NORTEK™
CLEANROOM SOLUTIONS
CLEANPAK



CLEAN-TRAK® 2.6 SYSTEM

Installation & Operation Manual

Including:

- Clean-Trak 2.6 Modular Ceiling Grid
- Clean-Trak 2.6 Stick-Built Ceiling Grid
- Clean-Trak 2.6 Modular Ceiling Plenum And Plenpak
- Clean-Trak 2.6 Ceiling Accessories

Page

INSTALLATION AND MAINTENANCE SAFETY PRECAUTIONS **3**
GENERAL **3**
Safety 3
Receiving and Inspection 3
Service and Warranty 4
Handling Requirements 4
Interstitial/Support Structure Preparation 4
CLEAN-TRAK® 2.6 MODULAR CEILING GRID **5**
Hanging Instructions 5
Bolting 6
Seismic Bracing 7
Perimeter Grid and Face-plate Closure 7
Caulking Requirements 8
Lighting 9
Light Fixture, Ballast Covers, Wireway Covers, Tuck Boxes Fit into Grid 9
Lighting Using Ship-Loose Parts 10
Wiring 11
Ionization 14
Lens Installation 17
Hard-piped Fire Protection 18
Flexible Fire Protection System 18
Preliminary Cleaning 23
Gel Pour 23
Final Cleaning 24
Filter Installation 24
CLEAN-TRAK 2.6 STICK-BUILT CEILING GRID **25**
Grid Handling Requirements 25
Interstitial Preparation 25
Grid Pre-Assembly 25
Grid Installation 26
Required Stick-built Reference Sections 26
CLEAN-TRAK 2.6 MODULAR CEILING PLENUM **26**
Hanging/Bolting Instructions 26
Seismic Bracing 28
Required Plenum Reference Sections 28
CLEAN-SCREEN® AND ALL-PERF SCREEN **29**
Screen Receiving 29
Screen Handling and Storage 29
Screen Installation 29
EQUALIZER® **30**
MAINTENANCE **30**

INSTALLATION CODES / PRECAUTIONS

IMPORTANT SAFEGUARDS

When using electrical equipment, basic safety precautions should always be followed, including the following:

READ AND FOLLOW ALL SAFETY INSTRUCTIONS

A. Only qualified service personnel may perform service.

B. Refer to the wiring diagram provided with the submittal drawings for the intended wiring connections.

C. Replace lamps with like lamps. Rotate lamps into the correct position for proper mounting.

D. Before replacing lighting components, check the label on the component for the correct electrical specifications (volts, Hz, amps, replacement interval, date and so on).

E. Replace fuses, if applicable, with the same size and value supplied by factory.

F. Do not mount near gas or electrical heaters.

G. Do not allow unauthorized personnel to service or tamper with equipment. Always consult the factory when replacing electrical component equipment.

H. Do not use equipment in a way other than intended.

I. When replacing electrical components, always use factory recognized components.

J. Consult our factory for additional information on features not discussed above.

SAVE THESE INSTRUCTIONS

SERVICE AND WARRANTY

For service on products, contact:

Service Department
19855 SW 124th Ave; Tualatin, OR 97062 USA
Tel: 503.639.0113

Refer to our Limited Warranty in the contract documents.

GENERAL

The information in this application booklet is provided as a guideline for the installer. It is the installer's responsibility to ensure proper installation, safety and adherence to the specifications as the owner or structural engineer outlines them. Do not alter products without prior written approval. We are not responsible for any unauthorized bracing or loading to the ceiling systems. The statements and diagrams contained herein are non-specific and do not necessarily reflect actual projects. The product is for indoor use only in dry locations.

SAFETY

The installer is responsible for providing qualified, trained personnel to install and operate the equipment. Consult all local building, occupational safety, electrical, gas and other codes applicable to the installation. Safety considerations include, but are not limited to, the accessibility of the equipment to non-service personnel, the provision of electrical switches and maintenance procedures.

RECEIVING AND INSPECTION

K. Cleanroom products are double-wrapped in the factory. Ship loose hardware is not wrapped unless otherwise specified.

L. Carefully inspect all parts after receiving them from the transporting agent. Since our cleanroom products are pre-cleaned and then wrapped, do not unwrap them outdoors or in a dirty environment. Components should be unwrapped in a clean area and the receiver is responsible for inspecting for damage.

M. Compare parts with the shipping documentation to make sure your shipment is correct, free of damage and complete. Your signature verifies that you have received all equipment in satisfactory condition.

N. If shipping damage has occurred, notify the freight carrier and our service department immediately. Provide photographs of the damaged freight and call the freight claims inspector to inspect the damage and submit a damage report.

O. After the claims inspector has released the shipment, perform a 100% inspection of the product. Isolate damaged equipment in a separate holding area to prevent it from being installed.

NORTEK™
CLEANROOM SOLUTIONS

HANDLING REQUIREMENTS

A. **USE SPECIAL CARE AT ALL TIMES WHEN HANDLING THE MODULES, INCLUDING WHEN MOVING CRATES AND UNCRATING AND UNLOADING INDIVIDUAL GRID MODULES, SINCE THERE ARE SENSITIVE COMPONENTS HOUSED ON THE GRIDS LIKE THE FIRE PROTECTION HOSES. FOR EXAMPLE, TAKE CARE THAT FORK LIFTS DO NOT DAMAGE HOSES WHEN MOVING, UNCRATING, UNLOADING, AND HANDLING MODULES. CRATING MAY BE OPEN ON THE UNDER SIDE. USE APPROPRIATE LENGTH FORKS OR FORK EXTENSIONS TO ENSURE THAT THE UNDERSIDE OF THE CRATE AND GRID ARE NOT DAMAGED FROM THE FORK ENDS.**

B. Handle modules with care to prevent damage during installation. Modules are pre-assembled, cleaned and wrapped to factory standards at the facility. From receipt through complete installation, the installer is responsible for handling all products on the jobsite. Purchaser is responsible for shipping from our facility.

C. Every module is cleaned at the factory before it is shipped. After unloading them from the truck, do not leave modules and parts outdoors. Do not store modules in high-traffic or unprotected areas. To avoid contaminating modules, place them on blocks to raise them off the floor.

D. Module must be stored in a controlled environment when delivered to job sites in variable or humid climates. The optimum storage temperature is 70 degrees F/21 degrees C.

E. Visually inspect plastic wrapping nightly to ensure that any rips in the plastic have been sealed.

F. Each module should be brought directly into the cleanroom staging area and installed in a flat and level manner. Observe owner's protocol while moving module into staging areas. Protocol varies with owner requirements. Protocol reflected in this manual may not represent protocol standards of all owners.

G. ****CAUTION**** Modules must be protected with foam wraps so that exposed surfaces are not damaged during handling. This applies to all steps in this manual.

INTERSTITIAL/SUPPORT STRUCTURE PREPARATION

A. Pre-install all threaded rod hanger locations level at the pre-determined height.

B. Some procedures may require attaching turnbuckles to all threaded rods at this stage. Ensure that rod is fully engaged in the turnbuckle. Other procedures may require installation of the turnbuckle at a later stage.

CLEAN-TRAK® 2.6 MODULAR CEILING GRID

HANGING INSTRUCTIONS

A. Ceiling system must be installed in a temperature controlled environment to avoid growth issues from temperature swings. A maximum temperature variation guideline is +/- 7.5 degrees F.

B. Install the grid level and on the plane described in the owner's specification/drawings by adjusting the grid supports that you will connect to the grid exterior extrusion. Where a torque is specified, make sure to use a calibrated torque wrench. Unless otherwise specified, tighten assemblies to "snug tight" as defined by AISC. Do not over-tighten assemblies. Over-tightening may deform the aluminum hangers. Do not use deformed hangers.

C. Be sure to monitor the cumulative module dimensions during the course of installation in order to maintain overall cleanroom dimensions.

D. Lift modules into place one at a time using a genie lift or duct lifter with a flat surface that fully supports the modules. Be sure to protect the modules with foam wrap so that the grid surfaces and lenses are not scratched or damaged.

E. Lift gently to avoid damaging any of the pre-assembled lights and light lenses. Keep the grid level and avoid racking. See Figure 1.



Figure 1. Lifts raising grid module (one side shown here).

F. Install the hanging hardware. Check the job specific drawings as sometimes custom hanging hardware is provided. In general, the following instructions can be followed. See Standard Drawing numbers 27-01-06, 27-01- 07, 27-01-08, 27-01-11, 27-01-19, 27-01-32, and 27-01-33. Tighten the all-thread rod (for Dwg 27-01-06 and 27-01-32) or ½"-13 Allen head screws (for Dwgs 27-01-07, 27-01-08, 27-01-11 and 27-01-33) as far as possible with your fingers first. Then, hold the right and left suspension hangers together tightly in the area of the interior nut with a vice grip (Vise Grip 11 SP) while tightening the all-thread rod or Allen head screws with a tool. The vice grip is used to keep the two-piece aluminum hanger assembly together and to keep the interior nut from turning. For 27-01-06 (see Figure 2) and 27-01-32 use two temporary LH nuts jammed together to tighten down the all-thread rod. Ensure that the top ½" nut is loose during this procedure (if the top ½" nut does not remain free while tightening the Allen-head bolt, hanger parts may twist and become pre-loaded). Release the vise

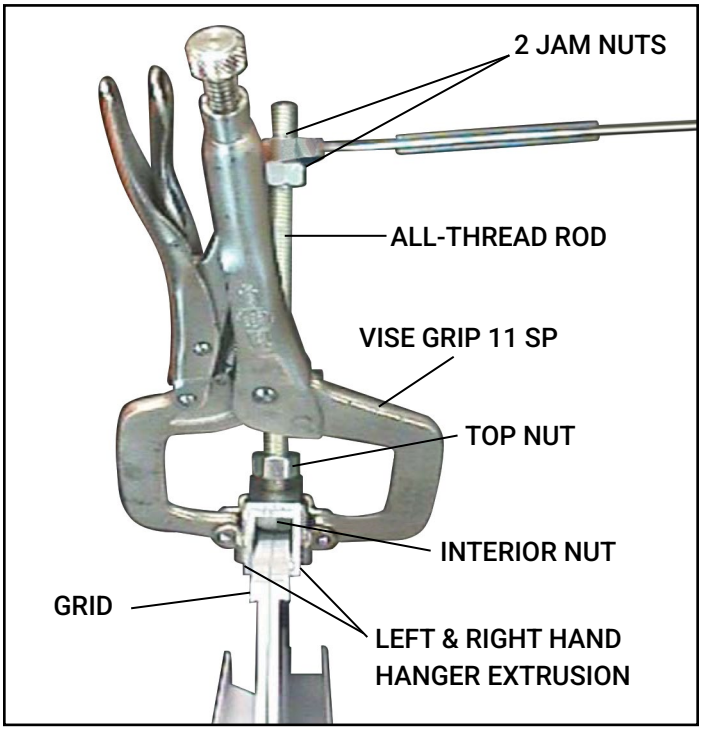


Figure 2. Tightening of hanger assembly.

grip. If jam nuts were used, ensure that the rod does not loosen when removing the jam nut. Then, tighten the top ½" nut to snug tight condition. Do a visual inspection of the hanger assembly to ensure that the hanger legs are properly seated in the grid extrusion. Refer to Figure 6 for seating of the hanger assembly.

G. If using filter hold-downs that attach to the hanger rods, make sure that two 1/2" nuts are pre-installed into the hanger rod assembly.

H. Before installing the turnbuckle, ensure the hanging brackets are tightened to the grid extrusion.

I. Gather and tuck the wiring up and over grid members so that wires are not unknowingly pushed up between grid modules during installation. See Figure 3.

J. Once the entire module attachment is complete and the ceiling appears level, laser level the grid and tighten all hanging hardware and attachment blocks before removing lifting equipment.

K. The Clean-Trak hanging system requires a complete 2.6" cross section, formed either by two adjacent modules or a perimeter extrusion back-to-back with a perimeter module. See Figure 4.



Figure 3. Gather and tuck wires prior to lifting.

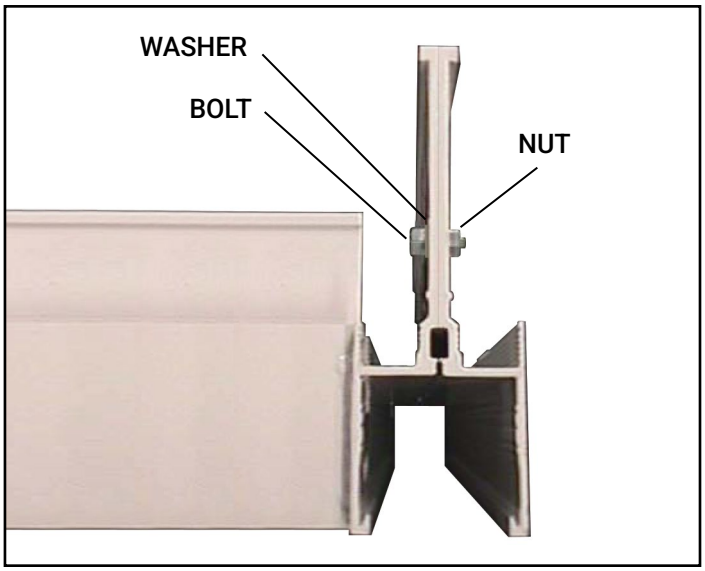


Figure 4. Bolting module to module and perimeter grid to module (shown here).

