



***Niagara Regional Group, Ltd.***

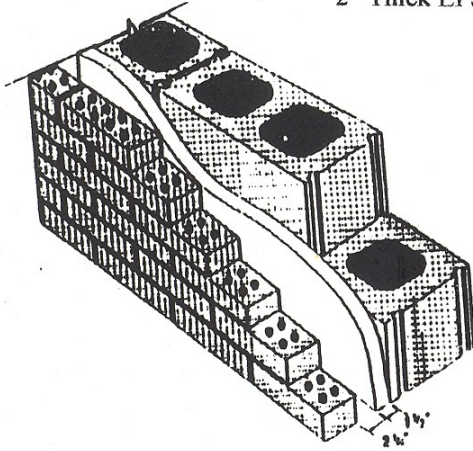
# **Engineer Technical Information Package**

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## Composite Masonry Wall

Insulation 2" Thick EPS	Material \$.98	Labor \$.34	=	Total <b>\$1.32</b>
				<b>\$6.50 (CMU, Brick &amp; Mat.)</b>
				<b>\$27.00 Labor</b>



**Wall Cost**     \$34.82/ Sq. Ft.

**Effective R-Value 18.50**

## NRG Insulated Wall System

10" <u>Half High</u> NRG ICMU Split Face (Earth tone)	\$1.70 (w/Mat.)
ICMU Labor	\$15.50 (Sq. ft.)

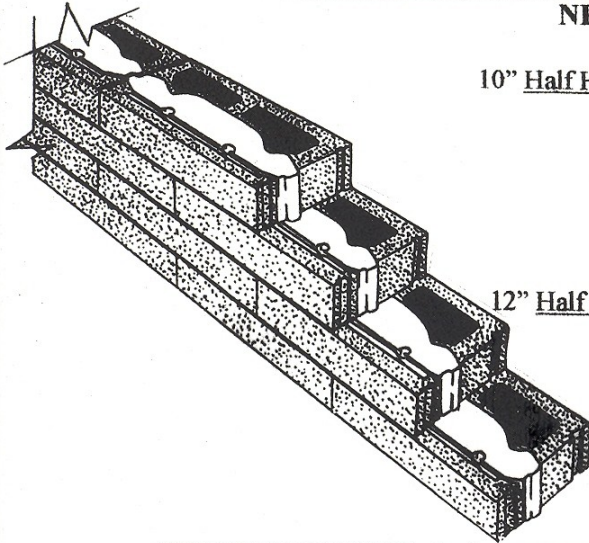
**10" Half high NRG Wall Cost**     \$17.20 / Sq. ft.

**Effective R-Value 19.80**

12" <u>Half high</u> NRG ICMU Split Face (Earth tone)	\$1.90 (w/Mat.)
ICMU Labor	\$15.50 (Sq. ft.)

**12" Half High NRG Wall Cost**     \$17.40 / Sq. ft.

**Effective R-Value 23.50**



**Mason**  
\$34.85 / hr.

**Laborer**  
\$27.50 / hr.

**Material**  
Rebar / CMU / Grout

**Note : Estimates based on averaged labor & material cost in USA**

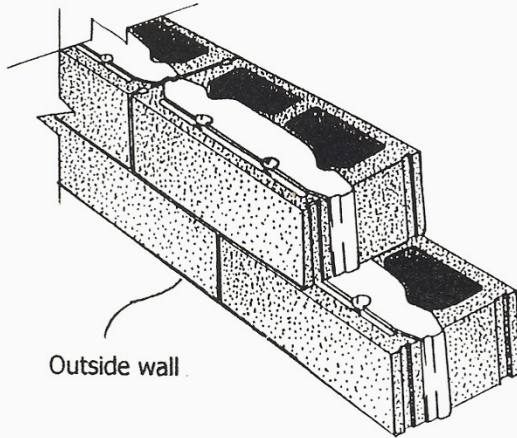
### Disclaimer Notice

This cost guide should never be used as the sole measurement, guide or considered mandatory. The final determination in cost must always be made in light of relevant market considerations such as availability of supplies, labor, inflation and competitive pressures.

Moreover, these cost are merely guides and should not be construed as correct or accurate estimating cost for any particular project. Because each project is unique and market considerations so relevant, each user of this guide is advised to consult a qualified mason contractor and not rely on cost herein contained.

As such, Niagara Regional Group, Ltd., and those cooperating with (NRG) assumes no liability for any consequences, which may follow the use of this cost guide and expressly disclaim any implied or impressed warranties with regard to such use and the cost herein contained.

# Instructions for Installing NRG™ Wall Systems

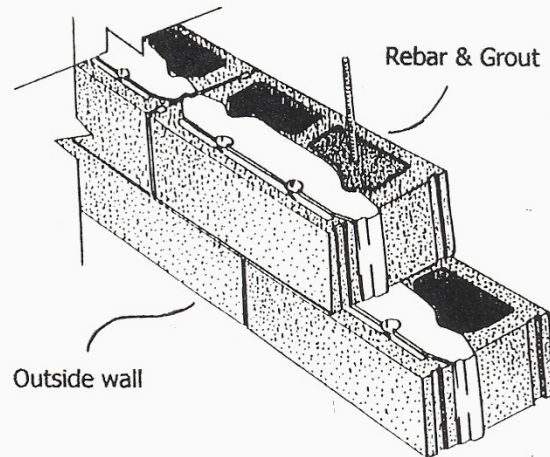
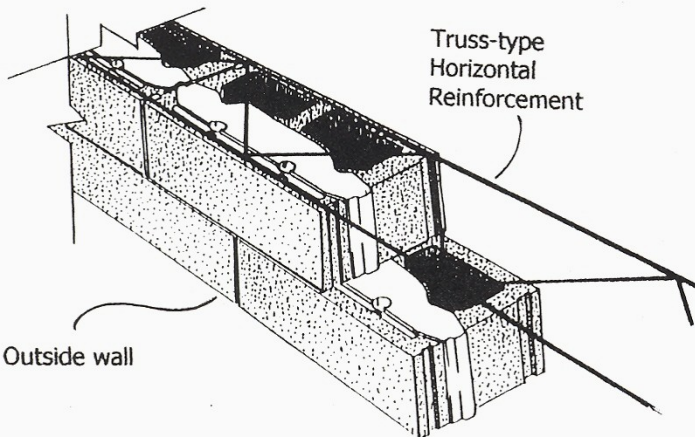


## STANDARD CONFIGURATION

- \*Blocks are placed in a wall with the "dog bone" side out.
- \*Use thumbholes for ease of installation.
- \*Align units so that all "dog bones" are facing the same way.
- \*Mortar face-shells only, keeping excess mortar off of the insulation.
- \*Mortar head joints keeping excess mortar off of the insulation. insulation should be touching at all head joints.
- \*Block tender should align blocks in the same fashion according to mason's instructions.

## VERTICAL REINFORCING

- \*Using the inner cores vertically reinforce this wall system the same as a regular or standard concrete masonry wall.



## HORIZONTAL REINFORCING

- \*Truss-Type reinforcing must maintain 16-inch centers.
- \*Align units so that all "dog bones" are facing away from you.

NOTE: These illustrations are merely suggestions on how to install NRG blocks. Check with your architect or design engineer for specific details.

## **Specifications: NRG Insulated Wall System**

**Specification:** Add, delete, or change any of the following, where local codes, standards, or practices require amendment.

**General Conditions Part I:** It is important to note that the NRGtm ICMU (Insulated Concrete Masonry Unit) is designed with an off-centered core configuration. Therefore, the vertical rebar (positioned and set in the poured foundation) must be matched to the same off-centered designation. (According to specific size units the position of the vertical rebar will vary.) i.e.: 12” ICMU offset is 2.5”

**General Conditions Part II:** List the requirements for mortar, reinforcing, concrete block work and other associated work and details that relate to this product. If this information is detailed in another section, it should be cross-referenced under this heading. The NRGtm Insulated Wall System is laid similar to any other block, either in a running bond or stacked bond. Units shall be presented to the mason, and the mason shall lay each ICMU with each “cap” on top of the block and facing the same direction. (To insure that the thermal mass of the unit is on the *inside*, face shell and thumb holes toward the *outside* exterior of the wall.) Note: This will also insure that the wall is laid with the tightest thermal barrier.

**Scope:** Interior and exterior walls shall be insulated, web-less, concrete masonry units as shown on the plans/ or indicated on the finish schedule.

**Material:** All insulated, web-less, concrete masonry units shall be NRGtm ICMU’s, Except corner, half, solid bottom bond beam and sash units. These “special” units shall be conventional units and shall interspersed into the NRGtm wall construction where needed. Incorporation of conventional CMU’s into the NRGtm wall system will have no adverse effect upon thermal performance of the overall system. NRGtm ICMU’s are available from manufacturers licensed by *Niagara Regional Group, Ltd.* ICMU’s shall be specified as lightweight, medium weight, or normal weight NRGtm design units. All ICMU’s shall conform to ASTM C90 Standard Specification for load-bearing Type 1 moisture control units. Additives such as *Dry-Blocktm* or equivalent shall be specified into the mix design for the ICMU if the units are exposed to exterior environmental conditions The NRGtm ICMU’s are available in a large variety of Face textures and colors. However, (Similar to any architectural block) not all manufacturers make all varieties. Therefore, check with local suppliers for availability.

**Submittal:** Submit color samples for selection from manufactures standard or custom series. Submit product literature, certificates, test reports, full size sample(s) of each color specified or selected and test reports for color stability performed under similar conditions of use to ensure against fading. A sample panel of no less than 4’x4’ may be constructed of units of each color and size to be used in the project (these units need not be NRGtm ICMU’s).

**Project Site Delivery:** NRGtm ICMU's shall be wrapped and delivered on wooden pallets. Delivered pallets shall be set on level ground and single stacked. Glazed units shall be kept dry while stored by means of a waterproof covering, e.g. tarpaulin or plastic wrap.

**Face Sizes:** Modular 8"x 16"

**Face Mortar Joints:** 3/8" exposed.

**Hourly Fire Rating:** Define fire rating required as 1, 2, 3 or 4 hours (Depth of wall specified must increase as hour ratings increase).

**Shapes:** Shapes not available in the NRGtm design shall be substituted for using conventional hollow core CMU's matching the same finish and color of the NRG tm units.

**Scoring:** Scoring of the face shall be accomplished through the molding process, or by cutting 3/8" wide x 1/4" deep grooves into the face of the ICMU's or CMU's These grooves shall be pointed and tooled using the same mortar as used to lay the units. Face joints shall be 3/8" wide and the block joints on the sides, top and bottom shall be 3/8" wide, (thereby giving the visual effect of 8" x 8" squares)

**Miscellaneous Tools and Products Required by Masons:** Contractor shall include products such as mortar, reinforcing, ties, anchors, and other masonry attachments as may be required to properly finish the project. Striking or jointing tools, rags, and masonry cleaners shall also be required.

**Lighting:** Adequate lighting shall be provided for mason contractor's work.

**Base Course:** Base course shall be properly aligned on the floor slab, or footer.

**Cove Base:** Cove base shall be tight to the slab if thin floor tiles (vinyl) is to be installed. For thicker flooring material cove base course shall be raised to desired height.

**Cutting:** All cuts for bonding, boxes, holes, etc. shall be made using a motor driven masonry saw using either an abrasive or diamond blade.

Note: the NRG unit should not be cut in half.

**Workmanship:** ICMU's shall be laid with the faces level, plumb, and true to a line strung horizontally at the face. Units shall have uniform joint dimensions 1/4" both horizontal and vertical. Joints shall be tooled, straight and inform neatly after they are finger hard. Cut pieces shall be sized and placed appropriately to maintain consistency and bond. Masonry construction shall be completed using procedures and workmanship consistent with the best masonry practices.

**Scored Face Glazed Units:** Head and bed joints shall be raked back 1/4" after they have hardened, the scored unit shall be tuck pointed and joints raked out.

**Reinforcing:** Horizontal and other reinforcing shall be installed in locations designated.

**Control Joints:** Control joints shall be installed in the locations designated in design plans.

**Weeps and Vents:** The bottom 2” of the vertical joints shall be left open in every other block unit in the first course above grade. Such open joints shall also be left open above flashing, beam units, and filled block areas that act as water stops.

**Coping:** As shown in details/ Or specified.

**Cleaning:** Walls shall be kept clean during installation using brush or rags, and a clean damp cloth. Excess mortar clumps or smears shall not be allowed to harden onto surfaces. Green mortar to be removed with a dry cloth.

**Final Clean down:** The complete wall shall be cleaned with a detergent cleaner strictly following the cleaner manufacturers instructions including thorough rinsing. No acids or abrasives shall be used on the glazed surface. (Masonry cleaners such as VANATROL and DEOX have been used successfully).

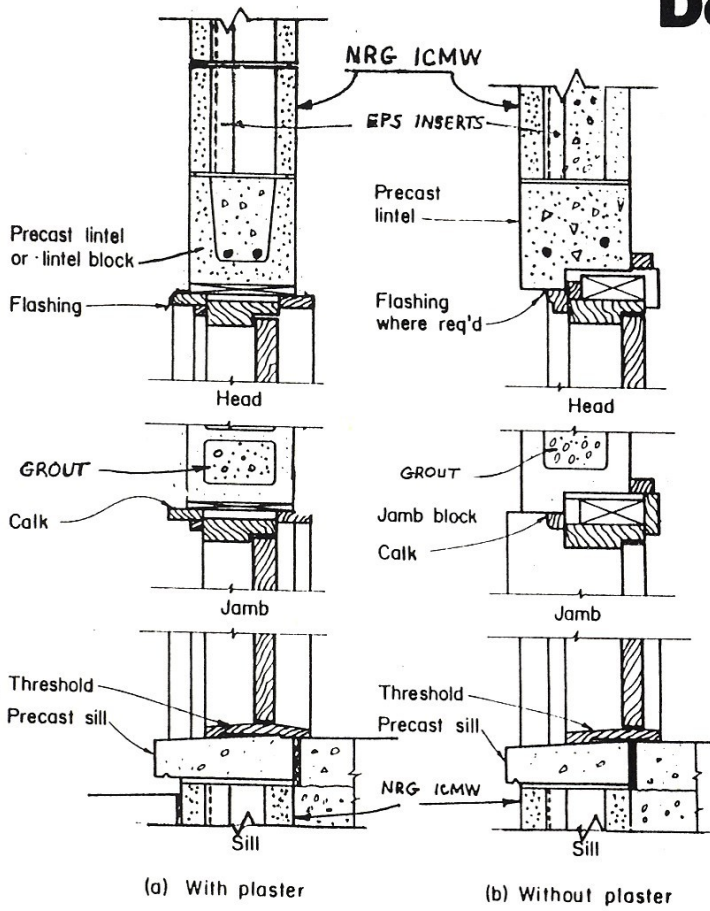
**Other Recommendations:**

\*All lighting should be placed a reasonable distance from wall for even illumination.

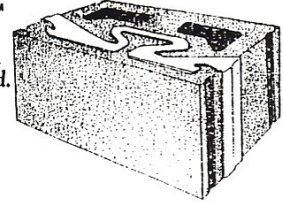
\*When center scored units are used, the finished wall will be much neater to lay if stack bond is used. The use of scored units which have bonding patterns that do not require continuous vertical joints can be installed faster and more economically.

\*Exterior mortar joints should be raked back a minimum of ¼” and tuck pointed with an approved water resistant grout. A typical exterior tuck pointing grout is “LATICRETE 1776 Grout Admix Plus” used full strength instead of mixing water. (“LATAPOXY SP 100” may be used for interior chemical resistant installation).

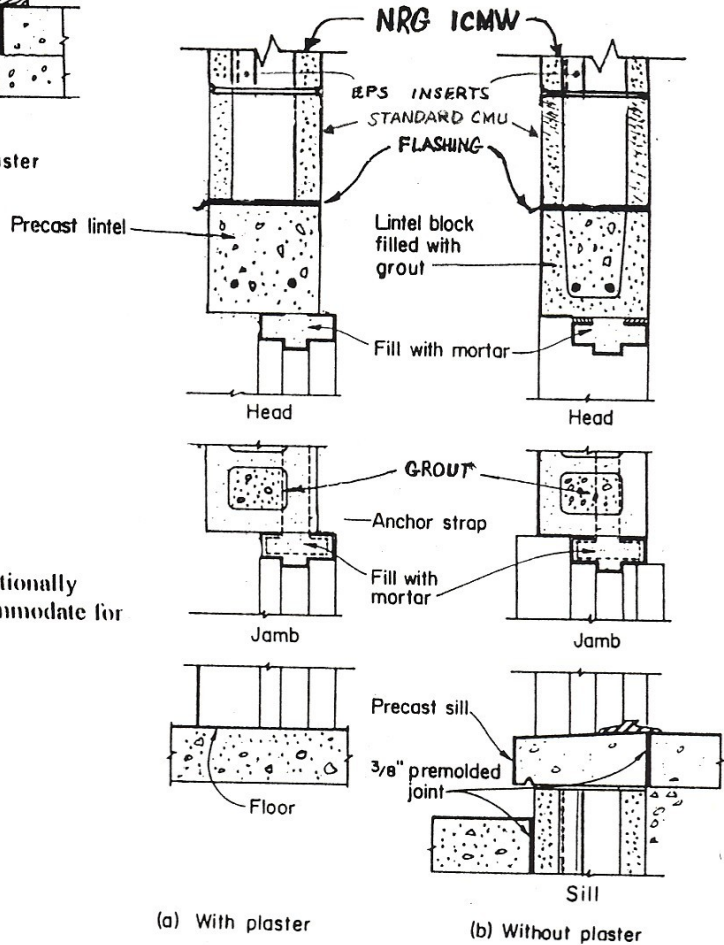
# Door Frame Details



**NRG**<sup>TM</sup>  
Niagara Regional Group, Ltd.



Wood door frame with and without plaster.



(a) With plaster

(b) Without plaster

Metal door frames with and without plaster.

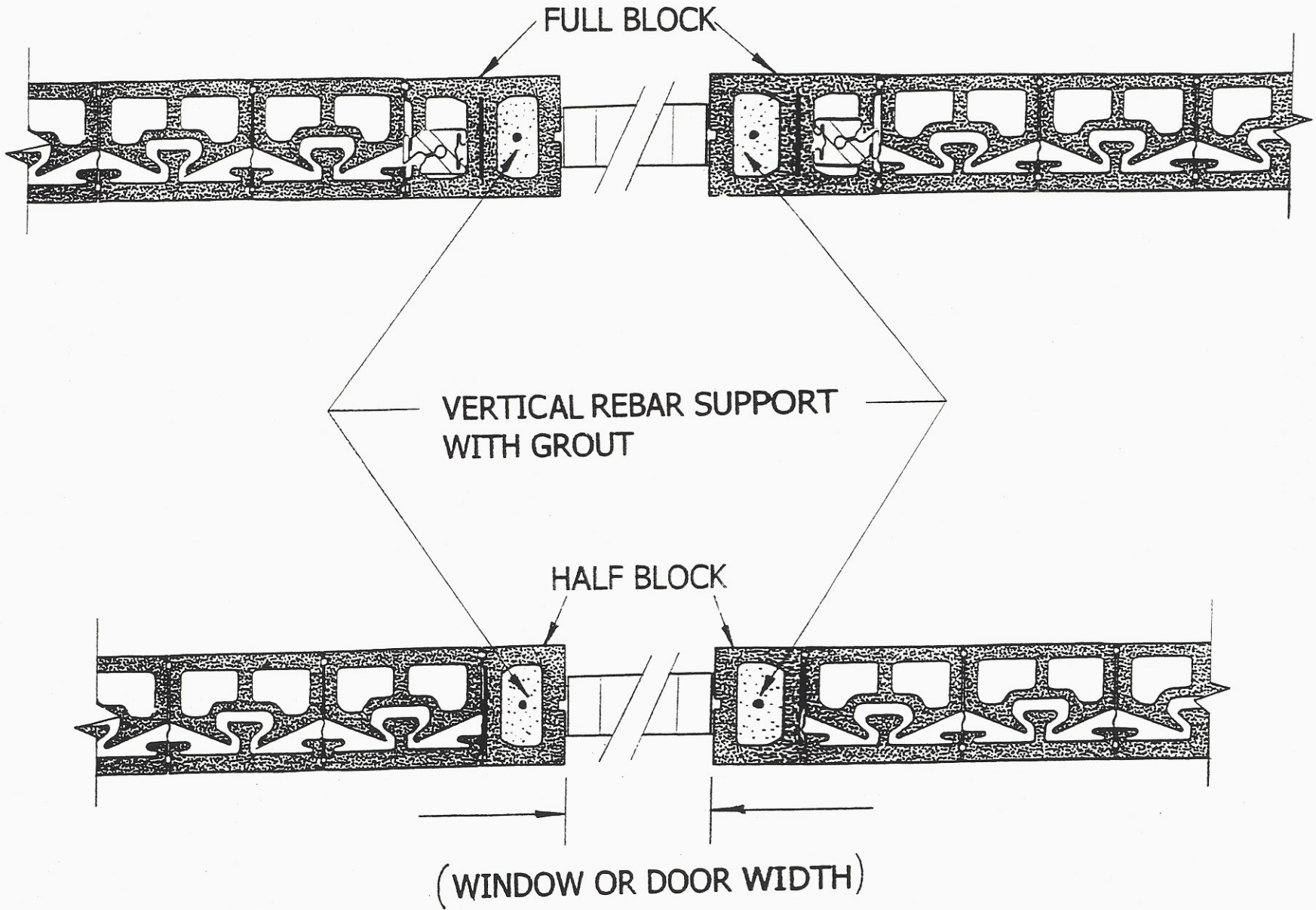
## Flashing Details

**NOTE:** The outer concrete wall of an NRG unit has been intentionally designed thicker than conventional CMU's specifically to accommodate for free access of weepholes.



