



WHITE RIVER **CONNECT**

Powered by **WRVEC**



DROP AND INSTALLATION
STANDARDS

Drop Crew Responsibilities

The drop crew is responsible for the following items for each drop.

1. Ensure the customer is comfortable with the process.
2. Communicate any issues that arise during the drop installation with the customer or White River Connect (WRC) as appropriate.
3. If the crew needs to leave for any reason the customer will be informed of when they will return.
4. Ensure the work area is always kept free from trash and is disposed of properly.
5. Ensure tools and fiber is kept out of reach of pets and children.
6. Never leave the work area without picking up all tools and loose items.
7. Document final testing of the drop is complete before leaving, as shown on page 6 of this RFP.
8. Ensure any penetrations are properly secured and sealed.
9. If the crew discovers a dead/defective RDT/MST port, the contractor shall notify WRC ASAP for resolution.
10. Fusion splice at the house NID a SC/APC Fiber Pigtail, provided by WRC, to the fiber drop.
11. Scope and clean all new drop connectors before terminating at any MST/NID/Slack box.
12. Leave the customer with a positive experience. Ensure everything looks “clean” including all attachments and the fiber path outside.
13. If ever in doubt regarding a standard do not assume, call WRC.
14. At no point create or place yourself in an unsafe condition.

Customer Walkthrough

Once the drop crew arrives on site the below process must be followed.

WRC will receive preauthorization for the drop to be run so that the work can be completed in the customer's absence. Please check the workorder for any specifics regarding how the drop should be completed. Drop crew should attempt to make contact with the homeowner.

Drop crew will show their WRC provided badge to the customer and introduce themselves to the customer; ***“Hello, I’m (name) working on behalf of White River Connect and will be installing your fiber drop today.”***

UNDER NO CIRCUMSTANCES - **If the customer is under 18 the drop crew will not enter the residence** until an adult is available. If the drop construction can be completed without entering the residence, complete the drop installation.

After the introduction, walk the customer through the drop install. This will include the following, not necessarily in this order.

- Explain where the drop will be located.
- Explain what materials will be used for the drop attachment.
- Point out any unusual items they may need to complete the install.
- Point out and document any damage to the house or property before starting.
- Do not start until the customer agrees.
 - If there are any discrepancies contact WRC for resolution before starting the install.
- After the drop is finished, complete a final walk through with the customer.
 - Point out the fiber path and show them where the NID is located.
 - If the customer does not agree with the install, the installer will reach out to their supervisor or WRC to assist in the resolution.

NID installation specifics

OptiNID® Duo Quick Start Installation Instructions



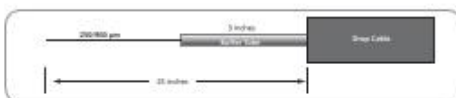
Mounting locations
Screw and Strap



Two types of grommets
Circular and U grommets



Drop Cable Preparation with half-piece
of foam tape. See Scales below.



Proper placement of drop
buffer tube



Secure drop cable with
compression connector



Secure drop cable with clip
and grommet



Field-installable connector
installed on drop cable



Slide removable splice chip to
disengage or engage into base



Populated splice chip
single, mass or splitter

OptiNID® Duo Quick Start Installation Instructions



Route spliced 900 µm pigtail.
Clean and install connector.



Additional devices may be installed
splitters or filters.



Optional demarcation cover and
optional security screw.



Insert additional SC or LC Adapters.
Install with metal clips in
demarcation chamber.



Clean and install premise drop
connector



Attach foam and tiewrap to secure
premise drops.



