Your Complete Line of Concrete & Masonry Building Supplies

A.C. KREBS

ESTABLISHED IN 1941

4000 Crittenden Drive • Louisville, KY 40209

(502) 367-6431

Remember...

WE HANDLE READY-MIX CONCRETE

- EASY TO HAUL
- EASY TO POUR

WE'VE TAKEN MOST OF THE WORK OUT OF CONCRETE DO-IT-YOURSELF PROJECTS!

U-cart CONCRETE

- Ready to pour
- No Mixing
  No Messing
- As little as 1/4 yard
- Free trailers

INDEX

INDEX
PRODUCT LISTING

PACKAGE/CUBE CODE

Ⓛ Lightweight
Ⓒ Concrete
△ Combination cube - contain two different shapes in the same cube
(SPO) - special order units - call for availability

PRODUCT LISTING

Aggregate
Coarse Sand
Creek Rock
Dense Grade
Limestone #57
Mortar Sand
Pea Gravel
White Sand

Architectural
Custom Cast Stone

Block Products
Colored Block
Concrete Block
Control Joint
Decorative Block
Dry Block
Fluted Face Block
Glass Block
Ground Face Block
Korfil & Icon Block
Lightweight Block
NRG Block
Sound Block
Split Face Block

Brick Products
Back-Up Brick
Concrete Brick
Face Brick
White Brick

Cleaning Products
Anti-Freeze 5 gal
Custom Masonry Cleaner
Heavy Duty Pain Stripper
Lt. Duty Concrete Cleaner
Lt. Duty Restoration Cleaner
Siloxane P.D.
Smoke Remover
Sure Klean #101 Lime
Sure-Klean 600
Sure-Klean Vana-Trol

Fireplace Products
Ash Dumps
Cleanout Doors
Dome Dampers
Fire Brick 9 x 4 1/2 x 1 1/4
Fire Brick 9 x 4 1/2 x 2 1/4
Flue Block
Flue Liners
Flue Thimbles
Heat Stop

Insulation Products
Foamular Board
Zonolite Insulation

Miscellaneous Products
Polyfilm- 6, 12, 16, 20, & 24 mil 100 Ft. Rolls
Cop-R-Flashing 3.oz. & 5. oz
Mortar Break 10” x 50’ Rolls
Nervatral Seal Flashing
Perm-A-Barrier Flashing 12” & 18” Rolls
Reinforced Poly Film
Terra Cotta Wall Coping

Mortar & Cement Products
Mortar Type N.S. & M.
Cement
White Cement
White Mortar
Mortar Colors
Buff 1 lb
Brown 2 lb
Red 1.5 lb
Black 1,2,3,4 lb
Chocolate 3 lb
Tan 1 lb
Concrete Mix
Mortar Mix
Sand Mix
Masonry Lime
Silica Sand
Bag Sand

Paving Products
Holland-Stone Paving Bricks
Paver-Bond
Uni-Decor Paving Brick

Precast Concrete Products
Address Stones
Air Conditioning Pads
Century Group Concrete Steps
Keystones
Parking Bumpers
Precast Coping
Precast Lintels
Precast Sills
Pyramids
Splash Block
Stepping Stones

Retaining Wall Products
Everlok Retaining Walls
Versa-Lok Retaining Walls

Steel Products
2.5 Galv Metal Lath
Access Doors
Door Anchors
Foundation Vents
Locks & Hinges
Masonry Reinforcing
Steel Doors Flush & 6 Panel
Steel Frames
Steel Angles (Primed)
Wall Ties
Weep Holes

Thoro Products
Acryl 60
Thorobond
Water Plug

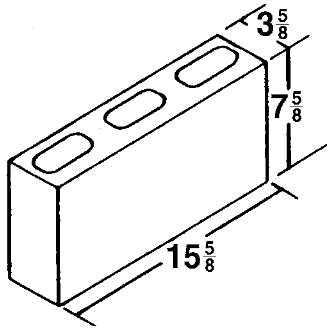
Tool Products
Bricklayer Tools
Concrete Tools
Diamond Blades
Masonry Abrasive Blades

Window Products
4 x 3 Sliders Vinyl
Custom Windows

A.C. KREBS CO. IS A CERTIFIED W.R. GRACE MANUFACTURER OF “DRYBLOCK” MASONRY PRODUCTS.

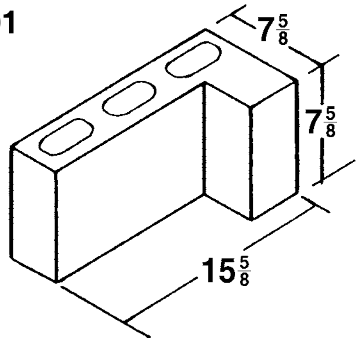
4” BLOCK

400



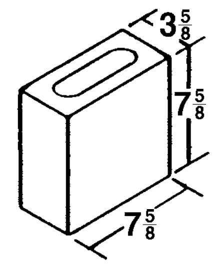
4X8X16 COMMON
o 180 WT 16 Ⓛ o 150 WT 26 Ⓒ

401



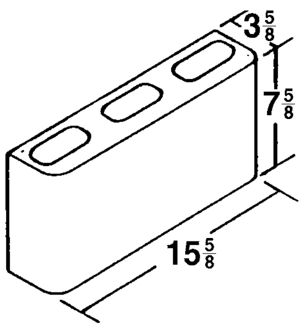
4X8X16 L CORNER
o 120 WT 22 Ⓛ o 80 WT 30 Ⓒ

402



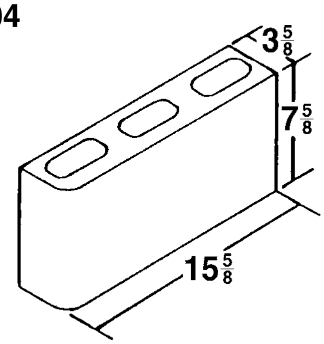
4X8X8 COMMON
o 300 WT 8 Ⓛ o 240 WT 13 Ⓒ

403



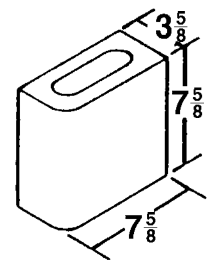
4X8X16 DOUBLE BULL NOSE PILASTER
o 180 WT 16 Ⓛ S.P.O. Ⓒ

404



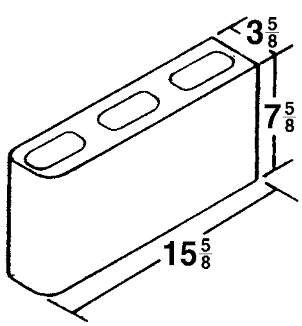
4X8X16 SINGLE BULL NOSE
o 180 WT 16 Ⓛ S.P.O. Ⓒ

405



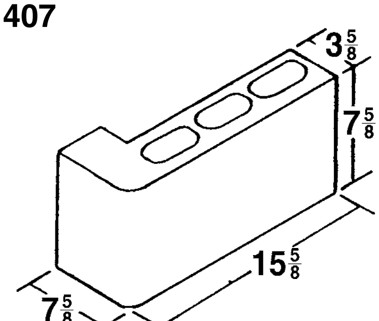
4X8X8 SINGLE BULL NOSE
o 300 WT 8 Ⓛ S.P.O. Ⓒ

406



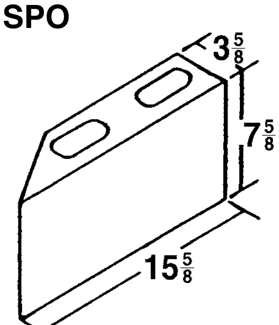
4X8X16 BULLNOSE BULLET
o 180 WT 16 Ⓛ S.P.O. Ⓒ

407



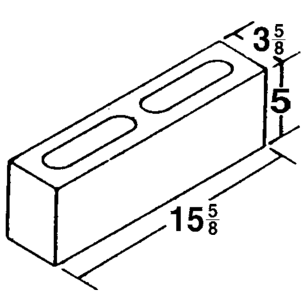
4X8X16 L CORNER BULLNOSE
o 120 WT 22 Ⓛ S.P.O. Ⓒ

408 SPO



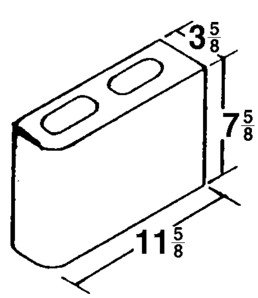
4X8X16 60° COMMON
o 180 WT 15 Ⓛ S.P.O. Ⓒ

409



4X5X16 5” HIGH
o 210 WT 11 Ⓛ S.P.O. Ⓒ

410



4X8X12 SINGLE BULLNOSE
o 200 WT 12 Ⓛ S.P.O. Ⓒ

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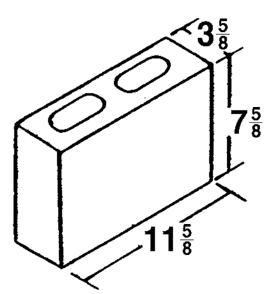
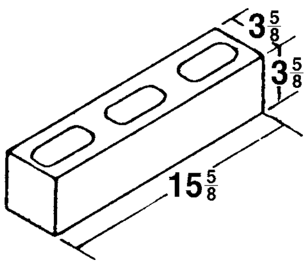


4X8X12 COMMON
o 200 WT 12 Ⓛ o 160 WT 20 Ⓒ

Package/Cube Code o On Pallet Ⓛ Lightweight Ⓒ Concrete △ Combination Cube (SPO) Special Order

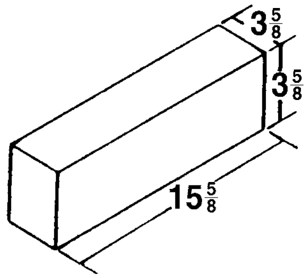
4" BLOCK

412



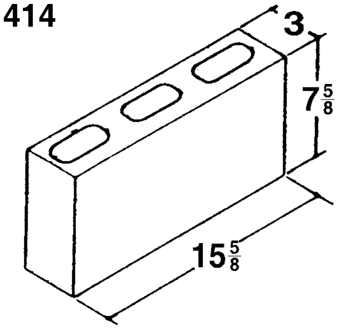
4X4X16 4" HIGH
o 300 WT 7 Ⓛ S.P.O. ©

413



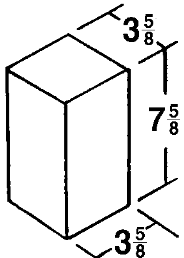
4X4X16 4" HIGH SOLID
o 240 WT 13 Ⓛ S.P.O. ©

414



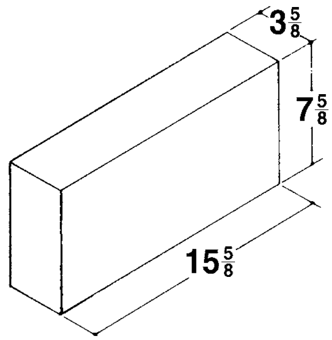
3X8X16 COMMON
o 180 WT 14 Ⓛ S.P.O. ©

415



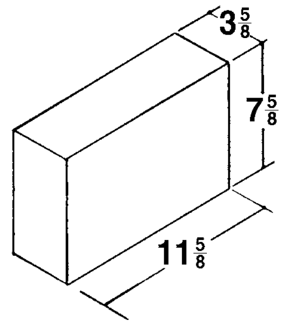
4X8X4 SOLID DOBY
o 600 WT 4 Ⓛ o 600 WT 8 ©

416



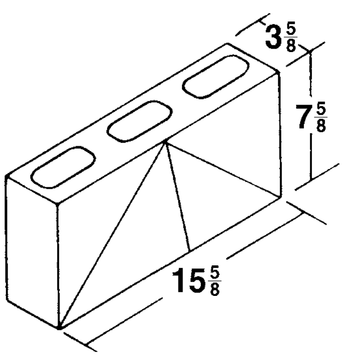
4X8X16 SOLID
o 150 WT 21 Ⓛ o 120 WT 34 ©

417



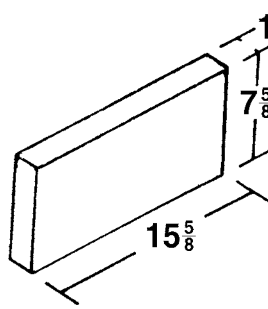
4X8X12 SOLID
o 160 WT 16 Ⓛ S.P.O. ©

418



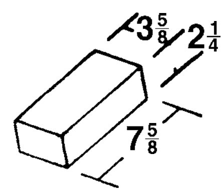
4X8X16 HI-LITE
o 150 WT 16 Ⓛ S.P.O. ©

421



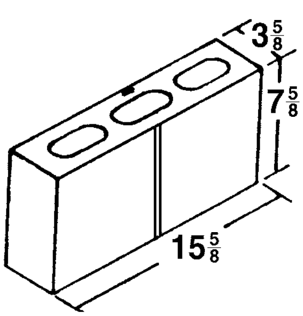
$1\frac{5}{8}$X8X16 SOLID
o 300 WT 10 Ⓛ o 240 WT 15 ©

420



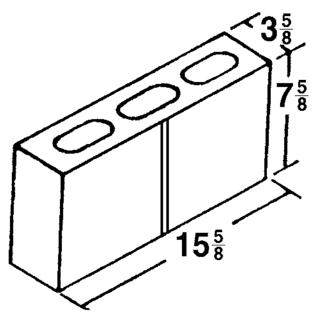
$2\frac{1}{4}$ X $3\frac{5}{8}$ X $7\frac{5}{8}$
o 720 WT 3 Ⓛ o 720 WT 4 ©

426



4X8X16 SCORED 2-SIDE
o 180 WT 16 Ⓛ o 150 WT 27 ©

425

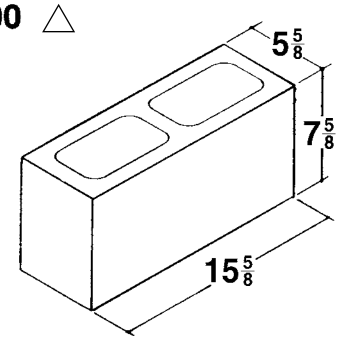


4X8X16 SCORED 1-SIDE
o 180 WT 16 Ⓛ o 150 WT 27 ©

Package/Cube Code o On Pallet Ⓛ Lightweight © Concrete △ Combination Cube (SPO) Special Order

6” BLOCK

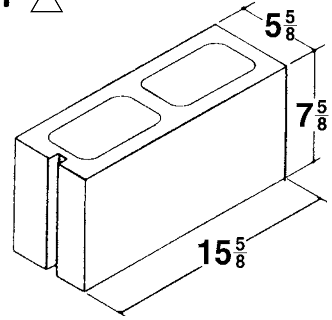
600 △



6X8X16 COMMON

o 115 WT 19 Ⓛ o 115 WT 32 ©

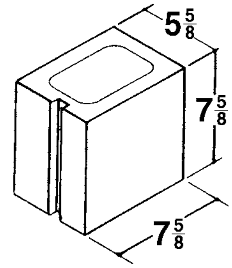
601 △



6X8X16 COMB. CORNER

o 115 WT 22 Ⓛ o 115 WT 32 ©

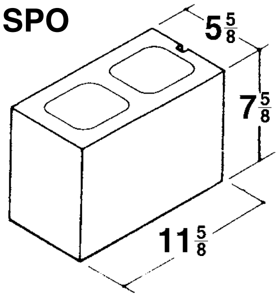
602



6X8X8 COMB. CORNER

o 190 WT 11 Ⓛ o 190 WT 10 ©

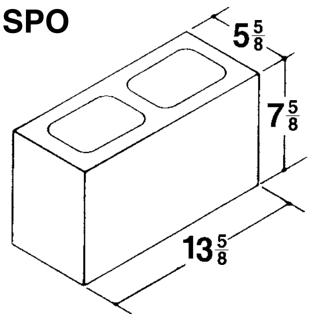
603 SPO



6X8X12 CORNER-SASH W/G

o 120 WT 16 Ⓛ S.P.O. ©

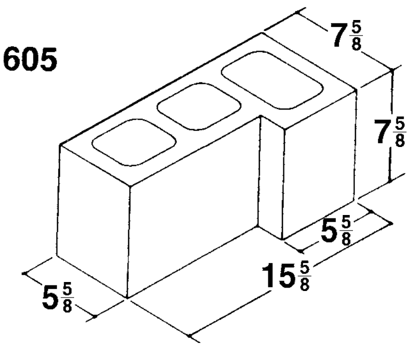
604 SPO



6X8X14 COMMON

o 110 WT 17 Ⓛ S.P.O. ©

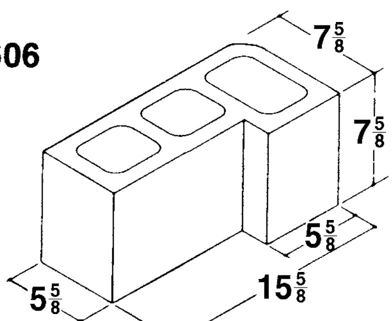
605



6X8X16 L-CORNER

o 90 WT 25 Ⓛ o 90 WT 32 ©

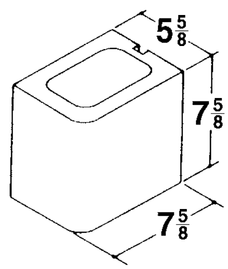
606



6X8X16 L-CORNER BULLNOSE

o 90 WT 25 Ⓛ S.P.O. ©

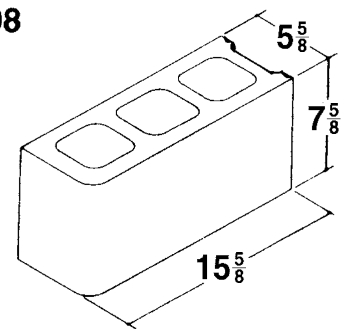
607



6X8X8 BULLNOSE W/G

o 190 WT 11 Ⓛ S.P.O. ©

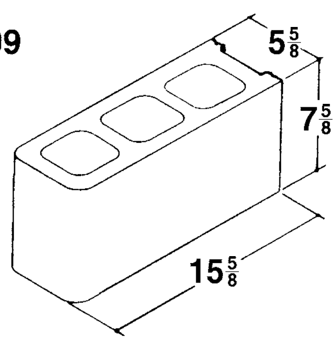
608



6X8X16 BULLNOSE CORNER

o 110 WT 22 Ⓛ S.P.O. ©

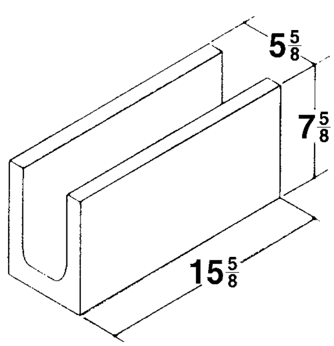
609



6X8X16 BULLNOSE BULLET

o 110 WT 22 Ⓛ S.P.O. ©

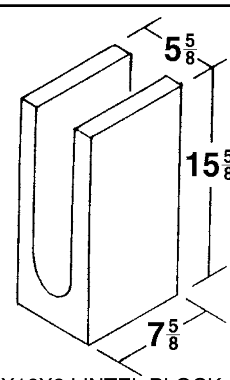
610



6X8X16 BOND BEAM SOLID BOTTOM

o 114 WT 19 Ⓛ S.P.O. ©

611



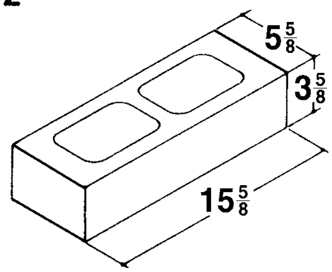
6X16X8 LINTEL BLOCK

o 114 WT 16 Ⓛ S.P.O. ©

Package/Cube Code o On Pallet Ⓛ Lightweight © Concrete △ Combination Cube (SPO) Special Order

