Laguna Woods Village – Prewire Standards

I. Definition

Prewire: Fiber wiring from the **Network Interface Device (NID)** to the **entry point outside the exterior wall of each unit**, run through existing **Raceway** (Panduit) wherever possible. Raceway currently contains coax and should be reused to minimize new raceway installation.

All existing coax cable must be considered live and active and must be gently handled and protected from damage.

II. Prewire Standards Goals

1. **Reduce customization** – remove ambiguity and customization for technicians at the time of prewire and in-unit installation. In-unit power outlet location and customer preference for termination location do not govern fiber entry point, prewire termination location, or interior wall plate location.
2. **Reduce pathway decisions** – pathways and termination points should be predetermined and defined prior to prewire installation.
3. **Reduce panduit additions** – maximize reuse of existing exterior panduit pathways.
4. **Approved routing dictated** – clear decision & approval process on non-standard prewire termination points.
5. **Define Pre-wire Termination Preferred Location hierarchy –** (see Section III).
6. **Aligned to building types** – Pre-wire standards apply to the majority of building types.
7. **Eliminate rework during in unit installation and risk to in unit installation reschedule** – Ensure that the location and quality of the prewire allows the in unit installation to occur at the scheduled time without issue, rework, or reschedule.

III. Prewire Termination Location Standards

Each unit must have **one pre-defined exterior termination point** for prewire. Utilizing the existing Panduit (raceway) pathways from NID to Unit, the options for prewire termination are:

- **Option 1 – Preferred: Living Room**
    - Default termination point.
    - Used in the majority of cases.

- **Option 2 – Secondary: Entry point other than the living room (i.e. Bedroom) aligned with the existing raceway.**
    - Acceptable alternative if living room entry is not feasible due to pathway conflicts or structural restrictions.
- **Option 3 – Exception (Requires Approval):**
    - If neither Option 1 nor Option 2 are usable (e.g., raceway pathways blocked, raceway is inaccessible, or physical constraints), the termination must follow the **Exception Process** outlined in **section V.**

Additional prewire location criteria:

- Only one termination point is selected per unit. No multiple-entry scenarios.
- Prewire termination location should be at a vertical run of raceway to allow for entry hole height adjustment at time of in-unit install.
- Prewire termination locations must be accessible to in-unit installers without additional structural modification (i.e. a first floor prewire should be terminated on the first floor and not terminated on the 2nd floor).

IV. Prewire Construction Standards

Raceway obstructions

Where raceway pathways intersect with obstructions such as beams or moulding the options for crossing the obstructions are:

- **Option 1 – Preferred:** Installers **must first attempt** to fish the fiber through the obstruction, by following the existing coax cable, utilizing fish tape or other methods **that will not damage the coax cable**. Apply clear silicone as needed to reseal the hole from water intrusion.
- **Option 2:** If Option 1 cannot be completed without damaging the coax or structure, installers shall drill **adjacent to the existing hole** using a standard ⅜″ bit, ensuring the raceway fully covers the fiber and the new hole is sealed with clear silicone to prevent water intrusion.
- **Option 3:** If Options 1 and 2 cannot be safely or technically completed, installers must route the fiber around the obstruction on the exterior and add new raceway to fully cover the fiber pathway, per raceway standards.

Raceway

- Raceway must be flush against the building.
- Raceway must fully cover fiber cables.
- Raceway must be installed in accordance with the CABLEREADY installation instruction guide. The guide can be found at www.ppc-online.com and searching for “Cableready Installation Instruction Guide”.
- Raceway must be left in previous or better condition.

Slack/Fiber Management

- Slack or Fiber Coils must be left clear of any doorways, windows, or items that may damage the fiber prior to installation.
- Fiber must be either zip tied to the existing coax cable or raceway brackets to ensure that it does not fall out of the raceway or get pinched during replacement of raceway cover.
    - Fiber cannot be zip tied to any coax removed from a raceway
- Fiber must not be pinched, bent, or stressed beyond fiber specifications.
- Fiber slack staged at each prewire termination point must be at least 20 feet.

Prewire Testing & QA

- Prior to installation QA is performed to ensure the standards in this document are met.
- After the prewire is placed to the termination location and spliced at the NID, all ground-level prewires are tested utilizing bare-fiber tester prior to the in-unit installation.

