12-port Patch Panel

Fiber Optical
Network
Terminal
(Ont)

1	1 TV data
2	2 study data
3	3 bedroom data
4	4 great room data
Phone	5 great room phone
Phone	6 kitchen phone
	7 bedroom phone
	8 media console data
	9 bedroom 2 data
	10 bedroom 3 data
	11
	12

Power Transformer/
Battery Backup

24"x24" plywood panel

Outer Wall

3/4 " Plastic Conduit Installation Example

36"

subfloor

foundation

24"x24"
plywood
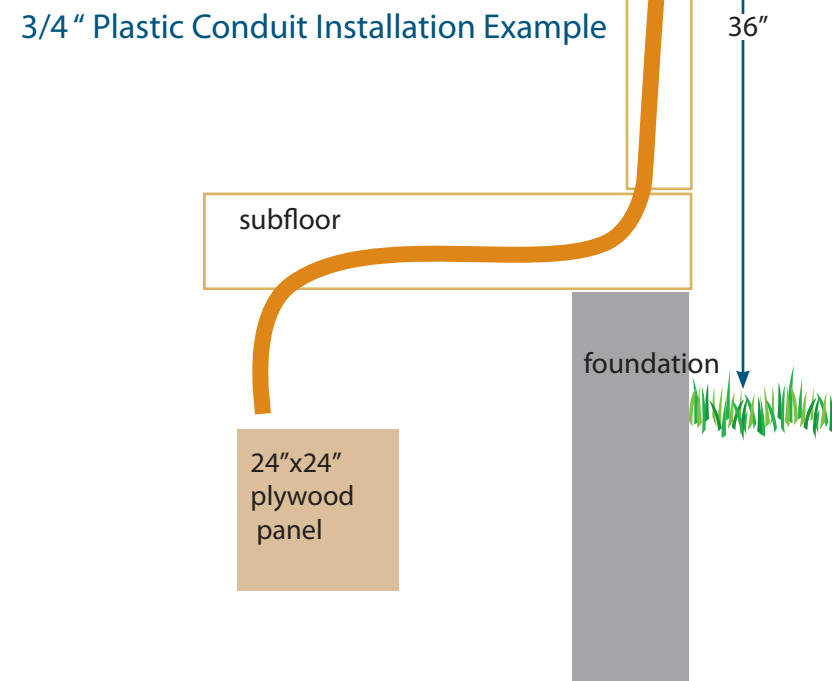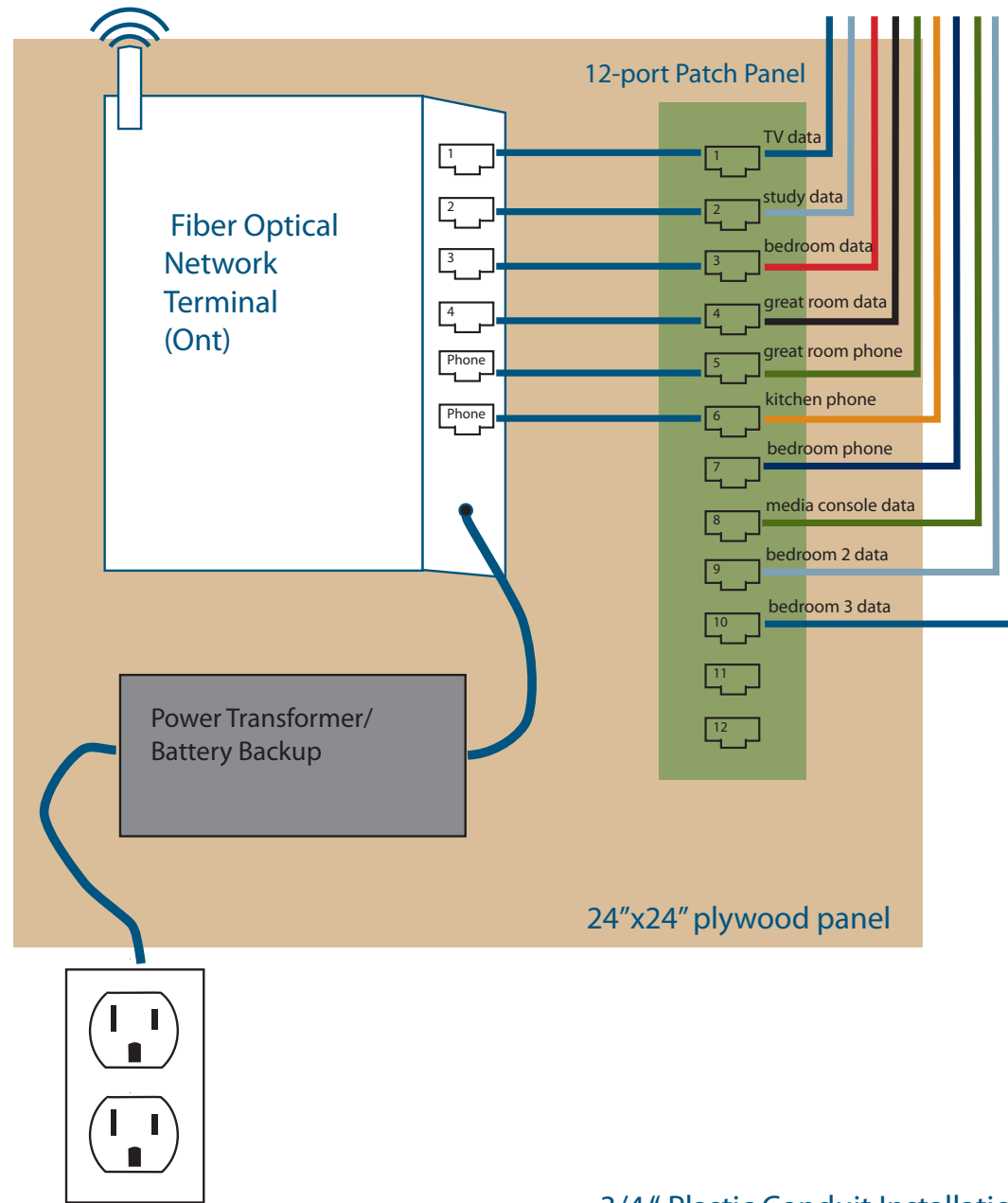panel

