1.3) อุปกรณ์จับยึด Fiber Optic Suspension for Self-Support Cable (ADSS/ARSS) (CDD-OFC-ACC-FS01)

Fiber Optic Suspension for Self-Support Cable (ADSS/ARSS)

1. General

This is specification cover the requirement of Fiber Optic Suspension for Self-Support Cable (ADSS/ARSS) aerial Fiber Optic line construction.

2. Standard

2.1 This is suitable for use with ADSS/ARSS standard of fiber optic cable.

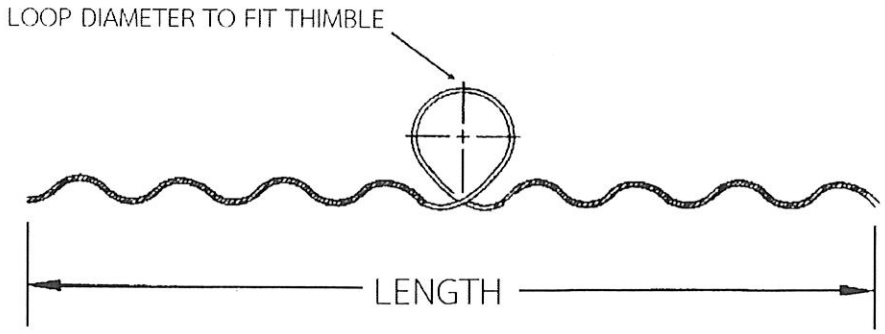
2.2 There Fiber Optic Suspension for Self-Support Cable will installation with Machine bolt concrete poles, cross-arm , cable extension arms and design for difficult to come off Machine bolt in long term.

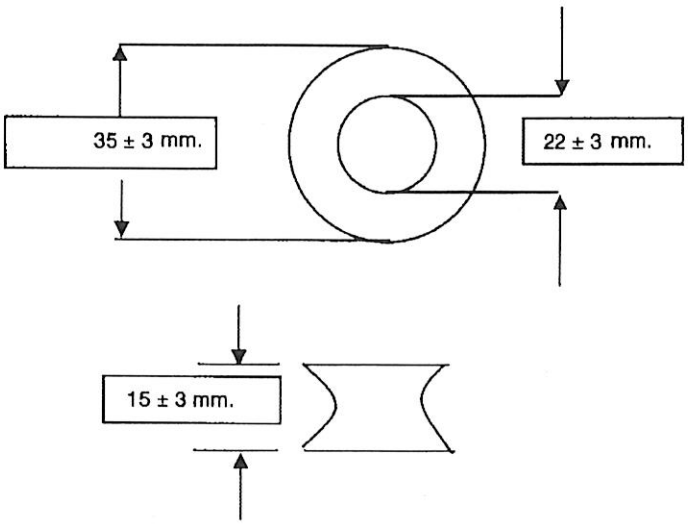
3. Material data

The material are a mixture of aluminum and aluminum clad steel.

Cable Type	Diameter Range		Length	Holding Strength
	Min (mm.)	Max (mm.)	(mm.)	Not Less Then (N)
ADSS/ARSS 12 Cores	14	15.2	890 - 910	≥1800
ADSS/ARSS 24 Cores				
ADSS/ARSS 48 Cores				

Remark : Tolerance ± 5% all dimensions





THIMBLE RING

1.4) อุปกรณ์จับยึด Optical Fiber Cable (Fig-8) Aluminum Clamp (DAS-FAC-001)

Specifications No.: DAS-FAC-001 PEA Material No.: 2290330002

Optical Fiber Cable (Fig-8) Aluminum Clamp

1. General

1.1 This specification covers the requirement of Optical Fiber Cable (Fig-8) Aluminum Clamp for Optical Fiber Cable Network usage.

1.2 Optical Fiber Cable (Fig-8) Aluminum Clamp shall be compatible with Fig-8 Optical Fiber Cable.

2. Material Requirement

2.1 The Clamp Bodies shall be manufactured using Die Casting process.

2.2 The Clamp Bodies shall be made in a workmanlike manner and free from sharp edges, cracks, and fractures that could cause harm to operators.

2.3 When installed, the insulated messenger strand of Optical Fiber Cable shall be inserted in the teeth clamp area without separating the insulated messenger strand from the main cable.

2.4 One set of Optical Fiber Cable (Fig-8) Aluminum Clamp shall consist of the followings.

2.4.1 The Body Clamp - Qty. 2 Ea.

2.4.1.1 The 2 Body Clamps shall be identical (exactly the same size and shape).

2.4.1.2 Appearance and sizing shall be according to Figure 1 Or Figure 2. However, design can be slightly different to Figure 1 or Figure 2 as long as there are no usage problems with PEA.

2.4.1.3 Must have smooth surfaces.

2.4.1.4 The Body Clamp shall be made of Aluminum Alloy Casting according to BS:LM6 or JIS:AD12 standards or equivalent.

2.4.1.5 The Body Clamps are capable of supporting a longitudinal load of 150 Kg between the insulated messenger strand and the clamp.

2.4.2 The Isolator - Qty. 2 Ea.

2.4.2.1 The 2 Isolators shall fit in the hole of Body Clamps firmly.

2.4.2.2 Must pass the Dielectric Strength Test of not less than 2,000 volt (AC) at 50 Hz for 60 seconds.

2.4.2.3 Isolator Test shall be tested in PEA proven laboratories or government institutions only and shall be according TIS 17025 or IEC 17025.

2.4.2.4 Dielectric Strength Test Report and other Isolator Test Report shall be submitted with Technical Proposal.

2.4.2.5 The Isolator shall be made of HDPE or ABS that is suitable for outdoor use.

2.5 If Bidders decide to propose patented product similar to Optical Fiber Cable (Fig-8) Aluminum Clamp to PEA, Bidders shall submit the Patent Certificate and Letter of Acknowledgement from the patent owner that the patented product can be used in PEA projects along with Technical Proposal.

3. Marking

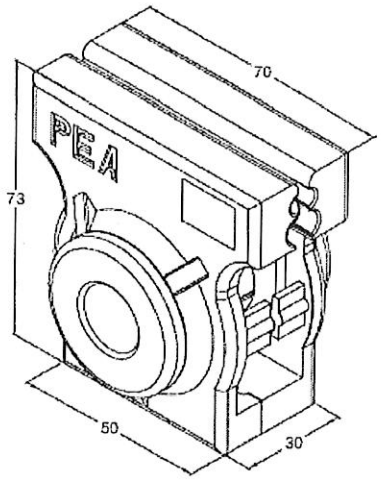
PEA Logo and Manufacturer's Symbol shall be permanently and legibly engraved on the two Body Clamps.

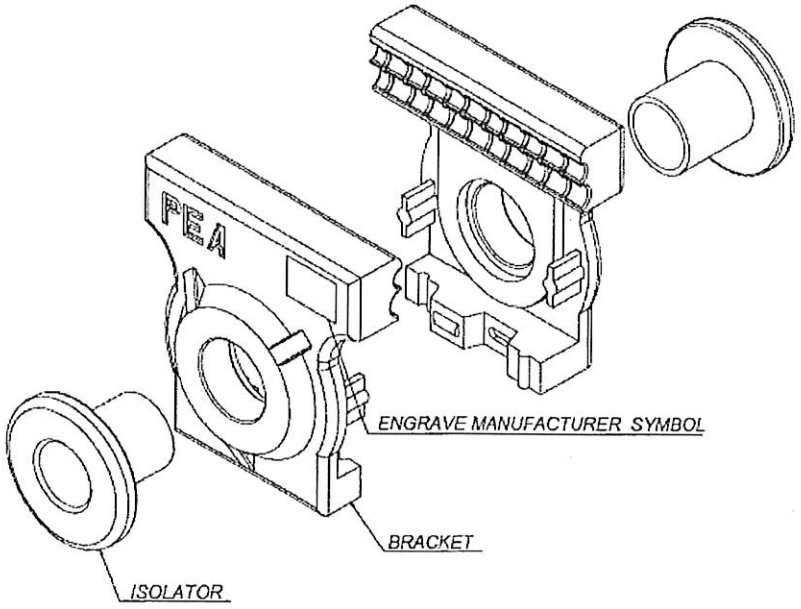
4. Packing

4.1 Fifty sets of Optical Fiber Cable (Fig-8) Aluminum Clamp shall be packed in a sturdy carton and easy to transport.

4.2 A label containing Product Description, Quantity, Contract/PO Number and Supplier's Name shall be attached on the carton.

