SPEED BLOCK™

TECHNICAL MANUAL

CONCRETE MASONRY UNIT (CMU) WALL BUILDING SYSTEM



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REVISION 1.0 – CHANGES & UPDATES

- Tech Manual Changes: Facility Location, Contact Information updated.
- ICC - ESL-1163 listing report: Facility Location and Contact Information updated. (pages 37-40)
- Corrected hardware specs. (pages 17-19)
- Updated shop drawing examples & photos. (pages 30-34)
- Date of Revision: October 5th, 2026
- Approved By CEO, COO & Valued Engineering

INTRODUCTION



DESCRIPTION OF SPEEDBLOCK CONCRETE MASONRY UNIT (CMU)

SpeedBlock is a large format CMU, which represent the next generation of hollow, concrete masonry units (CMU), SpeedBlock is manufactured per ASTM C90 specifications, and can be used in any construction project where CMU ASTM C90 are allowed by the building code.

SpeedBlock wall construction utilizes SpeedBlock ASTM C90 hollow CMUs, mortar, reinforcing steel, and concrete grout, which is the same method as traditional concrete masonry construction.

SpeedBlock CMU blocks are typically manufactured up to 5,000 PSI strengths and wall construction is built using small cranes or reach-forklifts and are fast and labor efficient to build walls.



STANDARD SPEEDBLOCK CMU SIZE: 8" WIDTH X 32" HEIGHT X 288" LENGTH (24-FEET)

TOTAL AREA: 64 SQ. FT.

PATTERN SHOWN: 8 X 16 SPLIT FACE



DESCRIPTION OF TRADITIONAL CONCRETE MASONRY UNIT (CMU)

Traditional Concrete Masonry Units are hand laid hollow concrete masonry units, manufactured per ASTM C-90 specifications, and have been developed over the last 115 years, and can be used in any construction project where CMU ASTM C90 are allowed by Building Codes.

Concrete masonry block wall construction utilizes ASTM C90 hollow CMUs, mortar, reinforcing steel, and concrete grout.

Traditional 8x16 CMU blocks are typically manufactured in 2,000 PSI strengths and wall construction is done with hand placed blocks, which can be slow and labor intensive to build.



STANDARD CMU SIZE:
8" WIDTH X 8" HEIGHT X 16" LENGTH

TOTAL AREA:
0.88 SQ. FT.

PATTERN SHOWN:
8 X 16 SPLIT FACE



SPEEDBLOCK - ARCHITECTURAL FINISHES

SPEEDBLOCK CONCRETE MASONRY UNITS ARE AVAILABLE IN VARIETY OF STANDARD AND CUSTOM FINISHES.

Standard Colors: Our natural color is our standard block color and is considered paint grade.

Standard Patterns and Finishes:
Precision Block – *no pattern or texture*
Split-face with 8 x16 block pattern
Reveal band – *horizontal 1.25" x .25" at top of block*

Custom Patterns & Textures (Custom Special Orders):
SpeedBlock can fabricate our blocks with custom patterns, textures, and brick veneers factory applied.*

Custom Colors: SpeedBlock can manufacture our blocks in custom colors.*
**For price and availability contact the sales department.*

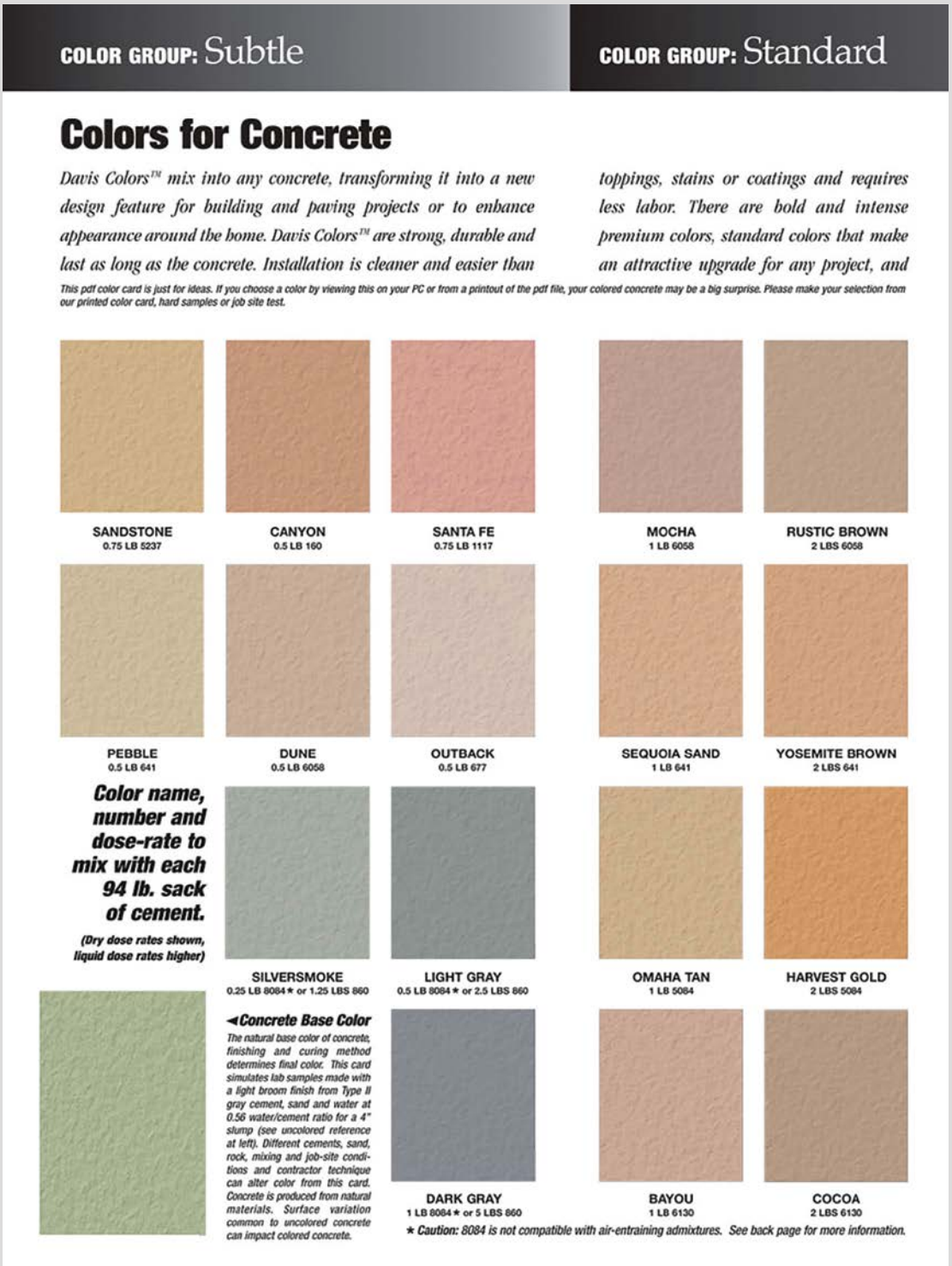


SPEEDBLOCK UTILIZES SPEC FORMLINERS, INCORPORATED FOR ITS PATTERN AND TEXTURE TEMPLATES.

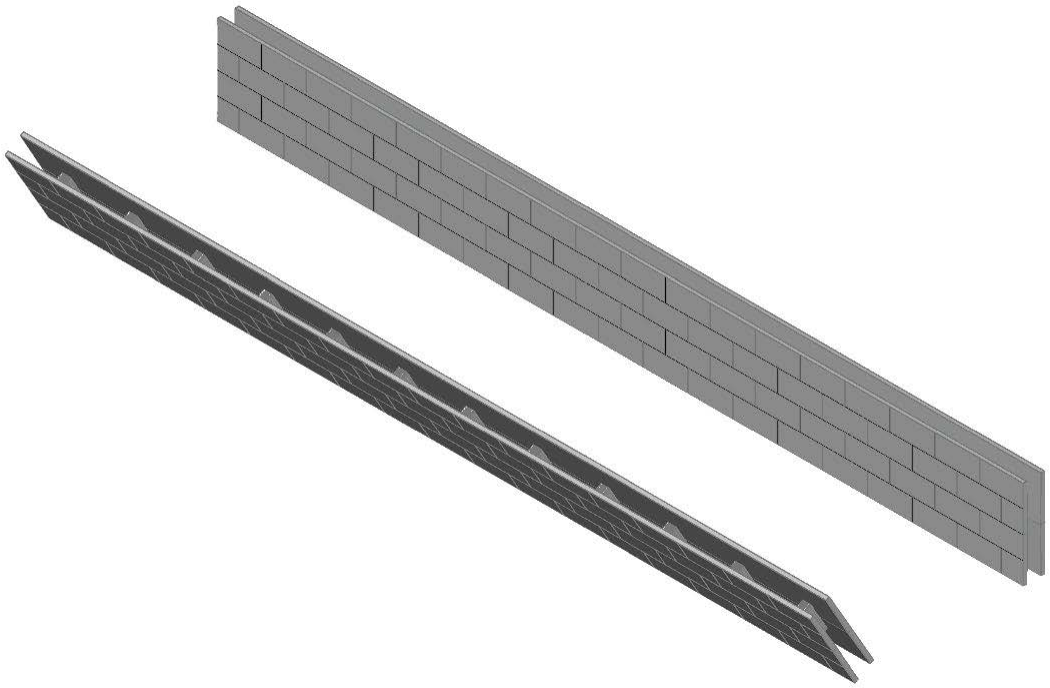
WWW.SPECFORMLINERS.COM



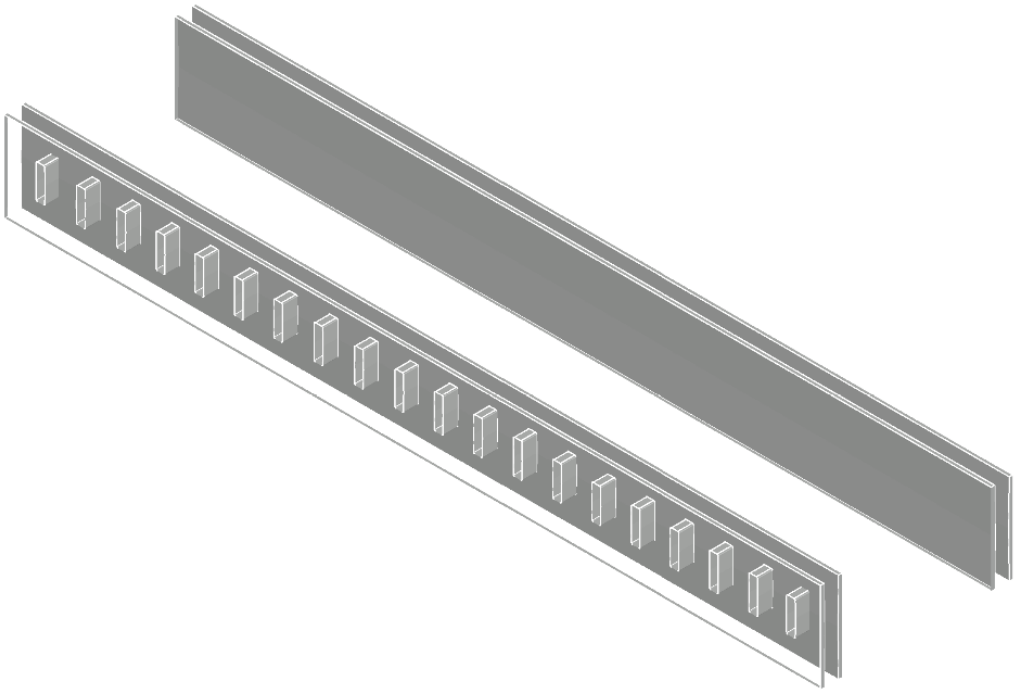
SPEEDBLOCK CAN ADD COLORS POST PRODUCTION WHEN REQUESTED.



SPEEDBLOCK STANDARD CONCRETE MASONRY UNITS STRUCTURE



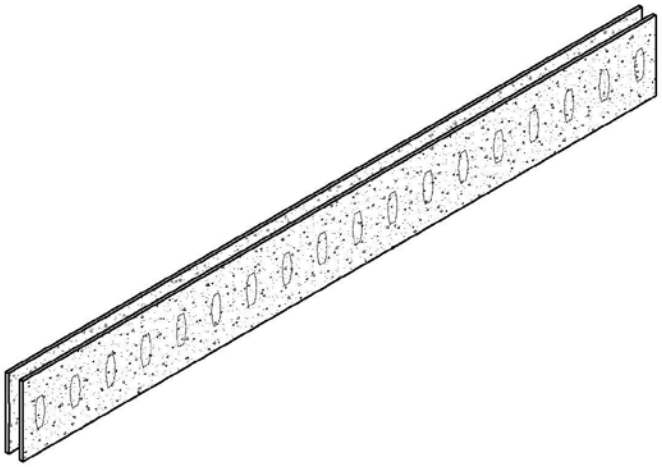
8" X 32" X 24' UNIT



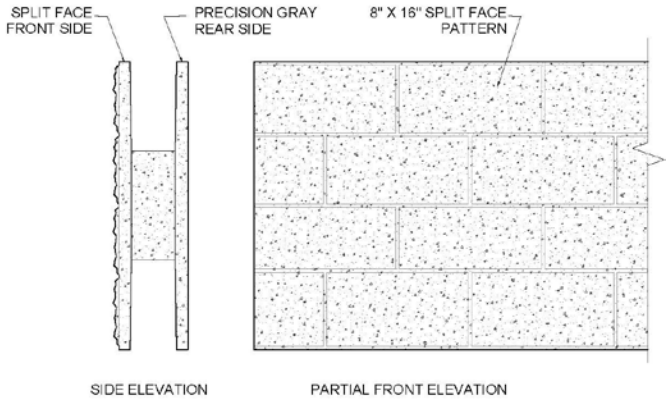
12" X 32" X 24' UNIT

Face wall cut away to show cross-webs

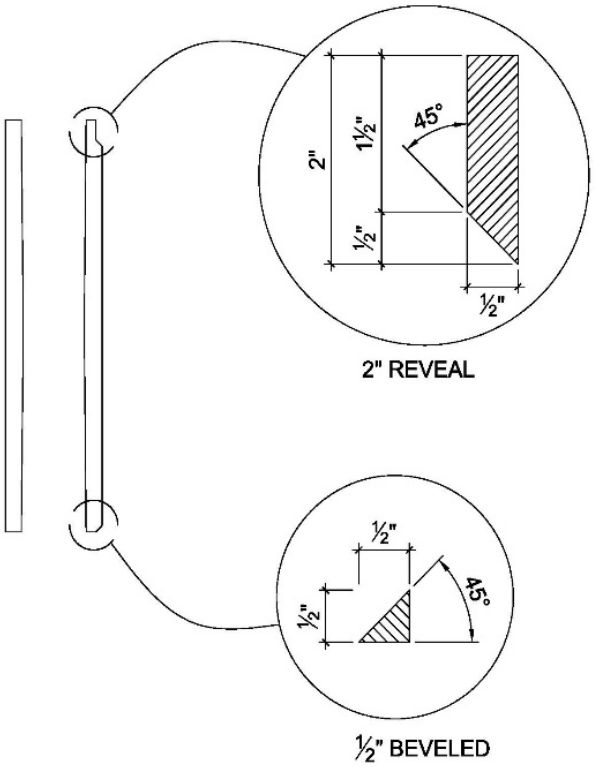
SPEEDBLOCK CMU PATTERN EXAMPLE



8" OR 12" X 32" X 288" PRECISION UNIT



8" OR 12" X 32" X 288" SPLIT FACE WITH 8 X 16 PATTERN



8" OR 12" X 32" X 288" REVEAL AND BEVELED STYLE

SPEEDBLOCK SERVICES

THE TOTAL SOLUTION

SpeedBlock provides a total solution for your wall building needs, from design, engineering to wall construction by a SpeedBlock certified licensed contractor.

PRIMARY SERVICES

- SpeedBlock CMU Installation Shop Drawings & CMU Lists
- SpeedBlock CMU Cut for Project Dimensions
- SpeedBlock CMU and Installation Hardware delivered FOB Job Site

SECONDARY SERVICES

- SpeedBlock Wall Cost Estimates & Value Engineering Analysis
- SpeedBlock CMU Engineered Plans, Details, Specifications and Calculations
- Construction bids and building by a SpeedBlock Certified Contractor.

FOR MORE INFORMATION SEE OUR WEBSITE WWW.SPEEDBLOCK.COM

Our Sales Team can review your project requirements and provide pricing, time to build, ordering, wall design and engineering, delivery, and construction information.

APPLICATIONS FOR SPEEDBLOCK CMU

TYPES OF STRUCTURES


Warehouses & Distribution Centers


Retail & Commercial Buildings


Schools & Gymnasiums


Hotels & Motels


Sound Walls & Fences


Retaining Walls


Low-rise Buildings


Parking Structures


Apartments & Condominiums


Data Centers


Public Storage Buildings


Subterranean Structures & Basements

SPEEDBLOCK CONCRETE MASONRY UNIT (CMU) BUILDING CODE COMPLIANCE

SpeedBlock Concrete Masonry Units are manufactured in our proprietary state-of-the-art manufacturing facilities per ASTM C-90 Type 1 specifications with unit strengths available up to 5,000 psi.

Corporate and Manufacturing:
427 Crystal Way
Galt, CA 94025
ICC ES Listing Report No. ESL-1163

FOR MORE INFORMATION SEE OUR WEBSITE WWW.SPEEDBLOCK.COM
Our Sales Team can review your project requirements and provide pricing, time to build, ordering, wall design and engineering, delivery, and construction information.

CONSTRUCTION INSTALLATION DETAILS

NOTE:

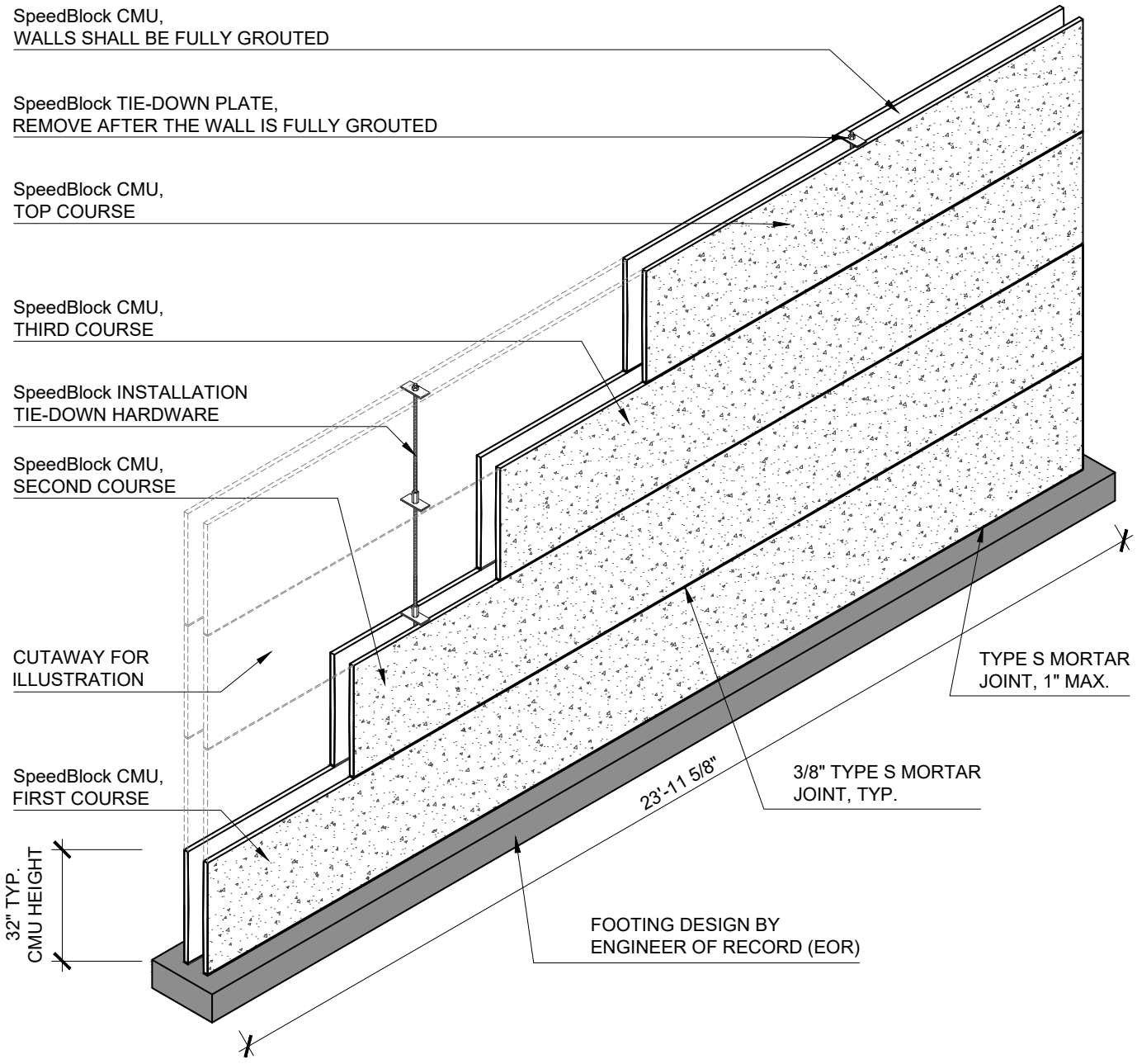
Engineer of Record shall specify; Reinforcing Steel, Embeds, Grout, and Strength for each project.

All construction details in this section are available in DWG format and can be obtained upon request.

DISCLAIMER:

The details as shown in this manual are intended to illustrate a general concept or a general method of construction. Details that show different or modified concepts or methods can not be of equal validity and should be excluded from consideration. These details shall not be used for construction withouth the approval and signature of a licensed design professional. The person using these details shall be responsible for its complete design and proper application.

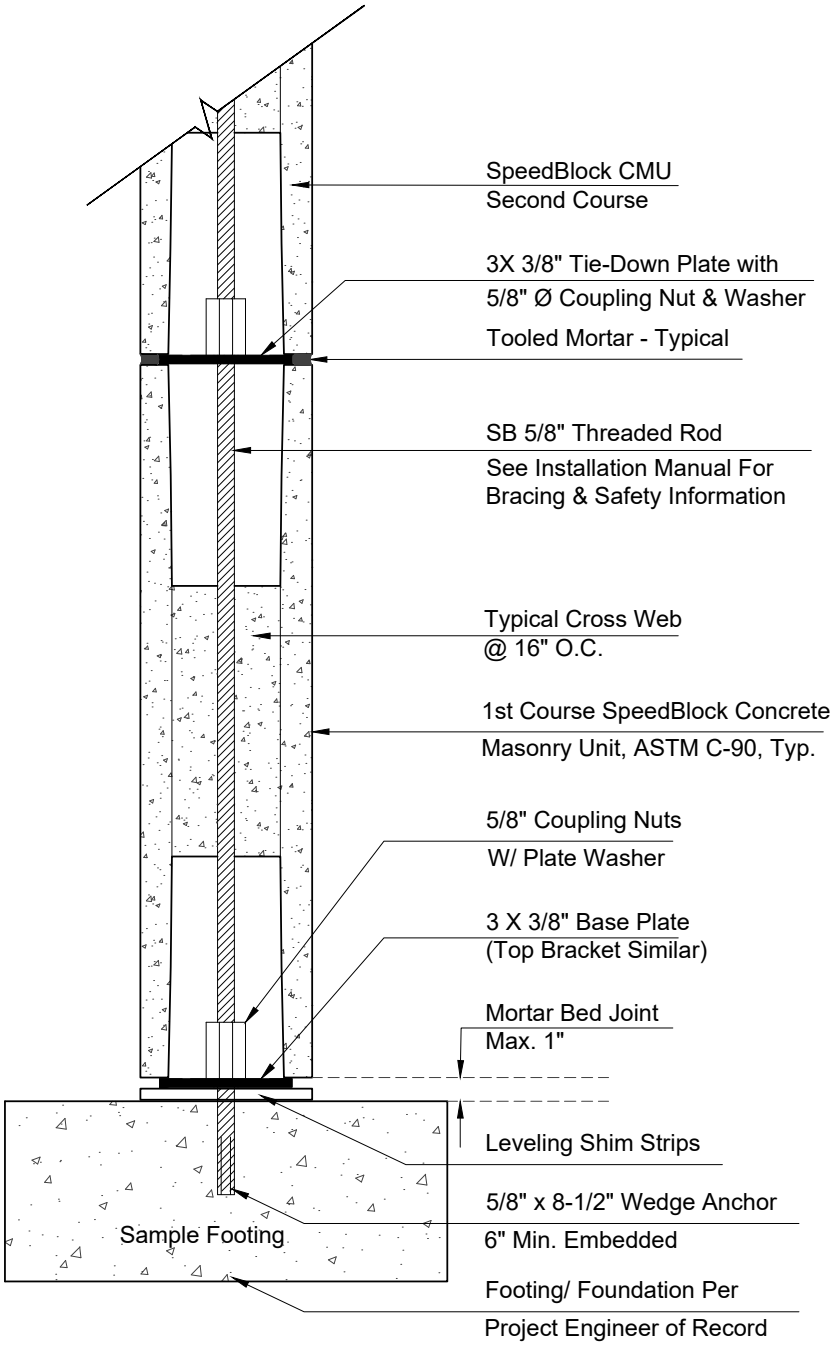
SAMPLE SPEEDBLOCK WALL ASSEMBLY



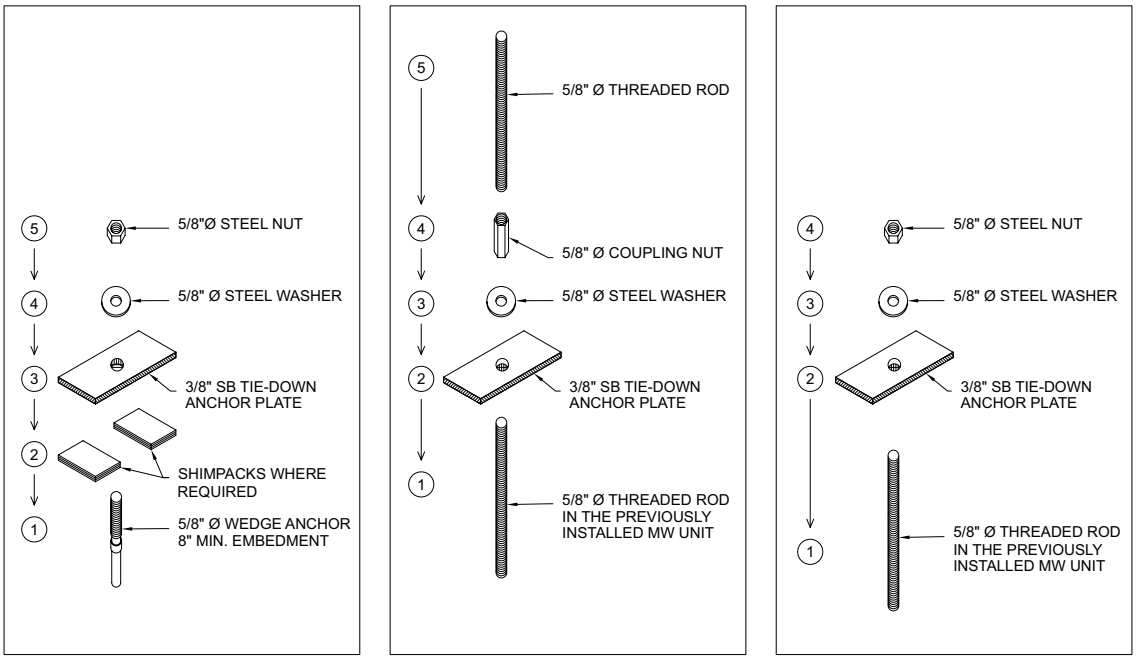
NOTE:

SB Installation Tie-Down Hardware are for temporary wall bracing only. Walls shall be reinforced and fully grouted as specified by each project's engineer of record.

