



**ANDERSON STEEL SUPPLY, INC.**  
**BILLINGS, MT DIVISION**

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# **Quality Manual**

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## Mission Statement

Anderson Steel Supply is a team of highly skilled individuals providing quality service and the following products primarily to construction contractors:

- Reinforcing Steel
- Fabricated Steel
- Structural and Miscellaneous Metal
- Commercial Doors and Frames
- Finish Hardware
- Building Specialty Products
- Hoists and Cranes
- UL Listed Tanks
- Hoppers
- Ducting
- Specialty Paint Applications
- Computerized Shape Cutting

We are committed to providing our customers with the best possible service and products in a timely manner at a competitive price. We have a high level of knowledge about our products and their uses. We can solve our customers' individual problems. We want our customers to be satisfied.

We retain highly motivated people in the Anderson Steel family by providing a fair and equitable living, rewarding initiative and encouraging individual development and growth. Collaborative efforts and individual contributions of every employee are the key assets in establishing Anderson Steel Supply as a consistent leader in our industry.

Anderson Steel Supply is proud to be a good neighbor in the communities in which it operates. We maintain the highest standards of ethical and social responsibility in the conduct of our business.

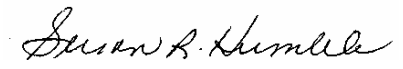
## Quality Control Policy

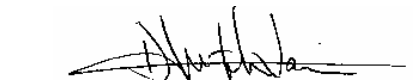
Anderson Steel Supply will supply contractors with the finest quality structural and miscellaneous steel obtainable from any fabrication shop.

Our goals are:

- to provide professional, easily-read shop and erection drawings
- to provide quality fabrication of components to specified requirements
- to minimize field fit-up problems
- to provide immediate response to field problems
- to facilitate reasonable material delivery when required by construction schedules

The management of Anderson Steel Supply is committed to providing the necessary training and tools to assure that quality products can be provided to customers.

  
\_\_\_\_\_  
President

  
\_\_\_\_\_  
General Manager

## Safety Program

**Commitment:** Anderson Steel Supply is committed to preventing accidents. Senior management is highly visible and expects that Anderson Steel Supply will provide an accident-free work environment.

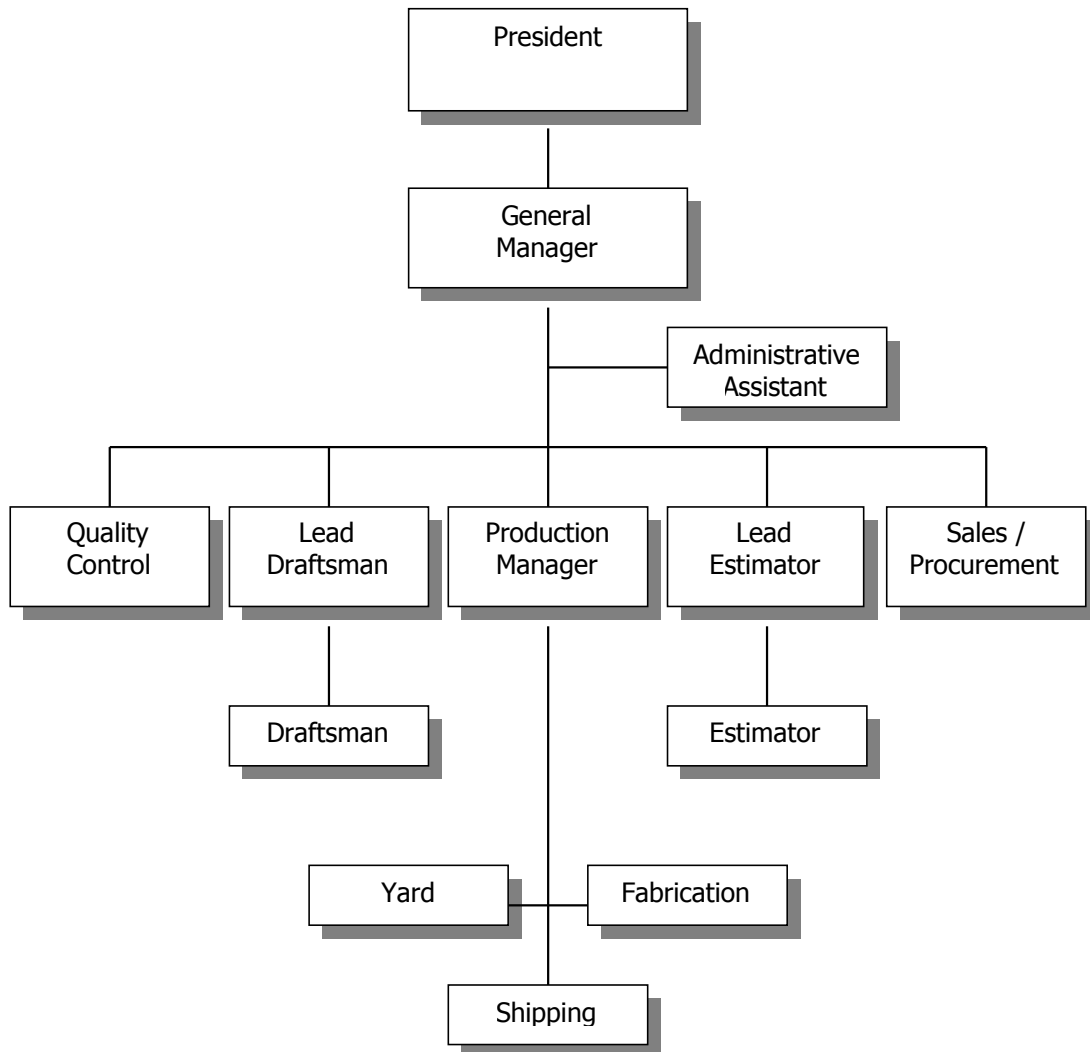
**Training:** The company trains employees to do their jobs correctly, with an emphasis on quality, productivity, cost control and safety. Training and follow-up, both individually and in group safety meetings, is ongoing. Anderson Steel Supply complies with OSHA standards, which include 27 separate training requirements for general industry such as steel fabrication. This compliance is ensured through written policy, procedure, and individual and group training for each of the 27 requirements. Written Safe Operating Procedures (SOP's) for most of the equipment and jobs have been developed and are actively used for training.

