28-DEC-2021

BR321.dgn

Note
Negative values for "F_L" or "F_R" indicates that corner of top slab extends beyond end of girder web.

"E_L"
"F_L"
Flare #3 transverse bars @ 6" max. ctrs. as req'd
12" min.
"E_R"
"F_R"
#4"U" bars @ 12" max. each end of girder
Note: Provide "a" ≥ 14

* Use staggered diaphragm beams when θ > 65°. Provide 4 conc. inserts in each girder web at each diaphragm beam.
2" dia. vent holes at diaphragm beams.
* Use in line diaphragm beams when θ ≥ 65°. Provide 4 conc. inserts in exterior girder webs and 2" dia. holes thru interior girder webs for 4-#7 x 6'-0" bars.

℄ Span
See Deck Plans for diaphragm beams
θ
"D_L"
"D_R"
Negative Direction
Positive Direction

6" web
5'-0" flange
End beam per project plans
"E_L"
"F_L"
Pour this part of flange for exterior side of exterior girders (unless shown otherwise on detail plans), typ. each end
℄ holes or inserts
"E_R"
"F_R"
Chamfer corners when angle is less than 60°
"D_L" and "D_R" = Girder spacing / 2 x tan θ

TYPICAL PLAN

9-#5 "U5" stirrups each end. Vary spacing to avoid insert or hole locations
2"
8@2¼" = 18"
9@4" #4 "U4"
"a" spaces @ 6" #4 "U4" stirrups
"b" spaces @ 12" #4 "U4" stirrups
1'-6" max. #4 "U4" stirrups (2 bars each stirrup, typ.)
Diaphragm ℄'s when θ < 65°
1'-6" max. #4 "U4" stirrups
1'-6" max. #4 "U4" stirrups
4-1" dia. conc. inserts (*) in exterior girder webs and 4-2" dia. holes thru interior girder webs for 4-#7 x 6'-0" bars (unless shown otherwise on detail plans)

* CONCRETE INSERTS
Expanded coil concrete inserts with closed-back ferrule threaded to receive 1" dia. x 2'-3" rods AASHTO M314, GR36 (ASTM A307) threaded full length.

1" dia. hole for cable restraint when Alternate A restraint is used (typ.) "x" = 0.50 girder depth.
6" typ.
#4 "U4" stirrups
2-#5 x 4'-6" L-bars (std. 90° hook)
6" to 2'-6" equal spacing
℄ dual hold downs (deflected strands > 14)
Strand c.g.
"x"
"yc"
Strand c.g.
"ye"
#4 "U" bars @ 12" max. ctrs. each end of girder
10"
℄ Bearing
#3 "U3" bars
0.4 Span Length (ctr. - ctr. bearing) ±2'-6"
℄ hold down
Diaphragm ℄'s when θ ≥ 65°
℄ Bearing
10"
2-#5 "U6" bars at each end of girder
Horizontal girder length "A" (add grade correction and estimated shortening allowance to "A" for fabrication length)

TYPICAL ELEVATION

BACK END OF GIRDER (on stationing)
AHEAD END OF GIRDER (on stationing)

Note
Girder details are symmetrical except as noted otherwise

5'-0"
6-#5 bars cont.
½" cl.
6"
2½"
4½"
#3 x 4'-10" @ 6"
10-#3 x cont. @ 6" (or 6 x 6 - D12 x D12 welded wire reinforcement) ⚠1
3"
3"
2"
2'-3"
6" web
#4 "U4" stirrups (2 bars each stirrup)
#3 "U3" bars (#3 "U3a" bars where deflected strands conflict) at each "U4" stirrup and at alternate "U5" stirrup
1" min. clr. unless shown otherwise (typ)
12"
6"
4"
See Bulb Detail
7'-6" BT90
8'-0" BT96

MIDSPAN SECTION

5¼"
2-#5 x 4'-6" L-bars (std. 90° hook)
9-#5 "U5" stirrups (2 bars each stirrup)
Deflected strands @ 2" ctrs.
c. g. strands
"he"
"ye"
2-#5" U6" bars of each end of girder
2'-6"
6" o-o
5'-0"

END VIEW

END BLOCK NOTE
When End Block is required, see Girder Schedule for details

NOTES
Provide all material and preform all work according to the current Oregon Standard Specifications.
Girders designed for live loading and superimposed dead load as shown in the General Notes.
Provide reinforcing steel as shown in the General Notes except as noted. Provide welded wire reinforcement conforming to ASTM A1064. ⚠1
Provide 0.6" dia. 7-wire low relaxation strands conforming to AASHTO M203 (ASTM A416), Grade 270, Supplement 1. Provide an initial tension (after harping deflected strands) of 43.9 kips per strand unless shown otherwise on Girder Schedule.

TYPICAL DETENSIONING ORDER

DETENSIONING NOTE
Detension strands in a systematic order about girder ℄ to limit eccentricity.

℄ Girder
Strand
⑧ ① ② ⑦
⑨ ④ ③ ⑩
⑫ ⑤ ⑥ ⑪

4'-4"
Slant bars as required to fit inside "U5" stirrups.
3"
0-0
BAR "U"
(ASTM A706)

6"
4¼"
"m"
Girder depth + 4¼"
2" dia. tight bend for #5 this bend only
4"
1'-4"
BAR "U4" or "U5"

14"
8⅝"
4"
10"
12½"
2'-4"
3½"
BAR "U3"
BAR "U3a"
(Use in lieu of "U3" bars when deflected strands conflict).

BAR BENDING DETAILS

Provide the class of concrete shown on Girder Schedule.
Keep girders in an upright position w/the support points within 2'-0" of the girder ends.
Deflected strands may be bundled between hold-down points.
Provide temporary diaphragm beams as required, see BR350.
Ensure girder ends are plumb in their final position under full dead load.

Upper group deflected strands (10 max.)
Middle group deflected strands (10 max.)
Lower deflected strand group (10 max.)
2"
3@2" = 6"
2"
2"
0.6" spacing deflected strands at midspan
"yc"
c. g. strands at midspan
"hc" ≥ 3" at midspan
2¼"
5@2" = 10"
0.9" (typ.)
2¾"
2'-6"
Chamfer soffit corners 1" max.

BULB DETAIL

Accompanied by dwgs. BR350 and DET3322

The selection and use of this Standard Drawing, while designed in accordance with generally accepted engineering principles and practices, is the sole responsibility of the user and should not be used without first consulting a Registered Professional Engineer.

All materials shall be in accordance with the current Oregon Standard Specifications.

OREGON STANDARD DRAWINGS

BT90 AND BT96 (PRECAST PRESTRESSED CONCRETE GIRDERS)

2024

DATE	REVISION DESCRIPTION
⚠1 01-2022	Revised welded wire reinforcement specification.

CALC. BOOK NO. N/A | SDR DATE 05-JAN-2022 | **BR321**

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