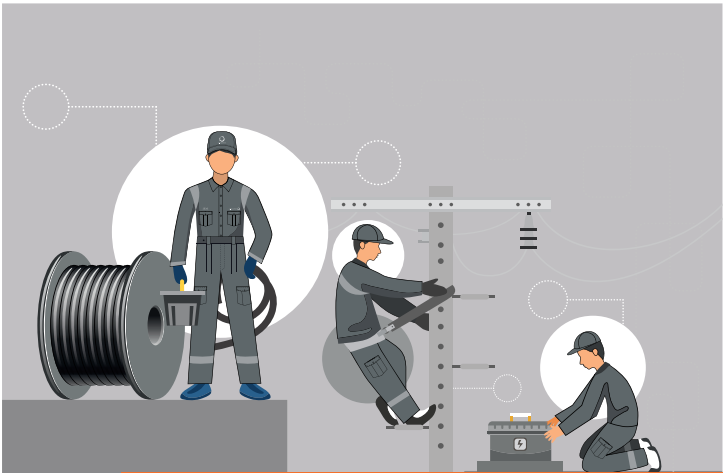
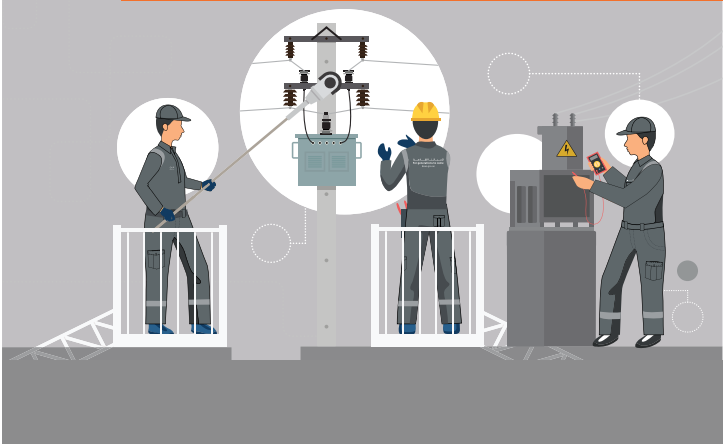


DISTRIBUTION MV NETWORK

# SAFETY AND PROTECTION GUIDELINES



# PREFACE

This guidelines booklet is issued by the Patrolling Section of the Distribution Maintenance Department at DEWA to help people who are involved in project work or any excavation in the vicinity of DEWA's Distribution of High or Medium Voltage networks.

It is based on DEWA NOC conditions and DEWA regulations for electrical connections.

It is intended to provide guidelines in relation to any work in the vicinity of underground or overhead lines (OHL) electrical cables, and improve communication between DEWA and its stakeholders.

**DEWA**
Distribution Maintenance Department
Patrolling Section
Tel: 04 32 27496 / 32 27533 / 32 27410
Email: dp.mz3@dewa.gov.ae

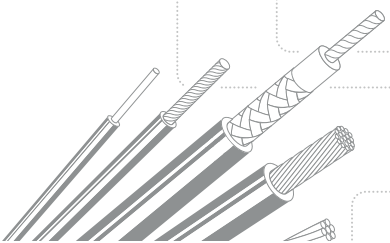
# CONTENTS

# 1. INTRODUCTION

Dubai Electricity & Water Authority (DEWA) owns and maintains the distribution grid, which is the heart of the network, connecting your homes, businesses and communities to the energy you use every day.

The purpose of these recommendations is to promote greater awareness of the hidden dangers present when work is undertaken near underground cables without adequate safety precautions and not following DEWA electrical NOC conditions. We hope these procedures and practices will minimise the possibility of cable damage.

From the past records, it is clear that the majority of accidents have been caused by failure to locate the underground cables prior to starting the work on a site and subsequently to take all practicable safety precautions to avoid cable damage.



# 2. CABLES, JOINTS, TAPES & TILES

DEWA provides one of the best distribution networks in the world, which has more than 33,000 km of medium-voltage (MV) cables (6.6kV, 11kV & 33kV).

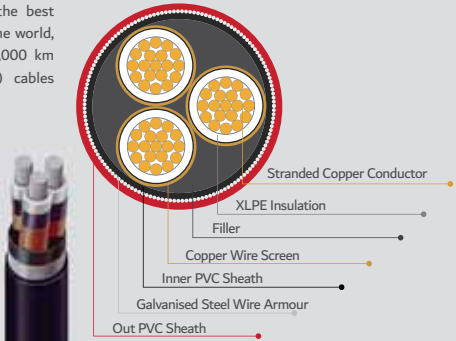
## 2.1 Cables

A) 6.6kV cable

B) 11kV Cable

C) 33kV Cable

D) 33kV Pilot Cable




### 2.2 Cable Joint

Cable joints (Cast iron and heat shrink) are the weakest points of the network. Joints should not be touched without a DEWA or DCL (Distribution Cable Licence) holder's supervision. Wooden box protection is required for all such joints during the work.

### 2.2 Depth, Warning Tape and Protection Tiles

High-voltage (HV) cables are usually buried at 90cm - 1.2m below the surface of the ground. It has a layer of protection tiles placed 30cm above the cable and warning tape placed 30cm above the protection tiles.

However, never assume the depth; you may find cables at shallower depths and also without warning tape or protection tiles.


# 3. CABLE DETECTOR

One way of detecting the presence of live underground cables is by using cable locating devices. It is mandatory that such a device is always available on site when excavating in the vicinity of underground cables.

Nowadays, cable detectors are available in the market, which shows the depth and direction of the cable.

Please note that the absence of a positive indication must not be taken as proof that a cable is not there or that it isn't live.

**Purpose:**

- To identify the cable position
- To avoid cable damage
- To avoid stopage work
- To avoid financial losses

# 4. OBTAINING AN NOC

**A No Objection Certificate abbreviated as NOC is defined as a written permission from DEWA to carry out the proposed construction as indicated on the submitted drawing.**

The Contractor should obtain the NOC from DEWA prior to starting the work. Copies of NOCs and GIS drawings should be kept at the site at all times during the project work.

**4.1 Design NOC (only for design purpose, not allowed to work)**

**4.2 Trial Pit NOC (only for hand excavation and not allowed for any construction activities)**

**4.3 Construction NOC**

**4.4 Shop Drawing NOC**

**4.5 NDRC/Drilling/Open Cut/Borehole/Dewatering NOC**

**4.6 Building NOC**

**4.7 Fence NOC**

**4.8 Shoring NOC**

**4.9 Demolition NOC**

**4.10 Grading/Levelling NOC for new area**

**4.11 Temporary Traffic Diversion NOC**

**4.12 Tree Removal NOC**

# 5. WORK NOTICE

**Purpose:**

One of the main causes of cable damage or violations is a lack of coordination between DEWA and the contractor. Contractors should notify DEWA prior to starting site activities. Contractors must identify clearly the extent of the work area and find out what underground services are within the area before considering whether they are likely to be disturbed.

**Steps:**

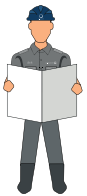
- Obtain copy of NOC, GIS drawing and trial pit verification drawing.
- Survey the site to identify the cables.
- Review the planned work to avoid disturbing cables, where ever possible.
- Allow sufficient time and provide sufficient resource to do the work safely.
- Identify all the cables (parallel and crossing) and install sufficient route markers.
- Barricade all the cable crossing locations with concrete or hard barriers to isolate the crossing cable from any damage.
- Walk around the full excavation area with a receiver or machine operator prior to issuing the permit.
- Mark the permit location in the layout drawing and mention the drawing number in the permit.
- Clearly mention the nature of work and validity & the conditions, if required (i.e. only manual excavation).
- Mention the cable details in the proposed working location.
- Get clearance from consultant or client prior to sending the work notification to DEWA.
- Send planned work notification along with location map to DEWA, two working days in advance to dp.mz3@dewa.gov.ae.

