STANDARD OPERATING PROCEDURE (SOP)

CABLE MANAGEMENT

Prepared by	Reviewed and verified by	Authorized by
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Document Change Note

Rev. No	Rev. Date	Comments / Changes
00	20-01-2023	New Issue

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1. PURPOSE

The purpose of this document is to establish the requirements and standards for the implementation and compliance to the applicable Site Cable Management to ensure that all cables at site are routed in organized manner and to prevent any electrical incident inside AMNS Project Site.

When cables lay exposed on floors or crammed underneath workspaces, they are at risk of being **pinched, frayed, stepped on, tripped over and tangled with other cables**. These issues can lead to injury, electrocution, fire, or faulty operation of equipment

2. SCOPE

This procedure shall apply to all AMNS project sites and related work areas including contractors to meet –

- Legal and regulatory requirements
- AMNS HSE requirements
- ISO 45001 and ISO 14001 standard requirements

3. DEFINITIONS

Cable management: It is the organization of power cables, at site / building, connected between electrical distribution boards or between a distribution board and electrical equipment.

4. RESPONSIBILITIES

Project Head

The Project Head is responsible for ensuring that the project is in compliance with the safety requirements stated in this procedure.

It is the responsibility of the Project Head to provide the required resources for cable routing, as mentioned in the procedure.

HSE Manager

Provide advice on this standard, and oversight inspections to verify compliance.

Ensure that the content of this procedure and necessary controls are communicated to all Contractors and carry out periodic inspections to verify compliance.

5. CABLE MANAGEMENT PROCEDURE

Temporary cables are routed in various method in disciplined and systematic way to avoid any damages of the temporary cables inside the AMNS project site. All temporary cables should be routed by the authorized electrician or competent electrical person or Electrical Engineer with the concurrence of AMNS. The following methods are used to route the temporary cables:

- Underground cable routing
- On the ground cable routing
- Above ground cable routing
- Cable routing inside the building
- Cable routing on the scaffolding, structures etc.

5.1 UNDER GROUND CABLE ROUTING

The following requirements need to be fulfilled to route the cables below the ground and to prevent accidental damage during excavation, heavy vehicle movement etc.:

- Prior to lay the cable under the ground, the proposed cable route map shall be discussed with RCM, Electrical responsible person and electrician
- Cable should not be laid wherever excavation, piling or any other earth disturbance activities going to take place near future
- Cable should be laid at least 1000 mm below the ground level
- Bricks to be provided 300mm over cable and area between cable and bricks to be filled with loose sand after laying the cable for easy identification
- Cable route marker / identification marker / signages need to be displayed on the temporary cable routed direction at every 25 mtrs of cable laying.
- Cable marker posts shall be one meter high including 300 mm display board (Refer Pic:01)
- After routing the temporary cable under the ground, the route map should be marked and circulated to AMNS for circulation
- Router map of underground cable should be displayed in the site notice board and issued to PTW issuer
- Cable avoidance tool (CAT) should be used prior to start of excavation.
- AMNS Electrical team of the area where excavation needs to be done must be informed and electrical clearance shall be taken before starting excavation.
- Cable tiles should be provided for long term/ permanent cable laying.

5.2 ON GROUND CABLE ROUTING

The following requirements need to be fulfilled to route the cables on ground:

- The cable shall be routed on ground with a cable identifier placed at, every 10 m distance.
- The height of the cable identifier shall be 1m from ground level.
- The cable identifier shall be painted in bright colour and shall be labeled as "Cable identifier".

- At road crossing, the cable shall be taken through a metal pipe / conduit buried at a depth of at least 200 mm.
- Flexible cable with portable machine will be allowed up to 10mtrs and to be terminated with DC cable glands only.

5.3 OVER HEAD CABLE ROUTING

The following requirements need to be fulfilled to route the cables above the ground and to prevent accidental damage during vehicle movement, shifting of materials etc.:

- Cable should not be routed directly on the ground; it may lead to trip hazard and damage to cables
- All temporary overhead cable should be laid more than 2.4m height
- Ensure the cable are not exposed to physical damage
- Ensure the cables are not exposed to fire hazard
- Don't allow joints in the routed cables (Only industrial socket type can be used)
- Ensure cables exposed to fall hazard are protected
- Cables should be laid on the stand like wooden stand, metallic stand with PVC pipe, wooden poles etc. and cable should not rest on sharp edges and wherever required additional insulation to be provided.
- Overhead cable should not be laid on the access or entrance/exit way
- Overhead cable should not be laid on the vehicle access area
- The sharp corners or projections should be avoided while laying the cable overhead
- Cable can be routed over the walls with the support of insulated projections or fabricated insulated wall hooks

