New Design of Wagons

AK Khosla
Jindal Rail Infrastructure Ltd.

Presentation Outline

- Wagon Holding on IR
- Type of Wagons on IR
- Max Moving Dimensions & Fixed structures
- Design Criteria
- Drivers for New Wagon Designs
- Brief on Jindal Rail Infrastructure Ltd.

Presentation Outline

- Wagon Holding on IR
- Type of Wagons on IR
- Max Moving Dimensions & Fixed structures
- Design Criteria
- Drivers for New Wagon Designs
- Brief on Jindal Rail Infrastructure Ltd.

Wagon Holding on Indian Railways

TYPE OF WAGON	WAGONS	TOTAL QTY.
OPEN WAGON	BOXN,BOXNHS,BOXNHL,BOXNLW,BOY,BOST,BOSTHSM2,BOXNLW, BOXNS	1,37,360
COVERED WAGON	BCNA, BCNHL, BCNAHS	70,239
FLAT WAGON	BFNS,BRNA,BRN22.9,BRHNEHS,	11,694
HOPPER WAGON	BOBYN,BOBYN22.9,BOBRN,BOBRNHS,BCFC,BOBRNHSM1,BOBRNAL,BOBSN	25,196
BRAKE VAN WAGON	BVZI,BVZC,BVCM	5,982
TANK WAGON	BTPN,BTPGLN,BTFLN	14,066
CONTAINER WAGON	BLC/BLL	14,891
SPECIAL PURPOSE WAGON	BCACBM (A-CAR/B-CAR), BOM, BWT & Others	6,780
Total		2,86,208

Presentation Outline

- Wagon Holding on IR
- Wagon Types on IR
- Max Moving Dimensions & Fixed structures
- Design Criteria
- Drivers for New Wagon Designs
- Brief on Jindal Rail Infrastructure Ltd.

Wagon Types on Indian Railways

- OPEN WAGONS
- COVERED WAGONS
- FLAT WAGONS
- HOPPER WAGONS
- TANK WAGONS
- BRAKE VAN WAGONS
- CONTAINER WAGONS
- SPECIAL PURPOSE WAGONS

OPEN WAGONS

BOXNHL WAGON

BOXNHS WAGON

SALIENT FEATURE	BOXNHL	BOXNHS	BOXNS	BOY
Material of Construction	IRS M44, CRF section	IS 2062 E250 A CU	IS 2062 E450 BR CU	IS:2062E250 A CU & IRSM41
Type of Commodity	Coal	Coal	Coal	minerals/ore
Loading	Top loading	Top loading	Top loading	Top loading
Unloading	Side doors & Grabber	Side doors & Grabber	Tippling operation Or Grabber Tippling operation	
Length over head stock (mm)	10034	9784	9784	11000
Length over couplers (mm)	10963	10713	10713	11929
Length inside (mm)	10034	9784	9784	10990
Width inside/Width Overall (mm)	3022/3250	2950/3200	3111/3135	2924/3134
Height inside/Height(max.)from RL.	2028/3301	1950/3233	2300/3581	1175/2450
Height of C.B.C. from R.L. (mm)	1105	1105	1105	1105
Floor area (Sq.M)	30.32	28.87	30.281	32.13
Cubic Capacity (Cu.M)	61.05	56.29	69.36	37.8

OPEN WAGONS

BOXNS WAGON

BOY WAGON

SALIENT FEATURE	BOXNHL	BOXNHS	BOXNS	BOY
Maximum axle load (tonne)	22.9	20.32	25	22.9
Tare Weight (tonne)	20.6	23.2	19.85	20.71
Pay load (tonne)	71.0	58.08	80.15	70.89
Gross load (Pay+Tare) (tonne)	91.6	81.28	100	91.6
No. of wagons per train	58	58	59	52
Throughput per rake (tonne)	4118	3368.64	4728.85	3686.28
Brake System	Air Brake	Air Brake	Air Brake	Air Brake
Coupler	C.B.C.	C.B.C.	C.B.C.	C.B.C.
Bearing	R.B.	R.B.	K Class CTRB	R.B.
Bogie	Casnub 22 HS Bogie	Casnub 22 HS Bogie	LWLH 25 Bogie	Casnub 22 NLB Bogie
Brake rigging (Under frame mounted/Bogie mounted)	Bogie Mounted	Under frame mounted	Under frame Mounted	Under frame Mounted
Maximum Speed	100 kmph	100 kmph	100 kmph	65 kmph

COVERED WAGONS

BCNHL WAGON

BCNAHS WAGON

SALIENT FEATURE	BCNHL	BCNAHS
Material of Construction	IS:2062 E450 BR CU	IS:2062E250A CU &IRSM41
Type of Commodity	Food grain, fertilizer and bag quantities	Food grain, fertilizer and bag quantities
Loading	Through sliding door	Through door opening
Unloading	Through door opening	Through door opening
Length over head stock (mm)	10034	13521
Length over couplers (mm)	10963	14450
Length inside (mm)	10034	13515
Width inside/Width Overall (mm)	3340/3450	2944/3200
Height inside/Height(max.) from RL.	3060/4385	2677/4014
Height of CBC from R.L. (mm)	1105	1105
Floor area (Sq.M)	33.51	16.46
Cubic Capacity (Cu.M)	102.5	103.40

COVERED WAGONS

SALIENT FEATURE	BCNHL	BCNAHS
Maximum axle load (tonne)	22.9	20.32
Tare Weight (tonne)	20.8	24.55
Pay load (tonne)	70.8	56.73
Gross load (Pay+Tare) (tonne)	91.6	81.28
No. of wagons per train	58	43
Throughput per rake (tonne)	4106	2439
Brake System	Air Brake	Air brake
Coupler	C.B.C.	C.B.C.
Bearing	R.B.	R.B.
Bogie	Casnub 22 HS Bogie	Casnub 22 HS Bogie
Brake rigging (Under frame mounted/Bogie mounted)	Bogie mounted	Under frame mounted
Maximum Speed	100 kmph	100 kmph

FLAT WAGONS

BRNA WAGON

BRNA –EUR WAGON

SALIENT FEATURE	BRNA/BRNAHS	BRNA-EUR	BFNS/BFNSM1	BFNSM 22.9
Material of Construction	IS:2062 E250A CU	IS:2062 E250A CU	IRSM41&IS:2062 E250A CU	IS:2062 E450BR CU&IS:2062 E250A
Type of Commodity	Rail , Steel plates ,Sleepers	Long welded rails	coil	coil
Loading	Top Loading	Top Loading	Top Loading	Top Loading
Unloading	Lifting by Crane	Lifting by Crane	Lifting by Crane	Lifting by Crane
Length over head stock (mm)	13716	13716	13716	10034
Length over couplers (mm)	14645	14645	14645	10963
Width Over Sole bar (mm)	2845	2845	2845	2845
Height(max.)from RL.	2544	2544	2776	1799
Height of C.B.C. from R.L. (mm)	1105	1105	1105	1105

