RAIL PICKETS & POSTS:
Structural Tube Pipe and Bar shall be in accordance with ASTM B221 or ASTM B429, Alloy 6061-T6. End Rail 90° bends and corner bends with maximum 4-0" post spacing may be Alloy 6061-T6. Posts and End Rail shall be fabricated and installed per manufacturer's instructions during foundation. Pickets shall be fabricated parallel to the posts. Corners and changes in tangential longitudinal alignment shall be made continuous with a minimum 9" bend radius or terminate at adjacent sections or locations while halving is not required. For changes in tangential longitudinal alignment greater than 45°, posts shall be positioned at a maximum distance of 2-0" each side of the corner and shall be located at the corner apex. For curved longitudinal alignments the top and bottom rails and handrails shall be bent to match the alignment radius.

RAILING MEMBER DIMENSIONS TABLE

<table>
<thead>
<tr>
<th>MEMBER</th>
<th>DESIGNATION</th>
<th>OUTSIDE DIMENSION</th>
<th>WALL THICKNESS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Posts</td>
<td>2&quot; x 4&quot; Rectangular Tube</td>
<td>2.00&quot; x 4.00&quot;</td>
<td>0.250&quot;</td>
</tr>
<tr>
<td>Posts</td>
<td>2&quot; x 4&quot; Square Tube</td>
<td>2.00&quot; x 4.00&quot;</td>
<td>0.250&quot;</td>
</tr>
<tr>
<td>Posts</td>
<td>2&quot; x 4&quot; Round Tube</td>
<td>2.00&quot; x 4.00&quot;</td>
<td>0.250&quot;</td>
</tr>
</tbody>
</table>

BASE PLATES & POST CAPS:
Base plates and Post Cap plates shall be in accordance with ASTM B209, Alloy 6061-T6.

SHELF PLATES:
Shelf Plates shall be aluminum in accordance with ASTM B209, Alloy 6061 or 6063. Shelf plates shall be used for foundation height adjustments greater than 4" and localized irregularities greater than 4". Field trim: Shelf plates when necessary to match the contours of the foundation. Beveled shelf plates may be used in lieu of trimmed flat shelf plates shown. Stacked shelf plates must be bonded together with adhesive bonding material and limited to a maximum total thickness of 4", unless anchor bolts are provided for the exposed threaded length.

ANCHOR BOLTS:
Anchor bolts shall be in accordance with ASTM F1554 Grade 56. Nondrilled anchor bolts for Adhesive Anchors shall be threaded full length. Cutting of reinforcing steel is permitted for drilled hole installation. Expansion Anchors are not permitted. All anchor bolts shall have single self-locking hex nuts. Tack welding at the nut to the anchor bolt may be used on self-locking nuts. Anchors shall be in accordance with ASTM A453 or ASTM A418. Flat Washers shall be in accordance with ASTM F936 and Flat Washers for long slotted holes only, shall be in accordance with ASTM A450 or ASTM A450 Grade 16. After the nuts have been snug tightened, the anchor bolt threads shall be distorted to prevent removal of the nuts. Distorted threads and tack welds shall be coated with a galvanizing compound in accordance with the Specifications.

RESCINT AND NEIGHBORING POSTS:
Rescint and neighboring posts shall be in accordance with Specification Section 932 except that existing of the finished posts shall not be required. Neoprene pads shall be secure to the foundation.

JOINTS:
All fixed joints shall be welded end to end. All welded joints shall be ground smooth and flushed. Expansion joints shall be spaced at a maximum 35'-0". Field splices shall be required for expansion joint only due to the minimum number of two posts. Only use the Continuity Field Splice (Detail "E") to make the rail alignment continuous for unsupported rail field adjustments.

DRAWINGS:
All welding shall be in accordance with the American Welding Society Structural Welding Code (Aluminum) AWS/D1.1/2 (current edition). Filler metal shall be either E518-L6, E5536 or E5556. Nondrilled expansion welding is not required. Plate metal for places welds may not be used.

SMALL DRAWINGS:
Complete details addressing project specific geometry (line & grade) showing post and expansion joint locations, anchor bolt installation "Case" or lengths, must be submitted by the Contractor for the Engineer’s approval prior to fabrication of the rail system. Shop drawings shall be in accordance with the Specifications.

