A Division of Eberl Iron Works, Inc.

STAIR COMPONENTS & SYSTEMS

STAIR REFERENCE MANUAL

01 MEASURING STAIRS TUTORIAL

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03 GLOSSARY OF STAIR TERMINOLOGY

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Build a Better Stair with Products That Are In Square

Stair Components & Systems

A Division of Eberl Iron Works, Inc.

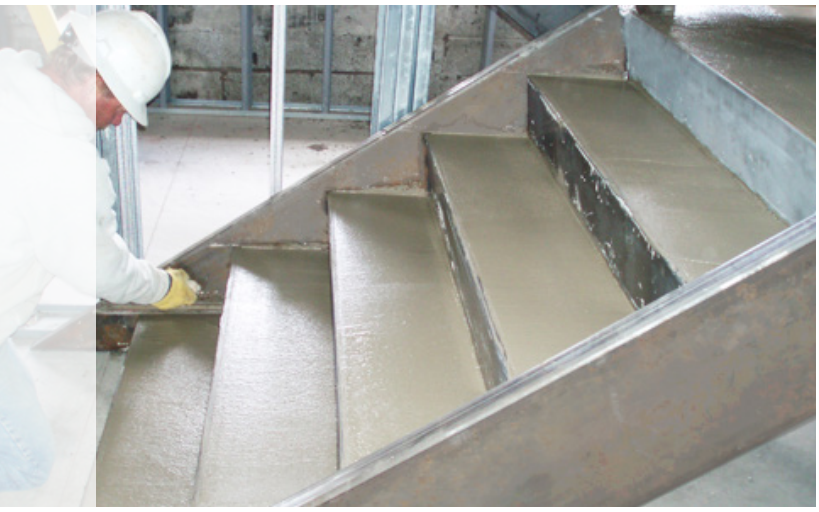
SCS Division: The Stair Components & Systems division of Eberl Iron Works has been providing stair components that are without equal to the commercial steel stair building industry for over half a century.

We are the premier, nationwide manufacturer of both standard and custom commercial stair system components.

What We Offer

Our estimators have decades of experience designing and fabricating the best steel stairpans and stair components in the industry. You can trust that our stair systems are manufactured from only the highest quality sheet and plate steel and formed to within the tightest of tolerances.

- Stairpans
- Stair Treads
- Landing Pans
- Carrier Angles
- Nosings
- Infill Panels w/ Hems
- Railing Brackets
- Walkway Grating



stairpans.com

What We Can Do For You

Our stair systems are formed in square for a perfect fit the first time. Avoid costly and time consuming re-work with stair components and systems that are second to none.

Our high quality materials and designs improve efficiency of installation for commercial steel stair fabricators.

Stair components are nested together on sturdy pallets and bound together with heavy-duty strapping for worry free – and damage free – transit. All components are labeled for ease of assembly and installation.

Here's what you can expect every time you work with us:

- In Square Products
- Unparalleled Expertise
- Fast, Accurate Quoting
- Quick Order Turnaround
- Top Quality Materials
- Professional Packaging
- Helpful Labeling
- Hassle Free Shipping

We Go the Extra Mile to Get the Job Done Right

We realize that every project, and every job site, is different. We've designed our standard components and systems to make installation quick and easy, but our ability to customize and tailor these designs is what makes us shine. If you've got a problem, we can help you solve it.

Contact Information

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EBERL IRON WORKS, INC.®

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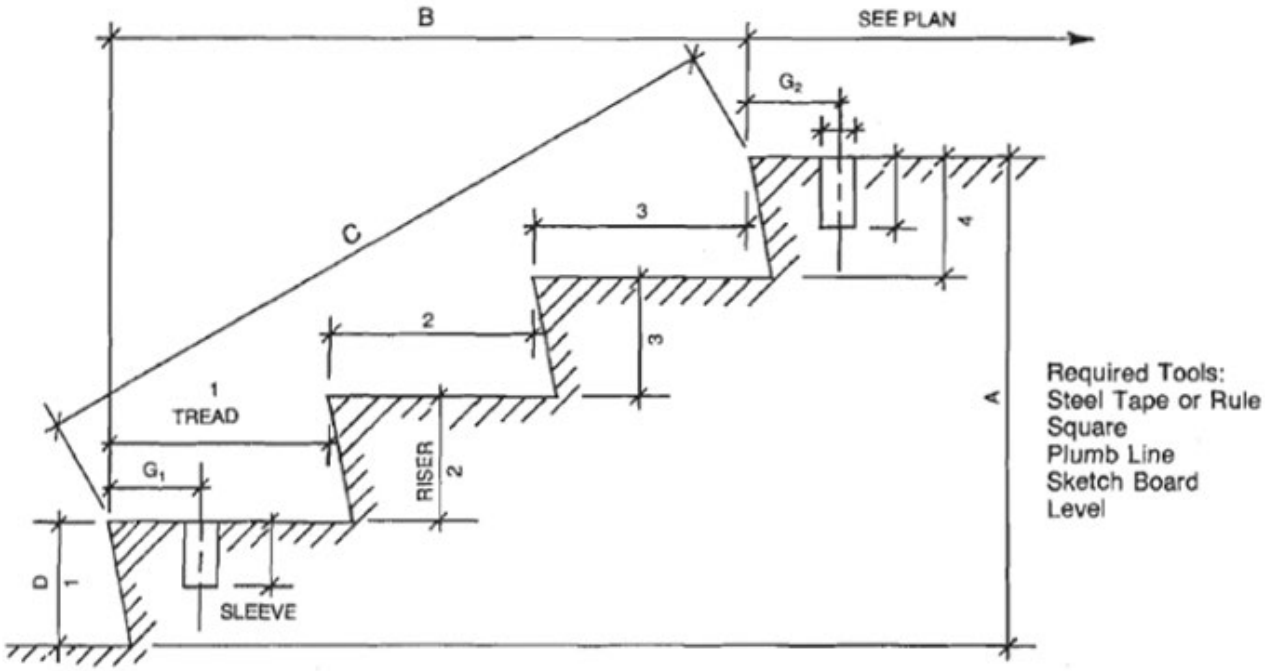
RTS Rooftop Support Systems® | TSP Traffic Safety Products® | UBS Unistrut Buffalo Supports | MFS Metal Fabrication Services | SCS Stair Components & Systems | MMS Modular Mechanical Supports

Contents

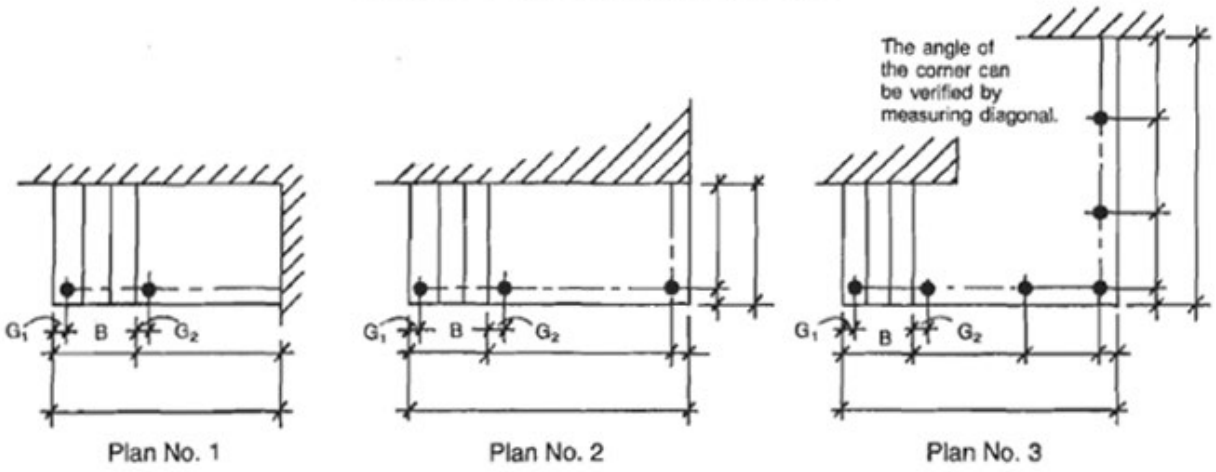
MEASURING STAIRS

When measuring existing stairs, provide all the information needed. To make a full-size shop layout, draw a profile of the stair and note all dimension lines shown for each part of the stair, using the arrangement plan best suited to actual job conditions (see example, plan Nos. 1,2 and 3).

