

**Summary Report for Individual Task  
052-204-1205  
Install Underground Cable  
Status: Approved**

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DISTRIBUTION RESTRICTION: Approved for public release; distribution is unlimited.

DESTRUCTION NOTICE: None

**Condition:** As a Power Line Distribution Specialist in a tactical or nontactical environment (when an underground cable needs to be installed), you are given electrical construction prints, applicable electrical distribution equipment as specified in the electrical construction prints, a line truck with a cable trailer, applicable digging or trenching equipment, lubricants, rigging, pulling equipment, a voltage detector, a lockout and tagout kit, grounding equipment, safety standing operating procedures (SOPs), applicable manufacturer's literature, the Lineman's and Cableman's Handbook (LCH), and applicable personal protective equipment (PPE). This task should not be trained in MOPP.

**Standard:** Install underground cable by ensuring that the cable is safely installed according to the electrical construction prints at the appropriate depth and according to the cable ratings in the safety standing operating procedures (SOPs), applicable manufacturer's literature, and the LCH.

**Special Condition:** None

**Safety Level:** Low

**MOPP:** Never

<b>Task Statements</b>
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**Cue:** None

## DANGER

1. THIS TASK SHOULD ONLY BE PERFORMED BY QUALIFIED PERSONNEL WHO ARE KNOWLEDGEABLE IN THE INSTALLATION, OPERATION, AND MAINTENANCE OF MEDIUM VOLTAGE ELECTRICAL POWER GENERATION EQUIPMENT AND ITS ASSOCIATED HAZARDS. FAILURE TO COMPLY MAY CAUSE PERMANENT INJURY OR DEATH.
2. IF A MANHOLE COVER IS ENCASED IN ICE, DO NOT STRIKE IT WITH STEEL OR IRON. THE STRIKING OF STEEL OR IRON AGAINST A STEEL COVER MAY RESULT IN AN EXPLOSION IF COMBUSTIBLE GAS IS PRESENT IN THE MANHOLE. FAILURE TO COMPLY MAY CAUSE PERMANENT INJURY OR DEATH.
3. NEVER ENTER A MANHOLE UNTIL ATMOSPHERIC CONDITIONS ARE TESTED AND FOUND TO BE IN COMPLIANCE WITH OCCUPATIONAL SAFETY AND HEALTH ADMINISTRATION (OSHA) STANDARDS. FAILURE TO COMPLY MAY CAUSE PERMANENT INJURY OR DEATH.
4. NEVER ENTER A MANHOLE WITHOUT AN ASSISTANT LOCATED OUTSIDE THE MANHOLE. FAILURE TO COMPLY MAY CAUSE PERMANENT INJURY OR DEATH.
5. DO NOT ENTER A MANHOLE TO PUMP OUT WATER. LOWER THE PUMP OR HOSE INTO THE HOLE, AND REMOVE STANDING WATER. FAILURE TO COMPLY MAY CAUSE PERMANENT INJURY OR DEATH.

## WARNING

1. All pits and trench work shall comply with WorkSafe requirements.
2. Failure to verify whether the manhole is a permit or nonpermit confined space may cause personnel to be subject to fines or legal action.

## CAUTION

1. Due to many different manufacturers, it is essential that the manufacturer's instructions for the air quality tester being used are referenced for the proper inspection of the detector and for proper test performance.
2. Different depths of the manhole should be tested. The sampling tube should not come into contact with the ground or any other foreign object.
3. While work is being performed in the manhole, the air quality tester should constantly be in use to monitor gases.

**Remarks:** All required Prime Power specific references and technical manuals will be provided by the local Prime Power Command.

**Notes:** None

## Performance Steps

# WARNING

## DIG PERMIT WILL BE REQUIRED

1. Review all of the safety SOPs, DANGERS, WARNINGS, CAUTIONS, manufacturer's literature, electrical construction prints, and wiring diagrams before proceeding.

