

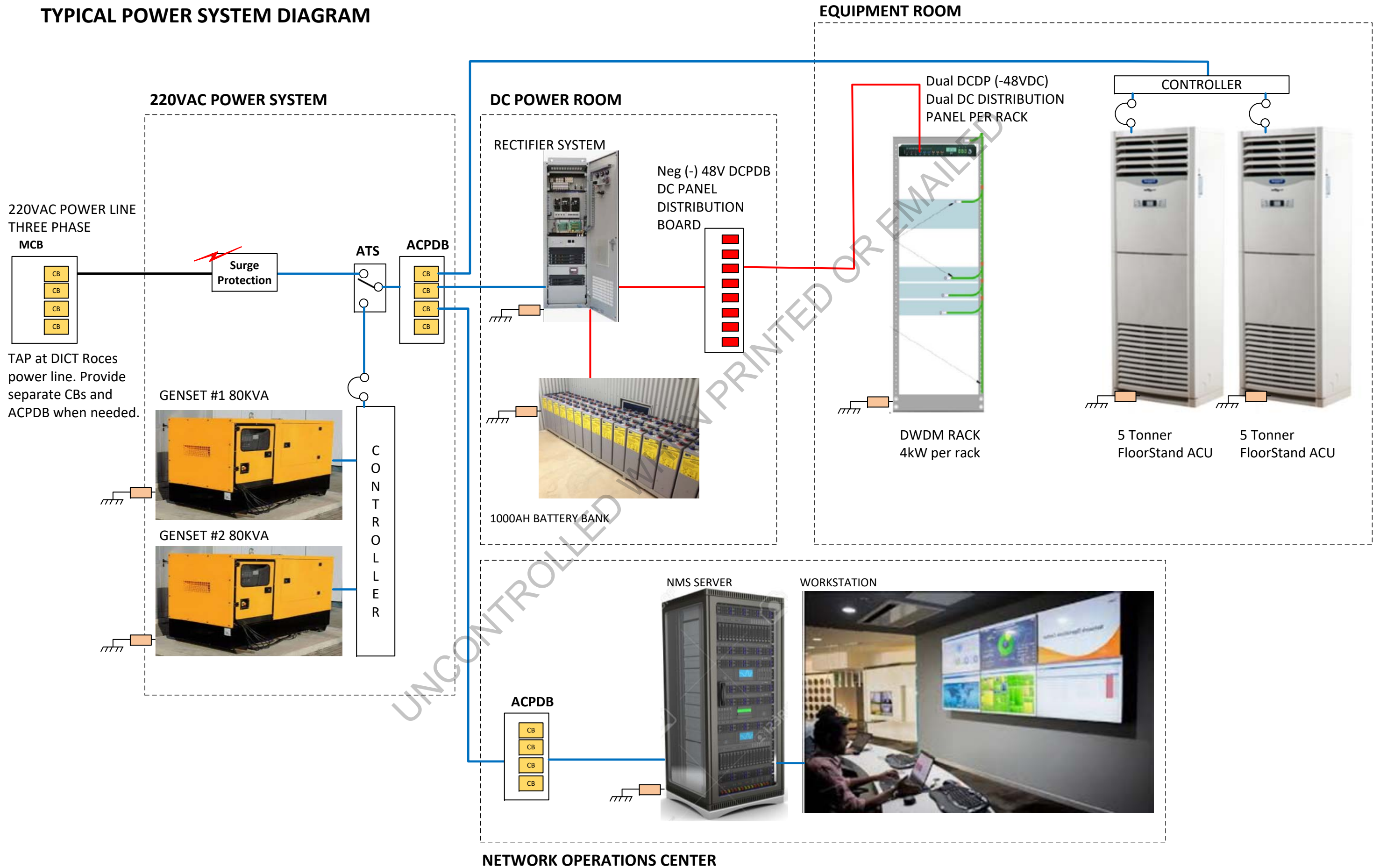
**OPTICAL TRANSPORT NETWORK
BILL OF QUANTITIES**

| | Description | Qty | Price (VAT Inclusive) |
|---|---|---|-----------------------|
| 1 | DWDM/ ROADM Broadband System a. DWDM/ ROADM b. In-Line Amplifier (ILA) | 24 sets 1 set | |
| 2 | Network Management System (NMS) 1. Base Software 2. License 3. Server | 1 lot | |
| 3 | Power and Backup Power System a. Rectifier b. Battery c. Generator Set d. Fuel Tank e. Air Conditioning Unit | 2 sites 2 sites 2 sets 1 set 2 sets | |
| 4 | Spares | 1 lot | |
| 5 | Other hardware peripherals, ancillaries, accessories but not limited to pluggable modules, SFPs, patch cords, distribution panels, circuit breakers, grounding busbars/rods/cable, cable trays, etc. for the operation of the Optical Transport Network | 1 lot | |

