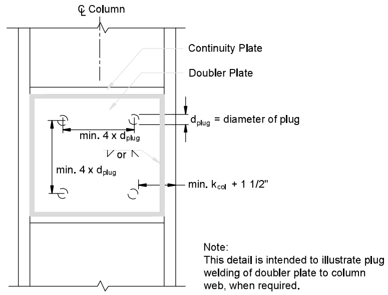
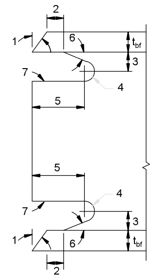


Note:
This detail is intended to illustrate plug welding of doubler plate to column web, when required.

(refer to AWS D1.1/D1.1M:2010 Section 2.3.5, 2.9, and 3.10 for minimum plug weld requirements)

Plug Welding of Doubler Plate to Column — Detail 16

Scale: Not to Scale

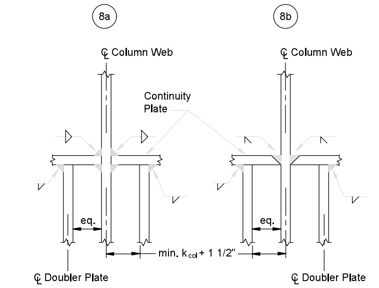


Notes:
1. Bevel as required by a selected AWS prequalified CJP groove welded joint detail.
2. Larger of t_{bf} or 1/2" (plus 1/2 t_{bf} , or minus 1/4 t_{bf}).
3. 3/4 t_{bf} to t_{bf}, 3/4" minimum (± 1/4").
4. 3/8" minimum radius (plus not limited, or minus 0).
5. 3 t_{bf}(±1/2").
6. Tolerances shall not accumulate to the extent that the angle of the access hole cut to the flange surface exceed 25°.
7. Weld access hole shall be ground smooth to a surface roughness value not to exceed 500 micro inch; and shall be free of notches and gouges.
8. This detail is required for FR (fully restrained) connection for OMF per AISC 341-10 seismic provisions sec. E1 where weld access holes are provided.

Alternative Weld Access Hole Detail — Detail 12

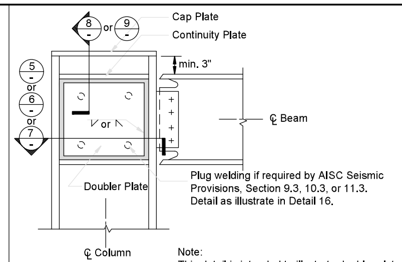
(Required per AISC 341-10 Sec E1. for OMF application, may use as alternative for RBS application per AISC 358-10 Sec 5.5/ C5.5)

Scale: Not to Scale



Doubler Plate Welds to Continuity Plate — Detail 8

Scale: Not to Scale



Plug welding if required by AISC Seismic Provisions, Section 9.3, 10.3, or 11.3. Detail as illustrate in Detail 16.

Note:
This detail is intended to illustrate doubler plate connection to column. Top and bottom of doubler plate terminates at the continuity plates.

(Refer to commentary E3 from the 2010AISC Seismic Provisions, "For Structural Steel Buildings")

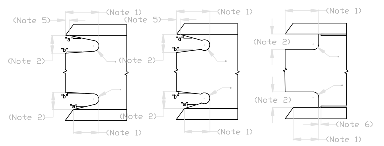
Web Doubler Plate Detail — Detail 4

Scale: Not to Scale

TYPICAL SHEET 3 GENERAL NOTES:

1. The illustrative details provided herein are intended to highlight the minimum fabrication and welding details that should be reflected on the structural plan. It shall not be used as a substitute for or in lieu of structural details that the Engineer or Architect of Record must provide on the structural plan.
2. These illustrative details do not provide information such as, but not limited to, size of columns or beams, continuity or doubler plate thicknesses, size and length of the fillet welds, the type of beam to column moment connections, locations of all seismic demand welds, location od all required lateral braces, steel column frame to foundation connections, or length and location of plastic hinging zones. This information shall be determined by the Engineer or Architect of Record and specified on the structural plan.
3. Where the illustrative details provide information such as weld type to use at a particular weld joint, minimum or maximum dimensions for length, weld size, or gap between base metals, it should be appropriately reflected on the structural plan by the Engineer or Architect of Record.
4. Engineer of Record shall indicate on this plan which Weld Access Hole detail to be used. See Detail 12 and 17 of Sheet 3

