



**LIST OF MATERIALS,
SUPPLIES
AND EQUIPMENT**

FOR

**TEACHER
ASSESSMENTS**

July 2010

The materials, supplies and equipment are listed for all jobs for each Teacher performance test. Each evaluator will need to determine the quantity of items required depending on the number of testing stations and test participants to be tested at one time unless it is specifically stated otherwise.

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| WRITTEN ASSESSMENTS |
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ALL WRITTEN ASSESSMENTS

- Non-programmable calculator, when appropriate
- Scrap paper
- No. 2 pencils

BUILDING CONSTRUCTION OCCUPATIONS (5163)

- 2007 National Electrical Code

ELECTRICAL CONSTRUCTION TECHNOLOGY (5171)

- 1999 National Electrical Code

PRECISION MACHINING (5176)

- Machinery's Handbook

PERFORMANCE ASSESSMENTS

ADMINISTRATIVE ASSISTING (5160)

Computer with word processing and spreadsheet software
Printer
Pen and pencil
CD or Diskette (or equivalent)
Blank paper (8 1/2 x 11)
Business/legal sized envelopes
Dictionary
Office reference manual
1 File folder
Copy holder (optional)
Adjustable chair

ADVERTISING AND DESIGN (5161)

JOB 1

Computer with page layout and drawing software (such as, QuarkXPress, Freehand, Illustrator, InDesign, or Corel Draw)
11" x 17" white printer paper
Digital image (theme appropriate for a travel flyer)
Sun graphic

JOB 2

Computer and drawing software (such as, QuarkXPress, Freehand, Illustrator, InDesign, or Corel Draw)
Color printer
Conventional layout materials (markers, colored pencils, tracing paper, masking tape)
Triangles
T-Square or straight edge
Rulers
Type sample books or computer font books
11" x 17" illustration board
11" x 19" flap paper (cover sheet)
Rubber cement

AUTOMOTIVE TECHNICIAN (5162)

JOB 1

40 tags or stickers to use as labels for the following parts:

Valve guide seal
Valve lifter (hydraulic roller-type)
Piston wrist pin
Timing belt
Oil control ring
Valve body assembly
Front pump assembly
Sprag clutch
Friction disc
Friction band
Shift fork
Clutch disc
Synchronizer ring
CV joint
Input shaft
Tie rod end
Strut assembly
Sway bar link
Power steering pump
High pressure hose
Proportioning valve
Caliper
Wheel speed sensor
Master cylinder
Star wheel brake adjuster
Circuit breaker
Fusible link
Rectifier diode
Relay
Starter solenoid
Accumulator
Orifice tube
Clutch cycling switch
Clutch assembly
Thermostat
Ignition coil, individual cylinder (coil on plug)
Idle air bypass valve
Throttle position sensor
Mass air flow unit
O₂ sensor

JOB 2

Front wheel drive vehicle with hubless rotor disc brake assembly
Socket set, 3/8" drive
Torque wrench and sockets
Rotor specification book
Rotor micrometer
Brake lathe
Hubless rotor to machine

JOB 3

Steel wheel, 14" or 15"
Tires, two (2) 14" or 15" to match rim size
Tire changing machine
Tire pressure gauge
Tire bead lubrication with applicator
Valve core removal tool
Electronic tire balance machine
Assorted clip-on wheel weights
Wheel weight hammer and pliers
Extra valve stems and cores (as needed)

JOB 4

Identified cylinder head with an exhaust valve removed and retained
Specification book corresponding to identified cylinder head
Straightedge
Feeler gauge set (metric and English marked)
Micrometers (0 to 1 inch and 0 to 25 mm)

JOB 5

Vehicle with electronic fuel injection, service port, and fuel pressure regulator
Fuel pressure gauge with adaptors
Fuel container
Fire extinguisher
Specification book
Vacuum hand pump with vacuum line plugs

JOB 6

Vehicle with operating washer pump that has an open ground circuit
Service manual for the vehicle used
12-volt test light
DVOM
Fused jumper wire
Spare fuses
Hand tools to access washer pump (as needed)

JOB 7

Test vehicle with correctly functioning battery, starting, and charging system
Volt-amp tester
Tachometer
Specification book
DVOM

JOB 8

Vehicle equipped with electronic fuel injection system (**vehicle must have two "bugged" sensors**)
"Bugged" sensors must match fault codes set in the PCM
Manufacturer's service manual
Scan tool