PAYMENT:
Railings shall be paid for per linear foot (Nom. No. 13½2=2-0abbl). Payment will be made on quantity measured at the length of the suprise or running length of the top rail, and includes rails, posts, rails, anywhere assembled base plates, anchor bolts, nuts, washers, resilient or neoprene pads and all incidental materials and labor required to complete installation of the rail system.
ELEVATION
(Shewing Outside Face of Railing)

TYPICAL RAILING DETAILS & RAILINGS ON GRADES 0% TO 5%

NOTES:
- Picket Spacing of 4½" centers is based on a 3½" NPS. If an alternate design is used maintain a maximum clear opening of 3½".
- End Railhead varies for Railings on grades steeper than 2½%.
- NPS = Nominal Pipe Size

STRUCTURES EXPANSION JOINTS NOTE:
- Keyed construction joints in Index No. 520 Gravity Wall are not considered to be expansion joints.

CROSS REFERENCE:
- For Details "G", "D" and "E", see Sheet 4 of 5.

EXPANDED ELEVATION AT CORNERS

DETEIL FOR NON-CONTINUOUS RAILING AT CORNERS

HANDRHOLD required for ramps (Handrail continuous at landings between runs).

HANDRRAIL is ⅜" NPS Schedule 40.

RAMP REQUIREMENTS
- For slopes greater than 5% Max. ramp slope = 8.25% Max. ramp cross-slope = 2.0%
- For grades less than 5% Max. landing slope = 2X Max. landing cross-slope = 2X

LANDING REQUIREMENTS

RAILINGS ON GRADES STEEPER THAN 5% TO 8.33%

2010 FDOT Design Standards
ALUMINUM PEDESTRIAN/BICYCLE PICKET RAILING
**DETAIL "J" - PLAN VIEW**: TOP RAIL TERMINATION

**DETAIL "K" - PLAN VIEW**: BOTTOM RAIL TERMINATION

**ALTERNATE END TREATMENT DETAILS**

**RAILINGS ON STEPS & STAIRS**

**ALUMINUM PEDESTRIAN/BICYCLE PICKET RAILING**

**RAILING CONTINUATION BEYOND STEPS OR STAIRS**
(Bottom shown, Top similar)

Concrete sidewalk to extend 6' min. behind railing.

Handrail required for three or more steps (Handrail and cheekwalls continuous at landings).

Handrail is 1 1/2" NPS (Sch. 40) pipe.

See "Typical Railing Details", Sheet 2 of 5 for post, rail & picket details.

See Index No. 521 or Contract Plans for Step Details.

**ELEVATION**
(At-Grade Steps shown, Elevated Stairs similar)

**ALTERNATE END TREATMENT**
TYPICAL SECTION ON CONCRETE SIDEWALK
(Case I)

TYPICAL SECTION ON RETAINING WALL
(Case II)

DETIAL "F" (OPTIONAL SHIMMING DETAIL FOR CROSS SLOPE CORRECTION)
(Used in lieu of Beveled Shim Plates)

DETIAL "A" (Cast-In-Place Anchor Bolts shown, Adhesive Anchors similar)

ANCHOR BOLT TABLE

<table>
<thead>
<tr>
<th>CASE</th>
<th>STRUCTURE TYPE</th>
<th>&quot;A&quot;</th>
<th>&quot;B&quot;</th>
<th>&quot;C&quot;</th>
<th>C.I.P. Hex Head Bolt</th>
<th>Adhesive Anchor</th>
</tr>
</thead>
<tbody>
<tr>
<td>I</td>
<td>Unreinforced Concrete</td>
<td>6&quot;</td>
<td>1&quot;-2&quot;</td>
<td>9&quot;</td>
<td>1095&quot;</td>
<td>11&quot;</td>
</tr>
<tr>
<td>IIa</td>
<td>Reinforced Concrete</td>
<td>4&quot;</td>
<td>4&quot;</td>
<td>9&quot;</td>
<td>1095&quot;</td>
<td>11&quot;</td>
</tr>
<tr>
<td>IIb</td>
<td>Gravity Wall</td>
<td>45°</td>
<td>20°</td>
<td>9&quot;</td>
<td>9&quot;</td>
<td>1&quot;-2&quot;</td>
</tr>
<tr>
<td>III</td>
<td>Step Cheekwall</td>
<td>45°</td>
<td>15°</td>
<td>9&quot;</td>
<td>1095&quot;</td>
<td>11&quot;</td>
</tr>
</tbody>
</table>

* Embedment length "C" may be reduced to 9" for the 3-6" height railings for Case IIb, when the post spacing does not exceed 5-0".