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DICT ROCES EQUIPMENT NODE

TYPICAL POWER SYSTEM DIAGRAM



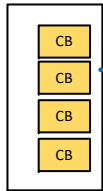
DICT NGDC3 NODE

TYPICAL POWER SYSTEM DIAGRAM

220VAC POWER LOAD LINE

TAP at NGDC3's ACPDB Load Line. Provide separate CBs and ACPDB when needed.

ACPDB



DC POWER ROOM

RECTIFIER SYSTEM



Neg (-) 48V DCPDB
DC PANEL
DISTRIBUTION
BOARD



1000AH BATTERY BANK

EQUIPMENT/SERVER ROOM

Dual DCDP (-48VDC)
Dual DC DISTRIBUTION
PANEL PER RACK



DWDM RACK
4kW per rack

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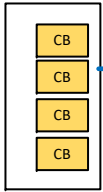
DICT LBI NODE (SFLU CLS, RS, BALER CLS)

TYPICAL POWER SYSTEM DIAGRAM

220VAC POWER LOAD LINE

TAP at LBI's ACPDB Load Line. Provide separate CBs and ACPDB when needed.

ACPDB



DC POWER ROOM

RECTIFIER SYSTEM



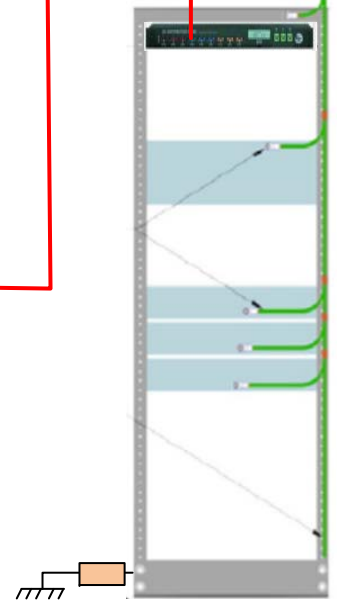
Neg (-) 48V DCPDB DC PANEL DISTRIBUTION BOARD