SPEEDBLOCK CMU
INSTALLATION COMPONENTS

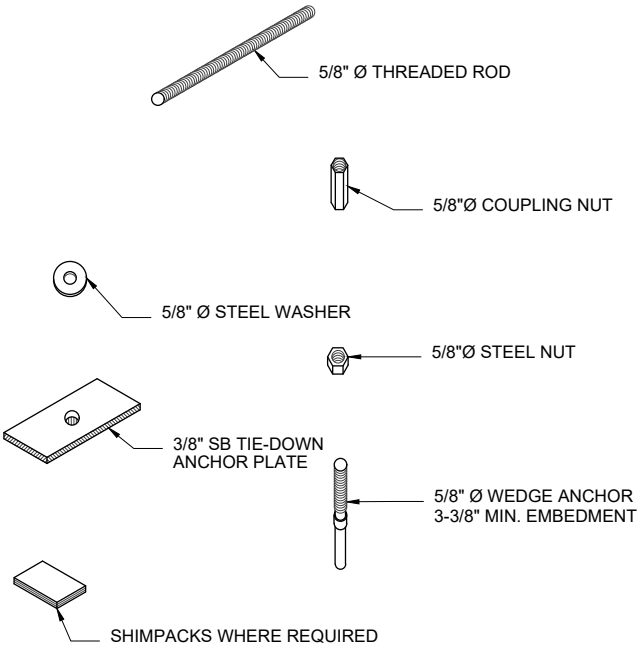


TYPICAL SPEEDBLOCK HARDWARE
INSTALLATION ORDER



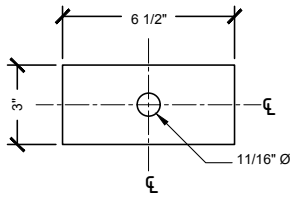
FIRST COURSE HARDWARE | **INTERMEDIATE COURSE HARDWARE** | **TOP COURSE HARDWARE**

SPEEDBLOCK INSTALLATION
TIE-DOWN HARDWARE

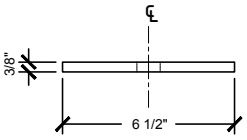


TIE-DOWN PLATES WIDTHS 8" & 12"

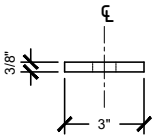
TIE-DOWN PLATES FABRICATED WITH ASTM A36 STEEL PLATE BAR



TOP VIEW

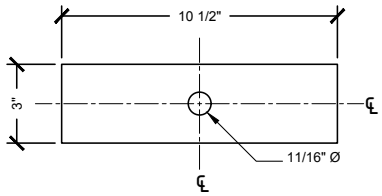


FRONT VIEW

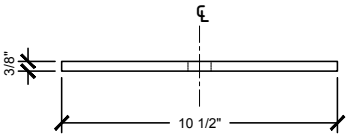


SIDE VIEW

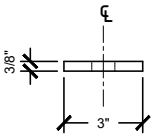
FOR STANDARD AND SPLIT- FACED 8" UNITS



TOP VIEW

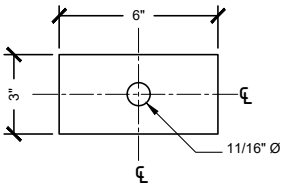


FRONT VIEW

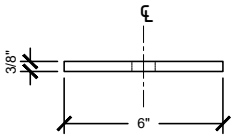


SIDE VIEW

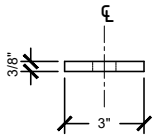
FOR STANDARD AND SPLIT-FACED 12" UNITS



TOP VIEW

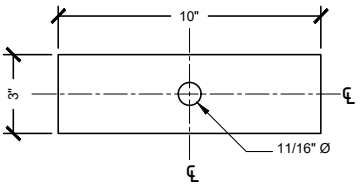


FRONT VIEW

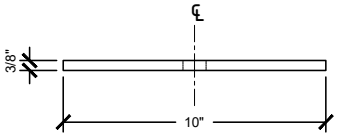


SIDE VIEW

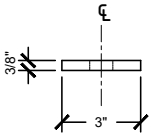
FOR REVEAL 8" UNITS



TOP VIEW



FRONT VIEW



SIDE VIEW

FOR REVEAL 12" UNITS

SPEEDBLOCK CMU SIZE AND WEIGHT CHART

DESCRIPTION	SIZE (INCH)	WEIGHT/SF	WEIGHT/LF	TOTAL WEIGHT (LBS.)
Precision Gray*	8x32x288	36	96	2,305
Split Face	8x32x288	37.5	100	2,400
Precision Gray*	12x32x288	54	144	3,456
Split Face	12x32x288	56	150	3,600
Wood Face	8x32x288	44	116	2,800

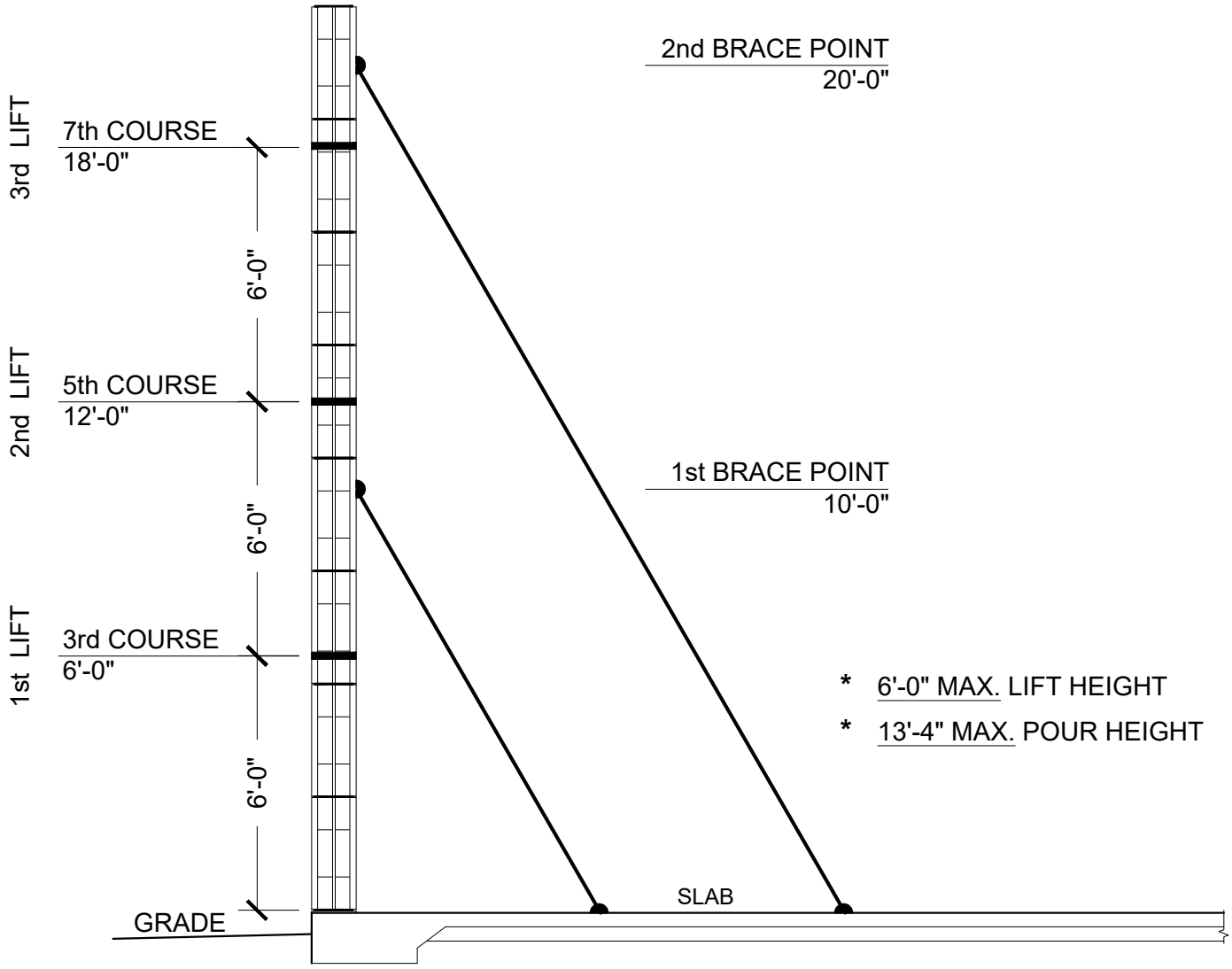
** Reveal and Beveled weights are the same.*

Weight/SF = Pounds per square foot

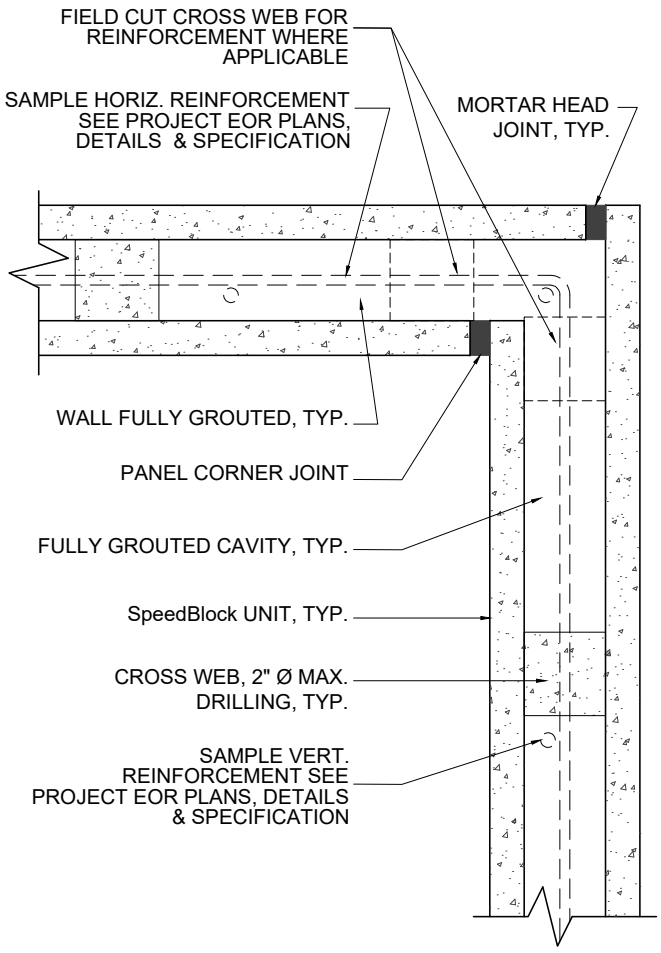
Weight/LF = Pounds per linear foot.

NOTE:
Weights in the chart are close approximate values. The actual weight may vary slightly depending on the pattern and the texture.

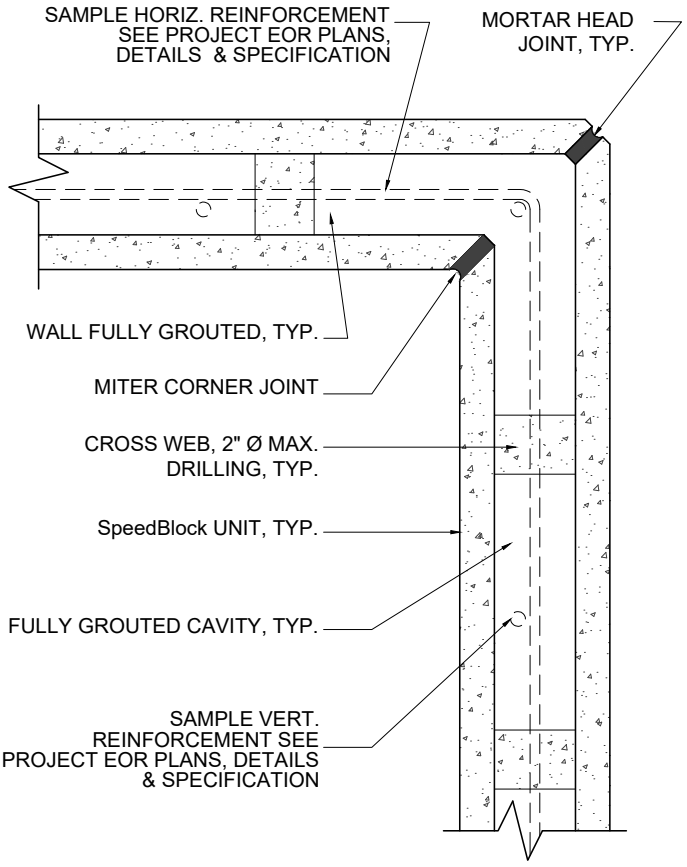
SAMPLE INSTALLATION, BRACING, AND GROUTING SCHEDULE



SAMPLE SPEEDBLOCK CMU - CORNER CONNECTION

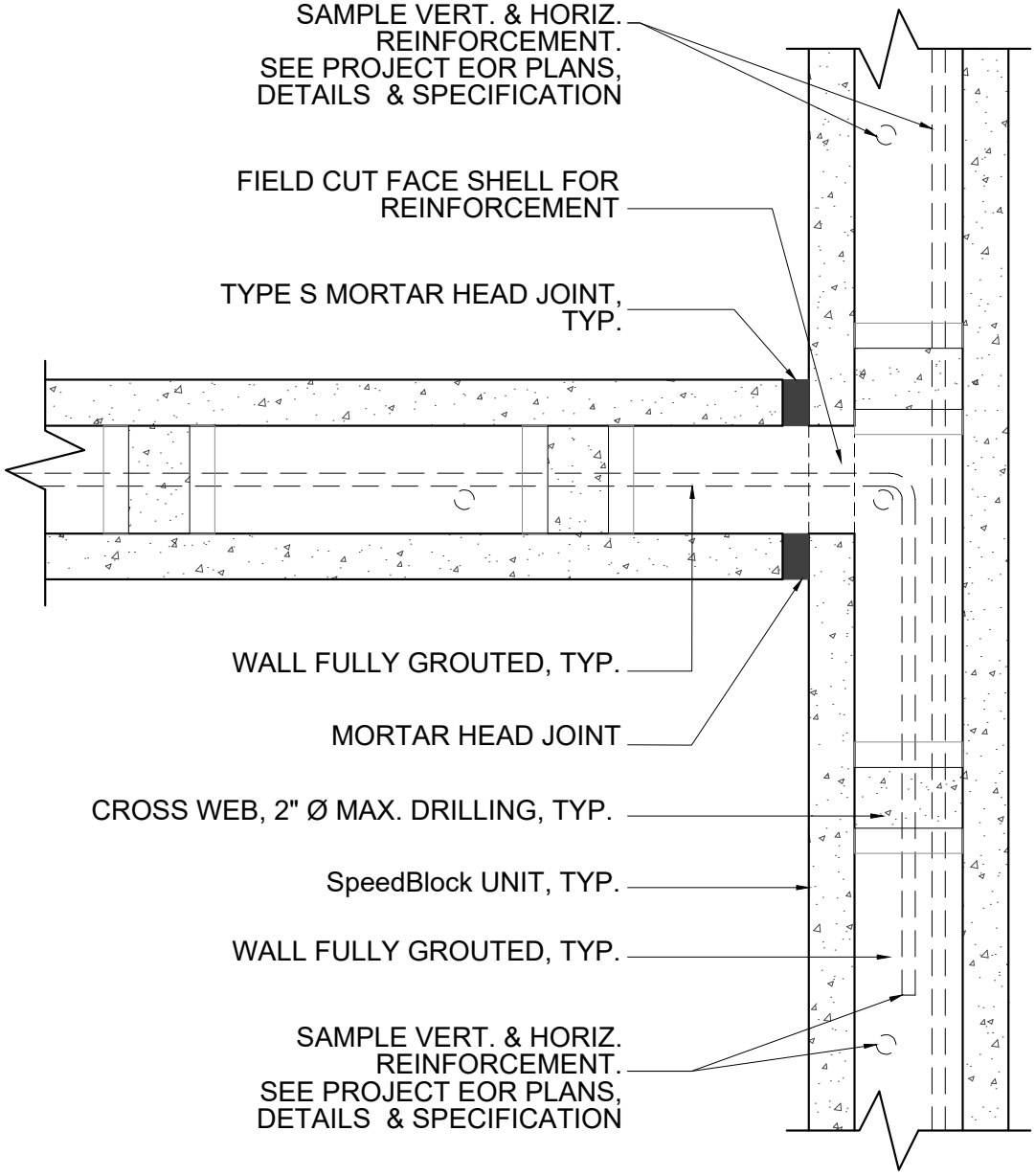


CORNER DETAIL: TYPE A

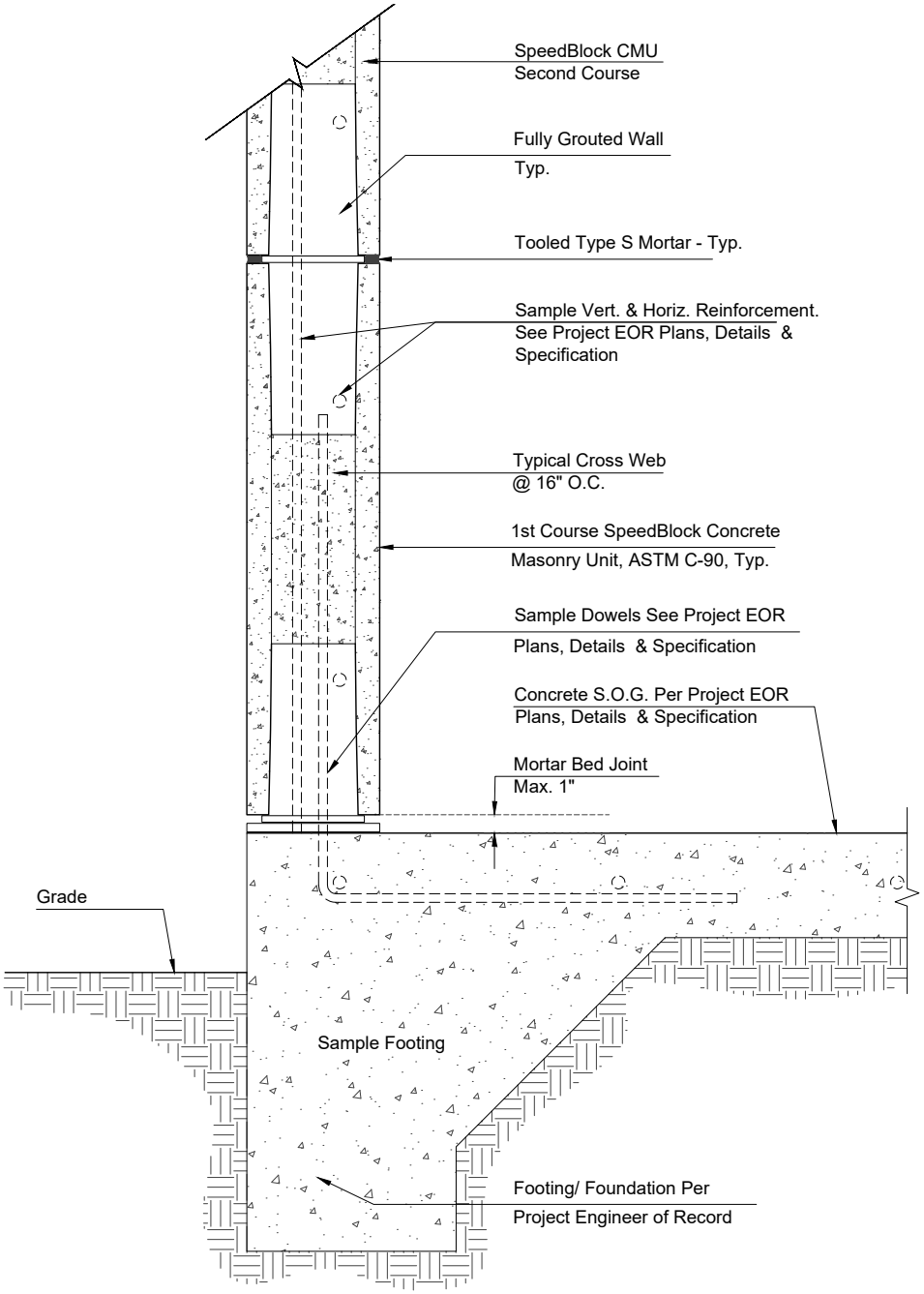


CORNER DETAIL: TYPE B

SAMPLE SPEEDBLOCK CMU - INTERSECTING PANELS

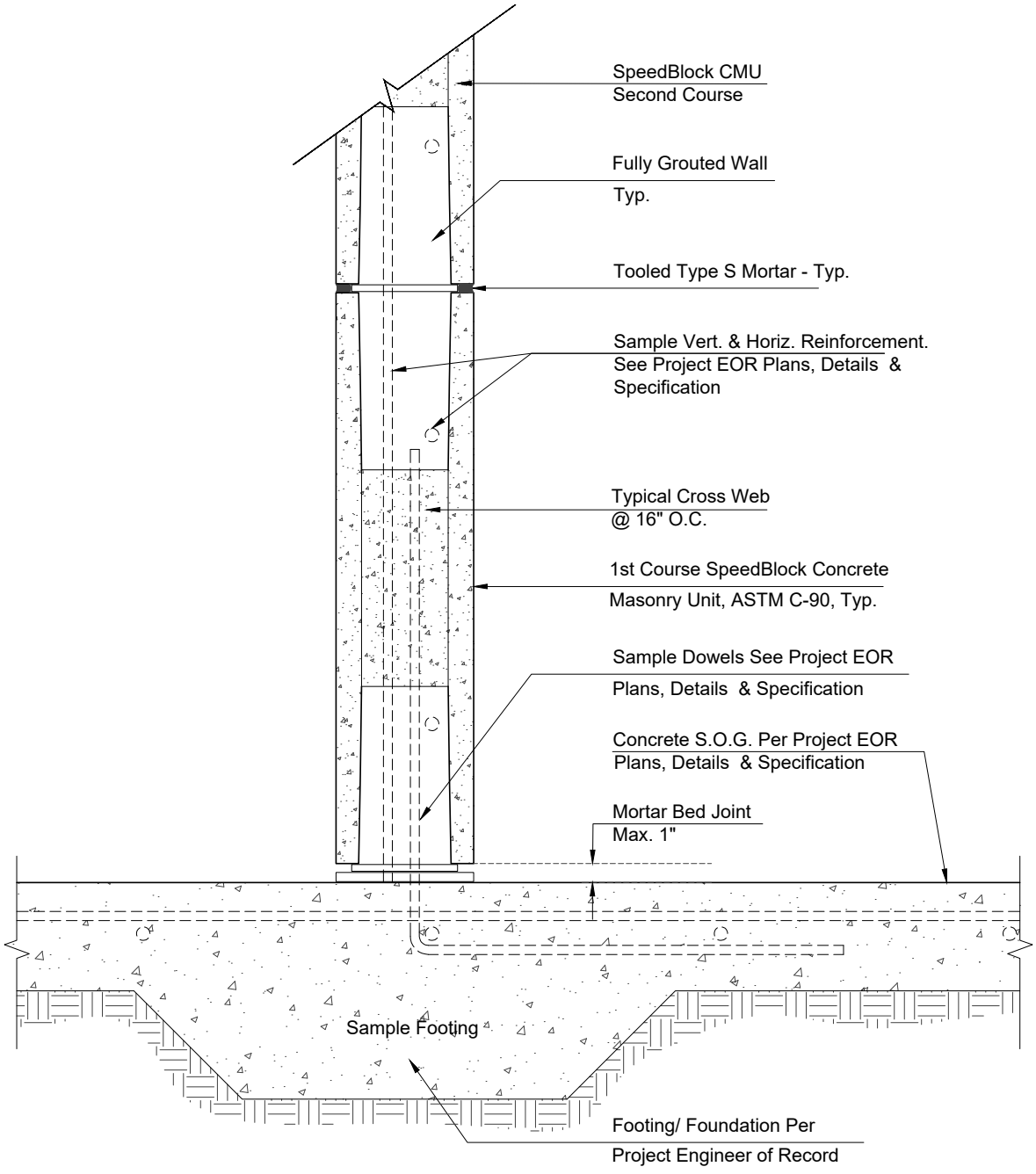


SAMPLE SPEEDBLOCK CMU
AT SLAB-ON-GRADE



NOTE:
SB Installation Tie-Down & Hardware is not shown.

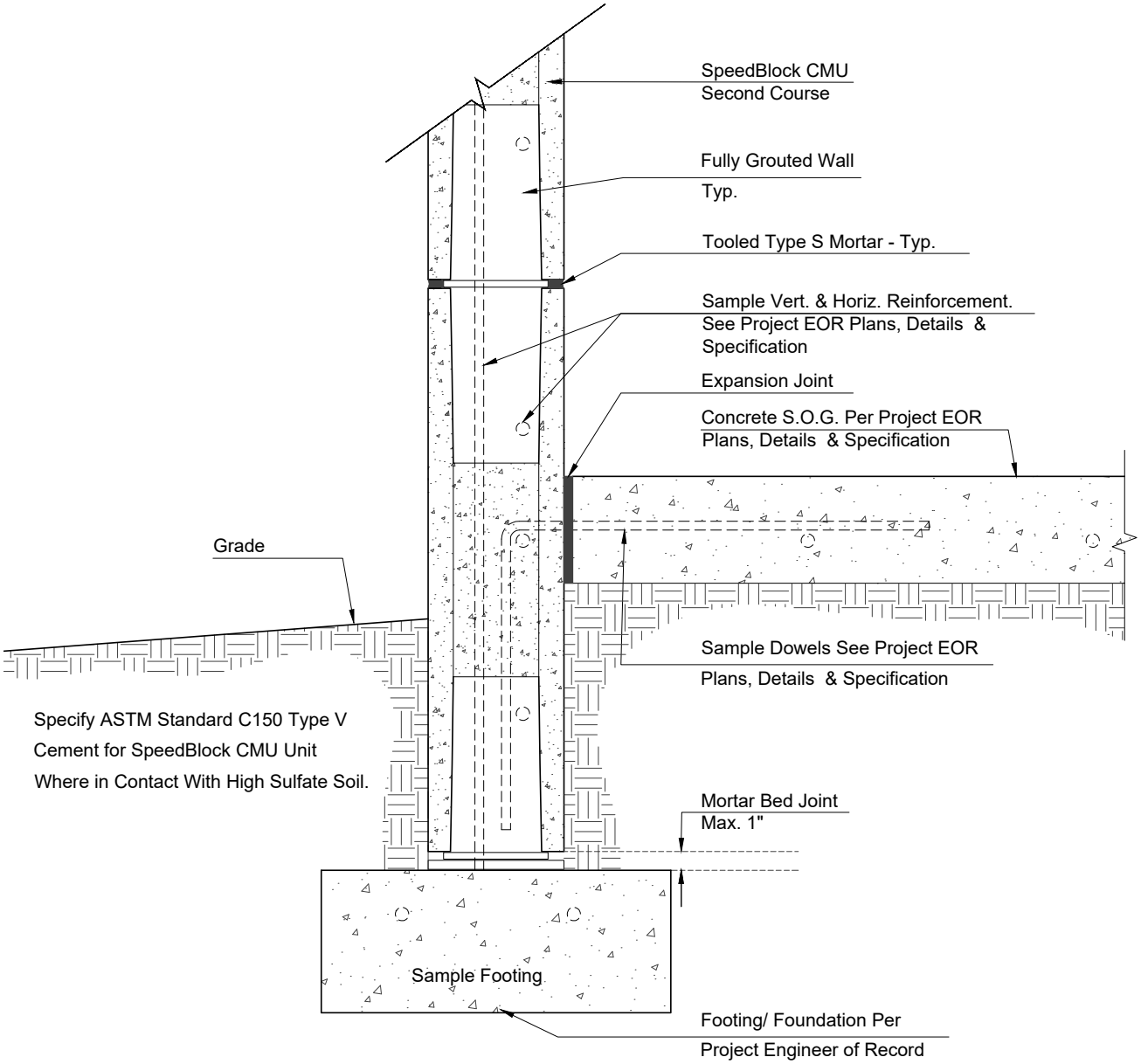
SAMPLE SPEEDBLOCK CMU
AT INTERIOR SLAB FOOTING



NOTE:

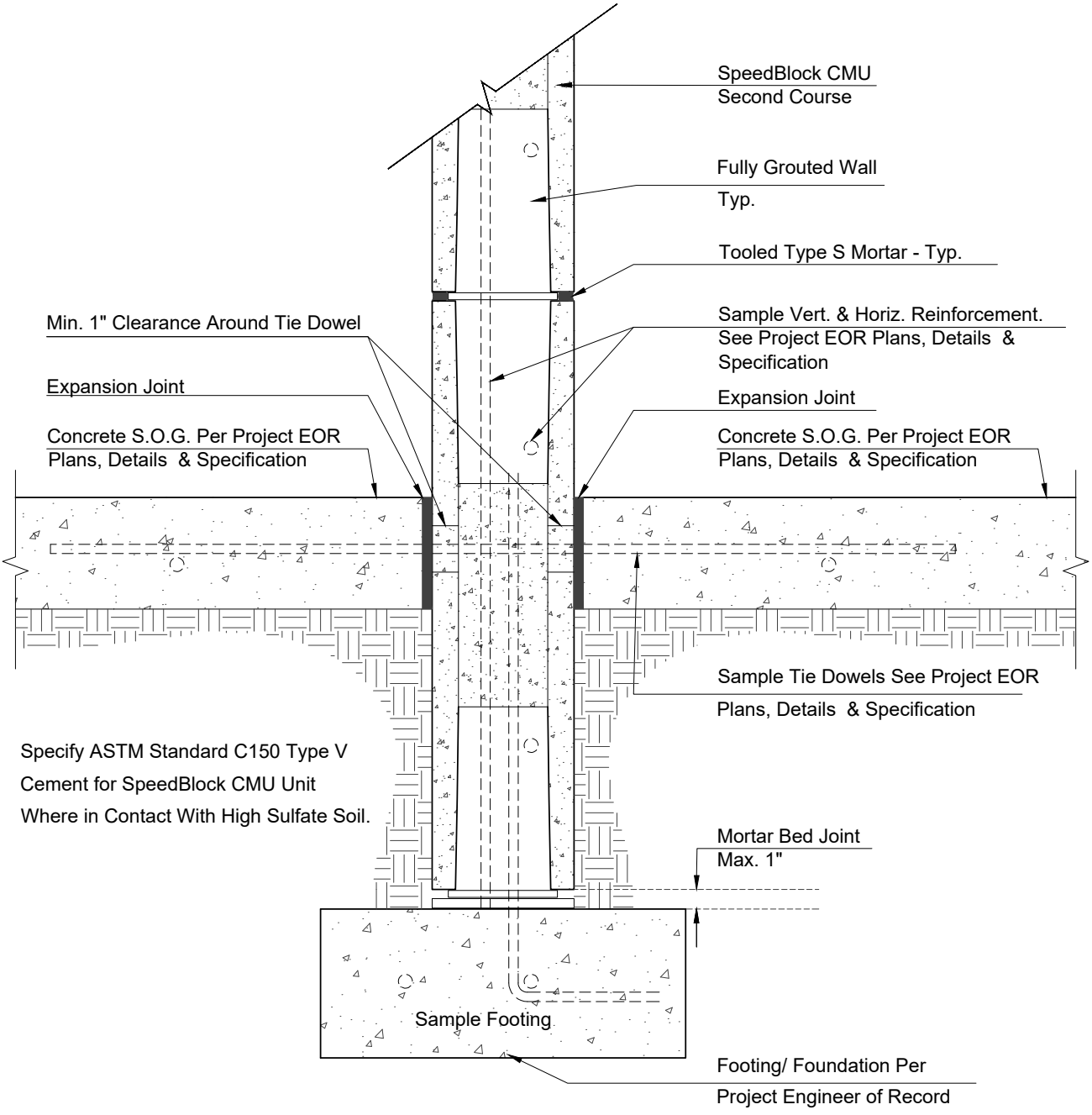
SB Installation Tie-Down & Hardware is not shown.