FLAT WAGONS

BRNA WAGON

BFNSM22.9 WAGON

SALIENT FEATURE	BRNA/BRNAHS	BRNA-EUR	BFNS/BFNSM1	BFNSM 22.9
Maximum axle load (tonne)	20.32	20.32	20.32/22.9	22.9
Tare Weight (tonne)	23.543	31.77/27.87	26.71	23.6
Pay load (tonne)	57.737	49.51/53.41	54.57/	68.0
Gross load (Pay+Tare) (tonne)	81.28	81.28	81.28/91.6	91.6
No. of wagons per train	43	18	43	58
Throughput per rake (tonne)	2425		2292	3944
Brake System	Air brake	Air brake	Air brake	Air brake
Coupler	C.B.C.	C.B.C.	C.B.C.	C.B.C.
Bogie	CASNUB HS	CASNUB 22NLB	CASNUB 22HS	CASNUB HS
Brake rigging (Under frame mounted/Bogie mounted)	Under frame mounted	Under frame mounted	Under frame mounted	Bogie mounted
Maximum Speed	75 kmph	75 kmph	100 /60 kmph Provisional	60 Kmph Provisional

HOPPER WAGONS

BOBYN WAGON

BOBSN WAGON

SALIENT FEATURE	BOBYN	BOBSN	BCFC	BOBRN	BOBRNHSM1
Material of Construction	IS:2062E250 A CU	IS:2062E250 A CU	IRSM 44	IS:2062E250 A CU & IRSM44	IS:2062E250 A CU & SAILMA 350
Type of Commodity	Ballast	Ballast	Fly ash / Cement	Coal	Coal
Loading	Top	Top	Top inlet hatches	Top	Top
Unloading	Bottom & Side discharge	Side discharge	Air Assisted Bottom discharge	Bottom discharge	Bottom discharge
Length over head stock (mm)	10718	10668	9784	9671	9671
Length over couplers (mm)	12000	11597	10713	10600	10600
Length inside (mm)	9000	9296	10085	9327	9327
Width inside/Width Overall (mm)	2863/3189	2743/3020	3129	3340/3500	3340
Height inside/Height(max.)from RL.	1781/3050	3304	4265	2466/3735	2456/3735
Height of C.B.C. from R.L. (mm)	1105	1105	1105	1105	1105
Cubic Capacity (Cu.M)	40.3	34.00	75.8	56.78	56.78

HOPPER WAGON TYPE

BOBRN WAGON

BCFC WAGON

SALIENT FEATURE	BOBYN	BOBSN	BCFC Fly ash/ Cement	BOBRN	BOBRNHSM1
Maximum axle load (tonne)	20.32	25.0	17.75 / 22.32	20.32	22.32
Tare Weight (tonne)	27.04	30.0	22	25.61	25.61
Pay load (tonne)	54.24	70.0	49 / 67.3	55.67	63.67
Gross load (Pay+Tare) (tonne)	81.28	100.0	71 / 89.3	81.28	89.28
No. of wagons per train	51	53	59	58	58
Throughput per rake (tonne)	2766.24	3710.0	2891/4130	3228.86	3692.86
Brake System	Air Brake	Air Brake	Air Brake	Air brake	Air brake
Coupler	C.B.C.	C.B.C.	C.B.C.	C.B.C.	C.B.C.
Bearing	R.B.	R.B.	R.B.	R.B.	R.B.
Bogie	CASNUB22HS	CASNUB22NLB	CASNUB22HS	CASNUB22NLB	CASNUB22HS
Brake rigging (Under frame mounted/Bogie mounted)	Under frame mounted	Bogie mounted	Bogie mounted	Under frame mounted	Bogie mounted
Maximum Speed	75 kmph	50 kmph	60 kmph	65 kmph	60kmph

TANK WAGONS

BTPN WAGON

BTAP WAGON

SALIENT FEATURE	BTPN	BTAP	BTALN	BTPGLN	BTCS
Material of Construction	IS:2062E250 ACU	IS:2062E250 ACU	Mild Steel	Mild Steel	Mild Steel
Type of Commodity	kerosene, petrol, diesel and naphtha	Alumina powder	Ammonia	LPG	Caustic soda
Loading	Top Inlet Hatches				
Unloading	Discharge valves at bottom of the barrel				
Length over head stock (mm)	11491	11400	16600	18000	9784
Length over couplers (mm)	12420	12329	17529	19282	10713
Length of barrel inside (mm)	11434	8400	16325	17960	9760
Dia. inside (barrel) (mm)	2850	3200	2200	2400	2300
Overall Height from R.L. (mm)	4265	4350	4265	4285	4110
Height of C.B.C. from R.L. (mm)	1105	1105	1105	1105	1105
Cubic Capacity (Cu.M)	70.40	62	60.660	79.4	38.75

TANK WAGONS

BTPGLN WAGON

BTCS WAGON

SALIENT FEATURE	BTPN	BTAP	BTALN	BTPGLN	BTCS
Maximum axle load (tonne)	20.32	20.32	20.32	20.32	20.32
Tare Weight (tonne)	27.00	27.00	49.130	≤43.5	26.00
Pay load (tonne)	54.28	54.28	32.13	37.6	55.28
Gross load (Pay+Tare) (tonne)	81.28	81.28	81.26	81.28	81.28
No. of wagons per train	47	47	33	30	58
Throughput per rake (tonne)	2551	2551	1060	1128	3206
Brake System	Air brake	Air brake	Air brake	Air brake	Air brake
Coupler	C.B.C.	C.B.C.	C.B.C.	T.S.	C.B.C.
Bearing	R.B.	R.B.	R.B.	R.B.	R.B.
Bogie	CASNUB 22NLB	CASNUB 22NLB	CASNUB 22NLB	CASNUB 22NLB	CASNUB 22NLB
Brake rigging (Under frame mounted/Bogie mounted)	Under frame mounted	Under frame mounted	Underframe mounted	Underframe mounted	Underframe mounted
Maximum Speed (Loaded)	75 kmph	75 kmph	65 kmph	80 kmph	65 kmph

BRAKE VAN WAGONS

BVZI WAGON

SALIENT FEATURE	BVZI	BVCM
Material of Construction	IS: 2062 E 250,IS:3502 & IRS:M41	IS:2062 E250 A Cu
Type of Commodity	BRAKE VAN	BRAKE VAN
Length over head stock (mm)	13540	9784
Length over couplers (mm)	14469	10713
Width inside/Width Overall (mm)	3200	3200
Height inside/Height(max.)from RL.	2448/3894	3894
Height of C.B.C. from R.L. (mm)	1105	1105
Tare Weight (tonne)	**23.5**	**21.1**
Brake System	**Air brake**	**Air brake**
Coupler	**C.B.C.**	**C.B.C.**
Bearing	**R.B.**	**R.B.**
Bogie	**ICF BOGIE**	**CASNUB 22HS**
Brake rigging	**Bogie mounted**	**Under frame mounted**
Maximum Speed (Loaded)	**100 kmph**	**100 kmph**

