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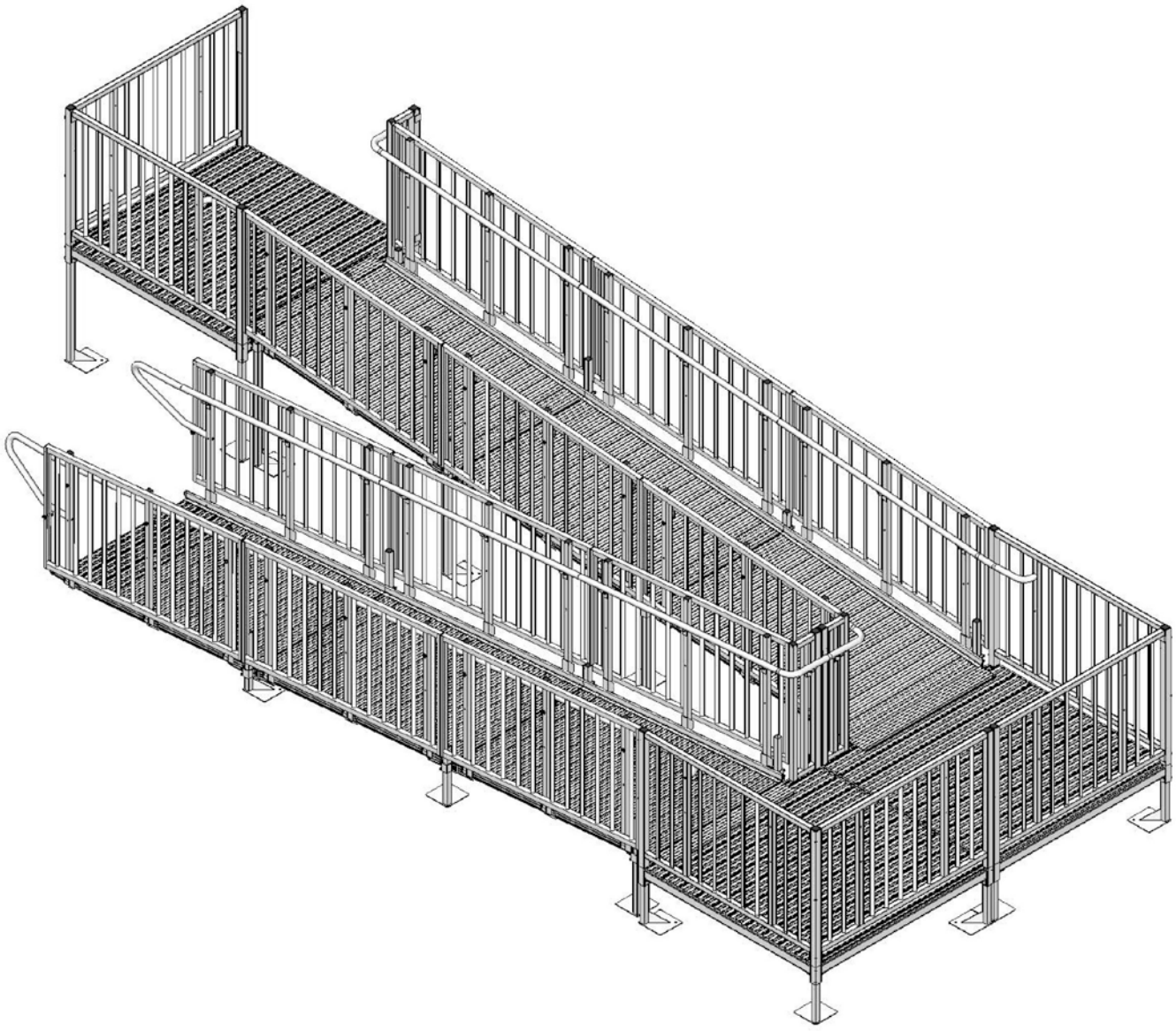
Titan Series Commercial Ramp System

Installation Manual



Manufactured in the USA

IMPORTANT! Read and follow all labels and assembly instructions – including warnings and cautions – prior to ramp use!

⚠ INSPECTION (BEFORE USE):

1. Read and follow all labels and assembly instructions prior to use. To obtain a copy of complete instructions, warnings, and cautions visit www.ezaccess.com or call 1-800-258-8503.
2. Ensure all fasteners and locking mechanisms are in place and tightened. Regularly check and tighten as needed.
3. Inspect for damaged or missing parts before use. If damaged or missing parts are noted, DO NOT USE!
4. Check that all parts are in good condition.
5. If any part of the system is damaged or loose, DO NOT USE until repairs can be made by a certified installer or other qualified person.

⚠ PROPER SET UP AND USE:

1. Consult local building codes in regard to securing system for wind loads.
2. Use ramp only with a qualified helper.
3. Always use your lap belt.
4. Before use, refer to your equipment's Owner Guide for the proper degree of incline/decline and chair direction. Never exceed its recommendations.
5. Do not use if walking surface is unsafe.
6. Ramp may be slippery when wet or icy.
7. Proper maintenance and upkeep to the system is vital. DO NOT USE if ramp guards, handrails, or supports are damaged or unstable.
8. Confirm that the system is correctly leveled and positioned securely. Periodically check for ground shifts.
9. **DANGER**! Metal conducts electricity. Do not use near exposed wiring or hang lights from system.
10. If any part of the system is damaged or loose, DO NOT USE until repairs can be made by a certified installer or other qualified person.
11. Never place anything under or attach anything to system to gain height or to adjust for uneven surfaces.
12. Do not use any component not supplied or approved by manufacturer with system.
13. Do not sit, stand, or climb on guards or handrails.
14. Do not play on or around system, including, but not limited to, running, jumping, bicycles, scooters, skateboards, etc.
15. Do not use handrails or ramp to support planters, decorations, etc.
16. Properly support and restrain system in transit or storage.

⚠ MAINTENANCE:

1. Proper maintenance and upkeep to the system is vital. DO NOT USE if ramp guards, handrails, or supports are damaged or unstable.
2. Do not use if surface is covered with ice and/or snow. Accumulation must be shoveled and the tread surface swept clean before use.
3. At all times, keep system clear of dirt, leaves, and other debris that may accumulate on the surface.
4. Confirm that the system is correctly leveled and positioned securely. Periodically check for ground shifts.
5. Ensure all fasteners and locking mechanisms are in place and tightened. Regularly check and tighten as needed.
6. Ramp may be cleaned with mild detergent and warm water (consult manufacturer before using abrasives or chemical cleaners). Rinse well and use extra caution when ramp surface is wet.
7. For additional care, use, or safety information, please call 1-800-258-8503.

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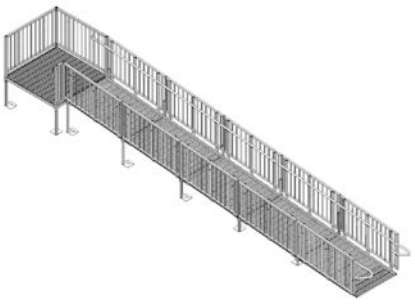
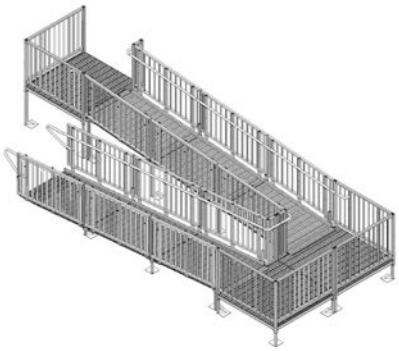
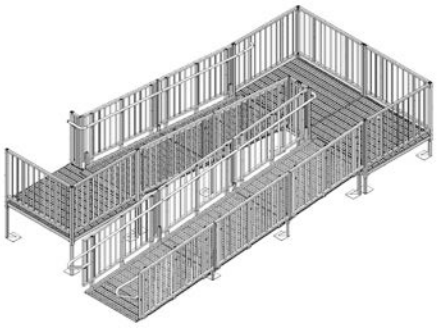
COMMON RAMP CONFIGURATIONS



System #1



System #2



System #3

BEFORE YOU BEGIN:

1. Read and follow all instructions/warnings prior to assembly and use.
2. Load rating: 100 lbs. psf live load, 300 lbs. concentrated

TOOLS NEEDED:

- ✓ Tape measure
- ✓ Level
- ✓ 9/16” socket or wrench
- ✓ 1/2” socket or wrench
- ✓ 3/16” hex key wrench
- ✓ 5/32” hex key wrench
- ✓ 5/16” masonry drill bit (if installing ramp to concrete porch, steps, etc.)
- ✓ Hammer
- ✓ #3 square drive bit
- ✓ File
- ✓ Power drill
- ✓ Metal cutting chop saw or reciprocating saw
- ✓ Digging tools (if an obstacle needs to be removed)
- ✓ Two able-bodied persons needed for installation
- ✓ Pop rivet gun (needed for child rail and corner cover plate installation only)

1. ASSEMBLE/SET PLATFORMS:

1.1 Determine platform height requirement.
- 1.1.1 Insert support legs into corner pockets at corners of platform (FIG. 1). Position foot pads so that they do not protrude past perimeter of the platform. **Note:** The support legs are also used to support the guardrails and when installed, the support tubes must protrude at least 24” above the platform walking surface (FIG. 2).
- 1.1.2 Ensure that the correct length support tubes are used.
- 1.1.3 Adjust legs to approximate height required then secure leg adjustment by tightening setscrews with 3/16” hex key wrench.

1.2 Position platform in desired location then make final height and level adjustments.

1.3 Ensure support legs are secure by tightening setscrews (a total of eight, two in each corner).

1.4 Assemble all platforms required in this fashion. Guardrails and handrails will be installed after platforms and ramps are assembled and set.