**Emergency Cases:**

- Emergency work still requires planning and notification to the Patrol Section of the Maintenance department of Distribution Power at DEWA.
- Contractor should call the concerned zone in-charge or to contact the Patrol Section office at 04-3227496 / 04-3227533 / 04-3227410 prior to starting the work.

# Do the following before starting any work at the site

Get cable plans and do mark-outs



Use cable locating devices

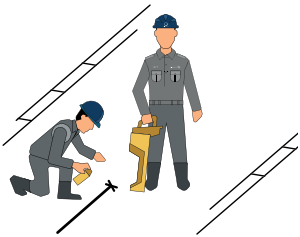
Use safe digging practices

# 6. TECHNICAL GUIDELINES

## 6.1 CABLE IDENTIFICATION

Make sure those involved in detecting and identifying services are competent in the proper use of detecting devices as well as reading and understanding the drawings. The position of the cable in or near the proposed work area should be pinpointed as accurately as possible using a cable detector.

Services should be traced through the full extent of the work area as they may not run in straight lines. Cables will often have bends or loops that are not shown on GIS drawings.



All the cables may not be visible in the GIS drawing due to smaller scale drawing or updating issues.

Even if no cables are shown on plans, or detected by a locator, there may still be cables present that could be live. You should keep a close watch for any signs that could indicate the presence of the cable.

If there is any doubt as to where the service is located or if the mentioned cable on GIS drawing cannot be located, seek appropriate assistance or advice from DEWA.

## 6.2 TRIAL PITS

- Trial holes by careful hand excavation are essential before any excavation begins.
- Hand digging must continue until all of the services have been found.
- For hard surfaces, the flat edge of the pick axe can be used.
- The sharp edge of the pickaxe should not be used.

### 6.2a Trial Pit Verification

All the parallel and crossing cables must be identified during trial pit verification.

Trial pits must be taken from right of way (ROW) to road edge, for road and infrastructure work.

If the proposed working area is a wide 3-metre trench, trial pits to be dug 5 metres wide (add 1 metre on both sides).

The distance from the cables to the proposed excavation edge must be mentioned in the drawing.

The depth of the cable must be mentioned in the drawing.

All the existing ducts must be identified in the proposed working area.

If the ducts are not available as per Geographical Information System (GIS), inform DEWA about this.

The following relevant documents (GIS and trial pit section drawing) must be made available at the site prior to sending a request for verification:

1. DEWA GIS drawing
2. Sufficient trial pits taken to ensure the cable routes and position.
3. A capable supervisor should be available at the site during verification.
4. Trial pit layout and cross section drawing should be as per the site showing vertical and horizontal clearance from existing HV cables and the proposed work site.
5. Existing cable should be exposed completely to verify number of cables and layers.

### Trial Pit for Bore Hole

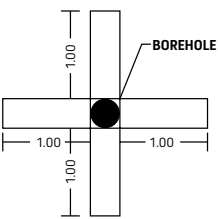
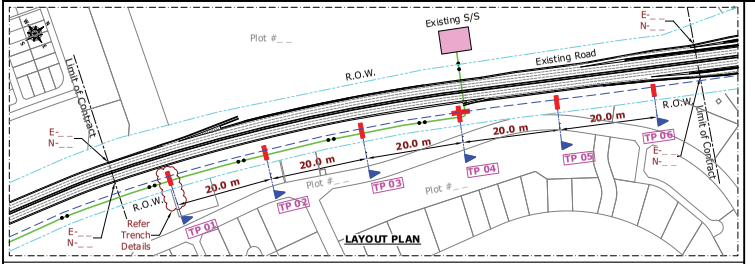


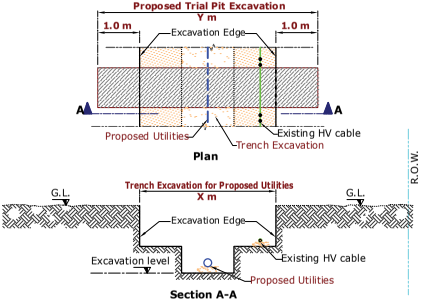
**Fig. No:**
**00.1**

# PROPOSED TRIAL PIT - LAYOUT PLAN AND TRENCH DETAILS




LEGEND :

- Right of Way (R.O.W)
- Proposed Utilities
- Existing HV Cable
- Existing Substation




**TRENCH DETAILS**

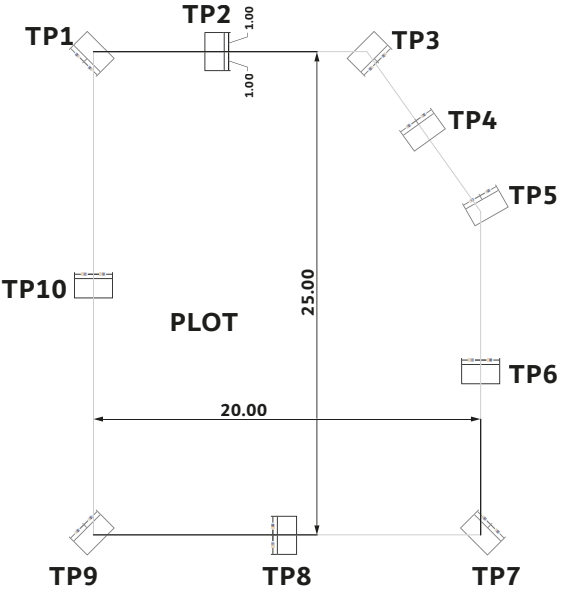
| | |
|---|---|
| Project | AAA |
| Client | AAA |
| Consultant | AAA |
| Main Contractor | AAA |
| Sub Contractor | AAA |
| Drawing Title | TRIAL PIT LAYOUT PLAN AND TRENCH DETAILS (PROPOSED TRIAL PIT) |

| Prepared | Checked | Approved |
|---|---|---|
| X | X | X |

| | |
|---|---|
| Drawing No. | XXX |
| Rev. | X |
| Date | DD-MM-YYYY |
| Sheet Size | X |
| Scale | X |



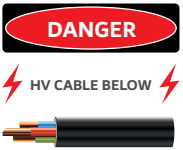
TOC




### 6.3 CABLE CROSSING

Cable crossings should be identified and hard barriers placed to isolate them. Crossing cables should be exposed by hand prior to continuing the excavation.

## 6.4 TEMPORARY CABLE MARKER




Don't remove the board without DEWA/Distribution Maintenance Dept. Permission

(Call: 0432-27496/27410 for Assistance)

- Once detected, identify and mark the cables. Confirm type, depth and number of cables.
- Do not use steel pins or rods for survey marking, which could damage cables laid at shallow depths.
- Install DEWA electricity temporary sign boards over the cables at regular intervals (approx. every 20 metres)
- If the cable is found in other corridor, inform DEWA for further action.

## 6.5 PERMANENT MARKER

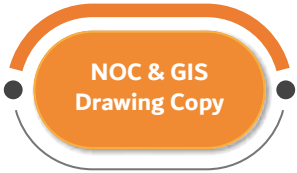
### 6.5.1 Post for 33kV cable

In most cases, there will be no permanent surface marker posts or other visible indication of the presence of an underground cable except for 33kV cable.