CONTAINER WAGONS

BLC WAGON

BLLA WAGON

SALIENT FEATURE	BLLA	BLLB	BLCA	BLCB
Material of Construction	IS:2062 E450 BR CU	IS:2062 E450 BR CU	IS:2062 E450 BR CU	IS:2062 E450 BR CU
Type of Commodity	Container	Container	Container	Container
Loading	By Crane	By Crane	By Crane	By Crane
Unloading	By Crane	By Crane	By Crane	By Crane
Length over head stock (mm)	15220	13810	13625	12212
Length over couplers (mm)	16161	14763	14566	13165
Length inside (mm)	-	-	-	-
Width inside/Width Overall (mm)	2100/2200	2100/2200	2100/2200	2100/2200
Height inside/Height(max.)from RL.	1008	1008	1009	1009
Height of S.D.B. from R.L. (mm)	1105	1105/845	1105/845	845

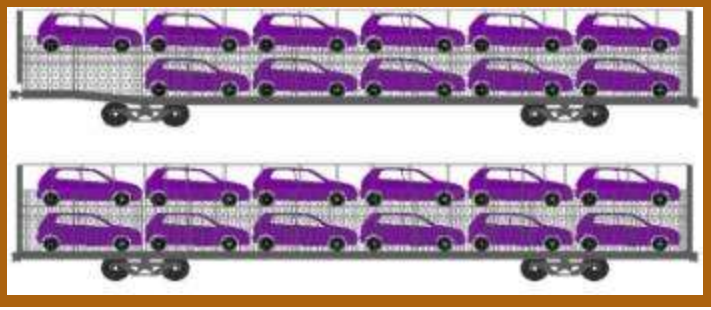
CONTAINER WAGONS

SALIENT FEATURE	BLLA	BLLB	BLCA	BLCB
Maximum axle load (tonne)	20.32	20.32	20.32	20.32
Tare Weight (tonne)	19.8	19	19.1	18
Pay load (tonne)	61	61	61	61
Gross load (Pay+Tare) (tonne)	80.8	80	80.1	79
No. of wagons per train	18	27	18	27
Throughput per rake (tonne)	1098	1647	1098	1647
Brake System	Air Brake	Air Brake	Air Brake	Air Brake
Coupler	C.B.C./S.D.B	Slack less Draw Bar	C.B.C./S.D.B	Slack less Draw Bar
Bearing	R.B.	R.B.	R.B.	R.B.
Bogie	LCCF	LCCF	LCCF	LCCF
Brake rigging (Under frame mounted/Bogie mounted)	Under frame mounted	Under frame mounted	Under frame mounted	Under frame mounted
Maximum Speed (Loaded)	100 kmph	100 kmph	100 kmph	100 kmph

SPECIAL PURPOSE WAGONS

BCACBM WAGON

BCACBM A&B WAGON



SALIENT FEATURE	BCACBM A-CAR/B-CAR	BOMN	BWTB
Material of Construction	IS:2062 E250A CU	IS: 2062 E250A CU	IS: 8500, Gr. 540 &IS: 2062
Type of Commodity	Car	Military Vehicle	Military Tank
Loading	By end	By end	By end
Unloading	By end	By end	By end
Length over head stock (mm)	22626	18460	15510
Length over couplers faces (mm)	23555	19742	15510
Length over car track (mm)	22446		
Width inside/Width Overall (mm)	2900	3200	3200
Height inside/Height(max.)from RL.	4305	1275	1306
Height from R.L. (mm)	1269	1306	1306

SPECIAL PURPOSE WAGONS

BWTB WAGON

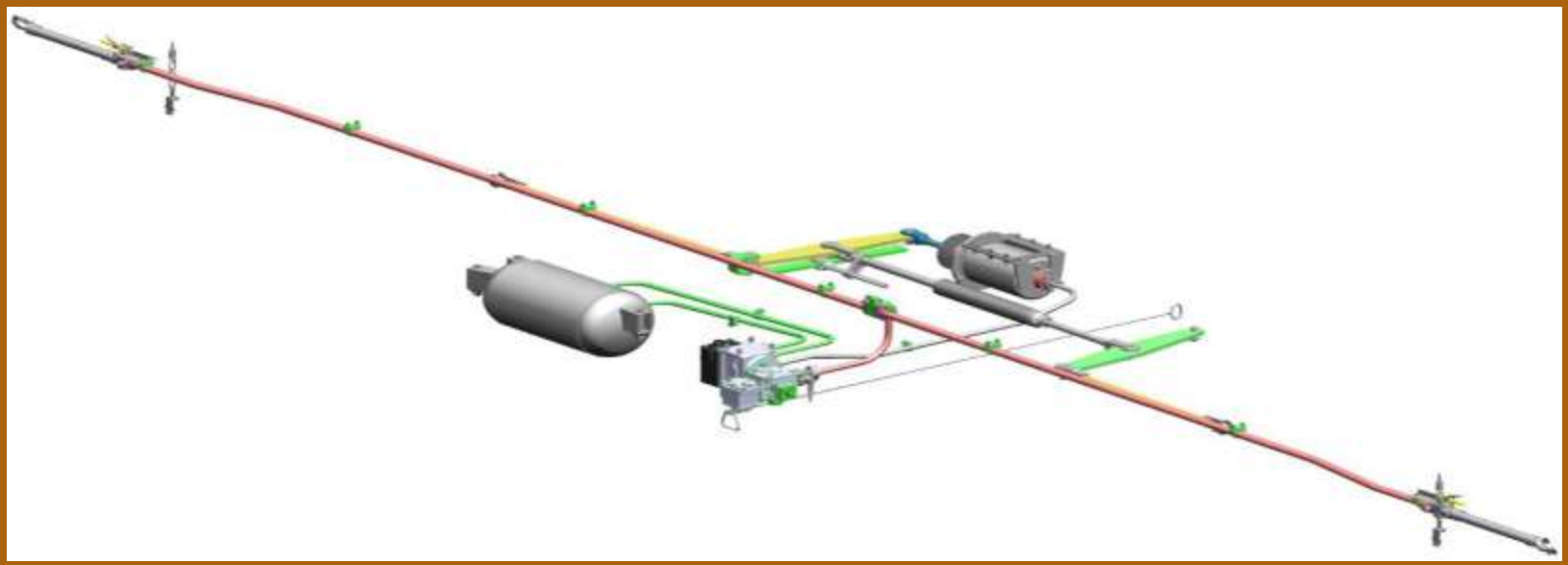
BOMN WAGON

SALIENT FEATURE	BCACBM A- CAR/B -CAR	BOMN	BWTB
Maximum axle load (tonne)	20.32/20.32	20.32	22.9
Tare Weight (tonne)	35.86/35.72	29.77	35.50
Pay load (tonne)	15	35.85	56.1
Gross load (Pay+Tare) (tonne)	50.86/50.72	65.62	91.6
No. of wagons per train	6/21	32	41
Throughput per rake (tonne)	90/315	1147	2300
Brake System	Air brake	Airbrake	Airbrake
Coupler	Centre buffer Coupler	C.B.C. along with side buffers	C.B.C. along with side buffers
Bearing	R.B.	R.B.	R.B.
Bogie	LCCF	CASNUB-22NLB	CASNUB-22NLB
Brake rigging (Under frame mounted/Bogie mounted)	Under frame mounted	Under frame mounted	Under frame mounted
Maximum Speed	**65kmph**	**65 kmph**	**65 kmph**

