certain embodiments, the opening may be created on the platform 116 via the cutting tool, as the cutting tool is guided through the lead-sleeve 114, as further described below.

[0024] In certain embodiments, the platform 116 may include an extension system 154 that fastens to the corrugated sheet metal 102 to provide support for the lead-sleeve 114 in positions where the lead-sleeve 114 is not entirely positioned at the peak 104 of the corrugated sheet metal 102. In other words, the platform 116 may be configured to support the lead-sleeve 114 utilizing two consecutive peaks 104 of the corrugated sheet metal 102. The extension system 154 may include one or more flanges 156 and/or include one or more attachment ends 158. The flanges 156 and/or attachment ends 158 may extend in either direction to secure the lead-sleeve 114 over the valley 106. The attachment ends 158 may be positions for securing the platform 116 to the corrugated sheet metal 102. In certain embodiments, the attachment ends 158 may include stiff locking elements each having a connection element for forming an interlocking coupling between the attachment ends 158 and the corrugated sheet metal 102. In certain embodiments, the attachment ends 158 may include a grooved emboss feature 160 or compliant block-out component that mates with a groove on the corrugated sheet metal 102 to securely position and seal the pre-installation system 102 over the valley 106 and the peak 104. In certain embodiments, attachment means may be utilized to secure the platform 116 to the corrugated sheet metal 102, such as, for example, screws, pins, adhesives, rivets, welding, direct fastening, hooks, etc. Furthermore, the platform 116 may secure the pre-installation system 100 against vibrations and other forces during subsequent drilling within the concrete. The platform 116 may be formed of a rigid material, such as metal, wood, plastic, fiber-reinforced material, etc.

[0025] In certain embodiments, the block-out component 118 may be coupled to the platform 116. Specifically, the block-out component 118 may be formed of any material or construction that prevents the spread of concrete when it is poured into a region of the corrugated sheet metal 102. In the illustrated embodiment, the block-out component 118 may be formed of two parallel components shaped to correspond to the dimensions and shape of the valley 106 (e.g., walls and floor), and may be configured to prevent poured concrete from entering the chamber 161 (e.g., space between the two parallel components, below the platform 116, and above the floor of valley 106), thereby allowing a post cutout of the corrugated sheet metal 102, as further described in detail below. It should be noted that the block-out component 118 may be shaped to fit into the

valley 106, such that a base 162 of the block-out component 118 (e.g., the two parallel components) form a tight seal with a floor 163 (as illustrated in FIG. 5) of the valley 106 of the corrugated sheet metal 102. Specifically, the corrugated sheet metal 102 may include variations in the shape, ridges or grooves 164 (as illustrated in FIG. 5), of the floor 163 of the valley 106, and the base 162 may be shaped to form a tight seal against such ridges and grooves 164 of the valley 106. In certain embodiments, the base 162 may be formed of a flexible or pliable material that adapts its shape to conform to the floor 163 of the valley 106. Further, in certain embodiments, the block-out component 118 may be configured to adapt to the angled walls of the valley 106 of the corrugated sheet metal 102.

[0026] FIG. 5 is a schematic view of an embodiment of the pre-installation system 100 of FIG. 1, where the pre-installation system 100 is disposed between the valley 106 and the peak 104 of the corrugated sheet metal 102. In the illustrated embodiment, the pre-installation system 100 may be positioned on the corrugated sheet metal 102 before concrete 180 is poured around system 100. In particular, the pre-installation system 100 may prevent the spread of the concrete 180 into certain regions of the corrugated sheet metal 102, thereby helping subsequent cutting of materials through the lead-sleeve 114 to create the through-penetration. For example, as noted above with respect to FIGS. 1-3, the block-out component 118 (e.g., two parallel sections of the block-out component 118) may be configured to prevent the spread of poured concrete 180 between the two parallel sections and underneath the platform 116. In certain embodiments, the block-out component 118 may be a single block section of material that fills a space within the corrugated sheet metal 102, such that the poured concrete 180 spreads around the block-out component 118. In certain embodiments, the block-out component 118 may be a ganged collection of single block sections of material to fill an extended space within the corrugated sheet metal 102, such that the poured concrete 180 spreads around the ganged block-out components 118. In certain embodiments, the block-out component 118 may be formed of any material (e.g., foam, mineral wool, elastic material, flexible material, fiber material, air bladder, cellulose pulp, etc.) that is flexible enough to tightly abut against the floor 163 of the valley 106 of the corrugated sheet metal 102, but may be structured enough to resist the spread or leaking of poured concrete 180.

[0027] FIGS. 6 and 7 are a schematic view of an embodiment of the pre-installation system 100 of FIG. 1, where the pre-installation system 100 is utilized with a cutting tool 190. As illustrated

in FIG. 6, in certain embodiments, the pre-installation system 100 includes a protective guiding sleeve insert 186. After the poured concrete 180 turns into solidified concrete 182, a cap 184 (illustrated in FIG. 5) covering a passage 188 through the lead-sleeve 114 may be removed. Further, a protective guiding sleeve 186 may be inserted through the passage 188 to protect the lead-sleeve 114 from the cutting process. In certain embodiments, the protective guiding sleeve 186 may be formed of a metal, plastic, foil, waxed cardboard, or any flexible, smooth, and/or non-adhesive surface that facilitates the passage of the cutting tool through the lead-sleeve 114.