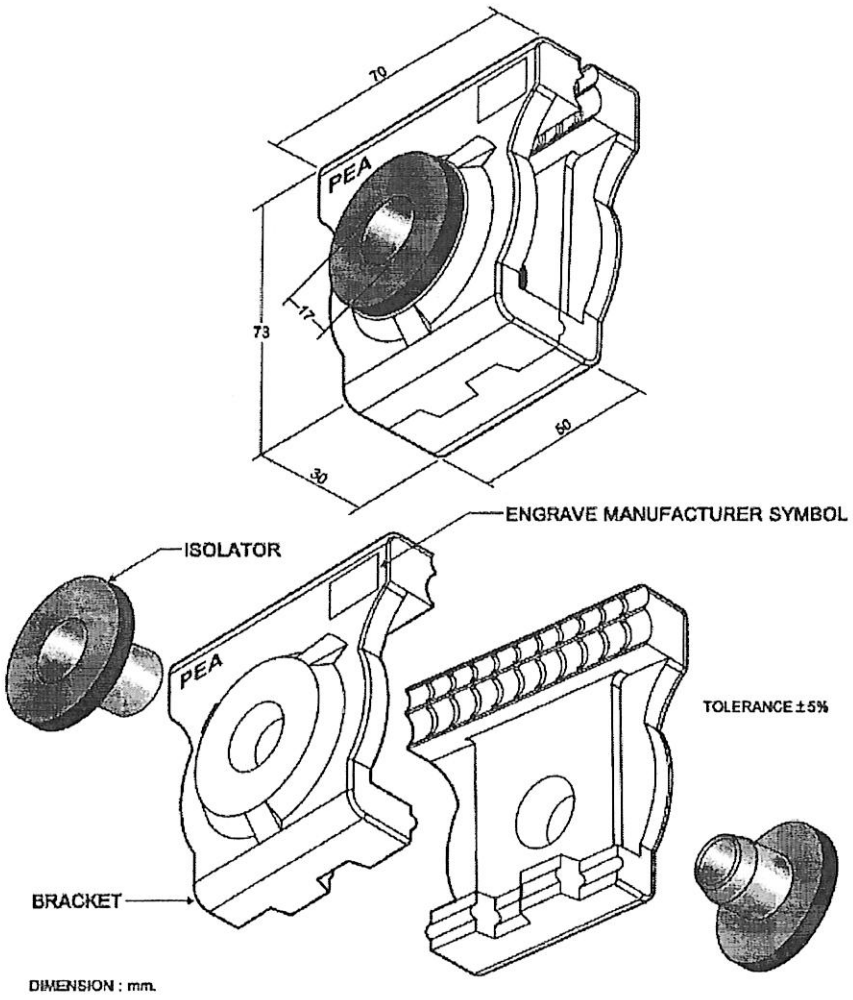
Figure 1.





Tolerance ± 5%

Figure 2.


70
PEA
17
73
30
50
ENGRAVE MANUFACTURER SYMBOL
ISOLATOR
PEA
TOLERANCE ±5%
BRACKET
DIMENSION : mm.

1.5) Dome Closure

(CDD-OFC-ACC-DC02)

Dome Closure

1. General

1.1 This specification covers the requirements of water proof type, re-enterable optic fiber cable splice closure kits to be supplied to the Provincial Electricity Authority (PEA). The splice closures shall be installed in aerial.

1.2 The splice closure kits shall allow easy handling and installation. The closure shall be easy to re-enterable and require minimum of excess material when resealing.

1.3 The splice closures shall be Universal (suit straight & branch configuration) The required branch configurations are specified in the technical requirements section.

1.4 The closures or family of closures shall be capable of accepting an industry-wide range of cable sizes and unit configurations with metallic & fiber glass strength member. This includes cable strength members that are external stranded, corrugated laminates, or internal solid. A means shall be supplied for sealing the cable ends excluding a unit tube, to prevent moisture intrusion into optic splice area.

1.5 The closure shall be capable of accommodating splice organizers which accept all types of fiber optic splices (mechanical, fusion, or multi-fiber array) The splice closure shall have provisions, for storing fiber in an orderly and identifiable manner. Mountings for splice organizer assemblies, and space for excess fiber. Splice organizers shall be re-enterable.

1.6 The splice closure shall have provisions for controlling minimum fiber bend radius of 30 mm.

1.7 Closure does not require filling compound.

1.8 The organizer hardware shall be constructed of stainless steel or material that no Hydrogen-producing metallic corrosion can develop to cause fiber attenuation.

1.9 The closure organizers shall accommodate at least 24 fiber and 48 fiber. The require fibers and the designation of outer diameter of cable for the proposed closure is specified in the technical requirements section.

1.10 Housing or Covers shall be fabricated from black high density thermoplastic, which resists to ultraviolet ray of sun for long life. Dimension of housing shall be less than (H) 370 mm x (L) 150 mm.

1.11 The closure shall be provided 1(one) set of pole mounting which shall be suitable for stainless steel tape installed.

1.12 Method assembly external Grounding Deriving Device outside of the closure.

2. Specified Requirements.

The factory testing method concerned in following item:

Test Items	Conditions
2.1 Mechanical	
2.1.1 Compression	Test temperature : (-15 ± 2)°C and (+40 ± 2)°C Test pressure : (40 ± 2) kPa regulated Load/Surface area : 1000 N / 25 cm^2 Test duration : 10 minutes
2.1.2 Torsion	Test temperature : (-15 ± 2)°C and (+40 ± 0)°C Test pressure : (40 ± 2) kPa regulated Torque : Max. 45 Nm or max. 90° rotation Torque application : 250 mm from end of cable seal sleeve No. of cycles : 5 per cable
2.1.3 Impact.	Test temperature : (-5 ± 2)°C and (+23 ± 2)°C Test pressure : (40 ± 2) kPa regulated Impact : 1 kg steel ball Drop height : 1 m No. of impacts : 1 at closure mid-point
2.1.4 Vertical Drop	Test temperature : (-18 ± 2)°C and (+40 ± 2)°C Drop height : 75 cm.
2.2 Environmental Performance	
2.2.1 Head of Water	Depth : 5 m Test pressure : (40 ± 2) kPa regulated Test duration : 100 +/- 1 hour.
2.2.2 Temperature Cycling in Air	Internal pressure : 60kPa ± 5kPa Test temperature range : (-20 ± 2)°C and (+60 ± 2)°C Dwell time : 2 hour Transition time : 1 hour Cycle duration : 8 hour Number of cycles : 3

Test Items	Conditions
2.2.3 UV Resistance	Test temperature impact : (-20 ± 2)°C Cycle UV : 4 hours at 60 °C Darkness : 4 hours at 50 °C Exposure time : 1000 hours
2.3 Chemical Resistance	
2.3.1 Alkaline Resistance or Corrosion Resistance	Test : Specimen shall be totally pH 12 Test medium : 10% IGEPAL Test duration : 72 hours

3. Technical Requirements

3.1 The specification if splice closure kit shall be accommodated as follow:

3.1.1	Maximum numbers of cassettes	2	4
3.1.2	Minimum numbers of fibers	24	48
3.1.3	Numbers of cable entries/exits	4 or more	4 or more
3.1.4	Cable diameter (mm.)	5.5 to 18	5.5 to 18
3.1.5	Re-entry kits requiring minimum numbers of heat shrink sleeve	2	2