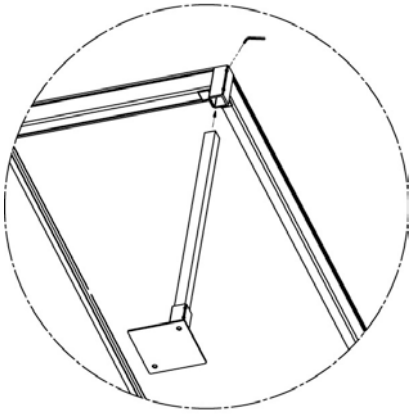


FIG. 1

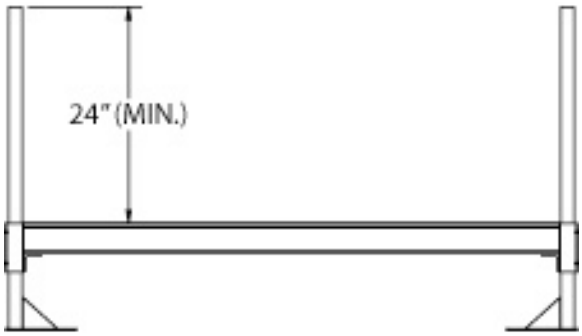


FIG. 2

1.5 Platforms over 3 ft. high from the ground require cross bracing.

1.5.1 Insert legs into platform and set platform at required height as described in previous steps.

1.5.2 Separate ends of brace bands until they go around the 1-1/2” square tube and install four bands on each leg with the part containing bolt holes at 90 degrees from each other and in line with the outer edge of the foot (FIG. 3).

1.5.3 The cross brace will come assembled with one bolt in the center. The brace assembly should be placed approximately in the middle of the platform legs on all four sides with the top brace bands approximately 2 ft. from the bottom brace bands.

1.5.4 If needed for the location, trim the ends of the brace assembly to fit.

1.5.5 Drill one 11/32” dia. hole on center approximately 1/2” from the end of each brace.

1.5.6 Install brace assembly using four 5/16”-18 x 1-1/2” long carriage bolts, nuts and washers in the desired location (FIG. 4).

1.5.7 Tighten all fasteners securely.

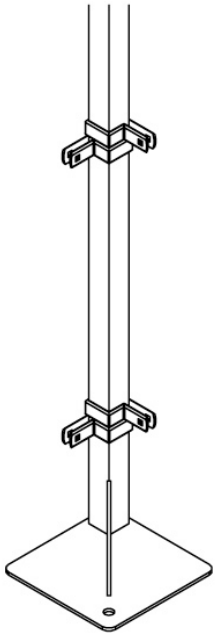


FIG. 3

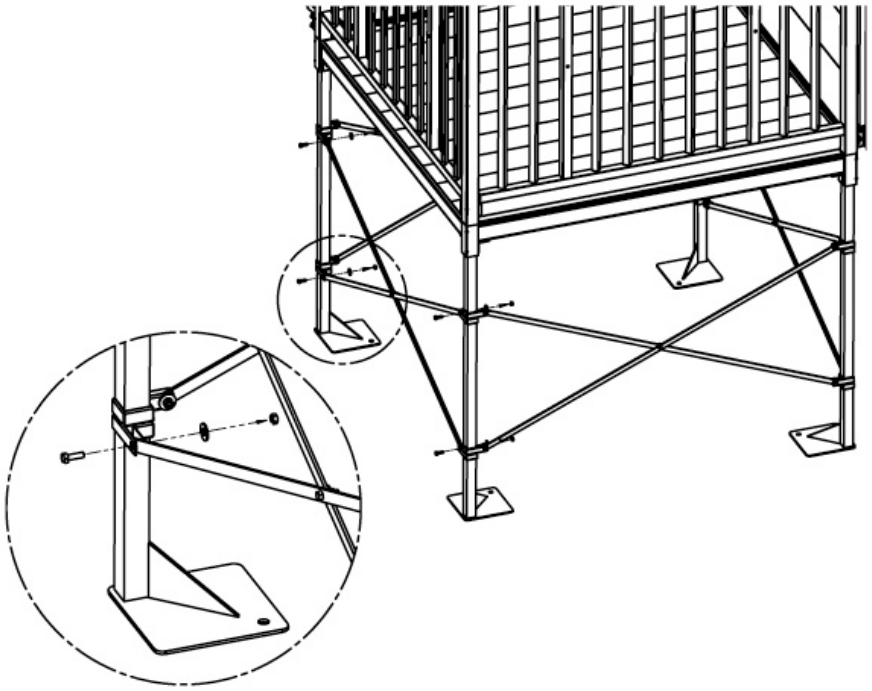


FIG. 4

1.6 If using two platforms to create a turn-back, connect platforms using the two Dual Platform Connector Kits provided.

1.6.1 On the first platform, install a dual platform connector on each of the two legs that will be adjacent to the second platform. Make sure that the pocket of the connector is oriented to the outside of the first platform in the direction of the second platform and that the setscrews are facing in a direction where they will be accessible (FIG. 5).

1.6.2 Install legs and set the first platform at required height (as described in previous steps).

1.6.3 Bring both connectors up until they touch the bottoms of the corner pockets in the platforms and tighten the setscrews securely (FIG. 6).

1.6.4 On the second platform install the two legs that will be opposite the first platform and set them to the same height as the first platform, then set the two corner pockets of the second platform on top of the platform connectors (FIG. 6).

1.6.5 Install two 1-1/2” square x 36” long tube through platform corner pockets and connectors until it aligns with bottom of connector, then tighten all setscrews securely (FIG. 7).

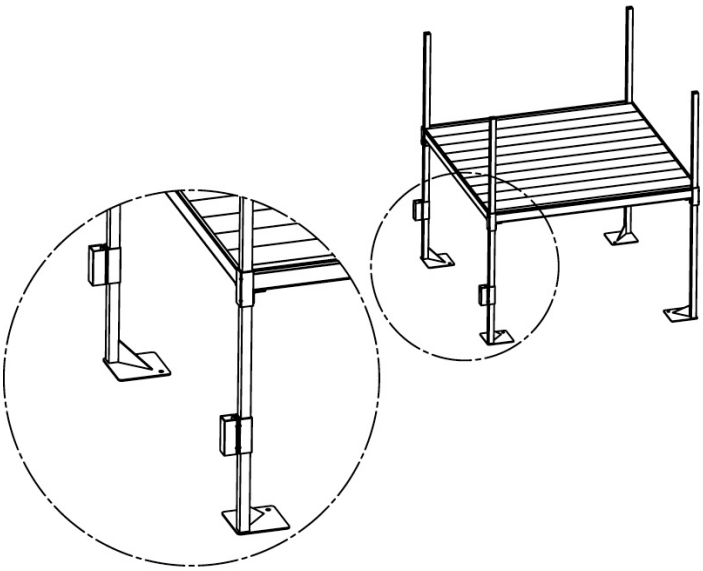


FIG. 5

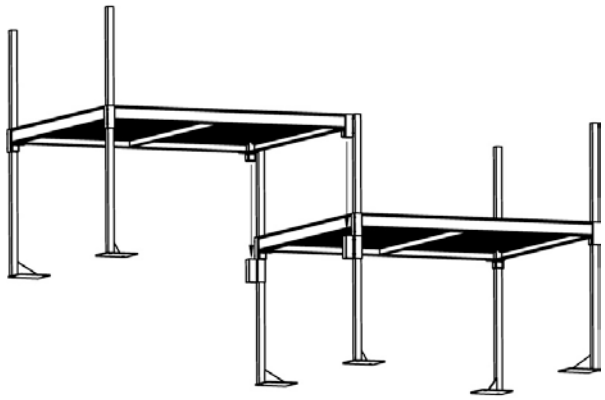


FIG. 6

1.7 Platforms can also be combined in any direction in multiples of 64-7/16” to create a deck. The initial steps are similar to Sec. 1.5, using two platforms to create a turn-back. Refer to the project drawings for the specific deck configuration.

1.7.1 On the first platform, install a dual platform connector on each of the two legs that will be adjacent to the second platform. Make sure that the pocket of the connector is oriented to the outside of the first platform in the direction of the second platform and that the setscrews are facing in a direction where they will be accessible (FIG. 5). **Note:** Usually the uppermost platforms will be used to create a deck but this may not always be the case. Since the first platform is the one that sets the height for the rest, it is strongly recommended that the first platform be located at a door or other fixed point where height is critical regardless of its position in the deck.

1.7.1.1 If more than one platform is connected to the “first” platform, install a dual platform connector on the remaining legs as needed. Planning will be required to make sure not only that the connectors are oriented in the right direction, but also that the subsequent platforms are supported by at least two legs as the deck is assembled before installing the legs in the platform (Refer to Section 1.7.8 for other requirements).

1.7.2 Install the legs and set the first platform at the required height as described in the previous steps.

1.7.3 Bring all connectors up until they touch the bottoms of the corner pockets in the platform and tighten the setscrews securely (FIG. 6).

1.7.4 On the second platform (and all subsequent platforms), install the two legs that will be opposite the first (previous) platform and set to the same height as the first platform, then set the two corner pockets of the second platform on top of the platform connectors in the first platform (FIG. 6).

1.7.4.1 Same as the first platform, if more than one platform is connected to the “second” platform, install a dual platform connector on additional legs as needed, bring the connectors up until they touch the bottoms of the corner pockets and tighten all setscrews securely. Planning will be required to make sure not only that the connectors are oriented in the right direction but also that the subsequent platforms are supported by at least two legs as the deck is assembled before installing the legs in the platform (Refer to Section 1.7.8 for other requirements).

1.7.5 If the platform connector is in a location that will require a guard, filler section or corner post (typically the outer edge of the deck), install the 1-1/2” square x 36” long tube provided through the platform corner pocket and connector until it aligns with the bottom of the connector and tighten all setscrews securely (FIG. 5). **Note**: Installation of platform guards and other components is described elsewhere in the manual.

1.7.6 In all locations where there will be no guards or filler sections install the 1-1/2” square x 11” long tube provided through the platform corner pocket and connector until it aligns with the bottom of the connector and tighten all setscrews securely (FIG. 5).

1.7.7 At this point there will be one or more legs that extend above the platform deck and will **not** be used to attach a guard, filler section or corner post. Mark these legs at the top of the corner pocket and cut the leg off at or slightly below the mark (FIG. 8). **Note**: The appearance and quality of the cut is not critical since these areas will be covered with a plate in later steps. What is critical is that the leg not stick up past the deck far enough to interfere with the plate when it is installed.

1.7.8 Additional platforms are added by repeating steps 1.7.4 thru 1.7.7 until the deck is complete. There are, however, a few requirements that should be followed regardless of platform’s position within the deck.

1.7.8.1 There should always be one leg and one “stub” in a dual platform connector. This may require repositioning a connector from the way it was initially oriented (or replacing a stub with a leg) depending on the configuration. **Never use two “stubs” without a leg in a dual platform connector.**

1.7.8.2 Where four platforms come together, the two legs should be oriented so that they are diagonally opposite from each other (FIG. 9).