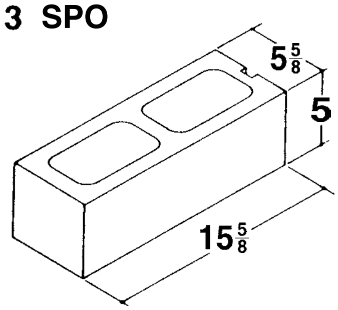
6” BLOCK

612



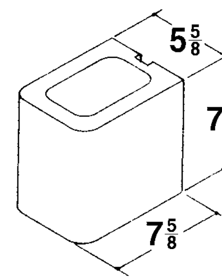
6X4X16 4” HIGH
o 200 WT 7 Ⓛ S.P.O. ©

613 SPO



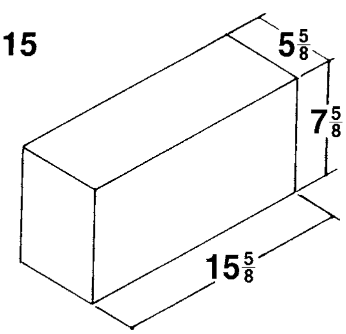
6X5X16 5” HIGH W/G
o 160 WT 11 Ⓛ S.P.O. ©

614



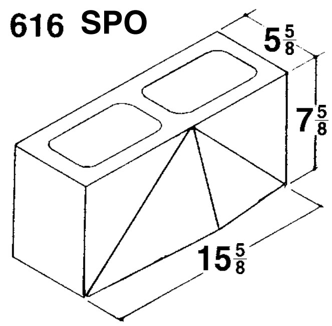
6X8X8 BULLET W/G
o 190 WT 11 Ⓛ S.P.O. ©

615



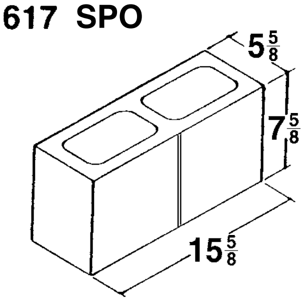
6X8X16 SOLID
o 75 WT 37 Ⓛ S.P.O. ©

616 SPO



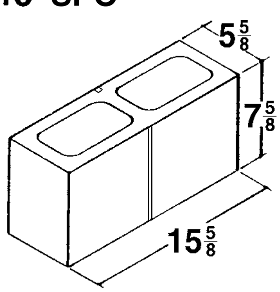
6X8X16 HI-LITE
o 114 WT 20 Ⓛ S.P.O. ©

617 SPO



6X8X16 SCORED 1-SIDE
o 115 WT 19 Ⓛ S.P.O. ©

618 SPO

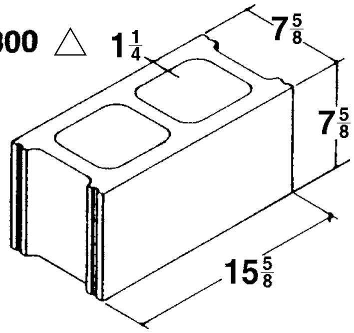


6X8X16 SCORED 2-SIDE
o 115 WT 19 Ⓛ S.P.O. ©

Package/Cube Code o On Pallet Ⓛ Lightweight © Concrete △ Combination Cube (SPO) Special Order

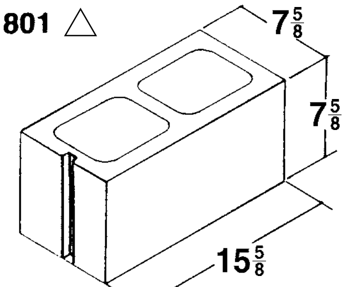
8” BLOCK

800 △



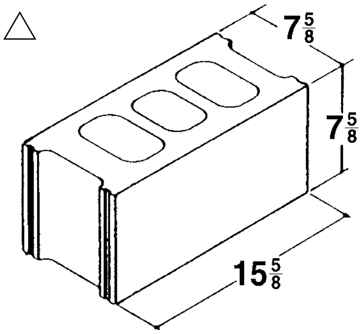
8X8X16 COMMON
o 90 WT 25 Ⓛ   o 75 WT 36 Ⓒ

801 △



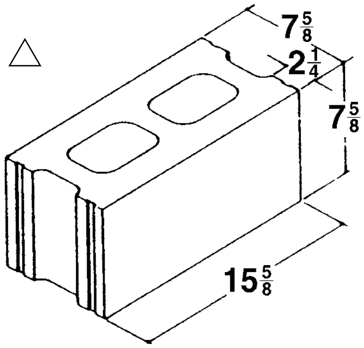
8X8X16 COMB. CORNER
o 90 WT 25 Ⓛ   o 75 WT 37 Ⓒ

802 △



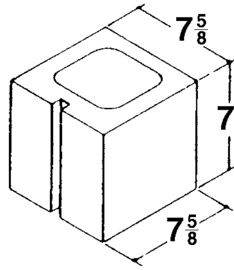
8X8X16 COMMON 3 CORE 3 HR RATED
o 90 WT 23 Ⓛ   S.P.O. Ⓒ

803 △



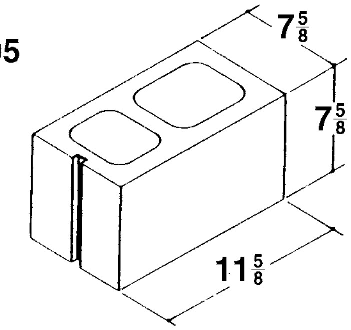
8X8X16 FIRE RATED 4 HR
o 90 WT 28 Ⓛ   S.P.O. Ⓒ

804



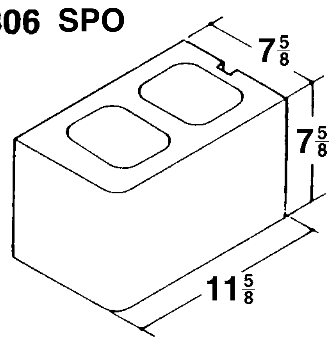
8X8X8 COMB. CORNER
o 180 WT 12 Ⓛ   o 150 WT 22 Ⓒ

805



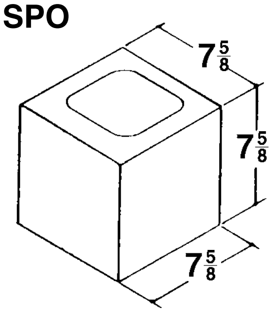
8X8X12 COMB. CORNER
o 100 WT 18 Ⓛ   o 100 WT 34 Ⓒ

806 SPO



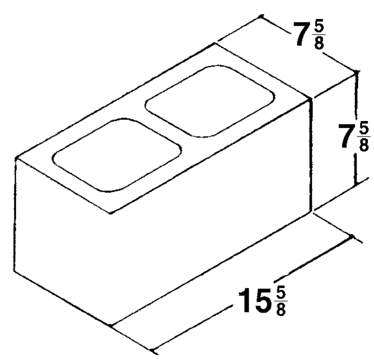
8X8X12 SINGLE BULLNOSE W/G 1” RAD
o 100 WT 18 Ⓛ   S.P.O. Ⓒ

807 SPO



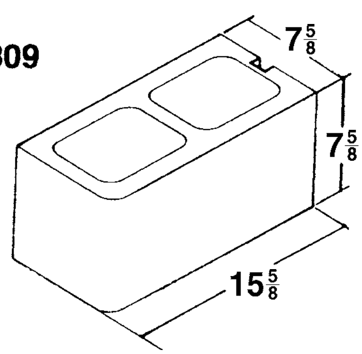
8X8X8 PIER BLOCK
o 180 WT 12 Ⓛ   S.P.O. Ⓒ

808



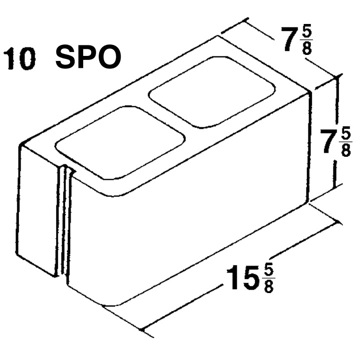
8X8X16 DOUBLE CORNER PILASTER
o 90 WT 26 Ⓛ   S.P.O. Ⓒ

809



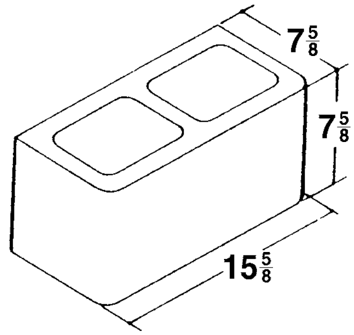
8X8X16 BULLNOSE CORNER W/G 1” RAD
o 90 WT 26 Ⓛ   o 75 WT 39 Ⓒ

810 SPO



8X8X16 BULLNOSE SASH 1” RAD
o 90 WT 26 Ⓛ   S.P.O. Ⓒ

811

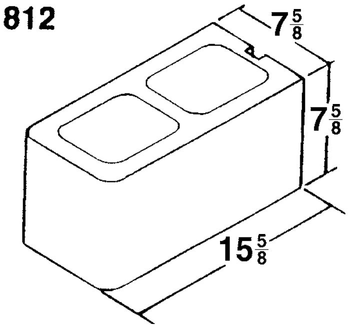


8X8X16 DOUBLE BULLNOSE PILASTER 1” RAD
o 90 WT 26 Ⓛ   S.P.O. Ⓒ

Package/Cube Code   o On Pallet   Ⓛ Lightweight   Ⓒ Concrete   △ Combination Cube   (SPO) Special Order

8” BLOCK

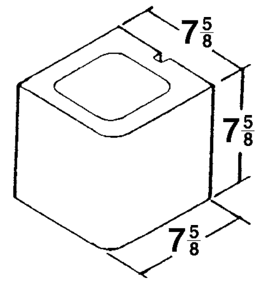
812



8X8X16 BULLNOSE BULLET W/G 1” RAD

o 90 WT 26 Ⓛ S.P.O. ©

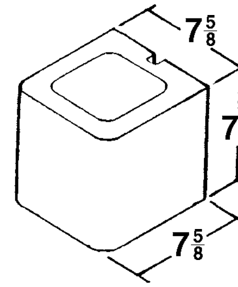
813



8X8X8 BULLNOSE CORNER “1 RAD

o 180 WT 14 Ⓛ o 150 WT 22 ©

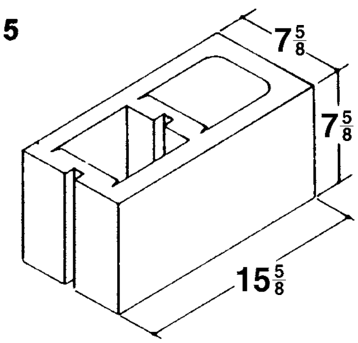
814



8X8X8 BULLET 1” RAD

o 180 WT 14 Ⓛ S.P.O. ©

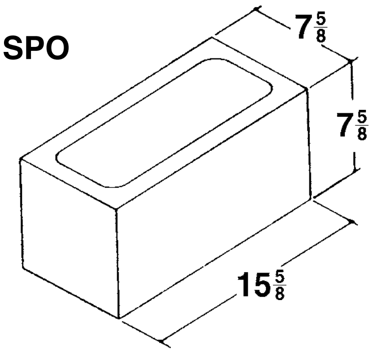
815



8X8X16 KNOCK-OUT

o 90 WT 26 Ⓛ o 75 WT 39 ©

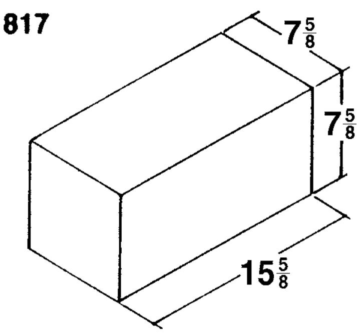
816 SPO



8X8X16 OBLONG

o 90 WT 24 Ⓛ S.P.O. ©

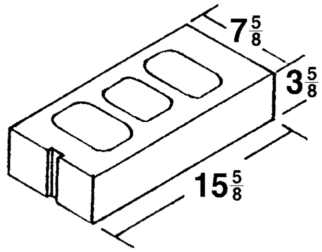
817



8X8X16 SOLID

o 75 WT 45 Ⓛ S.P.O. ©

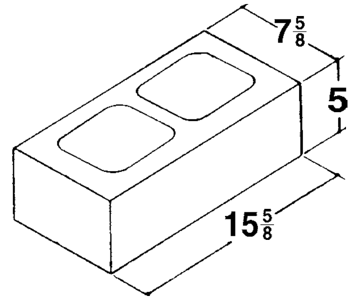
818



8X4X16 4” HIGH W/G

o 180 WT 8 Ⓛ S.P.O. ©

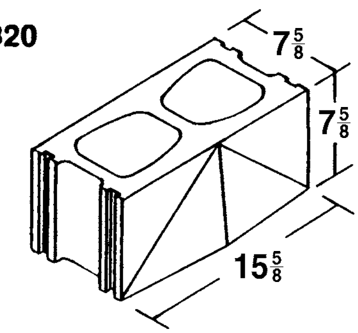
819



8X5X16 5” HIGH W/G

o 120 WT 15 Ⓛ S.P.O. ©

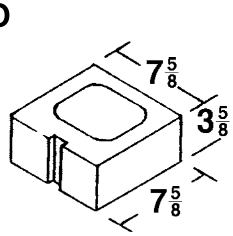
820



8X8X16 HI-LITE

o 90 WT 26 Ⓛ S.P.O. ©

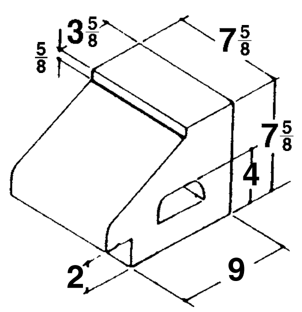
821 SPO



8X4X8 4” HALF-HIGH

o 300 WT 4 Ⓛ S.P.O. ©

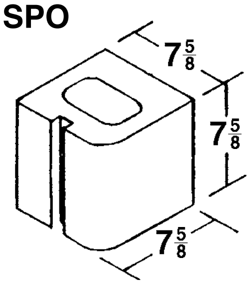
822



8X8X9 SILL BLOCK

o 150 WT 16 Ⓛ S.P.O. ©

823 SPO



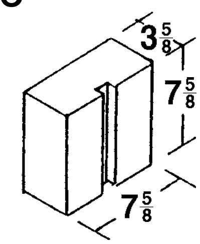
8X8X8 BULLNOSE SASH 1” RAD

o 180 WT 14 Ⓛ S.P.O. ©

Package/Cube Code o On Pallet Ⓛ Lightweight © Concrete △ Combination Cube (SPO) Special Order

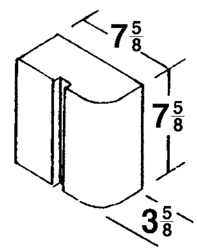
8" BLOCK

824 SPO



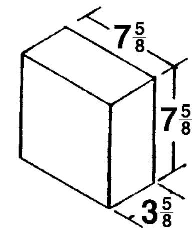
8X8X4 COMB CORNER SOLID
o 300 WT 8 Ⓛ S.P.O. ©

825 SPO



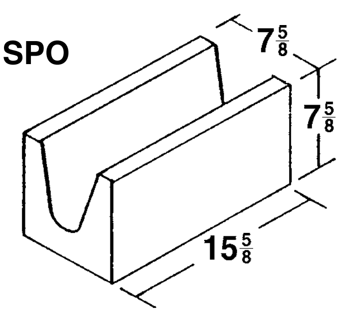
8X8X4 BULLNOSE SOLID 1" RAD CORNER SASH
o 300 WT 8 Ⓛ S.P.O. ©

826 SPO



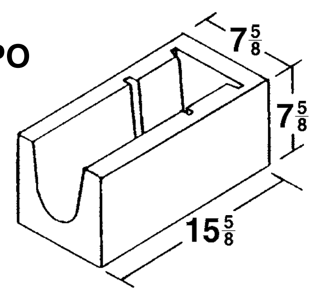
8X8X4 SOLID
o 300 WT 8 Ⓛ S.P.O. ©

827 SPO



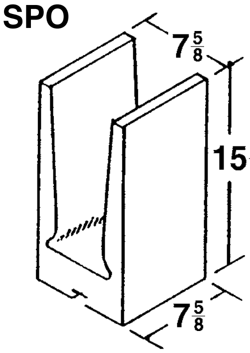
8X8X16 BOND BEAM
o 90 WT 26 Ⓛ o 75 WT 43 ©

828 SPO



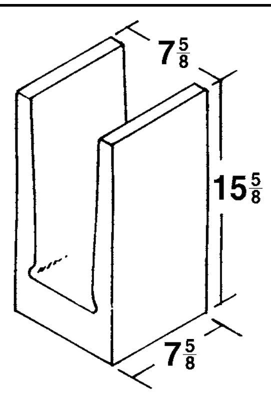
8X8X16 BOND BEAM CORNER
o 90 WT 26 Ⓛ S.P.O. ©

SPO
829



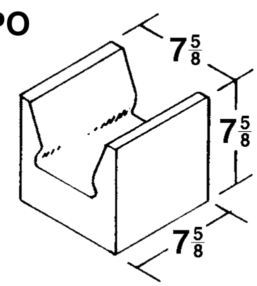
8X16X8 BEAM LINTEL W/G
o 90 WT 23 Ⓛ S.P.O. ©

830 SPO



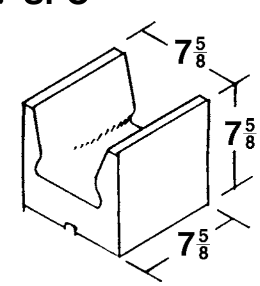
8X16X8 BEAM LINTEL
o 90 WT 23 Ⓛ S.P.O. ©

831 SPO



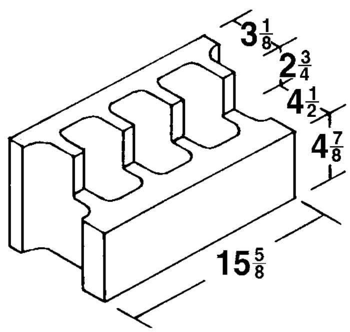
8X8X8 BEAM LINTEL
o 180 WT 12 Ⓛ S.P.O. ©

832 SPO



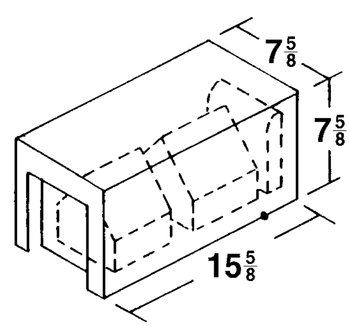
8X8X8 BEAM LINTEL W/G
o 180 WT 12 Ⓛ S.P.O. ©

833



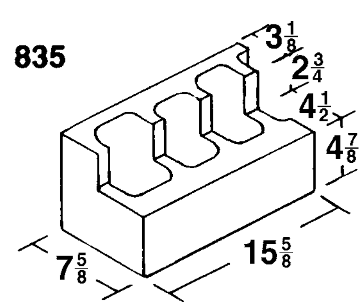
8X8X16 HEADER
o 108 WT 28 Ⓛ S.P.O. ©

834



8X8X16 F.H.A. TERMITE
o 75 WT 28 Ⓛ S.P.O. ©

835

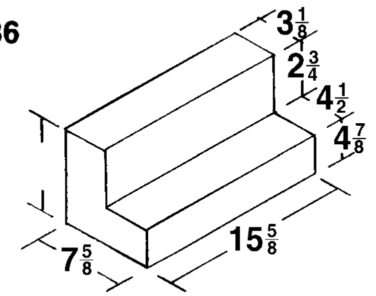


8X8X16 REGULAR HEADER CORNER
o 108 WT 29 Ⓛ S.P.O. ©

Package/Cube Code o On Pallet Ⓛ Lightweight © Concrete △ Combination Cube (SPO) Special Order