3.2 The protection sleeves for the spliced fiber shall be equal to maximum number of fiber As state in 3.1.2

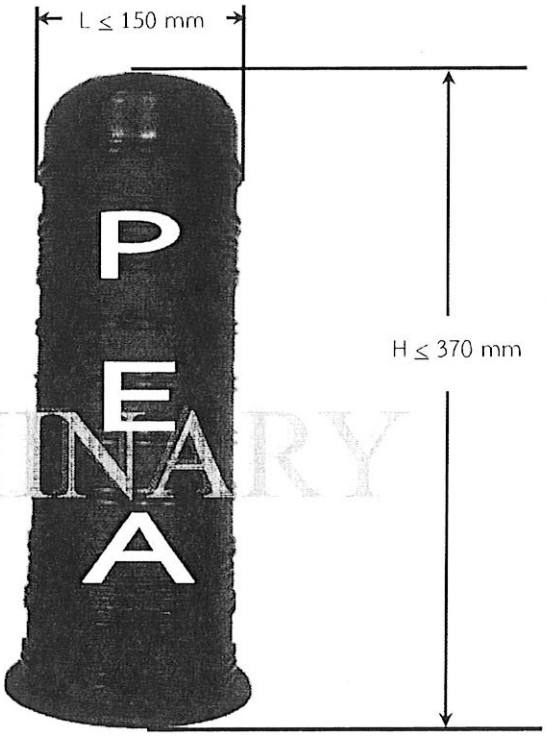
4. Manual

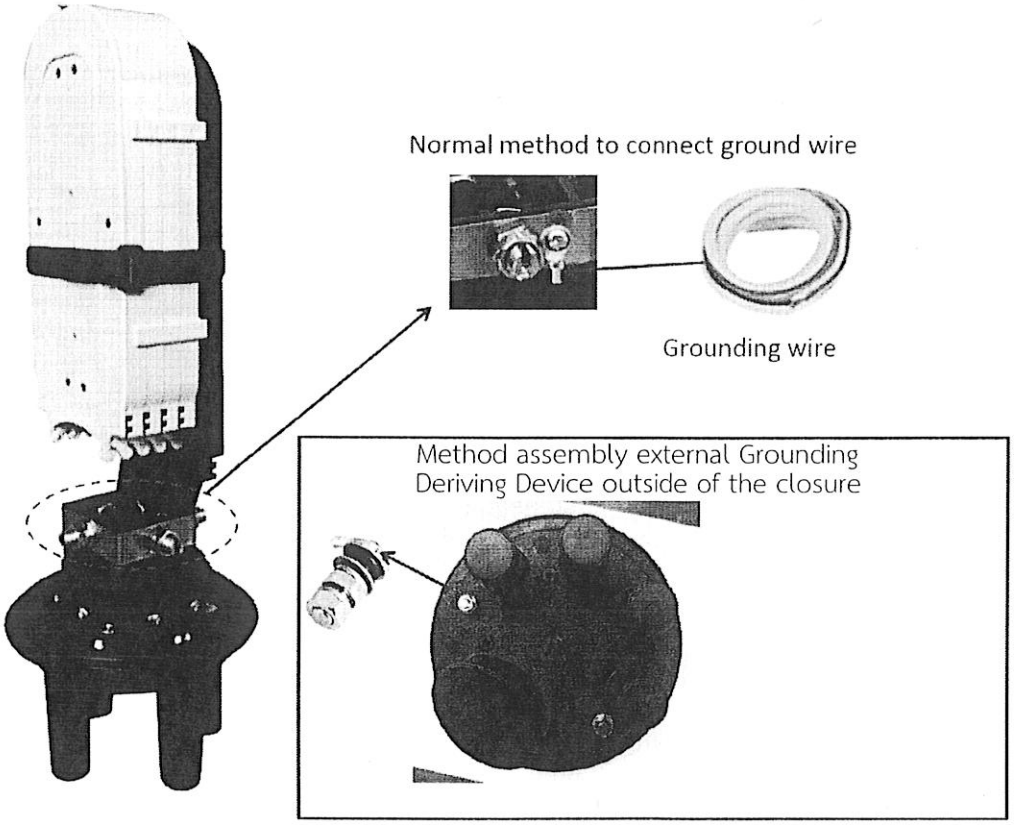
The manual for installation the closure shall be included at least one copy in Thai or English

5. Packaging

5.1 Closure shall be permanently marked in English or Thai at regular intervals as following PEA (Logo PEA)

5.2 Each kit shall be packed in suitable box and labeled the description and name of supplier





1.6) Machine Bolts

(CDD-OFC-ACC-MB01)

MACHINE BOLTS

1. General

1.1 The bolts and nuts shall be fabricated from mild steel

1.2 These Machine Bolts will installation with Drop wire clamp or Figure-8 cable clamp

1.3 Each set bolt consist of a square nut and two(2) square washers.

1.4 Machine bolt made by Rolled Thread process. It's accordance with ANSI/ASME B1.1 – 1982. The tensile strength for mild steel size 5/8"(inch) with 5,600kg. for 54,880 N.

1.5 Both threads of bolts and nuts will be inch series.

1.6 All ferrous material are galvanized after manufacturing. Method of galvanizing is following with ASTM A 153-95

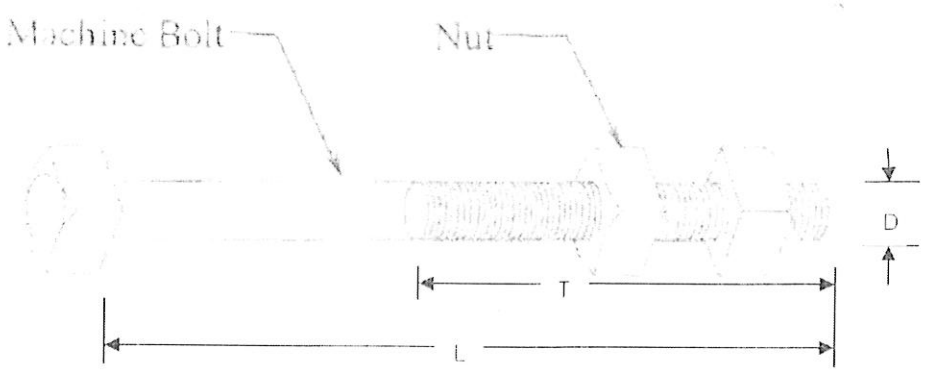
1.7 Machine bolt has the specification in table below.

Description	Length (L) Inch	Thread (T) Inch	Diameter (D) Inch	Minimum Tensile Strength (kg.f)	Minimum Average Zinc Coating (µm)
OFC Bolt 5/8" x 12"	12	6	5/8	5,600	53
OFC Bolt 5/8" x 14"	14	6	5/8	5,600	53
OFC Bolt 5/8" x 16"	16	6	5/8	5,600	53
OFC Bolt 5/8" x 18"	18	6	5/8	5,600	53
Tolerance	± 5%	± 10%	± 5%		

1.8 The treads of bolts will be cut oversize as to allow free with threads of the nuts.

2. Material-packing data for bolt

- Description of material used for the component part : Mild steel
- Surface finishing of the component part : Zinc Coating
- Zinc coating in um(1 um = 0.001 mm.) : ≥53 um
- Packing method / sack : 25



Machine Bolt and Nuts

1.7) Straight Thimble Eye Bolt

(CDD-OFC-ACC-TB01)

STRAIGHT THIMBLE EYE BOLT

1. General

These specification cover straight thimble eye bolt for fiber optic line construction

2. Standard

2.1 Straight thimble eye bolt made from mild steel

2.2 These straight thimble eye bolts will installation with ADSS standard of fiber optic Cable

3. Material data

3.1 Straight thimble eye bolt made by rolled thread process. It's accordance with ANSI/ASME B1.1-1982. The tensile strength for mild steel size 5/8"(inch) with 5,600 kg.f or 54,880 N.

3.2 All ferrous materials are galvanized after manufacturing. Method of galvanizing is following with ASTM A 153-95

3.3 The thread form of straight thimble eye bolts will be inch series.

3.4 Straight thimble eye bolt has specification in Table below.

PEA Material No.	Description	Length (L) Inch	Thread (T) Inch	Diameter (D) Inch	Minimun Tensile Strength (kg.f)	Minimun Average Zinc Coating (μm)
2290310001	Straight Thimble Eye Bolt 5/8" x 18"	18	6	5/8	5,600	53
2290310002	Straight Thimble Eye Bolt 5/8" x 16"	16	6	5/8	5,600	53
2290310003	Straight Thimble Eye Bolt 5/8" x 14"	14	6	5/8	5,600	53
2290310004	Straight Thimble Eye Bolt 5/8" x 12"	12	6	5/8	5,600	53
	Tolerance	±5%	± 10%	±5 %		

4. Material packing data for straight thimble eye bolts .

4.1 Description of material used for the component part : Mild steel

4.2 Surface finishing of the component part : Zinc coating

4.3 Zinc coating in μm (1μm = 0.001 mm) : ≥ 53 μm

4.4 Packing method / sack : 25

Thimble Eye Bolt 5/8"

Description	Size Of Material (D) in	Length in inches (L)	Thread Length in inches (T)	(R) mm	(G) mm	(b) mm	(c) mm
Straight Thimble Eye Bolt 5/8" x 12"	5/8	12	6	9.53	17.46	6.35	7.14
Straight Thimble Eye Bolt 5/8" x 14"	5/8	14	6	9.53	17.46	6.35	7.14
Straight Thimble Eye Bolt 5/8" x 16"	5/8	16	6	9.53	17.46	6.35	7.14
Straight Thimble Eye Bolt 5/8" x 18"	5/8	18	6	9.53	17.46	6.35	7.14
Tolerance	±5%	±3%	±10%	±10%	±10%	±5%	±5%

1.8) Thimble Eye Nuts

(CDD-OFC-ACC-TN01)

THIMBLE EYE NUTS

1. General

This specification covers thimble eye nuts for fiber optic line construction.

2. Standard

2.1 All thimble eye nuts are made of one of the following classes of materials.

2.1.1 Hot-rolled, open health, basis oxygen or electrical furnace steel , malleable type ferrous casting, non-ferrous metals or other suitable materials.

2.2 This thimble eye nuts will installation with ADSS standard or fiber optic cable.

3. Material data

3.1 The thread form is inch series coarse thread to meet the latest revision of EEI specification for steel nuts and bolts , TDJ-1 or equivalent.