Cleanup

- Jobsite must be left in “same or better” condition than before work began.
    - Panduit covers replaced.
    - Any hand prints from installation removed.
    - Trash/debris cleared.
    - Dispose of trash at designated area at the Broadband office.
    - Resident property (furniture, planters, decorations,etc) returned to original location(s).

NID

- Place NID in the lockbox on the exterior of the building.
- If a building does not have 2 NID locations, upsize the primary NID appropriately.
- Prewire crew to leave 5’ of excess.
- Testing complete with bare fiber test + necessary closeout photos.

Existing Coax Cable

- **ONLY if the raceway is completely full of coax cable** and there is not room for fiber, the coax cable may be removed from the raceway and temporarily secured to the outside of the raceway during the prewire.
    - **All coax cable must be considered live and active** and must be gently handled and protected from damage.
    - Any coax cable temporarily secured outside the raceway **must be taut, uniformly zip tied, and free of visible sag** to maintain a professional appearance until the end of the project when it will be removed.
- Coax must remain live and undamaged.

V. Exception Approval Process and Decision Tree

This exception process will be utilized for any scenario where the prewire will not follow the pre-approved path or for any prewires that are unable to meet the prewire standards.

1. Vendor to tag building in CMS as exception with proposed pathway and notes and photos.
2. Ting PM engaged via CMS for review and solution approval.
3. If Ting PM determines that GRF approval is required – Paul or Hank are engaged by Ting PM for alignment and approval on solution.

Laguna Woods Village – In-Unit Install Standards

I. Definition

In-Unit Install: Fiber wiring from the prewire termination point into the interior of each unit, minimizing custom in home wiring and terminating cleanly within each unit.

All existing coax cable must be considered live and active and must be gently handled and protected from damage.

II. In-Unit Standards Goals

- **Aligned to pre-wire options** – Interior standards must integrate seamlessly with existing pre-wire termination options.
- **Eliminate customization** – No resident-driven or technician-driven custom placement. Outlet locations are predetermined.
- **Eliminate exposed fiber** – Fiber must be contained within the wall, outlet box, or approved wallplate assembly. No visible fiber runs inside the unit other than those entering inside a closet.
- **Enable quick installs** – Standardized placement and termination ensures technician installs are consistent and fast.
- **At outlet level** – Fiber outlets shall be installed at standard electrical outlet height. If coax exists, fiber shall be placed directly left or right of the coax wallplate.

III. Unit Penetration, Fiber Wallplate, & ONT Placement Standards

Each unit must have **one pre-defined in-unit termination point** that aligns to the exterior prewire termination location.

Exterior Penetration Standards

- Exterior penetration points must be made behind the existing exterior raceway.
- Exterior penetration points must be sealed with clear silicone.
- Penetration should be made using a standard ⅜” bit.

Scenario 1 - Wallplate on exterior wall

In this scenario the prewire location is aligned with a wall cavity on an exterior wall of the unit. The wall plate will be installed directly on the inside of that exterior wall. The exterior fiber entry point must enter into the same wall cavity that will contain the interior wallplate, allowing a clean and direct pathway. Technicians may drill into the wall cavity and route the fiber to any suitable wallplate location within that cavity, provided the pathway remains contained and does not introduce unnecessary complexity.

1. Placement must always be at outlet level, not mid-wall or ceiling.
2. Inside the unit, the ONT wallplate may be placed 2–5 inches left or right of an existing utility wallplate (coax, power, or telecom) within the same wall cavity.

Scenario 2 - Wallplate on interior wall

In this scenario the prewire location is aligned with an interior wall perpendicular to the exterior wall. The wall plate will be installed on the interior wall in the first wall cavity closest to the exterior wall.

1. Placement must always be at outlet level, not mid-wall or ceiling.
2. Distance from any existing wallplate should be no less than 2 inches and no greater than 5 inches with the existing wall cavity.
3. Distance from the interior wall corner should be no less than 4 inches and no greater than 8 inches.

Scenario 3 - Wallplate on closet wall

In this scenario the prewire location is aligned with an interior closet. The wall plate will be installed on the outside of the closet wall.

1. Placement must always be at outlet level, not mid-wall or ceiling, and must be on one of the outside walls of the closet.
2. Fiber must be routed using approved clips spaced no more than 12 inches apart along interior closet walls from exterior wall penetration point to a point where the fiber will pass through the closet wall and into the wall plate on the outside of the closet.
3. Distance from any existing wallplate should be no less than 2 inches and no greater than 5 inches with the existing wall cavity.
4. Distance from the interior wall corner should be no less than 4 inches and no greater than 8 inches.
5. Interior holes inside the closet must be covered with fiber hole covers or sealed with clear silicone.