BOLTING

A. Proper module installation involves a certain craftsmanship to eliminate "growth" and maintain squareness. Check alignment after installing each module. Module misalignment that is not corrected when each module is installed may cause misfit of Clean-Trak snap-in components. Do not caulk between perimeter grid modules. Caulking between grid modules creates misalignment and growth that will conflict with the overall width and length of the cleanroom footprint. See Caulking Requirements below.

B. Install all 5/16"x ¾" grid bolts, washers and nuts to attach the exterior grid extrusion of one module to another and to attach the perimeter grid to the module (if required) as shown in Figure 4.

C. Square the grid module and then tighten the 5/16" grid bolts starting at one end and finishing at the other end. Ensure that the grid remains square and that it aligns with control datum lines. If possible, secure the initial grid to building. You may need to secure grid at additional intervals to maintain proper alignment. Tighten bolts to snug tight as defined by AISC. To secure grid in a manner not outlined in this guide, consult our factory.

D. It is recommended that all hangers be rechecked and re-tightened, if necessary, after modules are bolted together.

SEISMIC BRACING

A. Seismic bracing of the ceiling system should be installed per the appropriate structural calculations and codes. An optional seismic attachment bracket as shown in Standard Drawing 27-01-09 may be used to attach to the grid. Follow the instructions on the drawing and in the section above on Hanging Instructions with the exception that the Allen head screws will need to be torqued to 42 ft-lbs. See Figure 5 and refer to the instructions on drawing 27- 01-09. Figure 6 shows the limits on the dimension of the hanger assembly after torquing. It is the contractor's responsibility to ensure that this clip is adequate to meet the site requirements.

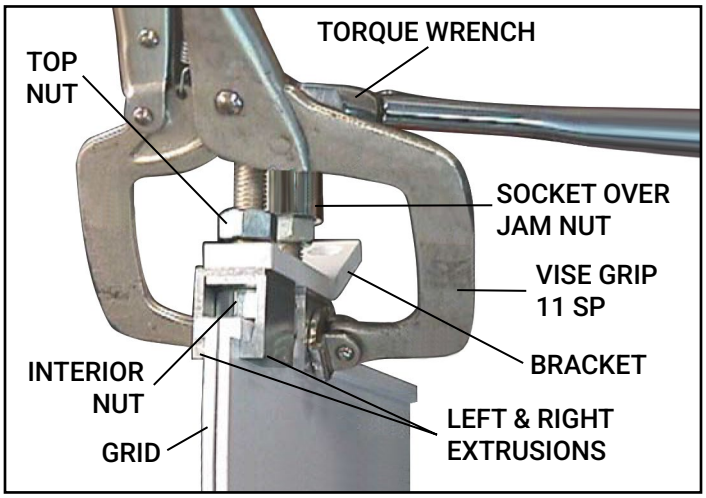


Figure 5. Seismic brace tightening.

PERIMETER GRID AND FACE-PLATE CLOSURE

A. Optional perimeter grid may be required, depending on the closure methods desired, at the perimeter of the fab for bolting to the grid modules. See Figure 4 and Figure 7.

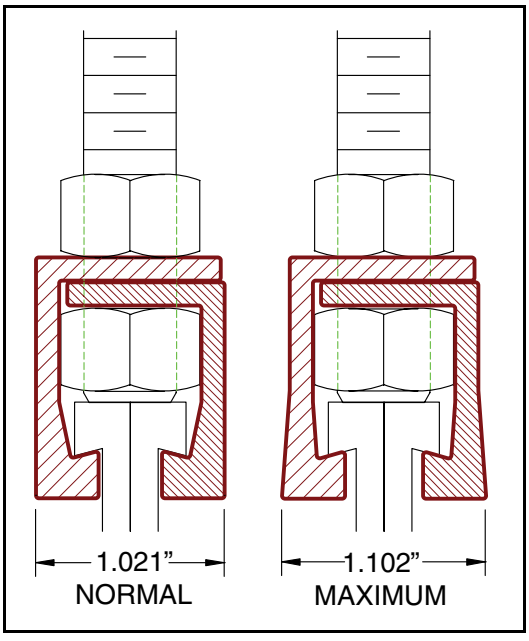


Figure 6. Limits on width of hanger assembly after tightening.

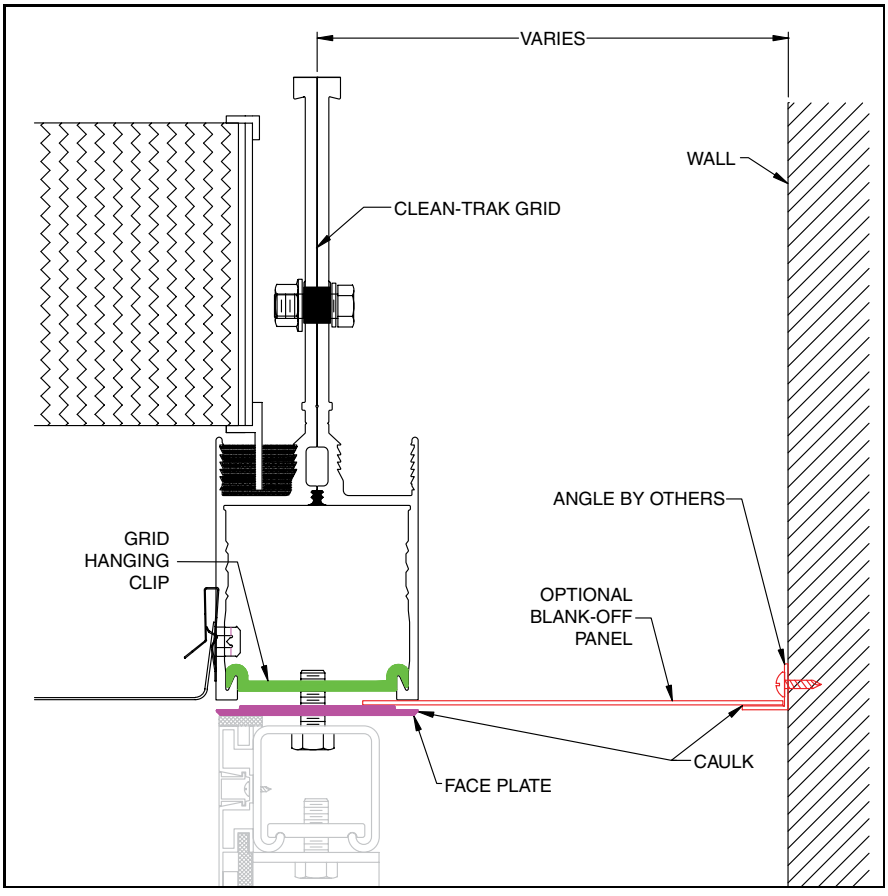


Figure 7. Perimeter grid and wall blank-off and closure detail.

B. The standard perimeter grid is supplied in standard lengths, with straight cuts (no miters) and with a standard punched hole pattern. The cutting to length, mitering at corners, and drilling of holes (to match holes in the grid modules) is the responsibility of the installing contractor.

C. We may sometimes supply non-standard pre-cut and pre-mitered perimeter grid. We will still not guarantee that the cut lengths, miters, or holes will match up to the grid modules. It is always the installing contractor's responsibility to make all necessary cut to lengths, miters, and holes to match up to the grid modules.

D. Optional face-plate closure may be required, depending on the closure methods desired.

E. The standard face-plate closure is supplied in standard lengths and with straight cuts (no miters). The cutting to length and mitering at corners is the responsibility of the installing contractor.

F. We may sometimes supply non-standard pre-cut and pre-mitered face-plate closure. We will still not guarantee that the miters and cut lengths will match up to the grid modules. It is always the installing contractor's responsibility to make all necessary cut to lengths and miters to match up to the grid modules.

CAULKING REQUIREMENTS

A. It is critical that modules be installed tight against one another as noted in the section on Bolting--this is the contractor's responsibility. Apply caulk after all grids are suspended, leveled, bolted and secured together to form the module "ballroom". Maintain protocol cleanliness prior to caulking. We strongly recommend that the same personnel install the caulk and the gel.

B. Urethane based caulk is preferred due to better adhesion. If silicone caulking is required by the client, use an approved primer on the surface (for both powder-coated aluminum and stainless steel) prior to caulking. Follow product instructions for cure time prior to caulking.

C. Completely caulk all grid seams (see Figure 8 and Figure 9) and around all grid penetrations using approved caulk. Caulk must be compatible with gel. The grid face seam must be a continuous seal. Since the grid face provides the primary seal, it requires one uninterrupted bead of caulk. If fresh caulk is applied to dry caulk, a "cold lap" may result, causing leakage.

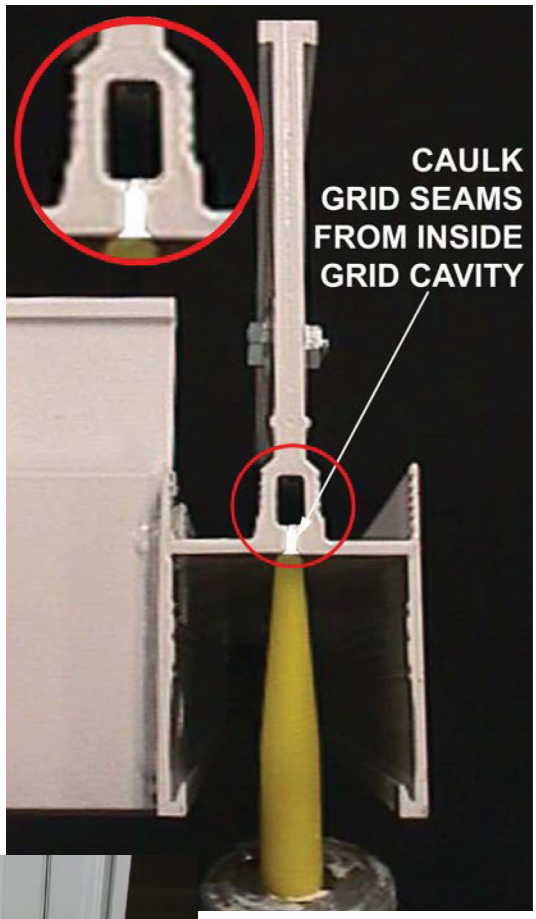


Figure 8. Caulking of grid face seam wherever two modules meet and at perimeter.



Figure 9. Caulking of grid face seam wherever two modules meet. This is a bottom view of the inside of the grid cavity.

Caulk must lie flat to allow for ballast installation. It is the installer's responsibility to maintain this seal. Caulk all open joints or grid areas that will allow gel to escape during the initial gel pour. The GelLink™ option has holes in the grid trough that allow gel to flow between grid modules. It is particularly important to thoroughly caulk along the bottom of the grid at the grid face seam. Improper caulk seal may result in gel leaking to the cleanroom during gel pour. All work to remedy gel leaks is contractor's responsibility.

D. Additional sealing locations include, but are not limited to (some of these penetrations may already be caulked at the factory depending on the configuration of grid purchased):

- **a.** Sprinkler piping penetrations and couplings to gel track
- **b.** Grounding screws penetrating gel track
- **c.** Grid intersections inside of gel track
- **d.** Electrical penetrations of gel track (see Figure 10).



Figure 10. Caulking in penetrations in gel trough.

LIGHTING

The interior of the grid modules is typically pre-wired at the factory. Consult our Service Department if you have any questions about lighting.

Light Fixture, Ballast Covers, Wireway Covers, Tuck Boxes Fit into Grid

A. The aluminum grid extrusion has three grooves inside the lower legs that provide a snap fit for an aluminum recessed fluorescent fixture, ballast covers, wireway covers and tuck boxes. Installing these items into the proper groove is critical for compliance with electrical codes and the UL listing.

B. To allow for a proper snap fit, all the above items are supplied with adjustable legs. The light fixture uses a flat extrusion. The ballast covers, wireway covers and tuck boxes may use a flat extrusion (Figure 11) or a U shaped extrusion with ends (Figure 12).

C. To adjust the U shape extrusion, simply bend the legs outward until proper fit is achieved.

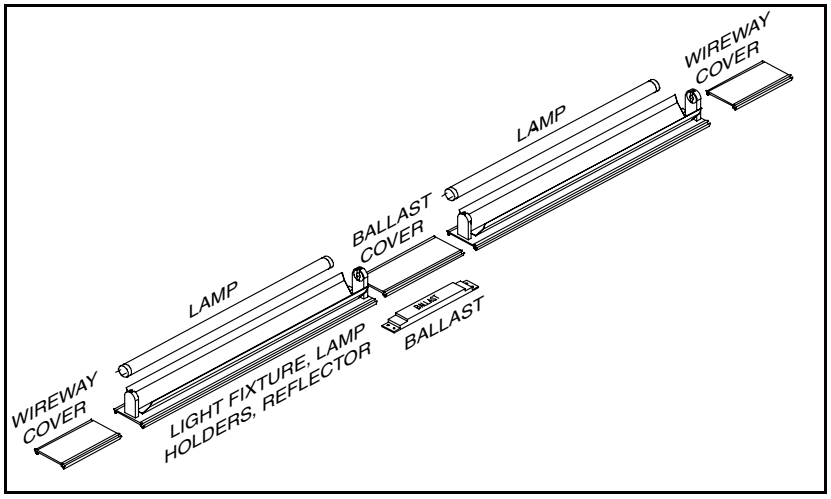


Figure 11. Light fixture assembly with flat ballast and wireway covers (shown upside down).