3.2 All thimble eye nuts are completely coated with corrosion resistant layer of hot dip galvanized or specification equivalent.

3.3 The thimble eye nuts have the specification in table below

3.3.1 The suitable bolt with eye nuts assemble is meet the minimum requirement of breaking strength between bolts and nuts, as list in the Table 1 , at speed of jaw seperation 50 mm/minute.

Table 1

Tapped for Bolt in inch	Thread (inch)	Breaking Strength (Kgf.)
5/8	11	5,600

3.3.2 A thimble eye nut has the specification in the Table 2

Table 2

Description	Tapped for Bolt in inch	Dimension (mm.)						
		A	B	C	D	E	F	R
Thimble eye nut	5/8	38.10	40.50	22.23	31.93	47.63	82.55	6.35
Tolerance		± 10 %						

4. Material packing data for thimble eye nuts.

4.1 Description of material used for the component part : Mild steel

4.2 Surface finishing of the component part : Zinc coating

4.3 Zinc coating in μm (1μm = 0.001 mm) : ≥ 53 μm

4.4 Packing method / sack : 25

Thimble Eye Nut

Tapped for Bolt in inch	Dimension (mm)						
	A	B	C	D	E	F	R
5/8	38.1	40.5	22.23	31.93	47.63	82.55	6.35
Tolerance	± 10 %						

1.9) Preform for ADSS

(CDD-OFC-ACC-ADSS-PF01)

Preform For ADSS

1. General

These specifications cover preform for fiber optic line construction.

2. Standard

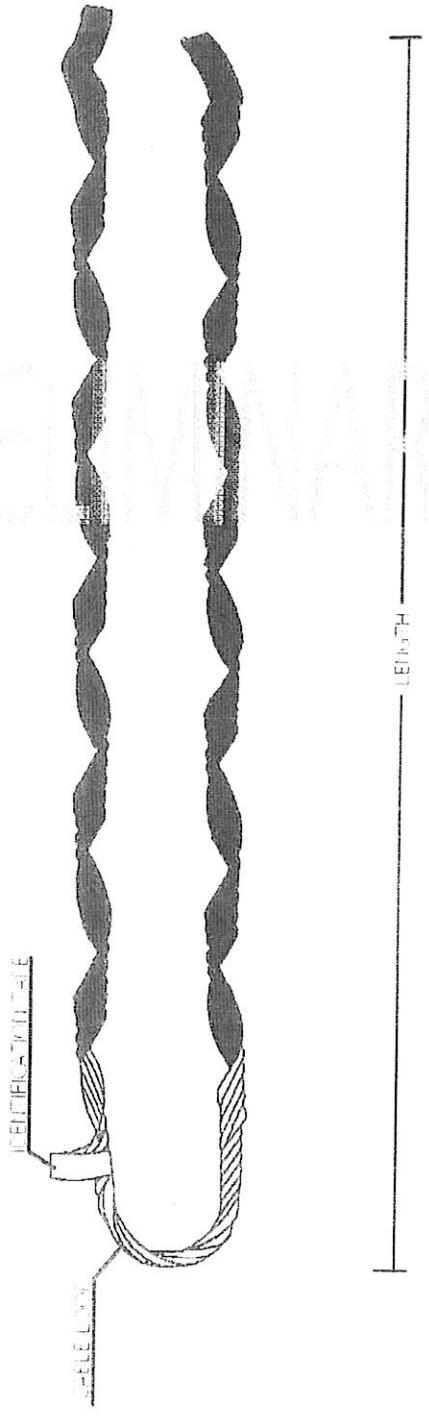
These Preform is installation with dead end ADSS fiber optic cable.

3. Material data

The material are a mixture of aluminum and aluminum clad steel

PEA Material No.	Cable Type	Diameter Range		Length (mm)	Holding Strength Not Less Than (kgf.)
		Min (mm)	Max (mm)		
2290340001	ADSS 12 Cores	14	15.2	730 - 760	500
2290340002	ADSS 24 Cores				
2290340003	ADSS 48 Cores				

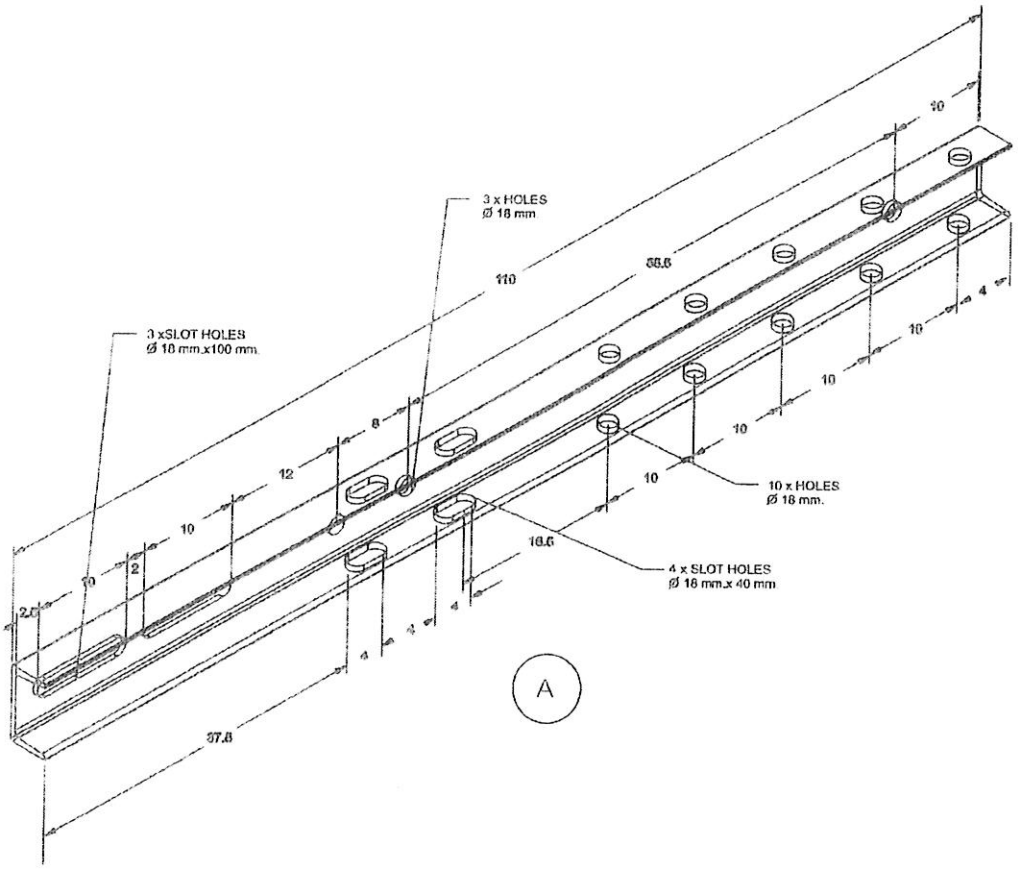
Remark : Tolerance ± 5 % all dimensions


LENGTH

1.10) Cross Arm Type-C

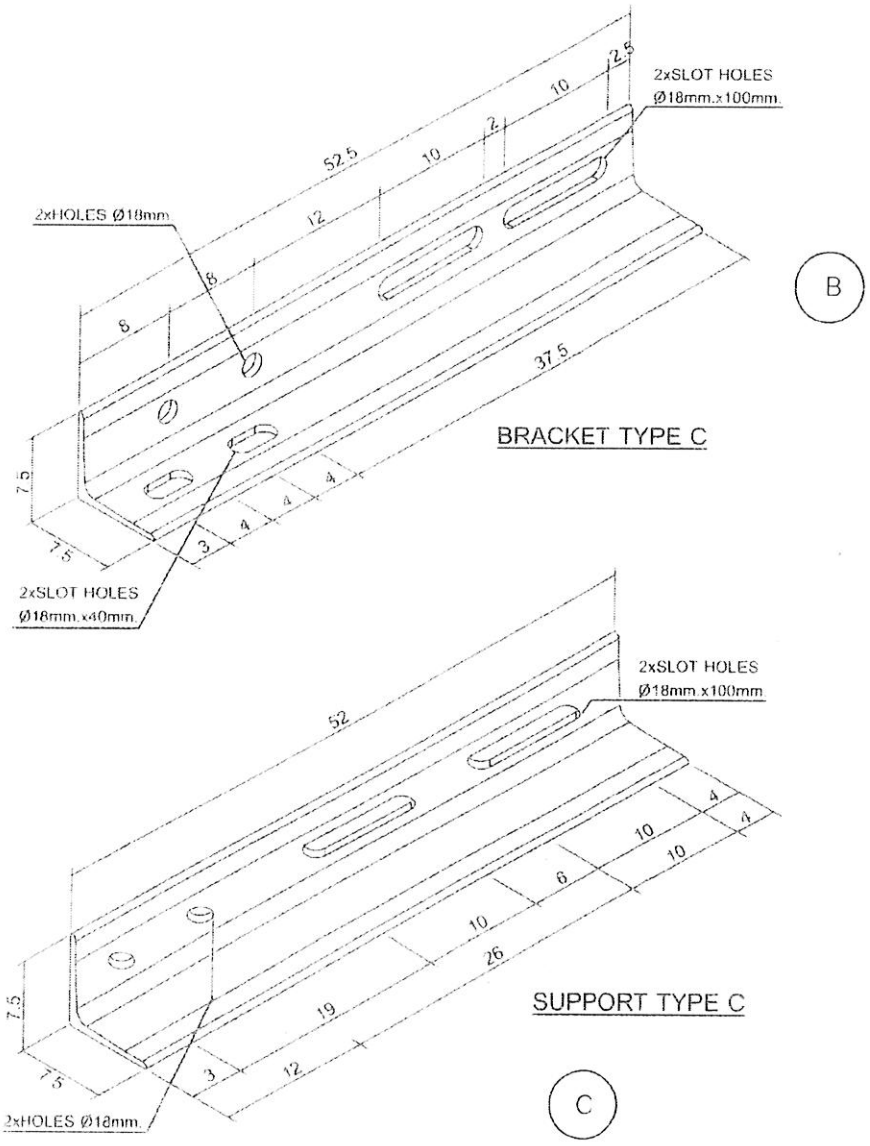
(CDD-OFC-ACC-CA01)