1.7.8.3 Whenever possible, especially where four platforms come together, the dual platform connector on one side of a platform should be oriented in the opposite direction from the other side and the orientation should then be alternated as the deck is created (FIG. 10).

1.7.8.4 Regardless of connector orientation, make sure there is a minimum of two legs installed in each platform’s corner pockets (FIG. 11).

1.7.9 Once the deck is complete all areas where platforms connect that are not used to attach a guard, filler section or corner post must be covered with a Corner Cover Plate (FIG. 12).

1.7.9.1 Use the corner cover plate provided to mark the location of the hole in the deck and drill four holes between 0.129” and 0.133” dia. (#30 drill size).

1.7.9.2 Use the four 1/8” dia. rivets provided to attach the corner cover plate.

1.7.9.3 Use two cover plates where four platforms come together.

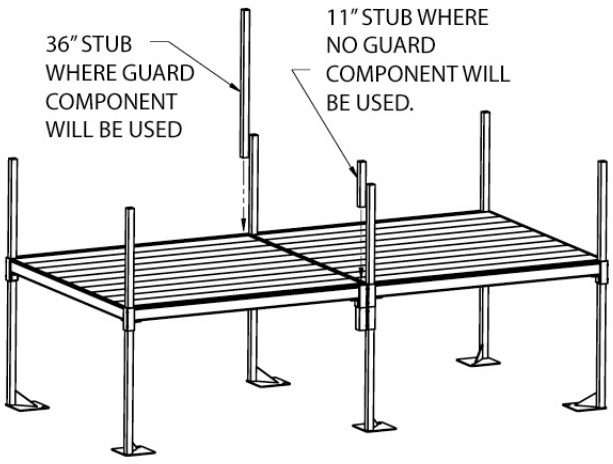


FIG. 7

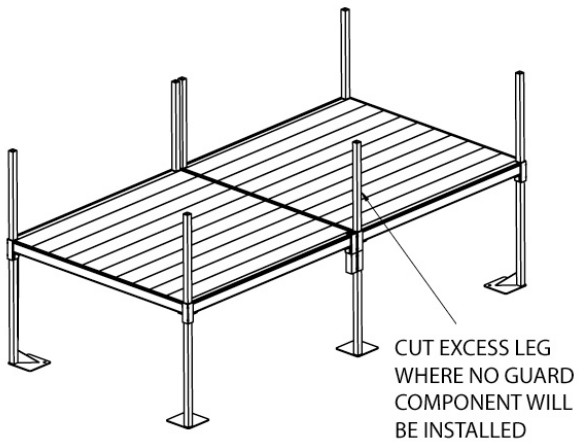


FIG. 8

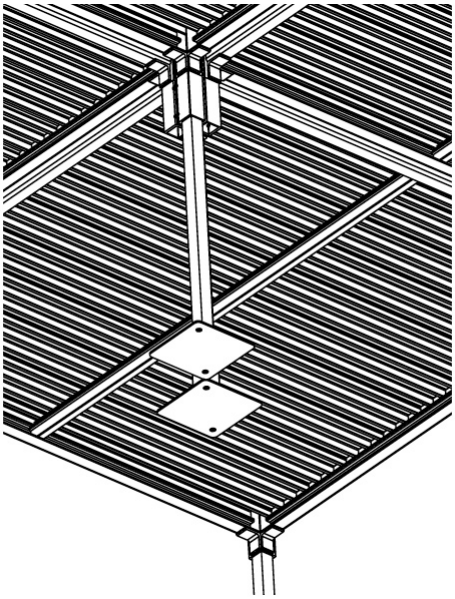


FIG. 9

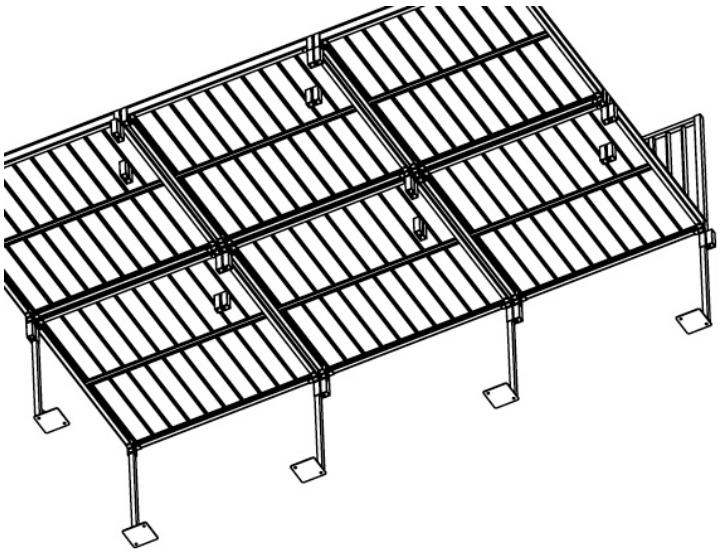


FIG. 10

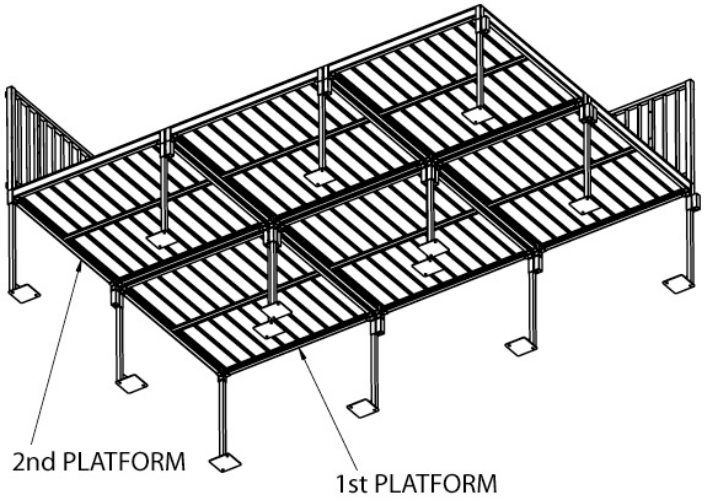


FIG. 11

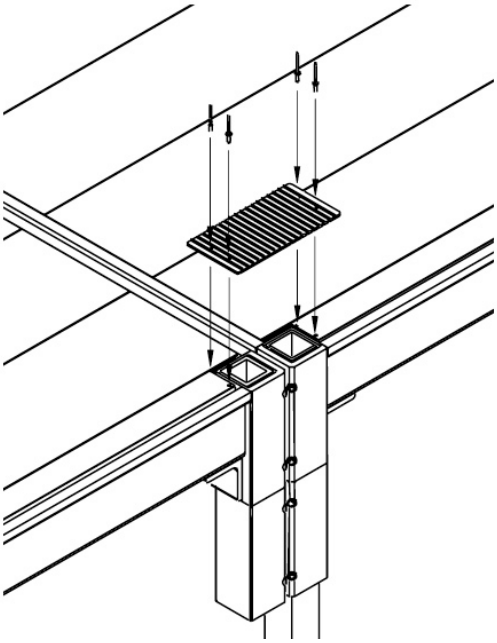


FIG. 12

2. ASSEMBLE/SET RAMPS:

2.1 Begin setting ramps with the uppermost ramps in the system.

2.2 There are three different bracket types that are used to assemble ramp sections (see FIG. 13a, FIG. 13b and FIG. 13c). All three bracket types are fit into the side rail of the ramp section and are best installed with the ramp section placed upside down using the 5/16-18" x 1.5" hex bolts and washers. **Note**: Take care that the narrow edge of the bracket engages the trough formed in the ramp section side rail as well as aligns with the threaded inserts preinstalled in the ramp section side rails. Use ½" wrench or socket to secure fasteners.

- 2.2.1 End support assembly bracket (FIG. 13a): These brackets come in a left and right pair and attach to the upper and lower end of a ramp run to support the ends of the ramp run when combined with support legs. These brackets also provide attachment points for the guardrails.
- 2.2.2 Guard brackets (FIG. 13b): This pair of brackets provides an attachment point for the guardrails at the mid-point of a ramp section.
- 2.2.3 Center support assembly bracket (FIG. 13c): This pair of brackets joins ramp sections together and is required where ramp sections meet in a ramp run. They support the ramp at this point when combined with support legs and provide attachment points for the guardrails.

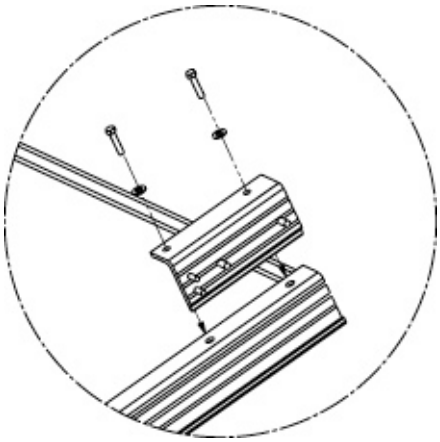


FIG. 13a

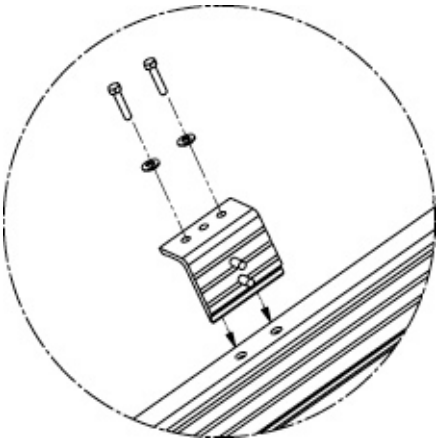


FIG. 13b

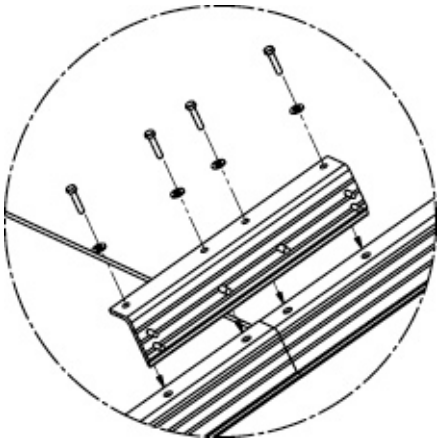


FIG. 13c

2.3 If using a single ramp as the first upper section:

- 2.3.1 Lay the ramp section upside down.
- 2.3.2 Install end support assembly brackets (FIG. 13a) at both ends of the ramp section. This will require two pairs of end support brackets. **Note**: Make sure that the two larger diameter studs protruding from the brackets are positioned toward the outer end of the ramp section.
- 2.3.3 Install one pair of guard brackets (FIG. 13b) at mid-point of ramp section in similar manner.

