

# Comcast Regional Systems

## MDU/COMMERCIAL BUILDING PRE-WIRE SPECIFICATIONS

This document covers the installation requirements for standard coax service, Fiber to the premise (FTTP) and Fiber to the Unit (FTTU) architectures

### COAXIAL CABLE – Home Run Wiring

1. All service or "drop" cable used in pre-wire construction must be Quad-shield, 75 ohm, RG-6 PVC jacketed coaxial cable. It consists of an 18 AWG copper clad center conductor protected by a foam dielectric, which is then covered with two overlapping foils of which the inner foil is bonded to the foam dielectric. One layer of a wire braid conductor with a minimum of 60° coverage wraps this; Copper braid is NOT acceptable. The cable must be rated for a medium to high noise environment. No other cable for pre-wire construction is acceptable without prior written consent from **Comcast**. All F-connectors must meet Comcast performance standards – Snap & Seal SNS6, Digicon PCT-DRS-6Q, or (PPC brand) EX6X11, or equivalent compression type connector.
2. All service or "drop" cable must meet the FCC's Cumulative Leakage Index (CLI) standard and be installed to meet or exceed National Electrical Code (NEC) and other local electrical, fire, and building codes.
3. According to NEC Article 820, coaxial cable designations depend on the environment it's being installed in and the actual methods of installation. The following excerpts will help you install the proper rated cable within the building.
  - I. Article 820-49: Coaxial cables installed as wiring within buildings shall be listed as being resistant to the spread of fire in accordance with Sections 820-50 and 820-51.
  - II. Article 820-50: Coaxial cables in a building shall be listed as being suitable for the purpose, and cables shall be marked in accordance with Table 820-50. The Cable voltage rating shall not be marked on the cable. (Voltage markings on cables may be misinterpreted to suggest that the cables may be suitable for Class 1, electric light, and power applications). Table 820-50 summary: Cable markings include CATVP, plenum cable; CATVR, riser cable; CATV, standard cable; CATVX, limited use.
  - III. Article 820-51: Cables shall be listed in accordance with (a) through (d) below. A cable with a more stringent rating can be substituted for a lesser rated one.
    - a. **Type CATVP**. Type CATVP community antenna television plenum cable shall be listed as being suitable for use in ducts, plenums, and other spaces used for environmental air and shall also be listed as having adequate fire-resistant and low smoke-producing characteristics.
    - b. **Type CATVR**. Type CATVR community antenna television riser cable shall be listed as being suitable for use in a vertical run in a shaft or from floor to floor (when penetrating more than one floor) and shall also be listed as having fire-resistant characteristics capable of preventing the carrying of fire from floor to floor.

- c. **TYPE CATV.** Type CATV community antenna television cable shall be listed as being suitable for general purpose CATV use, with the exception of risers and plenums, and shall also be listed as being resistant to the spread of fire.
  - d. **TYPE CATVX.** Type CATVX limited-use community antenna television cable shall be listed as being suitable for use in dwellings and for use in raceway (EMT conduit) and shall also be listed as being flame retardant.
  - e. **FTTU ( Fiber to the Unit) option Plenum Micro Duct**  
**(Durline product 2005213010)**
    - a. Microduct 10mm outside diameter/8mm inside diameter
    - b. Duct will be orange in color and marked with sequential footage and Comcast
    - c. Duct will have Silicore lining and have internal ribs.
    - d. Duct will have an installed 200lbs rated pull line.
    - e. Duct will meet standard and be installed to meet or exceed National Electrical Code (NEC) and other local electrical, fire, and building codes.
1. **Micro duct Installation Process:**
    - a. Should be installed loose in walls if possible.
      1. All conduit runs must not exceed 270° per run.
      2. Special handling care must be taken not to kink, twist, stretch, or burn through Micro Duct while pulling over and or around obstacles. Such damaged duct will not be acceptable and will be replaced.
    - b. Termination points should have 15 feet of coiled product.
    - c. Developer is responsible for each micro duct to be labeled with the unit or apartment number.
    - d. All micro duct runs must be installed whole and continuous from Smartbox (Premise Media Box) to Fiber Terminal locations. No couplers or splices will be accepted.

