



HANDBOOK

ON EHV OVERHEAD LINES
AND UNDERGROUND CABLE
PROTECTIVE REGULATIONS



Third Edition 2021

Issued by
Transmission Maintenance department
Transmission Power division
Dubai Electricity and Water Authority

HANDBOOK

on EHV overhead lines
and underground cable
protective regulations

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ABOUT THIS BOOK

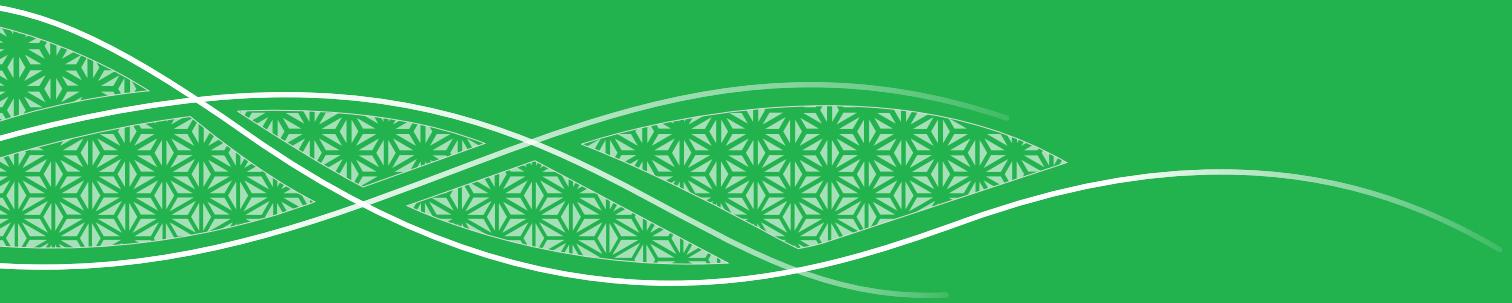
This book is a guide to the protection regulations for extra-high-voltage (EHV) overhead lines and underground cables for contractors, consultants, strategic partners, as well as anyone who is working on or near DEWA's electricity transmission network. This 3rd edition contains the updated work processes and requirements of DEWA's Transmission Line Maintenance Patrolling department. It provides the necessary information to ensure that completed projects conform to these regulations and necessary information, measures, documents, as well as all the criteria to ensure their successful completion.

How this book will help you

This book informs you about the procedures and requirements to ensure your work is done safely to avoid accidents and potential blackouts, and minimise risk.

CHAPTER 1

TRANSMISSION LINES & ACCESSORIES



TRANSMISSION LINES & ACCESSORIES

1.1 Underground Cables

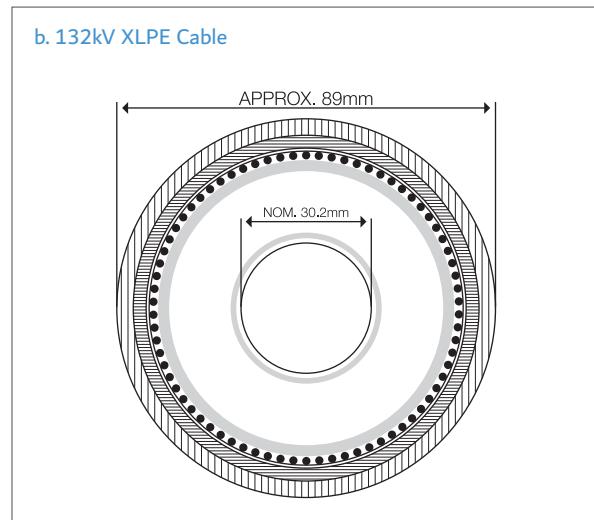
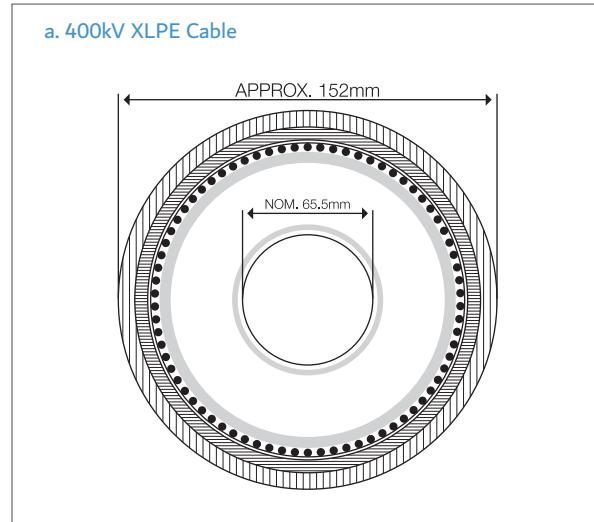
- a) There are 2 types of Underground Cables:
Power & Communications

Power Cables

- b) Power cables have 2 voltages: 400kV and 132kV.
- c) Based on the installation method, there are many types of Power cables. Currently, DEWA uses XLPE cables (Fig a & b).

Please note that cable detectors cannot detect power cables when they are not live.

- a. 400kV XLPE Cable
b. 132kV XLPE Cable

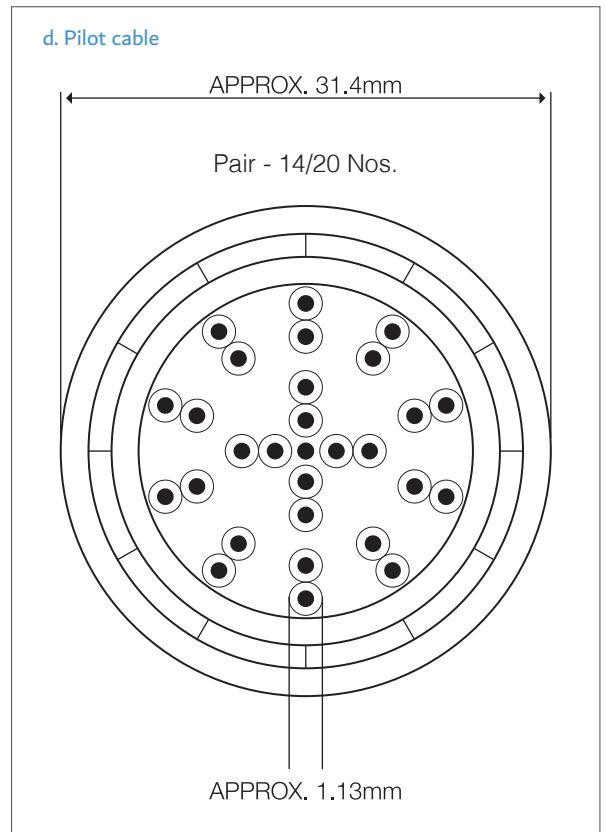
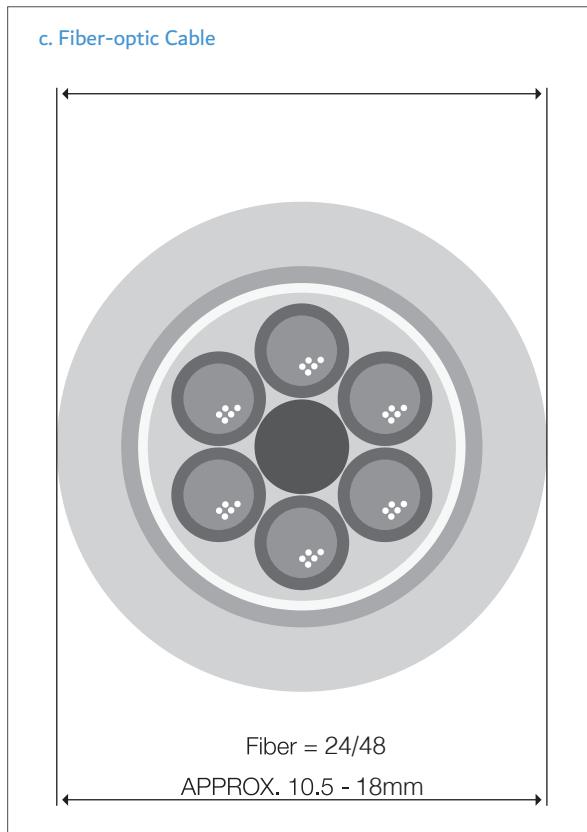


Communication cables

DEWA uses two types of communication cables:

1. Fiber-optic cable (Fig c)
2. Pilot cable (Fig d)

Note: Fiber-optic and Pilot cables cannot be detected by cable detectors, even when live.



TRANSMISSION LINES & ACCESSORIES

1.2 Overhead Towers

DEWA has two voltages for overhead lines: 400kV and 132kV. Overhead Lines are either

1. Tubular Monopole Tower: 400kV (Fig b)
2. Steel Lattice: 400kV (Fig a), 400/132kV (Fig c) or 132kV Steel Lattice (Fig d)

a. 400kV Overhead Transmission Tower



Double Circuit

Single Circuit

b. 400kV Tubular Monopole Tower



c. 400/132kV Gantry Tower



d. 132kV Steel Lattice (Double Circuit Tower)

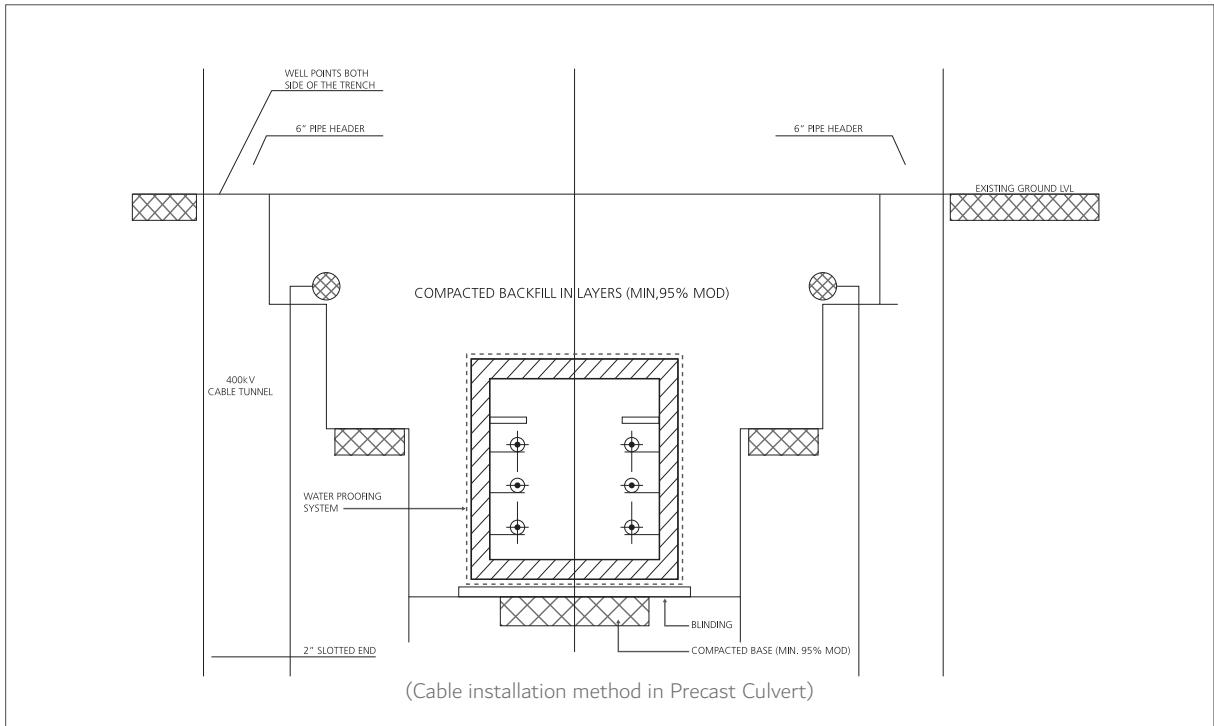


1.3 Underground existing EHV services

400 and 132kV - Power/Fibre/Pilot cables:

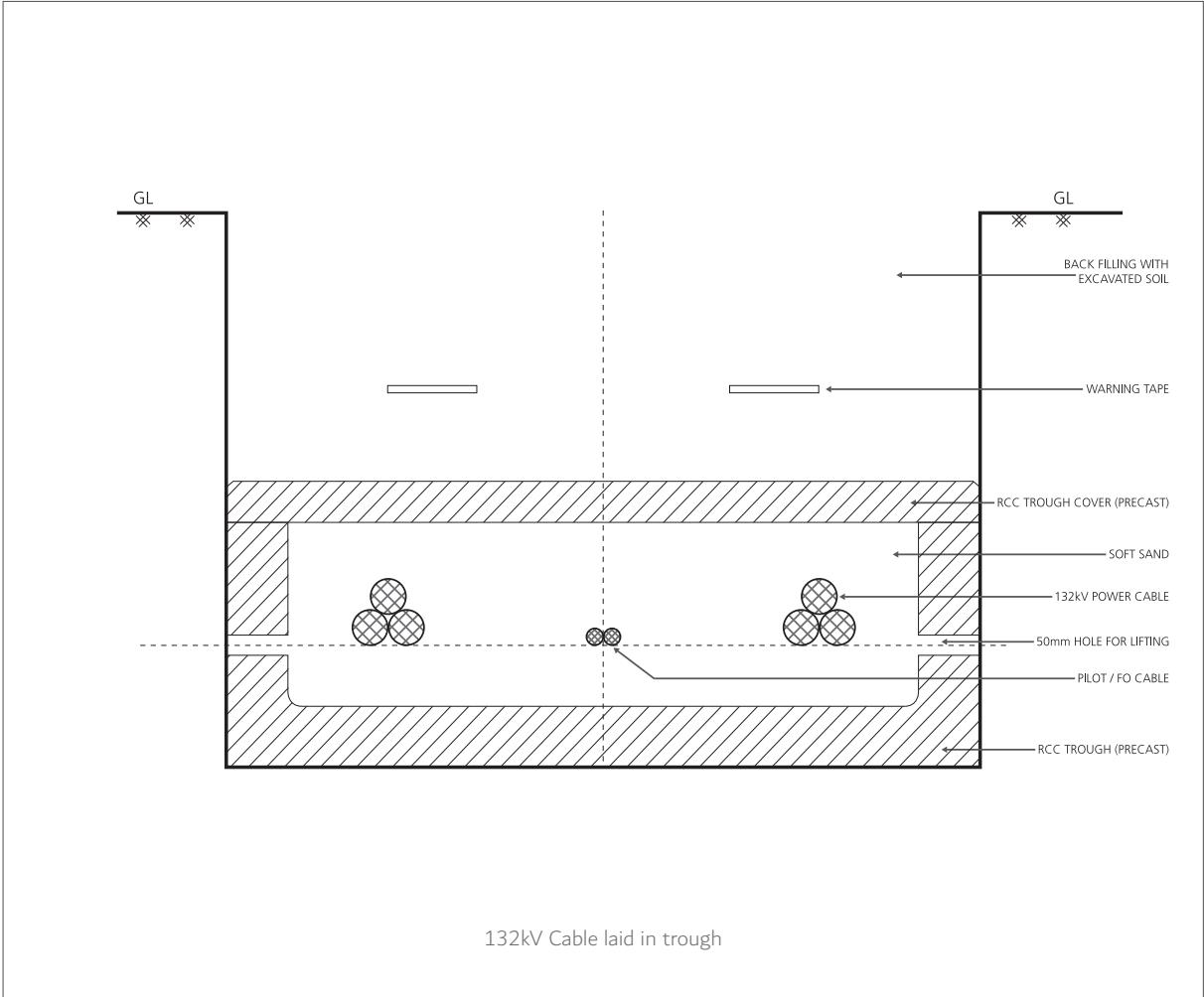
- a) In Tunnels 400kV
- b) In 2-metre & 1.5m wide concrete troughs -132kV
- c) In 50cm troughs for congested areas-132kV
- d) In HDPE duct by directional drilling methods - 132kV
- e) In PVC ducts with concrete surround duct bank-132kV
- f) In direct buried conditions-132kV

