Fence or Pedestrian Guard Connection Options

These generic pedestrian guard and fence details show a few potential options for their installation on the top of a Redi-Rock retaining wall. It is the design engineer’s responsibility to fully design and detail the connection of the guard posts to the retaining wall blocks and assure acceptable resistance to the applied forces. Redi-Rock blocks are plain concrete, without steel reinforcement.

Grouted Connection (1 Block)
- Grout fence or railing post in place
- Field core into Top block

Grouted Connection (2 Blocks)
- Grout fence or railing post in place
- Field core into block in second course

Flange Bolted Connection
- Flange base plate attached to top block with adhesive set anchor bolts

Moment Slab Connection
- Fence or railing post
- Core and grout or connect with flanged base plate
- Reinforced concrete sidewalk

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Fence or Pedestrian Guard Connection Locations

Front View

Fence or pedestrian guard post

Embedment depth as required to resist overturning forces on appurtenance

Side View

Top block (Width per design)

Block in second row down

Top View

Connection Option #1
Anchor into the top block
• Consider block lengths when determining post spacing
• Weight of a single block available to resist overturning forces

Connection Option #2
Grout posts in v-shaped opening between top blocks
• Spacing in multiples of 46 1/8" (1172 mm)
• Weight of a 2 adjacent blocks available to resist overturning forces

Connection Option #3
Core through top block and grout posts in V-shaped opening between lower blocks
• Spacing in multiples of 46 1/8" (1172 mm)
• Weight of a 2 adjacent blocks on second level down and 3 top row blocks available to resist overturning forces

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This drawing is for reference only. Determination of the suitability and/or manner of use of any details contained in this document is the sole responsibility of the design engineer of record. Final project designs, including all construction details, shall be prepared by a licensed professional engineer using the actual conditions of the proposed site.
ATTACH FLANGE MOUNTED FENCE POSTS TO CAP UNIT WITH CONCRETE ANCHOR BOLTS (RED HED TRU-BOLT WEDGE ANCHORS OR EQUAL)

SET CAP BLOCK ON TOP F-HC UNIT AND EMBED STEEL REINFORCEMENT IMMEDIATELY AFTER PLACEMENT OF CAST-IN-PLACE CONCRETE

CAST-IN-PLACE CONCRETE IN HOLLOW CORE OF F-HC UNITS AND IN TOP HALF OF VERTICAL CORE SLOT IN PC BLOCKS IMMEDIATELY BELOW F-HC BLOCKS, MINIMUM 28 DAY COMpressive STRENGTH = 4,000 psi

No. 6 HORIZONTAL BARS, CONTINUOUS, 24" OVERLAP ON ENDS TYPICAL, BOTH SIDES OF CENTER CORE

No. 6 VERTICAL BARS, 11 1/2" O.C. TYPICAL, BOTH SIDES OF CENTER CORE

No. 3 BAR HOOK - WRAP AROUND LIFTING INSERT IN TOP OF BLOCK AND EXTEND INTO HOLLOW CORE AREA OF F-HC BLOCK

RECESSED LIFTING HOOK AREA FILLED WITH CAST-IN-PLACE CONCRETE (WHEN FREESTANDING BLOCKS ARE FILLED)

COVER TOP OF RETAINING BLOCKS AND ALL EXPOSED GEOGRID WITH 6 mil VISQUEEN PLASTIC LAYER

NO. 57 STONE INFILL IN VERTICAL CORE SLOT BETWEEN ADJACENT BLOCKS, AND 12" BEHIND BACK OF BLOCKS. FILL BOTTOM HALF OF VERTICAL CORE SLOT FOR PC BLOCKS IMMEDIATELY BELOW FREESTANDING BLOCKS.

ALL REINFORCING STEEL TO CONFORM TO ASTM A706 OR AASHTO M31 GRADE 60.
ALL REINFORCING STEEL TO CONFORM TO ASTM A706 OR AASHTO M31 GRADE 60.

No. 3 REBAR HOOKS

END VIEW
CAP BLOCK CAST WITH R-ANCHORS (SPECIALTY BLOCK)

ATTACH FLANGE MOUNTED FENCE POSTS TO CAP UNIT WITH CONCRETE ANCHOR BOLTS (RED HED TRU-BOLT WEDGE ANCHORS OR EQUAL)

SET CAP BLOCK ON TOP F-HC UNIT AND EMBED STEEL REINFORCEMENT IMMEDIATELY AFTER PLACEMENT OF CAST-IN-PLACE CONCRETE

CAST-IN-PLACE CONCRETE IN HOLLOW CORE OF F-HC UNITS AND IN TOP HALF OF VERTICAL CORE SLOT IN PC BLOCKS IMMEDIATELY BELOW F-HC BLOCKS, MINIMUM 28 DAY COMpressive STRENGTH = 4,000 psi

