

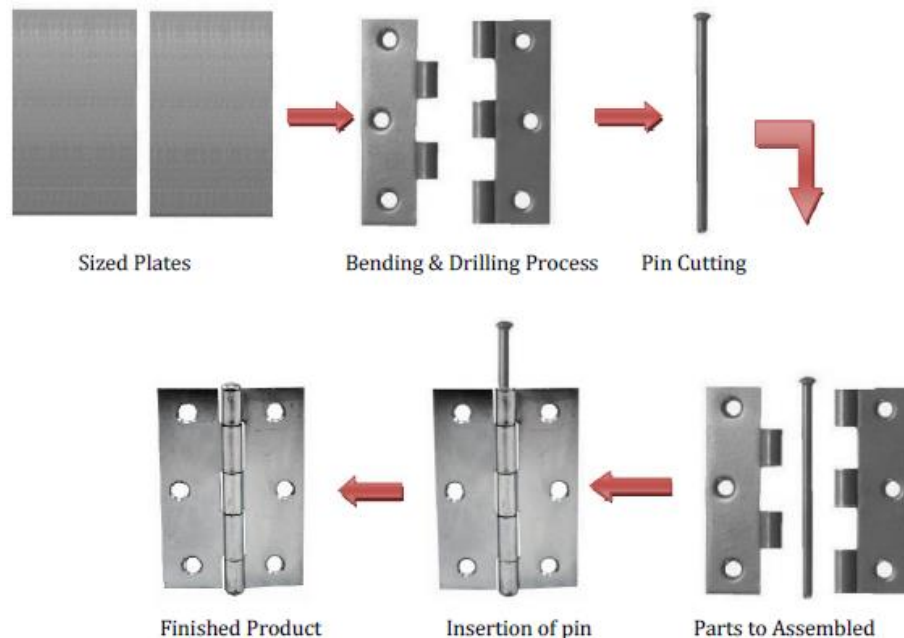
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Investment Opportunities for Down Stream Industries in Steel

1.1. Manufacturing of Hinges

Name of Project	Manufacturing of Hinges
Project Location	Kalinganagar and Jharsuguda
Area requirement	600 sq m
Approx. Project cost	a) Land and Buildings : ~ INR 55 - 60 Lakhs b) Plant and Equipment : ~ INR 90 – 120 Lakhs
Project Scale	Capacity – 900 tonnes per year
Process	Depending on the model of the hinge product there will be two to five operations on a single piece of the product.



- Cutting work: - Cutting of the mild steel and metals into size on shearing machine.
- Press work: - Blanking, bending and folding of the sheet metal on press using appropriate dies tools to obtain the hinges and the washer parts.
- Drilling Work: - After a work piece is laid out and properly mounted on drilling machine, no of holes are drilled as per the required design.
- Tumbling work: - Cleaning of rust and removal of sharp edges from the products.

Utilities	<ul style="list-style-type: none"> • Electricity (Connected Load) – approx. 60 kw • Water about 1500 m³/ day
Manpower requirement	26
Nodal agency	Investment Promotion and Investment Corporation of Odisha Limited (IPICOL)

1.2. Manufacturing of Link Chains

Name of Project	Manufacturing of Link Chains
Project Location	Kalinganagar and Jharsuguda
Area requirement	2000 sq m
Approx. Project cost	a) Land and Buildings : ~ INR 40- 45 Lakhs b) Plant and Equipment : ~ INR 55 – 60 Lakhs
Project Scale	Capacity – 900 tonnes per year
Process	<p>Mild Steel wire in coils is set on the de-coiler of wire bending machine. Then wire is fed to automatic wire bending machine where during the feeding wire get straightened then cut to the required link size and bent to form link. The process repeats and chain is formed with bent links. Now chains [one by one] fed on to the electro mechanical butt-welding machine, where open ends of the chains automatically welded and deburred. The chains are pickled and cleaned with acid and water. The welded chains are now inspected and tested as per the specifications laid down in the respective Indian Standards, after this welded chains are generally packed in wooden cases. The weight of packed chain is approximately 50 kgs. The defective chain links may be salvaged by gas welding.</p> <p>The chain should be inspected and tested as per the specifications laid down in the respective Indian Standards. The drawn wire should be of tested quality as per the IS Specifications. The following Indian Standards may also be referred:</p> <p>I S : 226 – 1975: Structural Steel [standard quality] with Amendment IS : 2429 Round Steel short link chain [Electric Butt welded, I S : 2429 – 1970 [Part II] Calibrated load chain for pulley blocks and other I S : 3109 Short Link Chain, Grade M . I S : 3109 – 1982 [Part II] Calibrated load chain for pulley blocks and other I S : 6216 – 1982 Short link chain, grade – T, Calibrated for pulley I S : 6217 – 1982 Short link chain grade S, Non-caliberated for lifting</p>
Utilities	<ul style="list-style-type: none"> • Electricity (Connected Load) – approx. 100 kw • Water about 2 m³/ day
Manpower requirement	17
Nodal agency	Investment Promotion and Investment Corporation of Odisha Limited (IPICOL)

