at 40' position)	Internal load: 2R-T(vertical)
10.3 Floor Rating	8,160kg (18,000LBS)
10.4 Front end Wall Strength (without bulkhead)	0.4P Uniform Load by Air Bag
10.5 Rear end Wall Strength	0.4P Uniform Load by Air Bag
10.6 Side Wall Strength	0.3P Uniform Load by Air Bag
10.7 Roof Strength	300kg (660LBS) (300×600mm)
10.8 Longitudinal Restraint (at 40' position)	R/side Internal load: R-T
10.9 Longitudinal Racking (at 40' position)	0.25R/side Internal load: Nil
10.10 Air tightness Test	Internal pressure: 250±10Pa
10.11 Thermal Test	In compliance with ISO 1496/2, Part 2. Thermal container.

Note: R: Max gross weight. P: Max payload. T: Tare weight.

## 11. GUARANTEE

Refer to the warranties outlined in the Purchase Order.

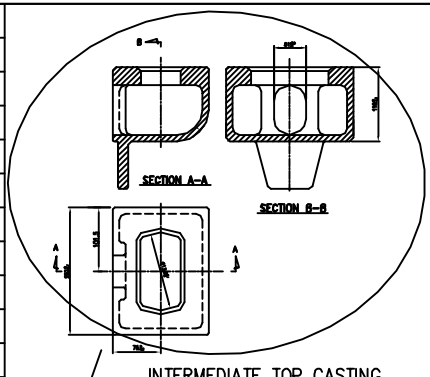
Any damages caused by mis-handling, mis-securing, mis-loading, impact and any accidents relating from bad practices are excluded.