a. 400kV cable laid in tunnel

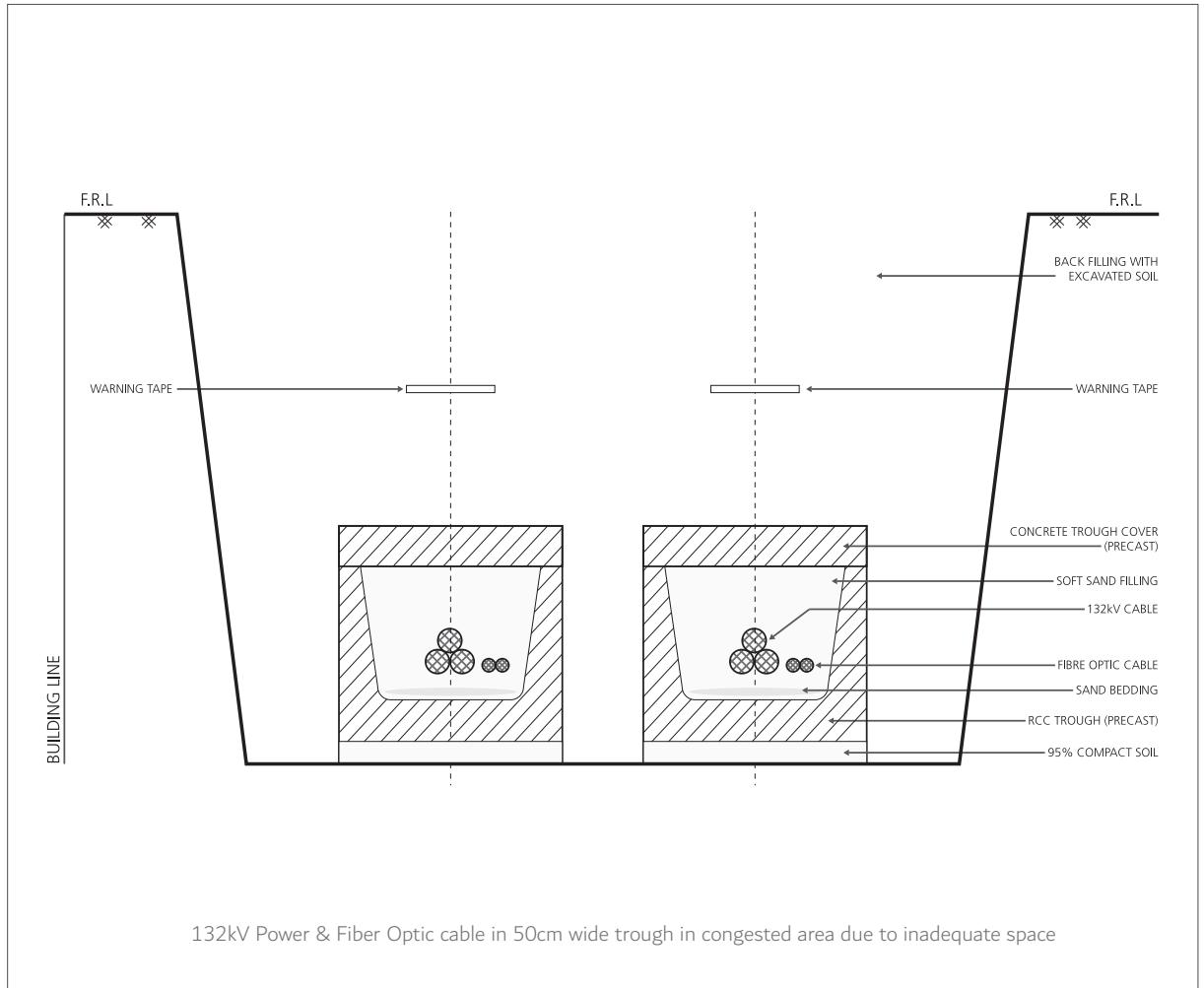


TRANSMISSION LINES & ACCESSORIES

b. 132kV cables laid in concrete troughs

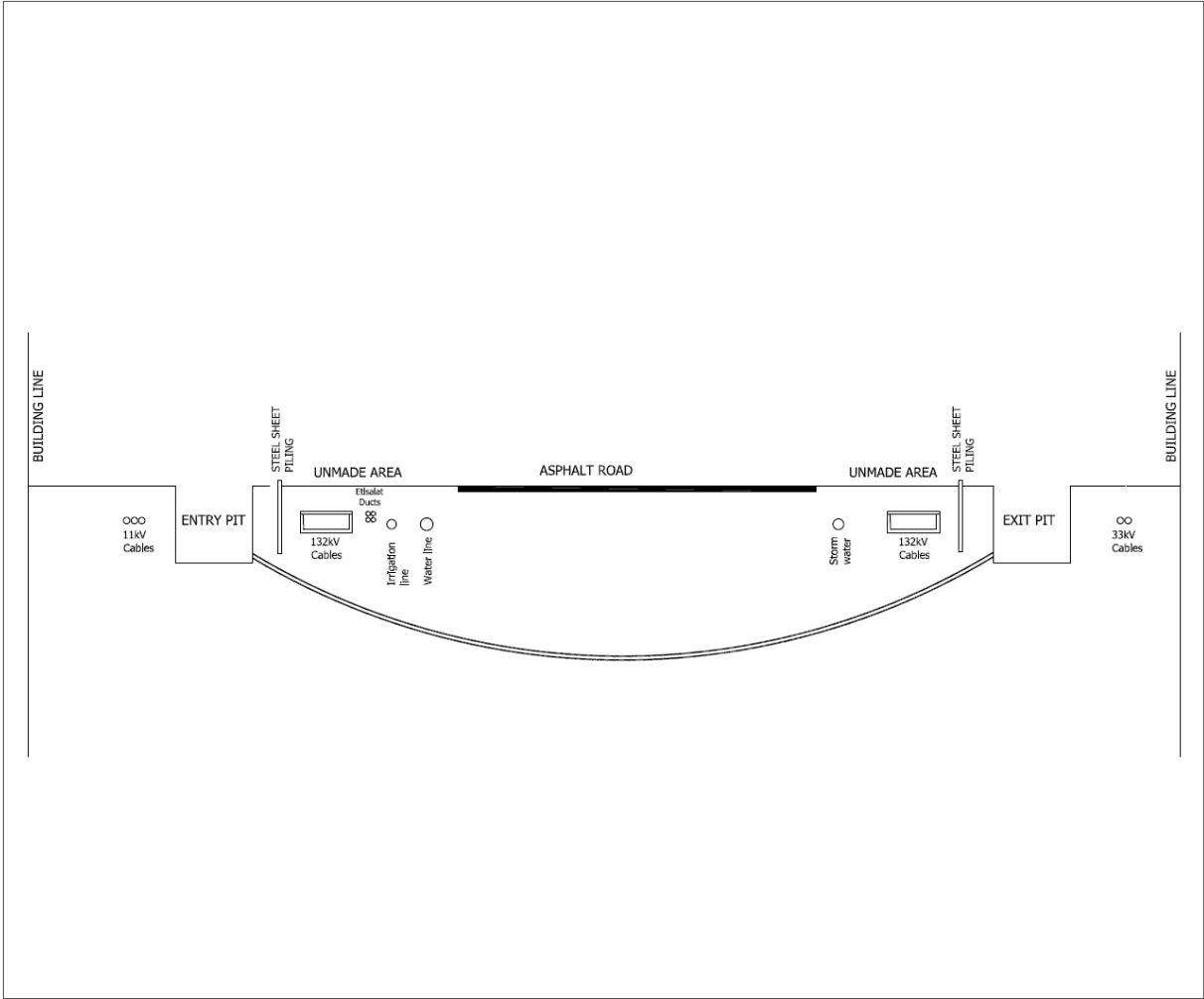


c. 132kV Cables laid in 50cm troughs in congested areas

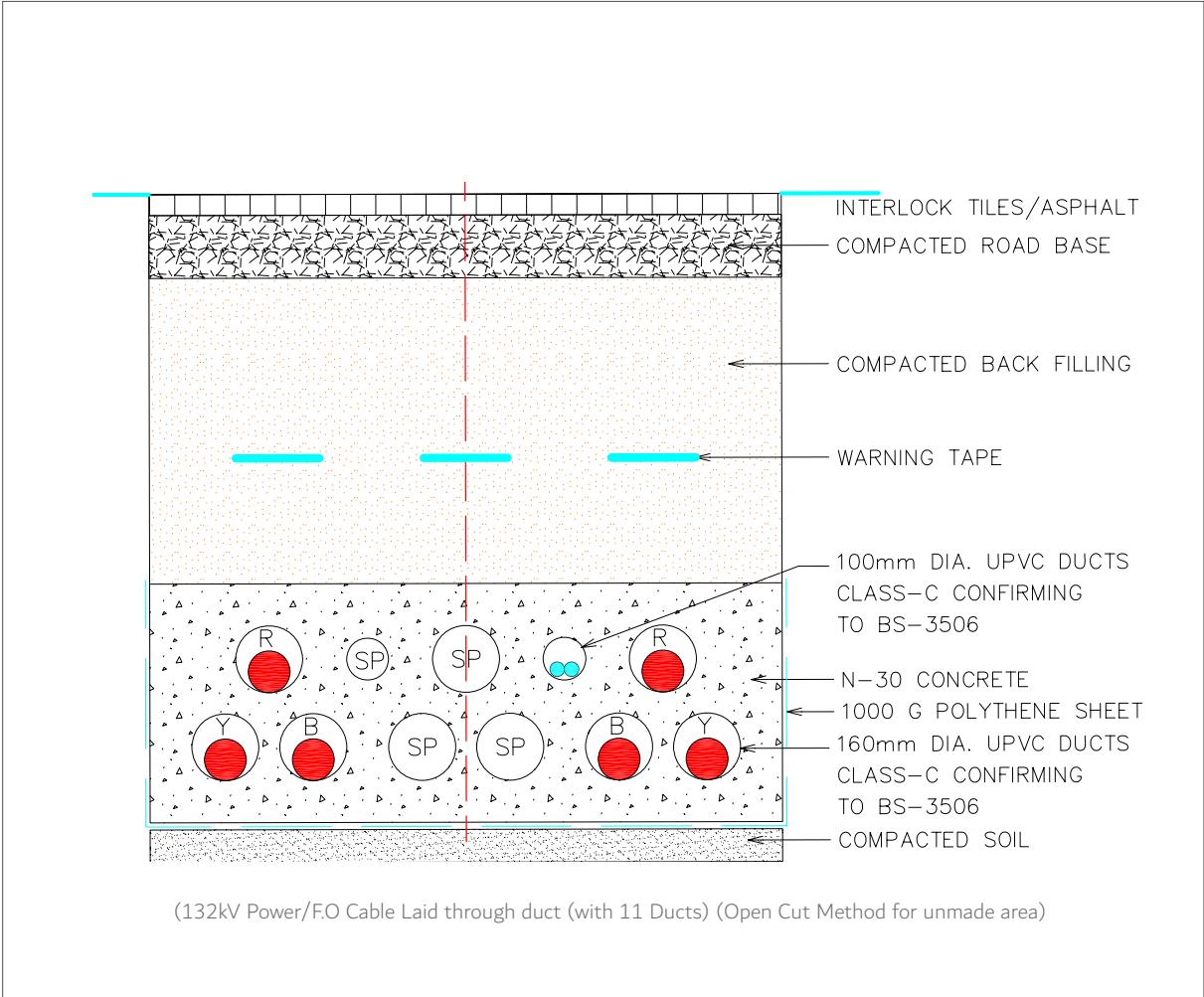


TRANSMISSION LINES & ACCESSORIES

d. In High Density Polyethylene (HDPE) ducts by directional drilling method – 132kV