Additional Criteria:

- Only one in-unit fiber ONT and wall plate per unit.
- Fiber outlets should be placed at outlet level, so that the top of the wall plate is 12 to 16 inches from the floor.
- 1 ft of slack fiber must be stored inside the wall plate. No slack fiber is permitted outside the wall plate.
- Any interior fiber penetration holes must be concealed behind the wall plate.

- “Property of Ting” Stickers will be placed on the ONT itself (not the wall plate).
- Installers are NOT expected to move furniture to meet these standards, and are NOT expected to change the in-unit standards to work around furniture or resident requests.
    - If the resident is unable to move furniture, the install may need to be moved to the exception process outlined in Section VI.
- **All existing coax cable must be considered live and active** and must be gently handled and protected from damage.

Power cord standards:

Power cords will be provided as a service to residents, but only given as a last resort:

1. Installers must use existing power outlets whenever available before requesting any extension cord.
2. If existing outlets are insufficient, the installer must ask the resident to provide a power strip or extension cord prior to requesting one from the lead.
3. If the install cannot be completed without providing an extension cord, installers must obtain lead approval before any extension cord is issued or used. Power cords will not be issued to installers directly and their use must be approved by their lead.

IV. In-Unit Eero/router placement Standards

- Place Eero within 10 ft of the ONT for a clean, reliable connection.
    - Do not route ethernet where cables could cause a tripping hazard.
- The quantity of Eeros installed will be pre-defined for installers based on the unit’s square footage: one Eero per 1,500 square feet, or two Eeros for units larger than 1,500 square feet.
- “Property of Ting” Stickers will be placed on the top of each Eero without covering the Eero label.
- Eeros must be placed in a central, open location—preferably on a table or credenza—to ensure optimal coverage.

  Best practices for best wireless coverage and aesthetics:

- Eeros must be positioned 3–4 ft above ground level, unless no elevated surface exists.
- Use the shortest ethernet cable that works for residents' solutions.
- Maintain 3 ft of clearance from TV, microwaves, and HVAC, if possible.
- Eero may only be placed on the floor when no elevated option exists.

V. Optical Light Level Testing & Verification Standards

Purpose:

To ensure every in-unit fiber installation meets the required optical power standards and performance specifications for the XGS-PON network prior to activation.

Testing Requirements:

- After the ONT has been connected to the interior fiber wallplate, the installer must measure the optical receive (Rx) power level at the ONT using an approved optical power meter.
- The ONT light level must measure between –12 dBm and –21 dBm.
- The target range for optimal performance is –13 dBm to –17 dBm.
- All light tests should be done at a wavelength of 1550 nm.
- Readings outside this range must trigger an inspection of connectors, splices, and fiber cleanliness before the installation is considered complete.
- Installers must not complete activation until an acceptable light level has been verified.

Documentation:

- The measured ONT light level must be recorded in the CMS, accompanied by photo documentation of the power meter display showing the reading.
- If the reading is outside the acceptable range, the installer must notify their Lead immediately to assist with resolution.

Cleanliness & Handling:

- All connectors must be cleaned and inspected before measurement and connection.
- No ONT should be left connected with an out-of-spec light level.

VI. Exception Approval Process and Decision Tree

This exception process will be utilized for any scenario where the in-unit install will be unable to be completed to meet the in-unit install standards for the following reasons.

- The unit is built in such a way that meeting the standards is impossible.
- There are furniture or other obstructions preventing the installer from meeting the standards.
- The resident pauses the installer from proceeding at time of install based on the standards (i.e. the resident stops the installer from placing the ONT in the location approved in the standards)

Exception process:

1. Installer will engage Vendor lead for approval to add additional exterior raceway:
    a. If approved, exterior raceway will be placed **per raceway standards outlined in LWV Standards - Pre-wire.**
2. If exterior raceway is not approved or possible, Vendor Lead will engage Ting PM who will make best efforts to facilitate completion of the install via:
    a. Customer engagement
    b. Pathway solutioning and approval
3. If installation cannot be completed through any approved option, the Ting PM must determine whether the unit is to be tagged as an exception and escalate to GRF for final approval – Paul or Hank are engaged by Ting PM for alignment and approval on solution and/or reschedule the install.