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LIMIT STATE TABLE: CONNECTION AVAILABLE STRENGTH

SHEAR | Single Plate, Through Plate, Single Angle

LIMIT STATE TABLE: CONNECTION AVAILABLE STRENGTH

SHEAR LOAD PARALLEL TO HSS LONGITUDINAL AXIS

WF Beam Connections to Round, Rectangular, and Square HSS

Element		Limit State	Single Plate (Conventional and Extended Configurations)		Thru Plate		Single Angle	
	AISC Specification and Manual References		AISC 360-10 and 14th Ed. Manual pp. 10-102 to 10-107	AISC 360-16 and 15th Ed. Manual pp. 10-87 to 10-91	AISC 360-10 and 14th Ed. Manual pp. 10-102 to 10-107	AISC 360-16 and 15th Ed. Manual pp. 10-87 to 10-91	AISC 360-10 and 14th Ed. Manual pp. 10-132 to 10-134	AISC 360-16 and 15th Ed. Manual pp. 10-116 to 10-119
	AISC Manual Considerations Specific to HSS Elements		14th Ed. Manual pp. 10-167	15th Ed. Manual pp. 10-153	14th Ed. Manual pp. 10-168	15th Ed. Manual pp. 10-154	14th Ed. Manual pp. 10-169	15th Ed. Manual pp. 10-155
	ROW NO. COL NO.		A	B	C	D	E	F
Bolts	1	Shear With No Eccentricity	–	–	–	–	Spec Section J3.6 at supported beam web bolts where eccentricity is less than 3" and one vertical row of bolts is used per Manual pp. 10-133	Spec Section J3.6 at supported beam web bolts where eccentricity is less than 3" and one vertical row of bolts is used per Manual pp. 10-116
	2	Shear With Eccentricity Effects	1) Spec Section J3.6 2) Consider eccentricity per Manual pp. 10-103/104 in combination with pp. 7-6 and Manual Tables 7-6 through 7-13	1) Spec Section J3.6 2) Consider eccentricity per Manual pp. 10-88/89 in combination with pp. 7-6 and Manual Tables 7-6 through 7-13	1) Spec Section J3.6 2) Consider eccentricity per Manual pp. 10-103/104 in combination with pp. 7-6 and Manual Tables 7-6 through 7-13	1) Spec Section J3.6 2) Consider eccentricity per Manual pp. 10-88/89 in combination with pp. 7-6 and Manual Tables 7-6 through 7-13	1) Spec Section J3.6 2) Consider eccentricity per Manual pp. 10-133/ 135 in combination with pp 7-6 and Manual Tables 7-6 through 7-13	1) Spec Section J3.6 2) Consider eccentricity per Manual pp. 10-118/120 in combination with pp. 7-6 and Manual Tables 7-6 through 7-13
Connection Material	3	Bolt Bearing and Tearout With No Eccentricity	–	–	–	–	Where eccentricity is not considered (See Bolt section above): Spec Section J3.10	
	4	Bolt Bearing and Tearout With Eccentricity Effects	Spec Section J3.10 in combination with Manual pp. 7-6 and Manual Tables 7-6 through 7-13		Spec Section J3.10 in combination with Manual pp. 7-6 and Manual Tables 7-6 through 7-13		Spec Section J3.10 in combination with Manual pp. 7-6 and Manual Tables 7-6 through 7-13	
	5	Shear Yielding	Spec Eq. (J4-3)		Spec Eq. (J4-3)		Spec Eq. (J4-3)	
	6	Shear Rupture	Spec Eq. (J4-4)		Spec Eq. (J4-4)		Spec Eq. (J4-4)	
	7	Flexural Yielding	Spec J4.5 per Manual pp. 10-104 thru 10-105, and Spec Eq. (F11-1) for extended configuration only	Spec J4.5 per Manual pp. 10-89 thru 10-90, and Spec Eq. (F11-1) for extended configuration only	Spec J4.5 per Manual pp. 10-104 thru 10-105, and Spec Eq. (F11-1) for extended configuration only	Spec J4.5 per Manual pp. 10-89 thru 10-90, and Spec Eq. (F11-1) for extended configuration only	Spec J4.5 per Manual pp. 10-104 thru 10-105, and Spec Eq. (F11-1) at angle legs where eccentricity is considered (See Bolt Section above)	Spec J4.5 per Manual pp. 10-89 thru 10-90, and Spec Eq. (F11-1) at angle legs where eccentricity is considered (See Bolt Section above)
Connection Material	8	Flexural Rupture	Manual Eq. (9-4) for extended configuration		Manual Eq. (9-4) for extended configuration		Spec J4.5 per Chap F and Manual pp. 9-6 at angle legs where eccentricity is considered (See Bolt Section above)	
	9	Flexural Buckling	Manual pp. 9-6 thru 9-9 for extended configuration		Manual pp. 9-6 thru 9-9 for extended configuration		Manual pp. 9-6 thru 9-9 for extended configuration	
	10	Block Shear Rupture	Spec Eq. (J4-5)		Spec Eq. (J4-5)		Spec Eq. (J4-5)	