No. 6 VERTICAL BARS, 11 1/2" O.C., TYPICAL, BOTH SIDES OF CENTER CORE

No. 6 HORIZONTAL BARS, CONTINUOUS, 24" OVERLAP ON ENDS TYPICAL, BOTH SIDES OF CENTER CORE

No. 3 BAR HOOK - WRAP AROUND LIFTING INSERT IN TOP OF BLOCK AND EXTEND INTO HOLLOW CORE AREA OF F-HC BLOCK

COVER TOP OF RETAINING BLOCKS AND ALL EXPOSED GEOGRID WITH 6 mil VISQUEEN PLASTIC LAYER

NO. 57 STONE INFILL IN VERTICAL CORE SLOT, BETWEEN ADJACENT BLOCKS, AND 12" BEHIND BACK OF BLOCKS. FILL BOTTOM HALF OF VERTICAL CORE SLOT FOR PC BLOCKS IMMEDIATELY BELOW FREESTANDING BLOCKS.

F-HC FREESTANDING BLOCK COPING
WITH FENCE ATTACHMENT

J. JOHNSON/N. LINDWALL

DRAWN BY: J. JOHNSON/N. LINDWALL

APPROVED BY: J. JOHNSON/N. LINDWALL

DATE: 11/05/2020

SHEET: 2 OF 2

FILE: F-HC Coping with Fence Attachment R-Anchor Option 110520.dwg
SET CAP BLOCK ON TOP F-HC UNIT AND EMBED STEEL REINFORCEMENT IMMEDIATELY AFTER PLACEMENT OF CAST-IN-PLACE CONCRETE

CAST-IN-PLACE CONCRETE IN HOLLOW CORE OF F-HC UNITS AND IN TOP HALF OF VERTICAL CORE SLOT IN PC BLOCKS IMMEDIATELY BELOW F-HC BLOCKS, MINIMUM 28 DAY COMpressive STRENGTH = 4,000 psi

No. 6 HORIZONTAL BARS, CONTINUOUS, 24" OVERLAP ON ENDS TYPICAL, BOTH SIDES OF CENTER CORE

No. 6 VERTICAL BARS, 11 1/2" O.C. TYPICAL, BOTH SIDES OF CENTER CORE

No. 3 BAR HOOK - WRAP AROUND LIFTING INSERT IN TOP OF BLOCK AND EXTEND INTO HOLLOW CORE AREA OF F-HC BLOCK

RECESSED LIFTING HOOK AREA FILLED WITH CAST-IN-PLACE CONCRETE (WHEN FREESTANDING BLOCKS ARE FILLED)

COVER TOP OF RETAINING BLOCKS AND ALL EXPOSED GEORGRID WITH 6 mil VISQUEEN PLASTIC LAYER

NO. 57 STONE INFILL IN VERTICAL CORE SLOT BETWEEN ADJACENT BLOCKS, AND 12" BEHIND BACK OF BLOCKS. FILL BOTTOM HALF OF VERTICAL CORE SLOT FOR PC BLOCKS IMMEDIATELY BELOW FREESTANDING BLOCKS.

ALL REINFORCING STEEL TO CONFORM TO ASTM A706 OR AASHTO M31 GRADE 60.
No. 3 BAR HOOK - WRAP AROUND LIFTING INSERT IN TOP OF BLOCK AND EXTEND INTO HOLLOW CORE AREA OF F-HC BLOCK

No. 6 HORIZONTAL BARS, CONTINUOUS, 24" OVERLAP ON ENDS TYPICAL, BOTH SIDES OF CENTER CORE

No. 6 VERTICAL BARS, 11 1/2" O.C. TYPICAL, BOTH SIDES OF CENTER CORE

CAST-IN-PLACE CONCRETE IN HOLLOW CORE OF F-HC UNITS AND IN TOP HALF OF VERTICAL CORE SLOT IN PC BLOCKS IMMEDIATELY BELOW F-HC BLOCKS, MINIMUM 28 DAY COMpressive STRENGTH = 4,000 psi

No. 4 BARS, 40" LONG (TIE TO EMBEDDED HOOKS)

(2) REDI-ROCK R ANCHORS (11 1/2" FROM EACH END)