Typical Sheet 3 Notes



Alternative "A" — **Alternative "B"**

Rolled Shapes and Built-Up Shapes Assembled Prior to Cutting the Access Hole

Alternative "C"

Built-Up Shapes Assembled After Cutting the Access Hole

Notes: These are typical details for joints welded from one side against steel backing (tw=thickness of material in which the hole is made)

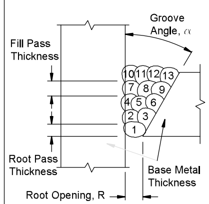
(1) Width: Greater of 1.5 x tw or 1½ in. Tolerance is +- 1/4 in.
(2) Height : Greater of 1.5 tw or 1 in. but need not exceed 2 in.
(3) R : 3/8 in. min. Grind the thermally cut surface of access holes in heavy shapes as defined in Section A.3.1c and A.3.1d (2010 AISC Seismic provisions). For heavy section as defined in A3.1c and A3.1d, the thermally cut surface of beam copes and weld access holes shall be ground to bright metal and inspected by either magnetic particle or dye penetrant methds prior to deposition of spice welds.
(4) Slope "a" forms a transition from the web to the flange. Slope "b" may be horizontal.
(5) The bottom of the top is to be contoured to permit the light fit of backing bars where they are to be used.
(6) The web-to-flange weld of built-up members is to be held back a distance of at least the weld size from the edge of the access hole.

(Refer to AISC 360-10 Specification for Structural Steel Buildings fig. C-J1.6. Weld Access Hole Geometry)

Weld Access Hole Detail — Detail 17

(Required per AISC 358-10 Sec 5.5/C5.5 for RBS application, may use detail 12 as alternative)

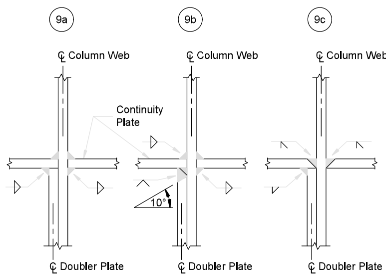
Scale: Not to Scale



Notes:
1. For maximum fill pass thickness, see Table 5 on Sheet 2.
2. For moment connection at bottom beam flange to column flange, the maximum root pass thickness shall not exceed 1/4" per Part V, Item 1. For welded connection at all other locations, see Table 5 on Sheet 2 for maximum root pass thickness.
3. Root Opening, R, and Groove Angle, α, shall be per selected AWS prequalified CJP groove welded joint detail.
4. Welding pass numbers are shown diagrammatically to indicate sequence. Quantity of passes may vary due to depth and/or position of weld. This figure is intended to illustrate recommended welding sequence for FCAW and SMAW welding process only to reduce stresses due to weld skrinkage

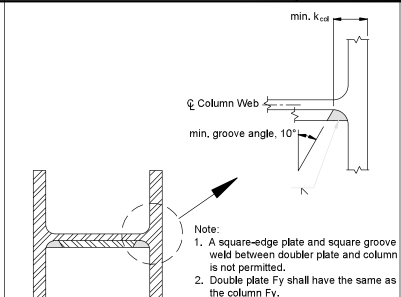
Weld Pass Sequence — Detail 13

Scale: Not to Scale



Doubler Plate Welds to Continuity Plate — Detail 9

Scale: Not to Scale

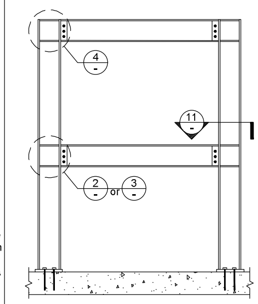


Note:
1. A square-edge plate and square groove weld between doubler plate and column is not permitted.
2. Double plate Fy shall have the same as the column Fy.