2.4 If using two or more ramp sections for uppermost ramp run:

- 2.4.1 Lay ramp section end-to-end upside down on a level surface (a level surface will make sections easier to connect).
- 2.4.2 Install one pair of center support brackets (FIG. 13c) at each junction of two ramp sections. **Note:** It is critical that the center support bracket be positioned equally with respect to threaded inserts in the ramp sections to avoid problems aligning the guards and handrails later. This may require measuring. There is a centering mark on the support bracket to assist with this process.
- 2.4.3 Install end support assembly brackets (FIG. 13a) at both ends of the ramp run (this will require two pairs of end support brackets). **Note**: Make sure that the two larger diameter studs protruding from the brackets are positioned toward the outer end of the ramp section.
- 2.4.4 Install one pair of guard brackets (FIG. 13b) at the mid-point of each ramp section making up the run.

2.5 If using as a turn or turn-back:

2.5.1 Ramp must be positioned to one side or the other of the platform and should always be positioned to the outside of the turn.

2.5.2 Position the ramp to one side of the platform so that the edge of the transition plate is 4½" from the outer edge of the platform (FIG. 14). **Note**: The transition plate will be secured later.

2.6 If the system requires an intermediate "resting" platform, the ramps must be positioned in the center of the platform (see FIG. 28 and FIG. 34).

2.7 Repeat this procedure when assembling and setting ramp runs until the lowest run is reached.

2.8 The lowermost ramp section (the only section that contacts the ground directly) is called the starter ramp section. This section can be identified by the taper at one end of the ramp.

2.8.1 The underside of the taper will sit directly on the ground so an end support assembly is not required.

2.8.2 Install (1) pair guard brackets (FIG 13b) at mid point of ramp section and either an end support assembly, if the starter section is the only ramp in the run, or a center support assembly if connecting to another ramp section as described in previous steps.

3. INSTALLING TRANSITION PLATE(S)

3.1 A transition plate is required at any point that a ramp section or ramp run meets a platform.

3.2 Install a transition plate into each end of the ramp section(s) by turning the section(s) over, then inserting as shown in FIG. 15.

3.3 Position ramp section so that the transition plate fully overlaps the platform surface as shown in FIG. 16. Make sure that the top transition plate overlaps the supporting surface as far as possible. **Note:** The transition plates may not rest flat on platform at this point and this is normal (transition plates will be secured later, as shown in FIG. 42).

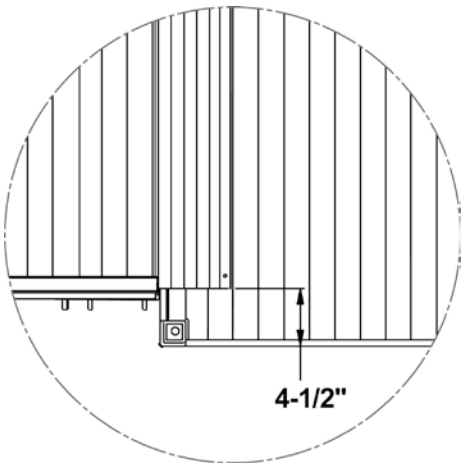


FIG. 14

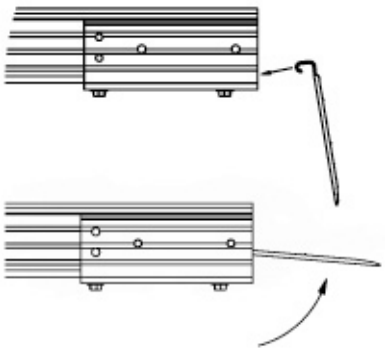


FIG. 15

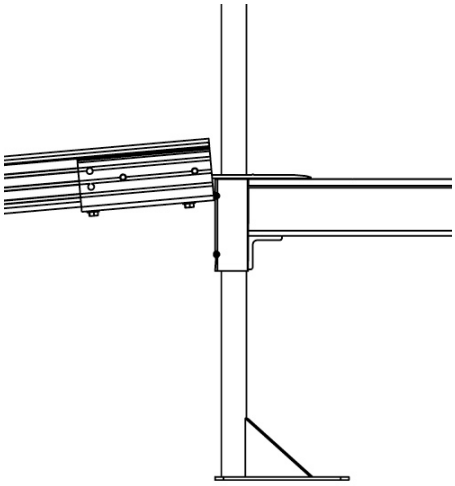


FIG. 16

4. INSTALLING SUPPORT LEGS TO RAMP SECTION(S):

4.1 Install leg support brackets and support legs to ramp section(s) as shown in FIG. 17. **Note:** Ramp support legs should extend at least 1" past the support tube bracket but no more than 20" above the walking surface of the ramp (FIG. 18).

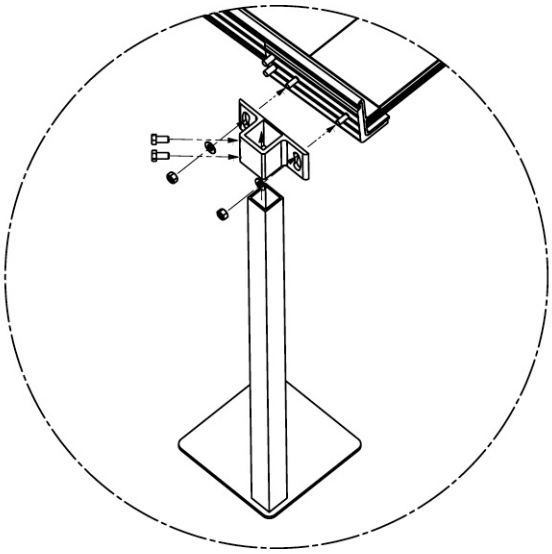


FIG. 17

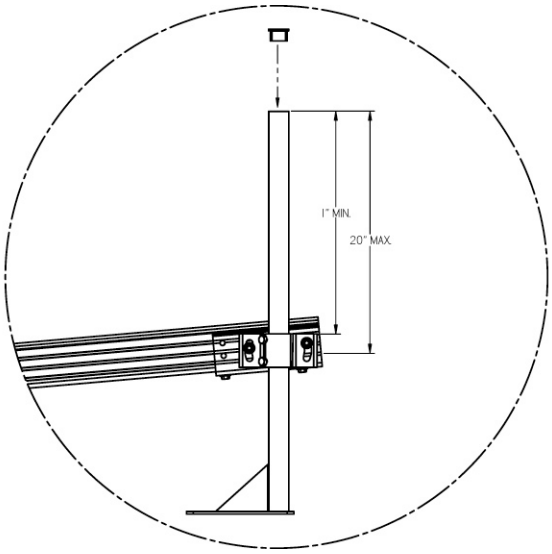


FIG. 18

4.2 Beginning at the upper end of the ramp system, insert a support leg into the leg support bracket (FIG. 19) and position the foot pad on the leg so it extends beneath the ramp.
4.3 Position the leg support bracket onto the end support assembly over the 3/8" diameter studs.
4.4 Check the height of the support tube above the walking surface of the ramp.
4.5 Install the leg support bracket to the end support assembly with two 3/8"-16 nuts and 3/8" washers.
4.6 Level the leg support bracket and secure in level position using a 9/16" wrench.
4.7 Insert 3/8-16 x 3/4" bolts (two each) into the threaded holes in the leg support bracket.
4.8 Adjust the ramp height until the transition plate is resting flat on the platform surface. Tighten both bolts, and then repeat process on the opposite side of the ramp.
4.9 Repeat process on the lower end of the ramp, again insuring that the transition plate rests flat on the platform surface.
4.10 Use same procedure to install the support legs on the center support brackets (if present).
4.11 Have a helper site down the top edge of the ramp side rail and adjust ramp height until top edge of ramp side rail is straight, then tighten adjusting bolt to maintain this level. **Note**: It is important that the support legs are adjusted correctly so the ramp sections are aligned in a straight fashion, neither bowing down or up (see FIG. 19 for correct positioning). Failure to adjust properly will result in difficulty attaching the ramp guards and handrails later.
4.12 Repeat this procedure when assembling and placing ramp section(s) between platforms until the lowest section is reached.

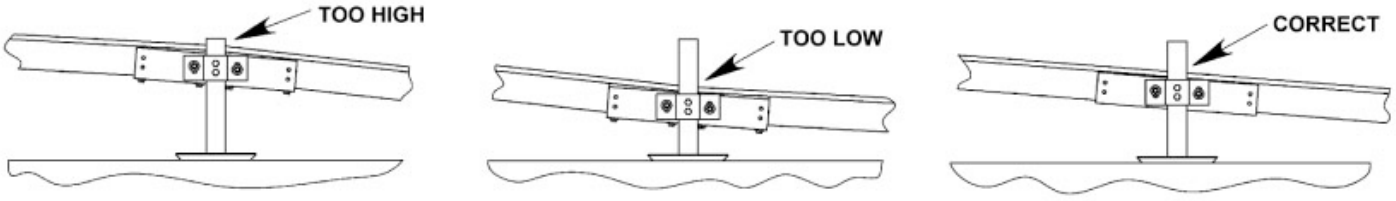


FIG. 19

4.13 The lowest ramp run will always begin with a starter section. This section requires the same installation procedure with two exceptions.
- 4.13.1 There is no end support assembly on the tapered end of the ramp section and, since it rests on the ground, no support leg is required.
- 4.13.2 Only one transition plate is required at the top of the ramp run.

4.14 Install plugs in the top of all support legs.

4.15 Ramps over 3 ft. high from the ground require cross bracing.
- 4.15.1 Insert legs into the ramp and set ramp at the required height as described in previous steps.
- 4.15.2 Separate the ends of brace bands until they go around the 1-1/2” square tube and install two bands on each leg. Orient the band so that the legs with the holes extend under the ramp (FIG. 20).
- 4.15.3 The cross brace will come assembled with one bolt in the center. The brace assembly should be placed approximately in the middle of the ramp legs with the top brace bands approximately 42 inches from the bottom brace bands and the brace assembly under the ramp.
  - 4.15.3.1 If needed for the location, trim the ends of the brace assembly to fit.
- 4.15.4 Drill one 11/32” dia. hole on center approximately 1/2” from the end of each brace.
- 4.15.5 Install brace assembly using four 5/16”-18 x 1-1/2” long carriage bolts, nuts and washers in the desired location (FIG. 20).
- 4.15.6 Tighten all fasteners securely.