	11	Rotational Ductility	Spec J1.2 per Manual pp. 10-102 thru 10-105 (conventional or extended configuration)	Spec J1.2 per Manual pp. 10-88 thru 10-90 (conventional or extended configuration)	Spec J1.2 per Manual pp. 10-102 thru 10-105 (conventional or extended configuration)	Spec J1.2 per Manual pp. 10-88 thru 10-90 (conventional or extended configuration)	Spec J1.2 per Manual pp. 10-132 OR pp.9-14	Spec J1.2 per Manual pp. 10-116 OR pp.9-17
	12	Bearing	–	–	–	–	–	–
	13	Lateral-Torsional Buckling	Manual Eq. (10-6)	Spec F11.2	Consider lateral-torsional buckling per Manual pp. 10-168	Consider lateral-torsional buckling per Manual pp. 10-155	Manual Eq. (10-6)	Spec F11.2
Welds	14	Direct Shear	Spec Section J2.4 and Minimum weld size per Manual pp. 10-102 at HSS support	Spec Section J2.4 and Minimum weld size per Manual pp. 10-87 at HSS support for conventional configuration	Spec Section J2.4; Refer to Manual pp. 10-168 for weld strength at through plate connections	Spec Section J2.4; Refer to Manual pp. 10-155 for weld strength at through-plate connections	–	–
	15	Shear With Eccentricity Effects	–	–	–	–	Spec Section J2.4, Manual Table 10-12 and Manual pp. 10-134: Use Instantaneous Center of Rotation Method per Table 8-10 for weld to HSS support	Spec Section J2.4, Manual Table 10-12 and Manual pp. 10-119: Use Instantaneous Center of Rotation Method per Table 8-10 for weld to HSS support
HSS Column	16	Wall Slenderness	Manual pp. 10-167	Manual pp. 10-153	–	–	–	–
	17	HSS Shear Rupture at Weld	Manual Eq. (9-2), and DG24 First Edition Eq. (2-4)		Manual Eq. (9-2), and DG24 First Edition Eq. (2-4)		Manual Eq. (9-2), and DG24 First Edition Eq. (2-4)	
	18	HSS Shear Yielding at Weld	–	–	DG24 First Edition Eq. (2-3)		–	–
	19	Shear Yielding (Punching) of the HSS Connecting Face	Spec Eq. (K1-3) Subject to limits in Table K1.1A or Table K1.2A	Manual Eq. (10-7)	–	–	–	–
	20	Yield Line Plasticity	–	–	–	–	–	–
	21	Additional HSS Provisions	–	–	–	–	Guidelines for weld at HSS column workable flat dimensions per Manual pp. 10-169	Guidelines for weld at HSS column workable flat dimensions per Manual pp. 10-155
Beam Web	22	Bolt Bearing and Tearout With No Eccentricity	–	Spec Section J3.10 (Conventional Configuration Only)	–	–	Where eccentricity is not considered (See Bolt Section Above): Spec Section J3.10	
	23	Bolt Bearing and Tearout With Eccentricity Effects	Spec Section J3.10 in combination with Manual pp. 7-6 and Manual Tables 7-6 through 7-13	–	Spec Section J3.10 in combination with Manual pp. 7-6 and Manual Tables 7-6 through 7-13		Spec Section J3.10 in combination with Manual pp.7-6 and Manual Tables 7-6 through 7-13	
	24	Web Local Yielding	–	–	–	–	–	–
	25	Web Crippling	–	–	–	–	–	–
	26	Block Shear Rupture	Coped Beam: Spec Section J4.3 Uncoped Beam: Not required					
	27	Strength at Cope	14th Manual pp. 9-6 to 9-9 15th Manual pp. 9-6 to 9-10					
	28	Shear Yielding	Coped Beam: Spec Section J4.2 Eq J4-3 Uncoped Beam: Not required					
	29	Shear Rupture	Coped Beam: Spec Section J4.2 Eq J4-4 Uncoped Beam: Not required					
Additional Provisions	30		1) Maximum element thicknesses per Manual Table 10-9 for conventional configuration and Manual Eq. (10-3) for extended configuration 2) Dimensional Limitations per Manual pp. 10-102/103 for conventional configuration and pp. 10-104 for extended configuration 3) Manual pp. 10-104 for additional design checks for extended configuration	1) Maximum element thicknesses per Manual Table 10-9 for conventional configuration and Manual Eq. (10-3) for extended configuration 2) Dimensional Limitations per Manual pp. 10-88 for conventional configuration and pp. 10-89 for extended configuration 3) Manual pp. 10-89 for additional design checks for extended configuration 4) When required by the applicable building code, design for structural integrity per Spec Section B3.9 (b) and (c)	–	1) When required by the applicable building code, design for structural integrity per Spec Section B3.9 (b) and (c)	–	1) When required by the applicable building code, design for structural integrity per Spec Section B3.9 (b) and (c)