BUILDING CONSTRUCTION OCCUPATIONS (5163)

JOB 1

2' of 1/2" copper tubing
2 – 1/2" 90-degree elbows (copper)
2' of 1/2" iron pipe
Solder
Flux
Emery cloth
Steel wool/sandpaper
Fitting brush
Pipe cutter
Pipe dies
Tubing cutter
Pipe vise
Plumber's torch
Cutting oil
Measuring tape
Flux brush

JOB 2

1 - 2 x 6 x 8
Framing square
Measuring tape
Stair gauges
Sawhorses
Pencil

JOB 3

1 - 2 x 12 x 8
Framing square
Measuring tape
Stair gauges
Sawhorses
Pencil

JOB 4

Studded or framed workstation
2 – Single-pole switches
3 – Non-metallic device boxes
2 - Duplex receptacles
2 – Split receptacles
2 – Three-way switches
12' – 14/2 cable
12' – 14/3 cable
10 – Yellow wire nuts
10 – Red wire nuts
20 – Cable staples
Lineman pliers
Long-nosed pliers
Hammer
Flathead screwdriver
Phillips screwdriver
Knife
Measuring tape
Wire strippers
Diagonal cutters
Tester
Pencil

JOB 5

4 - Corner (jamb) blocks
2 - Half corner (jamb) blocks
4 - Line (stretcher) blocks
Mortar
Concave jointer
Measuring tape
Mason's brush
Levels, 2' and 4'
Mortar board
Trowel
Chalkline
Pencil

BUILDING TRADES MAINTENANCE (5164)

NOTE: Successful completion of Jobs 2-6 requires a completed frame built in Job 1. Provide a completed frame, based on the instructions and specifications in Job 1, for use by any participant who is unable to complete Job 1.

JOB 1

Structural lumber, two pieces 2" x 4" x 8' long
Common nails, ten 16d
Common nails, four 8d
Workbench (or table)
Hammer
Circular saw
Tape measure
Framing square
Hand saw
Clamps to secure project to table
Pencil

JOB 2

CU caps, 1/2"
MIP fitting, 1/2"
Tee, 1/2"
45° Els, 1/2"
Copper straps, 1/2"
Four feet of CU pipe, 1/2"
Dry wall nails
Quick connect coupling, 1/2"
Emery cloth
Flux
Lead-free solder
Propane torch
Striker
Flux brush
Tape measure
Tubing cutter
Power drill
Spade bit, 5/8"
Hammer
Extension cord
Rags
Wire brush, 1/2", fitting
Teflon tape (or joint compound)
Pencil

JOB 3

Device box (plastic)
Octagon box (metal) with connector and strap or bracket
Nonmetallic (Romex) staples
14/2 Nonmetallic cable with ground, 5'
Roofing nails

JOB 3 - continued

Grounding screw
Yellow wire nuts
Hammer
Cable stripper (or utility knife)
Wire stripper
Lineman's pliers
Multipurpose screwdriver
Pencil

JOB 4

1 pc. 1/2" Drywall (2' x 2')
2' Paper tape
Drywall nails
Joint compound
Hammer
Keyhole saw
Power drill
5/8 spade bit
Utility knife
Framing square
Tape measure
Pencil
4" Taping knife
Hawk (or tray)

JOB 5

Single-pole switch, with ground
Porcelain keyless light fixture
Light bulb, 40 watt
Switch plate cover
Multipurpose screwdriver
Needlenose pliers
Multipurpose tool (or wire stripper)
Continuity tester

JOB 6

Butt hinge (square), 4"
Matching screws
Chisel, 3/4"
Hammer
Pencil
Tape Measure
Awl
Multipurpose screwdriver

CARPENTRY (5165)

Participants are allowed to use a non-programmable calculator during this performance assessment.