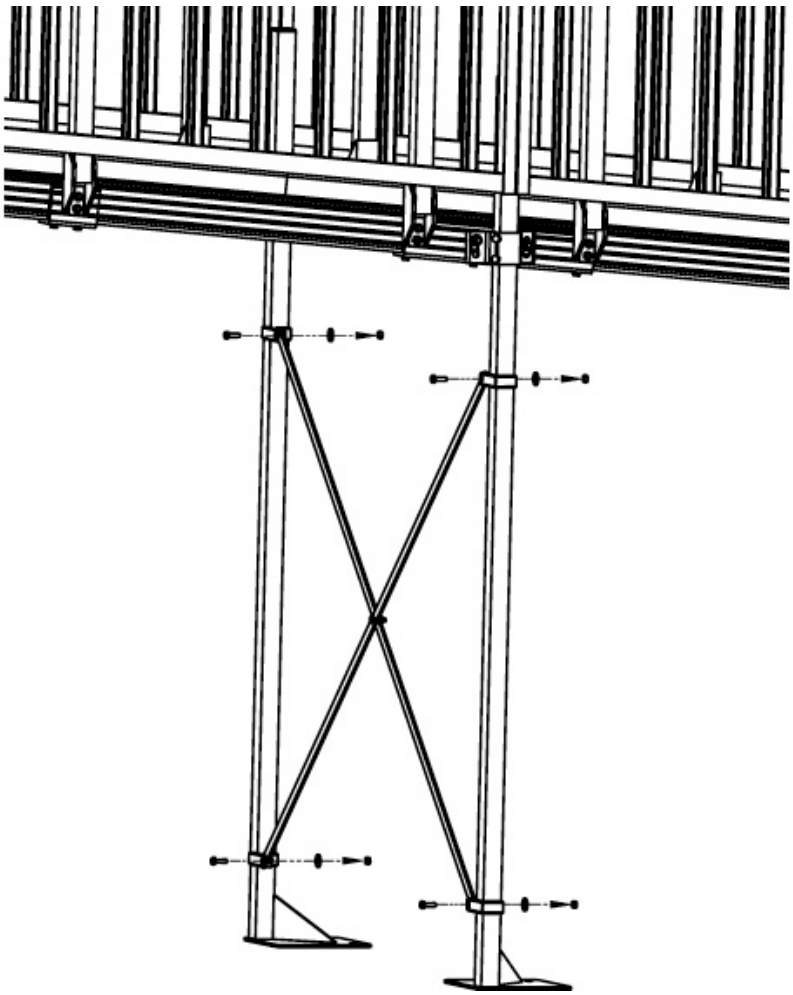


FIG. 20

5. INSTALLING PLATFORM GUARDS:

5.1 Depending on the system configuration, following are four platform guardrail component options that may be used that may be used in different combinations:

① Five-foot and six-foot guard sections (FIG. 21a)

② Guard post (FIG. 21b)

③ Guard filler sections for five-foot and six-foot platforms (FIG. 21c)

④ Guard corner sections for five-foot and six-foot platforms (FIG. 21d)

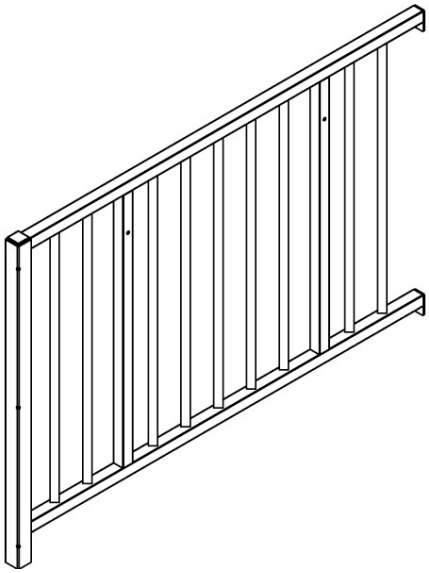


FIG. 21a

FIG. 21b

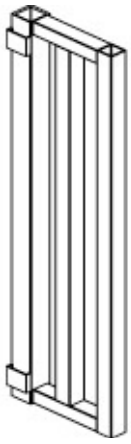


FIG. 21c

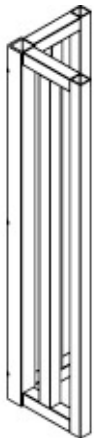


FIG. 21d

5.2 There are three basic platform arrangements: turn, turn-back, and straight through. Select appropriate guardrail installation and assemble rails as shown in FIG. 22 through FIG. 28.

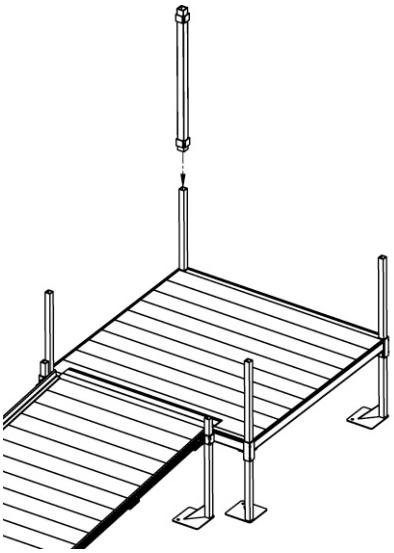


FIG. 22

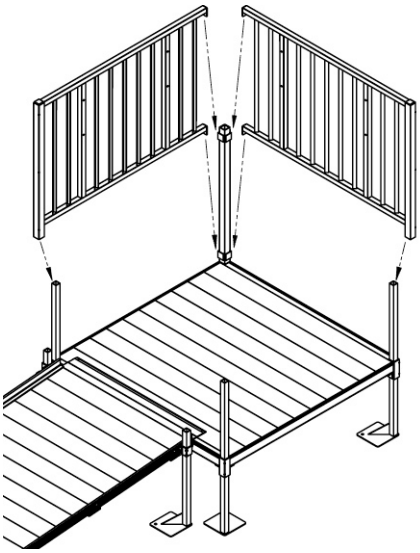


FIG. 23

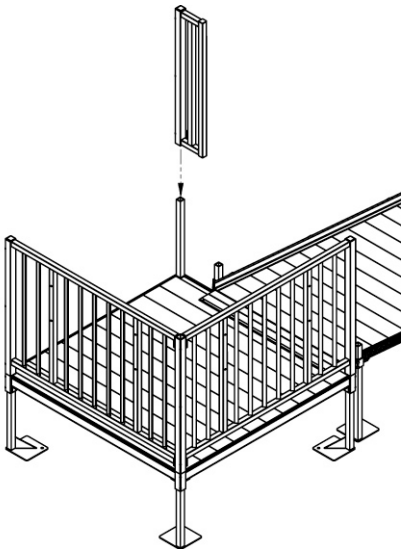


FIG. 24

5.3 If platform turns into a door at the top of the system:
- 5.3.1 Place one guard post over the support leg extending out of the platform corner pocket, opposite both the door and ramp side (FIG. 22). Do not tighten. **Note**: Tab brackets should be oriented toward the inside.
- 5.3.2 Place two 5 ft. guards over support legs protruding out of platform corner pockets adjacent to guard post (FIG. 23) and engage tabs on guard section into tab brackets on guard post. Do not tighten setscrews.
- 5.3.3 Place guard filler section over the remaining support leg with the tab brackets facing the outside of the platform (FIG. 24).
- 5.3.4 Tighten lower two 3/8”-16 setscrews in each of the four vertical guardrail posts with 3/16” hex key wrench securely (FIG. 25).

5.4 If platforms are used to create a turnback:
- 5.4.1 Both platforms will use the same guard components as above except in mirror image (shown in FIG. 26).
- 5.4.2 Tighten lower two 3/8”-16 setscrews in each of the four vertical guardrail posts with 3/16” hex key wrench securely (FIG. 25).

5.5 If platform is used as a turn from one ramp to another (FIG. 27):
- 5.5.1 Place one guard post over support leg extending out of the platform corner pocket opposite both ramps (tab brackets should be oriented toward the inside). Do not tighten.
- 5.5.2 Place two 5 ft. guards over support legs protruding out of platform corner pockets adjacent to guard post.
- 5.5.3 Engage tabs on 5 ft. guard sections into tab brackets on the guard post, but do not tighten.
- 5.5.4 Place guard corner section over the remaining support leg.
- 5.5.5 Tighten lower two 3/8”-16 setscrews in each of the four vertical guardrail posts with 3/16” hex key wrench securely (FIG. 25).

5.6 If platform is used as a straight through resting platform (FIG. 28):
- 5.6.1 Place two guard posts over protruding support legs on one end of the platform that a ramp is joining. **Note:** The unused tab brackets should be oriented to the outside of the platform and capped.
- 5.6.2 Place two 5 ft. platform guards two over support legs, making sure to engage tabs on platform guards into tab brackets on guard posts.
- 5.6.3 Tighten the lower 3/8”-16 setscrews, two in each of the four vertical guardrail posts with 3/16” hex key wrench securely (FIG 25).

5.7 If platforms are being used to create a deck the entire outer edge of the deck must be guarded.

5.7.1 Installation of the guards at a corner is the same as turning into a door at the top of the system. Refer to FIG. 22 and FIG. 23.

5.7.2 Installation of the guards in a straight run is similar except that only one guard section & post are needed so the unused tab brackets on the post should be oriented to the outside of the deck & capped (same as FIG. 28).

