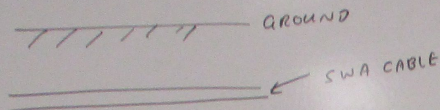
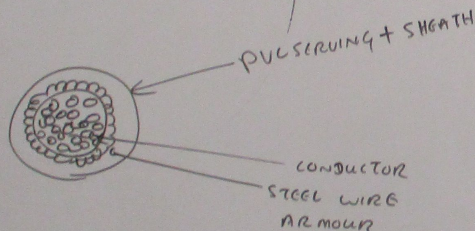


STEEL WIRE ARMoured CABLE



STEEL WIRE ARMoured CABLES (SWA) ARE SOMETIMES USED AS ALTERNATIVES TO WIRING SYSTEMS IN PVC CONDUIT WHERE MECHANICAL PROTECTION IS REQUIRED. THESE METHODS ARE GENERALLY MORE EXPENSIVE THAN TPI CABLES IN CONDUIT BUT THEY ARE GENERALLY QUICKER TO INSTALL.



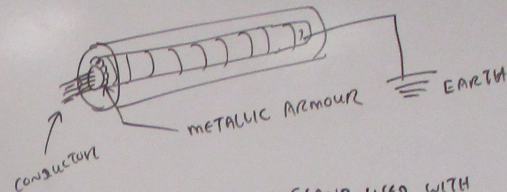
TO CUT STEEL WIRE ARMOUR, HACK SAW IS NEEDED.

TO JOIN STEEL WIRE ARMoured CABLE, CABLE GLAND IS TO BE USED.

ARMoured CABLES HAVE THE ADVANTAGE OF A METALLIC WRAPPING THAT SURROUNDS THE CORE OF THE CABLE WITH THE WRAPPING ITSELF BEING PROTECTED BY A PVC SHEATH.

METALLIC ARMOUR IS MECHANICAL PROTECTION NOT A CONDUCTOR

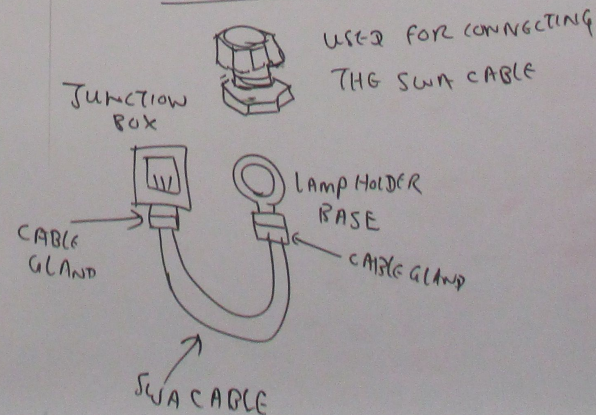
THE ARMOUR CAN BE USED AS EARTHING



THE FITTINGS (OR) CABLE GLAND USED WITH THIS TYPE OF CABLE MUST BE CAPABLE OF MAKING AN OPTIONAL ELECTRICAL CONNECTION TO THE STEEL ARMOUR. SOME GLANDS WILL ALSO MAKE A WEATHER PROOF SEAL WITH THE SHEATH OF THE CABLE.

THE EXTRA PROTECTION OFFERED BY THE STEEL ARMOUR LET THE CABLE TO INSTALL ESPECIALLY IN THE SITUATIONS THAT MIGHT OTHERWISE NEED THE PROTECTION OF CONDUIT.