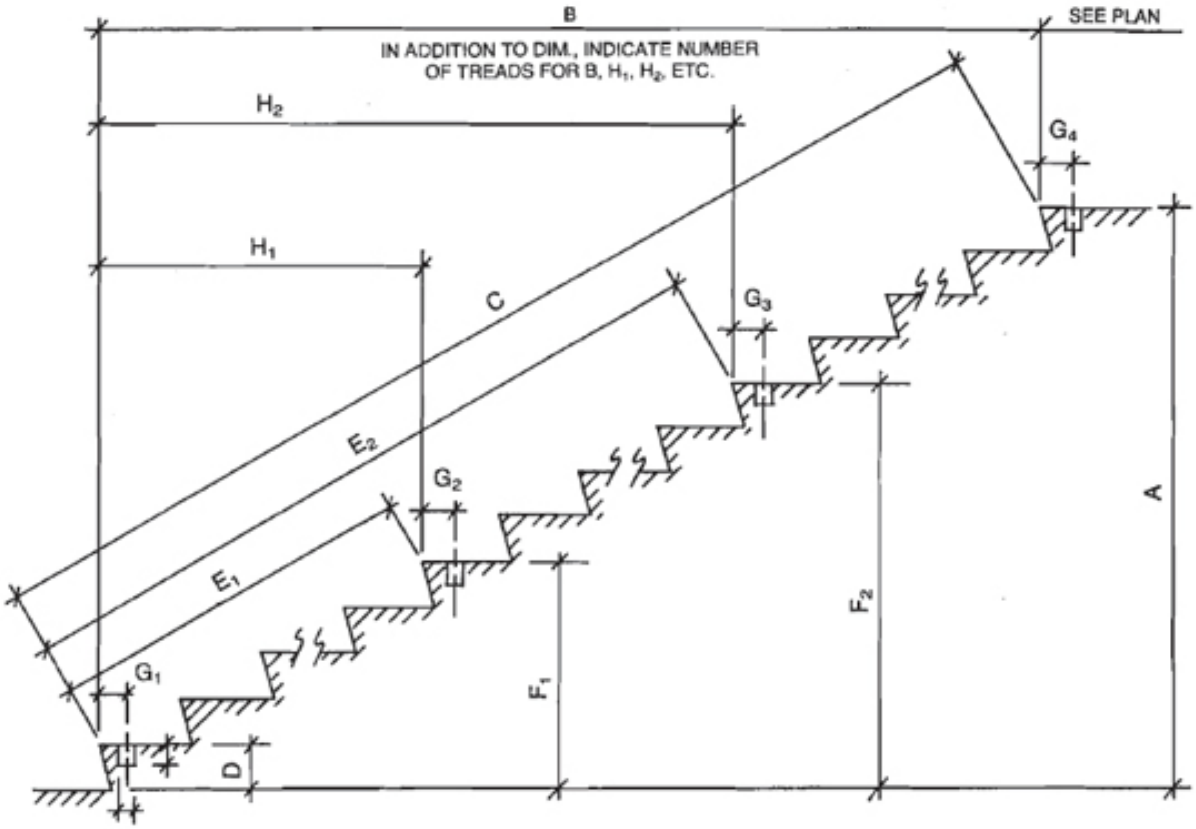
Measure every dimension that is indicated or preferably use one of the various trade-practice systems shown on pages below. Do not assume that dimensions for similar conditions will be the same. Prepare an accurate sketch for each layout. Check pitch of platforms to maintain required railing height.



SHORT RUN STAIR PROFILE

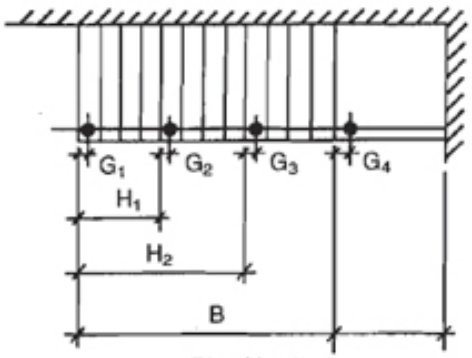


Plan No. 1 Plan No. 2 Plan No. 3

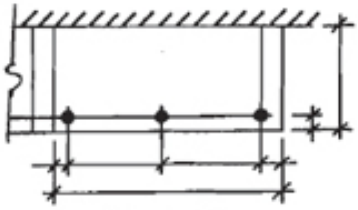


LONG RUN STAIR PROFILE

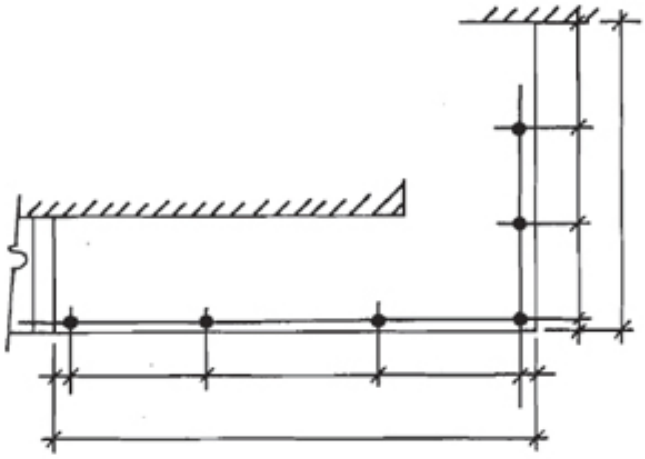
NOTE: PHOTO COPIES OF SHORT OR LONG RUN STAIR PROFILES AND PLANS SHOWN HERE MAY BE USED TO FACILITATE TAKING FIELD MEASUREMENTS WHEN THESE SKETCHES ARE ADEQUATE.



Plan No. 1



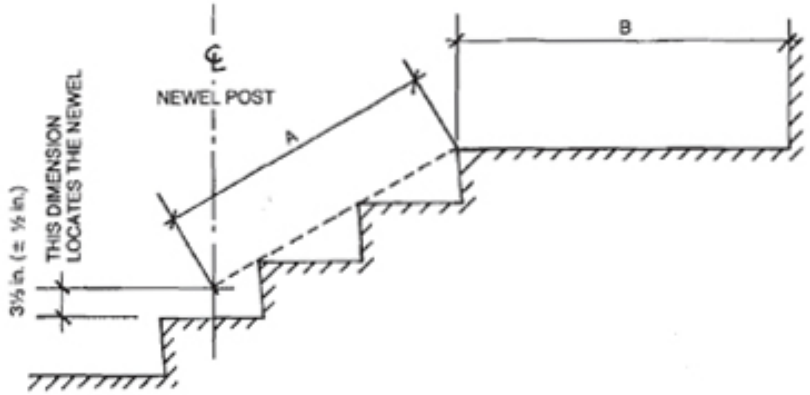
Plan No. 2



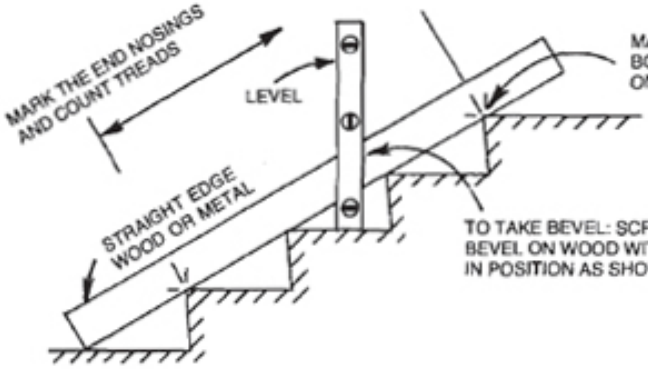
Plan No. 3

SEE NOTES SHOWN FOR SHORT RUN STAIR MEASUREMENTS.

MEASURING STAIRS, USING TRADE PRACTICE METHODS



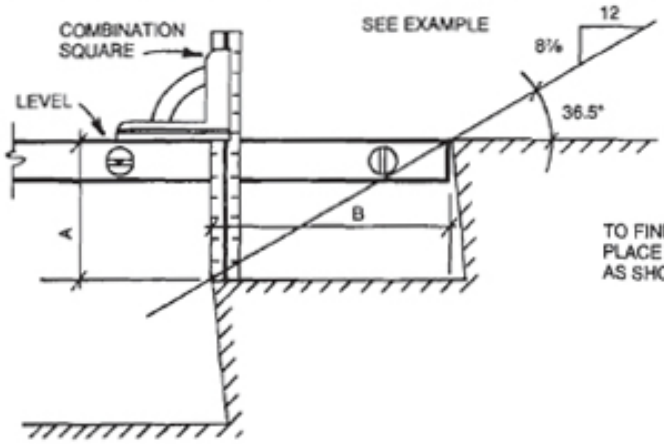
IF NEWELS ARE CUT TO UNIFORM STOCK LENGTHS, THE 3½ in. DIMENSION IS MAINTAINED BY ADJUSTING THE LOCATION OF THE FIRST NEWEL POST ON THE TREAD SO AS TO ACCOMMODATE THE PITCH OF THE STAIR AND MAINTAIN UNIFORM RAIL HEIGHT.



MARK LINE AT NOSINGS TO COMBINE BOTH BEVEL AND STAIR MEASUREMENT ON STRAIGHT EDGE.

TO TAKE BEVEL: SCRIBE LINE TO MARK BEVEL ON WOOD WITH PLUMBED LEVEL IN POSITION AS SHOWN.

NOTE: STRAIGHT EDGE METHOD MAY BE USED TO COMBINE BOTH STAIR MEASUREMENT AND BEVEL BY MARKING NOSINGS AND CARRYING STRAIGHT EDGE BACK FOR SHOP LAYOUT USE.



