

SAFETY GUIDELINES FOR IRON & STEEL SECTOR		
MINISTRY OF STEEL, GOVT. OF INDIA	TRANSPORTATION IN STEEL INDUSTRY	Doc. No: SG/24
		Rev no. : 00 Effective Date : --

1.0 Objective

This Safety guideline outlines the minimum acceptable mandatory requirements to develop and maintain Safe method of Transportation of materials by Heavy vehicles such as Truck, Trailer, Dumper, etc.

2.0 Scope

The scope of work covers all steel plants in Iron and Steel sector.

3.0 Procedure

3.1 Definitions

Heavy Motor Vehicle: Any goods carriage the gross vehicle weight of which or a tractor or a road roller the tare weight of either of which exceeds 12 Ton.

Projected Materials: Any over dimensional consignment which are of extra ordinary dimensions and tonnage.

Side Projection: Any load which is project more than 150 mm over the sides of the trailer, and must not be more than 2.5 meters in total width.

Rear Projection: Any load projected more than 1.2 meters over the rear side of the trailer. If measured from the centre of the trailer axle or axle group, a load must be Not more than 3.7 meters, and not longer than the length of the load in front of the axle, or axle group.

Height Projection: The height of the materials should not exceed above the height of the Vehicle cabin.

3.2 Risk Assessment

Concerned person should identify the risks associated with the activities and possible danger involved and what is causing those dangers. For example, could someone be hit by a moving vehicle? Could someone fall from a vehicle, e.g. while getting in or out, or during loading or unloading? Or be hit by an object falling from a vehicle? Could a vehicle tip over?

3.3 Identification of Associated Hazard

Here some associated hazards are identified which can cause danger during transportation:

SNo	Materials	Mode of Transportation	Types of Vehicle used for transportation through Road	Associated Hazards
1	Raw Materials			
1.1	Iron Ore	Road, Rail, Conveyor	Dumper, Truck, Trailer, Container	Falling of material, Spillage, Dust,

				Toppling, Dashing, Collision, Break Down
1.2	Coke, Coal	Road, Rail, Conveyor	Dumper, Truck, Tipper Trailer	Spillage, Dust, Toppling, Dashing, Collision, Break Down
1.3	Lime	Road, Rail, Conveyor	Dumper, Truck, Tanker	
1.4	Sinter	Conveyor		
1.5	Flue Dust	Road	Dumper, Truck	
1.6	Hot Metal	Road, Rail	Camag Car, Hot Metal Ladle Vehicle	
2.0	Finished Product			
2.1	Slab	Road	Trailer	Falling of Materials, Toppling, Dashing, Collision, Break Down
2.2	Billet	Road	Trailer	
2.3	Coils	Road	Trailer	
2.4	Sheet	Road, Rail	Trailer	
2.5	Bar	Road, Rail	Trailer	
2.6	Wire	Road, Rail	Trailer	
2.7	Rod	Road, Rail	Trailer	
3.0	Miscellaneous			
3.1	Supply Material	Road	Dumper, Truck	Falling of Materials, Toppling, Dashing, Collision, Break Down
3.2	Refractory Material	Road	Dumper, Truck	
3.3	Sand	Road	Dumper, Truck	Spillage of Materials, Toppling, Dashing, Collision, Break Down
3.4	Bricks	Road	Dumper, Truck	Falling of Materials, Toppling, Dashing, Collision, Break Down
3.5	Slag	Road, Rail	Dumper, Truck	
3.6	Granulated Slag	Road, Rail	Dumper, Truck	Spillage of Materials, Toppling, Dashing, Collision, Break Down
3.7	Scrap Uneven	Road	Dumper, Truck, Trailer	
3.8	Scrap Mill	Road	Dumper, Truck	
3.9	Descale of Tundish	Road	Dumper, Truck, Trailer	
3.10	Pig Iron Scrap	Road	Dumper, Truck	
3.11	Biodegrada ble Scrap	Road	Dumper, Truck	
3.12	Coal Tar	Road	Dumper, Truck	
4.0	Chemical & Gases	Road, Pipe lines	Tanker, Truck, Container	Spillage of Materials, Toppling, Dashing, Collision, Break Down, Fire
5.0	Petroleum Product	Road, Rail, Pipe Lines	Tanker, Container	

3.4 Responsibility

- i) Line Management.
- ii) Transporters/ Contractor/ Suppliers/ Vendors/ Customers/ User department.

3.5 Responsibility of Management

3.5.1 Develop and ensure implementation of Transportation Safety Standards.

- i) To ensure that this standard is made available to and understood by all transporters/ Contractor/ Suppliers/ Vendors/ Customers/ User Department.
- ii) To ensure that Transporters/ Contractor/ Suppliers/ vendors/ customers/ User Department are appropriately trained to transport materials.
- iii) Investigate thoroughly all motor vehicle incidents and collisions.
- iv) Recognize and reward excellence in motor vehicle operations and in safe transportation skills.
- v) Audit of loading, unloading, transportation of material and audit of fitness of vehicles as per check list on an established frequency.
- vi) All concerned party should be informed about the hazards prevailing while transportation of material in general and specific.

3.4.2 Responsibility of Transporters/Contractor/Suppliers/Vendors/Customers

- i) Adhere to mandatory requirements of road safety standards and other Government's Road Safety Rules and Regulations and guidelines given in Central Motor vehicles Rules (CMVR), 1989.
- ii) Comply with driving laws and regulations both inside and outside works guided by Authorities.
- iii) Ensure adequate and appropriate defensive driving safety training has been received and successfully completed.
- iv) Report all incidents and collisions to concerned line managers of department or Safety Office and keep record.

3.4.3 Responsibility of Driver/ Operator

- i) To adhere all rules & regulations, and Safe work procedures whilst operating the vehicles and mobile machinery.
- ii) To conduct daily inspection of vehicles & mobile machinery once in a shift as per checklist made available by line management.
- iii) To ensure all loads are tied and securely transported.
- iv) To ensure all unattended vehicles and mobile machineries have the handbrake or emergency brake applied & Scotch block provided under the wheel to avoid roll down.
- v) Driver carrying hazardous material must be carrying trem card/ MSDS.
- vi) To inform and request to line management/ contractor for repair of any fault or deviation observed.

- vii) To inform all incidents and near miss to line management / Contractor.
- viii) All drivers & Operators must observe the Safety of other road user also.

3.6 Regulatory Requirements

3.6.1 All Transporters/ Contractor/ Suppliers/ vendors/ customers must follow all government laws and regulation concerning driving, including

- i) Alcohol/ illegal drug prohibitions.
- ii) Having a valid vehicle pass, driver's license or permit to operate the vehicle being driven.
- iii) Obeying all traffic signage and regulations.
- iv) No loose clothing and improper Personal protecting Equipment (PPEs).

3.6.2 Painting of vehicle registration number

Registration number of motor vehicles must be marked as per the guidelines of CMVR, 1989.

3.6.3 Motor Vehicle records

The Factory/ Department/ Division must keep a record of heavy vehicles of Transporters/ Contractors/ Suppliers/ Vendors/ Customers operating under the specific department.

3.6.4 Driver Training

Drivers must undergo defensive driving training as appropriate to their levels of use. Line managers must organize training at regular intervals for their heavy vehicle's driver operating under their department.

3.6.5 Safe Driving audit:

Each Department/ Division/ other locations may establish and ensure a Transportation audit schedule. It must be carried out at loading, unloading, parking, and during movement of the vehicles inside as well as outside the plant. All collisions or incidents shall be reported to management promptly (e.g., within 24 hours).

3.7 Human

3.7.1 General Safety Requirement for Heavy Vehicle Drivers

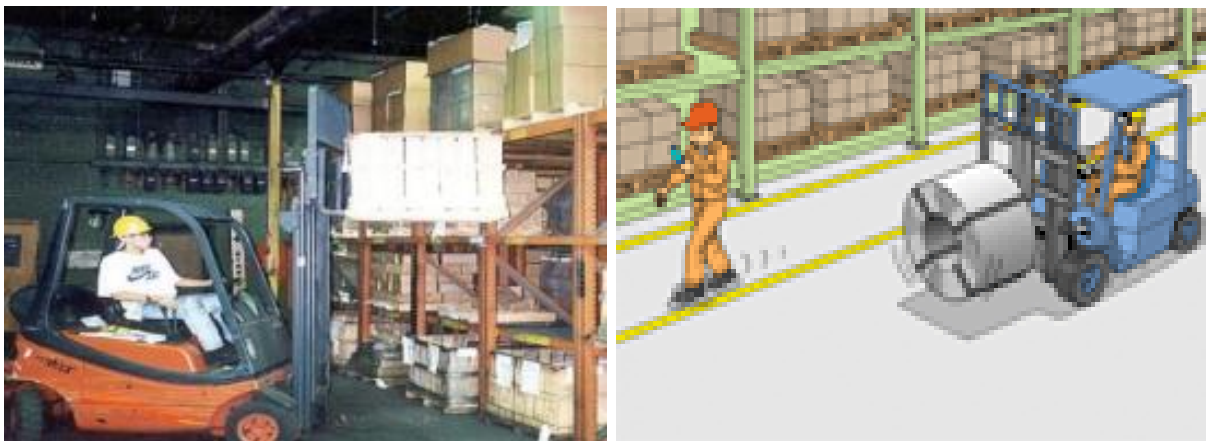
3.7.1.1 Following are some safety requirements for Heavy Vehicle Drivers:

- i) Do not allow any person to stand at foot rest or sit on the loaded material of the vehicle.
- ii) Do not allow any body to get ON and OFF during running of vehicle.
- iii) At all Railway level crossing follow the principle of STOP LOOK and PROCEED.
- iv) Never overload the vehicle beyond its carrying capacity.
- v) Before coming out or going inside Factory, stand in queue.