2. Ensure that all PPE has been correctly tested and is fully mission capable.

**Safety:** In a training environment, leaders must perform a risk assessment in accordance with FM 5-19, Risk Management. Leaders will complete a DA Form 7566 COMPOSITE RISK MANAGEMENT WORKSHEET during the planning and completion of each task and sub-task by assessing mission, enemy, terrain and weather, troops and support available-time available and civil considerations, (METT-TC). Note: During MOPP training, leaders must ensure personnel are monitored for potential heat injury. Local policies and procedures must be followed during times of increased heat category in order to avoid heat related injury. Consider the MOPP work/rest cycles and water replacement guidelines IAW FM 3-11.4, Multiservice Tactics, Techniques, and Procedures for Nuclear, Biological, and Chemical (NBC) Protection, FM 3-11.5, Multiservice Tactics, Techniques, and Procedures for Chemical, Biological, Radiological, and Nuclear Decontamination. All pits and trench work shall comply with WorkSafe requirements. They may include but are not limited to:

- When a pit is to be left open overnight, proper barrier mesh and flashing lights, etc, as required must be attached to pickets at least 12 inches from the edge of the excavation or the pit must be covered.
- Soil must be piled back from the edge of the pit at least 24 inches to conform to WorkSafe regulations.
- Pits or trenches deeper than five feet in normal soil may require a ladder for access and require shoring, benching or sloping of the sides of them.
- Pits or trenches may require shoring if less than five feet deep and the soil is unstable.
- Undermining walls, foundations, streets or pavements are to be avoided otherwise proper shoring is required.
- All shoring, benching and sloping must be installed to WorkSafe requirements and its Code of Practice: Excavation.
- Barriers shall be erected to prevent vehicles inadvertently falling into the excavation.
- Collapse or flooding of trenches.
- Lack of ventilation or suitable lighting.
- Dangerous gases.
- Confined working space.
- High temperatures.
- Traffic hazards

3. Excavate Trench to proper depth for application.

Note:

1. The most common trenching equipment in Army inventory is the backhoe and trencher.
2. Ensure depth is correct for direct burial or installation of ducts.
3. Directional drilling may also be used if the capability is attainable.

4. Install Cable

- a. Pull cable into trench or through duct.

Note: To properly install you need a capstan hoist (located on the line truck) cable sheave, cable reel trailer, cable grips and pulling eyes.

## **CAUTION**

Do not bend past the permissible bending radii of all cables. No twists, knots or kinks are permitted. This will cause damage to the cable and can cause a fault.

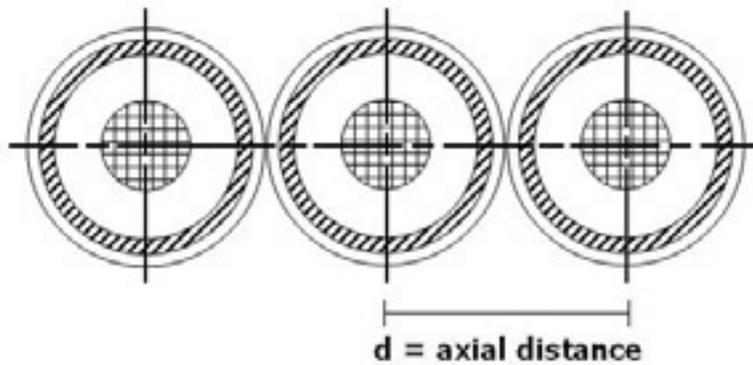
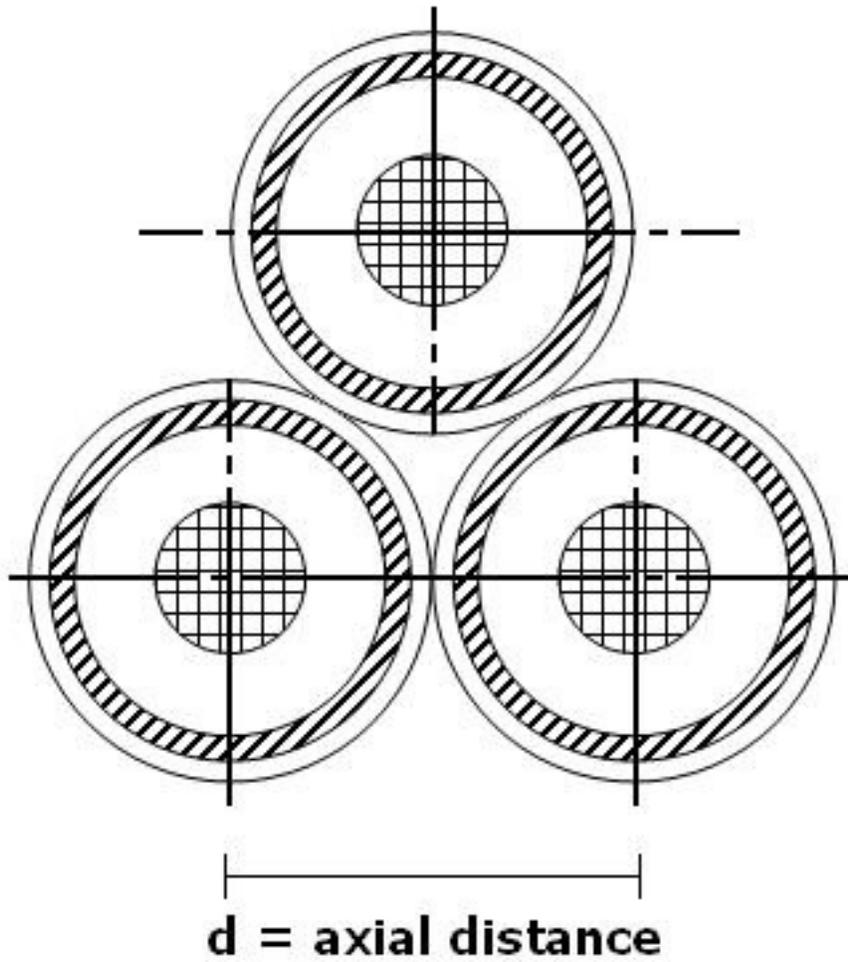
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- b. Use proper pulling tension.