**Accountability:** Everyone, including employees and the general manager, is evaluated on his or her attitude and effectiveness in preventing accidents. Individuals with a poor safety history or attitude are not retained. Individuals with good safety records are individually recognized through a Safety Incentives Awards Program.

**Accident Investigation and Follow-up:** All accidents and potentially dangerous incidents are investigated and discussed individually and in safety meetings. A number of changes in the training, equipment, or safe operating procedures have resulted from investigating a minor injury, near miss, or property damage accident. Both the supervisor and the injured employee are required to provide a written report on how the accident happened and what could have prevented it.

**Results:** In recent years each of the divisions is averaging seven months between lost-time accidents.

## Organizational Chart



## Job Descriptions and Biographies

### General Manager

- Reports to the vice president and president
- Familiarity with AISC, AWS, and local building code requirements for conventional steel building structures
- Authorizes type and scope of work to be estimated
- Assures safety procedures are in place and enforced
- Assures quality control measures are in place and enforced
- Coordinates jobs between all both divisions of Anderson Steel
- Supervises the day-to-day operations of the Billings Division
- Purchases large equipment
- Responsible for corporate purchasing of all steel and gauge
- Negotiates freight rates with trucking lines

### ***D. Christopher Vance:***

**General Manager** for Anderson Steel Billings Division since 2003. Hired in 2000, Chris was the Production Manager before moving into his current role as General Manager. Before coming to Anderson Steel, Chris was the General Manager of a printed circuit board processing equipment company as well as Director of Manufacturing for a slot machine manufacturer. He has a degree in Manufacturing Engineering and has also spent five years with Cessna Aircraft working in their metal fabrication facility.

### Lead Estimator

- Reports to the general manager
- Reviews other estimators' work for accuracy and completeness
- Checks on bids and writes estimates
- Manages projects including preliminary disbursement of lists to internal purchasing agents for mill and warehouse orders
- Handles detailing resources for each project
- Orders buyout materials such as joint, deck and grating
- Maintains schedule of contractors on projects
- Plans to have resources necessary to build project upon receipt of drawings
- Coordinates priorities on projects
- Oversees shipments
- Provides contractors with lists and notifies them of arrival schedules
- Corrects shortages and negotiates back charges, if any
- Addresses problems in the shop related to drawings

### ***Graham Dean Sims:***

**Lead Estimator** since 1980, began working as a draftsman for Anderson Steel in 1975. Later, he worked as an estimator and project manager before assuming his current position. In this capacity, Sims oversees the work of other estimators for accuracy and completeness. His responsibilities include arranging and overseeing projects to be estimated as well as follow up on projects estimated. He oversees shipments to the site

to ensure that projects are complete and delivered as promised. Sims attended a seminar in project management in 1998.

### **Estimator**

- Reports to the lead estimator
- Estimates projects accurately and in a timely fashion
- Reviews change orders on projects
- Checks on bids
- Reviews exchange projects
- Identifies and responds to customer needs in relation to estimates

### **Larry Radler:**

**Estimator** with Anderson Steel Supply since 1998. With 36 years of experience in the steel industry, he has spent the past 30 years as an estimator for structural steel, ASME pressure vessels, API, AWWA, UL tanks, truck tanks, conveyors, ductwork, hoppers, bins, and special plate work. He has also worked as a draftsman, a checker, and a shop superintendent. Radler has operated plate shear, plate rolls, press brakes, forklifts, overhead cranes, punch presses, CNC torches, welders, and paint sprayers.

### **Lead Draftsman**

- Reports to lead estimator, project manager and general manager
- Minimum 1-year degree in drafting required
- Must have knowledge of AISC, AWS and local building code requirements for conventional steel building structures
- Schedules and coordinates drafting jobs
- Hires and trains drafters
- Prepares shop drawings for fabrication and placing of reinforcing for concrete structures
- Prepares shop drawings for fabrication and erection of structural steel and miscellaneous steel
- Checks shop drawings prepared in Anderson Steel Billings Division
- Details rebar, miscellaneous steel, and structural steel
- Purchases buyout items

### **Duane Pegar:**

**Lead Draftsman** for Anderson Steel Supply since 1985, has worked 29 years in steel fabrication. Prior to working at Anderson Steel Supply, Pegar served as the Detailer and Drafting Department Head for Northland Steel (1971-1985). He holds a 1-year drafting degree from Billings Vocational-Technical Center and completed one year in Construction Technology at Montana State University-Bozeman.

