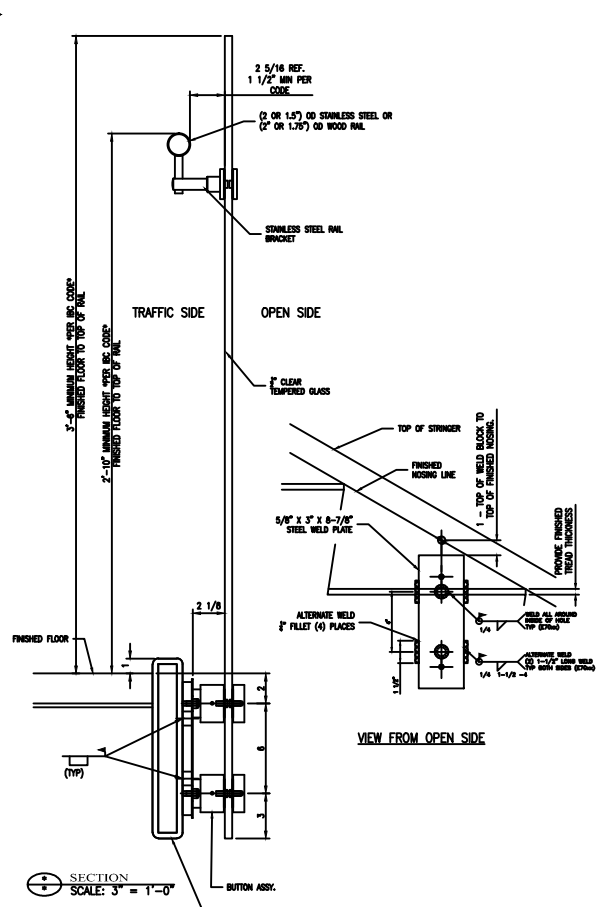


ELEVATION
SCALE: 3" = 1'-0"



SECTION
SCALE: 3" = 1'-0"

LIVERS BRONZE CO. RECOMMENDS 3/8" THICK (MINIMUM) STRUCTURAL STEEL TUBE (FOR TUBING ONLY) BY OTHERS. THE DESIGN AND PLACEMENT OF THE STAYS (BY OTHERS) SHALL BE LEVEL AND PLUMB.

INTERNATIONAL BUILDING CODE
GLASS BALUSTERS MUST HAVE AN ATTACHED HANDRAIL OR GUARDRAIL. THESE HANDS MUST BE SUPPORTED BY AT LEAST THREE GLASS PANELS OR SUPPORTED TO REMAIN IN PLACE SHOULD ONE PANEL FAIL. BUILDING OFFICIALS MAY ACCEPT LAMINATED GLASS AS A MEANS OF SUPPORT.

ILVERS BRONZE CO. STRONGLY RECOMMENDS THAT THE TOP GLASS EDGE BE PROTECTED. AN EXPOSED TOP GLASS EDGE HAS THE POTENTIAL TO BE DAMAGED BY JEWELRY, FINGER RINGS, ETC. THIS CAN RESULT IN A CRACK, BROKEN CORNER, OR FAILURE OF THE ENTIRE GLASS PANEL.
ILVERS BRONZE CO.