JOB 1

Handsaws: back, coping, crosscut, hack
Bits: speed, auger, masonry, twist
Circular saw blades: combination, crosscut, dado, abrasive
Wrenches: adjustable, Allen, box, open end
Nails: roofing, duplex, framing (sinker or box), finish
Fasteners: flathead screw, lag bolt, drywall screw, carriage bolt
Lumber scraps: fir, cedar, white pine, oak
Finishing tools: wood chisel, block plane, half-round file, nail set
Layout tools: combination square, framing square, speed square, sliding T-bevel
Marking tools: scratch awl, compass scribe, carpenter's pencil, chalk box
Set of adhesive labels (40) for above items

JOB 2

Appropriate personal protection equipment
Safety glasses
4 concrete blocks 8 inch x 8 inch x 16 inch
Tape measure, at least 25 feet (one for each workstation)
Chalk box (including blue chalk)
2 inch masking tape (may be used to mark corners of square)
Pencils
Broom to sweep away chalk lines between participants

JOB 3

Appropriate personal protection equipment
Safety glasses
Bracing materials (for set-up)
Builder's level with sight rod
Material for benchmark references, i.e. 4 inch x 4 inch, ledger on wall, concrete block, 2 feet x 4 feet wall panel or equivalent, etc.

JOB 4

Appropriate personal protection equipment
1 piece of lumber: 2 inch x 4 inch x 16 feet (species does not matter)
Adding machine paper, 3 1/2 inch x 16 feet, per participant
1 inch masking tape or stapler with staples
Tape measure, at least 25 feet
Pencils

JOB 5

Appropriate personal protection equipment
1 piece of lumber: 2 inch x 6 inch x 8 feet (species does not matter)
Roll of paper, 5 1/2 inch x 8 feet, per participant
Rafter framing square or speed square with accompanying book
Stair gauges/Square clips
Staples or masking tape
Pencils

JOB 6

Appropriate personal protection equipment
1 piece of lumber: 2 inch x 12 inch x 48 inch (species does not matter)
Roll of paper, 11 1/4 inch x 4 feet, per participant
Framing square
Stair gauges
Staples or masking tape
Tape measure
Pencils

JOB 7

Appropriate personal protection equipment
Bracing materials (for set-up)
Rough opening should be 1/2 inch larger than the frame size on all sides
1 frame, (approximately 2 feet x 3 feet) assembled
1 piece casing molding, 6 feet to 8 feet
Level (2-foot and/or 4-foot)
Framing square
Miter box (power or manual)
Block plane
16 oz. hammer
Handsaws, 8 and 10 pt.
Utility knife with blade
Finish nails, 4d, 6d, and 8d
Nail set
Wood shims
8d double head nails or 2 inch drywall screws (optional for frame installation only)
Pencils

COMPUTER TECHNOLOGY (5168)

JOB 1

- Personal computer running Windows 2000 or newer
- Wordpad software
- Four floppy diskettes **or** one Flash Drive per participant)
 - *The same Flash Drive will be used for Job 1, Job 2, and Job 3*
 - *The same floppy diskettes will be used for Job 1, Job 2, and Job 3*
- Printer access
- Printer paper
- Writing utensils

JOB 2

- Personal computer running Windows 2000 or newer
- Word processing software including Spellcheck and Thesaurus
- The **DATA2** floppy diskette (from Job 1) **or** the Flash Drive from Job 1
- Printer access
- Printer paper
- Writing utensils

JOB 3

- Personal computer running Windows 2000 or newer
- Spreadsheet software
- The **DATA3** floppy diskette (from Job 1) **or** the Flash Drive from Jobs 1 and 2
- Printer access
- Printer paper
- Writing utensils

JOB 4

- Personal computer running Windows 2000 or newer
- DNS or DHCP server
- Network connectivity
- Proxy server address and port
- Identify a specified Internet website, such as www.refdesk.com
- Specified server address
- Writing utensils

CRIMINAL JUSTICE (5169)

JOB 1

Tape to secure the area

Latent fingerprint equipment (black powder and white lifters)

Note pad and pen

Measuring tool (at least 25 feet)

Gloves

Evidence packaging (paper and plastic)

Tags

Marking tools

Three (3) different items of evidence:

- a) 1 cloth item with wet evidence
- b) 1 additional piece of evidence
- c) 1 glass item with a fingerprint on it

JOB 2

Handcuffs and key

"Suspect" role player (*must be same gender as the participant*)

Contraband to hide on the subject (2 pieces)

(Hide contraband in outside clothing, socks or shoes only)

Fingerprint cards

Fingerprint rolling equipment

Clean-up equipment

Pen

JOB 3

Adult size CPR mannequin

Pocket mask for CPR

Exam gloves

ELECTRICAL CONSTRUCTION TECHNOLOGY (5171)

Material List:

15 AMP GFCI receptacle and cover plate
Two 3-way switches and cover plates
Keyless lamp holder
Light bulb for Type-A lamp
Doorbell chime kit (transformer suitable for lock mount, single pole normally open-momentary closed door bell push button, door bell chime)
1/2" EMT conduit
1/2" conduit straps
1/2" conduit fittings
Bell wire staples
2-single gang plastic and 3-single gang metal electrical boxes
1-Octagon electrical box mounted on adjustable sliding bar suitable for mounting of keyless lamp holder
Solderless connectors (wire nuts suitable for 14/2, 14/3 and door bell wire)
NM cable staples
NM cable connectors
Nails and/or drywall screws for box mounting

Power Source:

Electrical power source – 100 AMP, 120/240 single phase service panel pre-mounted with 2 (two) 15 AMP breakers installed
One breaker is to be utilized for each job. If not available, 120 volt power source is suitable

Safety Equipment:

Safety glasses
Appropriate safety clothing
Work shoes

Wall Frame:

4' to 8' wall section or wiring booth

Tools:

Electrician's pouch with appropriate trade tools
1/2" electrical metallic tubing (EMT) bender (kickers or offset makers are **not** allowed)
Voltage tester with continuity or multimeter (tester used is the discretion of the proctor)
Hacksaw or cutting tool
Conduit deburring tool
Hammer
Torpedo level
MC cable cutter
Optional tools such as cordless drills and screwdrivers **are** allowed

Wiring:

14-2 MC cable
14-2 and 14-3 NM cable
Doorbell wire
#14 THHN in colors black, white, and green

Miscellaneous Supplies:

The National Electric Code (NEC) code book, **current** edition
Pencils
Scrap paper

GENERAL DRAFTING AND DESIGN (5172)

JOB 1

Drafting table equipment with parallel bar or drafting machine

Lead

Lead-holders or mechanical pencil

Lead pointer (if using lead holders)

One triangle or straightedge

Drafting scale

Compass (Pencil)

Drafting Tape

Eraser

JOBS 2, 3, 4, 5, and 6

NOTE: Site must determine method of completion, manual or CAD, prior to test administration.

Manual Completion

Drafting table equipment with parallel bar or drafting machine

Lead

Lead-holders or mechanical pencil

Lead pointer (if using lead holders)

One 45° triangle

One 30/60° triangle

Drafting scale

Compass or circle template

Lettering guide

Drafting Tape

Eraser

Eraser shield

Irregular curve

CAD Completion

CAD system with printer/plotter

HEALTH ASSISTING (5173)

JOB 1

Hand washing

Sink with hot and cold running water
Antibacterial soap
Nail brush and/or orange/cuticle stick
Paper towels
Waste container

Apply/remove PPE's

Work surface (clean and flat)
Gowns, assorted sizes
Gloves, assorted sizes (clean)
Surgical masks, assorted types
Waste container
Laundry container

JOB 2

Patient record jacket with file label
Sticker labels for allergy, insurance, etc.
Pen (black, fine point)

JOB 3

Volunteer to act as patient (teenager or adult)
Worksheet (provided in Participant booklets)
Oral thermometer with sheath
Blood pressure cuff
Stethoscope
Balance scales with measuring staff
Watch or clock with second hand (accurate)

JOB 4

Bed
Wheelchair
Volunteer to act as patient (teenager or adult)
Non-skid foot covering for patient
Bath blankets – two
Gait belt

JOB 5

Hospital bed
Chair or bedside table
Pillow
Laundry hamper
Sink with running water and antibacterial soap
Set of linen for each participant (choice of either):
2 large sheets, 1 draw sheet (a folded sheet may be used), 1 pillow case, 1 spread
or 1 fitted sheet, 1 large sheet, 1 flat bed pad, 1 pillow case, 1 spread

INDUSTRIAL MAINTENANCE MECHANICS (5174)

GENERAL TOOLS/MATERIALS:

All necessary protective clothing and safety equipment

JOB 1

Air pressure source for pneumatic
Electric supply source 24 VDC regulated power source
(minimum 5 amps DC supply)
1 - push button switch
1 - double-acting single throw selector switch (toggle switch)
with a "bat" handle
2 - metal mounting boxes for above switches
2 - limit switches
3/8 inch air line, 8 feet
1 - 24 VDC control relay with 2 N.O. contacts
Green and red indicator lamps (24 VDC) with holders
(sockets) with screw terminals
Phillips screwdriver
Flat head screwdriver
Utility knife
10 - 3/8 inch air line hose clamps
2 - flow control valves (full-flow one-way)
10 - 3/8 inch threaded barbed hose fittings
1 - double-acting pneumatic cylinder (1 inch x 6 inch) with
3/8 inch threaded ports
2/4 directional control valve (DCV) with one solenoid with 24
volt DC coil
20 feet - blue 16 gauge multi-strand wire (THHN) (+DC)
20 feet - white with blue stripe 16 gauge multi-strand wire
(THHN) (-DC)
2 - wire nuts appropriate for 16 gauge wire
Plywood sheet (2 feet x 2 feet)
30 - #8 wood screws (1/2 inch long)