5.8 Install plugs in the top of all open guard posts.

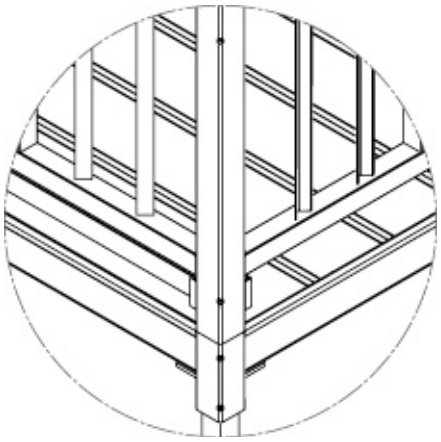


FIG. 25

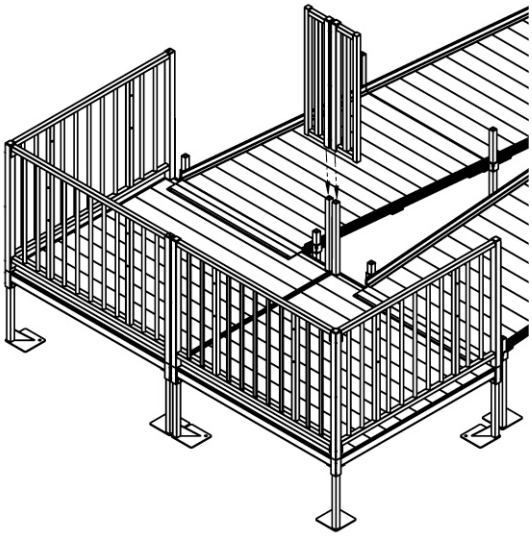


FIG. 26

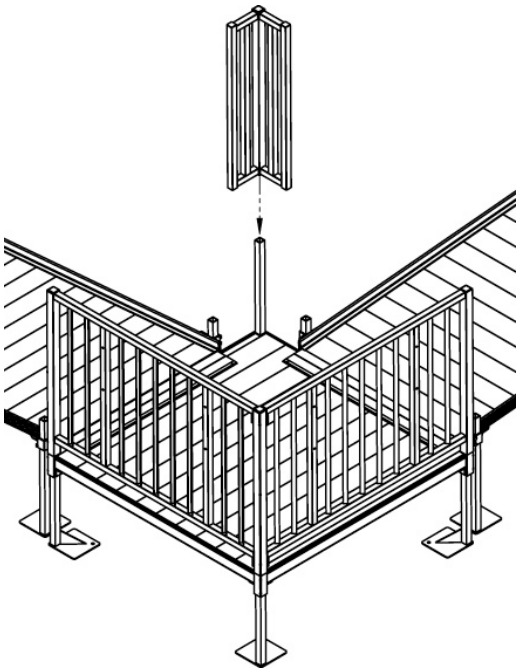


FIG. 27

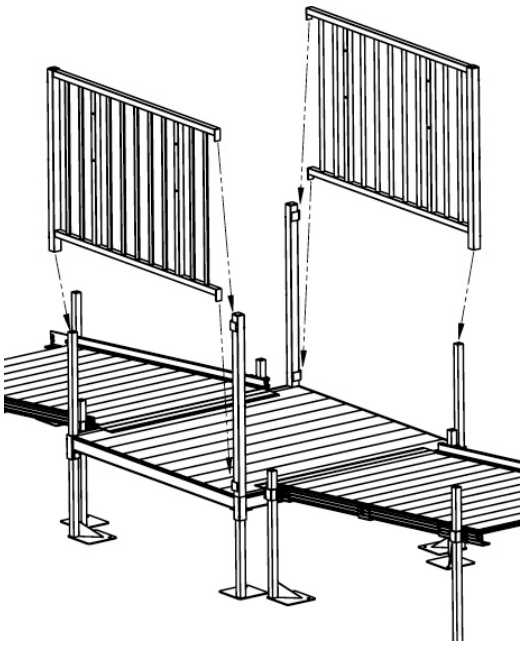


FIG. 28

6. INSTALLING RAMP GUARDS:

6.1 Ramp guards come in left and right pairs and are not interchangeable from side-to-side. For all ramp sections other than the starter section:

6.1.1 Install the Ramp Guard Post Spacers over the 5/16”-18 studs protruding from the brackets previously installed on the ramp section with the long end of the spacer pointing up (FIG 29).

6.1.2 Attach the ramp guard to the ramp section by positioning the lower holes in the ramp guard posts over the studs.

6.1.3 Once the guard is in place, place a 5/16”-18 nuts and 5/16” flat washers on each stud. Take up play with the nuts but do not tighten (this will help with alignment during handrail installation).

6.2 For the starter section, two of the three guard vertical posts are installed in the same manner. Secure the lowermost post using a 5/16”-18” x 2 3/4” carriage bolt inserted thru the holes in the ramp side rail and secured with a 5/16”-18 nut and 5/16” flat washer (FIG 30).

FIG. 29

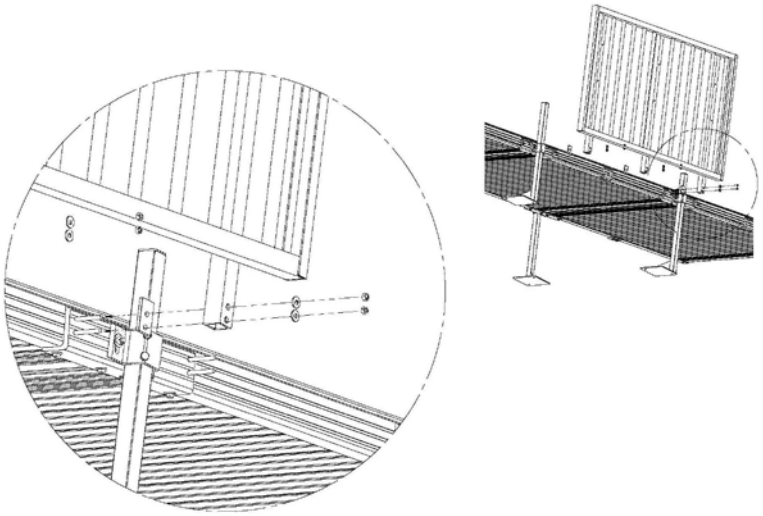
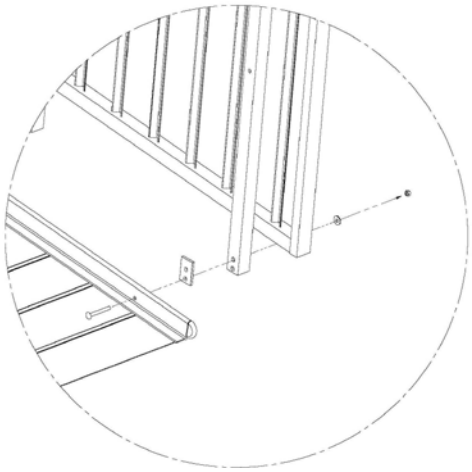


FIG. 30



7. INSTALLING HANDRAILS:

7.1 Ramp handrails are supplied in left and right pairs and are not interchangeable.

7.1.1 Starting at the lower end of ramp system, attach first handrail section by aligning holes in the handrail brackets with the holes in the guard vertical posts (FIG. 31). Secure with one 5/16”-18 x 2 1/2” button head bolt, washers and nylock nut (place two washers and nylock nut on outside of ramp).

7.1.2 Repeat on all three handrail brackets per handrail section. Secure bolts, but do not tighten.

7.1.3 Install handrails on opposite side in the same manner.

7.1.4 Install 4” joiner assembly to up hill end of the previously installed handrail section (FIG. 32), passing the next handrail section over the joiner assembly, then secure to guardrail in same manner as previous handrail.

7.1.5 Continue until all ramp handrail sections are installed.

7.1.6 Once all handrails are connected tighten all fasteners connecting handrails to guards, as well as guards to ramps and joiners, securely.

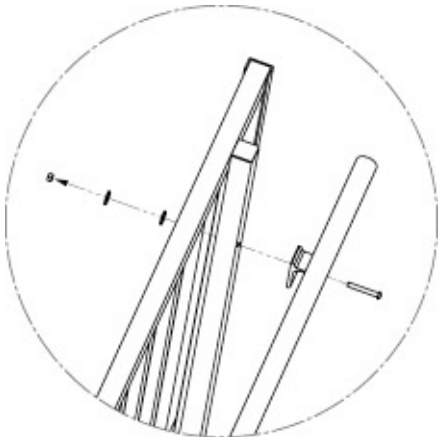


FIG. 31

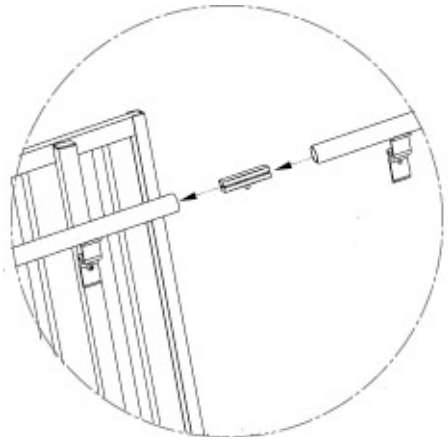


FIG. 32

8. INSTALLING HANDRAIL ATTACHMENTS:

8.1 There are five different handrail attachments that may be used in different combinations to finish the handrail installation:

① Lower loop (FIG. 33a)

② Upper loop (FIG. 33b)

③ 5-degree elbow (FIG. 33c)

④ 90-degree elbow (FIG. 33d) **Note**: 90 degree elbow will require trimming to size. When using with a joiner, DO NOT trim more than 3/8” off the short leg of the 90 degree elbow as this will not allow the joiner to seat properly

⑤ Adjustable elbow (FIG. 33e)

⑥ Dual termination loop (FIG. 33f)

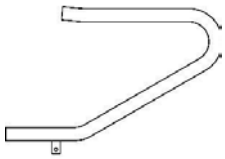


FIG. 33a

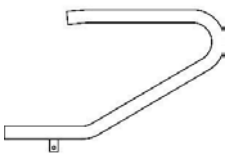


FIG. 33b

FIG. 33c

FIG. 33d

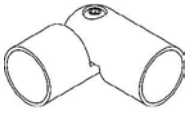


FIG. 33e

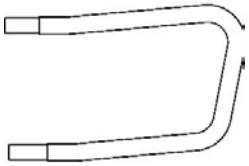


FIG. 33f

8.2 At the bottom of the ramp (i.e., ground), install two lower loops into the ends of each handrail (FIG. 34).

8.2.1 Install upper portion of loop to handrail using a 4” joiner. Tighten setscrew enough to hold in place, but leave loose enough to rotate.

8.2.2 Rotate lower portion of loop until it lines up with ramp guard post. Mark center, then drill 5/16” hole through post. Secure lower end of loop with 5/16”-18 x 2” button head bolt through the drilled hole and into threaded insert in lower end of loop.

