



TABLE OF CONTENTS

Table of Contents	1
Cable and Rod Bracing Details	3
AF0010 – Rod Bracing	3
AE0010 – Cable Bracing	4
AF0030 – Rod To Clevis Connections	5
AE0030 – Cable To Clevis Connections	6
AF0050 – Clevis To Floor	7
AE0040 – Web To Floor	8
AF0060 – Tiered Bracing – Cold-Formed Columns	9
AE0060 – Tiered Bracing – Cold-Formed Columns	10
Flange Bracing Details	11
AG0005 – Flange Bracing at Building Expansion	11
AG0030 – Flange Brace @ Girt And Built-Up Column	12
AG0035 – Flange Brace @ Rigid Frame Column	13
AG0040 – Flange Brace @ Masonry Wall And Built-Up Column	14
AG0010 – Flange Brace @ Purlin And Rafter	15
AG0015 – Flange Brace @ Expandable Endwall (Purlin)	16
AG0150 – Flange Brace @ Girt And Column With Liner Panel	17
Joist Bridging Details	18
BI0030 – Low Eave @ Eave Strut Connections	18
BI0140 – Joist Bridging – Typical Intermediate Location	19
Portal Frame Details	20
AJ0020 – Full Height Portal Frame	20
AJ0010 – Partial height Portal frame	21
AJ0050 – Flange Brace @ Frame/Portal Column – Stiffener	22
AJ0150 – Single leg Portal Frame @ End Bay W/Post & Beam Frame	23
AJ0160 – Full Height Single Leg Portal Frame	24
AJ0120 – Frame/Portal Column Girt Detail – Inset (Left)	25
AJ0140 – Frame/Portal Column Girt Detail – Inset (Right)	26
AJ0040 – Frame/Portal Column Girt Details - Bypass	27
CFR Purlin Bracing System Details	28
BE0001 – Gable, Less than 2:12 Roof Slope	28
BE0002 – Gable, Greater than or Equal 2:12 Roof Slope	29
BE1310 – Strong-Back Eave-Cee @ Built-Up	30
BE1320 – Strong-Back Eave-Cee @ C.F. Rafter	31
General Bracing Details	32

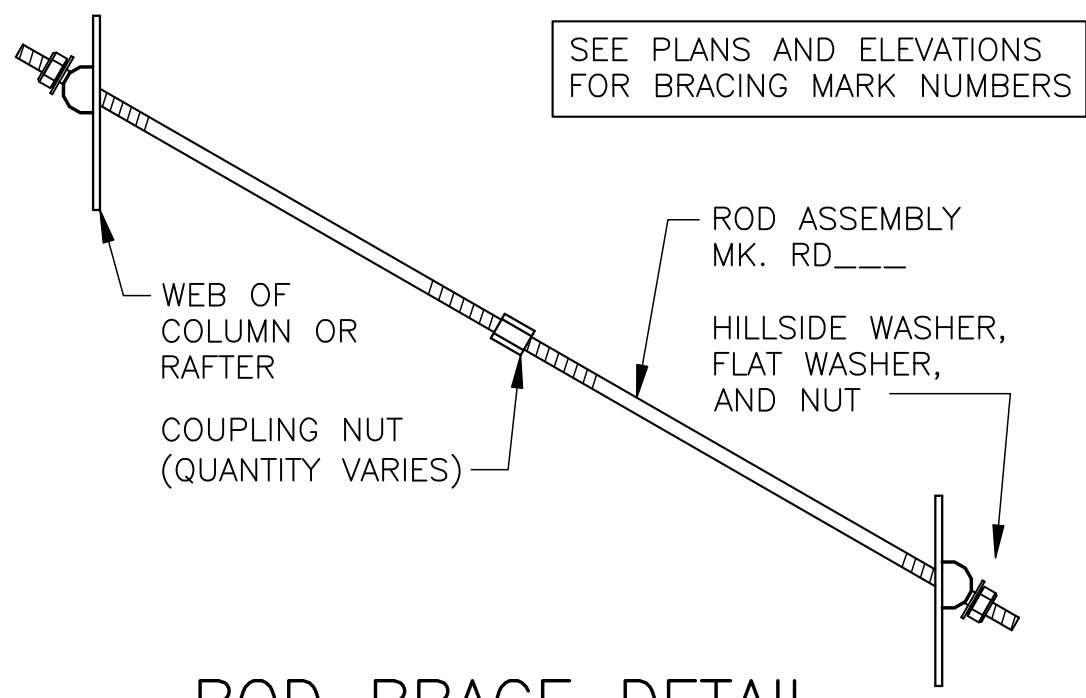


AK0060 – Strut Attached At Web Of Column Or Rafter (6” Pipe) 32
AK0050 – Strut Attached At Flange Of Column Or Rafter 33
AK0080 – Strut Attached To C.F. Rafter..... 34

CABLE AND ROD BRACING DETAILS

AF0010 – ROD BRACING

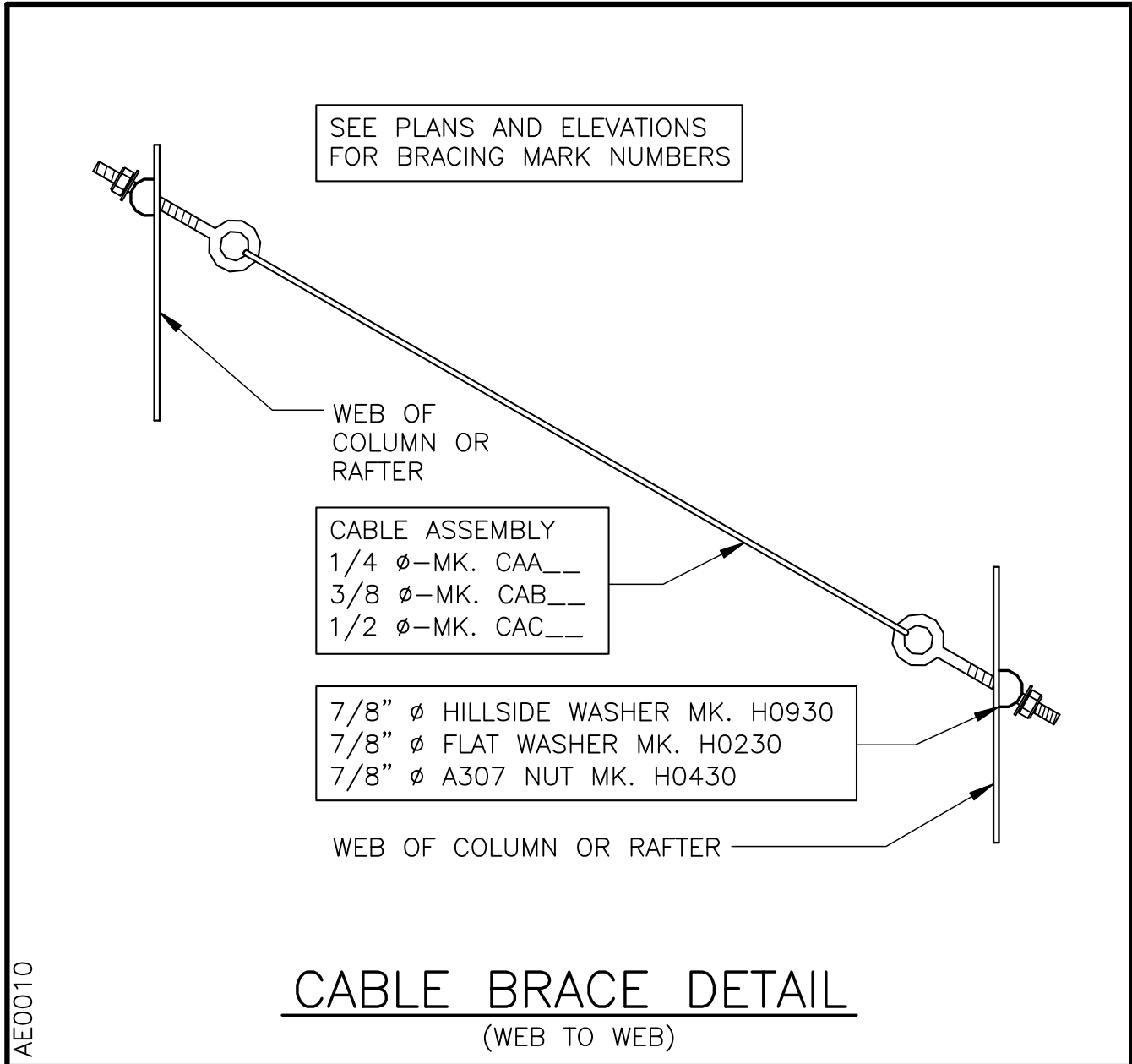
ROD DIAMETER	MARK NUMBER	HILLSIDE WASHERS	FLAT WASHERS	A307/A325 NUTS	COUPLING NUTS
5/8" ϕ	RDB ___	(2) H0930	(2) H0210	(2) H0310	H0810
3/4" ϕ	RDC ___	(2) H0930	(2) H0220	(2) H0320	H0820
7/8" ϕ	RDD ___	(2) H0930	(2) H0230	(2) H0430	H0830
1" ϕ	RDE ___	(2) H0960	(2) H0240	(2) H0330	H0840
1 1/8" ϕ	RDF ___	(2) H0960	(2) H0250	(2) H0450	H0850
1 1/4" ϕ	RDG ___	(2) H0960	(2) H0260	(2) H0340	H0860



ROD BRACE DETAIL
(WEB TO WEB)

AF0010

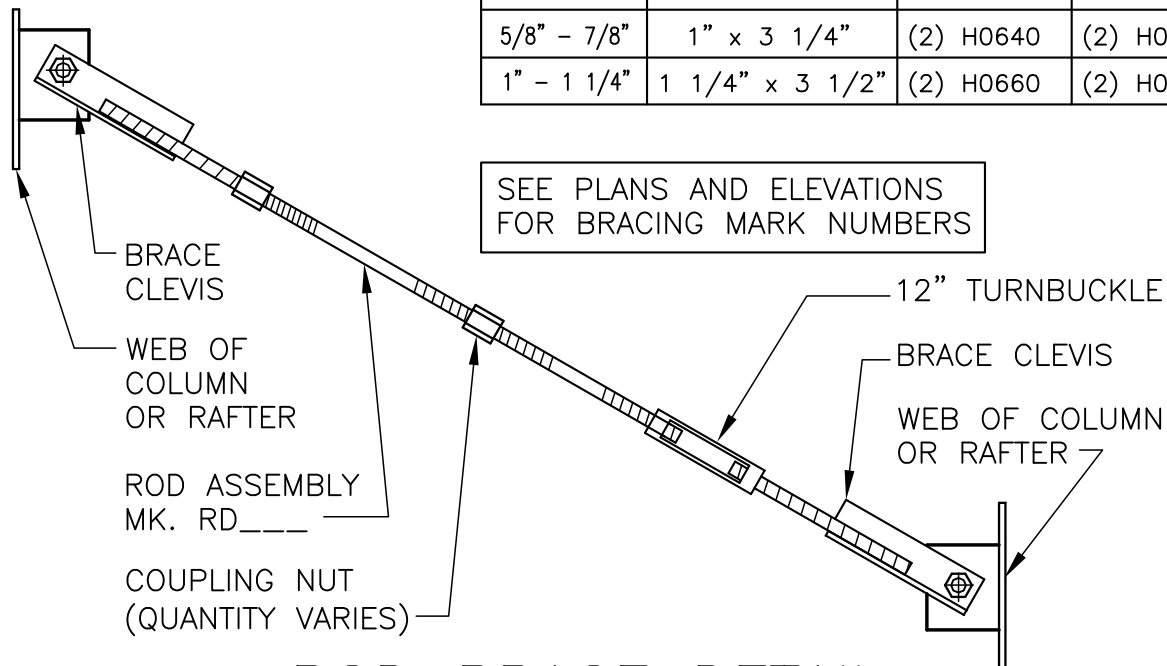
AE0010 – CABLE BRACING



AF0030 – ROD TO CLEVIS CONNECTIONS

ROD DIAMETERS	MARK NUMBERS	TURNBUCKLES	COUPLING NUTS	BRACE CLEVIS (AT TURNBUCKLE)	BRACE CLEVIS (AT COUPLING NUT)
5/8"	RDB ___	(1) H0710	(1) H0810	(1) BCS02	(1) BCS07
3/4"	RDC ___	(1) H0720	(1) H0820	(1) BCS03	(1) BCS08
7/8"	RDD ___	(1) H0730	(1) H0830	(1) BCS04	(1) BCS09
1"	RDE ___	(1) H0740	(1) H0840	(1) BCL05	(1) BCL06
1 1/8"	RDF ___	(1) H0750	(1) H0850	(1) BCL01	(1) BCL03
1 1/4"	RDG ___	(1) H0760	(1) H0860	(1) BCL02	(1) BCL04

BRACE CLEVIS BOLT AND NUT PART NUMBERS			
ROD DIAMETER	BOLT DIAMETER AND LENGTH	A325 BOLTS	A325 NUTS
5/8" - 7/8"	1" x 3 1/4"	(2) H0640	(2) H0330
1" - 1 1/4"	1 1/4" x 3 1/2"	(2) H0660	(2) H0340

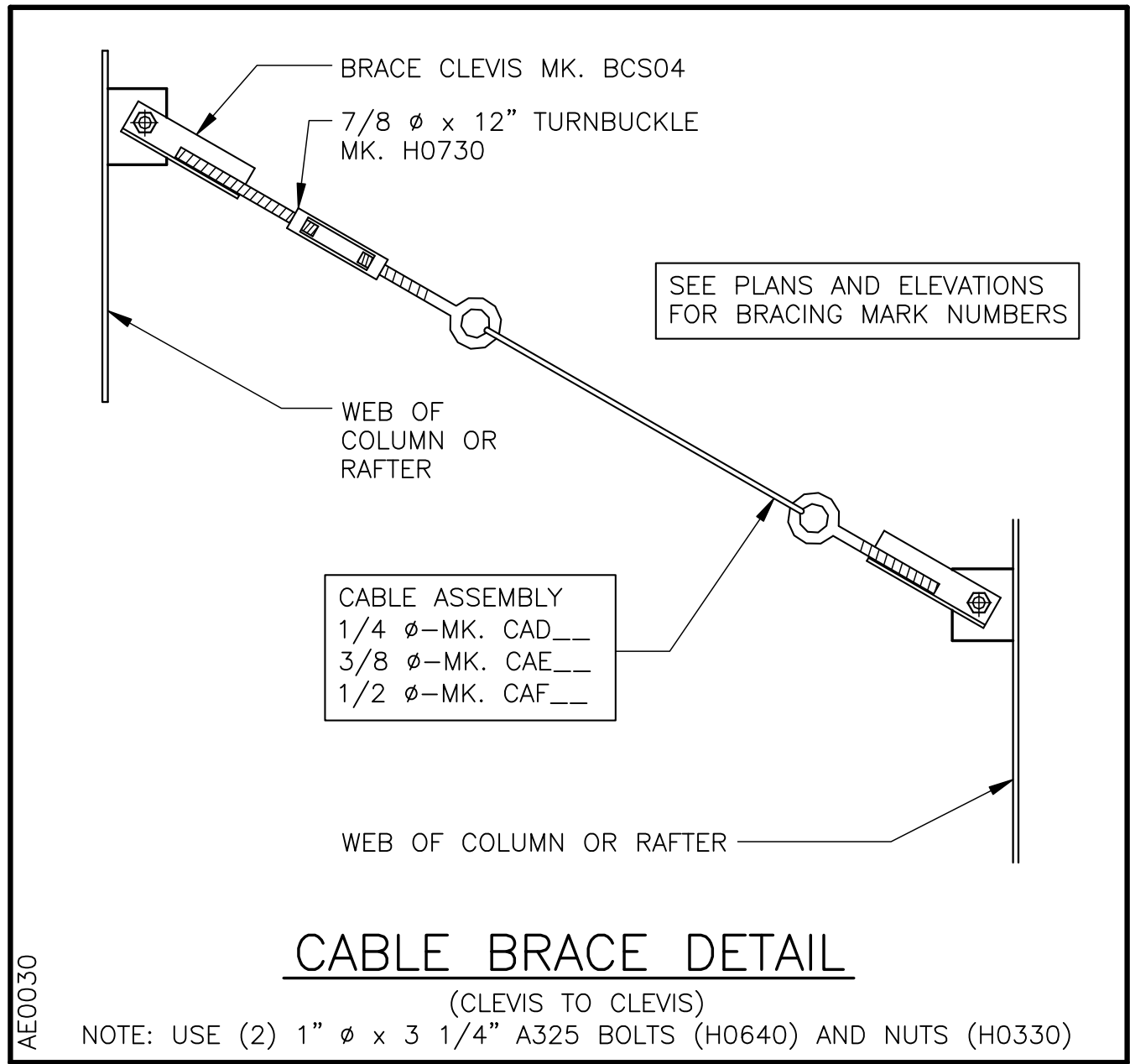


SEE PLANS AND ELEVATIONS FOR BRACING MARK NUMBERS

ROD BRACE DETAIL
(CLEVIS TO CLEVIS)