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LIMIT STATE TABLE: CONNECTION AVAILABLE STRENGTH

SHEAR | Double Angle, WT, Unstiffened Seat, Stiffened Seat

			LIMIT STATE TABLE: CONNECTION AVAILABLE STRENGTH							
Element	Limit State		SHEAR LOAD PARALLEL TO HSS LONGITUDINAL AXIS							
			WF Beam Connections to Round, Rectangular, and Square HSS							
			Double Angle		WT		Unstiffened Seat		Stiffened Seat	
	AISC Specification and Manual References		AISC 360-10 and 14th Ed. Manual pp. 10-7 to 10-12	AISC 360-16 and 15th Ed. Manual pp. 10-7 to 10-12	AISC 360-10 and 14th Ed. Manual pp. 10-138 to 10-139	AISC 360-16 and 15th Ed. Manual pp. 10-123 to 10-124	AISC 360-10 and 14th Ed. Manual pp. 10-84 to 10-88	AISC 360-16 and 15th Ed. Manual pp. 10-69 to 10-73	AISC 360-10 and 14th Ed. Manual pp. 10-93 to 10-96	AISC 360-16 and 15th Ed. Manual pp. 10-78 to 10-81 and 10-153
	AISC Manual Considerations Specific to HSS Elements		14th Ed. Manual pp. 10-167	15th Ed. Manual pp. 10-152	Similar to Double Angle Considerations per Manual pp. 10-167	Similar to Double Angle Considerations per Manual pp. 10-152	14th Ed. Manual pp. 10-167	15th Ed. Manual pp. 10-153	14th Ed. Manual pp. 10-168	15th Ed. Manual pp. 10-153
	ROW NO. COL NO.		G	H	J	K	L	M	N	O
Bolts	1	Shear with No Eccentricity	Spec Section J3.6 at supported beam web bolts where eccentricity is less than 3" and one vertical row of bolts is used per Manual pp. 10-8	Spec Section J3.6 at supported beam web bolts where eccentricity is less than 3" and one vertical row of bolts is used per Manual pp. 10-9	_	_	_	_	_	_
	2	Shear with Eccentricity Effects	Spec Section J3.6 in combination with Manual pp. 7-6 and Manual Tables 7-6 through 7-13		1) Spec Section J3.6 2) Consider eccentricity per Manual pp. 10-138 in combination with manual pp. 7-6 and Manual Tables 7-6 through 7-13	1) Spec Section J3.6 2) Consider eccentricity per Manual pp. 10-123/124 -in combination with manual pp 7-6 and Manual Tables 7-6 through 7-13	_	_	_	_
Connection Material	3	Bolt Bearing and Tearout with No Eccentricity	Spec Section J3.10		_	_	_	_	_	_
	4	Bolt Bearing and Tearout with Eccentricity Effects	Spec Section J3.10, Manual pp. 7-6, and Manual Tables 7-6 through 7-13		Spec Section J3.10 in combination with Manual pp. 7-6 and Manual Tables 7-6 through 7-13		_	_	_	_
	5	Shear Yielding	Spec Eq. (J4-3)		Spec Eq. (J4-3)		Spec Eq. (J4-3)		Spec Eq. (J4-3)	
	6	Shear Rupture	Spec Eq. (J4-4)		Spec Eq. (J4-4)		_	_	_	_
	7	Flexural Yielding	_	_	Spec J4.5 per Manual pp. 10-104 thru 10-105, and Spec Eq. (F11-1) at angle legs where eccentricity is considered (See Bolt Section above)	Spec J4.5 per Manual pp. 10-89 thru 10-90, and Spec Eq. (F11-1) at angle legs where eccentricity is considered (See Bolt Section above)	Spec J4.5 per Chap F and Manual pp. 9-6		_	_
Connection Material	8	Flexural Rupture	_	_	Manual Eq. (9-4)		_	_	_	_
	9	Flexural Buckling	_	_	Manual pp. 9-6 thru 9-9					
	10	Block Shear Rupture	Spec Eq. (J4-5)		Spec Eq. (J4-5)		_	_	_	_
	11	Rotational Ductility	Spec J1.2 per Manual pp. 10-9 OR pp.9-14	Spec J1.2 per Manual pp. 10-9 OR pp. 9-17	Spec J1.2 per Manual pp. 10-139 AND pp.9-14 Eqs. (9-36) thru (9-38)	Spec J1.2 per Manual pp. 10-124 AND Eqs. (9-37) thru (9-39)	Spec J1.2 per Manual pp. 10-84	Spec J1.2 per Manual pp. 10-70	Spec J1.2 per Manual pp. 10-94	Spec J1.2 per Manual pp. 10-79
	12	Bearing	_	_	_	_	Spec J7		Spec J7	
	13	Lateral-Torsional Buckling	_	_	Manual Eq. (10-6)	Spec F11.2	_	_	_	_
Welds	14	Direct Shear	Spec Section J2.4 at HSS support		Spec Section J2.4 at HSS support		_	_	_	_