### **Draftsman**

- Reports to the lead draftsman
- Minimum 1-year degree in drafting

- Must have knowledge of AISC, AWS and local building code requirements for conventional steel building structures
- Prepares shop drawings, material and fabrication lists, and erection details for structural, miscellaneous and reinforcing steel
- Interacts with shop personnel as required on assigned drafting projects

***Thomas Griggs:***

**Draftsman** for Anderson Steel since 1986. Griggs prepares his drawings using both conventional drafting methods and Autocad 10, 12 and 14. He holds a 1-year drafting degree from Billings Vocational-Technical Center and has worked in the steel industry for 27 years.

**Procurement Manager**

- Reports to lead estimator and production manager
- Evaluates material suppliers based on quality and satisfactory past experience
- Reserves inventory items and orders steel for jobs
- Inspects incoming materials to see that they match specifications of purchase order
- Maintains listing of current ASTM specifications
- Identifies each item according to specification, grade, and heat number
- Upon request, traces materials to the mill in which they originated
- Oversees outgoing materials by cross-checking shipping tags with material shipping list

***Mary Lou McConnell:***

**Procurement Manager** for Anderson Steel Supply since 2006, manages inventory control, purchasing, receiving and sales.

**Project Manager**

- Reports to general manager
- Interacts with architects, engineers, and customers as required for coordination of materials
- Changes orders, plans revisions, and resolves conflicts and problems as they arise.
- Works in concert with Estimating and Sales Departments in sub-contracting large detailing jobs
- Works with shop production as required in planning fabrication and delivery sequence
- Purchases some buyout items and handles shop drawings from suppliers of buyout items for approval and coordination with Anderson Steel

***Project Managers:***

Include Duane A. Pegar, Thomas L. Griggs, and Graham Dean Sims. Since this is a revolving position, it has been omitted from the organizational chart.

### **Quality Manager**

- Reports to General Manager
- Familiar with all AISC and AWS requirements for fabrication
- Must be a AWS certified weld inspector
- Assist in training shop personnel in all phases of welding, fabrication, and safety procedures
- Writes weld procedure specifications
- Certifies welding personnel
- Manages Safety Program

### ***Tim Carpenter:***

**Quality Manager** at Anderson Steel Supply since 2000. With 25 years of experience in the steel industry, he has 12 years of experience in fabrication and 13 years in management. Hired by Anderson Steel Supply in 1987, he worked 2 years as night foreman, 7 years as shop superintendent, and 2 years as an estimator prior to assuming his present position. He is accustomed to using the following equipment: shear, brake, plate roll, angle roll, pipe bender, band saw, chop saw, forklift, wheeled cranes, overhead cranes, man lifts, rebar shear, rebar bender, 4-head torch, manual cutting torch, plasma arc, and track torch. Carpenter is an AWS certified weld inspector.

### **Production Manager**

- Reports to General Manager
- Familiar with all AISC and AWS requirements for fabrication
- Hires shop personnel
- Assists in training shop personnel in all phases of welding, fabrication, and safety procedures
- Assigns tasks to welders based upon their qualifications and experience
- Manages all phases of production
- Coordinates shipping and receiving
- Oversees maintenance of all equipment

### ***John Elliott (acting):***

Hired in 2006, John has worked in the steel and fabrication supply industry for 15 years prior to joining Anderson Steel.

## Equipment

The production manager prepares a preventative maintenance schedule to ensure that all equipment is in good working condition. He arranges for repair and upkeep with established mechanics and repairmen.

Equipment that is not used on a daily basis, such as a bolt tension tester, will be rented or Anderson Steel Supply will subcontract with individuals to perform tasks associated with this equipment.

### **Cranes and Lift Capacity by Area**

#### ***South Shop***

- (1) Detroit top running 10-ton crane with 20-foot hook height and 7,020 square feet served
- (1) Shaw box top running 10-ton crane with 20-foot hook height and 7,020 square feet served
- These cranes service eight fabrication stations in a new structure that is approximately 7,425 square feet.

#### ***Central Shop***

- (1) Detroit top running 5-ton crane with 15-foot hook height and 5,000 square feet served
- (1) Harrington under hung 3-ton crane with 13-foot hook height and 5,000 square feet served
- These cranes service six fabrication stations in a structure that is 5,500 square feet.

#### ***North Shop***

- (1) Wright top-running, 5-ton crane with 15-foot hook height and 5,000 square feet served
- Various operations use this crane, including the shear, press brake, saw and iron workers.

#### ***Main Inventory/ Reinforcing Steel***

- (1) Custom under-hung, 5-ton crane with 20-foot hook height and 24,000 square feet served
- (1) Demag top-running, 5-ton crane with 20-foot hook height and 24,000 square feet served
- These cranes support movement of material held in inventory as well as serving two rebar shear lines.
- In addition, the north and central shops utilize four jib cranes that can service up to six fabrication workstations. Each jib crane is rated at 1 ton.