AF0030

AE0030 – CABLE TO CLEVIS CONNECTIONS



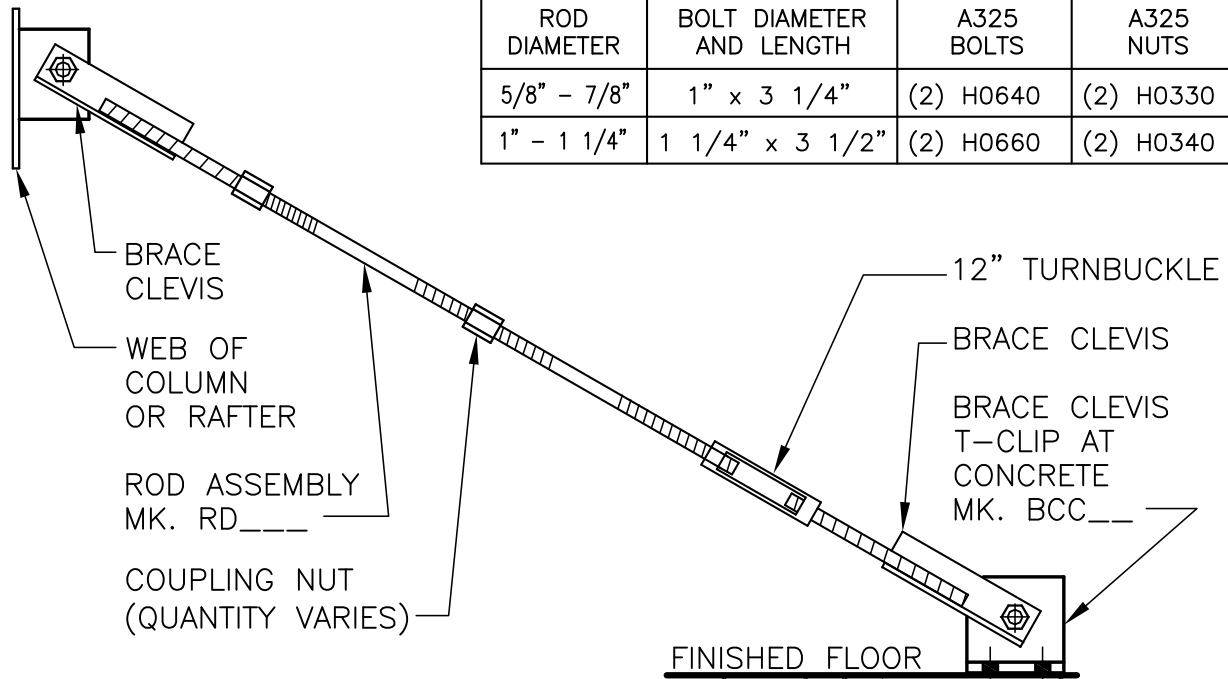
AE0030

AF0050 – CLEVIS TO FLOOR

ROD DIAMETERS	MARK NUMBERS	TURNBUCKLES	COUPLING NUTS	BRACE CLEVIS (AT TURNBUCKLE)	BRACE CLEVIS (AT COUPLING NUT)
5/8"	RDB ___	(1) H0710	(1) H0810	(1) BCS02	(1) BCS07
3/4"	RDC ___	(1) H0720	(1) H0820	(1) BCS03	(1) BCS08
7/8"	RDD ___	(1) H0730	(1) H0830	(1) BCS04	(1) BCS09
1"	RDE ___	(1) H0740	(1) H0840	(1) BCL05	(1) BCL06
1 1/8"	RDF ___	(1) H0750	(1) H0850	(1) BCL01	(1) BCL03
1 1/4"	RDG ___	(1) H0760	(1) H0860	(1) BCL02	(1) BCL04

BRACE CLEVIS BOLT AND NUT PART NUMBERS

ROD DIAMETER	BOLT DIAMETER AND LENGTH	A325 BOLTS	A325 NUTS
5/8" - 7/8"	1" x 3 1/4"	(2) H0640	(2) H0330
1" - 1 1/4"	1 1/4" x 3 1/2"	(2) H0660	(2) H0340



ROD BRACE DETAIL
(CLEVIS TO FLOOR)

SEE PLANS AND ELEVATIONS FOR BRACING MARK NUMBERS

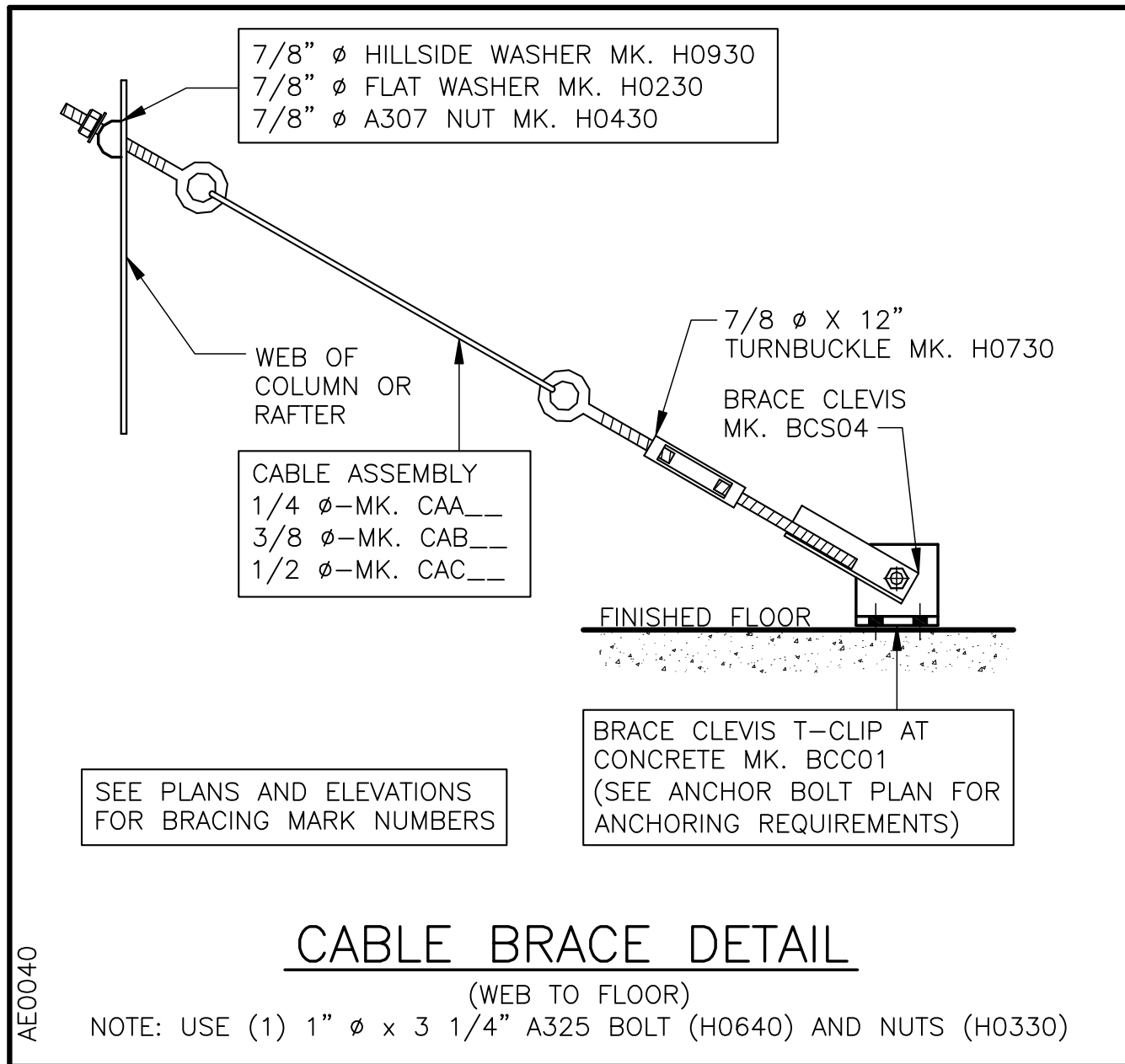
AF0050

LAST REVISION
DATE: 07/11/06
BY: RJF CHK: KMC

DETAIL NAME IF APPLICABLE
AF0050.DWG

11.3.7

AE0040 – WEB TO FLOOR



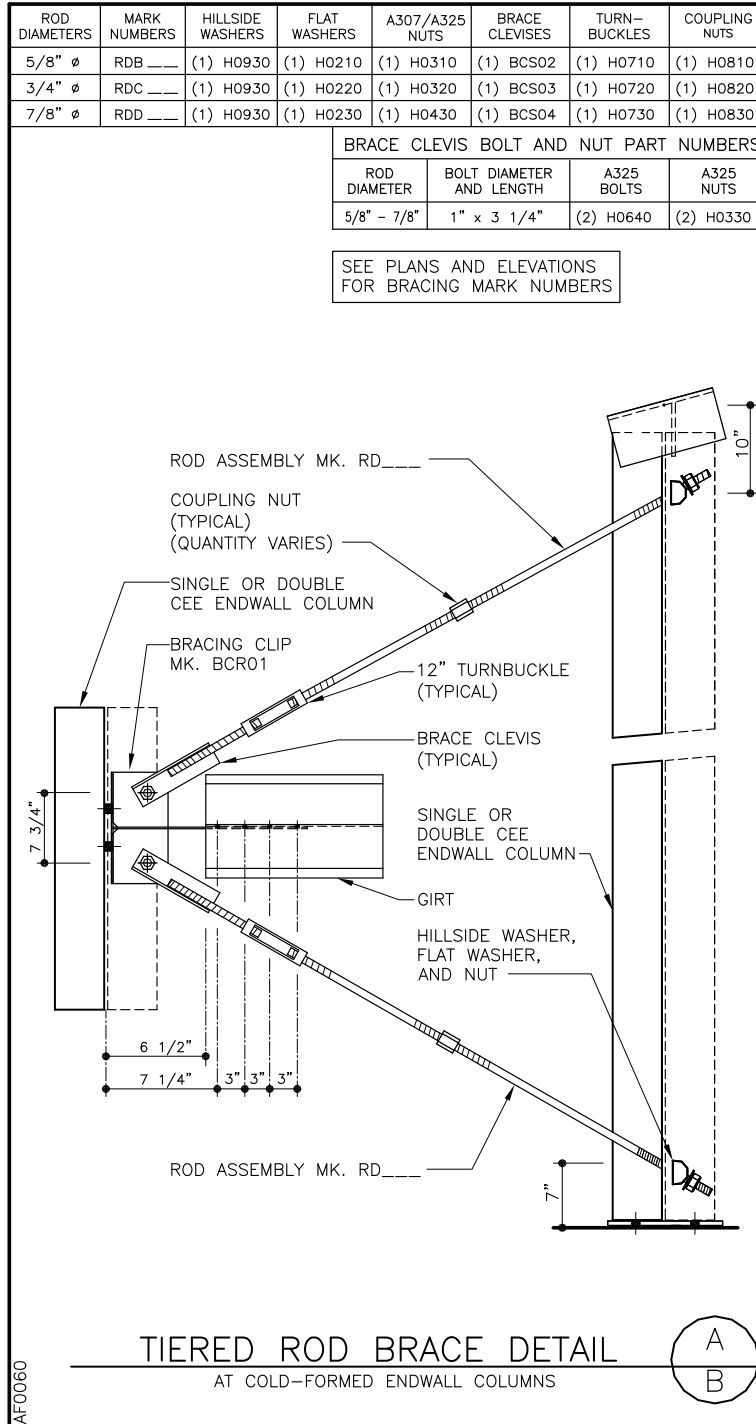
AE0040

LAST REVISION
DATE: <u>08/11/04</u>
BY: <u>KMC</u> CHK: <u>RJF</u>

DETAIL NAME IF APPLICABLE
AE0040.DWG

11.3.8

AF0060 – TIERED BRACING – COLD-FORMED COLUMNS

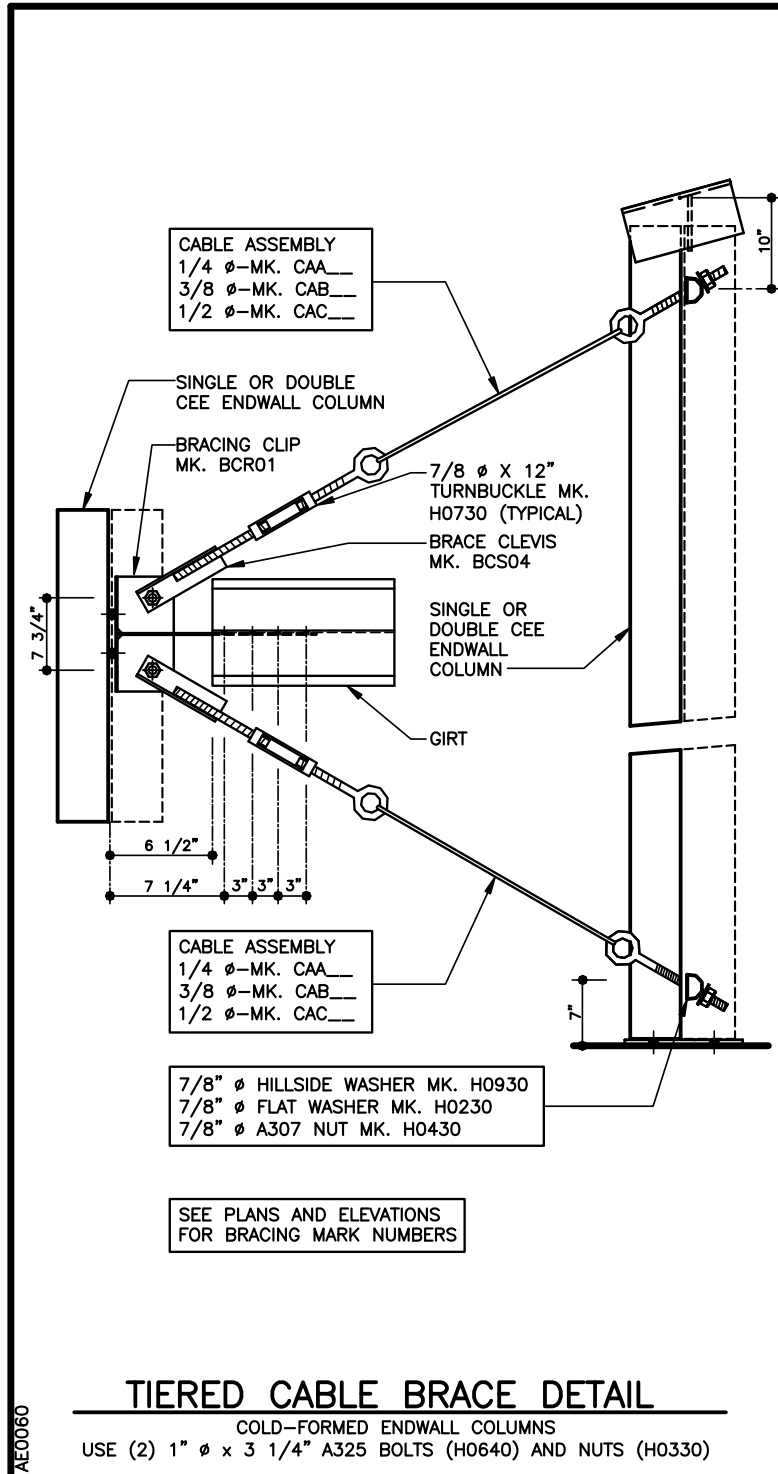


LAST REVISION
 DATE: 07/11/06
 BY: RJF CHK: KMC

DETAIL NAME IF APPLICABLE
AF0060.DWG

11.3.9

AE0060 – TIERED BRACING – COLD-FORMED COLUMNS



LAST REVISION
 DATE: 08/11/04
 BY: KMC CHK: RJF

DETAIL NAME IF APPLICABLE
AE0060.DWG

11.3.10



FLANGE BRACING DETAILS

AG0005 – FLANGE BRACING AT BUILDING EXPANSION

WARNING IMPORTANT ERECTION NOTE WARNING

AT THIS TIME OF BUILDING EXPANSION , IT IS IMPERATIVE THAT THE MAIN FRAME ENDWALL FLANGE BRACING REQUIREMENTS (FOR THE EXISTING BUILDING) ARE COMPLETED AS NOTED ON YOUR EXISTING BUILDING ERECTION DRAWING SET.