JOB 2

Work bench (or adequately sized work station)
1/2 horsepower variable speed electric motor, 110 volts
Flexible coupling appropriate size for motor
Clamp-on ammeter
8 - pillow block bearings, 5/8 inch
2 - shafts, cold rolled, 5/8 inch diameter x 12 inch length
(keyed for .185 key stock)
2 - shafts, cold rolled, 5/8 inch diameter x 8 inch length
(keyed for .185 key stock)
2 - spur gears, 12 diametrial pitch (DP) with 36 teeth

JOB 2 (continued)

1 - spur gear, 12 diametrial pitch (DP) with 48 teeth
1 - spur gear, 12 diametrial pitch (DP) with 24 teeth
Key stock, 2 feet, .185 inch
1 - prony brake
Bed plate (3 feet x 4 feet x 1/4 inch) - aluminum plate
(slotted to 3/8 inch per print)
10 nuts and bolts - 5/16 inch - 18 UNC-2A x 2-1/2 inch
20 nuts and bolts - 5/16 inch - 18 UNC-2A x 4-1/2 inch
60 flat washers - 5/16 inch
30 lock washers - 5/16 inch
2 - wrenches - 1/2 inch
1 rubber mallet
Punch #3
1 - ballpeen hammer - 22 ounce
1 - dial indicator with magnetic base
Power source, 110 volt
Sheave gage
10 - Shims, sheet metal (.005)
10 - Shims, sheet metal (.010)
Straight edge ruler, 4 inch
Grease gun - filled
Level, 3 inch

JOB 3

Pencils
Blueprint and worksheet (provided in performance
assessment booklet)

JOB 4

Grounded work bench (or adequately sized work station)
Rubber mat to stand on
Electric motor, 3-phase Y-connected (with a blown fuse from
Line 1 to H1 on transformer)
Multimeter
Fuse (working) appropriate size for motor
Switch (working) appropriate size for motor
Starter relay (working) 3-phase, appropriate size for motor
Phillips screwdriver
Flat head screwdriver
Fuse pullers (appropriate sizes for each size fuse)

PRECISION MACHINING (5176)

JOB 1

1/2 inch x 2 inch x 3 inch low carbon steel (cut from 1/2 inch x 2 inch flat stock)

Steel rule

0 to 1 inch depth micrometers

0 to 1 inch outside micrometers

1 to 2 inch outside micrometers

Vernier, dial, or digital calipers

Parallels

Dial indicator and attachments

Vertical milling machine

Abrasive shop cloth/Emory cloth

Adequate accessories (collets, chucks, swivel, or universal vise)

Selection of end mills, including one 3/8 inch and one under 3/8 inch

Mill file

Deburring tool

Cutting fluids

Cutting tools

Appropriate wrenches

Edge finder

Machinery's Handbook, or abbreviated version

Nonprogrammable calculator

Pencils/paper

Surface plate

Clean shop rags

JOB 2

Low carbon steel, 1.125 inch diameter x 6.62 inch (stock is to be pre-sawed, leaving enough material to face both ends)

Steel rule

0 to 1 inch outside micrometers

1 to 2 inch outside micrometers

Vernier, dial or digital calipers

Protractor with blade (from combination set)

Layout dye

Height gage

Thread micrometer

Engine lathe with live centers, aligned tailstock, and thread chasing dial

Chuck or collet

Drill chuck, key and sleeve for tailstock mounting

Dial indicator with stand

V-Block

Center drills (#3)

Standard tool holders

Tool bits for straight turning, shoulder turning and facing (HSS and WC)

Thread cutting tool holder and formed 60-degree thread tool

1/8 inch cut off tool and holder

Thread center gage (fishtail)

Threading compound

Screw pitch gage

Mill file

Cutting fluid

Appropriate wrenches (compound, Allen, Aloris)

