



REQUEST FOR QUOTATION

<p>Contact person/Telephone Srividya Deshpande/201-395-3449</p>	<p>Collective# 0000038896</p> <p>Bid Due Date 08/18/2014</p> <p>Bids must be received no later than 11:00 AM on the above Bid Due Date.</p> <p>Deliver Goods/Services To: Path Waldo Stockroom 122 Academy St. Jersey City NJ 07302</p>
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Quantity	Description	Unit Price	Total
	<p>Supply and Delivery of Track Tools for PATH - Two (2) Year Requirements Contract to commence on or about 10/29/2014.</p> <p>Attachments: "Path Stockroom Requirement Contract, Information for Bidders" (5 Pages) and "Part 6 Specifications and Plans for Track Tools " - Part A, B and C (Total 64 Pages) - to be made part of this contract.</p> <p>DELIVERY: PATH WALDO STOCKROOM 122 ACADEMY STREET JERSEY CITY, NJ 07302 TELEPHONE: 201-216-7070/7079 HOURS OF OPERATION: 7 AM to 2:30 PM, MON to FRI CONTRACT ADMINISTRATOR: Joseph Nestor</p> <p>A price preference of 10 % is available for NY/NJ Minority and Women Business Enterprises (M/WBE) or 5% for NY/NJ Small Business Enterprises (SBE) certified by the Port Authority (PA) by the day before bid opening for awards not exceeding \$1,000,000. My firm was certified as a _____ on _____.</p>		
	PLEASE QUOTE FULLY DELIVERED PRICES	PAYMENT TERMS	Total Delivered Price

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We have read the instructions and, if favored with an order, we agree to furnish the items enumerated herein at the prices and under the conditions indicated.

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144 EA	000871 FORK,BALLAST,10 TINE,AREA #2,AREA PLAN #22-62,@ COMPLETE WITH ARMORED ASH HANDLE,CONFORMING TO GRADE AA, HIGH CARBON STEEL,WITH TINE ROCKWELL HARDNESS OF 35-45 LGTH. 43" X 9-3/4"AVG.TINE SPACE 3/4",ALDON #4123-02 OR APPROVED EQUAL.VENDOR MUST SEND A CERTIFICATE VERIFYING THE PROOF OF AREA PLAN.THE CERTIFICATE CAN BE MAILED OR DELIVERED WITH THE MATERIAL TO ADDRESS LISTED ON PURCHASE ORDER.		
3 EA	001079 GAUGE,TRACK,STEEL PIPE,FOR 56-3/4"GAUGE,AREA PLAN 20-62,@ PAINTED YELLOW ,ALDON #4022-05 OR APPROVED EQUAL. VENDOR MUST SEND A CERTIFICATE VERIFYING THE PROOF OF AREA PLAN.THE CERTIFICATE CAN BE MAILED OR DELIVERED WITH THE MATERIAL TO ADDRESS LISTED ON PURCHASE ORDER.		
3 EA	001080 GAUGE,TRACK,STEEL PIPE,FOR 56-1/2"GAUGE,AREA PLAN 20-62,@ PAINTED GREEN ,ALDON #4022-05 OR APPROVED EQUAL. VENDOR MUST SEND A CERTIFICATE VERIFYING THE PROOF OF AREA		
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6 EA	003396 ADZE,CARPENTER,5 5/8", AREA PLAN#12A-62,ALDON#4123-01 OR APPROVED EQUAL.VENDOR MUST SEND A CERTIFICATE VERIFYING THE PROOF OF AREA PLAN.THE CERTIFICATE CAN BE MAILED OR DELIVERED WITH THE MATERIAL TO ADDRESS LISTED ON PURCHASE ORDER.				
50 EA	003402 BAR,LINING,DIAMOND POINT,64",22 LB.,AREAPLAN #5-62,@ VENDOR MUST SEND A CERTIFICATE VERIFYING THE PROOF OF AREA PLAN.THE CERTIFICATE CAN BE MAILED OR DELIVERED WITH THE MATERIAL TO ADDRESS LISTED ON PURCHASE ORDER.				
48 EA	003448 CHISEL,TRACK,24"HANDLE,ALLOY STEEL,GRADE"B" IN ACCORDANCE WITH FIGURE 6-34,AREA PLAN 35-83.HANDLE MADE IN ACCORDANCE WITH FIGURE 6-24 AREA PLAN 25-83.ALL MATERIAL THAT REQUIRES A PROOF OF AREA PLAN MUST BE QC'D BY JIM				
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	MARRONE(W&S) AT (201)216-6103.				
12 EA	003452 BAR,TIMBER,60"HUBBARD #268,WOODING VERONA #91,ALDON #91,@ AREA PLAN #5-62. VENDOR MUST SEND A CERTIFICATE VERIFYING THE PROOF OF AREA PLAN.THE CERTIFICATE CAN BE MAILED OR DELIVERED WITH THE MATERIAL TO ADDRESS LISTED ON PURCHASE ORDER.				
18 EA	003459 BAR,CLAW,27 LB.,BRINELL HARDNESS 300-375,AREA PLAN #11-80,@ WOODINGS VERONA #14-600 OR APPROVED EQUAL. VENDOR MUST SEND A CERTIFICATE VERIFYING THE PROOF OF AREA PLAN.THE CERTIFICATE CAN BE MAILED OR DELIVERED WITH THE MATERIAL TO ADDRESS LISTED ON PURCHASE ORDER.				
12 EA	003471 ADZE,TRACK,9",AREA PLAN #12-62.@ VENDOR MUST SEND A CERTIFICATE VERIFYING THE PROOF OF AREA PLAN.THE CERTIFICATE CAN BE MAILED OR DELIVERED WITH THE MATERIAL TO ADDRESS LISTED ON PURCHASE ORDER.				
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6 EA	003476 MAUL,SPIKE,10 LB.,36"HANDLE,ALLOY STEELGRADE "B",@ AREA PLAN #3-83 ,HANDLE AREA PLAN #25-83. VENDOR MUST SEND A CERTIFICATE VERIFYING THE PROOF OF AREA PLAN.THE CERTIFICATE CAN BE MAILED OR DELIVERED WITH THE MATERIAL TO ADDRESS LISTED ON PURCHASE ORDER.				
48 EA	003484 PUNCH,TRACK,ROUND,ALLOY STEEL GRADE "B",@ AREA PLAN #19-83,HANDLE AREA PLAN #25-83. VENDOR MUST SEND A CERTIFICATE VERIFYING THE PROOF OF AREA PLAN.THE CERTIFICATE CAN BE MAILED OR DELIVERED WITH THE MATERIAL TO ADDRESS LISTED ON PURCHASE ORDER.				
6 EA	003485 FORK,RAIL,AREA PLAN #10-62,ALDON #4123-13 OR APPROVED EQUAL.,@ VENDOR MUST SEND A CERTIFICATE VERIFYING THE PROOF OF AREA PLAN.THE CERTIFICATE CAN BE MAILED OR DELIVERED WITH THE MATERIAL TO ADDRESS LISTED ON PURCHASE ORDER.				
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6 EA	003486 WRENCH,TRACK,DOUBLE END,7/8" X 1",BOLT,@ 1-7/16" X 1-5/8"NUT,AREA PLAN #4-62,WOODINGS VERONA #80-500 OR APPROVED EQUAL.VENDOR MUST SEND A CERTIFICATE VERIFYING THE PROOF OF AREA PLAN.THE CERTIFICATE CAN BE MAILED OR DELIVERED WITH THE MATERIAL TO ADDRESS LISTED ON PURCHASE ORDER.			
8 EA	003487 WRENCH,TRACK,DOUBLE END,1-1/4" X 1-3/8",BOLT,@ 2" X 2-3/16"NUT,AREA PLAN #4-62,WOODINGS VERONE #80-400 OR APPROVED EQUAL.VENDOR MUST SEND A CERTIFICATE VERIFYING THE PROOF OF AREA PLAN.THE CERTIFICATE CAN BE MAILED OR DELIVERED WITH THE MATERIAL TO ADDRESS LISTED ON PURCHASE ORDER.			
8 EA	003488 PUNCH,TIE OR PLUG,CARBON STEEL,AREA PLAN#19-83,@ HANDLE AREA PLAN #25-83 ,ALDON #4123-84 OR APPROVED EQUAL. VENDOR MUST SEND A CERTIFICATE VERIFYING THE PROOF OF AREA PLAN.THE CERTIFICATE CAN BE MAILED OR DELIVERED WITH THE MATERIAL TO ADDRESS LISTED ON			
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8 EA	003489 LIFTER,SPIKE,RIGHT HAND,HANDLE,AREA PLAN32-83. @ HANDLE AREA PLAN #25-83 OR APPROVED EQUAL. VENDOR MUST SEND A CERTIFICATE VERIFYING THE PROOF OF AREA PLAN.THE CERTIFICATE CAN BE MAILED OR DELIVERED WITH THE MATERIAL TO ADDRESS LISTED ON PURCHASE ORDER.		
8 EA	003490 WRENCH,TRACK,DOUBLE END,1" X 1-1/8" BOLT,@ NUT,1-5/8" X 1-13/16",AREA PLAN #4-62, WOODING VERONA #80-600 OR APPROVED EQUAL.. VENDOR MUST SEND A CERTIFICATE VERIFYING THE PROOF OF AREA PLAN.THE CERTIFICATE CAN BE MAILED OR DELIVERED WITH THE MATERIAL TO ADDRESS LISTED ON PURCHASE ORDER.		
4 EA	003491 LIFTER,SPIKE,LEFT HAND HANDLE,AREA PLAN32-83,@ AREA PLAN #25-83,HANDLE TO BE ON LEFT SIDE PERPENDICULAR TO SPIKE,ALDON #4123-16 OR APPROVED EQUAL.. VENDOR MUST SEND A CERTIFICATE VERIFYING THE PROOF OF AREA		
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	PLAN.THE CERTIFICATE CAN BE MAILED OR DELIVERED WITH THE MATERIAL TO ADDRESS LISTED ON PURCHASE ORDER.				
10 EA	003527 PICK,CLAY POINT,CHISLED PONT ONE END,POINTED POINT ONE END,@ AREA PLAN #1-62. VENDOR MUST SEND A CERTIFICATE VERIFYING THE PROOF OF AREA PLAN.THE CERTIFICATE CAN BE MAILED OR DELIVERED WITH THE MATERIAL TO ADDRESS LISTED ON PURCHASE ORDER.				
240 EA	003715 SHOVEL,FIBERGLASS,REINFORCED,10-1/2" X 13", WITH WOODEN HANDLE,#1 GRADE NORTHERN ASH OR HICKORY, 40" LONG SHOVEL,TO BE PERMANENTLY BONDED TO HANDLE. NOTE:SHOVEL MAY NOT HAVE ANY METAL WHAT SO EVER,DUE TO THE FACT THAT THE SHOVEL IS USED NEAR THE THIRD RAIL.ALL MATERIAL THAT REQUIRES A PROOF OF AREA PLAN MUST BE QUALITY CONTROLLED BY JIM MARRONE.				
48 EA	003721 SHOVEL,24"SNOW PUSHER,RECOMMENDED VENDOR:TRUE TEMPER #24,AMES #16-426 ,UNION				
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	#24P.ALL MATERIAL THAT REQUIRES A PROOF OF AREA PLAN MUST BE QUALITY CONTROLLED BY JIM MARRONE.				
100 EA	003727 SCRAPER,ICE,(SOCKET PATTERN),# OSC TRUE TEMPER SIDEWALK CLEANERS OR APPROVED EQUAL.				
160 EA	003742 HAMMER,SLEDGE,10 LB. WITH 36" HANDLE,AREA PLAN AREMA #13-04.HANDLE AREA PLAN MUST MEET AREMA SPECIFICATION 6.2 FOR ASH & HICKORY HANDLES FOR TRACK TOOLS (2010). VENDOR MUST SEND A CERTIFICATE VERIFYING THE PROOF OF AREA PLAN.THE CERTIFICATE CAN BE MAILED OR DELIVERED WITH THE MATERIAL TO ADDRESS LISTED ON PURCHASE ORDER.				
100 EA	003743 HAMMER,SLEDGE,12 LB.WITH 36" HANDLE,AREA PLAN AREMA #13-04.HANDLE AREA PLAN MUST MEET AREMA SPECIFICATION 6.2 FOR ASH & HICKORY HANDLES FOR TRACK TOOLS (2010). VENDOR MUST SEND A CERTIFICATE VERIFYING THE PROOF OF AREA PLAN.THE CERTIFICATE CAN BE MAILED OR DELIVERED				
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8 EA	003745 TONG,TWO MAN TIMBER,AREA PLAN #8-62,@ VENDOR MUST SEND A CERTIFICATE VERIFYING THE PROOF OF AREA PLAN.THE CERTIFICATE CAN BE MAILED OR DELIVERED WITH THE MATERIAL TO ADDRESS LISTED ON PURCHASE ORDER.				
6 EA	003753 TONG,RAIL,AREA PLAN #6-62,ALDON #4123-14,@ VENDOR MUST SEND A CERTIFICATE VERIFYING THE PROOF OF AREA PLAN.TTHE CERTIFICATE CAN BE MAILED OR DELIVERED WITH THE MATERIAL TO ADDRESS LISTED ON PURCHASE ORDER.				
40 EA	003754 HAMMER,SLEDGE,8 LB.WITH 36" HANDLE,AREA PLAN AREMA #13-04.HANDLE AREA PLAN MUST MEET AREMA SPECIFICATION 6.2 FOR ASH & HICKORY HANDLES FOR TRACK TOOLS (2010). VENDOR MUST SEND A CERTIFICATE VERIFYING THE PROOF OF AREA PLAN.THE CERTIFICATE CAN BE MAILED OR DELIVERED WITH THE MATERIAL TO ADDRESS LISTED ON				
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3 EA	003760 PUNCH,BACKING OUT,5/8",16" HANDLE,@ WOODING VERONA #68901,WARWOOD #324 ,AREA PLAN #19-83. HANDLE AREA PLAN #25-83. VENDOR MUST SEND A CERTIFICATE VERIFYING THE PROOF OF AREA PLAN.THE CERTIFICATE CAN BE MAILED OR DELIVERED WITH THE MATERIAL TO ADDRESS LISTED ON PURCHASE ORDER.		
20 EA	003931 SHOVEL,GENERAL PURPOSE #2,ROUND POINT,SHORT "D" HANDLE,RECOMMENDED VENDORS:TRUE TEMPER #20,AMES #16-096,UNION #B3LRD,,AREA PLAN 21-62. VENDOR MUST SEND A CERTIFICATE VERIFYING THE PROOF OF AREA PLAN.THE CERTIFICATE CAN BE MAILED OR DELIVERED WITH THE MATERIAL TO ADDRESS LISTED ON PURCHASE ORDER.ALL MATERIAL THAT REQUIRES AN AREA PLAN MUST BE QUALITY CONTROLLED BY JIM MARRONE.		
20 EA	003932 SHOVEL,GENERAL PURPOSE,SHORT "D" HANDLE,SQUARE POINT,RECOMMENDED		
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	VENDORS:TRUE TEMPER #BS,AMES #13-093,UNION #B2LSD, ,AREA PLAN 21-62. VENDOR MUST SEND A CERTIFICATE VERIFYING THE PROOF OF AREA PLAN.THE CERTIFICATE CAN BE MAILED OR DELIVERED WITH THE MATERIAL TO ADDRESS LISTED ON PURCHASE ORDER.ALL MATERIAL THAT REQUIRES A PROOF OF AREA PLAN MUST BE QUALITY CONTROLLED BY JIM MARRONE.				
40 EA	003960 HANDLE,ADZE,34",GEM BRAND OR SHAWNEE,PE#AA1200010,@ AREA PLAN #25-83 ,WOODINGS VERONA #00-108. VENDOR MUST SEND A CERTIFICATE VERIFYING THE PROOF OF AREA PLAN.THE CERTIFICATE CAN BE MAILED OR DELIVERED WITH THE MATERIAL TO ADDRESS LISTED ON PURCHASE ORDER.				
20 EA	003961 HANDLE,PICK,36",HARDWARE GRADE,HICKORY,@ AREA PLAN #25-83,WOODINGS VERONA #00103 OR APPROVED EQUAL.. VENDOR MUST SEND A CERTIFICATE VERIFYING THE PROOF OF AREA PLAN.THE CERTIFICATE CAN BE MAILED OR DELIVERED WITH THE MATERIAL TO ADDRESS LISTED ON PURCHASE ORDER.				
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6 EA	003967 HANDLE,HAMMER,24",HARDWARE GRADE STANDARD,@ AREA PLAN #25-83,WOODINGS VERONA #00220 OR APPROVED EQUAL. VENDOR MUST SEND A CERTIFICATE VERIFYING THE PROOF OF AREA PLAN.THE CERTIFICATE CAN BE MAILED OR DELIVERED WITH THE MATERIAL TO ADDRESS LISTED ON PURCHASE ORDER.			
10 EA	003968 HANDLE,SLEDGE HAMMER 30",PE #AA1200210,AREA PLAN #25-83,@ VENDOR MUST SEND A CERTIFICATE VERIFYING THE PROOF OF AREA PLAN.THE CERTIFICATE CAN BE MAILED OR DELIVERED WITH THE MATERIAL TO ADDRESS LISTED ON PURCHASE ORDER.			
10 EA	003969 HANDLE,SLEDGE HAMMER,36",RAIHAN #1040897,CRESENT #616,@ AREA PLAN #25-83. VENDOR MUST SEND A CERTIFICATE VERIFYING THE PROOF OF AREA PLAN.THE CERTIFICATE CAN BE MAILED OR DELIVERED WITH THE MATERIAL TO ADDRESS LISTED ON PURCHASE ORDER.			
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3 EA	004219 PICK,TAMPING,ACCORDING TO AREA PLAN #2-62,@ VENDOR MUST SEND A CERTIFICATE VERIFYING THE PROOF OF AREA PLAN.THE CERTIFICATE CAN BE MAILED OR DELIVERED WITH THE MATERIAL TO ADDRESS LISTED ON PURCHASE ORDER.			
36 EA	004253 CHISEL,TRACK,FOR SHEARING RAIL ONLY,ALLOY STEEL,GRADE 8,@ AREA PLAN #17-83,24",HANDLE,AREA PLAN #25-83. VENDOR MUST SEND A CERTIFICATE VERIFYING THE PROOF OF AREA PLAN.THE CERTIFICATE CAN BE MAILED OR DELIVERED WITH THE MATERIAL TO ADDRESS LISTED ON PURCHASE ORDER.			
20 EA	004408 SHOVEL,SNOW,LONG HANDLE,SQUARE.RECOMMENDED VENDORS:TRUE TEMPER #51,UNION #LCSS1,OR AMES #16324.SHOVEL MUST HAVE A SQUARE POINT.ALL MATERIAL THAT REQUIRES A PROOF OF AREA PLAN MUST BE QUALITY CONTROLLED BY JIM MARRONE.			
12 EA	004455 SHOVEL,GENERAL PURPOSE #2,LONG HANDLE,ROUND			
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 Fax Number _____
 Federal Taxpayer ID _____

**Bidder
Must
Sign
In
Two
Places**

NOTICE TO BIDDERS: Unless the following term of assurance that the above offer is irrevocable is signed, the offer submitted herein shall not be deemed to be complete.

The foregoing offer shall be irrevocable for 90 days after the date on which The PORT AUTHORITY TRANS-HUDSON CORPORATION opens this proposal.

Signed _____ Date _____
 Firm Name _____



REQUEST FOR QUOTATION

Bid Due Date
08/18/2014

Quantity	Description	Unit Price		Total
	POINT,RECOMMENDED VENDORS:TRUE TEMPER #BLR,AMES #12017,OR UNION #B2R.ALL MATERIAL THAT REQUIRES A PROOF OF AREA PLAN MUST BE QUALITY CONTROLLED BY JIM MARRONE.			
24 EA	003711 PICK,DOUBLE POINT BOTH ENDS,AREA PLAN 1-62,@ VENDOR MUST SEND A CERTIFICATE VERIFYING THE PROOF OF AREA PLAN.THE CERTIFICATE CAN BE MAILED OR DELIVERED WITH THE MATERIAL TO ADDRESS LISTED ON PURCHASE ORDER.			
200 EA	004410 SHOVEL,SNOW,POLY,18",ERGO HANDLE,ARTIC BLAST:AMES#1627100 OR APPROVED EQUAL.			
PLEASE QUOTE FULLY DELIVERED PRICES		PAYMENT TERMS		
		Total Delivered Price		

This Quotation is subject to the terms and conditions set forth on the back page hereof. Bidder is advised to read these before signing.

We have read the instructions and, if favored with an order, we agree to furnish the items enumerated herein at the prices and under the conditions indicated.

Signed _____
 Firm Name _____
 Telephone number _____ Date _____
 Fax Number _____
 Federal Taxpayer ID _____

**Bidder
Must
Sign
In
Two
Places**

NOTICE TO BIDDERS: Unless the following term of assurance that the above offer is irrevocable is signed, the offer submitted herein shall not be deemed to be complete.

The foregoing offer shall be irrevocable for 90 days after the date on which The PORT AUTHORITY TRANS-HUDSON CORPORATION opens this proposal.