SAMPLE SPEEDBLOCK CMU
AT PERIMETER FOOTING



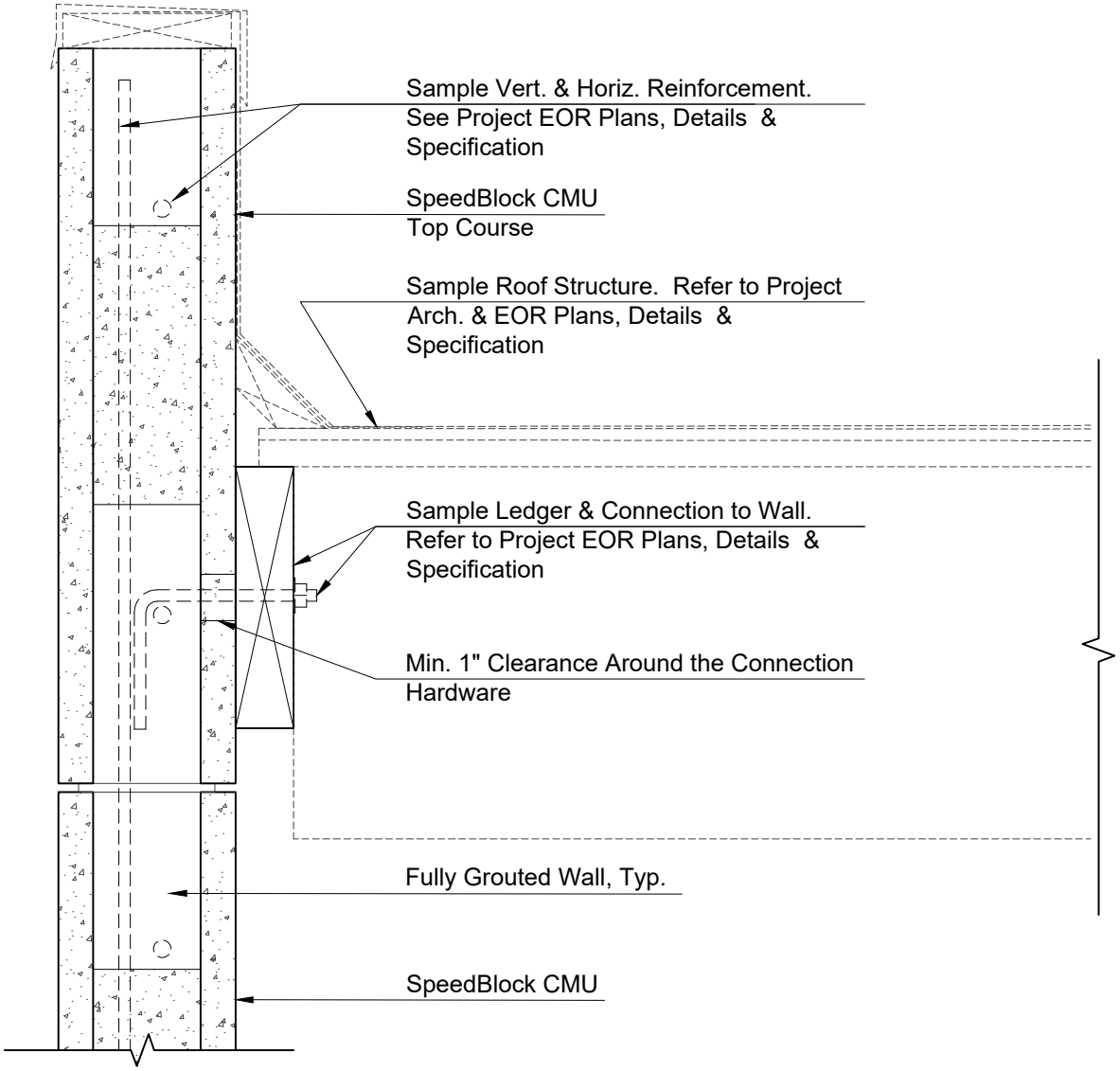
NOTE:
SB Installation Tie-Down & Hardware is not shown.

SAMPLE SPEEDBLOCK CMU
AT INTERIOR FOOTING



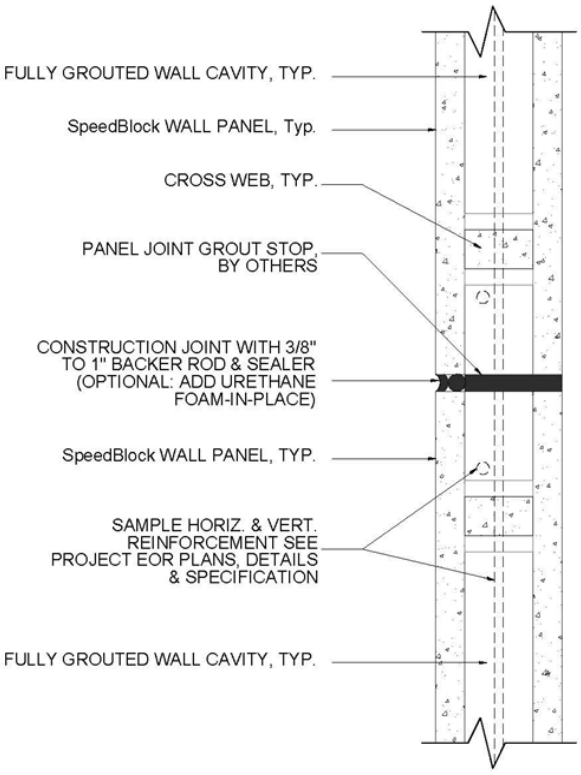
NOTE:
SB Installation Tie-Down & Hardware is not shown.

SAMPLE SPEEDBLOCK CMU - ROOF TO WALL CONNECTION

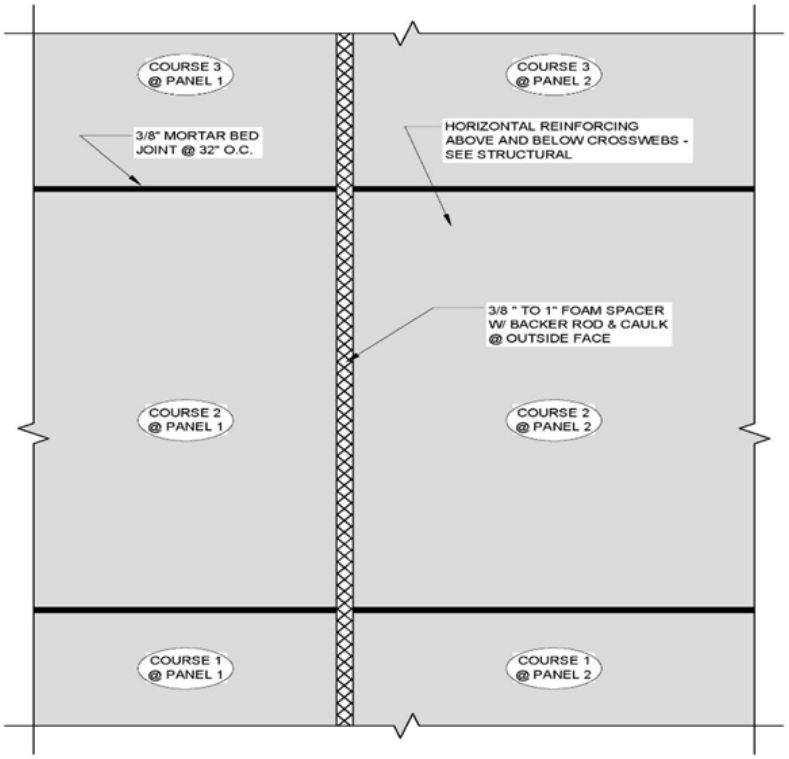


NOTE:
SB Installation Tie-Down & Hardware is not shown.

SAMPLE SPEEDBLOCK CMU - PANEL JOINT



PANEL JOINT – PLAN VIEW



PANEL JOINT – ELEVATION

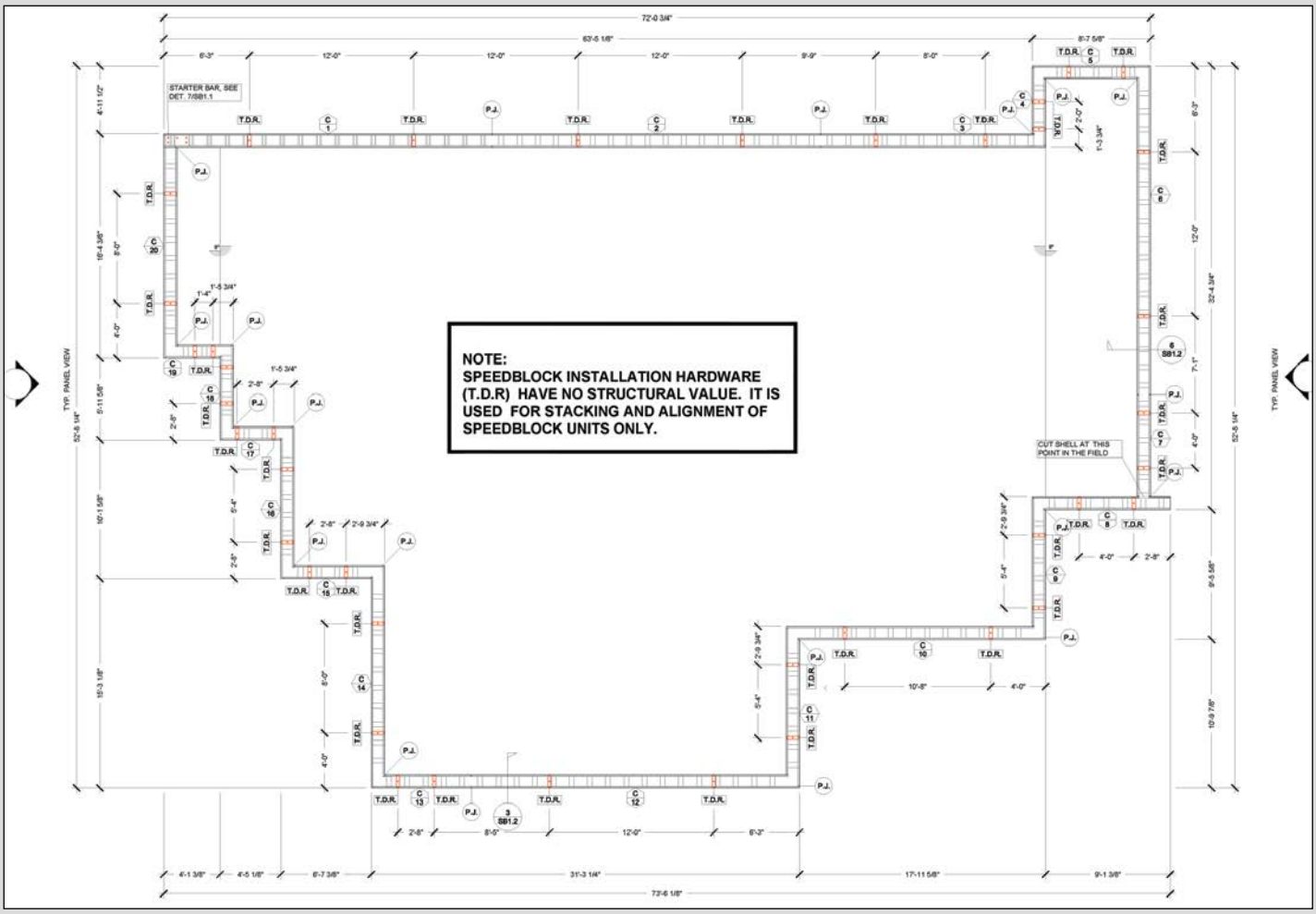
NOTE:
SB Installation Tie-Down & Hardware is not shown.

SPEEDBLOCK SHOP DRAWINGS

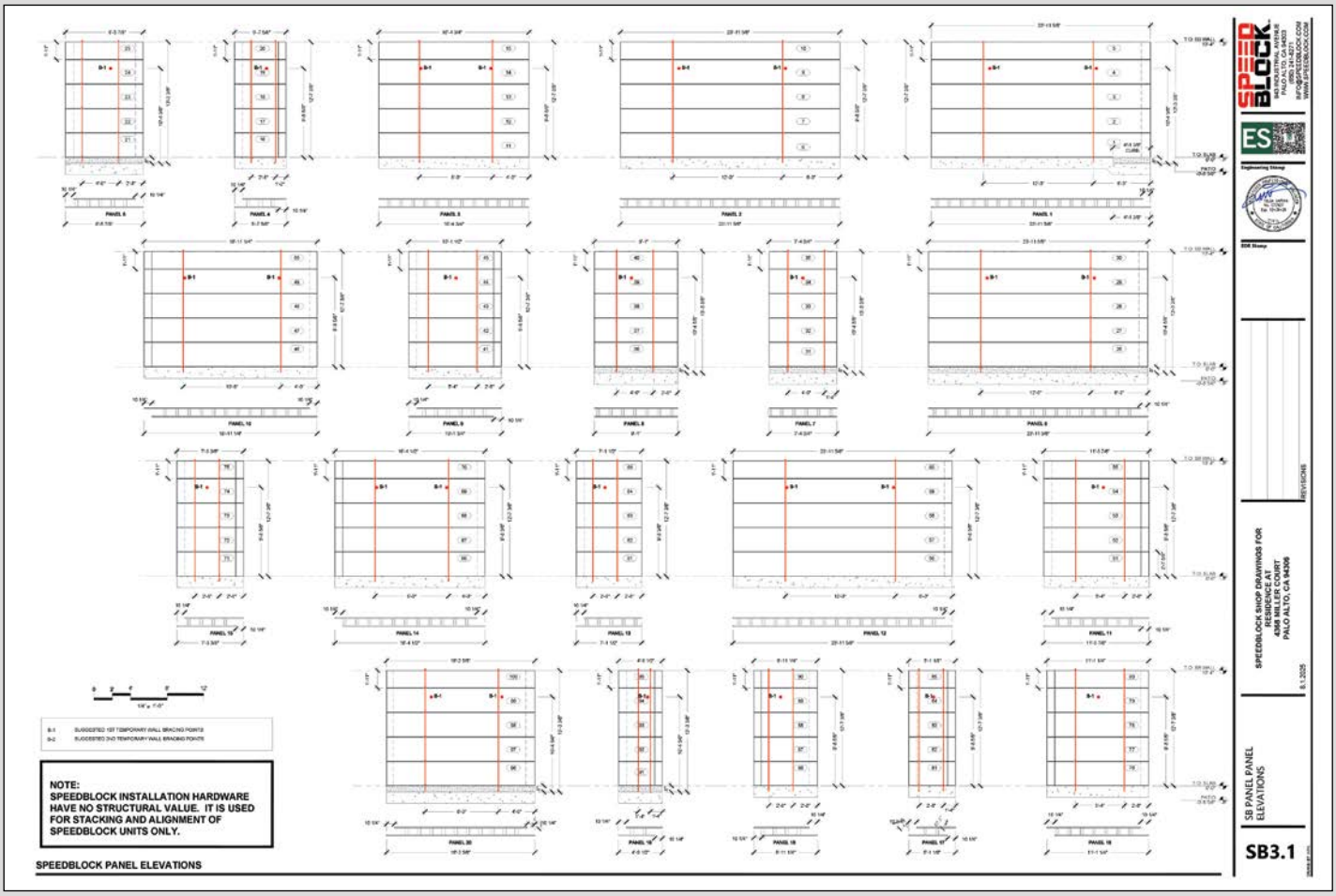
NOTE:

These shop drawings were developed for SpeedBlock offices at the Galt manufacturing facilities. Shop drawings are prepared separately and submitted to the architect of record for review.

STEP 1: ARCHITECTURAL PLAN VIEW

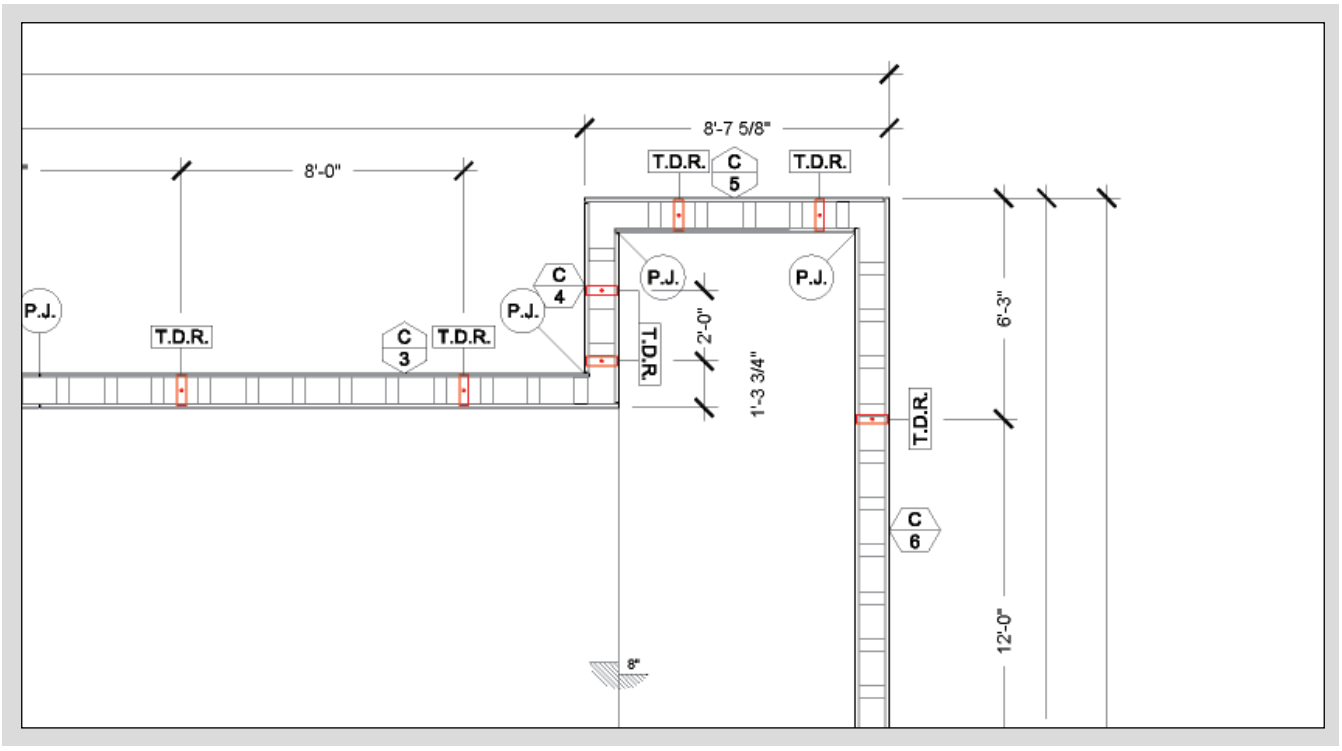


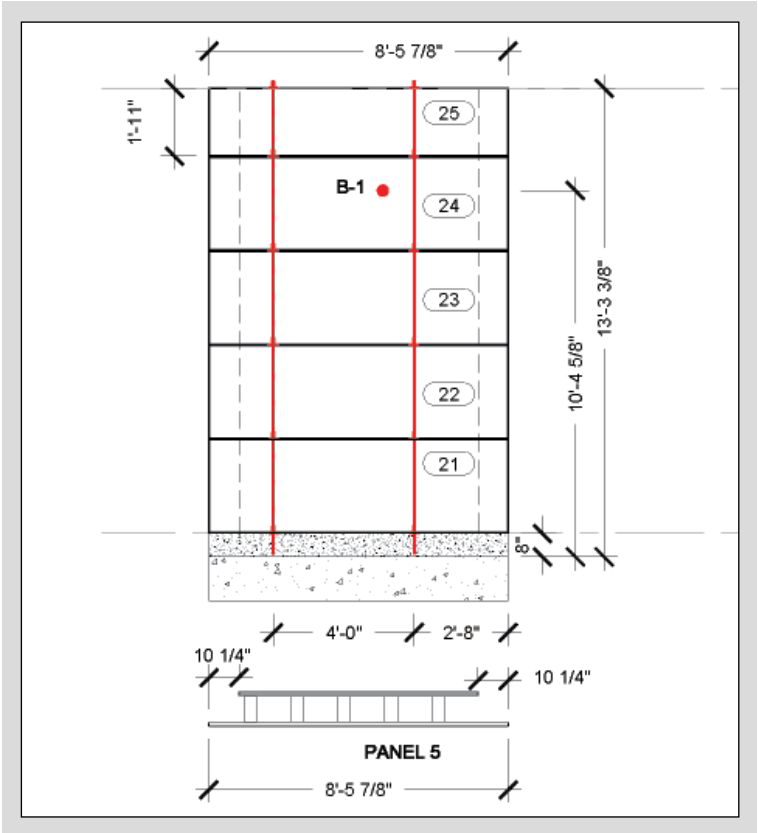
STEP 2: SPEEDBLOCK ELEVATION AND LAYOUT



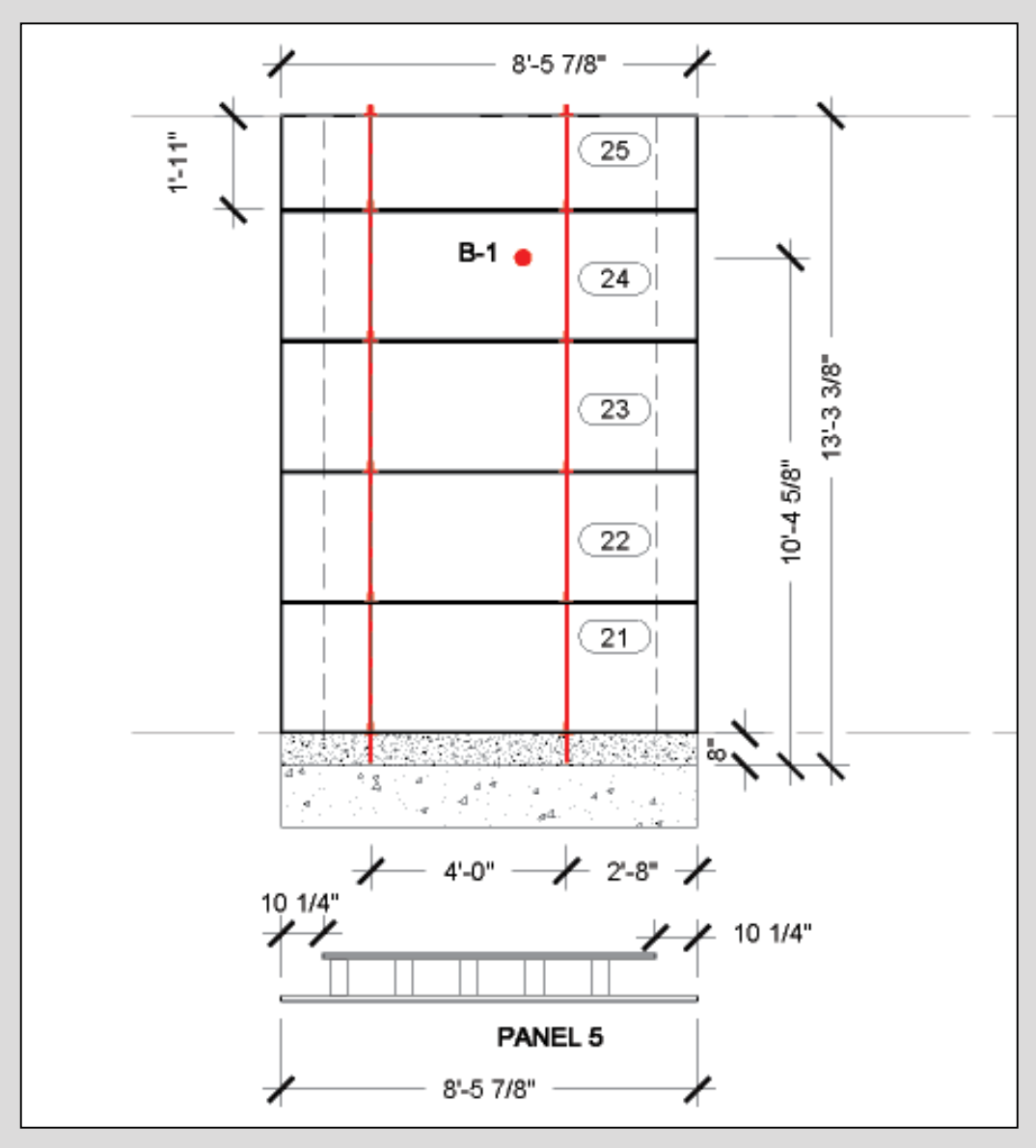
STEP 3: SPEEDBLOCK DETAILED ELEVATIONS

Example: Corner Details





STEP 4: SPEEDBLOCK ANCHOR AND TIE DOWN PLATE DETAILS



B-1 dot shows location for cross brace. Installation software is depicted in red lines.