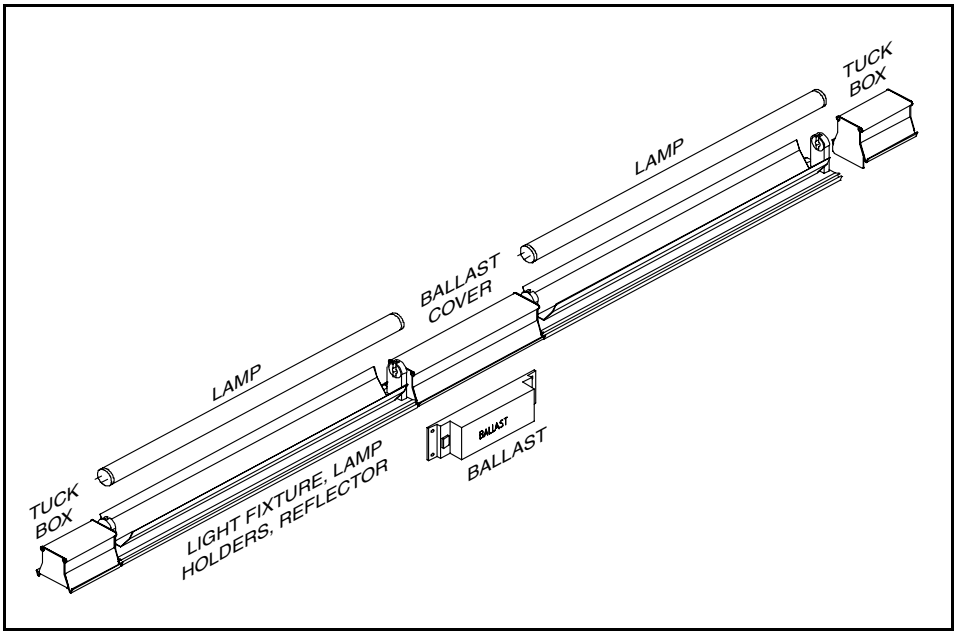


Figure 12. Light fixture assembly with U-shaped ballast and wireway covers (shown upside down).

D. To adjust the flat extrusion, use a large flat head screwdriver to expand the leg for proper fit into the grid. See Figure 13. To install the wireway into the grid one arm of a curved channel-lock plier can be used to cam the wireway into place.

E. Some light fixtures utilize a formed metal U-shaped wireway to which the lighting components are attached. These incorporate clips that snap into the legs at the bottom of the grid channel. To remove the fixture, undo the nuts holding the wireway in place. The wireway should drop out leaving the clips in place in the grid. Then you can individually remove each clip. To install the fixture assembly, first attach the clips to the fixture wireway with the nuts as shown in Figure 14. Then install the entire assembly making sure the bottom legs of the clip are above the grid leg and tighten the nuts to draw down the clip which pushes up the wireway. See Figure 15.

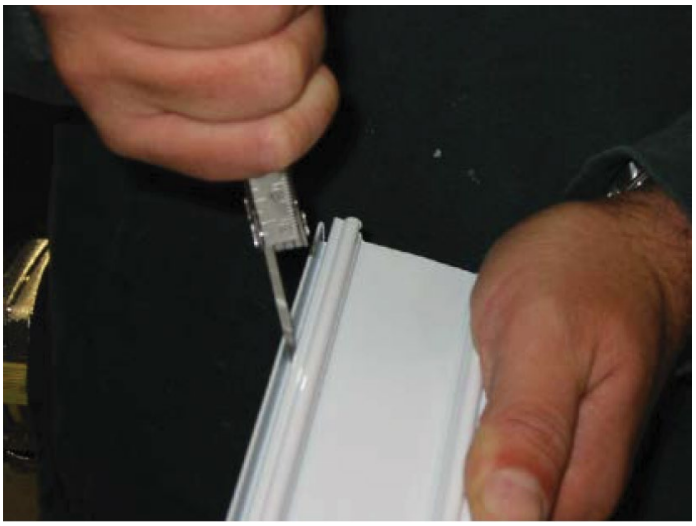


Figure 13. Bending out leg on wireway cover as needed to fit into grid channel grooves.

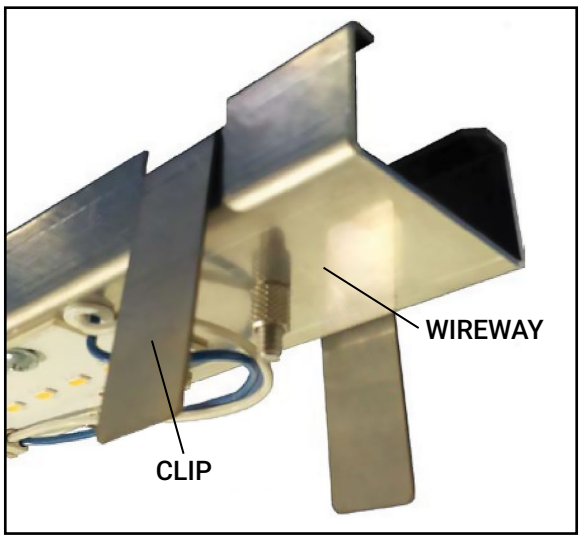


Figure 14. For formed U-shaped wireways, install clips onto fixture first.

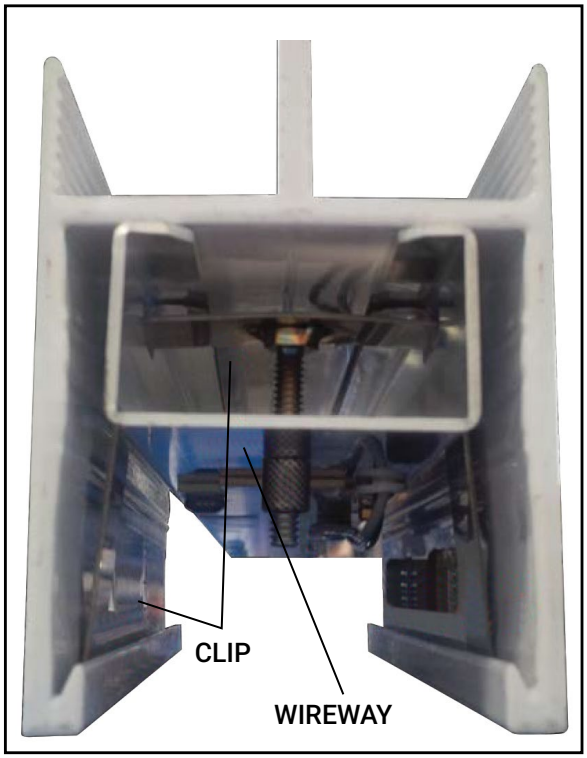


Figure 15. Formed U-shaped wireway shown installed in grid with clip.

LIGHTING USING SHIP-LOOSE PARTS

If recessed fluorescent fixtures are required along a module seam, they must be wired and installed as part of the grid installation. Note: Perform wiring in accordance with the factory-wiring diagram. All electrical components meet electrical standard codes and are UL listed.

A. Ground all recessed fluorescent fixtures to the grid. When grounding screws are installed properly, they may slightly pierce the center web of the extrusion. Avoid penetrating the gel track with the grounding screw. However, if the screw does penetrate the gel track, be careful to caulk the screw.

B. Figure 16 shows the ballast being inserted into the center of the light row. If ionization wire is present, ensure that it is moved out of the way so that it will be separated from the ballast by the ballast cover.

C. Install the ballast cover as shown in Figure 17. There are two types of ballast covers as discussed previously--one that is flat and a U-shaped one with end plates. The end plates on the ballast cover must finish flush with the recessed fluorescent fixture extrusion. The ballast and ballast cover fit together in tight quarters. It is important that the ballast rest on the top of the grid extrusion channel and that all the wiring is routed around the ballast.

D. Ensure caulk is completely flat at the grid seam before installing ballast. The light lens will not fit over the ballast if caulk overhangs the seam.

WIRING

We recommend that an experienced, licensed electrician make all electrical connections in accordance with wiring diagrams.

A. There are several different scenarios for field power connections for the main power as well as for module to module connections. Refer to the job specific drawings and notes. The standard straight-through harness scenario is shown in Figure 20 and Figure 21. Another, non-standard, optional wiring scenario with module side harnessing is shown in Figure 20 and Figure 22.

B. Connect like colored wires together at the module joints. If there are multiple circuits in the same raceway, ensure that the appropriate wires from the same circuit are connected, i.e., take care not to cross circuits. If quick- connects are provided, plug together all quick-connects between module fixtures (see Figure 18). Male/female quick connects may follow



Figure 16. Ballast being inserted into grid (for field-installed work).



Figure 17. Ballast cover with end plates being installed.



Figure 18. Attaching quick-connects together for lighting power circuit.

different rules of orientation. We cannot guarantee that all quick connects will mate up. If quick connects are not in the right orientation, it is the contractor's responsibility to cut, strip and wire nut the field connections at their own cost.

C. If quick-connects are not provided, contractor must provide and install properly sized wire nuts that meet applicable codes—wires may need to be stripped in the field.

D. Cover the quick-connects or wire nuts and wiring at each electrical connection at the module joints using the wireway covers or tuck boxes provided. If optional fuses are provided, they can be found inside the wireway covers or tuck boxes in each fixture row.

E. Install the 6" x ½" rigid nipple over the wire at each power drop using a backup wrench on the coupling supplied with the grid. See Figure 19. Caulk the wiring inside of the conduit by applying caulk into the 6" nipple below the c- conduit body. Then caulk wires that penetrate grid ensuring that wire is caulked at the grid face. For positively pressurized interstitials, install optional ½" c-conduit body (for field- installed seal) with a backup wrench on the 6" nipple. We strongly recommend pouring an electrical sealant (supplied by others) into the c-conduit body for an airtight seal. See Figure 19.

F. If terminal blocks are to be used to wire the power leads to external wiring, then the appropriate block should be used that conform to EN 60998-2-1 or EN 60998-2-2. This is in the scope of the electrical contractor.

G. Connect optional field conduit support system to c-conduit body at each power drop. It is the responsibility of the contractor to ensure adequate support of all field installed work.

H. Pre-test all circuits and lighting for functionality at this time. The electrical contractor shall make any required corrections.

I. Follow all applicable codes and site safety procedures. Contractor should also note the following precautions:

- **a.** Bring electrical power into the grid only through the provided power drops.
- **b.** All recessed fluorescent fixtures and ballasts must be grounded to the grid. A bonding jumper is provided on one side of the grid for this purpose.
- **c.** All connections should be accessible from the cleanroom side. No connections can be buried under walls. We recommend that all wall-to-grid interfaces use an accessible deflection head track to permit accessibility to electrical components and wireway field connections.
- **d.** If an accessible wall head track is not chosen, give special consideration to field modifications. Consult factory for recommendations about wall layout. In general, all wire connections must be accessible.
- **e.** Because our grid is UL-labeled before it leaves the factory, field modifications are the responsibility of the field installation contractor.
- **f.** At the contractor's expense, field modifications to electrical fixtures can be separately listed with UL or ETL.
- **g.** If interior walls are located below lights or ballasts, ensure they are de-energized before installing accessible wall head track. When wall head track is run under a row of lights, disconnect the power to those fixtures only. Consult your local electrical inspector to verify compliance with code.

J. If LED01 model tube lamp fixtures are provided, do NOT install regular fluorescent lamps into the lampholders. Only replace with like model LED tube lamps available from CLEANPAK. Note that one side of the LED tube lamp fixture carries power and the other side does not.

K. If LED03 model LED fixtures are provided, only replace with identical LED boards and LED drivers available from CLEANPAK. Disabling individual boards can increase the current through the remaining boards and reduce LED life. Consult factory on modifications.