Type of Bogies

SALIENT FEATURE	CASNUB 22HS	CASNUB 22NLB	LWLH 25	LCCF	ICF
Type	3 piece Cast Steel	3 piece Cast Steel	3 piece Cast Steel	3 piece Cast Steel	Fabricated
Max. Axle Load (tonnes)	22.9	20.32	25	22	13.25
Max. Speed (kmph)	100	80	100	100	100
Wheel Dia. (mm)	1000	1000	840	840	915
Journal Centres (mm)	2260	2260	2260	2260	2159
Wheel base(mm)	2000	2000	2000	2000	2896
CP Height from RL. Under tare (mm)	929 - 932	932	726.5	715	842
Complete weight (tonne)	5.4	5.4	4.95	5.2	5.9

Air brake system In Indian Wagons



SALIENT FEATURES	
Types	Single pipe & twin pipe graduated release
Air pressure (Empty/Loaded)	2.2/3.8 Kg/cm2
Brake rigging	Underframe mounted / Bogie mounted
Hand brake	Side / end operated screw type

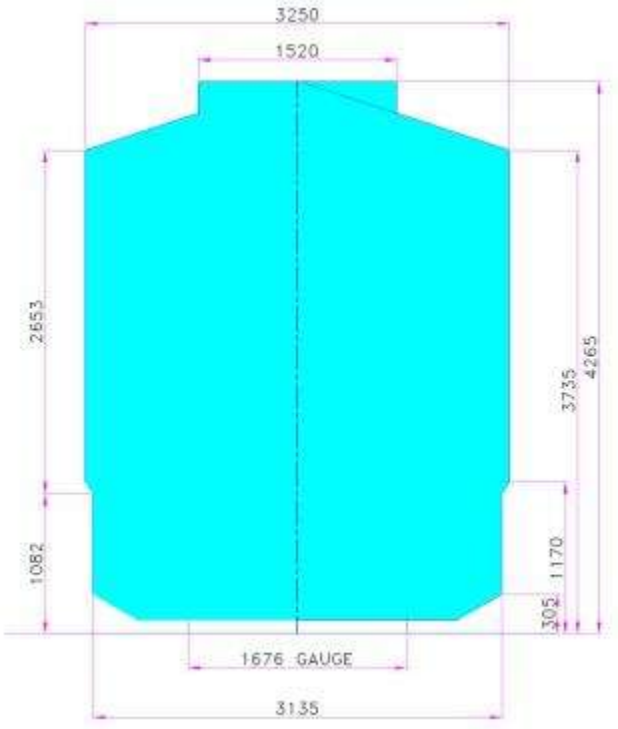
Type of Coupler Used In Indian Wagons

SALIENT FEATURE	
Type of coupler	AAR ‘E’ type High tensile Centre Buffer Coupler (Transition & Non-transition) and Screw coupling
Type Draft Gear	High capacity draft gear as per AAR-M901E
Tensile load	1000 kN
Compressive load	2000 kN
Coupler Parts	1. Coupler Body with Shank wear plate - Cast Grade E 2. Knuckle - Cast Grade E 3. Lock - Cast Grade E /Forged 4. Knuckle thrower - Cast Grade B /Forged 5. Knuckle Pin with Anti-theft cotter pin - Forged 6. Rotary bottom operated articulated lock lift assembly - Cast Grade B /Forged 7. Coupler Yoke - Cast Grade E 8. Yoke Pin - Forged 9. Yoke pin support with wear plate - Cast Grade B 10. Striker casting with wear plate - Cast Grade B

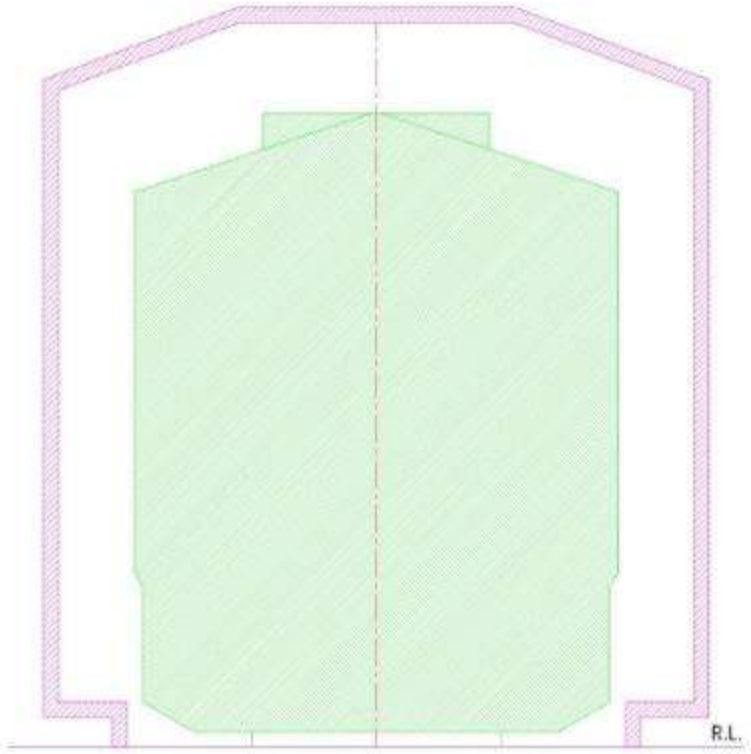
Presentation Outline

- Wagon Holding on IR
- Type of Wagons on IR
- Max Moving Dimensions & Fixed structures
- Design Criteria
- Drivers for New Wagon Designs
- Brief on Jindal Rail Infrastructure Ltd.