Note:

1. Be sure to include straight pulls and curved pulls when determining pulling tension.
2. The tensions of the pull shall not exceed that specified by the manufacturers for the particular type and size of cable being pulled and shall be smoothly and continuously applied.
3. To avoid damage due to overruns, the cable should be pulled just fast enough to keep the drum rotating smoothly.

- c. Use the proper cable formation for the application.



d. Ensure cable is bedded in clean sand, which shall extend six inches around the cable.

5. Splice or terminate all junctions in the cable.

Note: Test cable to ensure all splices and terminations are good.

a. Ensure all Splices and Terminations are precisely marked on drawings

b. Ensure each splice is marked with a pedestal.

6. Backfill trench.

a. Install marking tape 12 inches below finished grade the entire length of the run.

b. Spoil or other approved filling shall be carefully placed in the trench, (stones, rocks and paving material shall be removed) the surface shall be left in such a condition as not to constitute a hazard and shall be the same as the original unexcavated land.

(Asterisks indicates a leader performance step.)

**Evaluation Guidance:** Score the Soldier GO if all performance measures are passed (P).  
Score the Soldier NO GO if any performance measure is failed (F).  
If the Soldier scores NO GO, show the Soldier what was done wrong and how to do it correctly.

**Evaluation Preparation:** Provide the Soldier with all the items listed in the conditions. Give the Soldier a safety briefing and ensure that all safety precautions are followed. Prepare the area and equipment in advance to ensure that the task standards can be met.

PERFORMANCE MEASURES	GO	NO-GO	N/A
1. Reviewed all of the safety SOPs, DANGERS, WARNINGS, CAUTIONS, manufacturer's literature, electrical construction prints, and wiring diagrams before proceeding.			
2. Ensured that all PPE was correctly tested and was fully mission capable.			
3. Excavated Trench to proper depth for application.			
4. Installed Cable			
5. Spliced or terminated all junctions in the cable.			
a. Ensured all Splices and Terminations were precisely marked on drawings.			
b. Ensured all Splices were marked with a pedestal.			
6. Backfilled trench.			

**Supporting Reference(s):**

Step Number	Reference ID	Reference Name	Required	Primary
	EM 385-1-1	Safety and Health Requirements.	No	No
	FM 5-412	PROJECT MANAGEMENT	No	No
	LCH	The Lineman's and Cableman's Handbook, 11th Edition, McGraw-Hill. 2007	No	No
	NESC®	National Electrical Safety Code. 2012 Edition	No	No
	TM 3-34.45	ENGINEER PRIME POWER OPERATIONS	No	No
	TM 5-682	Facilities Engineering: Electrical Facilities Safety.	No	No
	TM 5-684	Facilities Engineering - Electrical Exterior Facilities. NAVFAC MO-200/AFJMAN 32-1082.	No	No
	TM 5-811-1	Electric Power Supply and Distribution {AFJMAN 32-1080}	No	No

