

DIVISION 500 - STRUCTURES

SECTION 501 - STEEL STRUCTURES

501.01 Description. This work includes constructing steel structures and steel structure portions of composite structures according to the contract.

501.02 Materials. Materials shall conform to the following:

Red Primer Paint	708.01(A)
Zinc Paint	708.02
Bearing Devices and Related Materials	712.09
Galvanizing	712.10
Structural Steel	713.01
Welded Stud Shear Connectors	713.02
Bolts and Nuts	713.03
High Strength Bolts	713.04
Steel Forgings and Steel Shafting	713.07
Steel Castings	713.08
Gray Iron Castings	713.09
Malleable Castings	713.10

501.03 Construction Requirements.

(A) Shop Plans. The Contractor shall submit to the Engineer for acceptance shop detail plans required for fabrication of the steel.

Shop drawings shall be thirty-six (36) inches long and twenty-two (22) inches wide. The Contractor shall make a two (2) inch margin on the left side of the sheet and half (1/2) inch margin on the other three (3) sides. The Contractor shall make a title in the lower right hand corner of each sheet. The title includes a statement of the contents of the sheet, the location of the structure and the project name and project number, if any.

The Contractor shall submit two (2) prints of the shop drawings initially to the Engineer. The Engineer will return one (1) set to the Contractor with comments and corrections. The Contractor shall make

such corrections as the Engineer may require. After the Contractor makes the corrections, the Contractor shall submit ten (10) prints of each drawing to the Engineer. The Engineer will return one (1) acceptable set of prints to the Contractor if the Engineer accepts the plans. The Contractor shall make and submit the shop drawings without cost to the Engineer. The Contractor shall not make changes on the accepted drawings without the written consent of the Engineer. The Contractor shall not fabricate the steel before acceptance by the Engineer. Acceptance of shop drawings shall not relieve the Contractor from responsibilities of doing the work according to the contract.

The Contractor shall submit shop drawings early to allow time for review by the Engineer and correction by the Contractor without delaying the start of the affected work.

Shop drawings shall show:

- (1) details for connections, not dimensions, on the plans,
- (2) the direction of rolling of the plates where the plans require specific orientation,
- (3) the sequence and procedures,
- (4) the location of butt welded splices on a layout drawing of the entire structure, and
- (5) the location of temporary supports and the vertical alignment of the members at each stage of fabrication.

(B) Required Prints and Reports. The Contractor shall submit drawings and reports according to the following requirements:

Item	Number Required	Furnish to
Preliminary Shop Drawings	2	Engineer
Final Shop Drawings	10	Engineer
Mill Orders and Test Reports	5	Engineer
Notice of Placing Shop Order	2	Engineer
Notice of Beginning Shop Work	3	Shop Inspector
Match Mark, Camber and Erection Diagrams	1 8	Shop Inspector Engineer
Shipping Statements	1	Shop Inspector
	4	Engineer
Report of Full Size Tests	1	Shop Inspector
	6	Engineer
Record of Annealing Charges	6	Engineer

(C) Mill and Shop Inspection. The Contractor shall give advance notice of shop and mill work and their location to the Engineer so that the Engineer may set up testing and inspectional procedure.

The Contractor shall furnish facilities for the inspection of material and workmanship in the mill and shop. The Contractor shall allow the inspectors free access to the necessary parts of the work.

If required by the Engineer, the Contractor shall furnish the test specimens at no cost to the State.

(D) Shop Work and Fabrication. The Contractor shall keep the structural material clean and free from injury due to rough handling during loading, transporting and storage.

The preparation, handling, inspection, shop assembly of the material and the details of fabrication shall conform to AASHTO "Standard Specifications for Highway Bridges," Division II, Section 10.

Shop and field welding shall conform to ANSI/AASHTO/AWS D1.5 "Bridge Welding Code" and AASHTO "Standard Specifications for Highway Bridges". Welding for structural supports for highway signs, luminaires and traffic signals and non-highway structures shall conform AWS D1.1 "Structural Welding Code".