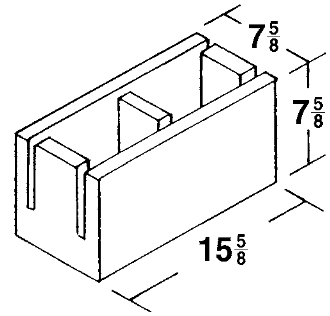
8” BLOCK

836



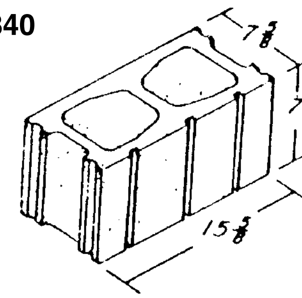
8X8X16 F.H.A. SOLID HEADER
o 90 WT 28 Ⓛ S.P.O. Ⓒ

837



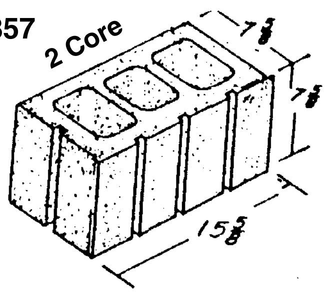
8X8X16 BOND BEAM OPEN BOTTOM
o 90 WT 26 Ⓛ o 75 WT 37 Ⓒ

840



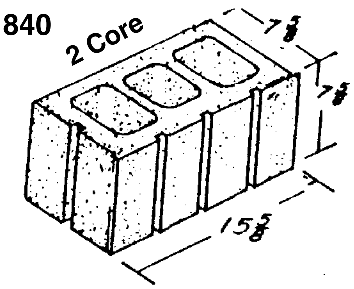
8X8X16 REGULAR
o 90 WT 26 Ⓛ o 75 WT 37 Ⓒ

857



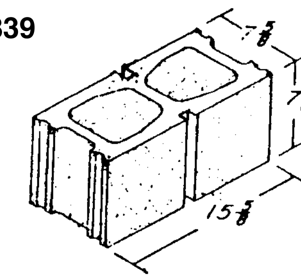
8X8X16 CORNER SASH
SCORED ONE SIDE
o 90 WT 28 Ⓛ S.P.O. Ⓒ

840



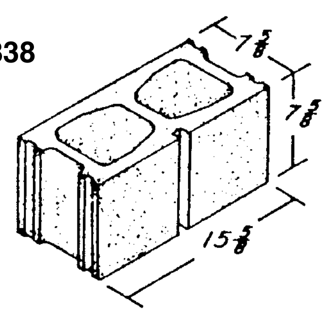
8X8X16 CORNER SASH
SCORED THREE SIDES
o 90 WT 28 Ⓛ S.P.O. Ⓒ

839



8X8X16 VERTICAL SCORE 2 SIDES
o 90 WT 28 Ⓛ S.P.O. Ⓒ

838

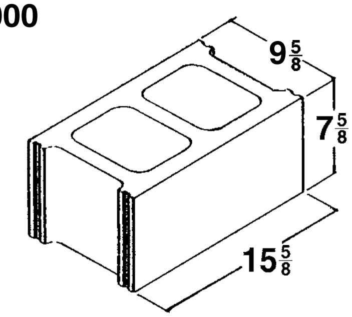


8X8X16 REGULAR
VERTICAL SCORED ONE SIDE
o 90 WT 28 Ⓛ S.P.O. Ⓒ

Package/Cube Code o On Pallet Ⓛ Lightweight Ⓒ Concrete △ Combination Cube (SPO) Special Order

10” BLOCK

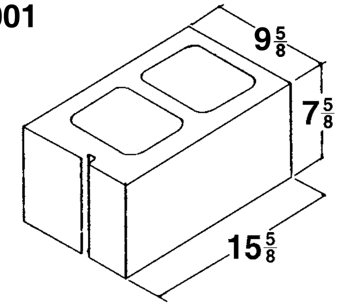
1000



10X8X16 COMMON

o 80 WT 31 Ⓛ o 67 WT 45 Ⓒ

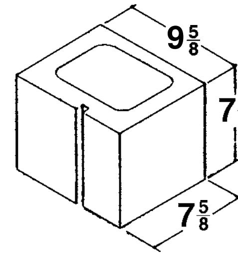
1001



10X8X16 COMB. CORNER

o 80 WT 32 Ⓛ o 67 WT 45 Ⓒ

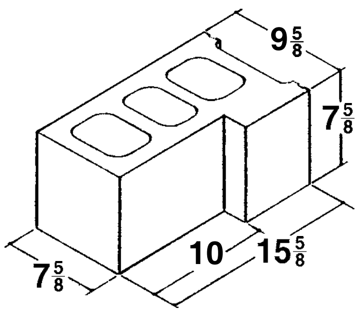
1002



10X8X8 COMB. CORNER

o 147 WT 22 Ⓛ o WT 30 Ⓒ

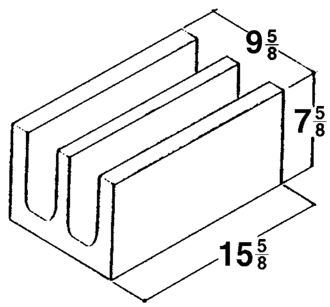
1003



10X8X16 “L” CORNER

o 60 WT 31 Ⓛ o 60 WT 45 Ⓒ

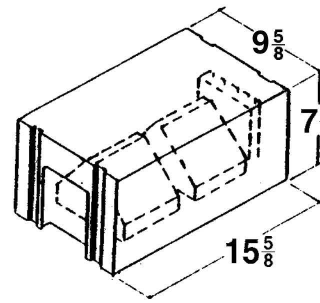
1004



10X8X16 BOND BEAM

o 78 WT 31 Ⓛ S.P.O. Ⓒ

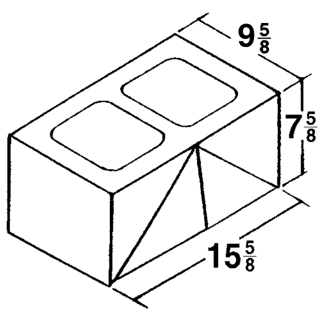
1005



10X8X16 TERMITE FHA

o 54 WT 50 Ⓛ S.P.O. Ⓒ

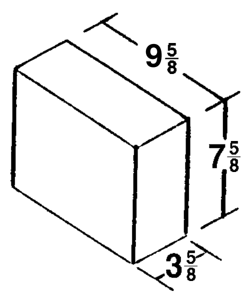
1006 SPO



10X8X16 HI-LITE

o 78 WT 31 Ⓛ S.P.O. Ⓒ

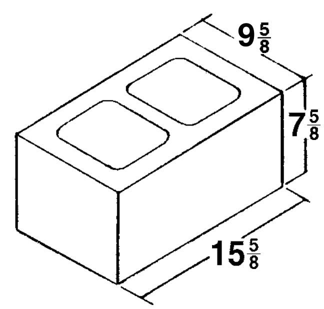
1007 SPO



10X8X4 SOLID

o

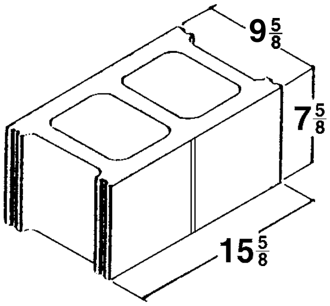
1008 SPO



10X8X16 PIER

o 78 WT 31 Ⓛ S.P.O. Ⓒ

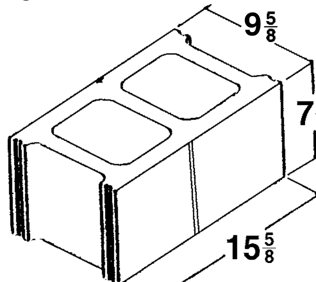
1009



10X8X16 VERTICAL 1-SIDE

o 80 WT 31 Ⓛ S.P.O. Ⓒ

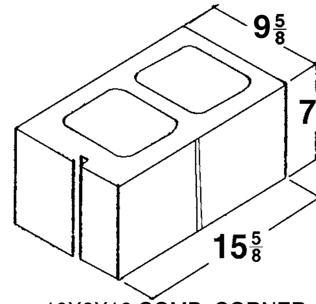
1010



10X8X16 VERTICAL 2-SIDE

o 80 WT 31 Ⓛ S.P.O. Ⓒ

1012



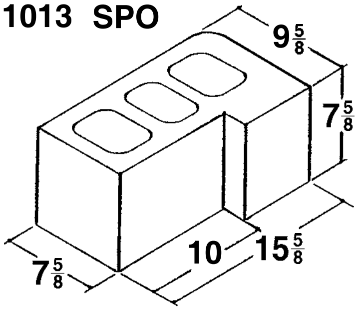
10X8X16 COMB. CORNER
SCORED 1- SIDED

o 80 WT 31 Ⓛ S.P.O. Ⓒ

Package/Cube Code o On Pallet Ⓛ Lightweight Ⓒ Concrete △ Combination Cube (SPO) Special Order

10” BLOCK

1013 SPO

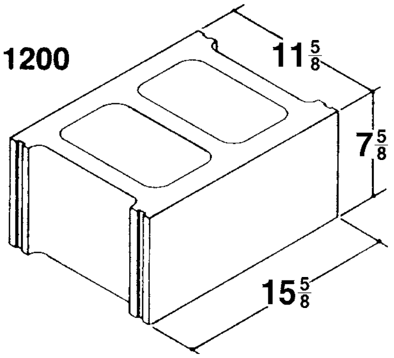


10X8X16 “L” CORNER BILLNOSE 1” RAD
o 60 WT 32 Ⓛ

Package/Cube Code o On Pallet Ⓛ Lightweight © Concrete △ Combination Cube (SPO) Special Order

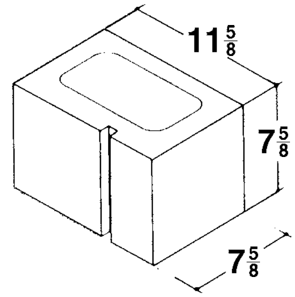
12” BLOCK

1200



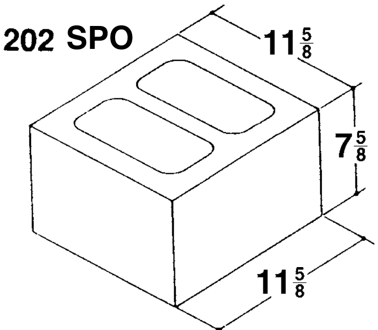
12X8X16 COMMON
o 65 WT 34 Ⓛ o 55 WT 50 ©

1201



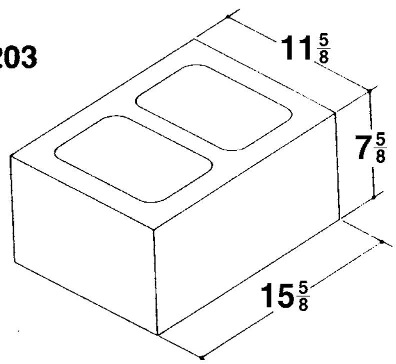
12X8X8 COMB. CORNER
o 100 WT 19 Ⓛ o 100 WT 30 ©

1202 SPO



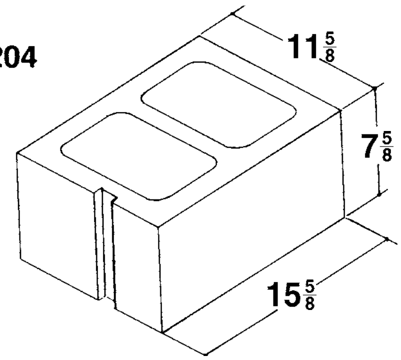
12X8X12 PIER BLOCK
o 80 WT 36 Ⓛ S.P.O. ©

1203



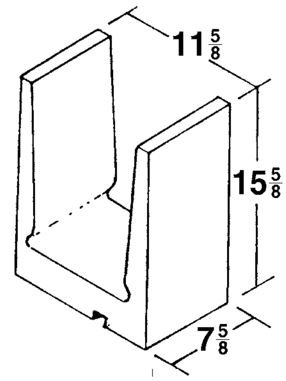
12X8X16 PIER
o 65 WT 35 Ⓛ S.P.O. ©

1204



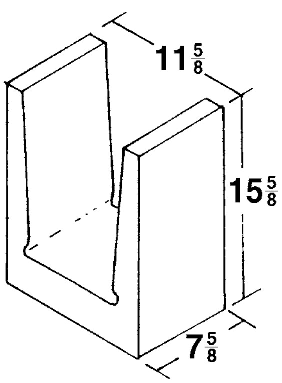
12X8X16 COMB. CORNER
o 65 WT 35 Ⓛ o 55 WT 52 ©

1205 SPO



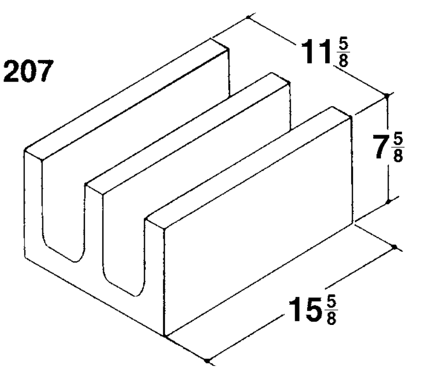
12X16X8 BEAM LINTEL W/G
o 60 WT 34 Ⓛ S.P.O. ©

1206



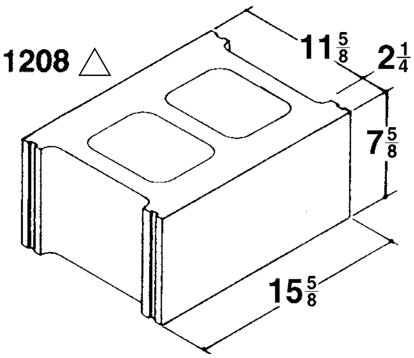
12X16X8 BEAM LINTEL
o 60 WT 34 Ⓛ S.P.O. ©

1207



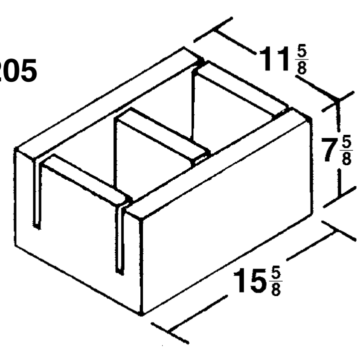
12X8X16 BOND BEAM
o 60 WT 34 Ⓛ S.P.O. ©

1208 △



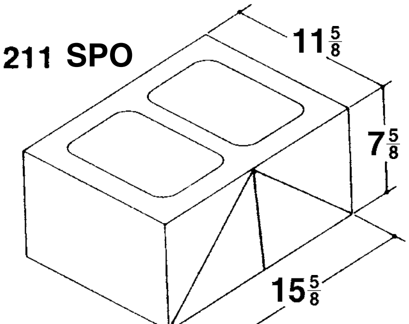
12X16X8 COMMON 4 HR RATES
o 65 WT 36 Ⓛ S.P.O. ©

1205



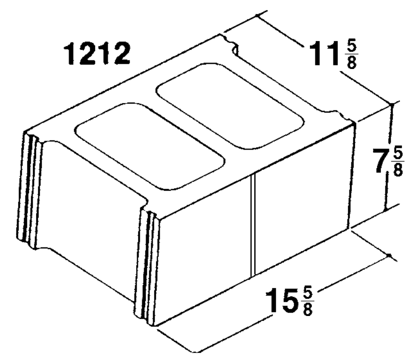
12X8X16 OPEN BOTTOM BOND BEAM
o 60 WT 34 Ⓛ S.P.O. ©

1211 SPO



12X8X16 HI-LITE
o 60 WT 34 Ⓛ S.P.O. ©

1212

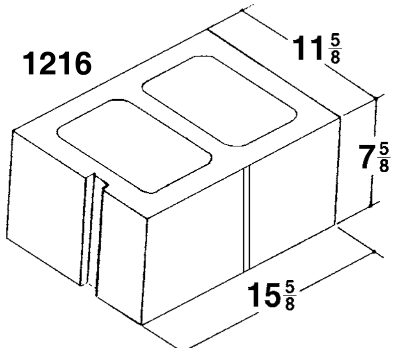


12X8X16 SCORE 1-SIDE
o 60 WT 34 Ⓛ S.P.O. ©

Package/Cube Code o On Pallet Ⓛ Lightweight © Concrete △ Combination Cube (SPO) Special Order

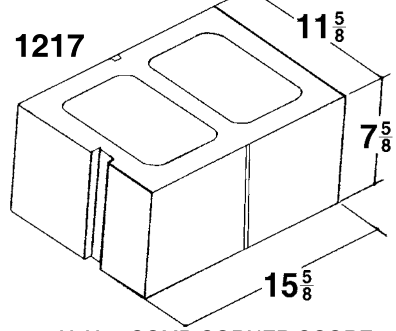
12" BLOCK

1216



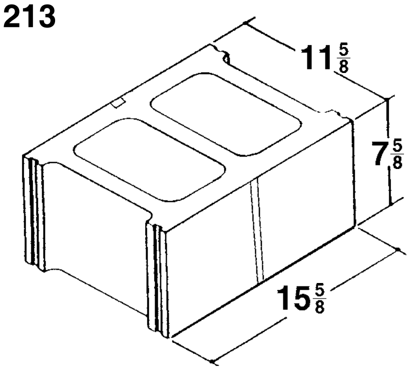
12X8X16 COMB CORNER SCORE 1-SIDE
o 60 WT 35 Ⓛ S.P.O. ©

1217



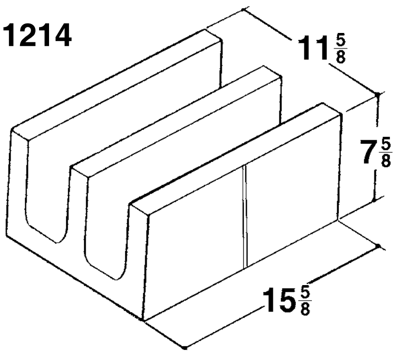
12X8X16 COMB CORNER SCORE 2-SIDE
o 60 WT 35 Ⓛ S.P.O. ©

1213



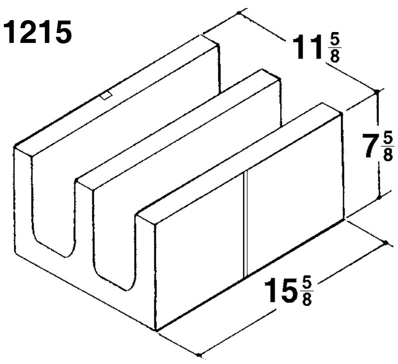
12X8X16 SCORE 2-SIDE
o 60 WT 34 Ⓛ S.P.O. ©

1214



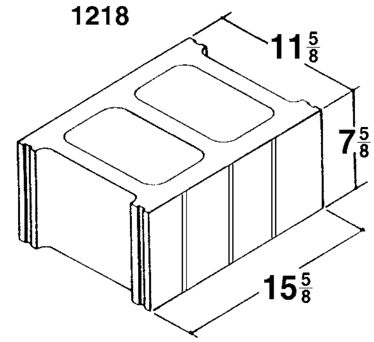
12X8X16 BOND BEAM SCORE 1-SIDE
o 60 WT 34 Ⓛ S.P.O. ©

1215



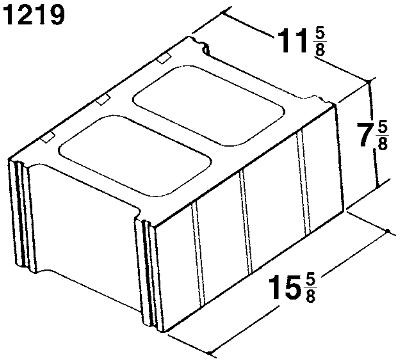
12X8X16 BOND BEAM SCORE 2-SIDE
o 60 WT 34 Ⓛ S.P.O. ©

