**Schematic Plan View – Near Lane Approach**

**Limits of Payment for Vertical Face Retrofit**

(include Tapered End Transition when provided)

**Design Notes**

The Tapered End Transition should only be used when space is limited which precludes the use of a guardrail end treatment or crash cushion.

**Notes**

1. The minimum length of advancement for both near lane and opposing lane approaches is 20'.
2. For Design Speeds greater than 40 mph the Tapered End Transition is not permitted. See Index No. 460 for length of Advancement of guardrail or other project specific end treatments.

**Schematic Plan View – Opposing Lane Approach**

**Length of Advancement – Tapered End Transition (40 MPH or Less)**

- **Design Notes**
  - For General Notes, Dowel Details, Expansion Dowel Details, Reinforcing Steel Notes and Reinforcing Steel Bending Diagram see Index No. 460.
NOTES:
1. On approach end provide a Roadway Guardrail Transition, Index No. 402 (Sheet 16 – Scheme 1) or other site specific treatment. See Roadway Plans for limiting station of Roadway Guardrail Transition or other site specific treatment.
2. Provide Railing & Curb Base Transitions (as shown) if curb does not extend beyond end of Spread Footing Approach, see Roadway Plans. Railing End Transition & Railing & Curb Base Transitions may be omitted on trailing ends with no apposing traffic.

CROSS REFERENCES:
For Section 3-4, C-C and X-X see Sheet 4.
## ESTIMATED TRAFFIC RAILING RETROFIT
### SPREAD FOOTING APPROACH QUANTITIES

<table>
<thead>
<tr>
<th>ITEM</th>
<th>UNIT</th>
<th>QUANTITY</th>
</tr>
</thead>
<tbody>
<tr>
<td>Concrete - Typical Section</td>
<td>CY/ft²</td>
<td>0.25</td>
</tr>
<tr>
<td>Reinforcing Steel - Typical Section</td>
<td>lb/ft²</td>
<td>38</td>
</tr>
<tr>
<td>Concrete - 20°-0&quot; Tapered End Transition plus Footing</td>
<td>CY</td>
<td>4.57 Total</td>
</tr>
<tr>
<td>Reinforcing Steel - 20°-0&quot; Tapered End Transition plus Footing</td>
<td>Lb</td>
<td>776 Total</td>
</tr>
</tbody>
</table>

**NOTE:** Quantities are based on a 9" curb, no curb cross slope.

### SECTION X-X (TYPICAL CURB, TYPE VARIES, TYPE F SHOWN)
(See Index No. 300 and Plans for Details)

- **#** Match Curb Slope at high side and low side at begin or end bridge or approach slab.
- **##** Match curb height of adjacent bridge and approach slab. Adjust height in transition area to match adjoining roadway curb.

### SECTION A-A
**TYPICAL SECTION**
(9" Curb shown, 6" Curb similar)

### SECTION B-B
**TAPERED END TRANSITION**
(Bars SS not shown for clarity)

### SECTION C-C
**GUARDRAIL END TRANSITION**

### CROSS REFERENCES
- For location of Sections A-A, B-B, and X-X see Sheet 2.
- For location of Section C-C see Sheet 3.
PARTIAL ELEVATION OF INSIDE FACE OF RAILING
(Expansion Dowel Assemblies and Bars 4C not shown for clarity)

SCHEME 2 - MODIFICATION FOR INDEX No. 481 - SCHEME 2
RAILING END TREATMENT FOR PARALLEL
WING WALLS WITH NARROW CURBS

NOTES:
1. Remove existing concrete along saw cut joints. Existing reinforcing steel may be cut at joint or extended into new concrete. Exposed existing reinforcing not encased in new concrete shall be removed 1" below existing concrete surface and grouted over.

2. Asphalt Overlay when present (Varies)
PARTIAL ELEVATION OF INSIDE FACE OF RAILING
(Expansion Dowel Assemblies and Bars 4C not shown for clarity)

SCHEME 3 ~ MODIFICATION FOR INDEX NO. 48I SCHEME 3
RAILING END TREATMENT FOR FLARED WING WALLS
WITH NARROW CURBS

CROSS REFERENCES:
For Section A-B see Sheet 4.
For Section D-G see Sheet 5.
For Section F-F see Sheet 6.
For Expansion Dowel Assemblies Details and placement of Dowel Bars 60 see Index 480.

TRAFFIC RAILING - (VERTICAL FACE RETROFIT)
SPREAD FOOTING APPROACH
PARTIAL PLAN OF RAILING

PARTIAL ELEVATION OF INSIDE FACE OF RAILING
(Existing Wing Post, Expansion Dowel Assemblies and Bars 4G not shown for clarity)

SCHEME 4 ~ MODIFICATION FOR INDEX NO. 482 SCHEME 2
RAILING END TREATMENT FOR PARALLEL CURBS AND WING WALLS WITH WIDE CURBS

PARTIAL PLAN OF RAILING

PARTIAL ELEVATION OF INSIDE FACE OF RAILING
(Existing Wing Post, Expansion Dowel Assemblies and Bars 4G not shown for clarity)

SCHEME 5 ~ MODIFICATION FOR INDEX NO. 482 SCHEME 3 AND 4
RAILING END TREATMENT FOR PARALLEL CURBS AND FLARED WING WALLS WITH WIDE CURBS

CROSS REFERENCES:
For Section A-4 see Sheet 4
For Section D-2 see Sheet 5
For Section G-C & H-H see Sheet 7
For Expansion Dowel Assemblies Details see Index 480.

TRAFFIC RAILING - (VERTICAL FACE RETROFIT)
SPREAD FOOTING APPROACH
PARTIAL ELEVATION OF INSIDE FACE OF RAILING
(Expansion Dowel Assemblies and Bars 4C not shown for clarity)

SCHEME 6 ~ MODIFICATION FOR INDEX NO. 483 SCHEME 2
RAILING END TREATMENT FOR PARALLEL CURBS AND WING WALLS WITH INTERMEDIATE CURBS

SECTION H-H

Note:
1. Match curb height at adjoining existing end bent wing.

CROSS REFERENCES:
For Section A-A see Sheet 4.
For Section D-D see Sheet 5.
For Expansion Dowel Assembly and placement of Dowel Bars 60 Details see Index 486.
**Scheme 7 ~ Modification for Index No. 483 Scheme 3**

**Railing End Treatment for Parallel Curbs and Flared Wing Walls with Intermediate Curbs**

**Partial Elevation of Inside Face of Railing**

(Expansion Dowel Assemblies and Bars #4 not shown for clarity)

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**Section I-I**

- Bond Breaker between wing wall only
- Bars 5/8 @ 8" spacing
- Bars 5/8 spaced Max (Typ.) 8" bars as read to maintain cover

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**Cross References:**
- For Section A-4 see Sheet 4.
- For Section D-5 see Sheet 5.
- For Section M-8 see Sheet 9.
- For Expansion Dowel Assemblies and placement of Dowel/Bars 60 details see Index 480.