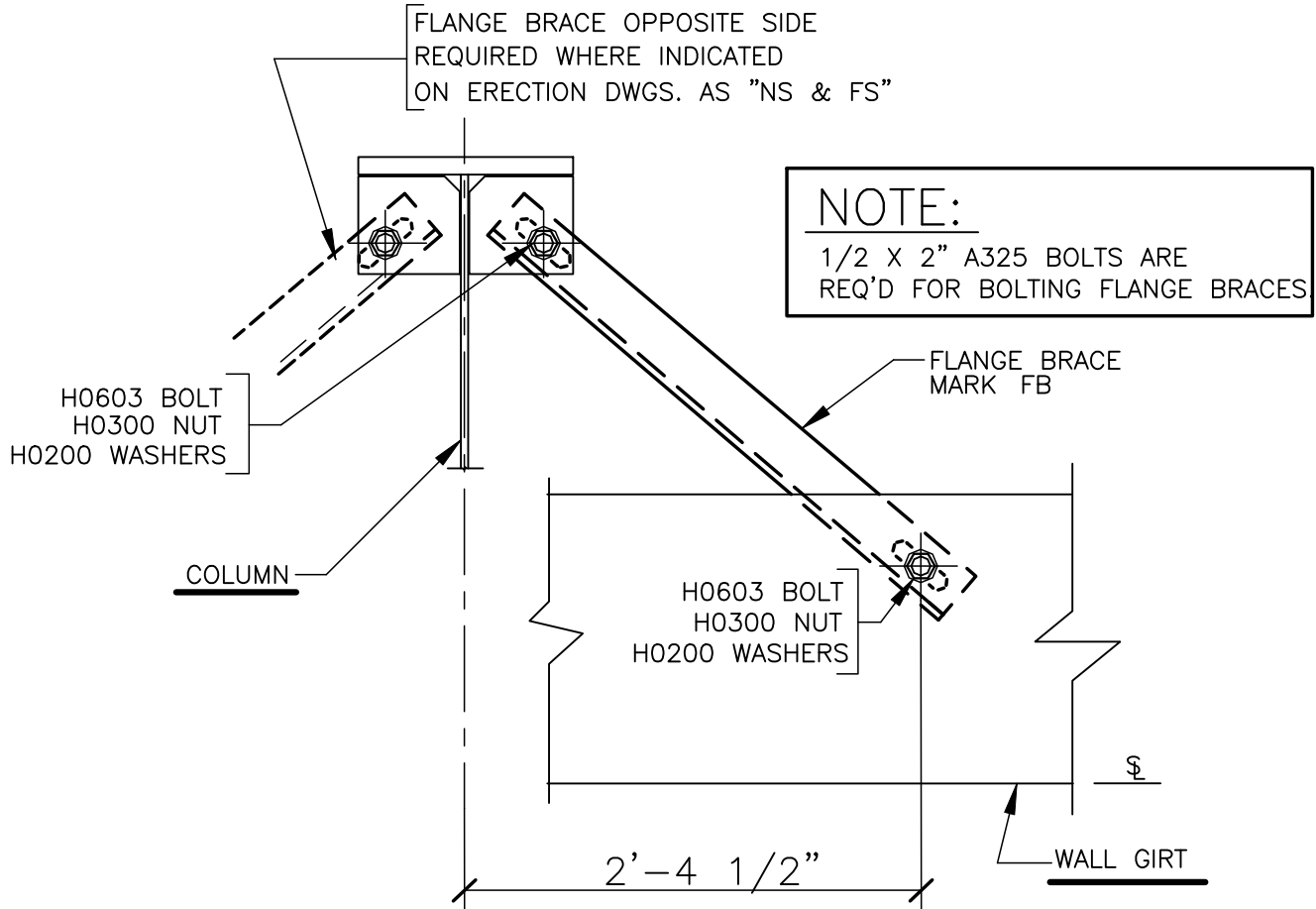
PLEASE REVIEW YOUR EXISTING BUILDING ERECTION DRAWING SET FOR SPECIFIC FLANGE BRACE LOCATIONS REQUIRING INSTALLATION ON BOTH SIDES OF THE EXISTING FRAME AT TIME OF EXPANSION AND INSTALL THESE ADDITIONAL FLANGE BRACES NOW! IF YOU ARE UNABLE TO LOCATE THE ADDITIONAL FLANGE BRACING MATERIAL SENT WITH THE EXISTING NBS BUILDING ORDER, IT IS YOUR RESPONSIBILITY TO ACQUIRE THE FLANGE BRACE MATERIAL AND INSTALL AT THIS TIME. IT IS VITAL TO THE STRUCTURAL INTEGRITY OF THE EXISTING MAIN FRAME THAT THIS FLANGE BRACE MATERIAL IS INSTALLED.

LAST REVISION
DATE: 08/25/041
BY: CDM CHK: RJF

DETAIL NAME IF APPLICABLE
AG0005.DWG

11.3.11

AG0030 – FLANGE BRACE @ GIRT AND BUILT-UP COLUMN



AG0030

TYP FLANGE BRACE @ BU COL & GIRT

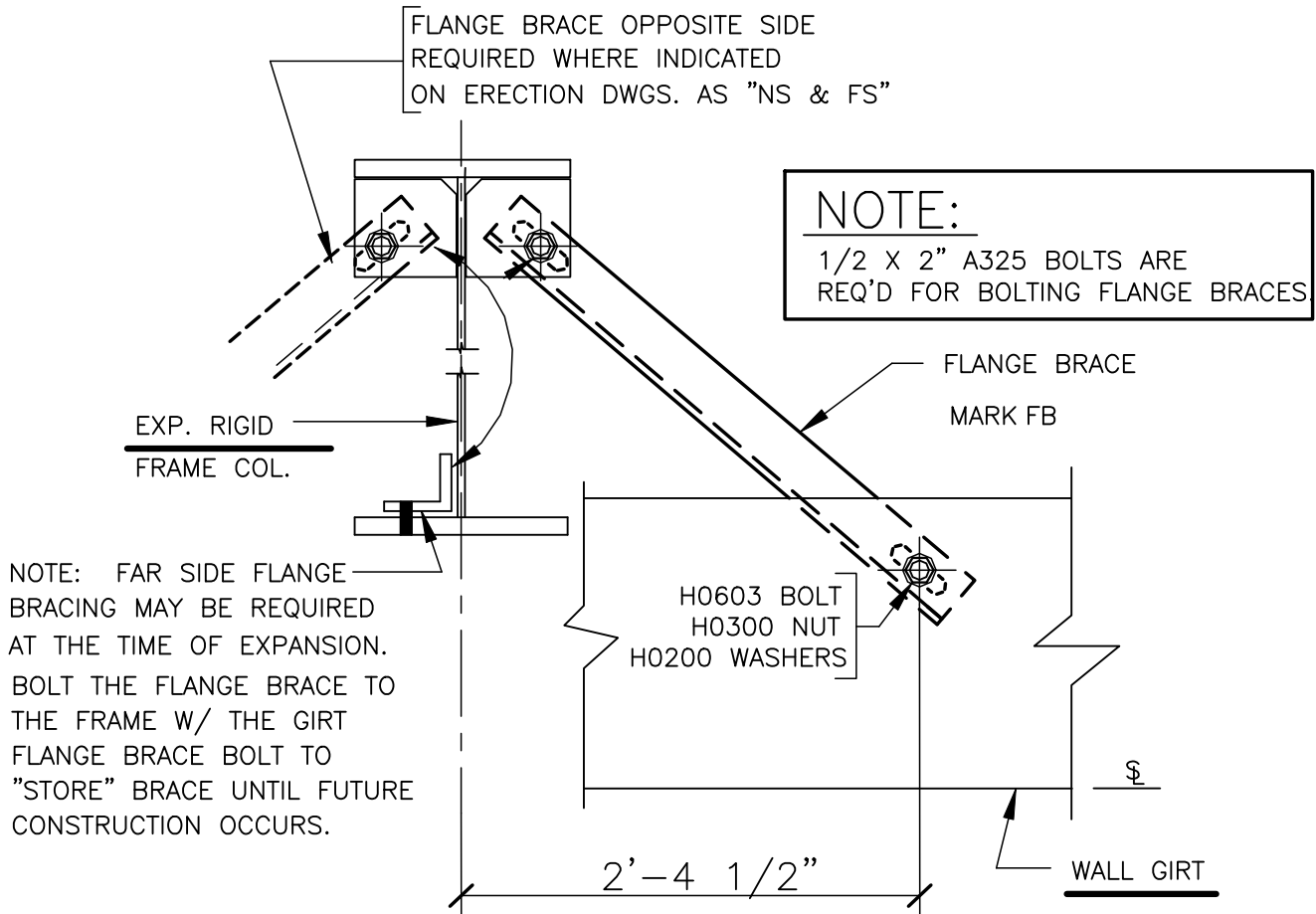
NOTE: SEE PLANS AND ELEVATIONS FOR
FLANGE BRACE PART MARKS

LAST REVISION
DATE: <u>02/09/01</u>
BY: <u>CDM</u> CHK: <u>RJF</u>

DETAIL NAME IF APPLICABLE
AG0030.DWG

11.3.12

AG0035 – FLANGE BRACE @ RIGID FRAME COLUMN



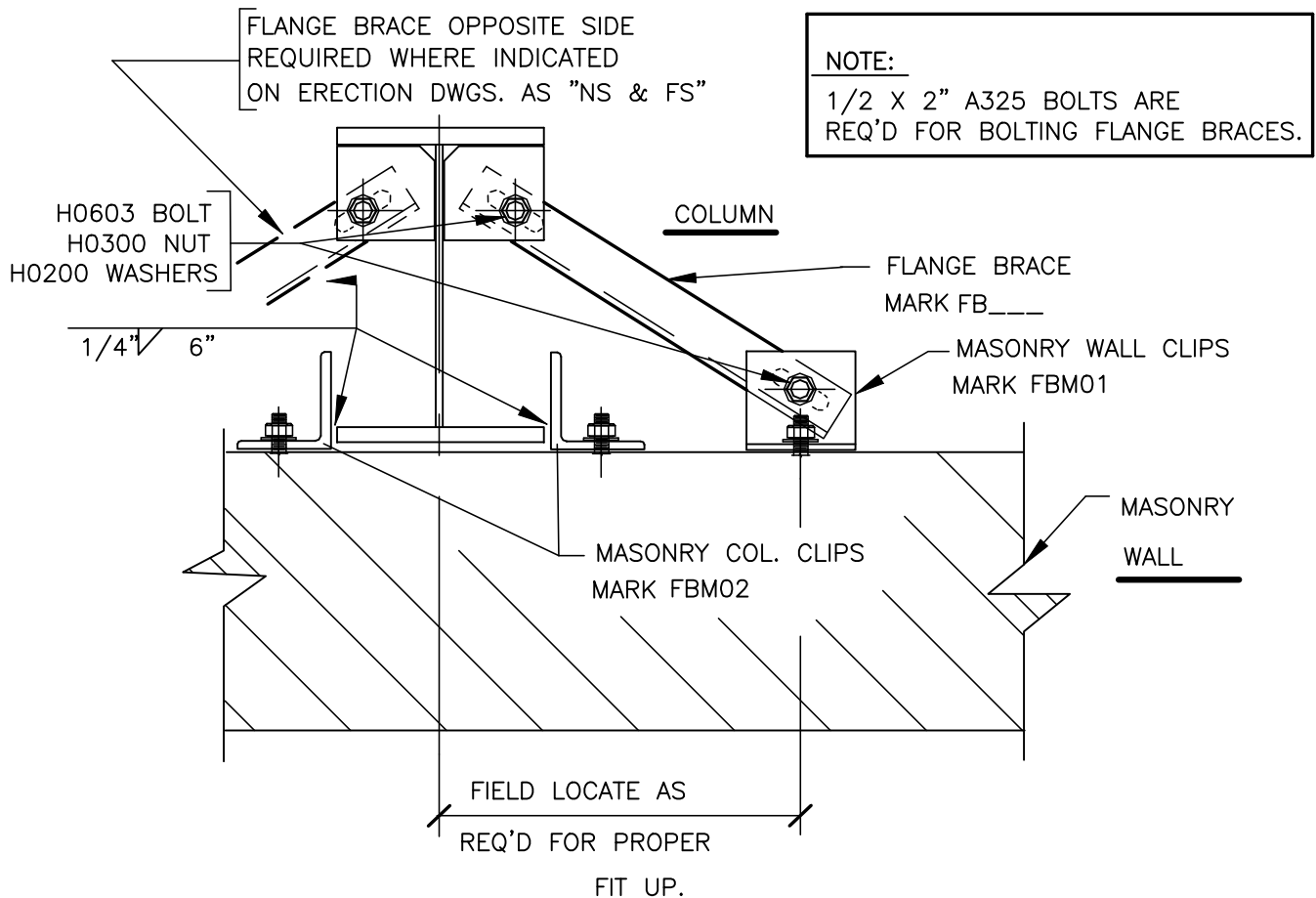
AG0035

TYP FLANGE BRACE @ EXP. RF COL & GIRT

NOTE: SEE PLANS AND ELEVATIONS FOR FLANGE BRACE PART MARKS

LAST REVISION DATE: <u>02/09/01</u> BY: <u>CDM</u> CHK: <u>RJF</u>	<u>DETAIL NAME IF APPLICABLE</u> AG0035.DWG	11.3.13
--------------------------------------------------------------------------	-----------------------------------------------------------	----------------

AG0040 – FLANGE BRACE @ MASONRY WALL AND BUILT-UP COLUMN



NOTE: 1/2" DIA. EXPANSION BOLTS INTO MASONRY BY OTHERS.