SET CAP BLOCK ON TOP F-HC UNIT AND EMBED STEEL REINFORCEMENT IMMEDIATELY AFTER PLACEMENT OF CAST-IN-PLACE CONCRETE

CAST-IN-PLACE CONCRETE IN HOLLOW CORE OF F-HC UNITS AND IN TOP HALF OF VERTICAL CORE SLOT IN PC BLOCKS IMMEDIATELY BELOW F-HC BLOCKS, MINIMUM 28 DAY COMpressive STRENGTH = 4,000 psi

No. 6 VERTICAL BARS, 11 1/2" O.C. TYPICAL, BOTH SIDES OF CENTER CORE

No. 6 HORIZONTAL BARS, CONTINUOUS, 24" OVERLAP ON ENDS TYPICAL, BOTH SIDES OF CENTER CORE

NO. 3 BAR HOOK - WRAP AROUND LIFTING INSERT IN TOP OF BLOCK AND EXTEND INTO HOLLOW CORE AREA OF F-HC BLOCK

COVER TOP OF RETAINING BLOCKS AND ALL EXPOSED GEOGRID WITH 6 mil VISQUEEN PLASTIC LAYER

NO. 57 STONE INFILL IN VERTICAL CORE SLOT, BETWEEN ADJACENT BLOCKS, AND 12" BEHIND BACK OF BLOCKS. FILL BOTTOM HALF OF VERTICAL CORE SLOT FOR PC BLOCKS IMMEDIATELY BELOW FREESTANDING BLOCKS.

F-HC COPING R-ANCHOR OPTION 110520.dwg
Typical Gravity Wall Section with Freestanding Hollow Core Coping

Cap block cast with R-anchors
F-HC block
Setback = 1 3/8" (41 mm)
(5° Wall Better Angle)

Cast-in-place concrete and reinforcing steel
Hook engaged with lifting insert of retaining block
Grade to drain surface water away from wall

PC retaining block (Typical)
Move blocks forward during installation to engage shear knobs (Typical)
Infill stone (No. 57 or equivalent)
Fill between adjacent blocks (all blocks)
Fill vertical core slot (PC blocks)
Stone to extend at least 12" (305 mm) behind blocks.

Non-woven geotextile fabric (if specified by Engineer based on site soil conditions)
Backfill per design requirements, Install in lifts and compact per project specifications.
Middle block (Typical)
Solid bottom block
Drain (As specified by Engineer)
Leveling pad (As specified by Engineer)

Blocks as shown are for reference only. Block sizes vary per site-specific design.

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Freestanding Blocks with Cap at Top of Wall

Secure cap block to freestanding block with polyurethane sealant. Optional shear lugs cast into cap block or rebar ties that can be embedded in site-cast concrete (with garden block) are also available.

Setback = 0" (0 mm) on Freestanding blocks

Setback = 2 7/8" (73 mm) when 10" (254 mm) knob used
Setback = 1 5/8" (41 mm) when 7 1/2" (190 mm) knob used
Setback = 1 5/6" (41 mm) when 10" (254 mm) knob used

Retaining blocks
Freestanding blocks

(Optional) Freestanding blocks can be secured to retaining blocks with J-Bolt connection

Front View

Back View

Freestanding blocks used where block is exposed and textured surface is required on both sides of wall

One-component, highly flexible, non-priming, gun grade, high performance elastomeric polyurethane sealant shall have movement of plus or minus 25% per ASTM C719, tensile strength greater than 200 psi (1.4 MPa) per ASTM D412, and adhesion to peel on concrete greater than 20 PLI per ASTM C794. Apply sealant in one and one half-inch (1.5") (38 mm) diameter round "hersey kiss" shaped dollops located in two rows at the top of the Freestanding blocks at 8" (203 mm) on center.

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Cap Block, Secure to Freestanding Block with Polyurethane Sealant, or Optional Rebar Embedded in Concrete

Freestanding Garden Block with Two (2) Continuous Reinforcing Bars, Filled with Cast-in-Place Concrete, as Designed by Wall Design Engineer

Freestanding Wall Blocks

Retaining Wall Blocks

Section View

Sealant Adhesive: One-component, highly flexible, non-priming, gun grade, high performance elastomeric polyurethane sealant shall have movement of plus or minus 25% per ASTM C719, tensile strength greater than 200 psi (1.4 MPa) per ASTM D412, and adhesion to peel on concrete greater than 20 PLI per ASTM C794. Apply sealant in one and one half-inch (1.5") (38 mm) diameter round "hersey kiss" shaped dollops located in two rows at the top of the Freestanding blocks at 8" (203 mm) on center.

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Cast-in-Place Moment Slab Traffic Barrier - Flat Grade Installation

Expansion joints shall be provided in moment slab every 90'-0" (27.4 m). Expansion joint shall be dot standard detail. Typical features shown for reference.