- vi) Before starting vehicle, ensure that the material loaded on the vehicle is properly secured.
- vii) Never drive vehicle beyond speed limit (Please know the specific speed limit before entering inside plant).
- viii) Give prior signal at least 30 meters before taking turn at right or left side.
- ix) Keep a safe distance of 2 seconds to the vehicle ahead.
- x) Never sit or take rest under the vehicle or within the vicinity of 10 feet of the vehicle or at any parking place area.
- xi) While taking a turn, speed should be below 10 km/hr.
- xii) When turning to the left, drive as close as to the left-hand side of the road from which the turn is being made and of the road which is being taken.
- xiii) When turning to the right draw as near as may be to the centre of the road and arrive as near as may be at the left hand side of the road which is being taken.
- xiv) Use seat belt while driving vehicle and all the vehicles must be fitted with seat belt for all the Crew members, if allowed.

3.7.1.2 General Safety requirement for Fork Lift Operation

- i) Fork lift operation will be restricted only for in plant operation.
- ii) Fork lift will not allow moving on road inside works with load.
- iii) Fork lift will be operated by only authorized trained & licensed personnel.
- iv) Use of seat belt is mandatory while operating Fork lift.
- v) Speed of the Fork lift should not be more than 5 KM/ hr.
- vi) Keep arms and legs inside the Fork lift while operating.
- vii) Fork lift will be used to handle only stable loads.
- viii) Be careful while negotiating sharp turns with load.
- ix) Load should be placed on fork in such a way that it should not block your view.
- x) No person will be allowed to sit on fork lift other than operator.
- xi) While operating fork lift with load, Centre the load on the forks and as close
- xii) to the mast as possible to minimize the potential for the forklift tipping or load falling.
- xiii) Overloading a Fork lift makes it hard to control and could make it tip over.
- xiv) Place the load at the lowest position for travelling.
- xv) Don't place extra weight on the rear of a counterbalanced forklift to allow an overload.



3.7.2 Safety precaution during parking of vehicle

3.7.2.1 Every vehicle needs to be parked at parking or any other place. Driver must know that where to park the vehicle. Following precautions before parking the vehicle to be observed.

- i) Do Not park the vehicle where there is “No Parking” board displayed. Park at designated parking place or at safer place and not on the road.
- ii) Do not park the vehicle in such a way that it is obstructing the movement of other vehicle or narrowing the width of road.
- iii) Keep the parking light ON.
- iv) Before parking please ensure that no one is at the rear side of the vehicle.
- v) After parking apply the hand brake.
- vi) Place scotch block under the wheel at both side of wheel.

3.7.2.2 Safety at Railway level crossing for all

- i) Stop your vehicle before crossing all railway level crossings.
- ii) First look left, then right and again left before crossing Rail.
- iii) At Road junction, allow the loco to cross the level crossing first.
- iv) Do not park your vehicle near/ on railway tracks.
- v) Do not enter into level crossing while the drop gates are lowering down.
- vi) Stop your vehicle before STOP line when the drop gate is being closed/closed.
- vii) Do not cross railway tracks at any other places than specified.

3.7.3 Rules for Using Mobile Phone while driving

- i) Do NOT use mobile phones while driving, with or without accessories like hands free, wireless, headset and Bluetooth etc. as it causes distraction while driving which in turn can cause accidents.
- ii) In case of emergency, one should park the vehicle at safe place and then attend the call.

3.7.4 Defensive driving method

Defensive driving is the practice of safe driving techniques. These techniques are used regardless of the actions of others or of adverse conditions created

by the environment or vehicle condition. Safe driving techniques call for the driver to be prepared for a variety of potentially dangerous and often life threatening driving situations. The following things must be ensured apart from the learning of the defensive driving method.

- i) Ensure the checklists that have been appended with this standard.
- ii) Keep the space on either side of your vehicle free.
- iii) Do not drive parallel to other vehicle except while overtaking.
- iv) Always Stop, Look and Listen at railroad crossings unmanned before proceeding.
- v) If the vehicle develops mechanical or tire trouble and begins to slowdown, drive it to the side of the road as far as possible from traffic.
- vi) Activate the vehicles hazard-warning lights.
- vii) Switch-off the ignition of immobilized crashed vehicles to reduce risk of fire.
- viii) Wear High Visibility Jacket while attending the breakdown.
- ix) Place a hazard-warning triangle (with Reflector) to the both side of the road, 50 meters from the scene.
- x) Barricade the vehicle with red tapes.
- xi) Avoid working on the traffic side of your vehicle.
- xii) Remove all the barriers and clean the oils from the road before moving ahead.

3.8 Physical

3.8.1 Vehicle Maintenance

Vehicle servicing must be performed at least according to the manufacturer's requirements and at the appropriate time, mileage, and driving condition intervals specified in the vehicle's operator's manual. Record must be available with the driver.

3.8.2 Vehicle fitness

All vehicle must be fit enough to transport the specific load. Vehicle must be selected as per requirement of materials to be transported. All Vehicles must comply the mandatory requirement of Transport Authority as per attached check list.

Checklist of Heavy Vehicles (Dumper, Truck, Trailer etc.)

SN	Criteria	OK	Not	NA	Remarks
1	Steering Bush Play (No Play)				
2	Steering wheel play (20-30 mm)				
3	Rear view mirror (Physical condition)				
4	Three Piece Mirror (left Side)				

5	Horn (Physical condition)				
6	Cabin door (Physical condition)				
7	Body condition (Standard physical condition)				
8	Material Body (physical condition)				
9	Seat Belt (Retractable Type)				
10	Reversing Buzzer (audible) connected with Reverse Gear				
11	Side Indicator with Audible Buzzer				
12	Wiper Blade assembly Should be in working condition				
13	Front wind Glass (Clear without scratch mark)				
14	Spring Pin bolt, Clamp (Looseness to be checked)				
15	Tire condition (Physical condition with visible tread)				
16	Self Start (Within 5 – 8 Sec)				
17	Head Light (Focus should be equal of the light)				
18	Emission check (< 65 HSU)				
19	Brake & Parking Light (Should be visible from 30 m)				
20	Oil Leakage				
21	Number Plate (Should be clear & as per MV Act)				
22	Foot rest (Physical Condition)				
23	Side & Rear side material body cover hinge & locking pin				
24	Hand / Parking Brake				
25	Main Wheel Brake				
26	Fail Safe Brake				
27	Trailer Brake				
28	Brake Air Line (Physical condition)				

3.8.3 General requirement to ensure road worthiness of vehicles

- i) Vehicle must be fit enough to transport the specific load. Vehicle fitness certificate must be issued by a competent person.
- ii) Retreaded tyres should not be used in front wheel.
- iii) Rear view mirror & three piece mirror should be fitted for clear visibility.
- iv) Horn sound should be audible from at least 30 meter distance. Intensity of sound should not be more than 90 db. Pressure horn should not be used in vehicle.
- v) Vehicle's cabin, cabin door, cabin door handle, material body etc. should be physically in good & working condition. Vehicles having bulged body should not be used for transporting the materials.

- vi) Vehicle's number plate, parking light, side indicator, brake light etc. should be cleaned at regular interval for clear visibility. Light reflecting radium tape to be pasted on periphery of the vehicle.

3.9 System

3.9.1 Safety during transportation of Materials

3.9.1.1 Transportation of hazardous materials

Transportation of hazardous materials/ dangerous goods must be done in accordance with applicable laws and regulations. Dangerous or hazardous goods specified in column 3 Table 1 to rule 137 of CMVR, 1989 must be transported as per guideline given in sec 129 to sec 137 of CMVR, 1989.

3.9.1.2 Safety during transportation of CR/ HR Coils

Associated Hazards

- i) Poor site layouts
- ii) Fall of coils from Vehicle
- iii) Height Restriction
- iv) Overturning
- v) Collisions
- vi) Striking people and equipment
- vii) Vehicle roll down

Loading/ Unloading of CR/ HR coils

Do's

- i) Wear personnel protective equipment (PPEs).
- ii) Wear High Visibility Jacket for better visibility to other crew member.
- iii) No person will be on trailer during loading/ unloading of material.
- iv) All sticker pasting, painting of the coil will be done on ground by keeping at safe distance.
- v) For positioning the coil at centre of the bed, signal will be given from ground.
- vi) Put scotch block under the wheel to prevent rolling down of vehicle.
- vii) Vehicle will be allowed to go only after ensuring that material is properly secured and tightened.
- viii) Materials to be loaded as per trailer capacity.
- ix) Use proper De-shackles, Pins, Chains and Links.
- x) Each Coil to be tied to trailer bed individually with two chains at an angle of 45 degree.
- xi) Three chains to be used for each coils.
- xii) Rubber pads to be provided for edge protection.
- xiii) Drivers should sit at drivers rest point during loading of coil.