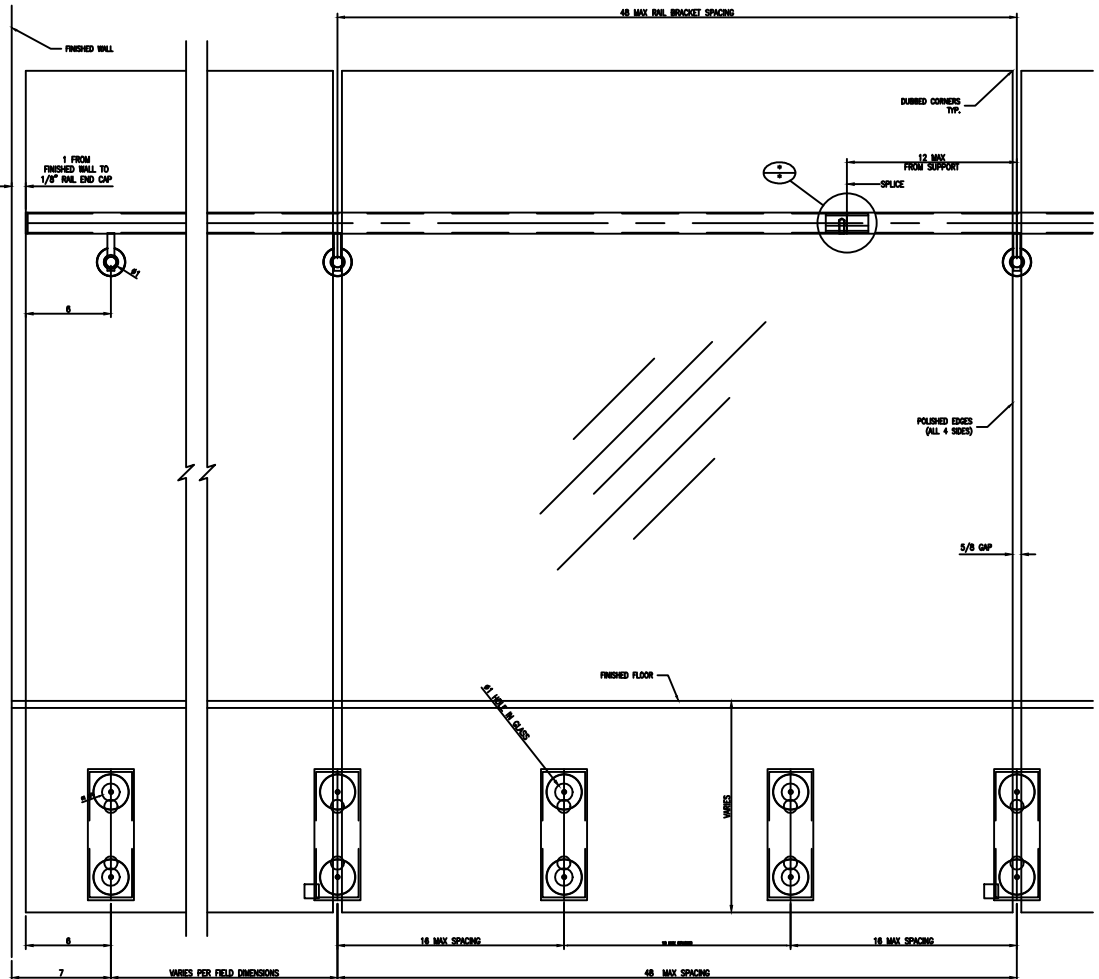
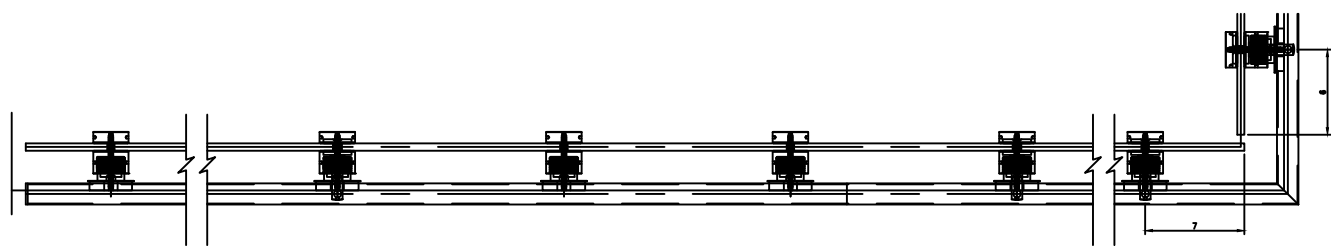
ILVERS BRONZE CO. IS NOT RESPONSIBLE FOR AN ARCHITECT'S CUSTOM DESIGNED RAILING SYSTEM MEETING EITHER IBC OR ASTM CODE. THIS INCLUDES MODIFICATIONS TO OUR STANDARD PRODUCT LINE, INCLUDING BUT NOT LIMITED TO CHANGES IN HEIGHT, POST SPACING OR MATERIAL SUBSTITUTIONS. IF A DOUBT EXISTS ON THE PERFORMANCE OF YOUR SYSTEM, IT IS ADVISABLE TO PURCHASE STRUCTURAL CALCULATIONS, PRIOR TO APPROVING DRAWINGS FOR MANUFACTURE.