1218



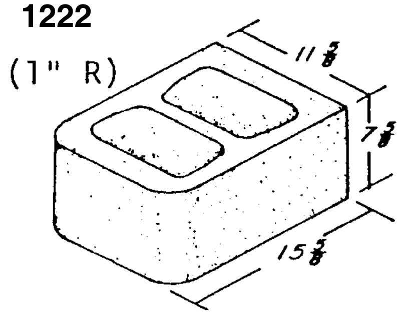
12X8X16 TRI-SCORE 1-SIDE
o 60 WT 34 Ⓛ S.P.O. ©

1219



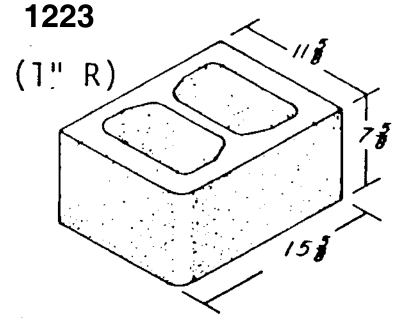
12X8X16 TRI-SCORE 2-SIDE
o 60 WT 34 Ⓛ S.P.O. ©

1222



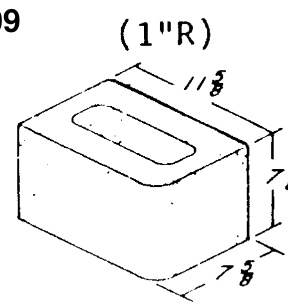
12X8X16 DOUBLE BULLNOSE BULLET
o 60 WT 34 Ⓛ S.P.O. ©

1223



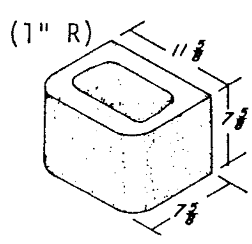
12X8X16 SINGLE BULL NOSE CORNER W/ CORNER
o 60 WT 34 Ⓛ S.P.O. ©

1209



12X8X8 SINGLE BULL NOSE HALF W/CORNER
o 60 WT 34 Ⓛ S.P.O. ©

1222

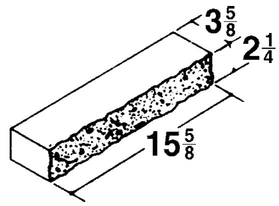


12X8X8 DOUBLE BULLNOSE BULLET
o 60 WT 34 Ⓛ S.P.O. ©

Package/Cube Code o On Pallet Ⓛ Lightweight © Concrete △ Combination Cube (SPO) Special Order

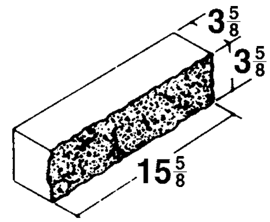
SPLIT FACE

300 SPO



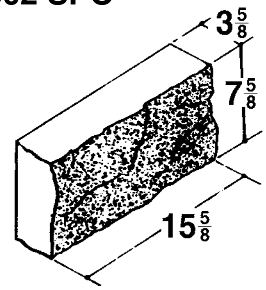
4X2¼X16
SPLIT FACE SOLID

301 SPO



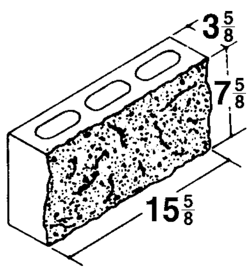
4X4X16
SPLIT FACE SOLID

302 SPO



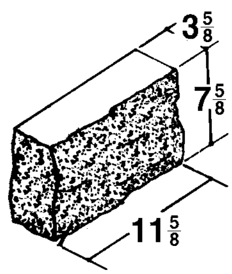
4X8X16
SPLIT FACE SOLID

303 SPO



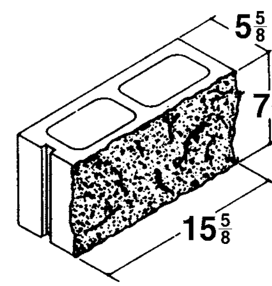
4X8X16
SPLIT FACE

305



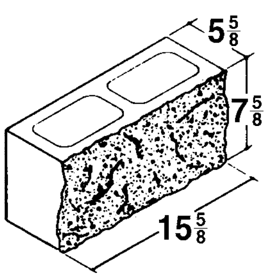
4X8X12
SPLIT FACE CORNER

306 SPO



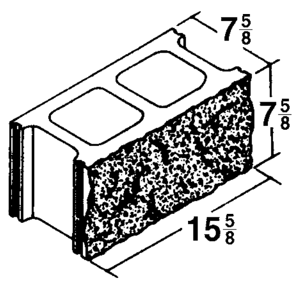
6X8X16
SPLIT COMB. CORNER

307 SPO



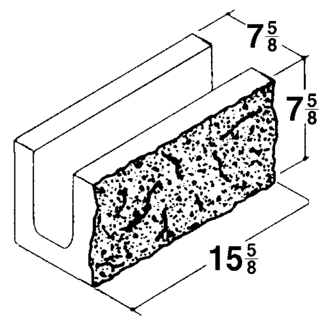
6X8X16
SPLIT DOUBLE CORNER

308 △



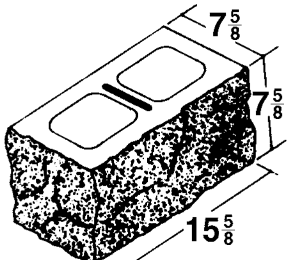
8X8X16
SPLIT FACE

309



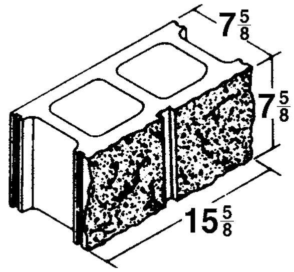
8X8X16
SPLIT FACE BOND BEAM

310



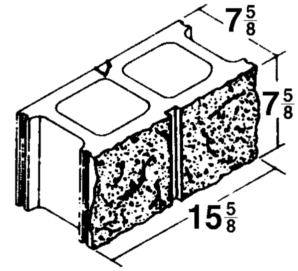
8X8X16
SPLIT FACE CORNER

311 SPO



8X8X16
SPLIT FACE SCORED 1 SIDE

312 SPO

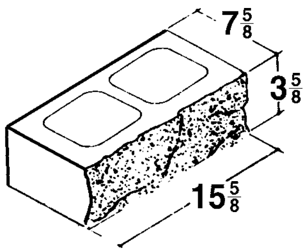


8X8X16
SPLIT FACE SCORED 2 SIDE

Package/Cube Code o On Pallet Ⓛ Lightweight Ⓒ Concrete △ Combination Cube (SPO) Special Order

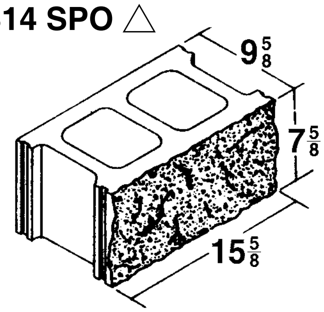
SPLIT FACE

313 SPO



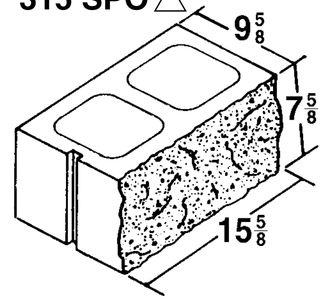
8X4X16
SPLIT FACE 4” HIGH

314 SPO △



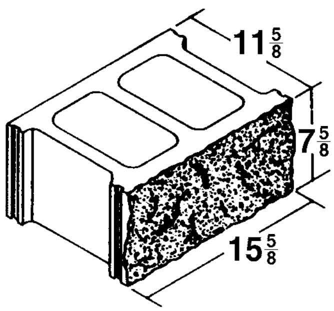
10X8X16
SPLIT FACE

315 SPO △



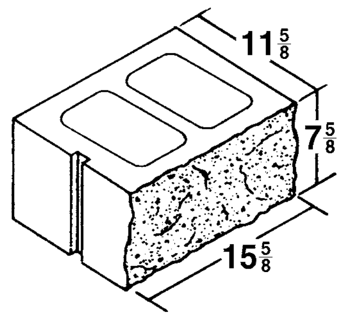
10X8X16
SPLIT FACE COMB. CORNER

316 △



12X8X16
SPLIT FACE

317 △

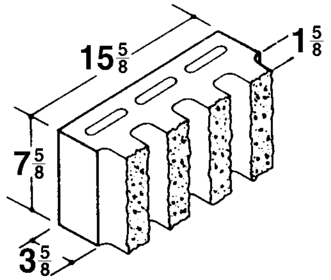


12X8X16
SPLIT FACE COMB. CORNER

Package/Cube Code o On Pallet Ⓛ Lightweight Ⓒ Concrete △ Combination Cube (SPO) Special Order

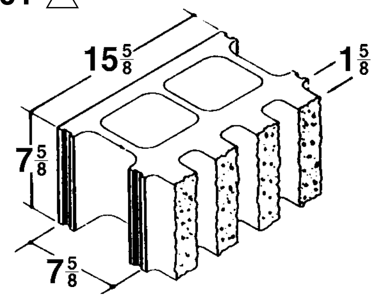
FLUTED BLOCK

100 SPO



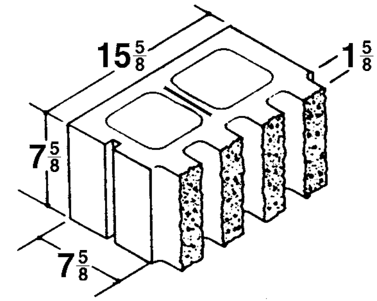
4X8X16
4-FLUTE

101 △



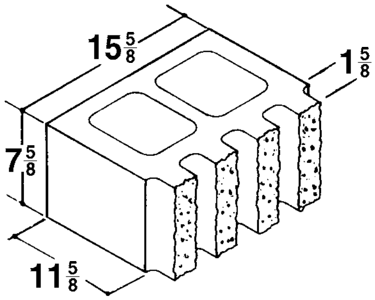
8X8X16
4-FLUTE

102 △



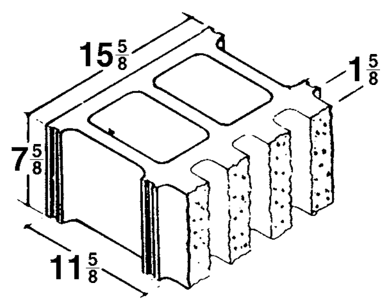
8X8X16
4-FLUTE C-CORNER

103 SPO △



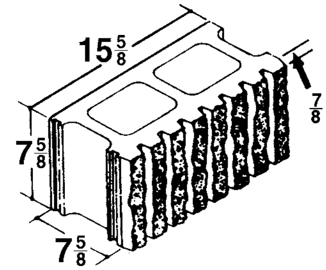
12X8X16
4-FLUTE C-CORNER

104 SPO △



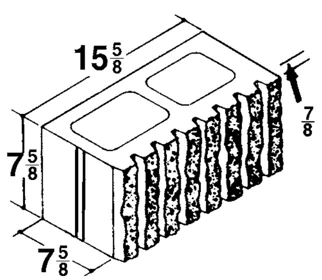
12X8X16
4-FLUTE

200



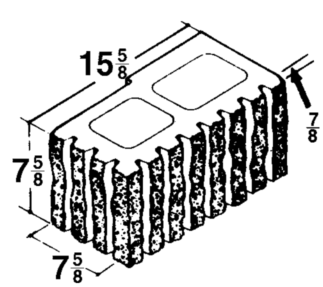
8X8X16
8-FLUTE

201



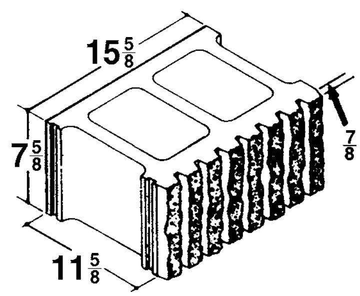
8X8X16
8-FLUTE C-CORED

202 SPO



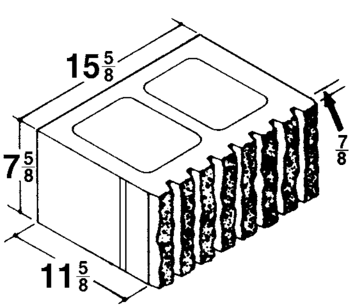
8X8X16
8-FLUTE CORED

203 SPO



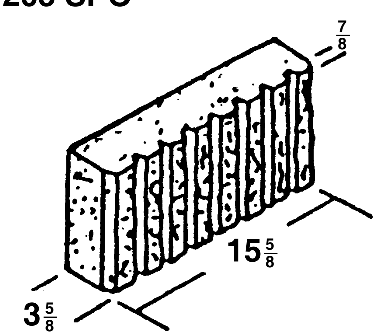
12X8X16
8-FLUTE

204 SPO



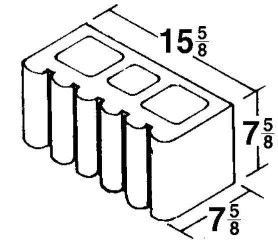
12X8X16
8-FLUTE C-CORED

205 SPO



4X8X16 SOLID SPLIT 8 FLUTE

20 SPO

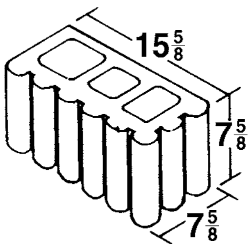


8X8X16
ROUNDED FLUTE

Package/Cube Code o On Pallet Ⓛ Lightweight Ⓒ Concrete △ Combination Cube (SPO) Special Order

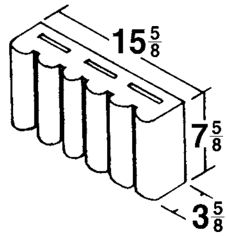
FLUTED BLOCK

21 SPO



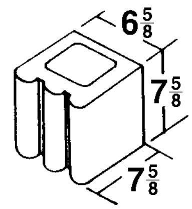
8X8X16
ROUNDED FLUTE CORNER

22 SPO



4X8X16
ROUNDED FLUTE

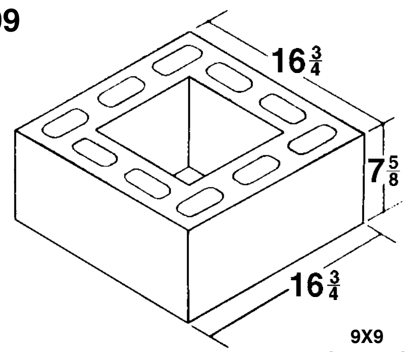
23 SPO



7X8X8
ROUNDED FLUTE

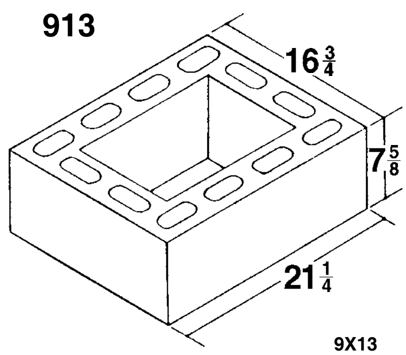
CHIMNEY BLOCK

99



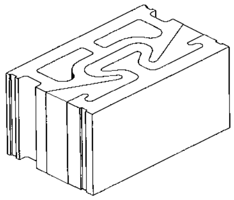
CHIMNEY BLOCK **9X9 OPENING**

913

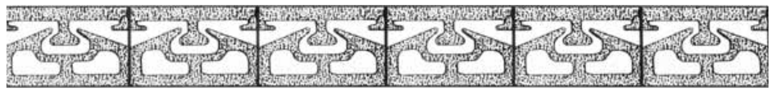


CHIMNEY BLOCK **9X13 OPENING**

NRG WALL SYSTEM



NRG Units are Load Bearing and arrive ready to install using standard methods. They are standard size and weight.



THE NRG WALL SYSTEM PROTECTS AGAINST:

HEAT & COLD

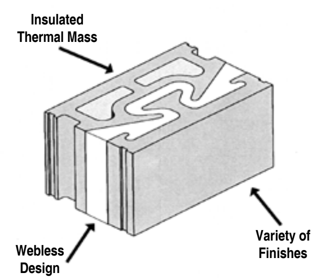
Independent Thermodynamic analysis shows that the NRG Wall System has the following effective R-Values:

8" NRG WALL = R - 20
10" NRG WALL = R - 21
12" NRG WALL = R - 22

The NRG wall's thermal mass works with heating / cooling systems for more efficient modulation of the interior temperature. this wall is webless and provides up to 50 hours of "Thermal Lag" vs. 2 -12 hours of other walls.

NOISE

This wall has built-in acoustic insulation with STC ratings of 53+ that shuts **out** unwanted street sounds, or shuts **in** manufacturing noise.



MOISTURE & MOLD

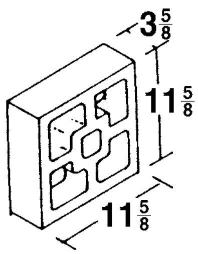
The insulation provides a continuous moisture barrier that can reduce dew point by as much as 80 degrees from outside to inside wall.

The expanded polystyrene (EPS) insert is made of Styropor™ by BASF Corp. The BASF Technical Manual states the following:

> "Micro organisms have no effect on Styropor foams. The material does not offer them a nutrient medium; it does not decay, become moldy or rot."
>
> "Styropor foams have no nourishing value to animals and do not provide a breeding ground for fungi or bacteria."