The Engineer will not permit electro-slag welding.

Welding of reinforcing steel shall conform to "Structural Welding Code - Reinforcing Steel" AWS D1.4 and Subsection 602.06(A)(2)(a) - Welded Splices.

The Contractor shall zinc-coat structural steel including hardware but excluding major steel bridges that the Contractor paints.

(E) Erection.

(1) General. The erection work shall be subject to inspection by the Engineer. The Contractor shall provide access to the facilities for a thorough inspection of the materials used and the quality involved.

(2) Plant. The Contractor shall provide the falsework, tools, machinery and appliances, including drift pins and fitting-up bolts, necessary for the handling of the work.

(3) Handling and Storing Materials. The Contractor shall place the materials that the Contractor stores on skids above the ground. The Contractor shall keep the storage area clean and properly drained. The Contractor shall place girders and beams upright and shored. The Contractor shall support long members, such as columns and chords, on skids. The Contractor shall place the skids near enough to prevent injury from deflection.

(4) **Falsework.** The Contractor shall design, construct, and maintain *| the falsework to handle the load on the falsework. The Contractor *| shall prepare and submit plans for falsework or for changes in an *| existing structure necessary for maintaining traffic to the Engineer *| for acceptance. The Engineer will not consider the acceptance of the Contractor's plans as relieving the Contractor of responsibilities.

The Contractor shall place and protect the falsework for steel *| structures on a footing safe against undermining and softening. The *| Contractor shall set the falsework to give the structural camber *| shown in the contract or specified by the Engineer. The Contractor *| shall level the top of the falsework, exclusive of blocking, *| transversely. *

(5) **Methods and Equipment.** Before the Contractor starts the work *| of erection, the Contractor shall submit for acceptance the method *| of erection the Contractor proposes to follow and the number and *| character of equipment the Contractor proposes to use. The *| acceptance shall not relieve the Contractor of the responsibility *| carrying out the work according to the contract. *

(6) **Bearing and Anchorages.** The Contractor shall not place the *| masonry bearing plates upon bridge seat bearing areas that are *| improperly finished, deformed or irregular. The Contractor shall set *| the bearing plates level in exact position and shall have a full and *| even bearing upon the masonry. The Contractor shall place the *| bearing plates on a layer of canvas and red primer paint applied as *| follows: |

(a) The Contractor shall swab the bridge seat bearing area *| thoroughly with red primer paint, *

(b) The Contractor shall place three (3) layers of twelve (12) *| to fourteen (14) ounce duck on the bridge seat bearing area. *| The Contractor shall swab each layer thoroughly on its top *| surface with red primer paint. |

(c) The Contractor shall place the superstructure shoes or *| pedestals in position while the paint is plastic. |

(d) As an alternate to canvas and red primer, the Contractor *| may use sheet lead in single sheets of the specified thickness, fabric pads or elastomeric pads.

The Contractor shall set the anchor bolts accurately in drilled *| or cast holes. Exceptions are when the Contractor builds the bolts *| into the masonry and fixed by completely filling the holes with portland cement grout. The location of the anchor bolts in relation to the slotted holes in the expansion shoes shall correspond with the temperature at the time of erection. The Contractor shall *| adjust the nuts on anchor bolts at the expansion ends of spans. *

(7) **Straightening Bent Materials.** The Contractor shall straighten the plates and angles or other shapes by methods not likely to produce fracture or other injury. The Contractor shall not heat the metal unless permitted by the Engineer. If permitted, the heating shall not be to a higher temperature that produces a dark "cherry red" color. After heating, the Contractor shall cool the metal as slowly as possible.

After the Contractor straightens the bends or buckles, the Contractor shall inspect the metal carefully for fractures.