GLASS BY OTHERS:
THE GLASS PANELS WILL BE MANUFACTURED AFTER THE FINAL DRAWINGS ARE APPROVED BY THE CUSTOMER.

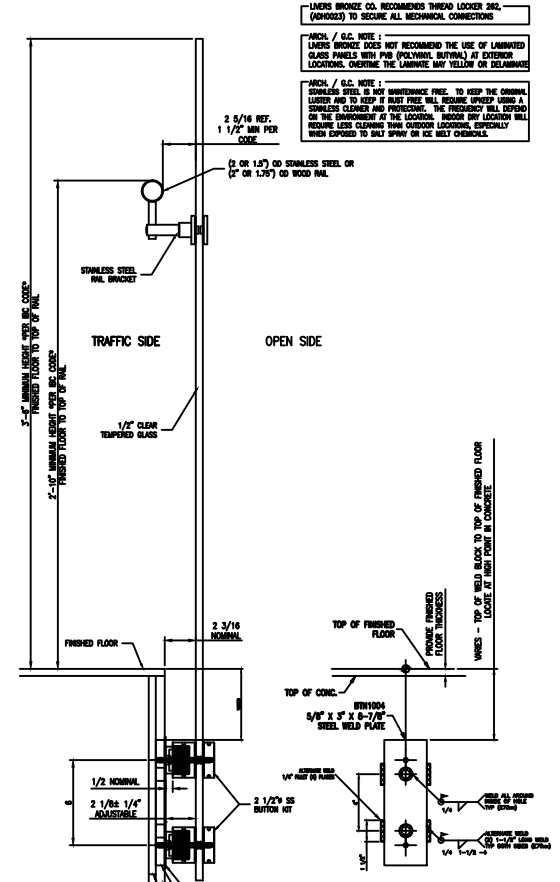
ILVERS BRONZE CO. RECOMMENDS THREAD LOCKER 242, (APPROVED) TO SECURE ALL MECHANICAL CONNECTIONS.

ARCH. / G.C. NOTE:
ILVERS BRONZE CO. RECOMMENDS THE USE OF LAMINATED GLASS PANELS WITH PVB (POLYVINYL BUTYRAL) AT EXTERIOR LOCATIONS. OVERTIME THE LAMINATE MAY YELLOW OR DELAMINATE.

ARCH. / G.C. NOTE:
ILVERS BRONZE DOES NOT RECOMMEND THE USE OF ORIGINAL LISTER AND TO KEEP IT RUST FREE WILL REQUIRE UPKEEP USING A STAINLESS CLEANER AND POLISHING. THE PRODUCT WILL DEPEND ON THE ENVIRONMENT AT THE LOCATION. BROOD SPRAY LOCATION WILL REQUIRE LESS CLEANING TIME OUTSIDE LOCATIONS, ESPECIALLY WHEN EXPOSED TO SALT SPRAY OR ICE MELT CHEMICALS.