### **Mobile Lift Capacity**

- (1) Towmotor 8-ton all terrain forklift with 8-foot forks
- (1) Champ 4-ton all terrain forklift with 4-foot forks
- (1) Cat forklift with 5,500 pound capacity
- (1) Carry deck drott rated as a 4-ton mobile yard crane
- (1) 8-ton straddle buggy used to carry raw material and work in process to various fabrication workstations

### **Saw/Cutting Equipment**

- (1) Hyd-Mec 2000 model horizontal saw; capacity 20 inches by 30 inches
- (1) Liquid-cooled Kalamazoo 12-inch cut off saw used primarily in the handrail fabrication area
- (1) Ellis model 2000 band saw with maximum throat size 11 inches, used primarily for cutting light gauge materials at precise angles
- (1) Dry 20-inch chop saw with maximum throat size 10 inches, used primarily for cutting small material within the main inventory area

### **Reinforcing Steel Equipment**

- (1) Steinweg reinforcing bar bending machine with maximum bar size #10, maximum quantity of bars per iteration 5 and maximum bending angle per iteration 220 degrees
- (1) Arnold reinforcing bar bending machine with maximum bar size #14, maximum quantity of bars per iteration 3, and maximum bending angle per iteration 180 degrees
- (2) Alamo air clutch bar shears rated at 150 tons and capable of shearing 28 #3 bars per iteration
- The bar-bending and bar-shear machines are supported by feeder tables for smooth entrance and exit of materials.
- (1) Vickers, hydraulic driven bar roll with minimum radius 12 inches and maximum bar size #11

### **Shear and Press Brake Equipment**

- Cincinnati 1/2" x 12' shear with mechanical drive
- Chicago press brake with hydraulic drive, 400-ton rating with a 10-foot bed, and maximum die opening 6 inches
- Anderson press brake with hydraulic drive, 100-ton rating with a 6-foot bed, used primarily for stair pans and light gauge materials
- Beam cambering machine with capacity for W21 by 49 pound beam

## **Welding Equipment**

- (6) Miller dimension model 400 wire/stick welders
- (2) Miller Deltaweld model 452 wire welders
- (2) Miller model CP300 wire welders
- (1) Miller Deltaweld model 450 wire welders
- (2) Miller model 250 wire welders
- (1) Miller SRH model 333 stick welders
- (3) Lincoln R3R model 300 stick welders
- (2) Lincoln SP model 130T stick welders
- (1) Linde CE model 300 stick welder
- (1) Hobart RA 1000 power supply for Nelson stud welding

## **Material Processing Equipment**

- (1) Unihydro with a 1"x 12" shear iron worker; 90-ton rating
- (1) Mubea iron worker; 60-ton rating
- (2) Whitney hydraulic flange punch; 90-ton rating
- (1) Unihydro punch with 1 ¼ through 1-inch plate capacity
- (1) Jancy slugger drill with capacity for 2-inch hole by 2-inch hole by 2-inch width of material
- (1) Thermal Dynamics plasma arc-cutting machine
- (1) Buggo systems track torch
- (1) Hill Acme threading machine; accepts round rod from ½" to 1 ¼" in diameter
- (1) Wallace Coast pipe bender; accepts 1 ¼" to 1 ½" pipe with a 2" radius
- (1) 2-inch pipe coper
- In addition, there are multiple pressurized air drops located in all three shops to facilitate the use of pneumatic equipment.

## **Painting Equipment**

- (1) Airless electric sprayer pump
- (2) 30:1 Graco Bulldog applicators
- (1) 5-gallon pot with agitator
- (1) 2-gallon pot sprayer
- (1) 200-pound sandblast pot
- (1) Sullair model 160 portable air compressor

## **Transportation Equipment**

- (1) 1994 Freightliner
- (2) 45-foot flatbed trailers
- (1) 65-foot expandable drop-deck trailer

- (1) 1990 Dodge 1-ton truck with 12-foot bed
- (1) 5-ton gooseneck trailer with 20-foot bed
- (1)  $\frac{3}{4}$  ton Chevrolet with an 8-foot flatbed

#### **Drafting Equipment**

- (2) CADD drafting systems using Gateway hardware and Autocad 14 software
- (1) Xerox 2230 thirty-six inch ink-jet plotter
- (1) Xerox 8825 printer located in Great Falls office and used for plotting drawings received over the internet and for plotting approval and field-use drawing sets
- (1) Diazit 36-inch blue line copier
- (1) Ozalid 5025 black line copier

## Operational Procedures

### Estimating and Bidding Procedure

1. The general manager approves the type and scale of work that will be bid, and he is responsible for all phases of work as well as quality control.
2. The estimator establishes rapport with all concerned parties and communicates what areas of the project Anderson Steel can effectively address.
  - a. Any and all exceptions are to be clearly noted in writing upon submission of quotation.
  - b. The estimator coordinates the timing and communicates the scale of the project to the production manager to assure that proper resources will be available.
3. The estimator will communicate with the procurement manager during the take-off phase.
  - a. The estimator determines what needs to be purchased for a particular project, including dimensions, weights, quantities and chemical composition.
  - b. The purchasing department will report on material availability, cost, and delivery to the estimator.
  - c. The estimator will cross-reference the data with plan specifications and the proposed construction schedule.
  - d. The procurement manager will order the required materials.
4. The estimator or lead estimator will arrange all necessary outside services and materials to satisfy the contract requirements. All vendors providing services or materials are required to submit written quotations regarding the type, cost and delivery of the services or materials requested. The estimator will match the proposed materials or services with the contract specifications.
5. When detailing services are required to meet scheduling parameters of a given project, the estimator will negotiate these services. Junior estimators are required to gain the approval of the lead estimator to finalize time frames, cost and contract language.