CABLE GLAND



INTER CONNECTION BETWEEN SWA AND EQUIPMENT

IT INCLUDES THREADS

BRASS GLAND

A2 - UNARMoured CABLE

BW - ARMoured CABLE GLAND

CX - FOR BRAIDED CABLE

CYT - FOR ALL TYPES OF SCREW FLEXIBLE WIRES

CW - STEEL WIRE ARMoured WITH OUT DOOR INSTALL

NICKEL PLATED GLAND

Hummel MS - 1P6B RA WATER PROOF

Hummel EMC - WATER TIGHT APPLICATION

NYLON GLAND

Hummel PA - 1P6B WATER TIGHT

SUPPORT OF SWA CABLE

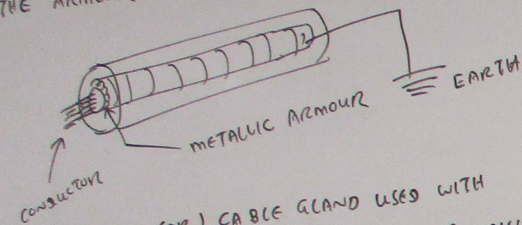
THE CABLES MUST HAVE SUPPORT TO PREVENT WHEN SWA CABLE IS R

THE SUPPORTS NEED TO THAN UNARMoured C

THE ARMoured CABLE

HEAVIER THAN UN

METALLIC ARMOUR IS MECHANICAL PROTECTION
NOT A CONDUCTOR
THE ARMOUR CAN BE USED AS EARTHING

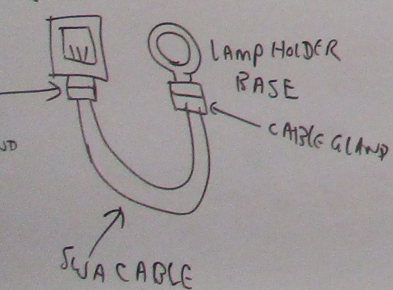


THE FITTINGS (OR) CABLE GLAND USED WITH
THIS TYPE OF CABLE MUST BE CAPABLE OF MAKING
AN OPTIONAL ELECTRICAL CONNECTION TO THE
STEEL ARMOUR. SOME GLANDS WILL ALSO MAKE
A WEATHER PROOF SEAL WITH THE SHEATH
OF THE CABLE.

THE EXTRA PROTECTION OFFERED BY THE
STEEL ARMOUR LET THE CABLE TO INSTALL
ESPECIALLY IN THE SITUATIONS THAT MIGHT
OTHERWISE NEED THE PROTECTION OF CONDUCT.

CABLE GLAND

USED FOR CONNECTING
THE SWA CABLE



INTER CONNECTION BETWEEN SWA CABLE
AND EQUIPMENT

IT INCLUDE THREADS

BRASS GLAND

- A2 - UNARMoured CABLE
- BW - ARMoured CABLE GLAND
- CX - FOR BRAIDED CABLE
- CYT - FOR ALL TYPES OF SCREEN
FLEXIBLE WIRES
- CW - STEEL WIRE ARMoured CABLE
WITH OUT DOOR INSTALLATION

NICKEL PLATED GLAND

Hummel MS - 1P6B RATED
WATER PROOF

Hummel EMC - WATER TIGHT
APPLICATIONS

Nylon GLAND

- Hummel PA - 1P6B
WATER TIGHT / DUST TIGHT

SUPPORT OF SWA CABLE

THE CABLES MUST HAVE SUFFICIENT
SUPPORT TO PREVENT UNDUE STRESS
WHEN SWA CABLE IS RUN VERTICALLY

THE SUPPORTS NEED TO BE CLOSER
THAN UNARMoured CABLE BECAUSE
THE ARMoured CABLE IS MUCH
HEAVIER THAN UNARMoured CABLE

INSTALLATION REQUIREMENT

CLAUSE 1.4.18, 3.9.7.2, 3.9.6, S.3.2.2

S.3.2

SAFETY TESTING

EARTH RESISTANCE IS SAFE, SUFFICIENTLY LOW 8.3.5

INSULATION RESISTANCE IS SAFE AND SUFFICIENTLY
HIGH 8.3.6

CORRECT POLARITY 8.3.7

NO TRANSPOSITION OF EARTH AND NEUTRAL 8.3.8

VERIFICATION OF EARTH LOOP RESISTANCE 8.3.9

RED OPERATION 8.3.10

CIRCUIT CONTROL AND PROTECTION 2.9.5

QUESTIONS / ANSWER

① HOW IS STEEL WIRE ARMoured CABLE
DEFINED

1.4.22 A CABLE PROVIDED WITH A
WRAPPING OF METAL USUALLY TAPES (OR)
WIRE PRIMARILY FOR THE PURPOSE OF
MECHANICAL PROTECTION

② IF THE STEEL ARMOURING OF STEEL
WIRE ARMoured CABLE NEEDS TO BE
EARTHED, WHERE SHOULD IT BE EARTHED?