METHOD OF USING COMBINATION SQUARE WITH LEVEL

TO FIND ACCURATE BEVEL FROM ONE TREAD AND RISER: PLACE LEVEL AND COMBINATION SQUARE AS SHOWN AND TAKE DIMENSIONS A AND B.

TO CONVERT A - B DIMENSIONS INTO READING OF SLOPE IN INCHES PER FOOT:
EXAMPLE: A = 7½ in., B = 10⅛ in.

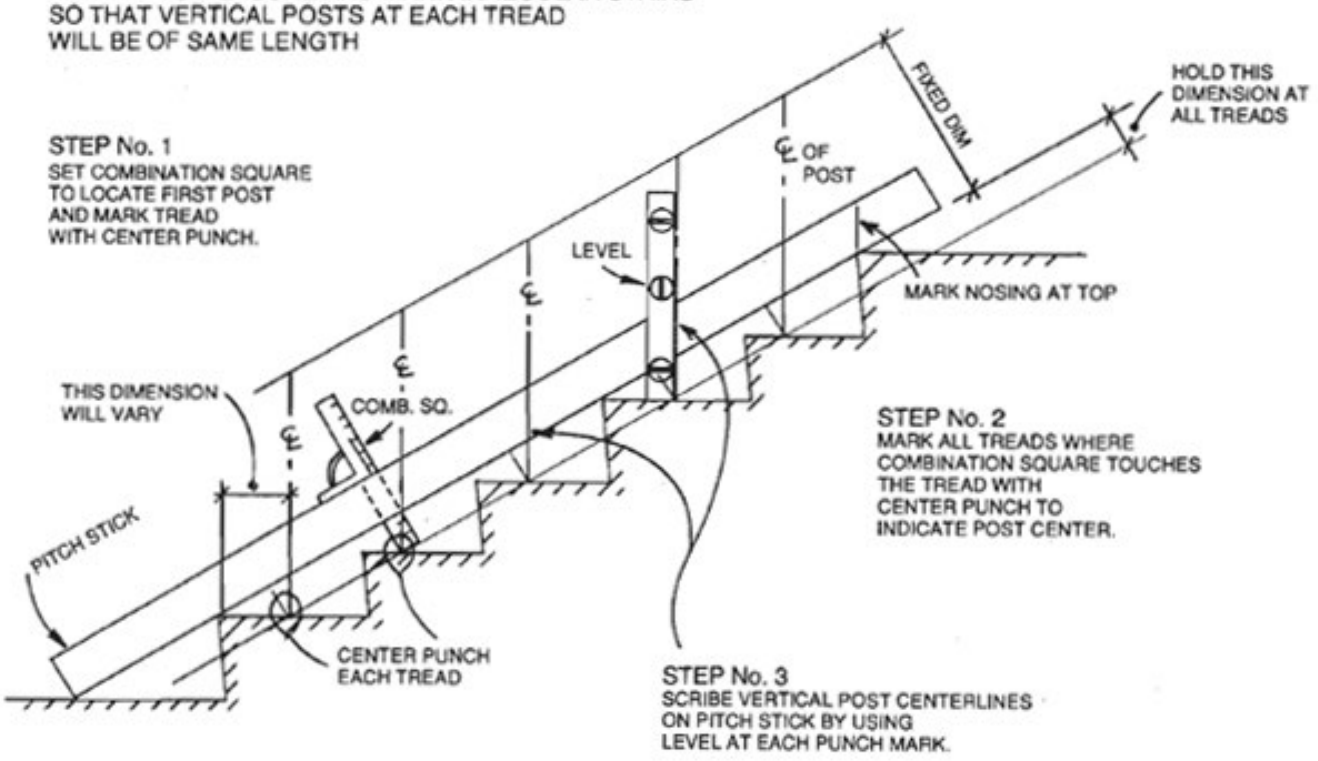
S = 7.5 × 12 ÷ 10.125

S = 8.89 in. = 8⅞ (+) to 12 Pitch

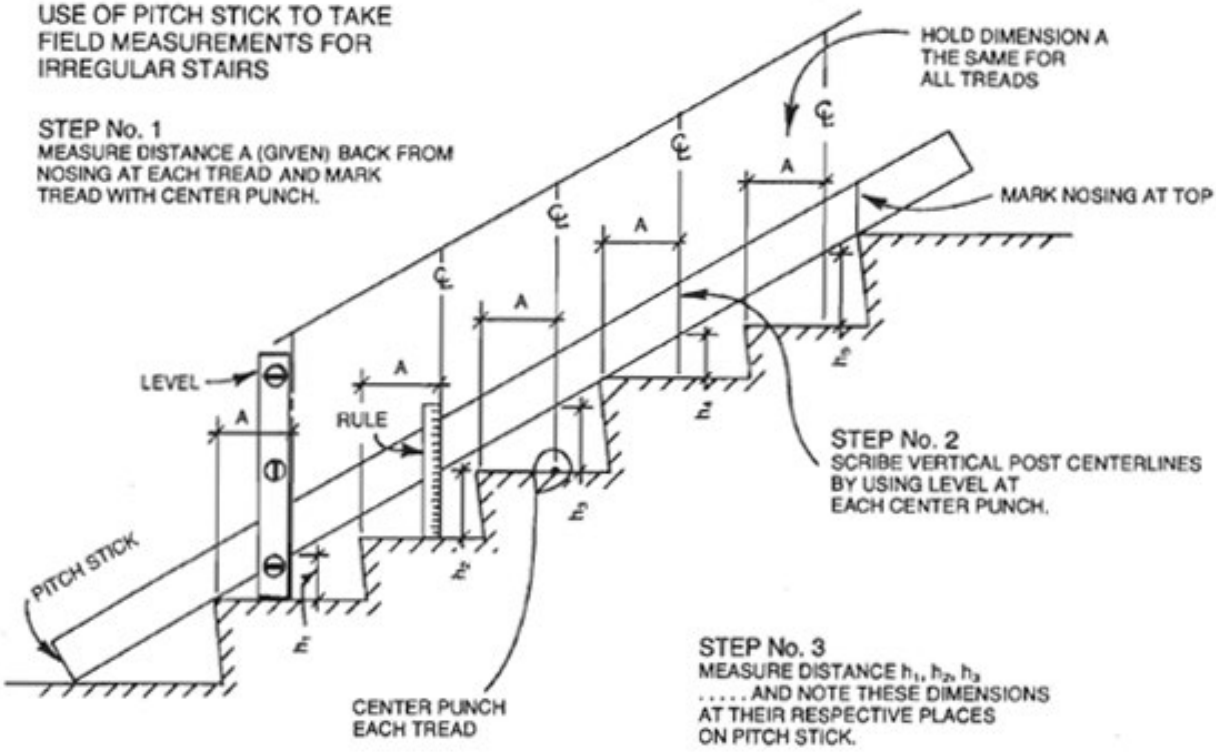
MAY BE CONVERTED TO DEGREES FROM SMOLEY'S BEVEL TABLE

TO CONVERT A - B DIMENSIONS TO ANGLE IN DEGREES BY CALCULATOR:
EXAMPLE: A = 7½ in., B = 10⅛ in. (TAN = A ÷ B)
TANGENT = 7.5 ÷ 10.125 = 0.741
0.741 INVERTED TO ANGLE = 36.5°
FROM A NATURAL FUNCTION OF NUMBERS TABLE

METHOD TO MEASURE AND MARK IRREGULAR STAIRS SO THAT VERTICAL POSTS AT EACH TREAD WILL BE OF SAME LENGTH



USE OF PITCH STICK TO TAKE FIELD MEASUREMENTS FOR IRREGULAR STAIRS



SAMPLE METAL STAIR SPECIFICATIONS

This page offers engineers and architects a sample specification for stair pans. Although Eberl Iron Works, Inc. does not take part in writing specifications for metal stairs we hope that this page functions as an example for those who will.

This sample specification includes three parts:

Part One describes a general overview and scope of the project.

Part Two describes the finished product including material and design form

Part Three covers the execution including installation and field preparation. This specification should help in putting together your own specification. Make sure to consult your local standards when specifying metal stairs.

SECTION 05510
METAL STAIRS

SPEC WRITER NOTE:

1. Delete between // _____// if not applicable to project.
2. Also delete any other item or paragraph not applicable in the section and renumber the paragraphs.
3. Occupational Safety and Health Administration (OSHA) requires a stair to areas where a mechanic must go up or down different levels to service equipment.
4. Use either open riser or industrial stair to roof where not accessible, to other than building service personnel.
5. See OSHA Section 1910.24, Fixed Industrial stair.
6. Design industrial stair or open riser stairs for maximum angle 50 degrees or less to horizontal when used to service equipment.
7. Consider open riser stairs with grate treads on exterior service areas.
8. Do not use "ships Ladders" or spiral stairs.

PART 1 - GENERAL

1.1 DESCRIPTION

A. Section specifies steel stairs with railings.
B. Types:

1. Closed riser stairs with concrete filled treads and platforms.
2. Industrial stairs: Closed // and open // riser stairs.