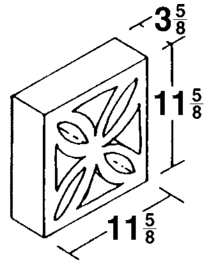
ARCHITECTURAL UNITS

1400



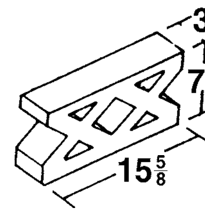
4X12X12
MALTESE

1401



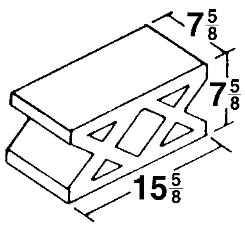
4X12X12
DAISY

1402



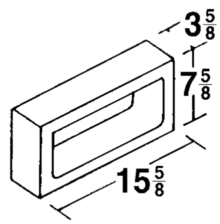
4X8X16
DOUBLE

1403



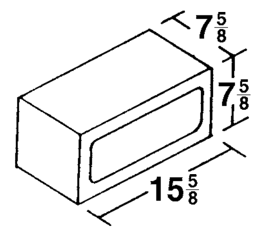
8X8X16
DOUBLE

1404 SPO



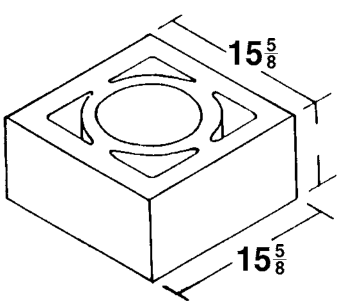
4X8X16
OBLONG

1405 SPO



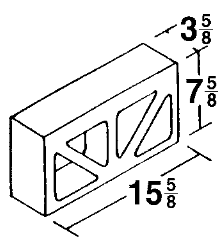
8X8X16
OBLONG

1406 SPO



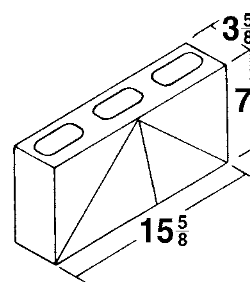
16X8X16
CIRCLE

1407



4X8X16
STYLE 4

418

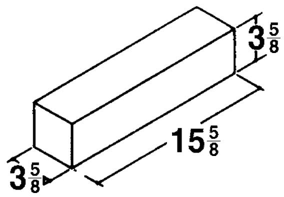


4X8X16
HI-LITE

Package/Cube Code o On Pallet Ⓛ Lightweight Ⓒ Concrete △ Combination Cube (SPO) Special Order

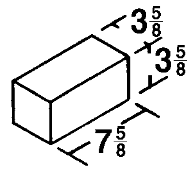
SOLID BLOCK

413



4X4X16
SOLID

415



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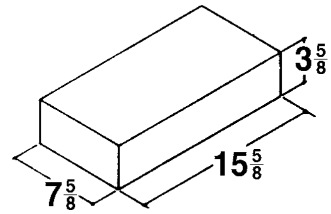

4X8X16
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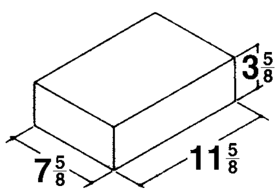

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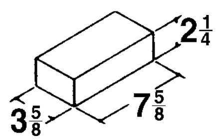

BRICK

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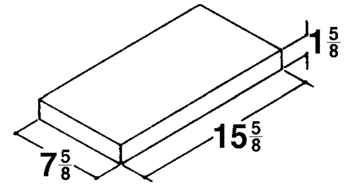
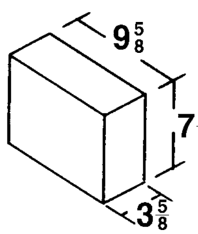


2X8X16
SOLID

1007 SPO



10X8X4
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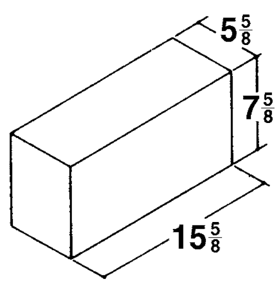
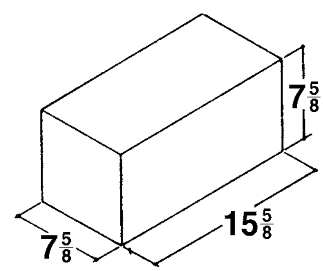
615



6X8X16
SOLID

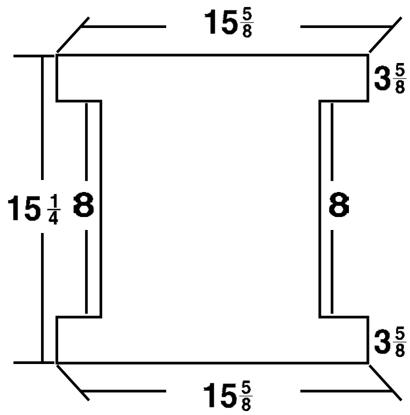
817



8X8X16
SOLID

SLOPE BLOCK

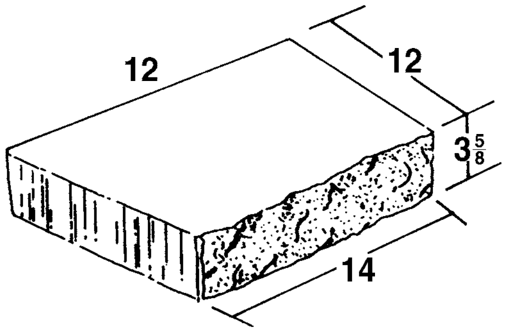
3 5/8 THICK



Package/Cube Code o On Pallet Ⓛ Lightweight © Concrete △ Combination Cube (SPO) Special Order

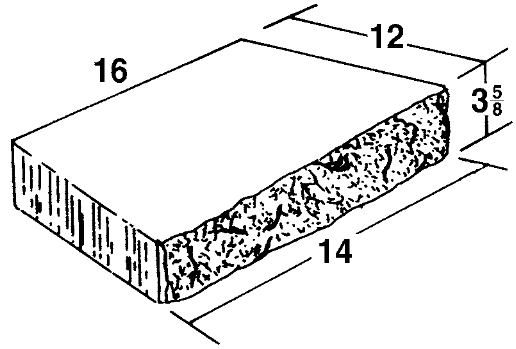
VERSA-LOK COMPONENTS

350



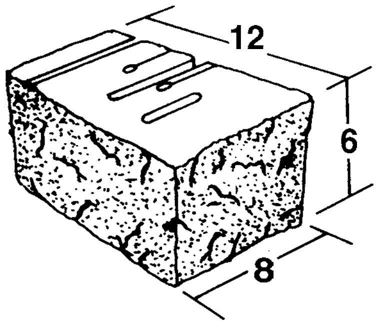
TYPE-B
12X3X14

351



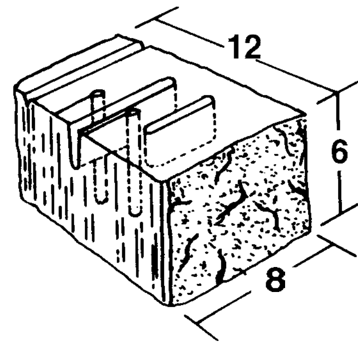
TYPE-A
16X3X14

352



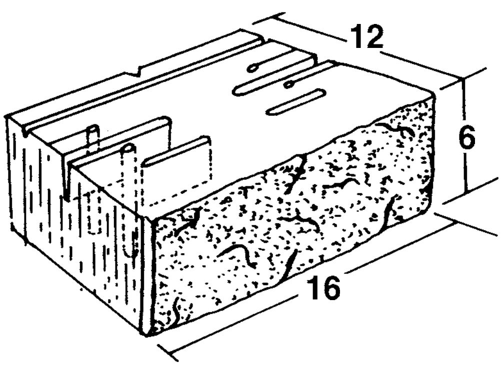
RIGHT
8X6X12

353



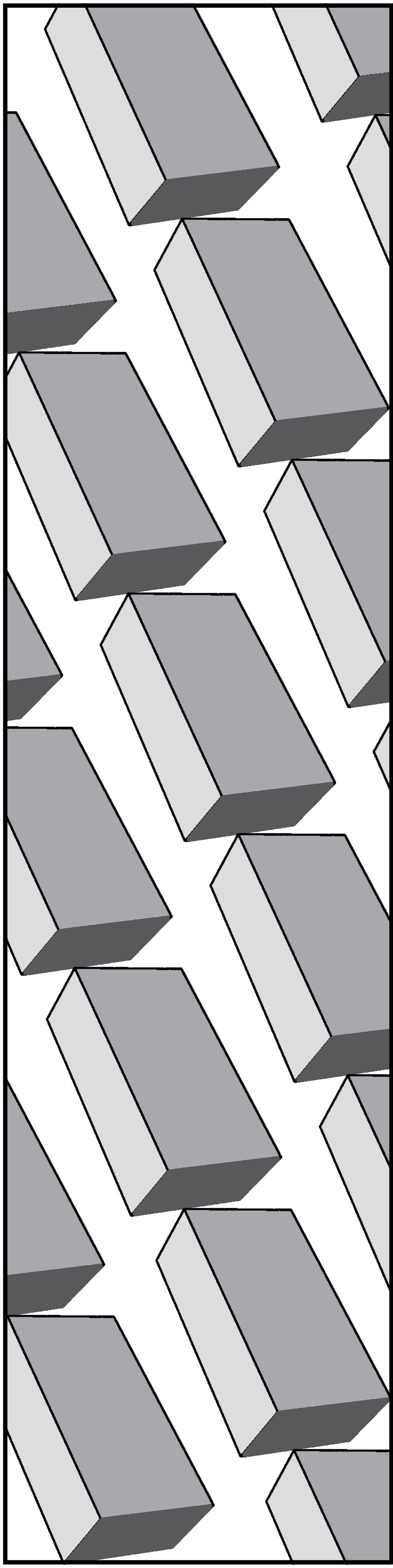
LEFT
8X6X12

354



16X6X12

Package/Cube Code o On Pallet Ⓛ Lightweight © Concrete △ Combination Cube (SPO) Special Order



The Versatility of Ground Stone

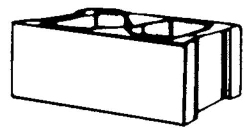
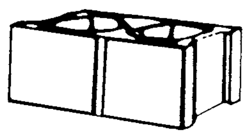
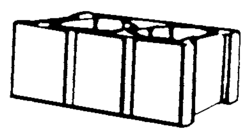
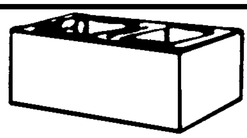
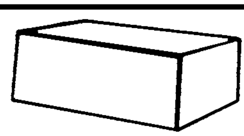
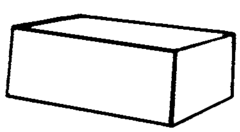
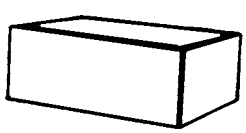
Architectural Ground Stone Masonry Units, by A.C. Krebs, combine the integrity of stone with the natural beauty of exposed aggregates. Ground Stone units are recommended for both interior and exterior applications.

Ground Stone masonry units are suitable for many applications, load bearing or non-load bearing. Single Wythe cavity or composite style wall systems provide the flexibility of outer veneer face and/or a back-up wall inner face.

Designs options are practically limitless. Select Ground Stone for use in full-finished walls, banding courses, or in combinations of these together or with other concrete products such as splitface or smooth face units. Ground Stone may be used to blend or contract with other building finishes.

A.C. KREBS

Available Shapes and Sizes

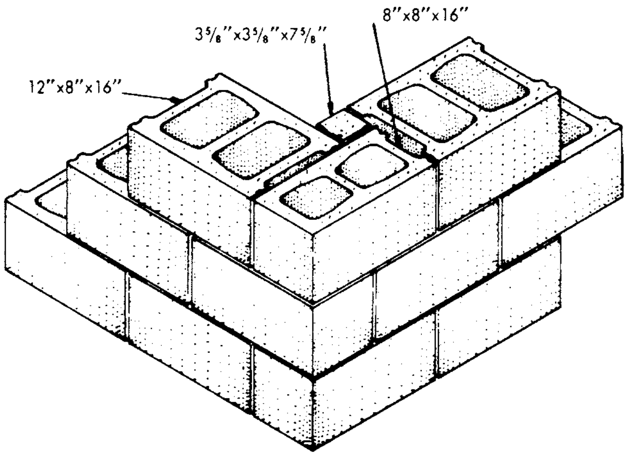
Shapes & Sizes	Normal Dimensions				
	2"	4"	6"	8"	12"
 1 Face (1F)	1F	1F	1F	1F	1F
 1 Face, 1 Score (1F1S)	1F1S	1F1S	1F1S	1F1S	1F1S
 1 Face, 2 Scores (1F2S)	1F2S	1F2S	1F2S	1F2S	1F2S
 1 Face, 1 End (1F1E)	1F1E	1F1E	1F1E	1F1E	1F1E
 1 Face, 1 Top (1F1T)	1F1T	1F1T	1F1T	1F1T	--
 2 Faces, 1 Top (2F1T)	2F1T	2F1T	2F1T	2F1T	--
 1 Face, 1 Top & 1 End (1F1T1E) *Specify left or right end*	1F1T1E	1F1T1E	1F1T1E	1F1T1E	--

Other special shapes available.

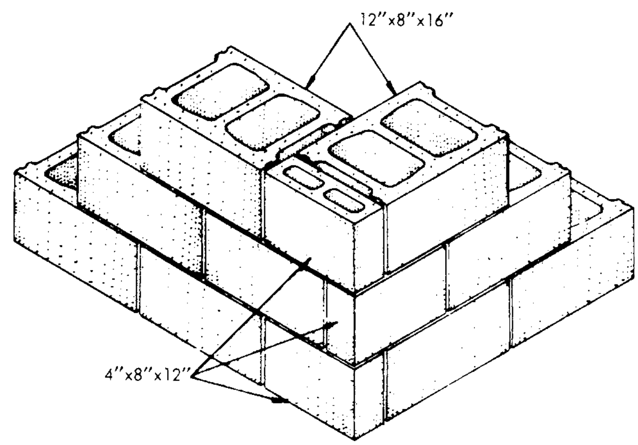
Distributed by:

A.C. KREBS
4000 Crittenden Drive
Louisville, Kentucky
502/367-6431

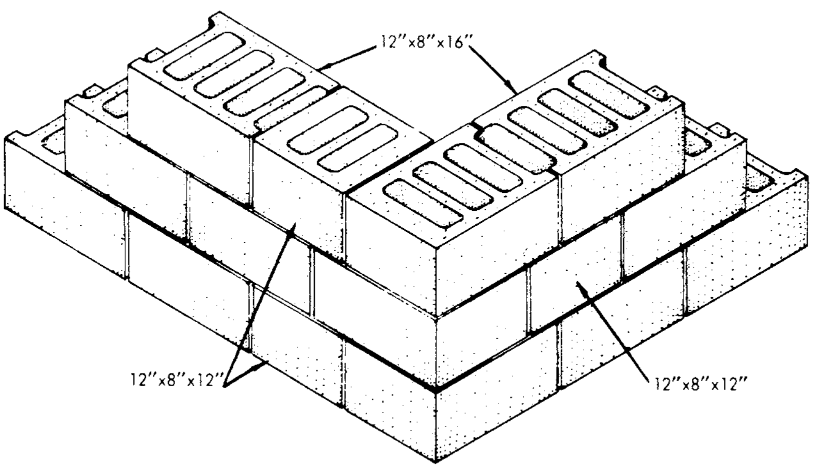
CORNER CONSTRUCTION DETAILS



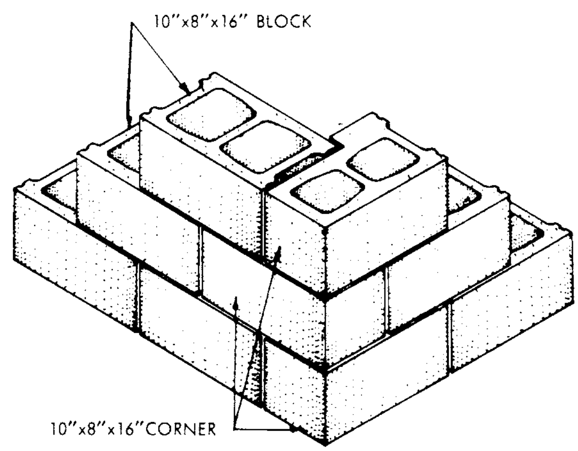
1 1⅝" Wall using 8x8x16 corner and 4x4x8 Brick



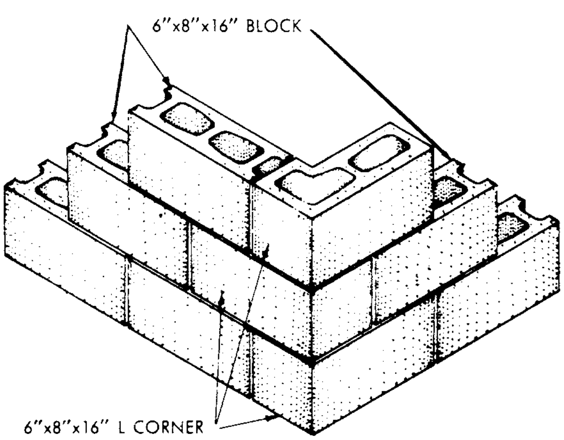
1 1⅝" Wall using 4x8x12 hollow



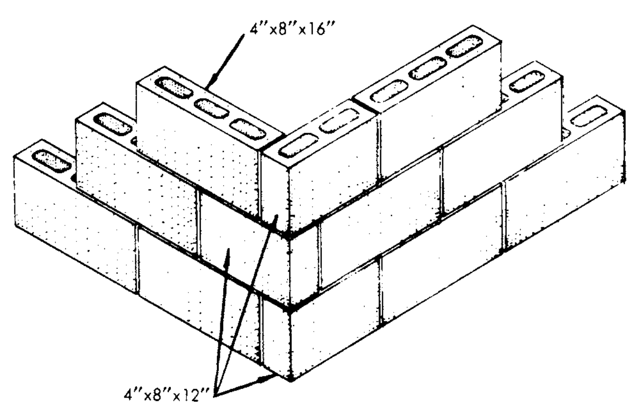
1 1⅝" Wall using 12x8x12 hollow



9⅝" Wall using 10x8x16 "L" Corner



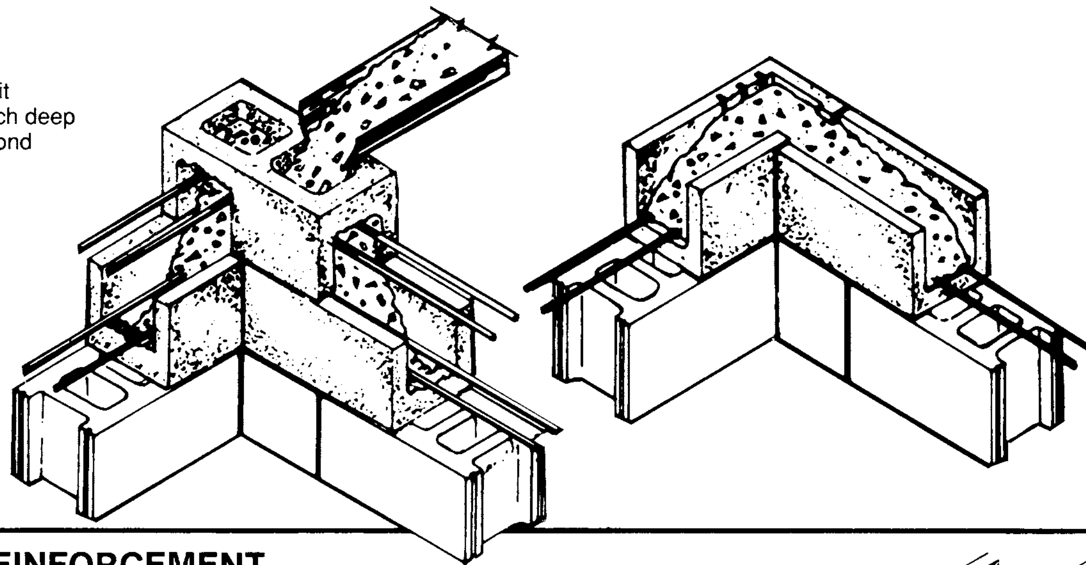
5⅝" Wall using 6x8x16 "L" Corner



3⅝" Wall using 4x8x12 hollow

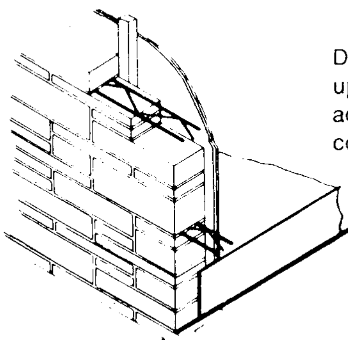
BOND BEAM BLOCK

›tandard size block so designed it permits construction of 8 or 16 inch deep continuous reinforced concrete bond around entire building. Vertical reinforced concrete column can be united with horizontal bond section to attain high strength masonry walls.

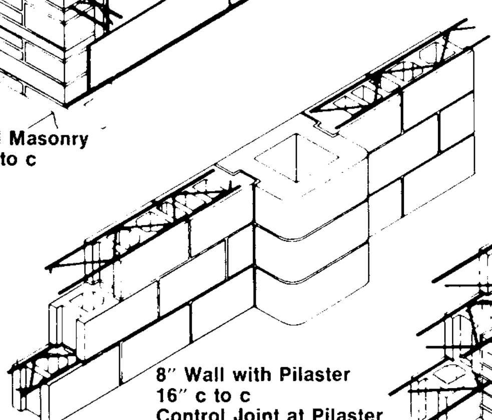


MASONRY WALL REINFORCEMENT

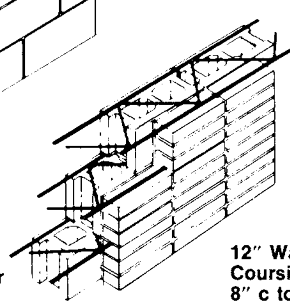
Designed to disperse the result of stresses set up by shrinkage. Available in all wall sizes. Gives additional strength to walls, assuring more rigid construction.