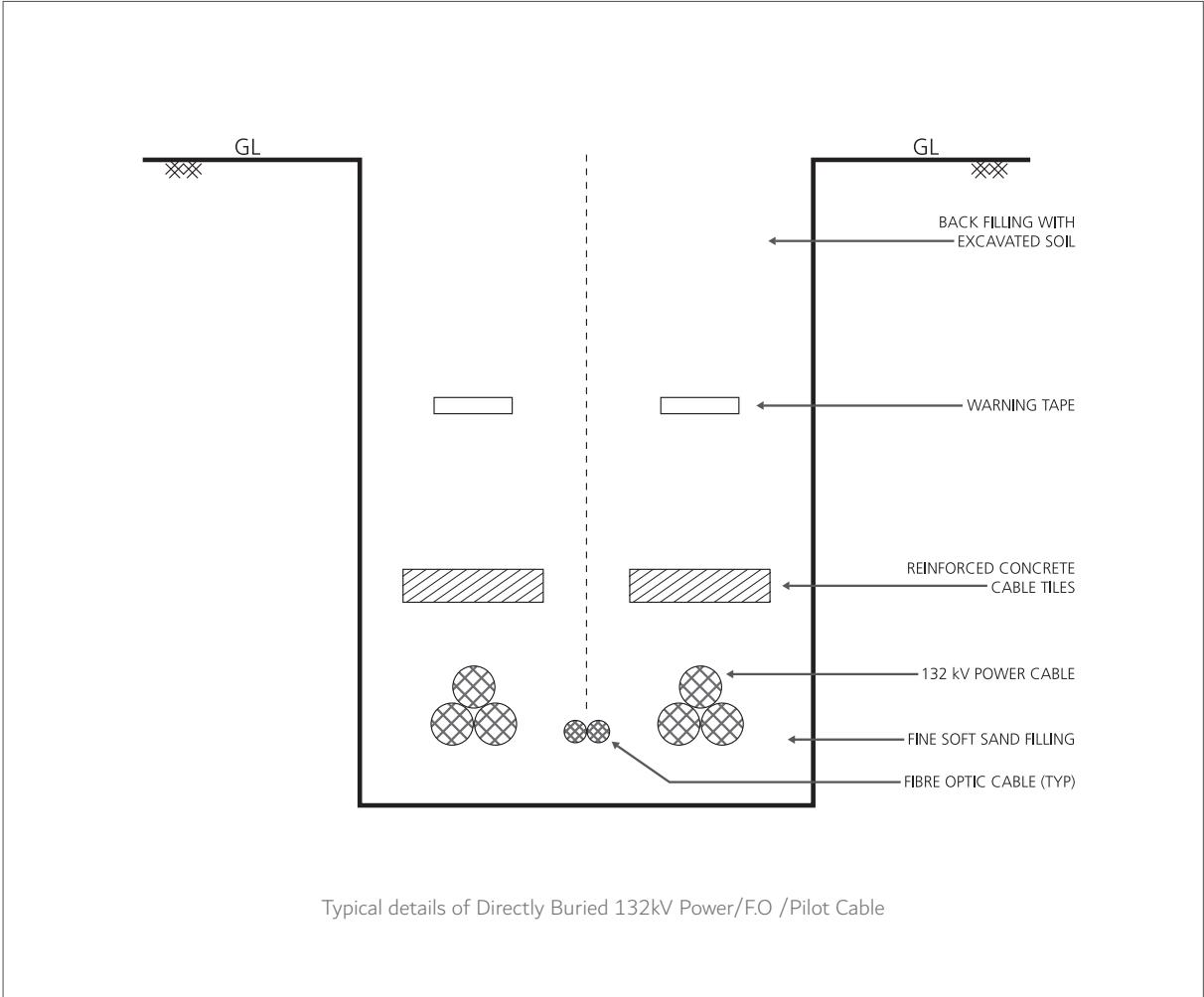


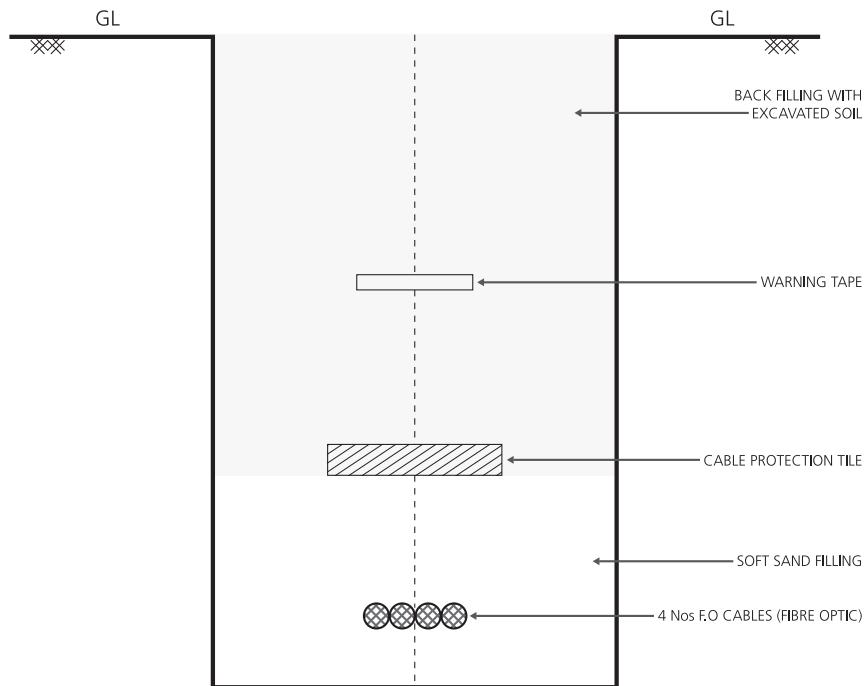
e. 132kV Power and FO cables laid in PVC ducts with surrounding concrete duct banks



TRANSMISSION LINES & ACCESSORIES

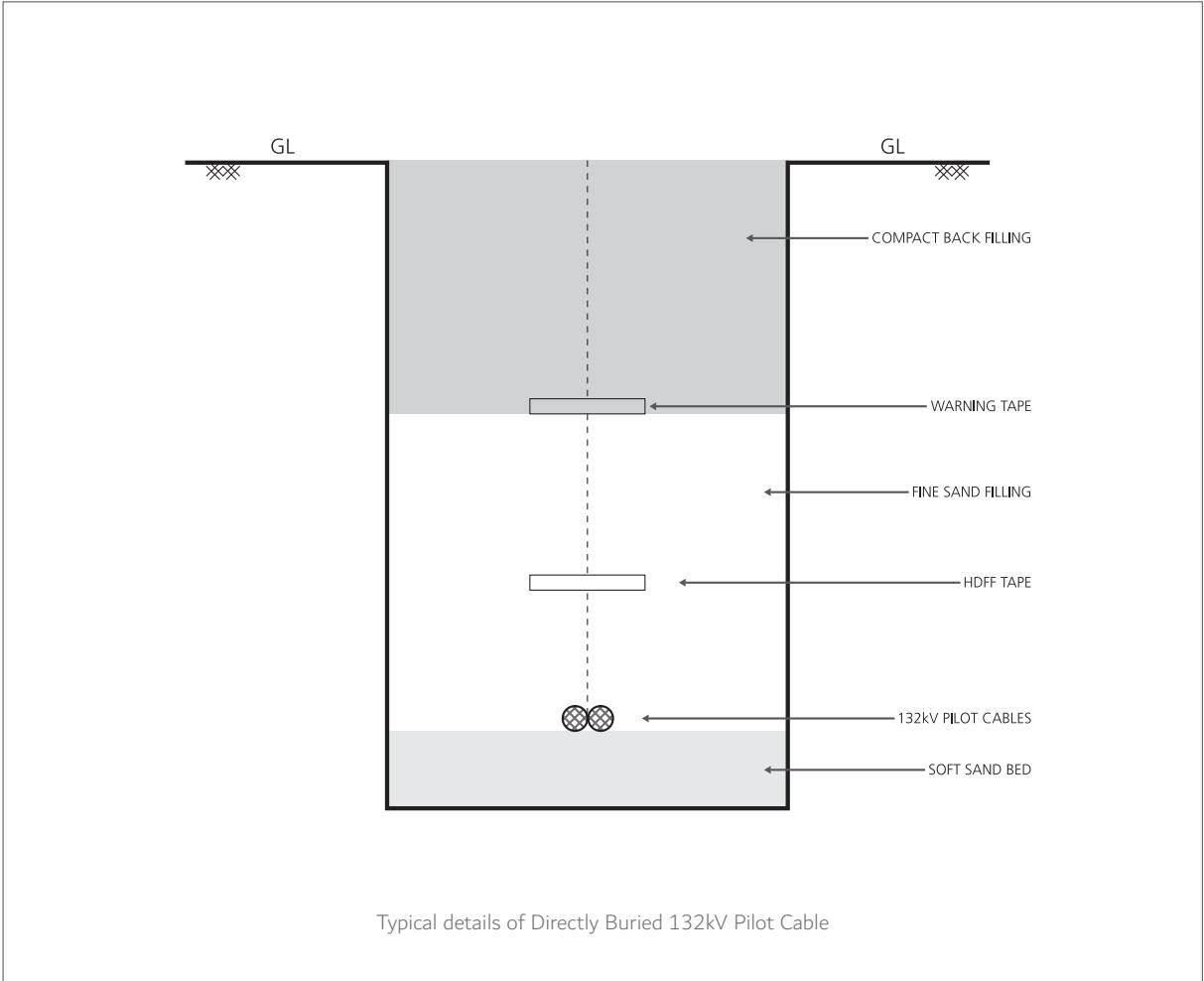
f. 132kV Power, Pilot and FO cables laid in directly buried conditions





Typical details of Directly Buried 132kV F.O. Cable

TRANSMISSION LINES & ACCESSORIES



1.4 Accessories

A. Cable Accessories

1.4.1 Cable Joints

Cable joints are integral parts of the Transmission underground lines system as a whole.

Note: A joint is a sensitive point in transmission cable systems. Maintaining and properly protecting the joint area ensures the reliability of the power supply.

Normally, a power cable joint is enclosed in 2.4-metre wide concrete troughs. Some joints are enclosed in troughs, with some access via manholes. Joint locations are identified with red and white route markers for all types of installation. (Fig 1.4.1.A)

1.4.2 Earth Link Boxes

This is one of the accessories for the transmission system used to easily test cable sheaths.

1.4.2 Types of installation of link box enclosures

- a. Vertical mounted
- b. Flush mounted (Underground)

1.4.3 Cable Route Marker (Power, Fiber Optic, or Pilot Cables)

- a. This is used for cable route identification and helps to indicate the presence of transmission cables. There are two types of route markers:

1. Surface or pole mounted (Figure: 1.4.6)
2. Flush mounted (Figure: 1.4.7)

- b. Install surface or pole route markers for direct buried or cable troughs under any un-paved area.
- c. Install concrete flush cable route markers for direct buried or cable troughs such as under any paved areas, roadways, and parking, with suitable markings for straight and angle runs and cable joints.
- d. Install all types of route markers at 50-metre intervals for straight routes.

1.4.1 A 132kV Cable joint location



Location of 132kV cable Joint bay installation with identification route marker

TRANSMISSION LINES & ACCESSORIES

1.4.4 Vertical mounted link box with steel bollard protection



1.4.5 Vertical mounted link box with steel crash barrier protection on the side of a road.



1.4.5A Flush type Link box



1.4.6 Surface-pole-type route markers installed at 50-metre intervals.



1.4.7 Flush type route markers on paved areas



B. Overhead Line Accessories

1.4.8 Permanent-height-limit gantry at road crossing



1.4.9 Permanent height-limit gantry at a road crossing



TRANSMISSION LINES & ACCESSORIES

1.4.10 Installation of signboards prohibiting activities in overhead line corridors



1.4.11 Contractors doing excavation work must not disturb or damage earthing systems within a 5-metre vicinity of tower leg foundations.

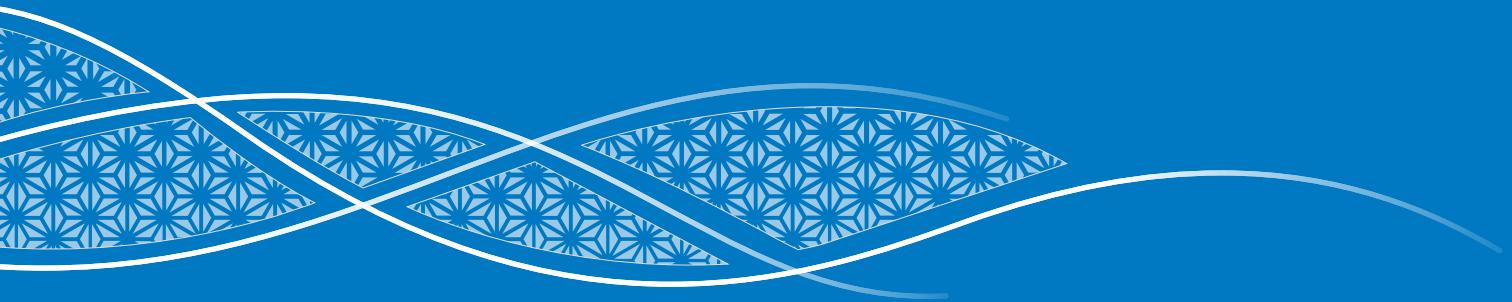
What's next?

In the next chapter, we cover the different hazards that affect transmission line and the precautionary measures to mitigate them.

The assessment and hazard risks are a pre-requisite for any working party to take into consideration when planning any work affecting transmission lines.