1.2 RELATED WORK

A. Concrete fill for treads and platforms: Section 03300, CAST-IN-PLACE CONCRETE.
B. Wall handrails and railings for other than steel stairs: Section 05500, METAL FABRICATIONS.
C. Requirements for shop painting: Section 09900, PAINTING.

1.3 SUBMITTALS

A. Submit in accordance with Section 01340, SAMPLES AND SHOP DRAWINGS.
B. Shop Drawings: Show design, fabrication details, installation, connections, material, and size of members.

1.4 APPLICATION PUBLICATIONS

A. The publications listed below form a part of this specification to the extent referenced. The publications are referenced in the text by basic designation.
B. American Society for Testing and Materials (ASTM):

A36/A36M-04..... Structural Steel
A47-99 (R2004)..... Ferritic Malleable Iron Castings
A48-03..... Gray Iron Castings
A53-04..... Pipe, Steel, Black and Hot-Dipped Zinc-Coated Welded and Seamless
A307-04..... Carbon Steel Bolts and Studs, 60000 psi Tensile Strength
A653/653M-04..... Steel Sheet, Zinc Coated (Galvanized)or Zinc Alloy Coated (Galvannealed) by the Hot-Dip Process
A563-04..... Carbon and Alloy Steel Nuts
A1008-04..... Steel, Sheet, Cold-Rolled, Carbon, Structural, High-Strength, Low-Alloy
A786/A786M-00..... Rolled Steel Floor Plates
A1011-04..... Steel, Sheet and Strip, Strip, Hot-Rolled Carbon, Structural, High-Strength, Low-Alloy

C. American Welding Society (AWS):

D1.1-00..... Structural Welding Code-Steel
D1.3-98..... Structural Welding Code-Sheet Steel

D. The National Association of Architectural Metal Manufactures (NAAMM) Manuals:

Metal Bar Gratings (ANSI/NAAMM MBG 531-93)
2nd Edition-1985..... Pipe Railing Manual, Including Round Tube

E. American Iron and Steel Institute (AISI):

Specification for the Design of Cold-Formed Steel Structural Members

SPEC WRITER NOTE:
1. Detail of stairs required.
2. Straight stairs, parallel, without newel post are preferred without stair well exceeding 100 mm (4-inches) in width.
3. See NAAMM stair manual.

PART 2 - PRODUCTS

2.1 DESIGN CRITERIA

A. Design stairs to support a live load of 500 kg/m2 (100 pounds per square foot).
B. Structural design, fabrication and assembly in accordance with requirements of NAAMM Metal Stairs Manual, except as otherwise specified or shown.
C. Design Grating treads in accordance with NAAMM Metal Bar Grating Manual.
D. Design pipe railings in accordance with NAAMM Pipe Railing Manual for 900 N (200 pounds) in any direction at any point.

SPEC WRITER NOTE: Update material requirements to agree with applicable requirements (Types, grades, classes, and other related items) specified in the referenced Applicable Publications.

2.2 MATERIALS

A. Steel Pipe: ASTM A53, Standard Weight, zinc coated.
B. Steel Grating: Metal bar type grating NAAMM BG.
C. Sheet Steel: ASTM A1008.
D. Structural Steel: ASTM A36.
E. Steel Floor Plate: ASTM 786.
F. Steel Decking: Form from zinc coated steel conforming to ASTM A446, with properties conforming to AISI Specification for the Design of Cold-Formed Steel Structural Members.
G. Steel Plate: ASTM A1011.
H. Iron Castings: ASTM A48, Class 30.
I. Malleable Iron Castings: ASTM A47.

2.3 FABRICATION GENERAL

A. Fasteners:

1. Conceal bolts and screws wherever possible.
2. Use countersunk heads on exposed bolts and screws with ends of bolts and screws dressed flush after nuts are set.

B. Welding:

1. Structural steel, AWS D1.1 and sheet steel, AWS D1.3.
2. Where possible, locate welds on unexposed side.
3. Grind exposed welds smooth and true to contour of welded member.
4. Remove welding splatter.

C. Remove sharp edges and burrs.
D. Fit stringers to head channel and close ends with steel plates welded in place where shown.
E. Fit face stringer to newel post by tenoning into newel post, or by notching and fitting face stringer to side of newel where shown.
F. Shop Prime Painting: Prepare surface and apply primer as specified for ferrous metals in Section, PAINTING.

SPEC WRITER NOTE:
1. Provide guard railings not less than 1060 mm (42-inches) high.
2. Use not less than two railings on industrial stairs.

2.4 RAILINGS

A. Fabricate railings, including handrails, from steel pipe with flush.

1. Connections may be standard fittings designed for welding, or coped or mitered pipe with full welds.
2. Wall handrails are provided under Section, METAL FABRICATIONS.

B. Return ends of handrail to wall and close free end.
C. Provide standard terminal castings where fastened to newel.
D. Space intermediate posts not over six feet on center between end post // or newel post //.
E. Fabricate handrail brackets from cast malleable iron.
F. Provide standard terminal fittings at ends of post and rails.

SPEC WRITER NOTE:
1. Use closed riser stairs accessible to public and patients.
2. Design treads to receive rubber treads with riser sloped to meet tread nosing.

2.5 CLOSED RISER STAIRS

A. Provide treads, risers, platforms, railings, stringers, headers and other supporting members.
B. Fabricate pans for treads and platforms, and risers from sheet steel // Fabricate pans for platforms from steel decking where shown //.

C. Form risers with sanitary cove.
D. Fabricate stringers, headers, and other supporting members from structural steel.
E. Construct newel posts of steel tubing having wall thickness not less than 5 mm (3/16-inch), with forged steel caps and drops.

SPEC WRITER NOTE:
1. Show Platform and tread type ad risers when required.
2. Do not exceed 50 degrees slope to floor per OSHA 1610.24. Preferred 175 mm (7-inch) maximum riser and 280 mm (11-inch) minimum tread.

2.6 INDUSTRIAL STAIRS

A. Provide treads, platforms, railings, stringers and other supporting members as shown.
B. Treads and platforms of checkered steel floor plate:

1. Turn floor plate down to form nosing on treads and edge of platform at head of stairs.
2. Support tread and platforms with angles welded to plate.
3. Do not leave exposed fasteners on top of treads or platform surfaces.
//4. Provide flat sheet steel risers for stairs with steel plate treads where shown //.

C. Treads and platforms of steel grating:

1. Fabricate steel grating treads and platforms in accordance with requirements of NAAMM Metal Bar Grating Manuals.
2. Provide end banding bars, except where carrier angle are used at tread ends.
3. Support treads by use of carrier plates or carrier angle. Use carrier plate end banding bars on exterior stairs.
4. Provide abrasive nosing on treads and edge of platforms at head of stairs.
5. Provide toe plates on platforms where shown.

PART 3 - EXECUTION

3.1 STAIR INSTALLATION

A. Provide hangers and struts required to support the loads imposed.
B. Perform job site welding and bolting as specified for shop fabrication.
C. Set stairs and other members in position and secure to structure as shown.
D. Install stairs plumb, level and true to line.
E. Provide steel closure plate to fill any gap between the stringer and surrounding shaft wall. Weld and finish with prime and paint finish of adjoining steel.

3.2 RAILING INSTALLATION

A. Install standard terminal fittings at ends of posts and rails.
B. Secure brackets, posts and rails to steel by welds, and to masonry or concrete with expansion sleeves and bolts, except secure posts at concrete by setting in sleeves filled with commercial non-shrink grout.
C. Set rails horizontal or parallel to rake of stairs to within 3 mm in 3650 mm (1/8-inch in 12 feet).
D. Set posts plumb and aligned to within 3 mm in 3650 mm (1/8-inch in 12 feet).

3.3 FIELD PRIME PAINTING

A. When installation is complete, clean field welds and surrounding areas to bright metal, and coat with same primer paint used for shop priming.
B. Touch-up abraded areas with same primer paint used for shop priming.
C. Touch up abraded galvanized areas with zinc rich paint as specified in section PAINTING.