	15	Shear with Eccentricity Effects	Spec Section J2.4, Manual Table 10-2, and Manual Eq. (10-1) on pp. 10-11 for Weld B to Support; Use Instantaneous Center of Rotation Method per Table 8-8 for Weld A to Beam Web		Spec Section J2.4, Manual Table 10-2, and Manual Eq. (10-1) on pp. 10-11 for Weld B to Support; Use Instantaneous Center of Rotation Method per Table 8-8 for Weld A to Beam Web		Spec Section J2.4, Manual Table 10-6, and Manual Eq. (10-2) on pp. 10-87 for welds to the HSS support	Spec Section J2.4, Manual Table 10-6, and Manual Eq. (10-2) on pp. 10-72 for welds to the HSS support	Spec Section J2.4, Manual Table 10-8, and Manual pp. 10-95; Use elastic method for weld to HSS support	Spec Section J2.4, Manual Table 10-8, and Manual pp. 10-80; Use elastic method for weld to HSS support
HSS Column	16	Wall Slenderness	_	_	_	_	_	_	Manual pp. 10-168 for vertical stiffener plate	Manual pp. 10-153 for vertical stiffener plate
	17	HSS Shear Rupture at Weld	Manual Eq. (9-2), and DG24 First Edition Eq. (2-4)		Manual Eq. (9-2), and DG24 First Edition Eq. (2-4)		Manual Eq. (9-2), and DG24 First Edition Eq. (2-4)		Manual Eq. (9-2), and DG24 First Edition Eq. (2-4)	
	18	HSS Shear Yielding at Weld	_	_	_	_	_	_	_	_
	19	Shear Yielding (Punching) of the HSS Connecting Face	_	_	_	_	_	_	Spec Eq. (K1-3) Subject to limits in Table K1.1A or Table K1.2A	Manual Eq. (10-7) at vertical stiffener plate Where connection is applied at a distance from the HSS member end less than [B*sqrt (1-β)], R_n shall be reduced by 50%. See Note 3
	20	Yield Line Plasticity	_	_	_	_	_	_	Manual pp. 10-168 and Table 10-15	Manual pp. 10-153 and Table 10-15
	21	Additional HSS Provisions	Guidelines for weld to HSS column workable flat dimensions per Manual pp. 10-167	Guidelines for weld to HSS column workable flat dimensions per Manual pp. 10-152	Similar to Double Angle Considerations per Manual pp. 10-167	Similar to Double Angle Considerations per Manual pp. 10-152	_	_	Manual Table 10-15	
Beam Web	22	Bolt Bearing and Tearout with No Eccentricity	Spec Section J3.10		Spec Section J3.10		_	_	_	_
	23	Bolt Bearing and Tearout with Eccentricity Effects	_	_	_	_	_	_	_	_
	24	Web Local Yielding	_	_	_	_	Spec J10.2 Manual Eq. (9-45)	Spec J10.2 Manual Eq. (9-46)	Spec J10.2 Manual Eq. (9-45)	Spec J10.2 Manual Eq. (9-46)
	25	Web Crippling	_	_	_	_	Spec J10.3 Manual Eq. (9-47) and (9-48)	Spec J10.3 Manual Eq. (9-48) and (9-49)	Spec J10.3 Manual Eq. (9-47) and (9-48)	Spec J10.3 Manual Eq. (9-48) and (9-49)
	26	Block Shear Rupture	Coped Beam: Spec Section J4.3 Uncoped Beam: Not required							
	27	Strength at Cope	14th Manual pp. 9-6 to 9-9 15th Manual pp. 9-6 to 9-10							
	28	Shear Yielding	Coped Beam: Spec Section J4.2 Eq J4-3 Uncoped Beam: Not required							
	29	Shear Rupture	Coped Beam: Spec Section J4.2 Eq J4-4 Uncoped Beam: Not required							
Additional Provisions	30		_	1) When required by the applicable building code, design for structural integrity per Spec Section B3.9 (b) and (c)	Recommended tee length and flange/web thicknesses per Manual pp. 10-139	1) Recommended tee length and flange/web thicknesses per Manual pp. 10-124 2) When required by the applicable building code, design for structural integrity per Spec Section B3.9 (b) and (c)	_	1) When required by the applicable building code, design for structural integrity per Spec Section B3.9 (b) and (c)	1) Connection geometry provisions per Manual Fig. 10-10 2) Stiffener plate thickness per Manual pp. 10-95	1) Connection geometry provisions per Manual Fig. 10-10 2) Stiffener plate thickness per Manual pp. 10-80 3) When required by the applicable building code, design for structural integrity per Spec Section B3.9 (b) and (c)