1.3. Manufacturing of Welding Electrodes

Name of Project	Manufacturing of Welding Electrodes
Project Location	Kalinganagar and Jharsuguda
Area requirement	600 sq m
Approx. Project cost	a) Land and Buildings : ~ INR 60– 65 Lakhs b) Plant and Equipment : ~ INR 90 – 100 Lakhs
Project Scale	Capacity – 8 tonnes per day
Process	<p>Wires of different chemical compositions and sizes are obtained from different steel manufacturers. In electrode making plant, they are chemically cleaned, cut to different lengths (The selling prices of welding electrodes vary according to length of the electrodes and the raw material used.</p> <p>There are two methods of applying Flux coating on the core wire, (a) By dipping, (b) By extrusion.</p> <p>Extrusion method is very fast and economical; produces strong uniform and concentric coatings and has largely replaced the dipping process.</p> <p>(a) Dipping method. Number of core wires cut to definite length is clamped vertically in a fixture and are dipped in a bath of molten flux. When a suitable thickness of the flux gets adhered to the core wire, the fixture is raised and the flux is allowed to dry.</p> <p>(b) Extrusion process.</p> <ul style="list-style-type: none"> • Coating ingredients are mixed up in desired quantities, binder (often sodium silicate) is added and the resultant mass is brought in the form of a thick, viscous, stiff paste. • This paste is shaped in the form of a cylinder which is fed into the extrusion press. • Core wire and thick paste of flux simultaneously under pressure pass through a die. Thus attaching the flux coating on the core wire. The coating thickness depends upon the die opening and can be varied. • As a next step the flux from the gripping end of the electrode is removed by an electrically rotated wire brush; • After which the electrodes are fed to ovens where they are dried and baked to remove excess moisture. • The electrodes are thereafter sorted, wrapped in polythene paper, put into packets, and bulk is boxed into wooden cases. • Packets and boxes generally have information about: electrode coding, electrode size, nature of current and polarity, batch number, name of manufacturer, date of manufacture, etc.
Utilities	<ul style="list-style-type: none"> • Electricity (Connected Load) – approx. 100 kw • Water about 2 m³/ day

Manpower requirement 27

Nodal agency Investment Promotion and Investment Corporation of Odisha Limited (IPICOL)

1.4. Manufacturing of Hacksaw Blades

Name of Project	Manufacturing of Hacksaw Blades
Project Location	Kalinganagar and Jharsuguda
Area requirement	2000 sq m
Approx. Project cost	a) Land and Buildings : ~ INR 30– 35 Lakhs b) Plant and Equipment : ~ INR 15 – 20 Lakhs
Project Scale	Capacity – 20,000 nos per day
Process	<p>Hacksaw blades (both hand & power hacksaw) are generally made from high carbon steel or high strength steel strip coils. The blank of required size is obtained by fixing the slitted strip coils on the uncoiler stand of semi-automatic strip cutting machine and holes are punched at both ends.</p> <p>Once hacksaw blanks are cut to the required length and holes are punched the teeth are cut by milling or hobbing process. After the teeth's are cut, the stack of hacksaw blades are heat treated and tempered to the required hardness. The final step is surface cleaning, painting, printing and packing of the hacksaw blades for market supply.</p>
Utilities	<ul style="list-style-type: none"> • Electricity (Connected Load) – approx. 50 kw • Water about 2 m³/ day
Manpower requirement	18
Nodal agency	Investment Promotion and Investment Corporation of Odisha Limited (IPICOL)

1.5. Manufacturing of Self Tapping Screws

Name of Project	Manufacturing of Self Tapping Screws
Project Location	Kalinganagar and Jharsuguda
Area requirement	600 sq m
Approx. Project cost	a) Land and Buildings : ~ INR 30 – 35 Lakhs b) Plant and Equipment : ~ INR 35 – 40 Lakhs
Project Scale	Capacity – 1,20,000 Packets of 1,000 Pcs. Per annum
Process	<p>Self-tapping Screws are manufactured on automatic machines. The sequence of operation are:</p> <ol style="list-style-type: none"> 1. Making of head, on header machine. 2. Slotting of head, on slotting machine. 3. Rolling of thread, on thread rolling machine. 4. Hardening & tempering of screws, in electric furnaces. 5. Electroplating, in Electroplating Plant. <p>Normally bright zinc plating is done to self-tapping screws. However, nickel plating can also be done, especially when required for resistance against sea weather.</p>
Utilities	<ul style="list-style-type: none"> • Electricity (Connected Load) – approx. 50 kw • Water about 2 m³/ day
Manpower requirement	23
Nodal agency	Investment Promotion and Investment Corporation of Odisha Limited (IPICOL)

