NOTES

PIPERAILING & POSTS:
Structural Tube, Pipe and Bar shall be in accordance with ASTM A221 or ASTM B429, Alloy 6061-T6. End Rail WP bends and corner bends with maximum A-D pitch spacing, may be Alloy 6063-T5. Posts and End Rails shall be fabricated and installed plumb, ± 0° tolerance when measured at 3'-6" above the foundation. Corners and changes in tangential longitudinal alignment, may be made continuous with a 9" bend radius or terminated at adjoining sections with a standard and hoop when handrails are 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 not be located at the corner apex. For curved longitudinal alignments the top and bottom rails and handrails shall be stop 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; NPS (Sch. 40)</td>
<td>2.375&quot;</td>
<td>0.154&quot;</td>
</tr>
<tr>
<td>Posts</td>
<td>2&quot; NPS (Sch. 40)</td>
<td>2.375&quot;</td>
<td>0.154&quot;</td>
</tr>
<tr>
<td>Rails</td>
<td>2&quot; NPS (Sch. 40)</td>
<td>2.375&quot;</td>
<td>0.154&quot;</td>
</tr>
<tr>
<td>Rail Joint/Splice Sleeves</td>
<td>1½&quot; NPS (Sch. 40)</td>
<td>1.900&quot;</td>
<td>0.150&quot;</td>
</tr>
<tr>
<td>Handrail</td>
<td>1½&quot; NPS (Sch. 40)</td>
<td>1.900&quot;</td>
<td>0.145&quot;</td>
</tr>
<tr>
<td>Handrail</td>
<td>1¼&quot; NPS (Sch. 40)</td>
<td>1.900&quot;</td>
<td>0.145&quot;</td>
</tr>
<tr>
<td>Handrail</td>
<td>1&quot; Ø Round Bar</td>
<td>1.315&quot;</td>
<td>0.138&quot;</td>
</tr>
<tr>
<td>Handrail</td>
<td>1/8&quot; Round Bar</td>
<td>1.000&quot;</td>
<td>N/A</td>
</tr>
</tbody>
</table>

BASE PLATES:
Base Plates shall be in accordance with ASTM B209, Alloy 6061-T6.

SHIM PLATES:
Shim Plates shall be in aluminum in accordance with ASTM B209, Alloy 6061 or 6063. Shim plates shall be used for foundation height adjustments greater than 1/8" and localized irregularities greater than 1/8". Field trim shim plates when necessary to match the contours of the foundation. Bowed shim plates may be used in lieu of trimmed flat shim plates shown. Stacked shim plates must be bonded together with adhesive bonding material and limited to a maximum total thickness of 1/4", unless larger anchor bolts are provided for the exposed thread length.

COATINGS:
The aluminum railing shall be mill finish unless otherwise noted in the Contract Documents. All nuts, bolts, and washers shall be hot-dip galvanized in accordance with Section 962 of the Specifications.

ANCHOR BOLTS:
Anchor bolts shall be in accordance with ASTM F1554 Grade 36. Headless anchor bolts for adhesive anchoring shall be threaded full-length without reinforcing steel is permitted for drilled hole installation. All anchor bolts shall have single self-locking hex nuts. Tack welding of the nut to the anchor bolt may be used in lieu of self-locking nuts. All nuts shall be in accordance with ASTM A563 or ASTM A194. Tack Washers shall be in accordance with ASTM F436 and Plate Washers (for long slotted holes only) shall be in accordance with ASTM A563 or ASTM A992. Anchor bolts shall be in accordance with ASTM A992. Tack Washers shall be in accordance with ASTM F436 and Plate Washers (for long slotted holes only) shall be in accordance with ASTM A563 or ASTM A992. Anchor bolts shall be in accordance with ASTM A992. Tack Washers shall be in accordance with ASTM F436 and Plate Washers (for long slotted holes only) shall be in accordance with ASTM A563 or ASTM A992.

RESILIENT AND NEOPRENE PADS:
Resilient and Neoprene pads shall be in accordance with Specification Section 932, except that testing of welds is not required.

SHIM PLATES:
Shim plates shall be aluminum in accordance with ASTM B209, Alloy 6061 or 6063. Shim plates shall be used for foundation height adjustments greater than 1/8" and localized irregularities greater than 1/8". Field trim shim plates when necessary to match the contours of the foundation. Bowed shim plates may be used in lieu of trimmed flat shim plates shown. Stacked shim plates must be bonded together with adhesive bonding material and limited to a maximum total thickness of 1/4", unless larger anchor bolts are provided for the exposed thread length.