## WIRING CONFIGURATION

1. Buildings must be pre-wired in a "home run" manner with each living unit having its own separate service cable running from a terminal location. Home runs must be continuous cables with no splices between the terminal location and the apartment and must be no greater than one hundred-fifty foot (150') in length, unless otherwise approved by Comcast . RG-11 cable may be use in runs longer than 150' in length – but **MUST BE** approved by Comcast prior to installation.
2. Special handling care must be taken not to kink, twist, stretch, or burn through cables while pulling over other cable or around obstacles. Such damaged cables are not acceptable and will be replaced.
3. A unit can have as many outlets installed as is practicable however, only one additional outlet per unit may be looped. If a unit will have more than one additional outlet, the outlets must be wired in a star configuration branching out from the living room (primary) outlet or other central location within unit; i.e. coat or hall closet. It is also an acceptable practice to home-run additional outlets to the terminal area if it is more convenient.

4. Each outlet location should consist of an open switch (plaster) ring or extra-deep two-gang electrical box with a single-gang cover plate. An open switch plaster ring is preferred in order to accommodate the excess cable, connectors, and signal equipment. The use of plaster rings is required at the primary outlet on all units wired in a star configuration.
5. Twenty-four inches (24") of cable must be left coiled at each outlet location. **Developer is responsible for trim out of each location using specified connectors aforementioned above.**
6. Single-gang wall plates with a 3/16" diameter hole, furnished by the Owner, must be installed on all outlets.
7. If so desired, one inch (1") EMT conduit with twelve inch (12") radius sweeps may be installed in lieu of the coaxial cable for any home-run or additional outlet. 90° pulling elbows of any type are not acceptable. The EMT must be equipped with a pull string so **Comcast** may install its cables within. The above specifications still apply.
8. Openings around penetrations through fire-resistant walls, partitions, floors, or ceilings shall be fire-stopped using approved methods.

## TERMINALS

1. Terminal locations must be placed in areas that are (and will remain) accessible to **Comcast** personnel at all times. Tradesman entrances, garages, utility rooms and telephone terminal closets are acceptable locations for placing cable TV terminals. Storage rooms and locked rooms that are controlled by individual residents are not to be used for terminal placement. Terminal locations must be placed at least six feet (6') from gas meters in an open area. They may not share a small space such as a closet or small room with gas meters.
2. Each terminal cabinet has the maximum capacity of 24 home run outlets, (multiple boxes can be used to accommodate additional home run outlets). **A 4' x 8' sheet of 3/4" plywood must be mounted for all terminal locations.**
3. A minimum of ten feet (10') of cable must be left at each terminal location.
4. The location of the terminal cabinet should be mounted at a height of no less than four feet high from the bottom of the terminal cabinet and no greater than six feet high. The location should be configured so that foot traffic is well clear of the eight-inch deep terminal box and must be free of hazards such as door openings and stairways.
5. **Comcast** will furnish and install terminal cabinets upon activation of the system. **Comcast** will issue terminal cabinets to Owners for custom flush mounting in MDU buildings, provided a Service Contract has been executed. Neutral boxes or terminal locations are to be provided by Owner, unless otherwise negotiated by with Comcast. Should more than one terminal cabinet be required at a single location, the layout of the cabinets must be approved in advance by **Comcast** personnel.
6. A suitable ground must be provided at each terminal location.
7. **FTTU (Fiber to the Unit) Option apartment premise**
8. **SmartBox (premise media box)**
  - a. Power required

## 1. Standard 110 Outlet grounded.

- b. 10"x 10" space to mount CPE (Comcast Premise Equipment)
- c. All coax cable outlet runs need to terminate in the SmartBox (premise media box)
- d. A unit can have as many outlets installed as is practicable. If a unit will have more than one additional outlet, the outlets must be wired in a star configuration branching out from the SmartBox (premise media box). In runs free of splices to the additional outlets throughout the unit.

## POWER SUPPLY

### Powering Requirements

Comcast may require a Power Supply to provide correct powering for all system related electronics:

- a. Developer to provide a 100 amp 240VAC 3 phase circuit or an equivalent metered socket preferable off the main house panel.
- b. Power Supply cabinet and sub meter will be installed by Comcast.
- c. Dimension for Alpha Technologies power supply are 26Wx44Hx24D.

## 9. INPUTS

- 1. Owner/ Developer shall place 3 Schedule 40, 2" PVC underground service (mainline sub- structure) conduit from the primary terminal in the building to the sidewalk location at the property line as specified by **Comcast**. Inside the building 4" EMT conduit may be substituted, unless otherwise specified.
- 2. 90° "Sweeps" with a twenty-four inch (24") radius are to be used at all bends. Larger sizes are acceptable. A pull string **must be** installed in all conduits.
  - Inside buildings and garage areas two-inch (2") EMT conduit may be substituted. All sweeps must have a minimum 18" in radius. For long runs, such as between terminal locations, a pull can measuring at least 16" x 16" with a depth of 10" must be installed every one-hundred fifty feet (150 maximum) and, when possible, should be configured to have the conduits positioned to reduce any offsetting connections. All conduit runs must not exceed 270° per run. **Pull line must be installed.** Two-inch EMT conduit sleeves will suffice in riser areas.
- 1. Properties being served with overhead (aerial) utilities shall provide a weather-head at the input point to the building. The weather-head shall be connected to the terminal location by a conduit at least two inches (2") inch diameter.