Anderson Steel maintains a list of detailing firms that have successfully served the organization in the past. The head estimator maintains the list and the list is subject to periodic review. It is the policy of Anderson Steel to match, as closely as possible, the requirements of the job or type of project with the detailing firm that has an established track record in performing a specific task (i.e., reinforcing steel, conveying systems, industrial structural steel, etc.).

If a scenario arises where external detailing resources are required and the best candidate has no previous business experience with Anderson Steel, a list of references will be required and each will be called to verify information given.

## Material Receipt Procedure

1. All vehicles delivering materials to Anderson Steel are directed to an appropriate space for check-in and unloading.
2. Only certain employees are qualified to receive and inspect materials.
3. An initial inspection is performed before any material is unloaded. This visual inspection is designed to determine whether materials are damaged upon receipt. If this inspection determines that damaged materials are present, steps 3 through 5 are required:
  - a. a notation is made upon the driver's delivery bill of specific damaged pieces; materials of unacceptable quality are documented and are subject to refusal.
  - b. during unloading, any additional damage is documented.
4. Upon completion of the unloading process, the document noting damaged, poor quality, or rejected items is forwarded to the procurement manager and the production manager.
  - a. The procurement manager will file a claim with the freight company for damaged materials or notify vendors of rejected or poor quality materials.
  - b. The production manager will determine the effect of the damaged or rejected material on the production schedule, and when necessary, acquire these pieces of material through local sources in order to maintain the production schedule.
5. The procurement manager communicates with the production manager regarding the material received and its destination within operations.
6. **If no material damage is noted**, each item is to be checked against the original purchase order for:
  - a. specification (e.g., A36, aluminum; A572).
  - b. size (length, width, thickness).
  - c. quantity (number of pieces or bundles).
7. A designated space in the yard will be used as a staging area for material disbursement as the material is assigned to a particular project. As the material is unloaded into the staging area, the employee is required to use a paint stick to designate each piece or bundle of material with the following information:
  - a. job number. Material allocated to a specific job receives an alpha-numeric code painted on the material to designate the specific job number.
  - b. material size (e.g., 1/2 pl. 8'0" x 16'0').

- c. material specification (e.g., AR400F). When material has unique chemical or physical attributes, an alpha-numeric code or identifier will be used to label the material.
8. The procurement manager enters materials received and designated for stock into the computer system to establish in-house tracking. Attributes listed in the computer system will include the purchase order number and date received.
9. Material received for a specific project will be entered by the procurement manager into the computer system, placed in allocated status for the project number and date received. Heat numbers and other information of special concern will be noted if required by customers.

## **Production Staging/Queuing Procedure**

1. The production manager is responsible for data entry of materials and sourcing first cut unapproved drawings so that purchasing can secure enough materials to satisfy production needs.
  - a. A master shipping list is generated to build a file on a specific set of drawings for the shop office. The production manager establishes and maintains a system that tracks drawings through the shop.
  - b. A master cutting list is generated from an approved set of drawings and becomes part of the job file in the shop office.
2. The production manager or the procurement manager surveys stock steel and allocates it to a specific project. Nesting routines are run when compatible with the bill of materials.
3. A yard pull list is issued to the shop and becomes part of the job file for shop operations. Copies of the yard pull list are issued out of the shop office to yard staff and the sawing station.
4. The production manager and saw operator coordinate on a schedule for materials to enter the sawing station. Yard staff pulls material and places it on bolsters in a staging area. In instances where sawing is the first operation of the production chain, material may be staged at the head of the feed mechanism for the saw.

Certain materials may be staged to enter into production as they are off-loaded and checked in the yard. The production manager determines the disposition of individual pieces in the staging process.

## **Sawing Procedure**

1. The production manager issues a saw cut list to the saw station. The saw operator
  - a. ramps the required material from the staging area onto the conveyor table of the saw.
  - b. performs one last check of the material before cutting begins. This involves checking the material against the provided cutting or nesting list for proper size, quantity, and specification.
2. After the sawing process is complete, the saw operator marks the material with a piece number. The number will serve as a tracking number through each operation of the production process.
3. Inventory control enters into the computer system all pieces discarded at the saw and subsequently returned to the yard as stock. This returned drop material is marked with the size, length and heat number or material specification.

## Plate Steel Procedure

1. The production manager generates a shear or torch cut list and distributes it to the brake and shear operator.
  - a. The production manager issues a pull list to the yard staff to stage the appropriate materials at the brake and shear area.
  - b. As material is ramped onto the processing tables of the brake and shear area, the operator performs a final check against the requirements of the cutting/nesting list.
  
2. Drop materials are indicated on the cut sheet and returned to inventory control to enter into the computer system. Inventory control marks materials with size, length and heat number or material specification and returns them to the yard.