(8) **Assembling Steel.** The Contractor shall assemble the parts accurately according to the contract. The Contractor shall follow match-marks. The Contractor shall handle the material carefully so that the Contractor does not bend, break, or damage the parts. The Engineer will not permit hammering. The Contractor shall clean the bearing surfaces and surfaces to be in permanent contact before the Contractor assembles the members. Unless built by the cantilever method, the Contractor shall build the truss spans on blocking so placed to give the trusses proper camber. The Contractor shall leave the blocking in place until the tension chord splices are fully connected and the Contractor pins and bolts other truss connections. The Contractor shall not tighten the bolts in splices of butt joints of compression members and bolts in railings until the Contractor has swung the span. Splices and field connection shall have half (1/2) of the holes filled with bolts and cylindrical erection pins (half bolts and half pins) before bolting with high-strength bolts. Splices and connections carrying traffic during erection shall have three-quarters (3/4) of the holes filled.

(9) **Pin Connections.** The Contractor shall furnish and use the pilot and driving nuts in driving pins at no cost to the State. The Contractor shall drive the pins so that the members take full bearing on the pins. The Contractor shall screw up the pin nuts and burr the threads tight at the face of the nut with a pointed tool.

(10) **Misfits.** The Engineer will consider the correction of minor misfits involving harmless quantities of reaming, cutting and chipping a part of the erection. The Contractor shall report errors in the shop fabrication or deformation resulting from handling and transportation immediately to the Engineer. The Contractor shall obtain the Engineer's acceptance regarding the method of correcting the error. The Contractor shall be responsible for misfits, errors, and injuries and shall make the necessary corrections and replacements.

(11) **Bolted Connections.** The Contractor shall not use bolted connections. Bolts, nuts and washers shall be of the type and dimensions specified in the contract. The Contractor shall use unfinished bolts.

Bolts shall have hexagonal heads. The Contractor shall furnish *| the bolts with hexagonal nuts. Bolts shall be long enough to extend *| entirely through the nut but not more than half (1/2) the thickness of the nut beyond. Bolts in tension shall have two (2) nuts.

Unfinished bolts in shear shall not have more than one (1) thread within the grip. The diameter of the unfinished bolt shall be not more than one thirty-secondth (1/32) inch smaller than the diameter of the hole.

The threads of turned bolts shall be entirely outside the grip. *| The Contractor shall ream the holes for turned bolts. The Contractor *| shall finish the bolts to provide a driving fit. The Contractor *| shall furnish the acceptable nut locks or flat washers quarter (1/4) *| inch thick as specified. *|

Bolted connections using high-strength steel bolts shall conform to the "Specifications for Structural Joints Using ASTM A 325 or A 490 Bolts," and the following provisions: |

(a) The Contractor shall clean the contact surfaces of high- *| strength bolted connections of rust, mill scale, dirt, grease, *| paint, lacquer, or other material foreign to the steel, before assembly.

(b) Bolts shall conform to ASTM A 325. The Contractor shall *| install the bolts with a hardened washer under the nut or bolt *| head, whichever is the element turned in tightening.

(c) The Contractor shall tighten the bolts by using a direct *| tension indicator acceptable by the Engineer. The Contractor *| shall submit the procedures for the installation and inspection *| of the direct tension indicator as recommended by the *| manufacturer to the Engineer for acceptance. *|

The Engineer will not permit tightening by turn-of-nut *| method or by calibrated wrench. *|

(d) The Contractor shall locate the nuts wherever practicable, *| on the side of the member that will not be visible from the *| traveled way. The Contractor shall locate the nuts for bolts *| that will be partially embedded in concrete on the side of the *| member that will be encased in concrete. *|

(F) Painting.

(1) General. The painting of metal structures includes the preparation of metal surfaces, the application, protection and drying of the paint coating and the supplying of tools, tackle, scaffolding, labor and materials necessary for the entire work.