STEP 5: CMU PRODUCTION & ORDER LISTS

Unit List

Job: Yu Residence
3439 Rosedale Dr
San Jose, CA 95117

Notes: LNS: Left NearSide Shell Cut; RNS: Right NearSide Shell Cut; BNS: Both NearSide Shell Cut;
H: Horizontal Cut; S: Multiple Cuts * Cut from scrap pieces; Left crossweb offset +- 1/4"

SB Job: 2022-10005 **(Rev 9.14.22)**

* Cut from scrap pieces

Unit Num	Panel Num	Course	Install Group	Install Sequence	Type	Cut Special	Unit Height	Offset to Left Web	Left End	Length	Right End	Identification	Load Num
1	1	1	1	1	12" No Pat, Natural Gray	LNS		6 1/4"	90	23'-11 5/8"	90	J2022-10005-P1-U1-L1	1
2	1	2	1	2	12" No Pat, Natural Gray	LNS		6 1/4"	90	23'-11 5/8"	90	J2022-10005-P1-U2-L1	1
3	1	3	1	3	12" No Pat, Natural Gray	LNS		6 1/4"	90	23'-11 5/8"	90	J2022-10005-P1-U3-L1	1
4	2	1	2	4	12" No Pat, Natural Gray			6 1/4"	90	23'-11 5/8"	90	J2022-10005-P2-U4-L1	1
5	2	2	2	5	12" No Pat, Natural Gray			6 1/4"	90	23'-11 5/8"	90	J2022-10005-P2-U5-L1	1
6	2	3	2	6	12" No Pat, Natural Gray			6 1/4"	90	23'-11 5/8"	90	J2022-10005-P2-U6-L1	1
7	3	1	3	7	12" No Pat, Natural Gray			6 1/4"	90	13'-6"	90	J2022-10005-P3-U7-L1	1
8	3	2	3	8	12" No Pat, Natural Gray			6 1/4"	90	13'-6"	90	J2022-10005-P3-U8-L1	1
9	3	3	3	9	12" No Pat, Natural Gray			6 1/4"	90	9'-9 7/8"	90	J2022-10005-P3-U9-L1	1
10	4	1	4	10	12" No Pat, Natural Gray	RNS		6 1/4"	90	21'-2 1/2"	90	J2022-10005-P4-U10-L1	1
11	4	2	4	11	12" No Pat, Natural Gray	RNS		6 1/4"	90	21'-2 1/2"	90	J2022-10005-P4-U11-L1	1
12	4	3	4	12	12" No Pat, Natural Gray	RNS		6 1/4"	90	21'-2 1/2"	90	J2022-10005-P4-U12-L1	1
13	4	4	4	13	8" No Pat, Natural Gray	RNS		6 1/4"	90	21'-2 1/2"	90	J2022-10005-P4-U13-L1	1
14	5	1	5	14	12" No Pat, Natural Gray	BNS		6 1/4"	90	5'-7 3/4"	90	J2022-10005-P5-U14-L1	1
15	5	2	5	15	12" No Pat, Natural Gray	BNS		6 1/4"	90	5'-7 3/4"	90	J2022-10005-P5-U15-L1	1
16	5	3	5	16	12" No Pat, Natural Gray	BNS		6 1/4"	90	5'-7 3/4"	90	J2022-10005-P5-U16-L1	1
17	5	4	5	17	8" No Pat, Natural Gray	BNS		6 1/4"	90	5'-7 3/4"	90	J2022-10005-P5-U17-L1	1
18	6	1	6	18	12" No Pat, Natural Gray	BNS		6 1/4"	90	21'-11 7/8"	90	J2022-10005-P6-U18-L2	2
19	6	2	6	19	12" No Pat, Natural Gray	BNS		6 1/4"	90	21'-11 7/8"	90	J2022-10005-P6-U19-L2	2
20	6	3	6	20	12" No Pat, Natural Gray	BNS		6 1/4"	90	21'-11 7/8"	90	J2022-10005-P6-U20-L2	2
21	7	1	7	21	12" No Pat, Natural Gray	BNS		6 1/4"	90	17'-3 1/2"	90	J2022-10005-P7-U21-L2	2
22	7	2	7	22	12" No Pat, Natural Gray	BNS		6 1/4"	90	17'-3 1/2"	90	J2022-10005-P7-U22-L2	2
23	7	3	7	23	12" No Pat, Natural Gray	BNS		6 1/4"	90	17'-3 1/2"	90	J2022-10005-P7-U23-L2	2
24	7	4	7	24	12" No Pat, Natural Gray	BNS	27 6/8	6 1/4"	90	17'-3 1/2"	90	J2022-10005-P7-U24-L2	2
25	8	1	8	25	12" No Pat, Natural Gray	LNS		6 1/4"	90	23'-11 5/8"	90	J2022-10005-P8-U25-L2	2
26	8	2	8	26	12" No Pat, Natural Gray	LNS		6 1/4"	90	23'-11 5/8"	90	J2022-10005-P8-U26-L2	2
27	8	3	8	27	12" No Pat, Natural Gray	LNS		6 1/4"	90	23'-11 5/8"	90	J2022-10005-P8-U27-L2	2
27	8	3	8	27	12" No Pat, Natural Gray	LNS		6 1/4"	90	23'-11 5/8"	90	J2022-10005-P8-U27-L2	2
28	8	4	8	28	12" No Pat, Natural Gray	LNS		6 1/4"	90	23'-11 5/8"	90	J2022-10005-P8-U28-L2	2
28	8	4	8	28	12" No Pat, Natural Gray	LNS		6 1/4"	90	23'-11 5/8"	90	J2022-10005-P8-U28-L2	2
29	9	1	9	29	12" No Pat, Natural Gray	RNS		6 1/4"	90	10'-10 1/2"	90	J2022-10005-P9-U29-L2	2
29	9	1	9	29	12" No Pat, Natural Gray	RNS		6 1/4"	90	10'-10 1/2"	90	J2022-10005-P9-U29-L2	2

Installation Sequence List

Job: Yu Residence
3439 Rosedale Dr
San Jose, CA 95117

Notes: LNS: Left NearSide Shell Cut; RNS: Right NearSide Shell Cut; BNS: Both NearSide Shell Cut;
H: Horizontal Cut; S: Multiple Cuts * Cut from scrap pieces; Left crossweb offset +- 1/4"

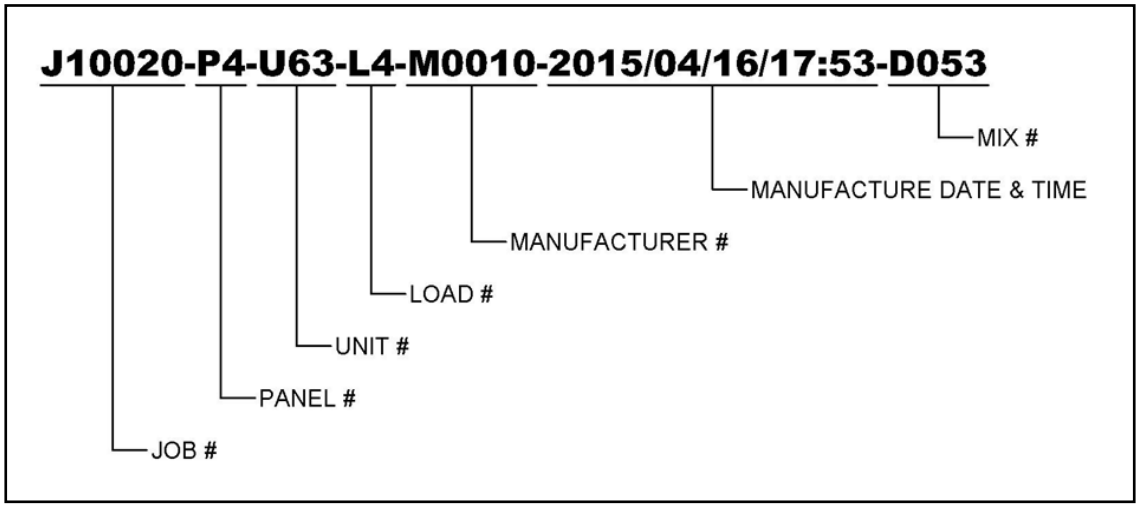
SB Job: 2022-10 **(Rev 9.14.22)**

* Cut from scrap pieces

Unit Num	Panel Num	Course	Install Group	Install Sequence	Type	Cut Special	Unit Height	Offset to Left Web	Left End	Length	Right End	Identification	Load Num	Load QC	Recut	Recut QC
1	1	1	1	1	12" No Pat, Natural Gray	LNS		6 1/4"		23'-11 5/8"		J2022-10005-P1-U1-L1	1			
2	1	2	1	2	12" No Pat, Natural Gray	LNS		6 1/4"		23'-11 5/8"		J2022-10005-P1-U2-L1	1			
3	1	3	1	3	12" No Pat, Natural Gray	LNS		6 1/4"		23'-11 5/8"		J2022-10005-P1-U3-L1	1			
4	2	1	2	4	12" No Pat, Natural Gray			6 1/4"		23'-11 5/8"		J2022-10005-P2-U4-L1	1			
5	2	2	2	5	12" No Pat, Natural Gray			6 1/4"		23'-11 5/8"		J2022-10005-P2-U5-L1	1			
6	2	3	2	6	12" No Pat, Natural Gray			6 1/4"		23'-11 5/8"		J2022-10005-P2-U6-L1	1			
7	3	1	3	7	12" No Pat, Natural Gray			6 1/4"		13'-6"		J2022-10005-P3-U7-L1	1			
1	14	5	1	5	14	12" No Pat, Natural Gray	BNS		6 1/4"		5'-7 3/4"		J2022-10005-P5-U14-L1	1			
1	8	3	2	3	8	12" No Pat, Natural Gray			6 1/4"		13'-6"		J2022-10005-P3-U8-L1	1			
	9	3	3	3	9	12" No Pat, Natural Gray			6 1/4"		9'-9 7/8"		J2022-10005-P3-U9-L1	1			
1	15	5	2	5	15	12" No Pat, Natural Gray	BNS		6 1/4"		5'-7 3/4"		J2022-10005-P5-U15-L1	1			
	16	5	3	5	16	12" No Pat, Natural Gray	BNS		6 1/4"		5'-7 3/4"		J2022-10005-P5-U16-L1	1			
1	10	4	1	4	10	12" No Pat, Natural Gray	RNS		6 1/4"		21'-2 1/2"		J2022-10005-P4-U10-L1	1			
	11	4	2	4	11	12" No Pat, Natural Gray	RNS		6 1/4"		21'-2 1/2"		J2022-10005-P4-U11-L1	1			
	12	4	3	4	12	12" No Pat, Natural Gray	RNS		6 1/4"		21'-2 1/2"		J2022-10005-P4-U12-L1	1			
	13	4	4	4	13	8" No Pat, Natural Gray	RNS		6 1/4"		21'-2 1/2"		J2022-10005-P4-U13-L1	1			
1	17	5	4	5	17	8" No Pat, Natural Gray	BNS		6 1/4"		5'-7 3/4"		J2022-10005-P5-U17-L1	1			
1	40	11	4	11	37	8" No Pat, Natural Gray	LNS		6 1/4"		5'-6 1/8"		J2022-10005-P11-U40-L3	3			
1	18	6	1	6	18	12" No Pat, Natural Gray	BNS		6 1/4"		21'-11 7/8"		J2022-10005-P6-U18-L2	2			
	19	6	2	6	19	12" No Pat, Natural Gray	BNS		6 1/4"		21'-11 7/8"		J2022-10005-P6-U19-L2	2			
	20	6	3	6	20	12" No Pat, Natural Gray	BNS		6 1/4"		21'-11 7/8"		J2022-10005-P6-U20-L2	2			
	21	7	1	7	21	12" No Pat, Natural Gray	BNS		6 1/4"		17'-3 1/2"		J2022-10005-P7-U21-L2	2			
	22	7	2	7	22	12" No Pat, Natural Gray	BNS		6 1/4"		17'-3 1/2"		J2022-10005-P7-U22-L2	2			
	23	7	3	7	23	12" No Pat, Natural Gray	BNS		6 1/4"		17'-3 1/2"		J2022-10005-P7-U23-L2	2			
	24	7	4	7	24	12" No Pat, Natural Gray	BNS	27 6/8	6 1/4"		17'-3 1/2"		J2022-10005-P7-U24-L2	2			
	25	8	1	8	25	12" No Pat, Natural Gray	LNS		6 1/4"		23'-11 5/8"		J2022-10005-P8-U25-L2	2			
	26	8	2	8	26	12" No Pat, Natural Gray	LNS		6 1/4"		23'-11 5/8"		J2022-10005-P8-U26-L2	2			
	27	8	3	8	27	12" No Pat, Natural Gray	LNS		6 1/4"		23'-11 5/8"		J2022-10005-P8-U27-L2	2			
	28	8	4	8	28	12" No Pat, Natural Gray	LNS		6 1/4"		23'-11 5/8"		J2022-10005-P8-U28-L2	2			
	29	9	1	9	29	12" No Pat, Natural Gray	RNS		6 1/4"		10'-10 1/2"		J2022-10005-P9-U29-L2	2			
	30	9	2	9	30	12" No Pat, Natural Gray	RNS		6 1/4"		10'-10 1/2"		J2022-10005-P9-U30-L2	2			
	31	9	3	9	31	12" No Pat, Natural Gray	RNS		6 1/4"		10'-10 1/2"		J2022-10005-P9-U31-L2	2			

SPEEDBLOCK LABELING INFORMATION

Each individual SpeedBlock unit is assigned its own unique identifying tag ("UID").



SAMPLE TAG

This UID guides the unit through manufacture, inventory and stocking, shipping, delivery to the correct wall panel location at the building site, and assembly of the wall panel.

Each block carries its UID in two forms. First, a paper label with the tag is printed and glued to the unit. Second, a Radio Frequency ID ("RFID") chip is fastened to the interior of each unit. A handheld RFID reader can detect this UID through the concrete sidewall of the unit at several yards and display it. The RFID chip has no battery; it draws power from the radio signal of the RFID reader. Therefore, it lasts for many years and can provide an accountability trace in the event of any problems with the building.

TECHNICAL & ENGINEERING

SpeedBlock has obtained ICC-ES (ESL-1163) certification for its large concrete masonry unit (CMU) products manufactured in its production facilities located at Galt, California.

REFER TO APPENDIX B (TEK FILES) FOR:

- Concrete Masonry Construction
- Sound Transmission Class Rating for CMU
- Grouting Concrete Masonry Walls
- Maintenance of CMU Walls
- Grout for CMU
- Strength Design Provisions for CMU
- Allowable Stress Design Table for Reinforced CMU Walls

* SpeedBlock ICC-ES Report Number ESL-1163, revised October 5, 2026.

FULL REPORT IS AVAILABLE ONLINE AT
Reports Directory - ICC Evaluation Service, LLC (ICC-ES)

SPEEDBLOCK ICC-ES REPORT NUMBER ESL-1163

ICC EVALUATION SERVICE®

ICC-ES Listing Report

ESL-1163

Reissued January 2026

Revised October 2026

This report remains under an active continuous compliance program through the end of January 2027.

Listings are not to be construed as representing aesthetics or any other attributes not specifically addressed, nor are they to be construed as an endorsement of the subject of the listing or a recommendation for its use. There is no warranty by ICC Evaluation Service, LLC, express or implied, as to any finding or other matter in this listing, or as to any product covered by the listing.

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DIVISION: 04 00 00—MASONRY Section: 04 22 00—Concrete Unit Masonry	LISTEE: SPEEDBLOCK INCORPORATED	PRODUCT: SPEEDBLOCK MASONRY UNITS	

PRODUCT CERTIFICATION SYSTEM:

The ICC-ES product-certification system includes evaluated evidence in support of test data in accordance with the standard(s) listed below. The product and system also involves factory inspections, and assessment and surveillance of the listee's quality system.

EVALUATION:

The Speedblock Masonry Units are wet-cast manufactured concrete hollow rectangular-shaped blocks that come in nominal 32 inches (813 mm) high with two standard widths of nominal 8 inches (203 mm) and nominal 12 inches (305 mm) and standard length of 288 inches (7315 mm). Each Speedblock unit weighs 2,305 lbs (1046kg). See Figures 1 and 2 for details. The SpeedBlock Masonry Units were evaluated to the following standard:

- ASTM C90 (-16a and -14), Specification for Loadbearing Concrete Masonry Units, ASTM International.

FINDINGS:

The SpeedBlock Masonry Units, when tested in accordance with the requirements in ASTM C90, have met the minimum face shell and web requirements, and strength, absorption and density requirements of Table 1 and 2 of ASTM C90, respectively, for a nominal 8-inches (203 mm) wide normal weight density. ASTM C90 is referenced under Article 2.3 of TMS-602.

IDENTIFICATION:

1. The ICC-ES mark of conformity, electronic labeling, or the listing report number (ICC-ES ESL-1163) along with the name, registered trademark, or registered logo of the listee must be included in the product label. [Electronic labeling is the ICC-ES web address (www.icc-es.org); specific URL related to the report; or the ICC-ES machine-readable code placed on the aforementioned items.]
2. In addition, packaging of the SpeedBlock Masonry Units carries a label indicating the manufacturer's address, the product name, and the ICC-ES Listing Mark.

SPEEDBLOCK ICC-ES REPORT NUMBER ESL-1163

3. The report holder's contact information is the following:

SPEEDBLOCK INC.
427 CRYSTAL WAY
GALT, CALIFORNIA 95632
(209) 214-9643
www.speedblock.com

INSTALLATION

The product must be installed in accordance with the SpeedBlock Inc.'s published Technical Manual, dated October 5, 2026, and as required by the Authority Having Jurisdiction (AHJ). See Figures 3 through 5 for typical hardware and installation details.

CONDITIONS OF LISTING:

1. The listing report addresses only conformance with the standard noted above.
2. The report user shall provide evidence of code compliance using this report, in accordance with the design application, for the Authority Having Jurisdiction (AHJ) review and approval.
3. The listing report applies only to the materials tested and as submitted for review by ICC-ES.
4. The SpeedBlock Masonry Units are manufactured under a quality control program with inspections by ICC-ES.

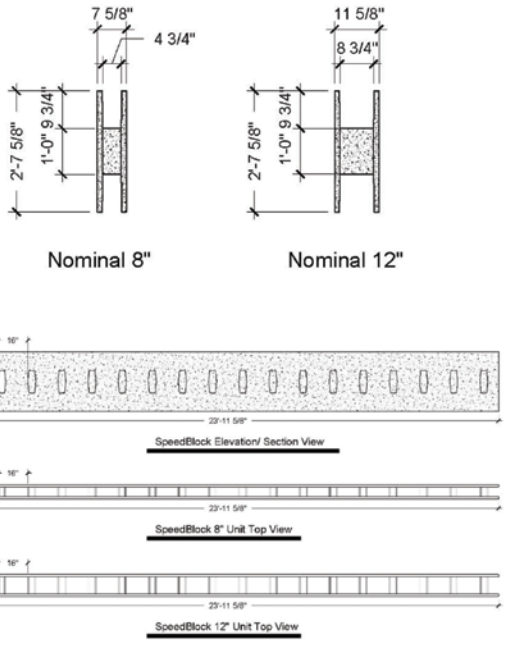
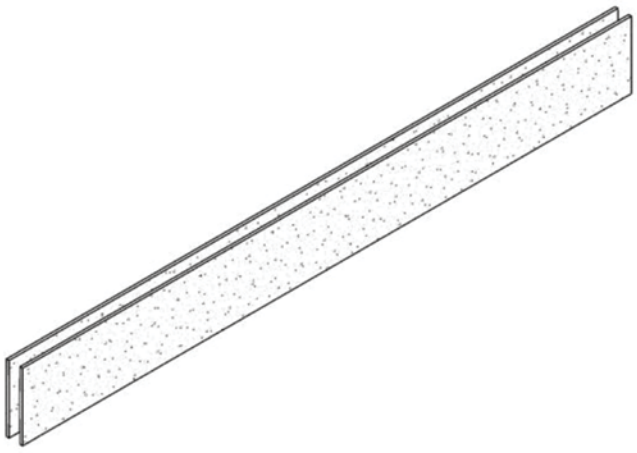


FIGURE 1 – SPEEDBLOCK MASONRY UNIT – STANDARD WIDTHS AND LENGTHS (1 in.=25.4 mm)

SPEEDBLOCK ICC-ES REPORT NUMBER ESL-1163

Page 3 of 4



8" x 32" x 288" Precision Unit

FIGURE 2 – SPEEDBLOCK MASONRY UNIT (TYPICAL) (1 in. = 24.5 mm)

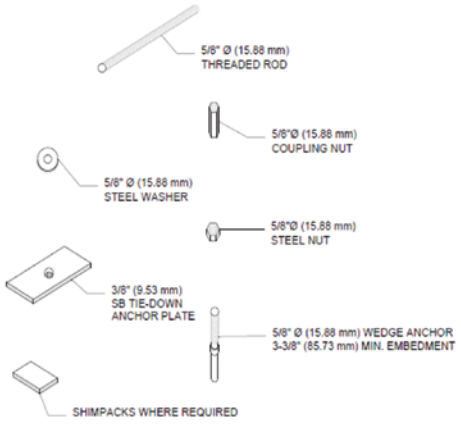


FIGURE 3 – TYPICAL HARDWARE USED FOR SPEEDBLOCK INSTALLATION (1 in.=25.4 mm)

SPEEDBLOCK ICC-ES REPORT NUMBER ESL-1163

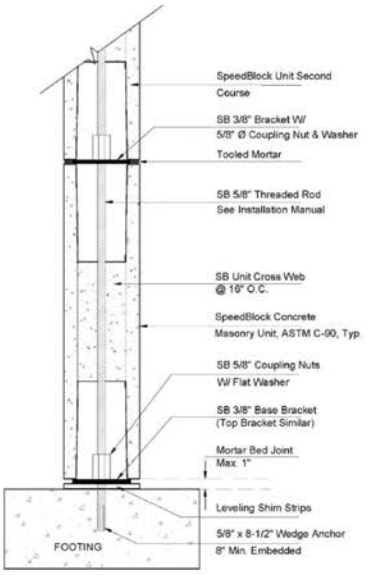


FIGURE 4 – INSTALLATION DETAIL (1 in.=25.4 mm)

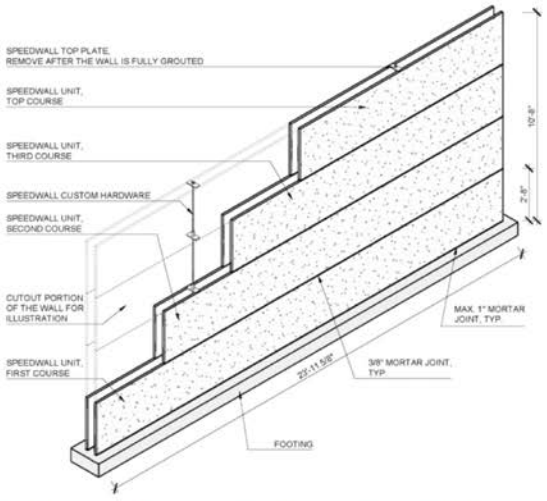


FIGURE 5 – SPEEDBLOCK WALL ASSEMBLY INSTALLATION (1 in.=25.4 mm)

SPEEDBLOCK STRUCTURAL LIMITS

Concrete masonry walls are designed per building code.

TYPE OF STRUCTURES

Industrial, Commercial, Public Works, and Residential structures (Type I through Type V construction). SpeedBlock products can be used in wall construction replacing concrete masonry units, Tilt-up, and/or cast-in-place concrete.

STRUCTURAL LIMITS

Heights up to 24 times thickness (12-inch CMU).

SEISMIC ZONES

All seismic zones.

GENERAL DESIGN DATA

Design data is based on Building Code Requirements for Masonry Structures (TMS 402-13/ACI 530-13/ASCE 5-13).

GENERAL SOIL MINIMUM REQUIREMENTS

Based on the site-specific soils' investigation prepared by a licensed geotechnical engineer/geologist or the minimum code allowed soil values.

LOAD AND RESISTANCE FACTOR DESIGN (LRFD)

Every project using SpeedBlock products must be structurally designed by the design professionals per the local geographic data, the local building codes, and the specific architectural requirements based on LRFD methodology or Allowable Strength Design (ASD) methodology to provide maximum protection for the life, safety, and welfare of its users.

SPEEDBLOCK PRODUCT TESTS, ATG

Applied Testing & Geosciences, LLC
When Quality Counts

September 30, 2021

Hamid Panahi
SpeedBlock Inc
Galt, CA

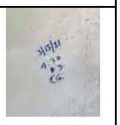
Ref: ASTM C90 Sampling
Applied Testing & Geosciences Project12727

Dear Mr. Panahi,

On March 15, 2021, virtual sampling was witnessed for SpeedBlock in support of their AC10 Product Listing Report. Sampling was performed by Applied Testing & Geosciences (ATG). During a video conference a cast sample from the previous day's production was selected and saw-cut into 12 prismatic samples suitable for ASTM C90/ASTM C140 testing. During the sampling the blocks were labeled for traceability to the samples that were received by the testing laboratory.

A list of sample details (Table 1), along with a complete list of the samples received and a detailed traceability study from raw materials to finished product (Table 2) is provided. All supporting documentation provided by the client as well as copies of the sample Chain of Custody and test report prepared by ATG are provided as attachments to this report.

Table 1 Project Information

ATG Project Number	12727	
Company	SpeedBlock (Erik Garfinkle)	
Name of Product	SpeedBlock	
Sampling Standard	AC10, AC85, ASTM C90, ASTM C140	
Sample Date	Batch Date= 3/15/21 (Cutting witnessed 3/16/21)	
Traceability	See Table 2. Samples received match samples seen during cutting. (See Screen Shot of sample labeling)	
Batch Number	Batch 7 (371), Machine 3, Mix #30, 4:30 PM	
Samples taken from production or inventory?	Previous Day's production	
Was sampling witnessed?	Sample cutting was witnessed virtually. Test Sample were saw cut by the client from the large cast SpeedBlocks	
Any abnormalities	No	
Batch Size	See Batch Ticket	
Raw Materials	See Table 2	
Sample By	T. Smith (Applied Testing & Geosciences)	
Sampling Agency	Applied Testing & Geosciences	
Accreditation	AA-672/TL-292	
List of samples obtained	See Chain of Custody COC-032721-12727-01 (12 saw cut prisms 8"x8"x16")	

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Applied Testing & Geosciences, LLC

When Quality Counts

Screenshots from virtual sampling (3/15/21)



Figure 1- Example Saw-cut sample



Figure 2-Cast SpeedBlock (Pre-cutting)



Figure 3 -SpeedBlock Sample loaded on Saw for cutting

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Applied Testing & Geosciences, LLC

When Quality Counts

Table 2 – Traceability Study

	Item	Spec	Tolerance	Reference	Actual (75% batch)	Reference	Conformance
QC properties	28 day Strength (psi)	5000	>5000	per Mix Design Submittal	Cylinder strengths not available Coupon strengths from 3rd party>5000	CTS reports	C
	Post Admix Slump (")	26	+/-3	Mix Design#30	25" (2" pre admix)	Notebook photocopy 3/15/21	C
	Air Content (%)	2.0	NA	Mix Design#30	not reported	not reported	NA
	Unit Weight (pcf)	148.8	NA	Mix Design#30	not reported	not reported	NA
Materials	Cement Type	C150 Type III	NA	Mix Design#30	C150 Type III	Cal Portland Mill Cert 12/2020	C
	Sand Type	Vernalis State Spec	NA	Mix Design#30	Vernalis State Spec Concrete Sand Caltrans 2018 Section 90 Concrete Sand	Teichart Materials Cert 7/3/19	C
	Stone Type	Vernalis Rewash 3/8"	NA	Mix Design#30	Vernalis Rewash 3/8 Caltrans 2018 Section 90 3/8" gravel	Teichart Materials Cert 7/3/19	C
	Admix 1 Type	Sika Viscorete 2100	NA	Mix Design#30	Sika Viscocrete 2100	E150 Ticket 3/15/21	C
	Admix 2 Type	SikaSet NC	NA	Mix Design#30	SikaSet NC	E150 Ticket 3/15/21	C
	Admix 3 Type	Stabilizer-4R	NA	Mix Design#30	Stabilizer-4R	E150 Ticket 3/15/21	C
Mix Design (Base Mix Rev1)	Mix ID	30	NA	Mix Design Submittal	30	E150 Ticket 3/15/21	C
	w/c	0.360	0.35-0.37	Mix Design#30	0.37	E150 Ticket 3/15/21	C
	water	316	+/-2%	Mix Design#30	242	E150 Ticket 3/15/21	C
	Cement (lbs/yd)	888	+/-2%	Mix Design#30	680	E150 Ticket 3/15/21	C
	Sand (lbs/yd)	1948	+/-2%	Mix Design#30	1490	E150 Ticket 3/15/21	C
	Stone (lbs/yd)	837	+/-2%	Mix Design#30	640	E150 Ticket 3/15/21	C
	Viscocrete 2100 (oz/yd)	97	+/-2.5%	Mix Design#30	71	E150 Ticket 3/15/21	C
	SikaSet NC (oz/yd)	110	+/-2.5%	Mix Design#30	81	E150 Ticket 3/15/21	C
	Stabilizer-4R (oz/yd)	23	+/-2.5%	Mix Design#30	17	E150 Ticket 3/15/21	C
	Fiber	4	+/-2.5%	Mix Design#30	Not reported	E150 Ticket 3/15/21	NA

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Finished Product Properties	Avg Net Area Compressive strength (psi)	>/=2000	>/=	ASTM C90	3570	ATG Test Report 12727-5138	C
	Avg Absorption (pcf)	</=13	</=	ASTM C90	10.3	ATG Test Report 12727-5138	C
	Avg thickness (faceshell) inches	>/=1.25	>/=	ASTM C90	1.582	ATG Test Report 12727-5138	C
	Avg thickness (web) inches	>/=0.75	>/=	ASTM C90	1.741	ATG Test Report 12727-5138	C
	Avg Oven Dry Density (pcf)	>/=125	>/=	ASTM C90	132.7	ATG Test Report 12727-5138	C

C=Conforms
DNC=Does not conform
(Manufacturing and QC testing not witnessed. Author did receive general virtual tour of manufacturing facility and process)