Slide Ground into place to engage
into base

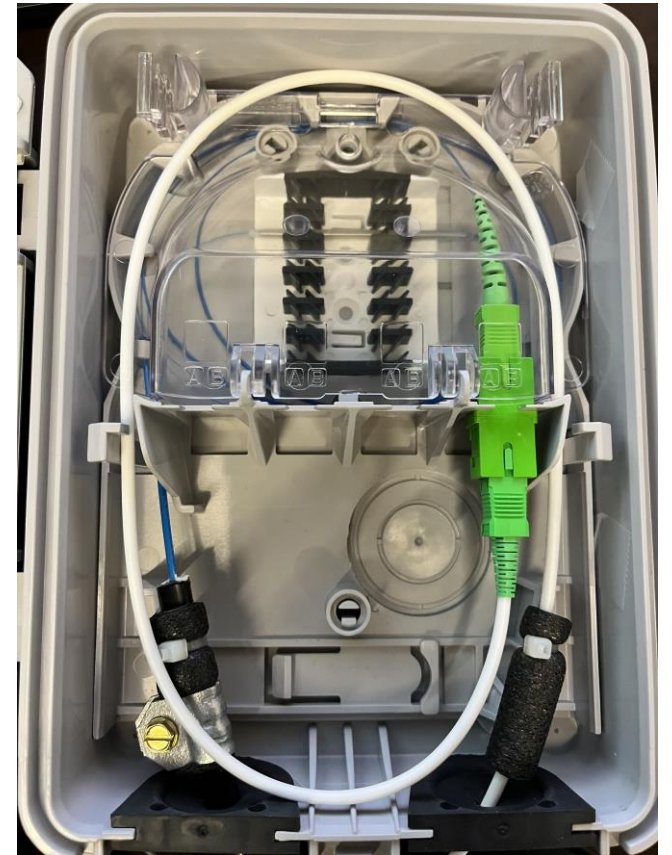
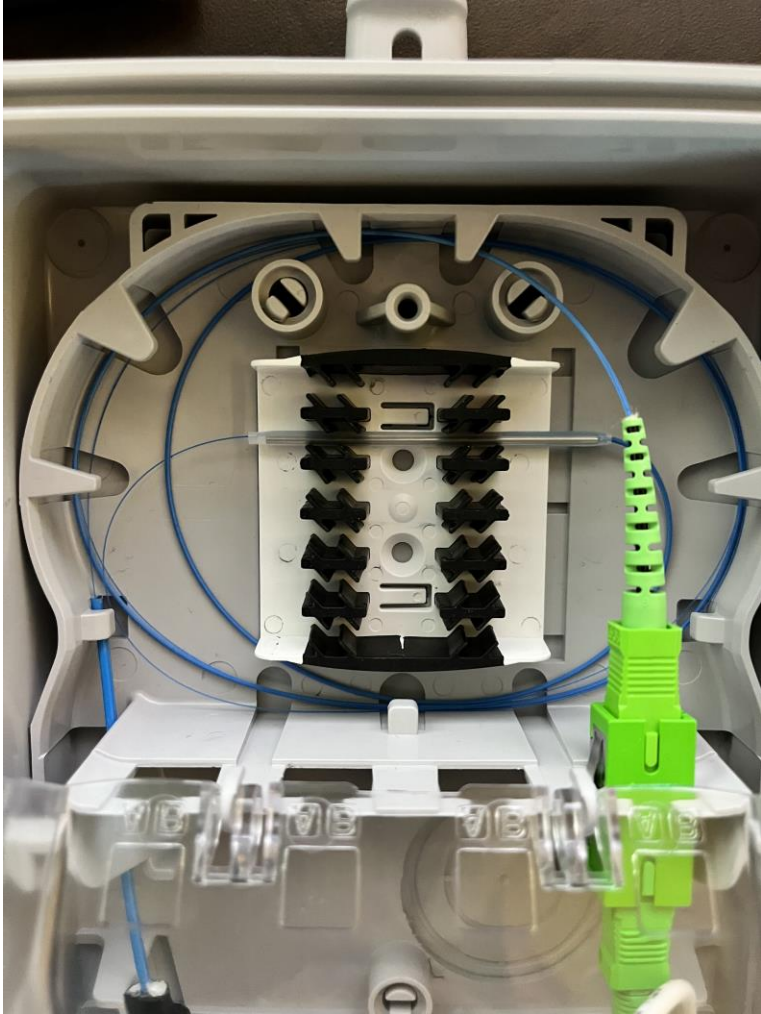


Close and Secure NID Optional screw



QR code for additional information.

