



STEEL DEPARTMENT

Unit Assembly Shop

This 27,065-sq. ft. shop has a 40' x 125' flat and level slab, and incorporates a 40' x 60' flat panel building area and a 40' x 270' pin jig area.

Shop cranes include one 40 ton bridge crane with 15 ton whip, a bridge crane with (2) 20 ton blocks, and a third bridge crane with a 15 ton block with heights of 43'. A combination of these cranes will yield a maximum lift of 80 tons. Additionally there are four wall-mounted 2-ton jib cranes.

Pier #3

Total fabrication area is 12,909 sq. feet with 10,179 sq. feet under a portable rolling cover for protection from weather. One 40-ton "whirley" type crane serves the area.

Mold Loft

Fabrication shops are supported by a 3,000-sq. ft. lofting floor and a CAD/CAM computer facility. The lofting floor is used for manual full or 1/10th scale layout and template development. The CAD/CAM facility is the primary source in generating burn packages for the NC burning machines. Special software currently employed at these stations includes *Auto-Cad 2000*, *Ship Constructor*, *ShipCam 4 Intergraph Microstation*, *ShipCam 4* (a shell plate development program), and *Sigma Nest Sigma Nest* (an automatic parts nesting program). This area also has (2) *SOKKIA* optical measuring devices that interface with the *Auto-Cad* systems and an *Auto-Cad* programmable template making machine.

Steel Burning & Forming Shop

The 18,420 sq. foot shop has two (2) overhead gantry cranes of 10-ton capacity with a 28'-10" floor to hook height. The plate burning area contains the following:

- CM 100 NC plasma burning machine with lay down for four (4) 10'x40' plates. Capabilities range up to 3" thick ferrous and non-ferrous plate cutting at speeds from 13 inches a minute up to 200 inches per minute.
- CM 56 NC/optic gas burning machine with lay down for one (1) 10'x40' plate. Six (6) torch heads will cut up to 6" thick steel.

The Steel Forming Area

- Pacific hydraulic press brake, model 4500-27, 1500 ton capacity with 22'-0" between vertical rams.
- 600 ton press, bed size 5' x 8', capable of producing flanged plate knuckles, conical pieces and dished plates. Typical capabilities are:

Plate Thickness	Min Radius	Length of Piece
1/4'	12"	96"
2'1/2	24"	24"



- Pyramid rolls capable of rolling cylinder or partial cylinder. Minimum radius and length capabilities are as follows:

Plate Thickness	Min Radius	Length of Piece
1/4'	15"	96"
1/2	24"	48"

Sub-Assembly Shop (T-155)

This 20,916 sq. foot shop has two overhead bridge cranes of 25 ton capacity with 5 ton whip hooks, and 28'-10" floor to hook height. The fabrication area has a concrete floor and measures 77' x 130'. The following equipment is located in this shop:

- Hilles & Jones Co. Metal shape bumper, 15" maximum jaw with 2'1/2" stroke.
- Vertical Hemsaw (bandsaw) with 22" maximum capacity.
- Mubea kbl 1100 punch
- Shear-coper-natcher, 120 ton punch with 1'3/8" dia.
- Maximum punch, 3/4" x 6" x 6" steel angle shear capacity, 3/4" x 6" flat bar capacity.
- 6" radial drill press, 36" adjustable height.
- Angle rollers, 1/2" x 5" steel angle capacity.



PIPE SHOP

The pipe shop has over 21,400 sq. feet of working area with direct connection to CAD/CAM capabilities with planning and engineering.

Pipe Shop Capabilities:

Pressure testing to 10,000 psi.

Pipe and tubing bending up to 8" ips for non-ferrous and up to 6" ips for all types of pipe except plastic.

Unlimited wave guide manufacturing and installation in copper, brass and aluminum.

Hose manufacturing for all applications.

Hanger manufacturing for all applications.

Heat exchanger and condenser repairs of all shapes and sizes up to 3/4" i.d. tubes and 1.5 ton weight limit for in-shop repairs.

Fabrication of new tube sheets of all types of material.

Cleaning and testing.

Threading capabilities up to 6" i.p.s. pipe of all materials.

Lofting capabilities including computerized bend sketches.

Piping system manufacturing including all types of joint designs:

- Welded
- Brazed (with certified employees tested by procedure)
- h101 torch
- Swage lock
- Glued
- Cryofit
- Lock ring
- Pipe lock

Flushing capabilities down to level 3, but lower upon request with flushing pumps capable up to 300 psi with 300 gallons per minute capacity.

Shipboard Capabilities:

- Full service pipe repair of all types of materials.
- Full service valve replacement (all applications).
- System trouble shooting.
- Full service pumping capabilities.
- On board flushing of all types of systems.

Hydrostatic and nondestructive testing.



ELECTRIC SHOP

The electrical department provides a complete facility able to accomplish all facets of shipboard electrical repair and construction. Todd electricians have the ability and equipment to trouble shoot and repair all types of shipboard electrical and electronic systems. The main shop has over 5,000 sq. feet of floor space and contains areas for fabrication, temporary power & lighting, motor repair, and a photo lab.

