

MASTER PLAN SHEET - ALUMINUM STRUCTURAL RAILING,  
ALL-WELDED CONSTRUCTION†, AT & ABOVE-GRADE APPLICATIONS

JANUARY 3, 2023	
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TOLERANCES TO BE PER INDUSTRY STANDARDS

- 1 TOP RAILS: 2" x 1-1/2" x 1/8" THICK, 6005-T5 OR 6061-T6 ALUMINUM.
- 2 POST: 2" SQUARE x 1/8" THICK, 6005-T5 OR 6061-T6 ALUMINUM.
- 3 PICKET: 3/4" SQUARE x 0.090" MIN. THICK
- 4 BOTTOM RAIL: 2" x 1" x 1/8" THICK
- 5 BOTTOM RAIL CLIP: 2" x 2" x 1/8" THICK

**RAILING SCHEDULE & DETAIL 1/01 NOTES:**

\* 1-7/8" MAX. DIMENSION BETWEEN FINISHED FLOOR AND UNDERSIDE OF BOTTOM RAIL MAY BE INCREASED TO RESIST 4" SPHERE WHERE PERMITTED BY CODE & APPROVED BY OTHERS.

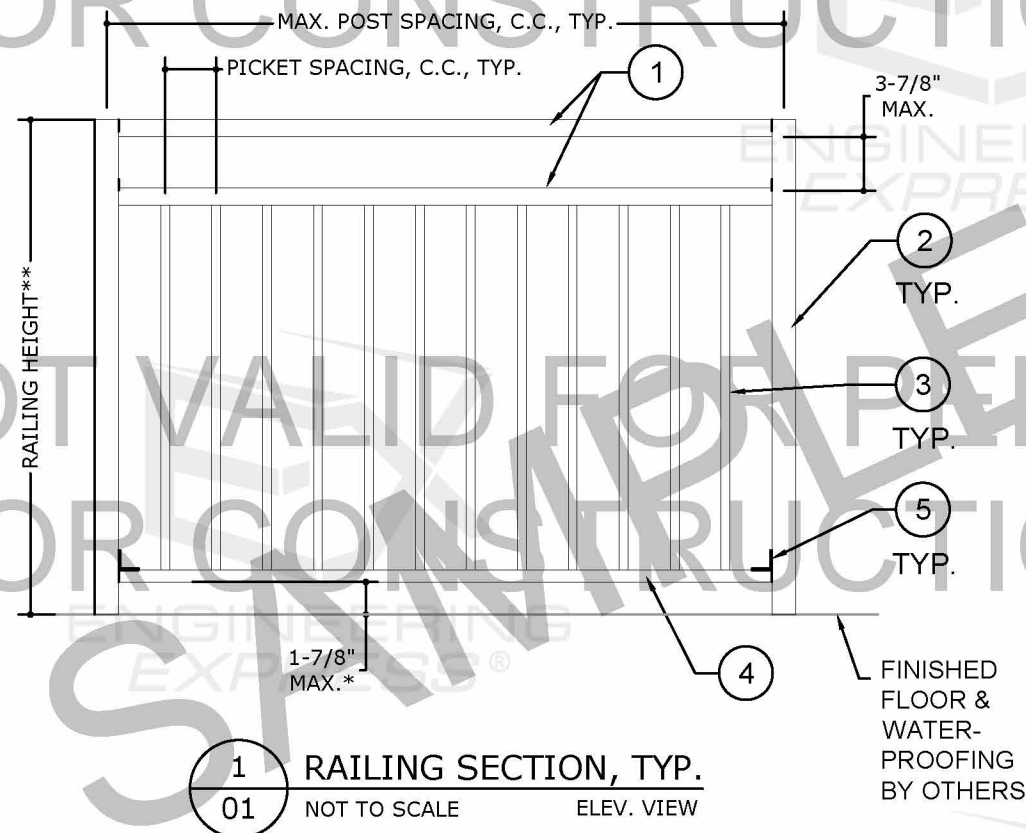
RAILING HEIGHT IS DEFINED AS THE HEIGHT FROM FINISHED FLOOR TO TOP OF RAILING. RAILING MAY BE LESS THAN 3'-6" WHEN PLACED ON KNEEWALLS PROVIDED HEIGHT FROM FINISHED FLOOR IS AS SHOWN.

