TOOLS REQUIRED FOR HANDRAIL ASSEMBLY
Level
Chalk Line
Tape Measure
Phillips Screw Driver
Compound Mitre Saw with an 80-100 tooth carbide blade
Drill
1/4" Drill Bit
1/2" Drill Bit
Socket wrench and socket set
Note: Drill bit sizes may differ for Masonary and other substrate applications, see instructions on the appropriate fasteners for the substrate (provided by others).

HARDWARE DETAILS (Provided by others)
End Cap and Corner Assembly:
#8 Self tapping screw
1/4-20x3/8" button head fastener
1/4-20 slot nut
Standoff Assembly;
For standard steel stud and drywall applications
Toggler® brand anchor
1/4-20x4" Phillips head screw
Aluminum Retainer Splice Connections;
Aluminum retainer splice
1/4-20x3/8" button head fastener
**INSTALLATION**

Install the longest run of the handrail first, use scrap for shorter runs. The handrail requires a minimum of 2 standoffs per unit/run. See *Minimum Layout Configuration* (Page 5) for minimum handrail layouts and sizes.

**STEP 1.** Using the correct plans, layout guides and local code requirements layout and mark the location of the handrail on the wall at the appropriate height above the finished floor. Measure 3-3/4” down from the desired top of the handrail and mark this location at each end of the run (See Figure 2). Snap a chalk line, or use a laser level to mark the height of the standoff fasteners.

**STEP 2.** Once the handrail is laid out, mark any required cuts to each aluminum retainer, vinyl covers, and impact cushion at different locations along the run. The minimum required spacing between the splice locations is 6”.

**Step 3.** Layout the aluminum retainer “face up”, mark and drill the mounting bracket hole locations, using the groove in the retainer to locate the centerline of the retainer (Figure 3, page 3). Refer to Minimum Layout Configurations (Page 5) for additional information concerning spacing and minimum wall guard length requirements. Important: All cuts must be square and deburred.

**NOTE:** observe all safety precautions when drilling to avoid all utilities and re-bar.
**STEP 4.** Locate and drill the mounting bracket holes in the wall construction using the aluminum retainer as a template or by careful measurement. Choice of hardware will dictate the required hole diameter.

**STEP 5.** Insert molded accessories into the end of the corresponding aluminum retainer, press firmly to ensure that the molded part is seated squarely against the end of the retainer. Drill, or mark and drill, the accessory mounting holes using the accessory as a template (See Figure 4, above).

**STEP 6.** Measure and cut the flexible impact cushion to fit comfortably between the molded accessories that are to be attached to the retainer. Then slide the impact cushion into the track located on the aluminum retainer (See Figure 5).

**STEP 7.** Attach the molded returns and corners to the aluminum retainer with the accessory seated firmly and squarely to the retainer while tightening. Fasten with a 1/4” bolt, flat washer, and nylon lock nut provided. **Caution:** Do not use a lock washer, use flat washer only. Always place a flat washer between the nut and the molded tab. Tighten to 10 ft-lbs maximum torque (See Figure 6).

**STEP 8.** Mount the assembly to the wall with the mounting brackets and the appropriate hardware according to the wall construction. See Step 9 for splicing information.

**Suggested Hardware:**
- Drywall: Toggler® brand toggle bolts (See Page 6)
- Masonry: Plastic Alligator® inserts or appropriate Tapcon®

**STEP 9.** When splicing is required always locate the splice joints a minimum of 4” from mounting bracket locations. For additional splicing detail see Figure 7 below. Offset the butt joint in the cover, handrail grip, accent strip, aluminum retainer, and impact cushion (See Typical Assembly Illustration, page 1)
**CLEANING INSTRUCTIONS**

1. For best results, the use of liquid cleaners such as “409”, “Fantastic”, “Mr. Clean”, etc. are recommended. The use of powder cleansers is not recommended, use of such cleaners can leave residue which is difficult to remove.
2. Do not use chlorinated or aromatic hydrocarbons, esters or ketones to clean Nudo vinyl products. Avoid the use of heavy degreasers, compounds containing surfactants, and abrasive compounds or cleaning devices.

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**STEP 10.** Measure between accessories (corners and returns) and cut the corresponding vinyl cover, accent strip, and handgrip profiles to the correct size. Cut the profiles so that they will span any retainer butt joints/splices.

*Important:* All cuts must be square and deburred.

**STEP 11.** Place the accent strip in the finger groove of the aluminum retainer, ID mark down (See Figure 8, below). Snap the handgrip cover into place on the retainer, then snap the lower vinyl cover into place by hooking the upper leg first, then pushing downward snap the lower hook into position.
CUTTING ADJUSTMENT DIAGRAMS AND SCHEDULE

MINIMUM LAYOUT CONFIGURATIONS
TOGGLE INSTALLATION INSTRUCTIONS & TECHNICAL DATA

STEP 1
Drill appropriate size hole (1/2”). Hold metal channel flat alongside plastic strips and slide channel through the hole. Minimum clearance behind wall: only 1-7/8”.

STEP 2
Hold ends of straps together between thumb and forefinger and pull toward you until channel rests behind the wall. Ratchet cap along the straps with other hand until flange of the cap is flush with wall.

STEP 3
Place thumb between the straps at the wall. Push thumb side to side, snapping off the straps level with the flange of the cap.

STEP 4
Place standoff to the wall over the flange. Using 1/4, 20 tap bolt, Insert tap and tighten until snug against the standoff, then stop.

Ultimate Tensile Pull-out Values (lb)

<table>
<thead>
<tr>
<th>UNC Thread</th>
<th>Drill dia.</th>
<th>1/2” Drywall</th>
<th>5/8” Drywall</th>
<th>&quot;1/2&quot; with 25 gauge stud</th>
<th>&quot;5/8&quot; with 25 gauge stud</th>
<th>Concrete block</th>
<th>1/2” Steel plate</th>
</tr>
</thead>
<tbody>
<tr>
<td>1/4”-20</td>
<td>1/2”</td>
<td>265</td>
<td>356</td>
<td>425</td>
<td>464</td>
<td>1080</td>
<td>1288²</td>
</tr>
</tbody>
</table>

* Failure measured as breakage of drywall portion
² Hardened bolts used

Ultimate Shear (lb)

<table>
<thead>
<tr>
<th>UNC Thread</th>
<th>Drill dia.</th>
<th>1/2” Drywall</th>
<th>5/8” Drywall</th>
</tr>
</thead>
<tbody>
<tr>
<td>1/4”-20</td>
<td>1/2”</td>
<td>241</td>
<td>324</td>
</tr>
</tbody>
</table>

- For maximum shear holding, orient channels vertically to the floor.
- Use hardened or stainless bolts for maximum weight load.
- Enlargement of specified insertion holes size will reduce anchor effectiveness.
- All toggle anchors meet requirements of Type V anchors in Federal Specification FF-B-588-D (superseded). 1/4-20 x 4” tap bolt/screw (fully threaded) meeting or exceeding ASTM A307 Grade A and SAE J429 Grade 1 requirements.