Dist	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No.	TOTAL SHEETS

REGISTERED CIVIL ENGINEER

May 31, 2018

PLANS APPROVAL DATE

REGISTERED PROFESSIONAL ENGINEER Gary Wang No. C58298 Exp. 6-30-18 CIVIL STATE OF CALIFORNIA

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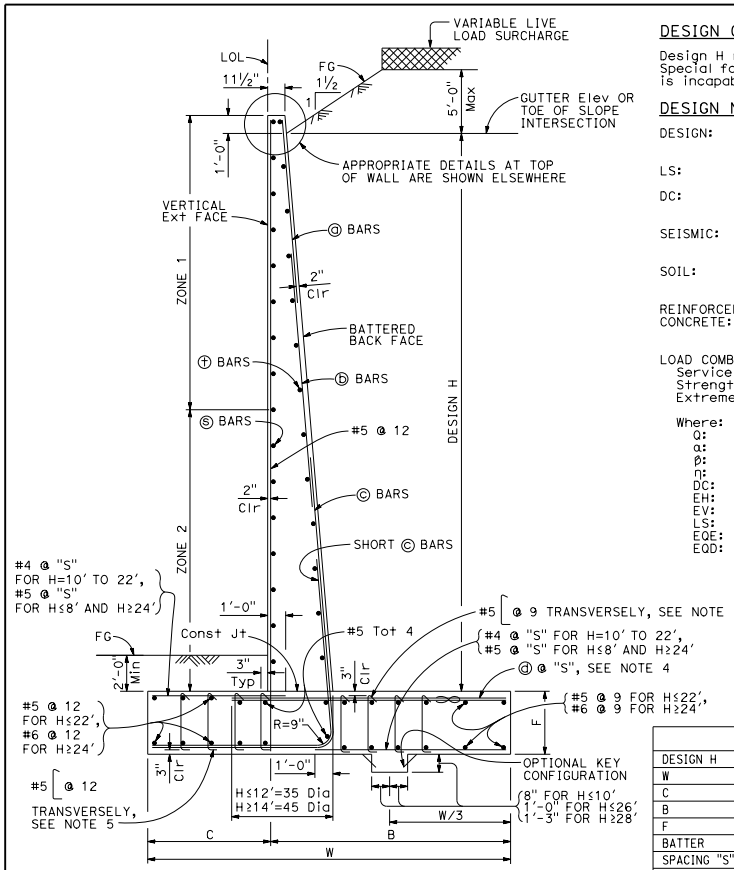


TYPICAL SECTION

DESIGN CONDITIONS:

Design H may be exceeded by 6" before going to the next size. Special footing design is required where foundation material is incapable of supporting bearing stress listed in the table.

DESIGN NOTES:

DESIGN: AASHTO LRFD Bridge Design Specifications, 4th Edition with California Amendments

LS: Varied surcharge on level ground surface

DC: Stem Architectural Treatment of thickness up to 6" of concrete (75 psf) considered

SEISMIC: $k_h = 0.2$
$k_v = 0.0$

SOIL: $\phi = 34°$
$\gamma = 120$ pcf

REINFORCED CONCRETE: $f'c = 3{,}600$ psi
$fy = 60{,}000$ psi

LOAD COMBINATIONS AND LIMIT STATES:

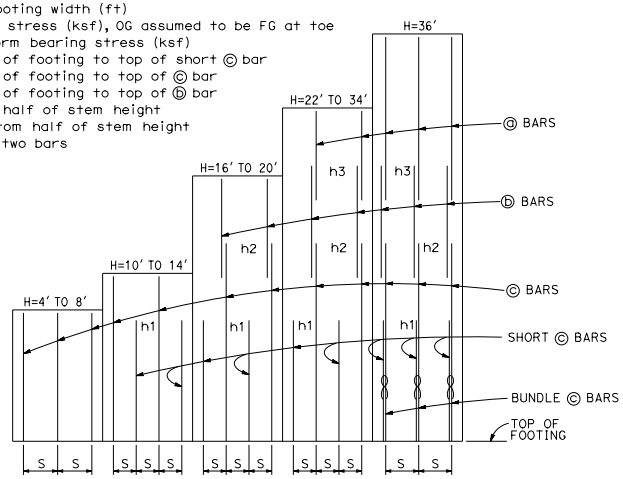
Service I $Q = 1.00DC+1.00EV+1.00EH+1.00LS$
Strength I $Q = \alpha DC+\beta EV+\eta EH+1.75LS$
Extreme I $Q = 1.00DC+1.00EV+1.00EH+1.00EQD+1.00EQE$