5.4 CABLE ROUTING INSIDE THE BUILDINGS:

The following requirements need to be fulfilled to route the cables inside the buildings and to prevent accidental damage during people movement, shifting of materials etc.:

- Cable should not be routed directly on the ground; it may lead to trip hazard and damage to cables
- All temporary overhead cable should be laid more than 2.4m height
- Cables should be laid on the insulated stand like wooden stand, metallic stand with PVC pipe, PVC hooks, wooden poles etc.
- Overhead cable should not be laid on the access or entrance/ exit way
- The sharp corners or projections should be avoided while laying the cable overhead
- Cable can be routed over the walls with the support of insulated projections or fabricated insulated wall hooks. Cable should not rest on sharp edges and wherever required additional insulation to be provided
- Cable conduit, trunk or trays can be used for temporary routing
- Fabricated wooden supports / stands can be used for routing the temporary cables

- Flexible cables may pass through doorways or other pinch points, proper protection to be provided to prevent damage
- Cables passing through holes shall be protected by bushings or covers etc.
- Cables should not be routed on the wet surface or water stagnated areas
- Temporary cable should be protected from rain water

5.5 CABLE ROUTING ON SCAFFOLDING & STRUCTURES:

The following requirements need to be fulfilled to route the cables on the scaffolding and structural materials to prevent accidental damage:

- "S" hooks should be fabricated with insulated materials or PVC Hooks to easily route on the scaffolding and other metallic structures
- "S" hook should be provided in proper spacing depending upon the size of the cable to avoid sagging
- Ensure the integrity of the "S" hook
- Don't over load on the "S" hook with large quantity of cable; it may lead to sagging and fall of cables
- Extended supports with insulated materials can be used to route the cable for higher elevations
- Don't route the cable directly on the metallic surface like scaffold, structures or rebar etc.
- Roll the excess cable and hang on the rigid insulated hooks
- Don't overload on fabricated insulated hooks
- Don't use binding wire to hang or route the cables instead of using the "S" hooks or cable tie
- Install additional distribution boards to reduce the cables in higher elevations

6. CHECKING, CORRECTIVE AND PREVENTIVE ACTION

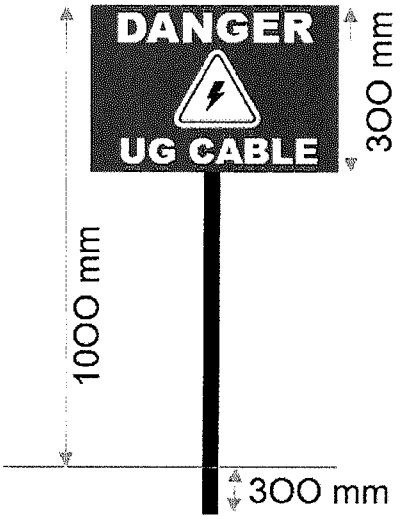
Periodic audits / inspections shall be carried out to assess the compliance to the procedure and effectiveness of the controls. Any deviations shall be reported to Project Head & Section Head for corrective/preventive actions if needed.

7. REFERENCE DOCUMENTS

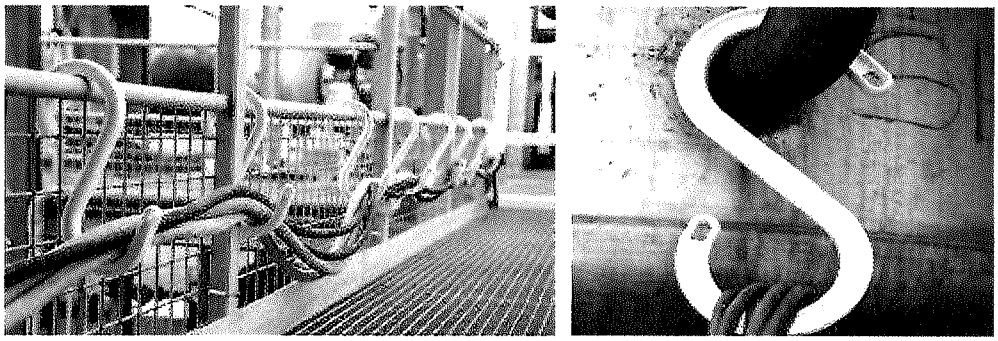
AMNS/Project/TS/HSEM/01	Excavation and piling safety
AMNS/Project/TS/HSEM/06	Electrical Safety
AMNS/Project/TS/HSEM/09	Traffic management

ANNEXURE-1

CABLE MANAMGMENT – SAMPLE PICTURES



Pic-1 – Cable marker / signage



Pic-2 – Cable hooks

Pic-3 – Cable stands