## 12. REVISION

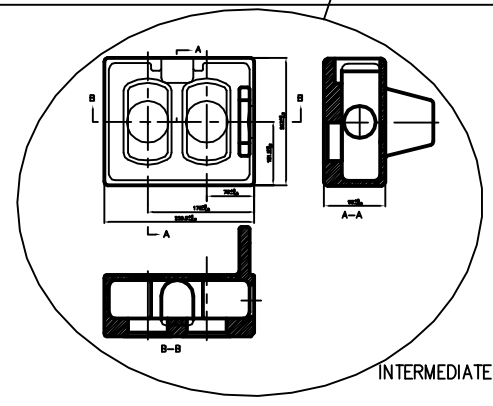
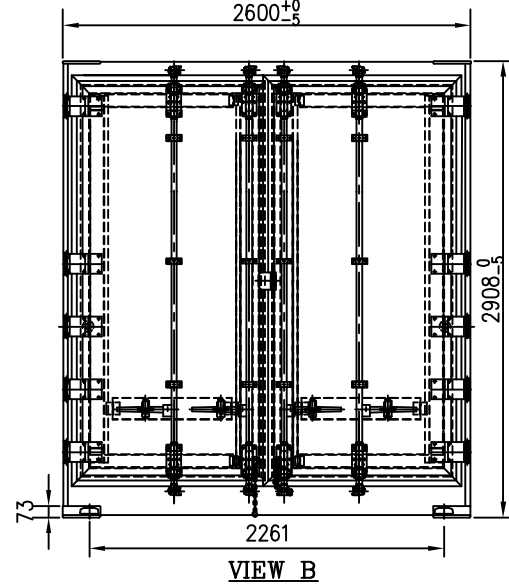
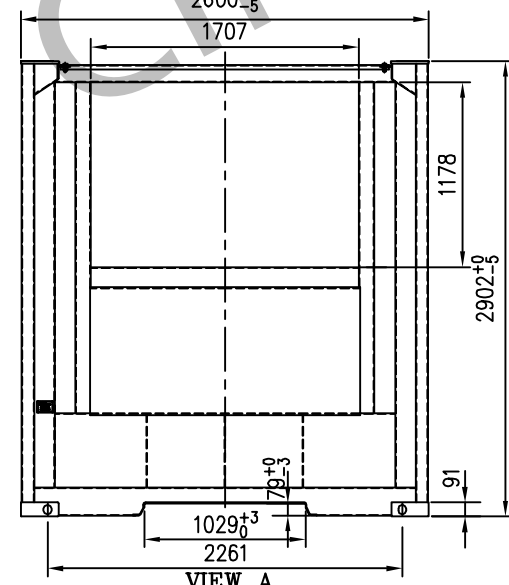
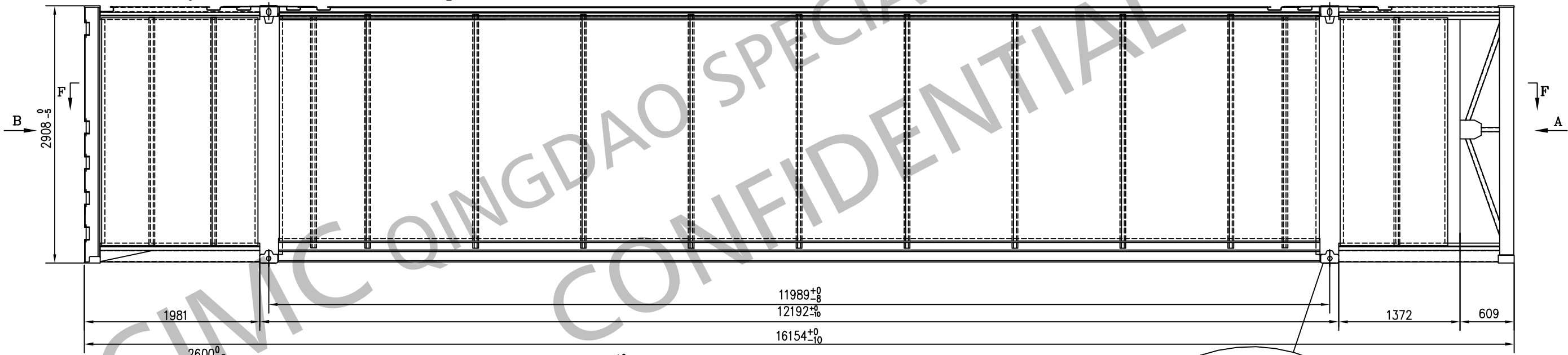
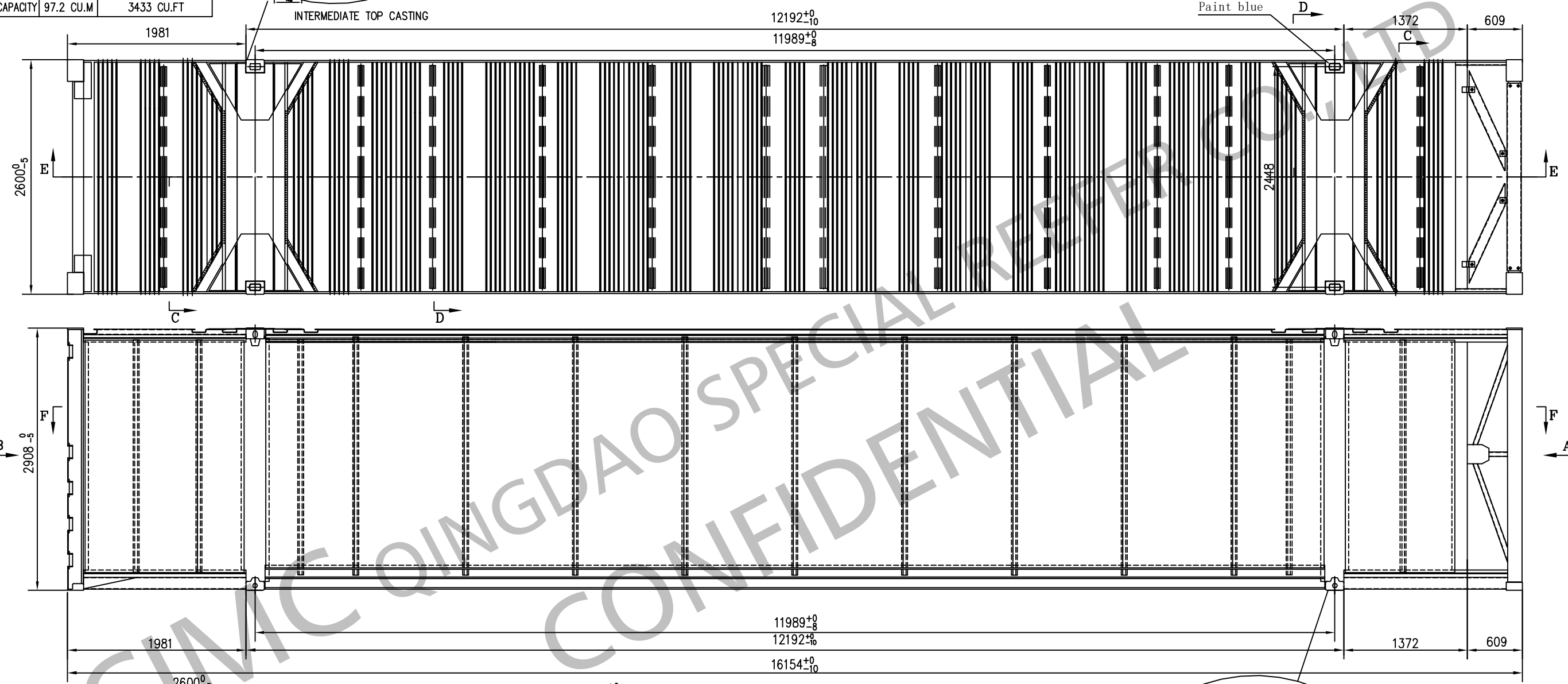
Spec. Item	Ref. Dwg. No.	Description	Date	Designer
		Update the inner length and inner cube according to the actual depth of reefer unit	2015.03.05	Henry
7. Special features		Change the description of E-track installation method.		
3. Insulated side walls		Change the description of Scuff lining installation method.	2015.07.01	Henry