Where:

Q: Force Effects
α: 1.25 or 0.90, Whichever Controls Design
β: 1.35 or 1.00, Whichever Controls Design
η: 1.50 or 0.90, Whichever Controls Design
DC: Dead Load of Structure Components
EH: Horizontal Earth Fill Pressure
EV: Vertical Earth Pressure from Earth Fill Weight
LS: Live Load Surcharge
EQE: Seismic Earth Pressure
EQD: Soil and Structural and Nonstructural Components Inertia

SYMBOLS:

Ser - service limit state I
Str - strength limit state I
Ext - extreme event limit state I
B' - effective footing width (ft)
q_o' - net bearing stress (ksf), OG assumed to be FG at toe
q_o - gross uniform bearing stress (ksf)
h1 = Top of footing to top of short ⓒ bar
h2 = Top of footing to top of ⓒ bar
h3 = Top of footing to top of ⓑ bar
Zone 1 = Top half of stem height
Zone 2 = Bottom half of stem height
∞ - Bundle of two bars



ELEVATION

NOTES:

1. For details not shown and drainage notes see B3-5
2. For wall stem joint details see B0-3/3-3 and B0-3/3-4
3. At ⓒ bars:
   H ≤ 6', no splices are allowed within 1'-8" above the top of footing.
   H > 6', no splices are allowed within H/4 above the top of footing.
4. Bundle ⓓ bars for H = 36'.
5. Hook stirrups around & space with alternating transverse reinforcement at 2 x "S". For required number of toe or heel stirrup rows, see table. The first stirrups are placed adjacent to the stem as shown.