Machinery's Handbook, or abbreviated version

Nonprogrammable calculator

Pencils and paper

Surface plate

Abrasive shop cloth/Emory cloth

Clean shop rags

SMALL ENGINE TECHNOLOGY (5177)

Engine, horizontal, four-stroke cycle, solid state type ignition (operable)

Engine service and repair manual

Workbench

Method for securing engine to bench

Engine stand

Disassembled engine (used) containing piston rings, crankshaft, coil, condenser, oil slinger, dipper, or pump, crankpin journal and cylinder

Engine, horizontal, four-stroke, with carburetor and fuel tank removed with service manual

Float-type carburetor with service manual (Walbro)

Diaphragm carburetor with service manual

0" - 1" micrometer

1" - 2" micrometer

2" - 3" micrometer

Dial caliper

Telescoping gauge, 2 1/8" to 3 9/16"

Continuity tester

Timing equipment

Tachometer, digital

Feeler gauge, flat

Feeler gauge, wire

Spark tester (appropriate type for each manufacturer)

Starter clutch wrench

Flywheel holder

Flywheel puller

Screwdriver, 1/4" blade

Screwdriver, 3/8" blade

Screwdriver, Phillips #1

Screwdriver, Phillips #2

3/8" drive socket set, 1/4" to 3/4" by 16ths

3/8" drive socket set, 1/4" to 3/4" by 16ths (deep)

Spark plug wrench, 13/16"

Spark plug wrench, 3/4" (deep)

Combination wrenches, box and open end, 3/8" to 3/4" by 16ths

Torque wrench

Valve spring compressor

Tools necessary to remove valves

Compression tester/leakdown tester

Non-magnetic feeler gauge

6" mechanic's scale - with 64ths

Gaskets and/or appropriate sealant

Spark plugs

Gasoline

Oil

Grease

Parts catalogs or electronic CD

Invoice blanks

Pencils

Shop towels

TECHNICAL DRAFTING (5178)

MANUAL

Drawing paper

Isometric grid paper

Orthographic grid paper

Scratch paper

30° - 60° triangle

45° - 90° triangle

Brush

Calculator

Circle template

Compass

Drafting machine or parallel bar

Drafting tape

Eraser

Erasing shield

Machinery's Handbook (or equal)

Pencils: 4H, 2H, H, and HB

Scale

Workstation

CAD

CAD software and documentation

Compatible printer/plotter with paper

Isometric grid paper

Orthographic grid paper

Scratch paper

Storage device (CDs, floppy disks, flash drive) if applicable

Machinery's Handbook (or equal)

CAD station

WELDING (5179)

The following list is recommended to be the minimum items necessary to test **ONE** participant. The evaluator may adjust the quantities, as needed, for the number of participants being tested. (*Multiple welding machine and booth redundancy is recommended to avoid delays due to equipment malfunction.*)

OXYFUEL CUTTING

- 1 Oxyacetylene cutting work stations with burning tables
- 1 Cutting tips for up to ¼ inch, up to ½ inch, and up to ¾ inch material thicknesses
- 2 Cutting outfits
- 2 Strikers
- 2 Tip cleaners

NOTE: An oxyfuel manifold system may be used by the participant. The evaluator must ensure that the manifold pipelines are pressurized prior to the participant testing.

SHIELDED METAL ARC WELDING

- 2 Welding booths with stools, welding tables, positioners and exhaust fans for ventilation
- 2 Welding machines: (DC rectifier type, 300 amp minimum **or** Combination AC/DC transformer-rectifier type, 300 amp minimum **or** inverters, 250-300 amp range)
- 1 Electrode oven (for heating low hydrogen electrodes)

GAS METAL ARC WELDING

- 1 Constant voltage (GMAW) or inverter welding machine with a capacity of 280 to 300 amps; and a wire feeder set up for .035 inch or .045" steel filler wire, a minimum 75% Argon/25% CO₂ shielding gas mixture with appropriate combination regulator/flowmeter or manifold flowmeter.
- 2 Welding stations for GMAW with tables, positioners, exhaust ventilation and stools
- 2 GMAW gun component sets with consumables
- 5 GMAW contact tips (for each required wire diameter)
- 1 Anti-spatter compound (spray or dip)

NOTE: All welding machines, wire feeders, welding guns with nozzles and contact tips and necessary gas cylinder(s) (or manifold) must be set up and ready for the participant prior to testing. The participant is responsible for adjusting shielding gas flow rates and adjusting the machine settings.