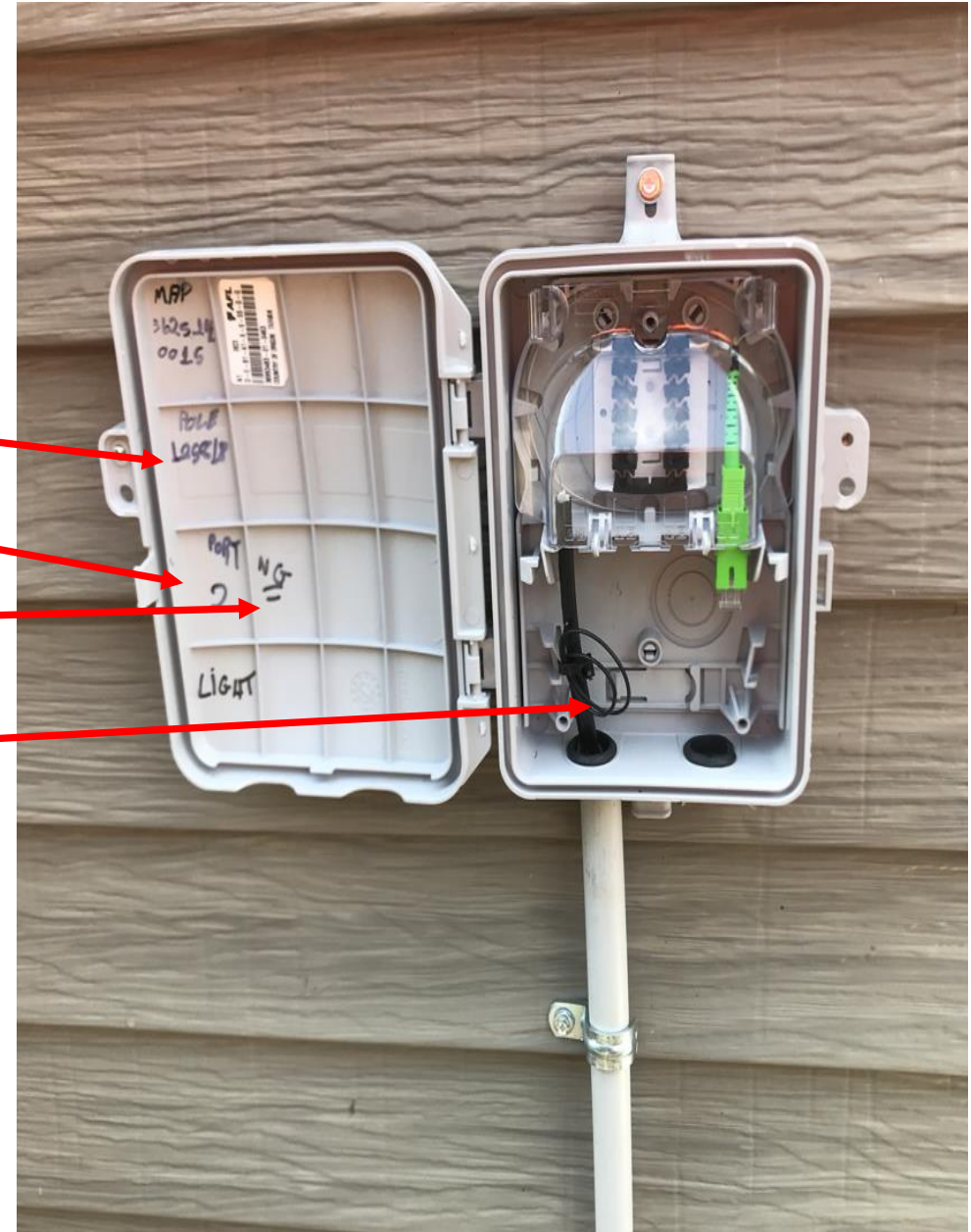
NID Examples



Labeling and Reporting

Provide the following information in the NID in black permanent marker:

1. RDT/MST port number.
2. Provide light levels at the house NID.
3. Initials of lead installer.
4. Locate trace wire on buried drops, leave a 5" coil inside of NID.
5. If light level is outside of acceptable range of -10 to -25dbm report to WRC immediately.
6. Complete drop template, close tasks in WRC system, and report required information including any issues when job is complete. **Document everything.**



Drop to NID example

Mobile Home

When performing an install at a mobile home, the NID will be installed on a trailer stake. The inside drop will be buried between the trailer stake and house and should not be more than 2'.

The drop between the pole and trailer stake must be buried a minimum of 12" deep.

Tracer wire is not required in this situation.

Aerial drops still must have the NID mounted on a trailer stake.



House Drop Attachment

When considering where to attach the drop to the house, below are a couple of considerations:

- Ensure there is enough clearance for the drop between the pole and house. Generally, 10' over walk areas and 15'6" over driveways.
- Follow comms if possible. If not follow power.
- Slack should match existing lines.
- From the house attachment to the NID, the drop should stay close to eaves by tucking under existing house structure where possible.
- When bringing the drop from the eaves to the NID, ensure a vertical line and attach approximately every 3 to 4 ft with the first anchor no more than a foot below the eaves.

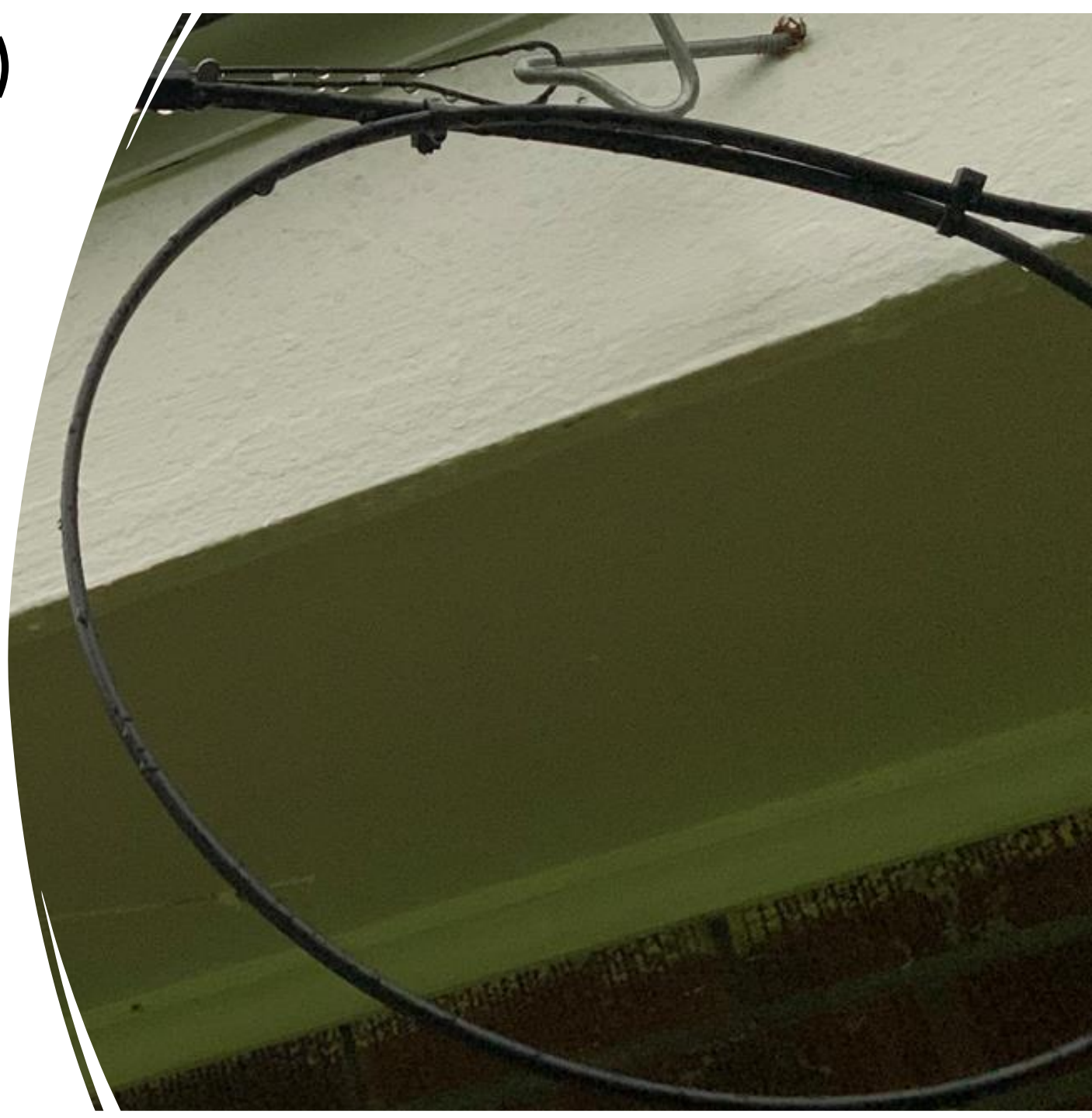
House Drop Attachment (cont.)