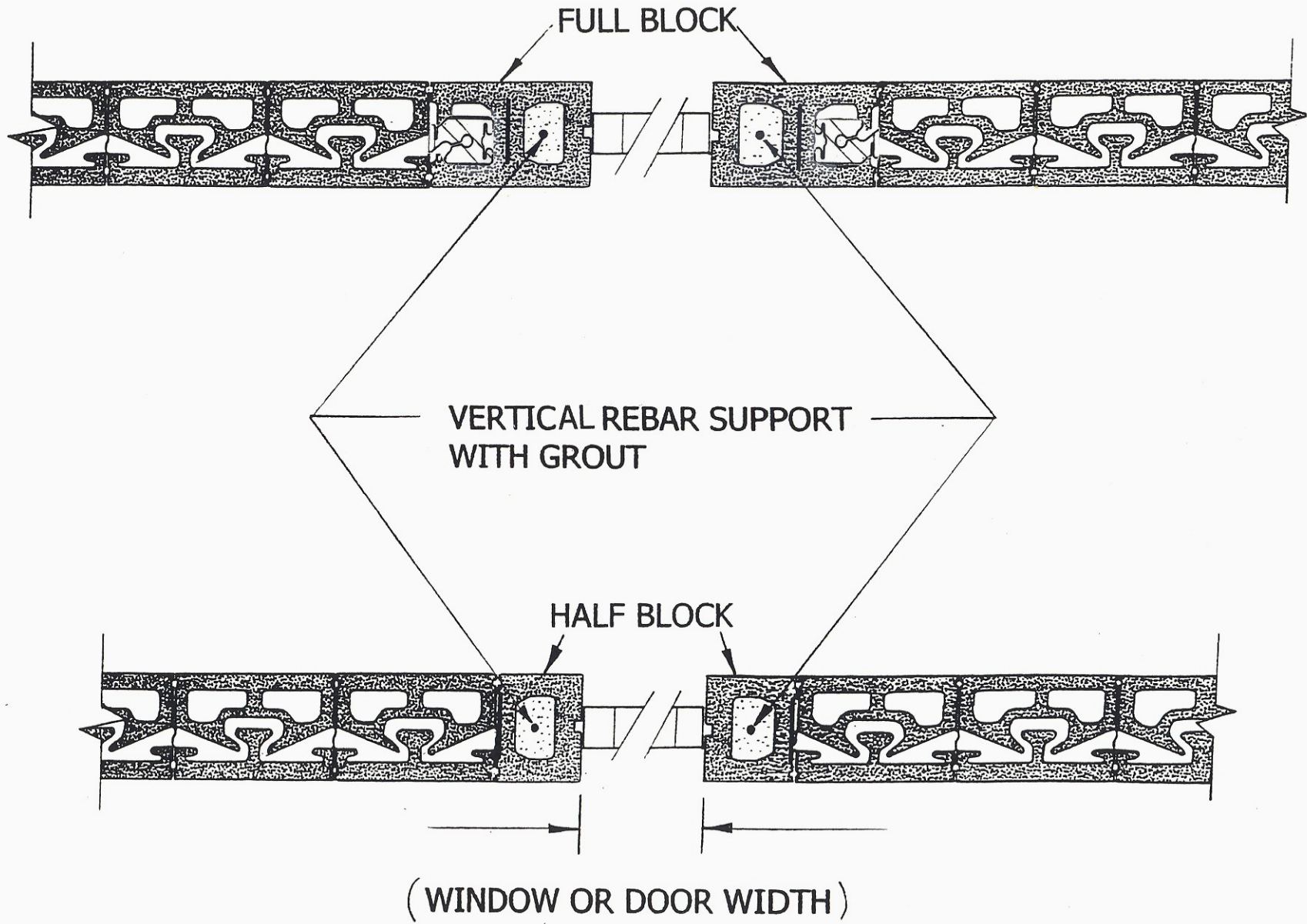
ALTERNATE COURSES

12X8X16 UNITS

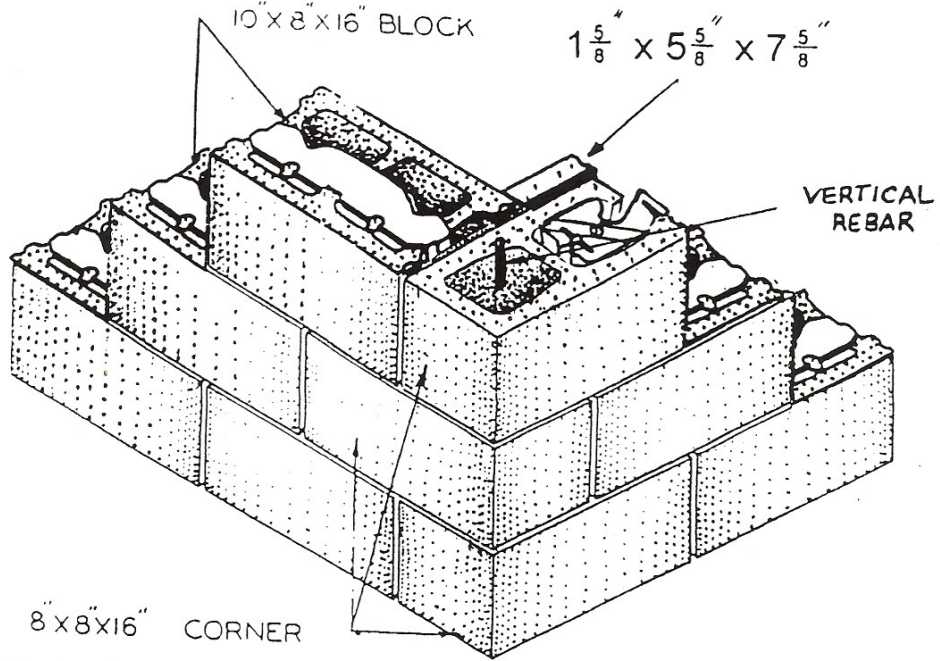


ALTERNATE COURSES

10X8X16 UNITS

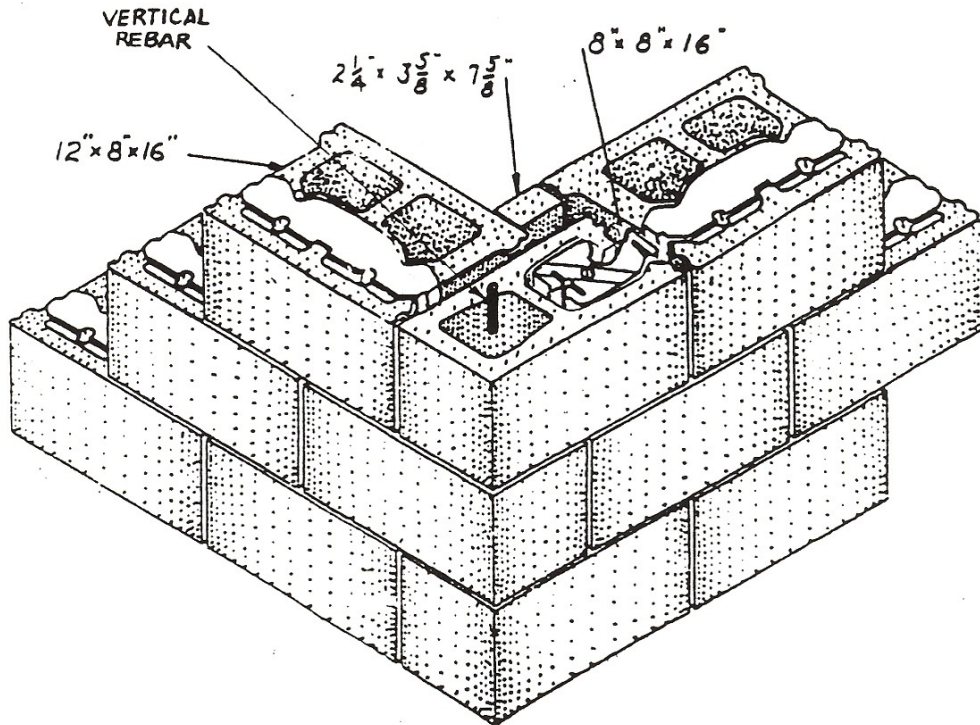


CORNER DETAIL FOR 10" BLOCK



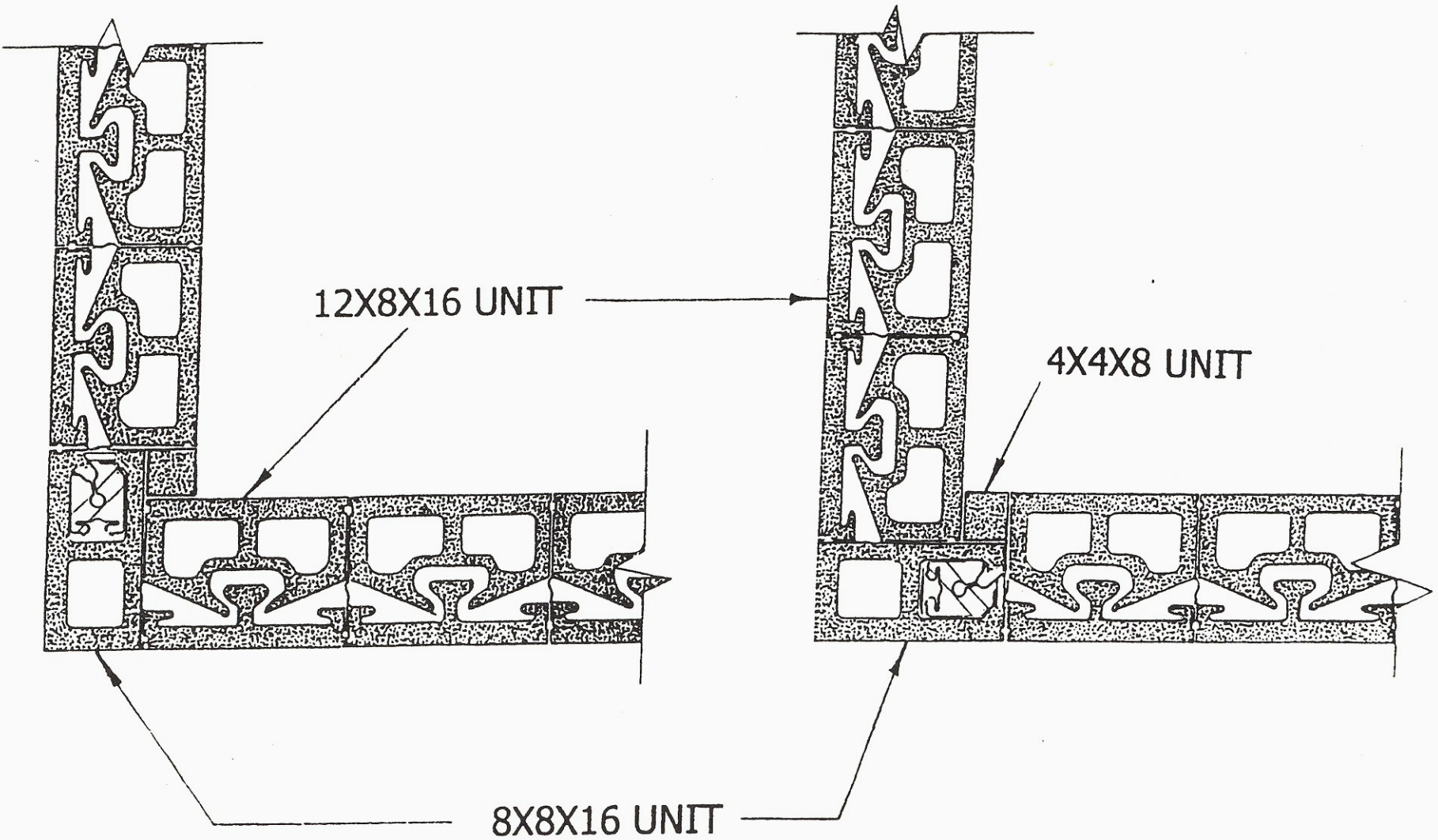
TURNING CORNER WITH 2" SOLID SECTION AND 8" X 8" X 16' CORNER BLOCK

CORNER DETAIL FOR 12" BLOCK

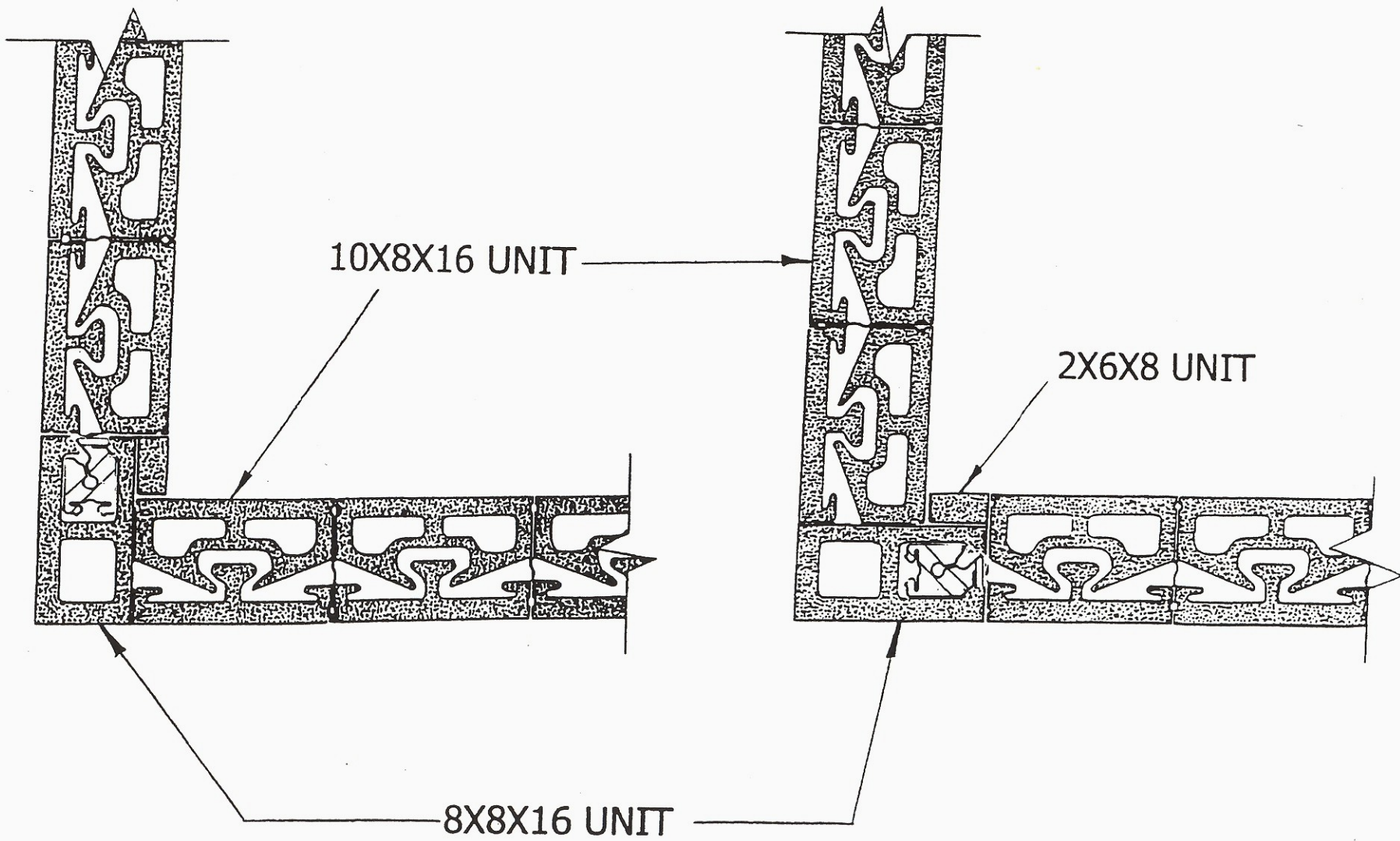


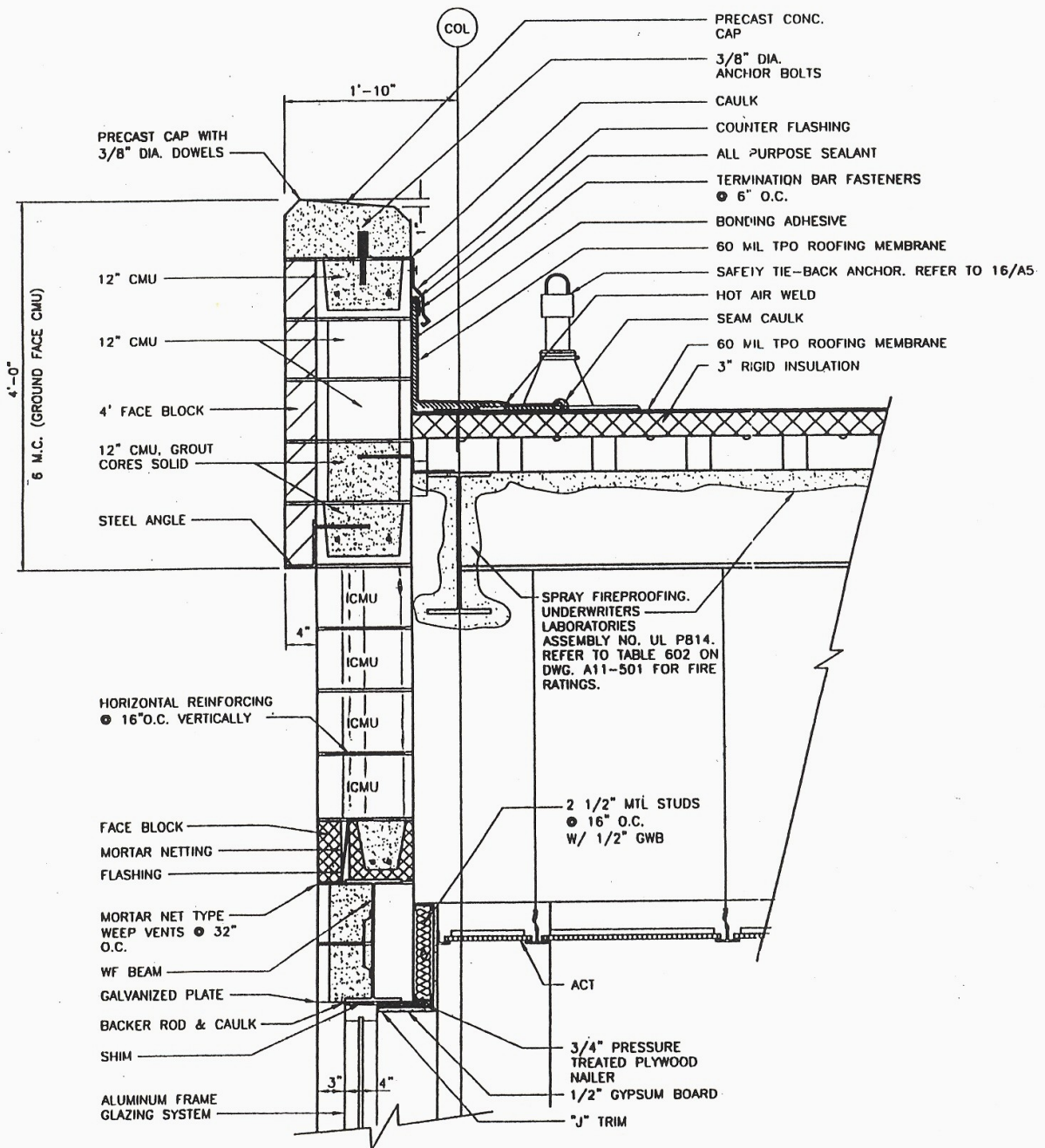
TURNING CORNER WITH BRICK AND 8" X 8" X 16" CORNER BLOCK