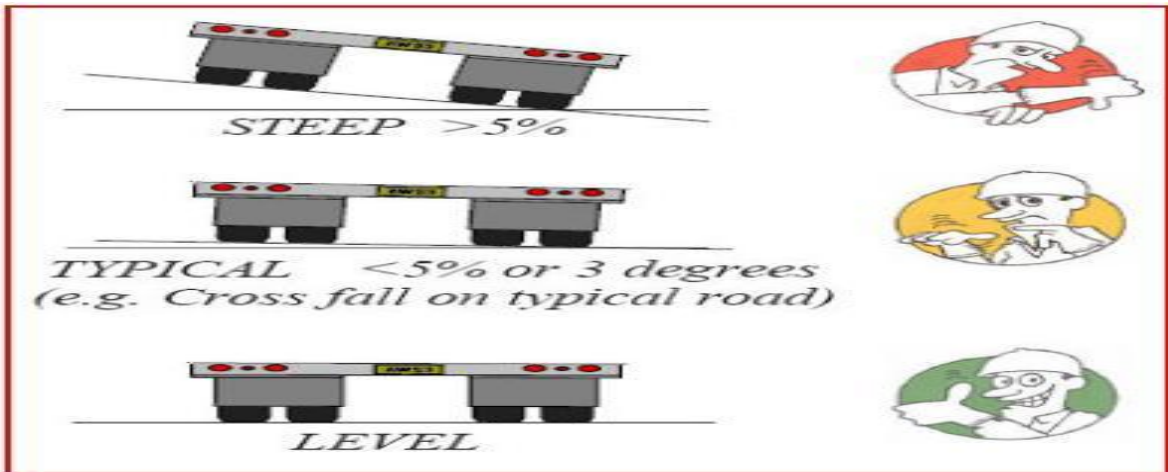
- xiv) Never overload the trailer beyond Safe work load.

Don'ts

- i) Do not cook food at in the trailer at loading/ unloading point.
- ii) Do not lash the coil with the hook of the bed.
- iii) Do not allow crew member and others in loose clothing.
- iv) No person will move under the hanging material.
- v) Do not sleep/ take rest in front of or below or side of the vehicles.
- vi) Do not park at unauthorized parking place.
- vii) Do not move here & there after placing the trailer at loading point.

Loading/ Unloading point design/ condition

- i) Wherever possible, loading areas should be selected and designed to be flat/ level. Where vehicle alignment is critical from safety point of view (e.g. when using twin hoist cranes), alignment lines must be clearly marked and the Safe Working Procedure must incorporate this requirement.
- ii) The loading/ unloading area design must be subjected to a full risk assessment. The loading/ unloading risk assessment must consider the following attributes of the loading point:
 - a) **Side slope/ Long slope:** When loading areas are not flat/ level, load stability may be compromised depending on the nature of the load. This is particularly relevant prior to load restraint being applied, or when removing load restraint prior to unloading.



- b) **Road Camber:** This can have a similar effect to side slope, and needs to be considered particularly if moving loads without full load restraint.
- c) **Surface condition:** Potholes, ruts and drains can have a destabilizing effect on forklifts (and any load being carried) as well as being slip/trip hazards for pedestrians.
- d) **Flagmen:** Trained, competent Flag men may be used to guide and direct reversing vehicles. Where Flagmen are deployed, there must be clear rules on signals and safe positioning to avoid potential for trapping. He should always be visible to operator.
- e) **Segregation of vehicles / pedestrians / other traffic.:** As an alternative to Flagmen, the loading area should be segregated to prevent pedestrian access during reversing. Use of robust barriers to protect plant/equipment may be necessary.

3.9.2 Safety during transportation of Wire coil / Wire rod

Associated Hazards

- i) Poor site layouts
- ii) Fall of coils from Vehicle
- iii) Opening of coil
- iv) Height Restriction
- v) Overturning
- vi) Collisions
- vii) Striking people and equipment
- viii) Vehicle roll down

Loading/ Unloading of Wire coils

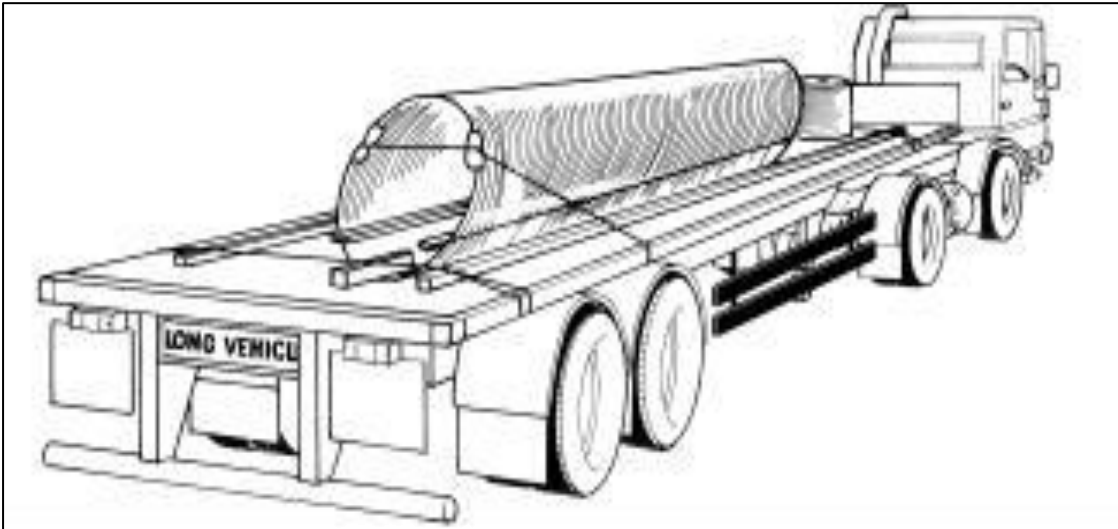
Do's

- i) Wear personnel protective equipments
- ii) Wear High Visibility Jacket for better visibility to other crew member No person will be on trailer during loading/ unloading of material.
- iii) All sticker pasting, painting of the coil will be done on ground by keeping at safe distance for positioning the coil at centre of the bed, signal will be given from ground.
- iv) Put scotch block under the wheel to avoid rolling down of vehicle.
- v) Vehicle will be allowed to go only after ensuring that material is properly secured and tightened materials to be loaded as per trailer capacity.
- vi) Use proper De-shackles, Pins, Chains and Links.
- vii) Coils to be tied to trailer bed with chains as shown in figure.

Don'ts

- i) Do not cook food at in the trailer at loading/ unloading point.
- ii) Do not allow crew member and others in loose clothing.

- iii) No person will move under the hanging material.
- iv) Do not sleep/ take rest in front of or below or side the vehicles.
- v) Do not park at unauthorized parking place.
- vi) Do not move here & there after placing the trailer at loading point.
- vii) Do not transport wire rod without providing red flag on both side of rear part.



3.9.3 Transportation of Pipes

Specific requirement for safe transportation of pipes:

- i) Pipes up to 200 mm dia shall be unitized before transporting. These are normally available at 6 m length. There shall be 6 straps in a length of 6.0 m. The largest dimension of the bundle shall not exceed 800 mm. These bundles shall be transported on trucks having full height side and back 'dala'. The posts of the dala shall be laterally fastened at the top [\(Sketch no.1\)](#).
- ii) Pipes more than 200 mm dia shall be transported on trailer bed, without being unitized.
 - a) For 6.0 m long pipes, there shall be 2-chain lashings and 2 wooden dunnages.
 - b) For 12.0 m long pipes, there shall be 3-chain lashings and 3 wooden dunnages.
- iii) Flat bed trailer shall be used for transporting pipes over long distance. Semi flat bed trailer can be used for local transportation. Semi flat bed trailers shall have 3 nos. of wooden logs in addition to the log for dunnage to make up level [\(Sketch no. 2\)](#).
- iv) Two types of wooden dunnage may be used on a trailer bed.
 - a) Grooved Dunnage: [\(Sketch no. 3a and 3b\)](#).
 - b) Flat Dunnage with side choker blocks: [\(Sketch no. 4a and 4b\)](#).
- v) Pipes of 1,300 mm or greater diameter will be transported over steel saddles with seating arrangement as shown in [sketch no. 5](#).

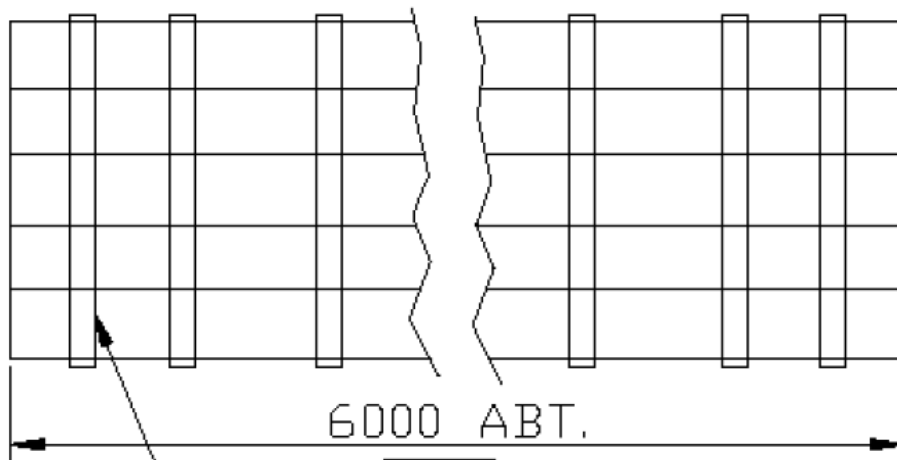
- vi) Proper platform with ladder shall be used for working on the trailer bed, for placing dunnage for the pipe, for lashing and for rigging work for loading and unloading.
- vii) Chain lashing of minimum 12 mm links or web lashing of equivalent strength shall be used. With chain lashings, necessary fixtures like bracket, D-Shackles, turn buckles shall be provided. The link chain shall be tightened with turn buckle and web lashing with standard ratchet.
- viii) The trailer shall be fitted with head boards to prevent injury to the driver by sliding of pipes in case of sudden braking.
- ix) Height of stacking on trailer bed: No. of tiers of pipes loaded on trailer shall not be more than the no. of pipes in the bottom row. In no case the carrying capacity of the trailer shall be exceeded. Any projection of pipe beyond trailer bed shall not be allowed. Single pipe having width and/or length more than the trailer bed shall be treated as an oversized consignment and arrangement for transportation shall be made accordingly.
- x) Loading and unloading of pipes shall be done using C- hooks and slings of adequate length. The C- hooks shall be anchored at the end of the pipes.
- xi) The arrangement of loading, depending on diameter of the pipe is given in **table: 1.**