Positives:

- Minimum 24" of fiber to create a coil.
- Double tie wrap approximately 6" apart.
- Ensure the drop loop is located between the P clamp and the first attachment on the house.
- P clamp is properly installed to house attachment.

Improvements:

- House attachments must be secured properly. The attachment will come out over time.



House Drop Attachment (cont.)

Positives:

- House attachment is properly installed.
- Clamp is properly installed.

Improvements:

- No coil.
- Drop should follow roofline back to the top of the wall and be attached.
- Drop attached no more than 12" below top of wall.
- Ensure the transition between roof and wall does not create a micro bend.



Aerial Drop Standards

When placing a drop on a pole below are a few considerations:

- WRC fiber drops are to be placed in the communication space only on the pole (following the 30"-40" rule). If make-ready is needed in order to achieve this, contact WRC and make them aware so that make-ready can be scheduled in a timely manner.
- WRC fiber drops will be placed below lowest power.
- "Lowest power" not to include unprotected, sheathed primary or secondary risers or streetlights.
- Attached fiber must never be in contact with any power equipment. Power mast clamps maybe used by exception only when a clearance issue is present and there is no other way to achieve the correct height. A power mast clamp should never be placed on a mast that is already carrying an excessive load. WRC must be contacted, and approval obtained, to use a power mast clamp.
- Locations where power equipment is present, such as transformers, switches, etc., fiber will maintain a 30" separation. In cases where its not possible to move existing 3rd party down due to a clearance issue exceptions may be given to lower 6" but must be approved by WRC. Drops must never be attached in a way to create an unsafe condition.
- WRC fiber drops are to be placed above 3rd party attachers unless an exception is provided by WRC.
- Use J-Hooks and P-clamps or wire-formed dead-ends at all poles depending on the type of drop.
- Drops should be placed above trees and brush. Drops should never be hanging in limbs.
- Sag should follow existing power neutral.
- Drop sag should not dip below any existing cables.
- If there is not enough space between existing cables to maintain proper sag. Contact WRC for further assistance.
- In cases where it is not possible to follow these rules or there is a question exactly where cable should be placed the construction crew will reach out to WRC for clarification.

Aerial Drop Standards (cont.)

Drop Midspan Clearance Standards:

- All heights at midspan below specified height must be preapproved by WRC.
- When the fiber drop is transitioning from the stub pole to the home, vehicle inaccessible areas require 10' of clearance.
- When the fiber drop is transitioning from the stub pole to the home, driveway and field access crossings require 15'6" of clearance.
- When fiber drops are spanning from stub pole to stub pole, a minimum of 18' of clearance is required in fields with farm equipment.
- All listed minimum clearances must be maintained throughout the entirety of the span and follow the sag of existing cables or power attached to poles.
- Before any construction starts all clearance will be reviewed with WRC and Construction Contractor.
- When placing drops, any drop paths with span lengths that are less than 325', Trident flat drop shall be placed. Any drop paths which have spans in excess of 325' shall use ADSS drops for the entirety of the drop run.