List of Attachments

1. ATG Chain of Custody
2. ATG Test Report C90-042721-12727-01
3. Customer paperwork (provided via email 9/1/21 "ICC Product Testing Docs 8-31-2021.pdf")
   - Production Flowchart
   - Sample Cutting Diagram
   - Daily production Record (3/15/21)
   - Daily Batch Report (3/15/21)
   - Sand Receiving Slip
   - Stone Receiving Slip
   - Cement Receiving Slip
   - Customer Mix Design (#30, Base Mix1 Rev1 7/13/2020 5000 psi)
   - Customer Batch Ticket (E150, 3/15/21)
   - Cement Mill Test Report
   - Sand Test Report
   - Stone Test Report
   - Admixture Specification Sheets
   - 3rd party CMU Test Reports

Respectfully submitted,
For **Applied Testing & Geosciences, LLC**

Thomas C. Smith

Product Materials Testing Manager

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Document No. COC-032721-12727-01
ID-ATG 5138-1
Date Received: 03/27/2021

Lab Chain of Custody - Sample Submittal Form

1. Client

Company Name		Company Address	Facility Location	Project Name
SpeedBlock Inc		943 Industrial Ave, Palo Alto, CA, 94303,	943 Industrial Ave, Palo Alto, CA, 94303,	12727 SpeedBlock Inc
Contact Name	Phone	Contact E-Mail	Report Notes / General	PO #
Hamid Panahi		hamid@speedblock.com		

2. Shipping / Delivery

# Samples	Carrier	Track #	Ship Date	Receipt Date	Received By	Shipped By	Sample As Received
	See attachment	See attachment		03/27/2021	Ryan Quitinsky		Intact

3. Sample Identification

ID-Client	ID-ATG	Photo	Material	Visual Description	Notes	Quantity	Reqd Storage Temp (F)	Reqd Storage RH (%)
SpeedBlock	5138-1		Concrete	8X8X16 #3	SpeedBlock	1 Bar(s)	No Requirement	No Requirement
SpeedBlock	5138-2		Concrete	8X8X16 #3		1 Block(s)	Not Specified	Not Specified
SpeedBlock	5138-3		Concrete	8X8X16 #3		1 Block(s)	Not Specified	Not Specified
SpeedBlock	5138-4		Concrete	8X8X16 #3		1 Block(s)	Not Specified	Not Specified
SpeedBlock	5138-5		Concrete	8X8X16 #3		1 Block(s)	Not Specified	Not Specified
SpeedBlock	5138-6		Concrete	8X8X16 #3		1 Block(s)	Not Specified	Not Specified

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Applied Testing & Geosciences, LLC
When Quality Counts

Document No. COC-032721-12727-01
ID-ATG 5138-1
Date Received: 03/27/2021

Lab Chain of Custody - Sample Submittal Form

SpeedBlock	5138-7		Concrete	8X8X16 #3		1 Block(s)	Not Specified	Not Specified
SpeedBlock	5138-8		Concrete	8X8X16 #3		1 Block(s)	Not Specified	Not Specified
SpeedBlock	5138-9		Concrete	8X8X16 #3		1 Block(s)	Not Specified	Not Specified
SpeedBlock	5138-10		Concrete	8X8X16 #3		1 Block(s)	Not Specified	Not Specified
SpeedBlock	5138-11		Concrete	8X8X16 #3		1 Block(s)	Not Specified	Not Specified
SpeedBlock	5138-12		Concrete	8X8X16 #3		1 Block(s)	Not Specified	Not Specified

4. Sample Collection

ID-Client	ID-ATG	Sampling Date	Name of Sampler	Method Sampled	Location Sampled	Sample Retention	Sample Disposal
SpeedBlock	5138-1	03/15/2021	Eric Garfinkel	AC-85 Cl 3.1		0 days	Discard w Charge
SpeedBlock	5138-2	03/15/2021	Eric Garfinkel	AC-85 Cl 3.1		0 days	Discard w Charge
SpeedBlock	5138-3	03/15/2021	Eric Garfinkel	AC-85 Cl 3.1		0 days	Discard w Charge
SpeedBlock	5138-4	03/15/2021	Eric Garfinkel	AC-85 Cl 3.1		0 days	Discard w Charge
SpeedBlock	5138-5	03/15/2021	Eric Garfinkel	AC-85 Cl 3.1		0 days	Discard w Charge
SpeedBlock	5138-6	03/15/2021	Eric Garfinkel	AC-85 Cl 3.1		0 days	Discard w Charge
SpeedBlock	5138-7	03/15/2021	Eric Garfinkel	AC-85 Cl 3.1		0 days	Discard w Charge
SpeedBlock	5138-8	03/15/2021	Eric Garfinkel	AC-85 Cl 3.1		0 days	Discard w Charge
SpeedBlock	5138-9	03/15/2021	Eric Garfinkel	AC-85 Cl 3.1		0 days	Discard w Charge
SpeedBlock	5138-10	03/15/2021	Eric Garfinkel	AC-85 Cl 3.1		0 days	Discard w Charge
SpeedBlock	5138-11	03/15/2021	Eric Garfinkel	AC-85 Cl 3.1		0 days	Discard w Charge
SpeedBlock	5138-12	03/21/2021	Eric Garfinkel	AC-85 Cl 3.1		0 days	Discard w Charge

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SPEEDBLOCK PRODUCT TESTS, ATG

Applied Testing & Geosciences, LLC
When Quality Counts

Document No. COC-032721-12727-01
ID-ATG 5138-1
Date Received: 03/27/2021

Lab Chain of Custody - Sample Submittal Form

5. Tests

Quantity	Test ID	Test Title
1	C90	Specification for Loadbearing Concrete Masonry Units (ASTM C90)
1	C140	Compressive Strength, Absorption, Unit Weight, Moisture, Flexural Strength of Concrete Masonry (C140)
1	C426	Drying Shrinkage of Concrete Masonry Units (C426)

6. Additional Information

Attachments

7. Signatures

Received By

Ryan Quitinsky

Ryan Quitinsky

SPEEDBLOCK PRODUCT TESTS, ATG

Applied Testing & Geosciences, LLC — **Report No. C90-042721-12727-01**

When Quality Counts

ASTM C90 - Standard Specification for Loadbearing Concrete Masonry Units

Client:

Company Name	SpeedBlock Inc
Reported To	Hamid Panahi
Company Address	943 Industrial Ave, Palo Alto, CA, 94303
Facility Location	943 Industrial Ave, Palo Alto, CA, 94303
Project	12727 SpeedBlock Inc
Report Notes	

Samples:

Chain of Custody	Client-ID	ATG-ID	Material	Description
COC-032721-12727-01	SpeedBlock	5138-1	Concrete	8X8X16 #3

Smpl. By	Sampled	Recv. By	Received	Method	Condition	Store
Eric Garfinkel	3/15/21	RQ	3/27/21	AC-85 CI ...	Intact	Amb.

Photo:

5138-1 Concrete 8X8X16 #3



Test Results:

ASTM	Description	Spec	Result	Units	C/NC
C140	Avg Net Area Compressive Strength	≥2,000	3,570	psi	C
C140	Avg Absorption	≤13	10.3	pcf	C
C140	Avg Absorption	N/A	7.8	%	R
C140	Avg Moisture Content	N/A	70.9	%	R
C140	Avg Oven Dry Density	≥125	132.7	pcf	C
C140	Avg Length	N/A	15.801	in	R
C140	Avg Height	N/A	7.649	in	R
C140	Avg Width	N/A	7.393	in	R
C140	Avg Thickness (Faceshell)	≥1.25	1.582	in	C
C140	Avg Thickness (Web)	≥0.75	1.741	in	C
C140	Avg Net Area	N/A	64.66	in^2	R
C140	Avg Net Volume	N/A	0.286	ft^3	R
C140	Avg Received Weight	N/A	39.26	lb	R
C426	Average Linear Drying Shrinkage at Equilibrium	N/A	-0.047	%	R

Statement of Conformity:

Tests (assigned C) conform to the referenced Spec value shown.

TS Technician: Thomas C. Smith
Test Date: -

TS Manager: Thomas C. Smith
Test Date: -

Notes:

1. Equip No. / Calib:
2. Technician Quals: C140 - 9/18/28; C426 - 9/18/28;
3. Chain of Custody on file.
4. Test Notes/Spec: Per Client / Standard(s) for applicable material(s).
5. Abbreviations: C=Conforms to Spec value shown, NC=Non-Conformance to Spec value shown, R=Report for Information only, NR=Not Requested by Client/Contract. Also see https://dms.appliedtesting.com/Download/abbreviations.pdf
6. Report may be reproduced or distributed only in its entirety.
7. Interpretation of test results is beyond the scope of this report.
8. Results apply to samples as received. Description per client.
9. Significance and use of test results per ASTM Standard.
10. Precision and bias of test results per ASTM Standard.

END-OF-REPORT

11. Test Location: 401 E. 4th St, Bridgeport PA 19405.
12. Decision Rule - Simple acceptance used in conformance decisions. Guardband (w) set equal to zero (0). (No application of measurement uncertainty). All acceptance criteria per ASTM C90.
13. Tested at 28 days (Cast Date = 3/15/21)
14. All samples sawcut to enclosed-cell, 4 sided prisms by client form larger specimens. Sampling witnessed virtually by ATG
15. All results are the average of a minumum of 3 samples
16. Samples tested as nominal 8"x8"x16" enclosed cell prisms
17. Report Updates (7/2/21) - Average Absorption (pcf) corrected, C90 spec limit for Density added, and C426 result added.

C90 Rev 08/09/2020
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SPEEDBLOCK PRODUCT TESTS, CTS

CONSTRUCTION TESTING SERVICES
*TESTING *INSPECTION *ENGINEERING

Concrete Masonry Unit Absorption and Compression Testing

Job No.: 16837 **Log No:** 225050 **Inspector:** Contractor **Lab Technician:** J. Peters
Date Sampled 10/1/2020 **Date Tested:** 10/9 - 10/30/20
Job Name: Speedblock - Masonry **Date Received** 10/7/2020 **Description:** Speedblock

Summary of Test Results

Physical Property	Specified Values	Average Test Results	
Net Compressive Strength	2000	6750	psi
Density ltwt (<105), med (105-125), >125		136	pcf
Absorption ltwt (18), Med (15), Normal (13)		10.45	pcf
Moisture Content	n/a	4.00	%

Physical Property	Average Test Results
Nominal Dimensions	8" x8" x 16" (Speed)
Net Cross-Sectional Area Absorption	11.50 in^2
Net Cross-Sectional Area Compression	9.38 in^2

Compression

	C1	C2	C3	
Received Wt. (lb)	3.23	3.25	3.22	lbs.
Cross Sectional Area (in^2)	9.31	9.77	9.07	in^2
Max Comp. load (P_{max})	64,250	65,992	59,887	lbs.
Comp. Strength (psi)	6,900	6,750	6,600	psi

Absorption

Weight:	A1	A2	A3
Received (lb), Wr	6.42	6.47	6.82
Immersed (lb), Wi	3.96	4.00	4.18
Saturated (lb), Ws	6.90	6.94	7.32
Final Oven-Dry (lb), Wd	6.40	6.46	6.79

Dimensions:	A1	A2	A3	Avg.
Width (in)	2.24	2.24	2.23	2.24
Height (in)	7.24	7.23	7.25	7.24
Length (in)	7.49	7.48	7.49	7.49

Calculations:	A1	A2	A3	Avg.
Absorption (pcf)	10.61	10.28	10.47	10.45
Density (pcf)	135.75	137.05	135.05	135.95
Net Volume (ft^3)	0.0472	0.0471	0.0503	0.05
Net Area (in^2)	11.26	11.26	11.99	11.50
Moisture Content** % of total absorption	3.50	3.10	5.41	4.00

Notes: 1). Sample coupons used for absorption
2). Sample coupons used for compression 3). Shrinkage test valid only for control joints spaced greater than 25 feet.

**Received weight determined at the time of unit delivery to the job site or from units sampled at that time and delivered to the laboratory in sealed containers for moisture content determination

Testing Procedure and results comply with ASTM C90, C140, and C1552.

Testing was performed by qualified personnel in accordance with generally accepted industry practice, material testing consultants procedures and the above referenced standards. This report is applicable only to the items listed herein. The Tests performed and in this report are not intended to be considered as any guarantee or warranty of suitability for service or fitness of use of items tested and should not be relied on as such. The report has been prepared for the exclusive use of the client and any partial or whole reproduction without the consent of the client is prohibited.

Construction Testing Services, Inc.

Reviewed by: James Peters, Staff Engineer

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4400 Yankee Hill Rd., Rocklin, CA 95677 • Phone (916) 419-4747 • Fax (916) 419-4774

SPEEDBLOCK PRODUCT TESTS, CTS

CONSTRUCTION TESTING SERVICES
*TESTING *INSPECTION *ENGINEERING

Concrete Masonry Unit Absorption and Compression Testing

Job No.: 16837 **Log No:** 225047 **Inspector:** Contractor **Lab Technician:** J. Peters
Date Sampled 9/23/2020 **Date Tested:** 10/9 - 10/30/20
Job Name: Speedblock - Masonry **Date Received** 10/7/2020 **Description:** Speedblock

Summary of Test Results

Physical Property	Specified Values	Average Test Results	
Net Compressive Strength	2000	**6280**	psi
Density ltwt (<105), med (105-125), >125		135	pcf
Absorption ltwt (18), Med (15), Normal (13)		**11.04**	pcf
Moisture Content	n/a	5.58	%

Physical Property	Average Test Results
Nominal Dimensions	8" x8" x 16" (Speed)
Net Cross-Sectional Area Absorption	11.51 in^2
Net Cross-Sectional Area Compression	9.43 in^2

Compression

	C1	C2	C3	
Received Wt. (lb)	3.21	3.20	3.21	lbs.
Cross Sectional Area (in^2)	9.45	9.67	9.18	in^2
Max Comp. load (P_{max})	58,270	59,592	59,890	lbs.
Comp. Strength (psi)	6,170	6,160	6,520	psi

Absorption

Weight:	A1	A2	A3
Received (lb), Wr	6.40	6.42	6.79
Immersed (lb), Wi	3.94	3.98	4.15
Saturated (lb), Ws	6.89	6.93	7.30
Final Oven-Dry (lb), Wd	6.38	6.39	6.75

Dimensions:	A1	A2	A3	Avg.
Width (in)	2.25	2.26	2.26	2.26
Height (in)	7.26	7.25	7.26	7.26
Length (in)	7.51	7.52	7.50	7.51

Calculations:	A1	A2	A3	Avg.
Absorption (pcf)	10.79	11.42	10.90	11.04
Density (pcf)	134.95	135.16	133.71	134.61
Net Volume (ft^3)	0.0473	0.0473	0.0505	0.05
Net Area (in^2)	11.25	11.27	12.02	11.51
Moisture Content** % of total absorption	3.92	5.56	7.27	5.58

Notes: 1). Sample coupons used for absorption
2). Sample coupons used for compression 3). Shrinkage test valid only for control joints spaced greater than 25 feet.

**Received weight determined at the time of unit delivery to the job site or from units sampled at that time and delivered to the laboratory in sealed containers for moisture content determination

Testing Procedure and results comply with ASTM C90, C140, and C1552.

Testing was performed by qualified personnel in accordance with generally accepted industry practice, material testing consultants procedures and the above referenced standards. This report is applicable only to the items listed herein. The Tests performed and in this report are not intended to be considered as any guarantee or warranty of suitability for service or fitness of use of items tested and should not be relied on as such. The report has been prepared for the exclusive use of the client and any partial or whole reproduction without the consent of the client is prohibited.

Construction Testing Services, Inc.

Reviewed by: James Peters
James Peters, Staff Engineer

Page 1 of 2

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This international standard was developed in accordance with internationally recognized principles on standardization established in the Decision on Principles for the Development of International Standards, Guides and Recommendations issued by the World Trade Organization Technical Barriers to Trade (TBT) Committee.

Designation: C90 – 16a

Standard Specification for Loadbearing Concrete Masonry Units[1]

This standard is issued under the fixed designation C90; the number immediately following the designation indicates the year of original adoption or, in the case of revision, the year of last revision. A number in parentheses indicates the year of last reapproval. A superscript epsilon (ε) indicates an editorial change since the last revision or reapproval.

This standard has been approved for use by agencies of the U.S. Department of Defense.

1. Scope*

1.1 This specification covers hollow and solid (see 5.3 and 5.4) concrete masonry units made from hydraulic cement, water, and mineral aggregates with or without the inclusion of other materials. There are three classes of concrete masonry units: Normal Weight, Medium Weight, and Lightweight. These units are suitable for both loadbearing and nonloadbearing applications.

1.2 Concrete masonry units covered by this specification are made from lightweight or normal weight aggregates, or both.

NOTE 1—The requirements of this specification have been researched, evaluated, and established for over a century, resulting in the physical properties and attributes defined here. These requirements are uniquely and solely applicable to concrete masonry units manufactured on equipment using low or zero slump concrete and the constituent materials defined herein. Many performance attributes of concrete masonry units are indirectly accounted for, or inherently reflected within, the requirements of this specification without direct measurement, assessment, or evaluation. Applying the requirements of this specification to products that may be similar in appearance, use, or nature to those covered by this specification may not address all pertinent physical properties necessary to ensure performance or serviceability of the resulting construction in real-world applications under typical exposure environments. Products manufactured using alternative materials, manufacturing methods, or curing processes not covered by this specification should not be evaluated solely using the requirements in this specification; however, developers of new products can consider the property requirements of this specification as a beginning benchmark for unit performance. It is reasonable to test new products for system performance as well as unit performance.

1.3 The text of this specification references notes and footnotes which provide explanatory material. These notes and footnotes (excluding those in tables and figures) shall not be considered as requirements of the standard.

1.4 The values stated in inch-pound units are to be regarded as standard. The values given in parentheses are mathematical conversions to SI units that are provided for information only and are not considered standard.

NOTE 2—When particular features are desired such as surface textures for appearance or bond, finish, color, or particular properties such as density classification, higher compressive strength, fire resistance, thermal performance or acoustical performance, these features should be specified separately by the purchaser. Suppliers should be consulted as to the availability of units having the desired features.

2. Referenced Documents

2.1 *ASTM Standards:*[2]

C33/C33M Specification for Concrete Aggregates
C140/C140M Test Methods for Sampling and Testing Concrete Masonry Units and Related Units
C150/C150M Specification for Portland Cement
C331/C331M Specification for Lightweight Aggregates for Concrete Masonry Units
C426 Test Method for Linear Drying Shrinkage of Concrete Masonry Units
C595/C595M Specification for Blended Hydraulic Cements
C618 Specification for Coal Fly Ash and Raw or Calcined Natural Pozzolan for Use in Concrete
C979/C979M Specification for Pigments for Integrally Colored Concrete
C989/C989M Specification for Slag Cement for Use in Concrete and Mortars
C1157/C1157M Performance Specification for Hydraulic Cement
C1232 Terminology of Masonry
C1240 Specification for Silica Fume Used in Cementitious Mixtures
C1314 Test Method for Compressive Strength of Masonry Prisms
E519/E519M Test Method for Diagonal Tension (Shear) in Masonry Assemblages
E72 Test Methods of Conducting Strength Tests of Panels for Building Construction

3. Terminology

3.1 Terminology defined in Terminology C1232 shall apply for this specification.

[1] This specification is under the jurisdiction of ASTM Committee C15 on Manufactured Masonry Units and is the direct responsibility of Subcommittee C15.03 on Concrete Masonry Units and Related Units.

Current edition approved Dec. 15, 2016. Published January 2017. Originally approved in 1931. Last previous edition approved in 2016 as C90 – 15. DOI: 10.1520/C0090-16A.

[2] For referenced ASTM standards, visit the ASTM website, www.astm.org, or contact ASTM Customer Service at service@astm.org. For *Annual Book of ASTM Standards* volume information, refer to the standard's Document Summary page on the ASTM website.

***A Summary of Changes section appears at the end of this standard**

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4. Materials

4.1 *Cementitious Materials*—Materials shall conform to the following applicable specifications:

4.1.1 *Portland Cement*—Specification C150/C150M.

4.1.2 *Modified Portland Cement*—Portland cement conforming to Specification C150/C150M, modified as follows:

(1) Limestone—If calcium carbonate is added to the cement, the $CaCO_3$ content shall not be less than 85 %.

(2) Limitation on Insoluble Residue—1.5 %.

(3) Limitation on Air Content of Mortar—Volume percent, 22 % max.

(4) Limitation on Loss on Ignition—7 %.

4.1.3 *Blended Hydraulic Cements*—Specification C595/C595M.

4.1.4 *Hydraulic Cement*—Specification C1157/C1157M.

4.1.5 *Pozzolans*—Specification C618.

4.1.6 *Blast Furnace Slag Cement*—Specification C989/C989M.

4.1.7 *Silica Fume*—Specification C1240.

4.2 *Aggregates*—Aggregates shall conform to the following specifications, except for the grading requirements:

4.2.1 *Normal Weight Aggregates*—Specification C33/C33M.

4.2.2 *Lightweight Aggregates*—Specification C331/C331M.

NOTE 3—The grading requirements of Specifications C33/C33M and C331/C331M may not be suitable for concrete masonry production. Because of this, producers are allowed to modify grading to meet their needs and the requirements of this specification.

4.3 *Pigments for Integrally Colored Concrete*—Specification C979/C979M.

4.4 *Other Constituents*—Air-entraining agents, integral water repellents, and other constituents shall be previously established as suitable for use in concrete masonry units and shall conform to applicable ASTM standards or shall be shown by test or experience not to be detrimental to the durability of the concrete masonry units or any material customarily used in masonry construction.

5. Physical Requirements

5.1 At the time of delivery to the purchaser, units shall conform to the physical requirements prescribed in Table 1 and Table 2. All units shall be sound and free of cracks or other defects that interfere with the proper placement of the unit or significantly impair the strength or permanence of the construction. Minor cracks, incidental to the usual method of manufacture or minor chipping resulting from customary methods of handling in shipment and delivery, are not grounds for rejection.

NOTE 4—Higher compressive strengths than those listed in Table 2 may be specified where required by design. Consult with suppliers to determine availability of units of higher compressive strength.

NOTE 5—Oven-dry densities of concrete masonry units generally fall within the range of 85 to 145 lbf/ft^3 (1360 to 2320 kg/m^3). Because available densities will vary, suppliers should be consulted before specifying project requirements.

5.1.1 When higher compressive strengths than those listed in Table 2 are specified, the tested average net area compressive strength of three units shall equal or exceed the specified compressive strength, and the tested individual unit net area compressive strength of all three units shall exceed 90 % of the specified compressive strength. Compressive strength shall be tested in accordance with 8.2.

5.2 At the time of delivery to the purchaser, the average linear shrinkage of the three units tested shall not exceed 0.065 % when tested in accordance with 8.3.

NOTE 6—The purchaser is the public body or authority, association, corporation, partnership, or individual entering into a contract or agreement to purchase or install, or both, concrete masonry units. The time of delivery to the purchaser is FOB plant when the purchaser or the purchaser's agent transports the concrete masonry units, or at the time unloaded at the worksite if the manufacturer or the manufacturer's agent transports the concrete masonry units.

5.3 *Hollow Units:*

5.3.1 Face shell thickness (t_{fs}) and web thickness (t_w) shall conform to the requirements prescribed in Table 1.

NOTE 7—Web thickness (t_w) not conforming to the requirements prescribed in Table 1 may be approved, provided equivalent structural capability has been established when tested in accordance with the applicable provisions of Test Methods E72, C1314, E519/E519M, or other applicable tests and the appropriate design criteria developed is in accordance with applicable building codes.

5.4 *Solid Units:*

5.4.1 The net cross-sectional area of solid units in every plane parallel to the bearing surface shall be not less than 75 % of the gross cross-sectional area measured in the same plane.

5.5 *End Flanges:*

5.5.1 For units having end flanges, the thickness of each flange shall not be less than the minimum face shell thickness.

NOTE 8—Flanges beveled at the ends for mortarless head joint

TABLE 1 Minimum Face Shells and Web Requirements[A]

Nominal Width (W) of Units, in. (mm)	Face Shell Thickness (t_{fs}), min, in. (mm)[B,C]	Webs	
		Web Thickness[C] (t_w), min, in. (mm)	Normalized Web Area (A_{nw}), min, in.^{2}/ft^2 (mm^2/m^2)[D]
3 (76.2) and 4 (102)	¾ (19)	¾ (19)	6.5 (45,140)
6 (152)	1 (25)	¾ (19)	6.5 (45,140)
8 (203) and greater	1¼ (32)	¾ (19)	6.5 (45,140)

[A] Average of measurements on a minimum of 3 units when measured as described in Test Methods C140/C140M.
[B] When this standard is used for units having split surfaces, a maximum of 10 % of the split surface is permitted to have thickness less than those shown, but not less than ¾ in. (19.1 mm). When the units are to be solid grouted, the 10 % limit does not apply and Footnote C establishes a thickness requirement for the entire faceshell.
[C] When the units are to be solid grouted, minimum face shell and web thickness shall be not less than ⅝ in. (16 mm).
[D] Minimum normalized web area does not apply to the portion of the unit to be filled with grout. The length of that portion shall be deducted from the overall length of the unit for the calculation of the minimum web cross-sectional area.

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TABLE 2 Strength, Absorption, and Density Classification Requirements[A]

Density Classification	Oven-Dry Density of Concrete, lb/ft³ (kg/m³)	Maximum Water Absorption, lb/ft³ (kg/m³)		Minimum Net Area Compressive Strength, lb/in² (MPa)	
	Average of 3 Units	Average of 3 Units	Individual Units	Average of 3 Units	Individual Units
Lightweight	Less than 105 (1680)	18 (288)	20 (320)	2000 (13.8)	1800 (12.4)
Medium Weight	105 to less than 125 (1680–2000)	15 (240)	17 (272)	2000 (13.8)	1800 (12.4)
Normal Weight	125 (2000) or more	13 (208)	15 (240)	2000 (13.8)	1800 (12.4)

[A]Compressive strength, absorption, and density determined in accordance with 8.2.

applications that will be filled with grout are exempt from this requirement. Flanges which are specially shaped for mortarless head joint applications which have been shown by testing or field experience to provide equivalent performance are exempt from this requirement.

6. Permissible Variations in Dimensions

6.1 *Standard Units*—For standard units, no overall dimension (width, height, and length) shall differ by more than ±⅛ in. (3.2 mm) from the specified dimensions.

6.2 *Particular Feature Units*—For particular feature units, dimensions shall be in accordance with the following:

6.2.1 For molded face units, no overall dimension (width, height, and length) shall differ by more than ±⅛ in. (3.2 mm) from the specified standard dimension. Dimensions of molded features shall be within ±1/16 in. (1.6 mm) of the specified standard dimensions and shall be within ±1/16 in. (1.6 mm) of the specified placement of the molded feature.

NOTE 9—Molded features include, but are not limited to: ribs, scores, hex-shapes, and patterns.

6.2.2 For split-faced units, all non-split overall dimensions shall differ by not more than ±⅛ in. (3.2 mm) from the specified standard dimensions.

6.2.3 For slump units, no overall height dimension shall differ by more than ±⅛ in. (3.2 mm) from the specified standard dimension.

NOTE 10—On faces that are split or slumped, overall dimensions will vary. Consult with suppliers to determine achievable dimensional tolerances for products including these features.

7. Finish and Appearance

7.1 No more than 5 % of the units in the shipment shall exhibit one or more of the characteristics described in 7.1.1 through 7.1.4 and 7.2.

7.1.1 Units with dimensions not meeting the requirements of 6.1.

7.1.2 Units with finished face(s) containing chips larger than 1 in. (25.4 mm) in any direction.

7.1.3 Units with finished face(s) containing cracks wider than 0.02 in. (0.5 mm) and longer than 25 % of the nominal height of the unit.

7.1.4 Units that are broken.

NOTE 11—Units specified to have particular features or finishes, such as split-face and tumbled units, should not be evaluated for conformance of such features to the requirements of 7.1.2.

7.2 Where units are to be used in exposed wall construction, the face or faces that are to be exposed shall not show chips or cracks, not otherwise permitted in 7.1.2 and 7.1.3, or other imperfections when viewed from a distance of not less than 20 ft (6.1 m) under diffused lighting.

7.3 The color and texture of units shall be specified by the purchaser. The finished surfaces that will be exposed in place shall conform to an approved sample, consisting of not less than four units, representing the range of texture and color permitted.

NOTE 12—Concrete masonry units are produced using a wide variety of natural aggregates and other materials. As such, slight variations inherent from natural materials should be expected. Since specifying units and approving samples can take place several months prior to production of actual units for a project, slight variations in appearance from the approved sample are to be expected.

8. Sampling and Testing

8.1 The purchaser or authorized representative shall be accorded proper facilities to inspect and sample the units at the place of manufacture from the lots ready for delivery.

8.2 Compressive strength, absorption, density, and dimensional tolerances shall be based on tests of concrete masonry units of any configuration or dimension made with the same materials, concrete mix design, manufacturing process, and curing method, conducted in accordance with Test Methods C140/C140M and not more than 12 months prior to delivery.