1.6. Manufacturing of Production of Wire Nail

Name of Project	Manufacturing of Production of Wire Nail
Project Location	Kalinganagar and Jharsuguda
Area requirement	800 sq m
Approx. Project cost	a) Land and Buildings : ~ INR 26 – 31 Lakhs b) Plant and Equipment : ~ INR 50 – 55 Lakhs
Project Scale	Capacity – 400 tonnes per day
Process	<p>The wire in the form of coil with diameters of 0.17 - 6 mm is first cleaned from rust and scale by mechanical scrapper. The cleaned wire in the form of coil is fed into automatic heading and pointing machines forming the final nail of desired size. This is collected for the next processing. The collected piece is further transferred to tumbling machine for polishing and de-burring of the finished nail ready for packing.</p>
Utilities	<ul style="list-style-type: none"> • Electricity (Connected Load) – approx. 74,000 kwh • Water about 1000 m³/ day
Manpower requirement	24
Nodal agency	Investment Promotion and Investment Corporation of Odisha Limited (IPICOL)

1.7. Manufacturing of Corrugated Sheets

Name of Project	Manufacturing of Corrugated Sheets	
Project Location	Kalinganagar and Jharsuguda	
Area requirement	3000 sq m (automatic Line) 200 sqm (manual Line)	
Approx. Project cost	Automatic Lin	Manual Line
	a) Land and Buildings : ~ INR 70 – 75 lac	15 – 17 lac
	b) Plant and Equipment : ~ INR 70 – 75 lac	20 – 25 lac
Project Scale	4500 m per day (Automatic line) 500 m per day (manual line)	
Process	<p>In the corrugation process sheet metal is pulled off huge rolls and through rolling dies that form the corrugation. After the sheet metal passes through the rollers it is automatically sheared off at a desired length in case of automatic line. The standard shape of corrugated material is the round wavy style, but can be easily modified to a variety of shapes and sizes by simply changing the dies. Automatic Roll Forming Line consists following parts, while the coil stock is passing through succession contoured rolls the material bends to its desired shape, after final shape is achieved profile straighter gives straightness to outgoing profile</p> <ol style="list-style-type: none"> 1) De Coiler (5 Ton) 2) Loop System 3) Entry gauge and Roll Forming machine 4) Cutting unit 5) Run out table 6) Integrated Hydraulic power Pack system 7) P L C control system. <p>Decoiler: Decoiler is provided to load Raw material coil on it's arms & Hold the coil and also generates Drag tension in process.</p> <p>LoopSystem: Loop System is incorporated in between 2 line equipments to synchronise line speed or some time to eliminate tension, stretch, on passing material.</p> <p>RollForming Line: Roll forming consists pairs of contoured roll tools. While the coil stock is passing through succession contoured rolls the material bends to its desired shape, after final shape is achieved profile straighter gives straightness to outgoing profile.</p> <p>Cutting System: Cutting as Stop Forming line Cuts length +/- 4 mm and very hay line speed cuts the blank or profile single word. Press is designed to accept type die or topping die without slug while cutting.</p> <p>Integrated hydraulic Power pack system: To Supply pressurized fluid to all hyd. actuators at desired pressure and quantity.</p>	
Utilities	<ul style="list-style-type: none"> • Electricity (Connected Load) – 30 KW (auto) , 15 kw (manual) • Water about 2 m3/ day 	
Manpower requirement	11 (automatic), 6 (manual)	
Nodal agency	Investment Promotion and Investment Corporation of Odisha Limited	

1.8. Manufacturing of Adjustable Hospital Beds

Name of Project	Manufacturing of Adjustable Hospital Beds
Project Location	Kalinganagar and Jharsuguda
Area requirement	200 sq m
Approx. Project cost	a) Land and Buildings : ~ INR 20 – 22 Lakhs b) Plant and Equipment : ~ INR 10 – 15 Lakhs
Project Scale	Capacity – 2 Nos. per day
Process	The basic operations involved in the manufacturing of adjustable beds are as follows: <ol style="list-style-type: none"> i) Cutting & bending of pipes ii) Cutting of MS angles iii) Cutting of strips iv) Welding & Riveting v) Grinding vi) Assembly of elevating mechanism vii) Painting & baking <ul style="list-style-type: none"> • Cutting work: - Cutting of the mild steel and metals into size on shearing machine. • Press work: - Blanking, bending and folding of the sheet metal on press using appropriate dies tools to obtain the hinges and the washer parts. • Drilling Work: - After a work piece is laid out and properly mounted on drilling machine, no of holes are drilled as per the required design. • Tumbling work: - Cleaning of rust and removal of sharp edges from the products.
Utilities	<ul style="list-style-type: none"> • Electricity (Connected Load) – approx. 20 kw • Water about 2 m³/ day
Manpower requirement	9
Nodal agency	Investment Promotion and Investment Corporation of Odisha Limited (IPICOL)

1.9. Manufacturing of Agricultural Implements

Name of Project	Manufacturing of Agricultural Implements
Project Location	Kalinganagar and Jharsuguda
Area requirement	1200 sq m
Approx. Project cost	a) Land and Buildings : ~ INR 40 – 45 Lakhs b) Plant and Equipment : ~ INR 60 – 65 Lakhs
Project Scale	
Process	<p>The manufacturing of proposed products involve various manufacturing processes like cutting of steel sections, fabrication, welding, drilling, turning making subassemblies, fitting & final assembly etc. where steel sections & other parts/components like tynes, springs & fasteners be outsourced & purchased as per own design & specifications.</p> <p>The manufacturing also involves inspections at various stages till they are finally assembled & packed as per their Quality assurance standards/plans.</p>
Utilities	<ul style="list-style-type: none"> • Electricity (Connected Load) – approx. 60 kw • Water about 3 m³/ day
Manpower requirement	24
Nodal agency	Investment Promotion and Investment Corporation of Odisha Limited (IPICOL)

