

DACUM Research Chart for Crane & Digger Derrick Operator

Produced for



**ELECTRICAL INDUSTRY
CERTIFICATIONS ASSOCIATION**

DACUM Panel

Danny Doss, Director
ALBAT
Medway, OH

Palmer Hickman, Director, Safety, Codes & Standards
Training
Electrical Training Alliance
Bowie, MD

Jeremy Hinton, Assistant Director
MSLCAT
Cedar City, UT

Rich Holbeck, Senior Vice President
PAR Electrical Contractors, Inc.
Goodyear, AZ

Fred Hoppe, Training Coordinator
CAL NEV JATC
Riverside, CA

Don Jamison, Assistant Training Director
NW Line JATC
Vancouver, WA

Virgil Melton, Curriculum Specialist
Electrical Training Alliance
Sharpsburg, GA

Alex Phillips, Western Region Construction Manager
MYR Group/Sturgeon Electric Co. Inc.
Salt Lake City, UT

David Shea, Manager, Safety, Health & Environmental
M.J. Electric LLC
Iron Mountain, MI

Neil Tolson, Executive Director
EICA
Midvale, UT

DACUM Facilitators

John Moser
Brooke Parker

August 23-24, 2016

Produced by



THE OHIO STATE UNIVERSITY

COLLEGE OF EDUCATION
AND HUMAN ECOLOGY

DACUM International Training Center

Columbus, OH

DACUM Research Chart for Crane & Digger Derrick Operator

DUTIES	TASKS			
A. Complete Daily Crane/Digger Derrick Inspections & Maintenance	A.1 Complete daily vehicle inspection and report (DVIR)	A.2 Verify annual boom inspection/certification	A.3 Verify presence of load charts and manuals (e.g., operations, accessories)	A.4 Complete visual inspection of hydraulic systems (e.g., hoses, cylinders, controls)
	A.10 Perform additional inspections (e.g., employer, manufacturer, customer)	A.11 Lubricate boom	A.12 Grease equipment components (e.g., turn table, outrigger, sheaves)	A.13 Verify resolution of DVIR issues
B. Manage Crane/Digger Derrick Access and Egress	B.1 Verify job site location	B.2 Identify transport access/egress routes (e.g., height, clearance, weight limit)	B.3 Verify permit requirements	B.4 Maintain Department of Transportation (DOT) logbook
C. Evaluate Worksite Conditions	C.1 Identify soil surface conditions (e.g., slope, voids, stability)	C.2 Identify sub-surface issues (e.g., utilities, obstructions, tanks)	C.3 Identify overhead obstacles (e.g., power lines, trees, bridges)	C.4 identify work-site traffic (vehicles, pedestrians, railroads)
D. Setup/ Assemble Crane/ Digger Derrick	D.1 Determine load weight and size	D.2 Determine load/ swing radius	D.3 Select crane/digger derrick type and size (based on working area diagram, load chart, range diagram)	D.4 Determine outrigger and crane placement
	D.10 Determine reeving requirements	D.11 Determine load path and placement	D.12 Assemble boom (e.g., sections, jibs)	D.13 Install attachments (e.g., personnel basket, counter weights)
E. Perform Safety Checks	E.1 Participate in tail board meetings	E.2 Develop critical lift plans	E.3 Conduct pre-flight test (e.g., LMI, anti two-block, control function)	E.4 Conduct proof test (for hoisting personnel)
F. Operate Crane/ Digger Derrick	F.1 Follow signal directions	F.2 Position hook above load	F.3 Perform test pick on crane./digger derrick	F.4 Monitor operating conditions (e.g., weather, gauges, personnel)

