

**CALIFORNIA APPRENTICESHIP
COUNCIL**

OPERATING ENGINEER ADVISORY COMMITTEE

MINIMUM INDUSTRY TRAINING CRITERIA

O*NET CODES:

CONSTRUCTION EQUIPMENT OPERATOR	47-2073.00
HEAVY DUTY REPAIRER	47-2073.00F
PLANT OPERATOR	47-2073.00K
CONSTRUCTION INSPECTOR	47-4011.00
ROCK, SAND & GRAVEL	47-2073R
DREDGE	53-7031.00

OPERATING ENGINEER MINIMUM TRAINING CRITERIA

1. LENGTH OF TRAINING

Program sponsors shall establish a minimum four-year program of not less than 6,000 hours on-the-job training.

2. ON THE JOB

Apprentices shall receive the minimum on-the-job training objectives described in Exhibit "A".

3. RELATED AND SUPPLEMENTAL INSTRUCTION

The required prescribed courses of related and supplemental instruction shall be no less than 144 hours per year. This instruction must include at a minimum, the related and supplemental training processes listed in Exhibit "B".

4. COMPETENCY TESTING

All apprentices must pass minimum level competency tests for all related and supplemental courses before advancement to journeyman status.

5. COMPLETION PERCENTAGES

Program sponsors must have a 45% graduation rate for all apprentices that satisfactorily complete the program's probationary period.

6. REVISIONS

The schedule for revisions to the operating Engineers Industry training criteria shall be in accordance with 212.01 of the California Code of Regulations.

EXHIBIT "A"

ON-THE-JOB TRAINING

- A. Construction Equipment Operator (CEO) O*Net Code 47-2073.00**
Plant Equipment Operator (PEO) O*Net Code 47-2073.00K

The major on-the-job training processes in which the CEO-PEO apprentices will be trained shall include approximately 6,000 hours in one or more of the following areas:

1. Safety training in working around other equipment and workers on the ground.
2. Track type equipment: Dozers, pushcats, crawler loaders track-type backhoes, all types of paving machines, screedman, including CTB machines, tractor-drawn scrapers and track-type trenching equipment.
3. Rubber-tire-type equipment: Scrapers, rubber-tire loader, rubber-tire backhoes, all compactors, combination backhoe loader, blade, hot roller and rubber-tired trenchers.
4. Hoisting-type equipment: Cranes (both crawler-mounted and rubber-tire mounted), derrick hoist, pile driving rigs, power shovels, clamshells, draglines, tower cranes, and self-propelled boom-type lifting device.
5. Stationary-type equipment: Drilling and boring equipment, crusher operations, concrete batch plants, lube equipment, grade setting and grade checking.
6. "Green Technology and construction, including but not limited to the philosophy and science of green technology and green building and construction techniques, green waste management, the installation of energy efficient systems including solar, photo voltaic, wind and hydro systems"

- B. Heavy Duty Repairer (HDR) O* Net Code 47-2073.00F**

The major on-the-job training processes in which the HDR apprentices will be trained shall include approximately 6,000 hours in the following areas:

1. Safety training in working around equipment, using power (both pneumatic and electrical) hand tools and proper maintenance/repair procedures.
2. Engines: Theory, operation, maintenance and repair to gasoline engines, diesel engines, fuel systems, cooling systems and intake exhaust systems.

3. Power Trains: Clutches, torque converters, transmissions, differentials and final drives.
4. Electrical: Starting systems, charging systems, lighting systems, control systems and electronic controls.
5. Hydraulic: Control valves, hydraulic cylinders, hydraulic motors, pumps and brake systems.
6. Welding: Theory, Stick welding (SMAW), wire/flux core welding, oxygen/acetylene cutting and burning and fabrication/layout.
7. Lubrication: Preventative maintenance, grease and oil, lubrication procedures and minor adjustments.
8. “Green Technology and construction, including but not limited to the philosophy and science of green technology and green building and construction techniques, green waste management, the installation of energy efficient systems including solar, photo voltaic, wind and hydro systems”

C. Construction Inspector

O*Net Code 47-4011.00

The major on-the-job training processes in which a Construction Inspector will be trained shall include a minimum of 6,000 hours in the following areas:

1. Proper general safety procedures in working on a construction site. This will include working around mobile equipment, proper use of scaffolding and proper training in fall protection.
2. Soils Technician will be trained to perform the following:
 - a. Write a daily report
 - b. Read and interpret plans
 - c. Use a nuclear density gauge
 - d. Understand basic terms for soils and soils density
 - e. Know procedures to compacting soil
 - f. Log a sand cone test
 - g. Log a maximum density test
 - h. Log a sieve analysis test
 - i. Soils testing equipment awareness
 - j. Classify different types of soils
3. Reinforced Concrete training will include the following:
 - a. Write a daily report
 - b. Read and interpret plans, check reinforced steel for size, spacing, clearances and splices