1. THIS SYSTEM HAS BEEN DESIGNED AND SHALL BE FABRICATED IN ACCORDANCE WITH THE REQUIREMENTS OF THE FLORIDA BUILDING CODE SEVENTH EDITION (2020). ALSO APPLICABLE FOR THE 2012, 2015, & 2018 INTERNATIONAL BUILDING & RESIDENTIAL CODES AS WELL AS THE CURRENT VERSIONS OF THE MN, NC, NJ, NY, OH, SC, & VA BUILDING CODES AS APPLICABLE. CODE ENFORCED COMPLIES WITH STATE OF SEAL AND IF MULTIPLE VERSIONS ARE LISTED THEN MOST STRINGENT APPLIES. CONTRACTOR SHALL INVESTIGATE AND CONFORM TO ALL LOCAL BUILDING CODE AMENDMENTS WHICH MAY APPLY AND GOVERN. DESIGN SHALL UTILIZE ASD DESIGN METHOD USING ASCE 7-16 OR ASCE 7-10 CODES FOR SITE-SPECIFIC APPLICATIONS AS APPLICABLE.
2. THIS RAILING IS DESIGNED TO MEET SECTIONS OF THE CODE GOVERNING ELEVATED BALCONIES AND STRUCTURAL RAILINGS (200 lb POINT LOAD, 50 plf TOPCAP LOAD, 50 lb POINT LOAD UPON 1 SF OF INFILL). THIS RAILING IS DESIGNED FOR WIND LOADING PER THE BUILDING CODES REFERENCED ABOVE & THE PROVISIONS OF ASCE 7, EXPOSURE CATEGORIES 'B', 'C', & 'D',  
RISK CATEGORIES I - IV,  $V_{ult} = 195$  mph MAX. ( $V_{ASD} = 151$  mph MAX.) (3 SECOND GUST), AS A 69% OPEN SIGN USING "ASD" METHODOLOGY.
3. INSTALLATION HEIGHT SHALL BE  $<=$  90 ft FLAT GRADE TO TOP OF RAIL.
4. ALL FLOOR FINISHES SHALL BE BY OTHERS, SHALL NOT EXCEED 1/2" MAXIMUM, AND SHALL BE STRUCTURALLY ADHERED, OTHERWISE THEY SHALL BE CERTIFIED SEPARATELY TO TRANSFER ALL LOADING TO THE SUPERSTRUCTURE. DIMENSIONS HEREIN ARE POST-FLOOR FINISHES. WATERPROOFING SHALL BE BY OTHERS.

5. ALL FASTENERS TO BE #12 x 3/4" OR GREATER SERIES 300 NON-MAGNETIC STAINLESS STEEL, OR CADMIUM PLATED OR OTHERWISE CORROSION-RESISTANT MATERIAL.
6. FOR ALUMINUM ATTACHMENTS, ALL ANCHORS SHALL BE SPACED WITH 2x DIAMETER MIN. END DISTANCE AND 2.5x DIAMETER MIN. SPACING TO ADJACENT ANCHORS, UNLESS NOTED OTHERWISE.
7. ALUMINUM CONSTRUCTION SHALL BE IN CONFORMANCE WITH THE TOLERANCES, QUALITY AND METHODS OF CONSTRUCTION AS SET FORTH IN
8. MINIMUM WELD IS 1/8" THROAT FULL-PERIMETER FILLET WELD, UNLESS NOTED OTHERWISE. WELD FILLER ALLOYS SHALL MEET ANSI/AWS A5.10 STANDARDS.
9. FOR SITES IN FLORIDA: FABRICATION SHALL BE IN ACCORDANCE WITH 2020 FBC SECTION 2003.8.

10. ALL EXTRUDED MEMBERS SHALL BE ALUMINUM ALLOY TYPE 6063-T6 OR BETTER, UNLESS NOTED OTHERWISE.
11. ALL CONCRETE SHALL BE UNCRACKED ONLY WITH A MINIMUM COMPRESSIVE STRENGTH OF 3000 PSI U.N.O. AND SHALL BE MINIMUM 1.5X THICKER THAN ANY MEMBER EMBEDMENT U.N.O.
12. ALL EPOXY & GROUT SHALL MEET OR EXCEED COMPRESSIVE STRENGTH OF THE CONCRETE AND SHALL BE IRON-FREE, NON-SHRINK AND NON-REACTIVE WITH A COMPRESSIVE STRENGTH OF 5,000 PSI MIN.
13. THE CONTRACTOR IS RESPONSIBLE TO INSULATE ALL MEMBERS FROM DISSIMILAR MATERIALS TO PREVENT ELECTROLYSIS.
14. ELECTRICAL GROUND, WHEN REQUIRED, TO BE DESIGNED & INSTALLED BY OTHERS.