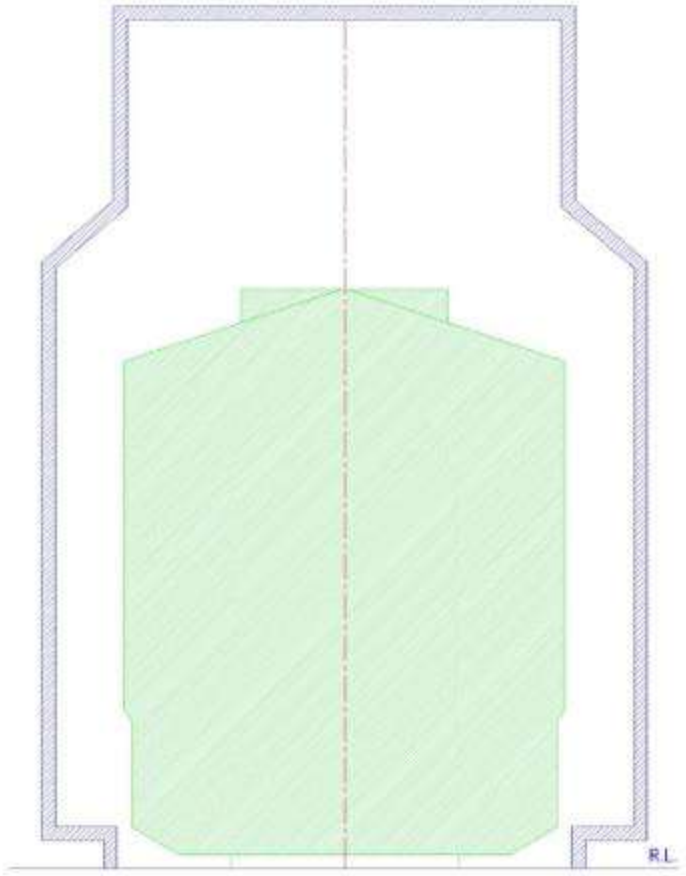
MAXIMUM MOVING DIMENSIONS
DIAGRAM NO. 1D-2004



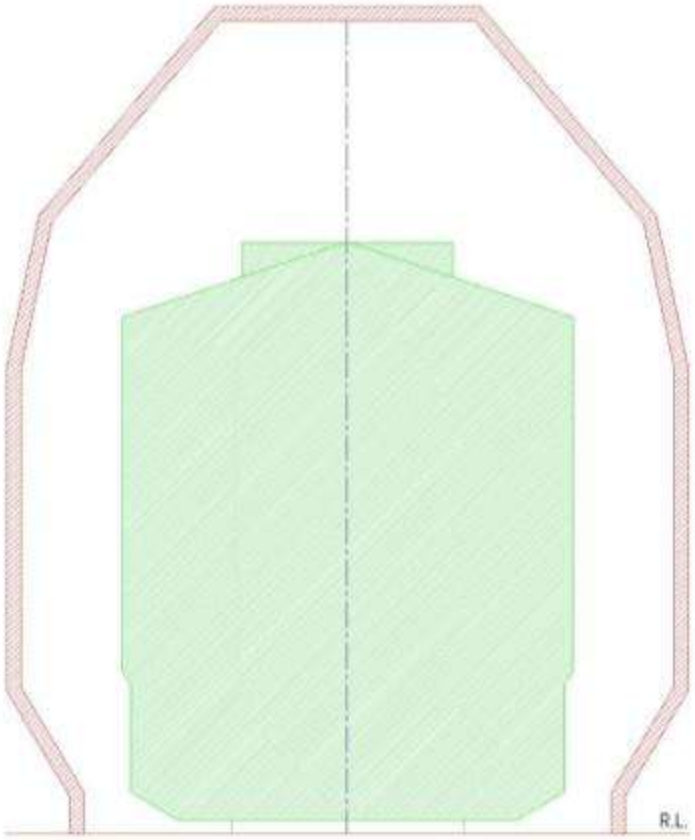
Fixed Structure –Non Electrified Route (Clearance with Max Moving Dimension)



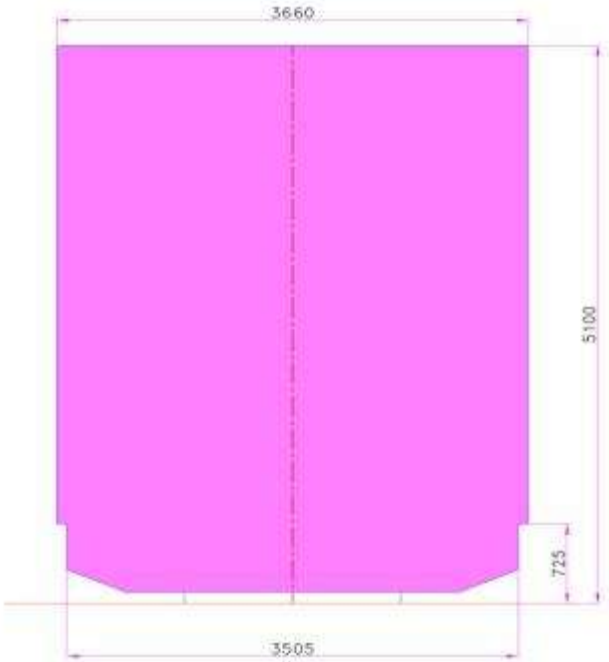
Fixed Structure – Electrified Route (Clearance with Max Moving Dimension)



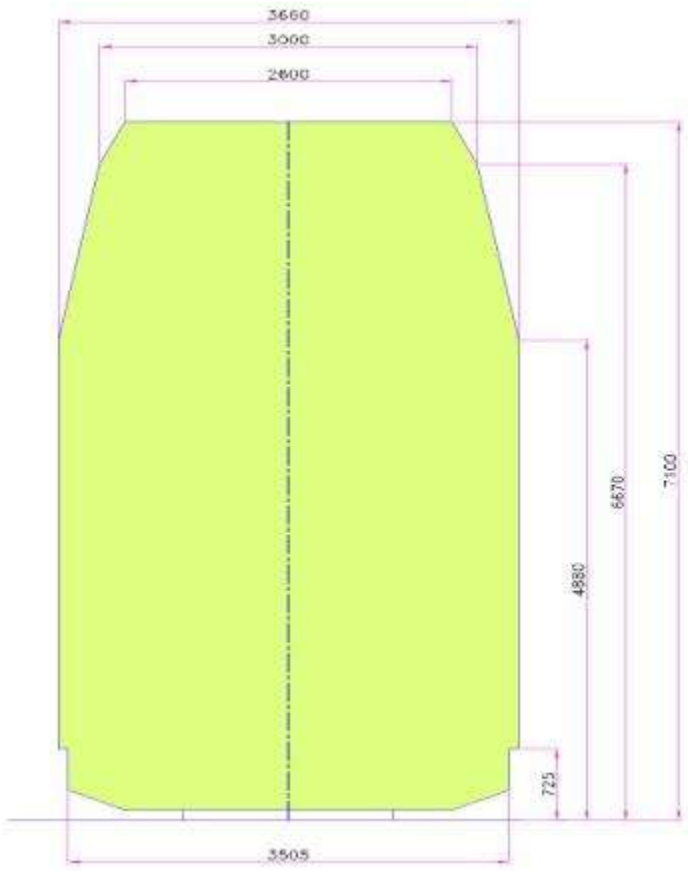
Fixed Structure – Bridges & Tunnel (Clearance with Max Moving Dimension)