Before painting, the Contractor shall round sharp edges of the structural steel to a maximum radius of one-sixteenth (1/16) inch. *

The Contractor shall treat the finished surfaces of bearing plates and rollers according to the contract. *

The Contractor shall paint the steel with one (1) shop or prime coat and with not less than two (2) field coats. The minimum dry film thickness for a shop coat shall be 1.5 mils, and the minimum dry film thickness for each field coat shall be 1.0 mil. The prime coat and first field coat shall be red primer paint, and the second field coat shall be a paint acceptable to the Engineer. The coats shall be sufficiently different in color to permit detection of incomplete application. *

(2) Weather Conditions. The Contractor shall paint only on thoroughly dry surfaces and during periods of favorable weather. The Engineer will not permit painting when the atmospheric temperature or moisture may damage freshly painted surfaces. The Contractor shall remove and replace the fresh paint damaged by the elements at no cost to the State. *

(3) Preparation of Zinc-Coated Surfaces. If the Contractor paints on zinc-coated surfaces, the Contractor shall defer the painting to allow the surfaces to weather. Before painting, the Contractor shall treat the zinc-coated surfaces with the following solution: Dissolve two (2) ounces each of copper chloride, copper nitrate, and sal ammoniac in one (1) gallon of soft water. Then add two (2) ounces of commercial muriatic acid. The Contractor should prepare this in an earthen or glass vessel. The Engineer will not permit tin or other metal receptacle. The Contractor shall apply the solution to the zinc-coated surface with a wide, flat brush. The surface shall assume a dark, almost black color which, on drying, shall become gray. The Contractor may use a commercial product to produce the same results on zinc-coated surfaces as the above solution or the Pretreatment Specifications No. 3 - Basic Zinc Chromate Vinyl Butyral Washcoat, of the "Steel Structures Painting Council Handbook" with the acceptance of the Engineer. *

(4) Cleaning of Surfaces. The Contractor shall paint the surfaces of metal thoroughly of rust, loose mill scale, dirt, oil or grease and other foreign substances. The Contractor shall remove anti-weld spatter coating before painting. If rusts appear before the Contractor can apply paint on the cleaned surface, the Contractor shall reclean the surfaces before painting. *

The Contractor may use the following methods of cleaning with the acceptance of the Engineer before painting begins: *

(a) **Hand Cleaning.** The Contractor shall remove dirt, loose rust and mill scale, dead paint or paint that is not firmly bonded to the metal surfaces by wire brushes, scraping tool or sandpaper. The Contractor may powerdrive the tools.

The Engineer will not allow pneumatic chipping hammers. The Contractor shall remove oil and grease with an acceptable solvent.

(b) **Blast Cleaning.** Abrasives used for blast cleaning shall be either clean, dry sand or material grit and shall be of a grading acceptable to the Engineer. The Engineer will not allow unwashed beach sand.

The Contractor shall remove dirt, rust, mill scale, old paint, stain and other foreign matter from steel surfaces with an acceptable dry blast cleaning apparatus. The Contractor shall blast clean according to Specification No. SP5-52T - Blast Cleaning to White Metal, of the "Steel Structures Painting Council Handbook." "White Metal" shall mean a surface with a uniform grey-white metallic color, slightly roughened to form a suitable anchor pattern for painting.

(5) **Application of Paint.** The Contractor shall paint according to the contract. The Contractor shall apply the paint by brush, spray, roller, or combination of these methods.

If the Contractor uses brushes, the Contractor shall apply the paint to produce a smooth, uniform, even coating. The Contractor shall brush out runs or sags. The Engineer will consider improper application of the paint when considerable quantity of brush marks appear.

If the Contractor uses rollers, the rollers shall be of a type that do not leave a stippled texture in the paint film.

If the Contractor uses spray methods, the Contractor shall submit a certificate of the operator's experience. Runs, sags, thin areas in the paint coat, or skips and holidays, shall be evidence of unsatisfactory work. The Engineer may require the Contractor to apply the remainder of the paint by brush.