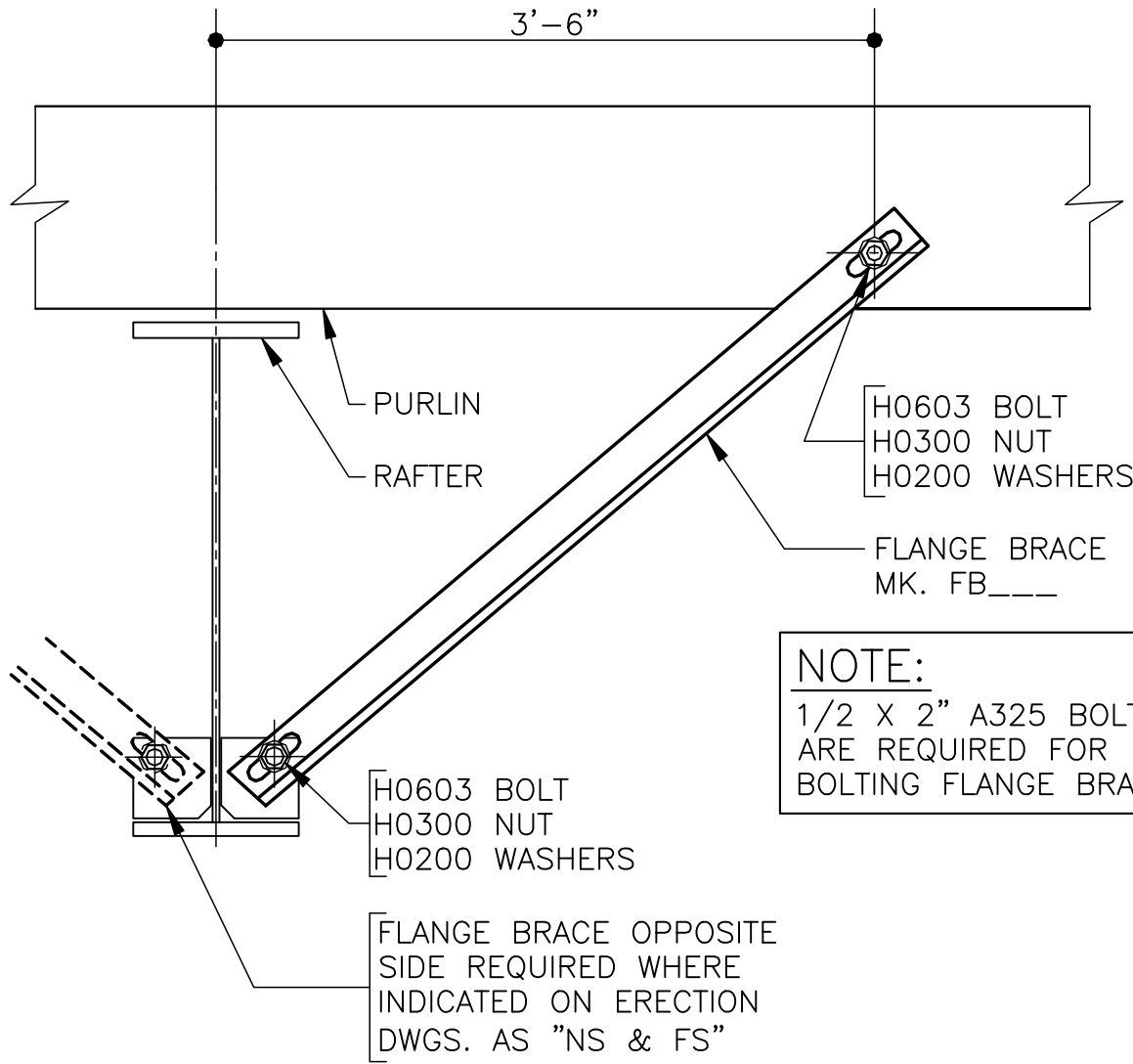
TYP FLANGE BRACE @ BU COL & MAS WALL

NOTE: SEE PLANS AND ELEVATIONS FOR FLANGE BRACE PART MARKS

AG0040

LAST REVISION DATE: <u>02/09/01</u> BY: <u>CDM</u> CHK: <u>RJF</u>	<u>DETAIL NAME IF APPLICABLE</u> AG0040.DWG	11.3.14
--------------------------------------------------------------------------	-------------------------------------------------------	----------------

AG0010 – FLANGE BRACE @ PURLIN AND RAFTER



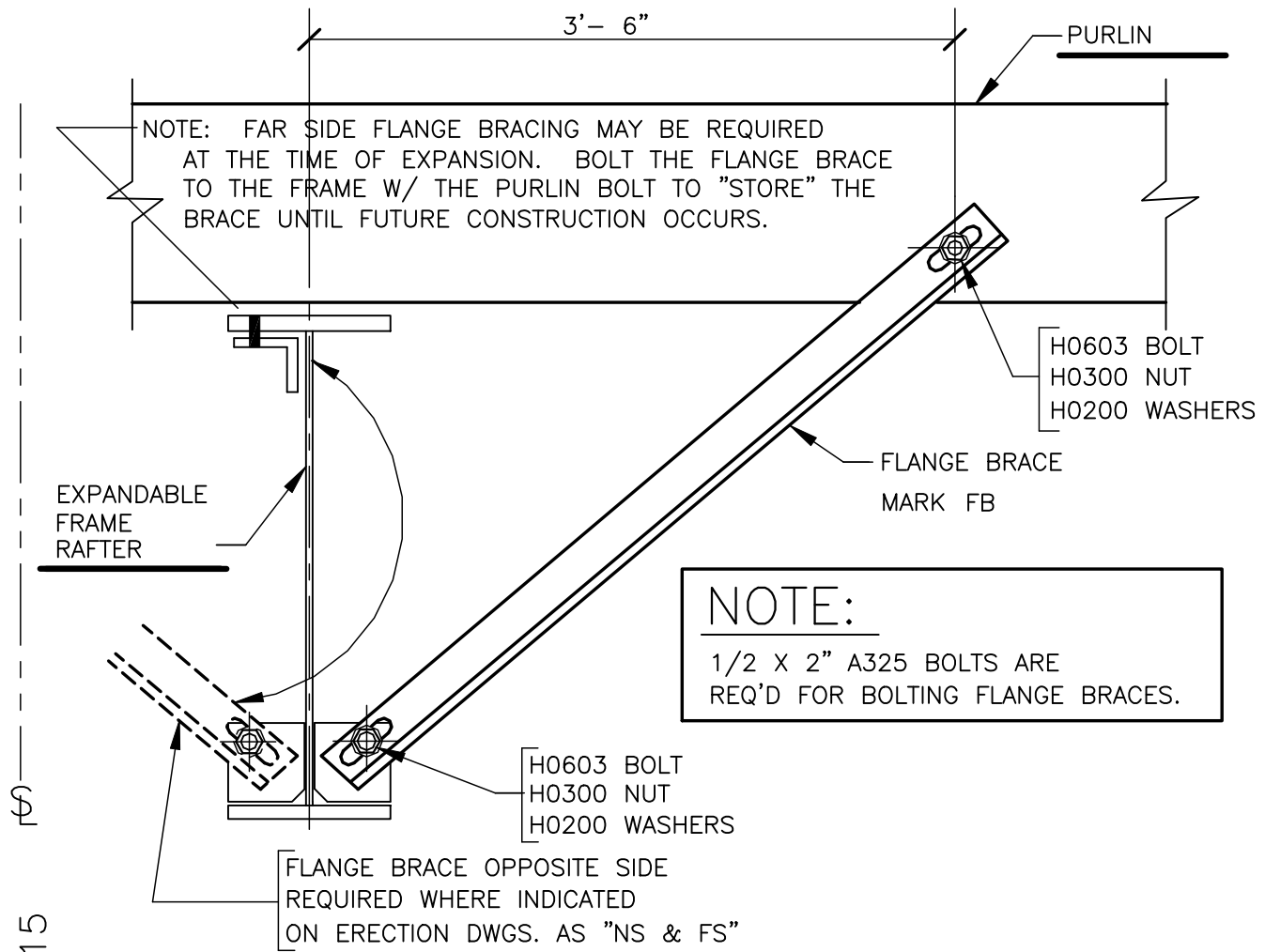
AG0010

TYPICAL FLANGE BRACE AT PURLIN & RAFTER

SEE PLANS AND ELEVATIONS FOR FLANGE BRACE PART MARKS

<p>LAST REVISION DATE: <u>04/08/02</u> BY: <u>CDM</u> CHK: <u>RJF</u></p>	<p><u>DETAIL NAME IF APPLICABLE</u> AG0010.DWG</p>	<p>11.3.15</p>
-----------------------------------------------------------------------------------------------------	---------------------------------------------------------------------	-----------------------

AG0015 – FLANGE BRACE @ EXPANDABLE ENDWALL (PURLIN)



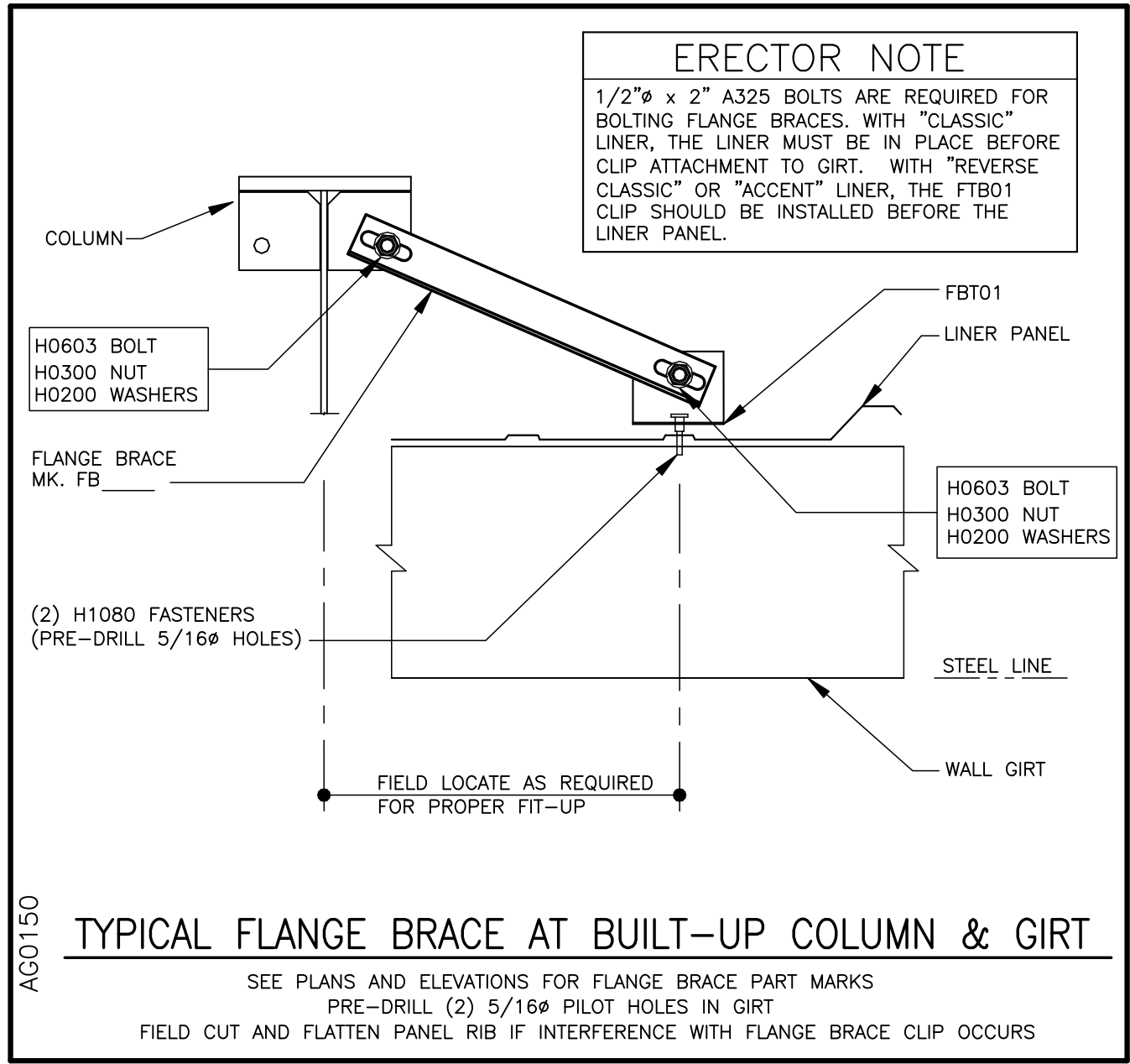
TYP FLANGE BRACE @ EXPANDABLE ENDWALL

NOTE: SEE PLANS AND ELEVATIONS FOR FLANGE BRACE PART MARKS

AG0015

<p>LAST REVISION DATE: <u>02/09/01</u> BY: <u>CDM</u> CHK: <u>RJF</u></p>	<p><u>DETAIL NAME IF APPLICABLE</u> AG0015.DWG</p>	<p>11.3.16</p>
-----------------------------------------------------------------------------------	---------------------------------------------------------------	-----------------------

AG0150 – FLANGE BRACE @ GIRT AND COLUMN WITH LINER PANEL



AG0150

TYPICAL FLANGE BRACE AT BUILT-UP COLUMN & GIRTS

SEE PLANS AND ELEVATIONS FOR FLANGE BRACE PART MARKS
 PRE-DRILL (2) 5/16φ PILOT HOLES IN GIRTS
 FIELD CUT AND FLATTEN PANEL RIB IF INTERFERENCE WITH FLANGE BRACE CLIP OCCURS

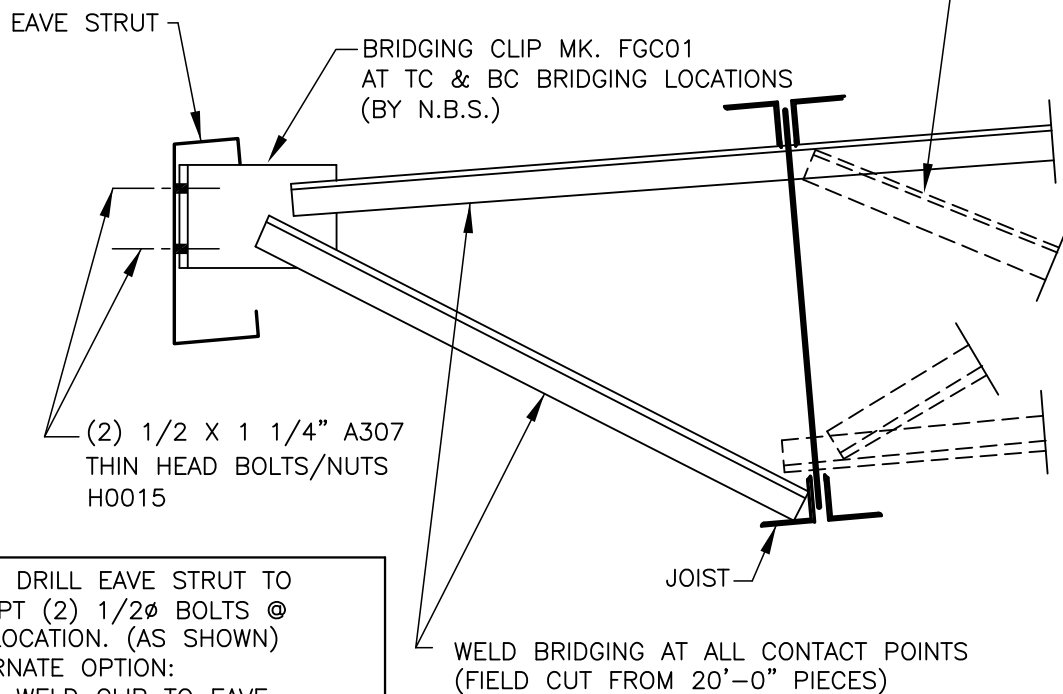
JOIST BRIDGING DETAILS

BI0030 – LOW EAVE @ EAVE STRUT CONNECTIONS

NOTE:

IF TOP & BOTTOM CHORD HORIZONTAL BRIDGING DOES NOT LINE UP,
LOCATE BRIDGING CLIP AT TOP & BOTTOM CHORD HORIZONTAL BRIDGING LOCATIONS.