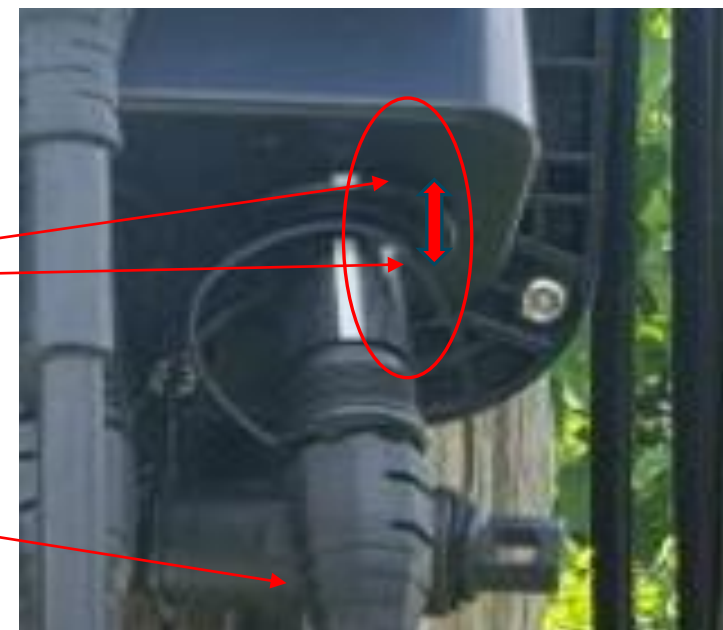
Pole drop attachment

- Cable must be attached in communications space on pole following to 30"-40" rule.
- Follow existing cable to determine what side of the pole to place drop.
- Use one J-Hook with two Mini Dead-ends or P-clamps where applicable.
- No less than 6" spacing between existing cables.
- On an angle pole a J-Hook should always be on the inside of the angle.
- Two drops can be placed per one J-Hook on each pole.



Pole drop attachment (cont.)

- When available use bridal rings for a drop path down the pole.
- Never tie wrap to another drop not owned by WRC.
- Bridal rings need to be installed every 36".
- Drops should maintain a 12" drip loop below the bottom of the terminal.
- Never tension the drop between two bridal rings.
- **When installing the connectorized drop into the MST/RDT port, ensure the two white lines match. Never force the drop into the port; doing so could ruin it.**
- Ensure the dust caps are screwed together.



Pole drop attachment (cont.)

- Never wrap a pole with a drop.
- Two drops per J-Hook.



Buried Drop Standards

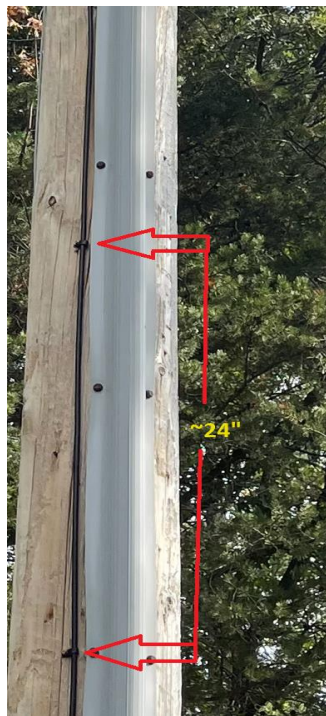
When burying a drop, below are a few considerations:

Drop crew should attempt to make contact with the homeowner. However, WRC will receive preauthorization for the drop to be run so that the work can be completed in the customer's absence. Please check the workorder for any specifics regarding how the buried drop should be completed.