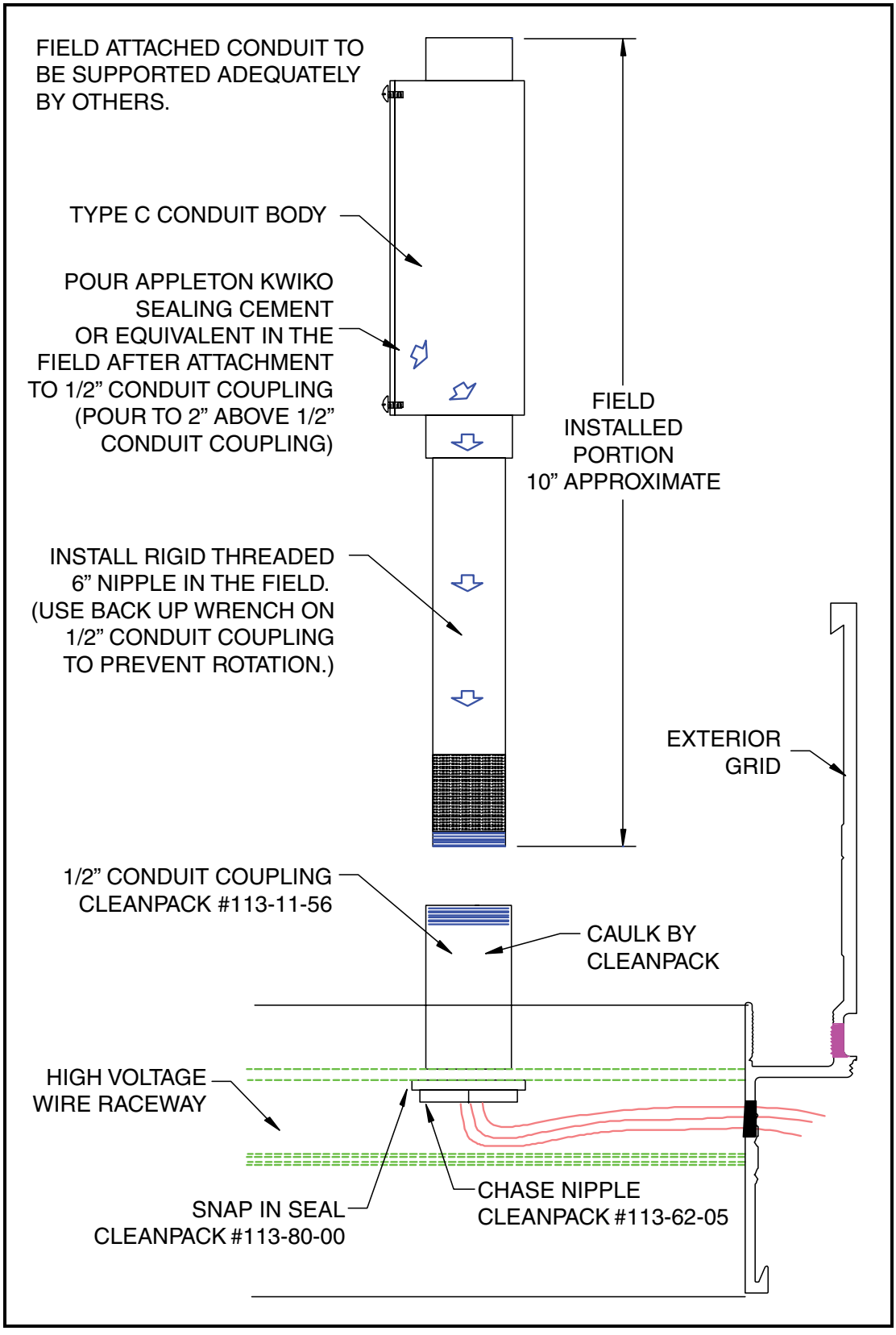


Figure 19. Field installed power connection.

IONIZATION

Ionization must meet local electrical code. When ionization is required, we provide ionization conductors inside the grid. The ionization contractor must provide all additional parts and their delivery. Contact us to order lens parts that are pre-manufactured for fitting to Ion Systems and SIMCO emitters.

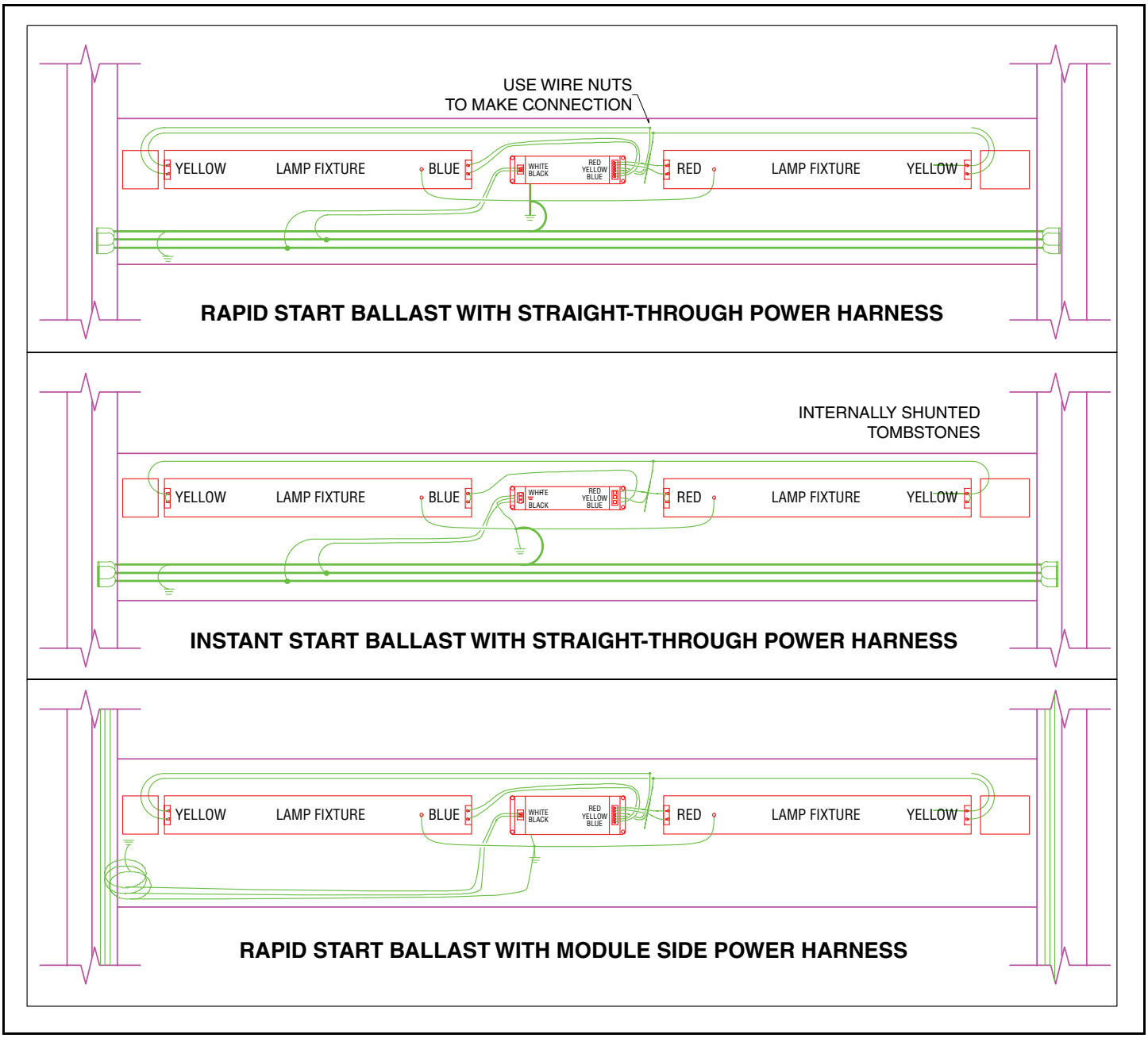


Figure 20. Typical wiring scenarios for lighting.

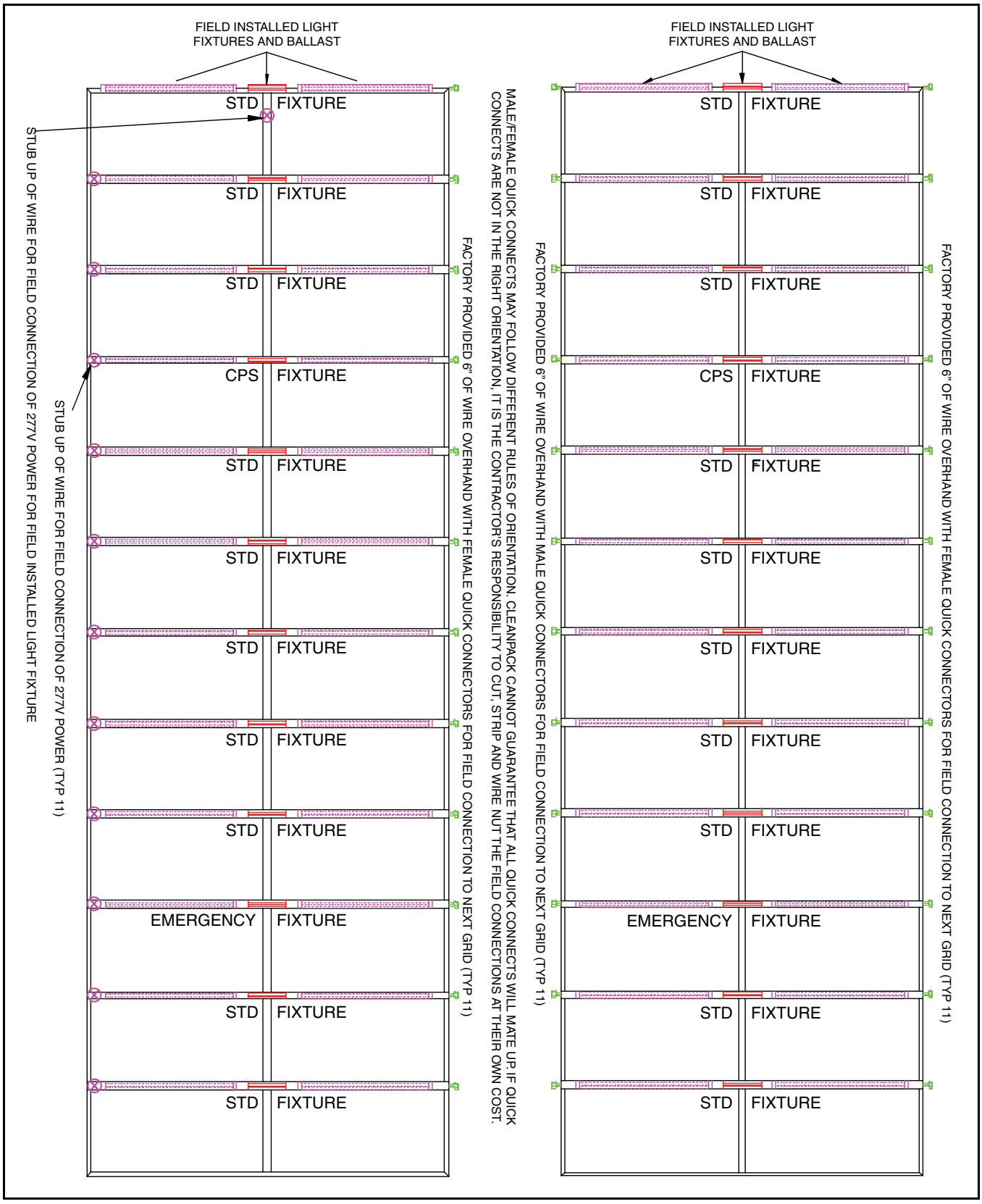


Figure 21. Standard wiring scenario with straight-through wiring harness.

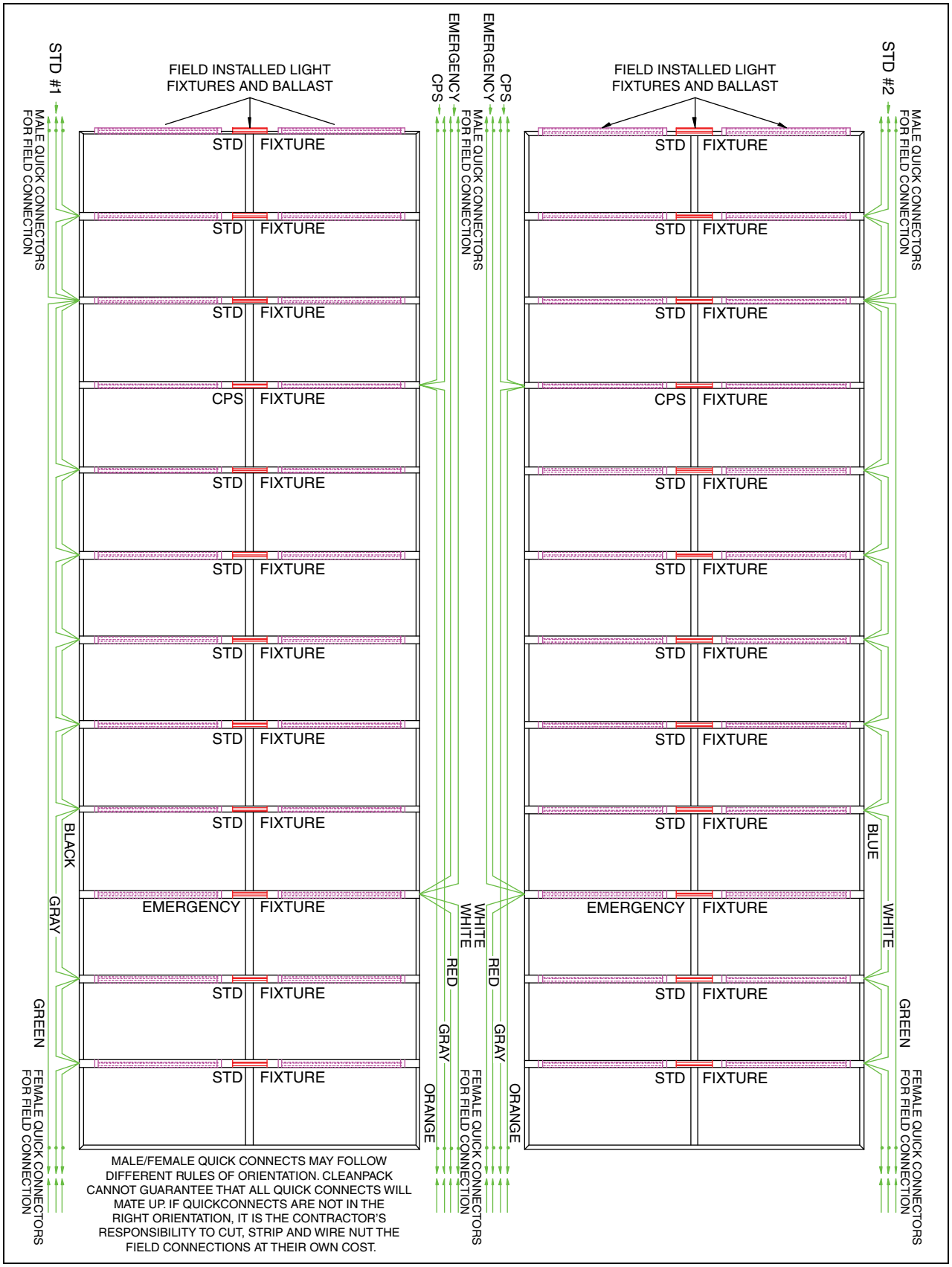


Figure 22. Non-standard wiring scenario with module side harnessing.