### 6.5.2 Concrete tile for 11kV

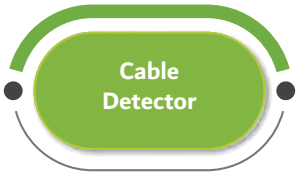
Concrete tile markers (300x300x100mm size) are placed over 11kV cable route in the interlock road / footpath area.

# 7. SITE REQUIREMENTS










# 8. SAFE WORKING PRACTICES

## 8.1 CABLE EXPOSING

Special care should be taken when digging above or close to the cable. Mechanical excavators, hand-held power tools and pick axes are the main causes of cable damage and they should not be used over or too close to underground services.

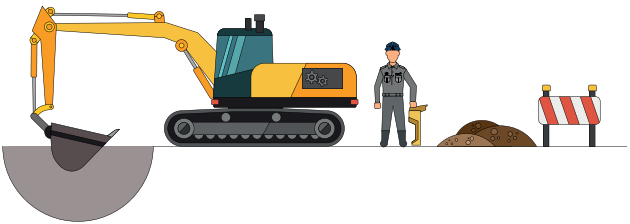
Hand shovels and flat edge pick axes should be used to expose the cable rather than other tools.

Pickaxes should not be used in soft soils near or over the underground cables. Pickaxes or sharp materials should not be thrown or spiked into the ground, where the cable has been exposed.

Pickaxes may be used with care to break the road base, asphalt, concrete or interlocking bricks.

## 8.2 MECHANICAL EXCAVATION NEAR CABLES

You should carefully plan and manage mechanical excavation, which is a common source of damage to cables. The proposed trench area should be marked and the cable detector used prior to starting the mechanical excavation. If there are no MV cables, mechanical excavation can be started as shown in the below picture.



**If there are cables, you have to follow the below steps:**

1. MV cables must be exposed manually up to the excavator wheel.
2. A Charge-Hand should assist the excavator operator, from a position where he or she can safely see into the excavation and warn the operator of any services or other obstacles.
3. Two labourers or helpers should stand inside the trench to expose the cable adjacent to the excavation, if any.

Make frequent and repeated use of locators during the course of the work. Assume all services are live until disconnected and proven safe at the point of work. Obtain confirmation from DEWA before removing the dead cable.

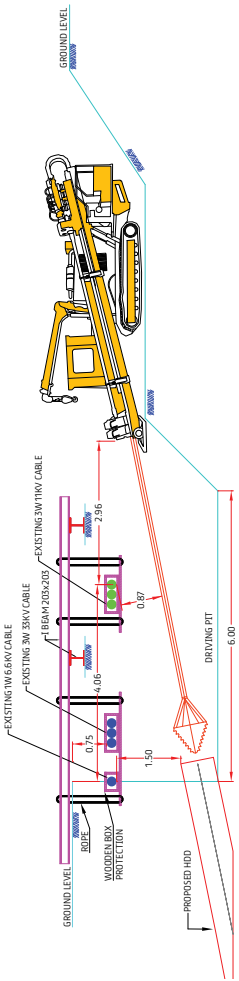
### 8.2A MECHANICAL EXCAVATION 1 METRE AWAY FROM THE CABLES

If the cables are more than 1 metre away from the edge of the proposed trench, you should follow the below steps:

1. Identify the cables by trial pits.
2. Place the DEWA ED sign boards.
3. Barricade the cable route with safety cones & mesh.

### 8.3 NDRC/DRILLING

- Contractors should submit the drilling profile, which should clearly mention the horizontal and vertical clearance from the cable.
- If the cable falls below 1 metre from the drilling or receiving pits, the contractor should expose the cable and protected it before starting work.
- If the pits are shown without a slope, a 3-metre clearance must be maintained towards building line.
- If the cables are found or collide in the excavation limit, they should be raised or lowered from the drilling pit and protected as well.


GROUND LEVEL
EXISTING 3W 11KV CABLE
EXISTING 3W 33KV CABLE
EXISTING 1W 6.6KV CABLE
I-BEAM 203x205
2.96
4.06
0.87
0.75
1.50
6.00
DRIVING PIT
GROUND LEVEL
ROPE
WOODEN BOX PROTECTION
PROPOSED HDD

## 8.4 ROAD WORK

### 8.4.1 Asphalt Carriageway

- No asphalt is allowed over the cable, except for a road crossing location.
- All the HV cables must be diverted prior to making asphalt.
- Proposed asphalt are not permitted under HV OHL.
- If there is no alternate, HV OHL should be kept underground.
- Separate NOC to be obtained for temporary traffic diversion work.
- Cables are to be lowered/raised at 1.2 metres depth from the FRL.

### 8.4.2 Asphalt Access / Service Road / Parking

- No foundation is allowed over the cable route.
- Duct marker/duct tile to be installed.

### 8.4.3 Interlock Access / Service Road / Parking

- Spare duct to be provided for existing cable crossing.
- Cables to be lowered/raised as per DEWA standard.

### 8.4.4 Pier / Bridges / Flyover / Ramp

- During the construction of pier/pile cap, all the cables adjacent to the proposed pier/pile cap, to be exposed and protected with wooden planks. Minimum 1 metre clearance is required from the cable to the proposed pile cap.
- Minimum 8 metres clearance is required from OHL conductor and 3 metres from the edge of stay rope to the proposed edge of the bridge/flyover/ramp.

### 8.4.5 Road Widening

- Contractors should identify the HV cable/duct crossing locations prior to start the work.
- If the cable is directly buried without duct in the existing road crossing, spare duct to be provided during widening of the existing road. (Bearing cost will be decided by RTA/DEWA).
- Duct markers to be reinstated after widening the road.
- Existing cables through ducts must be extended by split ducts with concrete surrounds. Spare ducts must be provided based on numbers of ducts affected, in case the existing ducts are blocked, due to the extention of ducts.

**8.4.6 Spare Ducts**

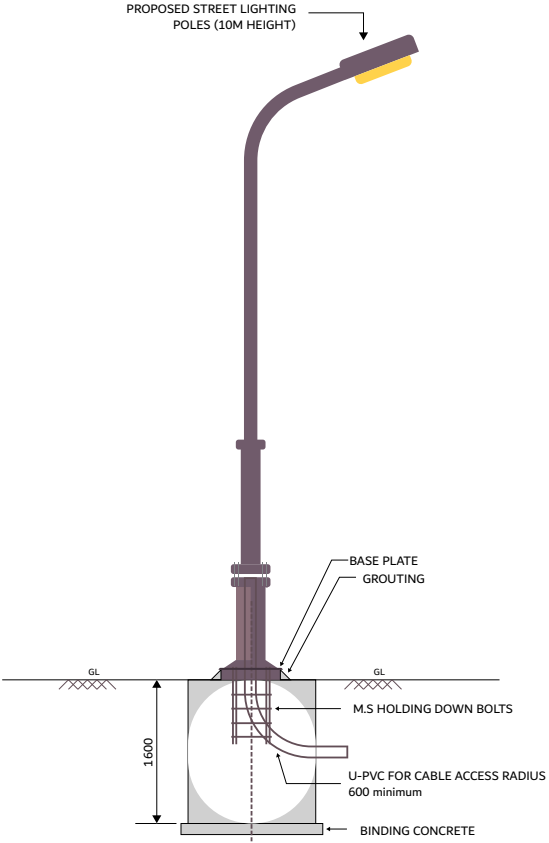
- Contractors should identify the HV cable/duct crossing locations prior to starting the work.
- Equivalent number of spare duct to be provided for existing cable crossing for new road construction in addition to the proposed future ducts.