A.5 Complete visual inspection of boom/turret (e.g., welds, wear pads, pins)	A.6 Complete visual inspection of hoisting system (e.g., ropes, hooks, sheaves)	A.7 Conduct operational check of electronic systems (e.g., boom lockout, anti-two block, LMI)	A.8 Perform visual inspection of crane padding and cribbing (e.g., quantity, condition)	A.9 Complete equipment inspection documentation
B.5 Maintain compliance to environmental restrictions (e.g., protected wildlife, invasive species, sensitive areas)	B.6 Identify off-road access issues (e.g., gates, culverts, fences)	B.7 Assign spotters (e.g., electrical, equipment)	B.8 Verify vehicle road worthiness (e.g., secure hook, check fuel, housekeeping)	
C.5 Identify right-of-way boundaries	C.6 Identify environmental considerations (e.g., weather, noise, wetlands)			
D.5 Place cribbing and outrigger support	D.6 Level crane/digger derrick	D.7 Install equipment grounds (e.g., crane, digger derrick)	D.8 Identify minimum approach distance	D.9 Place personnel barricades (e.g., electrical, swing radius)
E.5 Conduct trial lift (for hoisting personnel)	E.6 Manage equipment issues (e.g., damage, maintenance, missing parts)	E.7 Identify load pick points	E.8 Determine rigging requirements (e.g., type length, capacity)	E.9 Configure crane operating mode
F.5 Perform lift	F.6 Manage equipment load (e.g., boom angle, boom deflection, tag line)			

DACUM Research Chart for Crane & Digger Derrick Operator

DUTIES	TASKS			
G. Perform Digger Derrick-Specific Operations*	G.1 Unstow digger derrick auger	G.2 Extend kelly bar	G.3 Dig holes	G.4 Stow digger derrick auger
	G.10 Install capstan attachment			
H. Shut Down/ Disassemble Crane/Digger Derrick	H.1 Remove attachments (e.g., personnel basket, counter weight)	H.2 Disassemble boom (e.g., jib, sections)	H.3 Perform equipment shutdown (e.g., boom storage, outriggers, secure hook)	H.4 Remove personnel barricades
I. Maintain Employment Requirements	I.1 Maintain fit-for-duty status	I.2 Maintain employer requirements (e.g., medical card, CPR/first aid)	I.3 Maintain customer requirements (e.g., OSHA, orientation)	I.4 Maintain accredited certifications (e.g., crane, digger derrick)

* These tasks are specific to just the digger derrick

G.5 Transfer pole guides	G.6 Extend fiberglass boom section	G.7 Install anchor attachment	G.8 Install butterfly attachment	G.9 Install Christmas tree attachment
H.5 Remove equipment grounds				
I.5 Maintain state and local licenses	I.6 Participate in training (e.g., vendor, employer, apprentice)			

General Knowledge and Skills

There are a total of 180 knowledge and skill areas identified for the general, crane/digger derrick and specialty certification areas in the master list maintained by EICA. For space purposes, they are not listed here again.

Behaviors

Safety oriented
Knowledgeable
Decisive
Confident
Calm under pressure
Compliant
Patient
Team player
Self motivated
Observant
Open minded
Trustworthy
Detail oriented
Accurate
Reliable
Goal oriented
Common sense
Leader
Organized
Professional

Acronyms

OSHA	Occupational Safety & Health Administration
CPR	Cardiopulmonary Resuscitation
LMI	Load Moment Indicator

Tools, Equipment, Supplies and Materials

PPE	Motor/hydraulic oil
Grease gun	Basic hand tools
Calculator	Shovel
Cell phone	Neverseize®
Angle indicator	Matting
Level	Cribbing
Tape measure	Padding
Barricades	2-way radio
Anemometer	Signal placard
DOT logbook	Test weights
Luberboom®	Man basket
Inspection checklists	Jibs
GPS/map	Load blocks
Load chart	Auger/teeth
Rigging capacities chart	Safety manual
Operator manual	Traffic control signs and cones
Rigging capacities chart	Job brief forms
Permits	First aid kit
Grounding equipment	Fire extinguisher
Wheel chocks	

Future Trends and Concerns

- More stringent regulations to follow
- Aging workforce
- Changing equipment technology
- Increase in robotic cranes/arms
- Backyard equipment
- Lack of consistent enforcement in regulations
- Use of Dept. of Justice as an enforcement tool
- Electronic posting of OSHA logs
- Retention of key staff
- Need for industry certifications
- Growth in micro grids
- Vulnerability of power grid
- Increased security requirements
- Changing political climate