1.10. Manufacturing of Barbed wire

Name of Project	Manufacturing of Barbed Wire
Project Location	Kalinganagar and Jharsuguda
Area requirement	1000 sq m
Approx. Project cost	a) Land and Buildings : ~ INR 40 – 45 Lakhs b) Plant and Equipment : ~ INR 45 – 50 Lakhs
Project Scale	1 tons per day
Process	<p>The barbed wires are made on an automatic machine. The barbed wire is made out of 12/14 SWG MS Galvanized wires. While two main line wires are fed into the machines through its axes another wire is fed across into the pair of line wires to form barbs at required intervals.</p> <p>The line wire twine themselves automatically the point wire after forming the desired barbs strands with the line wires automatically at the desired distance thus forming the complete barbed wire. As the machine is automatic all its feeding and wire cutting mechanism is controlled by gear movements. The machine is powered through an electric motor attached to the machine. Once the machine is set up as per the desired settings it goes on working automatically.</p>
Utilities	<ul style="list-style-type: none"> • Electricity (Connected Load) – approx. 140 kw • Water about 5 m³/ day
Manpower requirement	8
Nodal agency	Investment Promotion and Investment Corporation of Odisha Limited (IPICOL)

1.11. Expanded Metal Mesh Manufacturing Unit

Name of Project	Expanded Metal Mesh Manufacturing Unit
Project Location	Kalinganagar and Jharsuguda
Area requirement	1000 sq m
Approx. Project cost	a) Land and Buildings : ~ INR 35 – 40 Lakhs b) Plant and Equipment : ~ INR 35 – 45 Lakhs
Project Scale	9000 MT per year
Process	<ol style="list-style-type: none"> 1. The plate, sheet, or coil is mechanically advanced beyond the fixed bottom die in an amount that is known as the strand width in regular (standard) expanded metal. The top cutting die then descends and simultaneously slits and cold forms an entire row of half diamonds. 2. The top die then ascends and moves one half diamond right/left as the base metal moves forward one strand width. 3. The top die then descends, slits and forms another row of half diamonds, completing a row of full diamonds in two strokes. 4. The die then ascends, returning to its normal position and begins the process again until the full sheet of expanded metal is completed.
Utilities	<ul style="list-style-type: none"> • Electricity (Connected Load) – approx. 200 kw • Water about 1-2 m³/ day
Manpower requirement	8
Nodal agency	Investment Promotion and Investment Corporation of Odisha Limited (IPICOL)

1.12. Cable Tray Manufacturing Shop

Name of Project	Cable Tray Manufacturing Shop
Project Location	Kalinganagar and Jharsuguda
Area requirement	1800 sq m
Approx. Project cost	a) Land and Buildings : ~ INR 40 – 45 Lakhs b) Plant and Equipment : ~ INR 65 – 70 Lakhs
Project Scale	500 tpd
Process	<p>The semi automatic line could be run for cable tray and covered cable tray production continuously punching and cutting at any length.</p> <p>This production line may produce the cable trays of different sizes by replacing punching moulds.</p> <p>The production line includes uncoiler, leveller device, feeding guide, main punching machine, roll forming, cutter with integrated hydraulic system and electric control system.</p>
Utilities	<ul style="list-style-type: none"> • Electricity (Connected Load) – approx. 60 kw • Water about 2 m³/ day
Manpower requirement	19
Nodal agency	Investment Promotion and Investment Corporation of Odisha Limited (IPICOL)