8.3 Total linear drying shrinkage shall be based on tests of concrete masonry units of any configuration or dimension made with the same materials, concrete mix design, manufacturing process, and curing method, conducted in accordance with Test Method C426 and not more than 24 months prior to delivery.

9. Compliance

9.1 If a sample fails to conform to the specified requirements, the manufacturer shall be permitted to remove units from the shipment. A new sample shall be selected by the purchaser from remaining units from the shipment with a similar configuration and dimension and tested. If the second sample meets the specified requirements, the remaining portion of the shipment represented by the sample meets the specified requirements. If the second sample fails to meet the specified requirements, the remaining portion of the shipment represented by the sample fails to meet the specified requirements.

NOTE 13—Unless otherwise specified in the purchase order, the cost of tests is typically borne as follows: (*1*) if the results of the tests show that the units do not conform to the requirements of this specification, the cost is typically borne by the seller; (*2*) if the results of the tests show that the units conform to the specification requirements, the cost is typically borne by the purchaser.

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10. Keywords

10.1 absorption; compressive strength; concrete masonry units; equivalent web thickness; face shell; flange; lightweight; linear drying shrinkage; loadbearing; medium weight; normal weight; webs

APPENDIXES

(Nonmandatory Information)

X1. WATER PENETRATION RESISTANCE

X1.1 Exterior walls are often subjected to moisture penetration from one or more sources. For example, basement walls may be exposed to water from saturated soil. Above-grade exterior walls are usually exposed to wind-driven rain. To prevent water penetration, proper detailing, construction, flashing, and drainage should be provided. Proper water penetration resistant treatments should be applied to the walls. While it is not within the scope of Specification C90 to include information on resistance to water penetration, such information and guidelines are available from other organizations.

X2. CRACK CONTROL

X2.1 Restrained or differential movement in building elements and building materials can result in cracking. Some common causes of movement are: loads created by wind, soil pressure, seismic forces, or other external sources; settlement of foundations; or volume changes in materials. For example, volume changes in concrete masonry units can be caused by moisture gain and loss, thermal expansion and contraction, and carbonation. To limit and control cracking due to these and other causes, proper design, detailing, construction, and materials are necessary. Specification C90 provides a maximum limitation on the total linear drying shrinkage potential of the units, but it is not within the scope of this specification to address other design, detailing, construction, or material recommendations. This type of information and related guidelines for crack control are available from other organizations.

SUMMARY OF CHANGES

Committee C15 has identified the location of selected changes to this standard since the last issue (C90 – 16) that may impact the use of this standard. (December 15, 2016)

(1) Testing frequency in Section 8 was modified to be based on time of delivery.

Committee C15 has identified the location of selected changes to this standard since the last issue (C90 – 15) that may impact the use of this standard. (July 1, 2016)

(1) Modified 5.1.1, 5.2, and Table 2 to clarify determining of compliance for physical properties.

(2) Modified 4.2 and added Note 3 to clarify requirements for aggregate gradations.

Committee C15 has identified the location of selected changes to this standard since the last issue (C90 – 14) that may impact the use of this standard. (December 15, 2015)

(1) Revised 1.1 to remove numerals preceding density classifications.

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Safety Data Sheet (SDS)

Product: Concrete Masonry Unit (CMU or Block)
SDS No: 001 **Preparation Date:** 02/22/2023
Version No.: 1.0 **Revision Date:** Not Applicable (N/A)

SECTION 1. IDENTIFICATION OF THE MIXTURE AND SUPPLIER

1.1 Product Identifier:

Product name:	Concrete Masonry Unit (CMU or Block)
Product code:	Various
Formula:	Mixture

1.2 Relevant identified uses of the substance or mixture and uses advised against:

Relevant identified uses:	Construction
Uses advised against:	Any use other than those recommended

1.3 Details of the supplier of the safety data sheet:

Manufacturer/Supplier	SpeedBlock, Inc.
Street Address	943 Industrial Ave. CA
Country ID/Postcode	USA/94303
Customer service telephone:	**833-773-3325**
E-mail address (competent person)	gamechanger@speedblockcom

1.4 Emergency telephone number:

Emergency telephone number:	833-773-3325
Hours available:	24 hours a day / 7 days a week

SECTION 2. HAZARDS IDENTIFICATION

2.1 Classification of the mixture:

Concrete Masonry Units (CMU) are defined by OSHA as an article (under normal conditions, no more than minute or trace amounts of a hazardous chemicals are released and the article does not pose a physical hazard or health risk to employees).

No SDS is required for articles; however, this SDS is provided to communicate hazards associated where activities related to the CMU Block (cutting, grinding, crushing, drilling or breaking) may result in the release of a hazardous substance in DUST.

GHS Classification(s) for CMU Block according to OSHA Hazard Communication Standard (29 CFR 1910.1200) under normal handling conditions:

None

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GHS Classification(s) for dust generated from cutting, grinding, crushing, drilling or breaking of CMU Block according to OSHA Hazard Communication Standard (29 CFR 1910.1200) under use conditions that may result in the release of hazardous substances:

Skin Corrosion/Irritation, Category 2 (H315)
Eye Damage/Irritation, Category 2 (H319)
Specific Target Organ Toxicity-Repeated Exposure (STOT-RE), Category 1 (H372)

***Note**: The CMU dust classifications are based on (1) individual ingredient classifications (i.e., Silica Sand [SiO_2], Limestone, Portland Cement, Fly Ash, etc.), (2) the final chemical composition of the CMU Block (based on cement chemistry) and (3) the form of the material (dust). Further, the Specific Target Organ Toxicity-Repeat Exposure is a conservative classification based on the potential presence of respirable crystalline silica. SpeedBlock Inc., has not performed analysis for the presence of respirable crystalline silica under these handling conditions.*

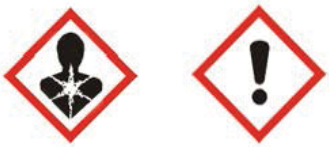
Additional information:
For full text of GHS Hazard statements (H-statements) and associated Precautionary statements (P-statements), see below.

2.2 Label elements

The Hazard Pictograms, Signal Word and Precautionary Statements only apply to activities that may release hazardous substances from the CMU (i.e., cutting / grinding / crushing / drilling / breaking).

No Hazard Pictograms, Signal Word or Precautionary Statements are applicable to the CMU Block.

Hazard Pictograms that apply to the dust generated from cutting, grinding, crushing, drilling or breaking of the CMU Block:



Signal Word:	Danger
Hazard Statements: (For CMU Dust Generated from Cutting, Grinding, Crushing, Drilling or Breaking)	H315: Causes skin irritation. H319: Causes eye irritation. H372: Causes damage to lungs through prolonged or repeated inhalation exposure.
Precautionary Statements: (For CMU Dust Generated from Cutting, Grinding, Crushing, Drilling or Breaking)	P260: Do not breathe dust. P270: Do not eat, drink or smoke while using this product. P271: Use only outdoors or in a well-ventilated area. P264: Wash thoroughly after handling. P280: Wear protective gloves/protective clothing/eye protection/face protection. P302 + P352: IF ON SKIN: Wash with plenty of water. P304 + P340: IF INHALED: Remove person to fresh air and keep comfortable for breathing. P305 + P351 + P338: IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing. P314: Get medical advice/attention if you feel unwell.

P321: See the SDS for specific treatment.
P332 + P313: If skin irritation occurs, get medical advice/attention.
P337 + 313: If eye irritation persists, get medical attention.
P362 + P364: Take off contaminated clothing and wash before reuse.
P501: Dispose of generated dust in accordance with local / regional / national / international regulations.

2.3 Other hazards related to CMU dust generated from cutting, grinding, crushing, drilling or breaking:

Listed Carcinogens: Silica dust (respirable, crystalline fraction) in the form of quartz.

IARC: Yes **NTP:** Yes **OSHA:** No **Other:** No (European Union)

Hazardous Properties: Dust generated from cutting, grinding, crushing, drilling or breaking may cause eye damage and skin irritation. May be irritating to respiratory tract. Respirable crystalline silica may cause damage to lungs upon repeated inhalation exposures.

SECTION 3. COMPOSITION / INFORMATION ON INGREDIENTS

3.1 Description of the mixture:

The product is a solid concrete block that, when subjected to cutting, grinding, crushing, drilling or breaking, may form hazardous dusts.

3.2 Hazardous Ingredients:

Name	CAS No.	Weight %	GHS Classification per OSHA Hazard Communication (29 CFR 1900.1200)
Silica dioxide (quartz)	14808-60-7	0-90%	STOT-RE, Category 1 (H372)*
Portland Cement	65597-15-1	8-15%	Skin Corrosion/Irritation, Category 2 (H315) Eye Damage/Irritation, Category 1 (H318) STOT-Single Exposure, Category 3 (H335)
Fly Ash	68131-74-8	0-4%	STOT-RE, Category 1 (H372*)

* *The Specific Target Organ Toxicity-Repeat Exposure (STOT-RE) is a conservative classification based on the presence/potential presence of respirable crystalline silica.*

SECTION 4. FIRST AID MEASURES

4.1 Description of first aid measures:

Inhalation: If dust generated from cutting, grinding, crushing, drilling or breaking is inhaled, remove person to fresh air and keep comfortable for breathing. Get medical attention if respiratory symptoms persist.

Skin contact: If dust generated from cutting, grinding, crushing, drilling or breaking is on skin, wash with soap and water. Get medical advice/attention if irritation occurs/persists.

Eye contact: If dust generated from cutting, grinding, crushing, drilling or breaking is in eyes, rinse cautiously with water for several minutes. Get medical advice/attention if irritation occurs/persists.

Ingestion: No specific first aid measures are required.

4.2 Most important health effects related to CMU dust generated from cutting, grinding, crushing, drilling or breaking, both acute and delayed:

Acute effects: Direct exposure to dust generated from cutting, grinding, crushing, drilling or breaking may cause eye damage/irritation, skin irritation and respiratory irritation. Dust can dry and irritate the skin and cause dermatitis. Can irritate eyes and skin through mechanical abrasion.

Delayed effects: Chronic exposure to inhaled dust generated from cutting, grinding, crushing, drilling or breaking may cause lung damage from repeated exposure. Chronic inhalation of dusts containing free crystalline silica may result in silicosis.

4.3 Indication of any immediate medical attention and special treatment needed:

Seek first aid or call a doctor if contact with dust generated from cutting, grinding, crushing, drilling or breaking with eyes occurs and irritation remains after rinsing.

SECTION 5. FIREFIGHTING MEASURES

5.1 Extinguishing Media:

Suitable extinguishing media: Product is not flammable. Use extinguishing media appropriate for surrounding fire.

Unsuitable extinguishing media: Not applicable; the product is not flammable.

5.2 Special hazards arising from the substance or mixture:

Hazardous combustion products: None known.

5.3 Advice for firefighters:

Special protective equipment and precautions for firefighters: As with any fire, wear self-contained breathing apparatus, MSHA/NIOSH (approved or equivalent) and full protective gear.

SECTION 6. ACCIDENTAL RELEASE MEASURES

6.1 Personal precautions, protective equipment and emergency procedures associated with CMU dust generated from cutting, grinding, crushing, drilling or breaking:

For Non-Emergency Personnel:

Protective equipment: In case of exposure to dust generated from cutting, grinding, crushing, drilling or breaking, wear specified protective equipment. (See Section 8).

Emergency procedures: Avoid the creation of dust generated from cutting, grinding, crushing, drilling or breaking. Use scooping, water/flushing/misting or vacuum cleaning systems. Wet methods of cutting, grinding, crushing, drilling or breaking are the preferred method of controlling dust.

For Emergency Responders:

Protective equipment: In case of exposure to dust generated from cutting, grinding, crushing, drilling or breaking, wear specified protective equipment. In case of fire, use self-contained breathing apparatus with full face mask.

6.2 Environmental Precautions

Discard any product or dust residue in compliance with local regulations.

6.3 Methods and material for containment and cleaning up:

For containment and cleaning up: After cutting, grinding, crushing, drilling or breaking activities, use scooping, water spraying/flushing/misting or ventilated vacuum cleaning system to clean up dust generated from cutting, grinding, crushing, drilling or breaking. Use closed containers. Do not use pressurized air to clean dust.

Other information: Take measures to avoid dust formation during cutting, grinding, crushing, drilling or breaking activities.

SECTION 7. HANDLING AND STORAGE

7.1 Precautions for safe handling:

Protective measures: Avoid contact with dust generated from cutting, grinding, crushing, drilling or breaking with skin, eyes, and clothing. Avoid breathing dust. Wash thoroughly after handling. Wet methods of cutting, grinding, crushing, drilling or breaking are the preferred method of controlling dust.

Measures to prevent fires: Not applicable; material is non-flammable.

Measures to prevent dust generation: Vacuum, scoop, or use water mist/spray/flush to remove generated dust during cutting, grinding, crushing, drilling or breaking activities. Do not use pressurized air. Wet methods of cutting, grinding, crushing, drilling or breaking are the preferred method of controlling dust.

Measures to protect the environment: Not applicable; material is not an environmental hazard.

Advice on general occupational hygiene: Practice good housekeeping. Avoid formation of dust generated from cutting, grinding, crushing, drilling or breaking. Do not breathe dust. Use adequate exhaust ventilation, dust collection and/or water mist to maintain airborne dust concentrations below permissible exposure limits. Respirable crystalline silica dust may be in the air without a visible dust cloud. In case of insufficient ventilation, wear a NIOSH approved respirator for silica dust when using, handling, storing or disposing dust from this product. Do not permit dust to collect on walls, floors, sills, ledges, machinery, or equipment. Maintain and test ventilation and dust collection equipment. Wash or vacuum clothing that has become dusty. Avoid eating, smoking, or drinking while handling the material.

7.2 Conditions for safe storage, including any incompatibilities:

Storage conditions: Minimize dust produced during loading and unloading.

SECTION 8. EXPOSURE CONTROLS / PERSONAL PROTECTION

8.1 Control parameters applicable to CMU dust generated from cutting, grinding, crushing, drilling or breaking:

United States

OCCUPATIONAL EXPOSURE LIMITS FOR HAZARDOUS SUBSTANCES IN THE WORKPLACE					
SUBSTANCE		OSHA PEL TWA / STEL (mg/m^3)	NIOSH REL TWA / STEL (mg/m^3)	ACGIH TLV TWA / STEL (mg/m^3)	CAL - OSHA PEL (mg/m^3)
Calcium Oxide		5	2	2	-
Crystalline Silica	Total Quartz	30 ÷ (%SiO_2+2) (Total Quartz)	-	-	0.3
	Respirable Crystalline Silica	10 ÷ (%SiO_2+2)	0.05	0.025 (α-quartz & cristobalite)	0.1
	Cristobalite	-	0.05	0.025 (α-quartz & cristobalite)	0.05 (respirable)
Particulates Not Otherwise Regulated	Total	15	15	-	10
	Respirable	5	5	-	5

8.2 Exposure controls:

8.2.1. Exposure Controls

Engineering controls: Ventilation should be adequate to maintain the ambient workplace atmosphere below the exposure limit(s). Use general and local exhaust ventilation and dust collection systems as necessary to minimize exposure to dust generated from cutting, grinding, crushing, drilling or breaking. Wet methods of cutting, grinding, crushing, drilling or breaking are the preferred method of controlling dust.

8.2.2. Personal Protective Equipment

Respiratory protection: Wear a NIOSH/MSHA approved particulate respirator if exposure to dust generated from cutting, grinding, crushing, drilling or breaking is unavoidable and where occupational exposure limits may be exceeded. If airborne dust exposures exceed the PEL or TLV, a self-contained breathing apparatus or airline respirator is recommended.

Eye and face protection: If eye contact with dust generated from cutting, grinding, crushing, drilling or breaking is anticipated, wear protective glasses with side shields. Avoid contact lenses.

Hand and skin protection: Wear gloves and protective clothing to minimize skin contact with dust generated from cutting, grinding, crushing, drilling or breaking. Wash hands with soap and water after contact with material.

Foot protection: Wear American National Standards Institute (ANSI) approved hard-toed safety shoes when handling CMUs.

8.2.3. Environmental Exposure Controls

Instructions to prevent exposure: No special requirements. Discard any product or dust residue in compliance with local regulations. Wet methods of cutting, grinding, crushing, drilling or breaking are the preferred method of controlling dust.

SECTION 9. PHYSICAL AND CHEMICAL PROPERTIES

9.1 Information on basic physical and chemical properties:

Property	Value	Property	Value
Appearance:	Solid Block	**Lower Explosive Limit (LEL):**	Not applicable
Odor	Odorless	**Vapor Pressure (Pa):**	Not applicable
Odor threshold	Not applicable	**Vapor Density:**	Not applicable
pH (25°C):	Not available	**Relative Density/Specific Gravity:**	2.2 – 2.8
Melting/Freezing Point (°C):	Not applicable	**Water Solubility:**	Negligible
Initial Boiling Point (°C):	Not applicable	**Partition Coefficient: *n*-octanol/water:**	Not applicable
Boiling Range (°C):	Not applicable	**Auto-ignition Temperature (°C):**	Not applicable
Flash Point(°C):	Not applicable	**Decomposition Temperature (°C):**	Not available
Evaporation Rate:	Not applicable	**Viscosity:**	Not applicable
Flammability (solid, gas):	Not combustible	**Explosive Properties:**	Not applicable
Upper Explosive Limit (UEL):	Not applicable	**Oxidizing Properties:**	Not applicable

SECTION 10. STABILITY AND REACTIVITY

10.1	**Reactivity**	Stable inert material
10.2	**Chemical stability**	Stable inert material
10.3	**Possibility of hazardous reactions**	None known.

10.4	**Conditions to avoid**	None known
10.5	**Incompatible materials**	None known
10.6	**Hazardous decomposition products**	None known

SECTION 11. TOXICOLOGICAL INFORMATION

11.1 Information on toxicological effects:

Acute toxicity:	No data is available on the CMU dust generated from cutting, grinding, crushing, drilling or breaking. No ingredients within the mixture exhibit acute toxicity.
Skin corrosion/irritation:	Contact with dust may cause skin irritation.
Serious eye damage / irritation:	Eye Irritant. Eye contact with dust generated from cutting, grinding, crushing, drilling or breaking may cause eye irritation.
Respiratory or skin sensitization:	No data is available on the CMU dust generated from cutting, grinding, crushing, drilling or breaking. No ingredients exhibit sensitization effects.
Germ cell mutagenicity:	No data is available on the CMU dust generated from cutting, grinding, crushing, drilling or breaking. No ingredients exhibit mutagenic effects.
Carcinogenicity:	No data is available on the CMU dust generated from cutting, grinding, crushing, drilling or breaking. Crystalline silica (respirable) has been identified as a carcinogen by IARC and NTP.
Reproductive toxicity:	No data is available on the CMU dust generated from cutting, grinding, crushing, drilling or breaking. No ingredients exhibit reproductive toxicity.
STOT single exposure:	No data is available on the CMU dust generated from cutting, grinding, crushing or drilling.
STOT repeated exposure:	No data is available on the repeated inhalation of CMU dust generated from cutting, grinding, crushing, drilling or breaking. Repeated inhalation of CMU dust generated from cutting grinding, crushing or breaking may cause lung damage if respirable crystalline silica is present. Crystalline silica (respirable) has been shown to cause silicosis after repeated exposure.
Aspiration hazard:	Not applicable, the material is a not a liquid.

SECTION 12. ECOLOGICAL INFORMATION

No data available on the CMU dust generated from cutting, grinding, crushing, drilling or breaking.

SECTION 13. DISPOSAL CONSIDERATIONS

Considered a non-hazardous waste. Follow applicable federal, state and local regulations.

Product:	**Concrete Masonry Unit (CMU or Block)**		
SDS No:	001	Preparation Date:	02/22/2023
Version No.:	1.0	Revision Date:	Not Applicable (N/A)

SECTION 14. TRANSPORT INFORMATION

Regulatory Entity		
US DOT	Shipping Name	Not regulated
	Hazard Class	Not regulated
	ID Number	Not regulated
	Packing Group	Not regulated

SECTION 15. REGULATORY INFORMATION

15.1 Safety, health and environmental regulations / legislation specific to the mixture:

United States Regulations		
Toxic Substances Control Act (TSCA) Inventory Status	All components of this product are listed on the TSCA Inventory or are exempt from listing.	
SARA (Section 311/312)	Reactive Hazard	No
	Pressure Hazard	No
	Fire Hazard	No
	Immediate/Acute Toxicity	No
	Delayed/Chronic Toxicity	Yes – respirable crystalline silica
SARA Section 313 Information:	This product does not contain any toxic chemicals listed under 313 of the Emergency Planning and Community Right-to-Know Act of 1986 (EPCRA).	
Clean Air Act (CAA)	This product does not contain any toxic chemicals listed under the CAA at concentrations greater than 0.1%.	
Volatile Organic Compounds (VOCs)	VOC Content (weight %).	0 wt. %
	Remarks:	Estimated
State Right-to-Know Status	California Prop. 65:	Crystalline Silica.
	Massachusetts:	Silica, Crystalline-Quartz; Calcium oxide; Calcium carbonate (Limestone); Portland cement; Iron oxide dust.
	New Jersey	Silica, Crystalline-Quartz; Calcium oxide; Calcium carbonate (Limestone); Cement, Portland, Chemicals; Iron oxide.
	Pennsylvania:	Quartz (silica dioxide); Calcium oxide; Calcium carbonate (Limestone); Cement, Portland, Chemicals; Iron oxide.

Dispose of all waste product and containers in accordance with federal, state and local regulations.

SECTION 16. OTHER INFORMATION

16.1 Indication of changes:

Initial SDS prepared on 04-07-2015

16.2 Abbreviations and acronyms:

ANSI:	American National Standards Institute
CAA:	Clean Air Act
Cal/OSHA:	California Department of Industrial Relations - Division of Occupational Safety and Health
CAS:	Chemical Abstract Service Registry Number
CFR:	Code of Federal Regulations
CMU:	Concrete Masonry Unit
CWA:	Clean Water Act
GHS:	Globally Harmonized System of Classification and Labeling
HMIS:	Hazardous Materials Identification System
IARC:	International Agency for Research on Cancer
LEL:	Lower explosive limit
MSHA:	Mine Safety and Health Administration
NA:	Not Applicable
NIOSH:	National Institute of Occupational Safety and Health
NTP:	National Toxicology Program
OSHA:	Occupational Safety and Health Administration
Pa:	Pascal
PEL:	Permissible exposure limit
SARA:	Superfund Amendments and Reauthorization Act
SDS:	Safety data sheet
STEL:	Short-term exposure limit
STOT-RE:	Specific target organ toxicity-repeated exposure
STOT-SE:	Specific target organ toxicity-single exposure
TLV:	Threshold limit value
TSCA:	Toxic Substances Control Act
TWA:	Time-weighted average
UEL:	Upper explosive limit
USA:	United States of America
US DOT:	United States of Department of Transportation
VOC:	Volatile organic compound

16.3 Other hazards:

Hazardous Materials Identification System (HMIS) Degree of hazard: 0 = low, 4 = extreme

Health: 1* **Flammability:** 0 **Reactivity:** 0

** Dust generated from cutting, grinding, crushing, drilling or breaking activities may result in a chronic health hazard (Category 3 Health Hazard)*

Personal Protection: B

Product:	**Concrete Masonry Unit (CMU or Block)**		
SDS No:	001	Preparation Date:	02/22/2023
Version No.:	1.0	Revision Date:	Not Applicable (N/A)

Disclaimer:

This SDS has been prepared in accordance with the Hazard Communication Rule 29 CFR 1910.1200. Information herein is based on data considered to be accurate as of date prepared. No warranty or representation, express or implied, is made as to the accuracy or completeness of this data and safety information. No responsibility can be assumed for any damage or injury resulting from abnormal use, failure to adhere to recommended practices, or from any hazards inherent in the nature of the product.

— End of Safety Data Sheet (SDS) —

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SPEEDBLOCK WALL BUILD PROCESS

ALL SPEEDBLOCK WALL BUILD PROJECTS INCLUDE:

- **SpeedBlock Shop Drawings** plans, details, and specifications.
- **SpeedBlock CMU Lists** with cut, load, and install data.
- **SpeedBlock CMU Blocks**, FOB job site, pre-cut to specified size, delivered in proper sequence, and schedule.
- **SpeedBlock Install Hardware** FOB job site.

GENERAL WALL BUILD PROCESS

SpeedBlock Shop Drawings include wall layout plans, wall elevations (showing each block), wall section details, and SpeedBlock Install Hardware and bracing locations and specifications.

SpeedBlock CMU List identifies each block's location, dimensions, and any attributes data.

SpeedBlock CMU blocks are delivered on flatbed trailers, are handled with small cranes, reach-forklifts, or other approved lifting equipment.

SpeedBlock CMU walls can use a dry stack method, with proper 3/8" spacing provided by the **SpeedBlock Install Hardware** tie-down plates. Install vertical and horizontal rebar per Structural Engineers plans, details, and specifications, ready for mortar work and grouting of wall.





DISCLAIMER:
The details & drawings as shown in this manual are intended to illustrate a general concept or a general method of construction. Details & drawings that show different or modified concepts or methods can not be of equal validity and should be excluded from consideration. These details shall not be used for construction withouth the approval and signature of a licensed design professional. The person using these details shall be responsible for its complete design and proper application.

Once walls are dry stacked and braced per shop drawings, the mortar can be placed into the 3/8" joints using a pump or hand grout bags. Workers should start placing the mortar at the top of the wall and work their way to bottom bed joint. Prior to placing mortar into the bed joint, clean the footing surface by removing any mortar droppings or loose debris with a pressure washer, air blow pipe, or shop vacuum, as required to achieve a clean and debris free footing surface. The bed joint allows for Special Inspectors to view that the bed joint is clean and free of debris or mortar droppings. If the contractor can demonstrate the joint is properly clean, the Special Inspector can eliminate the need for a clean-out hole at each vertical rebar. After all joints are properly mortared, the wall is ready to grout.

To grout the hollow, concrete block walls, obtain a Self-Consolidating-Grout mix design per ASTM specifications approved by the EOR. Grout walls using a 2-3 inch hose grout pump and place the concrete in lifts no more than 6 feet, and once adequately set, place the next lift over the previous lift, making sure to avoid a construction joint during the grout process.

Braces can be removed once the SpeedBlock walls are fully grouted, floors and roofs are connected to the wall per engineer's plans, details and specifications, and prior written approval by the EOR.



SPEEDBLOCK WALL BUILD COMPONENTS

SPEEDBLOCK™ CMU:

SpeedBlock™ Concrete Masonry Units per ASTM C-90
SpeedBlock Certified up to 4,800 *fn*

SPEEDBLOCK™ INSTALLATION TIE-DOWN HARDWARE:

- 5/8" Threaded rods – ASTM A36 Steel
- 5/8" Coupling nuts – ASTM A36 Steel
- 5/8" Plate Washers – ASTM A36 Steel
- 3/8" x 3" Tie-down plates – ASTM A36 Steel

STANDARD BRACES:

Dayton Superior Bracing per SpeedBlock Shop Drawing Specifications

STANDARD MATERIALS:

- Mortar Type S
- Reinforcing Steel – ASTM A615
- Grout - ASTM C476
- Anchor bolts
- Shims

GROUTING (PER CBC)

The contractor installing the SB CMU shall provide, to the project engineer of record and owner, certified stamped grout mix designs for each project for approval prior to placing grout. Grout mix shall meet project plans and specifications.

SpeedBlock concrete masonry units must be stacked so that they are aligned for an unobstructed continuous series of vertical spaces within the wall.

Care must be taken to prevent excess mortar from extruding and falling into the grout space. Mortar that projects more than 1/2 in. (13 mm) into the grout space should be removed because large protrusions restrict the flow of grout. The grout will tend to bridge at these locations and may cause incomplete filling of the grout space.

If foundation dowels are present, they should align with the voids of the units. If a few dowels interfere with placement of the units, they may be bent a maximum of 1 in. (25 mm) horizontally for every 6 in. (152 mm) vertically. If there is a substantial dowel alignment problem, the project engineer must be notified.

Vertical steel may be secured in place before the units are stacked, or it may be dropped into position after stacking is completed. When steel is placed after wall erection, steel spacer ties or other adequate positioning devices should be used. Both horizontal and vertical reinforcement should be located accurately and secured rigidly to prevent displacement during grouting. The California Building Code (ref 3) requires the steel to be secured at least every 200 bar diameters.

As the wall is constructed, horizontal reinforcement can be placed in the units. SpeedBlock Units can typically be grouted after allowing mortar to cure for about 24 hours.