2. Please refer to the Information for New Underground Subdivisions, Projects, and Buildings for a more detailed description

### ADVANCED SERVICES

- **Comcast**, in order to provide some advanced broadband services, requires inter-connect capabilities between our equipment and the property's telephone Minimum Point Of Entry (MPOE) punch-down terminal blocks.
  1. In the event that our equipment is in a location other than that of the telephone punch-down terminal blocks, the developer shall place a minimum of 2" conduit, as described previously under "INPUTS", between the telephone punch-down terminal block location and our nearest terminal location.
  2. Telephony inter-connect equipment supplied by **Comcast** shall be located adjacent to and in direct proximity with the property telephone punch-down terminal location. Each telephony inter-connect cabinet has the maximum capacity to feed 24 units. A 4' x 4' (minimum) sheet of 3/4" plywood must be mounted for each **Comcast** telephony inter-connect cabinet.
  3. An electrical ground must be provided at our telephony inter-connect cabinet location.

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### ACCESS

1. In order for **Comcast** to complete our make ready work, **Comcast** or its agent may require access to all pre-wired units to verify and tone out all pre-wired outlets. Failure to provide access to all units will be cause for **Comcast** personnel to postpone, reschedule, or cancel all scheduled work therein.
2. If the cable TV terminal location(s) is placed in a controlled access area, **Comcast** will require a key to said area(s), to be permanently held by **Comcast** for access to our equipment, before building will be released for installs.

### PROJECT PLANS

- Owner or Owners Agent shall provide **Comcast** with accurate scaled project plans in both a hard copy and electronic AutoCAD 14 (.dwg) format with distances of inputs and home run lengths prior to the start of work or activation of the cable system.
- Underground utility projects must include trench layout.
- Riser/communications diagrams.
- Unit matrix or final count an addressing

## New Underground Subdivisions, Projects, and Building

- For Single Family Homes the minimum size for the exterior service box at the side of the home shall be at least 14-3/4" wide x 11" tall by 5 1/2" deep or larger.
- Developer is responsible for placement of all sub-structure (ducts, conduits) from right of way to utility D mark location as specified by Comcast. All underground substructure work must be installed in accordance to G.O. 128 and any other applicable regulations. Comcast will place our distribution cable in the duct after the duct structures is inspected and approved by our representatives. A mule tape or pull string must be installed in all conduits. Comcast will install drop cable from our plant to pre-wired buildings after the pre-wiring job is inspected and approved by our representatives.
- Install Christy CATV Utility boxes with bases and lids, or other brands with the same dimensions, and space them to no greater than 250' or where indicated on the prints and/or deemed by Comcast Construction and Engineering Use the following dimension:
  - B-36 17 1/4" X 30"      **B-44 20 1/4" X 42 1/4"**      B-52 30" X 60"
- Install the main distribution (sub structure) duct structure with a minimum of (1) 4 inch mainline(if required by Construction and Engineering) and (3) 2 inch PVC, schedule 40 PVC for both with 2" or 4" 90 degrees sweeps. All sweeps must be at least 24" in radius. Larger sizes are acceptable. This pipe must be installed at a minimum depth of 18" below grade for sidewalk and 24"for street asphalt or otherwise deemed by local city department of public safety. All substructure runs **must not** exceed 270° maximum without a utility vault installed. If the length of the conduit run is short- Comcast will request that the run not exceed 180° without a vault installed.

## DISCLAIMER

- **Comcast** reserves the right to amend these specifications and descriptions without notice and will provide adequate written notification to the builder. Buildings not meeting these specifications may encumber the ability for **Comcast** to provide service.

## GROUNDING

**Grounding the CATV system is a major requirement by the National Electrical Code and State Electrical Code. In order that Comcast fully complies with these regulatory bodies. Comcast requires that builder to make provisions for attaching our CATV terminal box to the cold water distribution mast. A dedicated ground from this mast and attached #6 ground wire (preferably solid) to the Terminal location would fulfill this requirement.**