CHAPTER 2

HAZARDOUS FACTORS WHILE WORKING NEAR TRANSMISSION LINES



HAZARDOUS FACTORS WHILE WORKING NEAR TRANSMISSION LINES

These are the most common hazards that cause damage to EHV transmission lines due to unsafe construction activities:

2.1 Serious Hazards

- a) Works within and around Transmission lines without obtaining NOC or obtaining DEWA TLM-LP work clearance, or violations of NOC condition and method statements.
- b) Works without verification or identification of underground cables.
- c) Works without verification or checking clearance of overhead lines
- d) Usage of machinery for excavation over or in close vicinity of Transmission lines



2.2 Hazard Levels

Sl.No.	Hazards	Hazard level
a	Works within and around Transmission lines-without prior notification of or obtaining NOCs, without work permission from patrolling teams, violation of NOC conditions and Method statements	High
b	Work without verification or confirmation of the underground cables.	High
c	Work without verification or checking clearance of over headlines	High
d	Use excavation machinery on or near transmission lines	High

HAZARDOUS FACTORS WHILE WORKING NEAR TRANSMISSION LINES

2.3 Precautionary measures to eliminate hazards

Sl.No.	Precautionary measures	Hazard level
a	DEWA allows contractors to work within and around transmission lines: <ul style="list-style-type: none">- with prior notification,- valid NOC,- work-permission clearance from respective patrolling teams- following all NOC conditions or method statement	Low
b	All underground cables are identified and protected in work areas	Low
c	OHL clearance confirmed and height-limited gantry provided to work under OHL	Low
d	Based on the NOC, contractors should ensure that only manual excavations are done on or near transmission lines. Contractors must receive separate approval to work with machinery if the approved construction NOC doesn't mention any of the required details, cross sections, or clearances.	Low

Site photos –Precautionary measures

Identification & Barricading



Manual excavation



Clearance confirmed & Height limit gantry provided



HAZARDOUS FACTORS WHILE WORKING NEAR TRANSMISSION LINES

What's next?

In the next chapter, we outline different types of useful NOCs for site and project works.

We'll also explain the requirements for the processes for trial pit- and OHL-verification. We'll also cover their purpose and guidelines that need to be followed until the process is completed.

These details are vital and the first step towards receiving the construction NOC for the works.

It also covers the verification stage before issuing a NOC, which is a very important precautionary measure for eliminating hazardous factors. This includes the study and mitigation of the risks involved when executing any work in a safe manner on or near the vicinity of transmission lines.

CHAPTER 3

NOCs & GUIDELINES ON TRIAL PIT & OHL VERIFICATION



NOCs & GUIDELINES ON TRIAL PIT & OHL VERIFICATION

3.1 About NOCs

3.1.1 Definitions

The No Objection Certificate is abbreviated as a NOC and is defined as written permission issued by the Infrastructure Information and Permit and connection services departments at DEWA to any requesting party to carry out proposed construction activities as outlined in the submitted and approved drawings and documents.

3.1.2 Purpose

Issuance of NOC prior to construction works provides the first line of protection to all existing DEWA's assets from proposed construction, as it contains sets of regulatory requirements, protective rules, precautionary measures, and engineering construction standards that require clear understanding by all constructors and that they must adhere to the NOC's terms and conditions.

3.1.3 Scope

The extent of application of approved NOC are those areas within or in close proximity to the transmission line networks (400/132kV Overhead Line and underground cables)

3.2 Different NOCs

3.2.1 Design NOC

Design NOC is a permission given to consultants and organisations' utility departments to proceed with their proposed project. Their Tender Design Drawings

outline the approximate locations and clearance of all the existing transmission underground cables and overhead lines.

3.2.2 Trial Pit NOC

A trial Pit NOC is permission given to the contractor to proceed digging-in the number of Trial Pits based on the proposed scope of work limit outlined on the site as directed by DEWA's patrolling staff.

A. Purpose of Trial Pits

Digging trial pits is the best way of confirming the real identification and exact location of DEWA's existing assets in relation to the proposed construction work. These are the main parameters used in the evaluation and approval of the subsequent Construction NOC. However, GIS and As-built drawings can also be referred to, in most cases, depending on site conditions.

B. Requirements for Trial Pit Preparation

- a. Contractors should only dig trial pits under the supervision of DEWA's representatives: the TLM Patrolling staff. According to the scope of work, the supervisor will mark the trial pit location.
- b. The mandatory supervision specified in the previous point must be requested using DEWA work intimation request format and sending an e-mail to DEWA, at least 2 working days before starting any digging activities. (Annex 3.1.1)

- c. Trial Pit is a trench made across and over the suspected location of underground cable, trough, joint, etc. (Figure: 3.1.2)
- d. Trial pits should only be dug or to be carried manually by hand to ensure that the buried cables at unconfirmed location may not be damaged. (Figure: 3.1.3)

Annexure 3.1.1 Work Intimation request

 			
WORK INTIMATION REQUEST			
<input type="checkbox"/> Trial Pit Work Start Notification	<input type="checkbox"/> Construction Work Start Notification	<input type="checkbox"/> Trial Pit Verification	<input type="checkbox"/> Site Work Supervision
<input checked="" type="checkbox"/> TRANSMISSION POWER (132/400 KV) Attn: TRANSMISSION LINE PATROLLING & NOC, DEWA <input type="checkbox"/> CABLE ROUTE <input type="checkbox"/> DHL Email: tln.supervision@dewa.gov.ae Fax: 04-3229095			
<input type="checkbox"/> DISTRIBUTION POWER (6.6/11/33 KV) Attn: SR. MANAGER- DISTRIBUTION MAINTENANCE- DUBAI, DEWA <input type="checkbox"/> CABLE ROUTE <input type="checkbox"/> DHL Email for cable: dp.muz@dewa.gov.ae Fax:			
<input type="checkbox"/> WATER SERVICES Attn: SR. MANAGER- WATER MAINTENANCE DEPT., DEWA <input type="checkbox"/> ENGINEERING (WATER) <input type="checkbox"/> NOC SECTION Email: pow.noc@dewa.gov.ae Fax: 04-3220980			
Request Date			
Project No. & Title / Name			
Description of the work			
Consultant Name :		RC Name:	
Tel :		Mob No:	
Fax :		Email ID:	
Contractor Name :		Project Manager Name:	
Tel :		Mob No:	
Fax :		Email ID:	
DEWA NOC No. & Issue date (Copy to be attached)			
Location of work with nearest landmark			
Work Location Coordinate			
Length of work under this permit (Max. 1000 m)			No. of Trial pits to be verified at site
Requested Period for this Intimation (Work shall be done during DEWA office hours only)		Start Date & Time (*)	End Date & Time
Confirmation Checklist (To be filled and signed by consultant/client for work start notification)		Confirmation Checklist (To be filled and signed by consultant/client for work start notification)	
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
All DEWA services located in the working location		Exposed services (if any) protected and supported as per approved DEWA specification	
Ensure no material stored above DEWA services/corridor		Working area barricaded at site & Safety	
DEWA NOC, GIS drawing & TP Verification at site		No. of pipeline & size in the working area	Trans. Dist.
DEWA sign board/ markers placed at site & protected		No. of cables/ route in the working area (400/132/ 6.6/ 11/ 33 KV)	40 0 132 6.6 11 33
Water Valve chamber/ Surface box at site (Exposed)			
Remarks (if any):			
Hereby I assure that all the above mentioned details are checked and verified with my sole knowledge. Moreover I confirm that the excavation work near to DEWA services will be done manually by hand shovel only. This permit is requested for the area marked in the drawing No.		Contractor site In-charge Details Name of the Engineer : Mobile No. : Name of the Foreman : Mobile No. : (Note : Either Engineer or Foreman must available at site)	
Consultant/Client	Signature		
Note 1. Work Intimation request should be forwarded to the concerned department below working days in advance. 2. (*) Date and time will be confirmed by the concerned department for trial pit verification and site work supervision. 3. If requested period is beyond office hours, justification to be attached along with request for approval.			
Site communication channel for confirmation			
Transmission Power	Trial pit verification	04-3229819 / 04-3227925	Site work supervision 04-3221547 / 04-3227929
Distribution Power	Trial pit verification	04-3227494/050 6457594	Site work supervision Cable: 04-3227496/04-3227410 OHL: 04-3227511 / 04-3227540
Water	Trial pit verification	04-3475607/04-3220408/04-3220786	
22-05-2019		Ver.8	

NOCs & GUIDELINES ON TRIAL PIT & OHL VERIFICATION



Fig 3.1.2 Locating 132kV cable through Trial Pit.



Locating the service by referring the NOC

Fig 3.1.3 Manual excavation for Trial Pit.



Manual excavation for trial pit to trace the service

C. Trial Pit Verification

After exposing all existing cables, troughs, and joints, DEWA's representative (TLP – supervisor) needs to confirm the exact location of the cables, depth, coordinates and clearance (vertical/horizontal) and whether it is the same as incorporated in the proposed scope of the work limit drawings. The same supervisor should sign and stamp the confirmation.

Contractors should submit the verified trial pit details to DEWA with their application for the construction NOC.

Special Cases:

1. If the 132kV cable cannot be found (HDD area), DEWA's supervisor will write in the verification, that

the cable has not been found at the expected depth.

2. Additionally, DEWA can provide the coordinates from the As Built drawings for trial pits, if required.
3. As a final resort, the sensor method can be used for identification of 132kV cables.

Fig 3.1.4 Trail pit verification.



NOCs & GUIDELINES ON TRIAL PIT & OHL VERIFICATION

D. OHL Clearance verification

The OHL Clearance verification confirms the horizontal and vertical clearance details shown in the proposed scope of work. This shows maximum height, radial clearance and how close contractors can work near and under OHLs. This will be verified and signed by the TLP supervisor.

Contractors should submit this to DEWA with their application for the construction NOC.

D. Guidelines on drawing preparation: (for Verification by DEWA TLM-LP supervisor)

Contractors should prepare the trial pit drawing details in A1 size sheet, showing the following:

Before trial pits:

1. Contractors, when superimposing of DEWA GIS in their proposed drawings, should use one colour to show the proposed works and a different colour to show the 400/132kV lines.
2. Colour drawings should be made available at site for verification.
3. The DEWA supervisor will review the drawing and mark the trial pits' locations on the drawing and also mark them at the actual site.

After trial pit & during verification:

1. Trial pit numbers (TP1, 2, etc.) with coordinates of TP locations to be marked in the proposed scope of work drawings.
2. Contractor will show all the coordinates of identified service, in the drawing for example:
 - a. For 132kV trough – provide coordinates for the 2 edges of the trough
 - b. For Joint bay - provide coordinates for the 4 corners of the bay
 - c. For HDD entry and exit pit matching points - provide the entry and exit coordinates respectively
 - d. Coordinates of Link box area
 - e. Tower foundation coordinates

Cross section drawing:

Parallel & vertical clearance from proposed scope of work to 400/132kV lines, should be provided as a separate drawing.