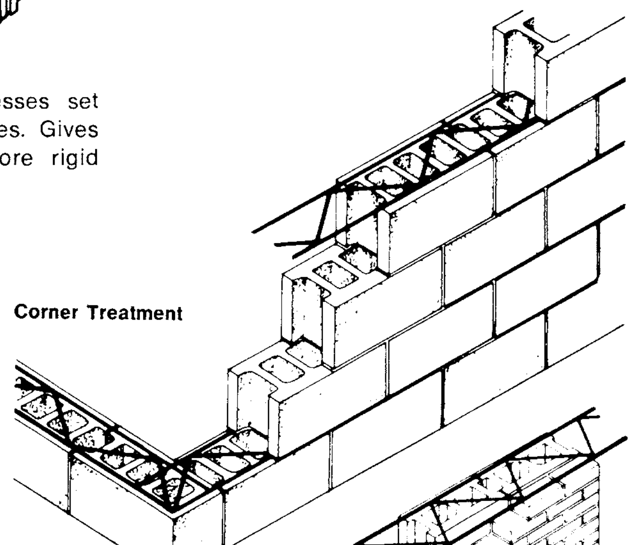
6" Coursed Masonry Wall 16" c to c



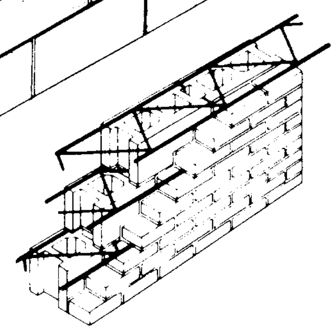
8" Wall with Pilaster 16" c to c Control Joint at Pilaster



12" Wall Stacked Coursing 8" c to c



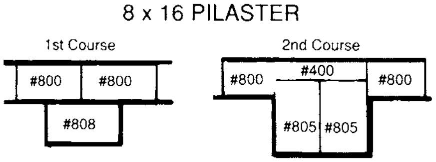
Corner Treatment



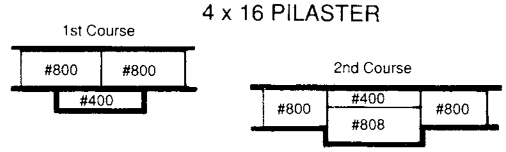
12" Tied Wall 8" c to c

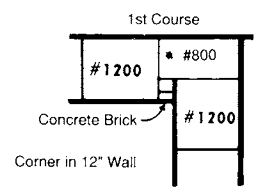
MASONRY DETAILS

8 x 16 PILASTER



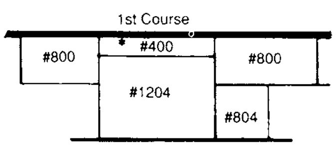
4 x 16 PILASTER



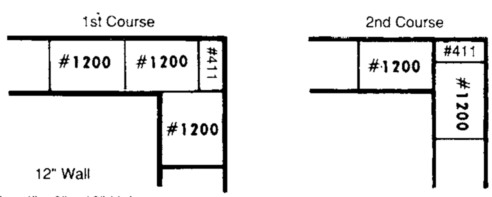


* Reverse for 2nd Course

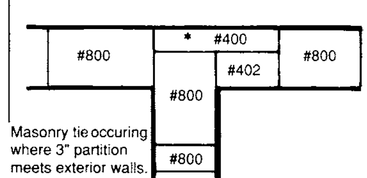
8 x 24 PILASTER



* Reverse for 2nd Course



Using 4" x 8" x 12" Units



* Reverse for 2nd Course

26

ESTIMATING GUIDES

(The figures shown below are intended for **"rule of thumb"** use only)

UNIT QUANTITIES

Standard Block (8x8x16)	- 1.13 block per square foot of wall area.
Regular Brick	- 7.0 brick per square foot of wall area.
Oversize Brick	- 5.5 brick per square foot of wall area.

MORTAR QUANTITIES

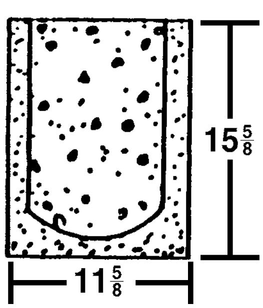
Per 1000 Units	Masonry Cement Bags	Sand Tons
4" and 6" Regular Block	20	2
8", 10" and 12" Regular Blcok	25	2½
Regular Brick	8	1¼

APPROXIMATE VOLUME REQUIRED TO FILL CORE VOIDS IN BLOCK

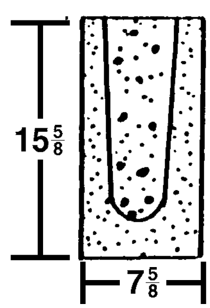
6x8x16	2 core	0.17 cu.ft./block
8x8x16	2 core	0.25 cu.ft./block
8x8x16	3 core	0.22 cu.ft./block
10x8x16	2 core	0.33 cu.ft./block
12x8x16	2 core	0.39 cu.ft./block

Example: 5000 - 8" -2 core H.C. to be filled
5000 x 0.25 = 1250 cu.ft. ÷ 27 (cu.ft. per yard) = 46.30 yards

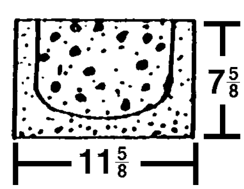
APPROXIMATE QUANTITIES OF CONCRETE REQUIRED TO FILL LINTELS AND BOND BEAMS



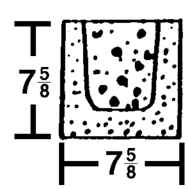
.74 cu.ft. concrete per lin.ft.



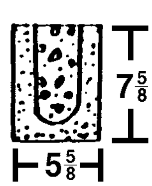
.46 cu.ft. concrete per lin.ft.



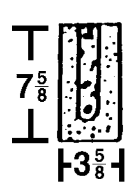
.37 cu.ft. concrete per lin.ft.



.22 cu.ft. concrete per lin.ft.

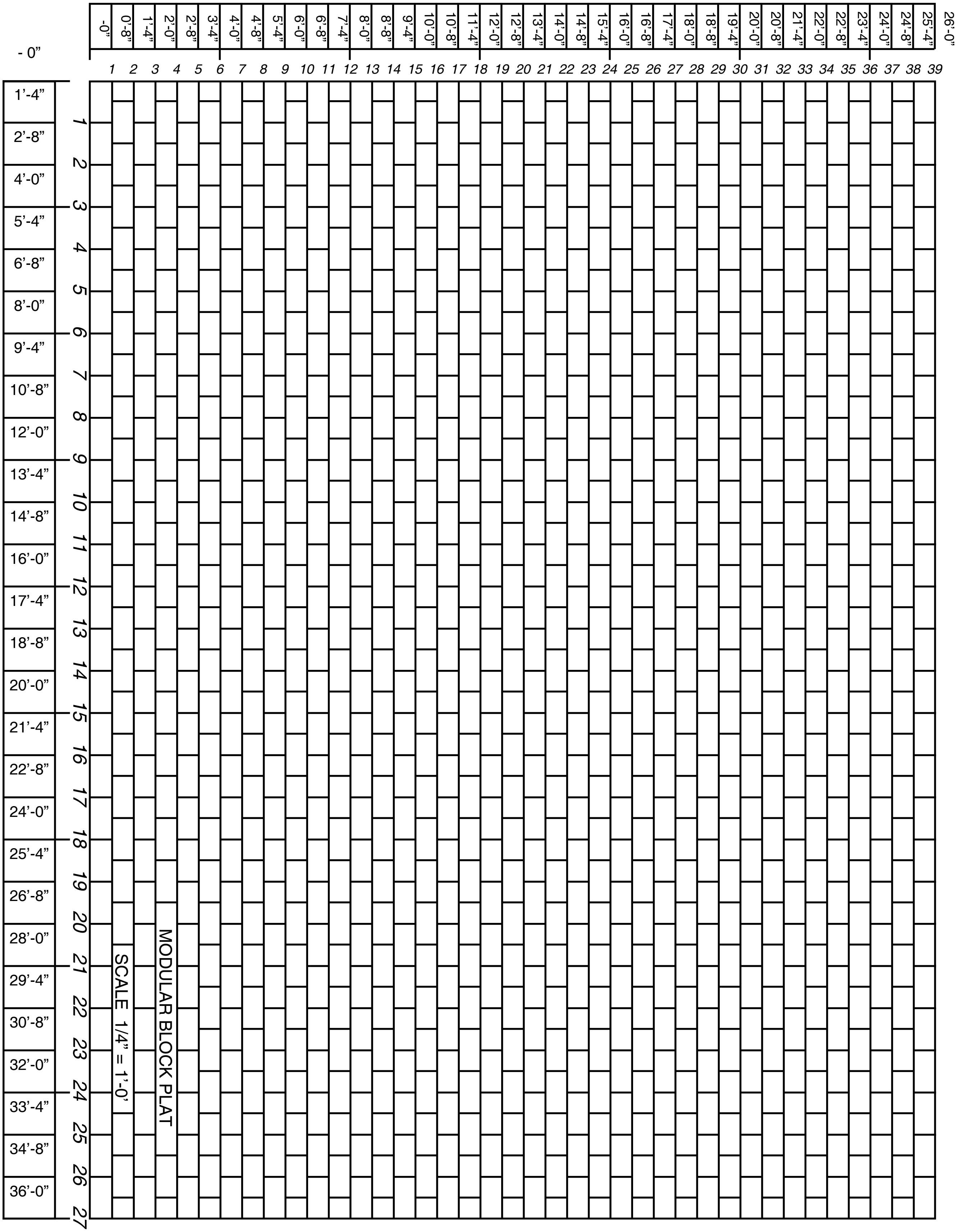


.173 cu.ft. concrete per lin.ft.



.08 cu.ft. concrete per lin.ft.

MODULAR BLOCK PLAT



Specifications for Mortars for Unit Masonry

MORTAR PROPORTIONS BY VOLUME

Mortar Type	Average Compressive Strength at 28 Days, psi *	Parts by Volume of Portland Cement or Portland Blast Furnace Slag Cement	Parts by Volume of Masonry Cement	Parts by Volume of Hydrated Lime or Lime Putty	Aggregate, Measured in a Damp, Loose Condition
M	2500	1 1	1 (Type II) . . .	. . . ¼	Not less than 2¼ and not more than 3 times the sum of the volumes of the cements and lime used.
S	1800	½ 1	1 (Type II) . . .	. . . over ¼ to ½	
N	750	. . . 1	1 (Type II) . . .	. . . over ½ to 1¼	
O	350	. . . 1	1 (Type I or II) . . .	. . . over 1¼ to 1½	
K	75	1	. . .	over 2½ to 4	

* The average compressive strength of three 2-in. cubes of laboratory prepared mortar shall be not less than the strength given in the table above for the mortar type specified.

† Water retention flow after 1 minute suction on all of above is 70%. For mortar flow see ASTM-C-190.

MORTAR TYPES FOR CLASSES OF CONSTRUCTION

ASTM Mortar Type Designation	Construction Suitability
M	Masonry subjected to high compressive loads, severe frost action, or high lateral loads from earth pressures, hurricane winds, or earthquakes. Structures below grade, manholes, and catch basins.
S	Structures requiring high flexural bond strength, but subject only to normal compressive loads.
N	General use in above grade masonry. Residential basement construction, interior walls and partitions. Concrete masonry veneers applied to frame construction.
O	Non-load-bearing walls and partitions. Solid load bearing masonry of allowable compressive strength not exceeding 100 psi.
K	Interior non-load-bearing partitions where low compressive and bond strengths are permitted by building codes.

MORTAR MATERIALS

Material	ASTM Designation	Weight Per Cu. Ft.
Portland Cement (Types I, II, III)	C 150	94
Air Entraining Portland Cement (Types IA, IIA, IIIA)	C 175	94
Blended Cement (Types IS, ISA, IP, IPA, S, SA)	C 595	94
Masonry Cement*	C 91	70-85# Weight on Bag
Quicklime	C 5	80
Hydrated Lime	C 207	50
Aggregate (Sand)	C 144	90-110
Mortar	100 to 110 lbs. per cu. ft.	

* Federal Spec. SS-C181

AGGREGATE FOR MASONRY MORTAR*

Sieve size number	Percentages passing each sieve
4	100
8	95 to 100
16	60 to 100
30	35 to 70
50	15 to 35
100	2 to 15

* ASTM C144.

SPECIAL MORTARS:

White mortar can be made from white portland cement, lime, and white sand. Colored mortar is now made by several companies in a wide range of colors. This is a prepared mortar ready to use with sand and water.

Admixtures for masonry mortars are available in a wide variety, and are functionally classified as agents promoting air entrainment, water retentivity, workability, accelerated set and so on. These are commercially prepared products and therefore should be specified by product name.

Fire Safety With Concrete Masonry

Introduction

Fire-safety precautions and regulations are predicated to a great extent on average performance, incidence, experience, and circumstances. Fire-resistance ratings of concrete masonry walls are based on fire tests conducted by Underwriters' Laboratories, Inc., the National Bureau of Standards, National Research Council of Canada, and other recognized fire-testing laboratories. Methods of fire tests are described in ASTM E 119, "Standard Method of Fire Tests of Building Construction and Materials." The test consists of exposing one side of a wall to a fire of controlled intensity for a time equal to or greater than its rated fire-resistance time. Immediately after firing, the hot face of the wall is subjected to a fire hose stream. During the test, loadbearing walls also carry a specified compressive load; and the wall must withstand the fire and the hose stream without passage of flame or gases. Also, heat transmission through the wall must be limited to less than 250° F average gain in temperature.

Results of such tests are the most useful tools we have for estimating the performance of the types of construction materials.

Concrete Masonry in Fire Protection

The resistance of concrete masonry to fire is well established and has been found by research to be a function of the type of aggregate employed in manufacture of the units and their equivalent solid thickness. During a standard fire test, the endurance of concrete block walls (their fire resistance rating) is invariably determined by temperature rise on the unfired, cold side. Few concrete masonry walls have ever failed during the fire test due to loading or due to the sudden cooling by the fire hose stream. Fire resistance rating can be reliably estimated from a knowledge of the aggregate type used in the block and equivalent thickness. Table I lists the equivalent thicknesses required for the different aggregate types and fire resistance ratings found in model building codes. As may be noted, differences in the codes are minor. Similar rationale is contained in other codes such as the National Building Code of Canada.

Equivalent thickness of hollow units is calculated from actual thickness and the percentage of solid materials (see calculation of equivalent thickness). Both needed items of information are normally reported by the testing laboratory using standard ASTM procedures listed in ASTM C 140 "Methods of Sampling and Testing Concrete Masonry Units." When walls are plastered or otherwise faced with fire-resistant materials, the thickness of these materials is included in calculating the equivalent thickness effective for fire resistance.

Although numerous fire tests on concrete masonry walls have been conducted, it would be almost impossible to test all combinations of unit sizes, shapes, and aggregate types used in construction. The equivalent thickness approach enables one to reliably determine fire resistance of concrete masonry assemblages that may not have been tested. At the same time, it may sometimes be helpful or advantageous to refer to results of a particular fire test in solving a fire resistance requirement. For this purpose the information contained in Table 2 is provided.

Calculating Equivalent Thickness

Equivalent thickness is the solid thickness that would be obtained if the same amount of concrete contained in a hollow unit were re-cast without core holes.

Calculating Estimated Fire Resistance Example

An 8" hollow masonry wall is constructed of expanded slag units reported to be 55%* solid. What is the estimated fire resistance of the wall?

(modular units)

Eq Th = 0.55 x 7.625 in. = 4.19 inches

From Table: 3 hr. Fire Resistance requires 4.00 inches

** Percentage solid can be deducted from net area or net volume values as determined by ASTM C 140 "Methods of Testing Concrete Masonry Units."*

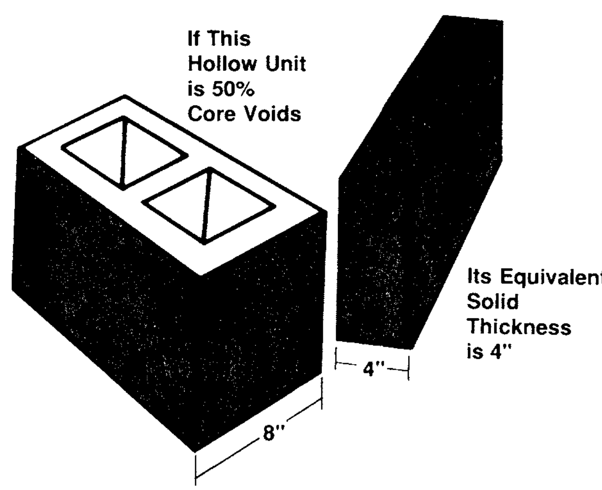


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TABLE I Summary of Building Code Estimated Fire Resistance Ratings for Concrete Masonry Walls of Various Equivalent Thicknesses

UNIFORM BUILDING CODE—
International Conference of Building Officials 1985 Edition and 1986 Supplement

Section 4302 (a) For the purpose of determining the degree of fire resistance afforded, the materials of construction shall be assumed to have the fire resistance rating indicated in Table No. 43-B

TABLE NO. 43-B
Rated Fire-Resistance Periods for Various Walls and Partitions

Material	Item Number	Construction	Minimum Finished Thickness Face-to-Face (in inches) 4 Hr.	3 Hr.	2 Hr.	1 Hr.
Concrete Masonry Units	30	Expanded Slag or pumice	4.7	4.0	3.2	2.1
	31	Expanded clay, shale or slate	5.1	4.4	3.6	2.6
	32	Limestone, cinders or air cooled slag	5.9	5.0	4.0	2.7
	33	Calcareous or siliceous gravel	6.2	5.3	4.2	2.8

Thickness shown for concrete masonry is equivalent thickness defined as the average thickness of solid material in the wall and is represented by the formula:

$$T_E = \frac{V_n}{L \times H}$$

Where:

T_E = Equivalent thickness, in inches
V_n = Net volume (gross volume less volume of voids), in cubic inches
L = Length of block, in inches
H = Height of block, in inches

Thickness includes plaster, lath and gypsum wallboard, where mentioned, and grout when all cells are solid grouted.

The equivalent thickness may include the thickness of portland cement plaster or 1.5 times the thickness of gypsum plaster applied in accordance with the requirements of Chapter 47 of the code.

The equivalent thickness of units composed of blends of two or more aggregate categories shall be determined by interpolating between the equivalent thickness values specified in Table No. 43-B in proportion to the percent by volume of each aggregate.

The equivalent thickness required to provide a desired fire-resistive time period for concrete masonry composed of units manufactured with fine aggregates passing a No. 4 sieve listed in Item No. 33 of Table No. 43-B blended with aggregates listed in Item No. 30 or 31 shall be determined by interpolating between the equivalent thickness values specified in Table No. 43-B in proportion to the percent by volume of each aggregate as follows:

1. $ET_{required} = ET_{33} \times V_{33} + ET_{30} \times V_{30}$
2. $ET_{required} = ET_{33} \times V_{33} + ET_{31} \times {}_{31}$

The required equivalent thickness of concrete masonry units manufactured with aggregates listed in Items Nos. 30, 31 and 33 of Table No. 43-B shall be determined as follows:

3. $ET_{required} = ET_{33} \times V_{33} + ET_{31} \times (V_{30} + V_{31})$

Where:

$ET_{30}, ET_{31}, ET_{33}$ = specified equivalent thickness for Items Nos. 30, 31, and 33 of Table No. 43-B.
V_{30}, V_{31}, V_{33} = volume of aggregates expressed as a percentage of the total aggregate volume for Item No. 30, 31, or 33 of Table No. 43-B.