ALTERNATE COURSES

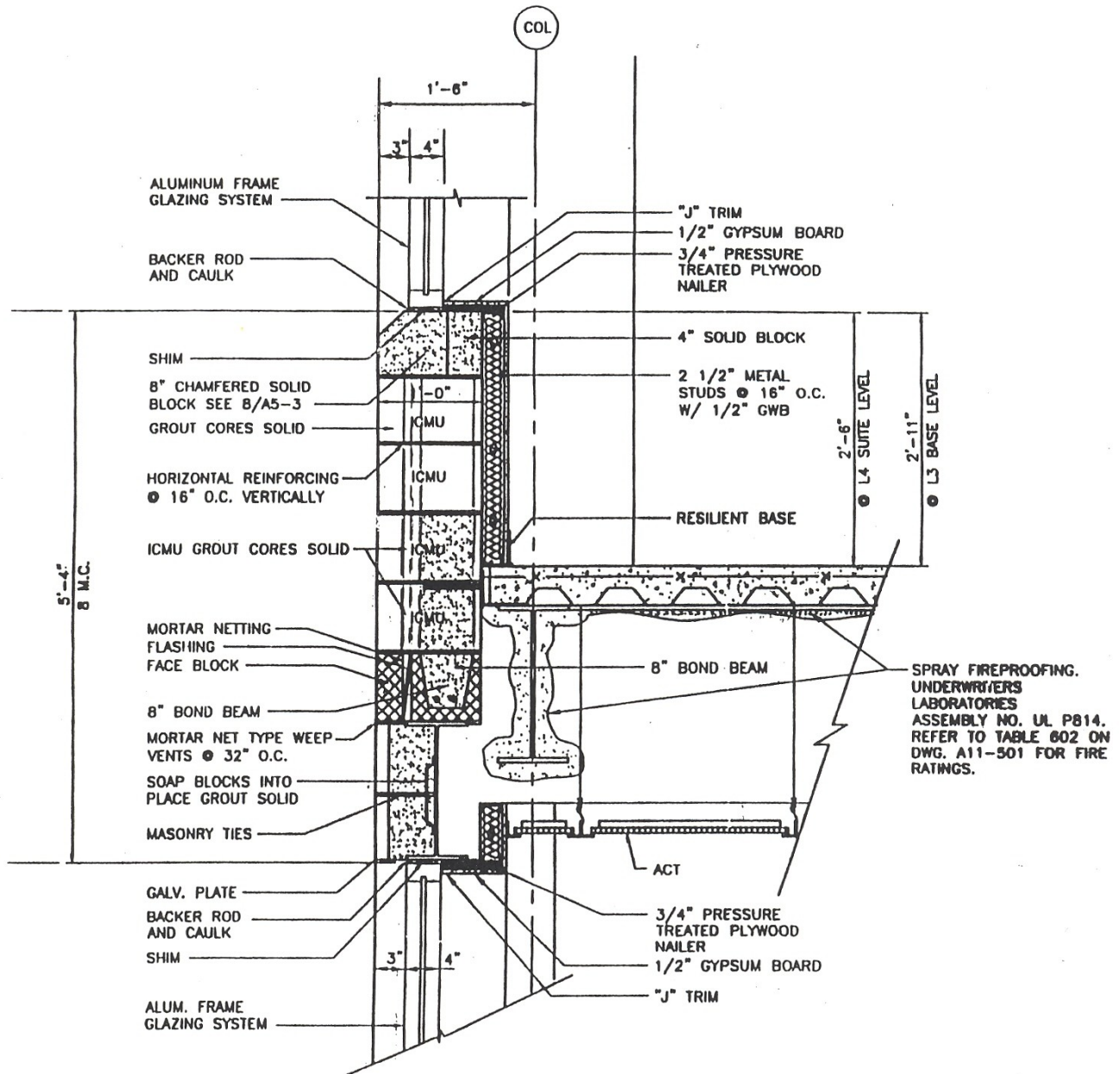


ALTERNATE COURSES



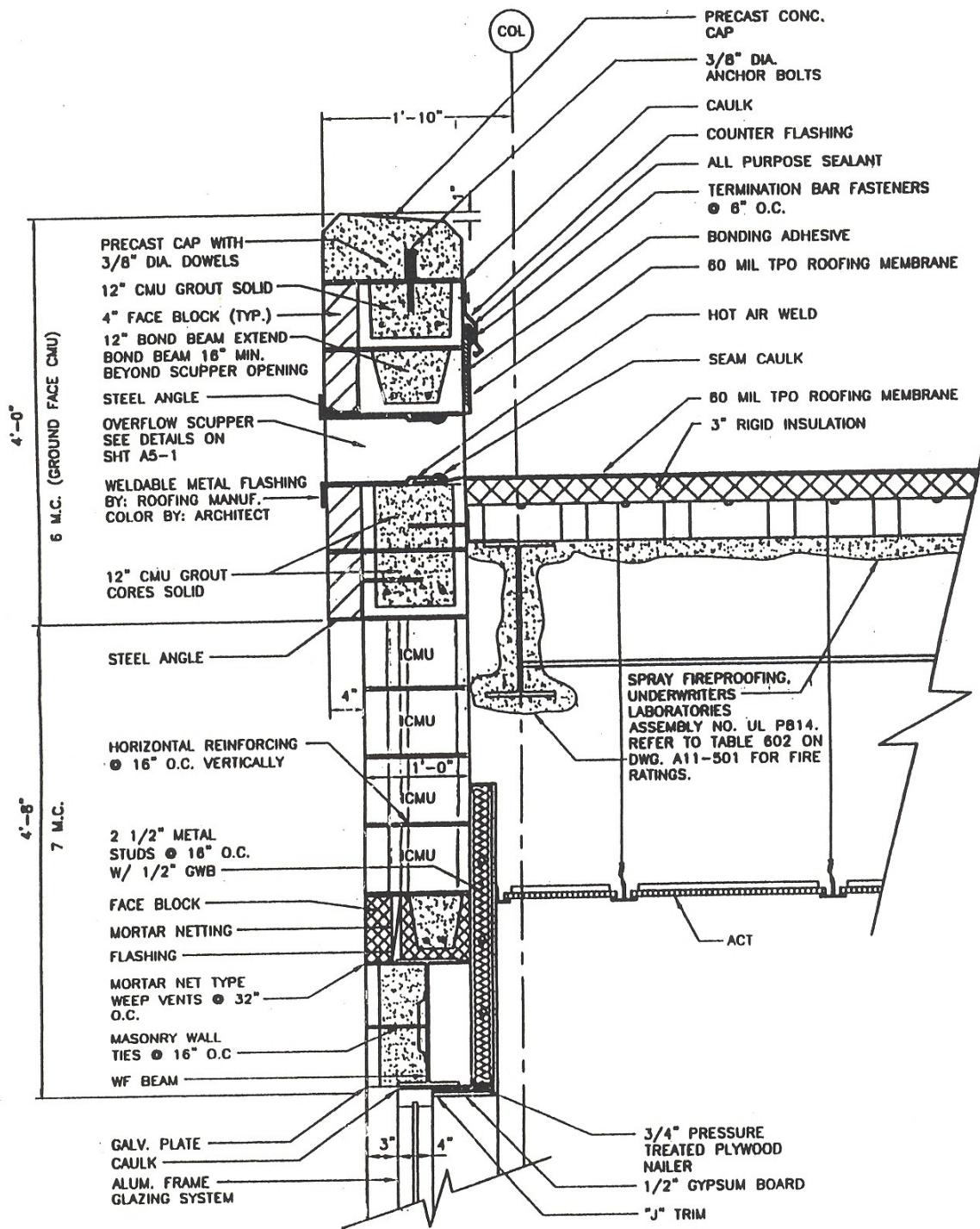


**1** EXTERIOR MASONRY WALL DETAIL  
 A6-3 SCALE: 1" = 1'-0" (SEE SCUPPER DETAIL 3/A5-3 FOR MORE INFO.)



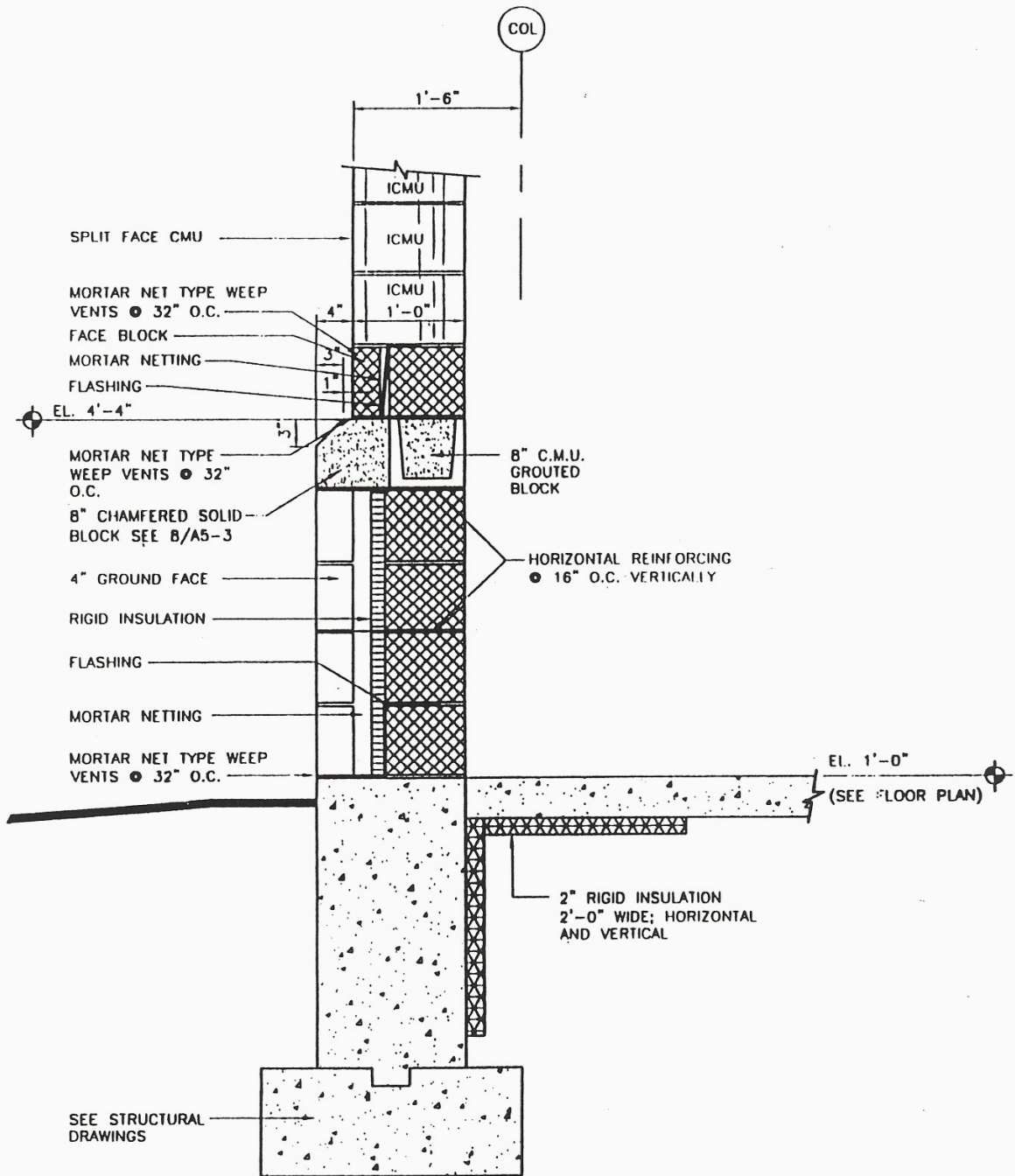
**2** **EXTERIOR MASONRY WALL DETAIL**  
**A5-3** **SCALE 1" = 1'-0"**

NOTE: NRG INSULATED CONCRETE MASONRY UNITS SHALL BE IDENTIFIED AS ICMU. REMAINING MASONRY UNITS SHALL BE STANDARD CMU.



3
A5-3
**SCUPPER DETAIL**  
 SCALE 1" = 1'-0"

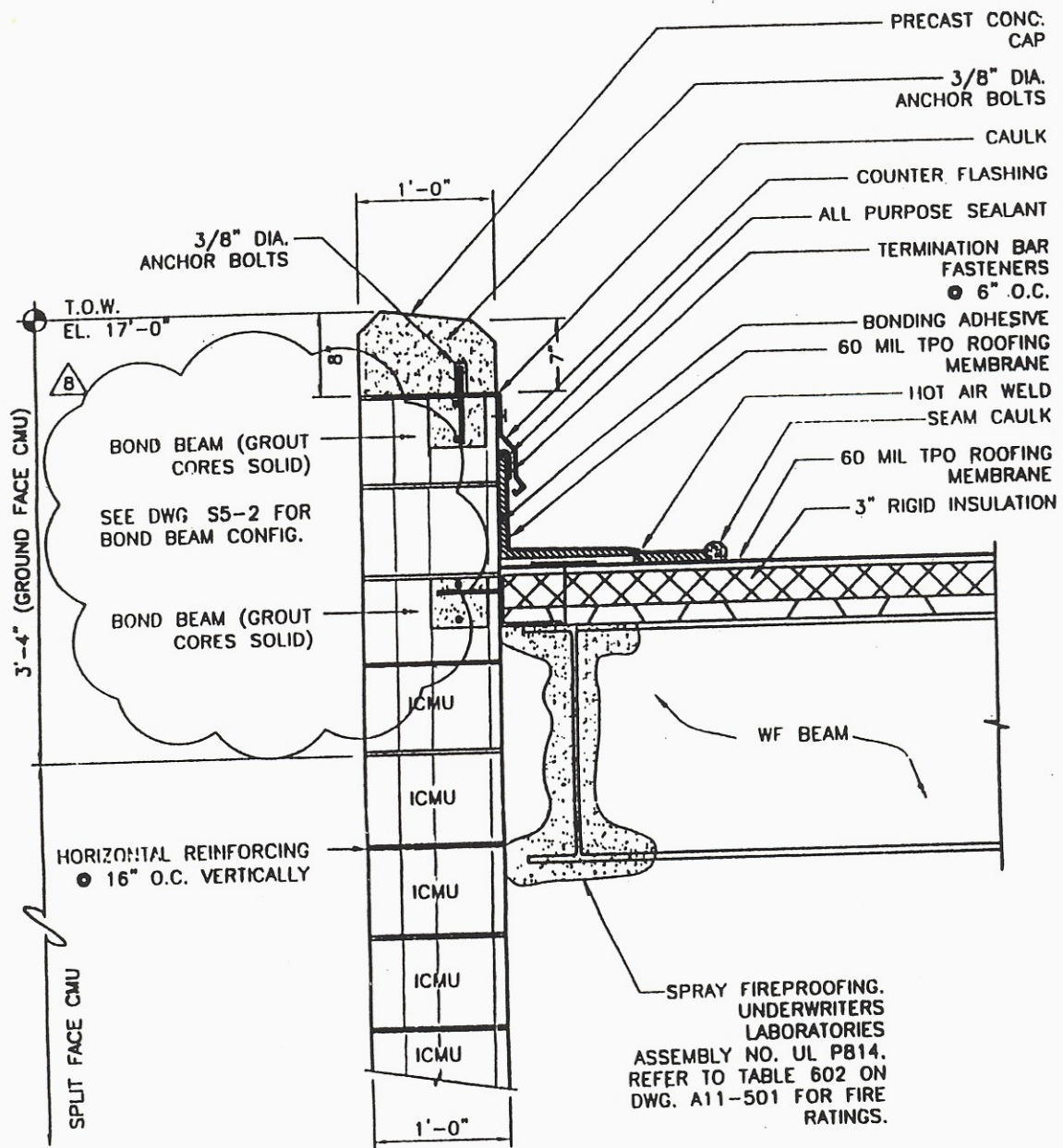




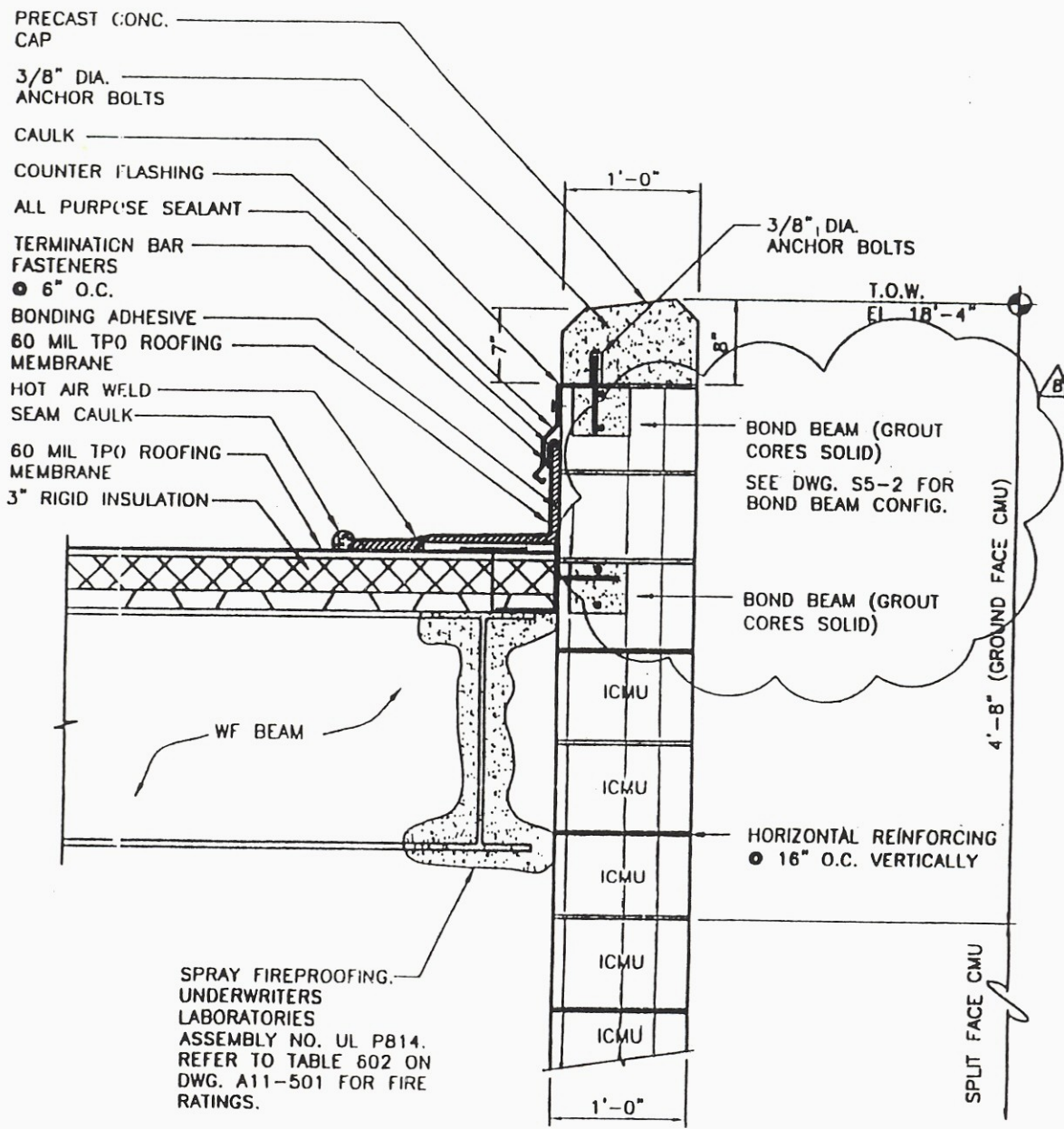
4  
A5-3

**EXTERIOR MASONRY WALL DETAIL**

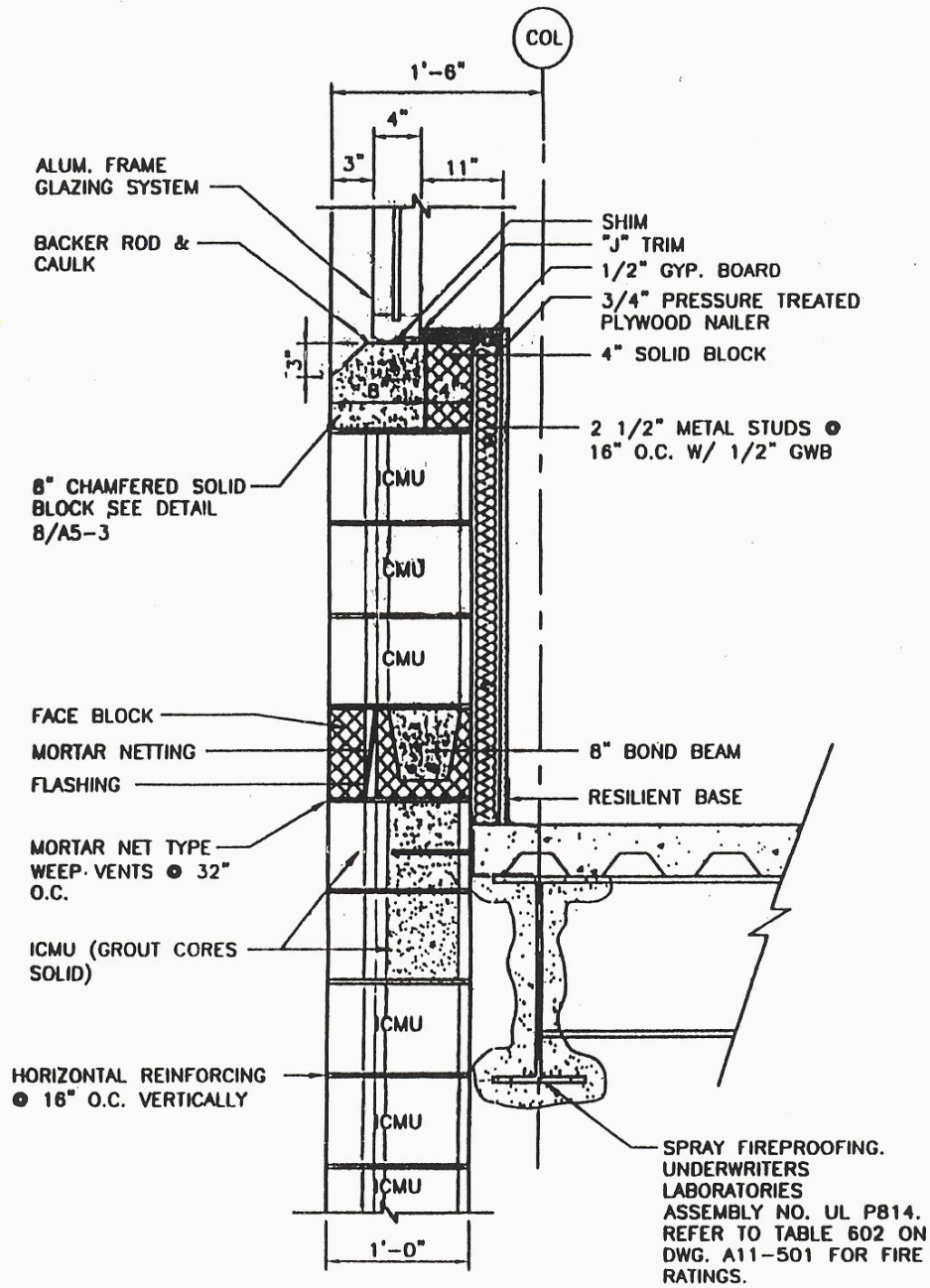
SCALE 1" = 1'-0"



**5**  
**MASONRY WALL DETAIL**  
 A6-3  
 SCALE: 1" = 1'-0"

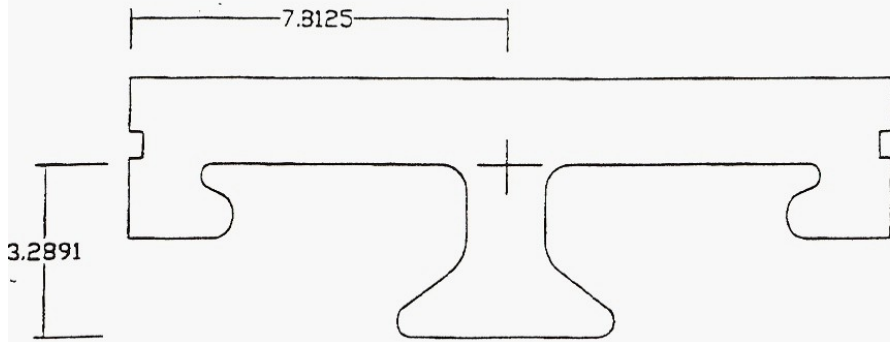


**6** **MASONRY WALL DETAIL**  
 A5-3 SCALE: 1" = 1'-0" • SEE 3/A5-3 FOR TYPICAL SCUPPER CONDITION

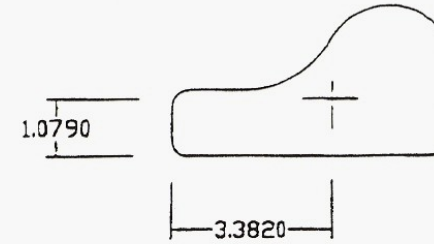


7 **MASONRY WALL DETAIL**  
 A5-3 SCALE 1" = 1'-0"

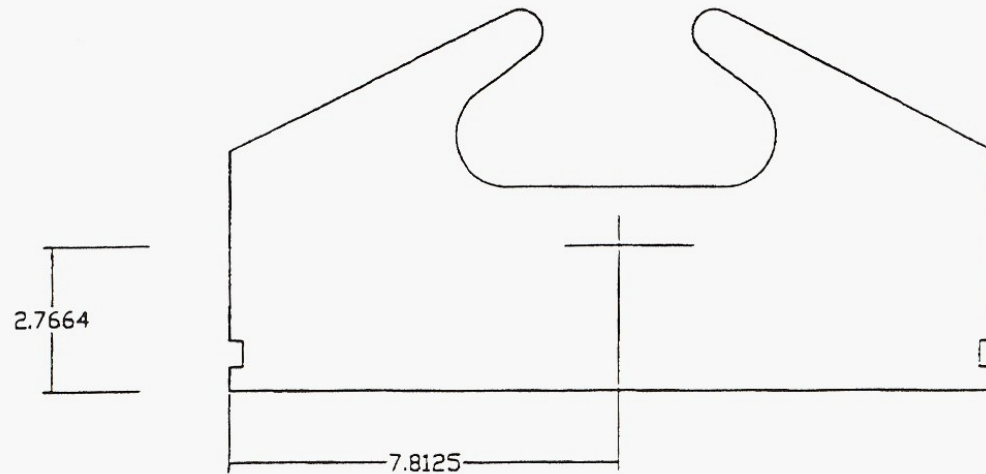
A= 38.74 in<sup>2</sup>  
 Ix= 66.99 in<sup>4</sup>  
 Iy=760.72 in<sup>4</sup>



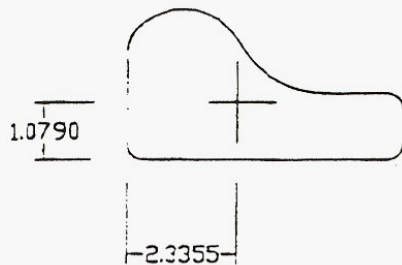
A= 10.94 in<sup>2</sup>  
 Ix= 5.74 in<sup>4</sup>  
 Iy= 26.82 in<sup>4</sup>




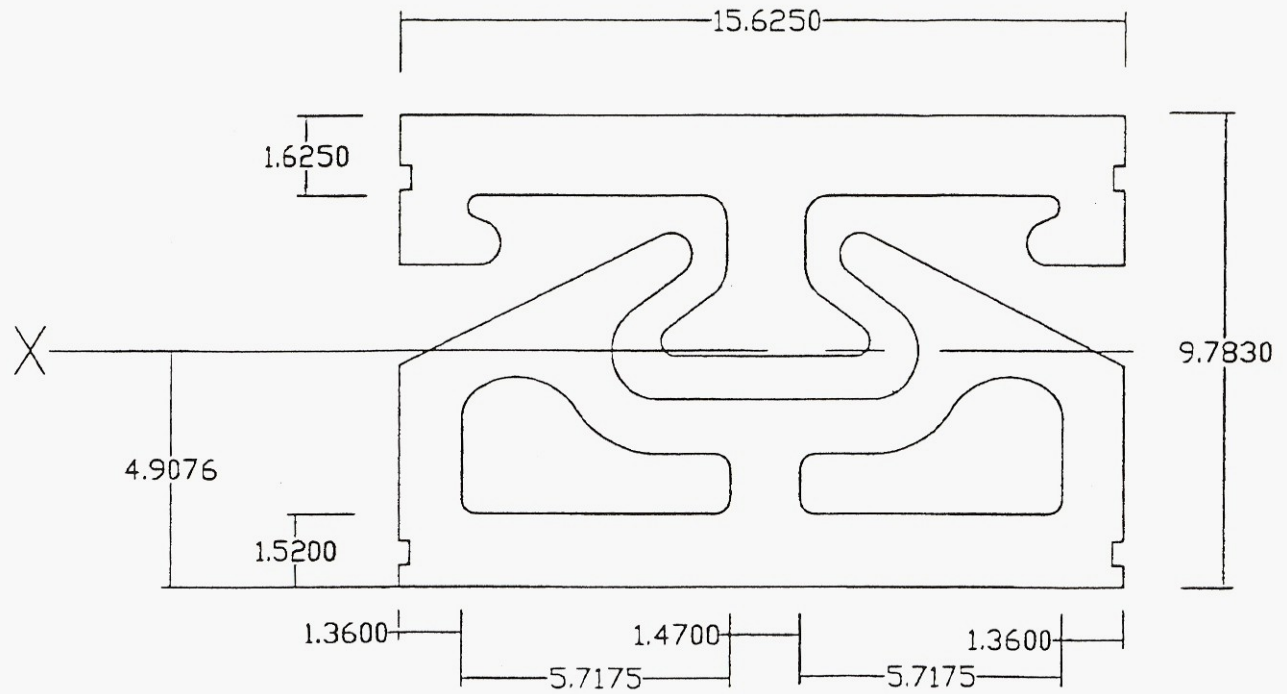
A= 38.74 in<sup>2</sup>  
 Ix= 66.99 in<sup>4</sup>  
 Iy=760.72 in<sup>4</sup>




A= 10.94 in<sup>2</sup>  
 Ix= 5.74 in<sup>4</sup>  
 Iy= 26.82 in<sup>4</sup>



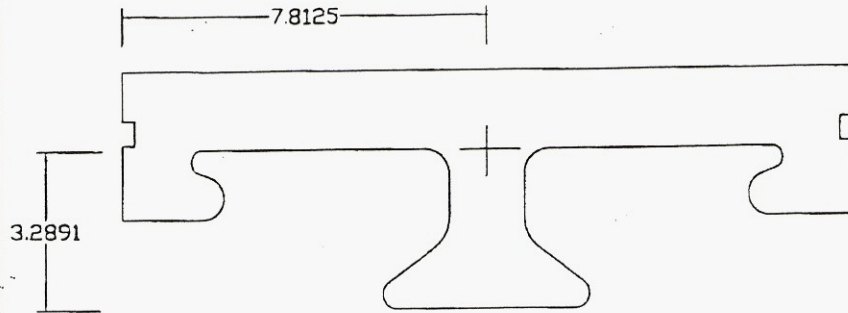
	<b>ADVANCED ENGINEERING TECHNOLOGIES, INC</b> 200 ROWE AVE, MILFORD, CT 06460 TEL: (203)878-8211 FAX: (203)878-1504		Date:04-01-03	Sheet -2-
			Concrete Block NRG 10"	
Drawn by EA	Scale 1:4			Advanced Concrete Technologies
Checked by EA				Rev.