CROSS ARM TYPE-C



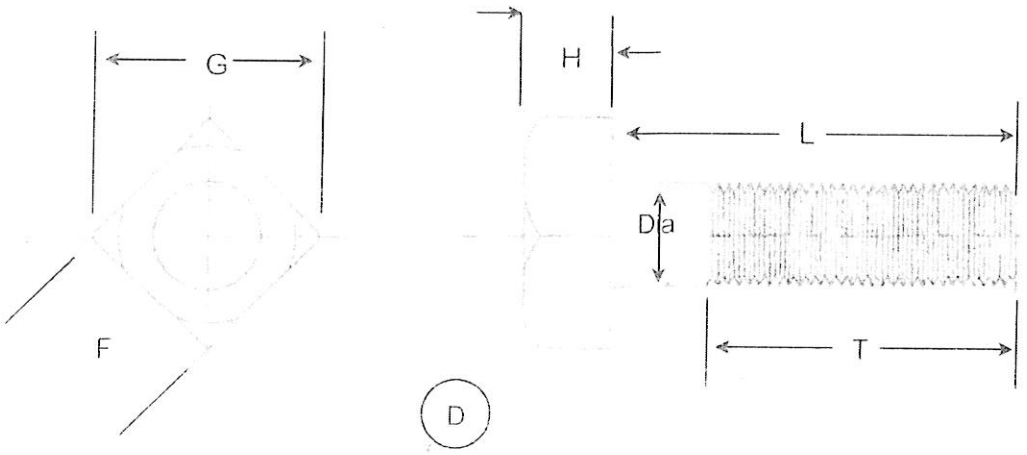
Standard :

1. Dimensions are in cm. unless other wire specified.
2. Material channel steel 75x40x6 mm. 110 cm. long.
   Conformed to TIS1227 and shall be hot-dip galvanized zinc coating
   Minimum average thickness of zinc coating shall not be less than
   120 microns
3. Tolerance ± 5%



Standard :

1. Dimensions are in cm. unless other wire specified.
2. Material shall be hot-dip galvanized zinc coating minimum average thickness Of zinc coating shall not be less than 120 microns
3. Tolerance ± 5%

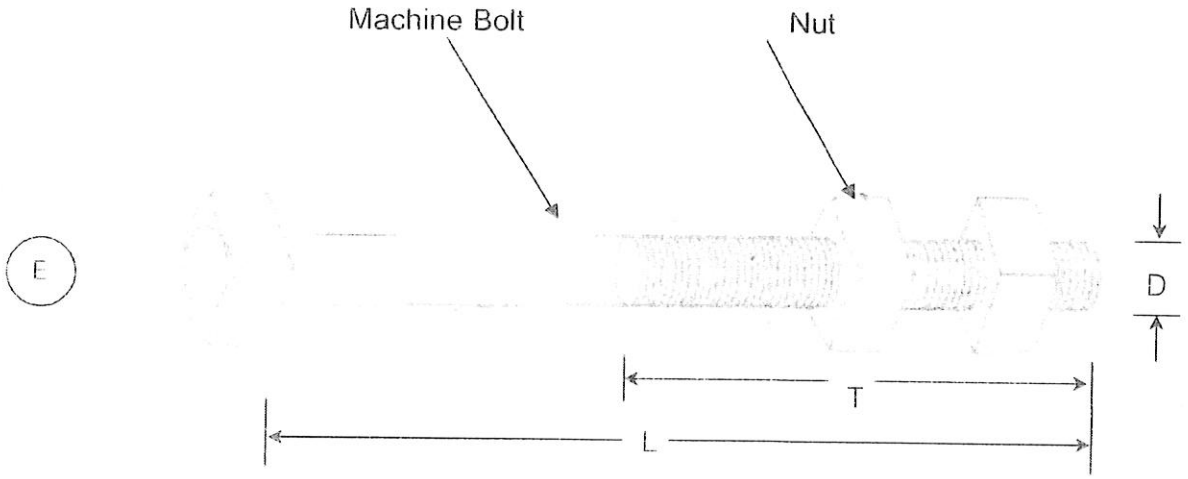


Machine Bolt Head

Standard :

1. Dimension of machine bolt heads in inches
2. Material shall be hot-dip galvanized zinc coating minimum average thickness Of zinc coating shall not be less than 120 microns
3. Tolerance ± 5%

Bolt Size	Dimensions of Square Head Bolt. In inches							
	Width Across Flats (F)			Width Across Corners (G)		Height (H)		
	Basic	Max.	Min.	Max.	Min.	Basic	Max.	Min.
5/8	15/16	0.9375	0.906	1.326	1.244	27/64	0.444	0.400



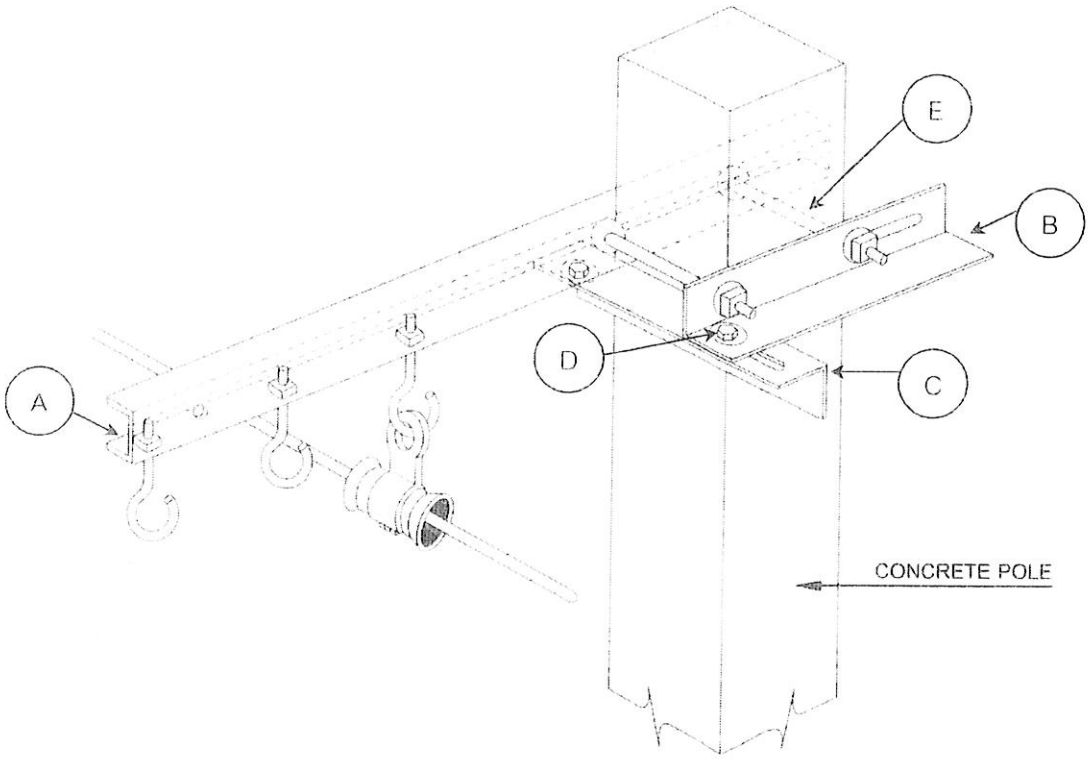
Machine Bolt and Nuts

Standard :