**8.4.7 Duct Inspection & Checklist**

- Split duct with concrete surround will be inspected by the Patrol Section of the Maintenance department.
- The Patrol Section shall verify the presence of ducts only.
- Verification of the duct installation work should be recorded at all times in the checklist.
- The MDU-P Duct inspection checklist should be submitted along with completion certificate.
- Mandrel tests must be done only under supervision from Distribution Projects Planning-Road Projects (DPP-RP).
- DPP-RP duct inspection checklist should be submitted along with the completion certificate.

**8.4.6 Street Light /Guard Rail /Gantry Foundation**

- All types of foundations should be placed away from HV corridor.
- Minimum 50cm clearance is required from HV corridor. For less than 50cm, the foundation should be in 1.5 metres depth.
- Proposed street light pole is not allowed under the HV OHL.




TYPICAL CROSS SECTION

(APPLICABLE AT LOCATION WHERE HORIZONTAL
DISTANCE BETWEEN EXISTING HV CORRIDOR TO PROP.
STREET LIGHT IS LESS THAN 0.50M)

### 8.4.7 Guard Rail Installation

- Separate NOC to be obtained for guard rail installation.
- All the cables to be identified and ensure clearance prior to starting the drilling for guard rail installation.

### 8.5 Drainage/Sewerage/Irrigation/Water pipe network

- Cables to be identified separately in manhole location.
- Cables should not be slewed for manhole work without sufficient loop, as this may lead to cable joint failure.
- If the cables are less than 50cm from the edge of proposed trench, ensure cables to be exposed and protected prior to starting the work.
- All the exposed (full / partial) cable backfilling to be done under DEWA supervision only.
- Manhole/chamber should not be placed in DEWA corridor.
- Separate NOC to be obtained for dewatering work.
- If the manhole encroaches DEWA corridor, it should be mentioned during the construction NOC stages for approval.
- All the proposed pipeline should cross under the cable with minimum clearance as below.

| Description | Vertical |
|---|---|
| Main/Pressure Line | 1 metres |
| Distribution/Gravity Line | 0.5 metres |

## 8.6 DEWATERING/SOIL INVESTIGATING

- Separate NOC to be obtained for bore hole/soil investigation.
- Separate NOC to be obtained for dewatering work, if the dewatering pit is outside the proposed excavation trench.
- Dewatering should be done on the opposite side of the HV cable corridor.
- 1 metre clearance is required from HV cable for soil investigation/borehole and dewatering drilling.
- No soil investigation/dewatering to be done below HV OHL.

## 8.7 LANDSCAPE WORK

### 8.7.1 Soft Landscape:

- Manual excavation up to 30cm is allowed for grass/shrubs work.
- Only lateral irrigation line (below 2 inch) is permitted.
- Separate NOC to be obtained for irrigation main line.
- Shallow cables to be lowered as per DEWA standard, if the depth of the cable is affected by the proposed landscape work.

### 8.7.2 Hard Landscape:

- No trees to be placed over DEWA corridor.
- No decorative tiles/stones/RCC/PCC is allowed over the cable route. Need approval for special cases.
- Trial pits to be taken in tree pit area prior to starting the excavation.
- 1.5 metres clearance required for the installation of the tree from HV corridor, if not HDPE route barrier to be provided.
- Separate NOC to be obtained for tree removal work.
- 1 metre clearance from cable required for tree removal, if not cables to be exposed & protected prior to remove the tree.
- Distance between the cable and the trees should be verified during trial inspection for tree removal.

## 8.8 DU/ETC DUCT WORK

### 8.8.1 Duct Laying Work

- Ducts to be laid under the cable only.
- Minimum vertical/horizontal clearance for cable crossing is 50 cm.
- If the proposed ducts are clashing with existing cable, ducts to be laid as per below drawing. (new drawing required)
- Any maintenance and repair work should be carried with prior intimation.

### 8.8.2 Chamber/Manhole

- No manhole or chamber to be constructed over DEWA corridor/HV cable.
- Bottom of the chamber/manhole should not occupy DEWA ED corridor.
- Min 50 cm clearance is required from HV cable to the proposed chamber/manhole.

## 8.9 LV/ MV/132KV TROUGH INSTALLATION WORK

### 8.9.1 LV cable laying

- Manual excavation is only permitted for laying LV cables.
- Work start notification should be sent two working days in advance.
- LV cables should be laid beside the HV cables, that are found in the LV corridor.

### 8.9.2 MV cable laying

Work start notification should be forwarded two working days in advance. Manual excavation is only permitted over the cable, which is less than 1 metre deep.

If the existing cable depth is more than 1 metre, the below steps should be followed:

- Take trial pits by hand shovel at every 20 metres.
- If cables are at the proper depth (more than 900mm) in all trial pits, then it is allowed to use flat bucket or teeth-covered machine excavation for the first 30cm only. A separate approval on a case-by-case situation should be obtained from Distribution Maintenance.

### 8.9.3 132kV Trough laying

- Machine excavation is not allowed over the MV cable route.
- If MV cables are falling in the proposed trough excavation area, MV cables should be exposed by hand shovel and slewed under MDU-P supervision, prior to using machines for excavation.
- DEWA sign boards should be placed at every 20 metres.
- Proposed troughs should cross under existing MV cables.
- Excavated soil should not be stored over the cable route.

## 8.10 SCAFFOLDING, MATERIAL STORAGE & TEMPORARY SITE OFFICES

- No scaffolding is allowed over the parallel cable route.
- If any cable crosses the proposed scaffolding, contractors should submit a shop drawing prior to starting work and provide a spare duct.
- Minimum 1-metre horizontal clearance is required from the MV cable to the proposed scaffolding.
- Construction materials, temporary site office, water tank, generator and rest area tent to be kept 1 metre away from the cable route.
- Cables to be barricaded and sign boards to be placed over the cable route.

### 8.11 ADVERTISING BOARD/TRAFFIC SIGN BOARD/GANTRY/SIGNAL

- All types of foundations should not be placed over MV corridor.
- Minimum 1.5metres clearance is required from MV corridor.
- Separate NOC to be obtained for advertising signboards, fencing and all types of gantries.

### 8.12 DEMOLITION

- A separate NOC should be obtained for demolition work.
- Cables to be exposed and protected with wooden box prior to the demolition work, if they are close to the proposed work.

### 8.13 SHORING WORK

- A separate NOC should be obtained for shoring work outside the plot limit.
- Cables to be exposed and protected with suitable material prior to start the work.
- Minimum 1 metre clearance is required from MV cable to the proposed shoring and anchoring.
- Hard barriers or scaffolding to be provided if the cables are less than 1 metre distance from the proposed shoring location.

## 8.14 BUILDING CONSTRUCTION PLOT

- Contractors should not start the construction work with Power NOC or Load NOC or Design NOC.
- Contractors should get a construction NOC from DEWA.
- Contractors should obtain a fence NOC if the contractor encroaches the Right of Way (ROW).
- Store the construction materials, excavated soil, tanks, offices and rest rooms away from the cable.
- Temporary DEWA sign boards should be installed over the cable route, even if the cables are outside the plot limit.
- Contractors should notify DEWA about the work before the mobilisation starts.
- If the HV cables are passing inside the plot, contractors should approach DEWA - CSD-Network Modification before shifting outside the plot.
- Do not take the soil from outside the plot limit.
- Cable level (1.2metres from FRL) to be maintained as per the DEWA standard.
- Spare ducts to be provided based on number of cables.