Signed _____ Date _____
 Firm Name _____

TERMS AND CONDITIONS

1. The Port Authority (PA) reserves the right to request information relating to seller's responsibility, experience and capability to perform the work.
2. Unless otherwise provided, complete shipment of all items must be in one delivery FOB delivery point. Payment will not be made on partial deliveries unless authorized in advance by the party to be charged and the discount, if any, will be taken on the total order.
3. PA payment terms are net 30 days. Cash discounts for prompt payment of invoices may be taken but will not be considered in determining award, except in the case of tie bids.
4. Separate unit and total FOB delivered prices must be shown.
5. Sales to the PA and to PATH are currently exempt from New York and New Jersey State and local taxes and generally from federal taxation. The seller certifies that there are no federal, state, municipal or any other taxes included in the prices shown hereon.
6. The PA shall have the absolute right to reject any or all proposals or to accept any proposal in whole or part and to waive defects in proposals.
7. Unless the phrase "no substitute" is indicated, bidder may offer alternate manufacturer / brands, which shall be subject to Port Authority approval. Please indicate details of product being offered with bid.
8. Acceptance of seller's offer will be only by Purchase Order Form signed by the PA. No change shall be made in the agreement except in writing.
9. If the seller fails to perform in accordance with the terms of this purchase order, the PA may obtain the goods or services from another contractor and charge the seller the difference in price, if any, a reletting cost of \$100, plus any other damages to the PA.
10. Upon request, sellers are encouraged to extend the terms and conditions of any terms agreement with the PA to other government and quasi-government entities by separate agreement.
11. By signing this quotation or bid, the seller certifies to all statements on Form PA 3764A regarding non-collusive bidding; compliance with the PA Code of Ethics; and the existence of investigations, indictments, convictions, suspensions, terminations, debarments and other stated occurrences to assist the PA in determining whether there are integrity issues which would prevent award of the contract to the seller. The PA has adopted a policy set forth in full on PA 3764A, that it will honor a determination by an agency of the State of New York or New Jersey that a bidder is not eligible to bid on or be awarded public contracts because the bidder has been determined to have engaged in illegal or dishonest conduct or to have violated prevailing wage legislation. The Terms and Conditions of PA 3764A apply to this order. A copy can be obtained by calling (201) 395-3405 or at <http://www.panynj.gov/business-opportunities/become-vendor.html>
12. The vendor may subcontract the services or use a supplier for the furnishing of materials required hereunder to such persons or entities as the Manager, Purchasing Services may from time to time expressly approve in writing. All further subcontracting shall also be subject to such approval.
13. The successful bidder (vendor) shall not issue nor permit to be issued any press release, advertisement, or literature of any kind, which refers to the Port Authority or that goods will be, are being or have been provided to it and/or that services will be, are being or have been performed for it in connection with this Agreement, unless the vendor first obtains the written approval of the Port Authority. Such approval may be withheld if for any reason the Port Authority believes that the publication of such information would be harmful to the public interest or is in any way undesirable.
14. Neither the Commissioners of the Port Authority, nor Directors of PATH, nor any of them, nor any officer, agent or employee thereof, shall be charged personally by the Contractor with any liability, or held personally liable to the Contractor under any term or provision of this Agreement, or because of its execution or attempted execution, or because of any breach, or attempted or alleged breach, thereof.

PATH STOCKROOM REQUIREMENT CONTRACT**Information for Bidders****1. AWARD METHOD****AWARD TO SINGLE BIDDER:**

It is the intent of the Port Authority to award this Bid to one Bidder based on the total estimated delivered price for all items. However, the Port Authority shall have the absolute right to reject any or all bids or to accept any bid in whole or in part and to waive defects in bids.

2. CORRECTION IN COMPUTATION

Each Bidder shall insure that all information and figures are inserted as required and that all computations have been verified for accuracy. Bidders are advised that the Port Authority may verify only the quotation or quotations that it deems appropriate and may not check each bid for errors in computation. The Port Authority reserves the unqualified right to recalculate any and all extensions set forth by the Bidder. In the event there is a discrepancy between any unit price listed and the "Estimated Total Price" or the "Total Estimated Contract Price," the Bidder's unit price, shall prevail.

3. ACCEPTABLE PRODUCTS

This Contract may call for specific brands that have been deemed acceptable for the purpose intended. The Bidder may however, offer alternate products other than those listed hereunder. In the event the Bidder offers alternate products, the Bidder may be requested, at its own expense, to submit a sample of the proposed alternate along with a copy of the specifications for the sample being submitted. All samples shall become the property of the Port Authority upon submittal, and all samples submitted to the Port Authority for evaluation shall be delivered within seven (7) days of request. Failure by the Bidder to deliver samples within the required time frame may result in the rejection of the bid. All samples submitted by the Bidder will be evaluated by the Port Authority/PATH and the Port Authority/PATH will make the final determination as to whether or not the alternate product is acceptable. Samples of proposed alternate products shall be sent separately from the Bid. The package containing samples should clearly indicate the following: 1) the Bidder's name and address 2) the Quotation number, 3) the Bid due date. Additionally, each item must be tagged with the PATH Material Number and Bidder's name and address. Samples of proposed alternate products are to be sent to: The PATH – WALDO Stock Room, 122 Academy Street, Jersey City, New Jersey 07302. The Bidder must identify the specific manufacturer and / or model number they intend to supply for alternate products only. The Bidder shall bear all costs of evaluation, if any. Should the proposed alternate product be deemed not acceptable, the Bidder shall be obligated to provide one of the listed acceptable brands and/or manufacturer and model numbers at the original quoted price to maintain eligibility for contract award.

STANDARD TERMS AND CONDITIONS

1. GENERAL AGREEMENT

The Vendor agrees to furnish and deliver on an "as needed" basis to the Port Authority's stockrooms as set forth herein, the Authority's stockroom requirements for the items set forth in the "Request for Quotation" form, within the calendar days indicated in paragraph 4 below. The furnishing and delivery shall be at the prices quoted in the Request for Quotation. The contract term is **2 years**.

The dollar value of this requisition is for evaluation purposes only and there are no guarantees as to the actual amount, if any, that may be ordered. In full consideration for the performance of all duties and obligations hereunder, the Vendor agrees to accept from the Port Authority a compensation consisting of payment for the items or services supplied by the Vendor computed at the bid prices quoted in the Request for Quotation. The "Unit Prices" quoted **shall not** exceed two decimal places. The Port Authority Trans Hudson Corporation (PATH) is a third party beneficiary of this agreement and may order its requirements for stockroom items upon the same terms and conditions by issuing a separate purchase order.

2. EXTENSION PERIOD

The Port Authority shall have the absolute right to extend the Base Term for an additional period of up to one hundred and twenty (120) days (herein called the "Extension Period") subsequent to the Expiration Date of the Base Term, subject to the same terms and conditions as the previous contract period. The prices quoted by the Contractor for the previous contract period shall remain in effect during this Extension Period without adjustment. If it so elects to extend this Contract, the Port Authority will advise the Contractor, in writing that the term is so extended, and stipulate the length of the extended term, at least thirty (30) days prior to the expiration date of the previous contract period.

3. FACSIMILE EQUIPMENT

The Vendor shall have available a facsimile machine for receipt of releases via facsimile message from the Port Authority Trans-Hudson Corp.

4. PURCHASE ORDERS

Releases against the Contract for the PATH stockroom(s) will be coordinated using Purchase Orders issued by PATH. Purchase Orders may be verbal or in writing. If verbal, the Port Authority will confirm all orders by a facsimile hard copy transmission bearing the stock number, quantity, delivery location and Purchase Order number. The Vendor shall accept Purchase Orders only from PATH. The Vendor shall deliver within seven (7) **business days**, from receipt of Purchase Order. There shall be no minimum quantities or dollars per order.

5. ADDITIONAL ITEMS

Additional related items may be added to this contract by the Manager, Purchasing Services Division. If the items on the contract were bid at a specified discount off list price, additional items, as determined by the Manager, Purchasing Services shall be priced at the same discount. Prices for items not covered by a discount off list price may be negotiated or bid by the Buyer, and added to the order if prices are deemed acceptable. The Port Authority shall not be obligated to add new items to the contract unless it is in the best interest of the Port Authority. All items to be added shall be set forth in a change order.

6. DELIVERY

Delivery shall be FOB delivered to any or all stockrooms listed in paragraph 8, below. All deliveries shall be made between the hours of 7:00 a.m. and 2:30 p.m. unless otherwise noted in the specifications. The Vendor **MUST** follow instructions for the proper method of making deliveries. Failure to do so may result in delayed payments.

- A. All deliveries must be accompanied by an original packing slip, which shall always contain:
 - 1. The PATH Purchase Order
 - 2. The Stock Number (s)
 - 3. A description of each item.
 - 4. The quantity shipped of each item.
 - 5. The Vendor's packing slip/invoice number.

- B. The Vendor shall not combine orders.

In the event the Vendor receives more than one separate and distinct purchase order for one delivery point, the Vendor shall package each order individually though delivery is made to the same location simultaneously. Each separate order must be accompanied by its own packing slip/invoice containing all information numbered 1 through 5 in Paragraph A above.

- C. Shipping cartons shall not contain loose and/or unmarked items.
- D. Unless otherwise provided, complete shipment of all items must be in one delivery. Only in extenuating circumstances partial deliveries to Port Authority stockrooms will be accepted. When partial deliveries are made, the receiving stockroom must be notified as to when the balance of the order will be shipped
- E. Trucks making deliveries must be standard loading dock height. No delivery from smaller trucks will be accepted.

7. DELIVERY CONDITIONS

Following a reasonable two (2) weeks set-up time after the initial award of the contract, delivery of material should be within **seven (7) days** from receipt of purchase order release.

8. DELIVERY LOCATIONS AND RESTRICTIONS

All shipments must be “inside standard delivery, dock level” except where noted below.

PATH - WALDO Stockroom

122 ACADEMY STREET

JERSEY CITY, NJ 07302

TEL: (201) 216-7070/7079

9. LEGAL HOLIDAYS

Except where otherwise specified, all of the following holidays will be observed at the Facility. Where specified, these holidays shall mean and include:

New Year's Day
Martin Luther King's Birthday
Lincoln's Birthday
President's Day
Memorial Day
Independence Day

Labor Day
Columbus Day
Veterans Day
Thanksgiving Day
The day after Thanksgiving Day
Christmas Eve Day – ½ day **Closed 11:00 AM**
Christmas Day

10. MATERIAL SAFETY DATA SHEETS

When required by Federal, State or Local law, a Material Safety Data Sheet must be included with all deliveries.

11. UNION JURISDICTION

The Vendor is advised to ascertain whether any union now represented or not represented at the facility will claim jurisdiction over any aspect of the operation to be performed hereunder including delivery.

12. BILLING

An invoice with a unique invoice number must be issued for all deliveries. The vendor must attach backup delivery receipts with Purchase Order number. **Mail all invoices to: The Port Authority of New York and New Jersey, Accounts Payable, 1 PATH Plaza, 5th Floor, Jersey City, New Jersey 07306.**

13. NON-PERFORMANCE OF VENDORS DUTIES RELETING CHARGES

If the Vendor fails to perform in accordance with the terms of this Contract, the Port Authority may obtain the goods or services from another Vendor and charge the seller the difference in price, if any, plus a reletting cost of \$100, plus any other damages to the Port Authority.

14. TERMINATION

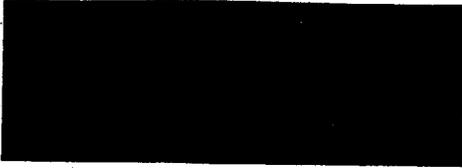
The Port Authority may terminate this Contract with cause or without cause at any time upon five (5) days written notice to the Vendor and in such an event this Contract shall cease and expire on the date set forth in the notice of termination as fully and completely as though such date was the original expiration date. Such cancellation shall be without prejudice to the rights and obligations of the parties arising out of portions of this agreement already performed but no allowance shall be made for anticipated profits. The Vendor shall complete delivery of all items ordered before receipt of the notice of termination.

15. CONFLICT OF TERMS AND CONDITIONS

In the event of any conflict between these "stockroom requirement contract terms and conditions" and the terms and conditions on the "Request for Quotation" form, these standard terms and conditions shall prevail.

16. PURCHASE BY OTHER GOVERNMENT AGENCIES

Upon such request, vendors who are awarded contracts are encouraged to extend the terms and conditions of these contracts under separate agreement, to other government and quasi-governmental entities.



Part 6

Specifications and Plans for Track Tools

— 1997 —

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SECTION 6.1 SPECIFICATION FOR TRACK TOOLS¹ (1997)

6.1.1 GENERAL

6.1.1.1 Workmanship

- a. The steel used in the manufacture of all tools shall be free from pipe, porous centers, gross non-metallic inclusions or any other defects.
- b. The chemical composition of percussion tools will be as stated in Article 6.1.2.3.
- c. Unless specifically stated otherwise in the section on non-percussion tools, the chemical composition of non-percussion tools made from carbon steel will be as follows:

	Carbon		Manganese		Phosphorous		Sulfur	
	Min	Max	Min	Max	Min	Max	Min	Max
Grade								
Carbon	.55	.70	.60	.90		.05		.05

- d. All tools shall be made in a workmanlike manner and shall be free from cracks, seams, laps and other injurious discontinuities. Tools shall be free from burrs and sharp edges not specifically shown on the plans.
- e. Eyes of tools with handle holes must be on center and in true alignment.

6.1.1.2 Finish

6.1.1.2.1 Percussion Tools

The body of the tool will be unpainted. The entire tool will be coated with a transparent lacquer type rust preventative.

6.1.1.2.2 Non-Percussion tools

The body of the tool will be coated with paint, oil or varnish to prevent corrosion. Each polished cutting edge will be oiled or coated with a transparent lacquer type rust preventative.

6.1.1.3 Marking

- a. Each tool shall be legibly marked by stamping the following:
 - (1) The manufacturer's name and/or trademark.
 - (2) A code indicating the production lot.
 - (3) For tools manufactured for use in the United States, any information required by the U.S. Department of Labor, Occupational Safety And Health Administration (OSHA). For tools manufactured for use in other countries, the requirements of that country will apply. This pertains

¹ References, Vol. 31, 1930, pp. 555, 1753; Vol. 33, 1932, pp. 582, 815; Vol. 34, 1933, pp. 508, 838; Vol. 35, 1934, pp. 930, 1118, 1122; Vol. 36, 1935, pp. 567, 978; Vol. 37, 1936, pp. 479, 1019; Vol. 41, 1940, pp. 560, 867; Vol. 45, 1944, pp. 337, 620; Vol. 47, 1946, pp. 482, 636; Vol. 54, 1953, pp. 974, 1398; Vol. 55, 1954, pp. 700, 1079; Vol. 58, 1957, pp. 834, 1258; Vol. 62, 1961, pp. 652, 946; Vol. 63, 1962, pp. 490, 755; Vol. 85, 1984, p. 25; Vol. 89, 1989, p. 49; Vol. 94, 1994, p. 81.

Track

6.1.2.1.2 Metal To Metal Contact Struck Tools

Track Chisels	Plan No. 17-83
Round Track Punch	Plan No. 19-83
Track Spike Lifter	Plan No. 32-83
Nut Cutter	Plan No. 35-83
3 lb. Hot Cutter	Plan No. 36-83
5 lb. Hot Cutter	Plan No. 37-83
Drift Pin-Short	Plan No. 38-83
Drift Pin-Long	Plan No. 39-83
Spiking Tool	Plan No. 41-94

6.1.2.2 Manufacture

6.1.2.2.1 Process

The shock resisting steel shall be made from carbon deoxidized, special quality, fine grain size alloy bar produced in accordance with ASTM A576, Standard Specification For Steel Bars, Carbon, Hot-Wrought, Special Quality.

6.1.2.2.2 Heat Treatment

- a. Each tool classified in Article 6.1.2.1.1 and Article 6.1.2.1.2 shall be hardened by liquid quenching and subsequent tempering in such a manner that the hardness range will be maintained to a sufficient depth to absorb the normal working stresses. This heat treatment shall be such that a fracture test of the tool will exhibit a silky, fine grained appearance according to Shephard Standard No. 6 or finer.
- b. All tools made with alloy steel to be redressed without subsequent heat treatment shall be initially heat treated so that the hardness specified in Article 6.1.2.3.1 is maintained to depth from the end not less than the average cross sectional thickness.

6.1.2.3 Chemical and Hardness Requirements

All striking and struck tools (Article 6.1.2.1.1 and Article 6.1.2.1.2) shall be made of shock resisting alloy steel of a chemical composition with standard AISI residuals (see Table 6-1).

Table 6-1. Chemical Hardness Requirements for Striking and Struck Tools

	Carbon		Manganese		Phos.	Sulfur	Silicon		Vanadium		Molybdenum	
	Min	Max	Min	Max	Max	Max	Min	Max	Min	Max	Min	Max
Carbon	.51	.60	.75	1.00	.025	.025	1.80	2.20	.45		.35	.50



6.1.2.3.1 Hardness

All hardness tests shall be performed according to the latest revision of ASTM Spec. E-18. Frequency of testing should be performed to the requirements in the latest revision of "MIL-STD-105D, Military Standard Sampling Procedure Tables for Inspection Attributes."

- All struck surfaces shall be 44/48 Rockwell "C" Hardness.
- All striking surfaces shall be 51/55 Rockwell "C" Hardness.
- All cutting surfaces shall be 56/60 Rockwell "C" Hardness.
- All punch ends shall be 52/56 Rockwell "C" Hardness.

6.1.2.4 Hardenability

6.1.2.4.1 Alloy Steel

Composition of the steel shall be such that, in the standard Jominy test, the hardness is greater than 50 Rockwell C at $\frac{3}{16}$ inch from the quenched end of the specimen.

6.1.2.4.2 Frequency of Testing

The steel manufacturer shall have conducted a Jominy test from the first, middle and last ingot of each heat of steel purchased.

6.1.2.5 Microscopic Inclusion Evaluation

Alloy steel shall meet the following requirements for inclusions.

6.1.2.5.1 Test Specimens

Specimens shall be taken from approximately 4 inch (100 mm) forged, square section taken from the top and bottom of the first, middle and last ingot. The specimen shall be $\frac{3}{8}$ by $\frac{3}{4}$ inch (9.5 by 19 mm) and shall be taken from an area midway between the center and outside of the test section. Procedures outlined in the latest revision of ASTM Method E 45 shall be followed.

6.1.2.5.2 Examination and Limits

Specimens shall be examined in accordance with the latest revision of ASTM Method E 45, Method D, using the modified JK Chart Fig. 12 of Plate III. The worst field in any specimen shall not exceed the following limits:

Table 6-2. Specimen Limits

	A	B	C	D
Thin	3.0	3.0	2.5	2.0
Thick	2.0	2.5	1.5	1.5

6.1.2.6 Nondestructive Test Requirements

To ensure that all tools are free from defects listed in Article 6.1.1, each tool shall be inspected after finished grinding by the supplier according to one of the following procedures:

- Magnetic Particle Inspection in accordance with the latest revision of ASTM Method A-275.
- Liquid Penetrant Inspection in accordance with the latest revision of ASTM Recommended Practice E-165.

6.1.2.7 Design

All tools shall conform substantially when applicable to the dimensions set forth. Dimensions for head contours are shown in Plans A-83, B-83 or C-83, D-83.

6.1.2.7.1 Head Contour

- Heads of tools with a round cross section shall be ground to the corner contours prescribed in Plans A-83, B-83 or C-83.
- Heads of tools with a hexagonal or octagonal cross section should also be ground to the corner contours prescribed in Plans A-83, B-83 or C-83. In addition, the arcs not tangent to the hexagonal or octagonal corners shall be "blended" into a smooth contour similar to that shown in Plan D-83.
- Punch ends shall have corner radii according to paragraph a, but with no crown radius.
- All ground surfaces shall be free of decarburization.

6.1.3 NON-PERCUSSION TOOLS (MATERIALS, INSPECTION AND PHYSICAL TESTS)

6.1.3.1 Clay Pick—Plan No. 1

Chemical composition for carbon steel as specified in Article 6.1.1.1c, or alloy steel as specified in AISI 4140. No special tests required.

6.1.3.2 Tamping Pick—Plan No. 2

Chemical composition for carbon steel as specified in Article 6.1.1.1c, or alloy steel as specified in AISI 4140. No special tests required.

6.1.3.3 Spike Maul—Plan No. 3

See percussion tools.

6.1.3.4 Track Wrenches—Plan No. 4

Chemical composition for carbon steel as specified in Article 6.1.1.1c. One wrench to be tested from each lot of 10 dozen or less by applying for 1 minute a load of 400 lb. at a point distant from the jaw end equal to 95 percent of the total length of the wrench without any spreading of the jaw or any permanent set in the handle. If requested by the purchaser, Article 6.1.2.6, Nondestructive Test Requirements, will be adhered to.



6.1.3.5 Lining Bars—Plan No. 5

Chemical composition for carbon steel as specified in Article 6.1.1.1c. One bar to be tested from each lot of 10 dozen or less by applying a load of 350 lb. 9 inch from the end of the handle, with the point suitably secured 6 inch from the end, without leaving a permanent set in excess of $\frac{1}{4}$ inch.

6.1.3.6 Rail Tongs—Plan No. 6

Chemical composition for carbon steel as specified in Article 6.1.1.1c. No special tests required.

6.1.3.7 Tie Tongs—Plan No. 7

Chemical composition for carbon steel as specified in Article 6.1.1.1c. No special tests required.

6.1.3.8 Timber Tongs—Plan No. 8

Chemical composition for carbon steel as specified in Article 6.1.1.1c. Three pairs of tongs to be tested from each lot of 10 dozen or less by suspending a load of 300 lb. or 400 lb. work wise in the tongs with the handles in a horizontal position and supported 2 inch from the end. Deflection with 300 lb. weight shall not exceed 1 inch with no permanent set, and with 400 lb. weight deflection shall not exceed $1\frac{1}{4}$ inches with a permanent set not to exceed $\frac{1}{8}$ inch.

6.1.3.9 Spike Puller—Plan No. 9

Chemical composition for carbon steel as specified in Article 6.1.1.1c. One puller from each lot of 10 dozen or less to be tested in actual use by pulling a spike with a standard claw bar.

6.1.3.10 Rail Fork—Plan No. 10

Chemical composition for carbon steel as specified in Article 6.1.1.1c. No special tests required.

6.1.3.11 Claw Bar—Plan No. 11

Chemical composition for carbon steel as specified in Article 6.1.1.1c. In the manufacture of claw bars, Article 6.1.2.6, Nondestructive Test Requirements will be adhered to. One bar from each lot of 10 dozen or less to be tested by placing the claws of the bar $\frac{1}{2}$ inch under the head of a standard spike, rigidly placed and so located as to hold the bar in a horizontal position while a shock load equivalent to that of a 200 lb. weight falling a distance of 1 foot is applied to the handle at a point 5 inches from its end, without the toes showing any cracks or the handle taking any permanent set.

6.1.3.12 Track Adz—Plan No. 12

Chemical composition for carbon steel as specified in Article 6.1.1.1c. Test one adz in each lot of 10 dozen or less by subjecting cutting edge to 5 normal blows on metal of the same composition as a railroad spike without breakage or serious nicking.

6.1.3.13 Carpenter's Adz—Plan No. 12A

Chemical composition for carbon steel as specified in Article 6.1.1.1c. No special tests required.

6.1.3.14 Double Face Sledge—Plan No. 13

See percussion tools.

Track

6.1.3.15 Tamping Bar—Plan Numbers 14–15

Chemical composition for carbon steel as specified in Article 6.1.1.1.c. No special tests required.

6.1.3.16 Tie Plug Driver—Plan No. 16

Material as shown on plan. No special tests required.

6.1.3.17 Track Chisels—Plan No. 17

See percussion tools.

6.1.3.18 Round Track Punch—Plan No. 19

See percussion tools.