LENS INSTALLATION

A. CAUTION: Do NOT allow any amount of isopropyl alcohol to touch the lens as it will instantly permanently damage the lens.

B. Install the lens after all the electrical items, ionization and fluorescent lamps are installed.

C. If a lens is being removed to be reinstalled or to be cut and reinstalled, replace it back into the grid stick that it originally came from.

D. Check that some of the internal grid components were not seated too low causing the lens to not seat properly. If so, follow appropriate procedures for re-seating the internal components.

E. There are two styles of lens that may in the Clean-Trak grid. The old style lens was generally used prior to April 2006 and required the use of lens shims. The new-style lens introduced in April 2006, does not use shims. The two style of lens have completely different installation techniques, so installation crews must be properly retrained.

Old straight-leg style lens:

a. Lens that are factory installed or field installed may require lens shims to be installed in the field for proper fit into the grid after module installation or modification and accessories have been installed.

b. Begin installing the lens by inserting one end of the lens into the grid channel. To insert it place one edge into the grid bottom at an angle as shown in Figure 23 and then rotate the other edge into place. Then insert the other end of the lens into the channel. Finally, snap the center portion of the lens into the channel. Sometimes, it may work better to snap in one end and then work towards the other end (see Figure 24).

c. The lens may be adjusted to accommodate proper fit using a snap-on lens shim clip (see Figure 25) supplied by us. Multiple lens shims may be required and may be used on both legs of the lens at the same time depending on the field conditions. Contact us for additional shim clips.



Figure 23. Insert one edge of the lens at an angle then rotate into place.



Figure 24. Installation of lens.

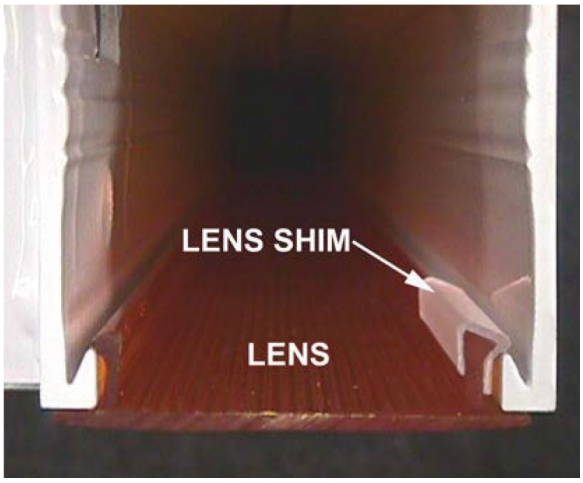


Figure 25. Lens shim clip installed in one leg of lens.

New curved-leg style lens:

a. Inspect the lens. If there are signs of cracking then discard the lens and use a new lens. There may be some whitening on the leg of the lens and this is normal after repeated use as long as the lens is not cracked.

b. Begin installing the lens by inserting one end of the lens into the grid channel. To insert it place the edge that is away from you into the grid bottom at an angle as shown in the picture and then rotate the other edge that is closest to you into place. This edge will need to be pushed in with your fingers to start the leg on the inside of grid channel.

c. Progress down the lens towards the other end continuously, following the procedure above. Keep the edge that is away from you in the grid and run the palm of your hand over the edge closest to you pushing up. While doing this, you may come to a tight point in the grid. Use a motion that pushes the lens leg inwards and up. If that does not work, use a 5-in-1 tool to carefully push the leg into the channel.

d. Do not use excessive force in installing the lens as it may crack.

e. Do not put concentrated force on the flat part of the lens as this part is not as impact resistant as the edges of the lens.

f. Check the lens for play by pushing up on the lens. Most of the lenses should be flush against the grid but generally speaking there should not be more than around 1 mm of play on the outside edges of the lens.

g. To remove a lens, do not pry on the prism or flat part of the lens. Use a 5-in-1 tool to pry the wing of the lens (between the lens and the extrusion leg). Progressively peel one side out similar to the reverse process of installing. Do not pull both legs of the lens out at the same time.

HARD-PIPED FIRE PROTECTION

For a field installed hard piped system, it is the sprinkler contractor's responsibility to hard pipe all sprinkler mains and branch lines and flexible hoses (if applicable) to the couplers in the grid modules and attach all sprinkler heads. After installation, they should be pressure tested per site requirements to confirm that they meet applicable fire sprinkler codes.

FLEXIBLE FIRE PROTECTION SYSTEM

Our 3" fire protection main and flex hoses are fully tested to ensure quality. We recommend performing a system pressure test in the field in accordance with NFPA standards. Figure 26 shows the fire protection system.



Figure 26. Tilt-up fire protection system with 3" mains (capped at ends) supported on tilt-up struts, and Clean-Flex flexible hoses.

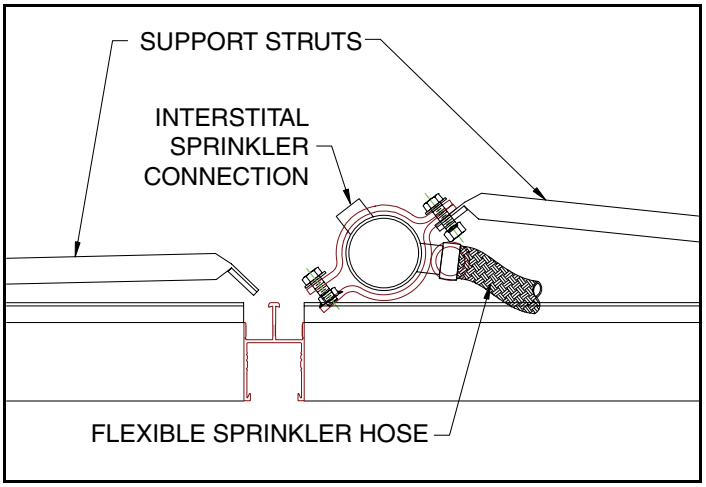


Figure 27. Sprinkler main and support struts shown in collapsed shipping position.

A. Special Tools and Part Required

- **a.** Hand driver with 1/4” hex opening, 8” overall length, Grainger Magna Stock No.6X989
- **b.** 1/8” hex bit, 1.25” long, McMaster Carr No. 8526A64
- **c.** Sprinkler Head Guard, for specific heads
- **d.** 3/8”-16x12” piece of all-thread (supplied by others)

B. Tilt-Up Main Assembly

- **a.** Clean-Flex is shipped with the 3” diameter main piping disassembled and collapsed (see Figure 27) onto foam shipping pads and zip-tied to the grid. The grid blocks can be easily guided into position by using the marks on top of the interior grid.

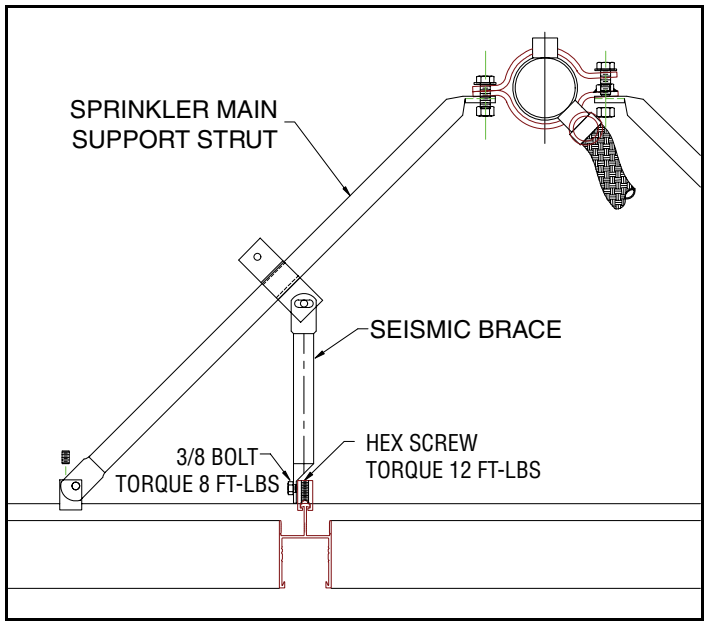


Figure 28. Attachment of seismic brace to sprinkler main struts.



Figure 29. Tilted up sprinkler main and struts with seismic bracing being attached to sprinkler strut.

- **b.** The blocks must be tightened into place using a cup-point socket-head set screw (provided with the blocks).

C. Seismic Bracing

- **a.** The 3” sprinkler mains need to be attached to the building structure by seismic braces. We offer an optional seismic brace that attaches to the ceiling grid (see Figure 28 and Figure 29). Consult us for standard layouts for your seismic zone. The 3” sprinkler main intersection between grid modules is braced to the building structure.

D. It is the sprinkler contractor’s responsibility to provide and install all fill-in spool pieces and couplers for the 3” mains to connect them together once they are tilted up.

E. Pre-installation Check

- **a.** Check each sprinkler head for cracked quartz tubes prior to installation. If a quartz tube is cracked, the sprinkler head must be replaced. Make sure the O-rings are in place on the sprinkler port plugs and on the Clean-Flex sprinkler drops. The O-rings maintain an airtight seal.

F. Port Plug

- **a.** If a DualSeal sprinkler port is in place, then unscrew the lower seal from the port that is in the grid cavity, if present.
- **b.** To remove a sprinkler port plug, loosen the two #10- 32 hex button head screws (see Figure 30). Screw a 3/8”–16x12” piece of all-thread into the receiver threads on top of the sprinkler port plug and remove the plug from the ceiling grid. Do not



Figure 30. Sprinkler port plug with two #10-32 hex button head screws.

discard the plug — the O-ring from this plug (use the larger O-ring for the DualSeal plug) will be used on the flex hose coupler.

c. To install a sprinkler port plug, reverse the above steps.

d. Sprinkler port plugs must remain in all unused ports.

G. Flexible Hose Sprinkler Assembly Installation

a. Flexible hoses are typically already attached to the main. If the flexible hoses are shipped loose and are to be installed in the field, follow the following suggested guidelines. Regardless of any suggestions herein, it is the installing contractor's responsibility to apply the right amount of sealants and tightening to ensure a seal, to test the method by which they apply the sealants, and to train their crew on the method of installation.

i. Prepare the female thread fitting into which the hose assembly will be installed. Using a tap, chase the female thread fitting to clean it out of rust, debris and other foreign material, and to dress up the female thread. Use a bottoming type tap 1- 1/4" NPT. Run the tap an eighth to a quarter turn at end with reasonable force. Clean out female thread thoroughly with brush and vacuum.

ii. Carefully remove hoses from their packaging and inspect the hose and head for damage. Use care when handling the hoses. Prepare the male thread on the hose. Inspect the male thread visually for damage. Apply tape as recommended by the tape manufacturer. A suggested guideline is to wrap the male thread with 5 wraps of nickel impregnated PTFE tape that is designed for use on stainless steel threads. Brand of this tape is Unasco thread-sealing PTFE tape with nickel. Other tapes may require different amounts of wraps to be utilized. Apply tape in such a manner such that it does not rotate off when the hose is threaded in the female fitting. Then apply RectorSeal T Plus 2 pipe thread sealant over the tape on the threads. Use this compound in addition to the tape. Source for this is RectorSeal, Houston, Texas www.rectorseal.com 800-231- 3345.

iii. Thread the hose assembly into the fitting. At no time during handling or installation is the hose to be twisted. Never apply a torque to one coupler end with the other end or tube restricted since this could twist the hose and cause damage. It is recommended that two people install the hose— one to thread and tighten the male coupler to the pipe and the other to support the hose in such a manner so as not to torque the hose and to prevent damage.

b. The flexible hose with sprinkler head, removed from its holster, may typically be installed into any of three locations on a standard grid configuration as shown in Figure 31. Again, port plugs shall remain in any unused ports.

c. Only qualified personnel familiar with this procedure should perform the following operations. Important: Do not remove live sprinkler heads without first depressurizing the flex hose and main. Do not bend the flex piping to a bend radius less than 3.5" for Clean-Flex welded hose and 6.5" for Clean-Flex WeldFree hose.

d. All flex hoses must be holstered when not in use as shown in Figure 32. Flexible hoses will typically come pre-installed in the holsters from the factory. If the hose needs to be placed into the holster make sure to use the screw location in the holster