1. Dimension of machine bolt heads in inches
2. Material shall be hot-dip galvanized zinc coating minimum average thickness Of zinc coating shall not be less than 120 microns

DESCRIPTION	DIMENSION OF BOLT		
	SIZE OF ROD	LENGTH	THREAD
	(D) inch	(L) inch	(T) inch
M 16 x 18"	5/8	18	10
TOLERANCE	± 3%	± 5%	± 5%

CROSS ARM TYPE-C INSTALLATION ON POLE



1.11) Ground Rod

(CDD-OFC-ACC-GR01)

GROUND ROD (GND)

1. General

This specification covers ground rod for fiber optic line construction

2. Material Requirements

2.1 Steel rod used will meet the requirements of TIS 20 latest issue or equivalent.

2.2 The ground rod will be completely coated with a corrosion resistant layer of hot dip galvanizing zinc coating minimum average thickness of zinc coating shall not be less than 100 microns

2.3 The ground rod will be free from badly formed, cracked or other defective structure.

2.4 Typical ground rod will be as shown in Fig.1.

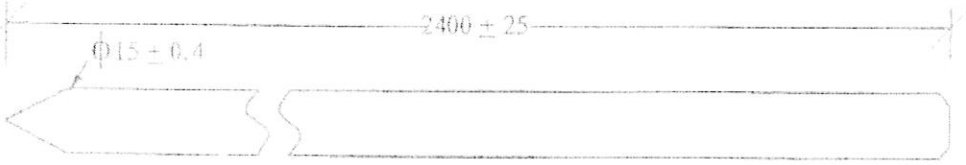


Fig.1 Typical Ground rod

3. Identifications

The ground rod will be as shown in Table 1 or as specified on order

Table 1

Description	Dimensions in mm.		Std.Pkg.
	Diameter	Length	PCs/Bd.*
Galv. Ground Rod	15	2,400	10
Tolerance	± 0.4	± 25	

* Bd. = Bundle

Note : The diameter of ground rod will be measured without zinc coated layer.

1.12) Optical Fiber Distribution Frame (ODF)

(CDD-ODF-001)

Specifications No.: CDD-ODF-001

Optical Fiber Distribution Frame (ODF)

General

At the station/office requiring the termination of fiber within a cable (CABLE incoming and CABLE outgoing), all fiber within that cable shall be connectorized and terminated in ODF in manner consistent with the following.

(1) ODFs Shall Support the termination of 48 fibers.

(2) ODFs shall be steel fabricated and finished on all surfaced. All metal and welds shall be thoroughly cleaned and sanded to obtain a smooth finish. All surfaces shall be treated for rust and primed to from a bond between metal and the finish coats of paint.

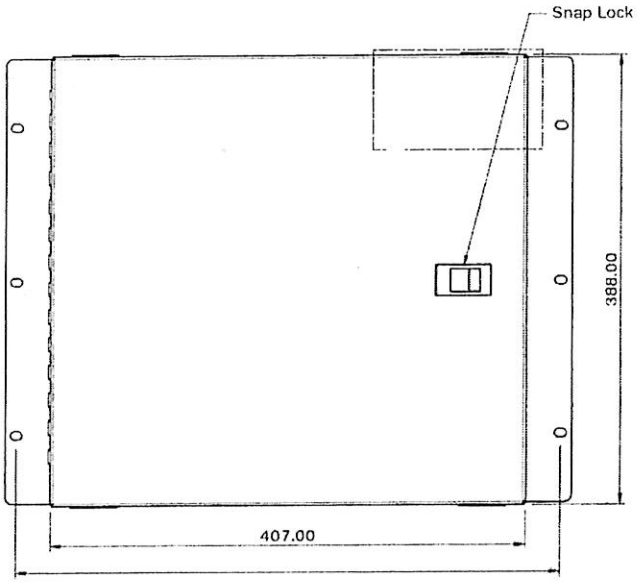
(3) Fiber optic terminations shall be housed using ODFs provisioned with splice trays. All fibers within a cable shall be fusion spliced to pre-connectorized pigtails and fitted to the "Back-side" of couplings.

(4) ODFs shall be suitable for use with each of the cable types provided as part of this contract. ODFs shall accommodate pass-through splicing. Interconnection splicing for fiber equipment / distribution panels (breakout) and fiber terminations.

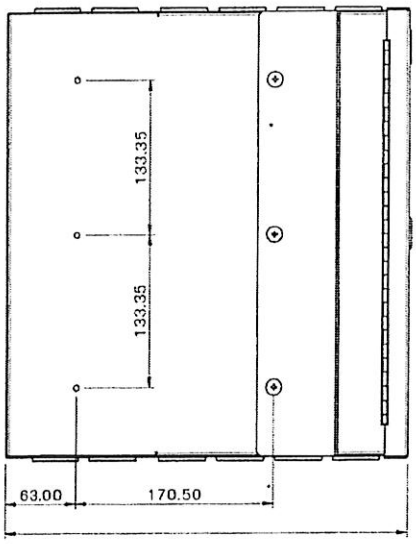
(5) All ODFs shall be of metal construction that is clean and smooth finished, treated to resist corrosion, and shall accommodate the storage of a minimum of 20 meters of coiled fiber service loop for future propose. The panel must be designed to work Swing by magnetic hold. ODFs shall be rack/enclosure and adaptable to wall mount installation using readily available mounting flanges. They shall allow top and bottom entry for the cable/patch cord access to the splice trays and patch panel as following Guideline Figure of Optical Fiber Distribution Frame (ODF). Specific selection of the entry point shall be made at the time of installation. Earthing lugs shall be provided on all splice boxes and Contractor shall ensure that all splice boxes are property earthed.

(6) ODFs shall be installed indoors protected from the elements whenever possible.

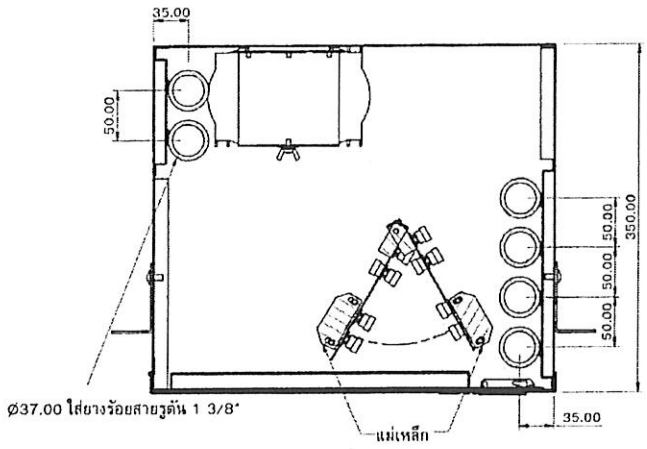
(7) ODFs must be installation in a 19" rack. and have a 4 Each splice tray.