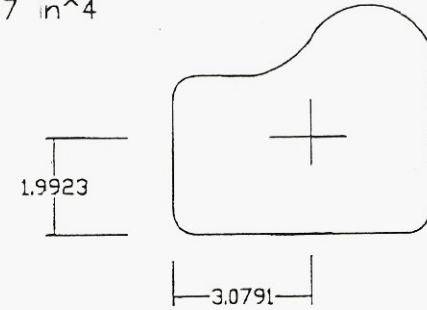
Horizontal Cross Area(A) = 152.86 in<sup>2</sup>  
 Horizontal Net Area (An) = 97.91 in<sup>2</sup>  
 Moment of Inertia (Ix) = 953.67 in<sup>4</sup>  
 Section modulus (Zx) = 194.32 in<sup>3</sup>  
 (Ix/An)<sup>.5</sup> = 3.12 in

	ADVANCED ENGINEERING TECHNOLOGIES, INC 200 ROWE AVE, MILFORD, CT 06460 TEL: (203)878-8211 FAX: (203)878-1504		Date:04-01-03	Sheet -1-
			Concrete Block NRG 10"	
Drawn by EA	Scale 1/4		Advanced Concrete Technologies	Rev.
Checked by EA				

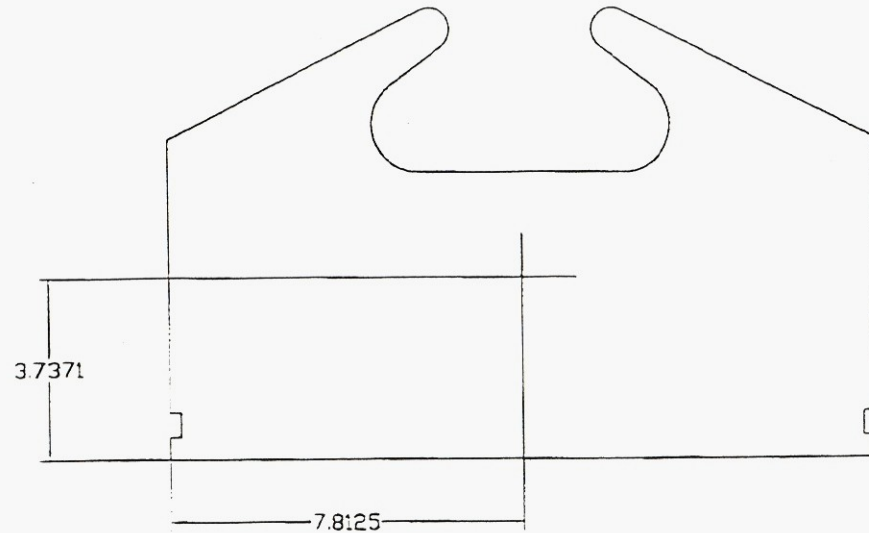
A= 38.74 in<sup>2</sup>  
 Ix= 66.99 in<sup>4</sup>  
 Iy=760.72 in<sup>4</sup>



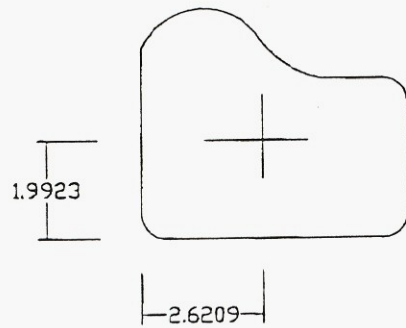
A= 21.96 in<sup>2</sup>  
 Ix= 31.26 in<sup>4</sup>  
 Iy= 56.97 in<sup>4</sup>



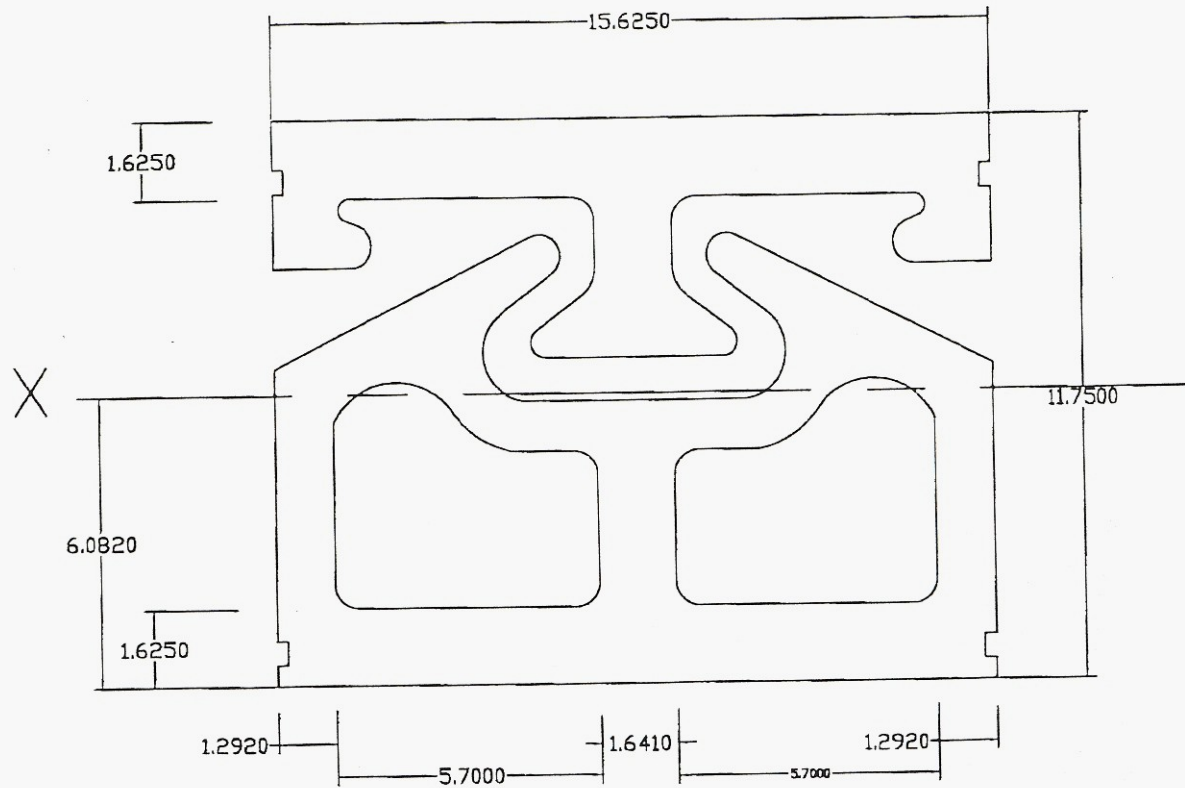
A= 112.76 in<sup>2</sup>  
 Ix= 586.93 in<sup>4</sup>  
 Iy= 2341.74 in<sup>4</sup>




A= 21.96 in<sup>2</sup>  
 Ix= 31.26 in<sup>4</sup>  
 Iy= 56.97 in<sup>4</sup>



	ADVANCED ENGINEERING TECHNOLOGIES, INC 200 ROWE AVE, MILFORD, CT 06460 TEL: (203)878-3211 FAX: (203)878-1504		Date:04-01-03	Sheet -2-
			Concrete Block NRG 12"	
Drawn by EA	Scale 1:4		Advanced Concrete Technologies	Rev.
Checked by EA				



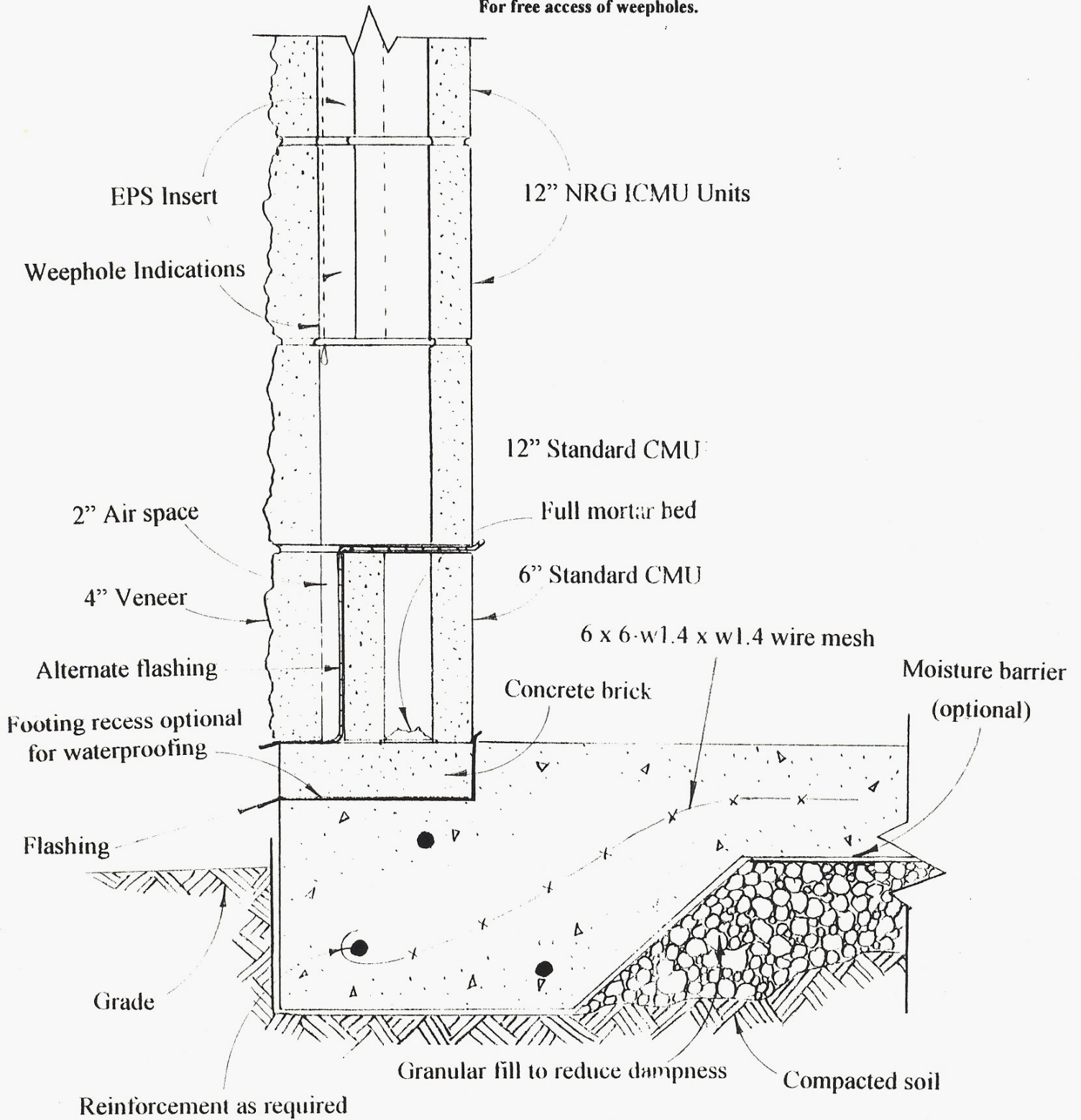
Horizontal Cross Area(A) = 183.59 in<sup>2</sup>  
 Horizontal Net Area (An) = 107.58 in<sup>2</sup>  
 Moment of Inertia (Ix) = 1613.64 in<sup>4</sup>  
 Section modulus (Zx) = 265.31 in<sup>3</sup>  
 (Ix/An)<sup>.5</sup> = 3.87 in

	<b>ADVANCED ENGINEERING TECHNOLOGIES, INC</b> 200 ROWE AVE, MILFORD, CT 06460 TEL: (203)878-8211 FAX: (203)878-1504		Date:04-01-03	Sheet -1-
			Concrete Block NRG 12"	
Drawn by EA	Scale 1:4		Advanced Concrete Technologies	Rev.
Checked by EA				



### Flashing Details

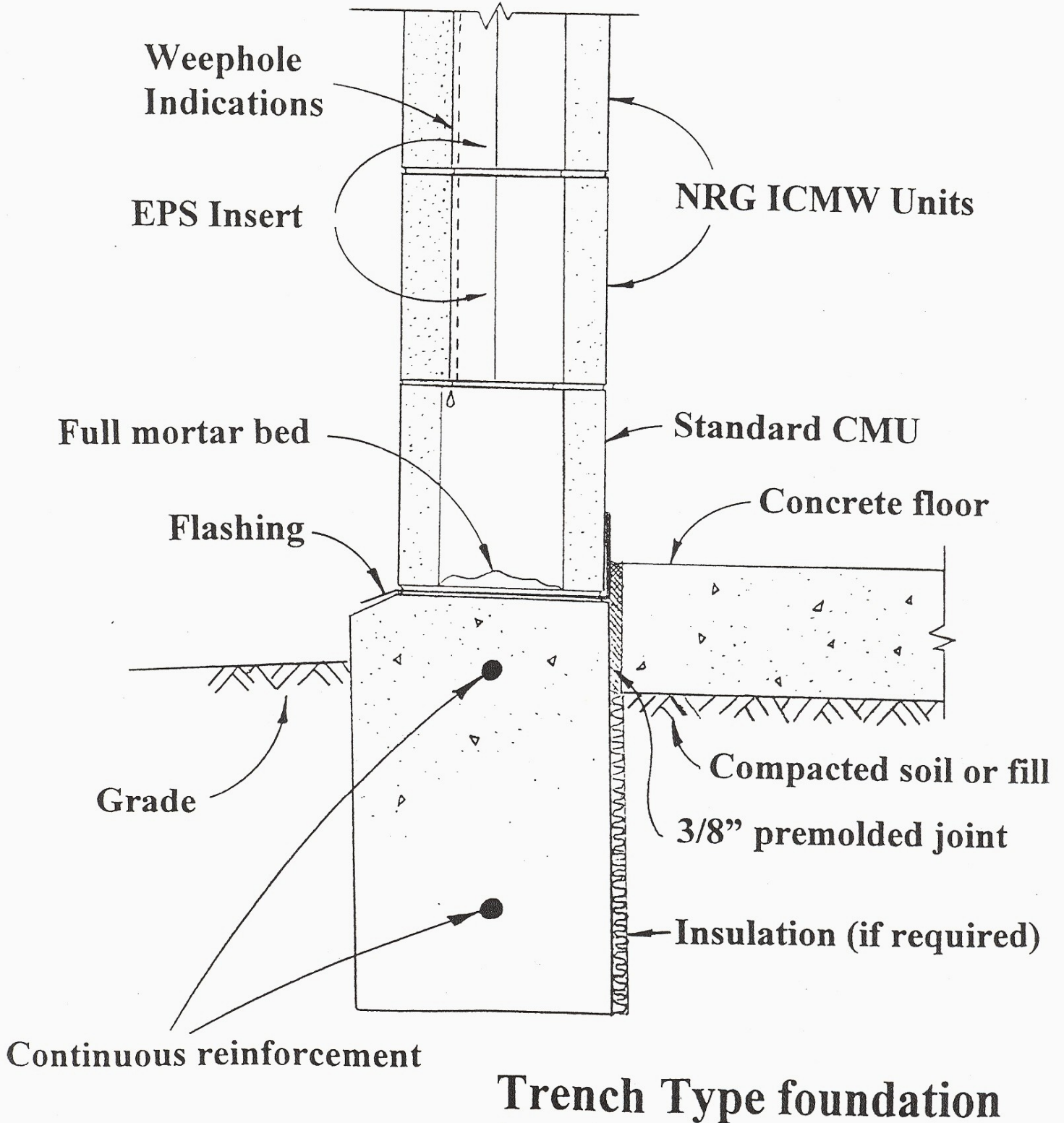
Note; The outer concrete wall of an NRG unit has been intentionally designed thicker than conventional CMU's specifically to accommodate for free access of weepholes.



### Floating Slab Foundation

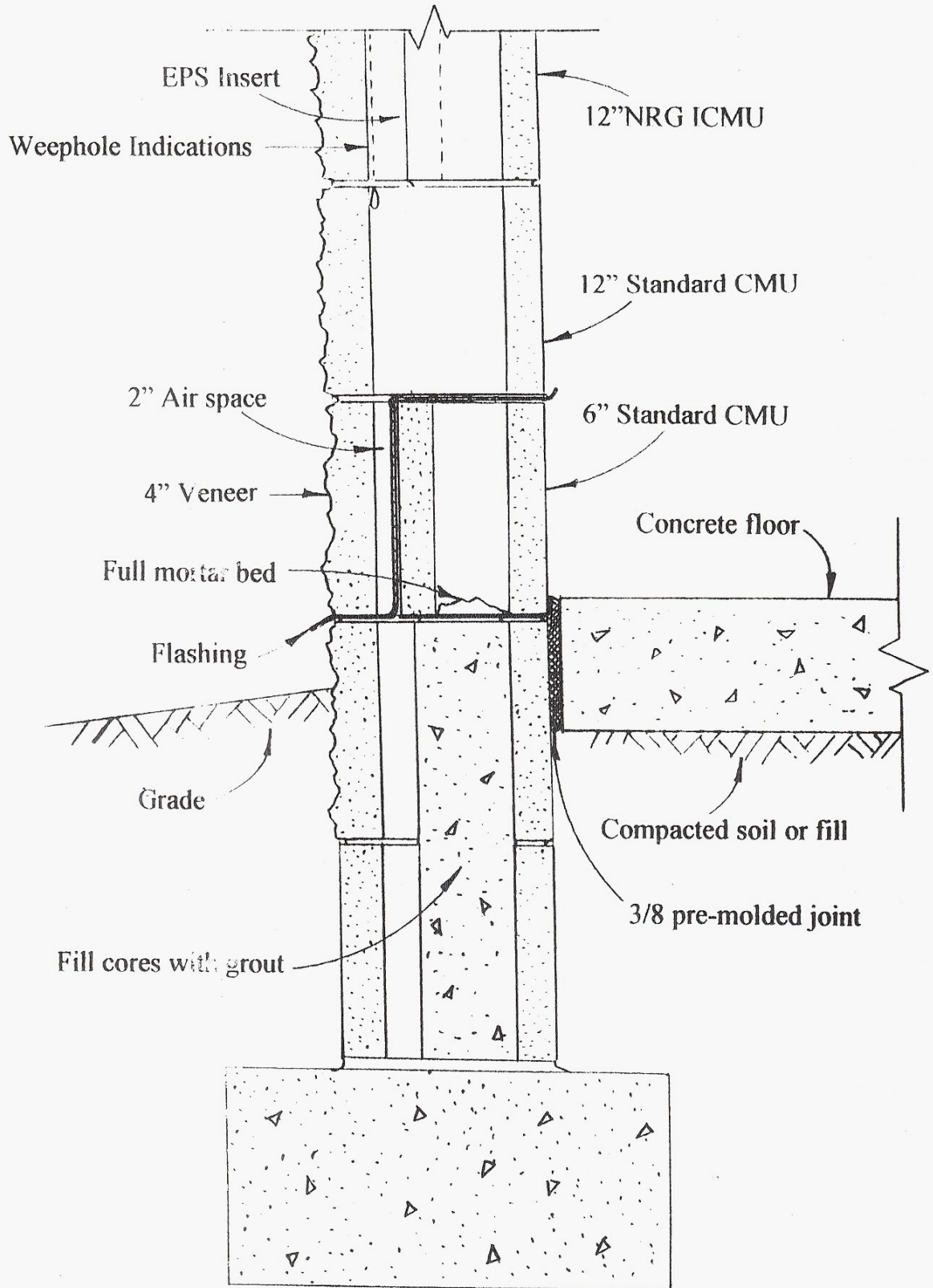
# Flashing Details

NOTE: The outer concrete wall of an NRG unit has been intentionally designed thicker than conventional CMU's specifically to accommodate for free access of weepholes.



## Flashing Details

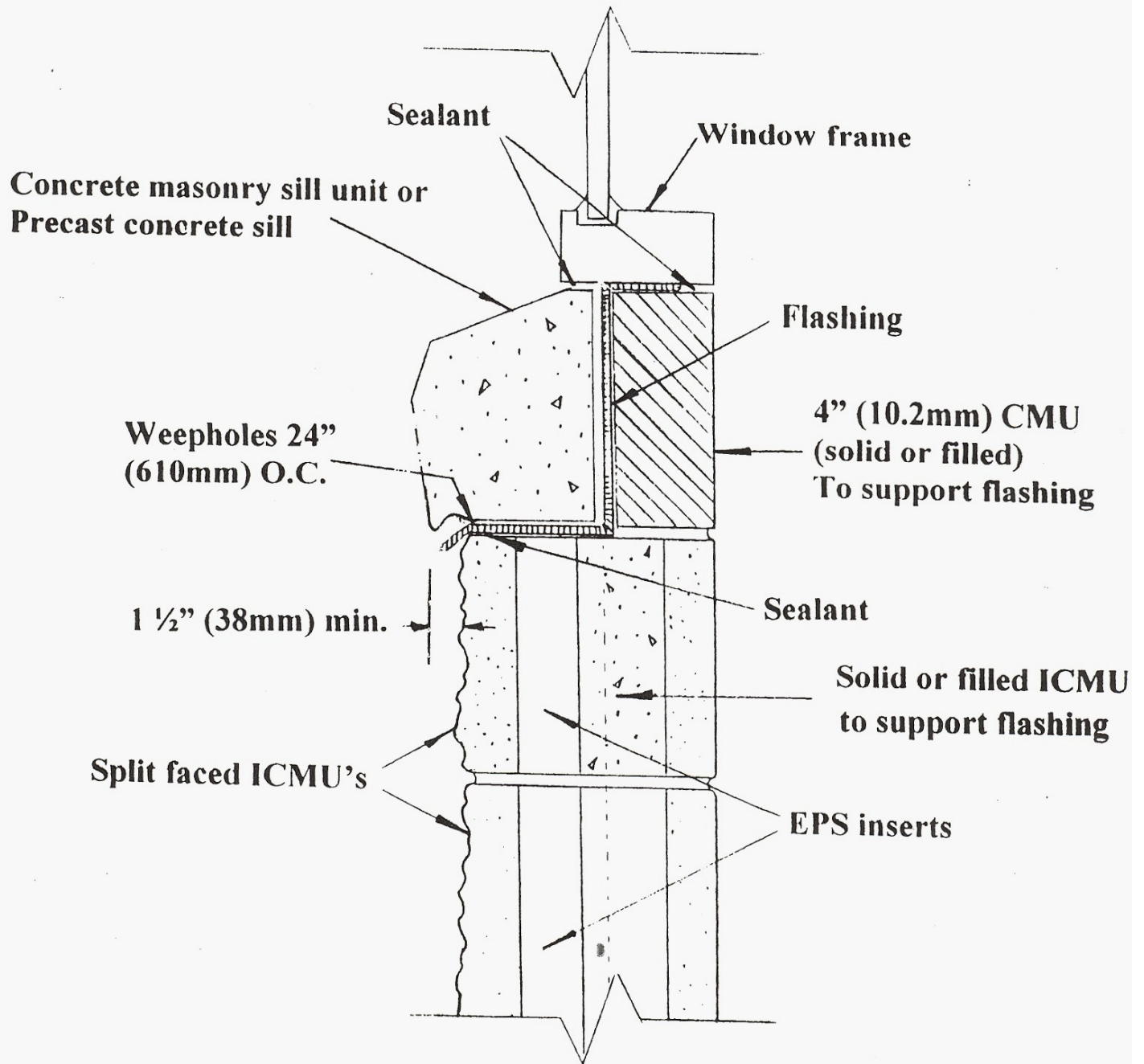
Note; The outer concrete wall of an NRG unit has been intentionally Designed thicker than conventional CMU's specifically to accommodate For free access of weepholes.