The Contractor shall provide traps or separators to remove oil and water from the compressed air. These traps or separators shall be adequate in size. The Contractor shall drain these traps or separators periodically during operations. The air from the spray gun impinging against the surface shall show no water or oil.

The Contractor shall paint the areas inaccessible to the spray gun by brush. If not accessible by brush, the Contractor shall use daubers or sheepskins. The Contractor shall use brushes to work paint into cracks, crevices and blind spots.

The Contractor shall mix and agitate the ingredients in the container thoroughly before use and often enough during application to keep the pigment in suspension. *

If the Contractor needs to thin the paint during cool weather so that the paint spreads more freely, the Contractor shall heat the paint container in hot water. The Contractor shall not add liquid to the paint. The Contractor shall not remove liquid from the paint. *

The Contractor shall cure or dry each coat of paint properly before the Contractor applies the succeeding coat. *

The Contractor shall remove painting that fails to conform to the contract. The Contractor shall clean and repaint the metal thoroughly. *

(6) Prime Coat. The Contractor shall ship the structural steel unpainted. The Engineer will inspect and accept the structural steel before the Contractor applies the paint. The Contractor shall give the steel one (1) prime coat of the required paint at the shop before delivery to the work site. *

Surfaces of metal in contact after field erection shall receive a shop coat of paint provided the paint does not interfere with assembly.

Metal surfaces not in contact but inaccessible after assembly shall receive the required coats of paint or three (3) shop coats of a specified primer before erection.

The Contractor shall not paint the surfaces of metal in contact assembled in the shop. The Contractor shall not paint the structural steel until the shop welding is completed. *

The Contractor shall not paint the field weld surfaces within two (2) inches from the point of weld. *

After field welding is complete, the Contractor shall clean the unpainted surfaces to bright metal and coat with an acceptable shop primer. *

The Contractor shall not paint the surfaces to be in contact with concrete. *

If the Contractor exposes the unpainted surfaces to the elements for a long time before erection, the Contractor shall protect them with an acceptable coat of lacquer or similar coating. The Contractor shall remove this coating before erection. *

The Contractor shall give surfaces of iron and steel castings, milled or finished, one (1) coat of paint. *

The Contractor shall coat the machine-finished surfaces with an acceptable hot mixture of white primer and tallow or other acceptable commercial product. The Engineer will inspect these before removal from the shop. The Contractor shall not coat abutting joints and base plates. *

The Contractor shall paint the erection marks for the field identification of members and weight marks upon surfaces previously painted with the shop coat. The Contractor shall not load the material for shipment until the material is thoroughly dry. The Contractor shall not remove the material less than twenty-four (24) hours after the Contractor applied the paint. *

(7) Field Painting. When the Contractor completes the erection, the Contractor shall clean the surfaces as required by Subsection 501.03(F)(4) - Cleaning of Surfaces. *

The Contractor shall clean the surfaces not coated with shop paint or those with the required coating worn off or defective and cover them thoroughly with one (1) coat of the required primer. *

The Contractor shall not paint the surfaces to be in contact with concrete. The Contractor shall paint the surfaces that are inaccessible after erection with the required field coats. When the paint applied for retouching the prime coat has thoroughly dried and the Contractor has completed the field cleaning according to the contract, the Contractor shall apply the required field coats. If the Contractor did not seal the small cracks and cavities watertight the Contractor shall fill them with a pasty mixture of red primer and linseed oil. The Contractor shall then apply the second coat. *

To secure a maximum coating on edges of plates or shapes and other parts subject to special wear and attack, the Contractor shall stripe the edges first with a longitudinal motion and follow the bolt heads with a rotary motion of the brush immediately by the general painting of the whole surface, including the edges and bolt heads. *

If required by the Engineer, the Contractor shall, at no cost to the State, take precautions and corrective measures to prevent dust, dirt and other foreign matter from touching the freshly painted surfaces or with surfaces before the Contractor applies the paint. *