FIELD INSTALL ONE WELDED CROSS
BRACE IN SECOND JOIST SPACE UP
FROM EAVE IF NOTED ON JOIST/
BRIDGING LOCATIONS



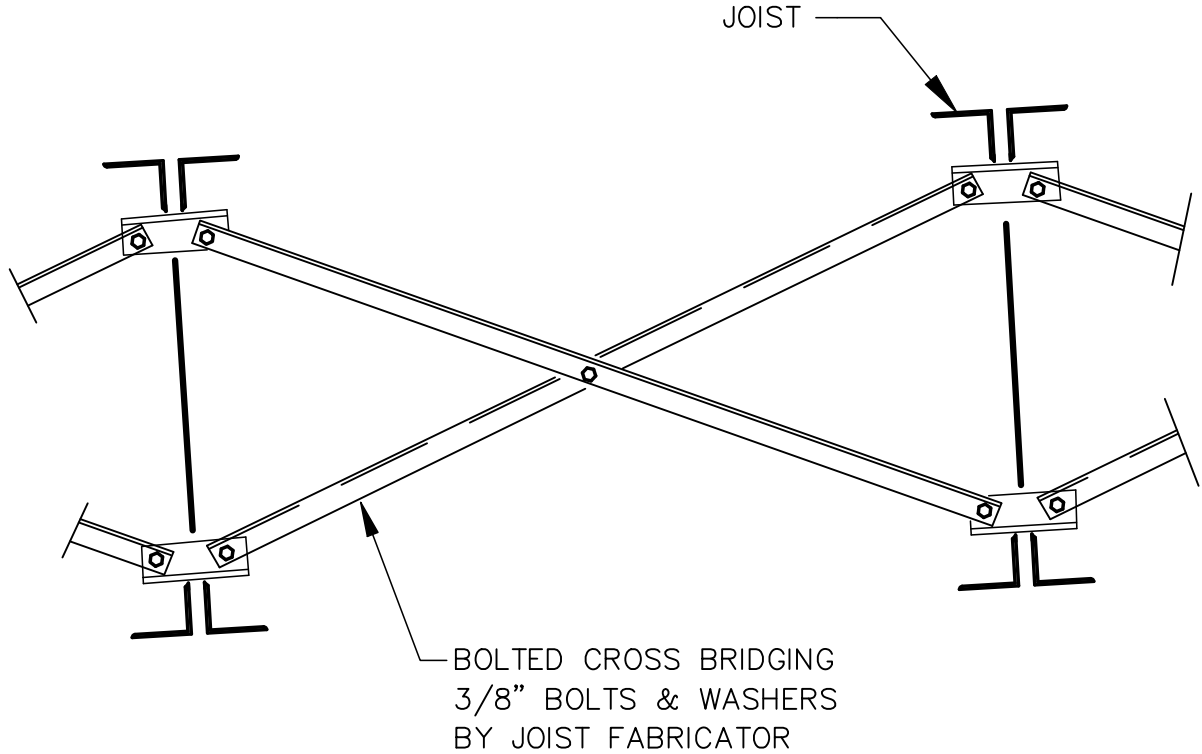
FIELD DRILL EAVE STRUT TO
ACCEPT (2) 1/2" BOLTS @
EA. LOCATION. (AS SHOWN)
ALTERNATE OPTION:
FIELD WELD CLIP TO EAVE
MEMBER.

BI0030

HORIZONTAL BRIDGING DETAIL

ROOF BRIDGING – LOW EAVE AT EAVE STRUT

BI0140 – JOIST BRIDGING – TYPICAL INTERMEDIATE LOCATION



BI0140

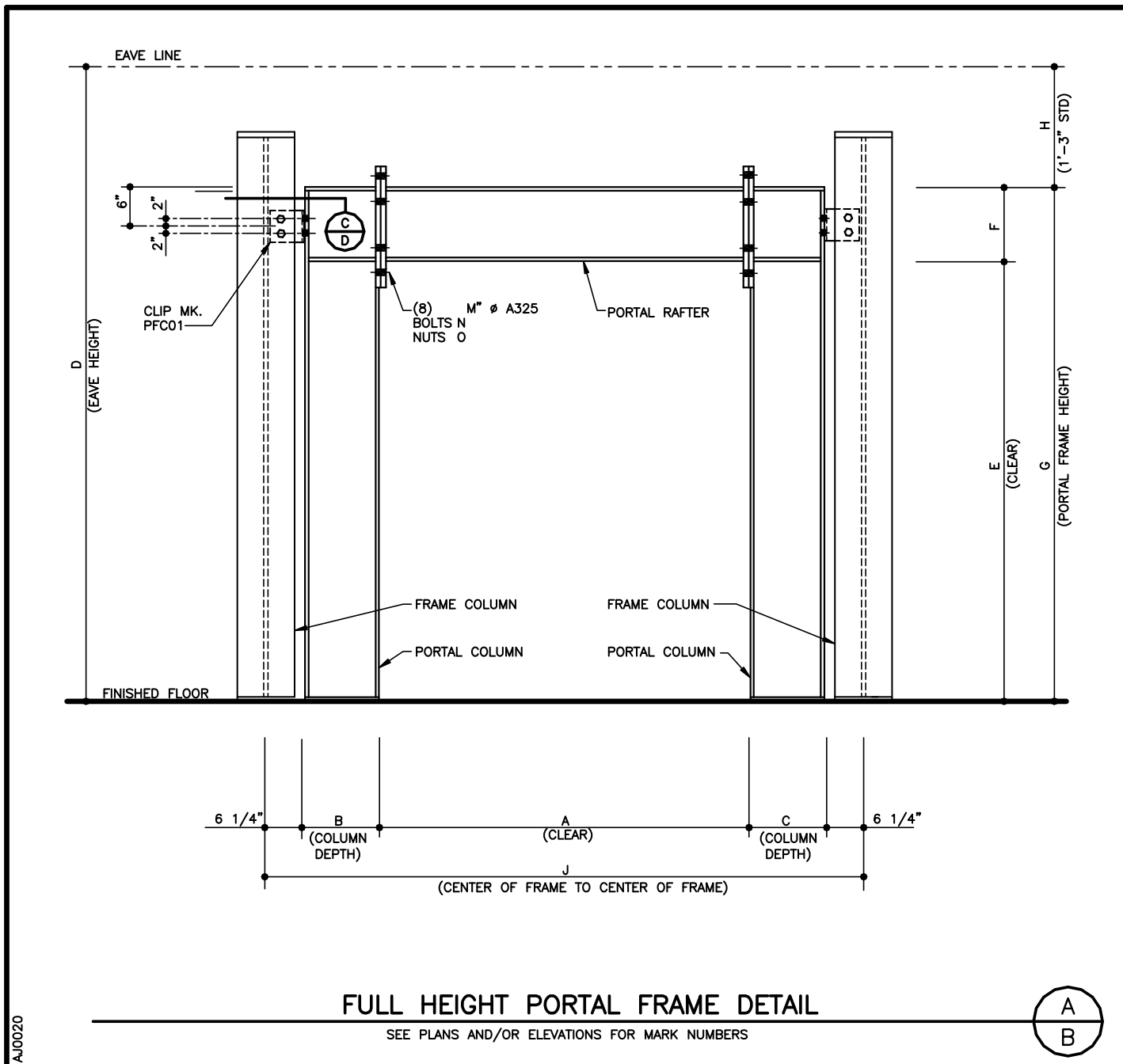
BOLTED BRIDGING DETAIL

ROOF BRIDGING – TYPICAL INTERMEDIATE LOCATION

<p>LAST REVISION DATE: <u>02/09/01</u> BY: <u>CDM</u> CHK: <u>RJF</u></p>	<p><u>DETAIL NAME IF APPLICABLE</u> BI0140.DWG</p>	<p>11.3.19</p>
-----------------------------------------------------------------------------------	---------------------------------------------------------------	-----------------------

PORTAL FRAME DETAILS

AJ0020 – FULL HEIGHT PORTAL FRAME



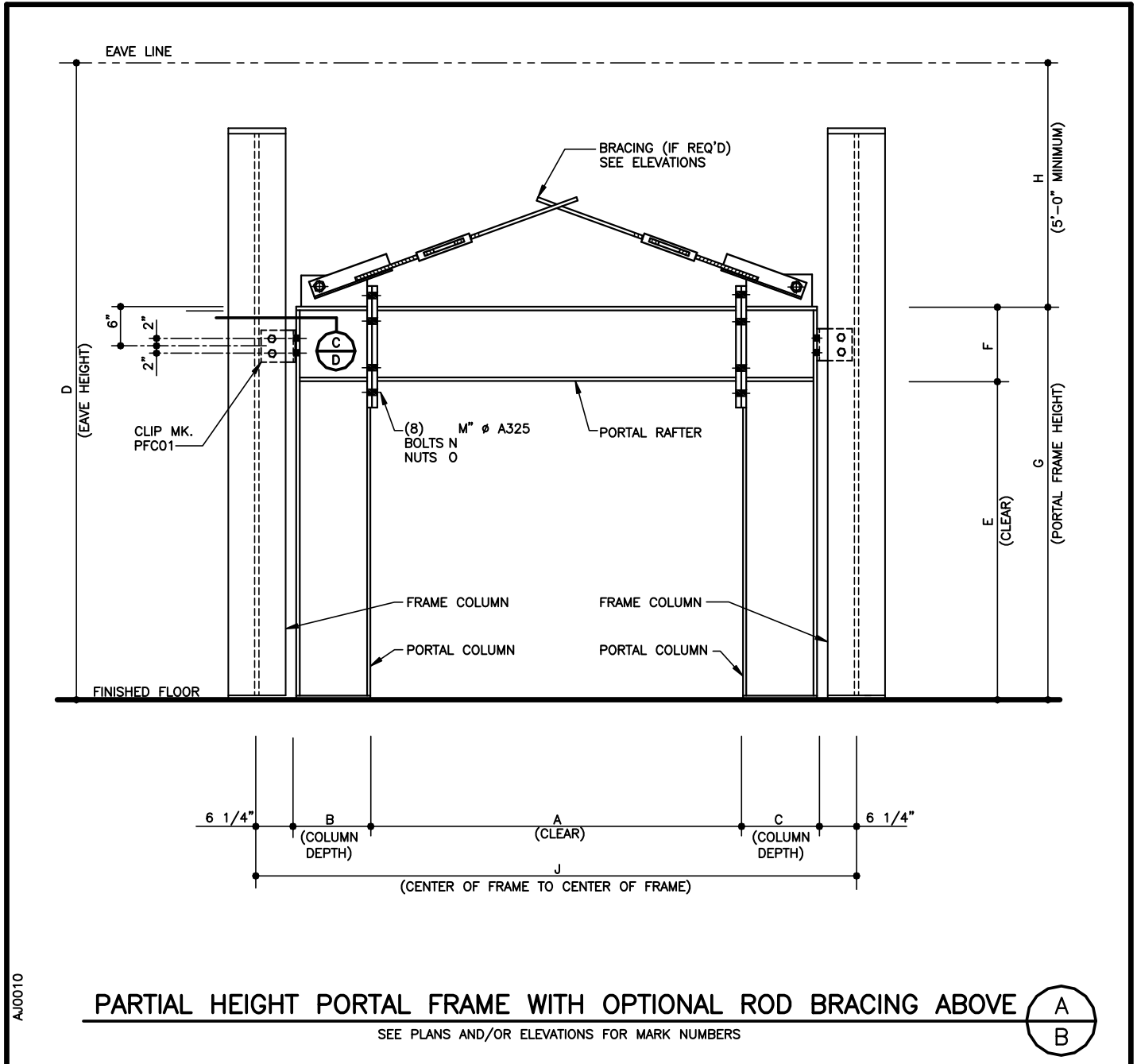
AJ0020

LAST REVISION
 DATE: 08/11/04
 BY: KMC CHK: RJF

DETAIL NAME IF APPLICABLE
AJ0020.DWG

11.3.20

AJ0010 – PARTIAL HEIGHT PORTAL FRAME



AJ0010

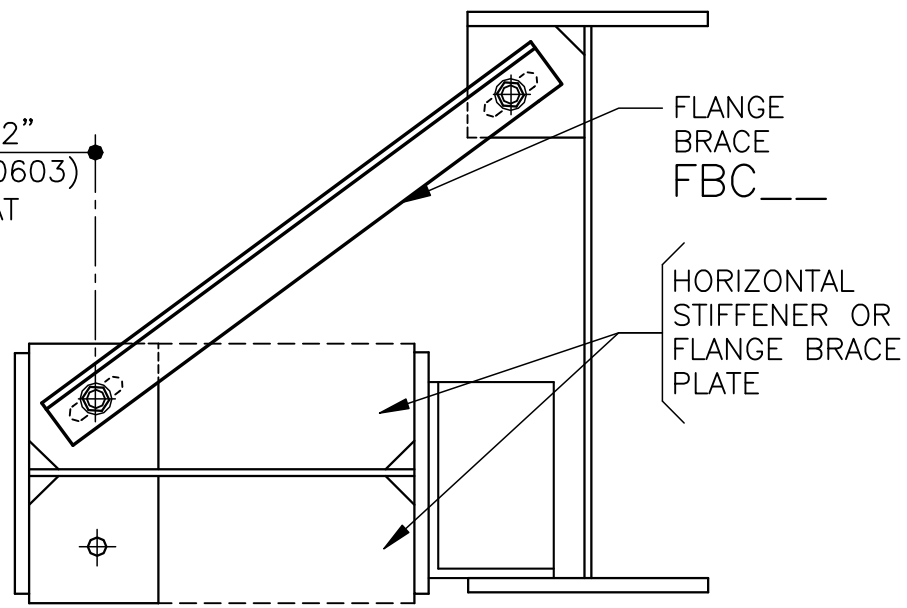
LAST REVISION DATE: <u>08/11/04</u> BY: <u>KMC</u> CHK: <u>RJF</u>

<u>DETAIL NAME IF APPLICABLE</u> AJ0010.DWG

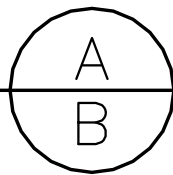
11.3.21

AJ0050 – FLANGE BRACE @ FRAME/PORTAL COLUMN – STIFFENER

(1) 1/2" ϕ X 2"
A325 BOLT (H0603)
NUT (H0300) AT
EACH END



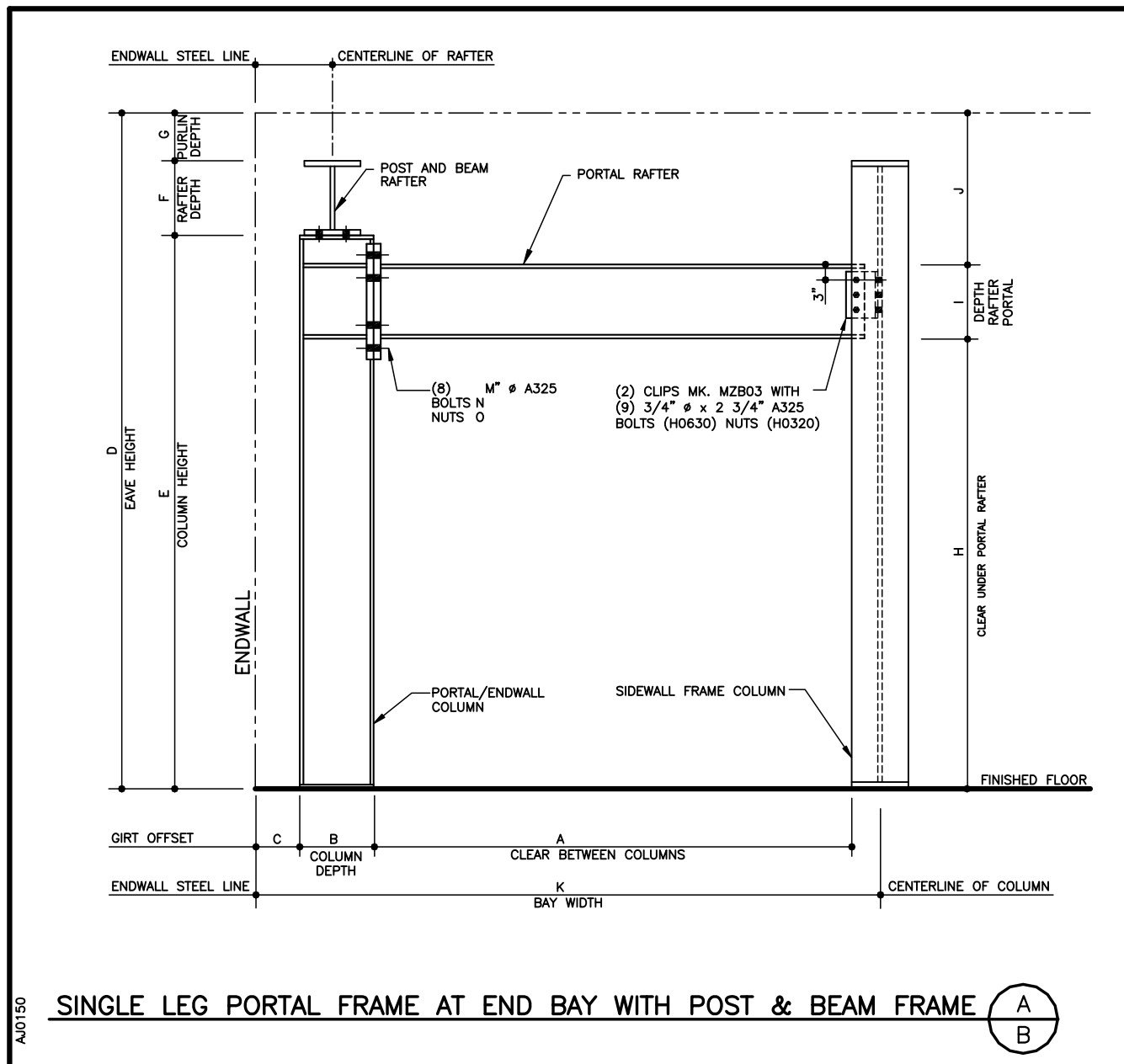
TYPICAL FLANGE BRACE CONNECTION
AT FRAME COLUMN AND PORTAL COLUMN



AJ0050

(REFER TO CROSS SECTIONS & ELEVATIONS FOR PART NUMBERS)