## Material Buyout Procedure

1. The master shipping list may contain some components that require acquisition from outside vendors. The project coordinator will insure that the necessary items are procured in a timely manner.
2. The procurement manager will inform the production manager of the type and estimated lead times of materials that have to be ordered.
3. Materials that are in stock are placed in the project staging area and checked against the master shipping list.
  - a. When requested, material test reports will be pulled and affixed to the master shipping list in the staging area.
  - b. An Anderson Steel purchase order will be issued to the appropriate vendors to supply the needed item.
  - c. Quotations from the vendor via phone or fax regarding basic criteria such as size, quantity and price will be noted on the purchase order. The vendor is required to label each container and provide shipping documents and invoices with the project number.
  - d. In some cases, the vendor will be instructed to ship materials directly to the job. Inventory control insures the materials are checked against the master shipping list. The procurement manager requests material test reports to be sent as part of the shipping documents when required.
  - e. Buy out materials sent directly to Anderson Steel will be received according to the Material Receipt Procedures.

## Fabrication Procedure

1. The production manager checks and approves all shop drawings before releasing them to fabrication.
2. The production manager reviews all shipping and cutting lists as they apply to the given set of prints.
3. The production manager will familiarize himself with every set of prints before releasing them to the shop floor following these steps:
  - a. Each print receives a quality control stamp. The primary purpose of the stamp is to trace the routing of the print, assuring that all required fabrication operations have been performed as well as tracking the individual who performed the operation.
  - b. Each print must be inspected and appropriately noted for any special fabrication materials or procedures. For example, the production manager may note, "respirator required" when reviewing a print that calls for welding of galvanized material or highlight "full penetration welds."
  - c. The production manager will note any special painting/coating materials and procedures. He will estimate shop lead times for pieces to be ready for the paint or blasting areas.
  - d. The production manager will match the difficulty of a procedure or set of procedures with the appropriate skill level of an individual in the shop. For example, a print that requires overhead welding will be routed to a welder certified in the 4G position.
4. The production manager tracks the status of every project. The criteria tracked include:
  - name of customer/contractor
  - project/job location
  - print numbers
  - date of receipt of prints
  - job status (e.g., pulling the staging material, sawing material)
  - date of release for shop fabrication
5. The production manager releases the pull sheets to the specified operation (e.g., shear, saw). The criteria listed on the nested pull sheet include:
  - mark numbers
  - quantity
  - dimensions
  - description

6. After review, the production manager releases prints to the appropriate fabrication station on the shop floor. The assigned fabricator will initiate preprocessing of various components for the weldment.
  - a. The fabricator will check the layout of material including the location of holes, work points and cutouts.
  - b. The fabricator will manufacture clip angles according to print specification.
  - c. The assigned fabricator will then transfer the piece to a Class B welder who will in turn perform the required operation(s) to ready the component for assembly. These operations may include punching, drilling or notching of plates.
  - d. Upon completion of layout, the fabricator is required to initial the bill of materials on the print for the component that was manufactured.
  
7. The prints for the completed accessory components are returned to the production manager. Depending on various criteria for the structure to be assembled,
  - a. the production manager may instruct the fabricator to retain the print and return to the fabrication area and complete the structure as specified on the print, utilizing the completed accessory components,
  - b. or the production manager may retain the print and issue new prints to the fabricator.
  
8. With prints and accessory components at the workstation, the fabricator takes the following steps:
  - a. A final check of main member parameters is performed. This includes the physical characteristics of length, width, depth or thickness, and weight per foot.
  - b. Accessory components are assembled to the main member by tack welds. See Welding Procedure.
  - c. A metal tag is affixed to the piece before it leaves the workstation containing the piece ID number or place mark.
  - d. A tyvek tag is also created by the shop superintendent and is temporarily placed on a designated rack in his office. This tag will be used during shipping.
  - e. Finally, the fabricator initials the quality control stamp on the print.
  
9. Upon completion of layout and tack-up at the workstation, the assembly is staged on a bolster for transport to a weld-out workstation. When an assembly is quite large and movement could compromise the structural integrity of the assembly, weld-out procedures will take place on location.
  - a. Prior to any weld-out procedure, the fabricator performs a quality control check on the assembly for dimensional characteristics. Then, the welding technician or fabricator performs the required tasks to complete this

phase of production. These tasks may include welding, coping, drilling, or grinding.

- b. The welding technician or fabricator initials the appropriate space(s) on the quality control stamp to signify completion of the required tasks.
- c. The completed assembly is then placed onto a bolster for transport to the succeeding operation.

**Note: Throughout the entire fabrication process, the quality manager, who is a certified weld inspector, performs daily spot checks. The CWI evaluates various parameters such as weld size, fit up, excess weld spatter, proper weld procedures, reentrant cut radius, and torch cut finishes.**

## Welding Procedure

1. A pre-qualified FCAW, WPS 3 welding procedure includes the following:

### Joint design used

Backing: none  
Groove angle: 45 degrees  
Back gouging: yes  
Method: carbon arc or grinder

### Base metals

Material specification: A36 to A36  
Thickness: 7/16 to 1 1/2

### Filler metals

AWS specification: A5.20  
AWS classification E71T-1

### Shielding

Gas: CO<sub>2</sub>  
Flow rate: 40 CFH  
Gas cup size: 5/8

Preheat temperature, minimum: 150 ° F

Position of groove: 1G

Electrical characteristics: DCEP

### Technique

Stringer or weave bead: stringer  
Contact tube to work distance: 3/4 inch  
Interpass cleaning: wire brush, needle gun