**Spread Footing Foundation**

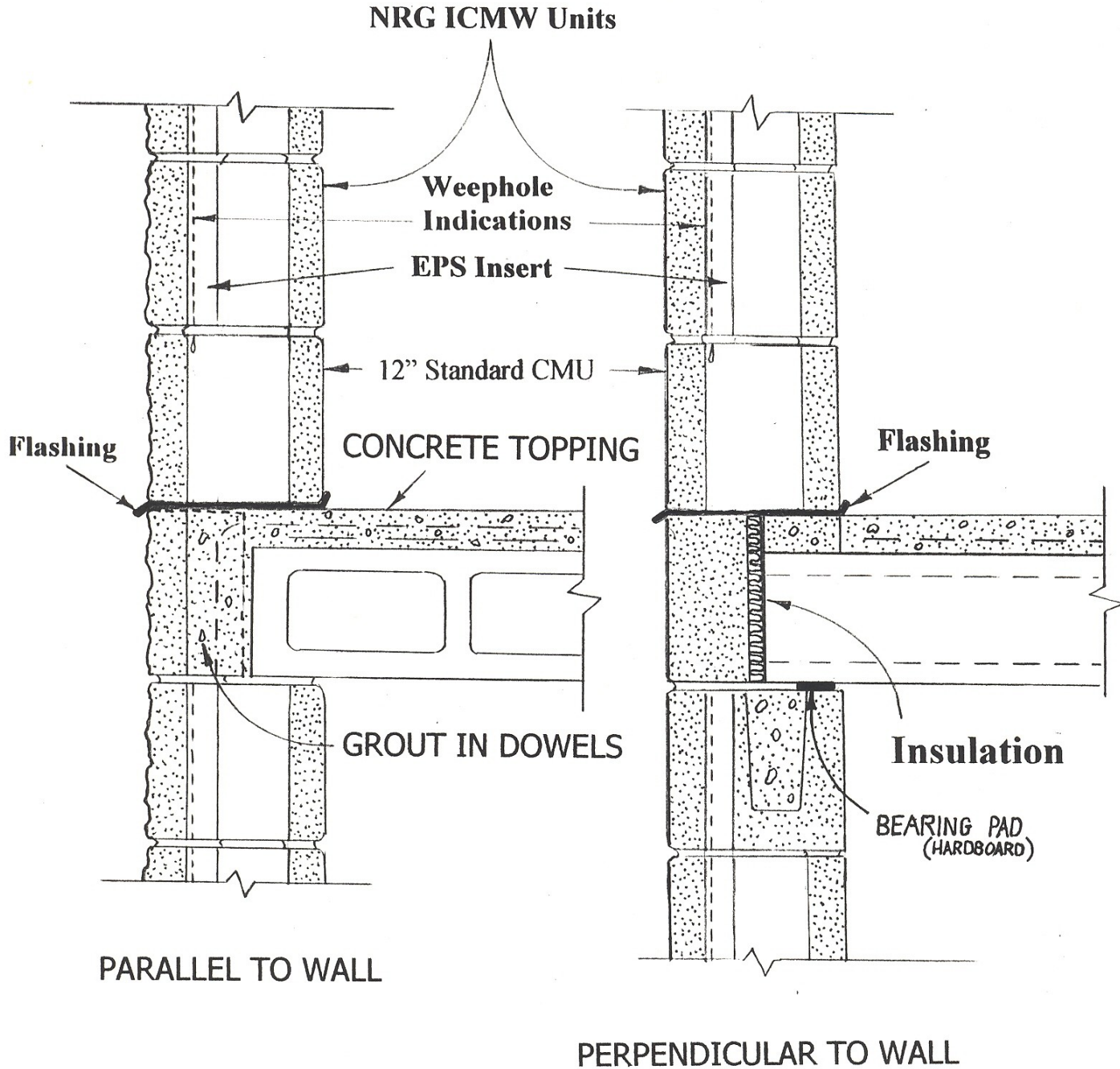
# Flashing Single Whyth Walls at Sills

**NOTE:** Rake out vertical joints where masonry units butt up to window jambs and fill with sealant.

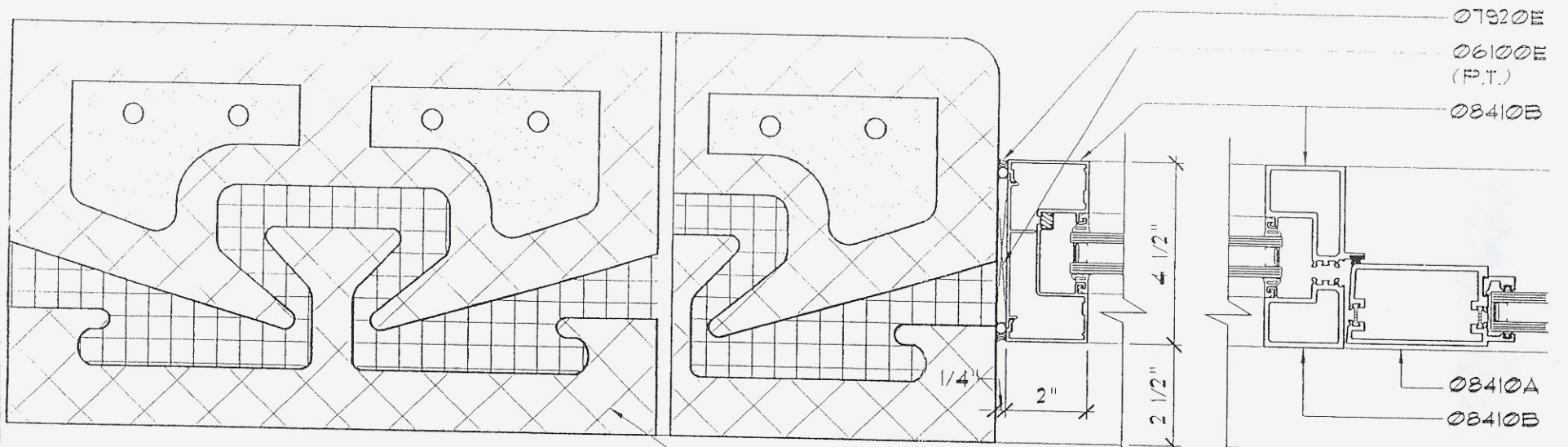


## Flashing Details

Note: The outer concrete wall of an NRG unit has been intentionally designed thicker than conventional CMU's specifically to accommodate for free access of weepholes.



## Wall Details at Precast Concrete Floors

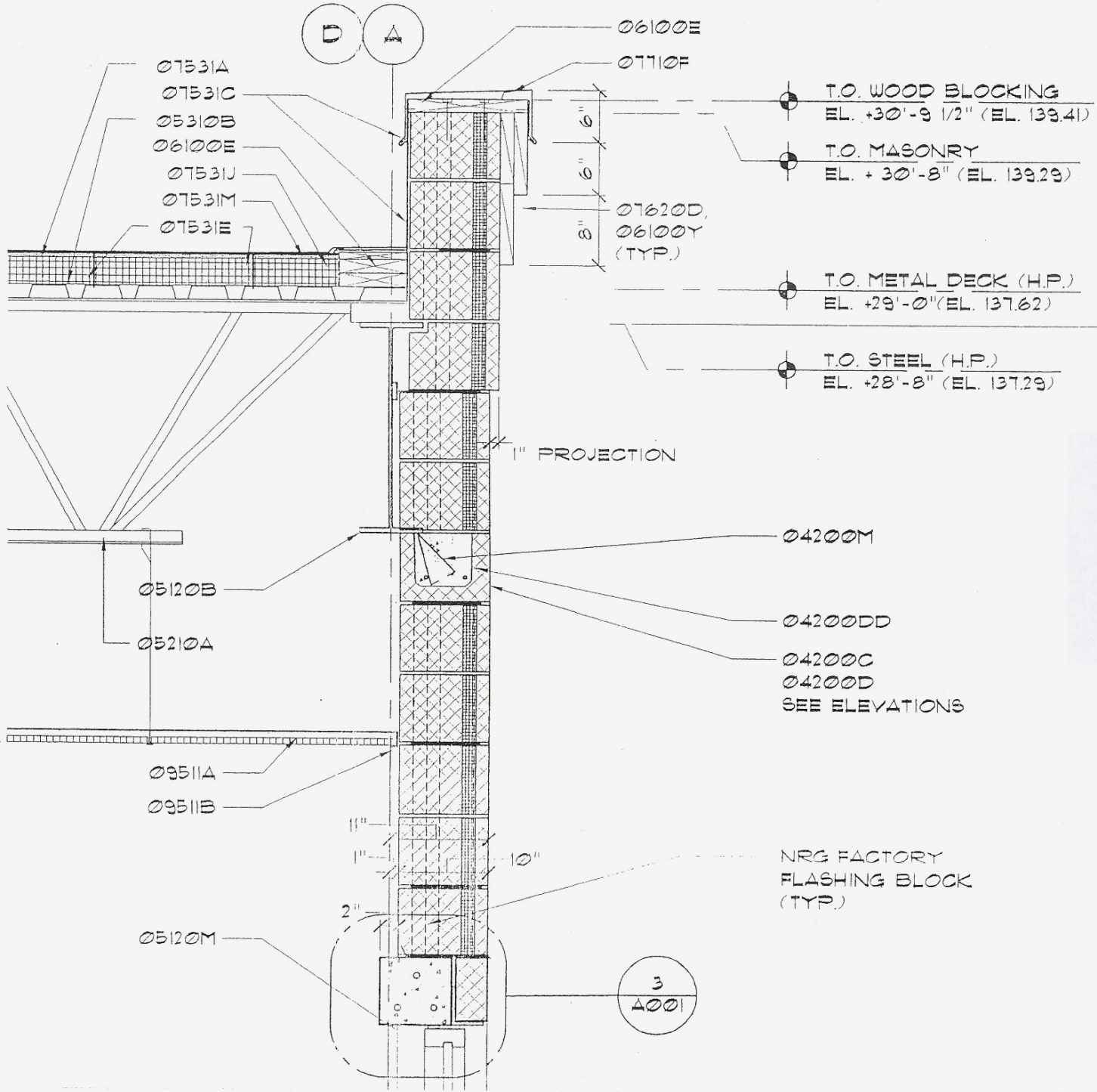


04200C  
 04200D  
 (NRG BLOCK)  
 SEE ELEVATIONS

07920E  
 06100E  
 (P.T.)  
 08410B  
 08410A  
 08410B

16'-0"

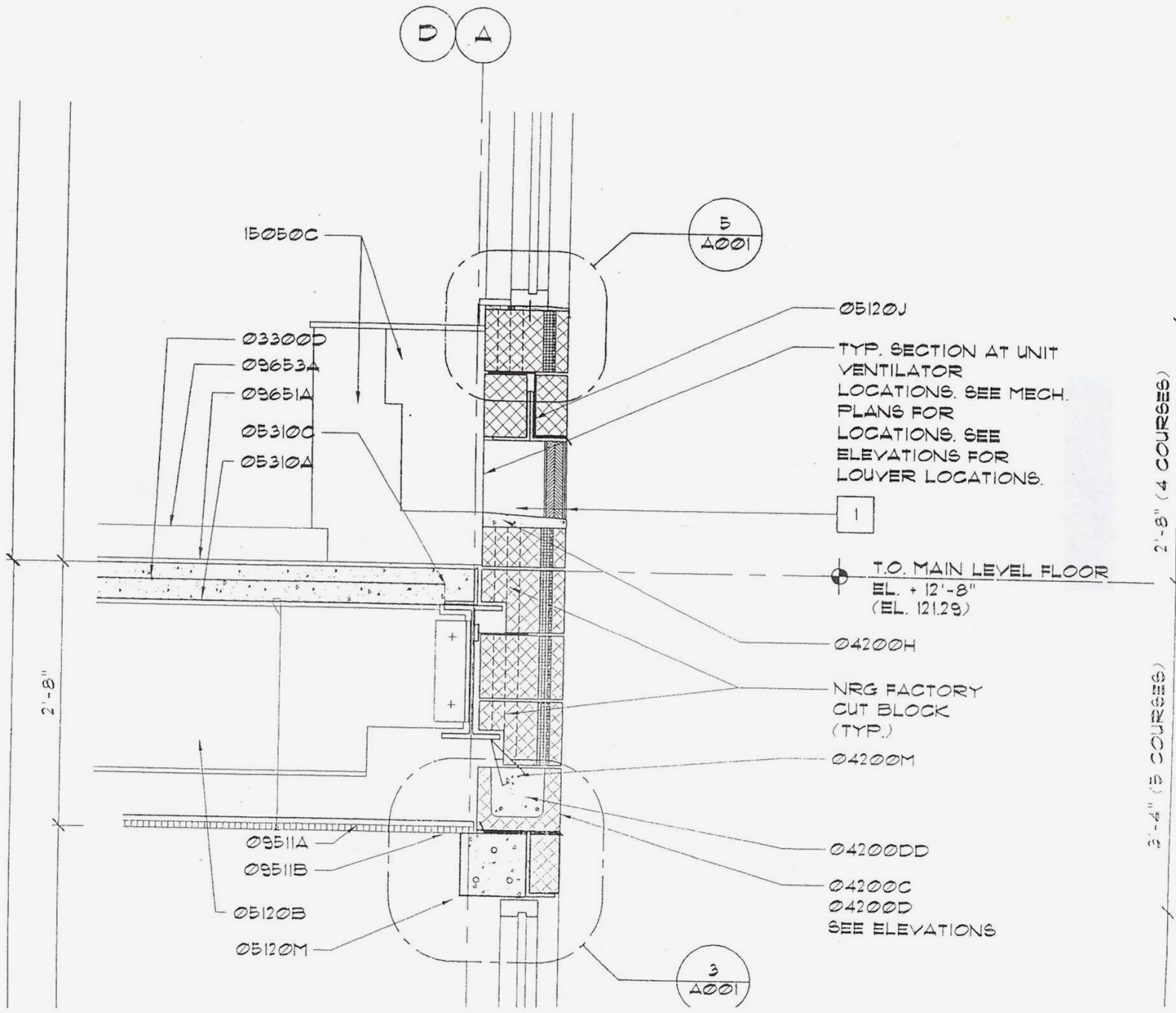
4'-0"



2'-0" (3 COURSES)

6'-8" (10 COURSES)

3  
A001



2'-8"

2'-8" (4 COURSES)

3'-4" (8 COURSES)

D A

5  
A001

3  
A001

15050C

03300D

09653A

09651A

05310C

05310A

05120J

TYP. SECTION AT UNIT VENTILATOR LOCATIONS. SEE MECH. PLANS FOR LOCATIONS. SEE ELEVATIONS FOR LOUVER LOCATIONS.

1

T.O. MAIN LEVEL FLOOR  
EL. +12'-8"  
(EL. 121.29)

04200H

NRG FACTORY CUT BLOCK (TYP.)

04200M

04200DD

04200C  
04200D  
SEE ELEVATIONS

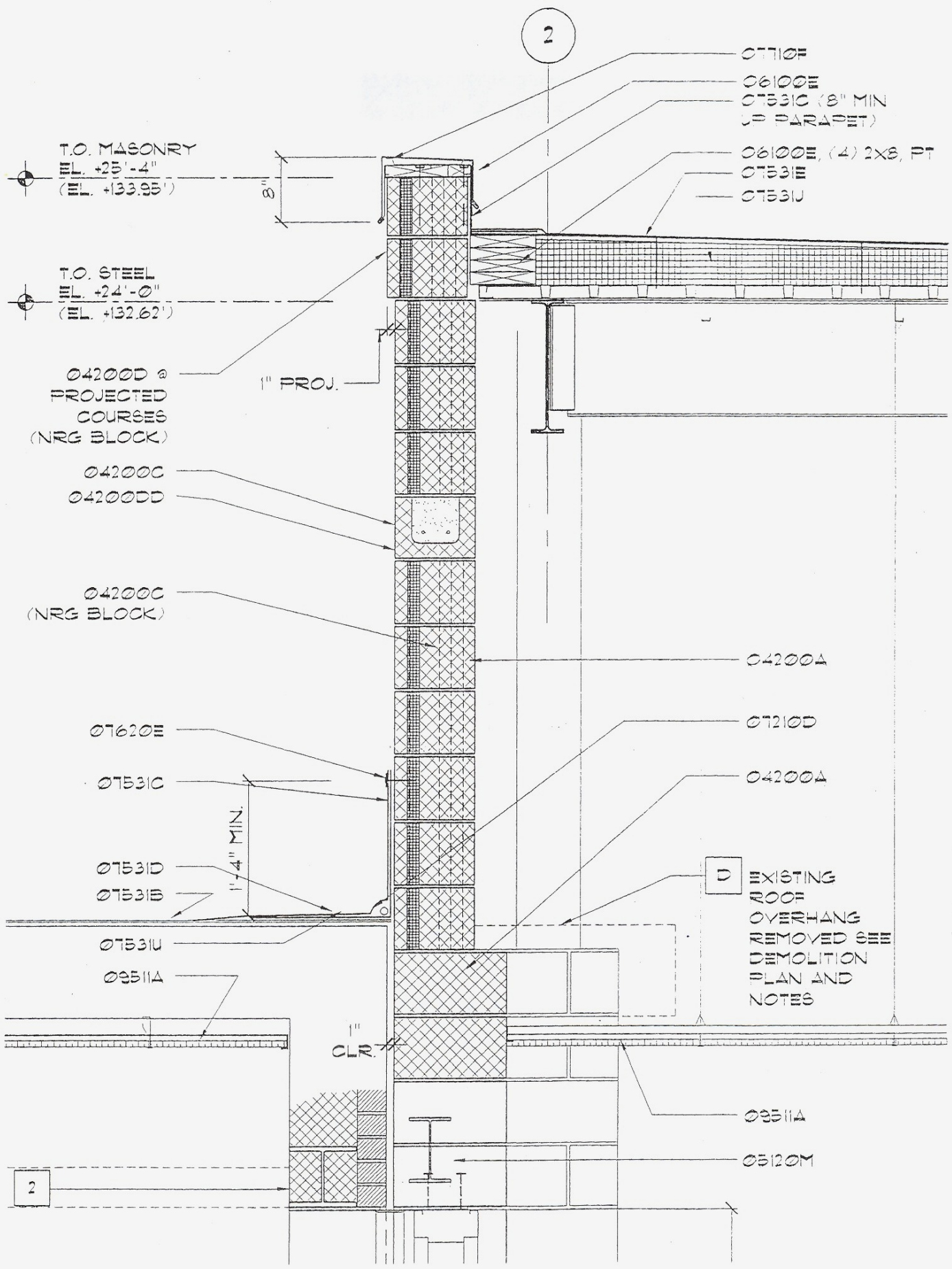
0511A

0511B

05120B

05120M





2

T.O. MASONRY  
 EL. +25'-4"  
 (EL. +133.95')

T.O. STEEL  
 EL. +24'-0"  
 (EL. +132.62')

OT710F  
 O6100E  
 OT531C (8" MIN  
 UP PARAPET)  
 O6100E, (4) 2X8, PT  
 OT531E  
 OT531U

04200D @  
 1" PROJ.  
 COURSES  
 (NRG BLOCK)  
 04200C  
 04200DD

04200C  
 (NRG BLOCK)

OT620E

OT531C

OT531D

OT531B

OT531U

O9511A

04200A

OT210D

04200A

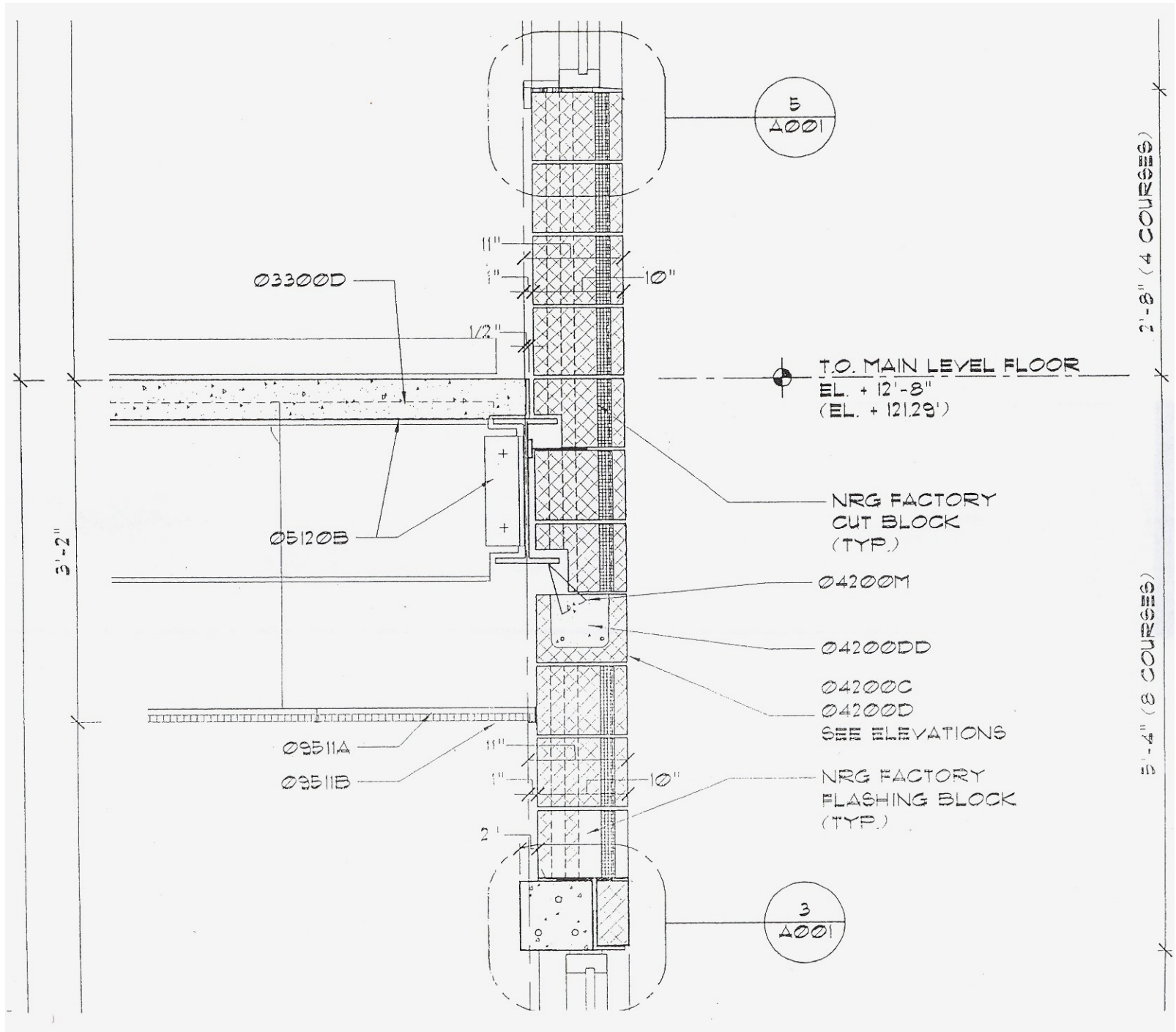
D EXISTING  
 ROOF  
 OVERHANG  
 REMOVED SEE  
 DEMOLITION  
 PLAN AND  
 NOTES

1" CLR.

O9511A

O5120M

2



03300D

05120B

09511A

09511B

5  
A001

3  
A001

T.O. MAIN LEVEL FLOOR  
EL. + 12'-8"  
(EL. + 121.29')

NRG FACTORY  
CUT BLOCK  
(TYP.)

04200M

04200DD

04200C  
04200D  
SEE ELEVATIONS

NRG FACTORY  
FLASHING BLOCK  
(TYP.)