## 8.15 FENCING WORK IN ROW DURING BUILDING CONSTRUCTION

- A fencing NOC should be obtained to keep the construction fence in the ROW.
- All the cables should be kept outside the fence for easy access (24X7).
- If the cables fall inside the proposed fence, contractors should submit an undertaking letter to MDU-P and should not store any materials over the cable route.

## 8.16 INTERLOCK ENTRY/EXIT ACCESS (OUTSIDE THE PLOT)

- A separate NOC should be obtained for interlock access.
- Spare ducts should be provided for existing cable crossings.
- Cables should be lowered or raised as per DEWA standard.
- Special permission is required for concrete or granite tiles.

### 8.17 GRADING/LEVELLING/FILLING

- Separate NOC to be obtained for grading and levelling/filling work in unmade area.
- Depth of the cables should be identified prior to start the work.
- Work notification to be forwarded two working days in advance.
- If proposed work affects the depth of the cable, contractor should maintain DEWA ED standard depth, which is 1.1 metres from FRL.

### 8.18 ROAD MILLING /TEMPORARY ROAD BASE

- Separate NOC to be obtained for shoring work outside the plot limit.
- Milling work is allowed for 10cm only over the existing asphalt.
- Cable crossing should be identified to ensure the depth of cable prior to starting the milling work.
- Work notification to be forwarded two working days in advance.

### 8.19 CYCLING & JOGGING TRACK

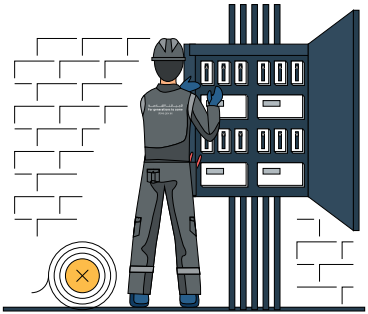
- Separate NOC to be obtained for interlock access.
- Cycling and Jogging tracks should be away from HV corridor.
- Special approval is required from DEWA for such work.

# 9. HANDLING CABLES

## 9.1 SUPPORT/PROTECTION

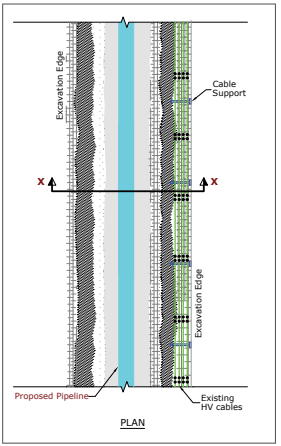
**Crossing Cable Protection**

- Where the cable is exposed for more than 2 metres across a trench, it should be supported with an I-beam, slings or props, and suitable planks should be placed over it.
- DEWA signboards should be placed on both ends of the cable crossing.

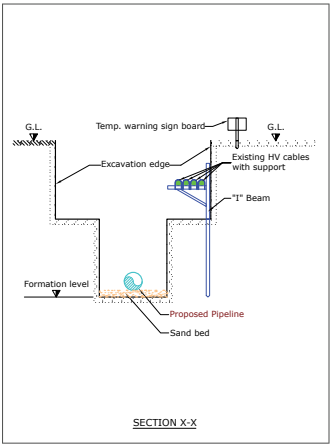


**Parallel Cable Protection**

Where the cables are exposed parallel to the trench, they should be protected and supported with I-beams.




PLAN




SECTION X-X

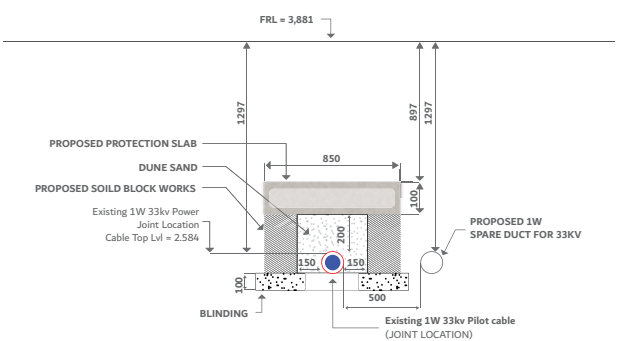
**Exposed Cable Protection**

Exposed cables must not be used as hand or foot-holds by anyone climbing in or out of the trench. All exposed cables in the excavated area should be protected by nail-free wooden planks or steel slews. Care must be taken not to use materials or equipment that could penetrate or damage the outer protective sheath of cables.

In addition, exposed cable should be barricaded to prevent access by unauthorised people.

**Cable Joint Protection**

Cable Joints need proper support and protection and should not be roughly treated. Do not touch and move these without DEWA supervision. If the cable joint falls in the road crossing or under the proposed ramp, it should be protected with concrete slabs with the retaining wall on both sides.


FRL = 3,881
1297
897
1297
PROPOSED PROTECTION SLAB
DUNE SAND
PROPOSED SOILD BLOCK WORKS
Existing 1W 33kv Power
Joint Location
Cable Top Lvl = 2.584
850
100
200
150
150
100
500
PROPOSED 1W
SPARE DUCT FOR 33KV
BLINDING
Existing 1W 33kv Pilot cable
(JOINT LOCATION)

**Cable Protection for Shoring**

Contractors should submit the profile drawing showing the clearance from the existing cable to proposed shoring work.

A) Expose the cable manually and provide wooden boxes or suitable protection before doing the shoring.

B) If the cable is passing more than 1 metre away from the proposed shoring limit, isolate the cable route with scaffolding or plywood or sheet piling to avoid any work or material storage over the cable.

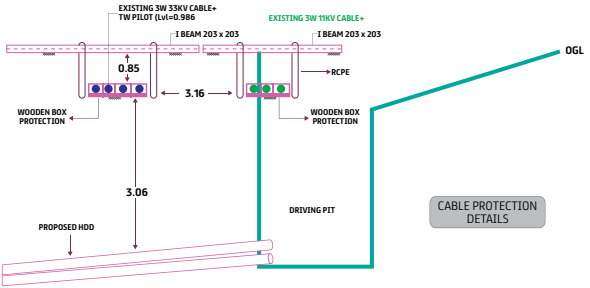
C) If the cable is very close, it should be temporarily slewed or shifted and reinstated to its original position after completing the shoring.

**Protection for Drilling**

Contractors should ensure the horizontal and vertical clearance from the entry pit and exit pit. If the cable is close to the drilling pit, the cable should be manually exposed and protected with wooden box and I-beam support.

**Cable Joint Protection**

Cable Joints need proper support and protection and should not be roughly treated. Do not touch and move these without DEWA supervision. If the cable joint falls in the road crossing or under the proposed ramp, it should be protected with concrete slabs with the retaining wall on both sides.



## 9.2 CABLE SLEWING

HV cables temporary or permenant slewing is sometimes required to complete or speed up the project. Cable slewing work should be done under DEWA supervision only.

**Temporary Cable Slewing:**

1. Contractor should submit the shop drawing to DEWA for temporary cable slewing.
2. Existing and proposed cable slewing location should be clearly mentioned in the drawing.
3. There should be no obstruction between the existing cable and the proposed slewing trench (location).
4. Temporary slewing within the same trench only.
5. Reinstatement date should be mentioned in the covering letter.
6. Cable joints should be protected with wooden box.
7. Adequate manpower should be arranged prior to starting the work.
8. Cables should not be raised above chest level while slewing or shifting.
9. Cables should not be twisted while shifting.
10. Machines and equipment should not be used to lift or slew the cables.