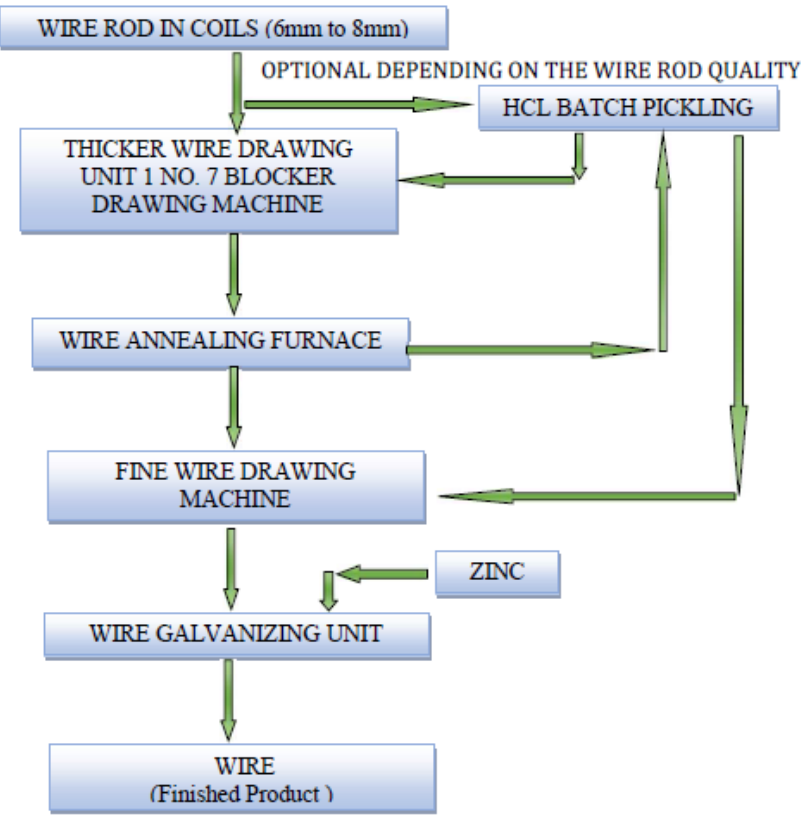
1.13. Electric Panel Manufacturing Shop

Name of Project	Electric Panel Manufacturing Shop
Project Location	Kalinganagar and Jharsuguda
Area requirement	300 sq m
Approx. Project cost	a) Land and Buildings : ~ INR 23 – 28 Lakhs b) Plant and Equipment : ~ INR 30 – 35 Lakhs
Project Scale	5 Nos. per day
Process	<p>The Control Panel is sheet metal fabricated in closure open, semi-enclosed or totally enclosed type, which provide and control electric power to equipment and appliances. Provision for indicating electrical parameters like voltage, current, frequency, power factor etc. will be available on the face of the panel. Regulation of the power supply is also possible with the help of auto transformer switches and circuit breaker.</p> <p>The sheet metal enclosure for the Control Panel is designed and fabricated in the unit. The components are bought out from the reputed sources and fitted at appropriate places on the panel as per manufacturers design. The circuit as per the design is laid out and the control panel is tested for the proper functioning as per relevant specifications.</p>
Utilities	<ul style="list-style-type: none"> • Electricity (Connected Load) – approx. 20 kw • Water about 2 m³/ day
Manpower requirement	16
Nodal agency	Investment Promotion and Investment Corporation of Odisha Limited (IPICOL)

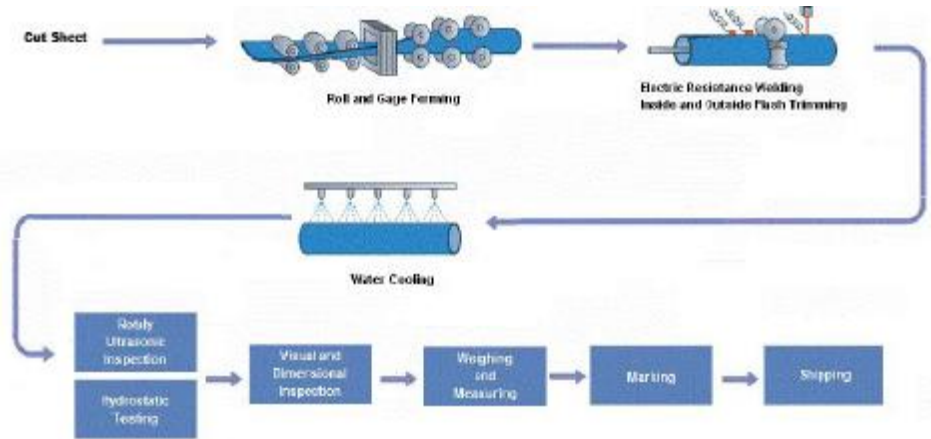
1.14. Bar Bending & Mesh Making Unit

Name of Project	Bar Bending & Mesh Making Unit
Project Location	Kalinganagar and Jharsuguda
Area requirement	8000 sq m
Approx. Project cost	a) Land and Buildings : ~ INR 75 – 80 Lakhs b) Plant and Equipment : ~ INR 16 – 18 Lakhs
Project Scale	60,000 tonnes per year
Process	<p>The rebars in straight lengths as well in coils will be stored in the storage area. The rebars will be brought from outside to in-shop area bay by trucks / hydra as per the production planning.</p> <p>An in-house Design department for production planning and preparation of shop fabrication drawings has been envisaged with latest state of art software & hardware.</p> <p>Further, the rebars in straight lengths or in coils will be fed to the respective machines as per the production planning with the help of shop EOT cranes / Fork lifts. The in-process items will be transported from one machine to the other as per the process requirement with the help of Bay cranes / Fork lifts.</p> <p>The fabricated parts after QA clearance will be tagged as per the order / part number and will be sent to the dispatch area for dispatch.</p>
Utilities	<ul style="list-style-type: none"> • Electricity (Connected Load) – approx. 1 Mw • Water about 50 m³/ day
Manpower requirement	10
Nodal agency	Investment Promotion and Investment Corporation of Odisha Limited (IPICOL)