BATTERY BANK

EQUIPMENT/SERVER ROOM

Dual DCDP (-48VDC)
Dual DC DISTRIBUTION
PANEL PER RACK

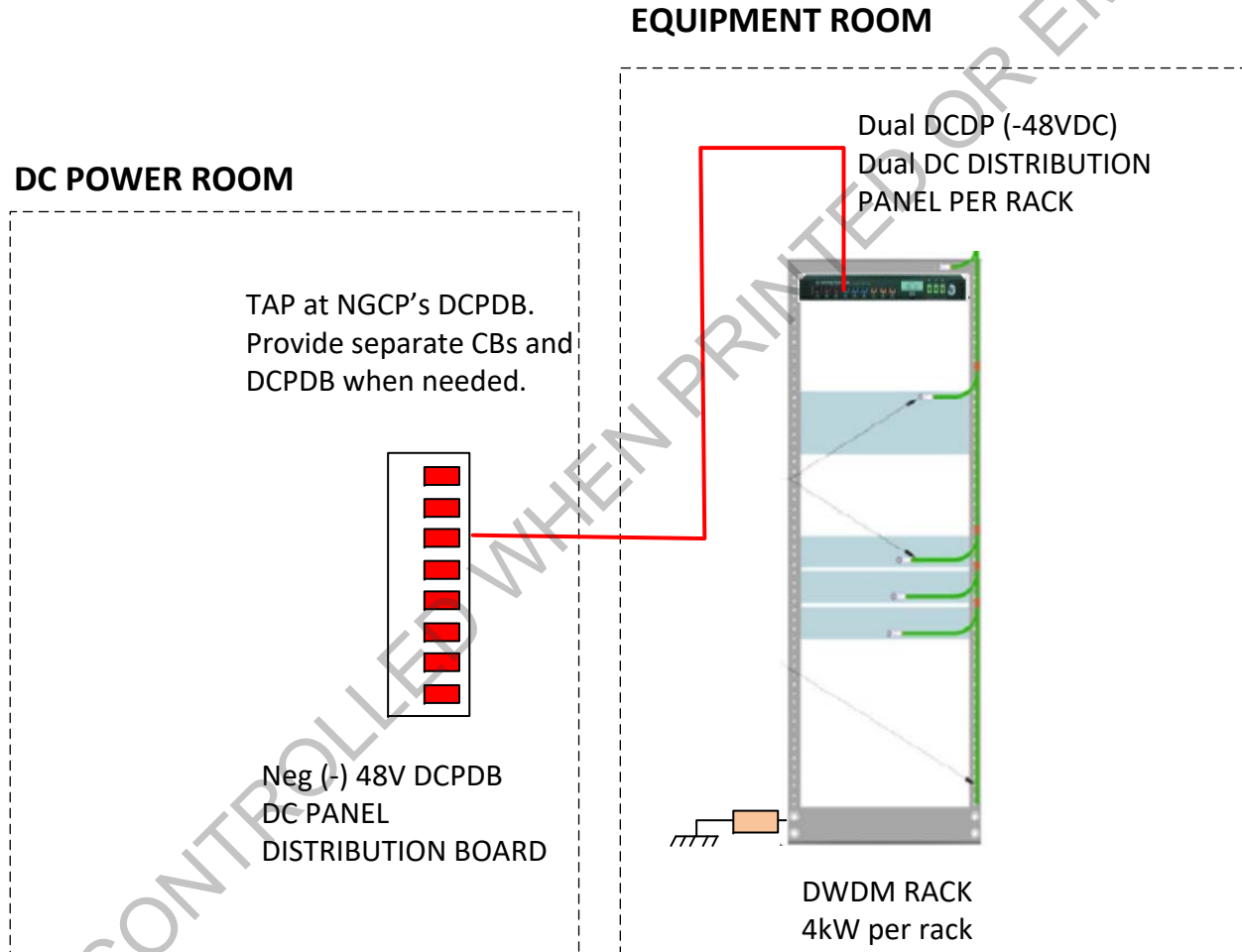


DWDM RACK
4kW per rack

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NGCP NODE

TYPICAL POWER SYSTEM DIAGRAM



FOC BUILD

C1.2 Nodes/Sites with Cable Entrance Facility (CEF)