The shop fabrication area is outfitted with various types of saws, drill presses, punches, and grinders and is able to produce all types of foundations and wireways. In addition, it is equipped to overhaul, fabricate, and assemble motor controllers, relays, alarm panels, etc.

The photo lab is equipped to provide high speed production of engraved labels in all types of material, aluminum cable tags, vinyl floaters, and photo metal label plates.

PAINT AND SHOT BLAST FACILITY

The shot blast/paint facility contains approximately 8,820 sq. ft. of environmentally controlled work area. The shot blast area is capable of housing steel structures up to 34 feet high by 40 feet wide. There are 2 buildings. The Blast/Paint Shop is comprised of two large 2,500 sq. ft. booths, one for blast and one for paint. In addition, there is a large holding/preparation bay.

The Paint Department, with the use of the latest equipment, can apply all types of coatings, including:

- Polyurethanes
- 100% solids epoxy
- Latex
- Alkyd
- Zinc
- High build epoxy
- Anti-fouling
- Non skid systems

Other paint services include full service custom signs and logos.



REPAIR CENTER

The Todd Inside Machine Shop is a full service shop housed in a centrally located 19,500 sq. foot building with two (2) 10 ton overhead bridge cranes and various ¼ to 1 ton jib cranes. This shop has material research and requisition services along with tool and die capabilities and a good supply of raw materials on hand including:

- Stainless steels (304,316,410,416)
- Phenolics (i.e. micarta)
- Brass & bronze
- ABS grade 2 steel

Machine shop machining capabilities include, but are not limited to:

- Shafting/rudder stock work up to 38" in diameter and 50' long with a 20 ton weight capacity.
- Shafting liner removal and reinstallation.
- Shaft straightening with the heat and quench method.
- Clad-welded build up of stainless and bronze liners re-machined.
- Shaft protective covering spark test capabilities.
- A.B.S. material Grades 2, 3, and 4 and Coast Guard certified repairs for shafting.

Controllable pitch propeller system overhaul capabilities include:

- Oil tube repair and construction for all vessels.
- CPP hub overhauls.
- Bow thrusters, retractable or fixed for all vessels.
- Fin stabilizer overhaul.

Dynamic balancing capabilities featuring the IRD-Mechanical analysis, self-calibrating, computerized balance.

- The large unit can handle up to 15,000 lbs. and is currently set up to swing 8' diameter and 16' in length.
- The small balancing unit can handle up to 500 lbs. and can swing 4' diameter x 5' long.
- Self-calibrated computer compensates for rpm's to 99,000.

Milling/boring mill capabilities include:

- Three (3) horizontal boring mills. The largest is a 6" spindle with an 8' x 12' table with 11.5' of horizontal travel and 8' of vertical travel. All boring mills have digital read outs for quick reference.
- Four (4) vertical milling machines.
- A 4' x 20' bed planer/mill with side head.

The shop's turning capacities includes vertical boring mills with 6' max. swing and 5' max. height, seventeen (17) engine lathes with up to 36" swing by 12' between centers, and two (2) shafting lathes one at 45" swing by 50' between centers and one at 48" swing by 40' between centers.

Very Large LeBlond No.7c (Shafting) Turing Lathe ----- Swing over the bed 54"----- Swing over cross slide turning carriages 40" ----- 80 feet turning capacity, 90 ton weight capacity.

The shop employees have expertise in all phases of marine repair including:



- Deck winches and deck gear, including CT.
- Pump, motor, and turbine overhaul.
- Valves of all types including high-pressure steam.

The Repair Center is a full service marine and industrial repair facility, that is A.B.S. and USCG certified for many marine processes.

Todd's Repair Center features complete propulsion system machinery repair capabilities. The first phase of this is stem to stem shafting overhaul. The OSM shop has qualified personnel capable of removing propeller hubs and shafting from all sizes of vessels. This includes fixed and controllable pitch propeller systems.

The shop's capabilities include the overhaul of all types of shaft bearings, i.e.; line, stern tube and strut bearings. This includes restoring all mounting surfaces, removal and reinstallation of bearing staves and renewing any zinc anode protection that may be needed.

The Repair Center shop also has the following capabilities:

- Removal, overhaul and reinstallation of Out-Drive boxes for controllable pitch propeller systems.
- Experience and tooling to accomplish boring of existing or new shaft coupling bolts whether they are straight or tapered in a wide range of sizes. This can be accomplished on-board, in place, pier-side or in the shop areas.
- Highly skilled in the verification of shafting alignment by using optical measuring equipment. Shop can correct misalignment by in-place line boring. The maximum size that can be done is 6' diameter by 27' long.
- Extensive experience in steam generation repair including the overhaul of high and low pressure turbines and ship's service turbine generators (SSTG) plus the disassembly, repair and reassemble of any turbine rotating assembly. The shop also has the experience in the overhaul of a wide range of turbo-chargers and steam governing and safety devices.
- The ability to work shipboard on in-line valves of all types and sizes including high-pressure steam, also pump overhauls and alignments.
- The Repair Center shop can also align all types of deck gear or shipboard machinery by shimming or chocking whether it is steel or resin chocking material.