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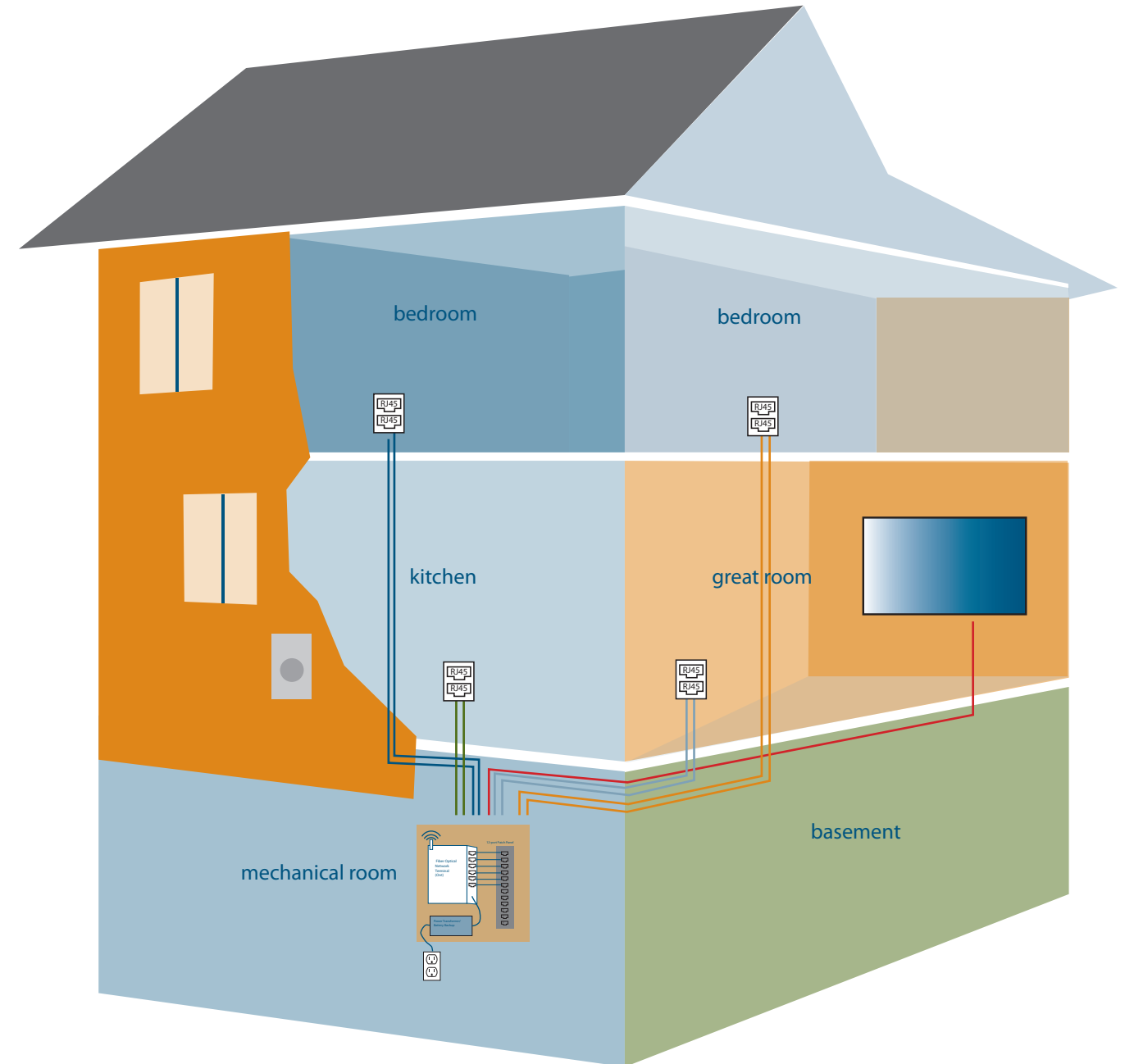
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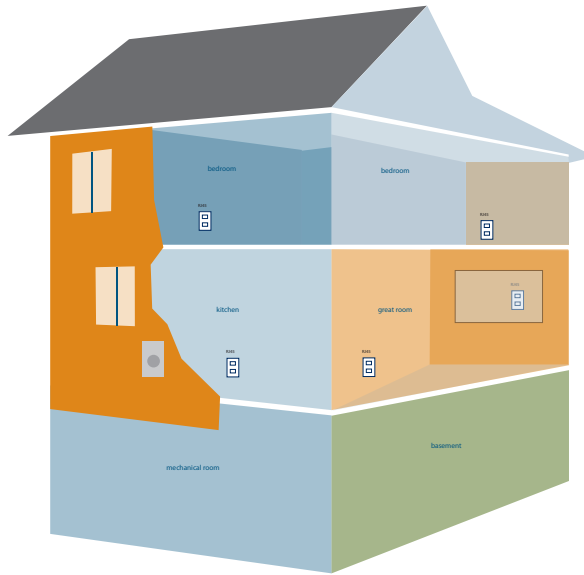## COMMUNICATIONS