Note: Any additional details (including sub-contractor details) requested by the DEWA supervisor should be included; based on site conditions.

F. Trial pit requirements (as per below table):

Sl.No.	Cable	Horizontal clearance from excavation edge of proposed works	Trial pits intervals are required at
1	Direct buried cables/HDD	Less than 2 metre	Min 10 metres
		Greater than 2 metre	Min 20 metres
2	Trough/duct bank	Less than 2 metre	Min 30 metres
		Greater than 2 metre	Min 50 metres
3	400kV Tunnel	Trial pit is required at min 30-metre intervals	
4	For cable route bending, joint bay/HDD& complex areas, trial pits will be advised as per site situation.		

3.2.3 Construction NOC

The Construction NOC allows contractors to do the construction they have requested.

3.2.3A Design and Build - Building permits system(BPS)

After obtaining a Design and Build - Building permits system(BPS) from RTA, Contractors should complete

DEWA Trial pit verification and obtain DEWA shop drawing approval, as mentioned in the Design & build NOC conditions when working close to 132kV cables. The scope and design for this NOC category includes fencing, site office, project signboard, temporary access, external paving and shoring work. After receiving the NOC, contractors must notify DEWA's TLM department, prior to start of work at the site.

NOCs & GUIDELINES ON TRIAL PIT & OHL VERIFICATION

3.2.3B RTA auto-approved NOC

The RTA issues this type of NOC for electricity and water connections for houses. Contractors should notify DEWA that they have received this NOC, and intend to start works at the site.

3.2.4 Revalidation or Renewal of Expired Construction NOC

This NOC is valid for 6 months only and should be revalidated 15 days before its expiry date.

Remember, it is easier to request that the NOC be revalidated than go through the complete procedure all over again.

3.3 Information

To make a successful submission of NOC applications, refer NOC Submission guideline from DEWA II&P Dept. Please visit website - <https://www.dewa.gov.ae/en/builder/useful-tools/user-manual> for the below:

1. Infrastructure NOC User Manual
2. Infrastructure NOC Submission Guidelines
3. Technical Services for Infrastructure Projects Submission Guidelines
4. Technical Services for Infrastructure Projects User Manual

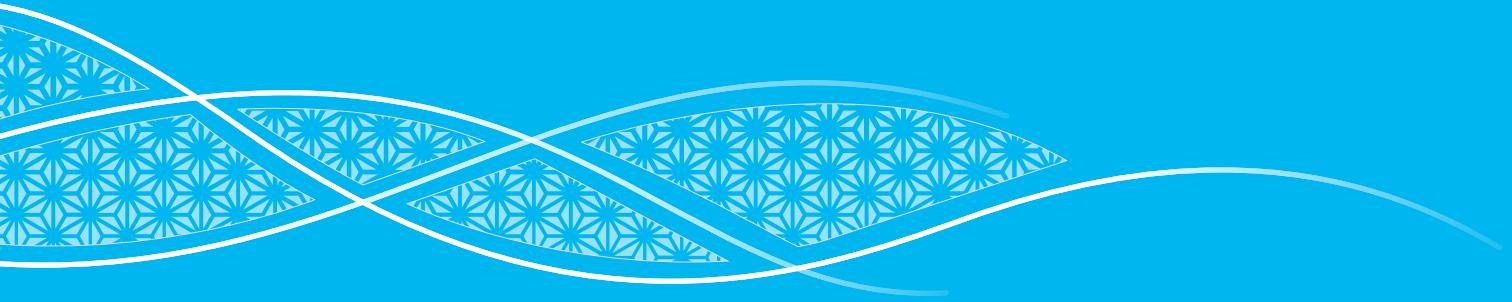
What's next?

Once you've received your NOC, you need to know what to do next to conform with its requirements. This next chapter covers these requirements to avoid any violations.

This is to ensure the best possible health and safety for everyone on site, and minimise and mitigate any hazards or risks within or near DEWA's transmission lines.

CHAPTER 4

REQUIREMENTS BEFORE & DURING WORK NEAR TRANSMISSION LINES



REQUIREMENTS BEFORE & DURING WORK NEAR TRANSMISSION LINES

4.1 Work start notification

Information to DEWA TLM-LP: Every working party or contractor must notify DEWA TLM-LP, at least 2 working days prior to starting work.

This rule is applicable for each and every NOC received from DEWA.

The working parties should notify the TLM Patrolling section, with the format Work intimation request shown in page 29.

Actions from TLM-LP:

The DEWA Patrolling Zone Engineer will assign a Critical Works Supervisor, to guide or to check the site and advise on implementation of the requirements that need to be completed before starting work, such as signs, barricades and safety notices.

4.2 Essential measures required before starting work

A. Cable & OHL identification

Underground cable identification:

After receiving the NOC and before starting work, contractors should physically identify the cables based on the DEWA TLM-LP verified trial pits, and confirm their coordinates. For further details can see the approved NOC issued by DEWA.

DEWA supervisors can recommend additional trial pits if required. Once contractors have done this, they should mark the coordinates of the trial pits and include the following details:

- Trough edge coordinates of underground cables
- Types of cable,
- Parallel/Crossing works (above/below),
- Work clearance,
- Work limit start/End coordinates &
- Proposed work details.

These details should be included in the Danger signpost shown on page 38.

OHL identification:

The NOC's issued for the works affecting Overhead lines contain the verified and approved vertical and horizontal distances between DEWA assets and the scope of work. These are to be included in all signs at the site.

B. Barricading & installation of signboards and height limit gantries:

Underground cables:

Proper barricading with mesh, safety cones, warning tape and barriers are required. Any plastic barriers must be filled with water. Concrete barriers can be used where applicable.

Danger signposts are to be installed at regular intervals along the affected cable routes, and should be clearly

understood by everyone working there. Vehicles and Machinery are not allowed near the barricaded cable route area. Signs will identify the work boundaries as defined by the NOC.

Overhead lines

In case of machinery works, the approved vertical and radial distances mentioned in the signposts must be included on the height limit gantries and clearly displayed for everyone present.

DEWA corridor access or access roads should only be used if approved in the NOC. All vehicle and machinery movement should be confined and barricaded to limit access to the work site. Please request a TLM-LP supervisor to be present when doing this. Signs will identify the work boundaries as defined by the NOC.

C. NOC availability

All working parties should make copies of the NOC and the TP verification drawings, route, cross section, method statement, sub-contractor approvals and make them available on site.

This will enable the contractor to refer to and complete the work and enable DEWA staff to permit work, as per the NOC.

Protective regulations, NOC conditions and work clearances must be strictly implemented at the work site. The DEWA TLM patrolling team will enforce this on a daily basis.

Any intended deviations outside of the issued DEWA NOC should be discussed with the DEWA TLM Patrolling Engineer, or the II&P or TLM-NOC centre. These must be resolved prior to any work being carried out.

D. General Protective Requirements

The below briefly mentioned site issues are important and protection must be provided as mentioned in the NOC conditions:

1. Vehicle/machinery movement

Above cable - Ramp protection as per NOC.

Below OHL - Only below height limit gantry with approved vertical clearance
Direction signage required at site to indicate the access, not affecting cable/OHL.

2. Material storage/soil dumping

As per NOC or designated area

Above Cable - this is not permitted and must not happen near the cable route

Below OHL - Not permitted

Signage is required on site to show the storage area.

3. Flammable/inflammable items

Above/near cable – Not permitted

Inside OHL corridor- Not permitted

Please discuss and get approval for any work procedures and methods of work with the NOC centre before starting work.

REQUIREMENTS BEFORE & DURING WORK NEAR TRANSMISSION LINES

E. Availability of capable staff

Working parties and contractors must ensure that they deputise capable site supervisors, engineers, and safety officers on site, who understand the importance of the work being carried out in the vicinity of the transmission lines.

Working parties and contractors must understand the approved NOC to work near lines, along with the regulations, work clearances, and precautionary measures required while using machinery. They must clearly communicate this to site staff on a daily basis.

Following and abiding by DEWA staff instructions will help protect the transmission lines, and ensure that all the work is completed safely.

4.3 Obtaining work start permission from patrolling team

F. Work start permission

After implementing all precautionary measures before starting the work, the Patrolling Engineer or representative will visit the contractor work site and ensure that these measures have all been undertaken.

G. Confirmation of horizontal & vertical work clearance form Transmission lines

Working parties and contractors need to confirm the

coordinates for all the transmission lines, using GPS or Total Station, and check them with the DEWA patrolling Engineer. They should resolve any deviations noted by the Patrolling Engineer or the II&P & TLM NOC centre.

Separate approvals

Working parties should include all the machinery-related details and requirements in the shop drawings while verifying where all the transmission lines are. This prevents unnecessary delays in completing the work after receiving the NOC.

If a Patrolling Engineer finds that working parties are using machinery on site that wasn't included in the drawings then all work will be stopped. Once the drawings are updated to add the machinery, then the working parties can obtain approval to continue their work.

H. Stand by site supervision

If the patrolling team assesses the work is being of a medium or high risk for transmission lines, then working parties can ask DEWA for a standby on-site supervisor. DEWA will assign the supervisor when the working party sends a request as shown on page 29. The work can only be completed while the supervisor is present.

Once the working party has implemented all the protective regulations mentioned in the NOC, they will be permitted to continue the work.

I. Site Photos

Identifying and installing barricades and signs



Vehicle movement restricted near transmission lines



Temporary height limit gantry installation



Material storage area is identified and marked with signage



Tower foundation protected with concrete barrier



Guidance provided to capable contractors on site



REQUIREMENTS BEFORE & DURING WORK NEAR TRANSMISSION LINES

Danger sign board- format

PROPOSED WORK -		CABLE TYPE (132kV POWER/F.O.C/PILOT)-	
 GOVERNMENT OF DUBAI		 هيئة كهرباء ومياه دبي Dubai Electricity & Water Authority	
		خطر جهد كهربائي عالي	
DANGER HIGH VOLTAGE		خطر جهد كهربائي عالي	
DEWA 400/ 132KV CABLE BELOW		ديوا 400 / 132 ك ف كابل ارضي	
Unauthorised Activities Prohibited		أنشطة غير مصرح بها	
			
No Machine Excavator Above Cable Crossing ممنوع عمل الآليات من غير تصريح من ديوا		No Dumping Above Cable Crossing ممنوع رمي النفايات فوق حرم الكابلات	
		No Parking Above Cable Crossing ممنوع وقوف المركبات فوق حرم الكابلات	
For Further Clarification / Inquiry Please Contact :		لمزيد من الاستفسارات ، الملاحظات يرجى التواصل على :	
CABLE/TROUGH EDGE COORDINATES : E = N =		WORK LIMIT COORDINATE: (START / END) E = N =	
CLEARANCE FROM PROPOSED WORK : mtrs.			
TROUGH DEPTH FROM GROUND LEVEL : mtrs.			