**Permanent Cable Slewing:**

1. An approved shop drawing is required for a permanent shift.
2. Slewing within the same trench must be supervised by MDU-P.
3. To slew the cable from one trench to another, contractors should approach DEWA Distribution Projects Planning - Road Project Section.

4. After the completion of the work, submit the as-built drawing.
5. There should be no obstruction between the existing cable and the proposed slewing trench (location).
6. Note: Cable slewing work should be carried out by DEWA - approved subcontractors only.

### 9.3 CABLE LOWERING/RAISING

If the cable at site is too shallow or too deep, it should be lowered or raised as per the DEWA standard. This work should be done under DEWA supervision only.

**Lowering/Raising Steps:**

1. Cables should be exposed by manual excavation only.
2. Support the exposed cable with an I-beam.
3. Deepen the trench under the supported cable as per the DEWA standard.
4. Provide 10cm dune sand bed.
5. Release the cable from wooden support and follow the backfilling steps.

Note: Cable lowering or raising work should be carried out by DEWA approved subcontractors only.

### 9.4 CABLE BACKFILLING

All the exposed (fully or partially) cables should be backfilled as per DEWA standard. If the warning tape and protection tiles were damaged or removed due to landslides during excavation adjacent to the cable, the contractor must replace the tiles and tapes.

Contractors must send prior notice before starting the backfilling work, to arrange the necessary spot supervision by DEWA.

**Backfilling Steps:**

1. Sand Bed: 10 cm dune sand should be provided below the cable.
2. Dressing: 15 cm horizontal and 10 cm vertical spacing between the cables should be maintained.
3. Dune Sand Filling: Should fill 30 cm dune sand over the cable.
4. PVC Protection Tile: PVC tiles should be laid over the dune sand.
5. Soil filling: 30 cm of excavated soil without stone should be filled over PVC tiles.
6. Warning Tape: Yellow warning tapes to be placed over the excavated soil filling.
7. Sand filing: Excavated soil to be filled in the remaining trench and contractor should compact the area.

Contractor should submit the checklist within 3 working days after completing the job. If the cable is backfilled without DEWA verification, the contractor should re-expose the cable for backfilling.

# 10. PREVENTIVE ACTION

### 10.1 TOOL BOX TALK

Give toolbox talks to the contractor's field staff for them to know about the safety and protection of the cable.

### 10.2 SAFETY NOTICE

Safety notices will be issued to the contractors for violations during the project's execution.

### 10.3 STOP NOTICE

Stop notices are usually issued only for major high risk violations which could cause cable damage, for working without DEWA NOC, and for cable damage.

### 10.4 PROJECT SURVEY REPORT

Project survey should be conducted and the observations forwarded to the contractor and consultant for rectifications. If not rectified, a Violation Control Report (VCR) will be issued.

### 10.5 VIOLATION CONTROL REPORT (VCR)

DEWA will issue a VCR to the contractor who violates the NOC conditions.

| SCHEDULE | |
|---|---|
| VIOLATIONS AND PENALTIES | |
| | Violation Description |
| 1 | Performing work or activities near the General Network without obtaining a permit or with an expired permit. |
| 2 | Initiating work in an area, that DEWA is planning to provide with utility services, in violation with the drawings plan or the work schedule set by DEWA. |
| 3 | Violating the permit's terms and conditions by the concerned person. |
| 4 | Permit documents and drawing issued by DEWA are not available at the work site. |
| 5 | A qualified supervisor is not appointed or available at the site during the work to supervise the work there. |
| 6 | Ground leveling work started without notifying DEWA 48 hours prior to starting it. |
| 7 | Failure to take all necessary measures and means to protect the safety of the General Network as per approved standards by DEWA. |
| 8 | Initiating work at the work site in violation to drawings and time schedule approved by DEWA. |
| 9 | Causing damage or affecting the safety of the General Network. |
| 10 | Failure to notify DEWA in case of any damage, or if the approved work is crossing with the General Network. |
| 11 | Failure to remove the violation by the violating party within the period set by DEWA. |
| 12 | Cable detectors are not available at the work site. |
| 13 | Commencement of the work without taking trial holes at the site. |
| 14 | Temporary signboards not installed to identify cable routes and water pipelines. |
| 15 | Obligations set in Article (7) of this Law are violated by the Landlord or occupants of properties in areas provided with services by DEWA. |
| 16 | Committing any of the prohibited action stated in Article (8) of this Law. |
| 17 | Refusing to comply with a Work Stop Notice issued by DEWA or any of its authorised employees. |
| 18 | Obstructing DEWA's employees' work or authorised people for inspection. |
| 19 | Committing any action in violation with the provisions of this Law and issued decisions other than violations set in this schedule. |

# 11. MAJOR CAUSES FOR DAMAGE

- Working without a NOC.
- Working without sending a work notice.
- Working without locating the cable position and depth.
- Working with machine over the cable route.
- Using sharp edge tool over the cable route.
- Lack of coordination between the groups.
- Improper work handing over between the shifts.
- Working outside the project limit, where the services were not identified.
- Working without protection for exposed cable.
- Improper protection of HV cable.
- Improper backfilling of exposed HV cable.

# 12. BLACK POINTS & VCR

Black points and violation control report will be issued to the contractors, who violate DEWA NOC conditions.

| | |
|---|---|
| **Two cables damaged (or) accumulated 14 Black Points.** | 1. **Warning to Site in-charge.**<br>2. **Work stoppage for three (3) Working days.** |
| **Three cables damaged (or) accumulated 21 Black Points.** | 1. **Removal/replacement of Site in-charge.**<br>2. **Work stoppage for five (5) working days.** |
| **4 Cables damaged (or) accumulated 28 Black Points.** | 1. **Withdrawal of DEWA-ED NOC.**<br>2. **No NOC to be issued for new project for one (1) year.**<br>3. **For resumption of work, new contractor/DEWA approved contractors to be appointed.** |