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1	RAILING SECTION, TYP.
01	NOT TO SCALE ELEV. VIEW

RAILING SCHEDULE		
RAILING HEIGHT**	MAX.POST SPACING, C.C.	PICKET SPACING, C.C.
3'-6"	4'-0"	3-7/8"

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**WELDED ALUMINUM RAILING**  
UP TO 90 ft ABOVE GRADE  
FBC 7TH Ed. (2020) & IBC/IRC (2012/15/18)

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INIT ISSUE	EPR RWN	01/04/22
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01

FLOOR OF HOST STRUCTURE BY  
OTHERS, SHALL BE 3 ksi MIN.  
CONCRETE



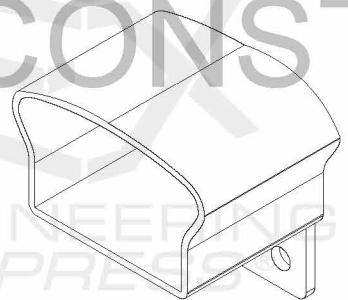
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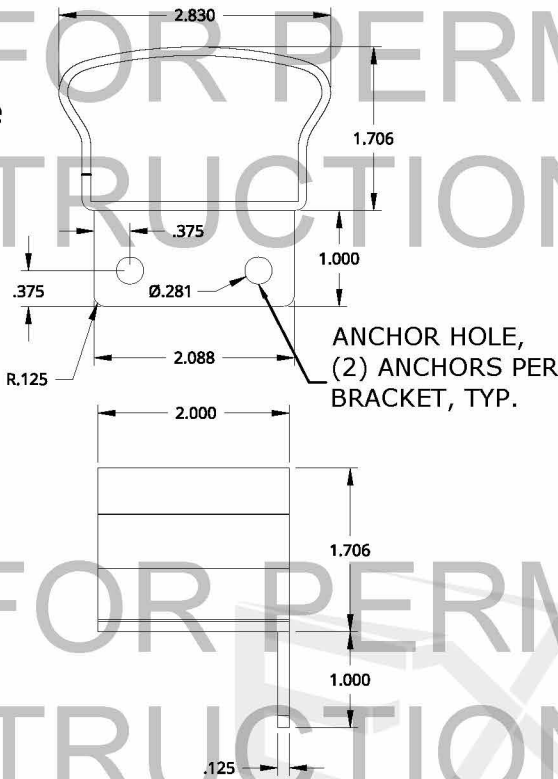
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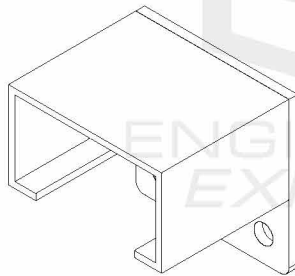
2-5/8" Outside Sleeve



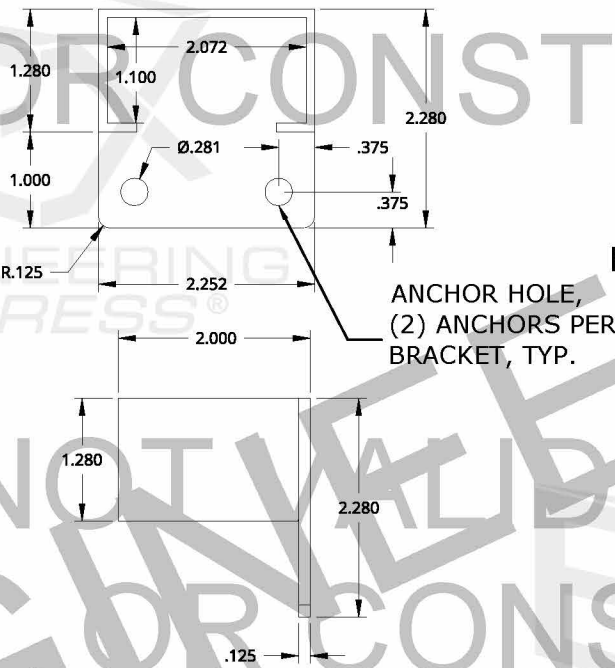
TAB MATERIAL 1/8"