6.1.3.19 Track Gage—Plan No. 20

Material as shown on plans. No special tests required.

6.1.3.20 Track Gage with Wood Rod—Plan No. 20-A

Material as shown on plans. No special tests required.

6.1.3.21 Track Shovel—Plan No. 21

6.1.3.21.1 Scope and Design

This specification covers the welded or riveted type and the solid shank type with either wood, malleable iron, combination wood metal, or user approved composition handle tops. Dimension shall conform to plans, which are made part of this specification. A variation of $\frac{1}{2}$ inch more or less from the dimensions shown on the plan for the length of the strap or shank and handle will be allowed. A variation of $\frac{1}{4}$ inch more or less from the dimensions shown on the plan for the width or length of the blade will be allowed, but the total variation in the overall length of shovels shall not exceed $\frac{1}{2}$ inch more or less of the dimensions shown on the plan.

6.1.3.21.2 Materials

- a. Blades shall be of carbon or alloy steel, with a Rockwell (Rc) hardness for carbon steel of 45 to 50.
- b. Carbon steel blades shall have a thickness of not less than No. 13 gage and alloy blades shall be not less than No. 14 gage U.S. Standard, the gage to be measured at the point where the hardness is taken. For welded or riveted types, the straps shall be welded or riveted to the blade.

6.1.3.21.3 Handles and Tops

This specification covers either wood, malleable iron, combination wood metal, or user approved composition handle tops. Wood handles shall be made of ash and shall conform to Grade AA and be in accordance with the general Specifications for Handles for Track Tools.

6.1.3.21.4 Tests

- a. One shovel from each lot of 10 dozen or less shall be selected. Metal straps (curved to fit the contour of the handle) shall be clamped to the upper and lower parts of the handle. Then, the shovel shall be placed in a prying position, supported at the end of the blade by clamps. The shovel shall be capable of



sustaining a load of 200 lb. suspended from the end for a period of 2 minutes without showing any permanent set, fracture or distortion.

- 
- b. Alloy steel shovels which have been given heat treatment to ensure uniformity in hardness shall be subject to shock test to ensure against brittleness. The test shall be made by forcibly striking the blade of the shovel with a hand hammer at several places when placed on an anvil.

6.1.3.22 Ballast Fork—Plan No. 22



6.1.3.22.1 Scope and Design

The dimensions shall conform to the plans, which are made part of this specification. The total variation in the overall length of the forks shall not exceed $\frac{1}{2}$ inch more or less of the dimensions shown on plan.



6.1.3.22.2 Material

Forks shall be made of high grade carbon steel. Tines of forks shall show Rockwell (Rc) harness of 35-45. Straps shall be 0.04 U.S. Standard gage steel.



6.1.3.22.3 Handles

This specification covers either wood, malleable iron, combination wood metal, or user approved composition handle tops. Wood handles shall be made of ash and shall conform to Grade AA and be in accordance with the general Specifications for Handles for Track Tools.



6.1.3.23 Track Tool Handles—Plan No. 25

See Specification For Ash And Hickory Handles For Track Tools for material requirements. No special tests required.



6.1.3.24 Scoop—Plan No. 26

6.1.3.24.1 Scope and Design

This specification covers the welded or riveted type and the solid shank type with either wood, malleable iron, combination wood metal, or user approved composition handle tops. Dimension shall conform to plans, which are made part of this specification. A variation of $\frac{1}{2}$ inch more or less from the dimensions shown on the plan for the length of the strap or shank and handle will be allowed. A variation of $\frac{1}{4}$ inch more or less from the dimensions shown on the plan for the width or length of the blade will be allowed, but the total variation in the overall length of scoops shall not exceed $\frac{1}{2}$ inch more or less of the dimensions shown on the plan.

6.1.3.24.2 Materials

Blades shall be of carbon or alloy steel, with a Rockwell (Rc) hardness for carbon steel of 45 to 50.

Carbon steel blades shall have a thickness of not less than No. 13 gage and alloy blades shall be not less than No. 14 gage U.S. Standard, the gage to be measured at the point where the hardness is taken. For welded or riveted types, the straps shall be welded or riveted to the blade.

6.1.3.24.3 Handles and Tops

This specification covers either wood, malleable iron, combination wood metal, or user approved composition handle tops. Wood handles shall be made of ash and shall conform to Grade AA and be in accordance with the general Specifications for Handles for Track Tools.

6.1.3.24.4 Tests

- a. One scoop from each lot of 10 dozen or less shall be selected and metal straps (curved to fit the contour of the handle) shall be clamped to the upper and lower parts of the handle, after which the shovel shall be placed in a prying position, supported at the end of the blade by clamps and shall be capable of sustaining a load of 200 lb. suspended from the end for a period of 2 minutes without showing any permanent set, fracture or distortion.
- b. Alloy steel scoops which have been given heat treatment to ensure uniformity in hardness shall be subject to shock test to ensure against brittleness. The test shall be made by forcibly striking the blade of the scoop with a hand hammer at several places when placed on an anvil.

6.1.3.25 Aluminum Track Level And Gage—Plan No. 27

Material as shown on plans. No special tests required.

6.1.3.26 Scythe—Plan No. 28

No special tests required.

6.1.3.27 Snath—Plan No. 29

Material as shown on plans. No special tests required.

6.1.3.28 Spot Board—Plan No. 30

Material as shown on plans. No special tests required.

6.1.3.29 Rail Tongs for use with crane—Plan No. 31

Material as shown on plans. In the manufacture of the rail tongs, Article 6.1.2.6, Nondestructive Test Requirements, will be adhered to.

6.1.3.30 Track Spike Lifter—Plan No. 32

See percussion tools.

6.1.3.31 Drive Spike Extractor Socket Wrench—Plan No. 33

No special tests required.

6.1.3.32 Rail Thermometer—Plan No. 34

Material as shown on plans. No special tests required.

6.1.3.33 Nut Cutter—Plan No. 35

See percussion tools.

6.1.3.34 Hot Cutter (3 Pound)—Plan No. 36

See percussion tools.



6.1.3.35 Hot Cutter (5 Pound)—Plan No. 37

See percussion tools.

6.1.3.36 Drift Pin (Short)—Plan No. 38

See percussion tools.

6.1.3.37 Drift Pin (Long)—Plan No. 39

See percussion tools.

6.1.3.38 Spiking Tool—Plan No. 41

See percussion tools.

6.1.3.39 Switch Clip Wrenches—Plan No. 43

Chemical composition for carbon steel as specified in Article 6.1.1.1c. If requested by the purchaser, Article 6.1.2.6, will be adhered to (see Table 6-3).

SECTION 6.2 SPECIFICATIONS FOR ASH AND HICKORY HANDLES FOR TRACK TOOLS¹ (1962)

6.2.1 MATERIAL (1980)

- a. Before manufacturing tool handles, the manufacturer shall ascertain which of the following kinds of ash or hickory will be accepted. Other woods will not be accepted unless specifically ordered.
- b. Ash for fork, hoe, rake, scoop, shovel, and scythe handles.
 - Black ash (*Fraxinus nigra*).
 - Green ash (*Fraxinus pennsylvanica lanceolata*).
 - Oregon ash (*Fraxinus oregona*).
 - White ash (*Fraxinus americana*).
- c. Hickory for adz, axe, canthook, chisel, hammer, hatchet, jack, maul, pick, punch and sledge handles.
 - Bitternut hickory (*Hicoria cordiformis*).
 - Mockernut hickory (*Hicoria alba*).
 - Nutmeg hickory (*Hicora myristicaeformis*).
 - Pignut hickory (*Hicoria glabra*).
 - Shagbark hickory (*Hicoria ovata*).
 - Shellbark hickory - Bigleaf (*Hicoria laciniosa*).
 - Water hickory (*Hicoria aquatica*).

¹ References, Vol. 43, 1942, pp. 519, 767; Vol. 47, 1946, pp. 484, 636; Vol. 54, 1953, pp. 975, 1399; Vol. 58, 1957, pp. 834, 125 8; Vol. 63, 1962, pp. 490, 755. Reapproved without change 1962.

6.2.2 PHYSICAL REQUIREMENTS (1980)

- a. Except as hereinafter provided, all tool handles shall be seasoned to a moisture content not exceeding 12%, and shall be free of injurious characteristics that may impair their serviceability, such as decay, cross grain, abrupt grain dip, holes, large knots, splits, heavy stain, warp, and lightweight wood.
- b. Any tool handle may be either all heartwood, all sapwood, or a mixture of both.

6.2.3 DESIGN (1980)

Tool handles shall conform to the design and dimensions shown on AREMA plans which form a part of these specifications, with an allowable variation of $\frac{1}{4}$ inch over or under in length and $\frac{1}{16}$ inch over or under in all other dimensions.

6.2.4 MANUFACTURE (1980)

- a. Tool handles shall be cut square at the ends, uniform in size and shape for each type, smoothly finished, and waxed. Lacquered, painted, or stained handles are not acceptable.
- b. The manufacturer shall legibly impress into each accepted handle, at a location and in a manner that will not weaken the handle and at a location designated by the purchaser, whatever grade, maker, or ownership symbol may be required by the purchaser.

6.2.5 INSPECTION (1980)

- a. Handles will be inspected at points of manufacture, shipment, or destination, in suitable and convenient places satisfactory to the purchaser.
- b. Inspectors representing the purchaser shall have free entry to the works of the manufacturer at all times while work on the contract of the purchaser is being performed, and shall have all reasonable facilities (including adequate light) afforded them, free of cost, to satisfy them that the handles being supplied are in accordance with these specifications.
- c. Inspectors will make a reasonably close examination of each handle and acceptance or rejection will be based on visual inspection and the judgment of the inspector. He will not determine the exact weight and density of each handle, but in case of question, one or both of these characteristics may be accurately measured for conformance with the requirements for each grade. Exactness of size and shape will be checked by accurate measurements of handles taken at random.
- d. Each handle will be judged independently, without regard for the decisions on others in the same lot.
- e. The inspector shall have his identifying designation legibly branded into the grasp end of each accepted tool handle.



6.2.6 TYPES OF BLEMISHES AND DEFECTS (1980)

Following is a list of blemishes and defects. Definitions for these effects are listed in the Glossary at the back of this chapter.

cross grain	abrupt grain dip	slight grain dip	hole
pin knot	small knot	medium knot	
split	light stain	medium stain	
small streak	medium streak	large streak	

6.2.7 DELIVERY (1980)

Accepted handles shall be shipped in accordance with the instructions in the order covering them, securely packed in containers marked with the name, type, grade, and quantity of the material therein and with the name of the shipper and the number of the purchaser's contract or order.



6.2.8 GRADE CLASSIFICATION (1984)

Grade classifications are found in Table 6-3.

Table 6-3. Grade Classifications

Grade Symbol	Color	Maximum Number of Annual Rings per Inch of Radius	Minimum Weight per Cu Ft Lb	Maximum Slope of Grain	Admissible Blemishes and Defects
AA	White, red or brown, or brown, red, and white; but dark brown or dark red only within 10" from tool end.	15	43	1 in 12	1 slight grain dip; tight pin knots and small streaks at least 12" apart; light stain.
AB	White, red or brown, or brown, red, and white; but dark brown or dark red only with 10" from each end.	18	36	1 in 12	1 small tight knot at each end; 2 slight grain dips and 2 tight pin knots at least 6" apart; medium stain; 2 small streaks.
HA	Red or white or red and white.	17	55	1 in 50	Light stain; medium streaks
HB-1	Red or white or red and white.	22	46	1 in 50	Medium stain; large streak bird pecks or tight knots not more than 1/4" in average diameter, in the eye end or first third of the grasp end.
HB-2	Red or white or red and white	27	46	1 in 20	Medium stain; slight grain dip; large streak; bird pecks or tight knots, the sum or whose average diameters does not exceed 1/4" in the eye end or the first third of the grasp end.



6.2.9 USE CLASSIFICATION (1989)

Use classifications are found in Table 6-4.

Table 6-4. Use Classifications

Handle	Handle Grade Symbol	Minimum Weigh per Dozen Handles Lb	Number of Tool Plan
Adz-34"	HA	15	12
Axe-36"	HA	17	-
Cant hook	HB-1	-	-
Chisel (Track) 24"	HB-2	-	17
Flatter (3" Square) 24"	HB-2	-	40
Fork (Ballast)	AA	-	22
Hammer	HA	-	-
Hatchet	HA	-	-
Hoe	AB	-	-
Hot Cutter (3 lb) 24"	HB-2	-	36
Hot Cutter (5 lb) 24"	HB-2	-	37
Jack	HB-1	-	-
Maul (Spike) 36"	HA	15	3
Pick-36"	HA	21	1 and 2
Punch (Round Track) 24"	HB-2	-	19
Rake	AB	-	-
Scoop	AA	-	26
Scythe (Snath) 59"	AA	-	29
Shovel (Track)	AA	-	21
Sledge-36"	HA	14	13
Track Spike Lifter-36"	HB-2	-	32

SECTION 6.3 RECOMMENDED LIMITS OF WEAR FOR TOOLS TO BE RECLAIMED¹ (1962)

6.3.1 GENERAL (1962)

- a. Dashed lines and notes indicating the limits of wear of tools to be reclaimed are shown on the plans of the following tools: Nos. 1, 2, 3, 5, 12, 12A, 13, 14, 15, 17, 19 and 21.
- b. For reclaiming alloy track tools, company forces should be limited to grinding methods; where it is advisable to reclaim them by heating methods, due to the numerous and continuous changes in alloy they should be returned to the manufacturer who is familiar with their precise metallurgical content.

¹ References, Vol. 42, 1941, pp. 587, 836; Vol. 43, 1942, pp. 522, 767; Vol. 52, 1951, pp. 519, 817; Vol. 54, 1953, pp. 975, 1399 ; Vol. 58, 1957, pp. 834, 1258; Vol. 63, 1962, pp. 490, 755. Reapproved without change 1962.

SECTION 6.4 INSULATION FOR TRACK TOOLS STANDARD SPECIFICATIONS (1989)

6.4.1 GENERAL (1989)

6.4.1.1 Scope

This specification covers the requirements for self-amalgamating sealant tape; heat shrinkable environmental sealing boots and thick wall tubing to be used for insulating track tools.

6.4.1.2 Type

- a. The products specified in this section shall be compatible with each other.
- b. Each product shall be furnished in sizes and quantities specified and manufactured in accordance with these specifications.

6.4.2 TECHNICAL REQUIREMENTS (1989)

6.4.2.1 Material

- a. Self-amalgamating sealant tape shall be a cross-linked Butyl based tape that fuses to itself in ambient temperatures. It shall be formulated so that it can be stretch orientated to at least four times its original length, allowing conformance to irregular shapes. The tape shall be supplied with a release paper backing, which allows at least a $\frac{1}{16}$ inch overlap to avoid roll contamination and ease of release.
- b. Environmental boots shall be heat shrinkable cross-linked blends of polyolefin and elastomers which provide low moisture permeability, weather resistance and resistance to ozone attack.
- c. Environmental boots shall include an adhesive system that provides an effective environmental seal that meets or exceeds the requirements of ANSI C119.1 for 600V rated systems.
- d. Heat shrinkable tubing and end caps shall be a cross-linked blend of modified polyolefin and elastomers. A sealant shall be applied inside the tubing and end caps which remains flexible for the life of the system. This sealant shall provide both environmental sealing and waterproofing. The tubing shall provide a shrink ratio of at least 3:1 and the end caps at least 2:1.
- e. The sealant system shall provide an effective environment seal to cable jacketing material, including standard plastic and elastomeric materials, yet will strip cleanly from most metallic substances, while resisting water ingress.

6.4.2.2 Properties

- a. The properties for self-amalgamating sealant tape are found in Table 6-5 and are a requirement.
- b. The properties for environmental boots are found in Table 6-6 and are a requirement.
- c. The properties for heat shrinkable tubing and end caps are found in Table 6-7 and must be adhered to.

¹ References, Vol. 90, 1989, p. 49. Adopted 1989.

Table 6-5. Self-Amalgamating Sealant Tape Required Properties

Properties	Test Method	Typical Values
Physical Properties		
Water Absorption	ASTM D-570-81	0.5%
Specific Gravity	ASTM D-792-66 Method A1	1.49
Adhesion:		
Lap Shear XLPE to XLPE	ASTM D-1002-72	8-10 psi
Elongation	ASTM D-142, Method A 412-80	350-400%
Electrical Properties		
Dielectric Strength (125 mil sample)	ASTM D-149-81	250 v/mil
Volume Resistivity	ASTM D-257-78	10 ¹⁴ (min)
Dielectric Constant	ASTM D-150-81	4.9
Dissipation Factor	ASTM D-150-81	0.06
Thermal Properties		
Maximum Service Temperature	C-792-75	265°F
Low Temperature Flexibility	ASTM-3111-76	-40°F on 1/2" mandrel
Chemical Properties		
Corrosivity	ASTM D-2671-80	Non-corrosive 16 hrs @ 150°C
Chemical Resistance	ASTM D-2671-80	Resistant to: alcohol, ketones, acids, alkalis. Non-resistant to: Mineral spirits, naphtha, hydrocarbons.
Fungus Resistance	ASTM G-21	Rating 0

Table 6-6. Environmental Boots Required Properties

Properties	Test Method	Results
Physical Properties		
Tensile Strength, psi	ASTM D-412 Method A	1500 (min)
Ultimate Elongation (%)	ASTM D-412 Method A	440 (min)
Hardness - Shore "D"	ASTM D-2240	55 ±5
Water Absorption (%)	ASTM D-570 24 hours	0.1% (max)
Specific Gravity	ASTM D-792 Method A1	1.22 ±12
Electrical Properties		
Dielectric Strength 125 mil 125 mils (v/mil)	ASTM D-149	350 (min)
Dielectric Constant (1 kHz)	ASTM D-150	4.5
Volume Resistivity (ohm-cm)	ASTM D-257	10 ¹⁴ (min)

Table 6-7. Heat Shrinkable Tubing and End Caps Required Properties

Properties	Test Method	Results
Physical Properties		
Tensile Strength, psi	ASTM D-412 Method A	1800(min)
Ultimate Elongation (%)	ASTM D-412 Method A	400% (min)
Hardness - Shore "D"	ASTM D-2240	48 ±5
Water Absorption (%)	ASTM D-570	0.1% (max)
Specific Gravity	ASTM D-792 Method A1	1.08 ±08
Chemical Properties		
Corrosivity	ASTM D-2671 Method A	Non-corrosive 16 hrs @ 175°C
Fungus Resistance	ASTM G-21	Rating 0
Oil Resistance - 24 hrs @ 25°C	ASTM D-412	Rating 0
Hydraulic Fluid Mil H5606 °C	% Original Strength	90 (min)
	% Original Elongation	100 (min)
Diesel Fuel	% Original Strength	100 (min)
	% Original Elongation	120 (min)
Electrical Properties		
Dielectric Strength 125 mils (v/mil)	ASTM D-149	350 (min)
Dielectric Constant (1 khz)	ASTM D-150	3.4 (min)
Volume Resistivity (ohm-cm)	ASTM D-257	10 ¹⁴ (min)
Dissipation Factor (1 khz)	ASTM D-150	0.005 nominal

6.4.2.3 Sizes

- a. The size selection chart for self-amalgamating sealant tape is found in Table 6-8. The size, length and quantity manufactured shall be as specified.

Table 6-8. Self-Amalgamating Sealant Tape Size Selection

Width (Inches)	Length (Feet)	Thickness (Inches)
1	25	1/16 (min)
3/4	10	1/8 (min)

- b. The size selection for environmental boots is found in Table 6-9. The size, length and quantity manufactured shall be as specified.
- c. The size selection for heat shrinkable tubing and end caps with sealant is found in Table 6-10 and Table 6-11. The size, length and quantity manufactured shall be as specified. Tubing shall be supplied up to and including 60 inch lengths with sealant applied. The recovered inside diameter dimensions are reduced by the flow of the sealant.

Table 6-9. Environmental Boots Size Selection

Expanded Diameter (Inches)	Recovered Diameter (Inches)	Nominal Length (Inches)	Recovered Wall Thickness (Inches)
0.75	0.37	3.0	0.10
1.50	0.70	3.5	0.10
2.50	1.20	4.0	0.10
3.60	2.20	4.0	0.14
4.50	2.20	6.0	0.16

Table 6-10. Heat Shrinkable Tubing Size Selection

Expanded Diameter (Inches)	Recovered Diameter (Inches)	Recovered Wall Thickness (Inches)
0.40	0.15	0.060
0.75	0.22	0.090
1.10	0.37	0.105
1.50	0.50	0.120
1.70	0.50	0.120
2.00	0.75	0.155
2.70	0.90	0.155
3.00	1.25	0.155
4.00	1.75	0.155
4.50	1.75	0.155

Table 6-11. End Caps with Sealant Size Selection

Nominal Length (Inches)	Min Expanded ID (Inches)	Max Rec ID (Inches)	Nominal Recovered Wall (Inches)
3.250	1.150	0.500	0.095
3.500	1.500	0.750	0.100
3.750	2.000	1.000	0.105
4.500	2.500	1.250	0.110

6.4.2.4 Tolerances

Tolerances shall be as stated in the pertinent test method under the properties part of this specification.

6.4.2.5 Manufacture

- a. Tubing and end caps can be black in color for ultraviolet protection. Other colors available (without ultraviolet protection) are green, white and red.
- b. All insulated tools shall be clean, without burrs or rough edges and have a uniform cross section throughout and finished in a first class, workmanlike manner.

6.4.2.6 Drawings

The manufacturer shall submit for approval to the railroad, shop drawings of each product to be manufactured. Such drawings shall consist of scale and full-size drawings showing in detail all dimensions, kind and quantity of materials, specifications and any other information required for the fabrication of each product. No work indicated by such shop drawings required for the fabrication of said item is to commence until the manufacturer has received written approval of the submitted drawings.

6.4.3 INSPECTION AND SHIPMENT (1989)

6.4.3.1 Inspection

The manufacturer shall have adequate facilities for the inspection of each product by a representative of the railroad during the course of manufacturing.

6.4.3.2 Testing and Acceptance

If the product offered by the manufacturer is not a standard catalog item in production for at least three (3) years the vendor will, prior to delivery, submit for approval seven (7) copies of notarized certified test reports from a recognized independent laboratory (approved by the railroad) that the material lot to be supplied is in accordance with the specifications contained herein.

6.4.3.3 Packing

Each product shall be carefully prepared for shipment to prevent any damage in transit. Any item found damaged in shipment will be rejected by the railroad and shall be removed.