AJ0150 – SINGLE LEG PORTAL FRAME @ END BAY W/POST & BEAM FRAME

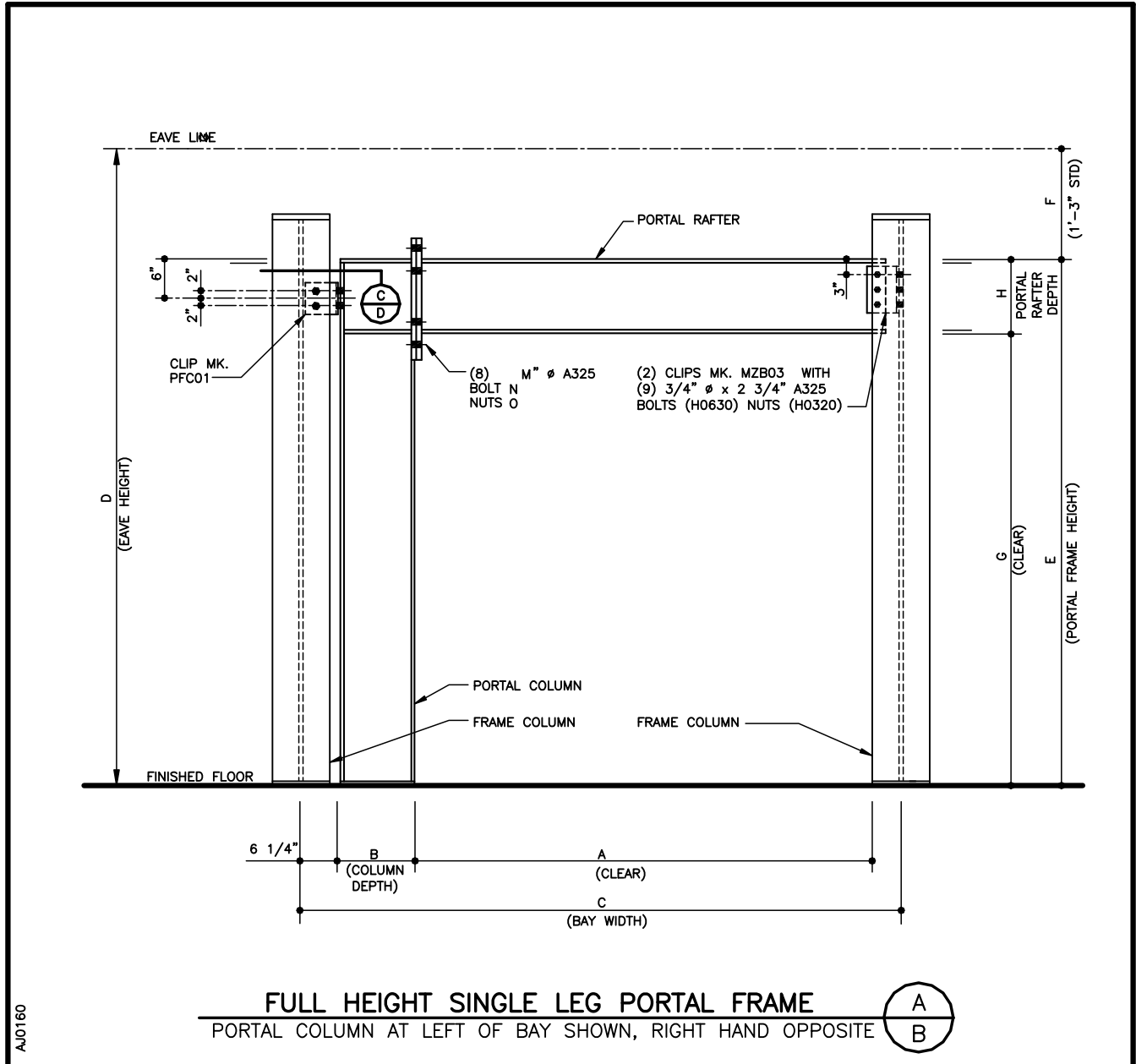


LAST REVISION
 DATE: 08/11/04
 BY: KMC CHK: RJF

DETAIL NAME IF APPLICABLE
 AJ0150.DWG

11.3.23

AJ0160 – FULL HEIGHT SINGLE LEG PORTAL FRAME



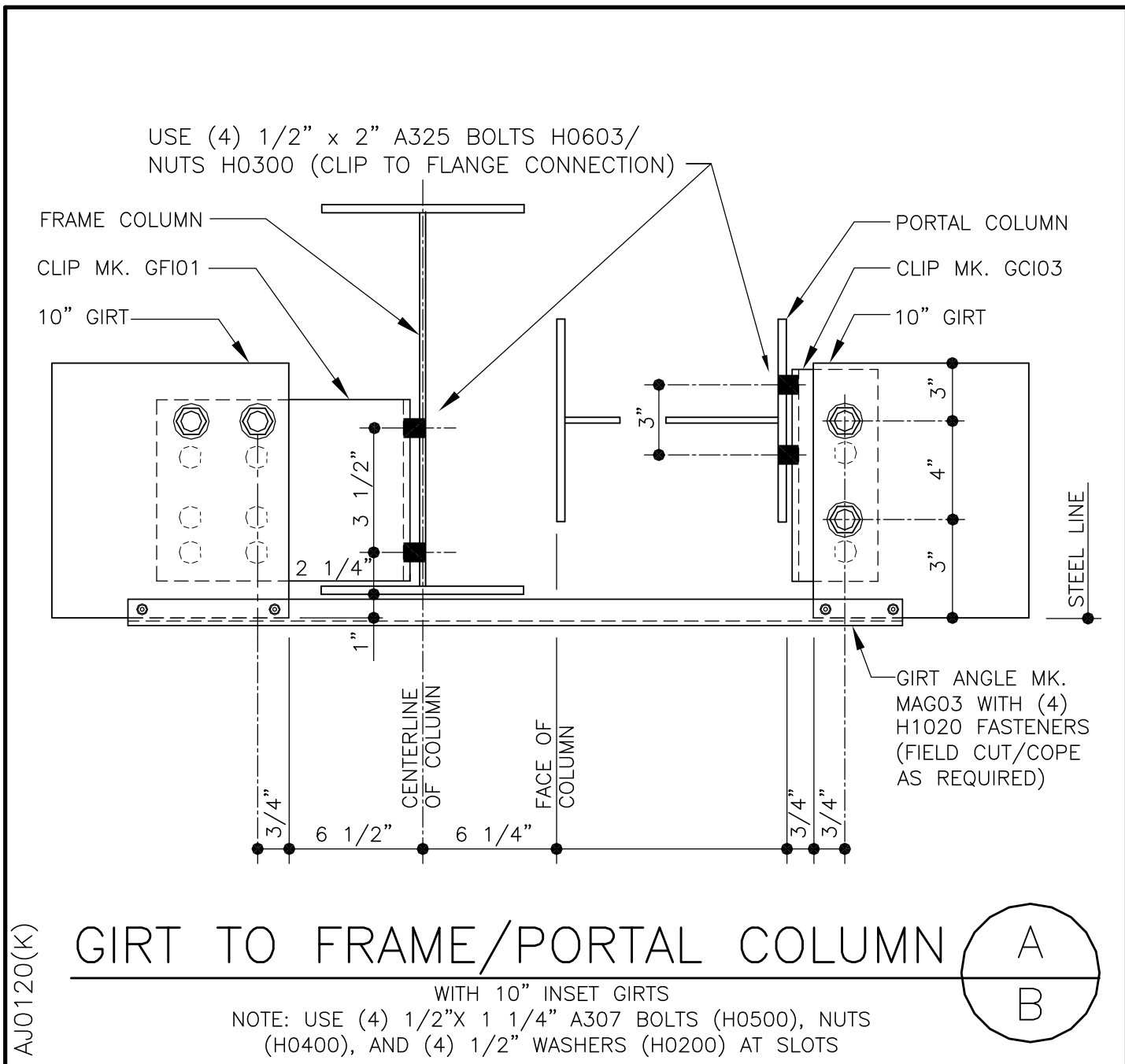
AJ0160

LAST REVISION DATE: 08/11/04 BY: KMC CHK: RJF

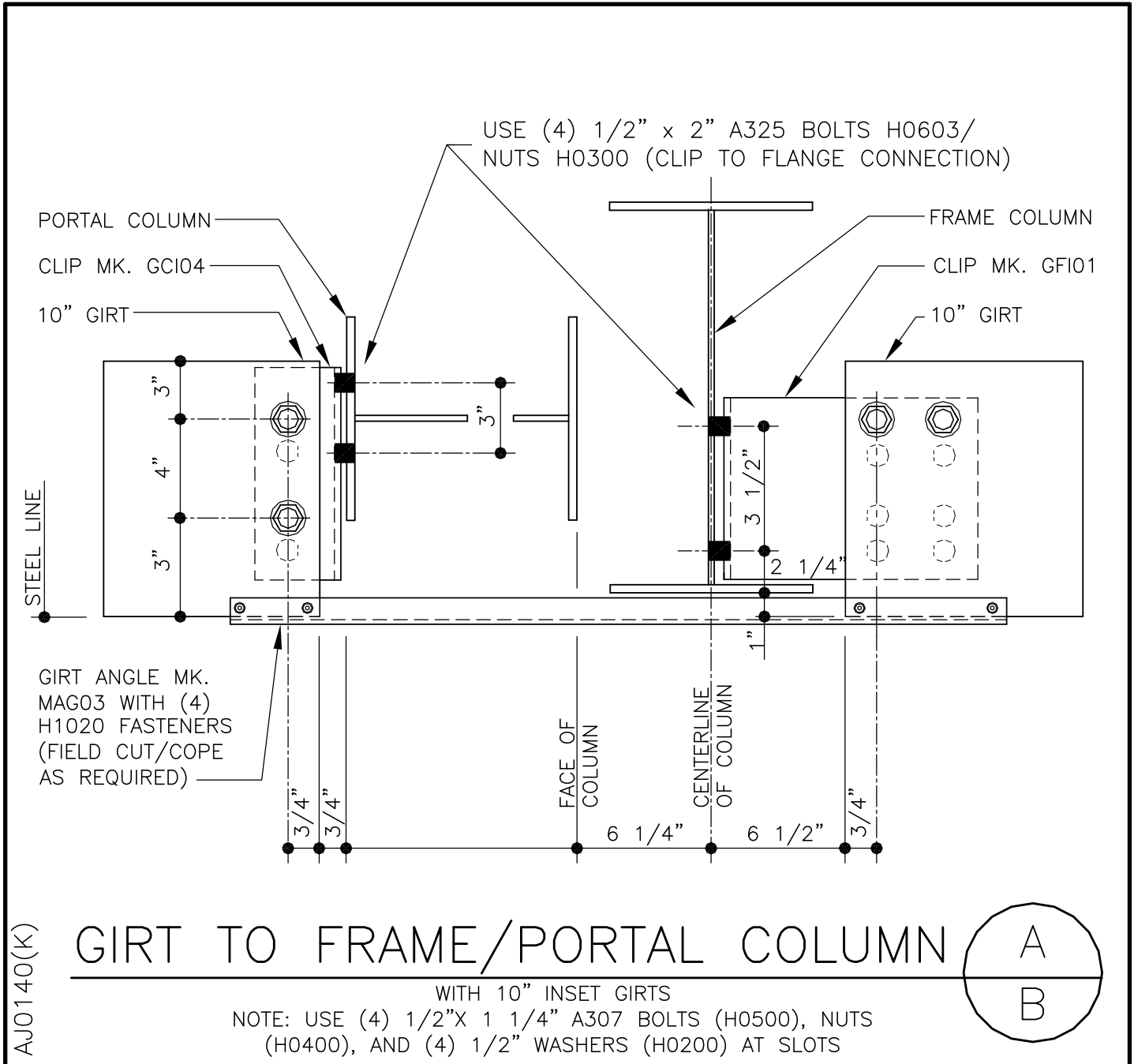
DETAIL NAME IF APPLICABLE AJ0160.DWG

11.3.24

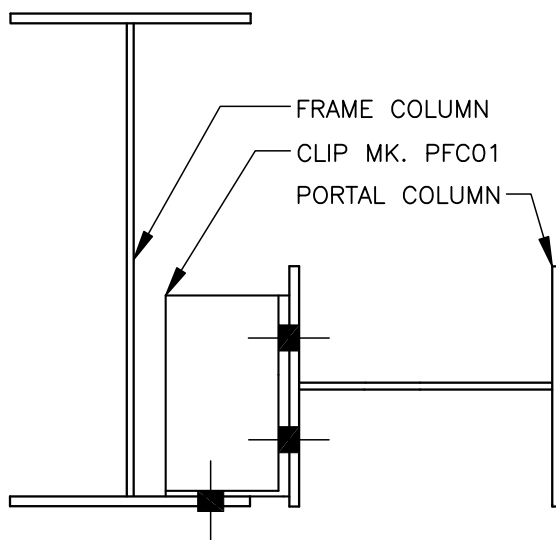
AJ0120 – FRAME/PORTAL COLUMN GIRT DETAIL – INSET (LEFT)



AJ0140 – FRAME/PORTAL COLUMN GIRT DETAIL – INSET (RIGHT)

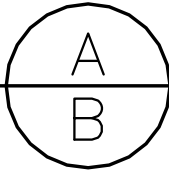


AJ0040 – FRAME/PORTAL COLUMN GIRT DETAILS - BYPASS



AJ0040(K)

FRAME/PORTAL COLUMN ATTACHMENT



WITH INSET OR BYPASS GIRTS
 USE (6) 3/4" X 2 3/4" A325 BOLTS (H0630), NUTS (H0320), AND (4) 3/4" WASHERS (H0220) AT SLOTS