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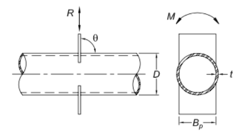
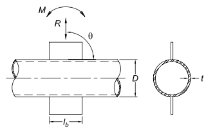
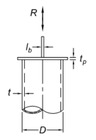
LIMIT STATE TABLE: CONNECTION AVAILABLE STRENGTH

AXIAL | Plate-to-Round HSS Connections

LIMIT STATE TABLE: CONNECTION AVAILABLE STRENGTH								
Element	Limit State		AXIAL LOAD PERPENDICULAR TO HSS LONGITUDINAL AXIS					
			Plate-to-Round HSS Connections					
			Transverse Plate T- and Cross-Connections		Longitudinal Plate T-, Y-, and Cross-Connections		Cap Plate Connections	
								
	AISC Specification and Manual References		AISC 360-10 and 14th Ed. Manual	AISC 360-16 and 15th Ed. Manual	AISC 360-10 and 14th Ed. Manual	AISC 360-16 and 15th Ed. Manual	AISC 360-10 and 14th Ed. Manual	AISC 360-16 and 15th Ed. Manual
	ROW NO. / COL NO.		A	B	C	D	E	F
Plate	1	Out-of-Plane Plate Bending	Table K1.1 top line right side (no equation number) Subject to limits in Table K1.1A	Spec Eq. (K2-1b) in Table K2.1 Subject to limits in Table K2.1A	–	–	–	–
	2	In-Plane Plate Bending	–	–	Table K1.1 second line right side (no equation number) Subject to limits in Table K1.1A	Spec Eq. (K2-2b) in Table K2.1 Subject to the limits in Table K2.1A	–	–
	3	Local Tension Yielding of Stem Plate	Spec Eq. (J4-1)		Spec Eq. (J4-1)		Spec Eq. (J4-1)	
	4	Local Compression Yielding and Buckling of Stem Plate	Spec Eq. (J4-6)		Spec Eq. (J4-6)		Spec Eq. (J4-6)	
HSS Column	5	Connection End Distance	See Note 3	Spec Table K2.1A	See Note 3	Spec Table K2.1A	–	–
	6	HSS Local Yielding	Spec Eq. (K1-1) in Table K1.1 Subject to limits of K1.1A	Spec Eq. (K2-1A) in Table K2.1 Subject to the limits of K2.1A	–	–	Spec Eq. (K1-4) in Table K1.1 Subject to the limits of K1.1A	If $(5t_b + b) < D$ Spec Eq. (J10-2): $k = t_p$ (Commentary for Section K2.3 pp. 16.1-467 thru 468 and Figure C-K2.2) $F_y = F_y$ of HSS $l_b = b$ (transverse plate thk) $t_w = t_{des}$ R_n shall be doubled for 2 HSS sidewalls If $(5t_p + b) \geq D$: Spec Eq. (J4-1): F_y and A_g of HSS
	7	Local Yielding of HSS Sidewalls	–	–	–	–	See HSS Local Yielding limit state above	See HSS Local Yielding limit state above
HSS Column	8	Plastification of the HSS Chord Connecting Face	–	–	Spec Eq. (K1-2) in Table K1.1 Subject to the limits of K1.1A	Spec Eq. (K2-2A) in Table K2.1 Subject to the limits of K2.1A	–	–
	9	Shear Yielding (Punching) of the HSS Chord Connecting Face	–	–	–	–	–	–
HSS Column	10	Local Crippling/Buckling of HSS Sidewalls	–	–	–	–	Local crippling of HSS sidewalls is likely not to govern over HSS local yielding for practical connections per DG24 Section 7.4	
	Additional Provisions		–	–	–	–	–	–

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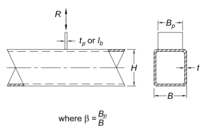
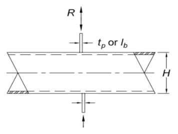
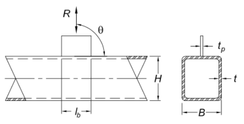
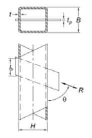
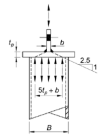
LIMIT STATE TABLE: CONNECTION AVAILABLE STRENGTH

AXIAL | Plate-to-Rectangular HSS Connections

			LIMIT STATE TABLE: CONNECTION AVAILABLE STRENGTH									
Element		Limit State	AXIAL LOAD PERPENDICULAR TO HSS LONGITUDINAL AXIS									
			Plate-to-Rectangular HSS Connections									
			Transverse Plate T-Connections		Transverse Plate Cross-Connections		Longitudinal Plate T-, Y- and Cross-Connections		Longitudinal Through Plate T- and Y-Connections		Cap Plate Connections	
												