- c. Check a concrete mix design
 - d. Know the proper technique for sampling concrete
 - e. Know the proper technique for water control
 - f. Know the proper technique for placing concrete
4. Pre-Stressed Concrete training will include the following:
- a. Write a daily report
 - b. Read and interpret plans
 - c. Check reinforced steel for size, spacing, clearances and splices
 - d. Verify the placement of pre-stressed or post-tensioned tendons
 - e. Prepare stressing sheets
 - f. Check a mix design
 - g. Know the proper technique for placing concrete
 - h. Know the proper procedures for stressing tendons and recording results
5. Masonry training will include the following:
- a. Properly write a daily report
 - b. Read and interpret plans
 - c. Check reinforced steel for size, spacing, clearances and splices
 - d. Witness and store completed masonry prisms
 - e. Identify concrete masonry units, pre-bagged mortar or grout
 - f. Know the proper technique for placing of grout into concrete masonry units
 - g. Know the proper technique for consolidation of grout with a vibrator
6. Structural Steel Bolting and Welding Inspector training will include the following:
- a. Write a daily report
 - b. Read and interpret plans
 - c. Check steel delivered to the jobsite with mill certifications and heat numbers
 - d. Read a welding procedure specification
 - e. Check a welder's certificate
 - f. Check for proper joint fit and configuration
 - g. Check for proper pre-heat and post-heat
 - h. Properly use and store electrodes
 - i. Observe interpass cleaning
 - j. Perform a shop inspection
 - k. Identify and verify the tension of high strength bolts
7. ACI Laboratory Testing Technician Grade I
- a. Test methods for bulk density (unit weight) and voids in aggregate
 - b. Test methods for compressive strength of cylindrical concrete specimens
 - c. Test methods for organic impurities in fire aggregates for concrete
 - d. Test methods for materials finer than 75-um (No.200) sieve in minor aggregates by washing.

- e. Test methods for density, relative density (specific gravity) and absorption of coarse aggregate.
 - f. Test methods for density, relative density (specific gravity) and absorption of fine aggregate.
 - g. Test method for sieve analysis of fine and coarse aggregates.
 - h. Test method for total evaporable moisture content of aggregate by drying.
 - i. Practice for capping cylindrical concrete specimens.
 - j. Practice for reducing samples of aggregate to testing size.
 - k. Practice for use of unbonded caps in determination of compressive strength of hardened concrete cylinders.
 - l. Practice for sampling aggregates.
8. ACI Laboratory Testing Technician Grade II
- a. Test method for obtaining and testing drilled cores and sawed beams of concrete.
 - b. Test method for flexural strength of concrete (using simple beam with third-point loading).
 - c. Test method for soundness of aggregates by use of sodium sulfate or magnesium sulfate.
 - d. Test method for lightweight particles in aggregate.
 - e. Test method for resistance to degradation of small-size coarse aggregate by abrasion and impact.
 - f. Test method for clay lumps and friable particles in aggregates.
 - g. Practice for managing and curing concrete test specimens in the laboratory.
 - h. Specification for molds for forming concrete test cylinders vertically.
 - i. Test method for resistance to degradation of large-size coarse aggregate by abrasion and impact.
9. “Green Technology and construction, including but not limited to the philosophy and science of green technology and green building and construction techniques, green waste management, the installation of energy efficient systems including solar, photo voltaic, wind and hydro systems”

D. Rock Sand & Gravel

47-2073R

The major on-the-job training processes in which RSG/PO apprentices will be trained shall include a minimum of 6,000 hours in the following areas:

- 1. Safety training in working around surface mining operations. This will include safety in working around mobile equipment, working around conveyors, belts and crushers, plant maintenance and repair.

2. Welding:
 - a. Theory
 - b. Stick welding (SMAW)
 - c. Wire/flux core welding
 - d. Oxygen/acetylene cutting and burning
 - e. Fabrication

3. Equipment Operation:
 - a. Rubber-tired loaders
 - b. Dozers
 - c. Graders

4. Repair Procedures
 - a. Pneumatic
 - b. Hydraulic
 - c. Industrial electrical components
 - d. Circuits

5. Rock Plant Maintenance
 - a. Disassembly
 - b. Diagnosis
 - c. Repair
 - d. Assembly
 - e. Adjustments

6. “Green Technology and construction, including but not limited to the philosophy and science of green technology and green building and construction techniques, green waste management, the installation of energy efficient systems including solar, photo voltaic, wind and hydro systems”

E. Dredge

O* Net Code 53-7031.00

The major on-the-job training processes in which Dredge apprentices will be trained shall include a minimum of 6,000 hours in the following areas:

1. Safety training in working around mobile equipment during shore operations; maintenance and repair on both shore, deck and engine room operations and proper training using powered (both pneumatic and electrical) hand tools.