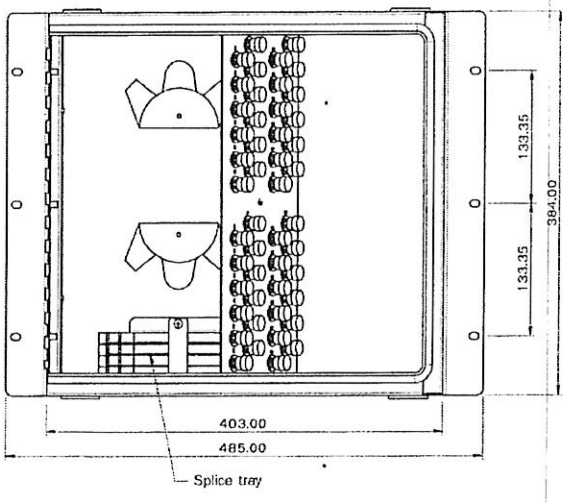


Front View

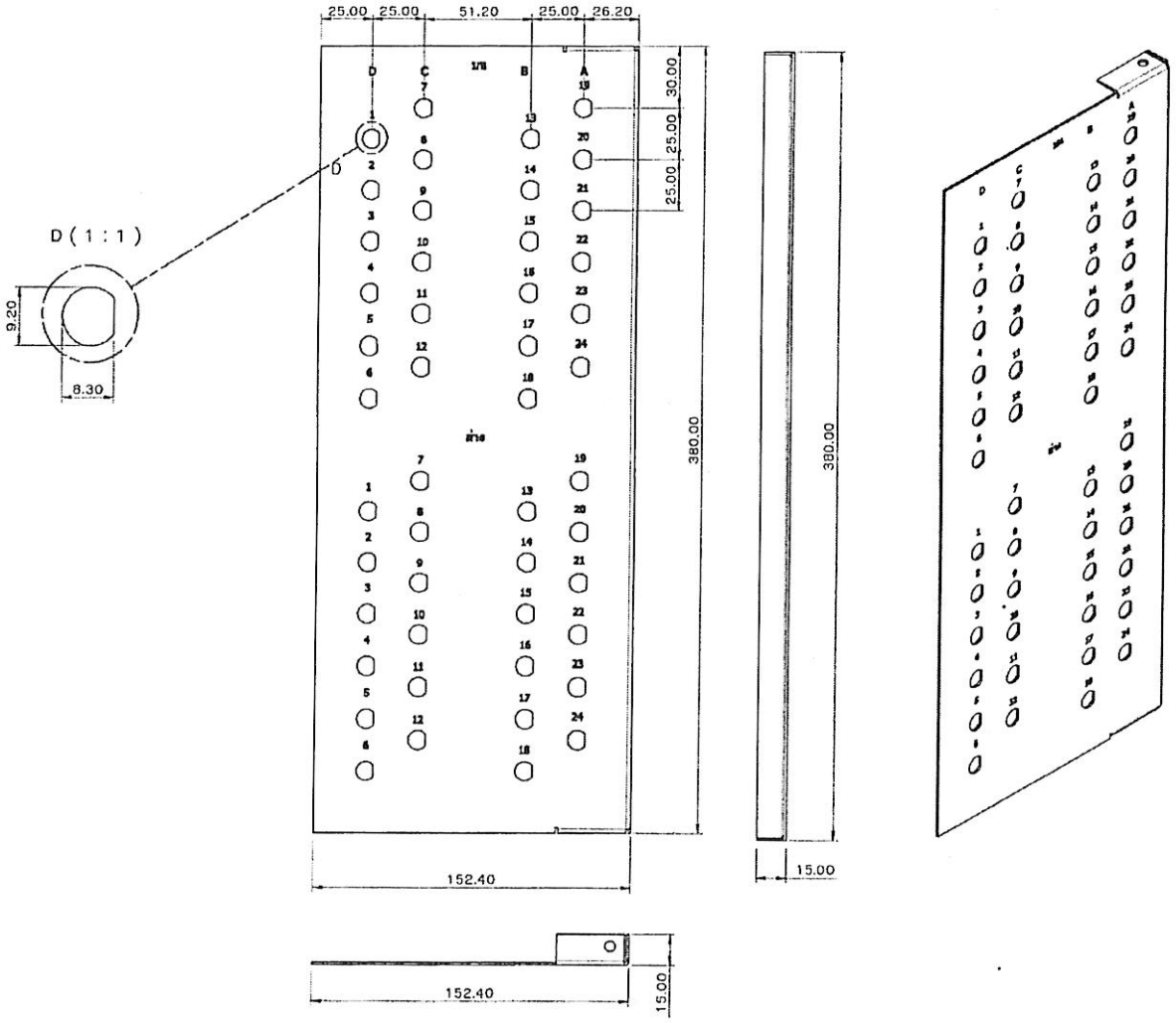


Side View

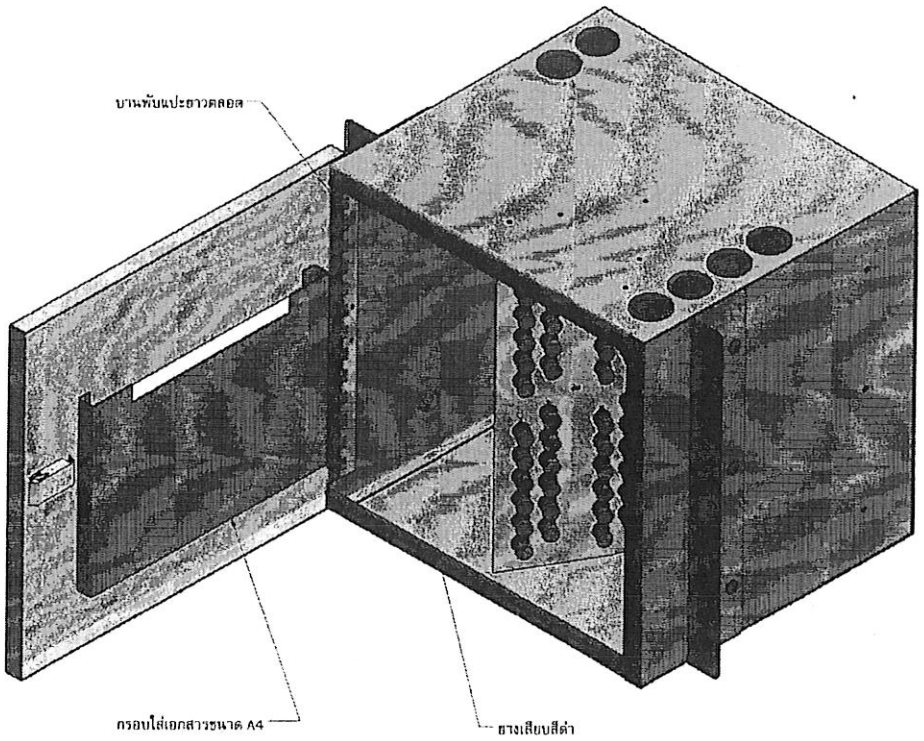




Top View


25.00
25.00
51.20
25.00
26.20
30.00
25.00
25.00
380.00
380.00
D (1 : 1)
9.20
8.30
152.40
15.00
152.40
15.00

Patch Panel



Optical Fiber Distribution Frame (ODF)

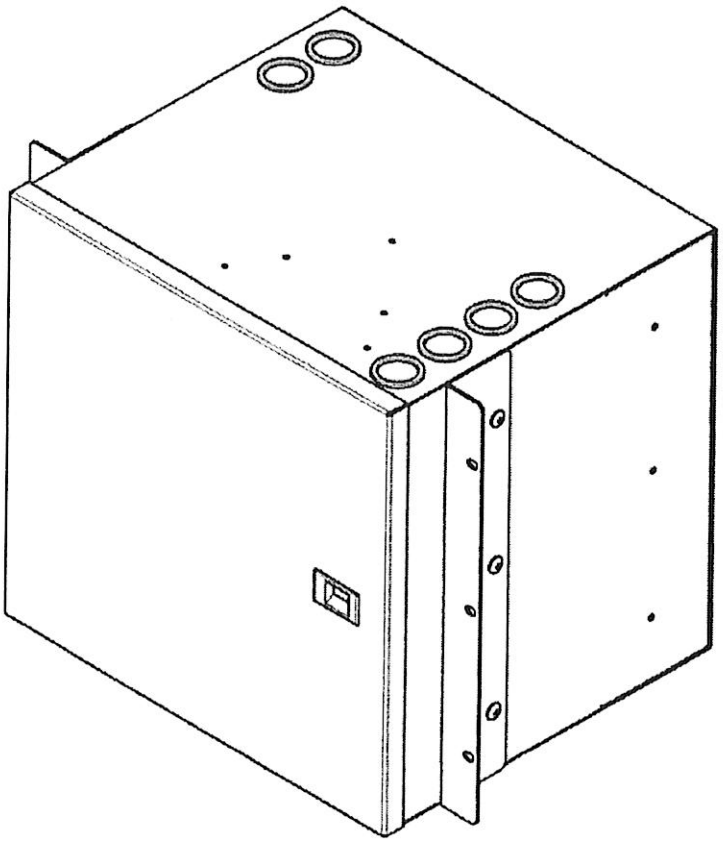
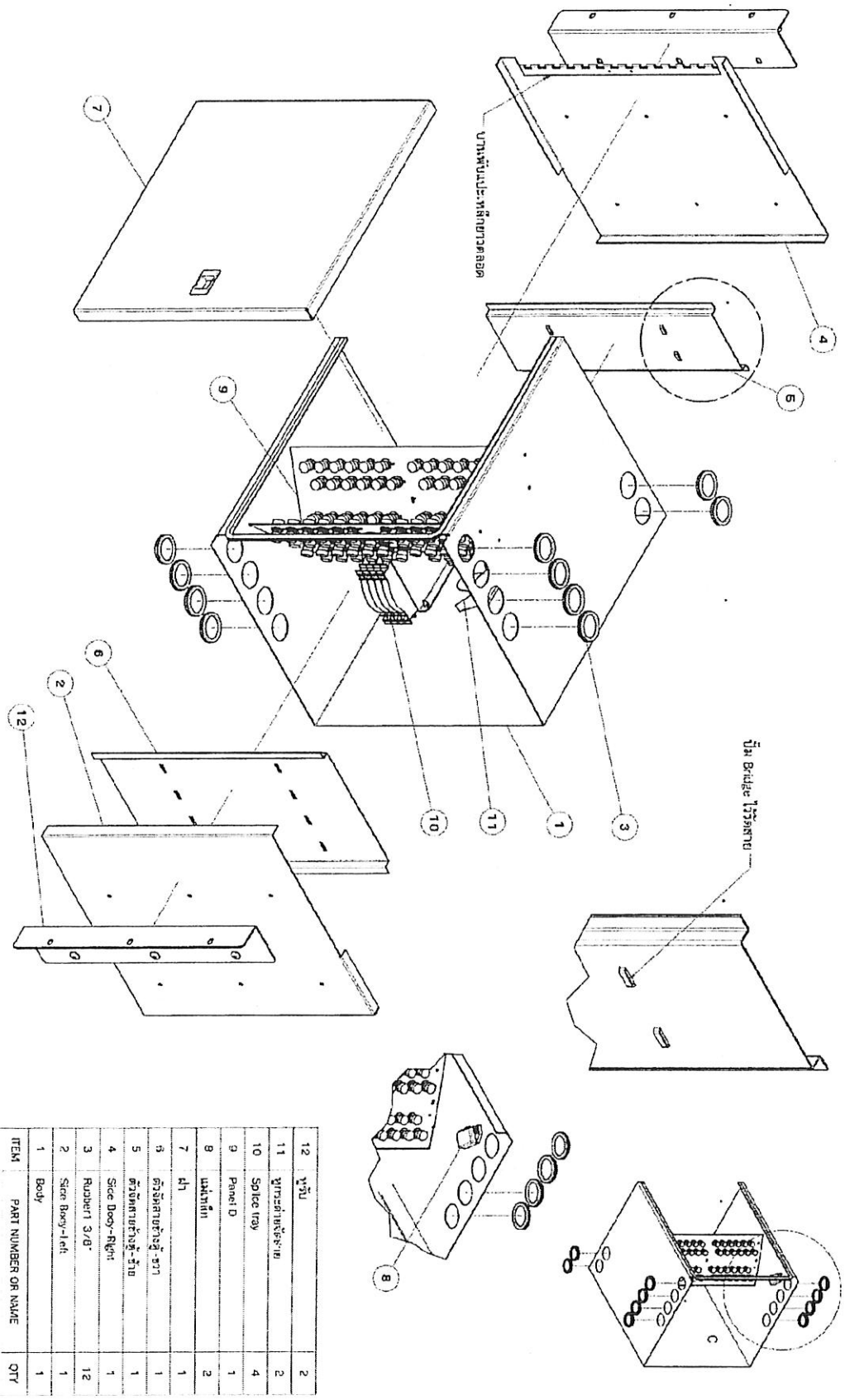