4.3 Information:

Please visit website - <https://www.dewa.gov.ae/en/builder/useful-tools/user-manual> for the Infrastructure NOC Technical manual

This manual has the protective regulations required for implementation prior to work being done by the contractor.

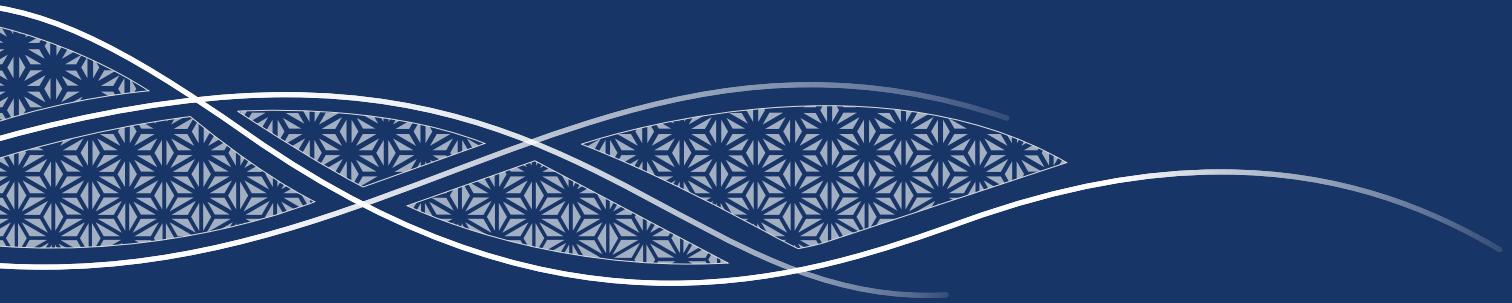
What's next?

In the next chapter, you will learn about the patrolling activities of DEWA's Transmission Line Maintenance department.

This will cover the precautionary measures to monitor and permit safe work near lines, like site instructions, issuing stop notices and conducting meetings on site.

CHAPTER 5

IMPLEMENTATION OF NOC CONDITIONS & PRECAUTIONARY MEASURES



IMPLEMENTATION OF NOC CONDITIONS & PRECAUTIONARY MEASURES

To ensure implementation of all the provisions of Protective Regulations of this Handbook during execution of any activities near or within the vicinity of the existing OHL and UG Cable Corridors.

5.1 Patrolling

Patrolling of all existing OHL and cable routes is carried out in a scheduled frequency to monitor DEWA's Transmission lines network from damages and third party violations by observing, reporting and preventive actions.

5.1.1 Routine Patrolling

DEWA's Transmission network and grids are divided into number of patrolling zones of which each zone should be patrolled twice a day.

5.1.2 Emergency Patrolling

This type of patrolling should be conducted as requested to specific area where damaged or tripping has occurred or where transmission facilities needs special attention or priority actions to minimise or prevent the possibility of damage.

During emergency visits, DEWA Patrollers will advise the working parties to stop work until further notice to identify the cause.

5.1.3 Intensive Patrolling

This type of patrolling is done at the request of the relevant parties, such as DEWA departments, to pay additional attention with extra patrols, to specific circuits to ensure the continued good condition of the remaining cables or lines in the ring network feeder.

5.1.4 Special Patrolling

This type of patrolling is done by request from the relevant parties to pay additional attention (extra patrols) to specific circuits.

This is to ensure the good condition of all the transmission lines or cables supplying substations. Examples include substations that power important occasions or VIP visits.

5.2 Pre-Commission Inspection

This type of inspection is conducted in response to the request for joint inspection of completed project. This will ensure that all installed components of transmission system were installed according to DEWA's standards.

5.3 Contractors' Work Supervision

TLM directly supervises the execution of all construction activities near or in vicinity with line or cable corridor to ensure that such work executions are in accordance with the provisions of NOC and Method statement. The following types of supervision should be scheduled as suitable to the kinds of work requirements. (Please refer Annexure-3.1.1 page 29)

5.3.1 Work Supervision Request

All works near or in vicinity of OHL or UG Cables corridor, if with relevant NOC, should only be executed under direct supervision of TLM's Standby Site Supervisor. The service of Standby Site Supervisor will be obtained based on the following requirements:

- A The work supervision request form should be obtained from TLM patrolling/NOC section of DEWA or from Patrolling staff at site. The DEWA work intimation request form is also on the DEWA website. [https://www.dewa.gov.ae/en/builder/useful Links & guides/forms](https://www.dewa.gov.ae/en/builder/useful%20Links%20&%20guides/forms). Working parties must complete it in full before sending it.

Submission of completed Forms

- B a. The completed forms should be submitted within two (2) working days, before commencement of the proposed works, to TLM Patrolling & NOC section Email: tlm.supervision@dewa.gov.ae .

- b. Alternatively, for priority actions, the contractor should submit the completed form with the required attachment, one day before commencing work, to the office of TLM Patrolling and NOC Section.

5.3.2 Critical Site Supervision

Any work execution near or in vicinity of OHL/UG cables corridor, which likely needs special actions to protect the lines by additional guidance and stringent measures. Where coordination with contractors, consultants or government utility departments are required, this may take more time.

5.4 Site Instruction Notice

During patrolling, the patroller checks the contractor's worksite and if any non-critical violations are found, then a site instruction notice will be issued to contractors for immediate correction. If contractors don't take the necessary steps, the patroller will issue a notice to stop work. (Format attached Figure:5.4)



IMPLEMENTATION OF NOC CONDITIONS & PRECAUTIONARY MEASURES

Figure: 5.4 - Site instruction Note



حكومة دبي
GOVERNMENT OF DUBAI



هيئة كهرباء ومياه دبي
Dubai Electricity & Water Authority

TRANSMISSION LINES MAINTENANCE – PATROLLING & NOC
SITE INSTRUCTION NOTE

Date:

M/s	Engineer/ Foreman	Contact No.	
Construction Work Type		Present Activity	
Affected Circuit		Zone / Location	

Please follow (✓) marked instruction very strictly to avoid work stop notice

1.	Prior intimation to be given DEWA - TLM for works commencement at least 2 working days in advance in the work supervision request format by fax – 04-3229095 or by email – tp.tlm@dewa.gov.ae.	
2.	NOC with approved method of statement. Trial pit verification/OHL clearance details & drawings must be available at work site throughout the project completion.	
3.	NOC is valid for 6 months only & should be reevaluated within 15 days before expiry by submitting the original stamped NOC copy.	
4.	Responsible Engineer/Supervisor should be available at site while working close to Tr. Lines.	
5.	Cross-sectional drawings with horizontal and vertical clearances & method of statement to be approved by TLM/D for cable / OHL crossing works.	
6.	Works should be carried out during DEWA working hours only. Works at night, holidays & beyond office hours are not allowed. Special approval to be obtained for emergency and very urgent works with justification to work beyond working hours.	
7.	Trial holes to be taken to locate existing 400/132KV Cable at proposed work area by hand shovel excavation only.	
8.	Before starting of drilling/boring/shoring/piling work, site location shall be confirmed by GPS coordinates and approved method of statement to be issued by DEWA TLM Supervisor.	
9.	Height limit gantry/Danger sign board/safety & crash barrier to be provided for the Cable/OHL route/tower at working area.	
10.	Existing route markers can be removed only after taking GPS co-ordinates and reinstalled at the same location after the completion of work as per the previously taken GPS co-ordinates. Displaced /damaged/missing route marker/bollard to be re-instated at the previous location as per the GPS coordinates.	
11.	New 400 / 132 KV Cable and OHL circuit is energized in the working area and shall obtain separate NOC from TLM for remaining works showing the newly energized Cable/OHL circuits.	
12.	Parking of Vehicle/Heavy machinery movement, excavated soil dumping, material storage should not be carried out over the Cable route, Joint & Link box Location/under OHL.	
13.	Existing cables coming under the proposed road crossings shall be provided with suitable protection along with spare ducts (if existing available then to be extended).	
14.	Steel sheet piling/shoring with dewatering arrangement should be provided for the deep excavation works in the close proximity of the Transmission lines after the approval of location and method of statement.	
15.	Separate NOC to be obtained for the utility services/street lighting, signal, plantation works, dewatering works and other works which are not included in the issued NOC.	
16.	Adequate manpower to be arranged while working near to the 400/132KV Cable/OHL network.	
17.	The undersigned (contractor/utility depts. representative) is agreed to follow all the above-ticked instructions and any failure will cause DEWA to issue Stop Work Notice. And necessary action shall be taken as per Law 06/15.	

Any other comments:

.....

.....

ISSUED TO (CONTRACTOR STAFF)	ISSUED BY (DEWA SUPERVISOR)	DEWA ENGINEER
Name:	Name:	Name:
Signature:	Signature:	Signature:

Contact Details: 04-3221546/04-3221500 Email: tp.tlm@dewa.gov.ae

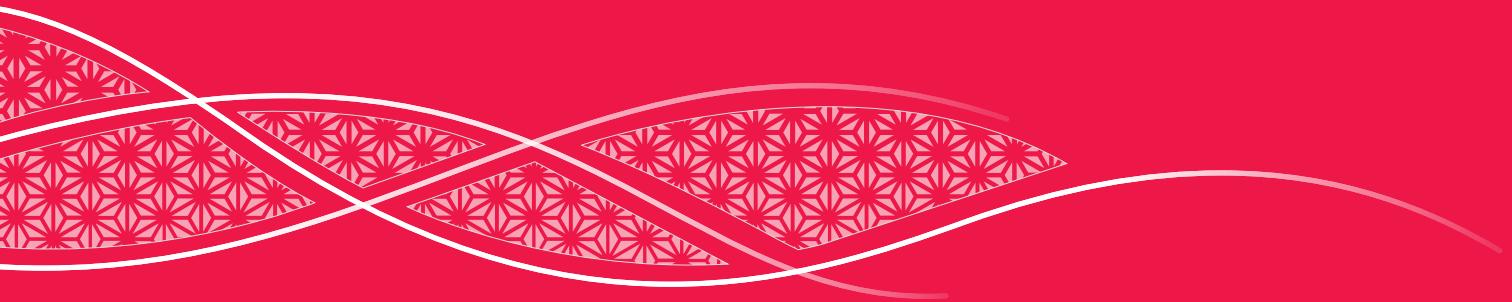
Dubai Electricity & Water Authority هيئة كهرباء ومياه دبي

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CHAPTER 6

ACTIONS AGAINST VIOLATORS



ACTIONS AGAINST VIOLATORS

6.1 Legal Requirements

Legal action and penalty shall be imposed to the violators as per Law no. (6) of 2015..