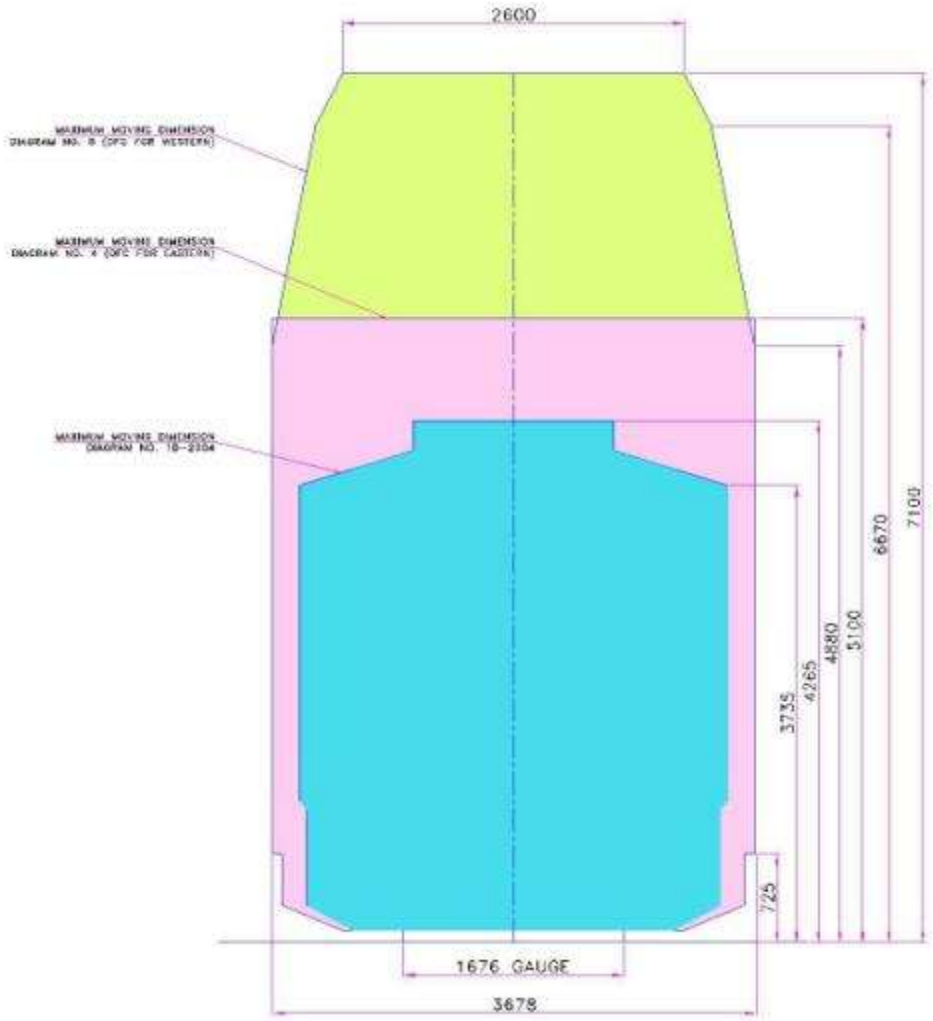
MAXIMUM MOVING DIMENSIONS FOR EASTERN DEDICATED FREIGHT CORRIDOR



MAXIMUM MOVING DIMENSIONS FOR WESTERN DEDICATED FREIGHT CORRIDOR



MAXIMUM MOVING DIMENSIONS OF IR



Presentation Outline

- Wagon Holding on IR
- Type of Wagons on IR
- Max Moving Dimensions & Fixed structures
- Design Criteria
- Drivers for New Wagon Designs
- Brief on Jindal Rail Infrastructure Ltd.

Design Criteria

- Design Requirements
- Inspection & Testing Procedure
- Acceptance Criteria

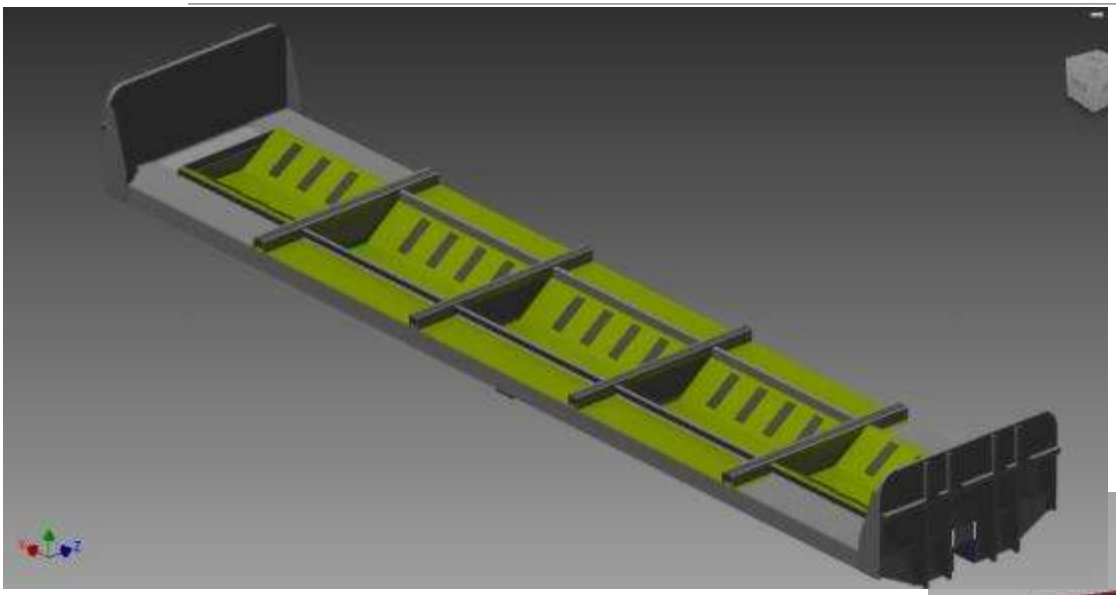
Basic Design Requirements

- Commodity to be transported
- Material of construction
- Max. Axle load
- Tare weight
- Pay Load and volumetric capacity
- Center of gravity
- Limiting gauge
- Special purpose equipment
- Type of Brake System, Bogie & Coupler

Design Development Process

- A conceptual sketch within limiting gauge
- Coupling Height
- Bogie Centre
- Track Loading Density
- Selection of material
- After finalization of conceptual sketches, 3D model preparation
- Finite element analysis of the model and material optimization