6.4.4 INSPECTION AND USE (1989)

- a. Tools must be inspected before each use to ensure that there has been no damage to the insulation. Tools with damaged insulation must not be used.
- b. Tools should be stored in location free of oils and grease to ensure proper protection of the insulation.



SECTION 6.5 PLANS FOR TRACK TOOLS¹ (1994)

6.5.1 GENERAL (1994)

- a. For the plans for track tools refer to Table 6-12 and Figure 6-1 through Figure 6-40.
- b. For the chemical specifications for carbon steel track tools refer to Article 6.1.1.1c.
- c. For the chemical specifications for alloy steel track tools, refer to Article 6.1.2.3.

Table 6-12. Plans for Track Tools (1997)

Plan Number	Description	Grade of Steel	Hardness
1-62	Clay Pick	Carbon or Alloy	425-500 BHN
2-62	Tamping Pick	Carbon or Alloy	425-500 BHN
3-83	Spike Maul	Alloy	51-55 Rc
4-62	Track Wrenches	Carbon	375-450 BHN
5-62	Lining Bars	Carbon	300-375 BHN
6-62	Rail Tongs	Carbon	
7-93	Tie Tongs	Carbon or Alloy	
8-93	Timber Tongs	Carbon or Alloy	
9-94	Spike Puller	Carbon	375-450 BHN
10-97	Rail Fork	Carbon	275-350 BHN
11-97	Claw Bar	Carbon	300-375 BHN
12-62	*Track Adz	Carbon or Alloy	375-450 BHN
12-A-62	*Carpenters Adz	Carbon or Alloy	
13-83	Double Faced Sledge	Alloy	51-55 Rc
14-62	Chisel End Tamping Bar	Carbon	425-500 BHN
15-62	Spear End Tamping Bar	Carbon	425-500 BHN
16-62	Tie Plug Driver	Carbon	
17-83	Track Chisel	Alloy	44-48 Rc (Head) 56-60 Rc (Point)
19-83	Round Track Punch	Alloy	44-48 Rc (Head) 52-56 Rc (Point)
20-62	Track Gage—Pipe Center	See Plan	
20-A-62	Track Gage—Wood Center	See Plan	
21-62	Track Shovels	Carbon or Alloy	45-50 Rc
22-62	Ballast Forks	Carbon	35-45 Rc
25-83	Track Tool Handles		

¹ References, Vol. 31, 1930, pp. 562, 1753; Vol. 33, 1932, pp. 582, 815; Vol. 34, 1933, pp. 508, 838; Vol. 35, 1934, pp. 936, 1118, 1122; Vol. 37, 1936, pp. 458, 1019; Vol. 39, 1938, pp. 405, 793; Vol. 40, 1939, pp. 544, 760; Vol. 41, 1940, pp. 564, 867; Vol. 42, 1941, pp. 587, 836; Vol. 43, 1942, pp. 522, 767; Vol. 45, 1944, pp. 338, 620; Vol. 47, 1946, pp. 483, 636; Vol. 50, 1949, pp. 569, 789; Vol. 51, 1950, pp. 650, 855; Vol. 52, 1951, pp. 519, 817; Vol. 54, 1953, pp. 975, 1399; Vol. 55, 1954, pp. 701, 1079; Vol. 57, 1956, pp. 685, 1066; Vol. 58, 1957, pp. 832, 1258; Vol. 62, 1961, pp. 652, 946; Vol. 63, 1962, pp. 490, 755; Vol. 67, 1966, pp. 409, 732; Vol. 68, 1967, p. 359; Vol. 69, 1968, p. 358; Vol. 72, 1971, p. 161; Vol. 94, p. 83.

Table 6-12. Plans for Track Tools (1997) (Continued)

Plan Number	Description	Grade of Steel	Hardness
26-62	Scoop	Carbon or Alloy	45-50 Rc
27-80	Aluminum Combination Track Level And Gage (Insulated)		
28-62	Scythe	See Plan	54-58 Rc
29-62	Snath	See Plan	
30-62	Spot Board	See Plan	
31-97	Rail Tongs For Use With Crane (Type 1 And 2)	See Plan	
32-83	Track Spike Lifter	Alloy	44-48 Rc (Head) 44-48 Rc (Claw)
33-83	Drive Spike Extractor	Carbon	300-350 BHN
	Socket Wrench		
34-71	Rail Thermometer		
35-83	Nut Cutter	Alloy	44-48 Rc (Head) 56-60 Rc (Point)
36-83	(3 lb.) Hot Cutter	Alloy	44-48 Rc (Head) 56-60 Rc (Point)
37-83	(5 lb.) Hot Cutter	Alloy	44-48 Rc (Head) 56-60 Rc (Point)
38-83	Drift Pin (Short)	Alloy	44-48 Rc (Overall)
39-83	Drift Pin (Long)	Alloy	44-48 Rc (Overall)
41-94	Spiking Tool	Alloy	44-48 Rc (Head) 52-56 (Point)
43-97	Switch Clip Wrench	Carbon	375-450 BHN

*When specified, the small eyed track tools will be furnished with AREMA handles. The handles are to be properly fitted and wedged.

Table 6-13. Chemical Specification for Carbon Steel Track Tools

Type	Specification
Carbon (Note 1)	0.55 to 0.70
Manganese	0.60 to 0.90
Phosphorous	0.05 max
Sulphur	0.05 max
Note 1: Applies to all carbon steel tools	

Table 6-14. Chemical Specifications for Alloy Steel Track Tools, Grades A and B

Grade	Carbon		Manganese		Phos	Sulfur	Silicon		Vanadium		Molybdenum	
	Min	Max	Min	Max	Max	Max	Min	Max	Min	Max	Min	Max
A	0.56	0.64	0.75	1.00	0.025	0.025	1.80	2.20				
B	0.51	0.60	0.75	1.00	0.025	0.025	1.80	2.20		0.45	0.35	0.50

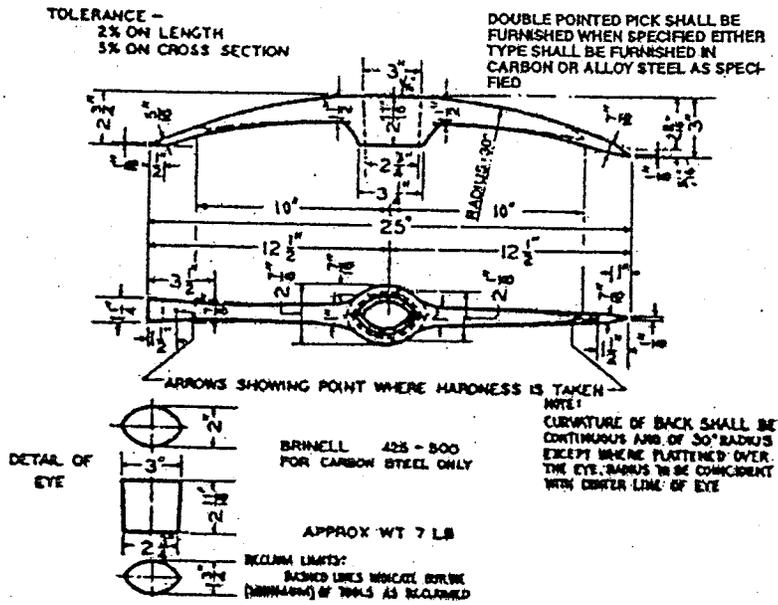


Figure 6-1. Plan 1-62 - AREMA Clay Pick

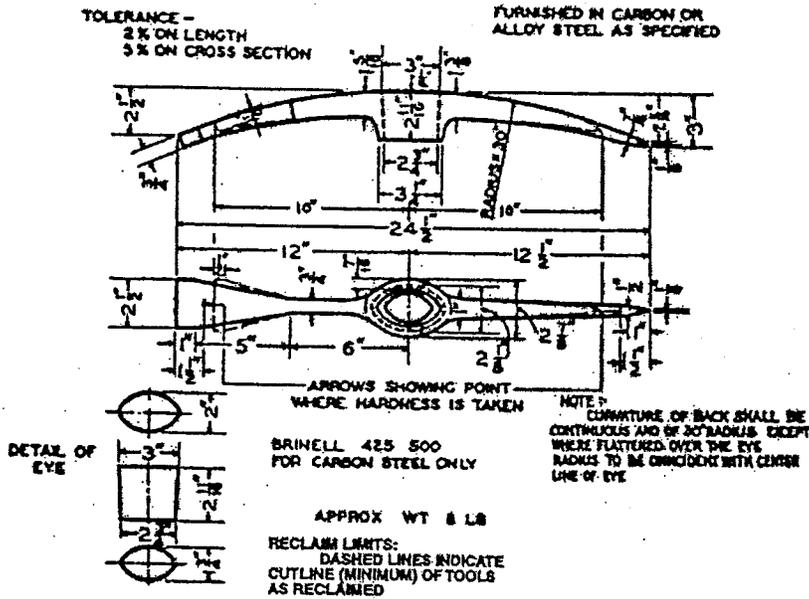


Figure 6-2. Plan 2-62 - AREMA Tamping Pick



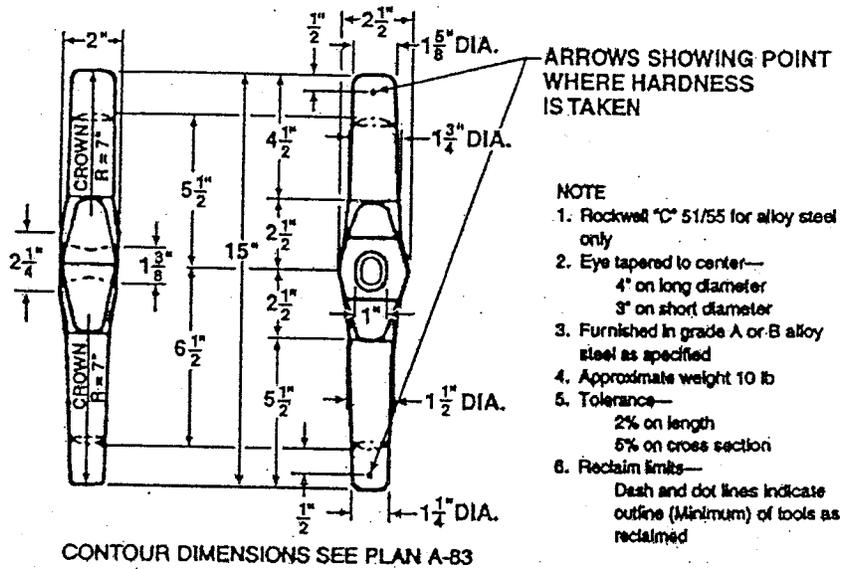


Figure 6-3. Plan 3-83 - AREMA Spike Maul

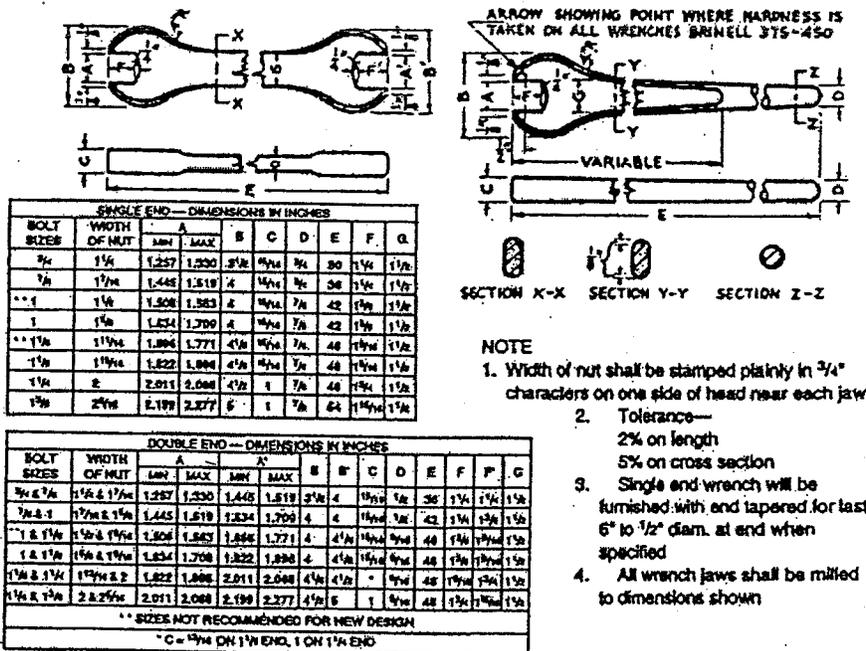


Figure 6-4. Plan 4-62 - AREMA Track Wrenches for Recommended Track Bolt Nuts

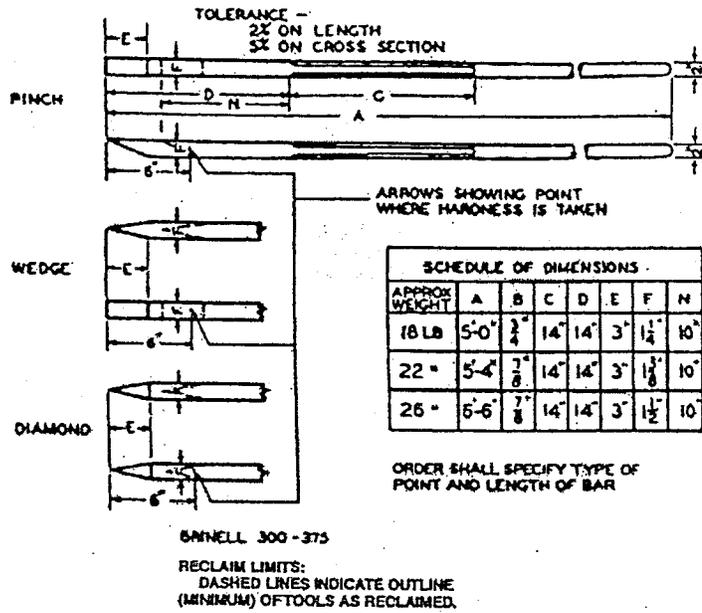


Figure 6-5. Plan 5-62 - AREMA Lining Bar

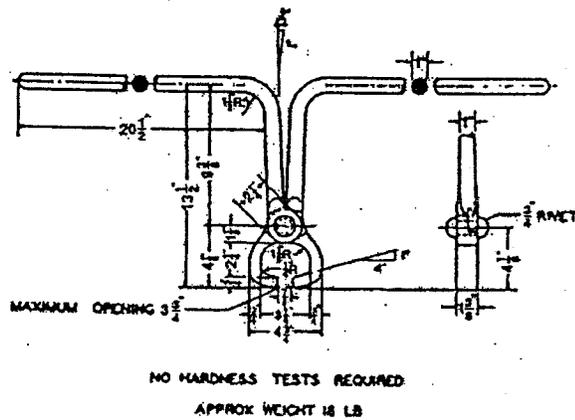


Figure 6-6. Plan 6-62 - AREMA Rail Tongs



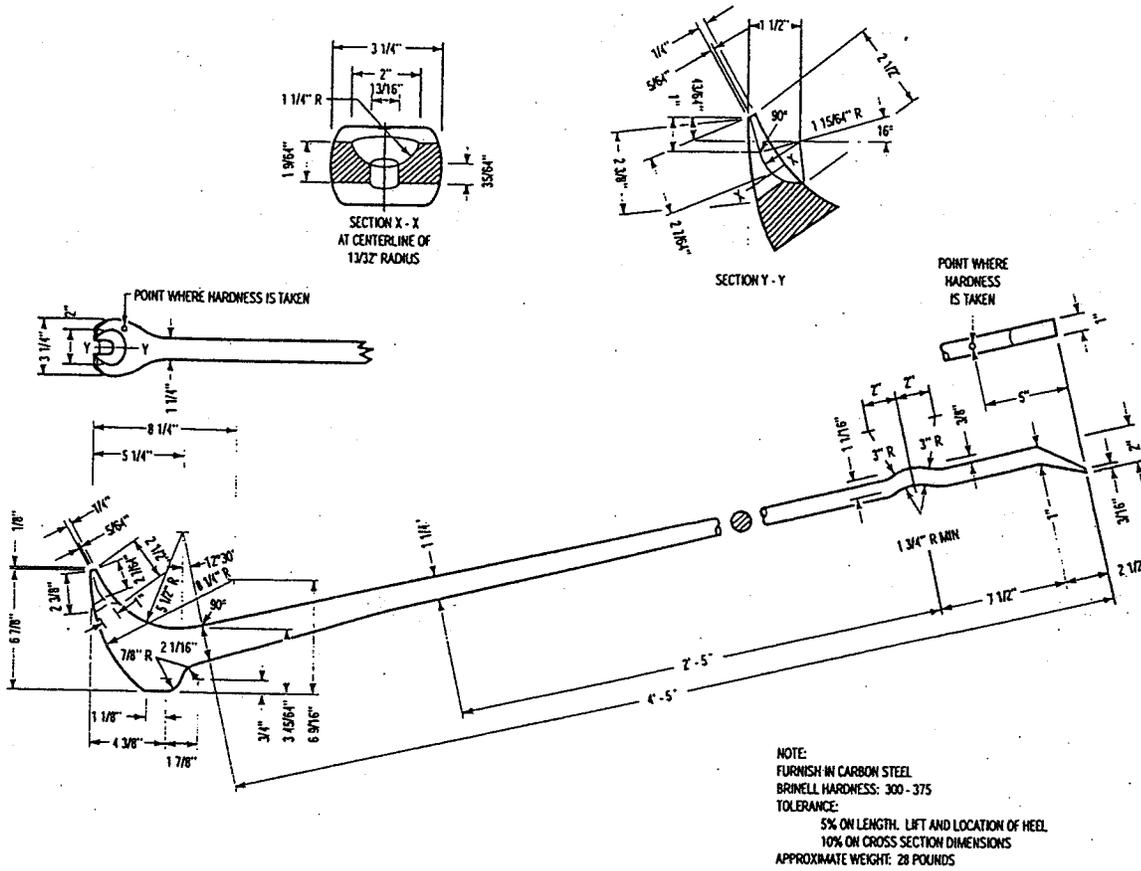


Figure 6-11. Plan 11-97 - AREMA Claw Bar

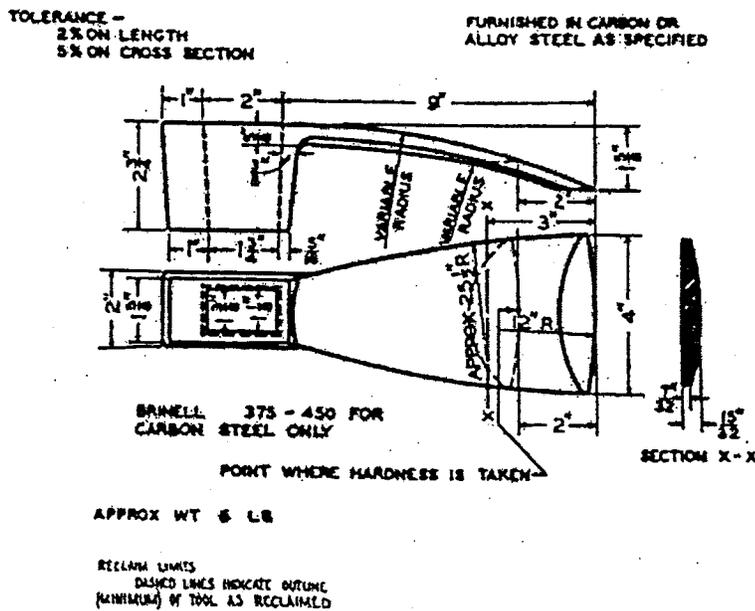


Figure 6-12. Plan 12-62 - AREMA Track Adz



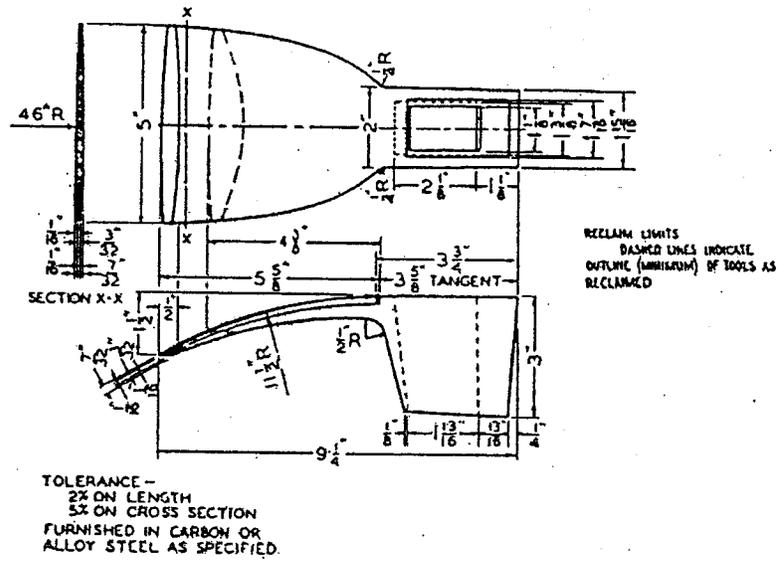


Figure 6-13. Plan 12A-62 - AREMA Carpenter's Adz

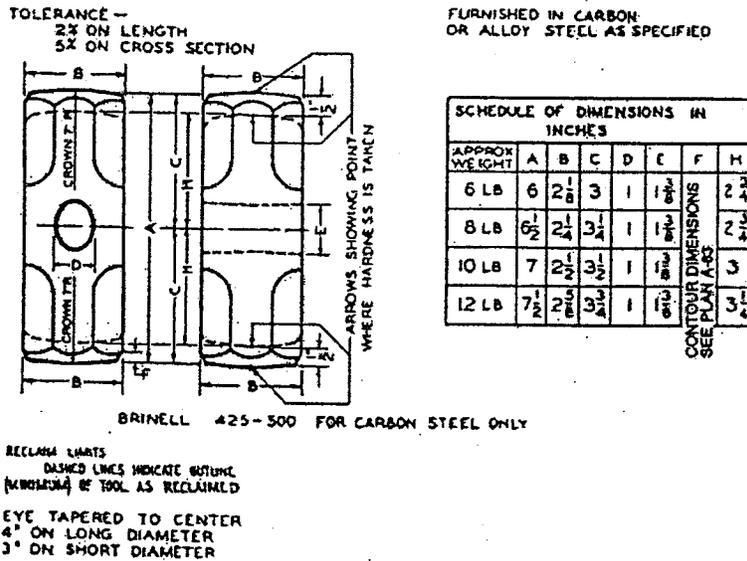
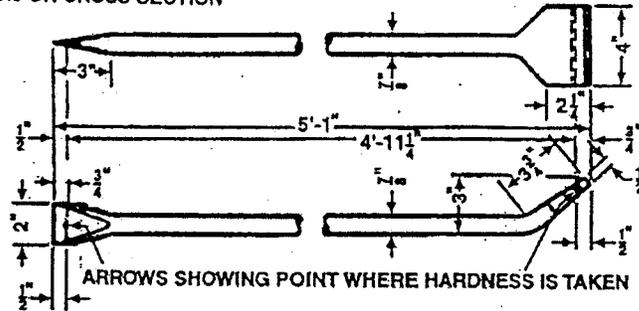