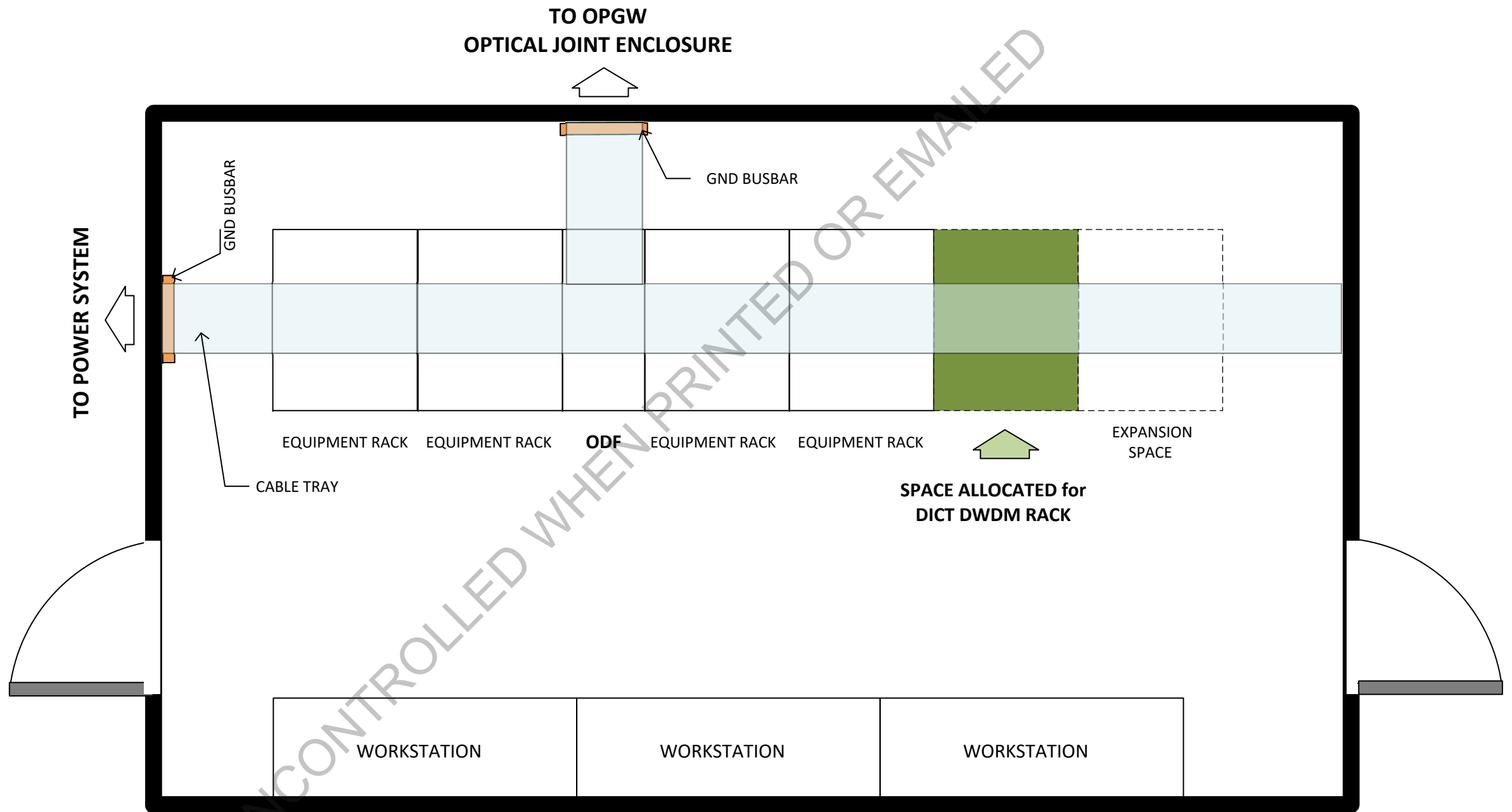
| Item No. | Node/Site |
|----------|-----------------------------------|
| | NGCP |
| 1 | Araneta (old name Doña Imelda) |
| 2 | Bacnotan |
| 3 | Balingueo |
| 4 | Bantay |
| 5 | Bauang |
| 6 | Bolo (old name Kadampat) |
| 7 | Cabanatuan |
| 8 | Clark |
| 9 | Concepcion |
| 10 | Hermosa |
| 11 | Laoag |
| 12 | La Trinidad |
| 13 | Mexico |
| 14 | Nagsaag |
| 15 | Olongapo |
| 16 | San Esteban |
| 17 | San Jose 500kV |
| 18 | Subic |
| | DICT |
| 19 | Baler ICLS |
| 20 | SFLU ICLS |
| 21 | NGDC 3 |
| 22 | Roces |
| 23 | Baguio PoP |
| | BCDA |
| 24 | Poro Point Management Corporation |
| 25 | John Hay Management Corporation |
| 26 | NGAC |
| 27 | Clark Free Port Zone |

Note:

Provision for telecommunication poles and/or pole risers near or adjacent to service manhole as needed