8.2.3 Attach tab on bottom of loop by drilling a 5/16” dia. hole through the channel at the end of the ramp guardrail and securing with a 5/16”-18 x 3” button head bolt, three washers and nut. Place nut and two washers on outside of ramp and place one washer between the head of the bolt and the tab on the loop.

8.2.4 Tighten all fasteners securely.

8.3 At a straight through resting platform (FIG. 34):

8.3.1 Install two upper loops at the top of the ramp and two lower loops at the start of the next run in the same manner as above. **Note**: The only difference between the upper and lower loop installation is that the upper loop uses a 4” ring joiner instead of the standard 4” joiner.

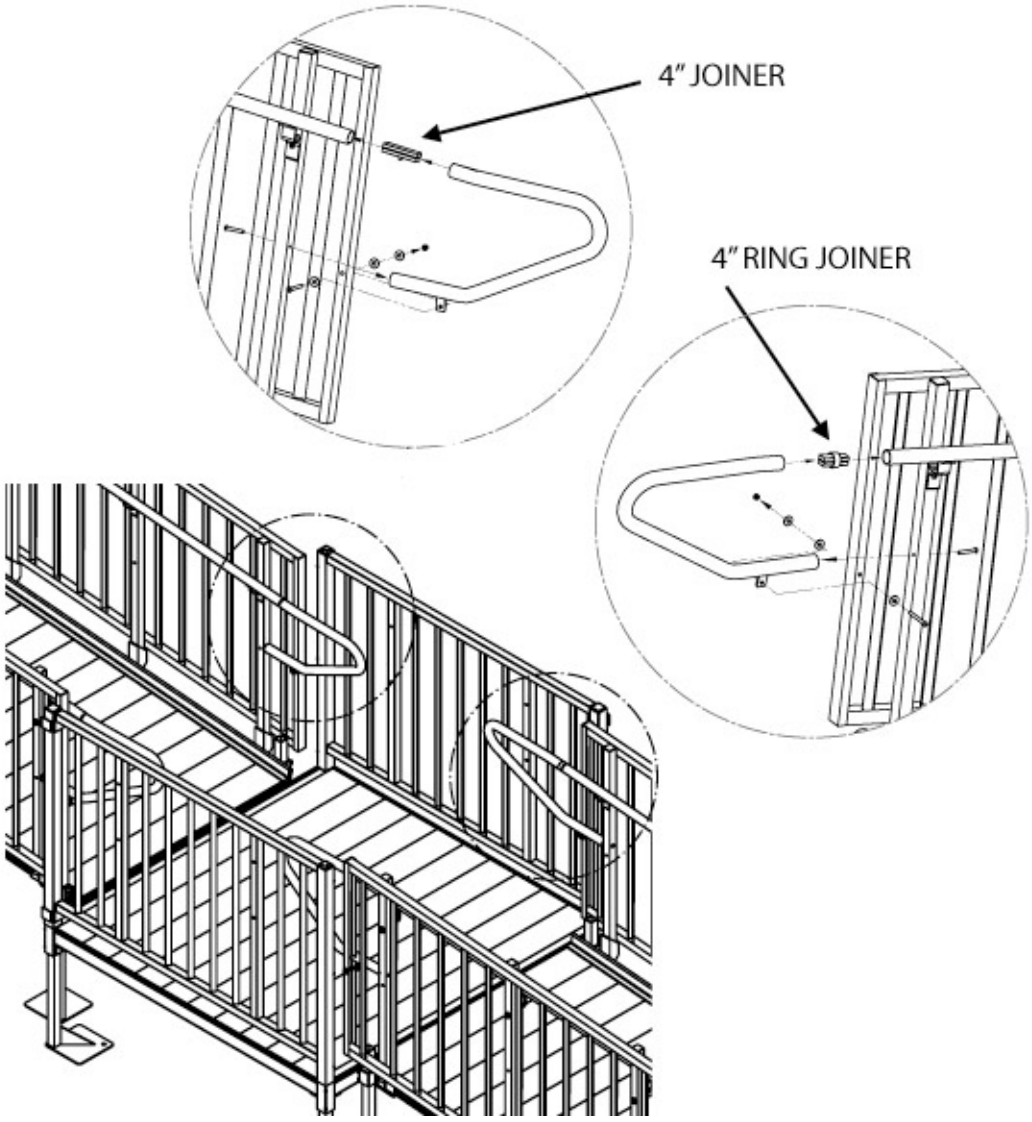


FIG. 34

8.4 At a turn platform on the outside, non-turn side (both where a the top of a ramp meets a platform and where a ramp starts at a platform) as shown in FIG. 35:

8.4.1 Use a ring joiner to attach one 5 degree elbow to ramp handrail.
8.4.2 Hold 90 degree elbow in position and mark for trimming.
8.4.3 After trimming, test fit elbow.
8.4.4 When fit is confirmed, install threaded insert into short end of elbow with a hammer.
8.4.5 Connect long side to 5 degree elbow with a ring joiner.
8.4.6 Connect short end to vertical tube on guard with 5/16”-18 x 2” button head screw.
8.4.7 Tighten all fasteners securely.

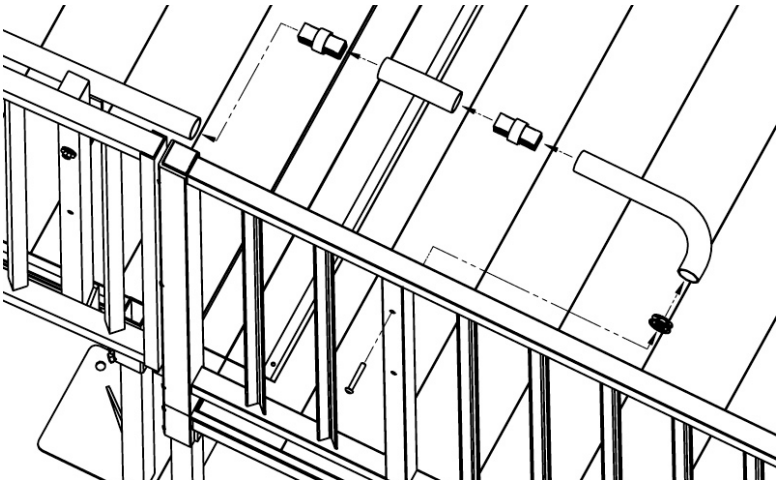


FIG. 35

8.5 At a turn platform at top of system on inside turn side (FIG. 36):

8.5.1 Hold 90 degree elbow and handrail bracket in position and mark for trimming.
8.5.2 After trimming, test fit elbow along with handrail bracket and spacer.
8.5.3 When fit is confirmed, install end cap on open end of long leg of elbow.
8.5.4 Attach short leg of elbow to handrail tubes with a ring joiner.
8.5.5 Attach handrail bracket and spacer to guard filler section by drilling 5/16” dia. hole through guard filler picket, and then secure using one 5/16”-18 x 3” bolt, nut and washer.
8.5.6 Attach elbow to handrail bracket using one 1/4” x 1” long self drilling square drive screw.
8.5.7 Tighten all fasteners securely.

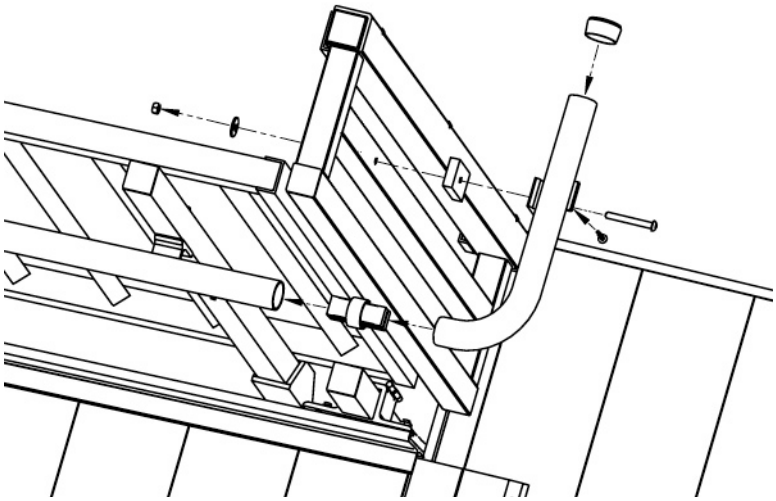


FIG. 36

8.6 At a turn-back platform on the inside, turn-back side (FIG. 37):

8.6.1 Hold two 90 degree elbows in position and mark for trimming.

8.6.2 After trimming, test fit elbows, handrail brackets and spacers.

8.6.3 Attach long legs of elbows in the middle with a ring joiner, and then attach both elbows to handrail tubes with ring joiners (FIG. 38)

8.6.4 Attach handrail brackets and spacers to guard filler section by drilling 5/16” dia. hole through the filler picket.