Wiring the Smart Home

Advice for contractors and homeowners on the inside wiring
requirements for homes served by a fiber optic broadband
network.

faster streaming broadband

bedroom

bedroom

kitchen

great room

basement

mechanical room

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DIRECT
COMMUNICATIONS

As all communication moves to IP technology, it's more important than ever to make sure the wiring and connections in modern homes are capable of delivering enough bandwidth to support future internet applications, including communications, entertainment, and smart-home security, automation, and control services.

Don't be fooled into thinking that homes are going wireless. Even the best wireless systems simply don't have the bandwidth or reach of a "hard" wire—wireless has bandwidth limits even in a perfect situation, and traveling through walls drastically reduces any wireless capabilities. Wireless signals also suffer from interference from other wireless networks, phones, appliances, radios and electronic devices. A wired connection is always more reliable and consistent. Cat5e cable can handle up to 1 Gigabit per second speeds, and Cat6 will feed up to 10 Gigabits per second. Our customers already know that any devices that stream HD video need to be hard wired to their home router to work properly. HD video is just the start of cloud-based entertainment—within a just couple of years the data requirements of video will quadruple, once Ultra HD, which has four times the resolution of 1080p HD, becomes the new common video standard.

A properly -wired home network is essential to maximize all of the advantages of our unique, better and special, state-of-the-art fiber to the home service here in Eagle Mountain. Fiber to the home will increase the value of any home by as much as $5,000, according to the Fiber-to-the-Home Council.* Our investment in constructing fiber to the homes in Eagle Mountain means more money in your pocket. More importantly, fiber to a home means a higher quality of life for homeowners in this digital information age, where so much of what we do to enrich our lives has moved online. More internet speed simply means more fun.

Home Network Wiring Example

MINIMUM IP NETWORK CABLING REQUIREMENTS
Following are the minimum Ethernet cable installation requirements we recommend for new homes:

1. All communications cabling must be home run to a central hub/network distribution point in the basement mechanical/utility room. (Usually the room where the furnace and water heater are located.)
2. A ¾" flexible plastic conduit/duct should be installed from an outside termination (demarcation) point, usually near the outdoor power meter, to the central distribution point inside the basement. Do not use any elbow bends. Direct Communications will feed fiber optic cable through this conduit from the street to the distribution point inside the home. This conduit could be useful to the homeowner for various future networking needs, including satellite TV cable. The outside demarcation point, or conduit stub-out, should be 2' from the power meter, and between 32" to 36" above ground.
3. Telecommunications cables need to be a minimum specification of Cat5e, which will support 1 Gig Ethernet speeds, but preferably Cat6 should be used, which will support the future multi-Gigabit speeds homeowners will require.
4. A label should be included on each Cat5 Ethernet cable identifying the location at which the wire is terminated.
5. A 24"x24" plywood panel should be secured to the wall in the furnace room at the network distribution point. It is the builder's responsibility to supply the wood panel. Direct Communications techs will mount the fiber electronics and power transformer/battery backup to this board. Direct Communications will supply to each customer an:
a. indoor fiber optical network terminal, (ONT) with
b. 4 x 1 Gigabit Ethernet ports
c. Built in wireless router
d. A 12-port patch panel to distribute voice and Ethernet throughout the home over the wired network. This will allow for very simple patching to/from routers, switches, multimedia ports, and easy replacement if any develop a fault.
6. The 24" wood panel should be located in the mechanical or utility room, at about chest level, should be easily accessible, preferably on an open wall, with at least 3' clearance for our techs to work in, and with a 120V power outlet situated
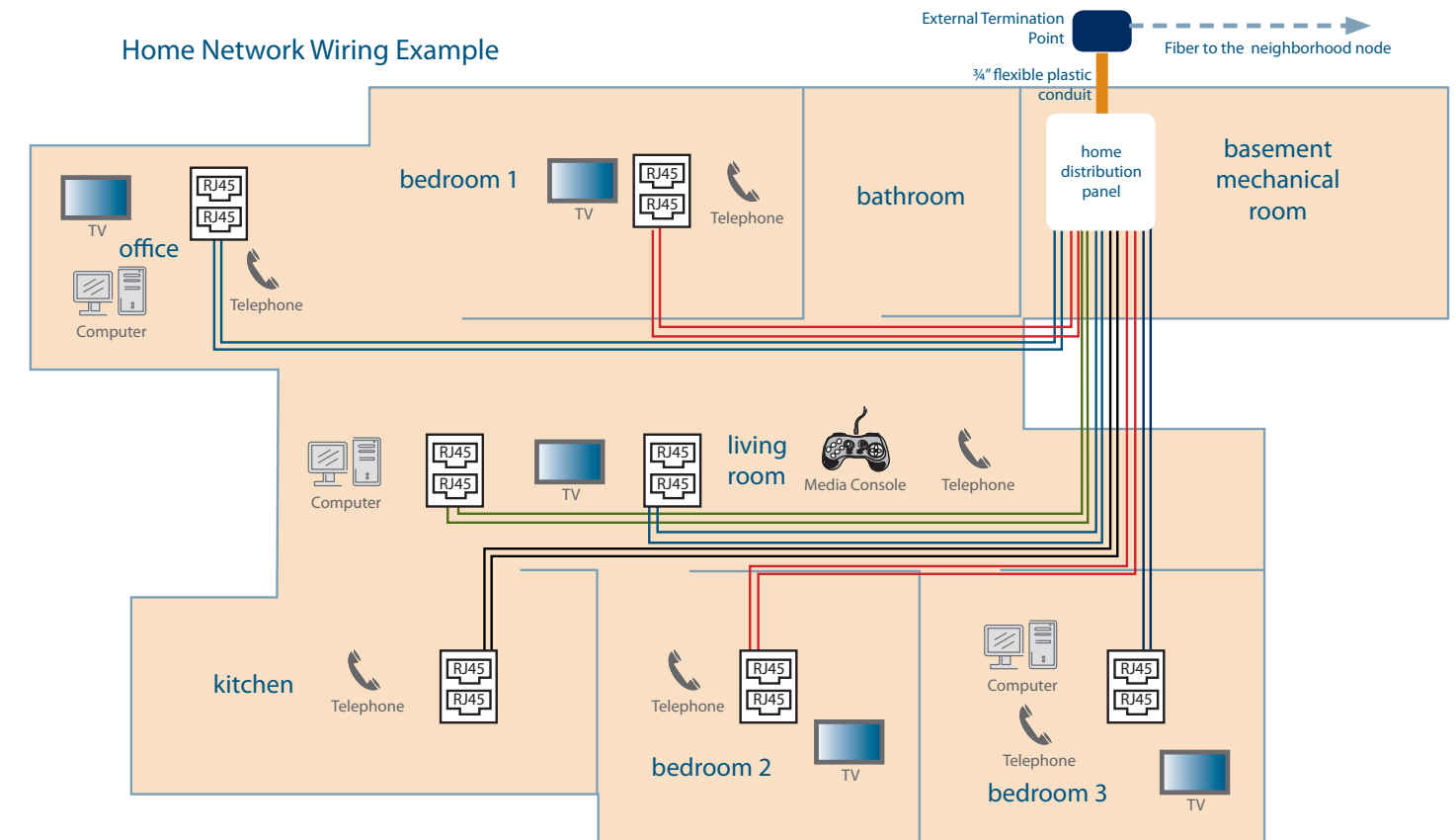
