MEMORANDUM TO: Project Engineers
                Project Design Engineers
FROM: T. K. Koch, P. E.
       State Structures Engineer
DATE: January 23, 2015
SUBJECT: 32" ALASKA RAIL AND 42" OREGON RAIL

The 32" Alaska Rail and 42" Oregon Rail (a.k.a. open rails) have been recognized by the Federal Highway Administration as Test Level Four (TL-4) bridge rails in accordance with the AASHTO LRFD Bridge Design Specifications. The 32" Alaska Rail consists of two horizontal metal tubes attached to vertical metal posts with a height 32" above the riding surface of the bridge deck. The 42" Oregon Rail consists of three horizontal metal tubes attached to vertical metal posts with a height 42" above the riding surface of the bridge deck. Use of the 32" Alaska Rail and 42" Oregon Rail shall be limited to the following types of projects:

- Bridge replacements in which the Project Commitments Sheet in the Environmental Document note the 32" Alaska Rail or the 42" Oregon Rail are required.
- Bridge replacements where the conveyance of storm water requires the use of an open rail.

The attached Design Manual Figures 6-35a, 6-35b, 6-35c, 6-35d, 6-37a, and 6-37b have been developed to show rail, curb, and slab details. The attached Figures 6-81b and 6-88a have been developed to show modified section properties when placing the 32" Alaska Rail or 42" Oregon Rail on exterior cored slab and box beam units.

Standard Drawings BMR8, BMR9, BMR10, and BMR11 have been developed to show metal rail details, rail post spacings, and end post attachment details for the 32" Alaska Rail and 42" Oregon Rail.

The models within Standard Drawings GRA3, PCBB2, PCBB4, PCBB6, PCBB8, PCS2, PCS3, and PCS4 have been revised to accommodate the 32" Alaska Rail and 42" Oregon Rail.

Rail post bases shall not be located on grooved contraction joints or expansion joints in the curb.
The metal rail pay item for the 32" Alaska Rail and 42" Oregon Rail shall be “32" Alaska Rail” and “42" Oregon Rail”, respectively, and paid for per linear foot. The concrete curb and end post pay item for the 32" Alaska Rail and 42" Oregon Rail shall be “1'-____ x ____" Concrete Curb” and paid for per linear foot.

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Attachments:

Figure 6-35a
Figure 6-35b
Figure 6-35c
Figure 6-35d
Figure 6-37a
Figure 6-37b
Figure 6-81b
Figure 6-88a

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SECTION THRU RAIL

SIDE VIEW AT POST LOCATION

"S" BAR DETAIL

"A" BAR DETAIL

NOTE TO DETAILER:
- DIMENSION = DIM. A + 2½"
- BOLT LENGTH = DIM. A + 9"

32" ALASKA RAIL ON A DECK SLAB

FIGURE 6 - 35a
NOTE TO DETAILER:

* DIMENSION = DIM. A + 2½"
** BOLT LENGTH = DIM. A + 9"

42" OREGON RAIL ON A DECK SLAB

FIGURE 6 - 35b
PLAN OF CURB

PLAN OF END POST

END VIEW

ELEVATION

CURB AND END POST FOR 32" ALASKA RAIL
**SECTION THRU RAIL**

\[ \text{DIM.} \ A = \text{WEARING SURFACE} @ \text{MIDSPAN} + 6\frac{1}{2}" \]

**EXTERIOR CORED SLAB AND BOX BEAM SECTION**

(Strand Layout Not Shown)

**S**' BAR DETAIL

\[ \text{SIDE VIEW AT POST LOCATION} \]

(Showing Additional S2 Bars at Each Post Assembly)

\[ \text{32" ALASKA RAIL ON CORED SLABS AND BOX BEAMS} \]

**FIGURE 6 - 37a**
SECTION THRU RAIL

DIM. A = WEARING SURFACE @ MIDSPAN + 6½"

EXTERIOR CORED SLAB AND BOX BEAM SECTION
(STRAND LAYOUT NOT SHOWN)

"S" BAR DETAIL

NOTE TO DETAILER:

* DIMENSION = WEARING SURFACE @ MIDSPAN + 1'-6½"

**DIMENSION = WEARING SURFACE @ MIDSPAN + 9½"

***BOLT LENGTH = WEARING SURFACE @ Q BEARING + 2'-0"

****DIMENSION = WEARING SURFACE @ MIDSPAN OR Q BEARING + 8½"

42" OREGON RAIL ON CORED SLABS AND BOX BEAMS

FIGURE 6 - 37b
CORED SLAB PROPERTIES

(FOR USE WHEN 32’’ ALASKA OR 42’’ OREGON RAIL IS ATTACHED; EXTERIOR UNITS ONLY)

FIGURE 6 – 81b
**BOX BEAM PROPERTIES**

(FOR USE WHEN 32" ALASKA OR 42" OREGON RAIL IS ATTACHED; EXTERIOR UNITS ONLY)

**FIGURE 6 - 88a**

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### 27" BOX BEAM

- **AREA:** 699.6 in.²
  4.858 ft.²
- **WEIGHT:** 4.858 X 150 = 729 lbs/ft.²
- **Ixx:** 53365 in.⁴  **Iyy:** 88115 in.⁴
- **CT:** 13.170 in.  **Ct:** 15.50 in.
- **CB:** 13.830 in.  **H:** 27.00 in.
- **St:** 4052 in.³
- **Sb:** 3859 in.³

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### 33" BOX BEAM

- **AREA:** 759.6 in.²
  5.275 ft.²
- **WEIGHT:** 5.275 X 150 = 791 lbs/ft.²
- **Ixx:** 92226 in.⁴  **Iyy:** 102739 in.⁴
- **CT:** 15.803 in.  **Ct:** 21.50 in.
- **CB:** 17.197 in.  **H:** 33.00 in.
- **St:** 5836 in.³
- **Sb:** 5363 in.³

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### 39" BOX BEAM

- **AREA:** 819.6 in.²
  5.692 ft.²
- **WEIGHT:** 5.692 X 150 = 854 lbs/ft.²
- **Ixx:** 144585 in.⁴  **Iyy:** 117350 in.⁴
- **CT:** 18.489 in.  **Ct:** 27.50 in.
- **CB:** 20.511 in.  **H:** 39.00 in.
- **St:** 7820 in.³
- **Sb:** 7049 in.³

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