(Refer to Figure C-E3.3 from the 2010 AISC Seismic Provisions, "For Structural Steel Buildings")

Groove Welded Doubler Plate — Detail 5

Scale: Not to Scale

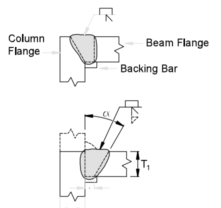


Note:
This detail is for illustrative purpose only. Refer to the structural plans for actual frame connections and details.

Sample Steel Moment Frame — Detail 1

Scale: Not to Scale

TOLERANCES	
As Detailed	As Fit-Up
R = +1/16, -0	+1/4, -1/16
α = +10°, -0°	+10°, -5°

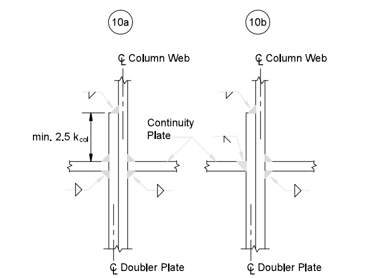


Welding Process	Joint Designation	Base Metal Thickness (U = unlimited)		Groove Preparation		Allowed Welding Positions	Gas Shielding for FCAW
		T_1	T_2	Root Opening	Groove Angle		
SMAW	TC-U4a	U	U	R = 1/4	α = 45°	All	-
				R = 3/8	α = 30°	F, V, OH	-
FCAW	TC-U4a-GF	U	U	R = 3/16	α = 30°	All	Required
				R = 3/8	α = 30°	F	Not required
				R = 1/4	α = 45°	All	Not required

Notes:
1. Groove welds in corner and T-joints of cyclically loaded structures shall be reinforced with fillet welds equal to T_1 /4, but need not exceed 3/8 inch.
2. For corner joints, the outside groove preparation may be in either or both members, provided the basic groove configuration is not changed and adequate edge distance is maintained to support the welding operations without excessive edge melting.
3. Adapted with permission from the AWS D1.1 Committee on Structural Welding, Structural Welding Code - Steel, AWS D1.1/D1.1M: 2010 Miami: American Welding Society, Figure 3.4 pg. 95 (top left).

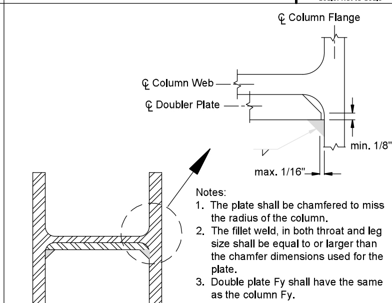
AWS Prequalified CJP Groove Welded Joint Detail — Detail 14

Scale: Not to Scale



Doubler Plate Welds to Continuity Plate — Detail 10

Scale: Not to Scale

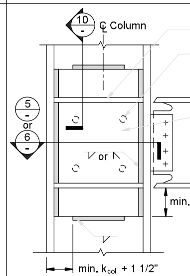


Notes:
1. The plate shall be chamfered to miss the radius of the column.
2. The fillet weld, in both throat and leg size shall be equal to or larger than the chamfer dimensions used for the plate.
3. Double plate Fy shall have the same as the column Fy.

(Refer to Figure C-E3.3 from the 2010 AISC Seismic Provisions, "For Structural Steel Buildings")

Fillet Welded Doubler Plate — Detail 6

Scale: Not to Scale



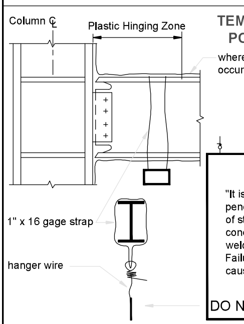
Plug welding if required by AISC Seismic Provisions, Section 9.3, 10.3, or 11.3. Detail as illustrate in Detail 16.

Note:
This detail is intended to illustrate doubler plate connection to column web. Doubler plate extend beyond continuity plate a distance not less than min. 2.5 k_{col}.