2.252 x 1.280 Outside Sleeve



TAB MATERIAL 1/8"



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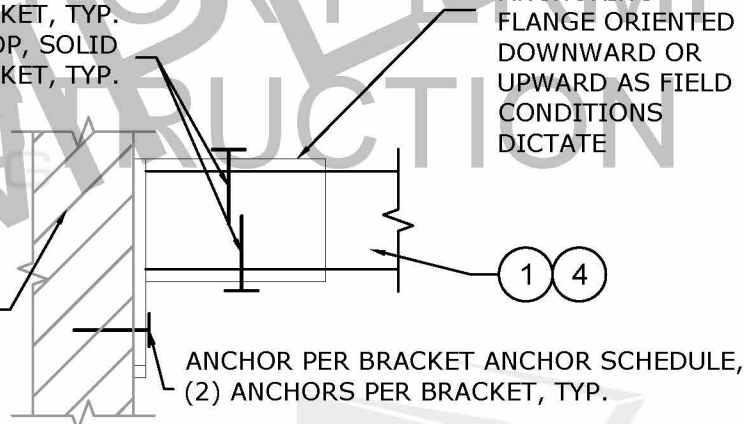
1  
03  
BRACKET TERMINATION OPTION:  
BRACKET FOR TOP RAILS, TYP.  
NOT TO SCALE  
EMS PART # 28-63-225

2  
03  
BRACKET TERMINATION OPTION:  
BRACKET FOR BOTTOM RAIL, TYP.  
NOT TO SCALE  
EMS PART # 52-63-4808

(2) #12 SS SMS WITH 3/4" MIN. SPACING AND 1/2" MIN. EDGE DISTANCE TO EDGE OF BRACKET.  
TOP RAILS: POSITION SMS ON BOTTOM, FLAT FACE OF TOP RAILS BRACKET, TYP.  
BOTTOM RAIL: POSITION SMS ON TOP, SOLID FACE OF BOTTOM RAIL BRACKET, TYP.

TOP/BOTTOM RAIL BRACKET, TYP.  
ANCHORING FLANGE ORIENTED DOWNWARD OR UPWARD AS FIELD CONDITIONS DICTATE

WALL OF HOST STRUCTURE BY OTHERS, TYP. SEE BRACKET ANCHOR SCHEDULE



3  
03  
BRACKET TERMINATION OPTION:  
BRACKET TO HOST ATTACHMENT, TYP.  
NOT TO SCALE  
EMS PART # 52-63-4808

BRACKET ANCHOR SCHEDULE  
(BRACKET TO WALL OF HOST STRUCTURE BY OTHERS)

HOST STRUCTURE	ANCHOR
2 ksi MIN. CONCRETE	(2) 1/4" ITW Ø TAPCONS OR EQUIVALENT WITH 1-1/4" MIN. SPACING BETWEEN ANCHORS, 3-1/2" MIN. SPACING FROM OTHER CONCRETE ANCHORS, AND 2" MIN. EDGE DISTANCE, TYP.
1.5 ksi MIN. GROUT-FILLED CMU CONFORMING TO UBC STANDARD 21-4.	(2) 1/4" Ø CARBON STEEL HILTI KWIK BOLT 3's OR EQUIVALENT INTO FACE OF CMU (INSTALLING TO TOP OF CMU NOT PERMITTED). PROVIDE 2" EMBEDMENT, 4" MIN. EDGE DISTANCE, 1-1/4" MIN. SPACING BETWEEN ANCHORS, AND 3-1/2" MIN. SPACING FROM OTHER CONCRETE ANCHORS, TYP.

BRACKET ANCHOR SCHEDULE NOTES:

- ANCHOR INSTALLATION SHALL CONFORM TO THE ANCHOR MANUFACTURER'S PUBLISHED INSTALLATION INSTRUCTIONS IN ADDITION TO THE SPECIFICATIONS LISTED HEREIN.
- BRACKET ANCHOR MAY UTILIZE EITHER ANCHOR HOLE LOCATION AS FIELD CONDITIONS DICTATE. ENSURE ANCHOR SPECIFICATIONS ARE ACHIEVED.