Figure 6-14. Plan 13-83 - AREMA Double-faced Sledge

TOLERANCE—
2% ON LENGTH
5% ON CROSS SECTION

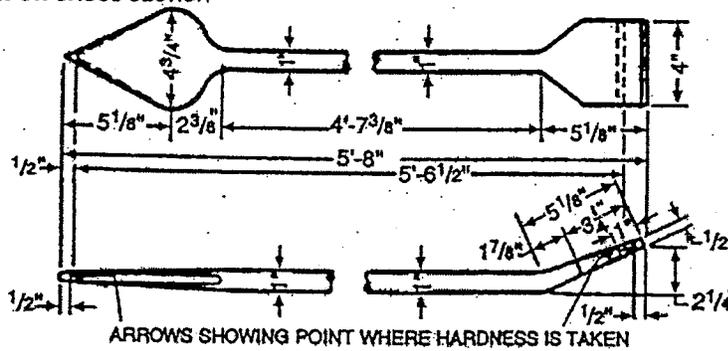


BRINELL 425-500
APPROX WT 13 LB

RECLAIM LIMITS:
DASHED LINES INDICATE OUTLINE
(MINIMUM) OF TOOLS AS RECLAIMED

Figure 6-15. Plan 14-62 – AREMA Chisel End Tamping Bar

TOLERANCE—
2% ON LENGTH
5% ON CROSS SECTION

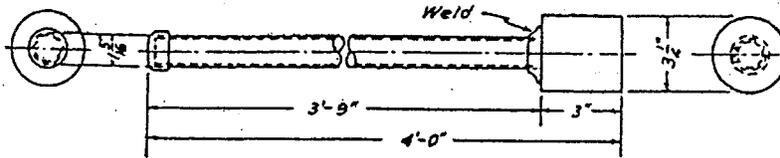


BRINELL 425-500
APPROX WT 15 LB

RECLAIM LIMITS:
DASHED LINES INDICATE OUTLINE
(MINIMUM) OF TOOLS AS RECLAIMED

Figure 6-16. Plan 15-62 – AREMA Spear End Tamping Bar



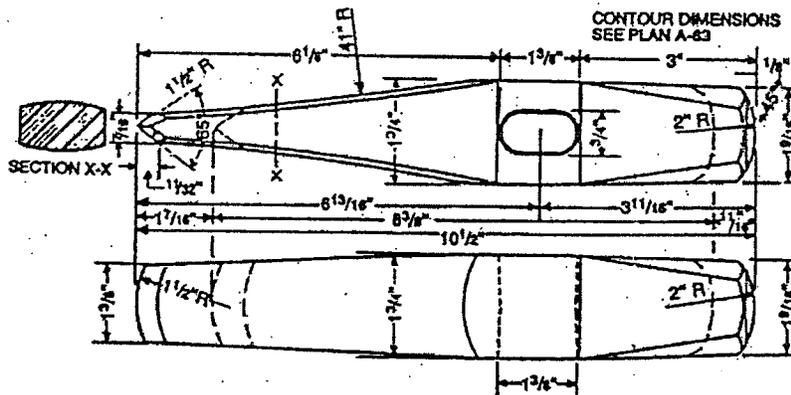


Handle: Standard weight pipe with cap
Block: Rolled round steel

Approx. weight 13.5 lb

NOTE:
ALL SHARP EDGES TO BE SMOOTHED BY GRINDING

Figure 6-17. Plan 16-62 – AREMA Tie Plug Driver



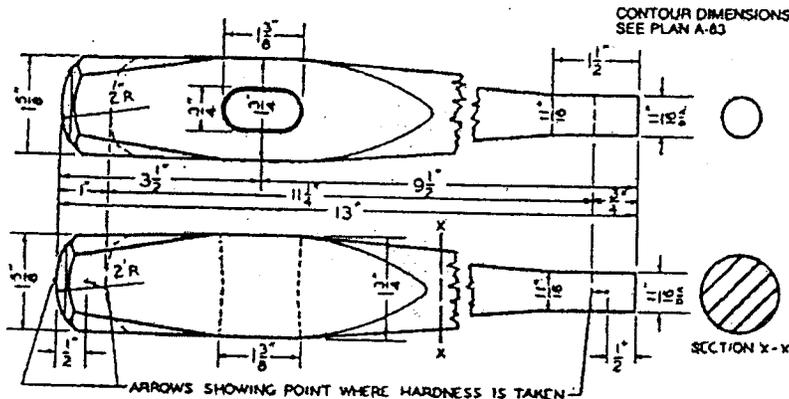
THIS DESIGN FURNISHED IN CARBON OR ALLOY STEEL AS SPECIFIED
APPROX WEIGHT 5 1/2 LB

TOLERANCE—
2% ON LENGTH, 5% ON CROSS SECTION
EYE TAPERED TO CENTER
4" ON LONG DIAMETER
3" ON SHORT DIAMETER

ROCKWELL "C" — POINT 58/60
HEAD 44/48

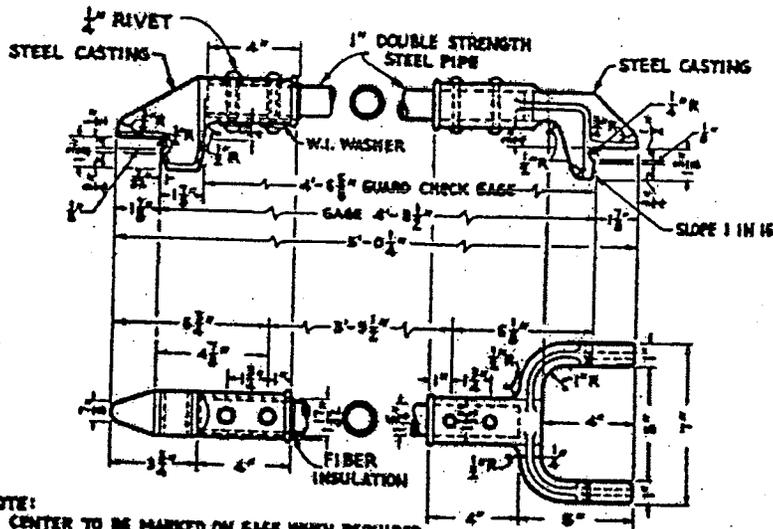
RECLAIM LIMITS:
DASHED LINES INDICATE OUTLINE
(MINIMUM) OF TOOLS AS RECLAIMED

Figure 6-18. Plan 17-83 – AREMA Track Chisel



- NOTE:
1. APPROX WT 8 1/2 LB
 2. TOLERANCE —
2% ON LENGTH
5% ON CROSS SECTION
 3. EYE TAPERED TO CENTER
4" ON LONG DIAMETER
3" ON SHORT DIAMETER
 4. RECLAIM LIMITS:
DASHED LINES INDICATE OUTLINE
(MINIMUM) OF TOOLS AS RECLAIMED
- 5 ROCKWELL "C" POINT 52-56 FOR ALLOY
HEAD 44-48
- 6 FURNISHED IN GRADE A OR B ALLOY STEEL
AS SPECIFIED

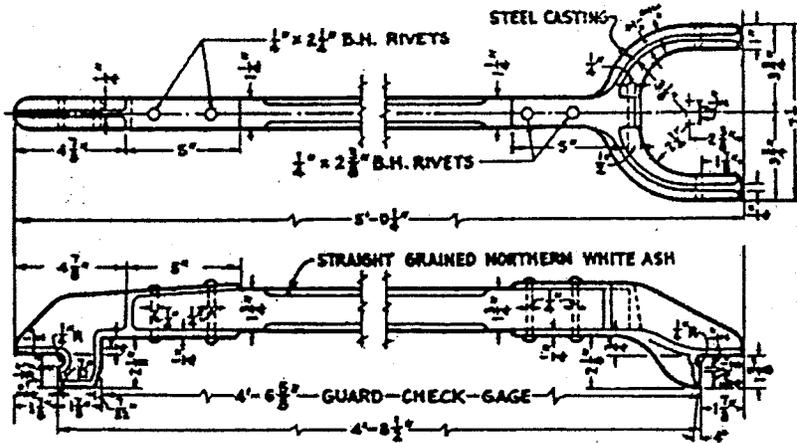
Figure 6-19. Plan 19-83 – AREMA Round Track Punch



- NOTE:
1. CENTER TO BE MARKED ON GAGE WHEN REQUIRED
 2. NO TOLERANCE ALLOWED ON GAGE DISTANCE
 3. TOLERANCE —
2% ON LENGTH
3% ON CROSS SECTION
 4. APPROX WT 17 LB

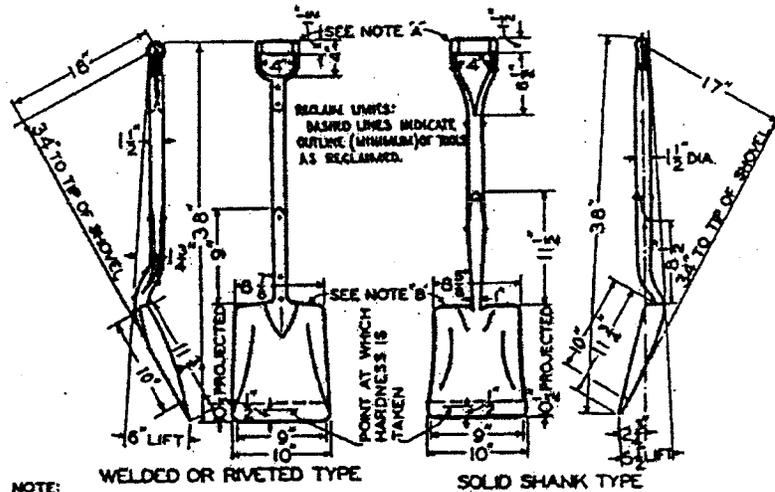
Figure 6-20. Plan 20-62 – AREMA Track Gage – Pipe Center





- NOTE:
1. CENTER TO BE MARKED ON GAGE WHEN REQUIRED
 2. NO TOLERANCE ALLOWED IN GAGE DISTANCE
 3. TOLERANCE -
 - 2% ON LENGTH
 - 5% ON CROSS SECTION

Figure 6-21. Plan 20A-62 - AREMA Track Gage - Wood Center



- NOTE:
- A. HANDLE TOPS WILL BE FURNISHED SUBJECT TO APPROVAL OF PURCHASER AS SPECIFIED IN SPLIT WOOD 'D', MALLEABLE 'O' OR COMBINATION STEEL WOOD 'D'.
 - B. FOOT TREAD ON TOP OF BLADE APPROX. 1/2\"/>

ROCKWELL 45-50

Figure 6-22. Plan 21-62 - AREMA Track Shovel

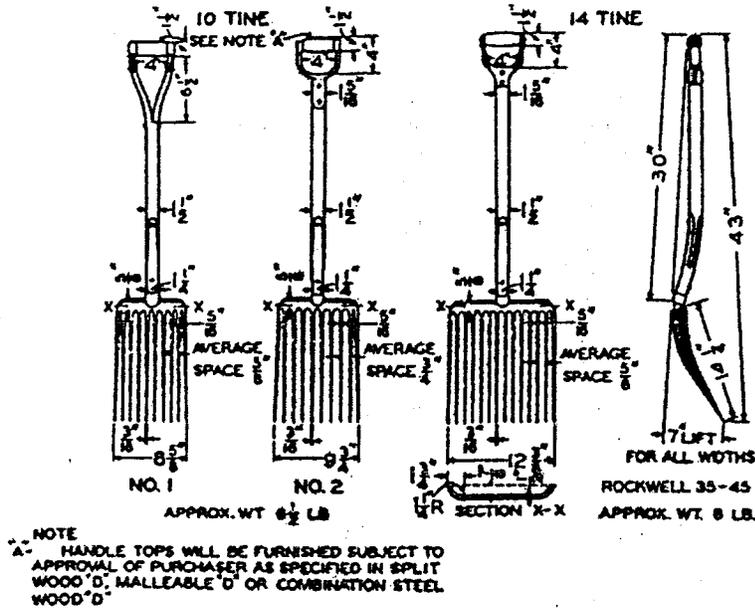


Figure 6-23. Plan 22-62 – AREMA Ballast Forks

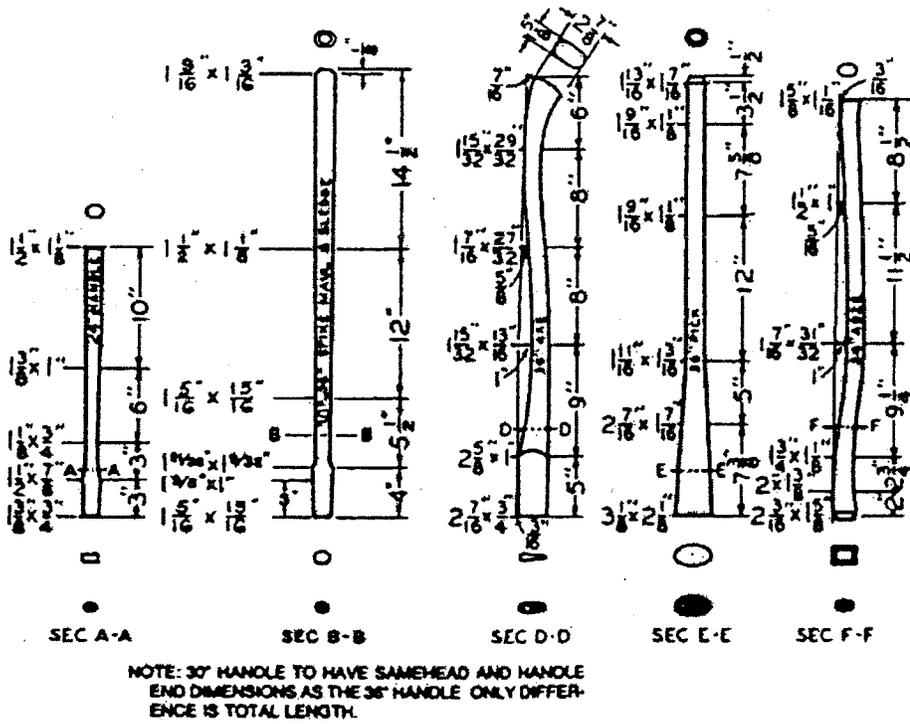


Figure 6-24. Plan 25-83 – AREMA Track Tool Handles



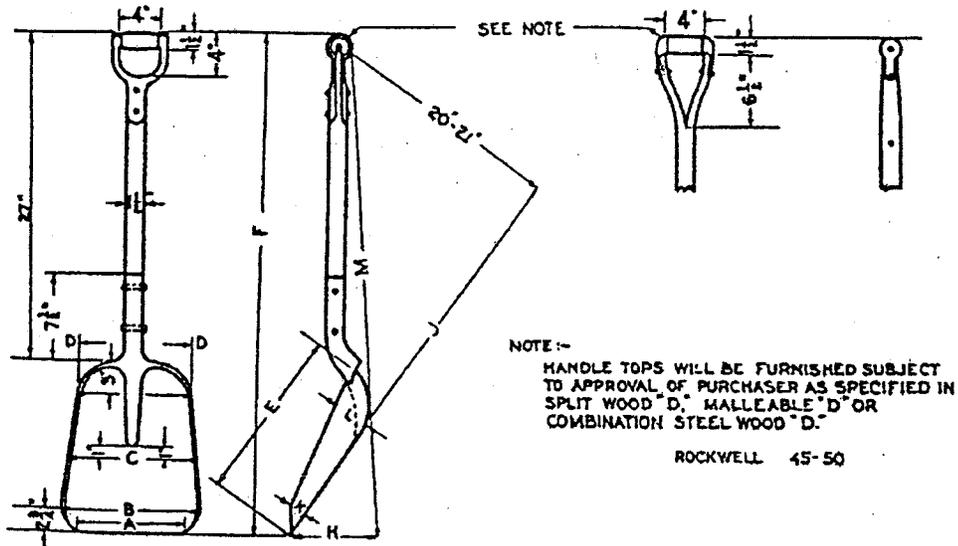


TABLE OF DIMENSIONS - SIZES NO 2, 4 AND 6.

SIZE	A	B	C	D	E	F	H	J	K	L	M
2	10 1/4"	11 3/4"	11"	8"	15"	40 3/4"	7"	35"	1 3/8"	3 3/4"	40 3/4"
4	11"	12"	11 1/4"	9 1/4"	16"	41 3/4"	7 3/8"	36"	1 5/8"	3 5/8"	41 3/4"
6	11 1/2"	12 1/4"	11 3/4"	9 3/4"	17"	42 3/4"	7 3/4"	37"	1 7/8"	3 7/8"	42 3/4"

TOLERANCE + OR - 1/4"