	AISC Specification and Manual References		AISC 360-10 and 14th Ed. Manual	AISC 360-16 and 15th Ed. Manual	AISC 360-10 and 14th Ed. Manual	AISC 360-16 and 15th Ed. Manual	AISC 360-10 and 14th Ed. Manual	AISC 360-16 and 15th Ed. Manual	AISC 360-10 and 14th Ed. Manual	AISC 360-16 and 15th Ed. Manual	AISC 360-10 and 14th Ed. Manual	AISC 360-16 and 15th Ed. Manual
	ROW NO. / COL NO.		G	H	J	K	L	M	N	O	P	Q
Plate	1	Out-of-Plane Plate Bending	–	–	–	–	–	–	–	–	–	–
	2	In-Plane Plate Bending	–	–	–	–	–	–	–	–	–	–
	3	Local Tension Yielding of Stem Plate	Spec Eq. (K1-7) in Table K1.2 Subject to the limits in Table K1.2A	Spec. Eq. (J4-1): $A_g = B_e t_p$ with B_e per Spec Eq. (K1-1)	Spec Eq. (K1-7)	Spec. Eq. (J4-1): $A_g = B_e t_p$ with B_e per Spec Eq. (K1-1)	Spec Eq. (J4-1)		Spec Eq. (J4-1)		Spec Eq. (J4-1)	
	4	Local Compression Yielding and Buckling of Stem Plate	Spec Eq. (K1-7) in Table K1.2 Subject to the limits in Table K1.2A	Spec. Eq. (J4-6): $A_g = B_e t_p$ with B_e per Spec Eq. (K1-1)	Spec Eq. (K1-7)	Spec. Eq. (J4-6): $A_g = B_e t_p$ with B_e per Spec Eq. (K1-1)	Spec Eq. (J4-6)		Spec Eq. (J4-6)		Spec Eq. (J4-6)	
	5	Connection End Distance	See Note 3		See Note 3		See Note 3		See Note 3		–	–
HSS Column	6	HSS Local Yielding	–	–	–	–	–	–	–	–	Spec Eq. (K1-14) in Table K1.2 Subject to the limits of K1.2A	If $(5t_b+b) < B$: Spec Eq. (J10-2): $k = t_p$ (Commentary for section K2.3 pp. 16.1-467 thru 468 and Figure C-K2.2) $F_y = F_y$ of HSS $l_b = b$ (transverse plate thk) $t_w = t_{des}$ R_n shall be doubled for 2 HSS sidewalls If $(5t_b+b) > B$: Spec Eq. (J4-1): F_y and A_g of HSS See Note 6
	7	Local Yielding of HSS Sidewalls	Spec Eq. (K1-9) in Table K1.2 Subject to the limits in Table K1.2A	For connections greater than d from HSS member end, Spec Eq. (J10-2): $F_{yw} = F_y$ of HSS $t_w = 2 * t_{des}$ $l_b = t_p$ k = corner radius $\geq$ 1.5 * t_{des} For connections less than d from HSS member end, use Spec Eq. (J10-3)	Spec Eq. (K1-9) in Table K1.2 Subject to the limits in Table K1.2A	For connections greater than d from HSS member end, Spec Eq. (J10-2): $F_{yw} = F_y$ of HSS $t_w = 2 * t_{des}$ $l_b = t_p$ k = corner radius $\geq$ 1.5 * t_{des} For connections less than d from HSS member end, use Spec Eq. (J10-3)	–	–	–	–	See HSS Local Yielding limit state above	See HSS Local Yielding limit state above