JOINTS:
All fixed joints are to be welded all around and ground smooth. Expansion Joints shall be spaced at a maximum of 8'-0". Field trim similar to the expansion detail joint may be approved by the Engineer to facilitate shipping and handling, but rails must be continuous across a minimum of two posts. Only use the Continuity Field Splice (Detail "E") to make the railing continuous for unforeseen field adjustments.

WELDING:
All welding shall be in accordance with the American Welding Society Structural Welding Code (Aluminum) ANSI/AWS D1.2 (current edition). Filler metal shall be either ER5183, ER5356 or ER5556. Nondestructive testing of welds is not required.

FIELD TRIM:
Details addressing project specific geometry (line & grade) showing post and expansion joint locations must be submitted by the Contractor for the Engineer's approval prior to fabrication of the railing. Shop drawings shall be in accordance with the Specifications.

PAYMENT:
Guiderail shall be paid for under the contract unit price for Pipe Guiderail (Aluminum), LF (Item No. 515-1-2). Payment for the Guiderail will be plan quantity measured as the length along the center line of the top rail, and includes rails, posts, rail splice assembly, base plates, anchor bolts, nuts, washers, resilient or neoprene pads and all incidental materials and labor required to complete installation of the Guiderail.
TYPICAL RAILING DETAILS & RAILINGS ON GRADES 0% TO 5%

ELEVATION

RAILINGS ON GRADES STEEPER THAN 5% TO 8.33%

RAMP REQUIREMENTS
For slopes greater than 5%:
Max. ramp slope = 8.33%
Max. ramp cross-slope = 2.0%

LANDING REQUIREMENTS
Max. landing slope = 2%
Max. landing cross-slope = 2%

NOTES:
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 "C", "D" and "E", see Sheet 4.
ALUMINUM PIPE GUIDERAIL

Railing continuation beyond steps
(Bottom shown, Top similar)

Concrete sidewalk to extend 6" min. behind guide rail.

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

- Handrail - 1½" NPS (Sch. 40)
- Aluminum Handrail required for three or more steps
- Handrail and cheekwalls continuous at landings

Handrail termination
See Detail "A" (Typ.)

Handrail continuity beyond steps

- Handrail - 1½" NPS (Sch. 40)
- Continuous at landings

Handrail termination
See Detail "A" (Typ.)

Elevation
(At-Grade Steps)

Length of landing 5' min.
Top Landing

ALTERNATE END TREATMENT

GUIDERAIL ON STEPS & STAIRS
**ALUMINUM PIPE GUIDERAIL**

**SECTION B-B** (Handrail Connection)

**SECTION C-C** BASE PLATE DETAIL

**ALTERNATE BASE PLATE DETAIL** (Recommended for Top of Step Cheekwalls)

**SHIM PLATE DETAIL**

**PLATE WASHER DETAIL**

**VECTOR**

**DETAI"L D" - EXPANSION JOINT (FIELD SPICE SLIP JOINT SIMILAR)**

**DETAI"L E" - CONTINUITY FIELD SPICE**

**DETAI"L A" - RAIL CONNECTIONS** (Showing Sloped Condition for Stairs or Ramp)

**DETAIL "B" - RAIL AND HANDRAIL** (Showing Sloped Condition for Stairs or Ramp)

CROSS REFERENCE:
For locations of Details "C", "D" and "E", see Sheet 2.

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**ALUMINUM PIPE GUIDERAIL**

**REV. 07/01/10**

**FDOT 2014 DESIGN STANDARDS**

**INDEX**

**ALUMINUM PIPE GUIDERAIL**

**NO.** 870

**SHET** 4 of 5
**TYPICAL SECTION ON CONCRETE SIDEWALK**

- 6" Standard Bar
- 2" for Ramps

**TYPICAL SECTION ON GRAVITY WALL**

- 6" Embedment Depth
- Width of Structure
- Slope 2% Max. (away from drop-off)

**TYPICAL SECTION ON STEPS & STAIRS**

- Top of step nosing
- Step Cheekwall

**DETAIL "F" (OPTIONAL SHIMMING DETAIL FOR CROSS SLOPE CORRECTION)**

- (Used in lieu of Beveled Shim Plates)

**OPTIONAL SIDEWALK ANCHORAGE DETAIL**

- 6" Embedment
- Epoxy Mortar (Type F) in accordance with Specification Section 926

**NOTES:**

- Adhesive anchors shall be fully threaded headless anchor bolts set in drilled holes (manufacturer recommended diameter) with an Adhesive Bonding Material System in accordance with Specification Section 416 and detailed in accordance with Specification Section 416. The minimum embedment is 6".

**DESCRIPTION:**

- Aluminum Pipe Guiderail
- FDOT 2014
- Design Standards
- Aluminum Pipe Guiderail

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**SHEET NO.**

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