Pass or Weld Layers	Process	Filler Metals		Current		Volts	Travel Speed	Joint Details
		Class	Diam	Type & Polarity	Amps or Wire Feed Speed			
All	FCAW	E71T-1	1/16	DCEP	290 ± 10%	26 ± 7% detail p. 35	11 IPM ± 25%	AWS D1.1 B-U4b-GF See joint

2. A FCAW, WPS 3B welding procedure includes the following:

Joint design used

Type: T-joint  
Backing: yes  
Material: base material  
Root opening: 1/16 maximum  
Root face dimension: N/A  
Groove angle: N/A  
Back gouging: no

Base metals

Material specification: A36 to A36  
Type or grade: N/A  
Fillet: all

Filler metals

AWS specification: A5.20  
AWS classification: E71T-1

Shielding

Flux: N/A  
Gas: CO<sub>2</sub>  
Composition: 100%  
Flow rate: 40 CFH  
Gas cup size: 5/8

Preheat temperature minimum: see drawing on p. 36

Interpass temperature

Minimum: N/A  
Maximum: N/A

Position

Position of groove: 1F, 2F, 3F  
Fillet: all  
Vertical progression: up

Electrical characteristics: DCEP

Technique

Stringer or weave bead: either  
Multi-pass or single pass per side: either  
Number of electrodes: 1

Electrode spacing  
 Longitudinal: N/A  
 Lateral: N/A  
 Angle: N/A  
 Contact tube to work distance: N/A  
 Peening: N/A  
 Interpass cleaning: grinder, wire brush, needle gun

Postweld heat treatment  
 Temperature: N/A; Time: N/A

Pass or Weld Layers	Process	Filler Metals		Current		Volts	Travel Speed	Joint Details
		Class	Diam	Type & Polarity	Amps or Wire Feed Speed			
All	FCAW	E71T-1	1/16	DCEP	290 ± 10%	26 ± 7%	11 IPM ± 25%	Horizontal
All	FCAW	E71T-1	1/16	DCEP	225 ± 10%	23 ± 7%	6 IPM ± 25%	Vertical
All	FCAW	E71T-1	1/16	DCEP	325 ± 10%	28 ± 7%	14 IPM ± 25%	Flat

**Minimum Preheat Temperature**

1/8" to 3/4"	= 32° F	"L" to 5/16	single pass
over 3/4" to 1 1/2"	= 50° F	"L" over 5/16	multi-pass
over 1 1/2" to 2 1/2"	= 150° F	"T" varies	
over 2 1/2"	= 225° F		

3. A pre-qualified SMAW, WPS 5B welding procedure includes the following:

Joint design used  
 Type: butt  
 Backing: yes  
 Material: base material  
 Root opening: 1/4 maximum  
 Root face dimension: N/A  
 Groove angle: 45 degrees  
 Radius (J-U): N/A

Base metals  
 Material specification: A36 to A36  
 Type or grade: N/A  
 Thickness

Groove: unlimited  
Fillet: all  
Diameter: all

Filler metals

AWS specification: A5.1  
AWS classification: E7018

Shielding

Flux: N/A  
Gas: N/A  
Composition: N/A  
Electrode flux: N/A  
Flow rate: N/A  
Gas cup size: N/A

Preheat temperature minimum: see D1.1, Table 4.1

Interpass temperature

Minimum: N/A  
Maximum: N/A

Position

Position of groove: all  
Fillet: all  
Vertical progression: up

Electrical characteristics: DCEP

Technique

Stringer or weave bead: either  
Multi-pass or single pass per side: either  
Number of electrodes: 1  
Electrode spacing  
    Longitudinal: N/A  
    Lateral: N/A  
    Angle: N/A  
Contact Tube to work distance: N/A  
Interpass cleaning: grinder, wire brush, needle gun

Postweld heat treatment

Temperature: N/A  
Time: N/A

Pass or Weld Layers	Process	Filler Metals			Current	Volts	Travel Speed
		Class	Diam	Type & Polarity	Amps or Wire Feed Speed		
All	SMAW	E7018	3/32	DC+	80-24%	18-24%	2-10
All	SMAW	E7018	1/8	DC+	110-140%	18-24%	2-10
All	SMAW	E7018	5/32	DC+	165-200%	18-24%	2-20

Joint notes: see pre-qualified joint tolerances in the detail sketch.

Base metal notes: See AWS D1.1-94 for group 1 steels.

Filler metal notes: Low hydrogen electrodes shall be stored per paragraph 4.5.2.

Preheat notes: See Table 4.3 for detailed preheat temperature based upon specifications and thickness.

Revision 1 was made to update this procedure to computer software format.

4. A pre-qualified FCAW, WPS 300 welding procedure includes the following:

Joint design used

Backing: no  
Groove angle: N/A  
Back gouging: yes  
Method: carbon arc or grinder

Base metals

Material specification: A36 to A36  
Type or grade: N/A  
Thickness: groove 3/8

Filler metals

AWS specification: A5.20  
AWS classification: E71T-1

Shielding

Gas: CO<sub>2</sub>  
Composition: N/A  
Flow rate: 40 CFH  
Gas cup size: 5/8

Preheat temperature minimum: 50 ° F.