TABLE OF REINFORCING STEEL, DIMENSIONS AND DATA

DESIGN H	4'	6'	8'	10'	12'	14'	16'	18'	20'	22'	24'	26'	28'	30'	32'	34'	36'
W	6'-5"	7'-3"	8'-3"	9'-3"	10'-8"	12'-6"	13'-9"	15'-1"	16'-6"	17'-10"	19'-3"	20'-4"	21'-5"	22'-8"	23'-11"	25'-1"	26'-4"
C	2'-2"	2'-6"	3'-0"	3'-6"	3'-8"	3'-11"	4'-0"	4'-7"	5'-3"	6'-0"	7'-0"	7'-9"	8'-3"	8'-8"	9'-0"	9'-6"	9'-10"
B	4'-3"	4'-9"	5'-3"	5'-9"	7'-0"	8'-7"	9'-9"	10'-6"	11'-3"	11'-10"	12'-3"	12'-7"	13'-2"	14'-0"	14'-11"	15'-7"	16'-6"
F	1'-4"	1'-4"	1'-4"	1'-6"	1'-6"	1'-6"	1'-8"	2'-0"	2'-4"	2'-9"	3'-2"	3'-0"	3'-0"	3'-0"	3'-3"	3'-3"	3'-3"
BATTER	½: 12	½: 12	½: 12	½: 12	½: 12	½: 12	½: 12	½: 12	½: 12	½: 12	⅝: 12	¾: 12	1 : 12	1 : 12	1⅛: 12	1⅛: 12	1⅛: 12
SPACING "S"	16"	16"	16"	8"	8"	7"	7"	7"	6"	6"	7"	7"	7"	6"	6"	6"	8"
ⓐ BARS	-	-	-	-	-	-	-	-	-	#5	#5	#5	#5	#5	#5	#6	#6
ⓑ BARS	-	-	-	-	-	-	#5	#5	#5	#7	#7	#7	#8	#8	#8	#9	#9
ⓒ BARS	#5	#5	#6	#5	#6	#6	#7	#8	#8	#9	#10	#10	#10	#10	#10	#11	#11
ⓓ BARS	#5	#5	#6	#5	#6	#8	#9	#9	#9	#10	#11	#9	#9	#9	#10	#10	#9
h1	-	-	-	4'-2"	4'-7"	6'-2"	7'-3"	8'-6"	8'-8"	9'-8"	11'-0"	12'-2"	14'-0"	13'-0"	15'-10"	14'-6"	12'-0"
h2	-	-	-	-	-	-	10'-6"	12'-9"	14'-2"	13'-8"	17'-0"	18'-6"	17'-10"	18'-9"	20'-3"	21'-0"	17'-0"
h3	-	-	-	-	-	-	-	-	-	15'-6"	17'-9"	19'-6"	21'-8"	23'-0"	24'-8"	25'-6"	24'-8"
No. of Toe Stirrups	0	0	0	0	0	0	0	0	0	0	0	6	6	7	7	7	8
No. of Heel Stirrups	0	0	0	0	0	0	0	0	0	0	0	6	6	6	6	6	6
ZONE 1 ⓢ BARS	#5 @ 18	#5 @ 18	#5 @ 18	#5 @ 18	#5 @ 18	#5 @ 18	#5 @ 18	#5 @ 18	#5 @ 18	#5 @ 18	#5 @ 18	#5 @ 12	#5 @ 12	#5 @ 12	#5 @ 12	#5 @ 12	#5 @ 12
ZONE 2 ⓢ BARS	#5 @ 18	#5 @ 18	#5 @ 18	#5 @ 18	#5 @ 18	#5 @ 18	#5 @ 12	#5 @ 12	#5 @ 12	#5 @ 12	#5 @ 12	#6 @ 12	#6 @ 12	#6 @ 12	#7 @ 12	#7 @ 12	#7 @ 12
ZONE 1 ⓣ BARS	#4 @ 18	#4 @ 18	#4 @ 18	#4 @ 18	#4 @ 18	#4 @ 18	#4 @ 18	#4 @ 18	#4 @ 18	#4 @ 18	#4 @ 18	#4 @ 18	#4 @ 12	#4 @ 12	#4 @ 12	#4 @ 12	#4 @ 12
ZONE 2 ⓣ BARS	#4 @ 18	#4 @ 18	#4 @ 18	#4 @ 18	#4 @ 18	#4 @ 18	#4 @ 18	#4 @ 18	#4 @ 18	#4 @ 18	#4 @ 12	#4 @ 12	#5 @ 12	#5 @ 12	#5 @ 12	#5 @ 12	#5 @ 12
Ser: B', q_o	4.3, 0.8	4.9, 1.1	5.6, 1.3	7.1, 1.5	8.0, 1.8	9.3, 2.1	10.6, 2.3	11.9, 2.5	13.3, 2.6	14.6, 2.8	15.9, 2.9	17.0, 3.0	18.0, 3.1	19.3, 3.3	20.4, 3.5	21.5, 3.7	22.7, 3.9
Str: B', q_o	2.4, 2.2	2.4, 2.7	2.7, 3.2	3.0, 3.7	4.3, 3.8	5.9, 3.8	7.0, 4.1	7.9, 4.3	9.0, 4.5	9.9, 4.7	10.8, 4.9	11.6, 5.0	12.3, 5.2	13.3, 5.4	14.2, 5.7	15.0, 5.9	16.0, 6.1
Ext: B', q_o	4.1, 1.5	3.9, 2.1	3.8, 2.8	3.5, 3.9	3.6, 4.9	4.2, 5.5	4.6, 6.3	5.0, 7.0	5.6, 7.4	6.0, 8.0	6.5, 8.4	6.9, 8.6	7.2, 9.2	7.7, 9.6	8.1, 10.4	8.4, 10.9	8.9, 11.3

STATE OF CALIFORNIA
DEPARTMENT OF TRANSPORTATION

RETAINING WALL TYPE 1 (CASE 3)

NO SCALE

B3-1C

2018 STANDARD PLAN B3-1C

1-29-18