- If there is any concern of unmarked private utilities the crew/supervisor should schedule with the customer to review the path prior to burial and spot any customer-owned facilities within the proposed path, including but not limited to gas lines, sprinkler systems, secondary power, etc.
- **NEVER START DIGGING WITHOUT 811 CALLS CLEARED AND REQUIRED PERMITS IN HAND.**
- Drops will be buried a minimum of 12" deep using trench, bore, or plow as applicable. Where not achievable, consult WRC for clarification on how to proceed.
- If rock is encountered during installation so that the drop cannot be placed to the required minimum depth, the installer shall determine for the customer the nature and extent of the rock encountered. Based on this information, WRC shall determine whether the cable is to be rerouted.
- Keep a minimum separation of 3' from parallel utilities and maintain a minimum of 1' separation when crossing other utilities.
- During install, care must be taken to not exceed manufacturer's specified bend radius.
- When/if duct is available, 3 drops are allowed per 1¼" when installed at the same time.
- Following the secondary power is preferred, whenever possible.
- Tracer wire to be placed with all drop installations where dielectric/non-locatable drops are used.
- If drop is damaged during installation, it is the responsibility of the installer to repair or replace it.
- Installer is responsible for any utility damages that may occur during placement of the fiber drop.
- Open pits will be fenced and covered before leaving any jobsite.
- Hand digging over top of existing secondary power maybe required as the most effective means of placing a drop to the home. In this case, fiber shall be placed at a minimum of 12" in depth.

Buried Drop Standards (cont.)

- 3' of orange ½" SDR11 duct will be placed at the riser pole to protect the fiber transition from the pole into the ground.
- At the house a cane or additional piece of ½" SDR11 will be used to protect the fiber transition up the side of the house.
- Upon completion of drop placement, all areas will be returned to the same status they were found in prior to construction. This may include returning the ground to the proper grade and placing grass seed and straw, or in certain situations, replacing any disrupted sod.
- If the need to place a NID on a riser pole does arise please locate the NID in a place that would have the least interference with someone attempting to climb the pole.
- When installing a NID on a pole, center the NID above the duct and mount at 4 feet from the ground.
- When transitioning from aerial to underground and placing a pole mounted NID, only one NID should be placed at each pole. Multiple drops can be spliced in a single NID.

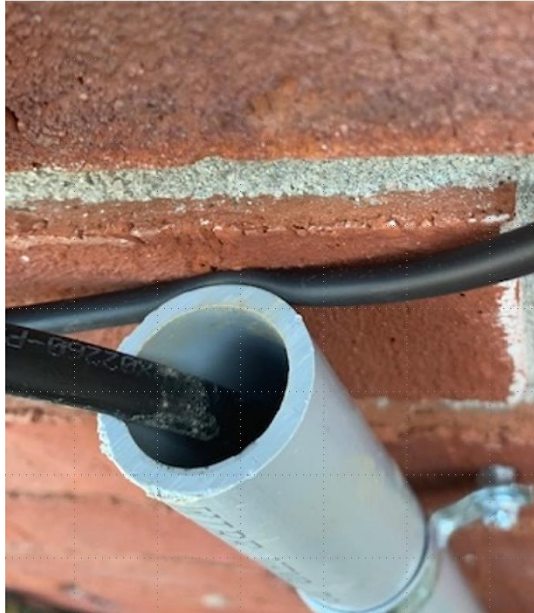
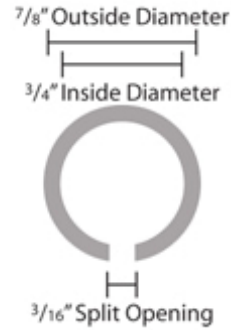


Buried Drop (cont.)

- If drop placement requires aerial to underground placement, ensure that the fiber is **protected at the base of the pole using 3' of 1/2" SDR11 duct a minimum of 6" below grade unless the service order notes otherwise.**
- E clips should be used to secure the drop. 24" spacing from top of drop to the NID.
- Drop is not to be tied or attached to any other utility attached to the pole except other WRC fiber drops where applicable.
- Care is to be taken to ensure that the drop is straight and does not wrap the pole.
- If placement requires a transition from aerial to tonable fiber, a NID should be placed at pole 4' above the ground. The contractor shall fusion splice the aerial drop to the underground drop in the NID.
- When any kind of duct is encountered seal the top to prevent water intrusion from occurring.