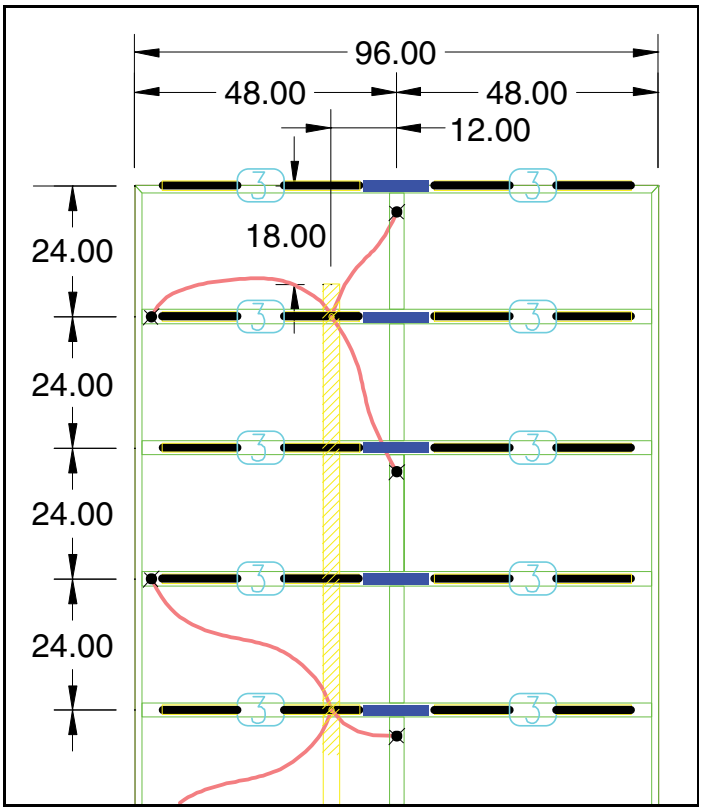


Figure 31. Flexible sprinkler hose potential locations.

that is the closest to the flexible hose entry end. The screw may need to be relocated depending on the end through which the flexible hose assembly will be inserted. Do not place a screw where it will touch the sprinkler head. Torque screw to 40 in-lbs.

e. Before installing the flex hose coupler with the sprinkler head (see Figure 33) into the sprinkler port, make sure the screws are threaded into the clamping collar and that they extend from the bottom of the collar by 0.125". Also, remove the O-ring from the previously removed sprinkler port plug (for the DualSeal Plugs plugs, use the larger of the two O-rings) and place it on the flex hose coupler as shown in Figure 33.

f. After removing the sprinkler head guard, insert the coupler with the sprinkler head into the sprinkler sleeve, aligning the clamping collar profile with the sleeve profile so the exposed part of the screws begin threading into the sleeve holes. See Figure 34.

g. Tighten one screw completely, and then back it out one complete turn so the O-ring is not compressed.

h. Tighten second screw until you feel the O-ring compress.

i. Tighten both screws until they are firmly seated. The hose is now seated into the port. A picture of this is shown in Figure 35 for a non-illuminated grid member and in Figure 36 for a grid member with lighting (this requires the addition of a wireway cover).



Figure 33. Sprinkler head end of Clean-Flex flexible hose.



Figure 32. Flexible sprinkler hose holster on 3" main.

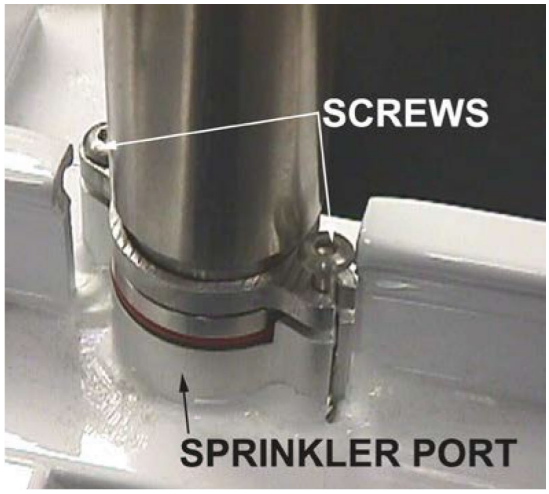


Figure 34. Screws to attach flexible hose coupler into port (screws shown loose here).

j. If the DualSeal Port option is provided, pass the lower seal nut O-ring and lower seal nut ring over the sprinkler head and flexible hose pipe and carefully thread it onto the port (see Figure 37). Ensure that the hose is vertical and not tilted to one side when installing the lower seal nut. This is a two person operation—one person to hold the hose straight from above and one person to install the nut from below. Carefully thread the lower seal nut onto the port — the threads are fine, so care should be taken to not cross-thread while starting the thread. Tighten snug tight using a special hand tool provided by us.

k. Visually inspect around the lower seal nut to make sure that the hose stem is centered in the nut and that the o-ring has not popped out of the lower seal nut. Take care not to put force or damage the sprinkler head during this procedure.

l. Install the sprinkler head escutcheon and the lens.

H. Moving a Flexible Hose Sprinkler Assembly to a New Location

a. Survey the ceiling grid from within the cleanroom to find the location of the existing sprinkler head and the port where you wish to relocate it.

b. Remove the lenses at the new head location and at the existing head location. Locate the same sprinkler port locations in the interstitial.

c. Remove the sprinkler port plug in the ceiling grid at the new head location. Remove the lower seal if the DualSeal Port option is provided. See paragraph F Port Plug.

d. Visually inspect the flange at the topside of the sprinkler sleeve to ensure clean mating for O-ring.

e. Remove the flexible hose sprinkler assembly from its existing sprinkler port location by removing two socket head cap screws found on each side of the port. If the DualSeal Port is provided, then remove the lower seal first. Loosen the first screw one complete turn. Then, loosen the second screw until it is no longer threaded into the sleeve. Completely loosen the first screw.

f. Pull the flexible hose sprinkler assembly up through the sleeve, taking care not to strike the sprinkler head on anything. Slip the sprinkler head guard over the sprinkler head immediately after removing it from the sleeve.

g. Back thread the screws into the clamp collar so the threads extend 1/8” from the bottom.

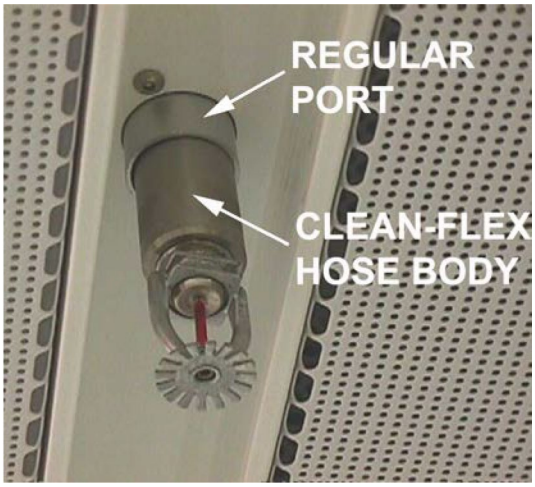


Figure 35. Sprinkler hose installed in regular sprinkler port (bottom view).

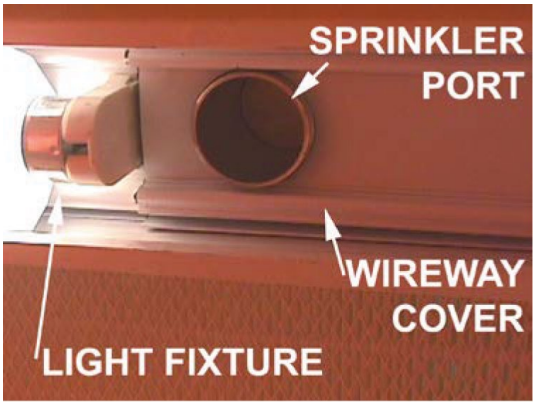


Figure 36. Wireway cover installed around sprinkler port where the port falls in a lighted grid member.

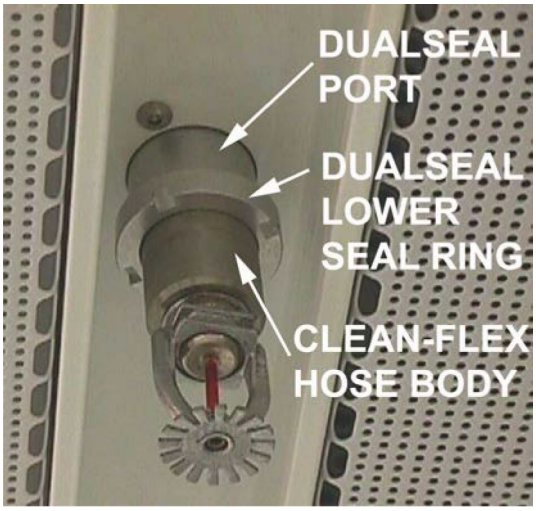


Figure 37. DualSeal Port lower seal ring installed after flexible hose is installed in port.

h. Guide the flexible hose sprinkler assembly to the new head location, routing it to clear obstructions such as flex-ducts, supports, etc. Do not bend the flex piping to a bend radius less than 3.5" for Clean-Flex and 6.5" for Clean-Flex WeldFree.

i. Remove the sprinkler head guard and insert the sprinkler head into the sprinkler sleeve at the new location. After inserting the sprinkler head into the sprinkler sleeve, do not re-install sprinkler head guard.

j. Follow the detailed instructions in the section above on Flexible Hose Sprinkler Assembly Installation pertinent to installation of the hose into the sprinkler port in the grid.

k. Re-inspect and re-install the sprinkler port plug in the old head location. Check O-ring.

l. Re-install the sprinkler escutcheon in the new head location and the lens in the new and former head locations. See Figure 38. When installing the escutcheon, you will be required to work the legs of the clip attached to the escutcheon into the grid channel with your fingers. The lens shall mount against the sprinkler escutcheon. The sprinkler escutcheon has a taper on its edges so that it slightly overlaps the edge of the lens to minimize light leakage from the end of the lens.

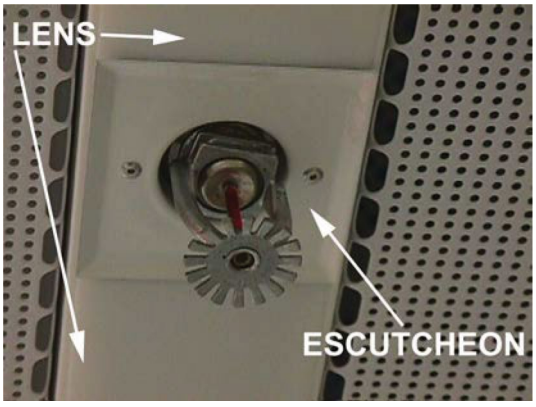


Figure 38. Escutcheon installed in grid.

PRELIMINARY CLEANING

A. Vacuum and clean the grid of all foreign objects.

B. Do a preliminary wipe down using a 10:1 solution of deionized water and isopropyl alcohol or as required by protocol procedures on the grid only (NOT the lens). It is important that the grid be dry before the gel is poured because alcohol will destroy the gel. Let the grid dry for up to 12 hours so that all moisture evaporates from corners and crevices. Important: Do not exceed a 10% ratio of isopropyl alcohol in the cleaning solution. Lens material should be cleaned using 100% deionized water only. Do NOT allow any amount of isopropyl alcohol to touch the lens as it will instantly permanently damage the lens. Do not over-wipe caulking as it may loosen.

GEL POUR

C. Various types of "gel" are available, including urethane, silicon and petroleum-based products. The caulk you use must be compatible with the gel seal you use. Consult the gel manufacturer about compatible caulk.

D. Installers must follow the gel manufacturer's instructions, including, but not limited to, specifications for required gel temperature and maximum shelf life.

E. If the gel is purchased through us, it is the contractor's responsibility to ensure that the gel is used prior to the expiration date. In addition to the manufacturer's instructions, the contractor should also:

a. Prior to pouring gel into Gel Link grid members, refer to the section on Caulking Requirements for information regarding the critical caulking required.

b. Store and handle gel in a temperature-controlled environment at all times.

c. Test each barrel of mixed gel to ensure the proper mixture and set-up. Keep a log of all test samples. Note in the log where each gel sample's corresponding batch is installed in the ceiling system.

d. If a partial pour is to be performed, the installer should ensure that the gel channel is blocked with a foam plug to act as a gel dam. For a partial pour on the GelLink grid, it is critical that the GelLink cavity between grid module seams (this is the cavity formed by the adjoining extrusions) also be

plugged with foam and/or caulking. The materials to form these temporary dams is the installing contractor's responsibility. Remember to remove these temporary plugs prior to subsequent pours.

F. All work to remedy gel leaks is the contractor's responsibility.

G. Pour gel to fill the trough to a height of 0.1 inches from the top of the trough.



Figure 39. Gel pour.

FINAL CLEANING

Once the cleanroom is ready for filter installation, wipe down all grid members with a site protocol-approved cleaning solution. This final cleaning removes debris deposited during the gel pour and any contaminants adhering to grid members. Important: Lens material should be cleaned using 100% deionized water only.

FILTER INSTALLATION

A. Follow the original filter manufacturer's handling instructions at all times. Do not rack or twist the filter frame or put pressure (even hand pressure) on the filter media at any time. It is recommended that two people handle each filter install and that lifts/jigs be used where appropriate to facilitate a safe install.

B. If Equalizers are to be installed on the upstream side of the filters, they can be installed on the filters prior to loading or after load filters as long as you have access to get to them.

C. The filters that go into top load grid can be loaded from the top of the grid or angled in through the bottom of the grid and then lowered into the ceiling grid channel.

D. For bottom load grid, rotate the clip tabs away to be next to the grid member so that the filter can be pushed up as shown in Figure 40. The nut on the clip may need to be loosened a bit to rotate the clip tab. Inspect the gel in the filter channel to see that it is not damaged. Carefully load the filter flat up into the grid opening. Rotate the clip tabs out perpendicular to the grid member to support the filter and tighten the nut.

E. If the top of the bottom load grid is to have walkable filters or walkable blank pans or if bottom-load FFUs are installed, it is required that special plates be installed in the corners and the nuts torqued as shown in Figure 41. Slip the corner triangular plate over the set screws. Place the split lock washer under the head of the button head screw. Tighten plate evenly. Torque the button head screws to 24 in.-lbs. Note: The set screws pictured are for alignment purposes. No nuts are required on the set screws.