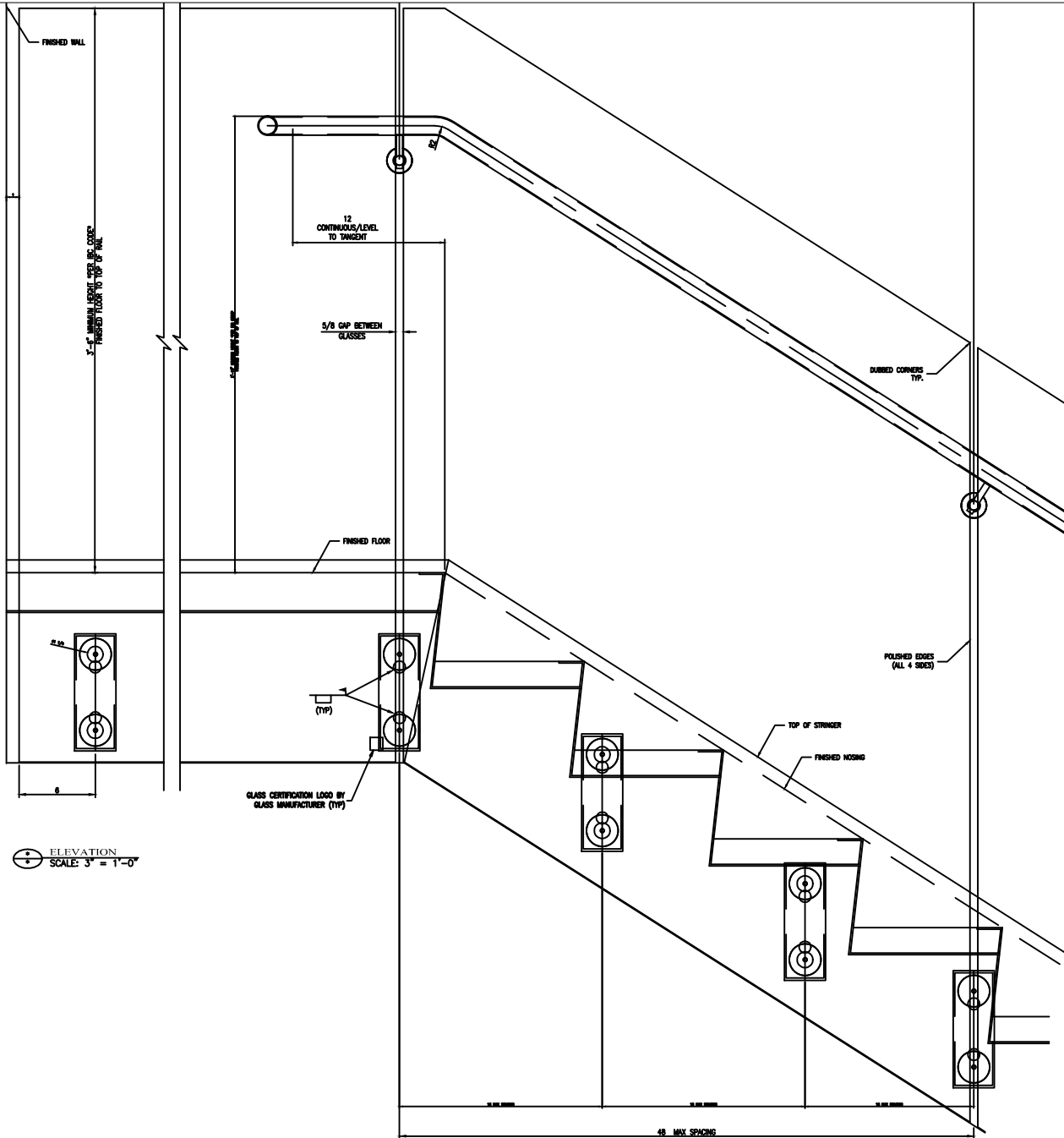
ELEVATION
SCALE: 3" = 1'-0"