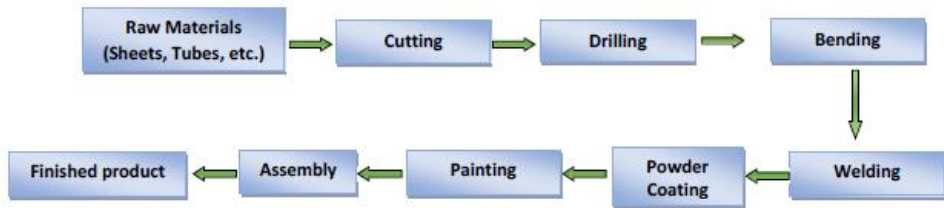
1.15. Wire Drawing Plant

Name of Project	Wire Drawing Plant
Project Location	Kalinganagar and Jharsuguda
Area requirement	8000 sq m
Approx. Project cost	a) Land and Buildings : ~ INR 120 Lakhs b) Plant and Equipment : ~ INR 870 - 880Lakhs
Project Scale	96000 t per year
Process	 <pre> graph TD A[WIRE ROD IN COILS (6mm to 8mm)] --> B[THICKER WIRE DRAWING UNIT 1 NO. 7 BLOCKER DRAWING MACHINE] B --> C[WIRE ANNEALING FURNACE] C --> D[FINE WIRE DRAWING MACHINE] D --> E[WIRE GALVANIZING UNIT] E --> F[WIRE (Finished Product)] G[HCL BATCH PICKLING] --> B G --> C G --> D H[ZINC] --> E I[OPTIONAL DEPENDING ON THE WIRE ROD QUALITY] --- G </pre>
Utilities	<ul style="list-style-type: none"> • Electricity (Connected Load) – approx. 1 Mw • Water about 4 m³/ day
Manpower requirement	18
Nodal agency	Investment Promotion and Investment Corporation of Odisha Limited (IPICOL)

1.16. Manufacturing of Lancing Pipe

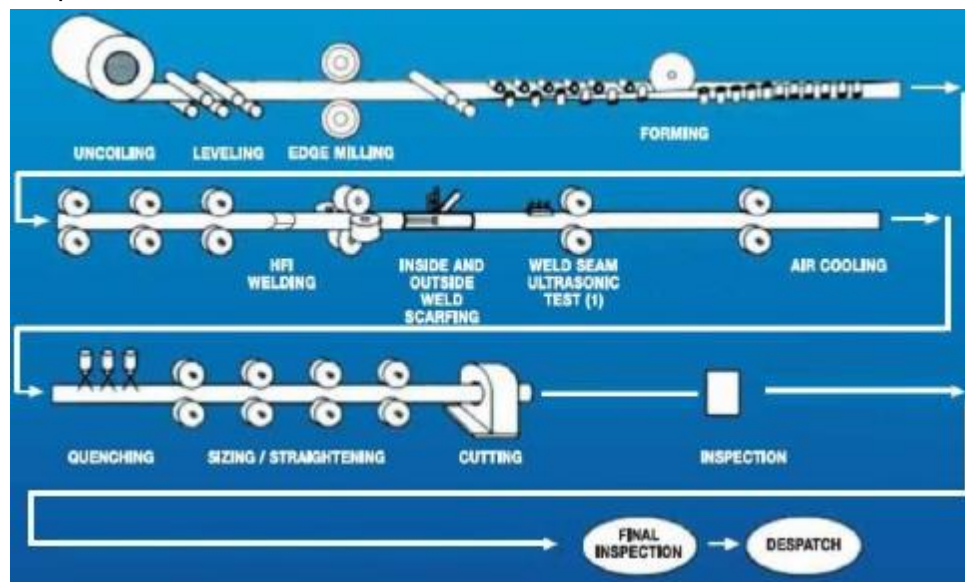
Name of Project	Manufacturing of Lancing Pipe
Project Location	Kalinganagar and Jharsuguda
Area requirement	900 sq m
Approx. Project cost	a) Land and Buildings : ~ INR 40 – 50 Lakhs b) Plant and Equipment : ~ INR 45 - 50 Lakhs
Project Scale	2400 t per day
Process	<p>The process involves the following operations:</p> <ol style="list-style-type: none"> 1. Cutting the sheets to size. 2. Rolling the sheets to tubes in the Tube mill. 3. Welding the edges in induction welding machinery. 4. Cooling of Lancing pipes 4. Inspection and packing. <p>The unit shall follow the IS specification & any of the following manufacturing processes.</p> <ol style="list-style-type: none"> a. Continuous oxy-acetylene gas welded pipes (OAW). b. Electric resistance welded (ERW). c. High frequency induction welded (HFIW). d. Hot finished welded (HFW).
	