Category	Diameter(mm)	Arrangement of loading																					
a.	$D \leq 200$	To be unitized and transported on truck with full height dala.																					
b.	$200 < D \leq 1200$	<p>Transport on trailer bed with number of lashings as specified. Based on available width of trailer bed between number of posts as 2400mm ,following configuration may be followed:</p> <table border="1" style="margin-left: auto; margin-right: auto;"> <thead> <tr> <th>Diameter of pipe</th> <th>No. of Horizontal Rows</th> <th>Max. No. of tier</th> </tr> </thead> <tbody> <tr> <td>250</td> <td>9</td> <td>9</td> </tr> <tr> <td>500</td> <td>4</td> <td>4</td> </tr> <tr> <td>700</td> <td>3</td> <td>3</td> </tr> <tr> <td>900</td> <td>2</td> <td>2</td> </tr> <tr> <td>1000</td> <td>2</td> <td>2</td> </tr> <tr> <td>1200</td> <td>2</td> <td>2</td> </tr> </tbody> </table>	Diameter of pipe	No. of Horizontal Rows	Max. No. of tier	250	9	9	500	4	4	700	3	3	900	2	2	1000	2	2	1200	2	2
Diameter of pipe	No. of Horizontal Rows	Max. No. of tier																					
250	9	9																					
500	4	4																					
700	3	3																					
900	2	2																					
1000	2	2																					
1200	2	2																					
c.	$D > 1200$	Transport one pipe on steel saddle as given in (sketch no 5).																					

CHECKLIST

Points	Yes	No	NA
1. Are the pipes upto 200mm diameter unitized before transporting? Is the largest dimension of the bundle exceeding 800mm? Are the bundles being transported on trucks having full height side and back 'dala'? Are the posts of the dala laterally fastened at the top as shown in(sketch no.1)?			
2. Are 2 chain lashings and 2 wooden dunnages used for transporting pipes with dia more than 200mm and 6.0 m in length on trailer bed?			
3. Are 3 chain lashings and 3 wooden dunnages used for transporting pipes with dia more than 200mm and 12.0 m in length on trailer bed?			
4. Is proper platform with ladder being used for working on the trailer bed, for placing dunnage for the pipe, for lashing and for rigging work for loading and unloading?			
5. Is the chain lashing of minimum 12mm ϕ links or web lashing of equivalent strength being used?			
6. Are chain lashings provided with necessary fixtures like bracket, D-Shackles, turn buckles ?			
7. Is the link chain tightened with turn buckle and web lashing with standard ratchet?			
8. Is the trailer fitted with head board?			
9. Is the no. of tiers of pipes loaded on trailer not more than the no. of pipes in the bottom row?			
10. Is it ensured that the carrying capacity of the trailer is not exceeded?			

ANNEXURE-I



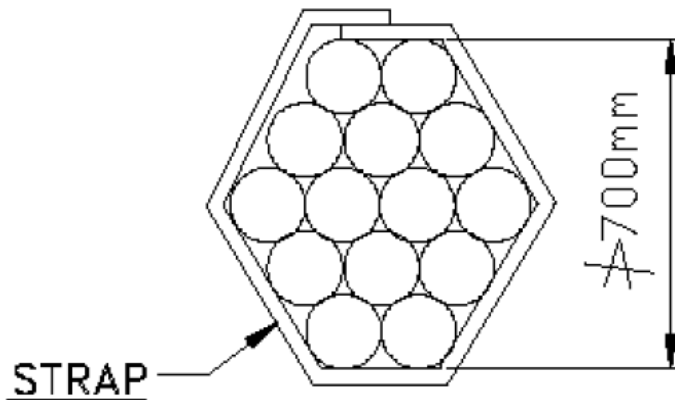
SIGNODE OR SIMILAR MAKE
32mm WIDE STEEL STRAP