- AT CONDUCTING SHEATHS, ARMOUR AND
SCREEN OF CABLE

S.3.2.1

STEEL WIRE ARMOUR CABLE

METAL BUSH

METAL HALF SADDLE

METAL CLAD SOCKET OUTLET



METAL CLAD SWITCH

SWA CABLE GLAND

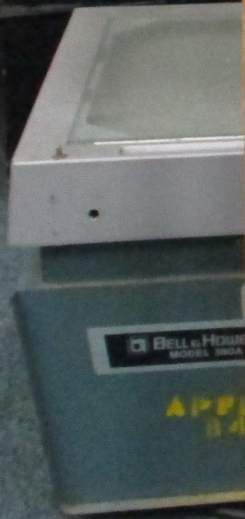
BATTEN HOLDER

BY METAL J BOX



SWA CABLE

CABLE CLIP





SWA CABLE GLANDS

METAL CLAD SWITCH

BATTEN HOLDER



METAL J BOX



SWA CABLE

CABLE CLIP

③ CAN SWA CABLE BE INSTALLED DIRECTLY IN A CONCRETE SLAB WITHOUT ANY FURTHER PROTECTION?

YES

TABLE 3-1 AS3000

④ WHAT IS MINIMUM DEPTH IN THE GROUND OF STEEL WIRE ARMoured CABLE INSTALLED UNDER GROUND IN A CATEGORY (A) SYSTEM?

300 mm

TABLE 3-6 AS3000

⑤ IS IT PERMISSIBLE TO INSTALL SWA CABLE BURIED DIRECTLY IN THE GROUND WITHOUT ANY FURTHER PROTECTION?

YES

3.11.3

⑥ WHAT IS MINIMUM BENDING RADIUS FOR 255g/mm² 4 CORE SWA CABLE, OVERALL DIAMETER 30 mm

360 mm $\Rightarrow 12 \times D = 12 \times 30 = 360$ mm

3.10.3.4



UN ARMoured CABLE $\rightarrow$ BENDING RADIUS = 6 X CABLE DIAMETER

ARMoured SHEATHED CABLE $\rightarrow$ BENDING RADIUS = 12 X CABLE DIAMETER

⑦ WHEN JOINING SWA CABLES THE STEEL ARMOURING WHAT ARE THE REQUIREMENT FOR ARMOURING

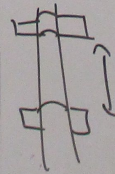
3.10.3.3 CONTINUITY

MECHANICAL AND ELECTRICAL CONTINUITY OF CONDUCTING ENCLOSURES SHALL BE MAINTAINED.

⑧ WHEN INSTALLING SWA CABLE ON VERTICAL WALL, WHAT CAN BE USED TO FIX THE CABLE TO THE WALL?

CABLE SUPPORTS SHALL BE PROVIDED AT INTERVALS NOT EXCEEDING 8m (OR) AS RECOMMENDED BY CABLE MANUFACTURER

3.9.5



8m maximum

3.9.3 support fixing

MUST COMPLY WITH 3.3.2.8

WIRING SYSTEM SHALL BE FIXED IN POSITION BY SUITABLE CLIPS, SADDLES (OR) CLAMPS. BY MEANS THAT WILL NOT DAMAGE WIRING SYSTEM.

⑨ WHAT IS MAXI TEMPERATURE OF SHEATHED SWA C

75 DEGREE

TABLE

SWA CABLE BE INSTALLED DIRECTLY IN A
CRETE SLAB WITHOUT ANY FURTHER PROTECTION?

YES TABLE 3.1 AS3000

IS MINIMUM DEPTH IN THE GROUND OF STEEL
ARMoured CABLE INSTALLED UNDERGROUND IS
A CATEGORY (A) SYSTEM?