SpeedBlock CMU Weights and Grout Volumes

WIDTH	WEIGHT PER 24' UNIT (lbs.)	WEIGHT PER SQ FT (lbs.)	GROUT PER 24' UNIT (cu yd)	GROUT PER SQ FT (cu yd)
8"	2305	36.54*	0.94	0.401
12"	2482	39.34*	1.65	0.707

** Add 3.5 pounds per sq. ft. for units with split-face pattern*

GROUT PLACEMENT (PER CBC)

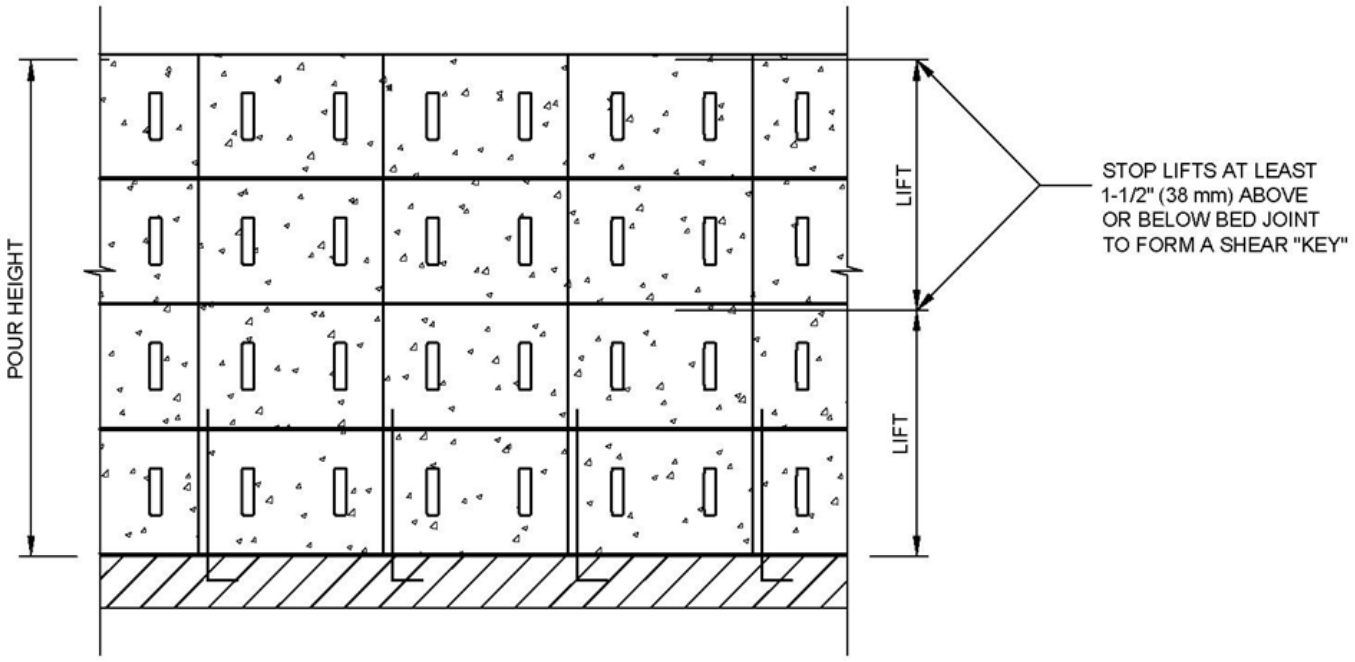
There are two grout placement procedures in general use: (1) low lift grouting, where the wall is constructed to pour heights up to 5 ft. (1.5 m) and no cleanouts are needed; and (2) high lift grouting, where grout is placed in pours over 5 ft. up to the story height and cleanout holes are required at the bottom of each grout space containing reinforcement. Where cleanouts are not required, special provisions must be made to keep the bottom and sides of the grout space, as well as the minimum total clear area as required in the California Building Code, Chapter 21, clean and clear prior to grouting.

A lift is the layer of grout placed in a single continuous operation. Grout lift heights are limited to 5 or 6 feet (1.5 or 1.8 m). A pour is the entire height of grout placed in one day and may be composed of a number of successively placed grout lifts. If a lift of grout is permitted to set for more than about one hour prior to placing the next lift, then that lift's height is the pour height.

SPEEDBLOCK CMU -
GROUT POUR VS. GROUT LIFT

The wall is built to a maximum of 5 ft. (1.5 m), and cells to be grouted are cleared of mortar and other debris. Steel reinforcing rods and other embedded items are then placed in the designated locations and the cells are grouted. For all lifts except the final, the level of the grout being placed is stopped about 1 1/2 inches (38 mm) below the top bed joint to form a "key" for successive lifts. For intermediate lifts, steel reinforcement should project above the top course for sufficient height to provide for the minimum required lap splice.

Grout should be moved from the mixer to the point of deposit as fast as practical. Pumping or other placing methods which prevent segregation of the mix should be used. Care should be taken to minimize grout splatter on reinforcement and on masonry unit surfaces not being immediately encased in the grout fill. On small projects, the grout can be placed with buckets equipped with spouts, such as coal scuttles. On large projects, grout pumps or concrete buckets equipped with chutes and handled with lift trucks are frequently used.



Spaces containing grout must be puddled or vibrated during placement to ensure complete filling of the grout space. Puddling with a wooden stick is allowed for grout pours of 12 in. (305 mm) or less. For higher pour heights, mechanical vibration is required. All grout lifts should be reconsolidated soon after initial placement.

HIGH LIFT GROUTING (PER BUILDING CODE)

In high lift grouting, grouting occurs after the concrete masonry wall is laid up to story height or to the maximum pour height shown. High lift grouting offers certain advantages, especially on larger projects. One advantage is that a larger volume of grout can be placed at one time, thereby increasing the overall speed of construction. A second advantage, in some instances, is that high lift grouting permits building the full story height before placing of vertical steel. Less steel is needed for splices, and the location of the steel can be easily checked by the inspector prior to grouting.

Cleanout openings of at least 3 in. (76 mm) must be made in the face shells of the bottom course of units in a grout pour. Cleanouts should be located at the bottom of all cores containing dowels or vertical reinforcement and at a maximum of 32 in. (813 mm) on center for solidly grouted walls. cleanouts should be made before the start of wall laying.

Proper preparation of the grout space before grouting is very important. After laying the masonry units, mortar droppings and projections must be removed from the masonry walls, reinforcement, and foundation or bearing surface. Removal of the debris may be accomplished by the use of a water or air hose, or by sweeping out through the cleanouts. The grout spaces should be checked by the inspector for cleanliness and reinforcement position before the cleanouts are closed. Cleanout openings may be sealed by mortaring the original face shell or section of face shell, or by forming over the openings to allow grouting to the plane of the wall. Face shell plugs should be adequately braced to resist the pressure of the fluid grout.

For economical placement, a uniform height of grout in maximum 5 ft. (1.5 m) lifts may be pumped, vibrated, and reconsolidated. Then pour succeeding lifts of grout.

Care must be taken between succeeding lifts of grout, particularly when using the 12 inch wide SB Units. Time must be allowed between grout lifts so that a minimum amount of hydrostatic pressure is placed on the SB Units during the grouting procedure. We recommend about 1/2 hour between grout lifts, but the time will vary depending on specific job conditions such as temperature, grout slump and wall construction set up.

The pouring, consolidation, and reconsolidation steps are repeated until the top of the pour is reached. The top lift is reconsolidated after the required waiting period and then filled with grout to replace any space left by settlement shrinkage. Waiting periods between consolidation and reconsolidation depend on weather conditions and absorption rates of the masonry.

CONSOLIDATION AND RECONSOLIDATION (PER BUILDING CODE)

An important factor mentioned in both grouting procedures is consolidation. As the water from the grout mixture is absorbed into the masonry, voids form and settlement may occur. Consolidation eliminates voids, helping to ensure complete grout fill and good bonding in the masonry system.

Reconsolidation is generally done between approximately 5 to 15 minutes after initial consolidation. The timing depends on the rate at which water is absorbed, which varies with such factors as temperature, absorptive properties of the masonry units, and the presence of water repellant admixtures in the units. In any case, reconsolidation must occur before the grout loses its plasticity. Consolidation and reconsolidation are normally achieved with a mechanical vibrator. A low velocity vibrator with a 3/4 inch (19 mm) head is typically used. The vibrator is activated for several seconds in each grouted cell of hollow unit masonry.

When reconsolidating a lift, the vibrator can be extended into the preceding lift. If conditions permit and grout pours are so timed, consolidation of a lift and reconsolidation of the preceding lift may be done at the same time.

CAUTION:
Excess vibration may blow out the face shells of hollow units or may separate wythes when grouting between wythes.

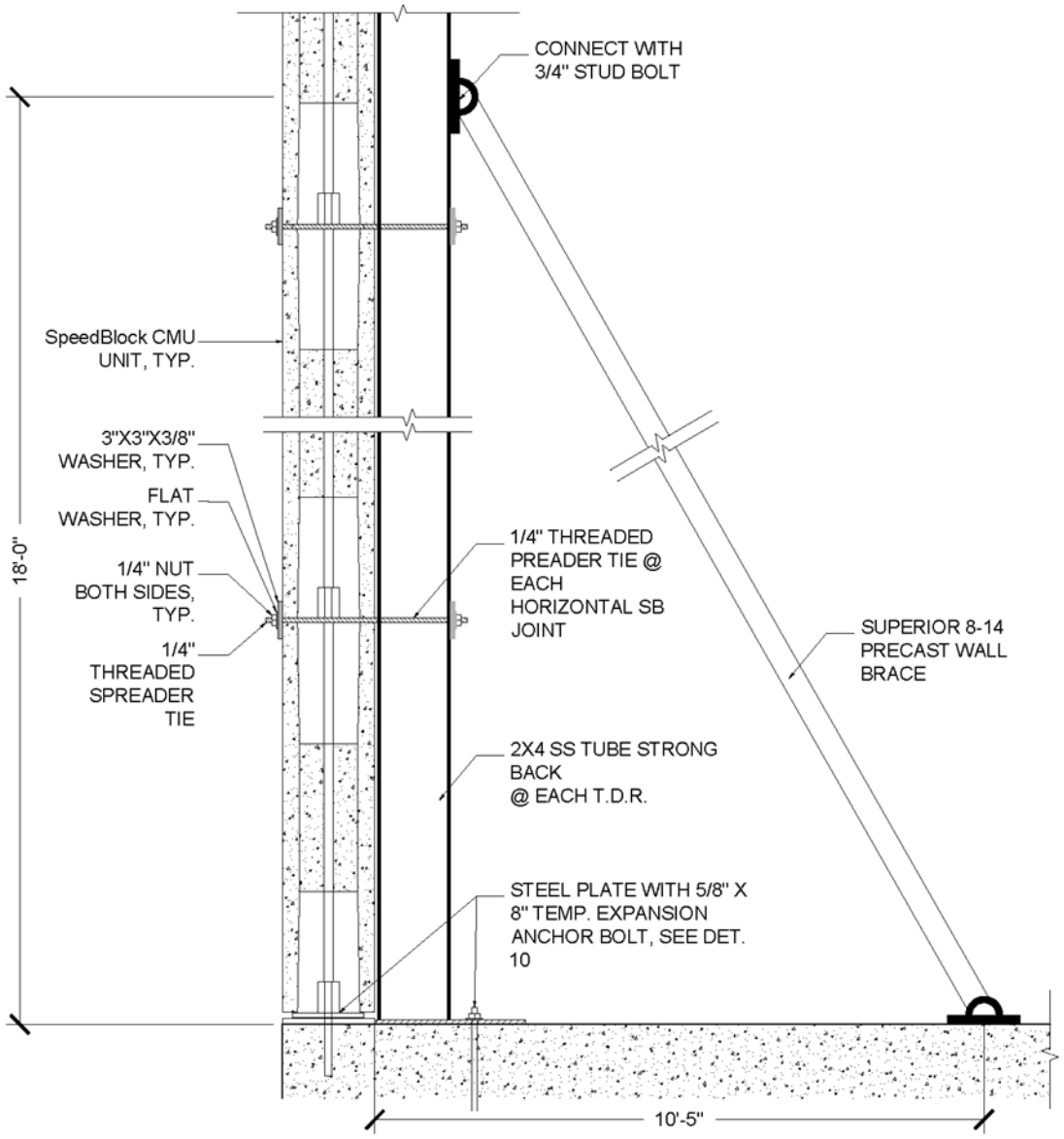
NOTES:
Project requirements can change sequence requirements and, in some cases, concrete deadman may be required to properly brace wall panels. Refer to the *SB ICC-ES Evaluation Report No. ESL-1163* for information on QC and QA testing and masonry test prisms.

WALL BRACING INSTALLATION

SpeedBlock can provide installation drawings for each project showing placement and type of wall bracing required. Wall braces shall be engineered as per local regulatory requirements.

SpeedBlock recommends the use of Dayton-Superior wall bracing systems in conjunction with SB proprietary Strong-back system. See Appendix A, Dayton-Superior wall bracing cut sheets and data information.

Prior to use, installers should review, understand, and follow all procedures associated with the safe and proper use of wall braces.



STEPS TO BUILD
16-FEET HEIGHT WALL

Step 1: Layout wall lines and install and level the base tie-down plates and threaded rods.



Step 2: Install 1st course CMU, plumb & level, install tie-down hardware, and release lifting straps, and install required reinforcing steel per plans and specifications.



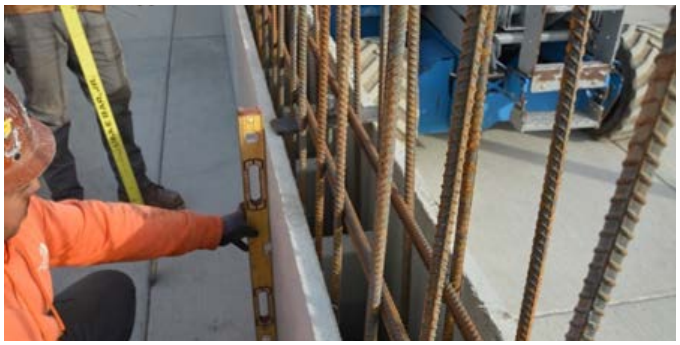
Step 3: Install 2nd and 3rd course CMUs, plumb & level, install tie-down hardware, and release lifting straps, and install required reinforcing steel per plan and specifications.



Step 4: Install 4th course of CMU, plumb & level, install tie-down hardware, wall brace, and release lifting straps, and install required reinforcing steel per plan and specifications.



Step 5: Install 5th and 6th course CMUs, plumb & level, install tie-down hardware, and release lifting straps and install required reinforcing steel per plan and specifications.



Step 6: Mortar each bed joint, starting at top course, and work to base course. Prior to placement of mortar, clean bed joint with water pressure washer, air pipe blower or vacuum and remove all debris and droppings, and place mortar bed joint.



Step 7: Place self-consolidating-grout (SCG) in maximum 4-feet lifts per lift placement rate chart.





Step 8: After walls are completed, remove wall braces.



STEPS TO BUILD 24-FEET HEIGHT WALL

Step 1: Layout wall lines and install and level the base tie-down plates and threaded rods.

Step 2: Install strong backs and braces, ready to stack blocks.

Step 3: Install 1st through 9th course CMU, plumb & level, install tie-down hardware, and release lifting straps, and install required reinforcing steel per plans and specifications.





Step 4: Mortar each bed joint, starting at top course, and work to base course. Prior to placement of mortar, clean bed joint with water pressure washer, air pipe blower or vacuum and remove all debris and droppings, and place mortar bed joint.



Step 5: Place self-consolidating-grout (SCG) in maximum 4-feet lifts per lift placement rate chart.



Step 6: After walls are completed, remove wall braces.







CONSTRUCTION AND SAFETY





SPEEDBLOCK INSTALLATION GUIDELINES

GENERAL TECHNICAL INFORMATION

The SpeedBlock™ CMU is a revolutionary new blend of existing precast and reinforced concrete masonry technologies. The SpeedBlock CMU is recognized as a reinforced masonry wall building system. The units are designed, manufactured, and constructed as per current CBC requirements for Masonry Chapter 21. Please refer to the ICC-ES Evaluation Report.

SpeedBlock (SB) concrete masonry units are manufactured to meet ASTM C-90 specifications and delivered to the job site.

SpeedBlock installation hardware consists of SB anchor plates, SB threaded rods and coupling nuts. SB anchor plates act as tie-down anchors for the SB units below and as a bearing plate for the next SB unit to be installed. SB threaded rods and SB coupling nuts are used to torque down anchor plates. Torque coupling nut and threaded rod to 50 foot-pounds.

SPEEDBLOCK TECHNICAL MANUAL

SpeedBlock provides a detailed Technical Manual for reference in conjunction with the installation guidelines. Installers should review the SpeedBlock Technical Manual in detail prior to installation of the SpeedBlock CMU.



DANGER:
Falling Units, Bracing or Hardware Can Cause Severe Injury or Death
Read, Understand and Follow the Information and Instructions in this Manual Before Handling or Installing any SpeedBlock Units. When in Doubt about Proper Installation of SpeedBlock Units Immediately Phone SpeedBlock Corporate Offices at 209-241-8271.

SPEEDBLOCK TECHNICAL SERVICES

SpeedBlock offers a full line of concrete masonry units and installation hardware as well as technical consulting services for the contractor. Trained field representatives can provide contractors with proper training and installation methods for the SpeedBlock CMU. SpeedBlock can provide shop drawings for each project. These drawings are used for wall design, generating a fabrication/cut list, delivery sequence list, and the installation and bracing plans.



ADVISORY:
First time installers should arrange for a SpeedBlock representative to be present at the jobsite to provide additional instruction prior to handling and installation of the SpeedBlock Units.

GENERAL CONSIDERATIONS

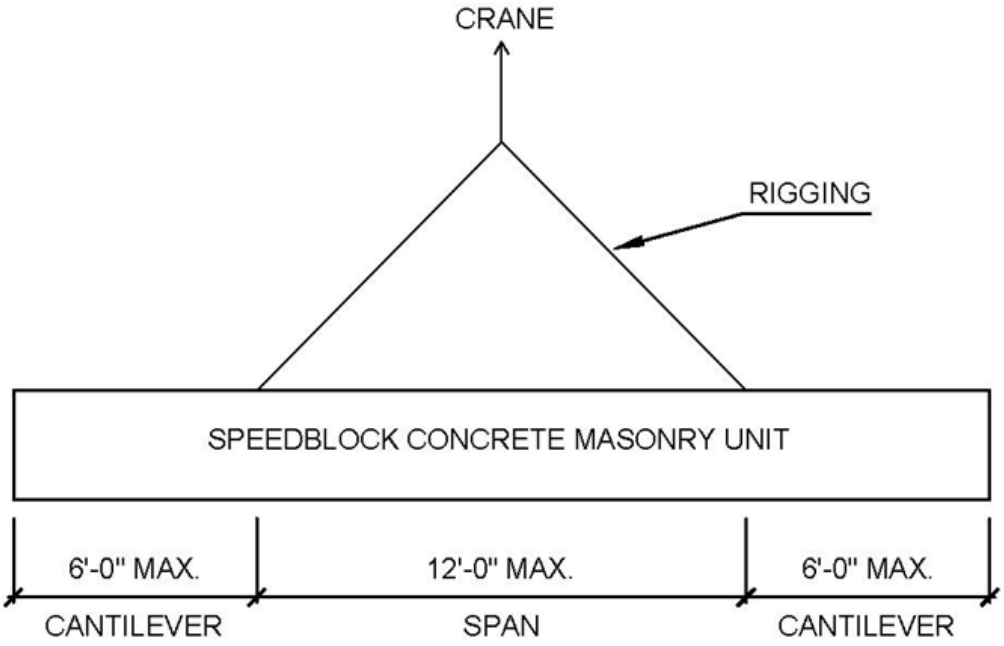
SpeedBlock Units are lifted into position using a mobile crane. Once the SB units are installed to a safe height, the wall panel is temporarily braced. The wall braces may be removed upon completion of steel reinforcing, mortar, grout and roof system work.

SB Units must always be supported at proper bearing points when being stored, transported, or installed.

SB Units can be lifted at each cross web. The cross webs chosen will affect the position and angle of the Unit during the lifting and placing procedure. Always keep the SB Unit balanced and level and in control during handling.

All SB Units **regardless of length** require at least **two (2) bearing points** during storage, shipping, and placement. SB Units may be "dry stacked" and then mortared.

SPEEDBLOCK CMU TYPICAL LIFTING POINTS



SPEEDBLOCK CMU TYPICAL BEARING POINTS

SB Units are designed to be lifted with no more than a 12'-0" span between lifting points and no more than a 6'-0" cantilever from any lifting point.

All lifting and handling design loads are for static loads only. Any additional loads should be approved in writing by an authorized representative of SpeedBlock.



INSTALLATION HARDWARE

SB Units require SB installation hardware for safe stacking and temporary tie down during the complete wall building process. SB Units should never be stacked without using SB hardware and temporary wall braces. Whenever walls more than 8'-0" in height are erected, SB installation hardware **must always** be used in conjunction with a properly designed wall bracing plan and appropriate wall braces. SpeedBlock can assist you with designing bracing plans and specifications.

SpeedBlock installation hardware consists of:

- Anchor bolts
- Shim packs 1/32" through 1/2"
- Threaded rod coupler nuts
- Tiedown threaded rods
- Anchor/Bearing plates
- Plate washers

SAFETY NOTES

In order to safely erect and construct walls with the SpeedBlock CMU, SpeedBlock has identified the following safety considerations:

- All safe working loads are based upon new hardware or hardware in "as new" condition.
- Lift rigging and slings shall be rated for the appropriate weight required and be new or in "as new" condition.
- Lifting slings shall be wrapped around cross webs. No "field made" lifting hole or insert should be used without written approval from an authorized SpeedBlock representative.
- All installation anchor plates should have a full bearing area and should not be cut, drilled or modified.
- Anchor plates should be properly located at doors and openings. When locating anchor plates, never exceed the allowable maximum span and cantilever dimensions for the SB Units.
- Anchor plates should have full bearing on the concrete bearing surface and all coupling nuts shall bear fully on the anchor plate. Caution must be used so that the hardware is not subject to a side loading that will cause an additional and unintended loading.
- Tiedown coupling nuts and threaded rods shall be of proper length and torqued as required to prevent anchor plate slippage and threaded rod movement.
- Coil bolts when used shall have a minimum coil penetration as required into coil expansion anchors. Impact wrenches must not be used to tighten bolts that are used for lifting, handling, stacking and bracing of SpeedBlock Units.
- SpeedBlock DOES NOT GUARANTEE any of its products altered in any way after leaving a SpeedBlock manufacturing plant.

CONDITION OF LOADING

All SpeedBlock lifting cross webs and installation hardware are for static load conditions only. If dynamic forces or impact loading conditions are anticipated, the safe working load must be reduced accordingly.

Care must be exercised to see that all SpeedBlock installation hardware is properly aligned, all rigging is equalized, and properly sized crane cables are used. In all cases, the centerline of the spreader bar and hook must be in line with the center of gravity line of the unit.

The installer of the SpeedBlock CMU must evaluate the product application, determine the necessary safety factor, calculate the safe working load, and control all field conditions to prevent application of loads in excess of the safe working loads.

WARNING:
When in doubt about the proper use or installation of the SpeedBlock CMU, contact SpeedBlock at 209-773-3325 for clarification. Failure to do so may result in exposure of workers to safety hazards, resulting in the possibility of injury.

SPEEDBLOCK CMU CONSTRUCTION PROCEDURES

SPREADER BEAM

Spreader beams are not required for lifting and handling SB Units.

PRE-PLANNING

The SpeedBlock CMU requires thorough pre-construction planning. Much of the economy of the SB CMU comes from the ability to establish an accurate set of shop drawings and specifications, which include a fabrication/cut list, delivery sequence and a safe bracing plan. The success of each project depends on proper pre-planning of the construction event.

SpeedBlock requires that all projects have shop drawings for the SB CMU. The shop drawings should include panel location and dimensions, identification tie-down and anchor layout, unit location, and brace information. SpeedBlock's staff architects can assist in preparing these drawings.

SITE ACCESS AND JOB SITE CONDITIONS

The job site must be thoroughly analyzed to evaluate access for equipment and delivery trucks as well as for safe lifting conditions for the crane.

WARNING:
Installation safety can be compromised by unfavorable weather conditions. Do not attempt to install SpeedBlock Units in extreme wind. Caution should be used when wind is present during installation.

CAUTION:
All standard job site safety procedures should be observed when handling SpeedBlock Units including proper steel-toed boots and hard hats.

SCHEDULING AND SEQUENCE

Construction sequences are critical to a smooth construction operation. If a contractor performs a function out of sequence it almost always involves costly delays and prevents the next construction sequence from progressing.

INSTALLATION OF SPEEDBLOCK HARDWARE AT FOOTINGS

Complete wall footings with proper layout of vertical reinforcing steel. At wall footings, first lay out all wall lines and identify panel locations and construction joints. Then, at wall footings, lay out proper locations of all SB tie-down anchor bolts, anchor plates, threaded coupling nuts and threaded rods at wall footings.

Next, at wall footings, install the SB tie-down anchor bolts when using either wedge anchor stud bolts or standard anchor bolts to secure the SB base plates at the foundation. Proper care must be taken in the installation of these bolts. Concrete at footings shall have a minimum of 2000 psi concrete strength prior to placement of any SpeedBlock Unit.

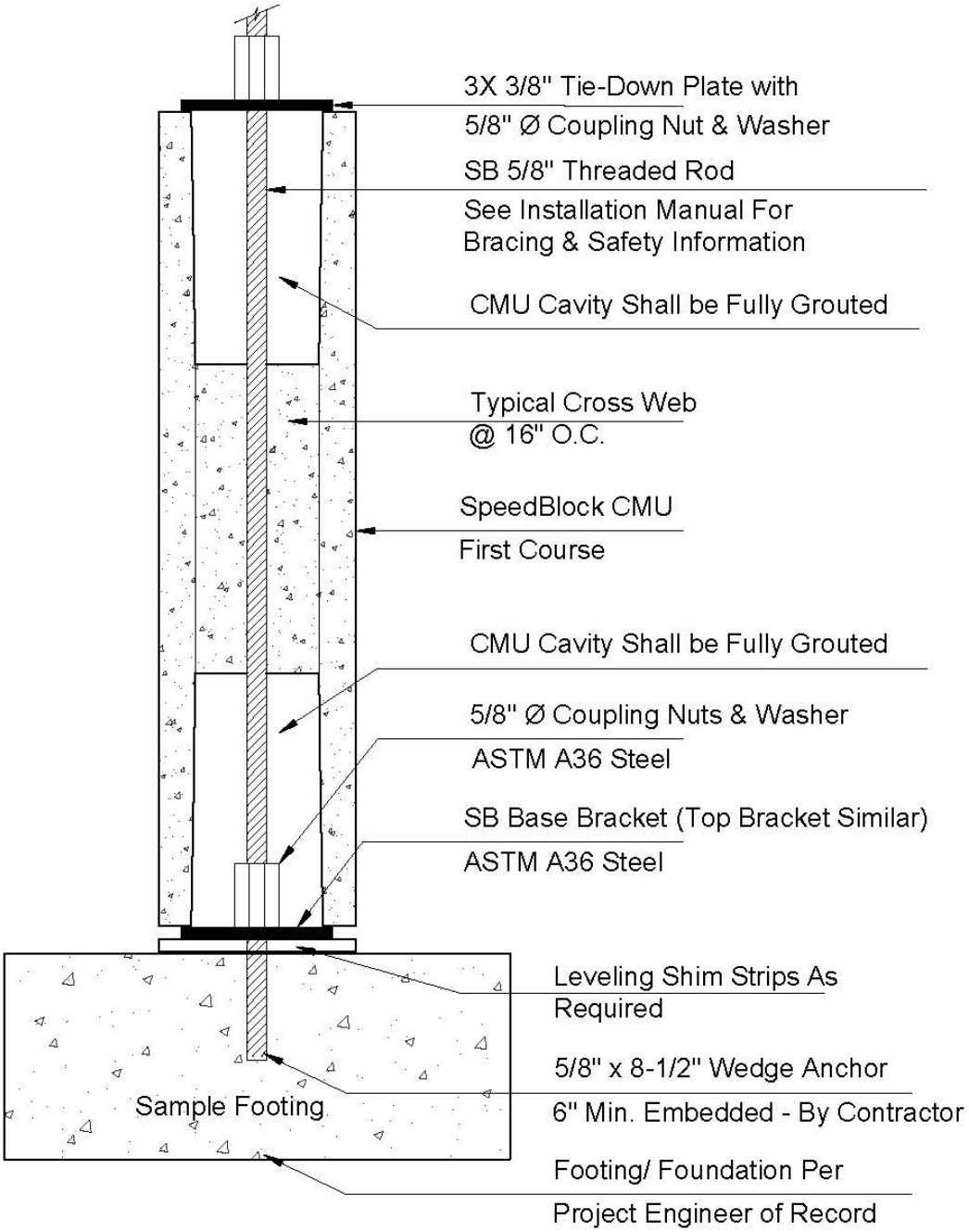
Follow anchor bolt manufacturer's requirements and recommendations for proper installation and edge clearances of anchor bolts. Place a SB anchor plate over each anchor bolt. At each SB anchor plate, shim to proper level. When completed, install a plate washer, and torque a coupling nut level. Make sure the coupling nut is centered on the anchor bolt threads for the next threaded rod connection to provide the maximum number of threads at each coupling nut connection.