[0028] The cutting tool 190 may be any cutting tool that may be inserted through the passage 188 of the lead-sleeve 114 to cut out one or more portions of the corrugated sheet metal 102. For example, the cutting tool 190 may be a plasma cutter, a gas torch, a diamond core cutting tool, a hole saw, or any generic cutting tool that forms a through-penetration of the desired diameter without damaging the pre-installation system 100. The cutting tool 190 may include other types of tools, such as drilling tools, grinding tools, laser tools, hole-saws, diamond saws, etc. Preferably, the appropriate cutting tool is selected according to the desired size of the through-penetration pre-determined by the selected lead-in sleeve. As illustrated in FIG. 7, in certain embodiments, the cutting tool 190 may be configured to cut through the block-out material 118 as well as the corrugated sheet metal 102. Further, in certain embodiments, the cutting tool 190 may be configured to avoid damaging other components of the lead-sleeve 114 (e.g., smoke-sleeve 192) when the cutting tool 190 is inserted through the pre-installation system 100. In particular, the cutting tool 190 may be configured to create a passage through the corrugated metal deck 102.

[0029] In certain embodiments, a tubular conduit insert may be inserted into the pre-installation system 100 through the through-penetration formed by the cutting tool 190. Specifically, after the cutting tool 190 removes a portion of the corrugated sheet metal 102 and/or the block-out material 118, a tubular conduit may be inserted through the solidified concrete 182.

[0030] FIG. 8 is a method 200 of inserting a tubular conduit through a corrugated sheet metal 102. In certain embodiments, the method 200 includes coupling the platform 116 and the block-out component 118 to the corrugated sheet metal 102 (block 202). As described above with respect to FIG. 1, the block-out component 118 may be shaped to conform to the bottom surface and the angles of the valley 106 of the corrugated sheet metal 102. In certain embodiments, the block-out

component 118 may be coupled to the platform 116 or may be removably attached to the platform 116. In certain embodiments, the platform 116 may be secured to the corrugated sheet metal 102 with one or more fasteners (e.g., screws, nails, etc.) and/or the attachment ends 158 with the grooves 160. For example, the grooves 160 of the platform 116 may couple with grooves within the corrugated sheet metal 102.

[0031] Further, the method 200 includes coupling the lead-sleeve 114 to the platform (block 204). For example, in certain embodiments, the platform 116 may include a mounting region that may be utilized to couple the lead-sleeve 114 to the platform 116.

[0032] In certain embodiments, the method 200 includes pouring the concrete 180 onto the corrugated sheet metal 102 such that it spreads over a desired area. It should be noted that the poured concrete 180 does not spread into areas prevented or blocked by components of the pre-installation system 100, such as into the passage 188 of the lead-sleeve 114 or the area below the pre-installation system 100 blocked by the block-out component 118.

[0033] The method 200 further includes inserting the protective guiding sleeve 186 into the lead-sleeve 114 (block 208) and inserting the cutting tool 190 through the protective guiding sleeve 186 and the lead-sleeve 114 to create a through penetration (block 210). After the desired portion of the corrugated sheet metal 102 and/or the block-out component 118 is removed, the protective sleeve 186 may be removed from the lead-sleeve 114 and the tubular conduit 195 may be inserted through the corrugated sheet metal 102.

[0034] This written description uses examples to disclose the invention, including the best mode, and also to enable any person skilled in the art to practice the invention, including making and using any devices or systems and performing any incorporated methods. The patentable scope of the invention is defined by the claims, and may include other examples that occur to those skilled in the art. Such other examples are intended to be within the scope of the claims if they have structural elements that do not differ from the literal language of the claims, or if they include equivalent structural elements with insubstantial differences from the literal language of the claims.

CLAIMS:

1. A method, comprising:

coupling a platform to a sheet metal comprising alternating peaks and valleys, wherein the platform comprises a block-out component configured to conform to a valley of the sheet metal;

coupling a lead- sleeve to a mounting region of the platform;

pouring concrete around the platform and lead- sleeve, wherein the block-out component blocks a flow of the concrete from below the platform; and

inserting a cutting tool through the lead-sleeve to remove one or more portions of the sheet metal and the block-out component to form an opening through the platform and a through-penetration through the sheet metal.

2. The method of claim 1, comprising inserting a tubular conduit through the through-penetration.

3. The method of claim 1, comprising inserting a protective sleeve into the lead-sleeve.

4. The method of claim 3, wherein inserting the cutting tool through the lead-sleeve comprises inserting the cutting tool through the protective sleeve in the lead-sleeve.

5. The method of claim 1, wherein coupling the platform to the sheet metal comprises securing one or more flanges of the platform to one or more grooves of the sheet metal.

6. The method of claim 1, wherein coupling the platform to the sheet metal comprises positioning the mounting region of the platform across a peak and a valley of the sheet metal.

7. The method of claim 1, wherein coupling the platform to the sheet metal comprises positioning the mounting region of the platform across a valley of the sheet metal.

8. The method of claim 1, wherein the block-out component comprises two parallel components having a chamber therebetween.

9. The method of claim 8, wherein the chamber is below the mounting region of the platform.

10. The method of claim 8, wherein the two parallel components conform to a floor of a valley of the sheet metal to prevent the flow of concrete into the space.

11. The method of claim 8, wherein the two parallel components conform to angled walls of a valley of the sheet metal to prevent the flow of concrete into the space.