00 mm TABLE 3.6 AS3000

IT PERMISSIBLE TO INSTALL SWA CABLE
DIRECTLY IN THE GROUND WITHOUT ANY
OTHER PROTECTION?

YES 3.11.3

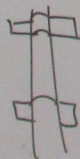
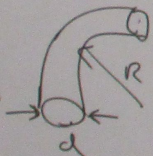
AT IS MINIMUM BENDING RADIUS FOR
50 mm 4 CORE SWA CABLE, OVERALL
DIAMETER 30 mm

60 mm $\Rightarrow 12 \times d = 12 \times 30 = 360$
mm

3.10.3.4

ARMoured CABLE $\rightarrow$ BENDING RADIUS = $6 \times$ CABLE
DIAMETER

ARMoured SHEATHED CABLE $\rightarrow$ BENDING RADIUS = $12 \times$ CABLE
DIAMETER



⑦ WHEN JOINING SWA CABLES THE STEEL
ARMOURING WHAT ARE THE REQUIREMENT
FOR ARMOURING

3.10.3.3 CONTINUITY

MECHANICAL AND ELECTRICAL CONTINUITY
OF CONDUCTING ENCLOSURES SHALL BE
MAINTAINED.

⑧ WHEN INSTALLING SWA CABLE ON
VERTICAL WALL, WHAT CAN BE USED TO
FIX THE CABLE TO THE WALL?

CABLE SUPPORTS SHALL BE PROVIDED
AT INTERVALS NOT EXCEEDING 8m
(OR) AS RECOMMENDED BY CABLE
MANUFACTURER

3.9.5

3.9.3 SUPPORT FIXING

MUST COMPLY WITH 3.3.2.8

WIRING SYSTEM SHALL BE FIXED
IN POSITION BY SUITABLE CLIPS,
SADDLES (OR) CLAMPS. BY MEANS
THAT WILL NOT DAMAGE WIRING
SYSTEM.

⑨ WHAT IS MAXIMUM OPERATING
TEMPERATURE OF VJS PVC
SHEATHED SWA CABLE

75 DEGREE C

TABLE 3.2

INSTALLATION REQUIREMENT

CLAUSE 1.4.18, 3.9.7.2, 3

S.S.3.2

SAFETY TESTING

EARTH RESISTANCE IS SAFE,

INSULATION RESISTANCE IS SAFE

HIGH 8.3.6

CORRECT POLARITY 8.3.7

NO TRANSPOSITION OF EARTH

VERIFICATION OF EARTH LOOP

RESISTANCE 8.3.10

CIRCUIT CONTROL AND PROTECTION

QUESTIONS / ANSWERS

① HOW IS STEEL WIRE
DEFINED

1.4.22 A CABLE PRO

WRAPPING OF METAL

WIRE PRIMARILY FOR

MECHANICAL PROTECTION

② IF THE STEEL ARM
WIRE ARMoured C
EARTHED, WHERE SHOU

AT CONDUCTING SHE

SCREEN OF CABLE

S.3.2.