(Refer to commentary E3 from the 2010 AISC Seismic Provisions, "For Structural Steel Buildings")

Web Doubler Plate Detail — Detail 2

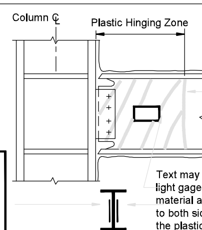
Scale: Not to Scale



WARNING SIGN

"It is PROHIBITED to attach and to cause penetration or damage to the plastic hinging zones of steel moment-frames. These PROHIBITED conditions include bolts, holes, screws, shot pins, welds and tack welds (permanent or temporary). Failure to comply with these requirements may cause the replacement of steel."

DO NOT MOVE OR REMOVE THIS SIGN

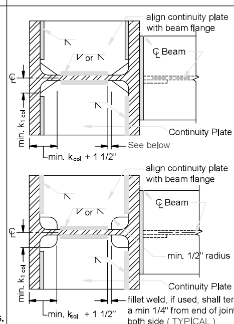


Text may be printed on either light gage plate or adhesive material and shall be affixed to both side of the beam within the plastic hinging zone.

Notes:
1. This detail is intended to illustrate the location of the "Warning Sign" at the plastic hinging zone.
2. "Warning Sign" shall be provided as required by Part IV Item 6 on Sheet 1.
3. Length of the plastic hinging zone shall be a min. of 2 x beam depth, unless noted otherwise on the structural plans.

Warning Sign at Plastic Hinging Zone — Detail 15

Scale: Not to Scale

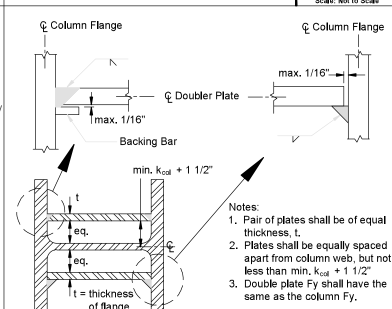


align continuity plate with beam flange
℄ Beam
Continuity Plate
See below
min. k_{col}
min. k_{col} + 1 1/2"
align continuity plate with beam flange
℄ Beam
min. 1/2" radius
Continuity Plate
fillet weld, if used, shall terminate a min 1/4" from end of joint on both side (TYPICAL)

Note:
- Continuity plate shall have a thickness greater than or equal to the beam flange or beam flange connection plate.
- At the end of the weld adjacent to the column web/flange juncture, weld tabs for continuity plates shall not be used, except when permitted by the engineer of record. Unless specified by the engineer of record that they be removed, weld tabs shall not be removed when used in this location (AISC 341-10 sec D2)

Continuity Plate Detail — Detail 11

Scale: Not to Scale

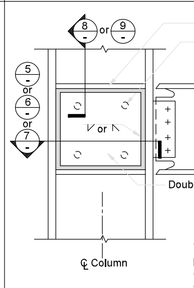


Notes:
1. Pair of plates shall be of equal thickness, t.
2. Plates shall be equally spaced apart from column web, but not less than min. k_{col} + 1 1/2"
3. Double plate Fy shall have the same as the column Fy.

(Refer to Figure C-E3.3 from the 2010 AISC Seismic Provisions, "For Structural Steel Buildings")

Groove or Fillet Welded Doubler Plate — Detail 7

Scale: Not to Scale



Plug welding if required by AISC Seismic Provisions, Section E1, E2 or E3. Detail as illustrate in Detail 16.

Note:
This detail is intended to illustrate doubler plate connection to column. Doubler plate extend between the top and bottom of the continuity plates.

(Refer to commentary E3 from the 2010 AISC Seismic Provisions, "For Structural Steel Buildings")

Web Doubler Plate Detail — Detail 3

Scale: Not to Scale

SITE ADDRESS:

OWNER:

STANDARD QUALITY ASSURANCE PLAN
For Steel Moment Frames

Engineer of Record

LADBS Logo.bmp

Date: 12/30/2017

Scale: Not to Scale

Sheet:

Sheet 3 of 3