

CONVERSION CALCULATIONS FOR:
CUSTOMER
1 INDUSTRIAL RD.
HOMETOWN, USA 07476

WAREHOUSE PARK: LOT#3
1 VALLEY FORGE DRIVE
PRODUCTIVE, USA
FOUNDATIONS

OEP PROJECT No. 2014-0000
JULY 4, 2014



OEPP Project #: 2014-0000

Customer: Customer

Project: Warehouse Park Lot #3 – Productive USA

Conversion From GR 60 Rebar to GR 80 Welded Wire Reinforcement (EWWR):

Spread Footings

F5030

(8)#6 E.W. Bottom:

$$(8)\#6 \rightarrow (8) * .44 = 3.52 [in^2](GR60) \rightarrow 3.52 [in^2] * \left(\frac{60GR}{80GR}\right) = 2.64 [in^2]$$

$$(2.64 [in^2]) / (10 \text{ wires}) = .264 [in^2] = (10)D26.4 @ 6" O.C. (GR80) E.W. Bottom$$

EWWR Sheet Styles 'F5030':

6 x 6 D26.4/D26.4 (GR80)

F5516

(7)#5 E.W. Bottom:

$$(7)\#5 \rightarrow (7) * .31 = 2.17 [in^2](GR60) \rightarrow 2.17 [in^2] * \left(\frac{60GR}{80GR}\right) = 1.628 [in^2]$$

$$(1.628 [in^2]) / (11 \text{ wires}) = .148 [in^2] = (11)D14.8 @ 6" O.C. (GR80) E.W. Bottom$$

Used D15.2 for ease of manufacturing.

EWWR Sheet Styles 'F5516':

6 x 6 D15.2/D15.2 (GR80) Bottom

F6016

(5)#6 E.W. Bottom:

$$(5)\#6 \rightarrow (5) * .44 = 2.2 [in^2](GR60) \rightarrow 2.2 [in^2] * \left(\frac{60GR}{80GR}\right) = 1.65 [in^2]$$

$$(1.65 [in^2]) / (12 \text{ wires}) = .138 [in^2] = (12)D13.8 @ 6" O.C. (GR80) E.W. Bottom$$

Used D15.2 for ease of manufacturing.

EWWR Sheet Styles 'F6016':

6 x 6 D15.2/D15.2 (GR80)

F7030

(11)#6 E.W. Bottom:

$$(11)\#6 \rightarrow (11) * .44 = 4.84 [in^2](GR60) \rightarrow 4.84 [in^2] * \left(\frac{60GR}{80GR}\right) = 3.63 [in^2]$$

$$(3.63 [in^2]) / (14 \text{ wires}) = .259 [in^2] = (14)D25.9 @ 6" O.C. (GR80) E.W. Bottom$$

Used D26.4 for ease of manufacturing.

EWWR Sheet Styles 'F7030':

6 x 6 D26.4/D26.4 (GR80)

F9020

(8)#5 E.W. Bottom:

$$(8)\#5 \rightarrow (8) * .31 = 2.48 [in^2](GR60) \rightarrow 2.48 [in^2] * \left(\frac{60GR}{80GR}\right) = 1.86 [in^2]$$

$$(1.86 [in^2]) / (17 \text{ wires}) = .109 [in^2] = (17)D10.9 @ 6" O.C. (GR80) E.W. Bottom$$

EWWR Sheet Styles 'F9020':

6 x 6 D10.9/D10.9 (GR80)

F14010030

(11)#6 in Long Direction & (8) #6 in Short Direction Top & Bottom

$$(11)\#6 \rightarrow (11) * .44 = 4.84 [in^2](GR60) \rightarrow 4.84 [in^2] * \left(\frac{60GR}{80GR}\right) = 3.63 [in^2]$$

$$(3.63[in^2]) / (20 \text{ wires}) = .182 [in^2] = (20)D18.2 @ 6" O.C. (GR80) in long direction top & bottom.$$



ENGINEERED PRODUCTS

$$(8)\#6 \rightarrow (8) * .44 = 3.52 [in^2](GR60) \rightarrow 3.52 [in^2] * \left(\frac{60GR}{80GR}\right) = 2.64 [in^2]$$

$(2.64[in^2]) / (28 \text{ wires}) = .094 [in^2] = (28)D9.4@ 6" O.C. (GR80) \text{ in short direction top \& bottom.}$
Used (28) D10.9

EWWR Sheet Styles 'F14010030-L (Top & Bottom):

6 x 48 D18.2/D10.9 (GR80)

EWWR Sheet Styles 'F14010030-S (Top & Bottom):

6 x 48 D10.9/D4 (GR80)

Continuous Footings & Walls

WF2430

Continuous Footing

(3)#6 Cont. Bottom

Support bar @48" O.C. Transverse:

$$(3)\#6 \rightarrow (3) * .44 = 1.32 [in^2](GR60) \rightarrow 1.32 [in^2] * \left(\frac{60GR}{80GR}\right) = .99 [in^2]$$

$$(.99 [in^2]) / (4 \text{ wires}) = .248 [in^2] = (4)D24.8 @ 6" O.C. (GR80) \text{ longitudinally}$$

ACI 318 Lap Calculations (D24.8):

Lap Calculation with long overhangs:

ACI 318 12.2.3

$$l_d(\text{From } 12.2.3) = \left(\frac{3}{40} \frac{f_y}{\lambda \sqrt{f'_c}} \frac{\psi_t \psi_e \psi_s}{\left(\frac{c_b + k_{tr}}{d_b}\right)} \right) d_b$$

$$k_{tr} = 0$$

$\lambda = 1.0$ --normal weight concrete

$$f_y = 80,000 \text{ psi}$$

$$f'_c = 3,000 \text{ psi}$$

$$\psi_t = 1.0$$

$$\psi_e = 1.0$$

$$\psi_s = 0.8$$
 --D24.8wires

$$d_b = .562 \text{ in}$$

$s = 6 \text{ in}$ --minimum center-to-center spacing of wires

$$c_b = \min\left(3 + \frac{d_b}{2}, \frac{s}{2}\right) = 3.28 \text{ in}$$

$$\left(\frac{c_b + k_{tr}}{d_b}\right) = 5.84 \text{ in} > 2.5 \text{ in} \rightarrow \text{Use } 2.5 \text{ in}$$

$$l_d(\text{From } 12.2.3) = \left(\frac{3}{40} \frac{80,000 \text{ psi}}{1.0 \sqrt{3,000 \text{ psi}}} \frac{1.0 \cdot 1.0 \cdot 0.8}{(2.5)} \right) .562 = 19.7 \text{ in}$$

ACI 318 12.15.1

Class B splice = $1.3 * l_d = 1.3 * 19.7 \text{ in} = \text{Use } 26 \text{ in lap min. for } D24.8 (GR80)$

EWWR Sheet Styles 'WF-2430':

6 x 48 D24.8/D10.9 (GR80) *Bottom*