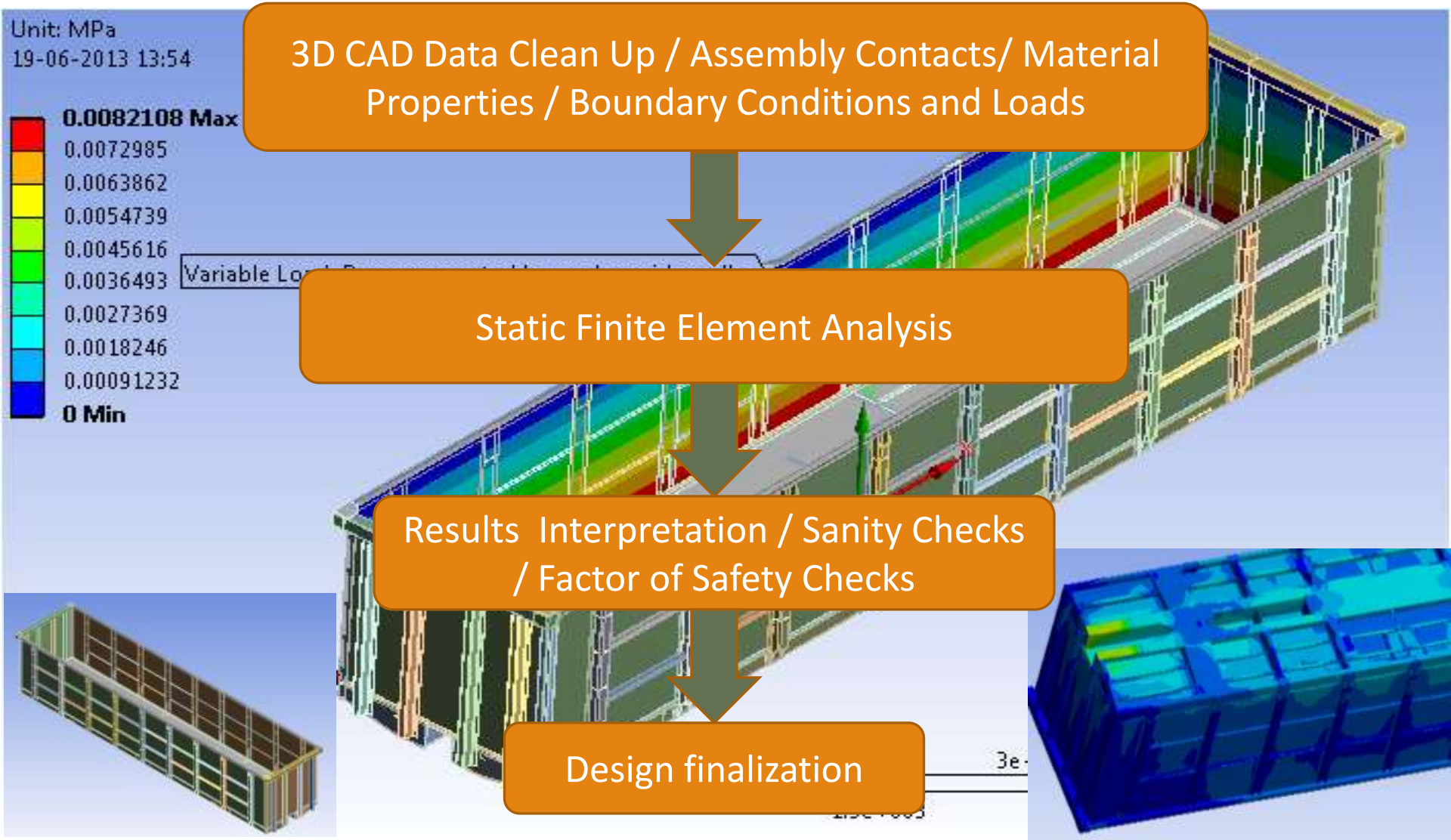
3D Modelling



Finite Element Analysis

- FEA on each sub assembly as well as full wagon structure under various load conditions
- Pay load on static condition
- 30% extra of pay for dynamic augmentation.
- Buffing load of 250 t
- Draft load of 100 t
- Payload & Buffing load / Draft load
- Simulation analysis

Project Flow of FEA



3D CAD Data Clean Up / Assembly Contacts/ Material Properties / Boundary Conditions and Loads

Static Finite Element Analysis

Results Interpretation / Sanity Checks / Factor of Safety Checks

Design finalization

Inspection & Testing Procedure

- Quality Assurance Plan
- Welding Procedure Specifications
- Check sheets
- Material, Stage & third party Inspection
- Load test on payload and 25% extra of payload
- Brake force test
- Squeeze load test
- Wagon weighment certificate
- Functional Test

Acceptance Criteria

- After successful factory testing/ Inspection of wagon, oscillation trials are conducted on prototype wagon in empty & loaded condition.
- On the basis of report along with modifications, if any, field trials also to be carried out.
- Maintenance & examination aspects of the wagon are also monitored.
- Safety aspects of the wagon during loading, unloading & operation also closely monitored.

Presentation Outline

- Wagon Holding on IR
- Type of Wagons on IR
- Max Moving Dimensions & Fixed structures
- Design Criteria
- Drivers for New Wagon Designs
- Brief on Jindal Rail Infrastructure Ltd.

New Wagon Design Drivers

- Private operators
  - CTO
  - SFTO
  - AFTO
- Wagon Leasing Companies
- Indian Railways for diversified commodities
- Transportation of Bulk commodities
- Higher axle loads for Dedicated Freight Corridors
- Longer/ wider steel products to reduce welding at site
- Export Projects

Commodities for Private Operators & Leasing Companies

- Bulk Cement, Fly ash & Clinker
- Auto Sector – Truck, tractors, Cars, SUV, Scooter, Bike etc.
- Finished Steel Products viz. Steel Coils, Steel plates, Rail panels, long beams, wagons with weather protection
- Dual purpose wagon

Commodities for Indian Railways

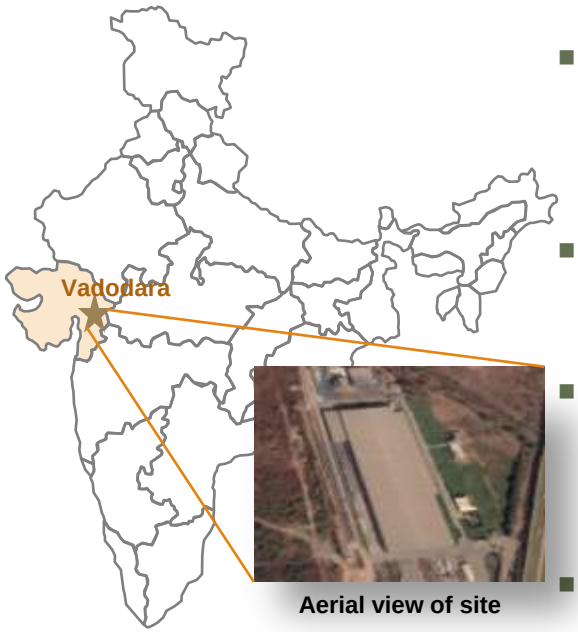
- Coal, Iron Ore, Limestone etc.
- Fly ash, Food Grain
- Finished Steel Products
- Milk, Non-standard Containers
- Refrigerated containers for perishable commodities

Presentation Outline

- Wagons Holding on IR
- Type of Wagons on IR
- Max Moving Dimensions & Fixed structures
- Design Criteria
- Drivers for New Wagon Designs
- Brief on Jindal Rail Infrastructure Ltd.