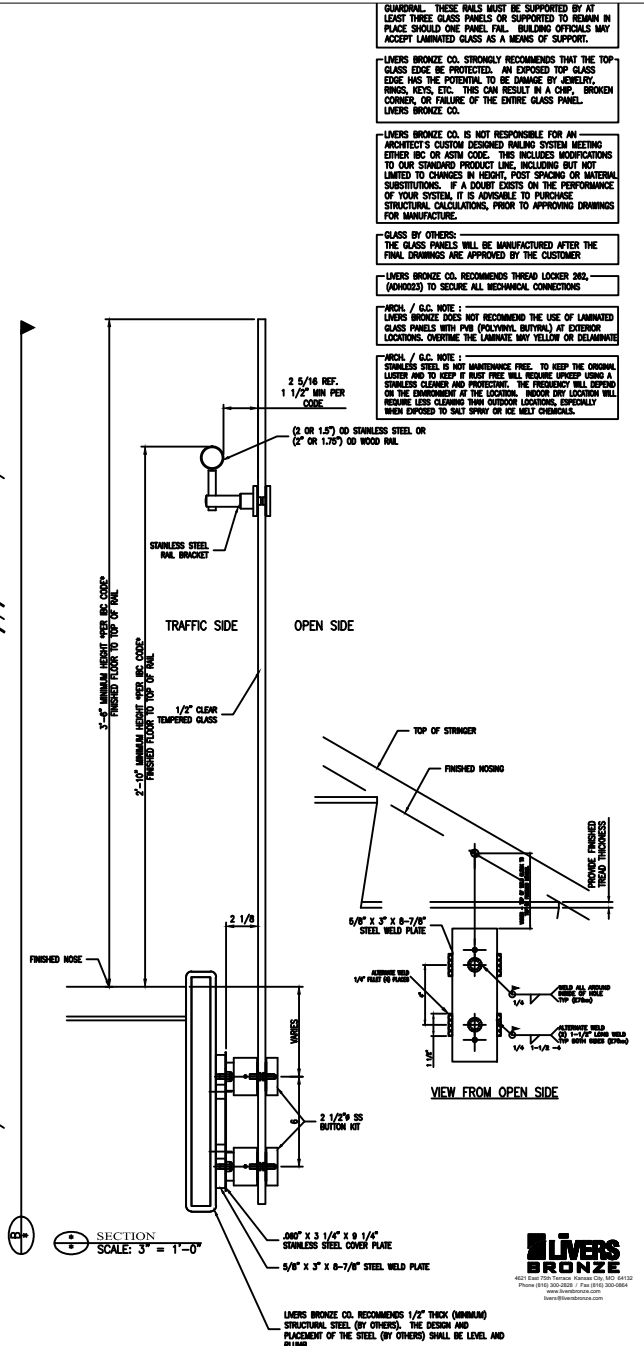
SECTION
SCALE: 3" = 1'-0"



482 East 10th Street, Kansas City, MO 64106
Phone: 816-234-2200 Fax: 816-234-0664
www.ilversbronze.com



ELEVATION
SCALE: 3" = 1'-0"



SECTION
SCALE: 3" = 1'-0"

GUARDRAIL. THESE RAILS MUST BE SUPPORTED BY AT LEAST THREE GLASS PANELS OR SUPPORTED TO REMAIN IN PLACE SHOULD ONE PANEL FAIL. BUILDING OFFICIALS MAY ACCEPT LAMINATED GLASS AS A MEANS OF SUPPORT.

LIVERS BRONZE CO. STRONGLY RECOMMENDS THAT THE TOP GLASS EDGE BE PROTECTED. AN EXPOSED TOP GLASS EDGE HAS THE POTENTIAL TO BE DAMAGED BY JEWELRY, RINGS, KEYS, ETC. THIS CAN RESULT IN A CRACK, BROKEN CORNER, OR FAILURE OF THE ENTIRE GLASS PANEL. LIVERS BRONZE CO.

LIVERS BRONZE CO. IS NOT RESPONSIBLE FOR AN ARCHITECT'S CUSTOM DESIGNED RAILING SYSTEM MEETING EITHER IRC OR ASTM CODE. THIS INCLUDES MODIFICATIONS TO OUR STANDARD PRODUCT LINE, INCLUDING BUT NOT LIMITED TO CHANGES IN HEIGHT, POST SPACING OR MATERIAL SUBSTITUTIONS. IF A COURT EXISTS ON THE PERFORMANCE OF YOUR SYSTEM, IT IS ADVISABLE TO PURCHASE STRUCTURAL CALCULATIONS, PRIOR TO APPROVING DRAWINGS FOR MANUFACTURE.