Figure 6-25. Plan 26-62 - AREMA Scoop

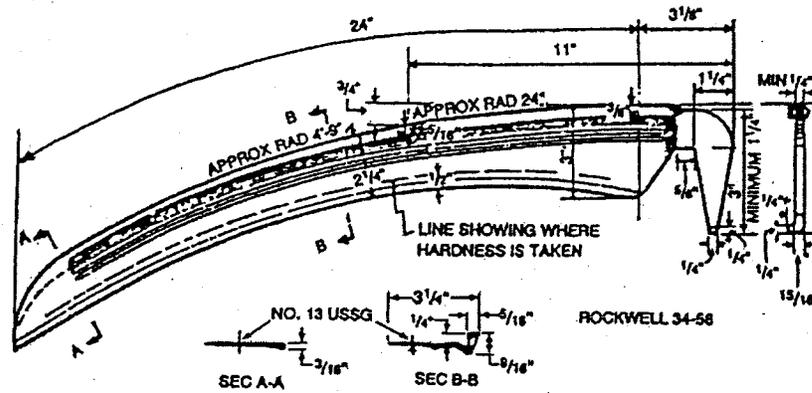


Figure 6-27. Plan 28-62 - AREMA Scythe

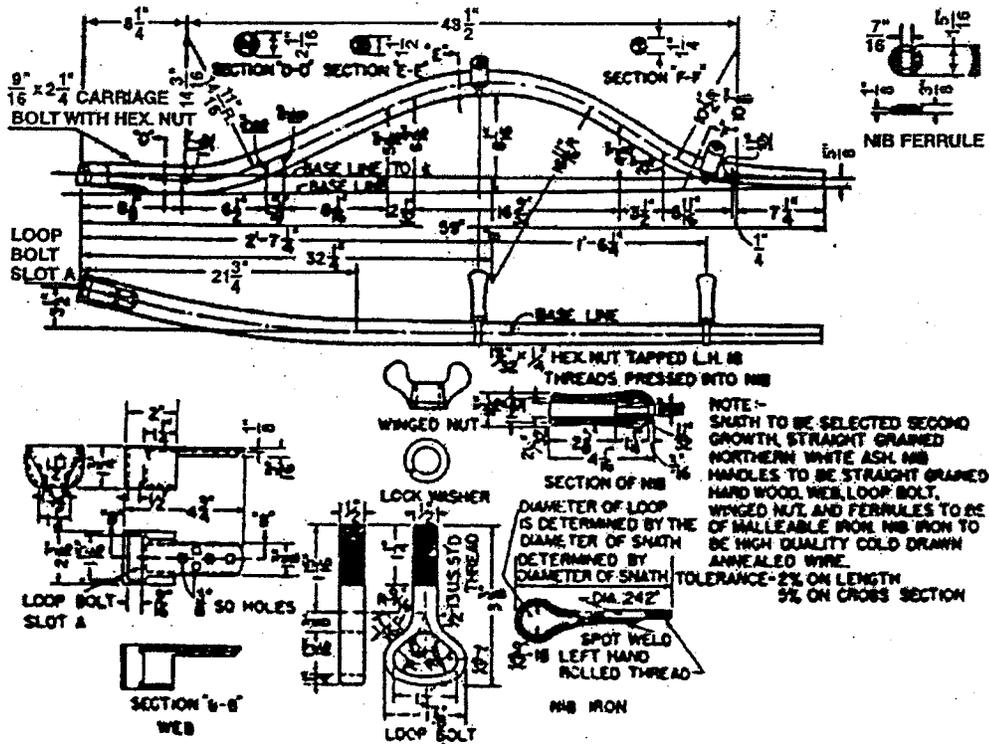


Figure 6-28. Plan 29-62 - AREMA Snath



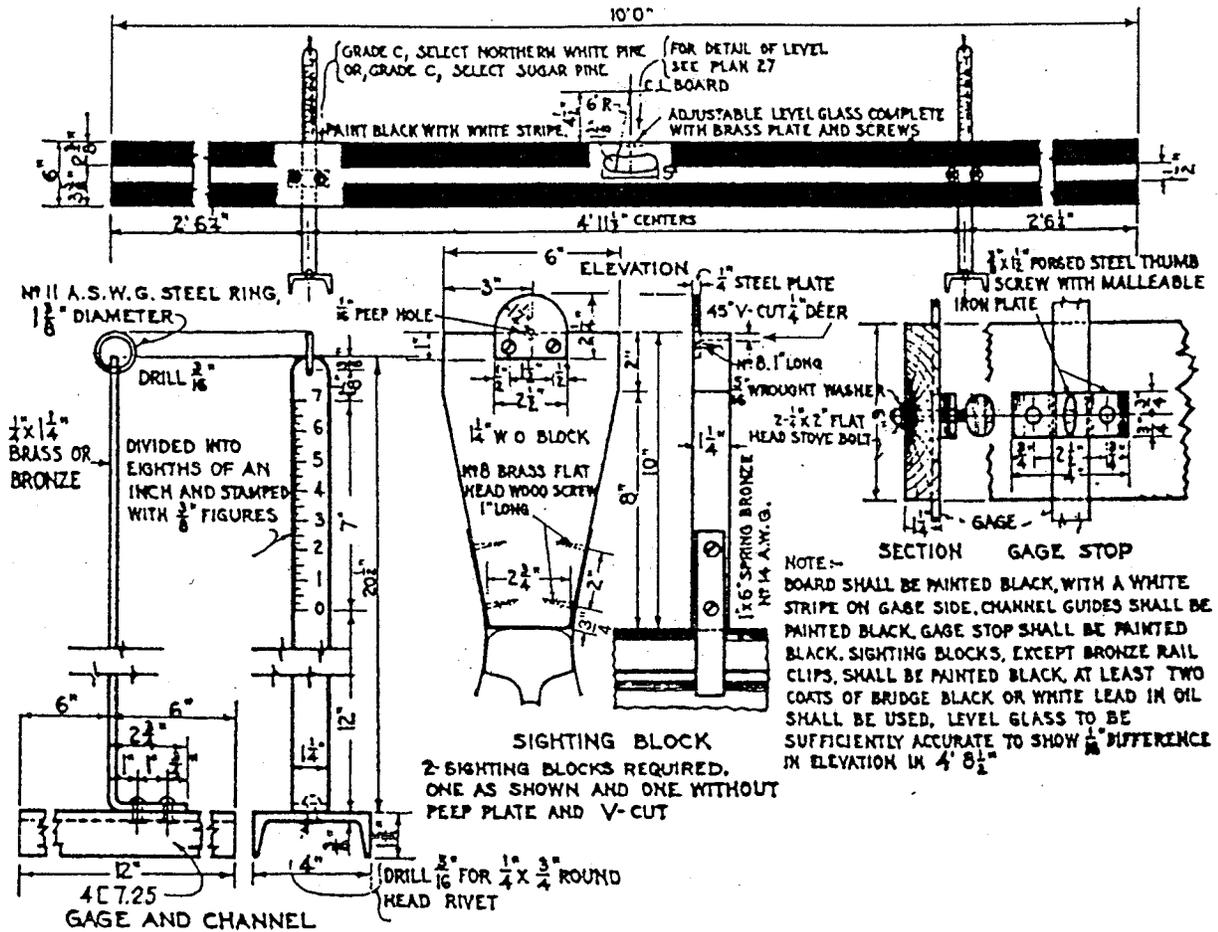
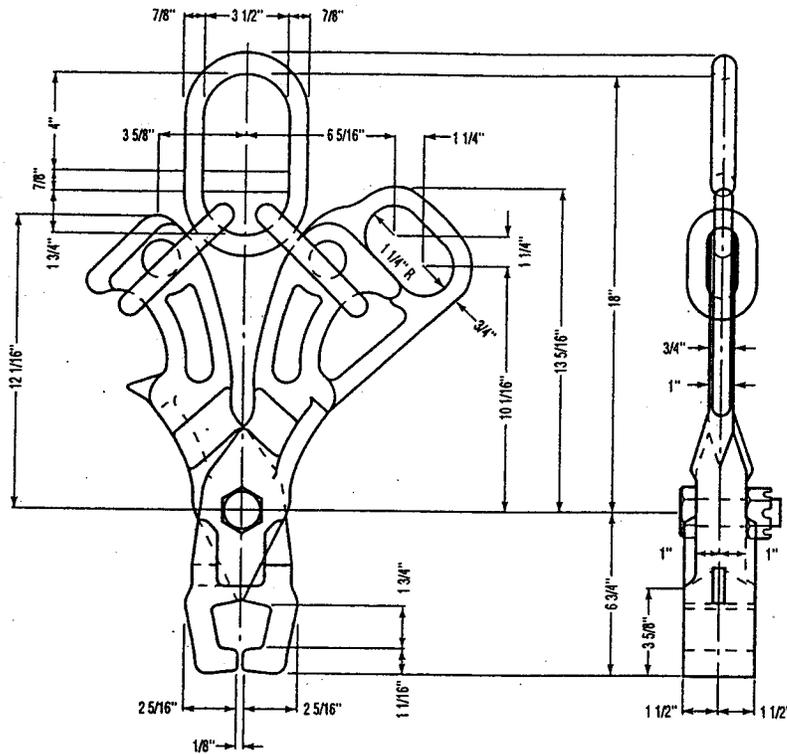


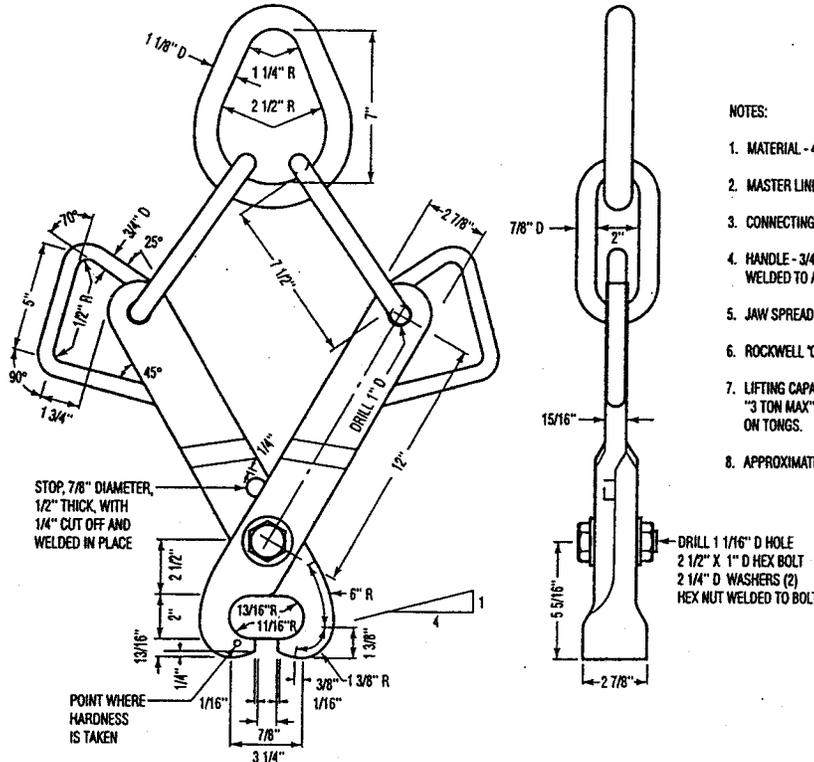
Figure 6-29. Plan 30-62 – AREMA Spot Board



NOTES:

1. MATERIAL - HEAT TREATED ALLOY STEEL.
2. LIFTING RING - 7/8" DIAMETER BAR, MILD STEEL.
3. OBLONG LINK - 7/8" DIAMETER BAR, MILD STEEL.
4. JAW SPREAD - APPROXIMATELY 6 3/4".
5. LIFTING CAPACITY - "3 TON MAX" TO BE STAMPED ON TONGS.
6. APPROXIMATE WEIGHT - 56 POUNDS.

TYPE 1



NOTES:

1. MATERIAL - 4140 STEEL FORGED.
2. MASTER LINK - 1 1/8" DIAMETER.
3. CONNECTING LINKS - 7/8" DIAMETER.
4. HANDLE - 3/4" DIAMETER MILD STEEL WELDED TO ARM.
5. JAW SPREAD - 6 3/8" MINIMUM.
6. ROCKWELL 'C' OVERALL 34/40.
7. LIFTING CAPACITY - "3 TON MAX" TO BE STAMPED ON TONGS.
8. APPROXIMATE WEIGHT - 40 POUNDS.

TYPE 2

Figure 6-30. Plan 31-97 - AREMA Rail Tongs for Use with Cranes

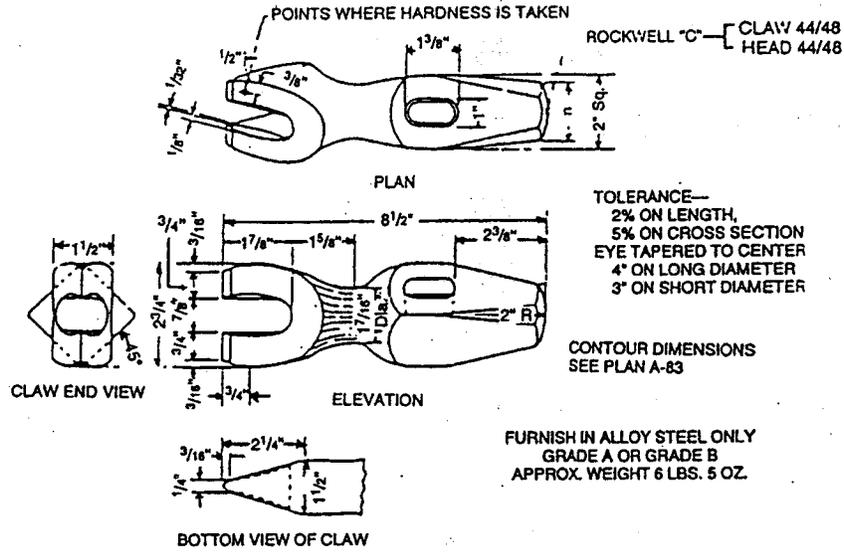


Figure 6-31. Plan 32-83 – AREMA Track Spike Lifter

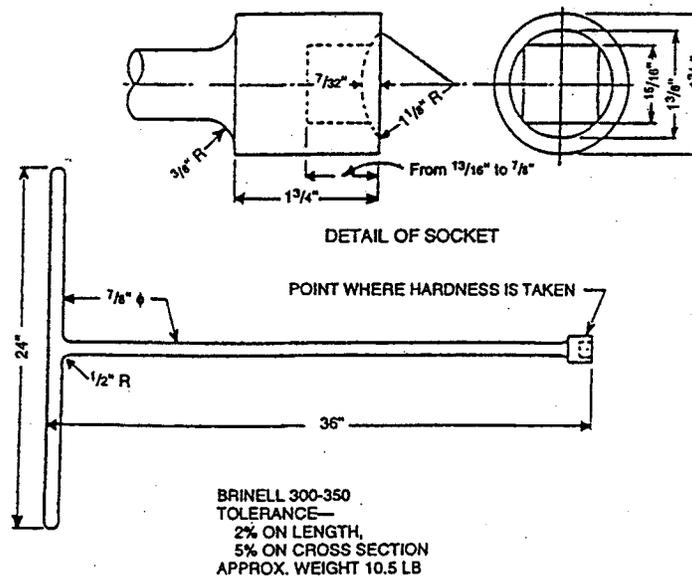
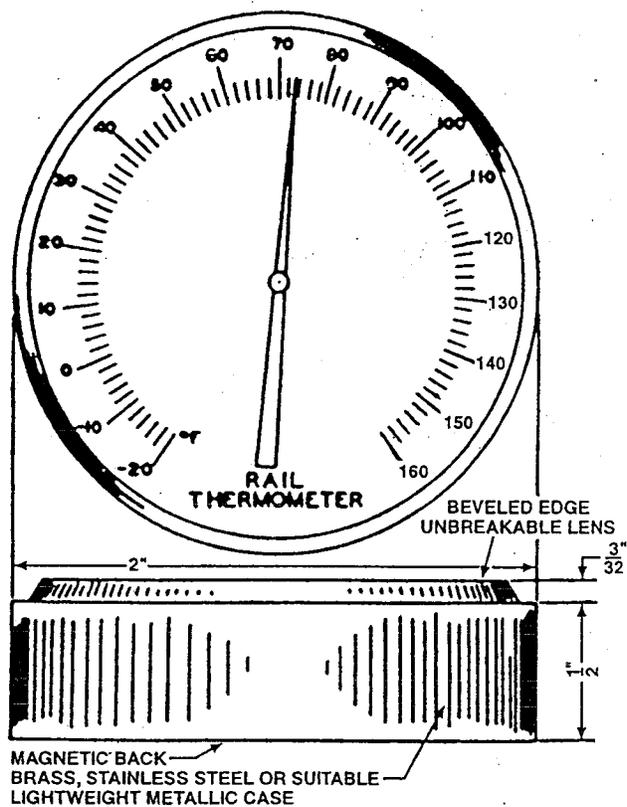
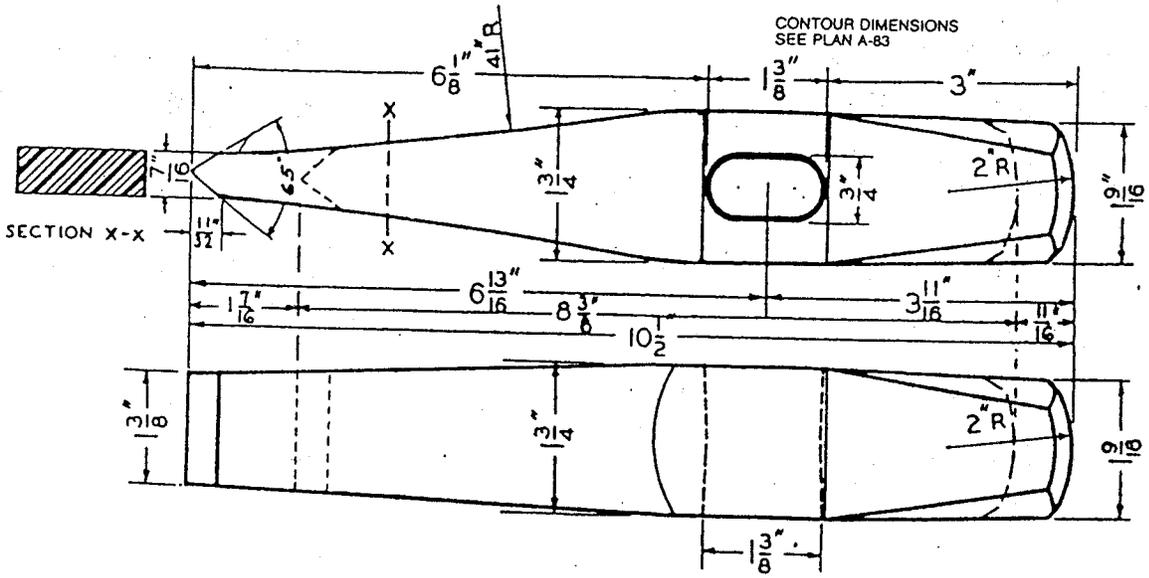


Figure 6-32. Plan 33-62 – AREMA Drive Spike Extractor Socket Wrench



1. THERMOMETER SHALL BE ENCLOSED IN A BRASS, STAINLESS STEEL OR SUITABLE LIGHTWEIGHT METALLIC CASE APPROXIMATELY 2 INCHES IN DIAMETER AND NOT MORE THAN 1/2 INCH THICK.
2. THERMOMETER SHALL HAVE A FLAT, BEVELED-EDGE, UNBREAKABLE PLASTIC LENS RAISED NOT MORE THAN 3/32 INCH ABOVE THE CASE.
3. THERMOMETER SHALL HAVE A WHITE FACE, BLACK TEMPERATURE SCALE, BLACK NUMERALS AND A RED INDICATION HAND. NUMERALS SHALL BE AS LARGE AS POSSIBLE FOR EASY READABILITY. SCALE GRADUATIONS SHALL BE IN 2-DEGREE INCREMENTS AND 10-DEGREE INTERVALS.
4. THERMOMETER SHALL HAVE A BIMETALLIC SENSING ELEMENT PRE-CONDITIONED AND TESTED FOR PERMANENT CALIBRATION FOR ACCURACY TO WITHIN $\pm 2\%$ OF FULL SCALE RANGE.
5. THERMOMETER SENSING ELEMENT SHALL BE COMPLETELY ENCLOSED AND SHALL REACH SENSING EQUILIBRIUM STABILITY WITHIN 3 MINUTES.
6. THERMOMETER SHALL HAVE ENCLOSED MAGNET OR MAGNETS ON INNER SURFACE OF BACK SIDE OF CASE. MAGNETS SHALL BE STRONG ENOUGH TO SUSTAIN ITS OWN WEIGHT IN ANY POSITION.
7. THERMOMETER SHALL NOT WEIGH MORE THAN 2 OZ.

Figure 6-33. Plan 34-71 – AREMA Rail Thermometer

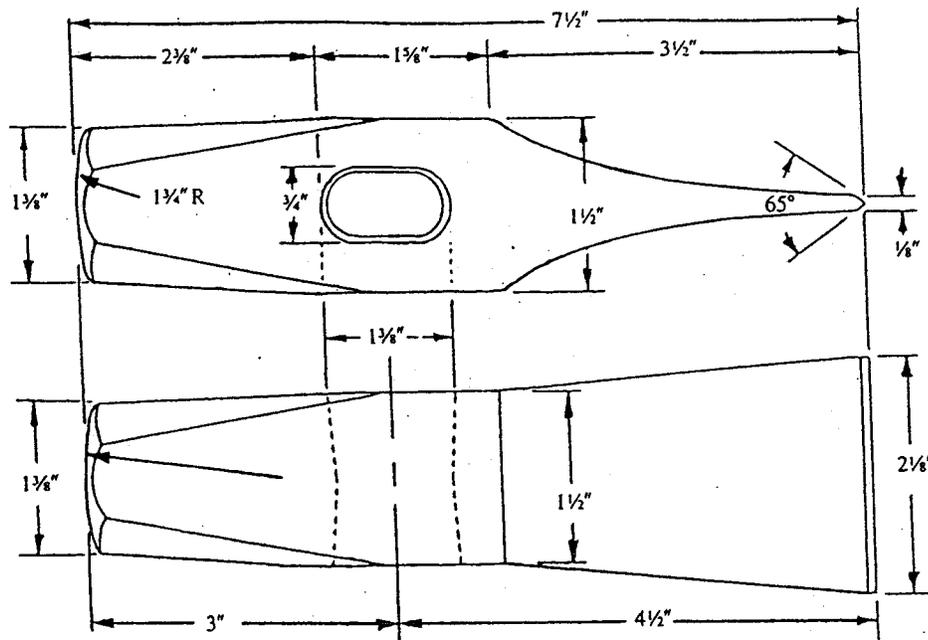


THIS DESIGN FURNISHED IN GRADE A OR B ALLOY
 STEEL AS SPECIFIED
 APPROX WEIGHT 5 1/2 LB
 Rockwell POINT 56/60
 "C" HEAD 44/48

TOLERANCE —
 2% ON LENGTH, 5% ON CROSS SECTION
 EYE TAPERED TO CENTER
 4° ON LONG DIAMETER
 3° ON SHORT DIAMETER

RECLAIM LIMITS:
 DASHED LINES INDICATE OUTLINE
 (MINIMUM) OF TOOLS AS RECLAIMED.

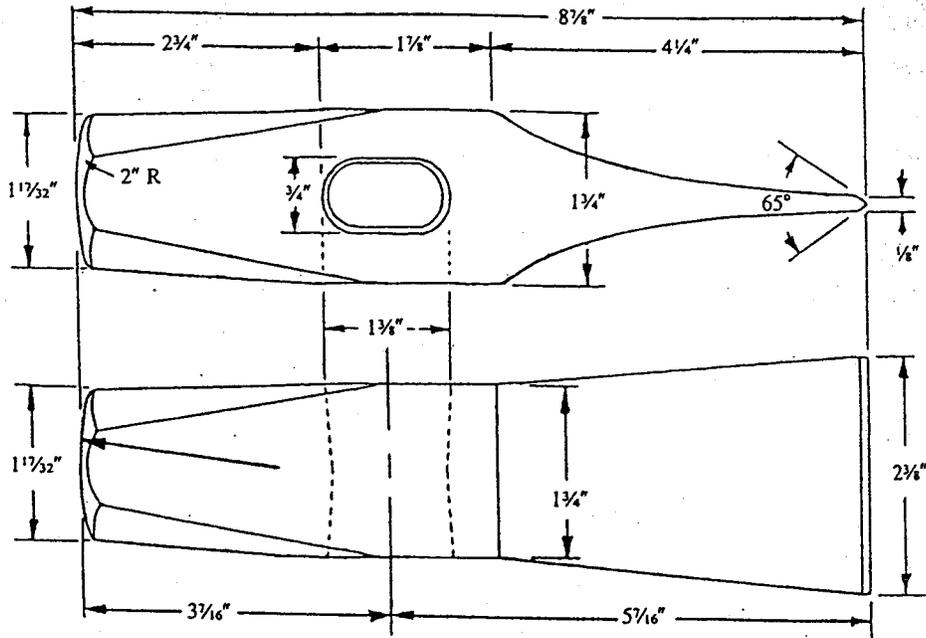
Figure 6-34. Plan 35-83 – AREMA Nut Cutter



TOLERANCE
 2% ON LENGTH
 5% ON CROSS SECTION
 EYE TAPERED TO CENTER
 4° ON LONG DIAMETER
 3° ON SHORT DIAMETER

FURNISHED IN GRADE A OR B
 ALLOY STEEL AS SPECIFIED
 ROCKWELL "C" POINT 56/60
 HEAD 44/48
 CONTOUR GROUND HEAD (Plan A-83)

Figure 6-35. Plan 36-83 – AREMA 3 Lb Hot Cutter



TOLERANCE
 2% ON LENGTH
 5% ON CROSS SECTION

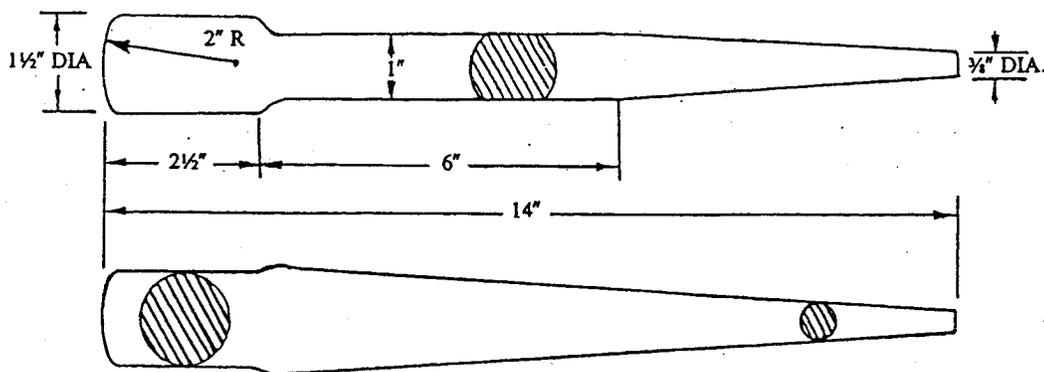
EYE TAPERED TO CENTER
 4° ON LONG DIAMETER
 3° ON SHORT DIAMETER

FURNISHED IN GRADE A OR B
 ALLOY STEEL AS SPECIFIED

ROCKWELL "C" POINT 55/60
 HEAD 44/48

CONTOUR GROUND HEAD (Plan A-83)