The Contractor shall not paint the steelwork in structures with concrete floors with the first field coat of paint until after the completion of the concrete floors, including removal of the formwork. In other cases, the Contractor shall defer application of *

the second field coat until the Contractor has placed and finished *
 the adjoining concrete work, not including concrete floors. The *
 Contractor shall reclean and repaint the painted surfaces damaged *
 by concreting operations. *

The Contractor shall protect pedestrian, vehicular and other *
 traffic damage or disfigurement by spatters, splashes and smirches *
 of paint or paint materials. *

The Contractor shall stencil the structure number and month *
 and year of painting with letters and figures two (2) inches high *
 at such locations shown in the contract or designated by the *
 Engineer. The paint used for stenciling shall be distinctly in *
 contrast to the background. The Contractor shall stencil at no *
 cost to the State. *

(G) Zinc-Coating.

(1) **General.** The Contractor shall zinc-coat after fabrication by *
 the hot-dip process upon the largest practical sections according *
 to Subsection 712.10 - Zinc-Coating. Fabrications shall include the *
 operations such as shearing, punching, forming, bending, welding, *
 and riveting. When straightening sections after zinc-coating is *
 necessary, the Contractor shall do such work without damaging the *
 spelter coating. *

(2) **Repairing Damaged Zinc-Coated Surfaces.** The Contractor shall *
 repair the zinc-coating that the Contractor chipped off or damaged *
 in handling, transporting or welding by a field zinc-coating method *
 conforming to Annex A1 of ASTM A 780. Repair shall be by the *
 application of a repair material, conforming to Federal *
 Specification O-G-93, stick form. The Contractor shall clean the *
 areas thoroughly including removal of slag or welds, before the *
 Contractor applies the repair material. The Contractor shall heat *
 the surfaces first with a torch to a sufficient temperature so that *
 the Contractor melts the repair material. The Contractor shall not *
 damage the zinc-coated surfaces by the torch. *

The Contractor may repair the damaged zinc-coated surfaces *
 by wire brushing the damaged area thoroughly and removing the loose *
 and cracked spelter coating. The Contractor shall paint the *
 cleaned area after with two (2) coats of either: *

(a) zinc oxide-zinc dust paint conforming to Federal *
 Specification MIL-E-15145 B. The Contractor shall compound *
 the paint properly in a suitable vehicle in the ratio of one *
 (1) part zinc oxide to four (4) parts zinc dust by weight, or *

(b) a premixed formulation containing not less than ninety-five (95) percent zinc in the dried film and certified to meet Federal Specification MIL-P-26915A,

(c) or high zinc dust content, conforming to Federal Specification MIL-P-21035.

(H) **Concrete Floors.** Before the Contractor places the concrete floors on steel spans, the Contractor shall have released the centering under the bridge and the spans swung free on their supports. The placing of concrete in the floor slab shall be continuous between joints according to the contract or as ordered by the Engineer. In case of emergency, construction joints shall be made as ordered by the Engineer.

(I) **Removal of Falsework.** Upon completion of the erection and before final acceptance of the structure, the Contractor shall remove the falsework, excavated or useless materials, rubbish and temporary buildings. The Contractor shall replace or renew the damaged fences according to the contract. The Contractor shall replace or renew damaged public and private properties that the Contractor may have damaged during the prosecution of this work. The Contractor shall leave the structure site and adjacent highway in a neat and presentable condition according to the contract. The Contractor shall remove excavated material or falsework placed in the stream channel during construction before final acceptance.

501.04 Method of Measurement. The Engineer will measure the Structural steel by the pound or lump sum as specified in the proposal.

The weight to be paid for will be the shop scale weight of the structural steel in the fabricated structure. This includes the required field bolts. The field bolts will not exceed the computed weight by more than 1.5 percent. The weight of cast steel or cast iron will not exceed the computed weight by more than 7.5 percent.