Figure Guideline of Optical Fiber Distribution Frame (ODF)



Parts List

ITEM	PART NUMBER OR NAME	QTY
1	Body	1
2	Side Body-Left	1
3	Rubber1 3/8"	12
4	Side Body-Right	1
5	ตัวจับสายเข้าตู้-ซ้าย	1
6	ตัวจับสายเข้าตู้-ขวา	1
7	ฝา	1
8	แผ่นกั้น	2
9	Panel D	1
10	Splice tray	4
11	หูกระดิกยึดถาด	2
12	หูรับ	2

1.13) Outdoor Optical Distribution Frame (Outdoor ODF) (CDD-ODF-OUTDOOR-001)

Specifications No.: CDD-ODF-OUTDOOR-001

TECHNICAL SPECIFICATION

(1) Outdoor ODF used for outdoor applications and shall be install outdoor on concrete pole or wall. (Include accessory for install on concrete pole and wall)

(2) Outdoor ODF shall be totally protected against dust and protected against strong jets of water. (Same as IP65)

(3) Outdoor ODF shall support the termination of 48 fibers or better which have 24 fiber per splice tray or better and Individual removable each splice tray outdoor type

(4) Outdoor ODF shall support adapter type at least FC, SC, LC, ST.

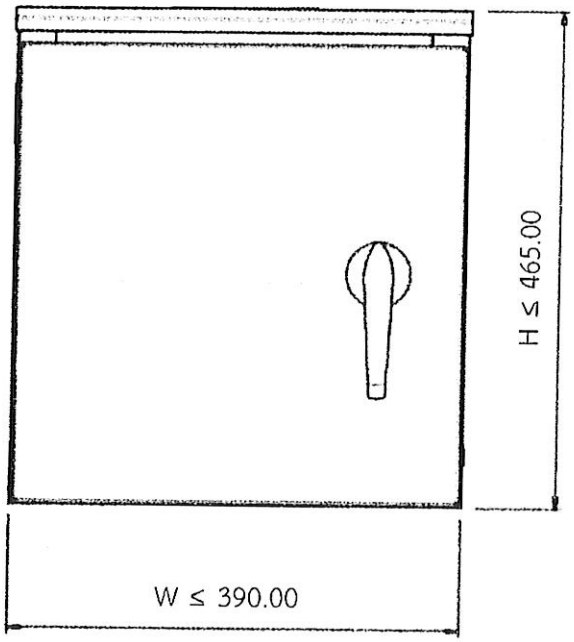
(5) Outdoor ODF shall have cable entry at the bottom not less than 4 ports use cable glands. And Provide rubble sealing 4 mm thickness for water protection.

(6) The dimension of Outdoor ODF should be less than or equal to (W) 390 mm. x (H) 465 mm. x(D) 162 mm. and have one door lockable and keys

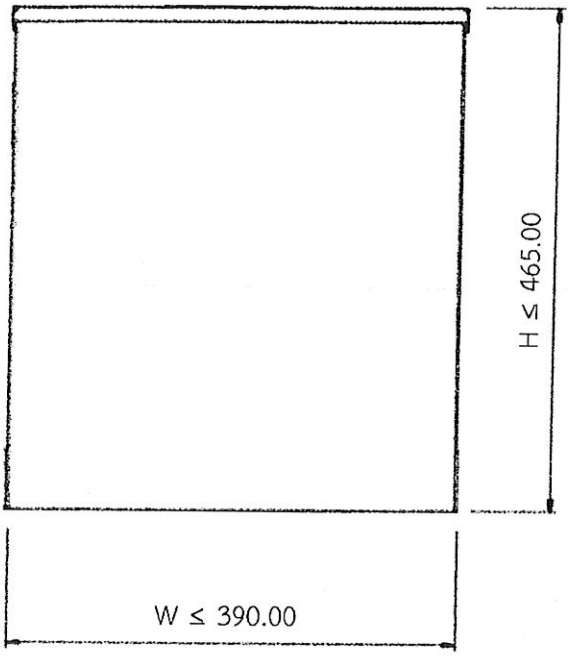
(7) A weatherproof lock is provide by Cylinder Lock with Sealing cover

(8) Outdoor ODF body made of Aluminum or stainless steel thickness shall be not less than 1.5 mm. and powder coated 65 microns. All screw or nut made of stainless steel

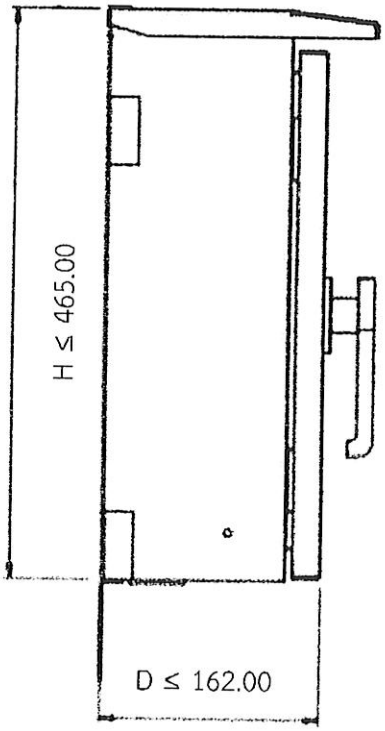
(9) Outdoor ODF bracket (I frame) made of Galvanizing Hot dip or Aluminum thickness shall be not less than 2.0 mm. and can be sliding.



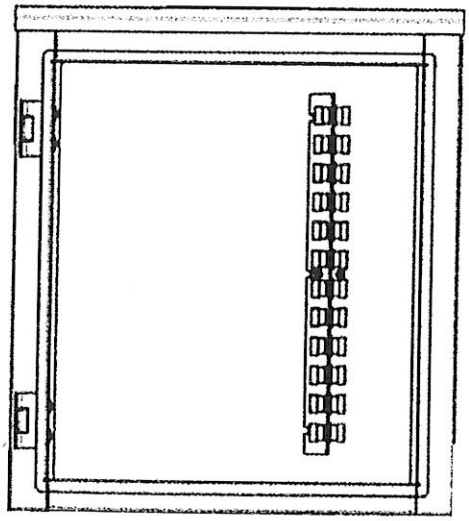
Font View



Back View



Side View



Inside View

Unit : mm.