Next, at each coupling nut, install a proper length tie-down threaded rod.

The footing is now ready to receive the first course SB units.

SPEEDBLOCK CMU INSTALLATION OF BASE COURSE

INSTALLATION OF A TYPICAL SPEEDBLOCK UNIT



Each SB Unit is engineered to allow for 2 lifting points. Each lifting point should be equally spaced on the Unit for a balanced flat lift.

Each SB Unit is engineered to have as much as a 12' span or 6' cantilever from each lifting point. Use a proper crane and rigging to handle and construct with the SB Units. To handle the SB Units, use only an approved rated nylon lifting sling. Slip nylon slings around the 2 correct cross webs. Make sure SB Unit is balanced and properly secured prior to pick and place.



CAUTION:
Inspect for any cracks at the face shell and lifting crosswebs.

Pick and place the SB Unit into its initial position making sure the SB Unit is bearing properly onto the SB anchor plates. While the SB Unit is still connected to the rigging, align, shim, and plumb the Unit.



WARNING:
SpeedBlock Units are extremely heavy. Installers must keep hands, fingers, and other extremities clear of all potential contact points of the SpeedBlock Unit. Failure to do so can result in crushed body parts.

Install the next anchor plate and coupling nut. When the SB Unit is in its final position properly torque down coupling nut and anchor plate. Make sure the coupling nut is centered at the next threaded rod connection.

SpeedBlock Installers must be trained on the proper torque to apply on the threaded rod during wall erection. The installer can visually use the anchor plate to establish the desired torque: once the installer sees the anchor plate is beginning to deflect, no additional torque is required.

Install the next threaded rod. Make sure the coupling nut is centered at the threaded rod connection.

Disconnect the rigging from the SB Unit. Move the rigging to pick and place the next SB Unit.

Install horizontal reinforcing steel into the SB Unit as specified by the project engineer. In some applications additional horizontal reinforcing steel may need to be pre-installed through SB Unit crosswebs.

Only properly certified crane operators should be operating cranes in conjunction with SpeedBlock installation and handling.

For safety, lifting accessories must be properly used and maintained. The lifting accessories mentioned in this manual may be subject to wear, overloading, corrosion, deformation, intentional or unintentional alteration and factors which may affect the accessories' safe working load. All accessories must be inspected regularly by the user to determine if they may be used at the rated safe working load or removed from service. The frequency of inspection depends upon factors such as frequency of use, period of use and environment. It shall be the responsibility of the user to set up a schedule to inspect lifting accessories for wear and to discard the parts when wear is noted.

ACKNOWLEDGEMENT

RECEIPT AND ACKNOWLEDGEMENT OF SPEEDBLOCK INSTALLATION MANUAL

Please read the following statements and sign below to indicate your receipt and acknowledgement of the SpeedBlock Installation Manual.

I have received and read a copy of the SpeedBlock Installation Manual. I understand that the policies described in it are subject to change at the sole discretion of SpeedBlock at any time. I understand that this manual replaces (supersedes) all other previous SpeedBlock Installation Manuals.

I understand that it is my duty to:

1. Act in accordance with this Installation Manual.
2. Use sound judgement when loading, unloading, or installing SpeedBlock Units.
3. Visually inspect SpeedBlock Units for damage prior to installation.
4. Contact SpeedBlock directly with any questions or concerns that arise regarding installation.

I understand that my signature below indicates that I have read and understand the above statements and have received a copy of the SpeedBlock Installation Manual.

Installer's Printed Name	Installer's Corporation
Installer's Signature	Date
SpeedBlock Representative's Signature	Date

NOTE: Installer must complete SpeedBlock Training Installation Certification.

APPENDIX A

BRACING INFORMATION

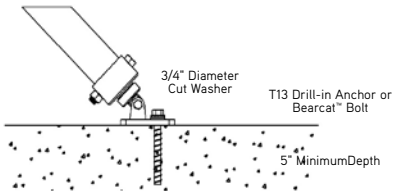
BRACING INFORMATION

DAYTON® SUPERIOR®

Bracing Information

Brace to Floor Slabs

Dayton Superior specifies the T13 drill-in anchor for use in attaching braces to the floor slab.



Warning! The floor slab sections may not be adequate to safely support the loads applied to the floor slab by the wall braces. It is the contractor's responsibility to ensure if a section of floor slab can safely support the applied brace loads. Dayton Superior cannot make this determination as it has no control over floor slab thickness, control joint spacings, width of the floor slab "leave out" strip or other factors that may affect the load carrying capacity of the floor slab. Movement of a section of floor slab can cause panels to fall, which may result in property damage and/or severe personal injury. The floor slab should be designed by a competent engineer to resist the applied loads. To assist the contractor or engineer, the maximum strength level brace load per panel is shown on each panel detail sheet provided by Dayton Superior.

Brace Length and Safe Working Loads

How to Calculate Brace Length

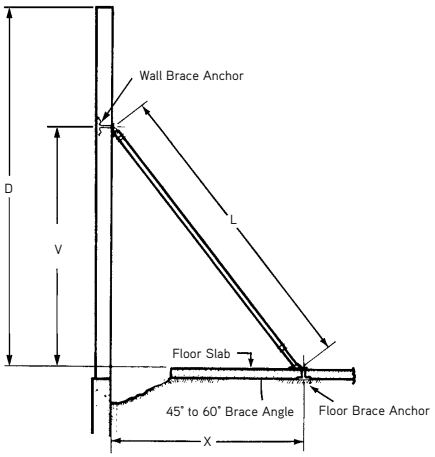
D = Elevation — top of panel above floor slab (not necessarily same as panel height).
V = Wall insert dimension
X = Floor insert dimension
L = Brace length

The wall insert dimension (V) must be a minimum of 5% above the panel's geometric and mass center of gravity. Additionally, the wall insert dimension, (V), must be at least 60% of the overall panel height. After the locations of the braces are determined, the panel structure should be checked to verify that it is able to resist temporary wind loads.

Brace locations other than those shown may drastically increase brace loads. Brace angles over 60˚ from the horizontal result in poor mechanical advantage and excessive vertical kick, while brace angles under 45˚ decrease brace buckling strength due to greater length and excessive sag.

Danger! Bracing must be installed at 90˚± 5˚ to plane of panel or brace safe working load will be greatly reduced.

The following is a quick "Rule of Thumb" to use in determining if a brace is installed at 90˚± 5˚ to the panel: The brace may be skewed left or right 1 inch for every 1 foot that the brace anchor is located away from the wall. For example: If your dimension "X" is 15 ft, then your braces may be skewed 15" left or right and still stay within the required 5˚ tolerance. See panel layout sheets for proper "X" dimension.



Plan View

DAYTON SUPERIOR

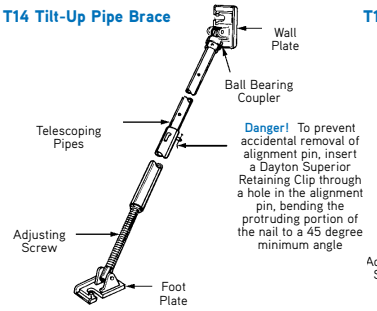
Bracing Information

T14 Tilt-Up Wall Braces

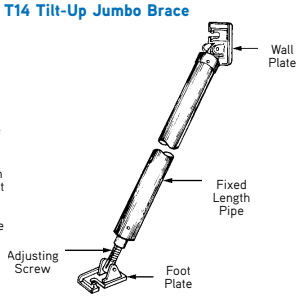
The T14 Tilt-Up Wall Braces are all steel, heavy duty wall braces designed to quickly and easily align and brace tilt-up wall panels. Rough adjustment of the T14 braces is easily accomplished by telescoping the pipes to the nearest incremental hole.

Final adjustment is then achieved by simply turning the brace. Dayton Superior wall braces are available in numerous sizes to provide a continuous range of tilt-up panel heights of fifty feet or more. Refer to the table below for additional information.

T14 Tilt-Up Pipe Brace



T14 Tilt-Up Jumbo Brace



To Order:
Specify: (1) quantity, (2) name, (3) model.

Example:
200, T14 Tilt-Up Wall Braces. Model Superior 22.

T14 Pipe Brace Selection Chart

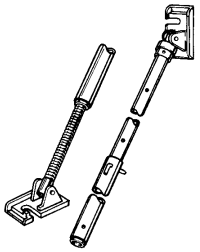
New Name	Old Name	Overall Length	Description	Brace Weight (Lbs)
Superior 5-8	B0	Adjustable - See Description	5'-0" to 8'-0"	60
Superior 8-14	B1A	Adjustable - See Description	8'-0" to 14'-0"	87
Superior 14-23	B4	Adjustable - See Description	14'-6" to 23'-6"	130
Superior 22-30	B5	Adjustable - See Description	22'-6" to 30'-10"	208
Superior 17	B7	17'-0"	17'-0" Fixed Length	107
Superior 22	B8	22'-0"	22'-0" Fixed Length	130
Superior 22+5	B9	27'-0"	22'-0" Fixed Length + 5'-0" Extension Pipe	172
Superior 22+10	B10	32'-0"	22'-0" Fixed Length + 10'-0" Extension Pipe	193
Superior 32	B12A	32'-0"	32'-0" Fixed Length	245
Superior 33 HD	B17S	33'-0"	33'-0" Fixed Length (Large Diameter HD Pipe)	489
Superior 32+5	B16	37'-0"	32'-0" Fixed Length + 5'-0" Extension Pipe	360
Superior 32+10*	B14	42'-0"	32'-0" Fixed Length + 10'-0" Extension Pipe	382
Superior 32+10+10	B15	52'-0"	32'-0" Fixed Length + (2) 10'-0" Extension Pipe	410
Superior 42	B17A	42'-0"	42'-0" Fixed Length	613
Superior 52	B18	52'-0"	52'-0" Fixed Length	984
Superior 62**	B20	62'-0"	52'-0" Fixed Length + 10'-0" Extension Pipe	1,275

Notes: Field assembly is required for Superior 32+10 (B14), Superior 32+10+10 (B15), and Superior 62 (B20) braces.Fixed length allows for +/-9" of adjustment except Superior 42 (B17A) brace has +/-7.5" of adjustment. Pipe Extensions: T15 for the Superior 22 (B8) model and T20 for the Superior 32 (B12) model.

*Ultimate Load based on adequate brace to HGA or slab connection. **Not available for rental.

T15 Pipe Brace Extensions

The Dayton Superior Pipe Brace Extensions are available for the Superior 22 (B8) and Superior 32 (B12A) pipe brace models. The T15 extension for the Superior 22 model extends the brace five feet or ten foot increments. The T20 extension for the Superior 32 model extends the brace in five or 10 foot increments.



To Order:
Specify: (1) quantity, (2) name, (3) model.

Example:
40, T15 Pipe Brace Extension, 5' extension for Superior 22 braces.

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Bracing Information

Brace Length and Ultimate Loads

Superior 8-14 Short Pipe Brace				
D	V	X	L	Ultimate Load
9'-0"	6'-0"	4'-6"	7'-6"	9,750 lbs
9'-6"	6'-5"	4'-8"	7'-11"	9,750 lbs
10'-0"	6'-8"	5'-0"	8'-4"	9,750 lbs
10'-6"	7'-0"	5'-3"	8'-9"	9,750 lbs
12'-0"	8'-0"	6'-0"	10'-0"	9,750 lbs
13'-0"	8'-9"	6'-3"	10'-9"	9,675 lbs
14'-0"	9'-6"	6'-9"	11'-8"	7,838 lbs
15'-0"	10'-0"	7'-4"	12'-5"	6,675 lbs
16'-0"	10'-9"	7'-9"	13'-3"	5,625 lbs

Superior 14-23 Heavy Duty Regular Pipe Brace				
D	V	X	L	Ultimate Load
18'-0"	12'-0"	9'-0"	15'-0"	9,750 lbs
19'-0"	12'-8"	9'-6"	15'-10"	9,750 lbs
20'-0"	13'-4"	10'-0"	16'-8"	9,750 lbs
21'-0"	14'-0"	10'-6"	17'-6"	8,888 lbs
22'-0"	14'-8"	11'-0"	18'-4"	7,200 lbs
23'-0"	15'-4"	11'-6"	19'-2"	5,888 lbs
24'-0"	16'-0"	12'-0"	20'-0"	5,363 lbs
25'-0"	16'-8"	12'-6"	20'-10"	4,463 lbs
26'-0"	17'-4"	13'-0"	21'-8"	3,750 lbs
27'-0"	18'-0"	13'-6"	22'-6"	3,413 lbs
28'-0"	18'-8"	14'-0"	23'-4"	2,525 lbs

Superior 22-30 Heavy Duty Long Pipe Brace				
D	V	X	L	Ultimate Load
27'-0"	18'-0"	13'-6"	22'-6"	8,963 lbs
28'-0"	18'-8"	14'-0"	23'-4"	7,988 lbs
29'-0"	19'-4"	14'-6"	24'-2"	7,200 lbs
30'-0"	20'-0"	15'-0"	25'-0"	6,375 lbs
31'-0"	20'-8"	15'-6"	25'-10"	5,175 lbs
32'-0"	21'-4"	16'-0"	26'-8"	4,238 lbs
33'-0"	22'-0"	16'-6"	27'-6"	3,825 lbs
34'-0"	22'-8"	17'-0"	28'-4"	3,150 lbs
35'-0"	23'-4"	17'-6"	29'-2"	2,625 lbs
36'-0"	24'-0"	18'-0"	30'-0"	2,400 lbs
37'-0"	24'-8"	18'-6"	30'-10"	2,025 lbs

T23 Square Braces

Square Braces							
New Brace Name	Former Brace Name	Outside Dim.	Std. Brace Length	Brace Length Min.	Brace Length Max	Ultimate Load** (Lbs)	Brace Weight* (Lbs)
B21R23S	B21F	4.0"	21'	21'-0"	23'-3"	23,250	230
B27R36S	B27BF	5.0"	27'	25'-7"	27'-3"	36,000	350
B32R24S	B32F	5.0"	32'	30'-9"	33'-3"	24,375	405
B33R22S	B33F	5.0"	33'	31'-9"	34'-3"	22,500	410

Notes::* Does not include weight of connectors.
** Ultimate Load based on adequate brace to HGA or slab connection.

Jumbo Pipe Braces						
New Name	Old Name	D	V	X	L	Ultimate Load
Superior 5-8	B0	8'-0"	6'-4"	4'-10"	5'-8"	10,000 lbs
Superior 17	B7	15'-0" to 24'-0"	13'-6"	10'-4"	17'-0"	13,050 lbs
Superior 22	B8	19'-0" to 31'-0"	17'-6"	13'-4"	22'-0"	9,750 lbs
Superior 22+5	B9	23'-0" to 39'-0"	21'-6"	16'-4"	27'-0"	7,200 lbs
Superior 22+10	B10	27'-0" to 46'-0"	25'-6"	19'-3"	32'-0"	5,400 lbs
Superior 32	B12A	27'-0" to 46'-0"	25'-6"	19'-4"	32'-0"	13,500 lbs
Superior 33 HD	B17S	32'-3" to 33'-6"	26'-4"	19'-11"	33'-0"	25,000 lbs
Superior 32+5	B16	42'-0"	29'-6"	22'-4"	37'-0"	12,000 lbs
Superior 32+10	B14	35'-0" to 60'-0"	33'-6"	25'-4"	42'-0"	7,800 lbs
Superior 32+10+10	B15	43'-0" to 60'-0"	41'-6"	31'-4"	52'-0"	5,700 lbs
Superior 42	B17A	35'-0" to 60'-0"	33'-6"	25'-3"	42'-0"	19,000 lbs*
Superior 52	B18	52'-0"	41'-6"	31'-4"	52'-0"	19,200 lbs*
Superior 62**	B20	62'-0"	49'-6"	37'-4"	62'-0"	17,000 lbs.

Notes: Field assembly is required for Superior 32+10 (B14), Superior 32+10+10 (B15), and Superior 62 (B20) braces. Fixed length allows for +/-9" of adjustment except Superior 42 (B17A) brace has +/-7.5" of adjustment. Pipe Extensions: T15 for the Superior 22 (B8) model and T20 for the Superior 32 (B12) model.

*Ultimate Load based on adequate brace to HGA or slab connection. **Not available for rental.

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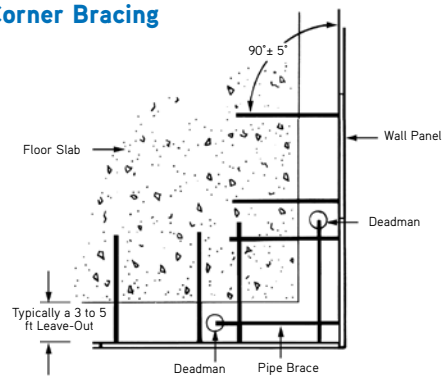
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BRACING INFORMATION

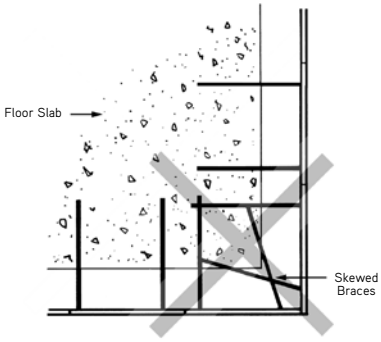
DAYTON® SUPERIOR®

Bracing Information

Corner Bracing



Correct



Wrong

The proper method of bracing corner panels is shown above. Attachment of braces to deadman in the leave-out area allows the braces to be properly located without having to skew the braces for attachment to the floor slab. Corner brace locations must be adjusted during the design process to eliminate pipe interference.

Note: Deadmen should be designed by a qualified engineer based on project specific soil conditions.

Warning! Braces must be installed at 90˚± 5˚ to plane of panel or brace safe working load will be drastically reduced. Panel stability may be jeopardized when braces are skewed.

Brace Maintenance

During the construction process braces may be exposed to adverse conditions that could damage or render them unusable. Braces should be inspected for proper operation, damage and wear after each use.

This inspection is typically performed by Dayton Superior or a Dayton Superior Certified Tilt-Up Dealer when the braces are returned. However, when braces are transferred from one job to another without being returned to Dayton Superior or a certified dealer for maintenance, the user must inspect all braces prior to their installation.

This inspection should check for missing parts, wear, dings, kinks, straightness, indication of any application of heat and/or other damage or misuse.

Any brace that shows signs of wear, has missing parts, damage, or is questionable should be set aside and not used.

Our full rental return policy and banding instructions can be obtained from the Tilt-Up Rental Fleet Manager.

Bracing Information

DAYTON® SUPERIOR®

Bracing Information

Accubrace® Total Bracing System

An integrated, in-line total bracing system designed to decrease labor costs and increase project efficiency.

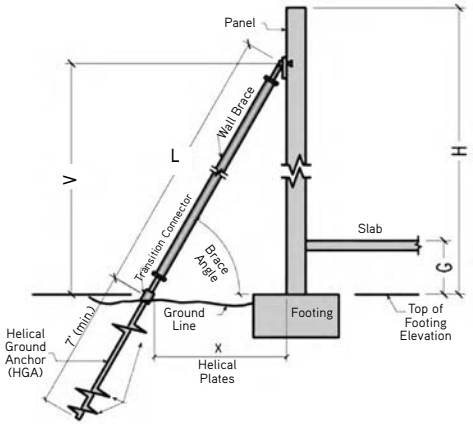
The Accubrace Total Bracing System is designed for rapid installation and has the ability to immediately load the helical ground anchor for unsurpassed speed and efficiency on tilt-up or precast projects. Bracing products are available at regional offices and can quickly be transported to job sites.

Custom braces can also be designed and manufactured to meet any project application.

Dayton Superior provides safe engineered solutions by installing Helical Ground Anchors (HGAs) and renting necessary components.

Features

- HGAs are an engineered alternative to concrete deadmen and/or floor slabs, reducing the associated time and labor costs
- Rapid, all-weather brace installation — capable of immediate loading when used with the helical ground anchor
- Remove and relocate ground anchors if installation of braces requires adjustment
- Anchor location is adaptable — can be installed inside or outside of structure
- Bracing on the outside of wall simplifies structural steel erection especially in multi-story buildings
- Bracing on the outside of the wall eliminates holes in floor slab and vapor barrier
- Integrated in-line connection to the brace utilizing a HGA and Transition Brace Connector (STBC)
- Dayton Superior offers Professional Engineer review and stamp services
- Removable and reusable
- HGAs can be used with any Dayton Superior brace
- May reduce the number of braces needed if HGAs are used with high capacity braces



KEY:

L	Brace length	X	HGA Mark - Horizontal distance from panel face
V	Brace connection height above bottom of panel	G	HGA elevation +/- relative to panel bottom
H	Panel height		









Bracing Information

10/21

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APPENDIX B

NATIONAL CONCRETE MASONRY ASSOCIATION (NCMA) TEK SHEETS

- Concrete Masonry Construction
- STC ratings for CMU walls TEK 13-01C
- TEK 01-01F ASTM Specs for CMU
- TEK 03-02A Grouting walls
- TEK 08-01A Maintenance CMU walls
- TEK 09-04A Grouting
- TEK 14-04B Strength Design Provisions For Concrete Masonry
- TEK 14-19A Allowable Stress Design

Available upon request.

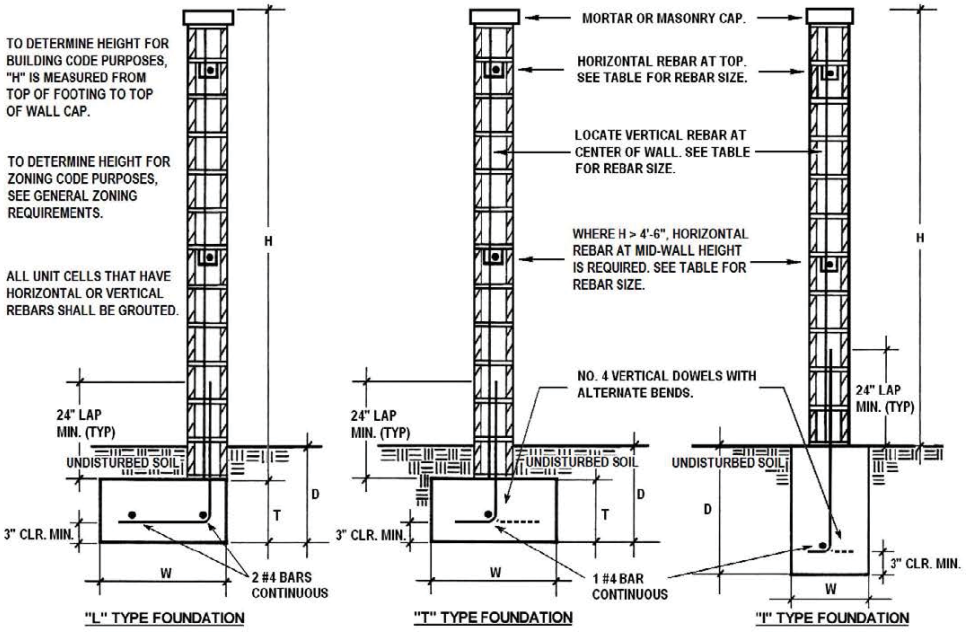
APPENDIX C

STANDARD CMU BLOCK WALL DETAIL

STANDARD CMU BLOCK WALL DETAIL

Standard CMU Block Wall Detail

The purpose of this Information Bulletin is to assist owners and builders who may choose to erect simple freestanding concrete masonry unit (CMU) block walls using the Department's standard detail. This Information Bulletin provides general requirements and specifications for the construction of standard CMU block walls of various height, thickness or footing configurations. These walls are designed for the average condition and may not be suitable in all cases. Where the proposed wall construction is located on a site with slope steeper than 10%, with adverse soil conditions (e.g., expansive soil, liquefaction, flood hazard, etc.) or deviates from this Information Bulletin, a registered design professional licensed in the State of California should be consulted.



GENERAL ZONING REQUIREMENTS:

For zoning code purposes, fence height shall be measured from grade adjoining the fence on the public right-of-way side of the fence and/or from the average grade of both sides of the fence between two private properties. For lots that slope more than 5'-0" from front to rear, contact a Planning staff at the Development Services Center to help establish the fence height. A 6'-0" corner cutoff may be required for fencing adjacent to driveways and sidewalks that obstruct visibility.

1 of 2

Standard CMU Block Wall Detail

WALL HEIGHT	"L" TYPE FOUNDATION			"T" TYPE FOUNDATION			"I" TYPE FOUNDATION		VERTICAL REBAR	HORIZ. REBAR
	W	D	T	W	D	T	W	D		
3' - 6"	18"	18"	9"	14"	12"	6"	12"	22"	#4 Rebar @ 48" o.c.	#4 Rebar
4' - 6"	18"	18"	9"	18"	12"	6"	12"	26"	#4 Rebar @ 48" o.c.	#4 Rebar
5' - 6"	24"	24"	12"	22"	12"	6"	12"	30"	#4 Rebar @ 48" o.c.	#4 Rebar
6' - 6"	24"	24"	12"	26"	14"	6"	12"	36"	#4 Rebar @ 24" o.c.	#4 Rebar

GENERAL BUILDING REQUIREMENTS:

Wall over 4'-0" in height measured from the bottom of the footing to the top of the wall shall require a building permit. Foundation must be poured against undisturbed soil with no appreciable slope of sidewalls. All horizontal and vertical reinforcements shall maintain a min. 3" clearance from the bottom and sides of the trench. Horizontal bond beam reinforcement is required to be located in the 2nd course from the top of the wall. Prefabricated joint reinforcement in each two top mortar joints consisting of two No. 9 gage galvanized wires with No. 9 gage steel welded cross wires spaced a max. 16" o.c. may be substituted for the horizontal bond beam reinforcement in the top of walls 5'-6" or less in heights. All wires shall be thoroughly embedded in the bed joint mortar and lapped a min. of 12". Units shall be staggered (common bond are not permitted) and may be partially grouted with grout confined to those cells that have horizontal and vertical reinforcing steel.

SPECIFICATIONS:

Concrete:	Min. 2,500 psi strength in 28 days. Mix for concrete footing to be 1 part cement to 2-1/2 parts sand to 3-1/2 parts gravel with a max. of 7-1/2 gallons of water per sack of cement.
Block:	Grade "N" ASTM C 90-03. Nominal width of units shall be a min. 6".
Reinforcement:	Deformed steel bar conforming to ASTM A-615 Grade 40 or Grade 60.
Mortar (Type "S")	Mix to be 1 part cement to 1/2 part lime to 3 parts damp loose sand.
Grout:	Mix to be 1 part cement to 3 parts sand to max. 1/10 part lime. Sufficient water should be added to produce consistency for pouring without segregation of the constituents. May contain 2 parts pea gravel (max. size 3/8").

INSPECTIONS:

Foundation Insp.: When trench is ready for concrete and all steel reinforcements are tied in place.
Pre-Grout Insp.: When first horizontal bar and all vertical bars are in place, ***but not grouted!***
Final Insp.: After wall is grouted and cap is installed

COMMON PROPERTY FENCE WALL:

Where a common property fence wall is requested, a completed and signed "Common Property Wall Line Agreement and Maintenance" form by all of the common property owners is required prior to approval of the 1st inspection (i.e., foundation inspection).

2 of 2

SPECIAL ACKNOWLEDGEMENT

IN MEMORIAM: PROF. GARY C. HARTJAN 26, 2018

Gary Curtis Hart was born in San Bernardino, California and died in Marina del Rey, California on October 21, 2017. He received his bachelor's degree in civil engineering from the University of Southern California in 1965, and his master's and doctoral degrees in structural engineering from Stanford University in 1966 and 1968, respectively. His PhD dissertation was titled "Response of Three-Dimensional Buildings to Multiple Random Wind Loads".

SpeedBlock has a special thanks and gratification for Gary's specialized knowledge, and support in the development of our new generation, high strength, large format "hollow, concrete masonry unit" product.



NOTICE

Care has been taken to provide the most accurate data possible in this technical manual. However, SpeedBlock Inc. does not assume responsibility for errors or omissions. The examples herein are intended as a guide for the preliminary selection of these products and sample construction details. We suggest that to ensure the best results, you contact a SpeedBlock representative for assistance and design review.

THE SPEEDBLOCK PROCESS WILL CHANGE THE WAY YOU BUILD.

Call us today to discover how you can save valuable time, reduce labor costs, and keep your projects on schedule and within budget.

209-214-9643



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