within a 2' distance to power the indoor ONT battery backup and router.
7. Two Cat5e cables must be fed from the distribution point, through the wall to the External Termination/Demarcation Point, (which will be about a 6"x6" fiber junction box) leaving at least 2' of cable slack at the ETP and at least 3' of slack at the inside network distribution point. This is simply to prepare for any future externalities or homeowner networking needs.
8. Two Cat5e cables should be fed from the home distribution hub to each low-voltage outlet position at which communication services are required.
9. Be sure to wire Ethernet to each future possible TV position, to accommodate Smart TVs and future IPTV needs.
10. Leave at least 8" of cable slack at each outlet.
11. All voice or data jacks should be RJ45 type.
12. When considering where to install outlets or RJ45 data jacks, be sure to consider the following:
a. At least two RJ45 type jacks (one for phone, one for internet) on the same faceplate in each bedroom and normally occupied room.
b. Two or more such outlets are recommended in the great room and study.
c. Minimum of one outlet per level, including the basement.
13. Wire should be routed through 1/2" drilled holes in wall and ceiling headers or through conduit.
14. Ethernet wiring should not be placed in the same conduit with wires that conduct electricity.
15. RJ45 Jack Placement: Think about where furniture will go in each room, and where a media station (such as an Xbox), computer, phone, TV, or future smart appliance might be placed when thinking about installing jacks. It's easier to plan ahead than for the homeowner to install more Ethernet ports after construction.
16. Wire should not be stapled, kinked or smashed—avoid abrading or puncturing the insulating jacket.
17. Avoid excessively hot locations—heating ducts, hot water pipes, etc.
18. Premium homebuilders might consider also installing indoor fiber optic cable to communication points along with Cat6 as part of the home wiring package, which will be the best way to future-proof any home network.