Contraction joints shall be provided in moment slab every 30'-0" (9.1 m) between expansion joints. Contraction joint shall be dot standard detail. Typical features shown for reference.

Materials
Concrete for cast-in-place barrier and moment slab shall be dot standard structure mix. Minimum 28 day compressive strength shall be 4,000 psi (27.6 mpa) or higher as specified. Reinforcing steel shall conform to ASTM A706 or AASHTO M31 Grade 60 (420 MPa).

Design
Moment slab shown is dimensioned based on an equivalent static load of 10,000 lbs (44.5 kN) per NCHRP Report 663. Moment slab reinforcement shown is based on AASHTO LRFD Bridge Design Specifications, 5th edition, 2010, TL-4 loading detailed in Table A13.2.1.

The selection and use of this detail, while designed in accordance with generally accepted engineering principles and practices, is the sole responsibility of the registered professional engineer in charge of the project.

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Cast-in-Place Moment Slab Traffic Barrier - Sloping Installation

Steel ties per traffic barrier design
#4 (#13) bars at 6" (152 mm) O.C. minimum

Cast-in-place traffic barrier
(Texas T551 railing shown)

Cast-in-place moment slab
30'-0" (9.1 m) Sections

8'-0" Minimum

#5 (#16) bars at 8" (203 mm) O.C., top and bottom

2" (51 mm) cover

Pavement

3" (76 mm) cover

AASHTO No. 57 stone

Transverse reinforcement #4 (#13) bars at 11.5" (292 mm) O.C., top and bottom

Dowels at contraction and expansion joints

1" (25 mm) Expanded polystyrene foam
(Low density, 0.75 lb/ft³ 0.12 kN/m²)

Expansion joints shall be provided in moment slab every 90'-0" (27.4 m). Expansion joint shall be dot standard detail. Typical features shown for reference.

Contraction joints shall be provided in moment slab every 30'-0" (9.1 m) between expansion joints. Contraction joint shall be dot standard detail. Typical features shown for reference.

Expansion cap

1½" (38 mm) dia. x 18" (457 mm)
A36 galvanized or epoxy coated smooth dowel bar centered vertically in slab at 12" (305 mm) O.C. along expansion joint

Sawed joint with hot-poured, rubber-asphalt sealant

Provide grease or sleeve bond breaker on one side

CONTRACTION JOINT

1½" (38 mm) dia. x 18" (457 mm)
A36 galvanized or epoxy coated smooth dowel bar centered vertically in slab at 12" (305 mm) O.C. along expansion joint

Materials
Concrete for cast-in-place barrier and moment slab shall be dot standard structure mix. Minimum 28 day compressive strength shall be 4,000 psi (27.6 mpa) or higher as specified. Cast-In-Place level up concrete shall be manufactured in accordance with ASTM C94. Minimum 28 day compressive strength shall be 3,500 psi (24.1 MPa) or higher as specified. Reinforcing steel shall conform to ASTM A706 or AASHTO M31 Grade 60 (420 MPa).

Design
Moment slab shown is dimensioned based on an equivalent static load of 10,000 lbs (44.5 kN) per NCHRP Report 663. Moment slab reinforcement shown is based on AASHTO LRFD Bridge Design Specifications, 5th Edition, 2010, TL-4 loading detailed in Table A13.2.1.

The selection and use of this detail, while designed in accordance with generally accepted engineering principles and practices, is the sole responsibility of the registered professional engineer in charge of the project.

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Top of Wall Step Options

Stack bricks under back corner of Corner Garden block to keep block supported prior to backfilling.

Grade drops along back and end of Corner Garden block.

Alternate Garden Block Placement

Sawcut and remove inside edge of Corner Garden block and fill with topsoil (Recommended).

Grade drops along side of Corner Garden block.

Top block

Middle block

Corner Garden block at end of each row (Typical).

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Top of Wall 9" (230 mm) Stepdown Blocks

Freestanding block or Top Retaining block (Typical)

Freestanding Corner block (Typical)

9" (230 mm) Stepdown block (Garden insert optional)

Sawcut and remove inside edge of Corner Garden block and fill with topsoil (Optional)

Field cut stepdown block to length (if needed)

Middle Block with no knobs (Typical) (Specialty block / Non-inventory item)

Retaining blocks (Typical)

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Drainage Swale Options

Grass Swale

Concrete Swale

Non-woven geotextile fabric (AASHTO M288 Survivability Class 2) between geomembrane and soil

Concrete 6" (152 mm) thick (Minimum)

Grade swale cross-slope to provide 1% to 2% (minimum) fall parallel to wall

Grade swale around blocks in step down areas

Rock check dams as required

Drainage Swale Behind Wall

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