F. Reverse the above instructions for removal of filters.



Figure 40. Non-walkable bottom load filter clip shown rotated out of the way for filter installation. Rotate out perpendicular to grid and tighten nut.

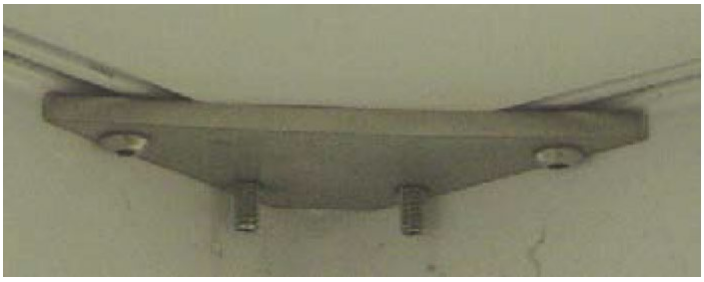


Figure 41. FFU on bottom load filter or walkable bottom load filter clip at corners of grid opening. Torque the screws.

CLEAN-TRAK 2.6 STICK-BUILT CEILING GRID

GRID HANDLING REQUIREMENTS

A. Because the success of the installation depends upon the proper installation of each stick component, handle all components with extreme care throughout the installation.

B. Do not twist or rack the pre-assembled individual grid members to prevent torque on the T-connector hangers. If twisting or racking occurs, the grid connections may slip. It is the installer's responsibility to loosen the screws and re-tighten the grid members in the event that grid connections are moved.

C. Should the connection blocks require re-adjustment, tighten the setscrews to 12 ft-lbs of torque.

See Handling Requirements under Clean-Trak 2.6 MODULAR CEILING GRID for complete grid handling guidelines.

INTERSTITIAL PREPARATION

The installer determines and sets the heights of rods and turnbuckles. Fully engage all rods into their turnbuckles and set the elevation using a laser level.

Grid Pre-Assembly

A. Do all assembly work, especially in the field, on a clean, flat work surface or stationary table that is large enough to accommodate the largest grid module or configuration.

B. Prefabricate all grid components in sized corresponding to the hanging hardware, for example, on 8-foot centers.

C. Pre-assemble the modules in accordance with the grid layout provided by us.

D. Assemble the grid intersections as shown in standard drawings 27-15-20, 27-15-21, 27-15-22 and 27-15-23 or per the job specific drawings. Do not tighten the set screws over 8 foot-pounds.

E. Remove debris from the grid and clean it thoroughly.

F. Grid is now ready to be lifted into place.

Grid Installation

A. Keeping the grid module flat and level, move it into place directly below its hanger locations.

B. Lift each module into place one at a time using a genie lift or a duct lifter with a flat surface that fully supports the module. Protect the modules with foam wrap so that the finished surfaces are not scratched or damaged.

C. Lift gently to avoid damaging the pre-assembled lights and light lenses.

D. Engage the turnbuckles into the grid hanger assembly and pre-level the grid to room height.

E. Once all grid modules are pre-hung and leveled, install the interior grid T-connections.

REQUIRED STICK-BUILT REFERENCE SECTIONS

See the Clean-Trak 2.6 MODULAR CEILING GRID section above for instructions including, but not limited to:

- Seismic Bracing
- Perimeter Grid and Face-plate Closure Caulking Requirements
- Lighting
- Light Fixture, Ballast Covers, Wireway Covers, Tuck Boxes Fit into Grid
- Lighting Using Ship-Loose Parts Wiring
- Ionization
- Lens Installation
- Hard-piped Fire Protection
- Flexible Fire Protection System
- Preliminary Cleaning
- Gel Pour
- Final Cleaning

CLEAN-TRAK 2.6 MODULAR CEILING PLENUM

HANGING/BOLTING INSTRUCTIONS

Install the plenum module level and on the plane described in the owner's specification/drawings by adjusting the module supports that you will connect to the roof of the plenum and sometimes to the side of the plenum. Where a torque is specified, make sure to use a calibrated torque wrench. Unless otherwise specified, tighten assemblies to "snug tight" as defined by AISC. Do not over-tighten assemblies. Do not use deformed hangers assemblies. Be sure to monitor the cumulative plenum dimensions during the course of installation in order to maintain overall cleanroom dimensions.

A. Pre-install the plenum suspension assemblies on the hanging rods/turnbuckles from structure.

B. Lift modules into place one at a time using a lift, genie lift or duct lifter with a flat surface that fully supports the modules. Be sure to protect the modules with foam wrap so that the grid surfaces and lenses are not scratched or damaged.

C. Gather and tuck the wiring up and over grid members so that wires are not unknowingly pushed up between modules during installation.

D. Lift gently to avoid damaging any of the pre-assembled lights and light lenses. Keep the module level and avoid racking.

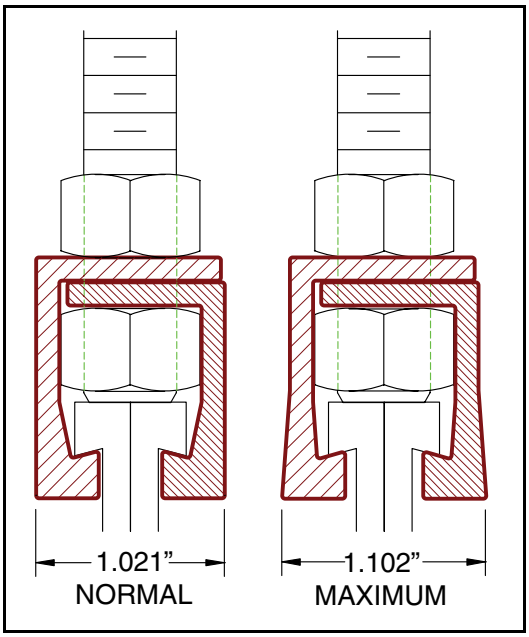


Figure 6. Limits on width of hanger assembly after tightening.

E. Install the plenum suspension assembly hardware loosely (finger tighten only for now).

F. Level the bottom face of the grid at the exterior extrusions to the customer's level specification during plenum hanging. The interior grid may be leveled after hanging, if required, by using all- threaded rod attached to interior grid intersections (this would be provided by others). Do not level by using the top of the plenums.

G. Follow the bolting and tightening sequence as outlined in Figure 42 and Figure 43.

H. Install all 5/16"x ¾" grid bolts, washers and nuts to attach the exterior grid extrusion of one module to another and to attach the perimeter grid to the module (if required).

I. Square the module and then tighten the 5/16" grid bolts starting at one end and finishing at the other end. Ensure that the module remains square and that it aligns with control datum lines. If possible, secure the initial module to building. You may need to secure module at additional intervals to maintain proper alignment. Tighten bolts to snug tight as defined by AISC. To secure module in a manner not outlined in this guide, consult our factory.

J. Install the bolts at the corners and the bolts at the upper locations on the side walls. Tighten these bolts.

K. Tighten the suspension plate bolts.

L. It is recommended that all hangers be rechecked and re-tightened, if necessary, after modules are bolted together.

M. Once the entire module attachment is complete and the ceiling appears level, laser level the grid and tighten all hanging hardware and attachment blocks before removing lifting equipment.

N. The Clean-Trak hanging system requires a complete 2.6" cross section, formed either by two adjacent modules or a perimeter extrusion back-to-back with a perimeter module.

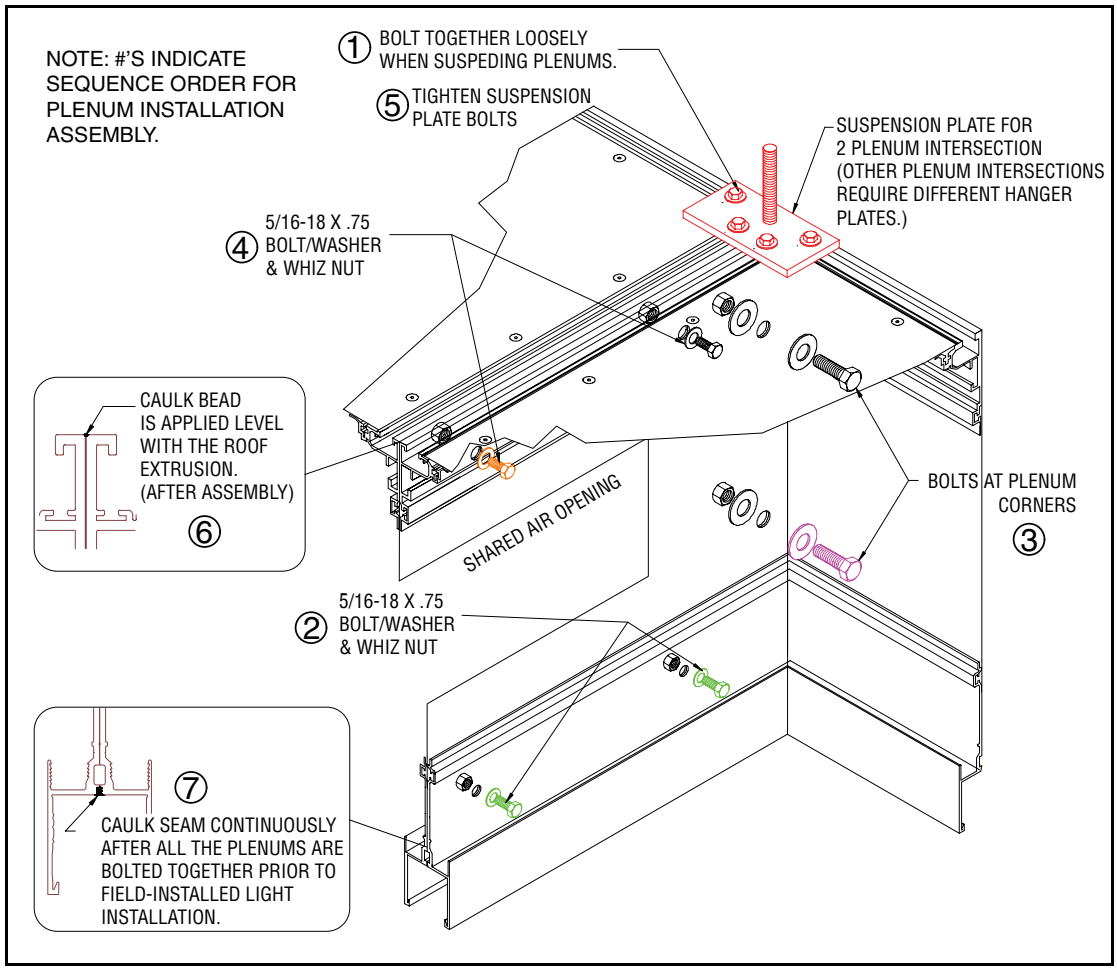


Figure 42. Riveted plenum bolting, suspension and caulking.

O. Proper module installation involves a certain craftsmanship to eliminate “growth” and maintain squareness. Check alignment after installing each module. Module misalignment that is not corrected when each module is installed may cause misfit of Clean-Trak snap-in components. Do not caulk between perimeter grid modules. Caulking between grid modules creates misalignment and growth that will conflict with the overall width and length of the cleanroom footprint.

See Caulking Requirements section for caulking of the grid to grid joints. Caulk the top of each plenum to plenum joint continuously on the roof of the plenums. For plenums, on the perimeter of the fab, caulk the vertical plenum to plenum joints too.

SEISMIC BRACING

Seismic bracing of the plenum system should be installed per the appropriate structural calculations and codes.