GLASS BY OTHERS: THE GLASS PANELS WILL BE MANUFACTURED AFTER THE FINAL DRAWINGS ARE APPROVED BY THE CUSTOMER

LIVERS BRONZE CO. RECOMMENDS THREAD LOCKER 202, (LOKREZ) TO SECURE ALL MECHANICAL CONNECTIONS

ARCH. / G.C. NOTE : LIVERS BRONZE DOES NOT RECOMMEND THE USE OF LAMINATED GLASS PANELS WITH PVB (POLYVINYL BUTYRATE) AT EXTERIOR LOCATIONS. OVERTIME THE LAMINATE MAY YELLOW OR DELAMINATE

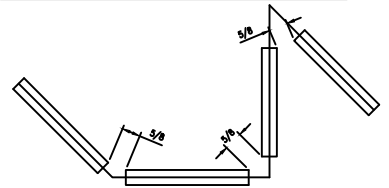
ARCH. / G.C. NOTE : STAINLESS STEEL IS NOT MAINTENANCE FREE. TO KEEP THE ORIGINAL LUSTRE AND TO KEEP IT FREE FROM CORROSION, IT WILL REQUIRE REGULAR STAINLESS CLEANER AND PROTECTANTS. THE FREQUENCY WILL DEPEND ON THE ENVIRONMENT AT THE LOCATION. INDOOR USE LOCATIONS WILL REQUIRE LESS CLEANING THAN OUTDOOR LOCATIONS, ESPECIALLY WHEN EXPOSED TO SALT SPRAY OR ICE MELT CHEMICALS.



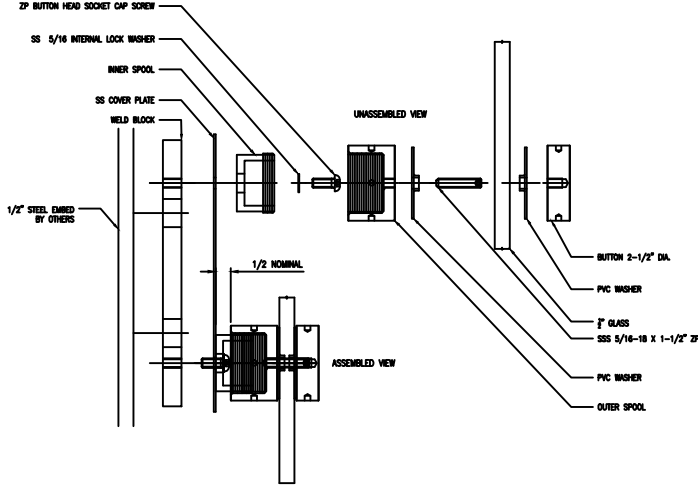
MATERIAL DESIGN STRENGTHS

GLASS FULLY TEMPERED - PULMONING DATA A75-129 - 24,000PSI TYPICAL MEAN MOR
 SOCKET CAP SCREW, STAINLESS - ASTM F837 - 80KSI TENSILE (MIN)
 FLAT HEAD CAP SCREW, STAINLESS - ASTM F878 - 80KSI TENSILE (MIN)
 HEX HEAD CAP SCREW, STAINLESS - ASTM F893 - 100KSI TENSILE (MIN)
 BUTTON HEAD CAP SCREW, STAINLESS - ASTM F879 - 80KSI TENSILE (MIN)
 BUTTON CAP SCREW, STAINLESS, 5/16" BSHROOD - 40KSI TENSILE (MIN)
 FLANGE 12-POINT SCREW, ALLOY STEEL - F1-115 - 170KSI TENSILE (MIN)
 SELF-DRILLING TAPPING SCREW, STAINLESS - SAE J78 - 180KSI TENSILE (MIN)
 BAR STAINLESS - 30KSI - YIELD (MIN)
 BAR 1018 CF - ASTM A108 - 54KSI - YIELD
 BAR ALUMINUM 6061-T6 & 7051-T1 - 35KSI - YIELD (MIN)
 BAR BR C230 - 20KSI - YIELD (MIN)
 PIPE STAINLESS - ASTM A312 - 30KSI - YIELD (MIN)
 PIPE WELDED STEEL - ASTM A53 Gr. B - 30KSI - YIELD (MIN)
 PIPE SIZE TUBE, STEEL ERW - A500 Gr. C - 40KSI YIELD (MIN)
 PIPE ALUMINUM 6061-T6 - 35KSI - YIELD (MIN)
 PIPE BR C230 - 18KSI - YIELD (MIN)
 TUBE 304 STAINLESS - ASTM A249 - 30KSI YIELD (MIN) - 46KSI YIELD (MIN)
 TUBE CUSTOM STAINLESS, 1-1/2" DIAMETER 1.065 WALL - 46KSI YIELD (MIN)
 TUBE 1028 STEEL - ASTM A516 - 47KSI YIELD (MIN)
 TUBE STEEL ERW - A500 Gr. B - A513 T1B2 - 40KSI YIELD (MIN)
 TUBE ALUMINUM 6061-T6 - 35KSI YIELD (MIN)