TOTAL 6 - BANDS

2 - BANDS AT ONE END

2 - BANDS AT THE OTHER END

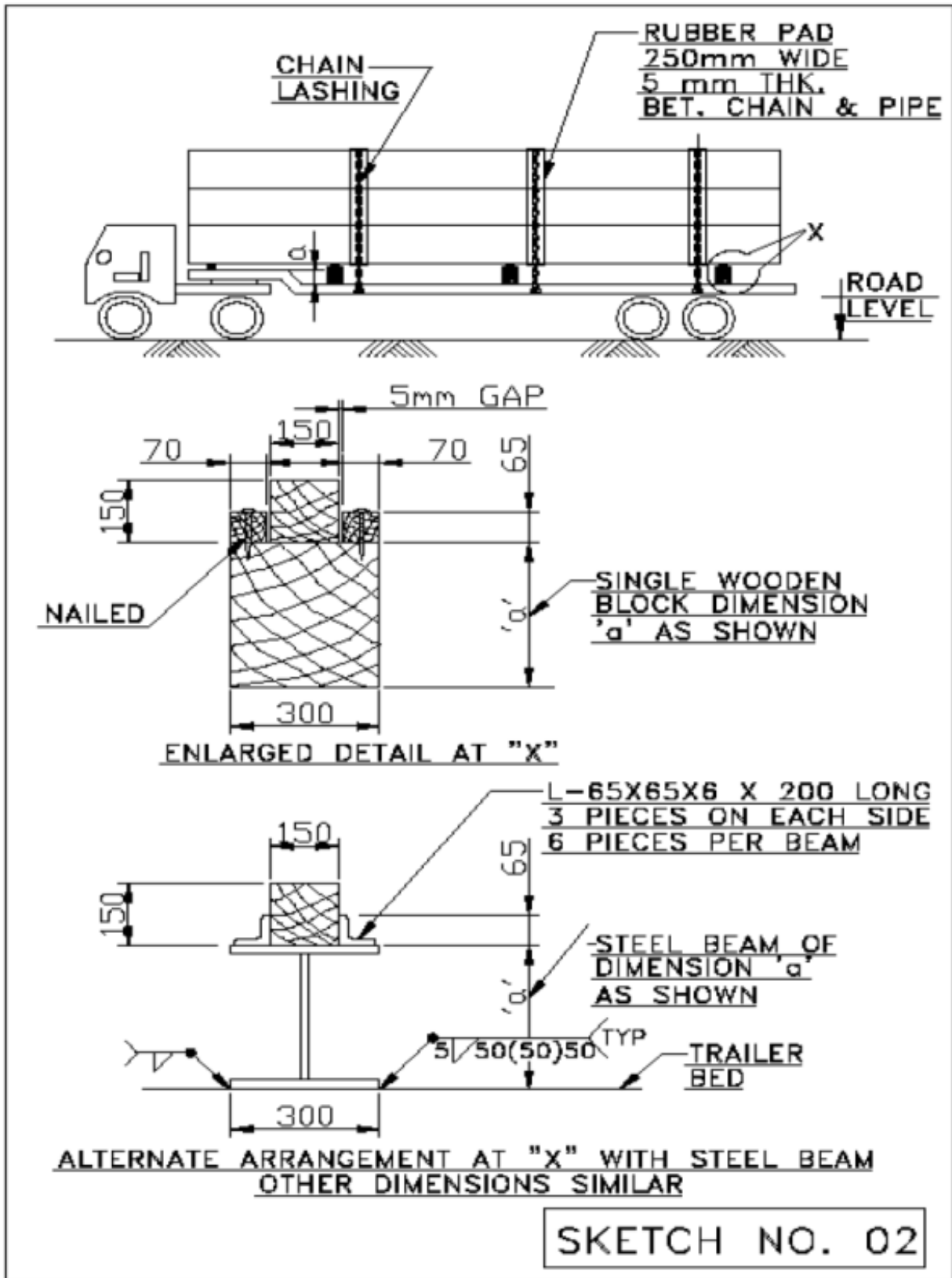
2 - BANDS IN THE MIDDLE



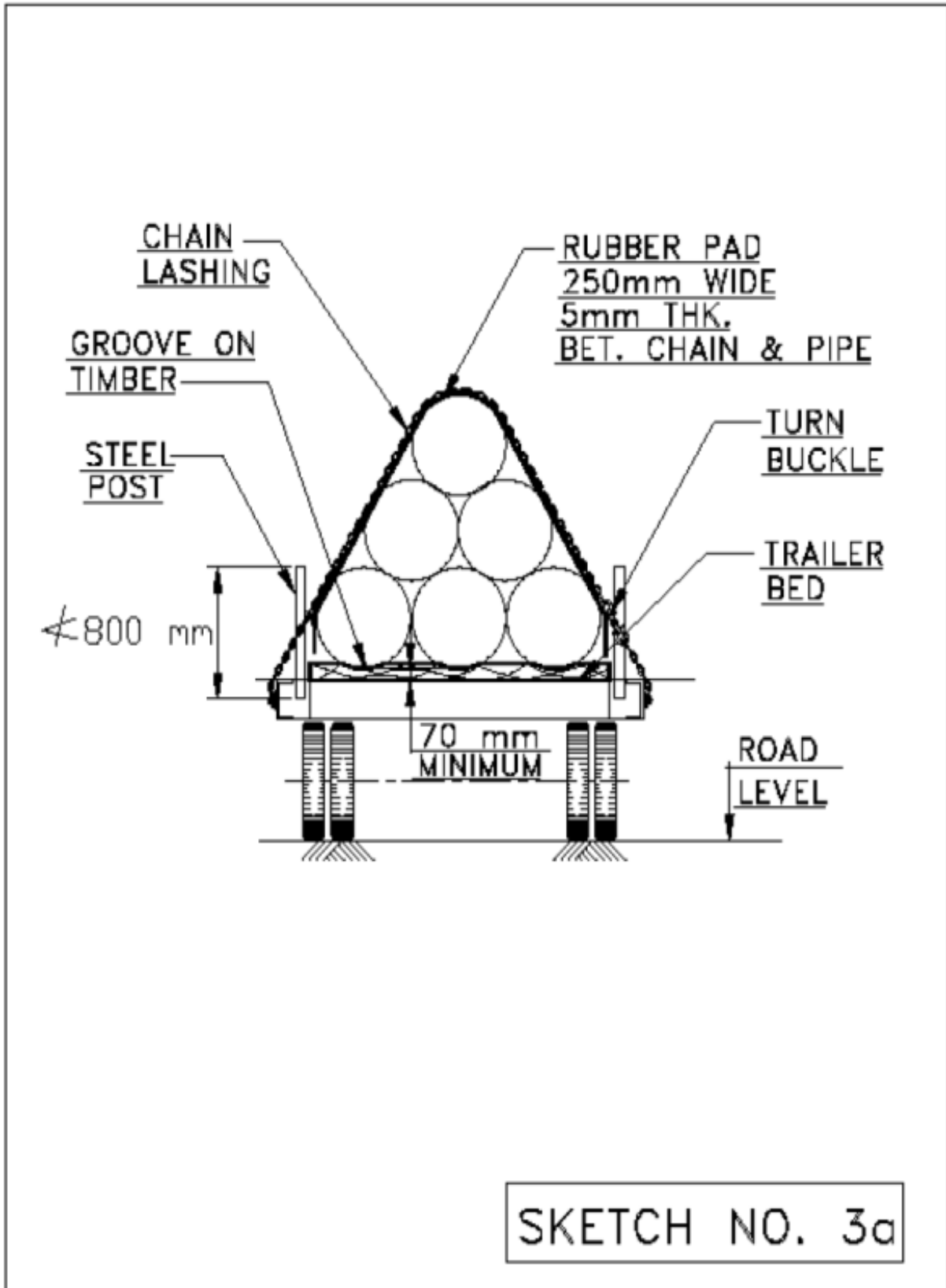
TYPICAL
CROSS SECTION

SKETCH NO. 01

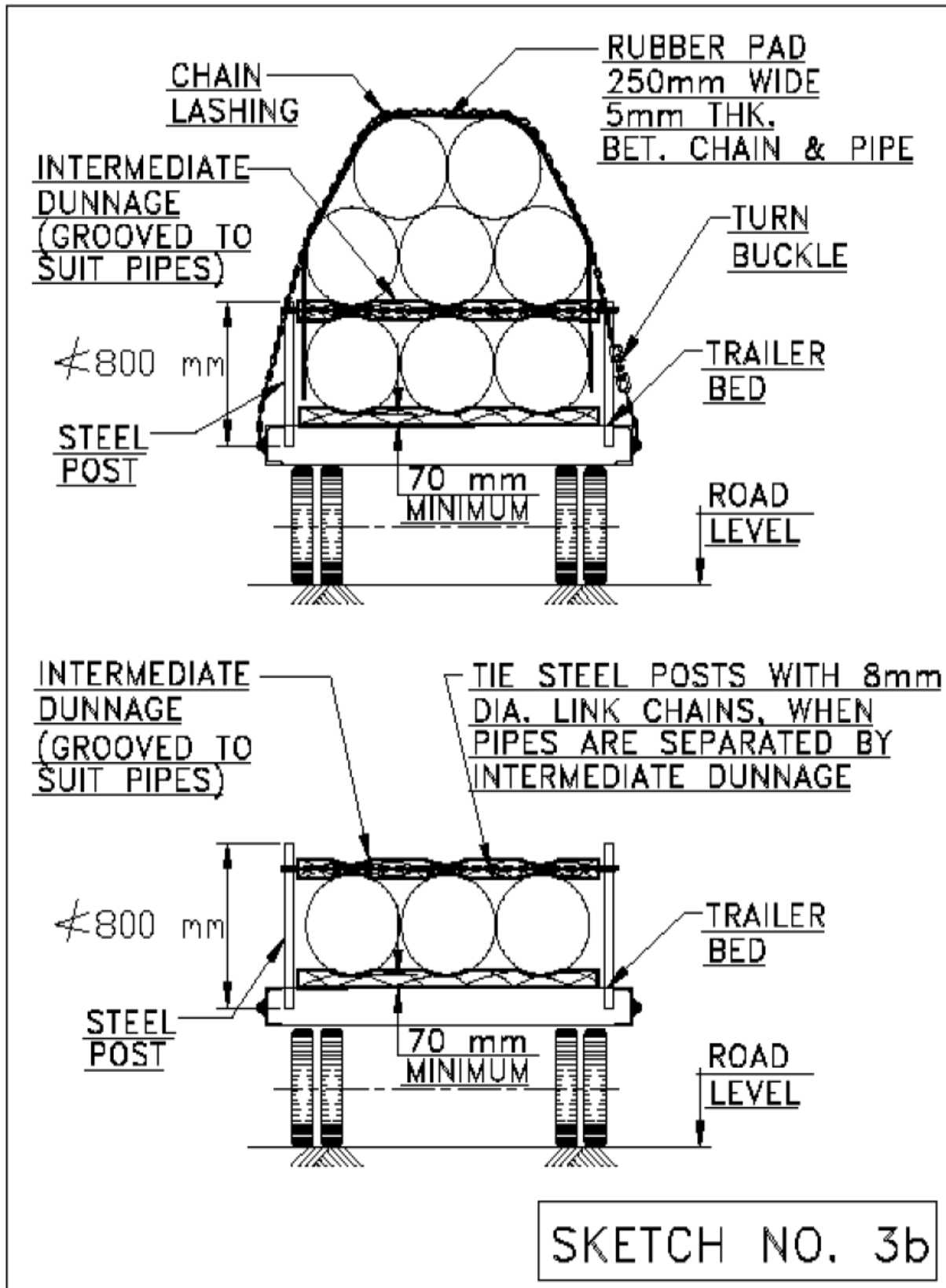
ANNEXURE-II



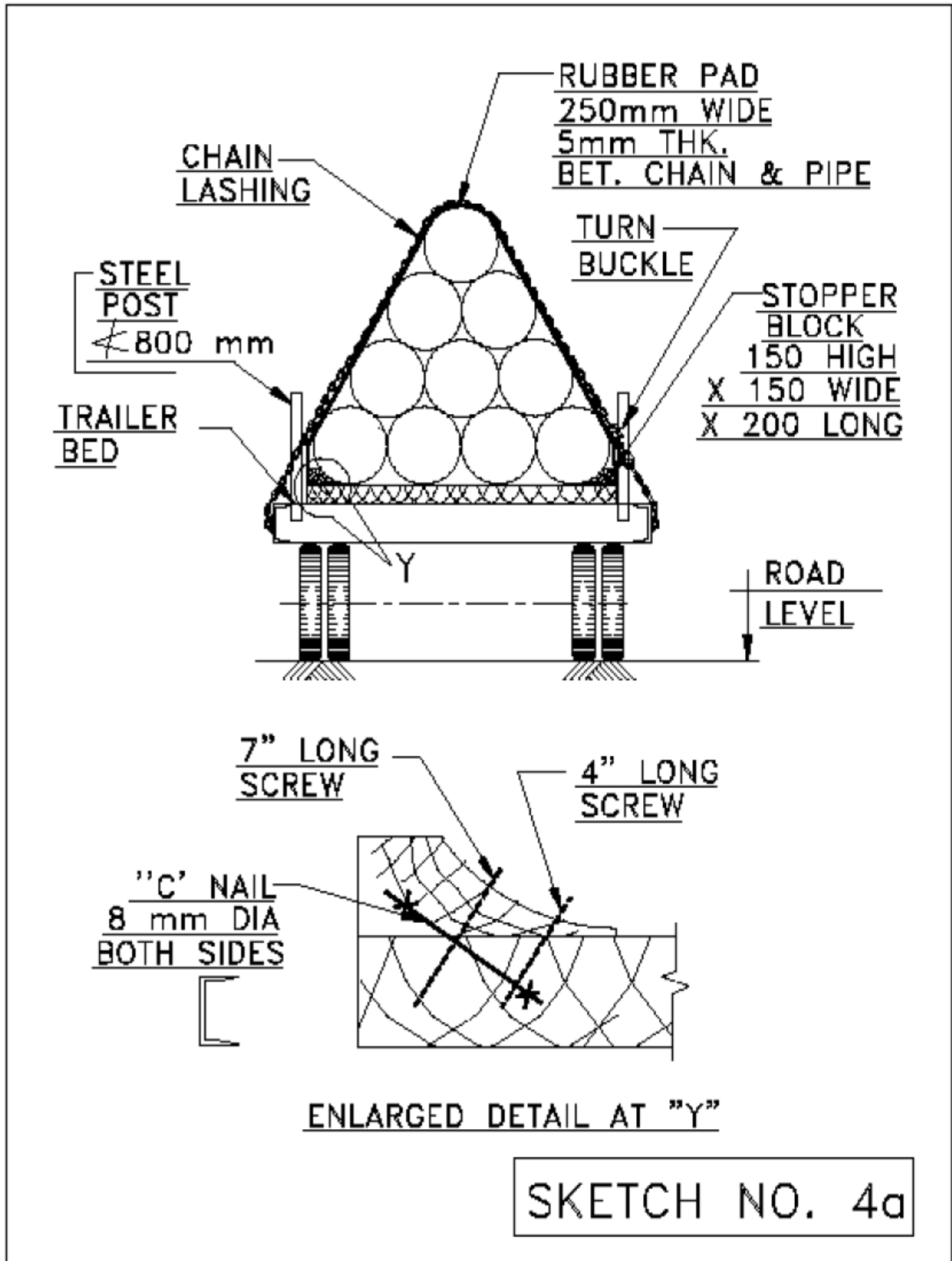
ANNEXURE-III



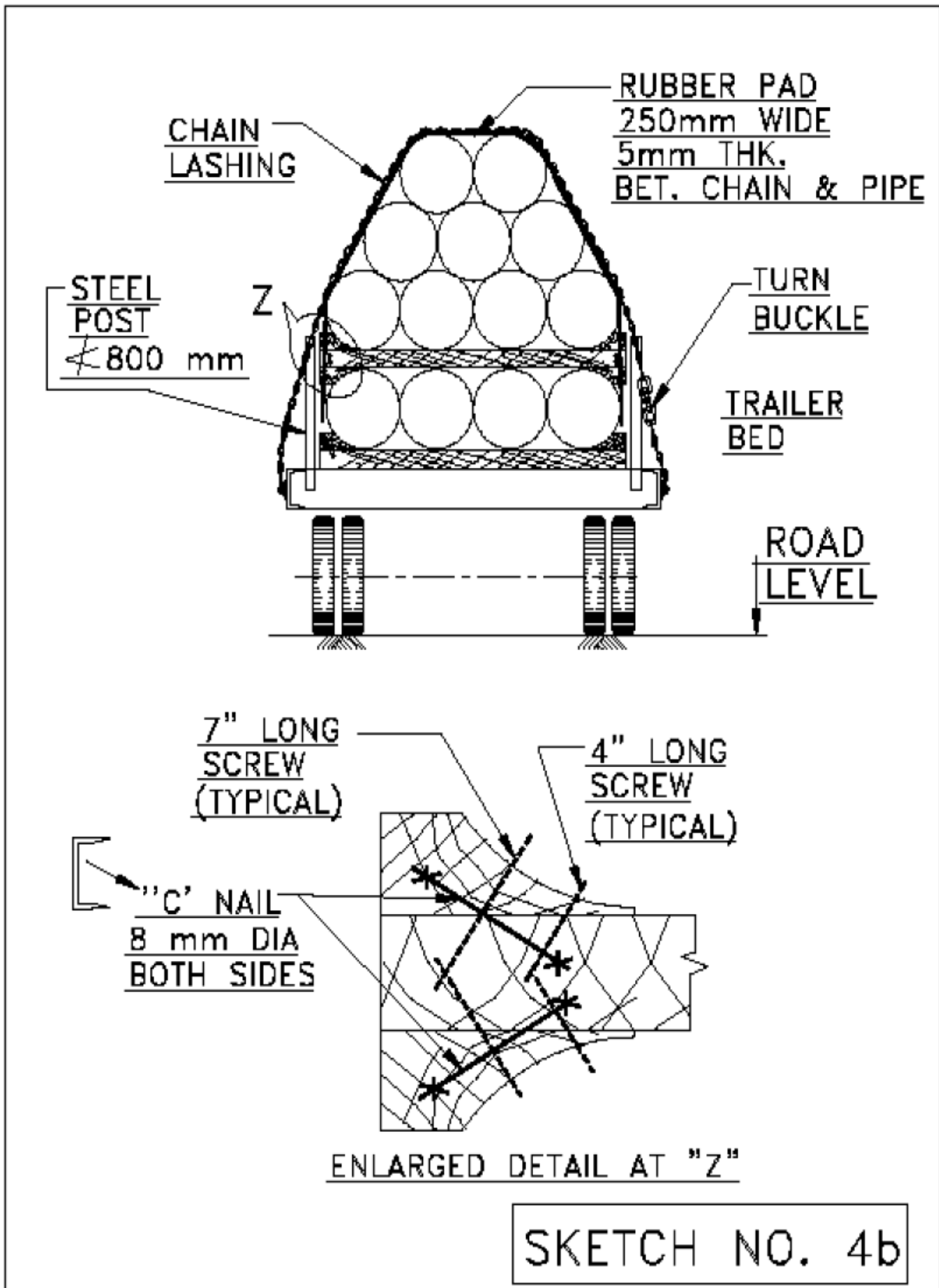
ANNEXURE-IV



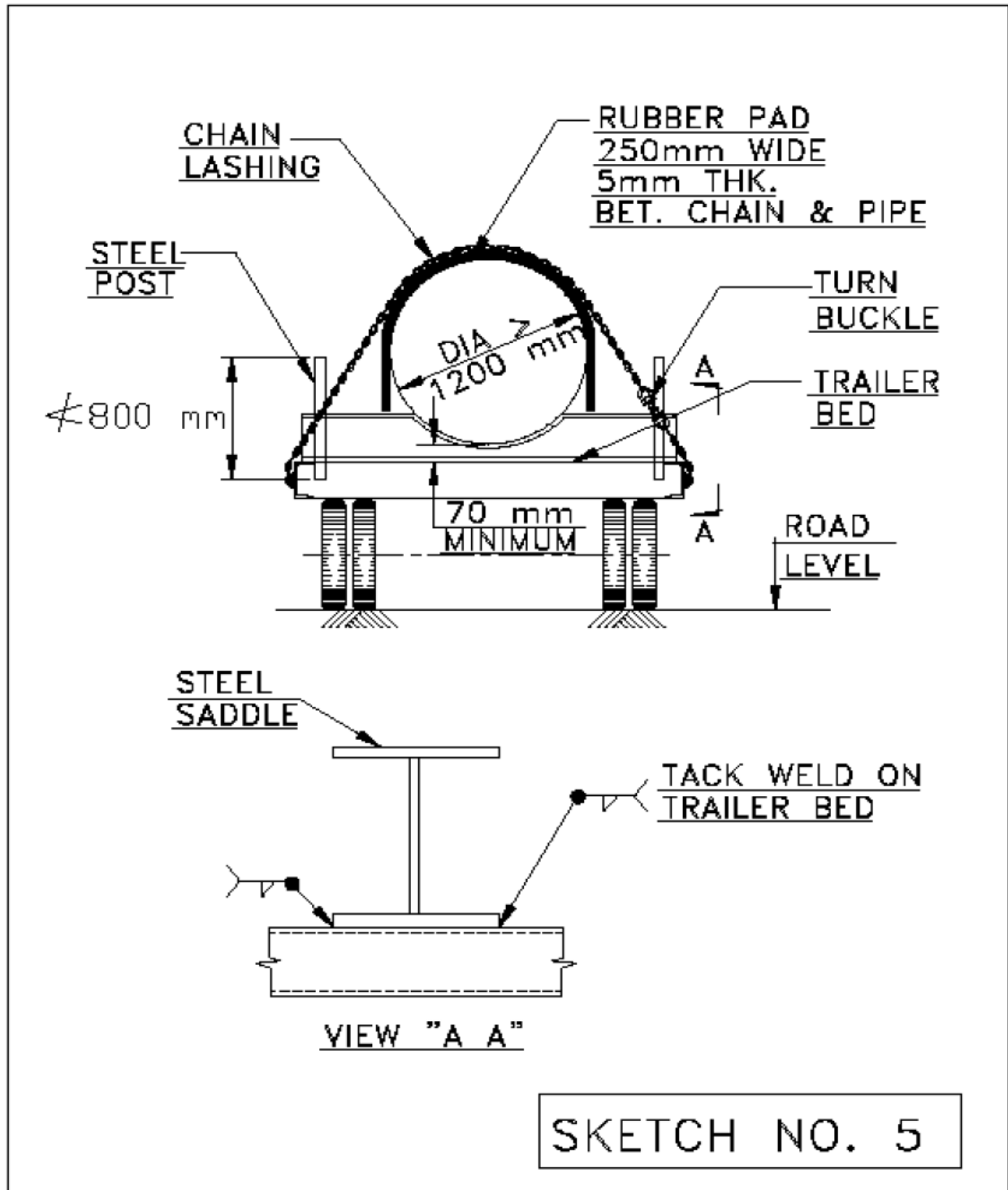
ANNEXURE-V



ANNEXURE-VI



ANNEXURE-VII



3.9.4 Transportation of freight materials (Granulated Slag, Coal, Coke, Flue dust, Scrap etc.)

Loading and unloading areas should be:

- i) Clear of other traffic, pedestrians and people not involved in loading or unloading.
- ii) Clear of overhead cables, pipes, or other dangerous obstructions.
- iii) Level to maintain stability, vehicles should be parked on firm level ground; fenced or provided with other edge protection where there is a danger of people falling.
- iv) If necessary, protected against bad weather, e.g. strong winds can be very dangerous during loading.
- v) Loads should be spread as evenly as possible, during both loading and unloading. Uneven loads can make the vehicle or trailer unstable. Loads should be secured or arranged so that they do not slide around.
- vi) All such materials must be transported with cover on it. In no case materials should fall on road.
- vii) For transporting materials like flue dust which is hot in nature, special arrangement should be made by line management / process owner to stop spillage of materials.