Concrete masonry construction meeting the equivalent thicknesses required for a two-hour rating under Item 30, 31, 32 or 33 and having a minimum finished thickness face to face of 7 5/8 inches shall be rated as four-hour fire-resistive construction when cores that are not solid grouted are filled with silicone-treated perlite loose-fill insulation conforming to U.B.C. Standard No. 43–10.

SOUTHERN STANDARD BUILDING CODE
Southern Building Code Congress
1985 Edition (Appendix "P")

P-3101.5 The fire resistance ratings of walls and partitions constructed of concrete masonry units shall be determined from Table P-3101.5. The rating shall be based on the equivalent thickness of the masonry and type of aggregate used.

TABLE P-3101.5
Minimum Equivalent Thickness (Inches) of Loadbearing or Nonloadbearing Concrete Masonry Walls

Type of Aggregate	Fire Resistance Rating (hours) 0.50	0.75	1	1.25	1.50	1.75	2	2.25	2.50	2.75	3	3.25	3.50	3.75	4
Pumice or Expanded Slag	1.5	1.9	2.1	2.5	2.7	3.0	3.2	3.4	3.6	3.8	4.0	4.2	4.4	4.5	4.7
Expanded Shale, Clay or Slate	1.8	2.2	2.6	2.9	3.3	3.4	3.6	3.8	4.0	4.2	4.4	4.6	4.8	4.9	5.1
Limestone, Cinders, or Unexpanded Slag	1.9	2.3	2.7	3.1	3.4	3.7	4.0	4.3	4.5	4.8	5.0	5.2	5.5	5.7	5.9
Calcareous Gravel	2.0	2.4	2.8	3.2	3.6	3.9	4.2	4.5	4.8	5.0	5.3	5.5	5.8	6.0	6.2
Siliceous Gravel	2.1	2.6	3.0	3.5	3.9	4.2	4.5	4.8	5.1	5.4	5.7	6.0	6.2	6.5	6.7

Values between those shown in the Table can be determined by direct interpolation.

Equivalent thickness is the average thickness of the solid material in the wall. It may be found by taking the total volume of a wall unit, subtracting the volume of core spaces, and dividing this by the area of the exposed face of the unit.

Where combustible members are framed into the wall, the thickness of solid material between the end of each member and the opposite face of the wall, or between members set in from opposite sides, shall not be less than 93% of the thickness shown in the table.

P-3101.6 Where all the core spaces of hollow or solid masonry are filled with loose fill material, such as vermiculite, perlite, or expanded shale, clay, slate or slag, the equivalent thickness of the masonry shall be assumed to be the actual wall thickness.

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BOCA BASIC/NATIONAL BUILDING CODE
Building Officials Conference of America, Inc.
1988 Supplement

903.1.3 Concrete Masonry Construction: Firesistance ratings of walls constructed with concrete masonry units of various equivalent thicknesses shall be in accordance with Table 903.1.3. Equivalent thickness is the solid thickness of masonry. For fully grouted cored units, it is the actual thickness of the masonry. For masonry of cored units, it is thickness that would result if the same volume of concrete were recast without hollow spaces (actual thickness × percent solid ÷ 100). Where walls are plastered or faced with gypsum wallboard, values in the table include the thickness of portland cement plaster, 1.5 times the thickness of gypsum plaster, or the thickness of the gypsum wallboard. Where combustible members are framed into the wall, the wall must be of such thickness or be so constructed that the thickness of solid material between the end of each member and the opposite face of the wall, or between members set in from opposite sides, will be not less than 93 percent of the thicknesses shown in Table 903.1.3.

TABLE 903.1.3
Minimum Equivalent Thickness
Inches, For Ratings of (see Section 903.1.3)

	4 hr.	3 hr.	2 hr.	1½ hr.	1 hr.	¾ hr.	½ hr.
Calcareous or siliceous gravel	6.2	5.3	4.2	3.6	2.8	2.4	2.0
Expanded clay, shale or slate	5.1	4.4	3.6	3.3	2.6	2.2	1.8
Expanded slag or pumice	4.7	4.0	3.2	2.7	2.1	1.9	1.5
Limestone cinders or slag	5.9	5.0	4.0	3.4	2.7	2.3	1.9

903.1.3.1 Increasing ratings: Walls composed of hollow concrete masonry units having a nominal thickness of 8 inches or greater and having a fireresistance rating of at least 2 hours shall be classified as 4 hours when the hollow spaces are completely filled with perlite or vermiculite, grout or a material such as expanded slag, clay, shale, slate or sand.

TABLE 2
Fire Tests—Masonry Walls

Aggregate Type	Details of Construction	Rating
Pumice	10 in. units 60% solid; unplastered (2)	4 hrs.
	4 in. units 100% solid; unplastered (8)	3 hrs.*
	4 in. units 75% solid; plastered on one side with 5/8 in. gypsum and sand plaster (8)	2 hrs.*
	4 in. units 63% solid; unplastered (1,2)	1 hr.*
Expanded Slag	10 in. unplastered cavity wall of two 4 in. wythes 2 in. apart; units 63% solid (1,2)	4 hrs.
	4 in. units 63% solid; plastered on one side with ½ in. 1:3 gypsum and sand plaster; other side faced with 3-¾ in. brick (1,2)	4 hrs.
	6 in. units 76% solid; unplastered (1,2)	3 hrs.
	6 in. units 61% solid; unplastered (1,2)	2 hrs.*
	6 in. units 50% solid; plastered on one side with ½ in. 1:3 gypsum and sand plaster (1,2)	2 hrs.*
	4 in. units 76% solid; plastered on one side with ½ in. 1:3 gypsum and sand plaster (1,2)	2 hrs.*
	3 in. units 76% solid; plastered on both sides with ½ in. 1:3 gypsum and sand plaster (1,2)	2 hrs.*
	4 in. units 63% solid; plastered on one side with ½ in. 1:3 gypsum and sand plaster (1,2)	1½ hrs.*
	4 in. units 63% solid, unplastered (1,2)	1 hr.*
Expanded Shale, Clay and Slate	10 in. units 60% solid; unplastered (1,2)	4 hrs.
	6 in. units 89.1% solid; unplastered (7)	4 hrs.*
	6 in. units 61% solid; unplastered; faced with 2-¼ in. brick (1,2)	4 hrs.
	6 in. units 89.4% unplastered (8)	4 hrs.*
	8 in. units, minimum face shell thickness 1-½ in. minimum end shell thickness 1-5/16 in. and minimum web thickness 3-1/16 in. unplastered. Concrete studs built into wall on 2 ft. centers by filling every third cell along the length of the wall. Each stud reinforced with ½ in. round bar. (3)	2 hrs.*
	4 in. units 76% solid; unplastered on one side with ½ in. 1:3 gypsum and sand plaster (2)	2 hrs.*
	6 in. units 68.8% solid; unplastered (5)	2 hrs.*
	4 in. units 100% solid; unplastered (6)	2 hrs.*
	6 in. units 61% solid; unplastered (1,2)	1½ hrs.*
	3 in. units 76% solid; plastered on both sides with ½ in. 1:3 gypsum and sand plaster (1,2)	1½ hrs.*
	4 in. units 67.7% solid; unplastered (8)	1 hr.*
Cinder	4 in. units 63% solid; plastered on one side with ½ in. 1:3 gypsum and sand plaster; other side faced with 3-¾ in. brick (1,2)	4 hrs.
	6 in. units 61% solid; unplastered faced with 2-¼ in. brick (2)	4 hrs.
	10 in. unplastered cavity wall of two 4 in. wythes 2 in. apart; units 63% solid (1,2)	3 hrs.
	6 in. units 61% solid; plastered on one side with ½ in. 1:3 gypsum and sand plaster (1,2)	2 hrs.*
	6 in. units 50% solid; plastered on both sides with ½ in. 1:3 gypsum and sand plaster (1,2)	2 hrs.*
	6 in. units 61% solid; unplastered (1,2)	1½ hrs.*
Calcareous Gravel	8 in. units 78% solid; unplastered (9)	3 hrs.
	8 in. units 57% solid; unplastered (9)	2 hrs.
	4 in. units 63% solid; plastered on both sides with ½ in. 1:3 gypsum and sand plaster (1,9)	1½ hrs.*
	6 in. units 66.3% solid; unplastered (8)	1½ hrs.*
	10 in. unplastered cavity wall of two 4 in. wythes 2 in. apart; units 63% solid (1,9)	1 hr.
	4 in. units 73.5% solid; unplastered (8)	1 hr.*
Siliceous Gravel	12 in. unplastered wall consisting of 8 in. units 57% solid and 4 in. units 67% solid (1,9)	4 hrs.
	12 in. units 58% solid; plastered both sides with ½ in. 1:3 gypsum and sand plaster (9)	4 hrs.
	6 in. units 64.5% solid; unplastered (8)	1½ hrs.*
	4 in. units 74% solid; plastered on both sides with ½ in. 1:3 gypsum and sand plaster (1,9)	1 hr.*
	4 in. units 71.6% solid; unplastered (8)	1 hr.*

*Nonbearing

continued next page

Calculating Fire Resistance

Supplementary to the equivalent thickness method and to specific fire tests, another acceptable method of determining fire resistance of masonry composite or cavity walls is by calculation. A calculation procedure is given in "Fire Resistance Classifications of Building Constructions," Appendix B, BMS 92, National Bureau of Standards. It is used for walls composed of two or more wythes or laminae, where the fire resistance period of the wythes or laminae are known; an example of this is a cavity wall consisting of 4" solid brick, 2" air space and 4" hollow block. The fire resistance of the wall is calculated from the formula.

$$R = (R_1^{0.59} + R_2^{0.59} + R_3^{0.59})^{1.7}$$

in this example,

R = fire resistance period of wall
R_1 = fire resistance period of brick wythe = 1 hr.
R_2 = fire resistance period of air space*
R_3 = fire resistance period of block wythe = 1 hr.

therefore

$$R = (1 + 0.3 + 1)^{1.7} = (2.3)^{1.7} = 4.12 \text{ hrs.}$$

*See Table 3 for $R^{.59}$ of plaster and continuous air space.

TABLE 3
Fire Reistance Properties for Miscellaneous Components

Component		$R^{.59}$
1/2 in. 1:3 sanded gypsum plaster	one side	.30
	both sides	.60
5/8 in. 1:3 sanded gypsum plaster	one side	.37
	both sides	.75
3/4 in. 1:3 sanded gypsum plaster	one side	.45
	both sides	.90
Continuous air space 1/2 in. to 3-1/2 in.	one space	.30
	two spaces	.60

Reference: "Fire Resistance Classifications of Building Construction," BMS 92, National Bureau of Standards.

References

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8. Fire Endurance of Selected Non-Loadbearing Concrete Masonry Walls, National Research Council of Canada, Fire Study No. 25, March, 1970.
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NATIONAL CONCRETE MASONRY NCMA ASSOCIATION

Reprinted from National Concrete Masonry Association Information Series

COLD WEATHER CONCRETE MASONRY CONSTRUCTION

INTRODUCTION

Seasonal effects on the construction industry and the economy in general are well documented. The U.S. Department of Commerce estimates that temporary delays and stoppages of construction projects due to inclement weather cost the nations economy over 10 billion dollars annually. This is reflected in many different ways. Building costs escalate and owners and businessmen suffer from lost rentals and sales revenues when stores, offices and factories are not completed on schedule. Idled workers must depend on unemployment compensation to support their families. As a result, retails sales lag and less money is available for deposit in savings accounts. A survey of mason contractors alone indicates that, on the average, skilled masons are unable to work approximately one-third of the year due to bad weather.

It is therefore evident that it is no longer possible to economically justify delaying or shutting down a project during the winter months. Winterizing and continuing masonry work during the cold months may increase the total contract price by .7f percent to 1.5 percent. This added cost in most cases is easily offset by the economic benefits of early completion.

Experience in Canada, northern Europe and several U.S. Cities has demonstrated that the effects of adverse weather conditions can be overcome with proper planning and the use of proven techniques. One of the prime requisites of successful cold weather construction is advance knowledge of local conditions. Required data fall into two general categories: climatology, which may be defined as the historic record of the average and extremes of the weather representative of the project area; and Meteorology, which may be defined as the current state (hour-to-hour or day-to-day) atmospheric conditions. The best source for both types of information is the U.S. Weather Bureau, Environmental Science Services Administration (ESSA), of the U.S. Department of Commerce.

Individual planning for an all weather masonry construction project is usually concerned with the climatological data, the average and extreme daytime and nighttime temperatures and wind velocities for the expected period of construction. The contractor, who is responsible for the execution of the project, is generally more interested in the immediate meteorogical condition, hourly temperatures during the day and early into the next morning.

The purpose of this TEK is to describe how masonry materials react under adverse either conditions and provisions which must be made to insure that construction can continue without interruption under these conditions.

Mortar and Grout Performance

General

Hydration and strength development in mortar proceed only at temperatures above freezing and only when sufficient water is available. However, cold weather masonry construction may proceed at temperatures below freezing, provided the mortar ingredients are heated and, as the ambient temperature decreases, the masonry units and the structure are maintained above freezing during the early hours after construction.

Mortars mixed using cold but unfrozen materials possess plastic properties quite different from their normal temperature counterparts. Mortars mixed at low temperature have lower water contents, longer setting and hardening times, higher air contents and lower early strength than those mixed at normal temperatures. Heated mortar materials produce mortars with performance characteristics identical to those in the normal temperature range.

Effects of Freezing

Frozen mortar takes on an outward appearance of being hardened mortar, as evidenced by its ability to support loads in excess of its unfrozen counterpart and its ability to bond to surfaces. The water content of mortar during freezing is considered a significant factor affecting its freezing characteristics. Mortars possessing water contents in excess of 6 to 8 % expand on freezing. Expansion increases as the water content increases, so every effort should be made, through the selection of masonry units or protection, to reduce the mortar water content from the initial 11% to 16% range to some value below 6% to avoid the disruptive expansion forces.

Loss of Water

The early freezing of mortar does not significantly reduce either transverse or compressive strength. The effects of cure condition on the strength of masonry that is subjected to long periods of freezing, where freeze drying or evaporation reduced the water content, is unknown. Mortar once frozen and dried may be expected to suffer a strength reduction. Consequently, mortars once frozen should be supplied additional water or allowed to absorb natural water to reactivate the portland cement hydration process for further strength development.

Grout is a close relative of mortar in composition and performance characteristics. During cold weather, however, special attention must be discredited toward the protection of grout or disruptive expansion will occur.

Like their masonry mortar counterparts, grouts undergo the hydration process, gain strength, cool down, protection through materials heating or enclosures. Unlike it mortar counterpart, grouts are confined within the enclosed cells of hollow concrete masonry units. To maintain grout fluidity and mobility during the groutling, water contents must be maintained at a very high level. These conditions make the grouted masonry particularly vulnerable to disruptive expansion with early freezing.

Materials

General

Cold weather masonry construction does not dictate and drastic changes of mortar or grout mixtures or the masonry units. Materials selected for normal temperature construction will generally require little change during construction at low temperatures. The masonry units, mortar and grout should conform to requirements of applicable ASTM Specifications.

Cement

During cold weather masonry construction, it may be advisable to substitute Type III, High-Early Strength Portland Cement as a direct replacement for Type I, Normal Portland Cement, in mortar or grout. Type III cement, because of its more rapid early age strength development characteristics, will provide greater internal protection for the masonry mortar.

Admixtures

In cold weather masonry construction, admixtures such as antifreezes, accelerators, corrosion inhibitors, coloring agents, and air entraining agents are often encountered. Most of the commercially available "antifreeze" admixtures are misidentified. They are accelerators rather than mortar freezing point depressants. Some actual antifreeze admixtures, including several types of alcohol, are available. If used in quantities that will significantly lower the freezing point of mortar, the compressive and bond strengths of the masonry may decrease rapidly. Since antifreeze compounds have little benefit, they are not recommended.

The purpose of an accelerator is to hasten the hydration of the portland cement in the mortar. Calcium chloride is the most commonly used accelerator. It is also the main ingredient in most proprietary cold weather admixtures. Although calcium chloride is an effective accelerator, it may produce undesirable side effects such as corrosion failures of joint reinforcement, door bucks, metal ties and anchors in masonry. Also, excessive salts can contribute to efflorescence and may cause masonry spalling. Accordingly, calcium chloride should not be permitted in masonry containing metal ties, anchors and reinforcement. If used, it is recommended that it be limited to amounts not to exceed 2% of the portland cement by weight. The effects of commercial accelerators containing corrosion inhibitors on masonry and cold weather masonry construction has not been evaluated. Consequently, the use of such accelerators cannot be recommended.

Material Storage

All masonry units, when delivered to the job site, must be carefully stored. Sand, when bulk delivered, should be covered to prevent the entrance of water from rain or melted snow. Consideration should be given to methods of stockpiling the sand that permit heating when lower temperatures warrant this construction practice. Bagged materials and masonry units should be stored elevated to prevent moisture migration from the ground to the materials, and then protected against water penetration through the sides and top.

Coverings should be properly installed so that all materials are completely covered. Tarpaulins, reinforced paper, polyethylene or other water repellent sheet material may be used. If the weather and size of the project warrant, a shelter may be provided for the materials storage and mortar mixing areas.

Materials Heating

The most convenient method of increasing the temperature of mortar or grout during cold weather is to heat the water. Heating only the water will be satisfactory if the other construction materials are unfrozen.

The mixing water should be heated sufficiently to produce temperatures between 40° F and 120°F. Once a temperature has been selected in this range, every effort should be made to maintain this temperature for consecutive batches.

Sand should be heated when the temperature of the sand is below freezing (32°F).

When the temperature of dry masonry units is below 20°F they should be heated so they are above 20°F at their time of use. Wet frozen masonry units should be thawed without overheating. These heating requirements prevent rapid cooling of the heated mortar or grout as it comes into contact with the masonry units. Even when the temperature is above 20°F, it may be advantageous to heat the units for greater mason productivity.

Protection

General

An enclosed construction site is maintained at the normal temperature (greater than 40°F) would be ideal for all cold weather construction. Economics, however, dictates how elaborate the protection can be, whereas ambient temperature dictates when the protection is needed or when work stoppage should be enacted. A balance of mason productivity and structure protection with economics is required. Because each case is different, specific procedures should be designed for each particular job. The range of protection may go from a simple windbreak to a completely enclosed structure.

Types

Enclosures and windbreaks are temporary and therefore are designed to fit a particular job. They can range in size from a single insulation blanket to an elaborate shelter which protects the entire work area.

Materials commonly used for protection are canvas and synthetic coverings (reinforced polyethylene and vinyl). The ingenuity of the individual contractor sometimes is exhibited by the use of other materials for protection. Such characteristics as strength, durability, flexibility, transparency, fire resistance, and ease of installation should be considered when selecting protection material. In most instances, an unheated enclosure reduces the chill factor (temperature plus wind), and provides the degree of protection that is adequate for most masonry construction.

SUMMARY

Cold weather masonry construction and its quality control require additional attention to construction and protection. Attention should be directed to the following details as well as those normally considered.

- Construction materials should be received stored, and protected in ways that prevent water from entering the materials.
- If climatic conditions warrant, temperatures of construction materials should be measured; frozen sand and wet masonry units must be thawed.
- Masonry units below 20°F must be heated above 20°F.
- Mortar ingredients should be heated to produce mortar temperatures between 40°F and 120°F. Every effort should be made to produce consecutive batches of mortar with the same temperatures falling within this range. The mortar temperature after mixing and before use should be above 40°F, maintainable either by auxiliary heaters under the mortar board or by more frequent mixing of mortar batches. Heated mortar should not become excessively hot (greater than 120°F).
- During below-normal temperatures, masonry should be placed only on sound unfrozen foundations. Masonry should never be placed on a snow or ice-covered surface, because of the danger of movement when the base thaws and the possibility of very little bond being developed between the mortar and the supporting surface.
- At the end of the day, the top surface of all masonry should be protected to prevent moisture, as rain, snow or sleet, from entering the masonry. This protection must cover the top surface and should extend a minimum of 2 feet down all sides of the masonry.