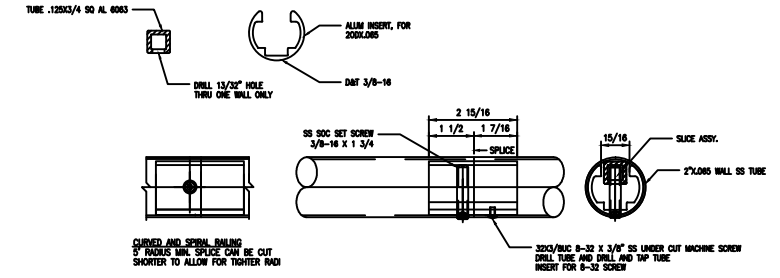
LIVERS BRONZE CO. RECOMMENDS THREAD LOCKER 202, (ADH0023) TO SECURE ALL MECHANICAL CONNECTIONS



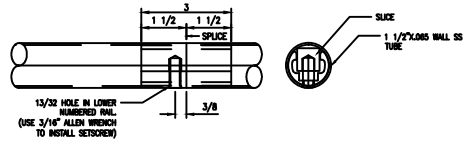
TYPICAL GLASS CORNERS DETAIL
 SCALE: 6" = 1'-0"



BUTTON ASSEMBLY DETAIL
 SCALE: 6" = 1'-0"



FACTORY CUT SPLICE
 SCALE: 6" = 1'-0"



FACTORY CUT SPLICE
 SCALE: 6" = 1'-0"

Button Rail System - Installation instructions

Determine the finished floor edge

- 1) Determine the highest floor elevation in the area, including turns.
- 2) Verify the straightness of the structure that will be used to support the Button Rail System. This Railing system is designed to accommodate straightness variation of +/- 1/4" any additional variation needs to be addressed with the Superintendent before construction.
- 3) Confirm the finished floor thickness and finish floor edge location including any leveling compound or finish trim.
- 4) From the highest finished floor point use a string line or a laser level to establish a straight and level datum line representing the exact edge of finished floor.

Locate and Weld Mounting Blocks

- 1) Measure down from datum line, the vertical locating dimensions as shown on the Livers Bronze Co. Final Drawing set and establish a reference line to the top of the Mounting Block (B7N-1004).
- 2) Layout the horizontal spacing locating the Mounting Block from the start of the run.
- 3) Do not weld any Mounting Blocks until you can verify all of the spacing in the run.
- 4) Level and damp the Mounting Blocks in position being certain to hold the horizontal and vertical dimensions from the Final Drawing Set.
- 5) Plug weld the Mounting Block to the structure using the (2) holes provided

Mounting of the Inner Spools

- 1) Screw the Inner Spool of the top button to the weld block.
 - A) Set the Button Head Cap Screw on the tip of your hex key.
 - B) Apply locktite to the screw threads.
 - C) Slide the Internal Lock Washer over the Button Head.
 - D) Slide the Button Head thru the Inner Spool and thru the Cover Plate.
 - E) Hold the Cover Plate with one hand while still holding the hex key in your other hand, you may now rotate and position the entire assembly in the upper hole in the Mounting Block. Do not concern over the position or rotation of the sleeve.
 - F) Start the Button Head Cap Screw and loosely tighten.
- 2) Screw the Inner Inner Spool to bottom hole of the Mounting Block using the Button Head Cap Screw & Internal Lock Washer.
- 3) Orientate both slots of the Inner Spools, horizontal and then center them under the Button Head Cap Screws.
- 4) Before tightening the Button Head Cap Screw, slide the Cover Plate, centering it over the Mounting Block.
- 5) Tighten the Button Head Cap Screw to 18 ftlb, using a #5 metric hex key.