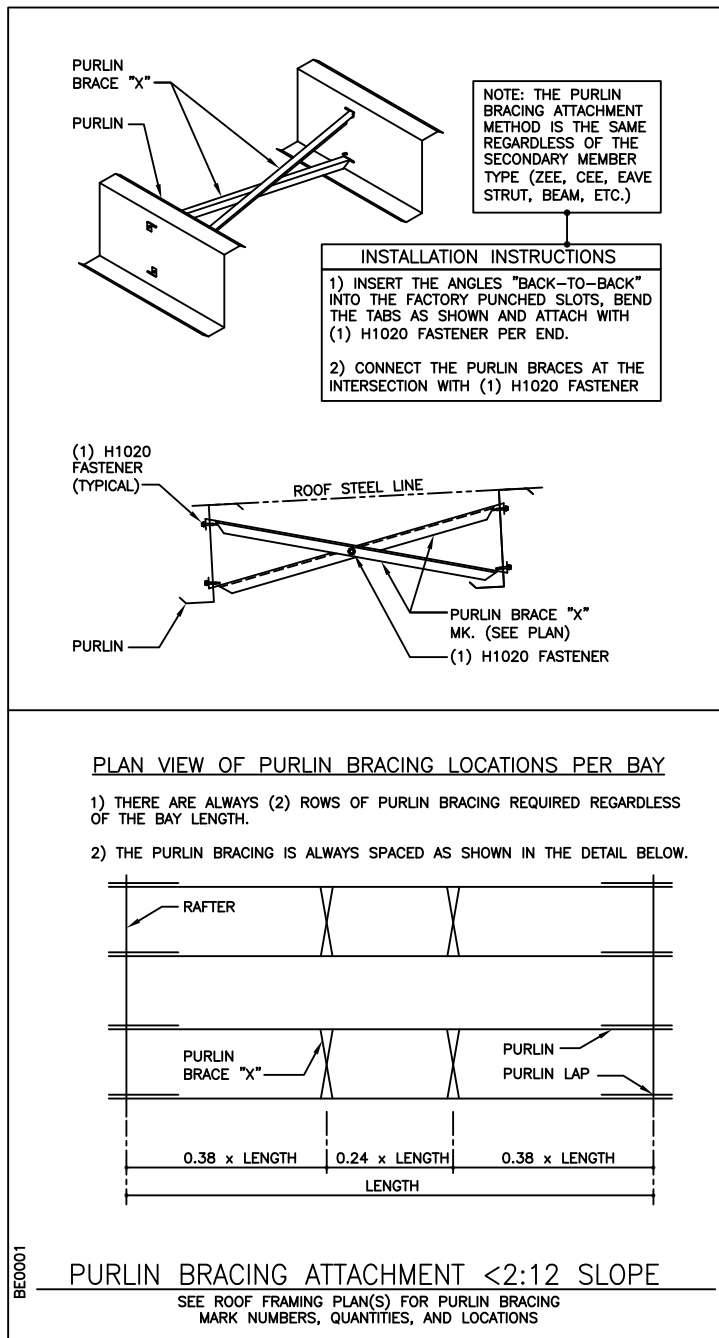
LAST REVISION
 DATE: 08/11/04
 BY: KMC CHK: RJF

DETAIL NAME IF APPLICABLE
AJ0040.DWG

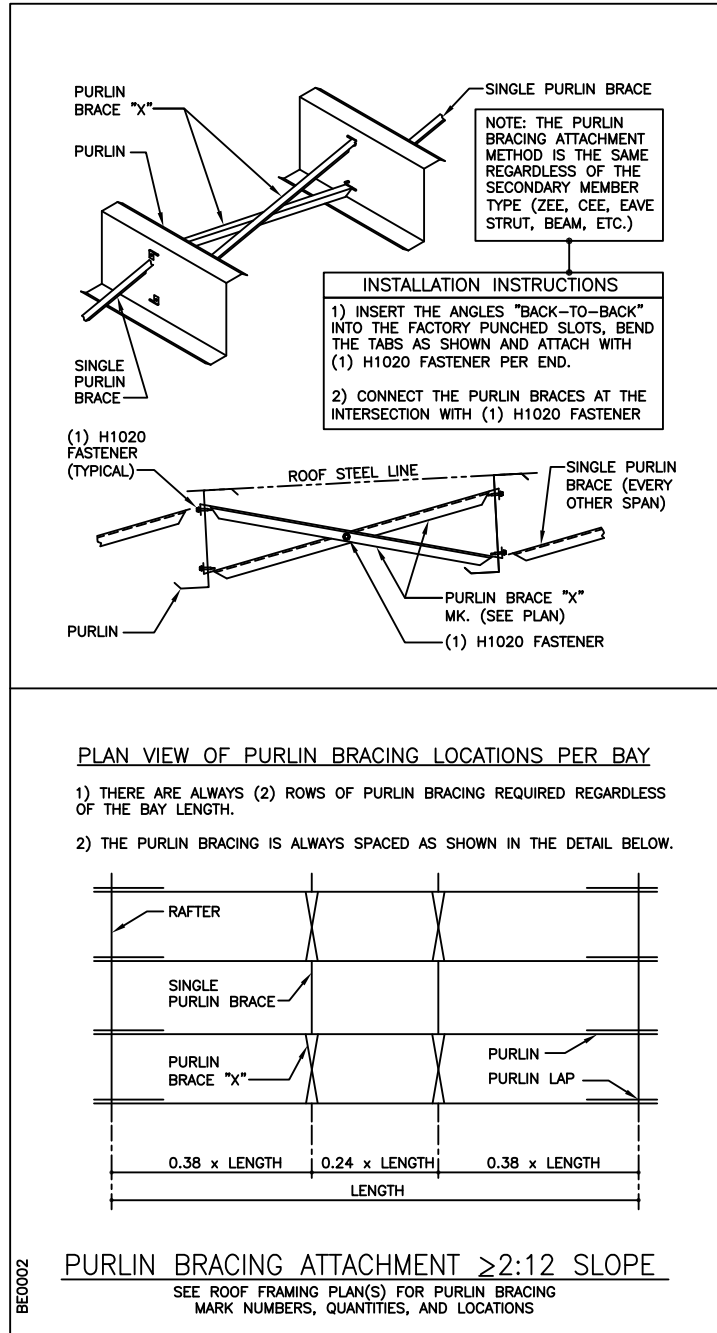
11.3.27

CFR PURLIN BRACING SYSTEM DETAILS

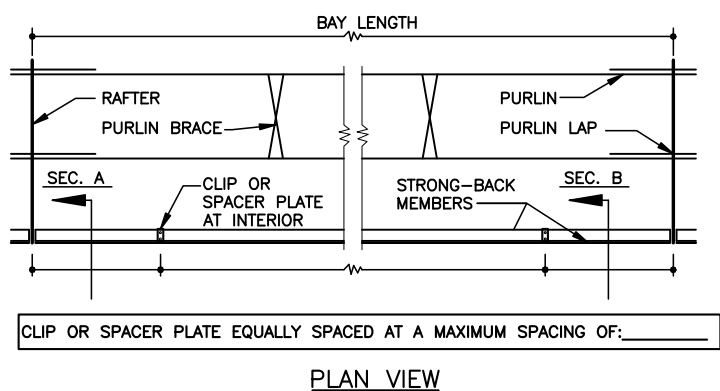
BE0001 – GABLE, LESS THAN 2:12 ROOF SLOPE



BE0002 – GABLE, GREATER THAN OR EQUAL 2:12 ROOF SLOPE



BE1310 – STRONG-BACK EAVE-CEE @ BUILT-UP



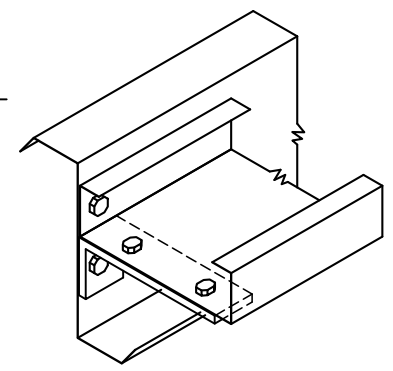
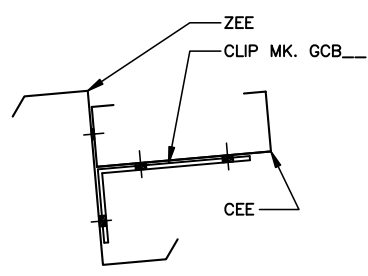
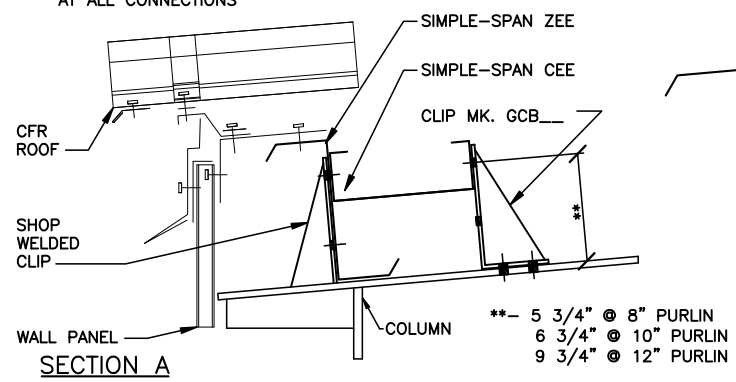
GENERAL NOTES

- 1) CEE EAVE MEMBERS AT THIS DETAIL WILL ALWAYS BE SIMPLE-SPAN MEMBERS (EXCEPT @ END FRAMES, CEES EXTEND TO STEEL LINE).
- 2) REFER TO THE ROOF FRAMING PLAN FOR CEE MEMBER SIZES AND MARK NUMBERS. NOTE: IT IS POSSIBLE TO HAVE A MIXTURE OF THE SINGLE-CEE AND DOUBLE-CEE DETAILS. REVIEW THE ROOF FRAMING PLAN QUANTITIES CAREFULLY.
- 3) THE CEES ARE FACTORY PUNCHED FOR ALL CLIP CONNECTIONS.
- 4) USE 1/2" x 2" A325 BOLTS (H0603) AND NUTS (H0300) FOR ALL CONNECTIONS
- 5) REFERENCE ERECTOR NOTE FOR TYPICAL WASHER REQUIREMENTS.

STRONG-BACK EAVE CEE DETAILS

STRONG-BACK SINGLE CEE EAVE DETAIL

USE 1/2" x 2" A325 BOLTS (H0603) AND NUTS (H0300) AT ALL CONNECTIONS

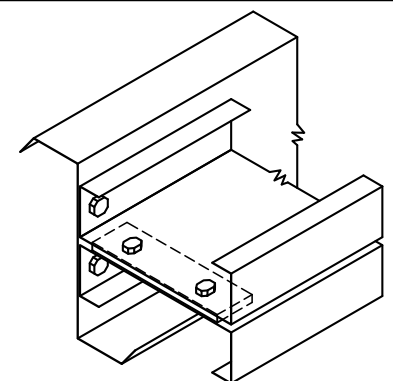
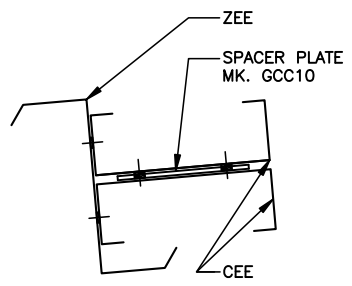
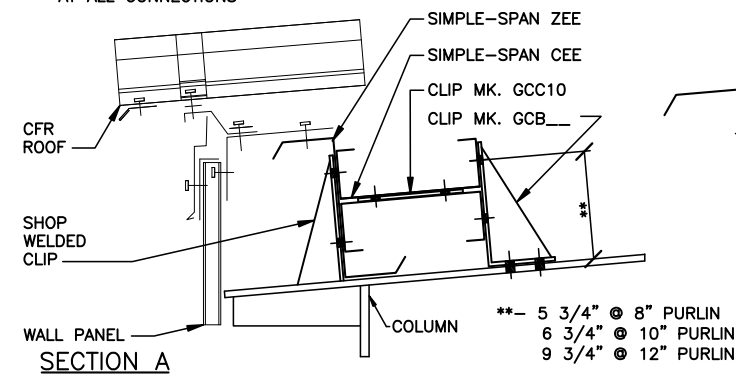


- ** - 5 3/4" @ 8" PURLIN
 6 3/4" @ 10" PURLIN
 9 3/4" @ 12" PURLIN

SECTION B
 SEE DETAIL AT TOP LEFT FOR CLIP SPACING

STRONG-BACK DOUBLE CEE EAVE DETAIL

USE 1/2" x 2" A325 BOLTS (H0603) AND NUTS (H0300) AT ALL CONNECTIONS



- ** - 5 3/4" @ 8" PURLIN
 6 3/4" @ 10" PURLIN
 9 3/4" @ 12" PURLIN

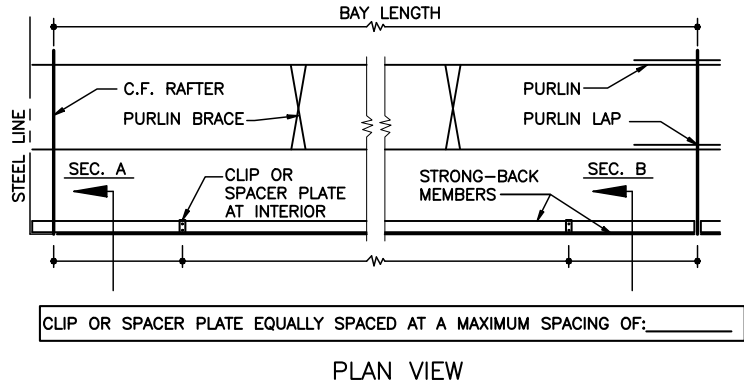
SECTION B
 SEE DETAIL AT TOP LEFT FOR CLIP SPACING

LAST REVISION
 DATE: 03/11/03
 BY: CDM CHK: RJF

DETAIL NAME IF APPLICABLE
BE1310.DWG

11.3.30

BE1320 – STRONG-BACK EAVE-CEE @ C.F. RAFTER



GENERAL NOTES

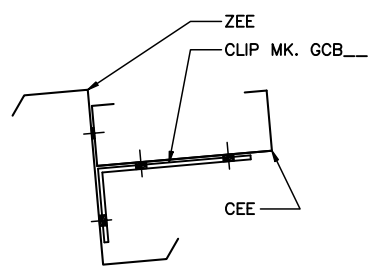
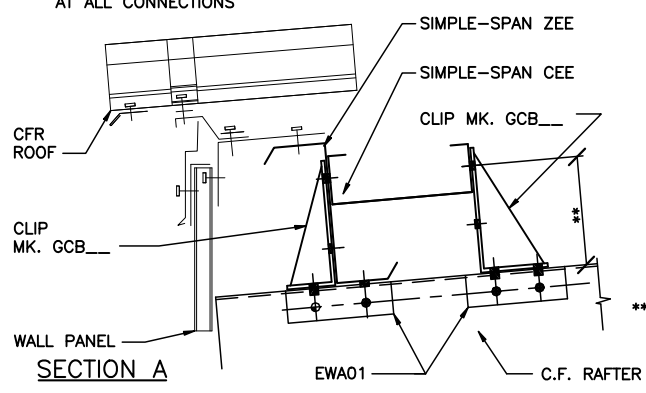
- 1) ZEE AND CEE EAVE MEMBERS AT THIS DETAIL WILL ALWAYS BE SIMPLE-SPAN MEMBERS (EXCEPT @ END FRAMES, CEES AND ZEES EXTEND TO STEEL LINE).
- 2) REFER TO THE ROOF FRAMING PLAN FOR ZEE AND CEE MEMBER SIZES AND MARK NUMBERS. NOTE: IT IS POSSIBLE TO HAVE A MIXTURE OF THE SINGLE-CEE AND DOUBLE-CEE DETAILS. REVIEW THE ROOF FRAMING PLAN QUANTITIES CAREFULLY.
- 3) THE ZEE AND CEE ARE FACTORY PUNCHED FOR ALL CLIP CONNECTIONS.
- 4) USE 1/2" x 2" A325 BOLTS (H0603) AND NUTS (H0300) FOR ALL CONNECTIONS
- 5) REFERENCE ERECTOR NOTE FOR TYPICAL WASHER REQUIREMENTS.