GLOSSARY OF TERMS

ABRASIVE - Hard granular material of varying fineness, used in grinding and/or polishing, or embedded in metal to provide a nonslip surface. [NOMMA-86]

ALUMILITE - A trade name used by the Aluminum Company of America for its clear or color impregnated anodized finishes in aluminum. [NOMMA-86]

ANCHOR - Any device used to secure a building component to adjoining construction or a supporting member. [NOMMA-86]

ANCHORAGE - Method of tying to adjoining construction or supporting member. [NOMMA-86]

ANGLED STAIR - (1) A stair in which successive flights are at an angle or other than 180 degrees. [NOMMA-86] (2) A stair in which successive flights are at an angle of other than 180 degrees to each other (often 90 degrees) with an intermediate platform. between them. [NAAMM-82]

ANNEAL - To heat above the critical or recrystallization temperature, then cool metal, glass or other materials, to eliminate the effects of cold working, relieve internal stresses or improve electrical, magnetic or other properties; to soften. [NOMMA-86]

ANODIC COATING - The surface finish resulting from anodizing. See Anodize. [NOMMA-86]

ANODIZE - To provide a hard non-corrosive oxide film on the surface of a metal, particularly aluminum, by electrolytic action in which the metal being treated serves as the anode. [NOMMA-86]

ARC WELDING - A process for the joining of metal parts by fusion, with the necessary heat being produced by an electric arc struck between an electrode and the metal or between two electrodes. [NOMMA-86]

AS FABRICATED - a) A term referring to the surface appearance and texture produced on metal mill products by the original forming process. b) A term referring to the surface appearance of a fabricated metal product before the removal of any disfigurations caused by the fabricating process. [NOMMA-86]

BALUSTER - One of a series of closely-spaced upright members which support the handrail in a railing. Also referred to as a Picket, Baluster Bar, Paling, Spacer Bar, etc. [NOMMA-86]

BALUSTRADE - A railing which is composed of balusters capped by a handrail, often serving as an architectural feature. [NOMMA-86]

BAR - A round, square, rectangular, hexagonal or similar section of rolled, drawn, or extruded metal. [NOMMA-86]

BAR SIZE SECTION - A hot rolled angle, channel, tee or zee having a greatest cross-sectional dimension less than 3 inches (76.2mm). [NOMMA-86]

BEND LINE - Point of change of direction of a structure. [NOMMA-86]

BEVEL (of stairs) - See Pitch (of stairs). [NOMMA-86]

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BEVEL (of stairs) - See Pitch (of stairs). [NOMMA-86]

BLOW HOLE - A hole or void in a casting, resulting from entrained gases. [NOMMA-86]

BONDERIZE - Chemical treatment of steel surface of another member, to strengthen and support it. (2) Chemical treatment of steel surface with proprietary phosphate solution, to provide limited, corrosion protection and improved paint base. [NOMMA-86]

BOTTOM RAIL - Lower member of railing system, supporting balusters or panels, if any. [NOMMA86]

BRACKET - Projecting member attached to surface of another member, to strengthen and support it. [NOMMA-86]

BRAKING - Mechanical bending, flanging, folding and forming sheet or plate material, using press brake or folding brake. [NOMMA-86]

BRAZING - The joining of metal parts by heating them and, by capillary action, drawing a molten copper-zinc or other brazing alloy between them. [NOMMA-86]

BUFFING - The process of providing a lustrous finish by means of power-operated soft fabric wheels coated with a wax compound containing fine abrasive particles. [NOMMA-86]

BULLNOSE STEP - (1) Stair tread, usually first tread at flight bottom, with one or both ends having semi-circular or similar shape in plan view. [NOMMA-86] (2) A tread with one or both ends having a semi-circular shape in plan: usually the first tread at the bottom of member projecting beyond supports(s). [NAAMM-82]

BURNISHING - Developing smooth, lustrous surface of metal part by tumbling in drum containing small steel balls or by rubbing with hard pads. [NOMMA-86]

BUTT JOINTING - Fastening squared edge or end of one member to squared edge, end or face of another member without overlapping. [NOMMA-86]

CANTILEVER - Portion of member projecting beyond support(s). [NOMMA-86]

CAP - A fitting used to close the end of a pipe or tubular rail or post or the top end of a tubular newel. [NOMMA-86]

CAP RAIL - See Handrail. [NOMMA-86]

CARBON STEEL - Steel having either 1) no specified minimum content of alloying elements; 2) a specified minimum copper content not exceeding 0.40%, or 3) maximum specified percentage contents as follows: manganese 1.65, silicon 0.60, copper 0.60. [NOMMA-86]

CARBURIZING - Producing hard surface layer on steel by heating in carbonaceous medium and subsequent quenching to increase carbon content. Also referred to as "Case-Hardening." [NOMMA-86]

CARRIER ANGLE - An angle connected to the inside face of a stair stringer to form a supporting ledge for the end of a tread or riser. Also referred to as Pitch Block. [NOMMA-86]

CARRIER BAR - A flat bar used in the same way as a carrier angle. [NOMMA-86]

CARRIERS - A term used for carrier angles or bars used to support treads formed from metal steps and gratings. [NOMMA-86]

CASE-HARDENING - See Carburizing. [NOMMA-86]

CASTING - A product formed by pouring molten metal into a mold. [NOMMA-86]

CAST IRON - A hard, brittle, non-malleable metal which can be produced in any shape. It cannot be hammered or bent. It is used for many miscellaneous metal products. Both functional and decorative, it has good resistance to corrosion. [NOMMA-86]

CAUSTIC DIPPING - Immersing metal in alkaline solution to chemically clean its surface. [NOMMA-86]

CAUSTIC ETCH - A decorative matte texture produced on aluminum alloys by treatment in an alkaline solution, generally caustic soda (sodium hydroxide); also known as "frosted finish." [NOMMA-86]

CEMENT, QUICK SETTING - Used in the installation of railing posts set in sleeves or holes. [NOMMA-86]

CHAMFER - To bevel a sharp edge. [NOMMA-86]

CHECKERED PLATE - See Floor Plate.

CIRCULAR STAIR - A stair which, in plan view, has an open circular form with a single center of curvature. See also Spiral Stair. [NOMMA-86]

CLIP - Small fastening device, usually of metal, to hold element or component in place by mechanical action or friction. [NOMMA-86]

CLOSURE BAR - A flat metal bar connected in the field to the top and/or bottom surface or edge of a wall stringer to close gaps between the stringer and the wall. [NAAMM-82]

COLD-FINISHED STEEL - Carbon steel which has been cleaned and pickled, then rolled or drawn through dies to produce a dimensionally accurate section with improved surface finish and often other improved properties. [NOMMA-86]

COLD ROLLING - Bringing metal sheet, plate or bar to final thickness and finishing by passing between heavy rollers without heating. [NOMMA-86]

COLLAR - See Escutcheon. [NOMMA-86]

COLUMN - A structural member which is subjected principally to axial compression loading. [NOMMA-86]

CONSTRUCTION JOINT - Discontinuity in structure. [NOMMA-86]

COPE - To cut away a portion of one member, either to form a close-fitting joint with, or provide clearance for, another member. [NOMMA-86]

CORROSION - The decay of metals, usually from oxidation. [NOMMA-86]

COR-TEN - The trade name used by the United States Steel Corporation for its weathering type of steel. See Weathering Steel. [NOMMA-86]

COUNTERBORING - Enlarging entrance of hole for placing bolt head or nut. [NOMMA-86]

COUNTERSINKING - Beveling end of hole for receiving conical head of flat- or oval-head fastener. [NOMMA-86]

COVER FLANGE - See Escutcheon. [NOMMA-86]

CURVED STAIR - A stair which, in plan view, has two or more centers of curvature, being oval, elliptical or some other compound curved form. [NOMMA-86]

DECKING - Light-gauge fluted, ribbed or cellular, sheet-metal platform for supporting floor or roof. [NOMMA-86]

DEFLECTION - (1) Bending or sagging deformation of member. [NOMMA-86] (2) A bending deformation of a structural member, usually within the elastic range of the material. [NAAMM77]

DRAINAGE HOLE - See Vent Hole. [NOMMA-86]

DRAWING - The process of pulling metal in solid form through dies to alter its finish, mechanical properties or cross-sectional shape. [NOMMA-86]

DRAWINGS - Architectural and structural plan, often prepared by architect or engineer. They should indicate by plan, elevation section and detail the location, quantity, size and extent of product to be furnished. [NOMMA-86]

DRAWINGS, **SHOP** - See Shop Drawings. [NOMMA-86]

DRIFT PIN - Tapered, round rod used to align holes in two or more pieces of metal. [NOMMA-86]

DROP (Stairs) - A fitting used to close the bottom end of a tubular newel. [NOMMA-86]

DURANODIC - Trade name used by the Aluminum Company of America for its hard anodic coatings. Se Hard Anodic Coating. [NOMMA-86]

EASEMENT (Stairs) - That curved portion of a handrail which forms a transition in a vertical plane, between a horizontal and an inclined section of the handrail. [NOMMA-86]

ELASTIC LIMIT - The maximum unit stress which can be applied to a material without causing permanent deformation. [NOMMA-86]

EMBED - To cast into concrete. [NOMMA-86]

EMBOSSED - Having a raised and/or indented pattern impressed on either one or both surfaces (of a sheet material) by means of patterned rolls or stamping dies. [NOMMA-86]

ESCUTCHEON - Protective or ornamental cover located usually at and around base of post or picket, baluster, or where a rail terminates against a wall. Also refereed to as Cover Flange, Collar, Wall Clip or Wall Flange. [NOMMA-86]

EXPANSION JOINT - A control joint designed to allow for differential movement of the joining parts due to thermal expansion and /or contraction, eliminating moment transfer. [NOMMA-86]

EXTRUSION - a) The process of producing metal shapes by forcing heated metal through an orifice in a die by means of a pressure ram. b) Any item made by this process. [NOMMA-86]

FABRICATE - To manufacture, form, assemble or construct metal products. [NOMMA-86]

FACE STRINGER - A stringer which supports, on one side, the ends of treads and risers, and is exposed on the other side. [NAAMM-77]

FACTOR OF SAFETY - The ratio of minimum yield stress or minimum ultimate stress to design or working stress. [NOMMA-86]