2'-8" (4 COURSES)

5'-4" (8 COURSES)

3'-2"

1 1/2"

1/2"

1 1/2"

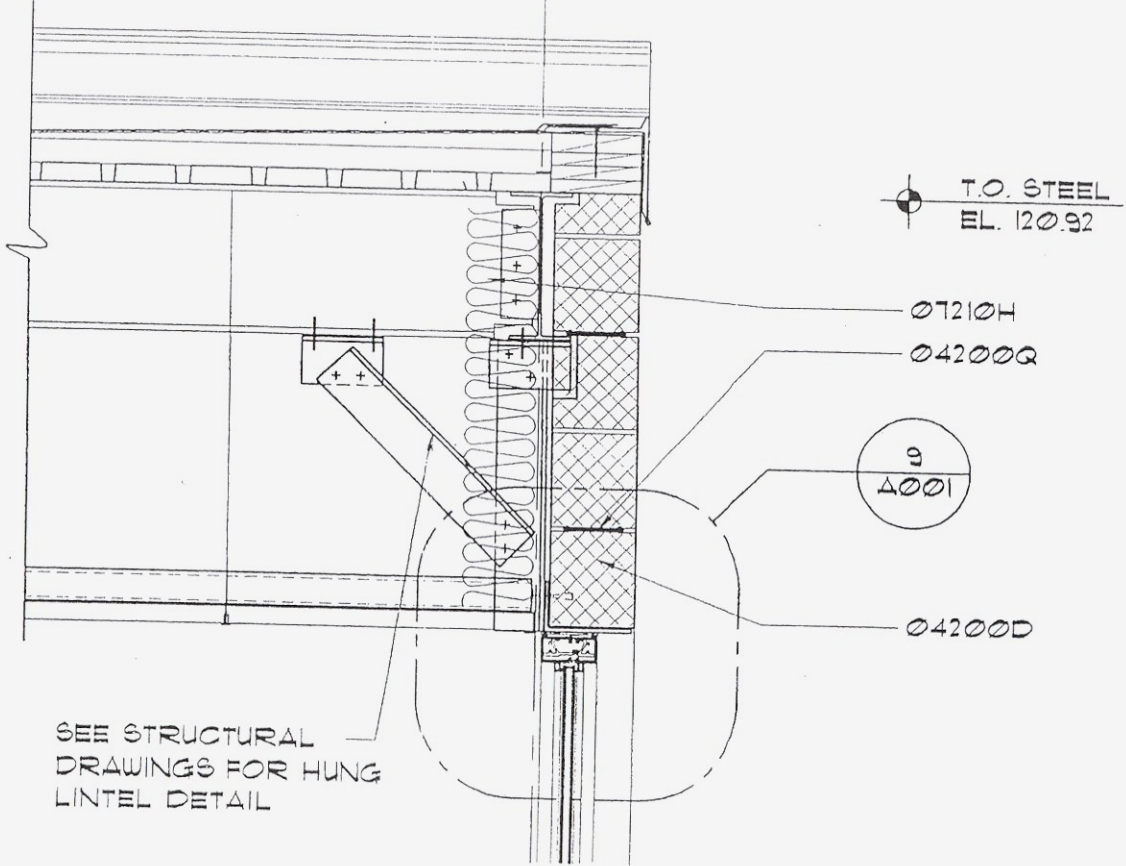
1"

2"

10"

10"

C.4



T.O. STEEL  
EL. 120.92

Ø7210H

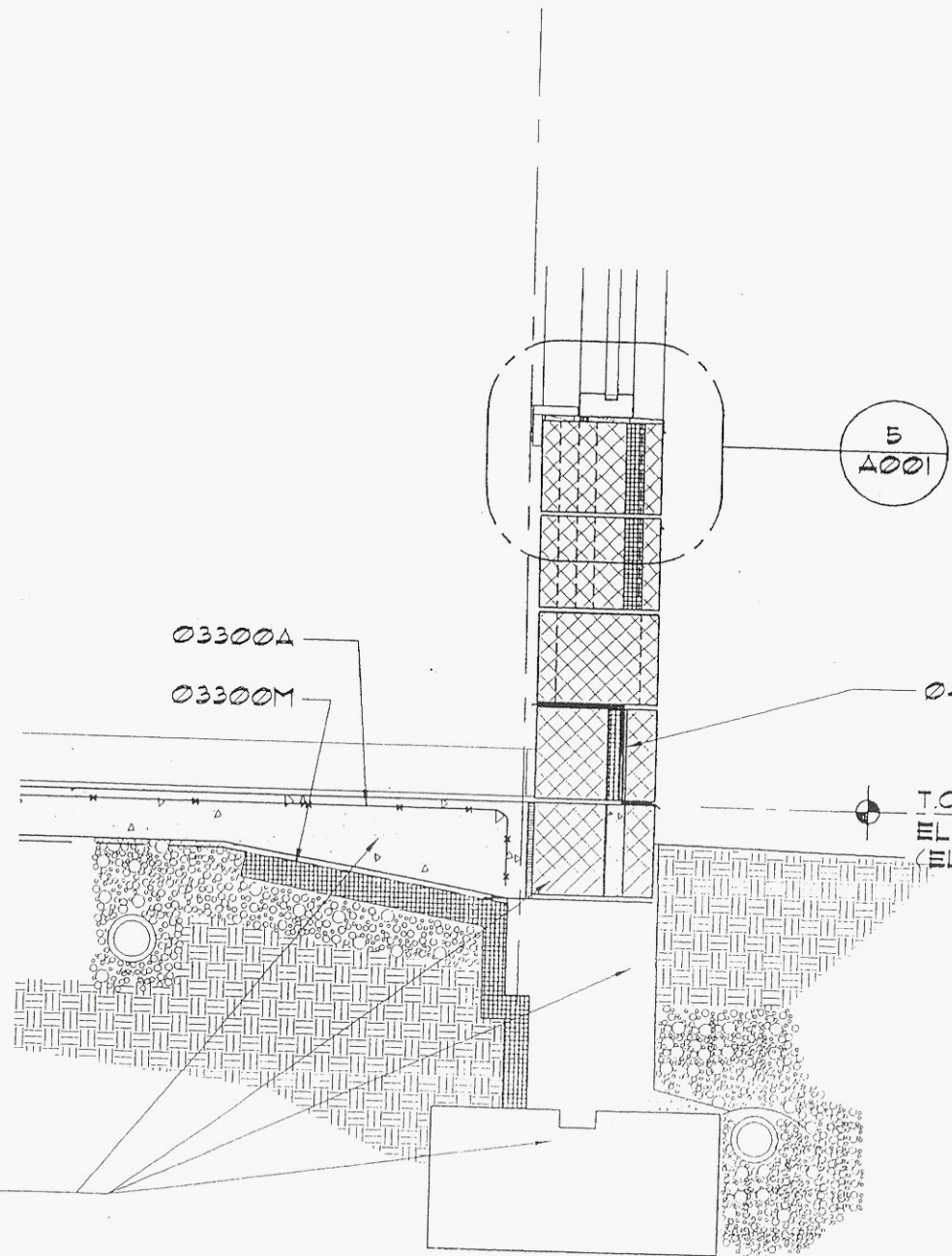
Ø4200Q

3  
Δ001

Ø4200D

SEE STRUCTURAL  
DRAWINGS FOR HUNG  
LINTEL DETAIL

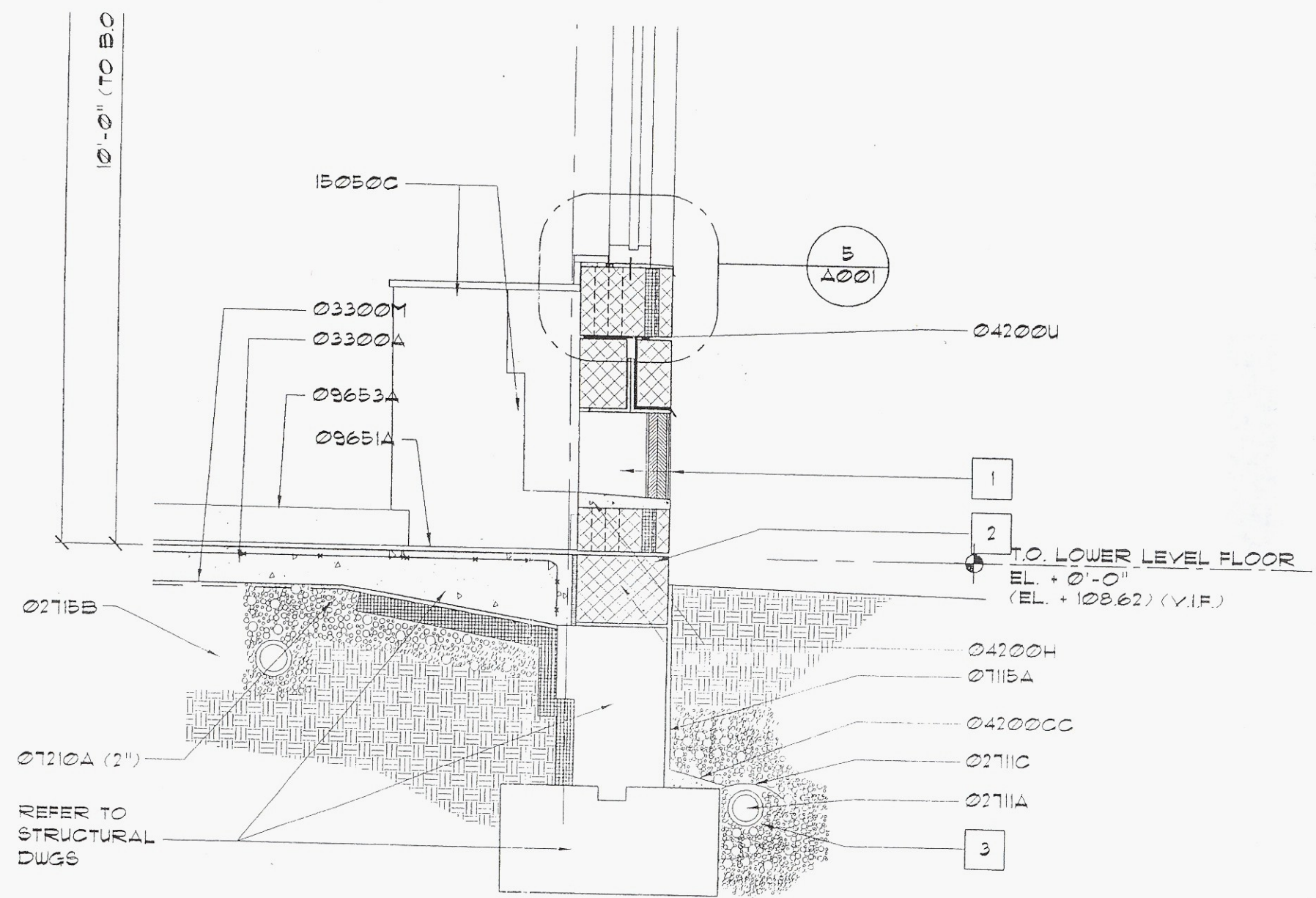
9'-0"

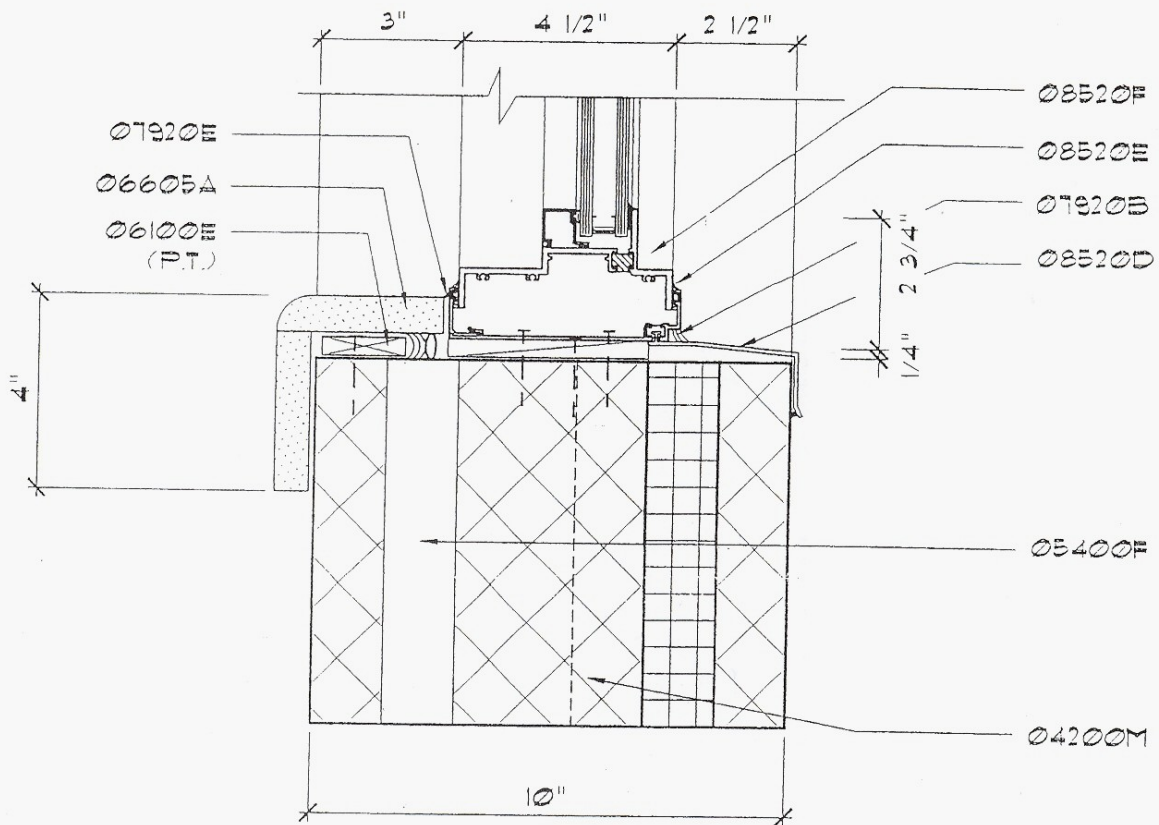


T.O. LOWER LEVEL FLOOR  
EL. + 0'-0"  
(EL. + 108.62') (V.I.F.)

2'-8" (4 COURSES)

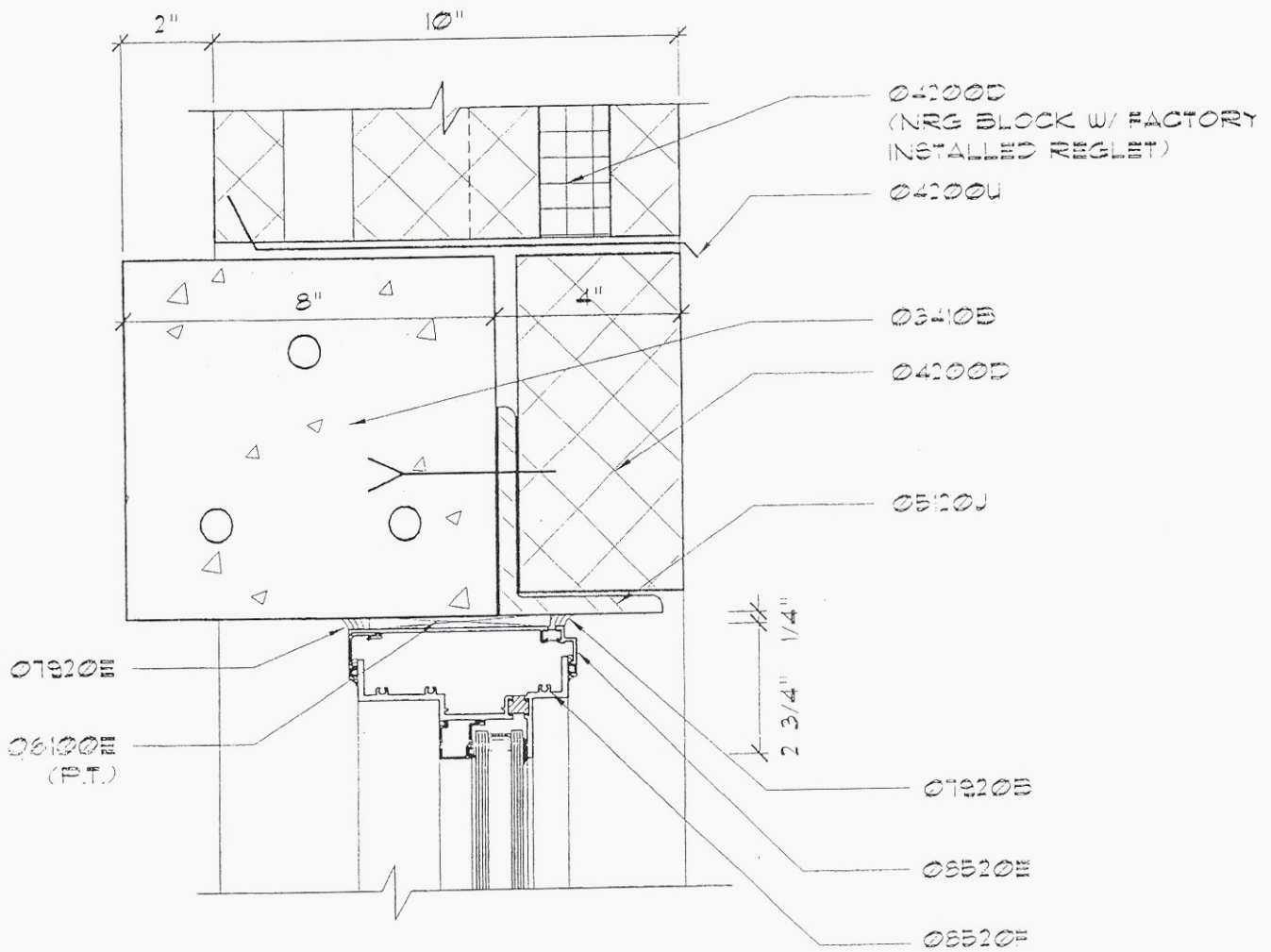
REFER TO  
STRUCTURAL  
DWGS





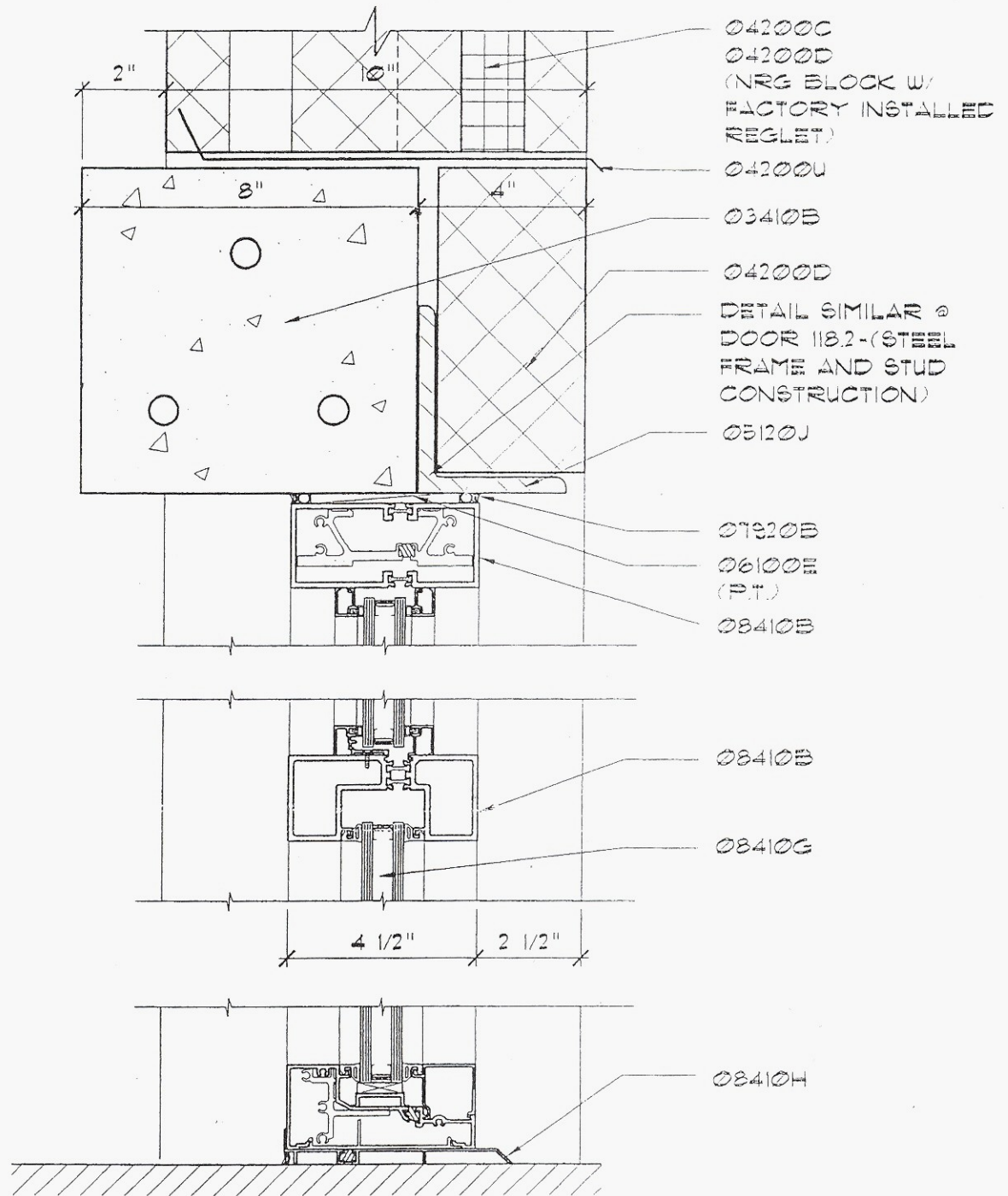
# Sill (Fixed)

SCALE: 3" = 1'-0"



# Head (Fixed)

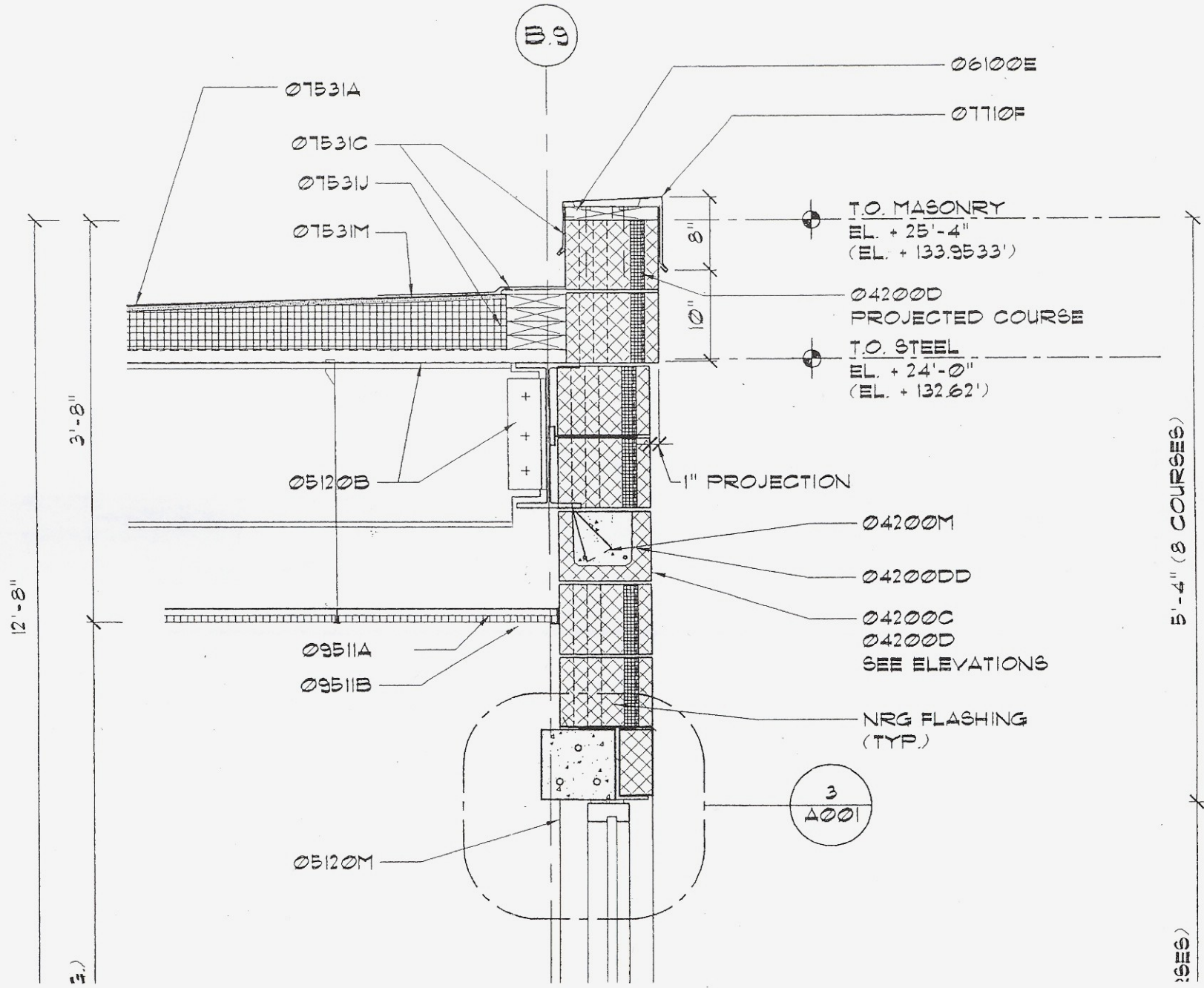
SCALE: 3" = 1'-0"