CARPENTER SHOP

The carpenter shop provides a 6,000 sq. foot covered work area and can turn out fine detail woodwork. Skilled shipwrights can provide the following skills:

- Joiner work.
- Shipwright lay out and alignment.
- Stage rigging and construction.
- Custom furniture; pattern making and jig building are available.
- Cutting and installation of phenolic stern tube bearings.
- Fabrication and repair of railing and gratings, wood or fiberglass.
- Fabrication and repair of fiberglass (including lifeboats).
- Optical and laser alignment of shafts, machinery and hull foundations.



SHEET METAL SHOP

- The Todd Sheet metal Manufacturing Center has a proven track record of quality, productivity and customer satisfaction. The Craftsmen in our Shop take great pride in the finished product.
- From Aircraft Carrier Galley Upgrades to Vent Packages the Sheet metal Shop has the capability for any size Fabrication that our Customers request.
- Sheet metal has been one of the first Shop's to learn how to apply the Lean Process for Fabrication and Continual Improvement of reducing waste, cycle time and cost's that we can then pass along to our customers.

The sheet metal shop is comprised of three fabrication areas and is supported by the sheet metal loft. The furniture, the flange shop, and the ventilation areas are housed under one roof. Their combined floor space is 11,700 sq. feet.

The ventilation shop contains a CM-250 burning machine, capable of burning 12' x 5' sheets and programmable from the shop floor or remotely from the loft. Other equipment includes a power shear, three hand breaks, two weld booths, and various hand and power tools. The shop is capable of producing 1,400 linear feet of duct per month with supporting items such as fan foundations, hangers, mushroom ventilators, fire dampers and louvers. The flange shop, providing flanges and gaskets for the ventilation shop, is equipped with a buffalo punch and shear, weld booth, and various sanders and grinders.

The furniture shop holds two press brakes, one of which is programmable and has a 12' capacity, three weld booths equipped with MIG and TIG welders and plasma cutting machines, one press brake for gang punching, one 10' shear, two power rollers, one pan break, one duplicator punch capable of punching holes up to 4" in diameter, one resistance spot welder, two belt sanders, and other various hand and power tools. The shop production capability covers a wide variety of sheet metal items. Production capacity, measured with a typical mix of habitability sheet metal items, would be for example, 2,000 linear feet of metal joiner bulkhead assembly, 100 units of furniture, and 12 galley dressers in a one-month period.

The sheet metal loft primarily supports the ventilation shop. Four drafting tables, two pattern making tables and the computer room containing four personal computers and one laser jet printer are the major components. Of the four personal computers two are equipped with Intergraph Microstation and are used for preparing shop sketches, development of foundation parts, and the manual nesting of these parts. An additional software application, NC Pyros, provides a GNC (geometric numerical control) capability, which interfaces with the CM-250 burning machine in the ventilation shop. Another computer links the sheet metal loft with the LAN. These three computers are run off Windows based software. The fourth computer carries a DOS based program with an East Coast Sheet Metal Duct Fabrication Package, which develops ventilation fittings, nests the parts, and interfaces with the CM-250 burning machine. An auxiliary software package, Transpac, develops radius corner fittings.

TOOL ROOM / CALIBRATION LAB

The tool room has over 15,000 different tools to check out to yard employees. The central tool room has an on line computer (A.T.T.S.) Automatic Tool Tracking System that provides current information for the tool room, and management, with the cost of tools used, certification status, and tool reliability.



WAREHOUSE / STORAGE FACILITIES

The warehousing facility is strategically located so easy delivery can be accomplished from within the yard or for outside the yard deliveries or pickups. The warehouse facility has the capabilities of custom packaging and shipping of customer's materials via truck, rail or air carrier commercial shippers. The warehouse is secure, sprinkler-protected, and environmentally controlled.

The warehouse department also operates a mag-crane with a 15 ton capacity, for off loading steel plate or shapes from trucks or railcars. With the use of spreader bars we also have the capability of using this crane to off load aluminum or CRES material.

Another function of this department is the receiving, inspection, storage and issue of customer furnished material, (if requested). A secured, restricted access area is available in this department.

RIGGING DEPARTMENT

The main function of the rigging department is the movement of stores and equipment on/off vessels and within the yard. The following rigging services are available:

- 500 ton swage press, up to 1-1/2" wire rope.
- Hot spelter and cold pouring.
- Certified weight testing up to 200 tons.
- Mobile 35 & 22 ton capacity cranes.
- Full wire rope, synthetic rope, lifelines and ground tackle services.
- 150 ton KAMAG transporter.

WELDING DEPARTMENT

Todd has approximately 50 different welding procedures that have been approved by U.S.C.G., A.B.S. or meet Navy welding standards. These welding procedures include carbon steel, stainless steel, chromemoly, manganese bronze, copper nickel and aluminum. These welding procedures also include 15 pipe certificates of various metals. The company is also certified in tail shaft repairs and clad welding using stick electrode or submerged arc. The welding department is capable of an output of 8-10 ft. of installed weld per hour. This is a shop, ship and building ways average.