Interpass temperature

Minimum: N/A  
Maximum: N/A

Position of groove: 1G

Electrical characteristics

Globular  
DCEP

Technique

Stringer or weave bead: stringer  
 Contact Tube to work distance: 3/4 inch  
 Peening: N/A  
 Interpass cleaning: wire brush, needle gun

Postweld heat treatment

Temperature: N/A  
 Time: N/A

Pass or Weld Layers	Process	Filler Metals		Current		Volts	Travel Speed	Joint Details
		Class	Diam	Type & Polarity	Amps or Wire Feed Speed			
All	FCAW	E71T-1	1/16	DCEP	290±10%	26±7%	11 IPM ±25%	AWS D1.1 B-L1b-GF, detail p. 40

## **Bolt Installation Procedure**

1. When it is necessary, per contract specifications, to include as part of our scope of work the bolting together of structural components, we will follow the instructions found in the current AISC Manual, Section C8. The estimating and drafting department personnel will determine the appropriate technique required for a given project. The general notes section of the shop drawings will include a reference to finger-tight and snug bolted connections, which will require no additional clarification.
2. Drawings that require the incorporation of the slip-critical or turn-of-the-nut procedures will be hand stamped to indicate which procedure is required. This stamp will include spaces for initials from the following individuals: draftsman, production manager, and shop employee. The production manager will give the drawing to the shop personnel with the directions necessary to achieve the correct tension of the applicable bolts.

## Revision and Change Order Procedure

1. Revisions can only be approved by the estimator and the contractual customer. No third party entity will receive approval for revisions unless directly contracted with Anderson Steel.
2. The estimator is responsible for all phases of negotiation with the customer in regard to material, delivery, and price adjustments generated by revisions or changes.
3. The estimator communicates all revisions and changes to the production manager who determines the impact on the production schedule. The drafting department establishes a new schedule to integrate revisions or changes.
4. When revisions or changes in specifications affect the prints that have been previously detailed and released to the shop, the estimator alerts the production manager to pull the affected prints. The production manager is responsible for halting all materials affected by revisions and changes if the final product has not departed the facility.
5. The estimator communicates all new information to the procurement manager in regard to revisions and changes. This may involve canceling materials that have been ordered or ordering new materials to meet specifications of the revision.

## Painting Procedure

1. The production manager checks all prints for the following paint/coating parameters:
  - a. type of paint
  - b. required surface preparation (e.g., SP-3)
  - c. proper quantities of products
  
2. The fabricator will clearly mark all weldments with any special paint instructions. In particular, information on the weldment may include:
  - a. no paint for slip critical connection(s)
  - b. no paint on any one side or area
  - c. no paint at field welded connections
  - d. no paint on embedded or threaded studs
  - e. no weld spatter
  - f. proper preparation of all torch-cut surfaces
  
3. Before any paint is applied, the painter inspects the weldment to ensure that no punch marks remain after drilling is complete. The production manager will be notified immediately should questionable markings on the weldment be discovered.
  
4. When the inspection is complete, the painter ensures that the paintable surfaces are free of any dirt or grease. In addition, the painter must ensure that the correct surface profile is present (e.g., SP-3; SP-6).
  
5. The painter will then apply the specified coating to the weldment. When dry, the weldment will be subject to testing with a dry film thickness gauge. Insufficient millage will require the application of additional material.
  
6. The material will be loaded for delivery or staged in the yard until shipment is required.

## Shipping Procedure

1. The production manager will coordinate shipping and scheduling of transportation. This requires frequent communication with the estimator and the customer.
2. The production manager is responsible for final inspection as the assembly is loaded onto the carrier. A tag is removed when the weldment is placed on the carrier and checked against the master shipping list.
3. As a courtesy to the customer, notification of shipment will take place no less than 24 hours before arrival of the carrier.
4. Appropriate care is given to ensure that the load has little chance of shifting or settling during transport. Dunnage will be used and strategically placed.
5. Care will also be taken with finished painted surfaces. Heavy rubber diapers and nylon sleeves will be used to protect painted surfaces.

## Inspection Procedure

1. Only qualified employees, including the production manager and procurement manager, will inspect materials as they are received. See Material Receipt Procedures.
2. The quality manager keeps a daily log of his inspections during the fabrication process documenting the following items as required:
  - a. detailing problems
  - b. material problems including out of mill tolerances per ASTM and non-arrival of materials
  - c. fabrication errors, including layout errors, welders' failure to perform to AWS D1.1 standards, and improper marking of fabricated pieces
  - d. painting errors, including improper DFT and improper surface preparation
  - e. loading errors, including improper handling of painted materials, the use of dunnage, and improper documentation of mark numbers, bill of lading, and material ship list
3. During fabrication, shop personnel and fabricators perform various other checks. See Sawing Procedures and Operations and Fabrication Procedures and Operations.
4. Inspection of the final product takes place before shipping. See Shipping Procedure.

## **Non-Conformance Procedure**

1. Weekly meetings will occur to discuss any problems observed and documented through the Inspection Procedure. All departments involved will have an opportunity to participate and contribute ideas and suggestions to correct the problems.
2. In the event of a major deviation, an immediate consultation will transpire between the general manager, project manager, and production manager to determine the appropriate course of action required to remedy the situation. Before the next meeting the general manager will review the situation and guarantee that the actions necessary to correct the problem have taken place.