# Storefront Detail

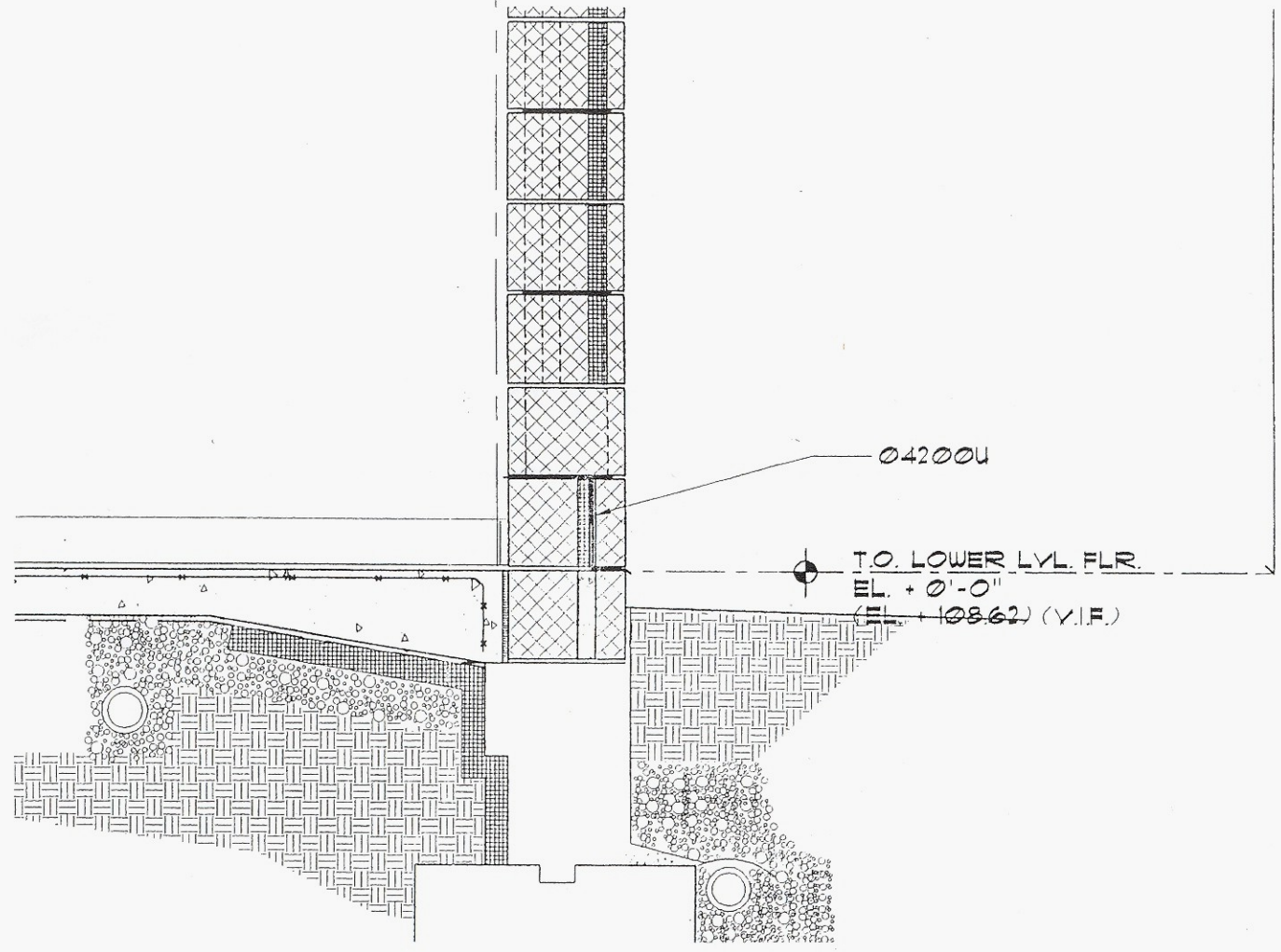
SCALE: 3"=1'-0"





7

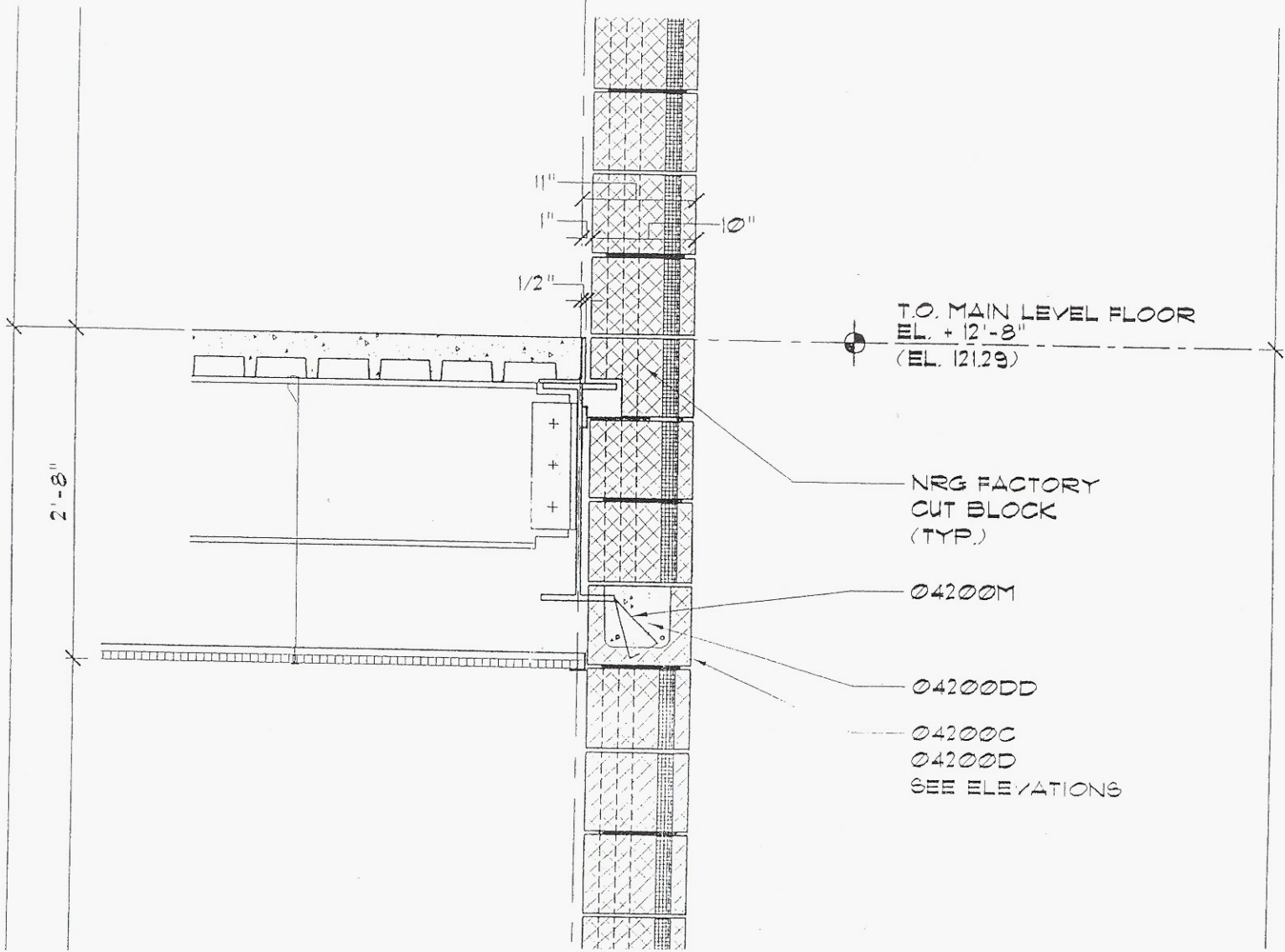
10'-0"



Ø4200U

TO LOWER LVL. FLR.  
EL. + 0'-0"  
(EL. + 108.62) (V.I.F.)

7



T.O. MAIN LEVEL FLOOR  
EL. + 12'-8"  
(EL. 121.29)

NRG FACTORY  
CUT BLOCK  
(TYP.)

04200M

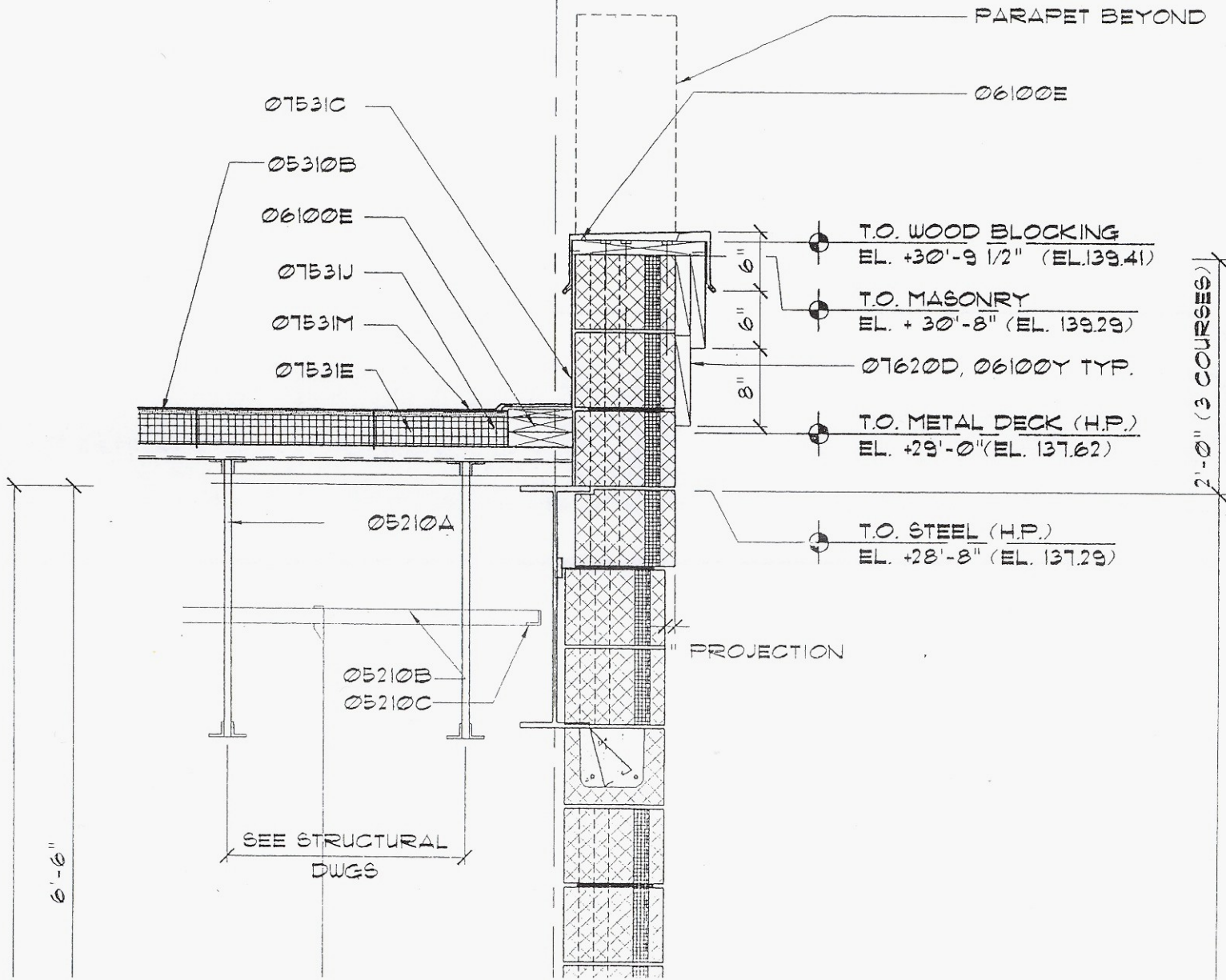
04200DD

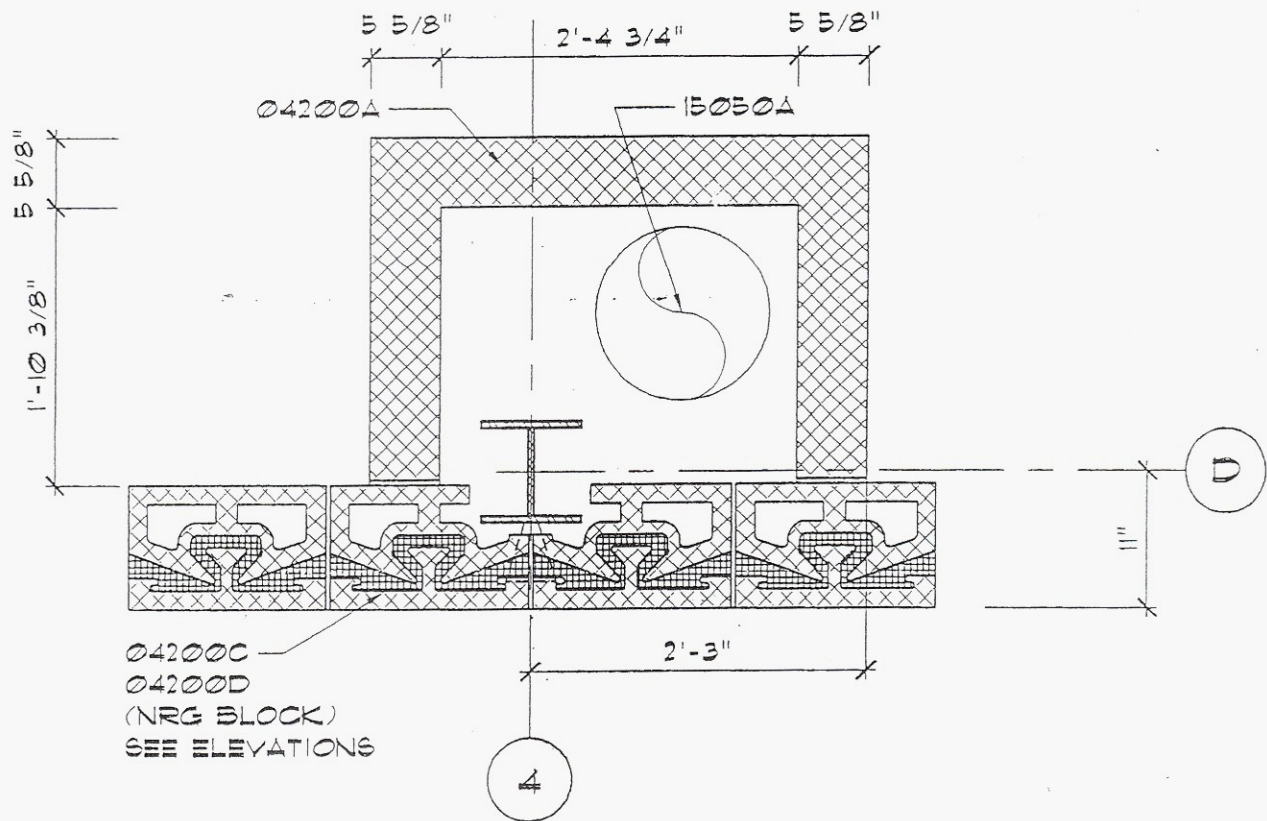
04200C  
04200D

SEE ELEVATIONS

2'-8"

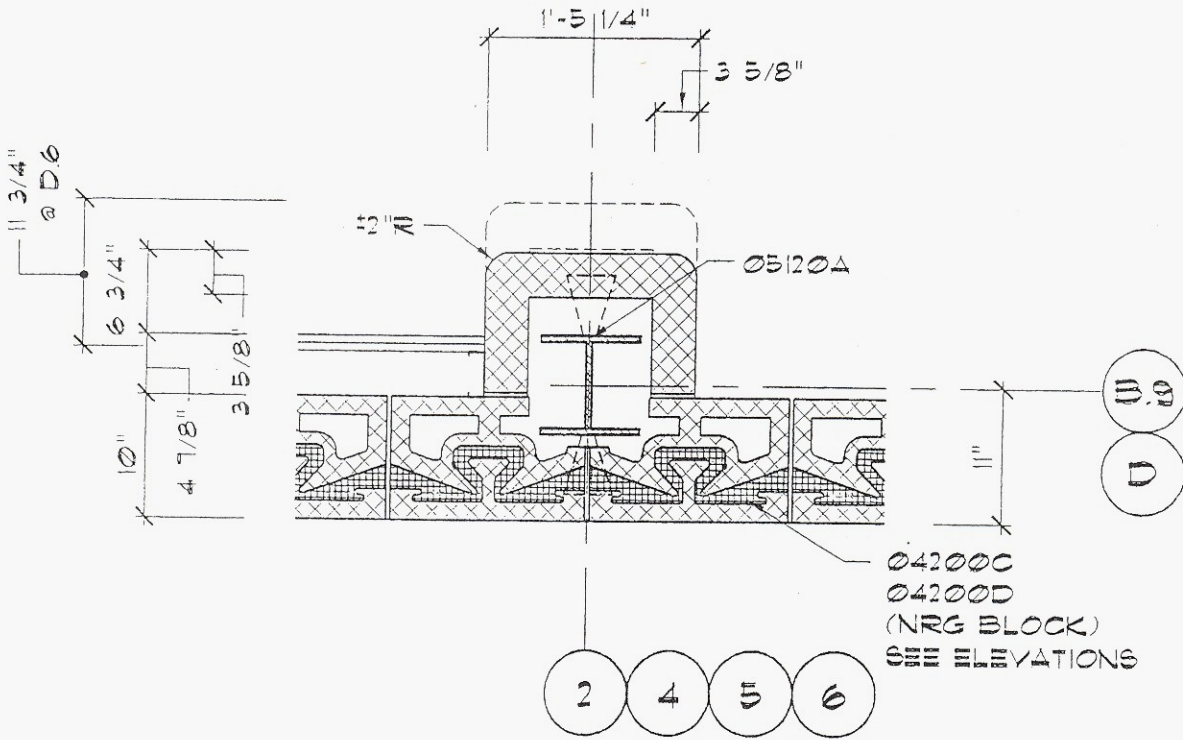
7





# Plan Detail

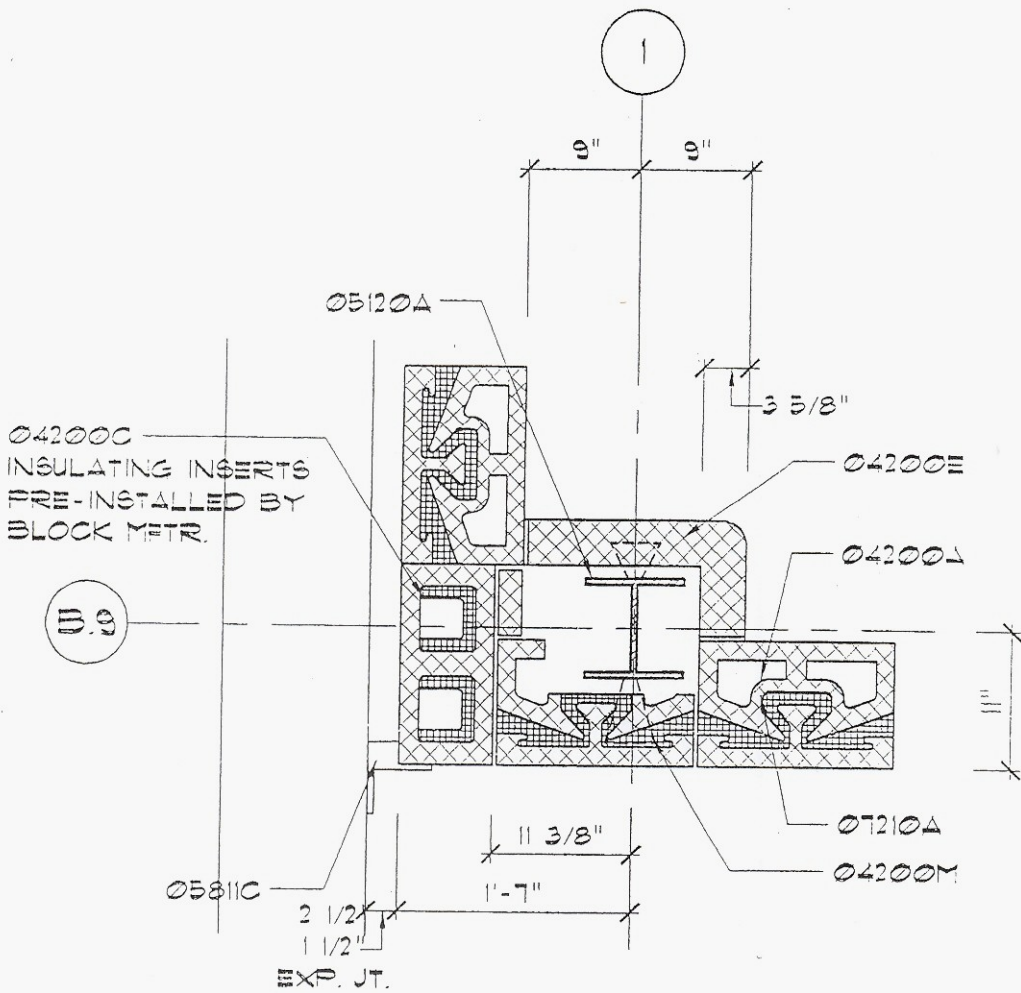
SCALE: 3/4" = 1'-0"



# Plan Detail

SCALE:  $3/4'' = 1'-0''$

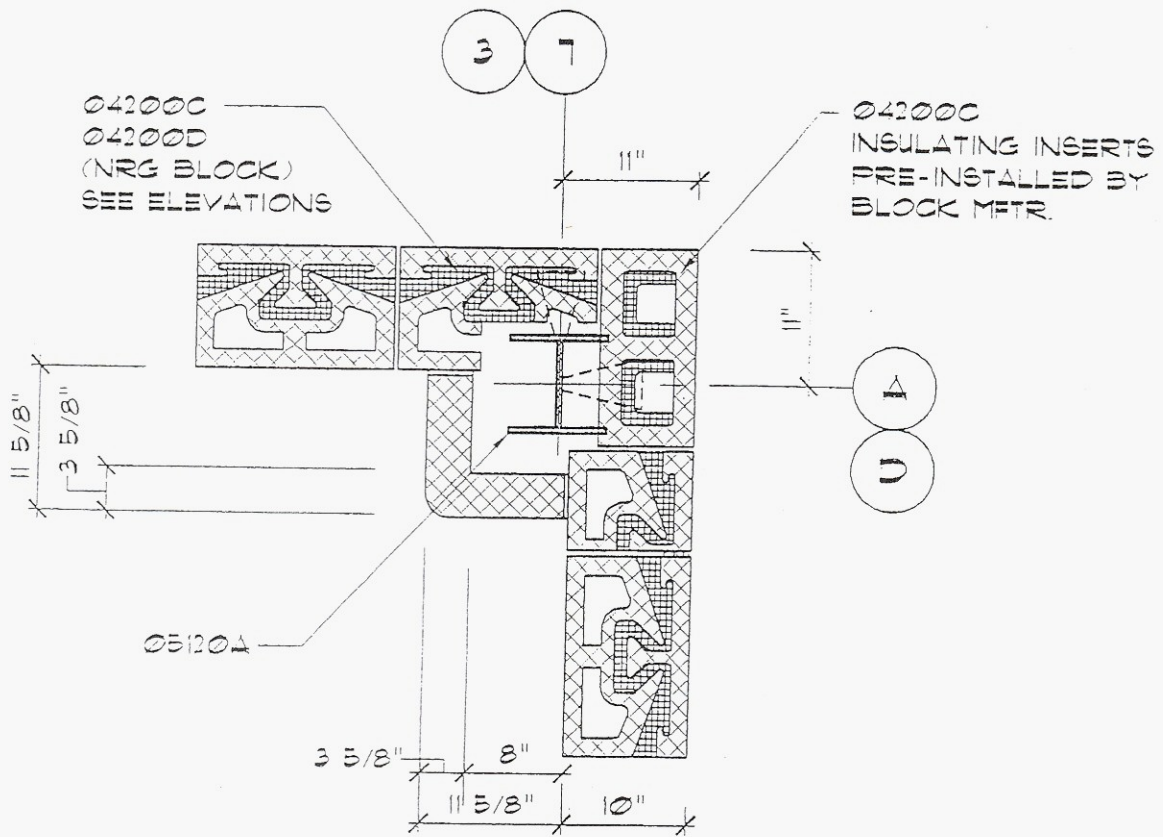
NOTE:  
 PLAN DETAILS REFER  
 TO CONDITIONS ON  
 BOTH THE FIRST AND  
 SECOND FLOORS.