FASCIA - (1) a) In general, a horizontal band treatment on a wall, or the edge facing of a projecting element. b) In metal stairs, the exposed facing of the outer edge of a platform or floor; usually similar in detail to the face stringer. [NOMMA-86] (2) The exposed facing of the outer edge of a platform or floor; usually similar in detail to the face stringer. [NAAMM-821

FASCIA MOUNT - See Side Mount. [NOMMA-86]

FATIGUE - Structural failure of a material caused by repeated or fluctuating application of stress, none of which individually is sufficient to cause failure. [NOMMA-86]

FERROUS METAL - Metal in which iron is the principal element. [NOMMA-861

FIELD CHECK - Verification of existing dimensions against those shown on drawing prior to fabrication. [NOMMA-86]

FIELD JOINT - A connection between two adjoining members or parts, made at the time of installation, generally accomplished by use of an internal mechanical connector or by welding. [NAAMM-77]

FIELD MEASURE - Survey of existing conditions. [NOMMA-86]

FILL (Stairs) - A cementitious material, such as concrete or terrazzo, which is placed over a metal substructure to provide the wearing surface of a tread or platform. [NOMMA-86]

FINIAL - An ornamental piece on top of railing post, newel or fence. Also referred to as Urn. [NOMMA-86]

FIXED METAL STAIR - A permanently stationary series of three or more steps in one or more flights, providing pedestrian access between different floors or levels. [NAAMM-82]

FLAT - Rectangular bar of width greater than its thickness. [NOMMA-86]

FLIGHT - An uninterrupted series of steps. [NOMMA-86]

FLIGHT HEADER - See Header, Flight. [NOMMA-86]

FLIGHT RISE - The vertical distance between the floors or platforms connected by a flight of stairs. [NOMMA-86]

FLIGHT RUN - The horizontal distance between the faces of the first and last risers in a flight. [NOMMA-86]

FLOOR PLATE - Steel plate having a raised pattern to provide a non-slip wearing surface; referred to as "tread plate" when made of aluminum. [NOMMA-86]

FLUSH BOLT - A rod or bolt which is mounted flush with the edge or face of the inactive door of a pair, to lock the door to the frame at the head and/or still. When mounted in the edge, operation is by means of a recessed lever. [NOMMA-86]

FLUSH FITTING - A pipe or tube fitting having the same outside diameter as the pipe or tube to which it is joined. [NAAMM-77]

FORGING - Heating and hammering metal into a desired shape. [NOMMA-86]

FORMING - The process of shaping metal by mechanical action other than machining, forging, or casting. [NOMMA-86]

GAGE - See Gauge [NOMMA-86]

GALVANIC CORROSION - The electrochemical action which takes place when dissimilar metals are in contact in the presence of an electrolyte, with the extent of corrosion being governed by both the difference in potential between the two metals and the relative areas of the metal parts. [NOMMA-86]

GALVANIZING - The process of coating metal with zinc, either by dipping in a bath of molten zinc, by mechanical coating or electrolytic action. [NOMMA-86]

GAUGE - a) A number indicating the thickness of metal or the diameter of a wire or a fastener shank, in

accordance with a standard series of numbers, each of which represents a certain decimal fraction of an inch (or number of millimeters). b) The distance, in inches, between adjacent lines of holes or fasteners. [NOMMA-86]

GENUINE WROUGHT IRON - Low carbon content used for finer types of decorative iron works where resistance to corrosion is of value. Suppliers are somewhat limited. When Genuine Wrought Iron is specified, the words "wrought iron" are not sufficient, and this term may denote any carbon steel. Therefore, in specifying, it is important that the words "Genuine Wrought Iron" be used. Also see Wrought Iron." [NOMMA-86]

GRAB RAIL (Grab Bar) - A short length of rail located for safety and convenience. [NOMMA-86]

GRINDING - Removing metal from a surface by means of abrasive action. [NOMMA-86]

GRIT - Granular abrasive material such as aluminum oxide or silicon carbide, which may be coated on cloth, paper or wheels for sanding grinding or polishing purposes. Also used as surface roughener for metal to provide non-slip surface. [NOMMA-86]

GRIT NUMBER - The grain size of an abrasive used for grinding or polishing metal. Also, the degree of fineness of a metal finish produced by that abrasive. Grit numbers are in an ascending order from coarse to fine. [NOMMA-86]

GUARDRAIL SYSTEM - Rail system usually located for protection of building occupants at or near outer edge of stair, ramp, landing, platform, balcony or accessible roof; at perimeter of any opening or accessible surface, such as opening for stairway; or at location where operating condition requires limitation of access to designated area to guard against accidental falls or injury. See Railing System. [NOMMA-86]

GUSSET - A piece of metal plate used to construct or reinforce a line or angular joint between two or more metal members. [NOMMA-86]

HAMMERING - Hot or cold, machine or hand peening or denting of metal surfaces for artistic effect. Also referred to as Swedish Look. [NOMMA-86]

HAND OF SPIRAL STAIR - A term used to designate the tuna direction of a stair. Right-hand refers to a stair on which the user turns counter-clockwise as he ascends. Left-hand refers to a stair on which the user turns clockwise as he ascends. [NOMMA-86]

HANDRAIL - Horizontal or sloping member normally grasped by hand. This member may be part of a railing system and often, but not necessarily, top member (top rail); or may be mounted on wall or other building element. When part of stair-rail system, it is a member paralleling the pitch of the flight and is often, but not necessarily, top member. See Wall Handrail. [NOMMA-86]

HANDRAIL BRACKET - (1) A device attached to a wall, post or other surface to support a handrail. [NOMMA-86] (2) A device attached to a wall, post or other surface to support a handrail. A left-hand handrail bracket is one which is located on the users left as he ascends the stairs. A right-hand handrail bracket is one which is located on the user's right as he ascends the stairs. [NAAMM-77]

HANGER (Stairs) - A load-carrying tension member used to support a stair framing member by suspension from floor construction or other support above. [NOMMA-86]

HARD ANODIC COATING - A coating on aluminum by a proprietary anodizing process, without the use of dyes or pigments. It provides a high resistance to abrasion and corrosion and is produced in various shades of bronze and gray, as well as black. [NOMMA-86]

HEADER, FLIGHT - A horizontal structural member used in stair construction at a floor or platform level to support the end(s) of one or more stringers. [NOMMA-86]

HEADER, PLATFORM - A horizontal structural member supporting stair platform construction but carrying no stringers. [NOMMA-86]

HEADING - The process of "upsetting" or enlarging the end of a piece of metal. [NOMMA-86]

HEADROOM - The minimum vertical distance from the top surface of a stair tread or platform to the ceiling, soffit or other overhead obstruction, measured at the outer edge of a tread. [NOMMA-86]

HIGH-STRENGTH LOW-ALLOY STEEL - Steel having a chemical composition specifically developed to impart higher mechanical property values and, in some cases, greater resistance to atmospheric corrosion than is obtainable from conventional carbon structural steels. [NOMMA-86]

HOT DIP GALVANIZING - The process or result of applying a protective coating to ferrous metal by dipping in a bath of molten zinc. [NOMMA-86]

HOT ROLLED - Shaped by passing a heated billet between rollers. [NOMMA-86]

HOT WORKING - The process of forming a metal when its temperature is higher than its recrystallization temperature. [NOMMA-86]

I.P.S. - Iron pipe size; the nominal inside-diameter dimension of pipe. [NOMMA-86]

KALCOLOR - The trade name used by Kaiser Aluminum and Chemical Corporation for its hard anodic coatings. See Hard Anodic Coating. [NOMMA-86]

KICK PLATE - a) A protective plate fastened to the lower face or faces of a door. b) A vertical plate forming a lip or low curb at the open edge of a stair platform or floor, or at the back edge or open end of a stair tread, on an open riser stair. Also referred to as Toe Plate, Toe Board. [NOMMA-86]

KNOB - An ornamental curved and tapered fitting terminating a handrail. [NOMMA-86]

KNOCKED DOWN - A term used in reference to any product that is shipped disassembled, for assembly at the building site; commonly abbreviated "KD." [NOMMA-86]

LAMB'S TONGUE - An ornamental curved and tapered fitting terminating a handrail. [NOMMA-86]

LANDING - Level part of staircase at end of stair flight. See Platform. [NOMMA-86]

LAP SEAM - Joint formed by overlapping edges of metal sheets or plates and joining them by riveting, welding, soldering, or brazing. [NOMMA-86]

LAY OUT - To scale out configuration of structure. [NOMMA-86]

LATERAL SCROLL - A fitting which curves in a horizontal plane, used to terminate a stair handrail. Often ends up as a round plate covering the top of a post. [NOMMA-86]

LINTEL - A horizontal structural member spanning a wall opening at its head to support the wall above the opening. [NOMMA-86]

MALLEABLE IRON - A sand cast iron which is annealed and can be bent cold to some degree. It is used in many metal building products where strength and ability to resist shock are essential. It is easily welded without danger of cracking by the same method used for welding steel. [NOMMA-86]