## R&D of Qingdao CIMC Special Reefer

CLASSIFICATION		DIMENSION			
EXTERNAL	LENGTH	16154 <sup>0</sup> <sub>-10</sub>	53'	-25/64"	
	WIDTH	2600 <sup>0</sup> <sub>-5</sub>	8'-6 3/8"	-3/16"	
	HEIGHT	2908 <sup>0</sup> <sub>-5</sub>	9'-6 1/2"	-3/16"	
INTERNAL	LENGTH	15203 <sup>0</sup> <sub>-10</sub>	49'-10 35/64"	-25/64"	
	WIDTH	2480 <sup>+0</sup> <sub>-10</sub>	8'-1 5/8"	-25/64"	
	HEIGHT	2579 <sup>0</sup> <sub>-10</sub>	8'-5 1/2"	-25/64"	
DOOR	WIDTH	2455 <sup>0</sup> <sub>-5</sub>	8'- 21/32"	-3/16"	
OPENING	HEIGHT	2574 <sup>0</sup> <sub>-5</sub>	8'-5 11/32"	-3/16"	
CARGO ACCESS HEIGHT		2570 <sup>0</sup> <sub>-5</sub>	8'-5 3/16"	-3/16"	
INTERNAL CUBIC CAPACITY		97.2 CU.M	3433 CU.FT		



MAX GROSS WEIGHT		30480 KGS	67200 LBS
TARE WEIGHT (±2%)	EXCL. UNIT & TANK	4750 KGS	10470 LBS
	INCLUDING UNIT ( 730KG )	5480 KGS	12080 LBS
	INCLUDING TANK ( 50KG AL )	5530 KGS	12190 LBS
	INCLUDING FUEL ( 120GAL=378KG )	5910 KGS	13030 LBS
MAX PAYLOAD		24570 KGS	54170 LBS
STACKING TEST LOAD		22860 KGS	50400 LBS
FLOOR RATING		8160 KGS	18000 LBS
HEAT LEAKAGE (283K M.W.T.)		58 kcal/hr. °c	127.6 B.T.U/hr. °F