3.9.5 Transportation of Projected material:

- i) Check and ensure that material has been properly tied with chain and shackle.
- ii) Fitness of vehicle must be checked and ensured that vehicle is fit to transport such material.
- iii) Measure, the dimension of loaded material, projected outside dala body at all or any sides (Rear, sideward, above the driver's cabin).
- iv) Driver must know the dimension of projected material.
- v) Centre of Gravity of the material must lie in the centre of vehicle to maintain the balance.
- vi) Route survey to be done from start to destination and must be ensured that through selected route there is adequate side & height clearance and material can be transported.

- vii) A Flag man must move at least 30 feet ahead of vehicle to escort the vehicle to destination and caution the Oncoming traffic (Red/ Green flag in day time and Red/ Green torch in night time).
- viii) While transporting in night time, red bulb in working condition must be fitted at both sides and rear of the outermost projected material. While in day time, red flag of appropriate size must be fastened up at outermost part of all projected material at both side and rear side.
- ix) Flag man must wear personnel protective equipments (PPEs).
- x) Flag man must wear high visibility jacket for better visibility to other crew member.
- xi) Use red/ green light battery-operated torch for signalling.

3.9.6 Transportation of Hot metal/ hot slag:

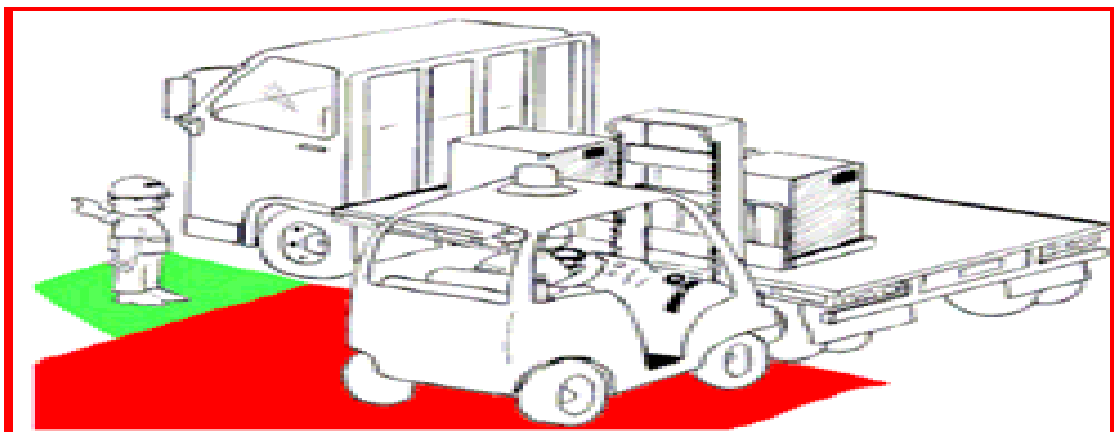
- i) Check and ensure that ladle has been properly placed on its foundation.
- ii) Check and ensure the material has been covered properly & there is no chance of heat emission.
- iii) Check for any spillage of materials from the ladle. Material should not spill out of ladle.
- iv) Movement of vehicle should be clear from other traffic.
- v) Flagman must accompany the vehicle to warn the other road users.
- vi) Provision of siren must be there which should be audible from safe distance. Siren must be in operation while vehicle will move on road.
- vii) In case of breakdown of vehicle, immediate action should be taken to remove the vehicle at safe place.
- viii) Vehicle should not be stopped under any gas pipelines or cable bridge.
- ix) Both operator & Flagman must be trained for safe operation of vehicle & can take appropriate action in case of emergency.

3.9.7 Exclusion zones:

Effective exclusion zones must be implemented at every loading point where mechanical handling equipment is used. This applies whether the loading point is inside or outside a building.

The principles that must be applied are:

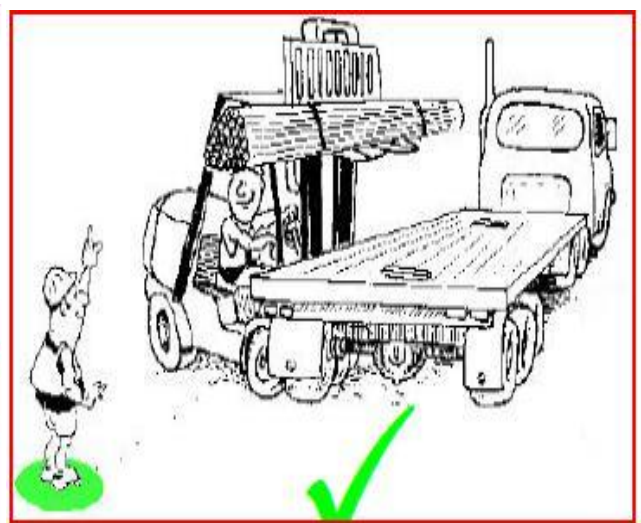
Unsafe "Red" zones must be clearly identified. These are the areas that no



one can enter during loading/unloading. The size /nature/ position of the zone will vary from product to product and situation to situation, but should be large enough to ensure that should something go wrong during the activity, personnel Safe “Green” Zones must be clearly identified. These are the areas where people should be during loading / unloading.

Note that it is the principles that must be applied – the actual implementation will vary and the identification of exclusion zones (e.g. painting, barriers etc.) is not prescriptive.

All relevant personnel should be trained in the principles and implementation of exclusion zones. This training must make clear that it is the crane driver/ forklift/ mobile plant driver in charge of loading who is responsible for enforcing the exclusion zone.

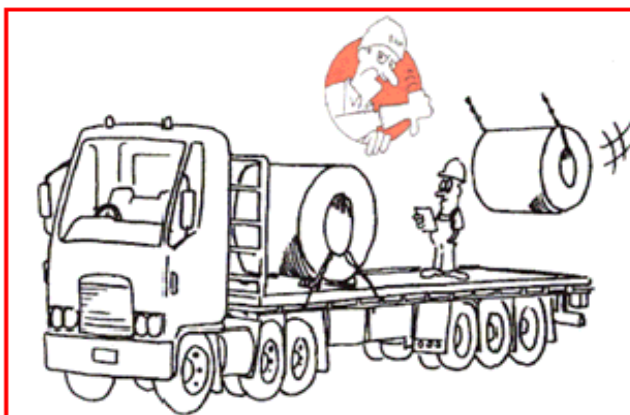


3.9.8 Falling off Trucks

Work on the bed of a vehicle or trailer must be avoided wherever possible. Where a task cannot be completed without accessing the vehicle, appropriate measures must be implemented to prevent falls or mitigate the consequences of falls.

3.9.9 Suspended Loads

The requirement to touch suspended loads must be avoided wherever possible. Suspended loads must not be taken over people, or be so close to them that they could be crushed or trapped by a swinging or falling load. When loads are being moved by overhead crane, where possible establish flight paths that avoid travelling over walkways or key equipment.



3.9.10 Load Limits

Be aware of the load limits of varying equipment when operating different machines throughout the day. Depending on the equipment set-up and size the load limits can change drastically. When lifting objects with a machine make sure loads are secure with the proper rigging attachments, and always inspect to ensure they are in good working condition. As with most equipment operations, confirm all workers are at a safe distance when lifting and moving loads. Load related notification may be referred as released by government of India as attached in **Annexure - VIII**.

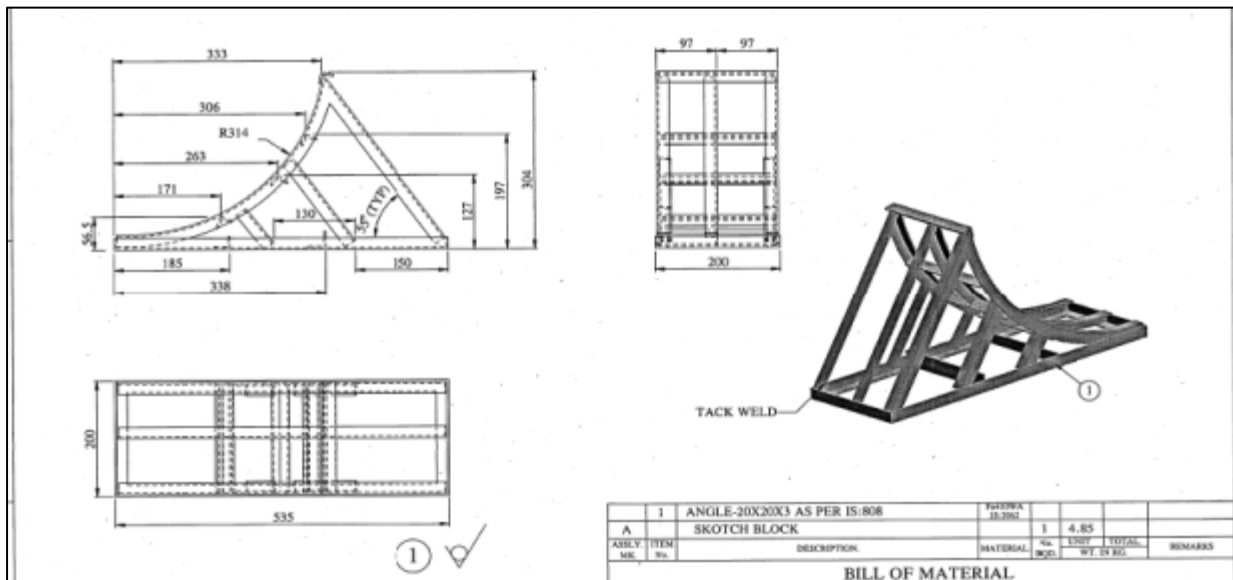
Annexure - VIII: Revised Safe Axle Load for Transport Vehicles:

Revised Safe Axle Load limits for Transport Vehicles										
Sr No	Type of Vehicle	Axle Combination on Tractor	Axle Combination on Trailer	No of Axles	Single Axles	Tandem Axle	Dual Axles	Tridem Axle	Permissible GWW	Remarks
1	Two Axle Rigid Truck	Two tyres on front axle and four tyres on rear axle	-	2	1	0	1	0	19	
2	Three Axle Rigid Truck	Two tyres on front axle and eight tyres on rear tandem (two) axle	-	3	1	1	0	0	28.5	
3	Four Axle Rigid Truck	Two tyres each on two axles and eight tyres on one tandem (two) axle	-	4	2	1	0	0	36	
4	Five Axle Rigid Truck	Two tyres each on three axles and eight tyres on one tandem (two) axle	-	5	3	1	0	0	43.5	
5	Five Axle Rigid Truck	Two tyres each on two axles, four tyres on one axle and eight tyres on one tandem (two) axle	-	5	2	1	1	0	47.5	
6	Six Axle Rigid Truck	Two tyres each on four axles and eight tyres on one tandem (two) axle	-	6	4	1	0	0	49	To be capped at 49 tonnes.
7	Tractor - semi articulated trailers	Two tyres on front axle and four tyres on rear axle	Four tyres on single axle	3	1	0	2	0	30.5	

8	Tractor - semi articulated trailers	Two tyres on front axle and four tyres on rear axle	Eight tyres on tandem (two) axle	4	1	1	1	0	40	
9	Tractor - semi articulated trailers	Two tyres on front axle and four tyres on rear axle	Twelve tyres on a tridem (three) axle	5	1	0	1	1	46	
10	Tractor - semi articulated trailers	Two tyres on front axle and eight tyres on rear tandem (two) axle	Four tyres on single axle	4	1	1	1	0	40	
11	Tractor - semi articulated trailers	Two tyres on front axle and eight tyres on rear tandem (two) axle	Eight tyres on tandem (two) axle	5	1	2	0	0	49.5	
12	Tractor - semi articulated trailers	Two tyres on front axle and eight tyres on rear tandem (two) axle	Twelve tyres on a tridem (three) axle	6	1	1	0	1	55	To be capped at 55 tonnes
13	Tractor Trailer	Two tyres on front axle and four tyres on rear axle	Eight tyres on two axles	4	1	0	3	0	42	
14	Tractor Trailer	Two tyres on front axle and eight tyres on rear tandem (two) axle	Eight tyres on two axles	5	1	1	2	0	51.5	
15	Tractor Trailer	Two tyres on front axle and four tyres on rear axle	Four tyres on single axle & Eight tyres on tandem (two) axle	5	1	1	2	0	51.5	
16	Tractor Trailer	Two tyres on front axle and eight tyres on rear tandem (two) axle	Four tyres on single axle & Eight tyres on tandem (two) axle	6	1	2	1	0	55	To be capped at 55 tonnes

11.12 Scotch block:

It is important to have adequate scotch block against the wheel once driver is coming out of vehicle. it is advised to have minimum one pair of wheel to be placed against the wheel nearer to driver. However, while using two pair of wheel chock it should be used to diagonally opposite wheels. Standard dimension of wheel Chock/Scotch block is mentioned in drawing for reference.



3.9.11 Unloading

All safety precautions related to loading apply equally to unloading points and activities. Loads must be inspected prior to the removal of any load restraint.

This is to ensure, so far as possible, that the load is stable and will not slip/fall when load restraint equipment is removed.

3.10 Safety Precautions during Movement of Mobile Crane and Other Cranes

Do's while operating Hydra/ Ace crane

- i) Use of Mobile cranes at construction sites to be restricted, so that there is no movement of persons around the Mobile cranes. Area around Mobile cranes operations should be identified and barricaded to prevent unauthorized person in the hazardous zone.
- ii) Mobile cranes are not allowed to move on road with load.
- iii) The operator should have only one helper to move ahead of Mobile crane at a distance of 3.0 m ahead of boom length on road at right side to guide the operator. While two helpers are allowed at Construction site only.
- iv) The helpers should wear fluorescent jacket. The Helpers should be provided with whistle at ground to caution the surroundings & his own presence to the operator.
- v) The operator should have a valid HMTV driving license.
- vi) The operator and Helper shall be well trained.
- vii) Extended guard on front & rear wheel and Bumper must be provided.
- viii) Guy ropes of required length on both sides of object shall be provided for lowering and lifting of material only.
- ix) Clear access while movement of the equipment to be ensured.
- x) Extra reflective mirrors in operator's cabin to overcome the difficulties pertaining to the left side view shall be provided.
- xi) Automatic reverse horn should be provided.
- xii) The operator should stop the movement of the crane if the helper's signal is not visible.
- xiii) Always keep the loading area as level as possible.
- xiv) The terrain should be reasonably hard. The undulation of path across the direction of travel ways should be less than 10 degrees.
- xv) The Centre of Gravity of the load shall always be within the wheel load.
- xvi) Before lifting load, check if connecting string / tackle are properly hooked and are strong enough to take the load.
- xvii) Before using Mobile cranes, proximity hazards and obstructions to the movement should be identified and corrected.
- xviii) Apply parking brake and scotch block when the machine is parked.
- xix) Lift loads as far as possible with crane in unscrewed position.
- xx) Helper to ensure avoidance of man movement within the vicinity of crane.

- xxi) Tyre pressure to be checked on daily basis.
- xxii) Keep the load to the minimum height.
- xxiii) Length of slings should not be too long to avoid swinging.
- xxiv) Avoid going over extremely rough tracks consisting of pot holes or sudden dumps. If at all such path is to be negotiated, minimum speed and lowest gear should be used

Don'ts while operating Mobile cranes/ Ace crane

- i) Engagement of two Mobile cranes to lift single object should not be done.
- ii) Overloading of the machine should not be done.
- iii) Do not start the crane unless all routine pre-operation is done.
- iv) Do not drive the crane too close to the edge of ditch or excavated pit.
- v) Do not coast down a gradient in neutral gear.
- vi) Do not leave the crane seat with the load raised and never leave the crane unattended while engine is running.
- vii) Mobile phone and radios should not be used by the operator and helper while crane is in operation.
- viii) No other person should be in driver's cabin during operation.
- ix) No oblique pulling on boom.

3.10.1 Some important points for loading cranes (e.g. Ace Crane) on trailer

- i) Examine the trailer for tyre condition, general health, road worthiness and conformance to all safety requirements.
- ii) Examine the under frame of the trailer to ensure that it can take the load of the crane at the edges. For transporting crane the loading will be mostly on the edges of the trailer.
- iii) Width of the trailer bed should be such that when the centre line of the track chain is parallel to the length of the trailer, most of the track chain will be within the width of the trailer.
- iv) The trailer should be parked on the level ground at the time of the loading. Necessary wedges should be put on the wheel to prevent movement during loading.
- v) No one should be on the trailer bed while loading the crane on the trailer.
- vi) The loading crane and lifting arrangement should be checked as per the relevant safety standards.
- vii) All fastening between the trailer and the crane like D-Shackles, chains, hooks etc. should be checked beforehand.
- viii) The counter weight, boom etc. of the crane being loaded should be removed before hand.
- ix) The cabin should be locked with the base to prevent any rotation.

- x) After the crane is loaded on the trailer, necessary cleats and stoppers of adequate strength shall be welded on all four sides to prevent any movement of the crane during transit. The cleats shall be welded without any movement of the trailer.
- xi) Necessary lashing, chain etc. shall be used to hold the load in desired condition. These should be of adequate strength to prevent toppling on transit.
- xii) All other jobs related to this shall be done as per the requirement of relevant safety standards.

3.11 VEHICLE INCIDENT / COLLISION REPORT:

Sl.	Criteria	Details
1	Registration Number of vehicle	
2	Type of vehicle	
3	Vehicle pass number	
4	Safety Number	
5	Department under which vehicle is operating	
6	Name of the driver/employee to whom vehicle is assigned	
7	P.No./ Gate Pass number	
8	Brief description of collision /incidents	
9	Damage report of company property	
10	If the operator injured then details of injury by first Aid Station	
11	Doctor's report if any	
12	Damage report of vehicle	
13	Is the vehicle collided with other vehicle?	
14	If Yes , Details of the other vehicle in the same format	
15	Weather conditions at time of collision/incident	
16	Were seat belts worn?	
17	Was the accident alcohol related?	
18	Was speeding involved?	
19	Road conditions	
20	Last time the vehicle operator received driver training:	

Reference:

1. Central Motor Vehicles Rules, 1989 & Road transport and Safety Bill 2015.

2. IPSS: 1-11-023-15 'Safety Standard for Transportation in Steel Industry'.
3. Tata Steel Standard -SS/GEN-29, Version-04 and SS/Gen-52