COLD WEATHER MASONRY RECOMMENDATIONS

MORTAR

WORK DAY TEMPERATURES	CONSTRUCTION REQUIREMENTS	PROTECTION REQUIREMENTS
Above 40°F	Normal masonry procedures	Cover walls with plastic or canvas at end of work day to prevent water entering masonry.
40°F - 32°F	Heat mixing water to produce mortar temperatures between 40°F - 120°F.	Cover walls and materials to prevent wetting and freezing. Covers should be plastic or canvas.
32°F - 25°F	Heat mixing water and sand to produce mortar temperatures between 40°F - 120°F.	With wind velocities over 15 mph provide windbreaks during the work day and cover walls and materials at the end of the day to prevent wetting and freezing. Maintain masonry above freezing for 16 hours using auxiliary heat or insulated blankets.
20°F - 0°F	Heat mixing water and sand to produce mortar temperatures between 40°F - 120°F.	Provide enclosures and supply sufficient heat to maintain masonry enclosure above 32°F for 24 hours.

GROUT

WORK DAY TEMPERATURES	CONSTRUCTION REQUIREMENTS	PROTECTION REQUIREMENTS
Above 32°F	Normal masonry procedures	Cover walls with plastic at end of work day to prevent water entering masonry.
32°F - 20°F	Heat grout materials to 90°F so grout has in-place temperature of 70°F at end of work day.	Cover walls with plastic or light (1/2 in.) insulation blanket to prevent rapid heat loss or water entering masonry.
20°F - 0°F	Heat grout materials to 90°F so grout has in-place temperature of 70°F at end of work day.	Cover walls with plastic or medium (1 in.) insulation blanket or maintain heated enclosure to 40°F for a period of two days.
	Heat grout materials containing Type III cement to 90°F so grout has in-place temperature of 70°F at end of work day.	Cover walls with plastic or medium (1 in.) insulation blanket or maintain heated enclosure at 40°F for a period of one day.

June 30, 2010

To Whom It May Concern;

At the request of A. C. Krebs, I am writing to describe some contributing factor which may effect subtle color changes of concrete masonry units.

All concrete masonry units, whether natural or pigmented, have several components which can contribute to color variability. They include; cement, pozzolans, aggregates, chemical admixtures and water. Many of these variables are controlled and eliminated by rigid manufacturing procedures producing consistency in batch weights and mixing; water/cement ratio; compaction; curing including time and temperature; and admixture use and dosage rates.

Other contributing color variance factors may come from cement color, pigment, and aggregates whether natural, manufactured or synthetic light weight aggregate.

A. C. Krebs utilizes Haydite manufactured by Hydraulic Press Brick for medium and light weight block production. Haydite is rotary-kilned, expanded shale aggregate, mined from Borden shale which is crushed and heated to approximately 2,300 degrees in a rotary kiln. Following kilning, the clinker is crushed and screened into various sizes. During the manufacturing process, kiln temperatures and the weight of the kilned material is subject to strict monitoring and quality control standards insuring a consistent weight and subsequently consistent color.

Hydraulic Press Brick strives to produce a lightweight aggregate extremely consistent in weight and color just as A. C. Krebs strives to produce a high quality concrete masonry unit for their customers.

Sincerely yours,

Jack Spaulding

Jack Spaulding
Hydralic Press Brick Company

The Original Lightweight Aggregate

HAYDITE

HYDRAULIC PRESS BRICK COMPANY

A. C. Krebs
Attention: Chris Cato
4000 Crittenden Drive
Louisville, KY 40209

HPB Shale Fines: LEED® NC V2.2 Recycled Materials

Hydraulic Press Brick Company's (HPB) Haydite shale fines are recycled materials made by reprocessing fines recovered from coarse lightweight aggregate production. Haydite shale fines are recovered, “Pre-consumer" materials diverted from the waste stream during the manufacturing process of coarse lightweight aggregate.
HPB-Haydite's expanded shale fines Type AU, A, AX and BX are 100% recycled materials and are not mixed with any other material when processed for use by third parties.

Materials & Resources

The A. C. Kreb block plant uses HPB’s AU, A, AX and/or BX expanded shale fines in the production of their medium and light weight concrete masonry units. The distance from the HPB Haydite production facility in Mooresville, Indiana to the A. C. Krebs block plant in Louisville, Kentucky is less than 500 miles.

Sincerely,

Tim Wolfe

Timothy Wolfe

Sales Manager

Hydraulic Press Brick Company
P.O. Box 130
Brooklyn, IN 46111

Notes:

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Glossary of Concrete Masonry Terms

Notation

A_n = net cross-sectional area of masonry unit, sq. in.
b = width of compression face of flexural member, in.
d = effective depth of flexural section, measured from extreme compression fiber to centroid of tension reinforcement, in.
E_m = modulus of elasticity of masonry, psi.
E_s = modulus of elasticity of steel, psi.
f_a = calculated axial compressive stress in masonry, psi.
F_a = allowable axial compressive stress if member were carrying axial load only, psi.
f_m = calculated flexural compressive stress in masonry if members were subjected to bending stress only, psi.
F_m = allowable flexural compressive stress if members were carrying bending load only, psi.
f'_m = specified compressive strength of masonry expressed as force per unit of net cross-sectional area, psi.
f_s = calculated stress in reinforcement, psi.
F_s = allowable stress in reinforcement, psi.
f_t = calculated tensile stress in masonry, psi.
F_t = allowable flexural tensile stress in masonry, psi.
P = calculated axial load, lbs.
P_a = allowable axial load, psi.
u = unit bond stress, psi.
v = unit shear stress, psi.
V = total applied design shear force at section, lbs.
Σ_o = sum of perimeters of all effective bars crossing the section on the tension side, if of uniform size; for mixed sizes, substitute $4 A_s/D$, where A_s is the total steel area and D is the largest bar diameter; for bundled bars use the sum of the exposed portions of the perimeters.

Definitions

Absorption—The increase in weight of a porous solid body resulting from the penetration of a liquid into its permeable pores usually measured as a percentage of dry weight or in pounds per cubic foot.

Accelerator—Material such as calcium chloride and compositions predominately of calcium chloride which accelerate hardening and promote early strength development of concrete or mortar.

Admixture—A material other than water, aggregates, and hydraulic cement, used as an ingredient of concrete, mortar, or grout and added to the batch immediately before or during its mixing.

Aggregate—Granular material such as natural sand, manufactured sand, expanded clay, shale or slate, pumice, volcanic scoria, bituminous or anthracite cinders, gravel, crushed gravel, crushed stone, heavyweight aggregate such as magnetite or ilmenite, and air-cooled or expanded blast-furnace slag, which when bound together into a conglomerate mass by a matrix forms concrete, mortar, or grout.

Anchor—Metal rod, wire, or strap that secures building veneer to masonry backup, structural framework, or other elements.

ANSI—American National Standards Institute.

ASHRAE—American Society of Heating, Refrigerating and Air-Conditioning Engineers, Inc.

ASTM—American Society for Testing and Materials.

Backup—That part of a masonry wall behind the facing.

Batter—Recessing or sloping a wall back in successive courses; the opposite of corbel.

Bed joint—The horizontal layer of mortar on or in which a masonry unit is laid; may cover entire masonry unit or face shell only.

Bevel—One side of a solid body which is inclined in respect to the other, with the angle between the two sides either greater or less than a right angle.

Block, concrete—A hollow or solid unit consisting of portland cement and suitable aggregates combined with water. Other materials such as lime, fly ash, air-entraining agent, or other admixtures may be permitted.

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Bond—Adhesion and grip of concrete, mortar, or grout to reinforcement or to other surfaces against which it is placed; the arrangement of units in masonry so that vertical joints are discontinuous; the pattern formed by the exposed faces of the units in masonry construction.

Bond, grout—The adhesion to, and/or the interlocking of grout with the masonry units, and reinforcement.

Bond, mechanical—Tying masonry units together with metal ties or reinforcing steel or keys.

Bond, mortar—The adhesion of mortar to masonry units and reinforcement.

Bond beam—A horizontal reinforced concrete masonry member.

Bond breaker—A material used to prevent adhesion between two surfaces.

Bond strength—Resistance to separation of mortar from concrete masonry units and of mortar and grout from reinforcing steel and other materials with which it is in contact.

Brick, concrete—A solid unit having a rectangular prismatic shape usually not larger than 4 x 4 x 12 in. made from portland cement and suitable aggregates, with or without the inclusion of other materials.

Bullnose block—A unit having one or more rounded exterior corners.

Buttress—A masonry pilaster decreasing in area from the base to the top, generally used to give greater lateral strength and stability to a wall.

Cavity wall—A wall built of two or more wythes of masonry units separated by a continuous air space (with or without insulating materials) and in which the wythes are securely tied together with rigid corrosion resistant metal ties.

Chase—A groove or continuous recess built in a masonry wall to accommodate pipes, ducts, or conduits.

Class of unit—Class of unit shall distinguish between masonry units of different grade or type in ASTM specifications, being manufactured from different raw materials, or having different specified compressive strengths.

Cleanout—An opening in the first course of masonry for cleaning mortar droppings prior to grout placement in grouted masonry. Required in high lift grouting.

Collar joint—The vertical longitudinal joint between wythes of masonry.

Column—A compression member, vertical or nearly vertical, the width of which does not exceed four times its thickness and the height of which exceeds four times its least lateral dimension.

Composite wall—A multiple wythe wall in which at least one of the wythes is dissimilar to the other wythe with respect to type or grade of units or mortar.

Compressive strength—The maximum compressive load in pounds which a unit will support divided by the gross cross-sectional area of the unit in square inches.

Concrete masonry unit, hollow—A unit whose net cross-sectional area in any plane parallel to the bearing surface is less than 75 percent of its gross cross-sectional area measured in the same plane.

Concrete masonry unit, solid—A unit whose net cross-sectional area in every plane parallel to the bearing surface is 75 percent or more of its gross cross-sectional area measured in the same plane.

Control joint—A continuous unbonded masonry joint to regulate the location and amount of separation resulting from the dimensional change of different parts of a structure so as to avoid the development of excessively high stresses.

Corbel—A shelf or ledge formed by successive courses of masonry projecting out from the face of a wall, pier, or column.

Core—The molded open space in a concrete masonry unit.

Cross-Sectional area, gross—The total area of a section perpendicular to the direction of the load, including areas within cells and within reentrant spaces unless these spaces are to be occupied in the masonry by portions of adjacent masonry. (The gross cross-sectional area of scored units is determined to the outside of the scoring).

Cross-Sectional area, net—The gross cross-sectional area of a section minus the average area of ungrouted cores or cellular spaces. (The cross-sectional area of grooves in scored units is not deducted from the gross cross-sectional area to obtain the net cross-sectional area).

Curtain wall—A non-loadbearing wall between columns or piers.

Customized masonry—Architectural masonry units having textured or sculptured surfaces. Methods used to obtain different surface textures include splitting, grinding, forming vertical striations, and causing the units to "slump." Sculptured faces are obtained by forming projecting ribs or flutes, either rounded or angular, as well as vertical and horizontal scoring, recesses, and curved faces.

Dampcheck—An impervious horizontal layer to prevent vertical penetration of water in a wall consisting of either a course of solid masonry, metal, or a thin layer of asphaltic or bituminous material. Generally near grade to prevent upward migration of moisture by capillary action.

Dampproofing—Prevention of moisture penetration due to capillary action by the addition of one or more coatings of a compound that is impervious to water.

Dovetail Anchor—A splayed tenow shaped like a dove's tail, broader at its end that at its base which fits into the recess of a corresponding mortise.

Dowels—Straight metal bars used to connect two sections of masonry.

Dry Stack—Masonry work laid without mortar.

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Eccentricity—The normal distance between the centroidal axis of a member and the parallel resultant load.

Effective area of reinforcement—The area obtained by multiplying the right cross sectional area of metal reinforcement by the cosine of the angle between its direction and the direction for which the effectiveness of the reinforcement is to be determined.

Effective height—The height of a member to be assumed for calculating the slenderness ratio.

Effective Thickness—The height of a member to be assumed for calculating the slenderness ratio.

Efflorescence—A deposit of water soluble salts, usually white, formed on a surface. It results when salts in solution migrate from the interior of the wall to the surface, water evaporates, and salt is left on the surface.

Empirical design—Design based on applying physical limitations based on experience or observations gained through experience without a structural analysis.

Engineered design—Design based on a rational analysis considering the interrelationships of the various construction materials, their properties, and actual design loads in lieu of empirical design procedures.

Expansion joint—A separation between adjoining parts of a masonry structure which is provided to allow small relative movements such as those caused by thermal changes, to occur without one part affecting an adjacent part.

Face shell—The side wall of a hollow concrete masonry unit; generally between $\frac{3}{4}$ and $1\frac{1}{2}$-in. thick.

Face shell bedding—Mortar is applied only to the horizontal face of the face shells of hollow masonry units and in the head joints to a depth equal to the thickness of the face shell.

Fire wall—Any wall which subdivides a building so as to resist the spread of fire, by starting at the foundation and extending continuously through all stories to, or above, the roof.

Flashing—A thin impervious material placed in mortar joints and through air spaces in masonry to prevent water penetration and/or provide water drainage.

Foundation wall—A wall below the floor nearest grade serving as a support for a wall, pier, column or other structural past of a building.

Furrowing—The practice of striking a v-shaped trough in a bed of mortar (not recommended).

Grid Pavers—Open type masonry units which allow the growing of grass when employed for soil stabilization in parking areas, along the shoulders of highways and airport runways, embankment erosion control, fire engine lines while providing a base to support vehicular traffic.

Grout—Mixture of cementitious material and aggregate to which sufficient water is added to produce desired placing consisting without segregation of the constituents; the hardened equivalent of such mixtures.

Grout lift—The height to which grout is placed in a cell, collar joint, or cavity without intermission.

Grout pour—The total grouted height between masonry lifts. A grout pour may consist of one or more grout lifts.

Grouted masonry—Concrete masonry construction composed of hollow units where hollow cells are filled with grout, or multi-wythe construction in which space between wythes is solidly filled with grout.

Grouting, high lift—The technique of grouting masonry in lifts for the full height of the wall.

Grouting, low lift—The technique of grouting as the wall is constructed, usually to scaffold or bond beam height but not greater than 4 feet.

Head joint—The vertical mortar joint between ends of masonry units; sometimes called the cross joint.

Interlocking block pavers—Solid masonry units capable of transferring loads and stresses laterally by arching or bridging action between units when subjected to vehicular traffic.

Joint reinforcement—Steel wires placed in the mortar joint (over the face shells in hollow masonry) and having cross wires welded between them at regular intervals.

Lateral support—Means whereby structural members are braced in the horizontal span by columns buttresses, pilasters, cross walls, or in the vertical span by beams, floor or roof construction.

Lintel—A beam placed over an opening in a wall to carry the superimposed weight of the construction and loads above the opening.

Loadbearing—A structural system or element designed to carry loads in addition to its own dead load.

Masonry cement—Hydraulic cement produced for use in mortars for masonry construction where greater plasticity and water retention are desired than is obtainable by the use of portland cement alone; such cements always contain one or more of the following materials: portland cement, portland-pozzolan cement, natural cement, slag cement, hydraulic lime, and usually contain one or more of the following: hydrated lime, pulverized limestone, chalk, talc, pozzolan, clay or gypsum; many masonry cements also include air-entraining and water-repellent additions.

Masonry unit—A construction unit in masonry (sometimes called a block or a brick).

Moisture content—The amount of water contained at the time of sampling expressed as a percentage of the total absorption.

Mortar—A plastic mixture of cemetitious materials, fine aggregate and water used to bond masonry or other structural units.

Net section—The minimum cross-section of the member under consideration. Usually, the mortar bedded area plus the grouted area.

Nominal dimension—A dimension which may vary from the actual dimension by the thickness of a mortar joint but not more than $\frac{1}{2}$ in. The actual dimension is usually $\frac{3}{8}$ in. less than nominal in concrete masonry units.

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Panel Wall—A non-loadbearing wall constructed between colums or piers and wholly supported at each story.

Parapet Wall—That part of a wall that extends above the roof level.

Parging—The process of applying a coat of cement mortar to the back of the facing material, the face of the backing material, the face of rough masonry, and the earth side of foundation and basement walls (sometimes referred to as pargeting).

Party Wall—A wall on an interior lot line, or any wall used to adapt for joint service between two buildings or adjacent living or work spaces.

Pier—An upright compression member whose height does not exceed four times its least lateral dimension.

Pilaster—An integral portion of the wall which projects on one or both sides and acts as a vertical beam, a column, an architectural feature or any combination thereof.

Prism—A small masonry test assemblage made with masonry units, mortar, and sometimes grout. Primarily used to predict the strength of full scale masonry members.

Reinforced masonry—Unit masonry in which reinforcement is embedded in such a manner that the component materials act together in resisting shearing and tensile forces.

Screen block—Open-faced masonry units used for decorative purposes or to partially screen areas from the sun or outside viewers.

Shear wall—A wall which, in its own plane, carries shear resulting from wind, blast, or seismic forces.

Shrinkage—Volume change due to loss of moisture or decrease in temperature.

Single Wythe Wall—A wall of only one masonry unit in thickness.

Slenderness ratio—The ratio of effective length or height of a wall or column to effective thickness; used as a means of assessing the stability of a masonry wall or column.

Slushed joints—Head or collar joints filled after units are laid by "throwing" mortar in with the edge of a trowel (a practice not allowed in good masonry construction).

Stacked bond—A bonding pattern where no unit overlaps either the one above or below, all head joints form a continuous vertical line.

Transformed Section—An assumed section of one material having the same elastic properties as the section of two materials.

Tuck Pointing—Tightly filling cut out or defective mortar joints with fresh mortar.

Veneer—A masonry facing which is attached to the backup but not so bonded as to act with it under load.

Waterproofing—Prevention of moisture flow through masonry.

Web—The cross wall connecting the face shells of a hollow concrete masonry unit.

Weep hole—Suitably formed holes or openings placed in the masonry to permit the escape of moisture from the interior of the wall. In retaining walls, a hole through the wall to permit water to flow through the wall to prevent build up of pressure.

Wythe—Each continuous vertical section of a wall, one masonry unit in thickness and tied to its adjacent vertical section or sections by bonders, metal ties, or grout.

NATIONAL CONCRETE MASONRY ASSOCIATION

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MASONRY SPECIFICATIONS

ASTM C-90	Hollow Load-Bearing Concrete Masonry Units. (Does not specify aggregate.)
ASTM C-55	Concrete Building Block.
ASTM C-145	Solid Load-Bearing Masonry Units.
ASTM C-33	Concrete Aggregates. (Normal weights.)
ASTM C-331	Light Weight Aggregate for Light Weight Concrete Masonry Units.
ASTM C-476	Mortar and Grout For Reinforced Masonry.
ASTM C-270	Mortar For Unit Masonry.
ASTM C-216	Facing Brick (Solid Masonry Units Made From Clay or Shale.)
ASTM C-652	Hollow Brick (Hollow Masonry Units Made From Clay or Shale.)
ASTM C-902	Paving Brick.

MATERIAL REQUIREMENTS

TO LAY 1,000, 12”X8”X16” BLOCKS
35 BAGS OF MORTAR, 4 TONS OF SAND

TO LAY 1,000, 8”X8”X16” BLOCKS
30 BAGS OF MORTAR, 3.5 TONS OF SAND

TO LAY 1,000, 6”X8”X16” BLOCKS
25 BAGS OF MORTAR, 3 TONS OF SAND

TO LAY 1,000, 4”X8”X16” BLOCKS
20 BAGS OF MORTAR, 2 TONS OF SAND

FORMULA FOR BLOCK QUANTITIES

Length of wall X Height of Wall	=	SQUARE FEET
Multiply square feet of wall X 1.125	=	QUANTITY OF BLOCKS NEEDED

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