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

6.2 Black Points System

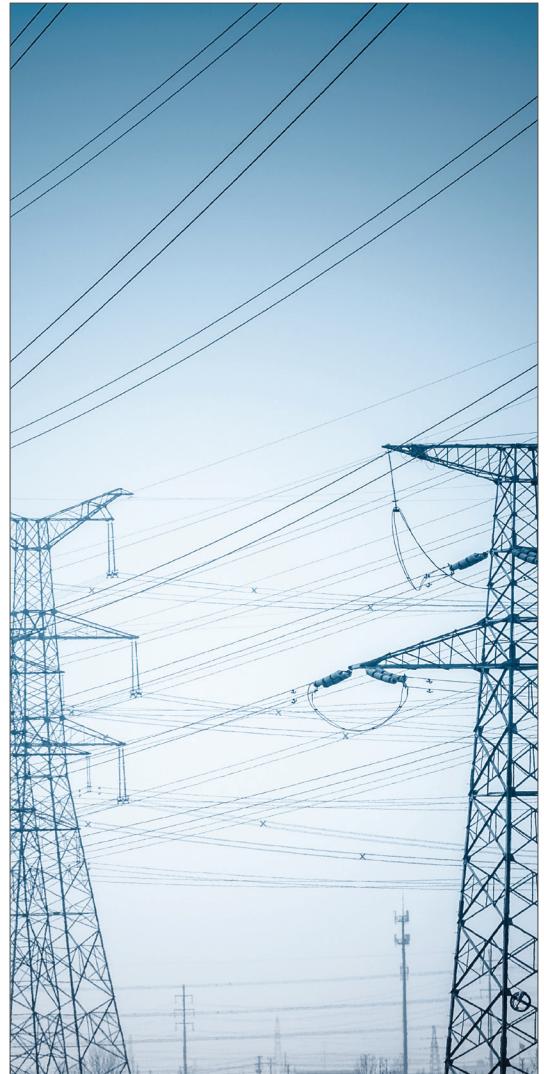
A System Implemented by DEWA as a Preventive measure to monitor and control the contractors, from performing violations of issued NOCs and its conditions at site, which will lead to damage of the DEWA's Transmission lines network.

Categories and Actions

6.2.1.1 Action against violators who fall under Category A:

If contractor performs violation at site repeatedly and accumulates for example 18 black points (within a period of one year), as per the violations of NOC conditions and protective regulations, the following action shall be taken as mentioned below,

- A1. Contractor works at violated locations will be stopped.
- A2. Inform other Dubai Government authorities and DEWA departments about the Contractor's violation and request measures against them.
- A3. Meeting with clients (DEWA or Private), Contractors & Consultants and list the necessary steps to prevent repeats of these violations.
- A4. Action Plan for safe construction work in close vicinity of 400/132 kV OHL/ Cable should be prepared by the contractor or consultant, and Dubai Government authorities and DEWA departments and will submit them to TMD/TLM for review and approval.
- A5. Warning to be issued to Site In charge.



ACTIONS AGAINST VIOLATORS

6.2.1.2 Action against violators who fall under category B:

If accumulation of black points reaches 35 or damage of 400/132kV transmission lines without tripping (within a period of one year), the following action shall be taken as mentioned below,

- B1. All works of the particular project will be stopped.
- B2. All issued NOC's will be suspended for the particular project until fulfilling the requirements specified in B5.
- B3. Inform the utility and DEWA depts. about the Contractor's violation and request for their action against the violated contractor.
- B4. Meeting with clients (DEWA or Private), Contractors & Consultants to list actions to avoid repeating of violations.
- B5. Replace the Project Engineer, Safety Engineer, and Site Supervisor of the project. CV's of the newly appointed staffs will be submitted to TMD/TLM for review/approval.
- B6. Action Plan for safe construction work in close vicinity of 400/132 kV OHL/Cable should be prepared by the Contractor/Consultant, and Utility/DEWA Dept. and submit to TMD/TLM for review/approval to avoid repetition of violation /damage.

6.2.1.3 Action against violators who fall under category C:

If damage of 400/132kV Cable/OHL occurs with tripping and accumulation of black points reaches 48

(within a period of one year), following action shall be taken as mentioned below,

- C1. All works of the particular project will be stopped.
- C2. All issued NOC's will be cancelled for the particular project.
- C3. Stop issuing new NOC's for the period of 3 months to the involved Contractor.
- C4. Inform the utility and DEWA depts. about the Contractor's violation and request for their action against the violated Contractor.
- C5. Meeting with clients (DEWA or Private), Contractors & Consultants to list actions to avoid repeating of violations.
- C6. For resumption of work, either new Contractor/DEWA approved Contractors to be appointed or Replace the Project Manager, Project Engineer, Safety Engineer, and Site Supervisor of the project. CV's of the newly appointed staffs will be submitted to TMD/TLM for review/approval.
- C7. Action Plan for safe construction work in close vicinity of 400/132 kV OHL/ Cable should be prepared by the Contractor/Consultant, and Utility/DEWA Dept. and will submit to TMD/TLM for review/approval. Also New NOC application for the particular project shall be applied through proper channel.

Furthermore works can be resumed, subject to fulfilling above mentioned requirements and agreements as per respective categories.

CHAPTER 7

SERVICES PROVIDED BY TLM



SERVICES PROVIDED BY TLM

7.1 Trial pit/OHL Verification & Supervision

To verify the clearance and geographic details of the transmission lines (Cable and OHL) and accessories from the proposed scope of works for NOC applications, Transmission Line Maintenance-Patrolling section provides the following services to customers, including contractors, consultants and other utilities, in Dubai.

7.1.1 Prior Notice, Supervision for trial pit work and verification for the trial pit.

The DEWA work intimation request format should be filled in and sent to DEWA-TLM, at least 2 working days in advance by

- a) Applying directly to DEWA TLM – TLP office, 2nd Floor, DEWA Warsan Complex, Warsan (During DEWA office hours 7:30am to 2:30pm) (During DEWA office hours 7:30am to 2:30pm)
- b) by email tlm.supervision@dewa.gov.ae with sample attached in page 29.

7.1.2 Getting confirmation

Contractors sending an email to request a DEWA Supervisor will get an automatic reply with the Engineer's name and contact details. Contractors can call TLM-LP to follow up on 04 322 1547 or 04 322 7929.

7.1.3 Work Hours

Works should be carried out during DEWA working hours only. Special approval to be obtained for emergency and

very urgent works with justification to work beyond working hours.

7.2 Construction Work Supervision

To provide supervisor during the construction activities in the vicinity of 400/132kV Cable/OHL or inside DEWA Corridor.

7.2.1 Prior notice, supervision for OHL and cable line protection works

DEWA Work supervision request format duly filled to be sent to DEWA-TLM, 02 working days advance by

- a) applying directly to DEWA TLM – TLP office, 2nd Floor, DEWA Warsan Complex, Warsan (During DEWA office hours 7:30am to 2:30pm) (During DEWA office hours 7:30am to 2:30pm)
- b) by email tlm.supervision@dewa.gov.ae with samples attached in page 29.

7.2.2 Getting confirmation

Contractors sending an email to request a DEWA Supervisor will get an automatic reply with the Engineer's name and contact details. Contractors can call TLM-LP to follow up on 04 322 1547 or 04 322 7929.

7.2.3 Work Hours

Works should be carried out during DEWA working hours only. Special approval to be obtained for emergency and

very urgent works with justification to work beyond working hours. For clarification and follow up in English or Arabic, you can contact us on the following telephone numbers: 04 322 1547 or 04 322 7929 for English, 04 322 1499 or 04 322 1500 for Arabic.

7.2.4 Emergency Utility repairs

In case of emergency utility repairs, working parties and contractors should contact our Patrolling Engineers or call 04 322 1547 or 04 322 7929.

The Patrolling Engineer or team will assess the risks to the transmission lines and advise the working party to implement precautionary measures at the site, prior to the repairs.

7.2.5 Awareness/training sessions

Awareness/training sessions are available for contractor's staff to improve and certify their safety skills to work in the vicinity of 400/132kV transmission lines.

In this HandBook, the following items are explained in different chapters, on how to safely execute works & protect existing 400/132kV Transmission Lines network

1. Transmission Lines and Accessories
2. Hazardous factors while working near Transmission Lines
3. NOC's & guidelines on Trial pit/OHL verification
4. Requirements-before and during work near transmission lines

5. Implementation of NOC conditions and precautionary measures
6. Actions against violators.

All of this will help contractors, consultants, utility departments and private parties with their NOC applications, along with the proper method statement and doing safe construction work in and around the transmission lines.

Everyone involved will get general or technical knowledge about the transmission lines and safety precautionary measures to avoid unwanted damage.

All are welcome for queries, clarifications and suggestions if any.

We trust that all contractor, consultant, utility departments and private parties will follow DEWA protective rules and regulations, and cooperate to achieve Dubai Government's mission to provide uninterrupted electricity supply in Dubai.

List of Abbreviations

Approx Approximate

CS Connection Services

DM Dubai Municipality

DUSUP Dubai Supply Authority

EHV Extra High Voltage

EXTG Existing

FO Fibre Optic

FIG Figure

FRL Finished Road Level

GIS Geographical Information System

GPS Global Positioning System

HDD Horizontal Directional Drilling

II&P Infrastructure Information & Permits

kV Kilo Volt

M Meter

MM Millimeter

MTR meter

NDRC Non Disruptive Road Crossing

NOC No Objection Certificate

OHL Overhead Line

OPGW Optical Ground Wire

RCC Reinforced Cement Concrete

ROW Right Of Way

RTA Road and Transport Authority

TBT Tool Box Talk

TLM - LP Transmission Lines Maintenance -
Lines Patrolling

TMD Transmission Maintenance Dept

TP Trial Pit

UG Underground

XLPE Cross Link Poly Ethylene

Contact Us

For any clarification related to any information mentioned in the Handbook, please send your queries to:

Tel : [04 3227922](tel:043227922)/[04 3221542](tel:043221542)

Email : tlm.supervision@dewa.gov.ae

Website : www.dewa.gov.ae



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