REQUIRED PLENUM REFERENCE SECTIONS

See the Clean-Trak 2.6 MODULAR CEILING GRID section above for instructions including, but not limited to:

- Perimeter Grid and Face-plate Closure Caulking Requirements
- Lighting
- Light Fixture, Ballast Covers, Wireway Covers, Tuck Boxes Fit into Grid
- Lighting Using Ship-Loose Parts Wiring
- Ionization
- Lens Installation
- Hard-piped Fire Protection
- Flexible Fire Protection System
- Preliminary Cleaning
- Gel Pour
- Final Cleaning

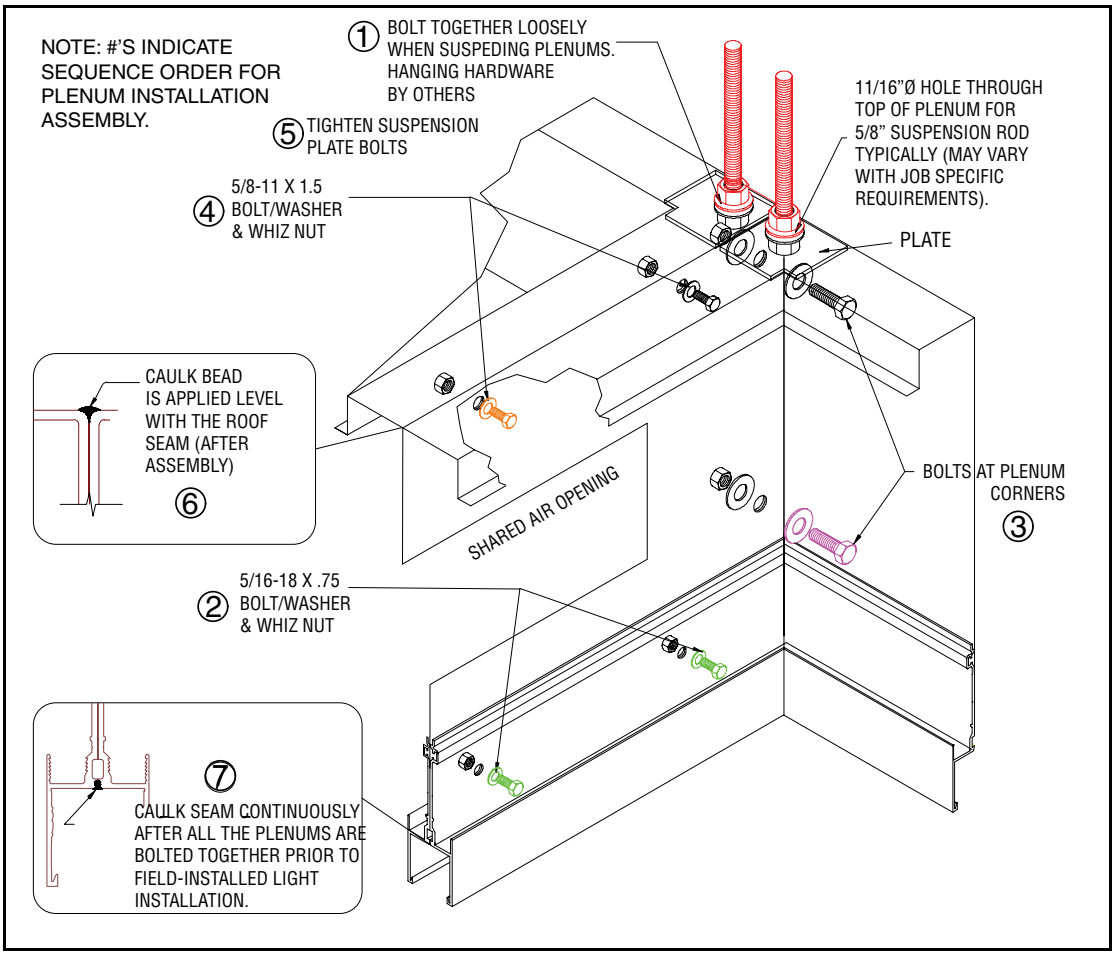


Figure 43. Welded plenum bolting, suspension and caulking.

CLEAN-SCREEN® AND ALL-PERF SCREEN

The optional Clean-Screen reduces the possibility of particles migrating via turbulence below the grid line and in the light lens area. Clean-Screens and All-Perf Screens, herein referred to as screen, are installed after gel pour and filter installation.

SCREEN RECEIVING

A. Visually inspect the shipping containers for damage.

B. Visually inspect the triple corrugated boxes for:

- **a.** Physical damage or impact
- **b.** Punctures
- **c.** Moisture damage

C. If shipping damage has occurred, notify the our Service Department immediately. Provide photos of the damaged freight and call the trucking claims inspector to inspect the damage and submit a damage report. After the inspector has released the shipment, perform a 100% inspection of the screens. Damaged screens should be isolated in a holding area to prevent them from being installed. Check the face of the screen for visible dents.

D. Check the sidewall and end walls for non-uniform bending and angles. Check screen corners for bent or damaged areas.

E. It is the installer's responsibility to ensure screens are not damaged from the time they are accepted until the time they are properly installed into the ceiling.

SCREEN HANDLING AND STORAGE

A. Carefully unload and move the screen into a covered, protected storage area.

B. Store the screens in an area where they will be protected from harm and from environmental damage.

C. Stack the shipping boxes no more than two high. When stacking, observe the instructions printed on the box. Do not stack the screens in any manner that will damage the surfaces of the screen or the angle of the sidewall brake.

D. Observe the owner's protocol while moving the screens into the final staging area.

E. Stage the final product only in controlled areas where other trades cannot damage the screens while performing their work.

SCREEN INSTALLATION

A. Take special precautions to ensure that the screen does not touch filter media. In the event that the screen touches the filter media, notify the cleanroom contamination specialist who is in charge. Do not install the screen until the filter has been scanned with a particle counter and repaired or replaced as necessary.

B. Compare the grid opening with the screen size to ensure that the proper screen is being installed in the grid opening. Figure 44 shows the critical edge of the screen, which is the sidewall that engages with the screen clips that are mounted in the grid.

C. Observe the following precautions when testing the screen clips to ensure they work properly:

- **a.** Inspect the clip for cracks in the clip body caused by improper screen installation. It will be hard to see this damage once the screens are installed, so follow these installation procedures carefully.
- **b.** Ensure each grid opening has four clips installed.

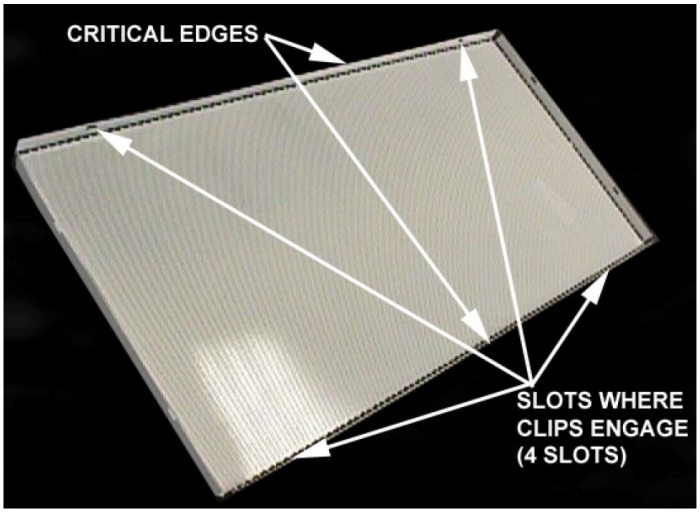


Figure 44. Screen slots for clip engagement (Clean-Screen shown here).

D. Each screen is manufactured with an open brake to absorb tolerances and to ensure positive fit into grid members and positive engagement with the screen clip. Figure 45 shows the critical brake angle is a minimum of 95 degrees to a maximum of 98 degrees.

- **a.** Position the screens so that the sidewall clip slots are resting on two of the screen clips along the long side of the screen.
- **b.** Maintain the position of the screen (engaged on the clips) while slowly lifting the other side into position to engage with the clip on the opposite side.
- **c.** Light finger pressure may be required to get the screen into final position. Be sure the screen does not bend and change the angle of the sidewall.
- **d.** After installing screen, visually inspect all four clips to make sure they are engaged with the screen.
- **e.** A 1/8” Allen wrench also may be inserted into the four corners of the screen. A gentle tug downward at the corners will ensure positive screen clip engagement. Some variation in the height of the seated screen is normal.
- **f.** To remove the screen, there are two different procedures depending on the type of clip:
  - **i.** For the clip that is inserted through the side of the grid (like Figure 45): Gently push one up on one corner of the screen
  - **ii.** approximately 1/8 to 1/4 inch. Then insert the screen removal card or credit card between the screen and the screen clip so as to disengage the clip tang from the screen slot. Raising the screen disengages the clip tang from the screen vertically, and pushing the card between the screen and the clip disengages the clip tang from the screen horizontally. Lower the screen at this corner (you may need a clip to grab onto the screen) and then repeat the procedure at the remaining clips.
  - **iii.** For the clip that attaches from the bottom-load grid (like Figure 46) or is welded to the side of the grid (like Figure 47): To remove a screen, go to one corner of the screen. Push up on the screen face, it should rise about a quarter inch and hold this in place with one hand. Carefully insert a 1/16” allen wrench through a hole in the perforation of the screen (taking care not to insert too far so that the filter media is not touched) and push the bottom of the clip, where it usually engages the screen, away from the grid side. So, raising the screen disengages the clip tang from the screen vertically and pushing the clip disengages the clip tang from the screen horizontally. Lower the screen (you man need to use a clip to grab onto the screen). Repeat at the other corners. You may need two people to do this job safely.

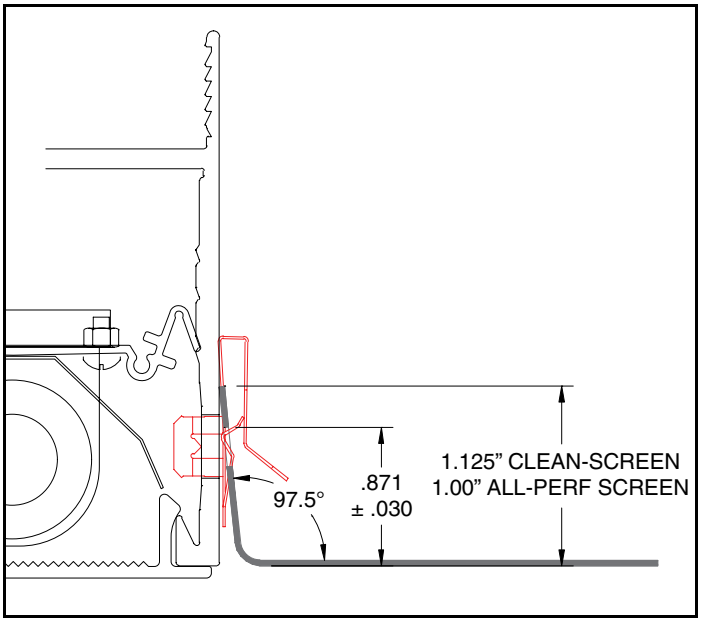


Figure 45. Screen dimensions and clip that inserts into side of grid.

E. In addition to the procedures outlines above, it is important that all trades who work with the ceiling system receive proper training on how the screen is attached. Typically, these trades include electricians, ionization installers, air filter balancers, contamination specialists, fire protection contractors, cleaning personnel, tool installers, automated material handlers, systems installers, wall installers, and others.



Figure 46. Screen clip that attaches from bottom-load grid.



Figure 47. Screen clip that is welded to side of grid.

EQUALIZER®

In plenum and grid systems, Equalizer modules allow complete regulation of airflow. Each filter's airflow can be adjusted from ports at room level from open to virtually 100 percent shut off. In the air balancing process, it is important to start with the Equalizers open 100% initially at the start of balancing and then start to adjust equalizers as needed so as not to waste energy.

The Equalizers are typically attached to the filters in the field with double sided adhesive tape. The filter/Equalizer assemble is then loaded into the ceiling grid. The Equalizer can be removed and reused if the filter is changed out.

There are two types of equalizer setups. One is with the adjusting mechanism on the side of the equalizer (like Figure 48) and is accessed though a port in the grid stick and the other is with the adjusting mechanism in the center of the equalizer (like Figure 49) which is accessed though a port in the center bar of the final filter. Use a 3/16" hex ball-end T-handle allen wrench.

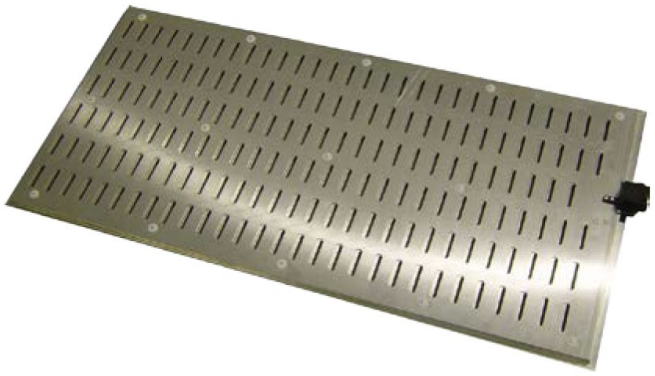


Figure 48. Equalizer (with gear on the side).

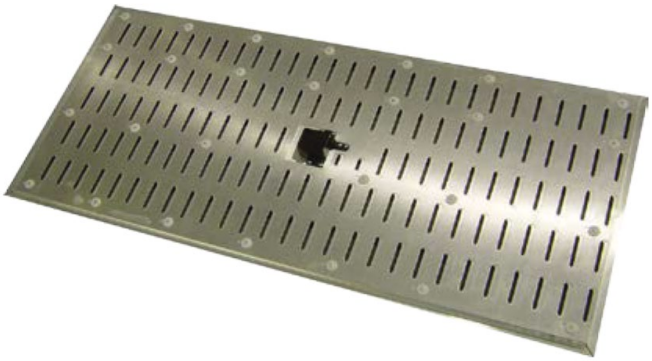


Figure 49. Equalizer (with gear in the middle).

MAINTENANCE

Generally speaking there is no maintenance required on the grids or plenums other than what may be required for site specific protocols like cleaning and filter and lamp replacement. Follow the instructions on removing and reinstalling components such as lens, screens, filter and Equalizers as listed above.

No part of this book may be reproduced, stored in a retrieval system, or transmitted in any form by an electronic, mechanical, photocopying, recording means or otherwise without the written permission of Nortek Air Solutions.

Illustrations cover the general appearance of Nortek Air Solutions products at the time of publication and Nortek Air Solutions reserves the right to make changes in design and construction at any time without notice. The manufacturer reserves the right to modify, discontinue or change the materials and specifications resulting from a program of continued product improvement or the availability of new materials without notice or obligation.

Products may be protected under one or more of the patents listed under www.nortekair.com/patents.

Clean-Trak® and Cleanscreen®, and are registered trademarks of Nortek Air Solutions, LLC.
CLEANPAK™ is a trademark of Nortek Air Solutions, LLC.

Specifications and illustrations subject to change without notice and without incurring obligation.

NORTEK™
CLEANROOM SOLUTIONS

nortekair.com

© Nortek Air Solutions, LLC 2025. All Rights Reserved.
CPK-TUA-CRM-IOM-CleanTrak-20251205