2. Shore Operations:
 - a. Hook, place and handle discharge pipe
 - b. Demonstrate knowledge in spillways, dykes and grading
 - c. Welder’s helper
 - d. Boom truck operation
 - e. Winch operation

- f. Tractor operation
3. Deck Operations:
 - a. Care and placing of pontoon lines and anchors
 - b. Painting, chipping and cleaning of ship
 - c. Rigging, spicing rope and cable
 - d. Operation of deck equipment
 - e. Maintenance of deck equipment
 - f. Welding operations
 - g. Sounding and engineering
 - h. Boat and skiff handling
 - i. Pump repair and maintenance
 - j. Read and understand gauges and meters
 - k. Learn lever controls
 - l. Learn the job of leverman using prints and cross sections
 - m. Learn leverman's responsibility in directing all operations
 - n. Seamanship
 4. Engine Room Operations:
 - a. Proper use of gauges, meters and keeping a log
 - b. Use of real scow and fuel scow
 - c. Electrical gas and diesel repair and maintenance
 - d. Pump, shaft and bearing maintenance and installation.
 5. "Green Technology and construction, including but not limited to the philosophy and science of green technology and green building and construction techniques, green waste management, the installation of energy efficient systems including solar, photo voltaic, wind and hydro systems"

EXHIBIT "B"

RELATED AND SUPPLEMENTAL INSTRUCTION TOPICS FOR
OPERATING ENGINEERS TRAINING CRITERIA

- | | | |
|-----------|--|-------------------------------|
| A. | Construction Equipment Operator | O*Net Code 53-7031.00 |
| | Plant Equipment Operator | O*Net Code 47-2073.00K |
| | 1. Safety | |
| | 2. Track equipment | |
| | 3. Rubber-tired type equipment | |
| | 4. Hoisting type equipment | |
| | 5. Stationary type equipment | |
| | 6. Grade Checking and Grade Setting | |

“Green Technology and construction, including but not limited to the philosophy and science of green technology and green building and construction techniques, green waste management, the installation of energy efficient systems including solar, photo voltaic, wind and hydro systems”

Environmental Awareness, reduce waste and energy consumption, safety, disposal, hazardous waste removal, green construction awareness and technology including use of low pollutant emitting materials, recycling/waste diversion and solar.

B. Heavy Duty Repairer

1. Safety
2. Engines
3. Power Trains
4. Electrical Systems
5. Hydraulic Systems
6. Welding
7. Lubrication

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Environmental Awareness, reduce waste and energy consumption, safety, disposal, hazardous waste removal, green construction awareness and technology including use of low pollutant emitting materials, recycling/waste diversion and solar.

C. Construction Inspector

1. Safety
2. Soils
3. Reinforced Concrete
4. Pre-Stressed Concrete
5. Masonry
6. Structural Steel and Welding

“Green Technology and construction, including but not limited to the philosophy and science of green technology and green building and construction techniques, green waste management, the installation of energy efficient systems including solar, photo voltaic, wind and hydro systems”

Environmental Awareness, reduce waste and energy consumption, safety, disposal, hazardous waste removal, green construction awareness and technology including use of low pollutant emitting materials, recycling/waste diversion and solar.

D. Rock Sand & Gravel

1. Safety
2. Welding
3. Track Equipment
4. Rubber-Tired Equipment
5. Component Repair
6. Plant Disassembly/Assembly

“Green Technology and construction, including but not limited to the philosophy and science of green technology and green building and construction techniques, green waste management, the installation of energy efficient systems including solar, photo voltaic, wind and hydro systems”

Environmental Awareness, reduce waste and energy consumption, safety, disposal, hazardous waste removal, green construction awareness and technology including use of low pollutant emitting materials, recycling/waste diversion and solar.

E. Dredge

1. Safety
2. Shore Operations
3. Deck Operations
4. Engine Room Operations

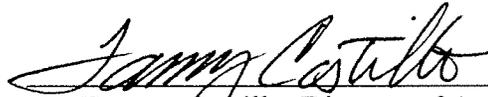
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Environmental Awareness, reduce waste and energy consumption, safety, disposal, hazardous waste removal, green construction awareness and technology including use of low pollutant emitting materials, recycling/waste diversion and solar.

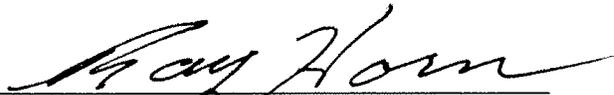
The above minimum training criteria for Operating Engineers apprenticeship training programs is hereby adopted and submitted for approval to the Chief of Apprenticeship Standards on this 17th day of September in the year 2010.

For the Advisory Committee:

Tammy Castillo, Operating Engineers Local 3 JAC
Rod Michaelson, Bay Cities Paving and Grading
Sue Weiler-Dokes, Kiewit Pacific
Jack Estill, Appian Engineering
Bert Tolbert, Operating Engineers Local 12 Apprentice Training Trust
Ray Horn, Operating Engineers Local 12 Apprentice Training Trust
Rich Beesmer, Operating Engineers Local 12 Apprentice Training Trust
Jim Hulse, Bragg Crane Service
Leslie Farrow, Les Farrow Excavating and Grading, Inc.
Peter Saucedo, AGC San Diego Apprenticeship Trust
Tom Brown, Sierra Pacific West
Monty Wilde, Hanson SJH Construction



Tammy Castillo, Director of Apprenticeship
Operating Engineers Local 3 Joint Apprenticeship Committee



Ray Horn, Assistant Administrator
Operating Engineers Local 12 Apprentice Training Trust



Pete Saucedo, Director
AGC San Diego Apprenticeship Trust