THE STEEL
REQUIREMENT

CONTINUITY
SHALL BE

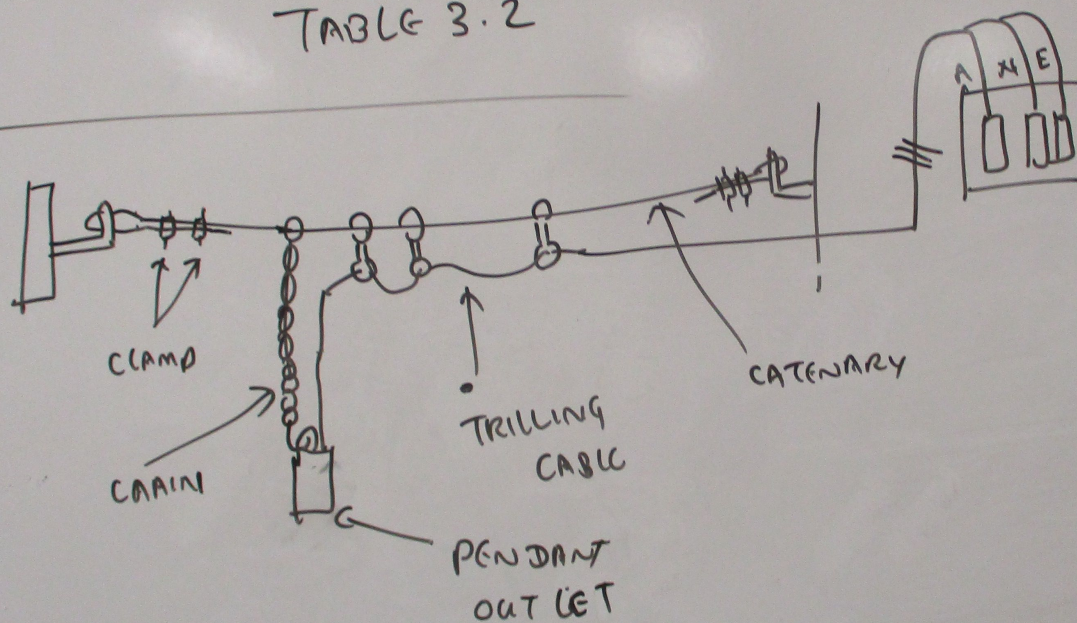
ABLE ON
BE USED TO
WALL?

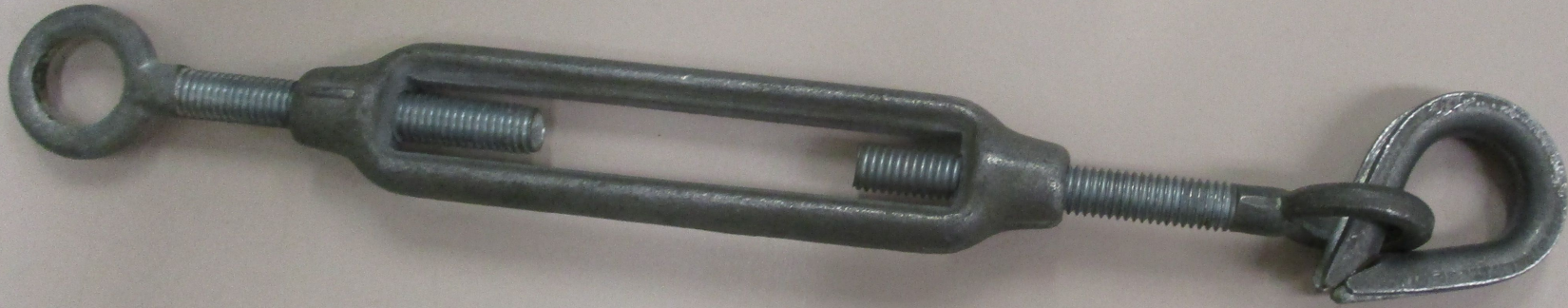
PROVIDED
NG 8m
ABLE

⑨ WHAT IS MAXIMUM OPERATING
TEMPERATURE OF VJS PVC
SHEATHED SWA CABLE

75 DEGREE C

TABLE 3.2





TAFE Student's Attendance Record
Year _____

Section A
Student Name _____
Number _____
Course _____
College/Campus _____
Location _____
Contact Person _____
Phone Number _____
Employer Name _____
Address _____
Phone Number _____

Section B - Advice to Employer
The student named on this card is enrolled in _____ classes at TAFE NSW.
Teachers will sign at the end of each class to verify student's attendance (Section C on reverse).
The student will present this card to you. Please sign Section C at your convenience to indicate that you have agreed the student's attendance record.
Please sign below to acknowledge that you are aware of the purpose of this card.

Employer/Supervisor Name _____
Print Name _____
Signature _____

Section C - Present to your employer/supervisor upon request
Students must not leave the college/campus premises except during the lunch hour, without the permission of the teacher.

Teacher for signature at the end of each class _____
Employer/supervisor upon request _____