NGCP

TYPICAL EQUIPMENT ROOM



Node Design Details

| Item No. | Site A | | | | | | | Site B | |
|----------|------------------|--------------|--------------------|--------|--------|--------|------------------|-----------------|--------------------------------|
| | Node | Province | Ring Configuration | Router | Type | Degree | Client Interface | DICT PoP Sites | Distance from Access Node (km) |
| 1 | NGCP Araneta | Metro Manila | Ring 2 | | C-F | 2 | - | - | - |
| 2 | DICT Baler_CLS | Aurora | | | C-F | 1 | 3x10GE | Aurora PoP | 0 |
| 3 | NGCP Balingueo | Pangasinan | | | C-F | 2 | 1x10GE | Dagupan PoP | 15.5 |
| 4 | NGCP Balintawak | Metro Manila | Ring 2 | | CD-F | 3 | - | - | - |
| 5 | NGCP Bauang | La Union | | | CD-F | 3 | - | - | - |
| 6 | NGCP Bolo | Pangasinan | Ring 1 | | CD-F | 3 | - | - | - |
| 7 | NGCP Botolan | Zambales | | | ILA | - | - | - | - |
| 8 | NGCP Clark | Pampanga | | | C-F | 1 | 1x10GE | Mabalacat PoP | 16 |
| 9 | NGCP Concepcion | Tarlac | Ring 1/Ring 3 | | CD-F | 3 | 3x10GE | Tarlac PoP | 13.5 |
| 10 | NGCP Diliman | Quezon City | Ring 2 | | C-F | 2 | - | - | - |
| 11 | NGCP Hermosa | Bataan | Ring 1 | | C-F | 2 | 1x10GE | Bataan PoP | 24.5 |
| 12 | NGCP La_Trinidad | Benguet | | | C-F | 1 | 3x10GE | Baguio PoP | 5 |
| 13 | NGCP Mexico | Pampanga | Ring 1/Ring 3 | | CD-F | 3 | 1x10GE | Pampanga PoP | 10 |
| 14 | NGCP Nagsaag | Pangasinan | Ring 1/Ring 3 | | CD-F | 3 | - | - | - |
| 15 | DICT NGDC3 | Zambales | | PE | C-F | 1 | 3x10GE | Subic PoP | 0 |
| 16 | NGCP Olongapo | Zambales | Ring 1 | | CD-F | 3 | - | - | - |
| 17 | DICT Roces | Metro Manila | Ring 2 | PE | CD-F | 2 | 1x10GE | Roces PoP | 0 |
| 18 | DICT RS2 | Pangasinan | | | C-F | 2 | - | - | - |
| 19 | NGCP San_Jose | Bulacan | Ring 3 | | CD-F | 3 | 1x10GE | Bulacan PoP | 32 |
| 20 | NGCP San_Rafael | Bulacan | | | Bypass | - | - | - | - |
| 21 | DICT SFLU_CLS | La Union | | PE | CD-F | 2 | 1x10GE | La Union PoP | 3.5 |
| 22 | NGCP Subic | Zambales | | | Bypass | - | - | - | - |
| 23 | NGCP Cabanatuan | Nueva Ecija | Ring 3 | | C-F | 2 | 1x10GE | Nueva Ecija PoP | 27 |
| 24 | NGCP Bacnotan | La Union | | | C-F | 2 | - | - | - |
| 25 | NGCP San Esteban | Ilocos Sur | | | C-F | 2 | 1x10GE | Bangued PoP | 45 |
| 26 | NGCP Bantay | Ilocos Sur | | | C-F | 2 | 1x10GE | Vigan PoP | 2.51 |
| 27 | NGCP Currimao | Ilocos Norte | | | Bypass | - | - | - | - |
| 28 | NGCP Laoag | Ilocos Norte | | | C-F | 1 | 1x10GE | Laoag PoP | 3 |

Notes:

1. PE router will be deployed Q3 YR2021, not included in this bidding
2. FOC length provided in this file is for DWDM/ROADM pluggable module design considerations only
3. Baler and SFLU DWDM will be connected using DWDM/ROADM via RS site, FOC installation on the Luzon Bypass Infra is included in the Fiber Build component of the Phase 1 Project
4. Refer to Annex C on the details of FOC Build component of the Phase 1 Project
5. Minimum C-F (Colorless-Flex grid) ROADM architecture, upgradable to CD-F and CDC-F

National Fiber Backbone - Phase 1

| ITEM NO. | DESCRIPTION | QUANTITY | UNIT | ESTIMATED DIRECT COST | MARK-UPS IN PERCENT | | TOTAL MARK-UP | | VAT | TOTAL INDIRECT COST | TOTAL COST | UNIT COST |
|------------|---|----------|------|-----------------------|---------------------|--------|---------------|------------------|-----------------------|---------------------|------------------|------------------|
| | | | | | OCM | PROFIT | % | VALUE | | | | |
| (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8) | (9) (5) X (8) | (10) 12% ((5)+(9)) | (11) (9)+(10) | (12) (5)+(11) | (13) (12)/(3) |
| 15 | LC-LC Optical Patch Cords 20M SM/MM 1310nm | 60 | pcs | | | | | | | | | |
| 16 | LC-LC Optical Patch Cords 30M SM/MM 1310nm | 60 | pcs | | | | | | | | | |
| 17 | LC Optical Attenuators 1dB SM/MM 1310nm | 150 | pcs | | | | | | | | | |
| 18 | LC Optical Attenuators 3dB | 150 | pcs | | | | | | | | | |
| 19 | LC Optical Attenuators 6dB | 150 | pcs | | | | | | | | | |
| 20 | LC Optical Attenuators 10dB | 150 | pcs | | | | | | | | | |
| 21 | Fused 2x2 LC - LC Couplers | 90 | pcs | | | | | | | | | |
| 22 | Rectifier Module | 2 | pcs | | | | | | | | | |
| 23 | Slot Fillers | 2 | pcs | | | | | | | | | |
| 24 | Other peripherals required to maintain the rectifier system | 1 | set | | | | | | | | | |
| TOTAL COST | | | | | | | | | | | | |