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03 OF 4

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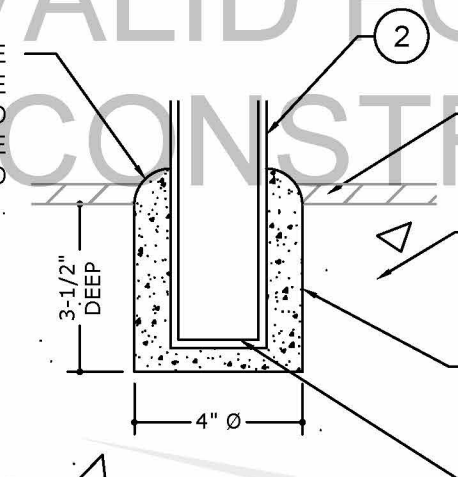
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OVERFILL AND SLOPE GROUT TO PROVIDE DRAINAGE. REQUIRED SEALANT SHALL BE APPROVED AND INSTALLED BY OTHERS.



FLOOR FINISH BY OTHERS, NOT TO EXCEED 1/2" THICKNESS, TYP.

3 ksi CONCRETE HOST BY OTHERS

CORE DRILL. POSITION CORE DRILL 5-1/4" MIN. FROM CENTER OF CORE DRILL TO CONCRETE FACE. CONCRETE BY OTHERS SHALL BE 5" MIN. THICK, TYP. CORE DRILL SHALL BE FILLED WITH HIGH-STRENGTH, NON-SHRINK GROUT PER PAGE 01 DESIGN NOTES, TYP.

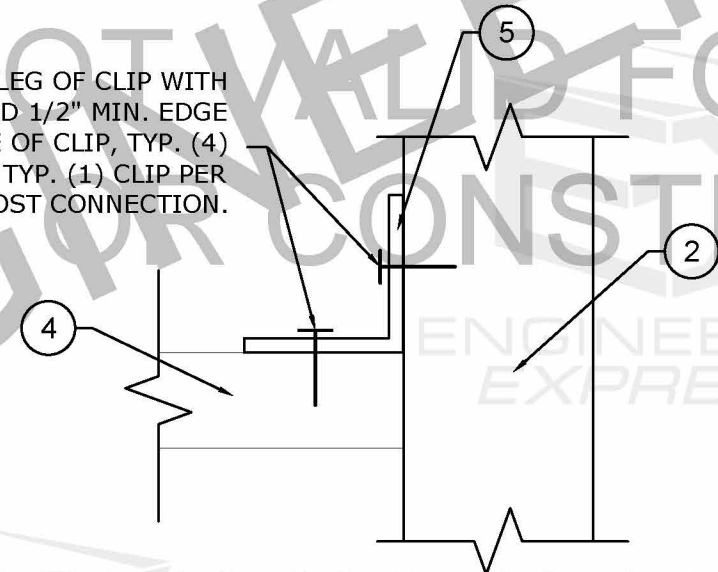
ALUMINUM COATING WHERE EMBEDDED IN CONCRETE SHALL BE APPROVED AND INSTALLED BY OTHERS.

1 POST CORE DRILL, TYP.  
04 NOT TO SCALE ELEVATION VIEW

**CORE DRILL NOTES:**

1. CONTRACTOR SHALL CONTACT EOR FOR ANY POST-TENSIONED BALCONY INSTALLATION REQUIREMENTS.
2. CONTRACTOR TO VERIFY EXISTING CONCRETE REINFORCEMENT SIZE/TYPE/LOCATION VIA GPR OR OTHER METHOD.
3. POST EMBEDMENT IS EQUIVALENT TO CORE DRILL DEPTH.

(2) #12 SS SMS PER LEG OF CLIP WITH 3/4" MIN. SPACING AND 1/2" MIN. EDGE DISTANCE TO EDGE OF CLIP, TYP. (4) SCREWS PER CLIP, TYP. (1) CLIP PER BOTTOM RAIL-POST CONNECTION.



2 BOTTOM RAIL ATTACHMENT TO POST, TYP.  
04 NOT TO SCALE ELEVATION VIEW