Figure 6-36. Plan 37-83 – AREMA 5 Lb Hot Cutter

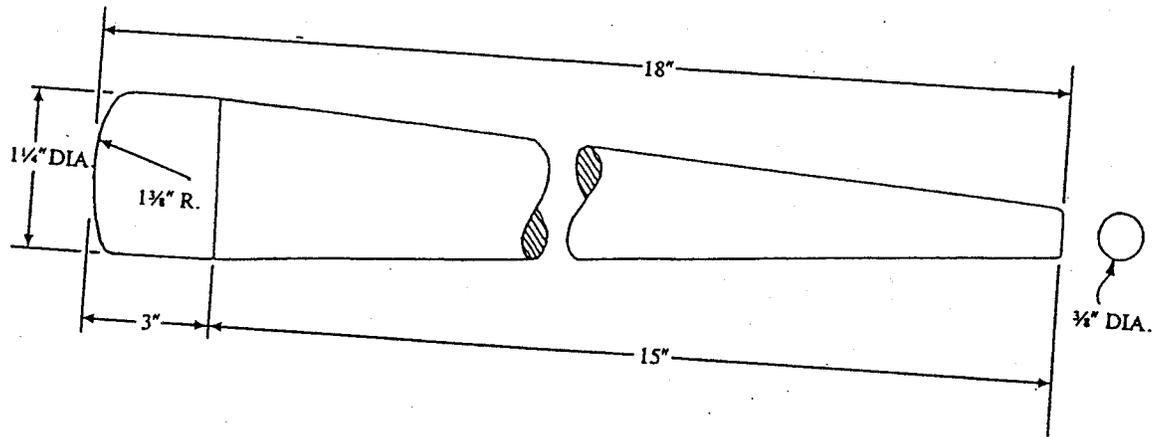


CONTOUR GROUND HEAD (Plan A-83)
 TOLERANCE—
 2% ON LENGTH, 5% ON CROSS SECTION

THIS DESIGN FURNISHED IN
 GRADE A OR B ALLOY
 STEEL AS SPECIFIED

ROCKWELL "C" OVERALL 44/48

Figure 6-37. Plan 38-83 – AREMA Drift Pin (Short)

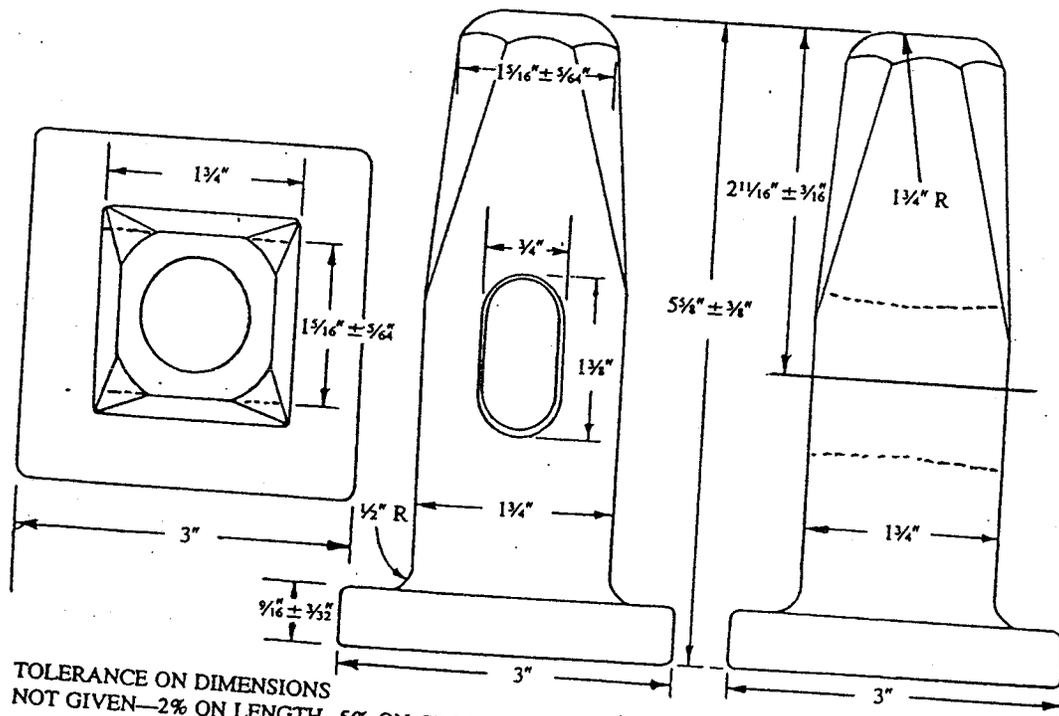


CONTOUR GROUND HEAD (Plan A-83)
TOLERANCE—
2% ON LENGTH, 5% ON CROSS SECTION

THIS DESIGN FURNISHED IN
GRADE A OR B ALLOY
STEEL AS SPECIFIED

ROCKWELL "C" OVERALL 44/48

Figure 6-38. Plan 39-83 – AREMA Drift Pin (Long)



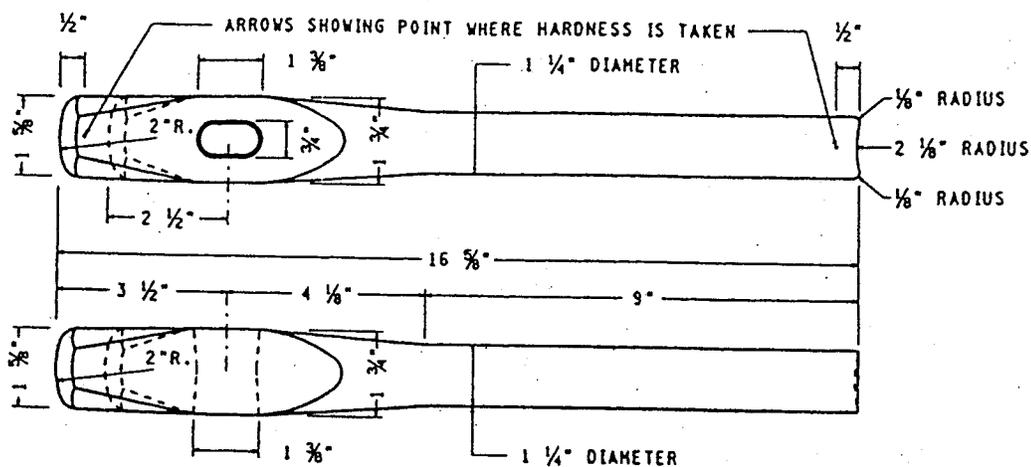
TOLERANCE ON DIMENSIONS
NOT GIVEN—2% ON LENGTH, 5% ON CROSS SECTION

EYE TAPERED TO CENTER
4° ON LONG DIAMETER
3° ON SHORT DIAMETER

THIS DESIGN FURNISHED IN
GRADE A OR B ALLOY
STEEL AS SPECIFIED

CONTOUR GROUND HEAD (Plan A-83)
ROCKWELL "C" OVERALL 44/84

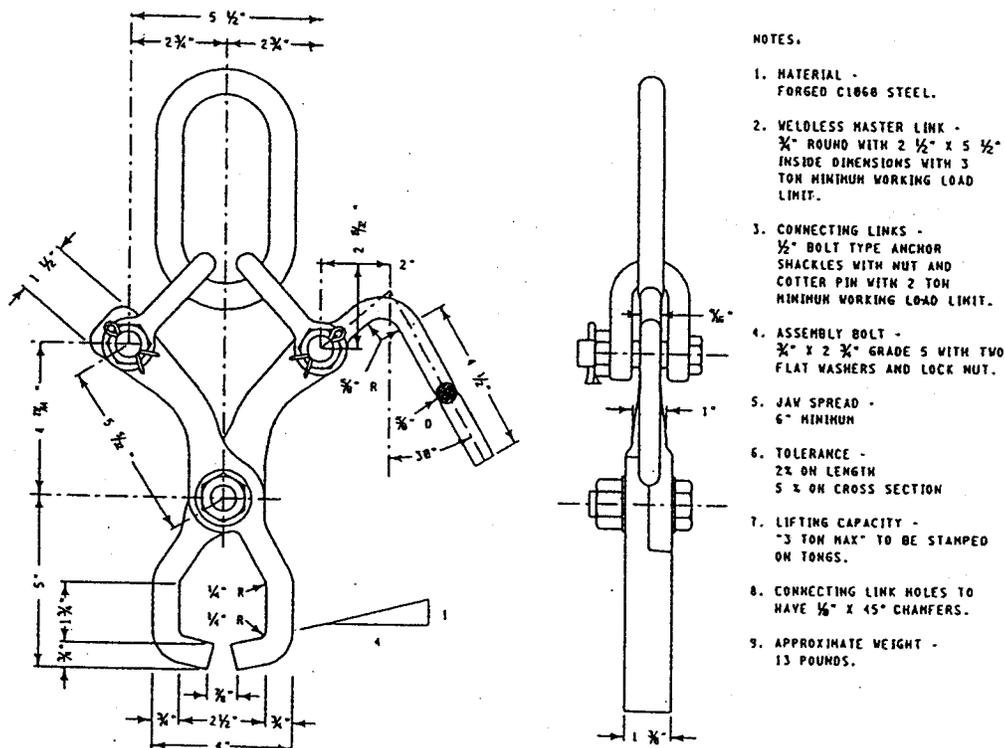
Figure 6-39. Plan 40-83 – AREMA 3 Inch Square Flatter



NOTE.

1. TOLERANCE -
2 % ON LENGTH
5 % ON CROSS SECTION
2. EYE TAPERED TO CENTER -
4° ON LONG DIAMETER
3° ON SHORT DIAMETER
3. TOOL TO BE FURNISHED IN
GRADE A OR B ALLOY STEEL.
4. ROCKWELL C -
POINT 52/56
HEAD 44/48
5. CONTOUR GRIND HEAD PER AREA
PLANS A-83, C-83, AND D-83.
6. DASHED LINES INDICATE
OUTLINE (MINIMUM) OF TOOLS
AS RECLAIMED.
7. APPROXIMATE WEIGHT 6 POUNDS.

Figure 6-40. Plan 41-94 – AREMA Spiking Tool



NOTES.

1. MATERIAL -
FORGED C1068 STEEL.
2. WELDLESS MASTER LINK -
3/4" ROUND WITH 2 1/2" X 5 1/2"
INSIDE DIMENSIONS WITH 3
TON MINIMUM WORKING LOAD
LIMIT.
3. CONNECTING LINKS -
1/2" BOLT TYPE ANCHOR
SHACKLES WITH NUT AND
COTTER PIN WITH 2 TON
MINIMUM WORKING LOAD LIMIT.
4. ASSEMBLY BOLT -
3/4" X 2 3/4" GRADE 5 WITH TWO
FLAT WASHERS AND LOCK NUT.
5. JAW SPREAD -
6" MINIMUM
6. TOLERANCE -
2% ON LENGTH
5 % ON CROSS SECTION
7. LIFTING CAPACITY -
"3 TON MAX" TO BE STAMPED
ON TONGS.
8. CONNECTING LINK HOLES TO
HAVE 1/8" X 45° CHAMFERS.
9. APPROXIMATE WEIGHT -
13 POUNDS.

Figure 6-41. Plan 42-97 – AREMA Rail Tongs For Use With Truck Crane

1. WIDTH OF NUT SHALL BE STAMPED PLAINLY IN 3/4" CHARACTERS ON TOP SIDE OF HEAD NEAR THE JAW.
2. TOLERANCE - 2% ON LENGTH
5% ON CROSS SECTION
3. ROUND CORNERS AT WRENCH END TO 1/16" RADIUS.

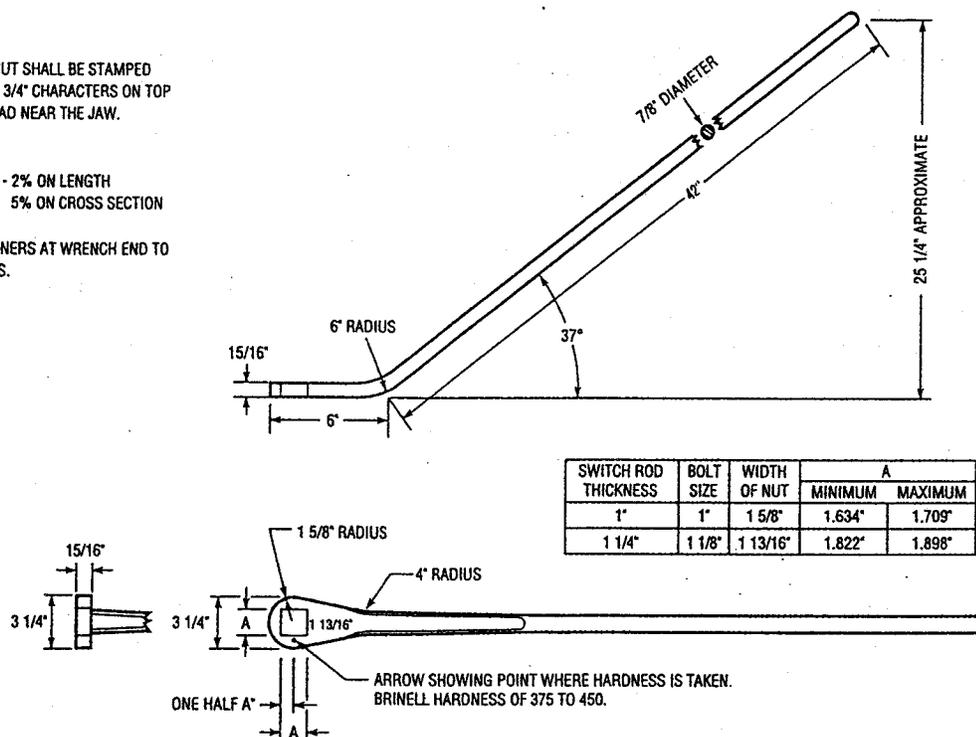


Figure 6-42. Plan 43-97 - AREMA Switch Clip Wrench

6.5.2 HAND TOOL CONTOUR DIMENSIONS (1984)

For the hand tool contour dimensions refer to Table 6-15.

Table 6-15. Plan A-83 - AREMA Hand Tool Contour Dimensions

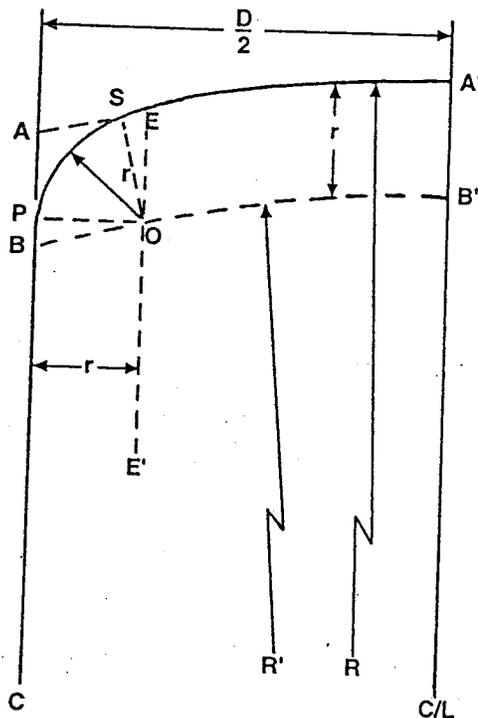
Type of Tool	Tool Size	Stock Diameter of Head (D) (Note 1)	Radius of Crown on Face (R)	Corner Radius (r)	Dimensions Indentation (C)	Also See Plan
Sledges	6 lb	2 1/8"	7.0"	3/8"	-	B-83 and D-83
	8 lb	2 1/4"	7.0"	7/16"	-	
	10 lb	2 1/2"	7.0"	7/16"	-	
	12 lb	2 5/8"	7.0"	7/16"	-	
Spike Maul	-	1 1/4"	7.0"	1/4"	-	B-83 and D-83
	-	1 5/8"	7.0"	1/4"	-	
Drift Pin	Long	1 1/4"	1 3/4"	3/8"	3/16"	C-83 and D-83
Square Flatter	3" Square	1 5/16"	1 3/4"	3/8"	3/16"	C-83 and D-83
Hot Cutter	3 lb	1 3/8"	1 3/4"	3/8"	3/16"	C-83 and D-83
Drift Pin	Short	1 1/2"	2"	7/16"	7/32"	C-83 and D-83
Hot Cutter	5 lb	1 7/32"	2"	7/16"	7/32"	C-83 and D-83
Track Spike Lifter	-	1 9/16"	2"	7/16"	7/32"	C-83 and D-83
Track Chisel	-	1 9/16"	2"	7/16"	7/32"	C-83 and D-83
Nut Cutter	-	1 9/16"	2"	7/16"	7/32"	C-83 and D-83
Round Track Punch	-	1 5/8"	2"	7/16"	7/32"	C-83 and D-83

Note 1: Distance across flats, if tools are hexagon or octagons

6.5.3 METHOD FOR ESTABLISHING THE CORNER CONTOUR OF HAND TOOL STRIKING FACES (1984)

Refer to Figure 6-43 when establishing the tool contact face contour according to the following steps:

- Draw tool head centerline C/L.
- Draw line AC, representing the side of the tool head. Except in tapered tools, this line is parallel to C/L at a distance of $D/2$. D is the stock diameter of the tool or with hexagons and octagons the distance across the flats.
- Draw arc AA' with a radius of R.
- Draw line EE' parallel to line AC at a distance (r) equal to the corner radius to be used.
- Draw arc BB' parallel to arc AA' at a distance equal to the corner radius. The radius of this arc (R') is equal to the crown radius minus the corner radius.
- Draw arc SP with a radius r from point O, the intersection of line EE' and arc BB'. The resultant arc is tangent to arc AA' and line AC at points S and P, respectively.



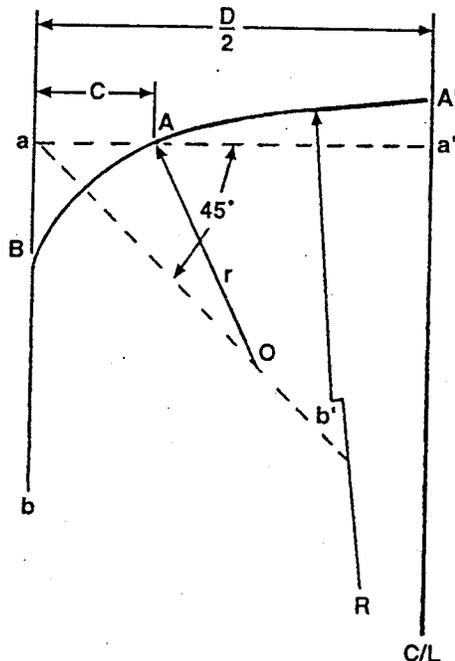
D = Stock Diameter or with hexagons and octagons the distance across the flats
 R = Crown Radius
 r = Corner Radius
 R' = Crown Radius - Corner Radius

Figure 6-43. Plan B-83 - AREMA Contour of Hand Tool Striking Faces

6.5.4 METHOD FOR ESTABLISHING THE CORNER CONTOUR OF HAND TOOL STRUCK FACES ($\frac{3}{4}$ INCH STOCK AND OVER) (1984)

Refer to Figure 6-44 when establishing the tool contact face contour according to the following steps:

- a. Draw tool head centerline C/L.
- b. Draw line ab, representing the side of the tool head, parallel to C/L at a distance of $D/2$. D is the stock diameter of the tool or with hexagons and octagons the distance across the flats.
- c. Draw line aa' perpendicular to C/L.
- d. Draw line ab' at a 45 degree angle from line aa.
- e. On line aa', locate point A, which is the distance C (Corner indentation shown in table) from point a.
- f. From point A, locate point O on line ab by scribing an arc of radius r (the corner radius).
- g. From point O scribe the corner arc BA with radius (r).
- h. From point A locate the center of struck face arc AA' by scribing arc of radius R (crown radius) so that it intersects C/L.
- i. From this point of intersection scribe arc AA' with radius R.



D = Stock Diameter or with hexagons and octagons the distant across the flats.
 R = Crown Radius
 r = Corner Radius
 C = Corner Indentation

Figure 6-44. Plan C-83 - AREMA Contour of Hand Tool Struck Faces

6.5.5 CONTOUR BLENDING OF CORNERS (1984)

Refer to Figure 6-45 for the contour blending of corners.

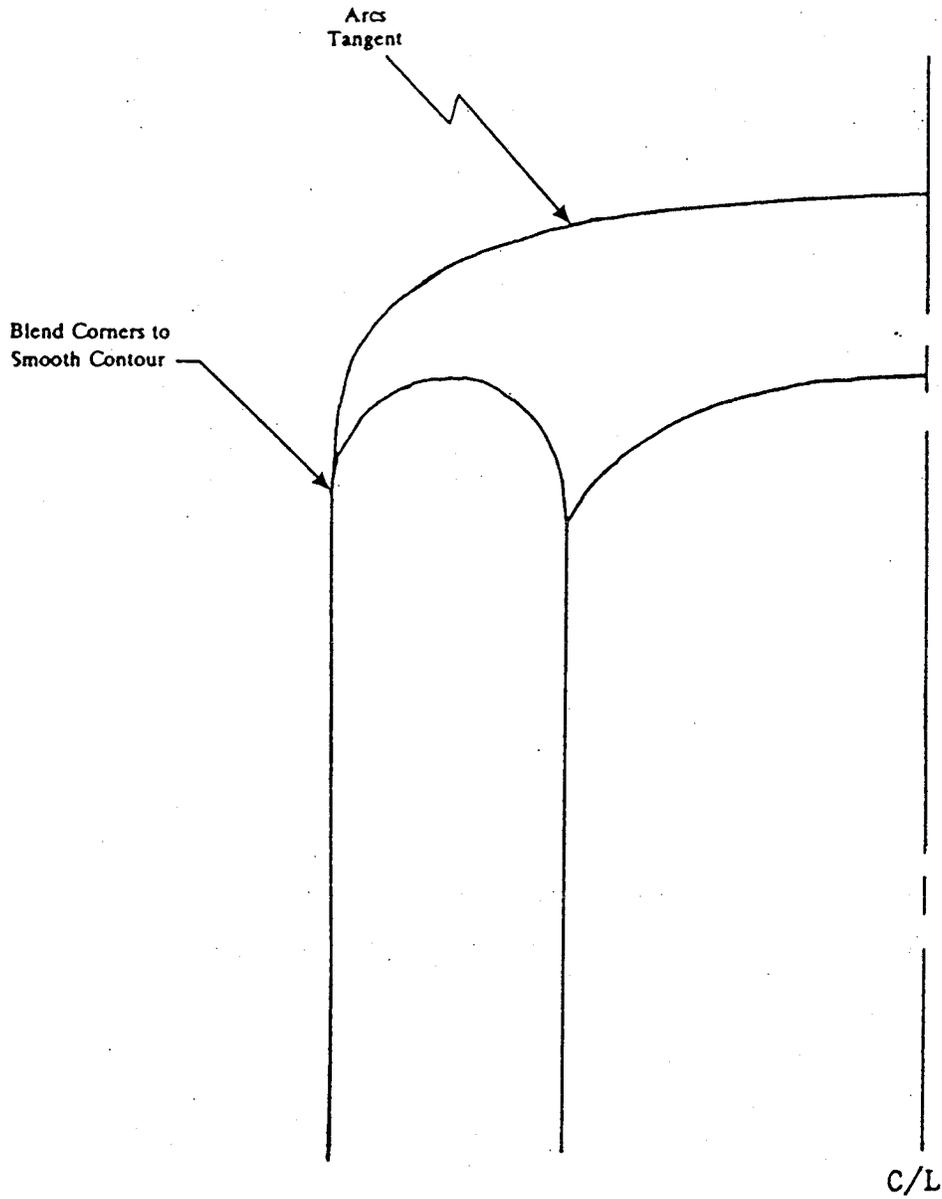


Figure 6-45. Plan D-83 – AREMA Contour Blending of Corners

SECTION 6.6 RECOMMENDED PRACTICES FOR USING, REDRESSING, SHARPENING AND REPLACING HANDLES IN TRACK TOOLS¹ (1994)

6.6.1 INTRODUCTION (1994)

- a. Striking and struck track tools such as spike mauls and sledge hammers are the most used hand tools in the maintenance of track. These and other tools are subject to severe service and require constant attention to ensure that they are in a safe condition to use.
- b. Proper use of these tools requires the following of a few basic rules in conjunction with the appropriate safety rules.
 - (1) A hammer swing should end up with the hammer face parallel with the surface being hit. Avoid glancing blows, over strikes and under strikes.
 - (2) Use a spike maul only to drive spikes.
 - (3) Never strike one hammer with another hammer.
 - (4) Match the hammer to the job. Don't use a sledge to drive small nails. If another tool is being struck, the face of the hammer should be larger than the face of the tool being hit.
 - (5) Make sure the handle is tight and not damaged.
 - (6) Check the striking or struck face for cracks or mushrooming. Check the cutting end for cracks and sharpness. Redress, sharpen, or replace tool depending on severity of condition that is present.
 - (7) Redress frequently to reduce the amount of grinding required to keep the tool in good working condition.