MAYARI-R STEEL - Trade name used by Bethlehem Steel Corporation for its type of Weathering Steel. See Weathering Steel. [NOMMA-86]

MECHANICAL COATING - The process of applying a protective coating to ferrous metal by hammering zinc powder or flakes into metal surface with glass pellets during tumbling. [NOMMA-86]

MECHANICAL CONNECTIONS - A connection between railing members made by means other than welding or adhesive bonding. [NAAMM-77]

MECHANICAL PROPERTIES - Properties characterizing response to applied forces, such as strength, stiffness, elasticity and ductility. [NOMMA-86]

METALLIZE - To apply a coating of metal, usually in a powdered or molten form, on a base metal or other material. [NOMMA-86]

MID RAIL - Rail located between top and bottom rails. [NOMMA-86]

MILL FINISH - The original surface finish produced on a metal mill product by rolling, extruding, or drawing. [NOMMA-86]

MILL SCALE - The scaly oxidized surface produced on steel by heating and hot rolling. [NOMMA-86]

MOCKUP - A section of a structure or assembly, built full size or to scale, for purposes of testing its performance, studying its construction details or judging its appearance. [NOMMA-86]

MOLD - A form into which molten metal is poured to produce a casting. [NOMMA-86]

NEWEL - A post member, usually square or rectangular in cross section, supporting the end of a stair railing or serving as a common support for two stair railings. [NOMMA-86]

NON-FERROUS - Metal without any iron content. [NOMMA-86]

NOSING - That part of a stair tread or platform which projects as a square, rounded or rounded and molded edge beyond the vertical face of the riser below it. [NOMMA-86]

PAN BRACKET (Stairs) - See Carrier Angle or Carrier Bar. [NOMMA-86]

PAN TREAD (Stairs) - See Tread, Pan Type. [NOMMA-86]

PANEL - Portion of railing between posts, top rail and bottom rail. [NOMMA-86]

PARALLEL STAIR - A stair consisting of flights which parallel each other and are separated only by one or more intermediate platforms. [NOMMA-86]

PATTERN - Model for making mold into which molten material is poured to produce casting; to reproduce like image in mold. [NOMMA-86]

PERFORATING - Punching or drilling an overall pattern of holes or openings in sheet metal. [NOMMA-86]

PERFORMANCE - Conformance with established criteria. [NOMMA-86]

PERMANENT - Functioning indefinitely without fundamental or marked change; in contrast to temporary. [NOMMA-86]

PERMANENT SET - The extent to which a component or structure is permanently deformed by an applied load after removal of the load. [NOMMA-86]

PHOSPHATIZING - The process of producing a phosphate conversion coating on metal by dipping it in a suitable aqueous solution of phosphoric acid, to improve paint adhesion and increase corrosion resistance. [NOMMA-86]

PHYSICAL PROPERTIES - Material properties, such as specific gravity or density, electrical and thermal conductivity, and coefficient of thermal expansion, serving to characterize and to distinguish between different kinds of matter. [NOMMA-86]

PICKET - One of a series of closely-spaced upright members which support the handrail in a railing. See baluster. [NOMMA-86]

PICKET CASTING - Ornamental design attached to a picket. [NOMMA-86]

PICKET RAILING - Railing consisting of posts, pickets, top rail and, sometimes, bottom rail. [NOMMA-86]

PICKLING - The treatment of metal surfaces with a strong oxidizing agent, such as nitric acid, to make them chemically clean and provide a strong, inert oxide film. [NOMMA-86]

PIPE RAILING - Railing fabricated of pipe. [NOMMA-86]

PIPE, ROUND - A hollow round section of metal, the size of which is usually designated by nominal inside diameter in inches (or millimeters). [NOMMA-86]

PITCH - The inclination or slope, measured either in degrees, percent, or by the ratio of rise to run. [NOMMA-86]

PITCH BLOCK - See Carrier Angle. [NOMMA-86]

PITCH DIMENSION (Stairs) - The distance between the bases of the top and bottom risers in a flight, measured parallel to the slope. Sometimes referred to as the nose to nose dimension. [NOMMA-86]

PITTING - Localized surface defects on metal, in the form of small depressions or 'pits', usually caused by electrochemical corrosion. [NOMMA-86]

PLATE - Flat Metal .180" or over in thickness and over 8" in width. [NOMMA-86]

PLATFORM (Stairs) - A horizontal surface having a dimension parallel to the stringer greater than a tread width and occurring in a stair at the end of a flight or between flights, either at a floor level or between floors. In the latter case, it is sometimes referred to as an intermediate platform or landing. [NOMMA-86]

PLATFORM HEADER - See Header, Platform. [NOMMA-86]

POCKET - Opening provided in structure to accept post, rail-supporting bracket or structural member. [NOMMA-86]

POST (Railing) - A vertical, supporting member of a railing system. [NOMMA-86]

PRE-ASSEMBLED STAIR - A stair whose components are assembled in the plant to make up units of varying sizes and degrees of complexity. [NAAMM-82]

PRE-ERECTED STAIR - A stair unit for multi-storied buildings designed to be self supporting. Such units

can be stacked one upon the other and field connected to form stair towers. [NAAMM-82]

PRIMER - Liquid coating applied to surface prior to application of paint or other finish. [NOMMA-86]

PRIMER PAINT - First coat applied to metal to retard corrosion temporarily and to provide satisfactory adhesion of finish coat. [NOMMA-86]

PUNCHING - A process of forcing a punch through the metal into a die, forming a hole in the shape of the punch. [NOMMA-86]

QUENCHING - The process of cooling heated metal by contact with a liquid, gas or solid, for purposes of hardening or tempering. [NOMMA-86]

RAIL - Horizontal, vertical or inclined member of railing system. See Railing System, Handrail, Wall Handrail, Stair Rail System. [NOMMA-86]

RAILING - See Railing System. [NOMMA-86]

RAILING SYSTEM - A framework of horizontal, vertical or inclined members or panels, or some combination of these, supporting a handrail and located at the edge of a stair flight platform or floor, as a safety barrier. See Guard Rail System and Stair Rail System. [NOMMA-86]

RAKE - See Pitch. [NOMMA-86]

RAKE DIMENSION - See Pitch Dimension. [NOMMA-86]

RAMP RAIL, SYSTEM - A railing system located along side(s) of ramp. [NOMMA-86]

RESIDUAL DEFLECTION - See Permanent Set. [NOMMA-86]

RETURN - A rail bend of 180°, as at a stair platform or railing terminal. See also Wall Return. [NAAMM-77]

RISE - See Flight Rise. [NOMMA-86]

RISER - The vertical or inclined face of a step, extending from the back edge of one tread to the outer edge of the tread or lower edge of the nosing next above it. [NOMMA-86]

RISER, OPEN - A term used to describe a stair having open spaces rather than risers between treads. [NOMMA-86]

RISER FIGHT -The vertical distance between the top surfaces of two successive treads. [NOMMA-86]

RUN - See Flight Run and Tread Run. [NOMMA-86]

SADDLE - See threshold. [NOMMA-86]

SAFETY NOSING - A stair nosing having an abrasive nonslip surface flush with the tread surface. [NOMMA-86]

SAFETY TREAD - A stair tread which is covered on its top surface with an abrasive or nonslip material. [NOMMA-86]

SAND BLASTING - Subjecting to a stream of sand projected at high velocity under air or steam pressure, for the purpose of removing scale or encrusted material or to provide a textured finish. [NOMMA-86]

SANITARY COVE (Stairs) - A small projection formed in the face of a metal riser along its full length to provide an angled or curved transition between the tread surface and the riser face, to facilitate cleaning. [NOMMA-86]

SCISSOR STAIR - A straight stair which in plan view has two parallel flights between floors but in which the stairs are at a 180 degree angle to each other. [NAAMM-82]

SCREEN - Perforated panel or wire mesh serving as a panel. [NOMMA-86]

SCROLL - Ornamental spiral or convoluted form serving, e.g., as decorative railing panel or insert, either cast or forged. [NOMMA-86]

SHEET - Thin, flat, rolled metal product having mill or cut edges, less than .229" in thickness. [NOMMA-86]

SKIP'S LADDER - A ship's ladder is named for its use as a stairway access between decks of a ship. These ladders ascend at steep angles of not less than 50 degrees nor more than 77 degrees with the deck, and cover the angularity of ascent between that of conventional stairs and straight ladders they are not used for public stairways in buildings. [NAAMM-82]

SHOP DRAWING - A working drawing usually prepared the fabricator. [NOMMA-86]

SIDE MOUNT - (1) Railing support anchoring post to vertical surface, such as fascia or stringer face. [NOMMA-86] (2) A method of railing support in which the posts are anchored to a vertical surface such as a fascia or stringer face. Also referred to as fascia bracket of fascia flange. [NAAMM-77]

SLAG - The crusty residue resulting form melting or welding metal. [NOMMA-86]

SLEEVE - a) A tubular section of sheet metal or other material placed in concrete or masonry to provide either a pocket or opening for the insertion or the penetration of another item. b) An internal tubular splice between abutting sections of pipe, tubing, or tube-like members. [NOMMA-86]