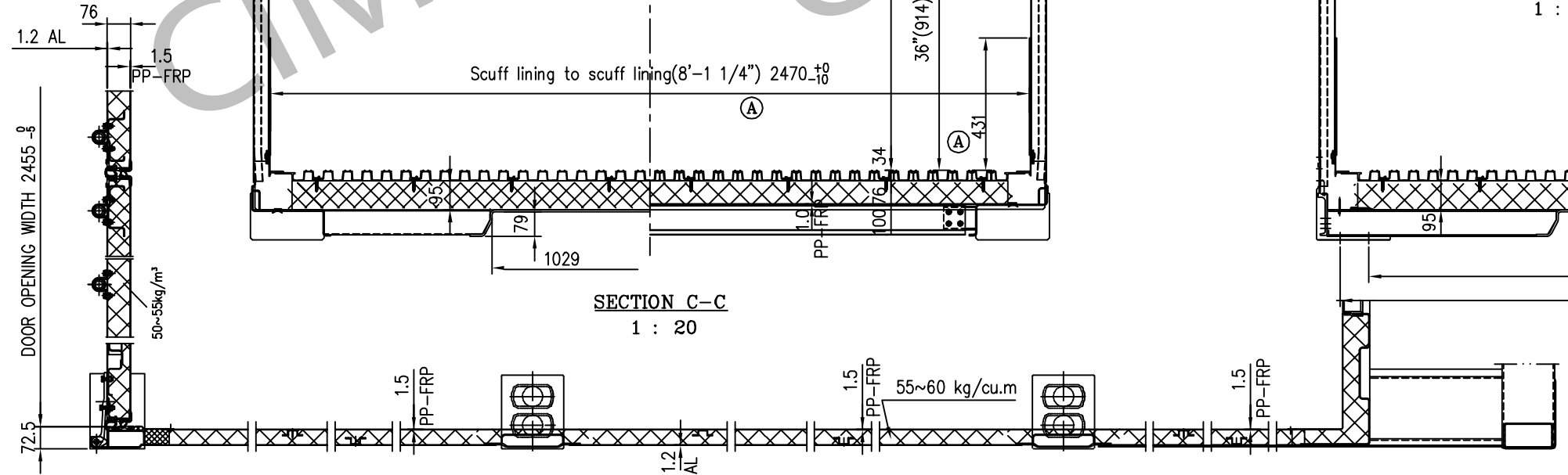
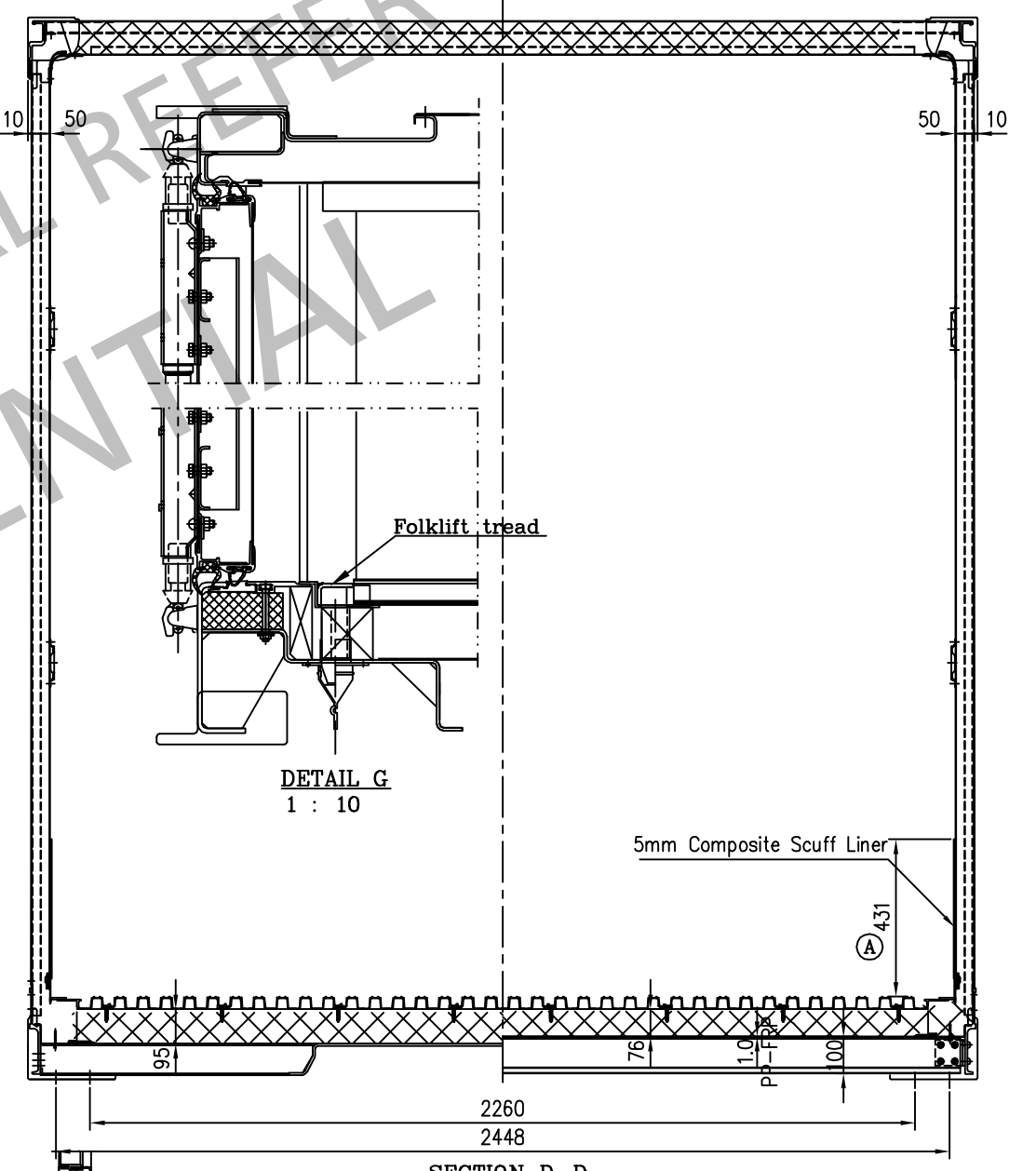
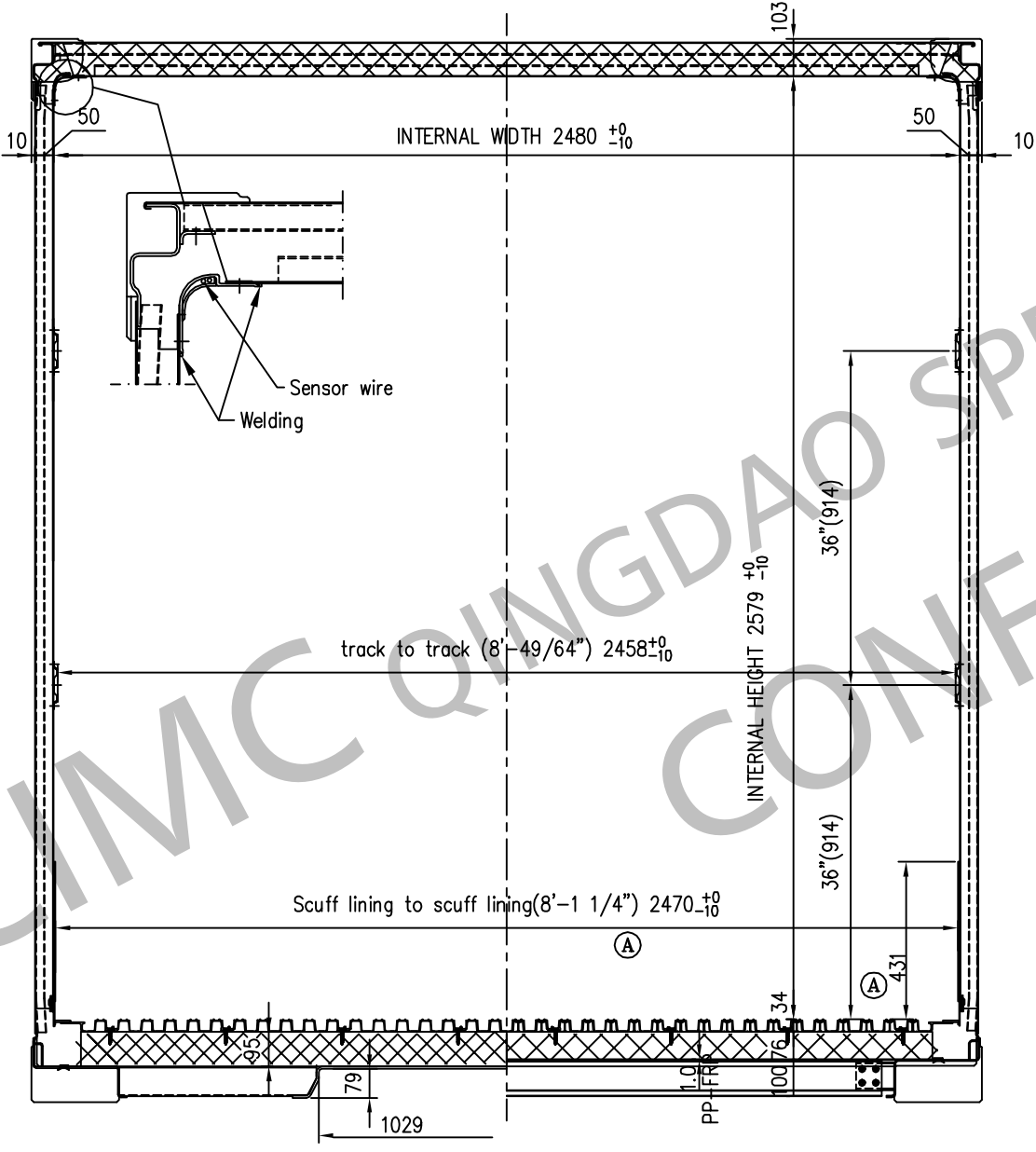
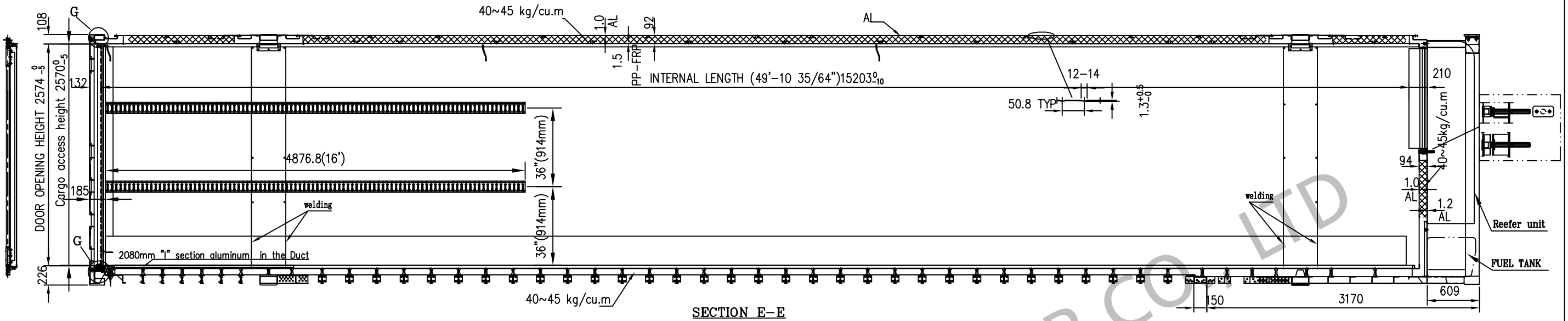
**CHINA INTERNATIONAL MARINE CONTAINERS (GROUP) LTD.**

TITLE: 53'x8'6 3/8"x9'6 1/2" Reefer GENERAL ARRANGEMENT

OWNED	BQCM	SCALE	1 : 50	QTY.	1
DESIGNED	Lifei	DATE	2015.04.01	DWG. NO.:	A53-05GD-972A1
CHECKED		DATE		SHEET	1 OF 2 SHEETS
APPROVED		DATE			

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ISSUE	DATE	DESIGNED	CHECKED	APPROVED



DETAIL G  
1 : 10

CHINA INTERNATIONAL MARINE CONTAINERS (GROUP) LTD.

TITLE: 53'x8'6 3/8"x9'6 1/2" REEFER GENERAL ARRANGEMENT

OWNED BQCM SCALE 1 : 50 QTY. 1

DESIGNED Lifei DATE 2015.04.01 DWG. NO.: A53-05GD-972A2

CHECKED Henry DATE 2015.04.01 SHEET 2 OF 2 SHEETS

ISSUE	DATE	DESIGNED	CHECKED	APPROVED
A	2015.05.04	Lifei		