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**DETAILED COST ESTIMATES (Design)
National Fiber Backbone - Phase 1**

| ITEM NO. | DESCRIPTION | QUANTITY | UNIT | ESTIMATED DIRECT COST | MARK-UPS IN PERCENT | | TOTAL MARK-UP | | VAT | TOTAL INDIRECT COST | TOTAL COST | UNIT COST |
|-------------------|--|----------|------|-----------------------|---------------------|--------|---------------|------------------|-----------------------|---------------------|------------------|------------------|
| | | | | | OCM | PROFIT | % | VALUE | | | | |
| (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8) | (9) (5) X (8) | (10) 12% ((5)+(9)) | (11) (9)+(10) | (12) (5)+(11) | (13) (12)/(3) |
| 1 | Design - FOC Build Network (Component 1) | 1 | lot | | | | | | | | | |
| 2 | Design - Transponder System (Component 2) | 1 | lot | | | | | | | | | |
| 3 | Design - Optical Transport Network (Component 3) | 1 | lot | | | | | | | | | |
| TOTAL COST | | | | | | | | | | | | |

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Design - Bill of Quantities

| | Description | Qty | Price (VAT Inclusive) |
|---|--|-------|-----------------------|
| 1 | Design - FOC Build Network (Component 1) | 1 lot | |
| 2 | Design - Transponder System (Component 2) | 1 lot | |
| 3 | Design - Optical Transport Network (Component 3) | 1 lot | |

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DETAILED COST ESTIMATES
National Fiber Backbone - Phase 1

| ITEM NO. | DESCRIPTION | QUANTITY | UNIT | ESTIMATED DIRECT COST | MARK-UPS IN PERCENT | | TOTAL MARK-UP | | VAT | TOTAL INDIRECT COST | TOTAL COST | UNIT COST |
|---------------------------|-----------------------------|----------|------|-----------------------|---------------------|--------|---------------|-----------|---------------|---------------------|------------|-----------|
| | | | | | OCM | PROFIT | % | VALUE | | | | |
| (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8) | (9) | (10) | (11) | (12) | (13) |
| | | | | | | | | (5) X (8) | 12% ((5)+(9)) | (9)+(10) | (5)+(11) | (12)/(3) |
| 100Gbps IP TRANSIT | | | | | | | | | | | | |
| 1 | 100 Gbps IP Transit- Tier 1 | 1 | Lot | | | | | | | | | |
| | TOTAL COST | | | | | | | | | | | |
| | | | | | | | | | | | | |

UNCONTROLLED WHEN PRINTED OR EMAILED

DETAILED COST ESTIMATES
National Fiber Backbone - Phase 1

| ITEM NO. | DESCRIPTION | QUANTITY | UNIT | ESTIMATED DIRECT COST | MARK-UPS IN PERCENT | | TOTAL MARK-UP | | VAT | TOTAL INDIRECT COST | TOTAL COST | UNIT COST |
|----------------------------------|--------------------------------------|----------|-------|-----------------------|---------------------|--------|---------------|-----------|---------------|---------------------|------------|-----------|
| | | | | | OCM | PROFIT | % | VALUE | | | | |
| | | | | | (6) | (7) | (8) | (9) | | | | |
| (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8) | (9) | (10) | (11) | (12) | (13) |
| | | | | | | | | (5) X (8) | 12% ((5)+(9)) | (9)+(10) | (5)+(11) | (12)/(3) |
| OPTICAL TRANSPORT NETWORK | | | | | | | | | | | | |
| 1 | DWDM/ ROADM Broadband System | | | | | | | | | | | |
| | a. DWDM/ ROADM | 25 | sets | | | | | | | | | |
| | b. In-Line Amplifier (ILA) | 1 | set | | | | | | | | | |
| 3 | NMS | | | | | | | | | | | |
| | 1. Base Software | 1 | lot | | | | | | | | | |
| | 2. License | | | | | | | | | | | |
| | 3. Server | | | | | | | | | | | |
| 3 | Power and Backup Power System | | | | | | | | | | | |
| | a. Rectifier | 2 | sites | | | | | | | | | |
| | b. Battery | 2 | sites | | | | | | | | | |
| | c. Genset | 2 | sets | | | | | | | | | |
| | d. Fuel Tank | 1 | set | | | | | | | | | |
| | e. Air Conditioning Unit | 2 | sets | | | | | | | | | |
| 4 | Spares | 1 | lot | | | | | | | | | |
| TOTAL COST | | | | | | | | | | | | |