6.6.2 TOOL DESIGN AND MANUFACTURE (1994)

- a. AREMA track tools may be made from one of three types of steel.
 - Carbon steel.
 - Alloy steel, grade A.
 - Alloy steel, grade B.

See Table 6-13 and Table 6-14 for the chemical composition of these steels.

- b. The chemical composition of grade B alloy steel is designed to allow field dressing of tools without the need of subsequent heat treating. Grade B alloy also has the highest resistance to spalling. Carbon and grade A alloy steel tools can be sharpened in the field but should not be redressed. Table 6-12 is a list of track tools and the type steel that can be used in their manufacture.
- c. The ends of tools are hardened as specified in Table 6-12. The distance back from the original end of the tool that this hardness extends is "not less than the average cross sectional thickness." The degree of hardness depends on the use the tool end is to receive.

¹ References, Vol. 94, (1994), p. 83.

- Struck surfaces: Rockwell C hardness 44 to 48.
 - Striking surfaces: Rockwell C hardness 51 to 55.
 - Cutting surfaces: Rockwell C hardness 56 to 60.
 - Punch ends: Rockwell C hardness 52 to 56.
 - Drift pins: Rockwell C hardness 44 to 48 overall.
- d. Striking and struck faces are contour ground. The original shape of striking and struck faces was to have a radius ending in a 45 degree bevel which extended to the side of the tool. The corner between the radius and the bevel was apt to spall if a glancing blow was struck. The bevel was replaced with a second radius. The radii used with various track tools are given in Article 6.1.2.7.1. It is difficult to use this information to redress tools in the field but a commercial template is available.

6.6.3 REDRESSING OF TOOLS (1994)

- a. The first thing to do in redressing a tool is to give it a good visual inspection.
- (1) Look for the manufacturer's brand. If not found, discard the tool. Look for the letter "B" to indicate "AREMA Grade B Steel." If not found, the tool is made of other than grade B alloy steel and cannot be field redressed without subsequent heat treatment but it may be sharpened.
 - (2) Will the tool be usable after redressing or will so much grinding have to be done that the hardened end will be lost or the shape of the tool changed to the point where it will no longer serve its intended purpose? Refer to Section 6.3, Recommended Limits of Wear for Tools to be Reclaimed (1962) for tool details or use a template.
 - (3) Look at the striking and struck end for spalls and cracks. If present, will the tool be returned to its original shape after grinding? If not, discard the tool.
 - (4) Check the condition of the eye for the handle. Usually, wear is not a problem in this area but look for cracks. At times, tools are abused by using the flat near the eye for striking which may lead to cracking. If cracks are found discard the tool.
 - (5) Discard any tool which has electric welding arc strikes on it or has indications of being repaired by oxy-acetylene welding.
 - (6) Replace the handle if it has cracks, slivers and other defects that cannot be sanded out.
- b. Redressing of tools has a few basic rules.
- (1) **ALWAYS WEAR EYE PROTECTION.**
 - (2) The tool must be returned to its original shape. Get a new tool of the type that is being redressed to act as a reference if the shape is in question or use a template.
 - (3) A stationary belt sander or bench grinder may be used. Use a medium or fine grit abrasive belt or grinding wheel.
 - (4) The grinding temperature must be kept low. If the grinding temperature is not controlled, the hardness may be changed in one of two ways. The section may have the hardness removed or a hard, brittle area created. The first case may lead to mushrooming. The second may cause chipping and



spalling. Keep water handy and dip the tool frequently to control the heat. Discard the tool if it is overheated during grinding. If the tool turns a bluish color, it indicates overheating.

- (5) If the handle requires replacement, remove the old handle before redressing. It is usually easier to redress a tool without a handle.
- (6) Redressing should be done in the long dimension of the tool whenever practicable. (From eye toward head.) Belt or wheel direction should be away from head.
- (7) Adjustable work rests should set to rigidly support the tool being worked.
- (8) Vary the grinding location of the tool being redressed frequently to avoid overheating the steel. Dip tool in water to cool as necessary.
- (9) All cracks and spalls must be removed. Dye penetrant testing kits are available to check for cracks.
- (10) Check shape of head against new item or with template to determine if the proper contour has been restored.
- (11) Repairing or altering tools by field welding is prohibited.

6.6.4 SHARPENING OF TOOLS (1994)

a. Sharpening of cutting edges requires caution.

- (1) **ALWAYS WEAR EYE PROTECTION.**
- (2) A stationary belt sander or bench grinder may be used. Use a medium or fine grit abrasive belt or grinding wheel.
- (3) Sharpening should be done in the long dimension of the tool whenever practicable. (From eye toward edge.) Belt or wheel direction should be away from edge. Get a new tool of the type that is being sharpened to act as a reference if the shape is in question or use the cutting edge guide of the template.
- (4) The steel is thinner in this section and is easier to overheat. Keep water handy and dip the tool frequently to control the heat. If the tool turns a bluish color, it indicates overheating.
- (5) Another error to watch for is making the edge too thin. The end shape and dimensions of track tools are shown in Section 6.3, Recommended Limits of Wear for Tools to be Reclaimed (1962). Avoid undercutting the edge. The cutting edge should go straight back from the point or may have a light "barrel" shape. This gives more steel behind the point to resist chipping.
- (6) The working end of drift pins and back out punches should be ground flat and square to the long axis of the tool.
- (7) When sharpening, the tool should be held at the desired angle and moved across the face of the belt or wheel. Adjustable work rests should be set to the proper angle. Pressure of the tool against the belt or wheel must be controlled to prevent overheating. Belt or wheel direction should be away from the cutting edge. (From eye toward edge.)

6.6.5 REPLACING HANDLES (1994)

a. The following procedure should be used to replace tool handles.

- (1) **ALWAYS WEAR EYE PROTECTION.**
- (2) Remove old handle by sawing close to the tool.
- (3) Place the tool on a proper support and drive out the part of handle remaining in the eye from the side opposite the wedges.
- (4) Clean the eye. Check inside the eye for pieces of the old handle and for any damage to the tool.
- (5) Select the correct replacement handle. Do not use a handle if it is not the right size or shape.
- (6) Partially insert the handle into the eye to check for a proper fit. Check to see if the handle and tool come into contact on the entire circumference of the eye.
- (7) Lubricate the eye portion of the handle. Waterless hand cleaner or a wax crayon may be used.
- (8) Place tool on a proper support so eye portion of handle can be driven through the tool to ensure a tight fit. Drive the handle on tight. Be careful not to drive the handle to point where the back side of the tool cuts deeply into the handle. This will damage the handle and could lead to the handle failing. The collar of the handle should be approximately $\frac{3}{4}$ to 1 inch from the tool.
- (9) After the handle has been seated properly, cut off the excess of the handle sticking out from the eye flush with the tool.
- (10) Open the slot in the tool handle in the eye of the tool with a chisel or similar tool.
- (11) Drive a wood wedge into slot as deeply as is possible. Trim or file off wedge flush with tool.
- (12) Drive steel wedge in center of eye. The steel wedge may be either circular or flat. If flat, it is to be driven at right angle to wood wedge. Drive wedge flush with tool. Be careful of glancing blows that might cause the steel wedge to chip or mushroom.
- (13) The above instructions apply to drive on handles. For slip on handles used with tools such as picks and adzes, drive out the old handle, slip head onto new handle, and tap firmly on a solid base until a tight fit is achieved.
- (14) Handles made from material other than wood are available and may be an acceptable substitute. Handles made of other materials have both advantages and disadvantages. Other materials may have better durability, a distinctive "feel" to users, a different method of installation and greater initial cost. Users should investigate and decide which material is most economical for use on their property.



6.1.3.29 Drive Spike Extractor Socket Wrench—Plan No. 33

No special tests required.

6.1.3.30 Rail Thermometer—Plan No. 34

Material as shown on plans. No special tests required.

6.1.3.31 Nut Cutter—Plan No. 35

See percussion tools.

6.1.3.32 Hot Cutter (3 Pound)—Plan No. 36

See percussion tools.

6.1.3.33 Hot Cutter (5 Pound)—Plan No. 37

See percussion tools.

6.1.3.34 Drift Pin (Short)—Plan No. 38

See percussion tools.

6.1.3.35 Drift Pin (Long)—Plan No. 39

See percussion tools.

6.1.3.36 Spiking Tool—Plan No. 41

See percussion tools.

6.1.3.37 Switch Clip Wrench—Plan No. 43

Chemical composition for carbon steel as specified in Article 6.1.1.1.c. If requested by the purchaser, Article 6.1.2.6, will be adhered to (see Table 5-6-4).

SECTION 6.2 SPECIFICATIONS FOR ASH AND HICKORY HANDLES FOR TRACK TOOLS¹ (1962)

6.2.1 MATERIAL (1980)

- a. Before manufacturing tool handles, the manufacturer shall ascertain which of the following kinds of ash or hickory will be accepted. Other woods will not be accepted unless specifically ordered.
- b. Ash for fork, hoe, rake, scoop, shovel, and scythe handles.
 - Black ash (*Fraxinus nigra*).
 - Green ash (*Fraxinus pennsylvanica lanceolata*).

¹ References, Vol. 43, 1942, pp. 519, 767; Vol. 47, 1946, pp. 484, 636; Vol. 54, 1953, pp. 975, 1399; Vol. 58, 1957, pp. 834, 1258; Vol. 63, 1962, pp. 490, 755. Reapproved without change 1962.

- Oregon ash (*Fraxinus oregona*).
- White ash (*Fraxinus americana*).
- c. Hickory for adz, axe, canthook, chisel, hammer, hatchet, jack, maul, pick, punch and sledge handles.
 - Bitternut hickory (*Hicoria cordiformis*).
 - Mockernut hickory (*Hicoria alba*).
 - Nutmeg hickory (*Hicoria myristicaeformis*).
 - Pignut hickory (*Hicoria glabra*).
 - Shagbark hickory (*Hicoria ovata*).
 - Shellbark hickory – Bigleaf (*Hicoria laciniosa*).
 - Water hickory (*Hicoria aquatica*)

6.2.2 PHYSICAL REQUIREMENTS (1980)

- a. Except as hereinafter provided, all tool handles shall be seasoned to a moisture content not exceeding 12%, and shall be free of injurious characteristics that may impair their serviceability, such as decay, cross grain, abrupt grain dip, holes, large knots, splits, heavy stain, warp, and lightweight wood.
- b. Any tool handle may be either all heartwood, all sapwood, or a mixture of both.

6.2.3 DESIGN (1980)

Tool handles shall conform to the design and dimensions shown on AREMA plans which form a part of these specifications, with an allowable variation of 1/4 inch over or under in length and 1/16 inch over or under in all other dimensions.

6.2.4 MANUFACTURE (1980)

- a. Tool handles shall be cut square at the ends, uniform in size and shape for each type, smoothly finished, and waxed. Lacquered, painted, or stained handles are not acceptable.
- b. The manufacturer shall legibly impress into each accepted handle, at a location and in a manner that will not weaken the handle and at a location designated by the purchaser, whatever grade, maker, or ownership symbol may be required by the purchaser.

6.2.5 INSPECTION (1980)

- a. Handles will be inspected at points of manufacture, shipment, or destination, in suitable and convenient places satisfactory to the purchaser.
- b. Inspectors representing the purchaser shall have free entry to the works of the manufacturer at all times while work on the contract of the purchaser is being performed, and shall have all reasonable facilities (including adequate light) afforded them, free of cost, to satisfy them that the handles being supplied are in accordance with these specifications.
- c. Inspectors will make a reasonably close examination of each handle and acceptance or rejection will be based on visual inspection and the judgment of the inspector. He will not determine the exact weight and density of each handle, but in case of question, one or both of these characteristics may be accurately

measured for conformance with the requirements for each grade. Exactness of size and shape will be checked by accurate measurements of handles taken at random.

- d. Each handle will be judged independently, without regard for the decisions on others in the same lot.
- e. The inspector shall have his identifying designation legibly branded into the grasp end of each accepted tool handle.

6.2.6 TYPES OF BLEMISHES AND DEFECTS (1980)

Following is a list of blemishes and defects. Definitions for these effects are listed in the Glossary at the back of this chapter.

cross grain	abrupt grain dip	slight grain dip	hole
pin knot	small knot	medium knot	
split	light stain	medium stain	
small streak	medium streak	large streak	

6.2.7 DELIVERY (1980)

Accepted handles shall be shipped in accordance with the instructions in the order covering them, securely packed in containers marked with the name, type, grade, and quantity of the material therein and with the name of the shipper and the number of the purchaser's contract or order.

6.2.8 GRADE CLASSIFICATION (1984)

Grade classifications are found in Table 5-6-4.

Table 5-6-4. Grade Classifications

Grade Symbol	Color	Maximum Number of Annual Rings per Inch of Radius	Minimum Weight per Cu Ft Lb	Maximum Slope of Grain	Admissible Blemishes and Defects
AA	White, red or brown, or brown, red, and white; but dark brown or dark red only within 10" from tool end.	15 22	43	1 in 12	1 slight grain dip; tight pin knots and small streaks at least 12" apart; light stain.
AB	White, red or brown, or brown, red, and white; but dark brown or dark red only with 10" from each end.	18	36	1 in 12	1 small tight knot at each end; 2 slight grain dips and 2 tight pin knots at least 6" apart; medium stain; 2 small streaks.
HA	Red or white or red and white.	17	55 48	1 in 50 20	Light stain; medium streaks
HB-1	Red or white or red and white.	22	46	1 in 50 20	Medium stain; large streak bird pecks or tight knots not more than 1/4" in average diameter, in the eye end or first third of the grasp end. <i>Slight grain Dip</i>
HB-2	Red or white or red and white	27	46	1 in 20	Medium stain; slight grain dip; large streak; bird pecks or tight knots, the sum or whose average diameters does not exceed 1/4" in the eye end or the first third of the grasp end.

6.2.9 USE CLASSIFICATION (2010)

Use classifications are found in Table 5-6-5.

Table 5-6-5. Use Classifications

Handle	Handle Grade Symbol	Number of Tool Plan
Adz - 34"	HA	12 and 12A
Axe - 36"	HA	-
Chisel (Track) 24", 36"	HB-2	17
Drift Pin Remover - 36"	HB-2	46
Fork (Ballast)	AA	22
Hot Cutter (3 lb) 24", 36"	HB-2	36
Hot Cutter (5 lb) 24", 36"	HB-2	37
Maul (Spike) 36"	HA	3
Nut Cutter - 24", 36"	HB-2	35
Pick - 36"	HA	1 and 2
Punch (Round Track) 24", 36"	HB-2	19
Scoop	AA	26
Shovel (Track)	AA	21
Sledge - 36"	HA	13
Spiking Tool - 24", 36"	HB-2	41
Track Spike Lifter - 36"	HB-2	32

SECTION 6.3 RECOMMENDED LIMITS OF WEAR FOR TOOLS TO BE RECLAIMED¹ (1962)

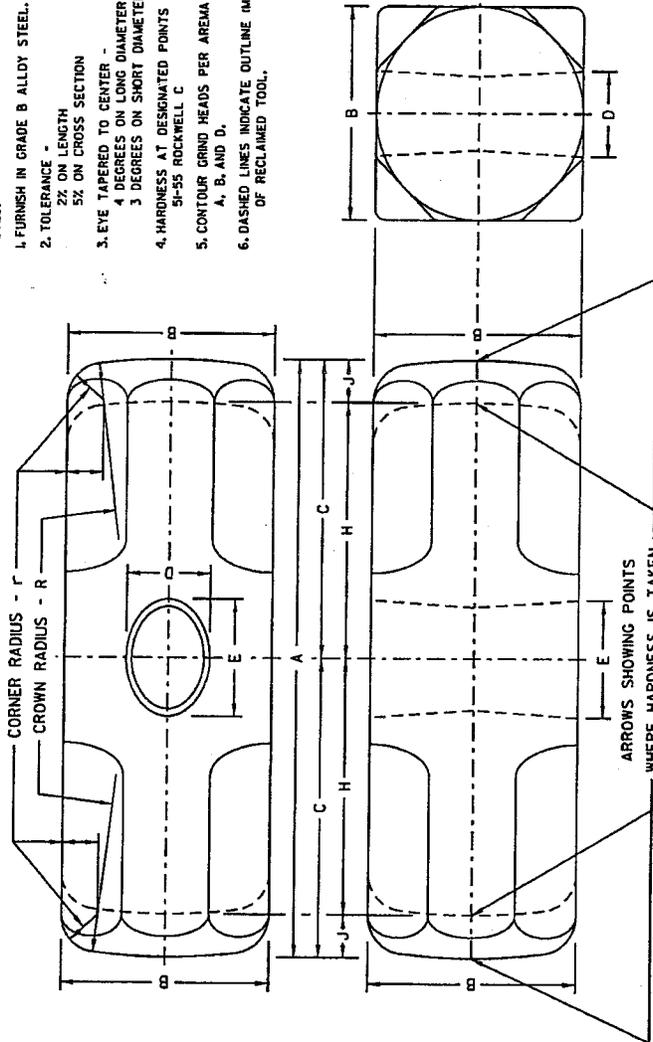
6.3.1 GENERAL (1962)

- a. Dashed lines and notes indicating the limits of wear of tools to be reclaimed are shown on the plans of the following tools: Nos. 1, 2, 3, 5, 12, 12A, 13, 14, 15, 17, 19 and 21.
- b. For reclaiming alloy track tools, company forces should be limited to grinding methods; where it is advisable to reclaim them by heating methods, due to the numerous and continuous changes in alloy they should be returned to the manufacturer who is familiar with their precise metallurgical content.

¹ References, Vol. 42, 1941, pp. 587, 836; Vol. 43, 1942, pp. 522, 767; Vol. 52, 1951, pp. 519, 817; Vol. 54, 1953, pp. 975, 1399; Vol. 58, 1957, pp. 834, 1258; Vol. 63, 1962, pp. 490, 755. Reapproved without change 1962.

Track

- NOTES:
1. FURNISH IN GRADE B ALLOY STEEL.
 2. TOLERANCE -
2% ON LENGTH
5% ON CROSS SECTION
 3. EYE TAPERED TO CENTER -
4 DEGREES ON LONG DIAMETER
3 DEGREES ON SHORT DIAMETER
 4. HARDNESS AT DESIGNATED POINTS -
51-55 ROCKWELL C
 5. CONTOUR GRIND HEADS PER AREMA PLANS
A, B, AND D.
 6. DASHED LINES INDICATE OUTLINE (MINIMUM) OF RECLAIMED TOOL.



APPROXIMATE WEIGHT IN POUNDS	LENGTH OF HEAD IN INCHES	WIDTH OF EYE AT FULL FACE IN INCHES	CENTERLINE OF EYE TO FACE IN INCHES	WIDTH OF EYE IN INCHES	LENGTH OF EYE IN INCHES	RADIUS OF CROWN ON FACE IN INCHES	CORNER RADIUS IN INCHES	CENTERLINE OF EYE TO HARDNESS AND WEAR POINT IN INCHES	FACE TO HARDNESS AND WEAR POINT IN INCHES
	A	B	C	D	E	R	F	H	J
1	4 1/4	1 1/4	2 1/8	3/8	3/4	7	1/4	2	1/4
2	4 3/8	1 3/8	2 3/8	3/4	1	7	1/4	2	1/4
2 1/2	4 1/2	1 1/2	2 1/4	3/4	1	7	1/4	2	1/4
3	4 3/4	1 3/4	2 3/8	3/4	1	7	1/4	2 1/8	1/4
4	5 1/4	1 3/4	2 3/8	3/4	1	7	3/8	2 3/8	1/4
6	6	2 1/8	3	1	1 3/8	7	3/8	2 3/4	1/4
8	6 1/2	2 1/4	3 1/4	1	1 3/8	7	3/8	2 3/4	1/2
10	7	2 1/2	3 1/2	1	1 3/8	7	3/8	3	1/2
12	7 1/2	2 3/8	3 3/4	1	1 3/8	7	3/8	3 1/4	1/2
15	8 1/2	2 3/8	4 1/4	1	1 3/8	7	1/2	3 1/2	1/2
20	9	3 1/8	4 1/2	1 1/4	1 1/2	7	1/2	3 3/8	1/2

Figure 5-6-14. Plan 13-08 - AREMA Double Faced Sledge