State-of-the-art manufacturing facility with capacity of 3000 Wagons

Manufacturing Details



Aerial view of site

- Plant located in India's fastest growing state i.e. Gujarat, known for industry friendly Government & uninterrupted power supply
- Plant spread across on more than 50 hectares of land adjacent to Karjan Railway station
- Flanked by Mumbai-New Delhi Main Railway line to the West and Mumbai-New Delhi Highway (NH-8) to the East
- Close proximity to ports to facilitate exports – JNPT/Nheva Sheva, Mumbai is the nearest port

Key Milestones

- Successfully executed first Order for stainless steel Freight Cars received in Jan. 2012 from Indian Railways ahead of delivery schedule with highest quality ratings amongst all Freight Car manufacturers in India
- Designed, manufactured and exported Cape Gauge Gondola Cars to Mozambique in 2013
- Emerged as Ministry of Railways' Regular Wagon Builder in April 2015 after 2 cycles of Developmental Orders and successful execution
- First wagon builder to have developed flat wagons with fixtures for transportation of 260 m long rail panels in 5-tiers
- Achieved highest outturn of 200 BOXNHL Freight Cars in Jan 2016

Production facility has proven robotic welding systems

Manufacturing Details

Plasma cutting

Welding robot for body panels

Robot for Full Welding of
Under frame Sub-assemblies

Underframe manufacturing

Box Manipulator Welding

JRIL specializes in Rail Cars and related equipment

Product Details

BOXNHL Freight Car for Indian Railways

Gondola Freight Car for JSPL Mozambique

BCNHL Freight Car for Indian Railways

Brake Vans for DLI

Freight Cars manufactured include

- ✓ Open type for Coal, Iron Ore etc.;
- ✓ Covered type for Cement, Foodgrain etc.,
- ✓ Flat type for Finished Steel Products, Containers etc.

JRIL also manufactures key sub-assemblies for Locomotives & Coaches

Product Details

Flat Cars for transporting Rail Panels

- First Freight Car builder in India to have successfully developed and manufactured BRNA type Flat Cars fitted with Fixtures for transportation of 260 m long welded Rail Panels

Container Flat Cars

- We supply these to prominent customers such as Tata-Aldesa

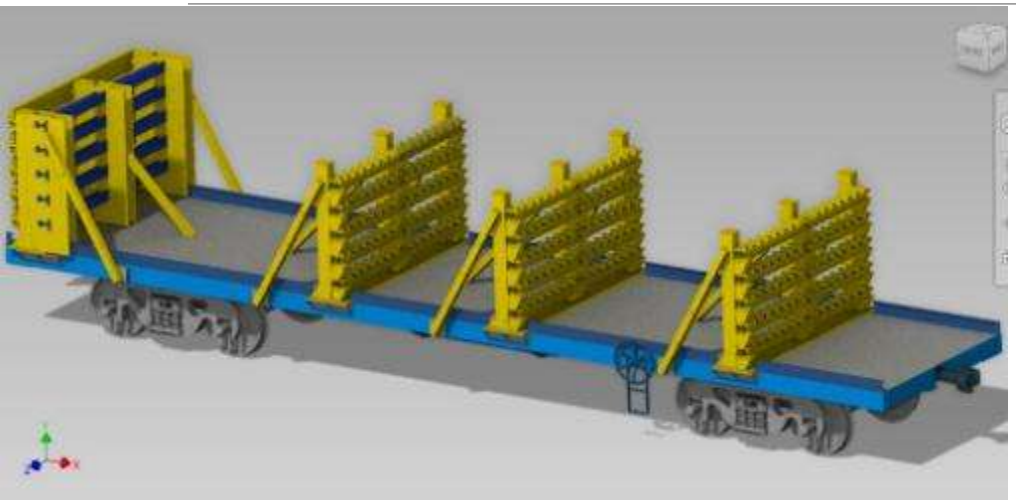
Bogie Frames for Indian Railways Coaches

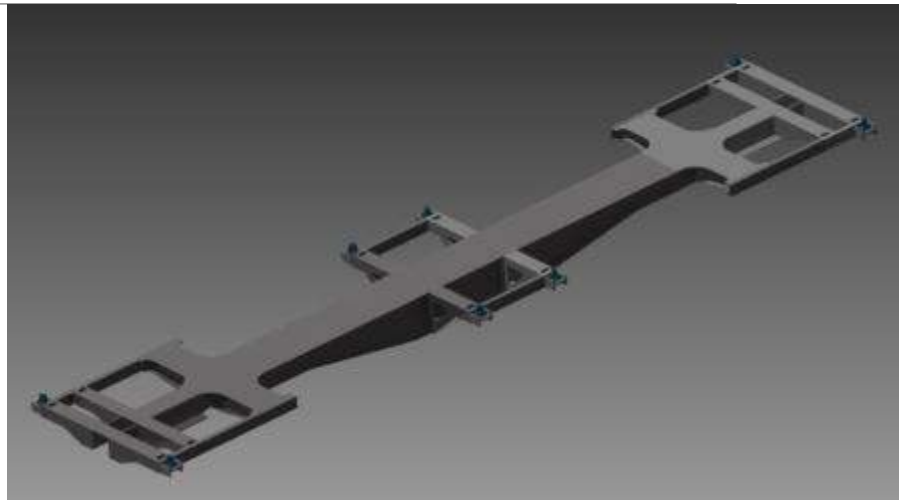
Floor Frame Assembly for Indian Railways Diesel Locomotives

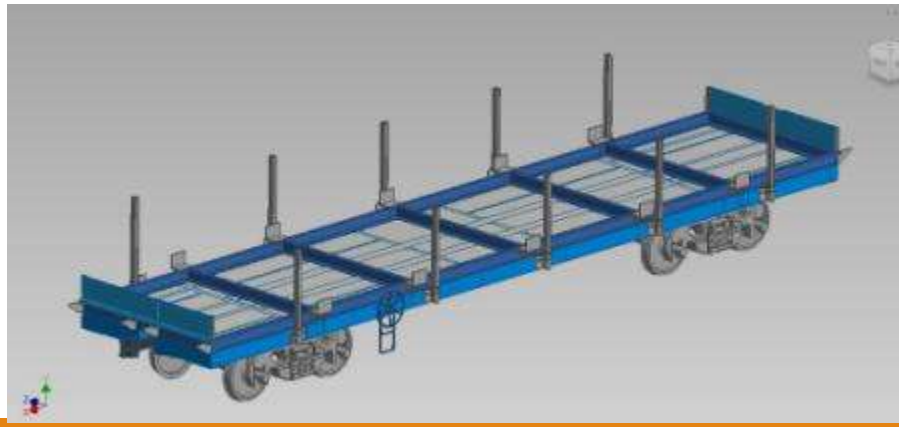
Design & Engineering Capabilities

- Highly experienced Design & Engineering Team for developing new designs for commodity-specific Freight Cars for maximizing throughput and performance
- Contributed in improved wagon design for transportation of 3.2 m wide plates & up to 26 m long steel products
- Contributed in improved wagon design for transportation of 260 m long rail panels in 5-tiers for new track construction
- Gondola Cars designed by us in successful operation in Mozambique for over 3 years now; key design features are:
  - ✓Cape Gauge 1067 mm; Scheffel Bogies
  - ✓Direct Release Air Brake System; Rotary Couplers

Recent Designs







Thank You