**Environment:** Environmental protection is not just the law but the right thing to do. It is a continual process and starts with deliberate planning. Always be alert to ways to protect our environment during training and missions. In doing so, you will contribute to the sustainment of our training resources while protecting people and the environment from harmful effects. Refer to FM 3-34.5 Environmental Considerations and GTA 05-08-002 ENVIRONMENTAL-RELATED RISK ASSESSMENT. Environmental protection is not just the law but the right thing to do. It is a continual process and starts with deliberate planning. Always be alert to ways to protect our environment during training and missions. In doing so, you will contribute to the sustainment of our training resources while protecting people and the environment from harmful effects. Refer to FM 3-34.5 Environmental Considerations and GTA 05-08-002 ENVIRONMENTAL-RELATED RISK ASSESSMENT.

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**Prerequisite Individual Tasks :**

Task Number	Title	Proponent	Status
052-204-1115	Rescue an Injured Victim From a Manhole	052 - Engineer (Individual)	Approved
052-204-1125	Operate a Line Truck with Auxiliary Equipment	052 - Engineer (Individual)	Approved
052-204-1128	Interpret an Electrical One-Line Diagram	052 - Engineer (Individual)	Reviewed
052-204-1117	Inspect Hot-Line Equipment	052 - Engineer (Individual)	Approved
052-204-1108	Inspect Safety Equipment	052 - Engineer (Individual)	Approved
052-204-1119	Perform Operator Preventive-Maintenance Checks and Services (PMCS) on a Line Truck With Auxiliary Equipment	052 - Engineer (Individual)	Approved
052-204-1113	Prepare a Manhole for Safe Entry	052 - Engineer (Individual)	Approved
052-204-1204	Tie Rope Knots and Splices	052 - Engineer (Individual)	Approved

**Supporting Individual Tasks :**

<b>Task Number</b>	<b>Title</b>	<b>Proponent</b>	<b>Status</b>
052-204-1115	Rescue an Injured Victim From a Manhole	052 - Engineer (Individual)	Approved
052-204-1213	Splice a Medium-Voltage URD Power Cable	052 - Engineer (Individual)	Approved
052-204-1214	Terminate a Medium-Voltage URD Power Cable	052 - Engineer (Individual)	Approved
052-204-1117	Inspect Hot-Line Equipment	052 - Engineer (Individual)	Approved
052-204-1120	Install a Grounding Set	052 - Engineer (Individual)	Approved
052-204-1119	Perform Operator Preventive-Maintenance Checks and Services (PMCS) on a Line Truck With Auxiliary Equipment	052 - Engineer (Individual)	Approved
052-204-1113	Prepare a Manhole for Safe Entry	052 - Engineer (Individual)	Approved
052-204-1202	Maintain Rigging/Hoisting Equipment	052 - Engineer (Individual)	Approved
052-204-1204	Tie Rope Knots and Splices	052 - Engineer (Individual)	Approved

**Supported Individual Tasks :**

<b>Task Number</b>	<b>Title</b>	<b>Proponent</b>	<b>Status</b>
052-204-1211	Install Distribution System Protection and Equipment (De-energized)	052 - Engineer (Individual)	Approved
052-204-2217	Manage a Power Line Crew	052 - Engineer (Individual)	Approved
052-204-2213	Locate an Underground Cable and/or Fault	052 - Engineer (Individual)	Approved
052-204-2216	Perform Maintenance on Electrical Distribution Equipment	052 - Engineer (Individual)	Approved
052-204-2309	Design Underground Electrical Distribution System	052 - Engineer (Individual)	Approved

**Supported Collective Tasks :**

<b>Task Number</b>	<b>Title</b>	<b>Proponent</b>	<b>Status</b>
05-3-5702	Install Underground Electrical-Power Distribution Equipment	05 - Engineers (Collective)	Approved
05-3-5727	Install Underground Distribution Equipment	05 - Engineers (Collective)	Approved
05-3-5723	Install Prime Power Generation Equipment	05 - Engineers (Collective)	Approved

**ICTL Data :**

<b>ICTL Title</b>	<b>Personnel Type</b>	<b>MOS Data</b>
ASI U4, Power Line Distribution	Enlisted	MOS: 12P, ASI: U4
12Q10, Power Line Distribution Specialist, skill level 1	Enlisted	MOS: 12Q, Skill Level: SL1