Buried Drop (cont.)



- At the outdoor demarcation point, fiber is to be protected from 6" below ground level to the NID by a house cane attached with screw clips every 2'.
- House cane is to be placed directly under the NID.
- Care is to be taken to ensure that placement is straight and neat.
- Installer is responsible for any damage to the home that may occur during drop placement and attachment.
- The new drop is not to be zip-tied or attached to any existing utilities on the home.
- There should be a minimum of 4" of separation between the new drop and any existing utilities:
- Drop is not to exceed manufacturer's recommended bend radius at any point of installation.

Buried Drop (cont.)

- If flowerpots are to be installed, ensure they are installed neatly and at grade.
- Ensure area is returned to its original state; use seed and straw as necessary.
- Pull boxes should only be placed in underground lot plans or as needed to ensure that there is a pull point when transitioning between property lines.



Installer Responsibilities

The installer is responsible for the following items for each install.

1. Installer shall ensure the customer is comfortable with the install process.
2. Installer shall communicate any issues that arise during the install with the customer or White River Connect (WRC) as appropriate.
3. If the installer needs to leave the install for any reason, the customer will be informed of when they will return.
4. Installer shall ensure the work area is always kept free from trash and is disposed of properly.
5. Installer shall ensure tools and fiber is kept out of reach of pets and children.
6. Installer will never leave the work area without picking up all tools and loose items.
7. Installer shall document final testing after the install is complete.
8. Installer shall ensure all penetrations are properly secured and sealed.
9. Verify light reading upon arrival before starting any work. (If an issue is found contact WRC immediately)
10. Installer lead shall document this information on the service order template when completing the assigned task.
11. Installer shall leave the customer with a positive experience. Ensure everything looks “clean” including all attachments and the fiber path.
12. If ever in doubt regarding a standard do not assume but call WRC.
13. At no point create or place yourself in an unsafe condition.
14. Installer is responsible for completing install template and closing service order install task.

Customer Walkthrough

Once the installer arrives on site the below process must be followed.

Installer shall show their WRC provided badge to the customer and introduce themselves to the customer; ***“Hello, I’m (name) working on behalf of White River Connect and will be completing your fiber install today”***

UNDER NO CIRCUMSTANCES - **If the customer is under 18 the installer will not enter the residence** until an adult is available. If no adult is available contact WRC and the install will be rescheduled for another day.

After the introduction, walk the customer through the install. This will include the following not necessarily in this order.

- Explain where the drop is located.
- Explain the best location for the customer’s equipment.
- Explain what materials will be used for the install.
- Point out any unusual items they may need to complete the install.
- Point out and document any damage to the house or property before starting the install.
- Do not start the install until the customer agrees.
 - If there are any discrepancies contact WRC for resolution before starting the install.
- After the install is finished, complete a final walk through with the customer.
 - Point out the fiber path and show them where the ONT and RG are located.
 - If the customer does not agree with the install the installer will reach out to their supervisor or WRC to assist in the resolution.
 - Make sure customer has their SSID and password.
 - Make sure customer’s devices are connected and working.

Mobile Home Install

When performing an install at a mobile home, the NID will be installed on a trailer stake.

The clear-curve will be run from the trailer stake underground under the trailer skirting to avoid damage to the trailer.

When the clear-curve is installed along the structure it should be covered by the skirting whenever possible.

Never make a penetration in a trailer on the side of the trailer. Always make trailer penetrations through the floor in trailers.



Summary

This standards document should be used as a reference. The examples the document shows are to be used as best practices with the understanding every install situation is different and expert judgement of the installer should always be considered.

Anytime the drop crew or installer comes into a situation where the standards cannot be followed, they should reach out to their supervisor or WRC as needed.

If anything is unclear regarding the standards provided in this document the drop crew or installer should reach out to WRC for further clarification.