Utilities	<ul style="list-style-type: none"> • Electricity (Connected Load) – approx. 20 kw • Water about 2 m3/ day
Manpower requirement	17
Nodal agency	Investment Promotion and Investment Corporation of Odisha Limited (IPICOL)

1.17. Manufacturing of Steel Furniture

Name of Project	Manufacturing of Steel Furniture
Project Location	Kalinganagar and Jharsuguda
Area requirement	2000 sq m
Approx. Project cost	a) Land and Buildings : ~ INR 35 – 40 Lakhs b) Plant and Equipment : ~ INR 25 – 30 Lakhs
Project Scale	1. Steel Almirahs 76" x 38" x 19" 800 Nos. Per Annum 2. Steel Almirahs 48" x 36" x 18" 150 Nos. Per Annum 3. Steel Cub Boards of assorted sizes. 900 Nos. Per Annum 4. Steel chairs: Folding type 1500 Nos. Per Annum S-type 1500 Nos. Per Annum
Process	<p>The manufacturing process of steel furniture's involves mainly cutting of sheets, tubes, flats to desired size, folding, bending, drilling, punching, riveting and assembling as per the design. Finally, these items are to be powder coated and cured in the oven the spray Painting is done as per the requirement.</p>  <pre> graph TD A[Raw Materials (Sheets, Tubes, etc.)] --> B[Cutting] B --> C[Drilling] C --> D[Bending] D --> E[Welding] E --> F[Powder Coating] F --> G[Painting] G --> H[Assembly] H --> I[Finished product] </pre>
Utilities	<ul style="list-style-type: none"> Electricity (Connected Load) – approx. 20 kw Water about 1.5 m3/ day
Manpower requirement	11
Nodal agency	Investment Promotion and Investment Corporation of Odisha Limited (IPICOL)

1.18. Manufacturing of Steel Pipes

Name of Project	Manufacturing of Steel Pipes
Project Location	Kalinganagar and Jharsuguda
Area requirement	500 sq m
Approx. Project cost	a) Land and Buildings : ~ INR 40-50 Lakhs b) Plant and Equipment : ~ INR 490 - 500 Lakhs
Project Scale	6600 tonnes per annum
Process	<p>The manufacture of steel tubes involves the continuous forming of steel sheet strip into an open seam tube, welding of the open seam edges with high frequency resistance heating and continuous pressure jointing into welded tube, followed by reduction in tube diameter and then cutting into the desired length.</p> <p>Alternatively, as the production process or technology is more labor intensive same workshop can be developed in to a multipurpose work shop.</p>



Utilities	<ul style="list-style-type: none"> • Electricity (Connected Load) – approx. 450 kw • Water about 5 m³/ day
Manpower requirement	20
Nodal agency	Investment Promotion and Investment Corporation of Odisha Limited (IPICOL)

1.19. Motor Rewinding Shop

Name of Project	Motor Rewinding Shop
Project Location	Kalinganagar and Jharsuguda
Area requirement	200 sq m
Approx. Project cost	a) Land and Buildings : ~ INR 30 – 35 Lakhs b) Plant and Equipment : ~ INR 30 - 40 Lakhs
Project Scale	10 Nos per day
Process	<p>An electrical motor consists mainly of stator and rotor. Depending on the type of motor, these differ slightly in nature. Winding refers to a system of insulated conductors forming the current carrying element of a machine, designed to produce a magnetic field, which influences a rotary movement.</p> <p>An electric machine operates 'because of the magnetic flux setup in its magnetic circuit by magneto- motive forces arising from currents flowing in groups of winding suitably disposed on the stator and rotor.</p> <p>Based on the construction & type of motor winding are arranged in slots provided in laminated iron core. Motor may be of single phase and three phase. Mostly in 3 phase motors, the number of coils equal to the slots. The coils are connected such a way that three separate windings are formed which are called phase winding. Each coil in these winding should be same size and shape, coil per phase are 1/3 of the total coils. The windings are connected in star or delta.</p>
Utilities	<ul style="list-style-type: none"> • Electricity (Connected Load) – approx. 5 kw • Water about 2 m³/ day
Manpower requirement	5
Nodal agency	Investment Promotion and Investment Corporation of Odisha Limited (IPICOL)


1.20. Manufacturing unit for Galvanising facilities for structural pipes

Name of Project	Manufacturing unit for Galvanising facilities for structural pipes
Project Location	Kalinganagar and Jharsuguda
Area requirement	5500 sq m
Approx. Project cost	a) Land and Buildings : ~ INR 125 – 150 Lakhs b) Plant and Equipment : ~ INR 625 – 650 lakhs
Project Scale	4000 tonnes per month
Process	The pipes/structural and its components are dipped into a degreasing tank to remove any oil/dirt etc., then these are dipped in acid (HCL) pickling tank for removal of oxides followed by rinsing. Thereafter, these are dipped into fluxing tank. Then the material is dried before dipping in to zinc pot (450-460 degree centigrade) for coating. The coated pipes/ structurals are passed through Dichromate tank for passivation purpose to avoid rust formation as per the requirement.
Utilities	<ul style="list-style-type: none"> • Electricity (Connected Load) – approx. 350 kw • Water about 5 m³/ day
Manpower requirement	26
Nodal agency	Investment Promotion and Investment Corporation of Odisha Limited (IPICOL)