GAS TUNGSTEN ARC WELDING

- 2 Welding booths with stools, welding positioners and exhaust fans for ventilation
- 2 Welding machines, combination AC/DC transformer-rectifier or inverter type set up for GTAW, using a minimum of 100% Argon shielding gas with appropriate regulator/flowmeter or manifold
- 2 Water-cooled 300-amp torches or air-cooled 200-amp torches connected to the power supply and operated by a remote foot control or controlled by a stop-and-start contactor switch (optional)
- 2 GTAW torch component sets

NOTE: All welding machines, TIG torches, cables, hoses and shielding gas cylinder (or manifold) must be set up and ready for the participant prior to testing. The participant is responsible for machine settings, adjusting gas flow rate, selecting and installing TIG torch cup and preparing and installing the correct tungsten.

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WELDING (5179) continued

Additional Apparatus

- 1 Large stationary vise
- 1 Power wire brush (portable or stationary)
- 1 Stationary grinder with two different grit wheels (fine and medium)
- 1 Portable power grinder with guard

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|----------------------|
| Miscellaneous |
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(Adjust quantity as necessary for number of participants being tested)

- Chipping hammer
- Hand held wire brush (for cleaning during SMAW operations)
- Hand held stainless steel wire brush (for GTAW cleaning operations)
- Vise grips/slip-joint pliers (various types)
- C-Clamps (various sizes, 4" to 8")
- 12" Scale
- Measure tape, 6'
- Side cutting pliers
- Soapstone
- Ball peen hammers (various sizes)
- Center punch
- Set of number and letter steel marking stamps, 1/4" size
- Combination square, 12"
- Scratch-awl (scribe)
- Compass – wing dividers

Personal Safety Equipment

NOTE: Depending on the policy of the testing facility, the following safety equipment must either be provided by the testing facility for each participant *or* each participant must supply their own.

Welding helmet with shade 10-12 replacement clear cover lenses
Welder's gloves and protective leathers (full jacket or sleeves and apron)
Safety glasses or face shield, shade 3-5
Cutting goggles, shade 3-5
Ear plugs

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WELDING (5179) continued

Consumable Supplies

The following list is recommended to be the minimum items necessary to test **ONE** participant. The evaluator may adjust the quantities, as needed, for the number of participants being tested.

- 5 lbs. each Electrodes (SMAW)
 AWS E-7018, 1/8"

- 30 lb. spool Welding wire for GMAW, AWS ER-70S-X
 .035" diameter (1 spool) or .045" diameter (1 spool)

- 2 lbs. each Welding filler rod for stainless steel, AWS Type ER308
 1/16" x 36"
 3/32" x 36"

- 2 lbs. each Welding filler rod for aluminum, AWS Type ER4043 or ER5356
 1/16" x 36"
 3/32" x 36"

- 1 pkg. each Tungsten Electrodes, AWS Types: EWP and EWTh-2
 1/16" x 7"
 3/32" x 7"

The participant is expected to know the different types and diameters of electrodes. The AWS electrode number is specified on the job sheets where required.

(continued on next page)

WELDING (5179) continued

MATERIALS

Refer to the "Evaluator's Materials List" for a job-by-job materials list. The evaluator should provide scrap materials for each participant, similar to the materials used in each job, to allow the participant to make equipment adjustments.

EVALUATOR'S MATERIALS LIST

| JOB # | TYPE OF MATERIAL | SIZE OF MATERIAL | EDGE PREPARATION | NUMBER REQUIRED | NUMBER OF PARTICIPANTS x No. Required = Total |
|--------------|--------------------------------------|---------------------------|-------------------------|------------------------|--|
| 1 | Mild Steel Plate | 1/2" x 6" x 6" | Square | 1 | |
| 2 | Mild Steel Plate | 1/4" x 2" x 10" | Square | 1 | |
| 2 | Mild Steel Plate | 3/8" x 3" x 7" | Bevel 22-1/2° | 2 | |
| 3 | Steel Tubing | 3/16" x 4" x 4" x 2" Long | Square | 1 | |
| 3 | Mild Steel Plate | 1/4" x 6" x 6" | Square | 1 | |
| 4 | Aluminum (Type 6061) | 1/8" x 2" x 6" | Square | 2 | |
| 5 | Stainless Steel (Type 304 or 308) | 1/8" x 1-1/2" x 6" | Square | 2 | |