## Plan Detail

SCALE: 3/4" = 1'-0"

NOTE:  
PLAN DETAILS REFER  
TO CONDITIONS ON  
BOTH THE FIRST AND  
SECOND FLOORS.

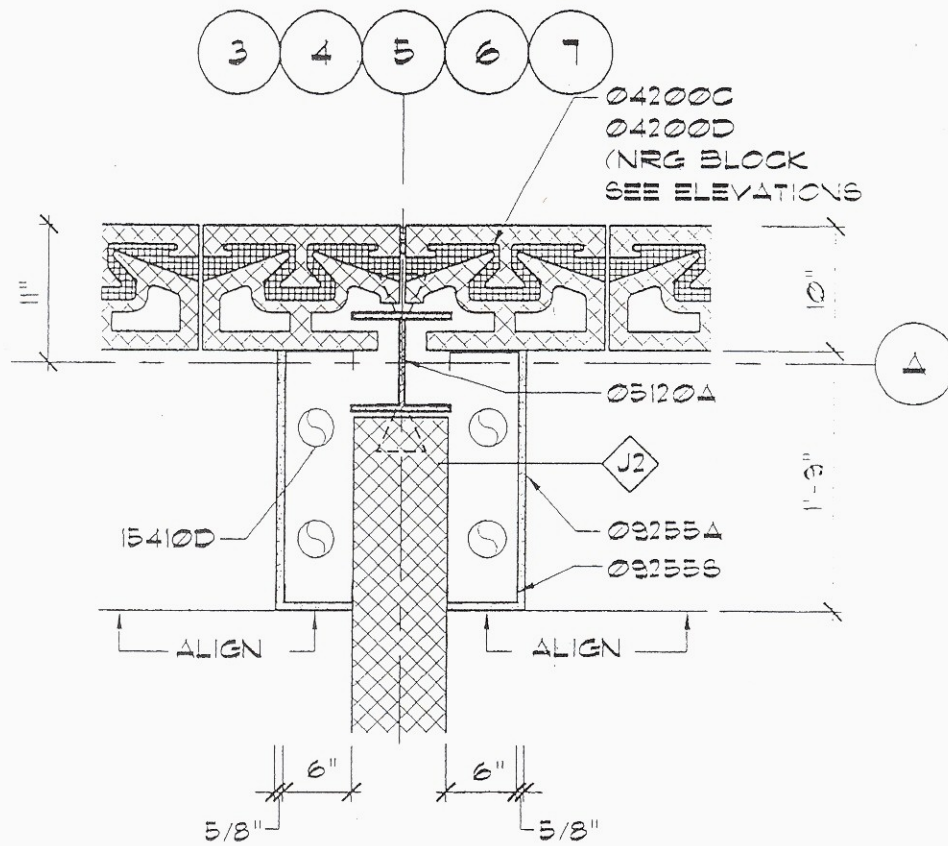


## Plan Detail

SCALE: 3/4" = 1'-0"

NOTE:  
PLAN DETAILS REFER  
TO CONDITIONS ON  
BOTH THE FIRST AND  
SECOND FLOORS.

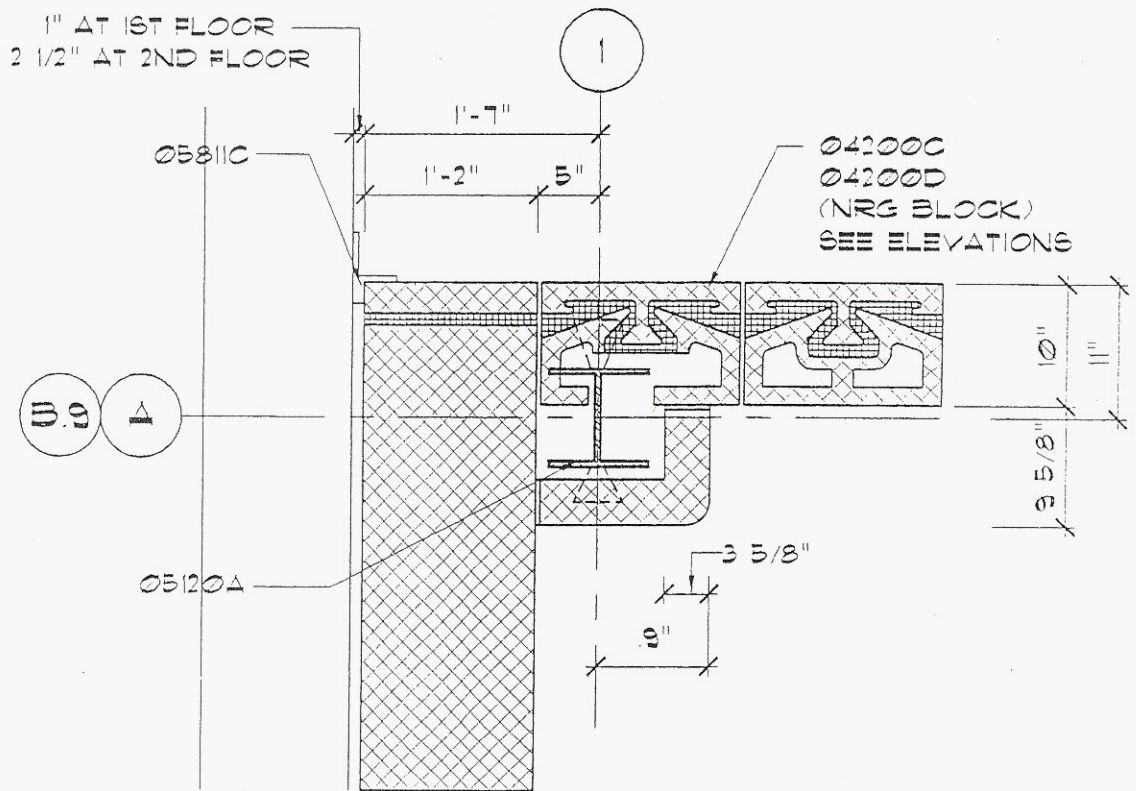




## Plan Detail

SCALE: 3/4" = 1'-0"

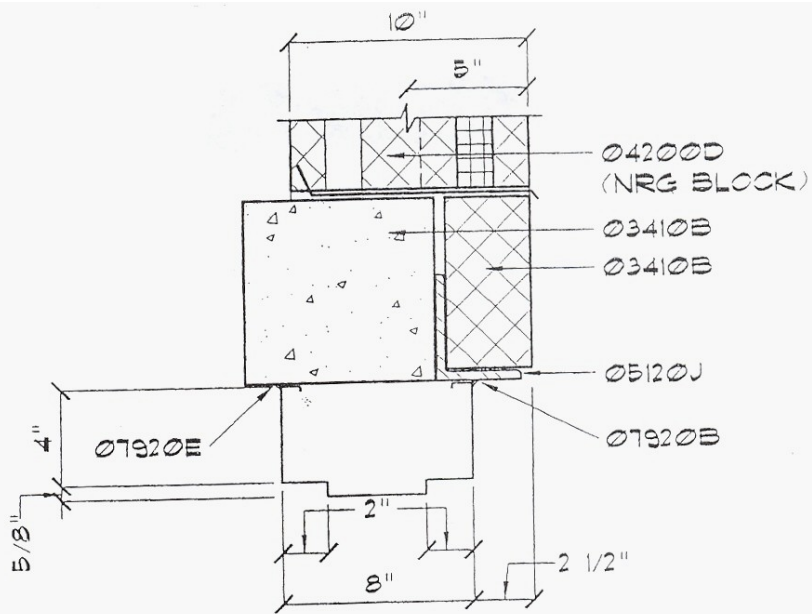
NOTE:  
 PLAN DETAILS REFER  
 TO CONDITIONS ON  
 BOTH THE FIRST AND  
 SECOND FLOORS.



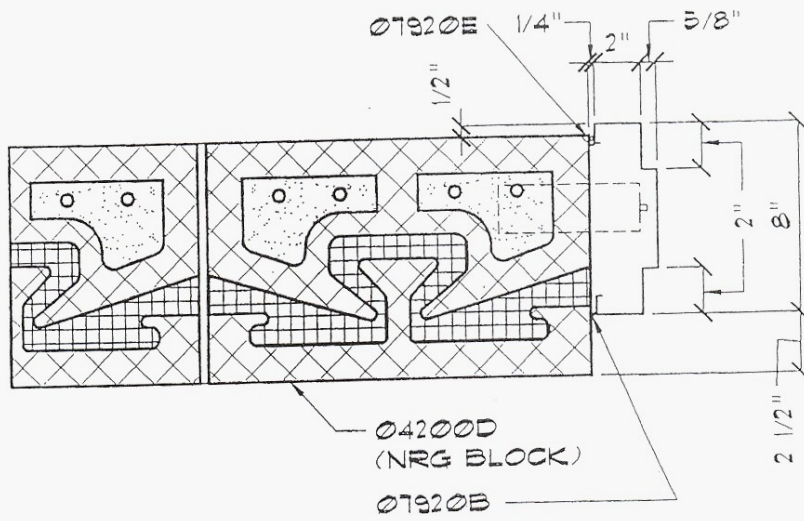
## Plan Detail

SCALE: 3/4" = 1'-0"

NOTE:  
PLAN DETAILS REFER  
TO CONDITIONS ON  
BOTH THE FIRST AND  
SECOND FLOORS.



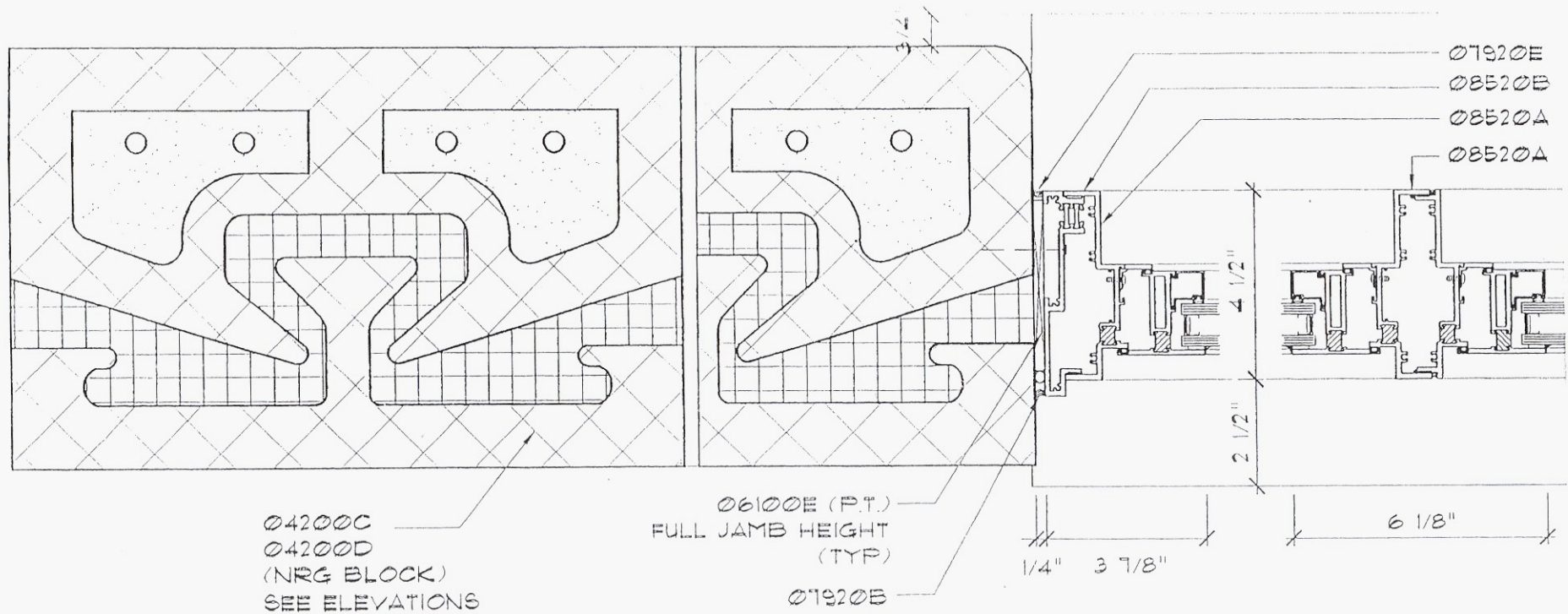
**H3A**



**J3A**

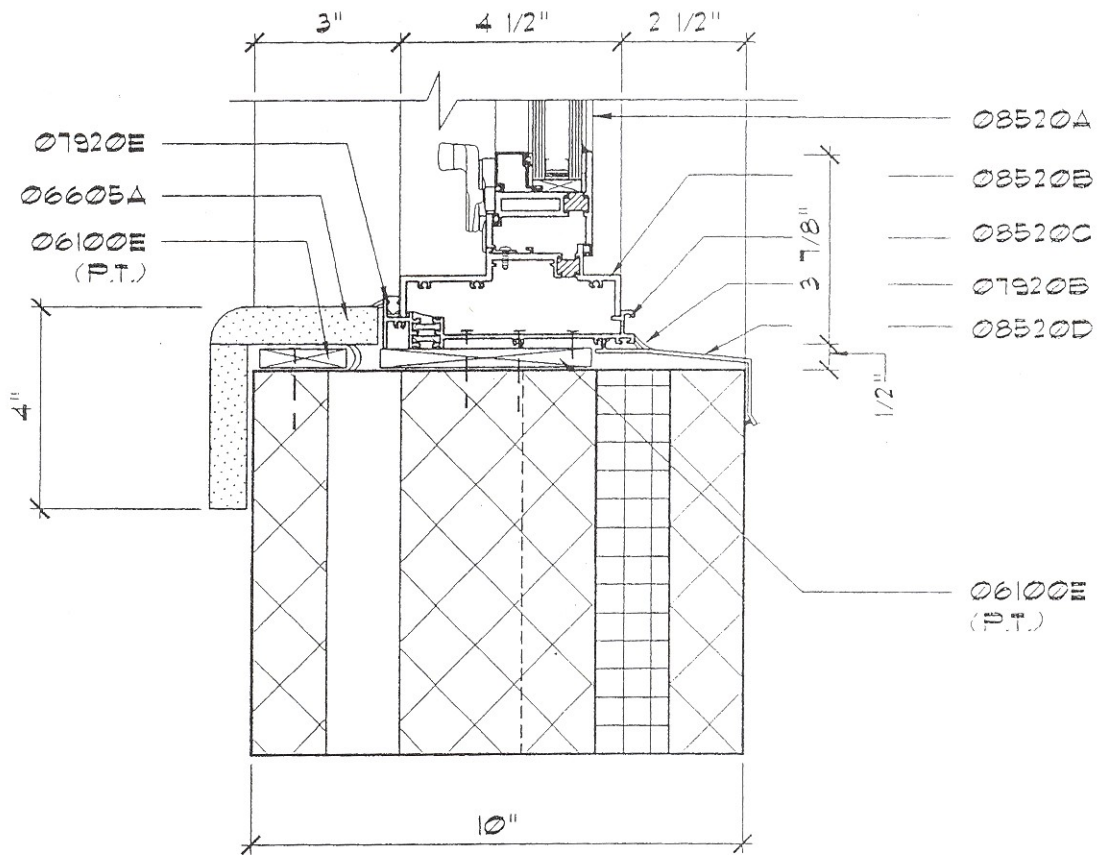
# Buck Details

SCALE: 1 1/2" = 1' - 0"



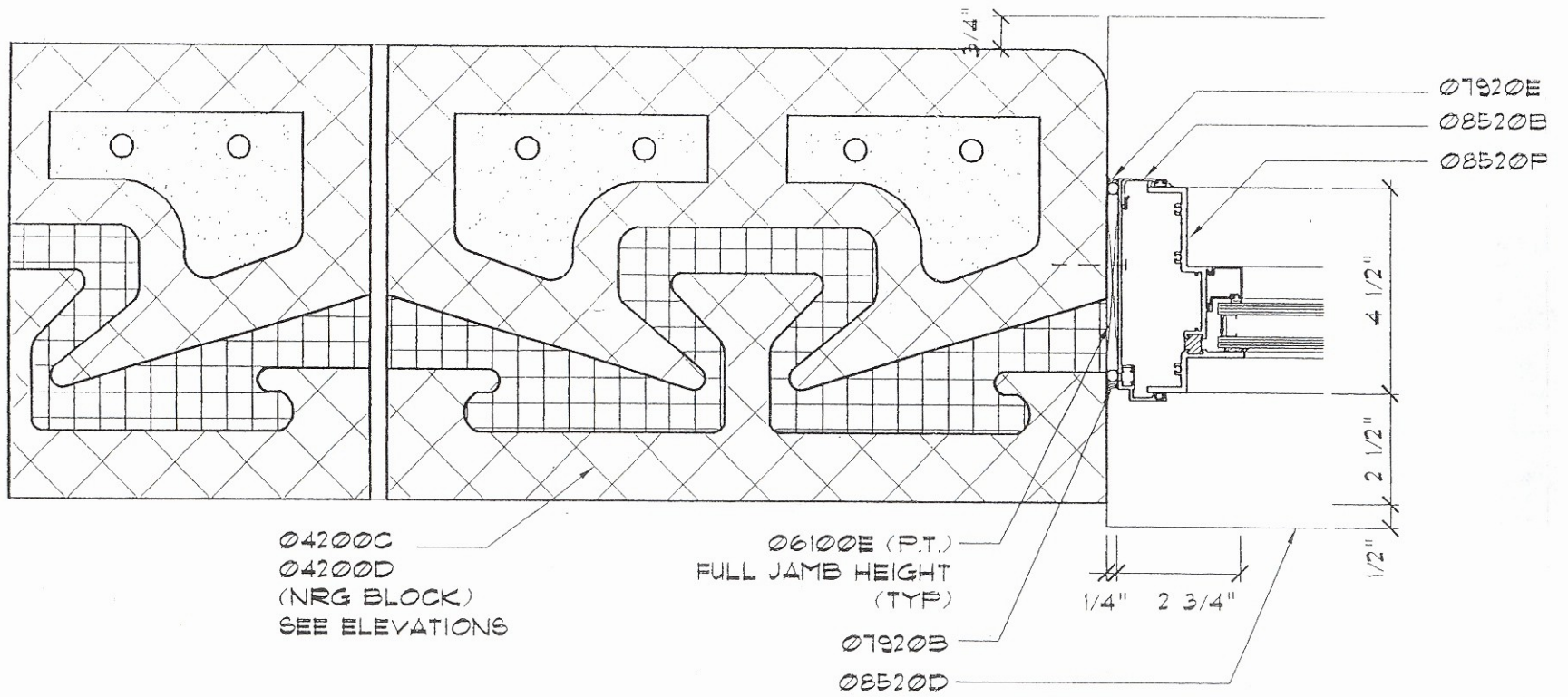
## Window Jamb (Project-out)

SCALE: 3" = 1'-0"



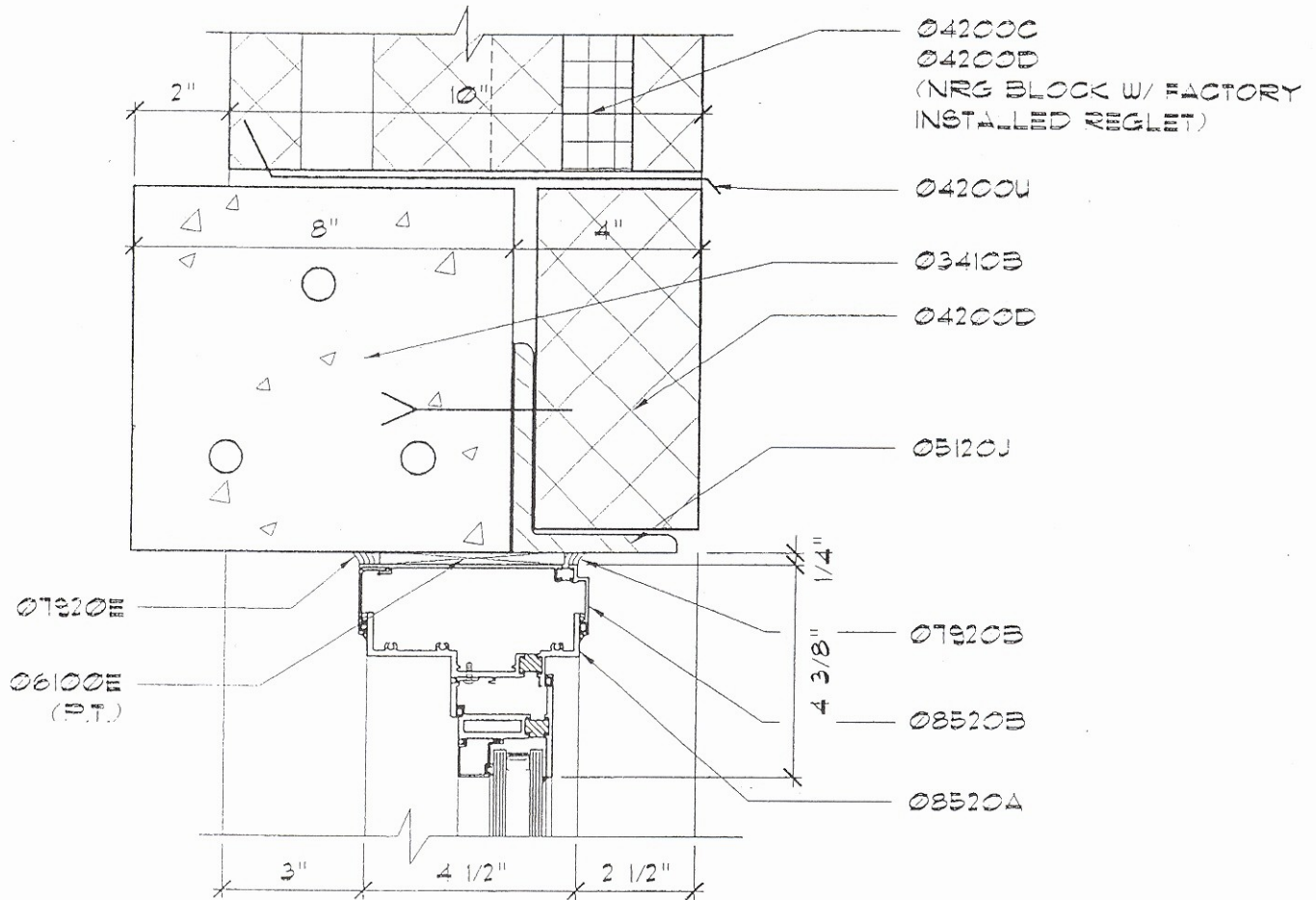
# Window Sill (Project-out)

SCALE: 3" = 1'-0"



# Window Jamb (Fixed)

SCALE: 3" = 1'-0"



# Window Head

SCALE: 3" = 1'-0"