8.6.5 Use one 5/16”-18 x 3” bolt, nut and washer per bracket to secure.

8.6.6 Attach elbows to handrail brackets using 1/4” x 1” self drilling square drive screw per bracket.

8.6.7 Tighten all fasteners securely.

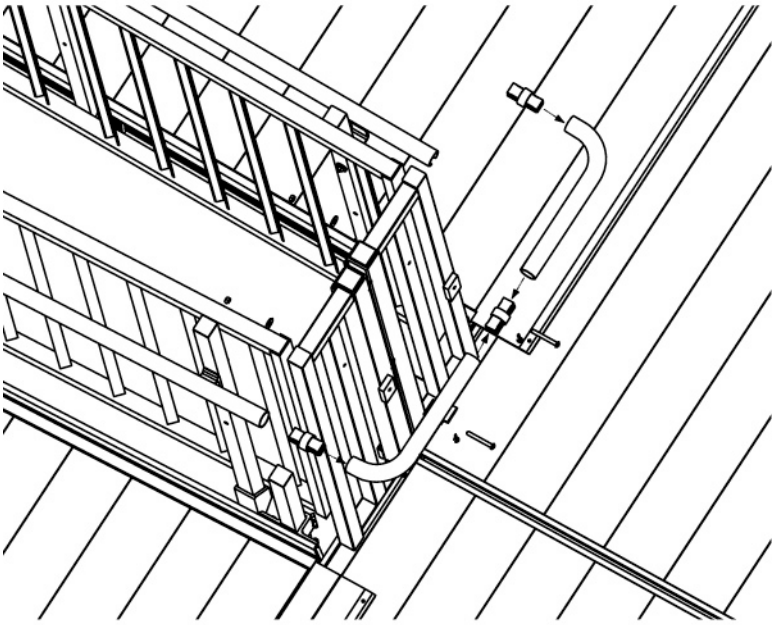


FIG. 37

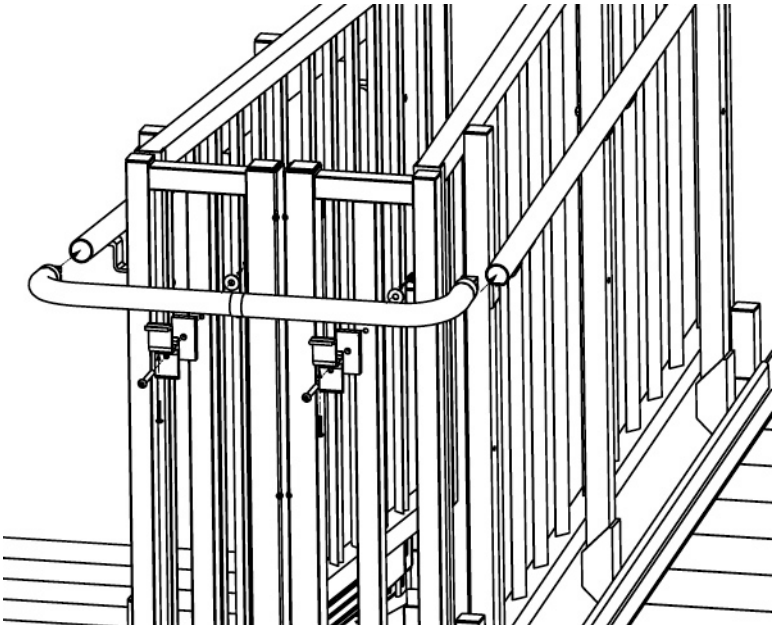


FIG. 38

8.7 At an intermediate turn platform on an inside corner (FIG. 39):

8.7.1 Hold two 90 degree elbows in position with the adjustable elbow and mark for trimming.

8.7.2 After trimming, test fit elbows, handrail brackets and spacers.

8.7.3 Attach long legs of 90 degree elbows to adjustable elbow with ring joiners then attach both elbows to handrail tubes with ring joiners.

8.7.4 Attach handrail brackets and spacers to guard post using one 5/16” x 1-1/2” self drilling square drive screw per bracket to secure (FIG. 40).

8.7.5 Attach elbows to handrail brackets using one 1/4” x 1” long self drilling square drive screw per bracket, then Tighten all fasteners securely.

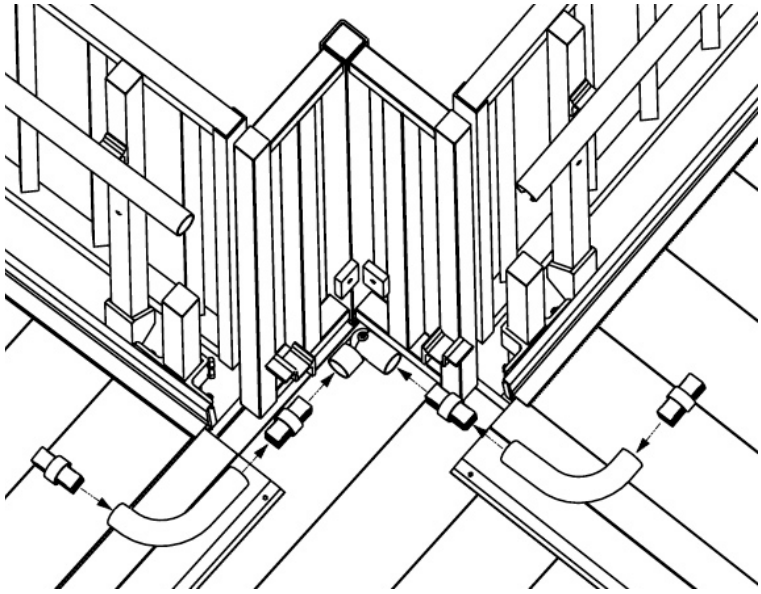


FIG. 39

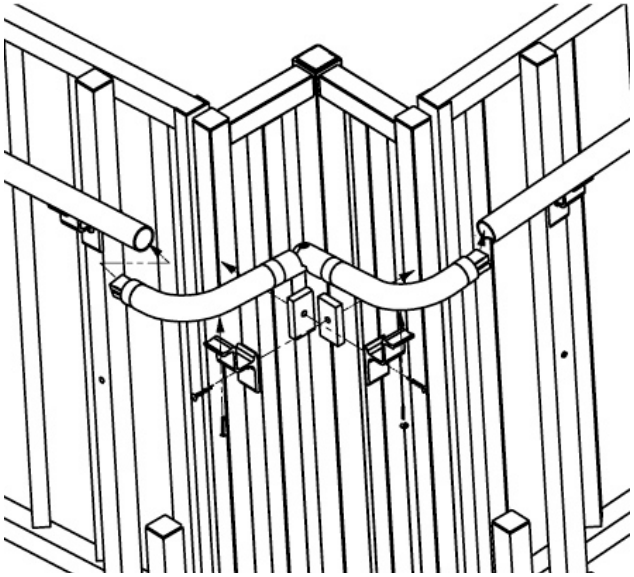


FIG. 40

8.8 When child rails are required, the lower (child) handrails and the various returns and connectors are installed in the same manner as the upper (normal) rail using the lower set of holes provided. Refer to instructions in previous steps.

8.8.1 The upper (adult) handrail is also installed in the same manner except the upper and lower termination loops are not used. These components will be replaced by either an upper or lower dual termination loop (FIG. 41).

8.8.2 Install connector pieces of dual termination loop into ends of upper and lower handrails.

8.8.3 Drill two holes between 0.129” and 0.133” dia. (#30 drill size) through the handrail tube and the connector piece in the underside of the end of each handrail where a dual termination loop is used. Drill one hole approximately 3/4” from the end and the second hole approximately 1-3/4” from the end.

8.8.4 Install two 1/8” dia. rivets (provided) in the end of each handrail using holes drilled in previous step.

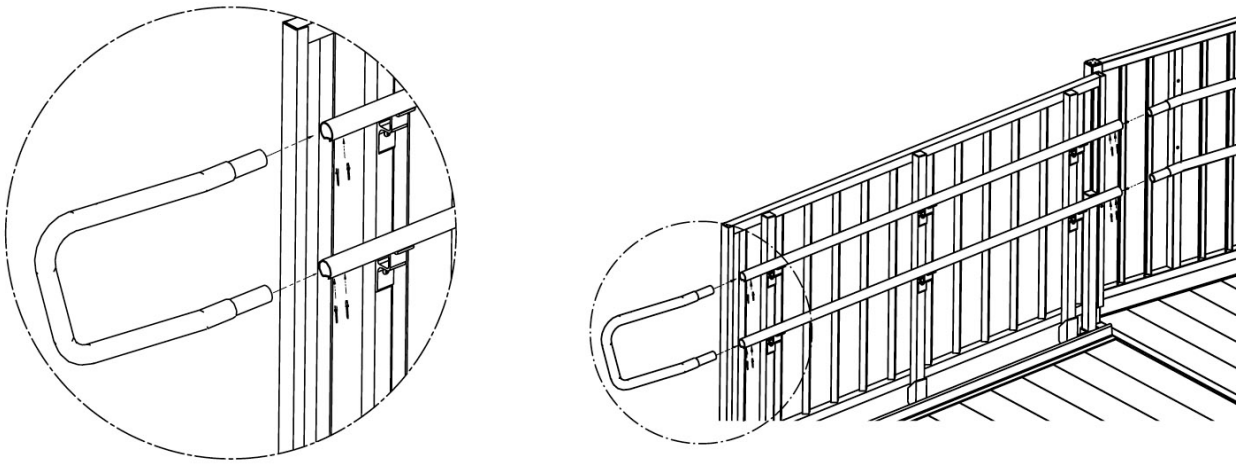


FIG. 41

9. FINAL STEPS:

9.1 Once all handrails and components have been positioned and all fasteners tightened, screw transition plates to platforms using two 1/4” x 1” long self drilling square drive screws (FIG. 42).

9.2 Ramp and platform legs can be secured to the ground using stakes or concrete anchors and the holes provided in the feet, if needed (FIG. 43). **Note**: Hardware not included.

9.3 Ensure that all fasteners are in place and secure.

9.4 Walk on the assembled system, checking for any undue movement.

9.5 Remove any debris and metal chips.

9.6 Ensure that the level and slope has not shifted during installation.

9.7 Check that all handrail ends are terminated with loops, returns, or end caps.

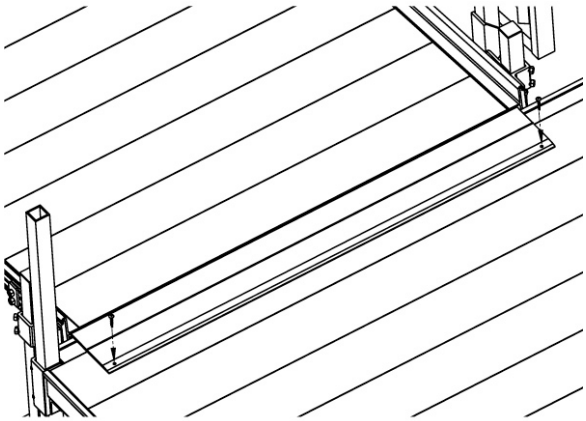


FIG. 42

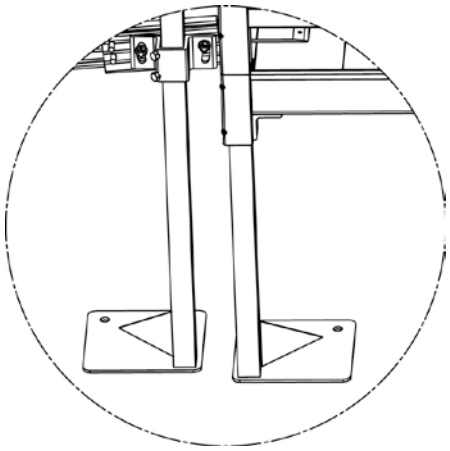


FIG. 43

NOTES:

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