**DEWA-ED (400/132/33/11/6.6KV POWER / PILOT / FO CABLE) NOC VIOLATIONS & BLACK POINTS**

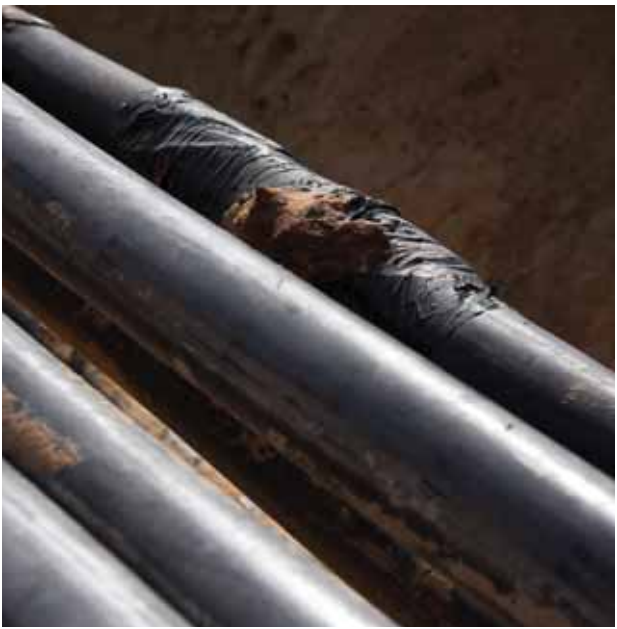
| CATG. | S# | DESCRIPTION OF THE VIOLATIONS | BLACK POINTS | ACTION BY DEWA | ACTION BY CONTRACTORS |
|---|---|---|---|---|---|
| A | 1 | 33/11/8.8KV CABLE DAMAGE | 7 POINTS | STOPPAGE OF WORK (AS PER SITE CONDITION) | CLIENT, CONSULTANT & CONTRACTOR SHOULD HAVE A MEETING IN DEWA OFFICE FOR FURTHER COURSE OF ACTION |
| | 2 | WORK WITHOUT DEWA-ED NOC/WORK PERMIT | 5 POINTS | ISSUING STOP NOTICE | TO OBTAIN THE REQUIRED DEWA-ED NOC/ WORK PERMIT |
| | 3 | WORK ON HOLIDAYS & NIGHT TIME WITHOUT APPROVAL | 5 POINTS | ISSUING STOP NOTICE | PRIOR APPROVAL HAS TO BE TAKEN FOR SUCH TYPE OF WORK |
| | 4 | DAMAGING OF EARTH WIRE/TOWER FLOODING OR ANY PARTS OF 400/132/33/11KV TOWER/LINE | 5 POINTS | STOPPAGE OF WORK (AS PER SITE CONDITION) | CLIENT, CONSULTANT & CONTRACTOR SHOULD HAVE A MEETING IN DEWA OFFICE FOR FURTHER COURSE OF ACTION |
| | 5 | OVERHEAD LINE ACCESS ROAD DAMAGE/BLOCKING | 5 POINTS | ISSUING STOP NOTICE | TO RECTIFY THE VIOLATIONS |
| | 6 | USING MACHINERY INSIDE OVERHEAD LINE CORRIDOR WITHOUT NOC | 5 POINTS | ISSUING STOP NOTICE | TO OBTAIN THE REQUIRED DEWA-ED NOC |
| | 7 | NOT PROVIDED HEIGHT LIMIT GANTRY/CRASH BARRIERS AS PER NOC/METHOD STATEMENT | 5 POINTS | ISSUING STOP NOTICE | TO PROVIDE HEIGHT LIMIT GANTRY |
| | 8 | EXISTING HIV CABLES ARE NOT RELOCATED FROM PROPOSED CARRIAGEWAY | 5 POINTS | STOPPAGE OF WORK (AS PER SITE CONDITION) | HV CABLES TO BE RELOCATED OUTSIDE THE CARRIAGEWAY |
| | 9 | UNAUTHORISED CONSTRUCTION/PLANTATION/WATER DISCHARGING OVER DEWA-ED CABLES | 5 POINTS | ISSUING STOP NOTICE | TO RECTIFY THE VIOLATIONS |
| | 10 | DUMPING OF GARBAGE/CONSTRUCTION MATERIALS/SOIL OVER DEWA-ED CABLES, JOINTS, LINK BOXES/OHL CORRIDOR ETC. | 5 POINTS | ISSUING STOP NOTICE | TO RECTIFY THE VIOLATIONS |
| | 11 | EXCAVATION/CUTTING/LEVELLING/REMOVING OVER OR IN THE VICINITY OF DEWA-ED ROUTES WITHOUT PRIOR INTIMATION PERMISSION | 5 POINTS | ISSUING STOP NOTICE | COORDINATION WITH DEWA-ED |
| | 12 | DRILING/HTRUST BORING UNDER THE CABLE WITHOUT APPROVAL OF METHOD STATEMENT AND SHOP-DRAWING | 5 POINTS | ISSUING STOP NOTICE | APPROVAL TO BE OBTAINED PRIOR TO WORK |
| | 13 | REFUSE TO ACCEPT STOP WORK NOTICES AND NOT COOPERATE AT SITE | 5 POINTS | FAX TO PARTY | TO REPLACE THE CONCERNED STAFF AND TO PROVIDE AWARENESS TRAINING TO ALL THE SITE STAFF |
| B | 1 | MACHINERY/VEHICLE PARKING/PASSING INSIDE OVERHEAD LINE CORRIDOR | 4 POINTS | ISSUING STOP NOTICE | TO RECTIFY THE VIOLATIONS |
| | 2 | WORKING WITH THE INVALID/EXPIRED NOC HANDLING CABLES WITHOUT DEWA SUPERVISION | 4 POINTS | ISSUING STOP NOTICE | TO OBTAIN VALID NOC BY APPLYING FOR REVALIDATION |
| | 3 | COPY OF DEWA-ED NOC NOT AVAILABLE ALL THE TIME AT WORK SITE | 4 POINTS | ISSUING SAFETY NOTICE | COPY OF NOC TO BE KEPT AT SITE ALL THE TIME DURING COURSE OF CONSTRUCTION |
| | 4 | NO PRIOR 48-HOUR NOTICE TO DEWA | 4 POINTS | ISSUING SAFETY NOTICE | WORK PROGRAM TO BE FORWARDED WELL IN ADVANCE PRIOR TO START OF WORK |
| | 5 | BACK FILLING OVER DEWA-ED CABLES & REINSTATEMENT OF CABLE ROUTES MARKERS, NOT DONE AS PER DEWA STANDARD | 4 POINTS | ISSUING SAFETY NOTICE | TO RECTIFY THE VIOLATIONS (WITH IN THE TIME PERIOD MENTIONED IN THE SAFETY NOTICE) |
| | 6 | INSTALLATION OF TEMPORARY/PERMANENT FENCING OVER/ BY ENCLOSING CROSSING DHL/CABLE ROUTES WITHOUT DEWA-ED NOC | 4 POINTS | ISSUING SAFETY NOTICE | OBTAIN NOC OR TO SUBMIT UNDERTAKING TO DEWA-ED AS PER DEWA REQUIREMENT |
| | 7 | EXPOSED CABLES ARE NOT BARRICADED/SUPPORTED PROPERLY | 4 POINTS | ISSUING SAFETY NOTICE | TO RECTIFY THE VIOLATIONS |
| C | 1 | NON CAPABLE SAFETY PERSONNEL/ SUPERVISOR AT WORKING SITE | 2 POINTS | ISSUING SAFETY NOTICE | TO RECTIFY THE VIOLATIONS |
| | 2 | WORK NOT CARRIED OUT AT SITE AS PER MUTUAL AGREED SCHEDULE/TIME | 2 POINTS | ISSUING SAFETY NOTICE | TO RECTIFY THE VIOLATIONS |
| | 3 | TEMPORARY ROUTE MARKERS/DANGER SIGNS ARE NOT PLACED ALONG THE CABLE ROUTES WHILE WORKING CLOSE VICINITY OF DEWA-ED CABLES | 2 POINTS | ISSUING SAFETY NOTICE | TO RECTIFY THE VIOLATIONS |
| | 4 | EXISTING SERVICES ARE NOT IDENTIFIED/VERIFIED AT SITE BY CONSULTANT/CONTRACTOR PRIOR THE COMMENCEMENT OF THE PROPOSED WORK. | 2 POINTS | ISSUING SAFETY NOTICE | TO RECTIFY THE VIOLATIONS |
| | 5 | EXPOSING OF TOWER FLOODING/EARTHWIRE, ETC. | 2 POINTS | ISSUING SAFETY NOTICE | TO RECTIFY THE VIOLATIONS |

# 13. OUTER PVC SHEATH DAMAGE

It is the contractor's responsibility to inform DEWA, if any old outer PVC sheath damage caused by another factor is found during the work.

If the outer PVC sheath has been damaged by the contractor during excavation, it is mandatory to inform DEWA for appropriate action to repair the damage.