If the scale weight of the member is less than 97.5 percent of the computed weight, the Engineer will reject the member. The Engineer will not measure for payment.

The Engineer will not include the weight of erection bolts, field paint, boxes, crates and other containers used for packing. The Engineer will not include materials used for supporting members during transportation, or materials not shown on the plans that the Contractor might have added for the benefit of the Contractor to ease erection.

The Engineer will reduce the scale weights by the weight of the shop paint on the members, on the basis of 0.3 percent of the total scaled weight of the member.

The Engineer will compute the weights on the following unit weights in *| pounds per cubic foot:

Type	Unit Weights (Pounds per Cubic Foot)
Aluminum, Cast or Wrought	173.0
Bronze, Cast	536.0
Copper Alloy	536.0
Copper Sheet	558.0
Iron, Cast	445.0
Iron, Malleable	470.0
Iron, Wrought	487.0
Lead, Sheet	707.0
Zinc	450.0
Steel, Cast, Copper, Bearing, Silicon, Nickel and Stainless	490.0

The Engineer will compute the weights of rolled shapes and of structural *| plates on the basis of their nominal weights and dimensions, according to the *| accepted shop drawings deducting for copes, cuts, and open holes, except bolt *| holes.

If the Engineer made no deduction in the computed weight of structural *| steel members for bolt holes, the Engineer will get the weights of the *| completed members by adding to the computed weights the weights of the heads *| of the bolts in the structure. *

The weights of high strength steel bolts will be the weights of portions *| of bolts outside the grip, including two (2) washers and one (1) nut. The *| Engineer will compute on the basis of the following weights: *

Diameter of Bolt (Inches)	Weight of 100 Bolts (Each Complete With Two Washers and One Nut, Less Grip Length) (Pounds)
5/8	46.0
3/4	71.0
7/8	105.0
1	145.0
1-1/8	194.0
1-1/4	259.0

501.04

The Engineer will compute the weight of shop and field fillet welds on the basis of the following weights:

Size of Fillet Weld (Inches)	Weight Per Linear Foot (Pounds)
1/4	0.20
5/16	0.25
3/8	0.35
1/2	0.55
5/8	0.80
3/4	1.10
7/8	1.50
1	2.00

The Engineer will not make allowance for the weight of paint in computing the weights of metal. *}

The Engineer will include the weight of railings and steel grid floor. *}

The Engineer will include the weight of steel shims or brass shims required. The Engineer will calculate the weight of brass shims based on the unit weight of brass. *}

The Engineer will compute the weight of castings from the dimensions shown on the accepted shop drawings, deducting for open holes. *}

The Engineer will compute the weight of pins and rollers from the dimensions shown on the accepted shop drawings, deducting for holes, openings, pockets and metal removed by machine finishing. *}

The Contractor shall furnish the pilot nuts and driving nuts for each size of pins for erection work. The Engineer will not include them in the weight of structural steel. *}

The Engineer will compute the weight of bolts, cap screws, anchor bolts, nuts, washers and anchor pipe sleeves remaining in the finished structure based on their nominal weights and dimensions shown on the accepted shop drawings. *}

The Engineer will measure bronze and stainless steel bearing plates under Section 506 - Bearing and Expansion Plates. *}

501.05 **Basis of Payment.** The Engineer will pay for the accepted quantities *|
of structural steel at the contract unit price per pound or at the contract *|
lump sum price for each pay item listed below that appear in the proposal. *|

The price paid shall be full compensation for furnishing, fabricating,
delivering, erecting, cleaning, galvanizing and painting structural steels
and other metals and for materials, labors, equipment, tools and incidentals
necessary to complete the work.

The Engineer will make payment under: *|

Pay Item	Pay Unit
Structural Steel	Pound
Structural Steel	Lump Sum

The Engineer will consider zinc-coating of structural steel, including *|
hardware, forgings and castings, and the cost connected incidental to *|
"Structural Steel". The Engineer will not make separate payment. *|