SLIP JOINT - A joint which permits relative sliding movements of the joining parts. [NOMMA-86]

SLOPE - See pitch. [NOMMA-86]

SOFFIT (Stairs) - (1) Underside of stair in exposed construction. Also, finish material applied to underside of stair. [NOMMA-86] (2) The under side of a stair, whether exposed construction or an applied finish material. [NAAMM]

SPECIFICATIONS - Document providing descriptive or performance requirements and criteria. [NOMMA-86]

SPINDLE - A tapered round picket, with center part larger in diameter than ends. [NOMMA-86]

SPIRAL STAIR - A stair with a closed circular form, uniform sector-shaped treads and a supporting center column. [NOMMA-86]

SPIRAL STAIR, LIMITED ACCESS - A spiral stair serving an occupant load of 10 or less and from an area of 600 square feet or less. [NAAMM]

SPIRAL STAIR, PRIMARY ACCESS - A spiral stair serving an occupant load of 50 or less. [NAAMM]

SPLICE PLATE - A plate used for fastening two or more members together. [NOMMA-86]

SPRAYING - The process of coating metal with paint, another metal or any other material by use of air or hydraulic pressure. [NOMMA-86]

SQUARES - A term used in reference to square metal bars having either slightly rounded or sharp corners. [NOMMA-86]

STAIR-(I) A flight or series of connecting flights extending between two or more floors. [NOMMA86] (2) A flight or series of connected flights extending between two or more levels within a given floor area or stair well. [NAAMM-77]

STAIR LIFT - See Flight. [NOMMA-86]

STAIR-RAIL SYSTEM - Railing system located along open sides of stair and landing. [NOMMA-86]

STAIR-RUN - One run of stairs between floors, platforms or floors and platforms. [NOMMA-86]

STAIRWAY - See Stair. [NOMMA-86]

STAIR-WELL - The vertical shaft space in a building occupied by a stair; also, the open well space between a series of flights. [NOMMA-86]

STEP - The combination of a riser and the tread immediately above it. [NOMMA-86]

STEP RISE - See Riser Height. [NAAMM-82]

STIFFENER - A reinforcing member which serves to prevent or limit the deformation of the member to which it is attached. [NOMMA-86]

STORY HEIGHT - The vertical distance, in a building, between one finished floor and the next.

STRAIGHT RUN STAIR - Stair extending in straight line between two floors and consisting of single flight or series of flights with one or more intermediate platforms. [NOMMA-86]

STRING - See Stringer, the preferred term. [NOMMA-86]

STRINGER (Stair) - An inclined structural member supporting a flight of stairs, or a structural member having an inclined section with a horizontal section at one or both ends, supporting a flight and one or two platforms. [NOMMA-86]

STRINGER, BOXED - A stringer having a hollow square or rectangular cross section. [NOMMA-86]

STRINGER, CENTER - A stringer located under a flight at its mid-width and supporting the treads, or treads and risers. [NOMMA-86]

STRINGER, CLOSED See Stringer, Boxed. [NOMMA-86]

STRINGER, FACE - A stringer which supports, on one side, the ends of treads and risers, and is exposed on the other side. [NOMMA-86]

STRINGER, OPEN - A structural channel used as a stringer. [NOMMA-86]

STRINGER, PLATE - A flat plate used as a stringer. [NOMMA-86]

STRINGER, PLATFORM - A stringer, or that part of a stringer, which is used to support a platform.

[NOMMA-86]

STRINGER, TUBE - A stringer made from a metal tube section. [NOMMA-86]

STRINGER, WALL - A stringer placed alongside a wall, and usually carrying no railing. [NOMMA-86]

STRIP - Flat metal, .229" or less in thickness and 12" or less in width. [NOMMA-86]

STRUT - (1) A vertical compression member designed to resist axial loads. [NOMMA-86] (2) A structural member which resists axial compression loads. Generally used to support a stair framing member by column action. [NAAMM-82]

SUB-PLATFORM - The metal subfloor over which a fill is placed to provide a platform. [NAAMM-82]

SUB-TREAD - See Tread, Pan Type. [NOMMA-86]

SWEDISH IRON LOOK - See Hammering. [NOMMA-86]

TACK WELD - a) A small temporary weld applied to metal parts to hold them in correct position while completing an assembly. b) One of a series of small welds applied where a continuous weld is unnecessary. [NOMMA-86]

TEMPERING - Heating metal, glass or other material to temperature below transformation stage, subsequently cooling it at controlled rate to change its hardness, strength, toughness or other property. [NOMMA-86]

TEMPLATE - a) A pattern used as a guide in fabricating a part. b) A precise detailed layout or pattern for providing the necessary fabrication details. [NOMMA-86]

TENSILE STRENGTH - The maximum load which can be sustained by metal in tension measured in pounds per square inch. [NOMMA-86]

THRESHOLD - A raised member extending between the jambs of a door frame at the floor. [NOMMA-86]

TOE BOARD - See Kick Plate. [NOMMA-86]

TOE PLATE - See Kick Plate. [NOMMA-86]

TOLERANCE - Permissible deviation from a nominal or specified dimension or value. [NOMMA-86]

TOP RAIL - The top member of a rail system, sometimes called cap rail. [NOMMA-86]

TRAFFIC RAH, SYSTEM - A railing system designed for the control of movement of people, requiring special consideration for given end-use conditions. [NOMMA-86]

TRANSFER RAIL SYSTEM - Railing system designed for transfer of body weight in such locations as toilets, showers and tub enclosures. [NOMMA-86]

TRAVEL AREA - That area with which -a stair user might normally make physical contact. [NAAMM]

TREAD - The horizontal member of a step. [NOMMA-86]

TREAD ANGLE - Se Carrier Angle. [NAAMM]

TREAD BAR - See Carrier Bar. [NAAMM]

TREAD DEPTH - The tread run plus the projection of the nosing, if any. NOMMA-86]

TREAD, GRATING TYPE - Tread fabricated from metal grating. [NOMMA-86]

TREAD LENGTH - The dimension of a tread measured perpendicular to the normal line of travel on a stair. [NOMMA-86]

TREAD PAN - A section formed from sheet metal to receive a fill and provide, when filled, either a tread or combination tread and riser. [NOMMA-86]

TREAD, PLATE TYPE - A tread, or a combination of tread and riser, fabricated from metal plate, floor plate, tread plate or a combination of plates. [NOMMA-86]

TREAD RUN - The horizontal distance between two consecutive risers or, on an open riser stair, the horizontal distance between nosings or the outer edges of successive treads, all measured perpendicular to the front edges of the nosings or treads. [NOMMA-86]

TREAD WIDTH - The tread run plus the projection of the nosing, if any. [NAAMM-82]

TUBING - A hollow section of metal having a round, square, rectangular or other cross-sectional form. Size is designated by outside dimension(s) in inches or millimeters, and wall thickness in gauge number, thousandths of an inch, or millimeters, or fraction of an inch. [NOMMA-86]

UPSETTING - A cold- or hot-forging operation by which the cross-sectional area of a bar of rod in increased locally. [NOMMA-86]

URNS - See Finials. [NOMMA-86]

VENT HOLE - Opening for escape of gas or liquid or for relief of pressure, especially required in fabricating when item is to be coated by immersion or hot-dip galvanized. Also referred to as drainage hole. [NOMMA-86]

VERTICAL BARRIER - A wall or railing adjacent or attached to the edge of a flight, platform or floor, to prevent persons from falling. [NAAMM-82]

VOLUTE (Stairs) - A spiral or scroll-shaped fitting used to terminate a stair handrail. [NOMMA-86]

WALL CLIP OR WALL FLANGE - A bracket used for anchoring. [NOMMA-86]

WALL HANDRAIL - Handrail attached to wall adjacent to stair and paralleling pitch of flight, also used along walkway, ramps and corridors. Also referred to as a Wall Rail. [NOMMA-86]

WALL RAIL - See Wall Handrail [NOMMA-86]

WALL RETURN - A bend at the end of a wall handrail, turning it toward the wall to which it is attached. [NOMMA-86]

WEATHERING STEEL - High-strength, low alloy steel made especially for application requiring light weight, high strength and resistance to corrosion of approximately 5 to 6 times that of lowcarbon steel. [NOMMA-86]

WEEPHOLE - A small opening provided to permit the drainage of fluid. [NOMMA-86]

WELDING - The process of joining two metals or alloys by fusion. [NOMMA-86]

WELDING ROD - Metal rod of suitable composition to be used as a source of filler material in arc or gas welding. [NOMMA-86]

WINDER - A tread having less width at one end than at the other. [NOMMA-86]

WIRE MESH - See Screen. [NOMMA-86]

WORKING DRAWING - See Shop Drawing. [NOMMA-86]

WROUGHT IRON - (1) Fabricated ornamental work, usually made of mild steel of commercial quality. Also see Genuine Wrought Iron. [NOMMA-86] (2) A ferrous material, aggregated from a solidifying mass of pasty particles of highly refined metallic iron, with which, without subsequent fusion, is incorporated a minutely and uniformly distributed quantity of slag. [ASTON]

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