Do not rectify the damage by any insulation tape or other materials. If such activity is found, severe action will be taken by DEWA.



# 14. COMPLETION CERTIFICATE

A completion certification confirms that the project has been accomplished in accordance with DEWA NOC conditions. The following information is essential to get the completion certificate without any delay.

- As-built drawing for cable relocation
- As-built drawing for cable slewing/shifting
- Backfilling checklist
- Joint location with coordinate
- Verified duct checklist by DM-MDU-P & DPP-RP
- MDU-P zone in-charge details during the project execution
- Project start and end date

# 15. AVOID THE FOLLOWING

**Fig. 1:** Do not use the machine close to the cable until the existing cables are exposed and protected.

**Fig. 2:** Don't let hanging cables sag when hung.

**Fig. 3:** Avoid keeping loops in diverted cables.

**Fig. 4:** Do not use sharp-edged tools over or near HV cables.

**Fig. 5:** Before soil cutting, protect the exposed exisiting cables.

**Fig. 6:** Avoid debris over the cable.

**Fig. 7:** Do not wrap the cable with hessian cloth


**Fig. 8:** Do not use a jack hammer machine over or close to the marked cable route.

**Fig. 9:** Do not make a manhole or chamber close to the cable without first ensuring a horizontal clearance

**Fig. 10:** Do not use a machine close to the cable without a hard barrier

**Fig. 11:** Do not use machines close to the cable

**Fig. 12:** Do not expose cable by mechanical excavator

**Fig. 13:** Do not cut the existing ducts during excavation
(Instead, notify DEWA if there is such an obstruction)

**Fig. 14:** Do not backfill the cable without proper spacing between the cables

**Fig. 15:** Do not dump excavated materials over the exposed unprotected cable.

**Fig. 16:** Do not use machines near the exposed, unprotected or barricaded cable.

**Fig. 17:** Avoid tying the cable directly with nylon rope

**Fig. 18:** Get approval before moving cables for construction work

**Fig. 19:** Don't dig trial pits by machine

**Fig. 20:** Do not lay the cable at shallow depths

**Fig. 21:** Do not block access to the substation

**Fig. 22:** Do not place street light foundation structures close to the cable

**Fig. 23:** Do not pour asphalt over the cable

**Fig. 24:** Do not mark with steel pins over the cable route

# CHECKLIST FOR DUCT INSPECTION

**DISTRIBUTION MAINTENANCE DEPARTMENT**
**MDU-PARTROLLING**
**DUCT EXTENTION CHECKING FORM**

PROJECT:.....

LOCATION:.....

CONSULTANT:.....

CONTRACTOR:.....

DATE:.....

TIME:.....

| SL# | Drawing Sheet No | Road No | Duct Location Number | Nos. of Duct | | | Chain age | Tile Marker | Remarks |
|---|---|---|---|---|---|---|---|---|---|
| | | | | Split Duct extension | Ex. Spare Duct | New Spare Duct | | | |
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Inspected by:.....
(DEWA-ED representative's Name & designation)

.....
Signature

Inspected by:.....
(Contractor RepXXXXXXXXXX's Name and design location)

.....
Signature

V:.....

.....
Signature

Note:

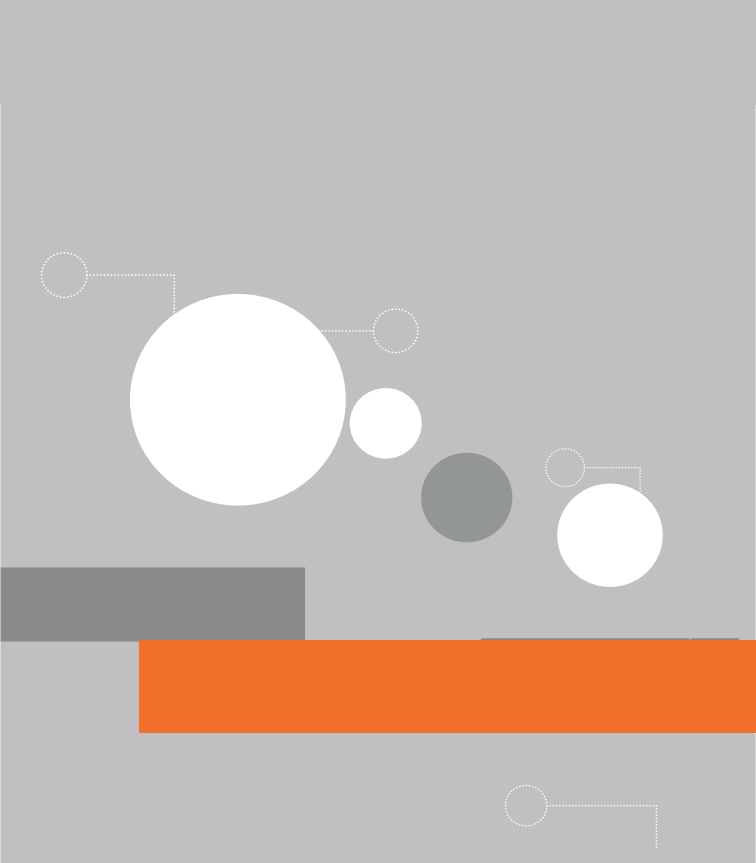
# CHECKLIST FOR BACKFILLING

**DISTRIBUTION MAINTENANCE DEPARTMENT**
**MDU-PATROLLING BACKFILLING CHECKING FORM**

| | | | |
|---|---|---|---|
| PROJECT NO: | | LOCATION:<br>(W/ ED LAYOUT) | |
| CONTRACTOR: | | CONSULTANT: | |
| LENGTH: | | NO. OF LAYER | |
| EXPOSED DATE: | | BACKFILLED DATE: | |

| S. No. | DESCRIPTION | STATUS | | REMARKS |
|---|---|---|---|---|
| 1 | HESSIAN CLOTH/PROTECTION MATERIAL REMOVED | ☐ YES | ☐ NO | |
| 2 | ANY OUTER PVC SHEATH DAMAGE | ☐ YES | ☐ NO | |
| 3 | TRENCH IS CLEAN & FREE OF WATER & RUBBISH MATERIALS | ☐ YES | ☐ NO | |
| 4 | TRENCH DEPTH | ..... CM (MIN 80 CM) | | |
| 5 | CABLE BEDDING | ..... CM (MIN 10 CM) | | |
| 6 | HORIZONTAL SPACING | ..... CM (MIN 10 CM) | | |
| 7 | VERTICAL SPACING (FOR DOUBLE LAYER) | ..... CM (MIN 10 CM) | | |
| 8 | 20CM SOFT SOIL FILLED OVER THE CABLE | ☐ YES | ☐ NO | |
| 9 | HDPE PROTECTION TAPE PROVIDED | ☐ YES | ☐ NO | |
| 10 | 30CM SOIL FILLED ABOVE HDPE PROTECTION TAPE | ☐ YES | ☐ NO | |
| 11 | ALLEN MARKING YELLOW WARNING TAPE PROVIDED | ☐ YES | ☐ NO | |
| 12 | 30CM MOTHER SOIL FILLED ABOVE WARNING TAPE | ☐ YES | ☐ NO | |
| NOTE: | | | | |

| | CONTRACTOR | CONSULTANT | DEWA - MDU - PATROLLING REPRESENTATIVE |
|---|---|---|---|
| NAME | | | |
| DESIGNATION | | | |
| MOBILE NO. | | | |
| SIGNATURE | | | |



**Our Vision** A globally leading sustainable innovative corporation committed to achieving Net-Zero by 2050
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