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National Fiber Backbone - Phase 1

| ITEM NO. | DESCRIPTION | QUANTITY | UNIT | ESTIMATED DIRECT COST | MARK-UPS IN PERCENT | | TOTAL MARK-UP | | VAT | TOTAL INDIRECT COST | TOTAL COST | UNIT COST |
|---|---|----------|-------|-----------------------|---------------------|--------|---------------|------------------|-----------------------|---------------------|------------------|------------------|
| | | | | | OCM | PROFIT | % | VALUE | | | | |
| (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8) | (9) (5) X (8) | (10) 12% ((5)+(9)) | (11) (9)+(10) | (12) (5)+(11) | (13) (12)/(3) |
| 6 | 2. Manhole | 4 | sets | | | | | | | | | |
| | 3. Optical Joint Enclosure | 2 | sets | | | | | | | | | |
| | 4. Optical Distribution Frame | 2 | sets | | | | | | | | | |
| | 5. Cable Entrance Facility | 2 | sets | | | | | | | | | |
| 48c Segment 7: NGCP Concepcion - BCDA NGAC, 15.1km | | | | | | | | | | | | |
| 7 | 1. FOC, 6.25km/drum | 3 | drums | | | | | | | | | |
| | 2. Manhole | 16 | sets | | | | | | | | | |
| | 3. Optical Joint Enclosure | 3 | sets | | | | | | | | | |
| | 4. Optical Distribution Frame | 2 | sets | | | | | | | | | |
| | 5. Cable Entrance Facility | 2 | sets | | | | | | | | | |
| 48c Segment 8: NGCP Clark - BCDA Clark FPZ, 9.8km | | | | | | | | | | | | |
| 8 | 1. FOC, 6.25km/drum | 2 | drums | | | | | | | | | |
| | 2. Manhole | 11 | sets | | | | | | | | | |
| | 3. Optical Joint Enclosure | 3 | sets | | | | | | | | | |
| | 4. Optical Distribution Frame | 2 | set | | | | | | | | | |
| | 5. Cable Entrance Facility | 2 | set | | | | | | | | | |
| 144c miniFOC: DICT SFLU ICLS - DICT Baler, 250km | | | | | | | | | | | | |
| 9 | 1. FOC, 6.25km/drum | 42 | drums | | | | | | | | | |
| | 2. Optical Joint Enclosure | 42 | sets | | | | | | | | | |
| | 3. Optical Distribution Frame | 3 | sets | | | | | | | | | |
| 10 | 7-way HDPE Microducts, 1km incl of kits and accessories | 57 | drums | | | | | | | | | |
| 11 | TELECOM Poles, 10m and pole hardwares | 12 | sets | | | | | | | | | |
| 12 | Spares | 1 | lot | | | | | | | | | |
| TOTAL COST | | | | | | | | | | | | |