Installation of the Outer Spool

- 1) Apply locktite to the threads of the 5/16-18 x 1-1/2" Set Screw and thread into the Outer Spool and tighten until snug.
- 2) Place one PVC Washer over the Stud.
- 3) On both ends of each run spin the Outer Spool onto the Inner Spool until the Outer Spool is 1/2" away from the cover plate and or weld block.
- 4) Set up a string line between the two ends of the Outer Spool to establish a straight reference line to check for both level and alignment.
- 5) Spin on the remaining Outer Spools onto the Inner Spools until they are in line with the string line.
- 6) Plumb the bottom buttons off of the top button. Buttons aligned, vertical & horizontal, at this step allow for a better installation of glass later.

WARNING!

GLASS PANELS ARE AT RISK OF EDGE DAMAGE. GLASS MUST BE PROTECTED BY INSTALLING A CUSHION OVER EXPOSED EDGES WHILE LIFTING, CARRYING OR INSTALLING GLASS.

WARNING!

PERSONS NOT ESSENTIAL TO THE INSTALLATION OF THE GLASS SHOULD NOT BE ALLOWED INTO THE AREA AROUND THE LIFT. AREAS BELOW ANY ELEVATED WORKING SURFACES ARE TO BE BARRICADED AND CLEARLY MARKED AS A FALLING HAZARD TO PREVENT INJURY OR DEATH.

Glass & button installation

- 1) The recommended method of hanging the glass is to have two men on the lift and one on the balcony.
- 2) The two men can raise the glass from the lift truck and set it on the PVC Washer covering the Studs.
- 3) The man on the balcony can then steady the glass while the two below install the outer PVC Washers then the outside Buttons.
- 4) Starting on one end of the run, set the glass and loosely tighten both Buttons that go thru the holes in the glass. The Button on the stud that passes between the glass will install later.
- 5) The man on the balcony must level the glass using the special foot bar while the men below tighten the buttons.
- 6) Install the second piece of glass the same as the first using only the buttons that are for the studs that pass through the holes in the glass, the buttons that pass between the glass will install later.
- 7) On this piece and all following glass, the upper man must not only level the glass, he must align the top edge with the preceding piece then check that the vertical gap between it and the preceding glass is uniform, this step is critical and must be correct before moving on.
- 8) The alignment front to back will happen with the installation of the side or top rail.
- 9) Install the two PVC Washers & Buttons between the glass sections before moving to set the next piece of glass.

Button adjustment

- 1) The Button Rail System is designed to allow slight adjustment if the installation requires
- 2) The Outer Spool can adjust the distance from the structure using a common spanner wrench.
- 3) The Spool may be adjusted along the structure either horizontally or vertically using the slot located in the Inner Spool.
 - A) Loosen and remove the Button, leaving the glass in place.
 - B) Remove the Set Screw from the Outer Spool.
 - C) A hex key can be inserted thru the hole in the Outer Spool to loosen the Button Head Cap Screw Holding the Inner Spool to the Mounting Block.
 - D) Adjust the Spool as required, re-tighten and re-assemble the hardware.

Handrail Installation

This system requires the installation of either a top rail or side rail to align the glass panels.



4621 East 33rd Street, Suite 100, Fort Worth, TX 76112
 Phone (817) 332-2823 Fax (817) 332-2824
 www.liversbronze.com
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GLASS BRKT DETAIL

GLASS BRKT DETAIL

LIVERS BRONZE CO. RECOMMENDS
 THREAD LOCKER 262, (ADH0023) TO
 SECURE ALL MECHANICAL CONNECTIONS