1.21. Pipe Coating Plant

Name of Project	Pipe Coating Plant
Project Location	Kalinganagar and Jharsuguda
Area requirement	4000 sq m
Approx. Project cost	a) Land and Buildings : ~ INR 2 – 5 lakhs b) Plant and Equipment : ~ INR 48 - 55 Lakhs
Project Scale	60000 tonnes per month
Process	<p>Steel pipes are coated with anti-corrosive coating materials to protect the pipe against corrosion. The coating materials should possess properties like resistance to different types of soil, different types of water, mineral oil, and low permeability, high electrical contact resistance, mechanical resistance against impact, etc. Besides, the coating materials should also have surface smoothness and absence of porosity, wide temperature range for application, resistance to ageing, etc.</p> <p>Synthetic materials such as polyethylene and epoxy possess the above properties and, therefore, are used as coating materials on outside and inside coating of pipes respectively. The inside coating of pipes with epoxy resin also fulfils other requirements like defect free internal coating in respect of arching, flaking, peeling, etc., uniformity of the layer thickness, high surface smoothness, good adhesion and high degree of hardness.</p> <p>The most common process for outside coating of pipes with polyethylene is the extrusion process. In this process, polyethylene granulate is plasticized in the extruder and then applied in the form of a jet to clean surface of the pipe heated to 1800 C to 2000 C. In the wrapping process, the pipes are first coated with thin layer of epoxy resin as primer followed by adhesive thin sheet and then wrapping by polyethylene sheet for proper bonding / adhesion.</p> <p>The coating of the inside surface of the pipe is carried out by inserting an arm with spraying head inside the pipe. The compressed air is blown during forward movement of the arm to remove any dusts inside the pipe. During return movement of the arm, epoxy material is sprayed from two die heads for providing double layer of coating.</p>
Utilities	<ul style="list-style-type: none"> • Electricity (Connected Load) – approx. 4.1 MVA • Water about 6 m³/ day
Manpower requirement	26
Nodal agency	Investment Promotion and Investment Corporation of Odisha Limited (IPICOL)

1.22. Fabrication Shop

Name of Project	Fabrication Shop
Project Location	Kalinganagar and Jharsuguda
Area requirement	3000 sq m
Approx. Project cost	a) Land and Buildings : ~ INR 100 – 125 Lakhs b) Plant and Equipment : ~ INR. 200 -250 Lakhs
Project Scale	
Process	Following operations will be carried out in the fabrication shop: <ol style="list-style-type: none"> 1. Sheet metal, pipe and rod are cut to the required size. 2. Sheets are formed to required shapes in the forming machine. 3. Rods and pipes are welded with formed sheet metal. 4. Finally Painting is done.
	 <pre> graph LR A[Raw Material (Steel sheet, pipe, rod)] --> B[Sheet Forming] B --> C[Fabrication] C --> D[Painting] </pre>
Utilities	<ul style="list-style-type: none"> • Electricity (Connected Load) – approx. 100 kw • Water about 10000 lit/ day
Manpower requirement	36
Nodal agency	Investment Promotion and Investment Corporation of Odisha Limited (IPICOL)

1.23. Forging Shop

Name of Project	Forging Shop
Project Location	Kalinganagar and Jharsuguda
Area requirement	500 sq m
Approx. Project cost	a) Land and Buildings : ~ INR 30 – 35 Lakhs b) Plant and Equipment : ~ INR 120 – 140 Lakhs
Project Scale	
Process	The work metal is heated in the induction furnace up to 50 degree above eutectic temperature. It is kept over the die and a compressive force is applied to get the desired shape. After forging, the product is heat treated to get the mechanical properties as required. Finally, the product is machined at various machines for finishing.
Utilities	<ul style="list-style-type: none"> • Electricity (Connected Load) – approx. 750 kw • Water about 10000 lit/ day
Manpower requirement	36
Nodal agency	Investment Promotion and Investment Corporation of Odisha Limited (IPICOL)

1.24. Foundry Shop

Name of Project	Foundry Shop
Project Location	Kalinganagar and Jharsuguda
Area requirement	4000 sq m
Approx. Project cost	Land and Buildings : ~ INR 50 – 70 Lakhs b) Plant and Equipment : ~ INR 250 – 280 Lakhs
Project Scale	
Process	<p>First of sand is mixed with water and keep in the mould box. The pattern is kept between cope and drag part of the mould box and the squeezed by mould squeeze type mould machine. After squeezing of sand, cope and drag part of the mould box is separated to take out the pattern and get the desired shape to be cast. Now, the cope and drag part of the mould is properly clamped and then molten metal is poured in the mould cavity through sprue and then molten metal is allowed to solidify. Before taking out the cast product from the mould box, one should ensure that the molten metal has been solidified properly.</p> <p>After taking out the solidified metal it is allowed to cool to room temperature. Before heat treatment to get the desired mechanical properties, it needs fettling. After heat treatment, the cast product is finally machined to get the finished product.</p>
Utilities	<ul style="list-style-type: none"> • Electricity (Connected Load) – approx. 750 kw • Water about 10000 lit/ day
Manpower requirement	36
Nodal agency	Investment Promotion and Investment Corporation of Odisha Limited (IPICOL)