STRONG-BACK EAVE CEE DETAILS

● C.F. ENDWALL

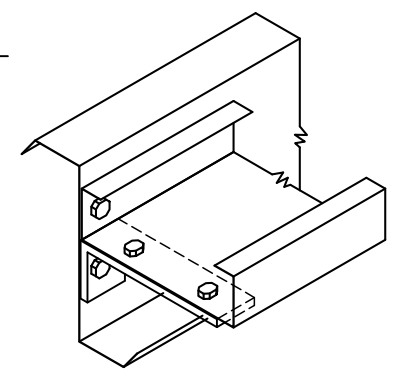
STRONG-BACK SINGLE CEE EAVE DETAIL

USE 1/2" x 2" A325 BOLTS (H0603) AND NUTS (H0300) AT ALL CONNECTIONS



SECTION B
SEE DETAIL AT TOP LEFT FOR CLIP SPACING

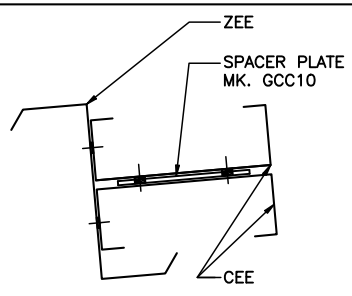
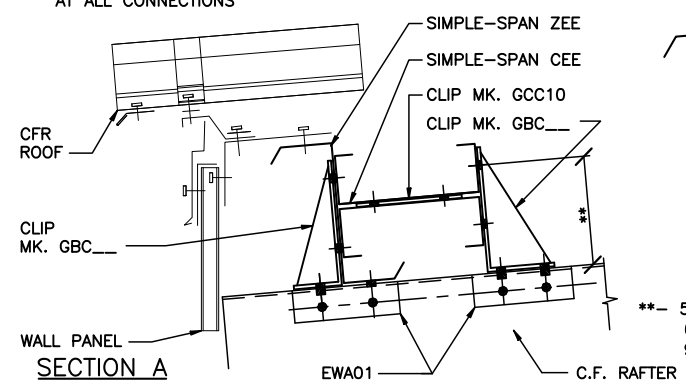
- ** - 5 3/4" @ 8" PURLIN
6 3/4" @ 10" PURLIN
9 3/4" @ 12" PURLIN



ISOMETRIC VIEW OF SECTION B

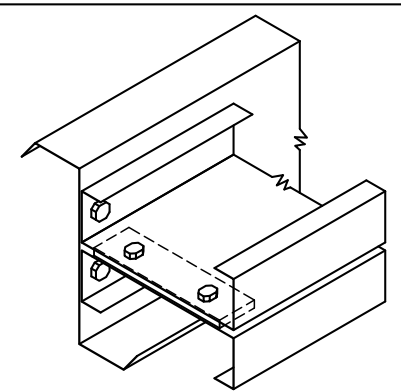
STRONG-BACK DOUBLE CEE EAVE DETAIL

USE 1/2" x 2" A325 BOLTS (H0603) AND NUTS (H0300) AT ALL CONNECTIONS



SECTION B
SEE DETAIL AT TOP LEFT FOR CLIP SPACING

- ** - 5 3/4" @ 8" PURLIN
6 3/4" @ 10" PURLIN
9 3/4" @ 12" PURLIN



ISOMETRIC VIEW OF SECTION B

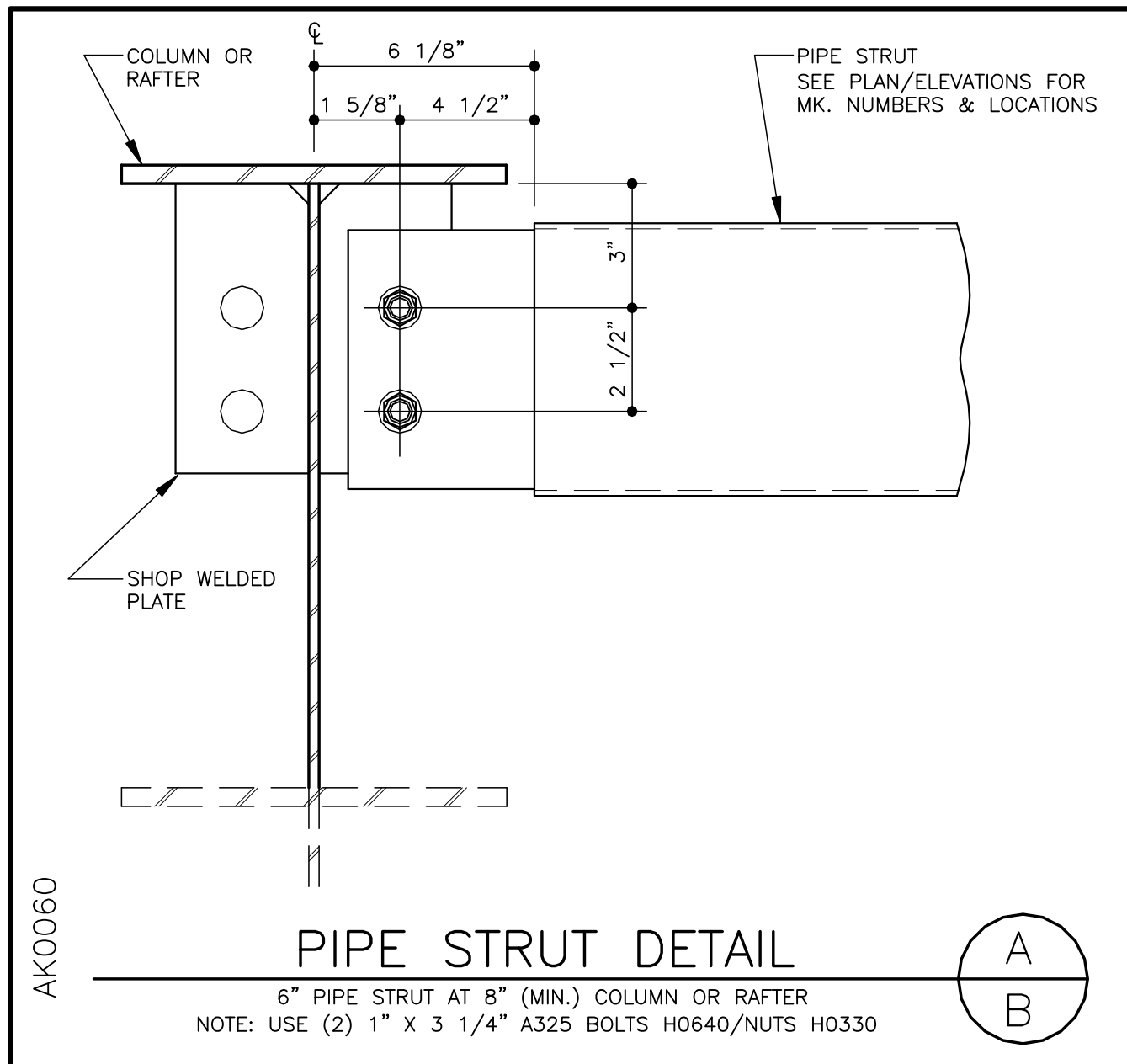
LAST REVISION
DATE: 04/10/02
BY: CDM CHK: RJF

DETAIL NAME IF APPLICABLE
BE1320.DWG

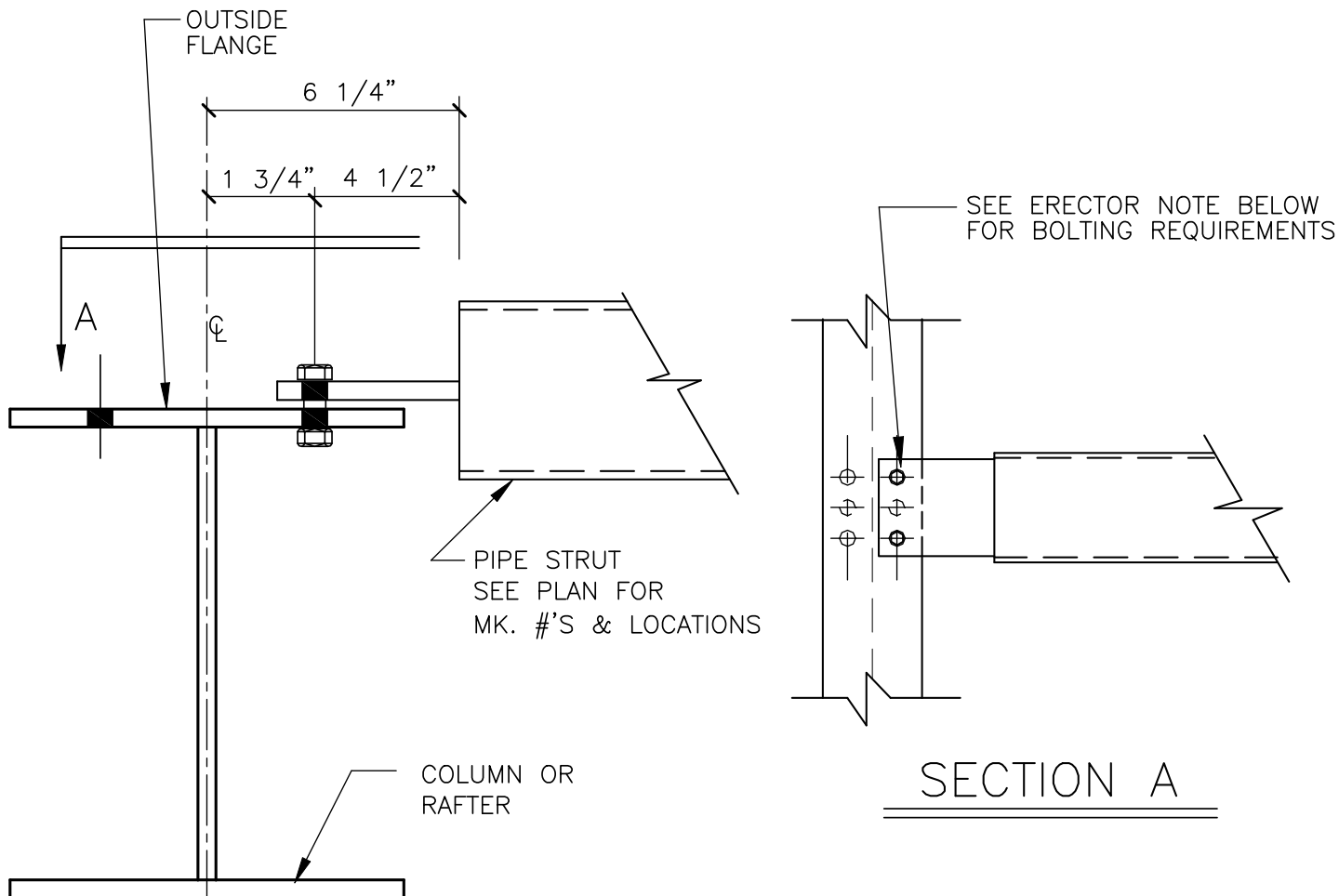
11.3.31

GENERAL BRACING DETAILS

AK0060 – STRUT ATTACHED AT WEB OF COLUMN OR RAFTER (6" PIPE)



AK0050 – STRUT ATTACHED AT FLANGE OF COLUMN OR RAFTER

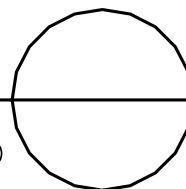


AK0050

ALT. PIPE STRUT DETAIL

STRUT AT COLUMN OR RAFTER FLANGE.

NOTE: ON A 6" STRUT USE (2) 1"X 3 1/4" A325 BOLTS H0640/NUTS H0330
ON A 8" STRUT USE (3) 1"X 3 1/4" A325 BOLTS H0640/NUTS H0330

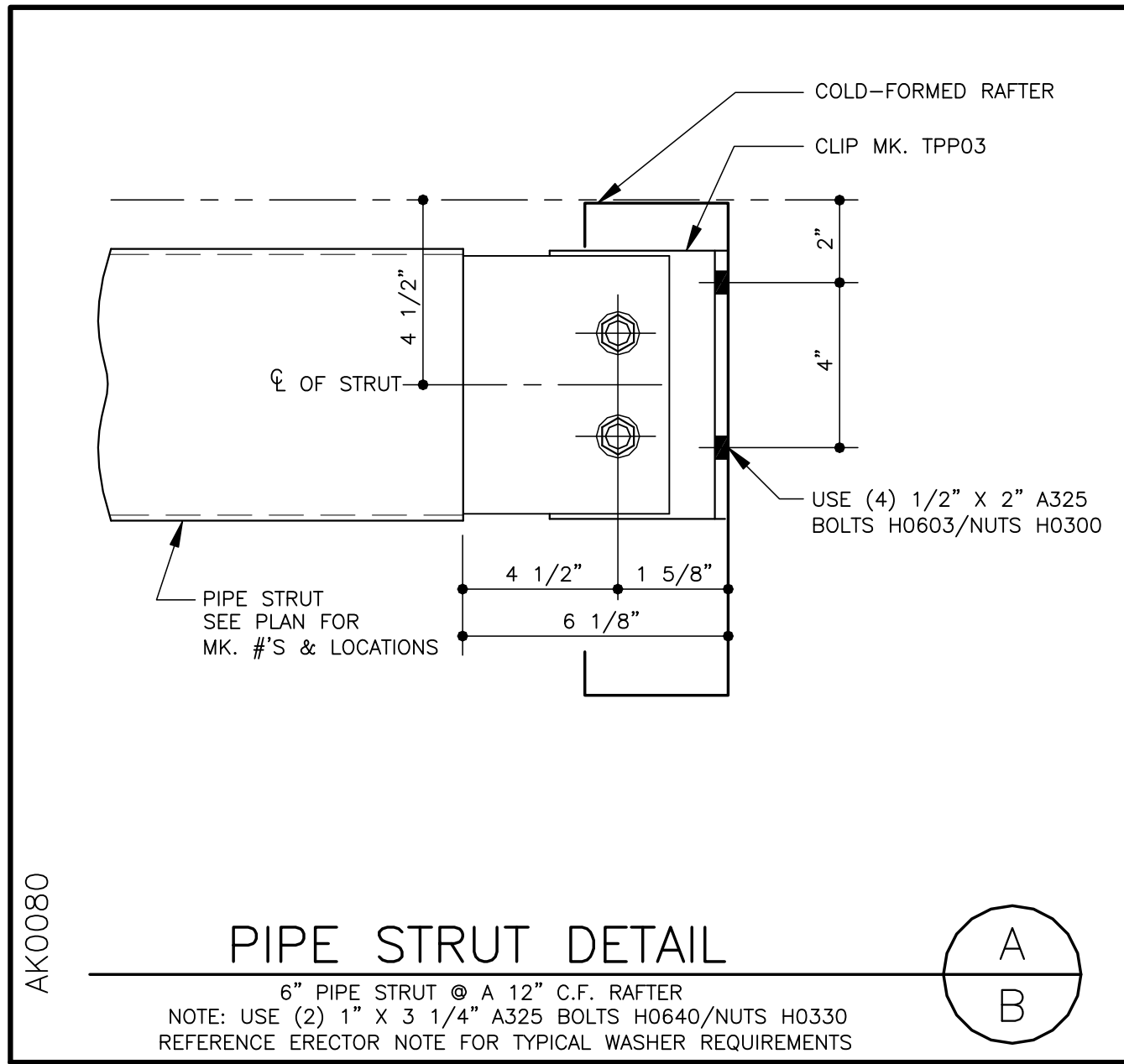


LAST REVISION
DATE: <u>08/11/04</u>
BY: <u>KMC</u> CHK: <u>RJF</u>

<u>DETAIL NAME IF APPLICABLE</u>
AK0050.DWG

11.3.33

AK0080 – STRUT ATTACHED TO C.F. RAFTER



LAST REVISION DATE: <u>08/11/04</u> BY: <u>KMC</u> CHK: <u>RJF</u>

<u>DETAIL NAME IF APPLICABLE</u> AK0080.DWG

11.3.34