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FIBER OPTIC CABLE BUILD

BOQ

| | Description | Qty | Price (VAT Inclusive) |
|---|--|---------|-----------------------|
| 1 | 48c Segment 1: NGCP Bauang- SFLU ICLS, 6.13km | | |
| | 1. FOC, 4.19km/drum | 2 drums | |
| | 2. Manhole, with MH/HH accessories | 7 lots | |
| | 3. Optical Joint Enclosure, with kits and accessories | 1 set | |
| | 4. Optical Distribution Frame, with kits and accessories | 2 sets | |
| | 5. Cable Entrance Facility | 2 lots | |
| 2 | 48c Segment 2: DICT Roces - NGCP Araneta, 3.0km | | |
| | 1. FOC, 4.19km/drum | 1 drum | |
| | 2. Manhole, with MH/HH accessories | 4 lots | |
| | 3. Optical Joint Enclosure, with kits and accessories | 0 | |
| | 4. Optical Distribution Frame, with kits and accessories | 2 sets | |
| | 5. Cable Entrance Facility | 2 lots | |
| 3 | 48c Segment 3: NGCP Subic - DICT NGDC3, 6.58km | | |
| | 1. FOC, 4.19km/drum | 2 drums | |
| | 2. Manhole, with MH/HH accessories | 8 lots | |
| | 3. Optical Joint Enclosure, with kits and accessories | 1 set | |
| | 4. Optical Distribution Frame, with kits and accessories | 2 sets | |
| | 5. Cable Entrance Facility | 2 lots | |
| 4 | 48c Segment 4: NGCP La Trinidad - DICT Baguio PoP, 4.8km | | |
| | 1. FOC, 4.19km/drum | 2 drum | |
| | 2. Manhole, with MH/HH accessories | 6 lots | |
| | 3. Optical Joint Enclosure, with kits and accessories | 1 set | |
| | 4. Optical Distribution Frame, with kits and accessories | 2 sets | |
| | 5. Cable Entrance Facility | 2 lots | |
| 5 | 48c Segment 5: DICT Baguio PoP - BCDA Camp John Hay, 5.23km | | |
| | 1. FOC, 4.19km/drum | 2 drums | |
| | 2. Manhole, with MH/HH accessories | 7 lots | |
| | 3. Optical Joint Enclosure, with kits and accessories | 1 set | |
| | 4. Optical Distribution Frame, with kits and accessories | 2 sets | |
| | 5. Cable Entrance Facility | 2 lots | |
| 6 | 48c Segment 6: DICT SFLU ICLS - BCDA PPMC, 2.8km | | |
| | 1. FOC, 4.19km/drum | 1 drum | |
| | 2. Manhole, with MH/HH accessories | 4 lots | |
| | 3. Optical Joint Enclosure, with kits and accessories | 0 | |
| | 4. Optical Distribution Frame, with kits and accessories | 2 sets | |
| | 5. Cable Entrance Facility | 2 lots | |
| 7 | 48c Segment 7: NGCP Concepcion - BCDA NGAC, 15.1km | | |
| | 1. FOC, 4.19km/drum | 4 drums | |
| | 2. Manhole, with MH/HH accessories | 16 lots | |
| | 3. Optical Joint Enclosure, with kits and accessories | 3 sets | |
| | 4. Optical Distribution Frame, with kits and accessories | 2 sets | |
| | 5. Cable Entrance Facility | 2 lots | |
| | 48c Segment 8: NGCP Clark - BCDA Clark FPZ, 9.8km | | |

| | | | |
|--|---|----------|--|
| 8 | 1. FOC, 4.19km/drum | 3 drums | |
| | 2. Manhole, with MH/HH accessories | 11 lots | |
| | 3. Optical Joint Enclosure, with kits and accessories | 2 sets | |
| | 4. Optical Distribution Frame, with kits and accessories | 2 sets | |
| | 5. Cable Entrance Facility | 2 lots | |
| 9 | 48c FOC stub, 11 sites | | |
| | 1. FOC, 4.19km/drum | 1 drum | |
| | 2. Manhole, with MH/HH accessories | 11 lots | |
| | 3. Optical Joint Enclosure, with kits and accessories | 11 sets | |
| | 4. Optical Distribution Frame, with kits and accessories | 11 sets | |
| 5. Cable Entrance Facility | 11 lots | | |
| 10 | 144c miniFOC: DICT SFLU ICLS - DICT Baler, 250km | | |
| | 1. FOC, 4.19km/drum | 63 drums | |
| | 2. Optical Joint Enclosure, with kits and accessories | 62 sets | |
| 3. Optical Distribution Frame, with kits and accessories | 3 sets | | |
| 11 | 7-way HDPE Microducts, 1km incl of kits and accessories | 57 drums | |
| 12 | TELECOM Poles, 10m, with pole hardwares | 12 | |
| 13 | Spares, section 1.2 | 1 lot | |
| 14 | Other kits and accessories, hardwares, ancillaries but not limited to earthing/grounding materials, bridge/culvert brackets/hanger kits, GI & PVC 4" Pipes, cable organizers, cable trays/ladders, conduit/microduct plugs, etc., necessary for the establishment and operation of the Fiber Optic Cable Build project. | 1 lot | |

Notes: Quantity is a minimum requirement. Actual quantity depends on the design of the winning bidder.

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