HSS Column	8	Plastification of the HSS Chord Connecting Face	Note: Not listed as it was perceived as non-governing (unless major compression load exists in the HSS) To perform this check, Spec Eq. (K2-7) can be used: $t = t_{des}$ (HSS wall thk) $\beta = B_b / B$ where $B_b = B_p$ (trans plate width) B = B (HSS width) $\eta = l_b / B$ where $l_b = t_p$ (trans plate thk)	Spec Section J10.10, J4.5, and Manual Eq. (9-30): T = B $L = t_p$ (trans plate thk) $t_p = t_{des}$ (HSS wall thk) $c = B_p$ $a = b = (B-B_p) / 2$ Q_f per Spec Eq. (K2-3) with B/t < 30 per Manual page 9-15 $\phi = 1.00$, $\Omega = 1.50$ Where connection is applied at a distance from the HSS member end less than as specified for Manual Eq. (9-30), R_n shall be reduced by 50%	Note: Not listed as it was perceived as non-governing (unless major compression load exists in the HSS) To perform this check, Spec Eq. (K2-7) can be used: $t = t_{des}$ (HSS wall thk) $\beta = B_b / B$ where $B_b = B_p$ (trans plate width) B = B (HSS width) $h = l_b / B$ where $l_b = t_p$ (trans plate thk)	Spec Section J10.10, J4.5, and Manual Eq. (9-30): T = B $L = t_p$ (trans plate thk) $t_p = t_{des}$ (HSS wall thk) $c = B_p$ $a = b = (B-B_p) / 2$ Q_f per Spec Eq. (K2-3) with B/t < 30 per Manual page 9-15 $\phi = 1.00$, $\Omega = 1.50$ Where connection is applied at a distance from the HSS member end less than as specified for Manual Eq. (9-30), R_n shall be reduced by 50%	Spec Eq. (K1-12) in Table K1.2 Subject to limits in Table K1.2A	Spec Section J10.10, J4.5, and Manual Eq. (9-30): T = B $c = t_p$ $a = b = (B-t_p) / 2$ $L = l_b$ Q_f per Spec Eq. (K2-3) with B/t < 30 per Manual page 9-15 $\phi = 1.00$, $\Omega = 1.50$ Where connection is applied at a distance from the HSS member end less than as specified for Manual Eq. (9-30), R_n shall be reduced by 50%	Spec Eq. (K1-13) in Table K1.2 Subject to limits in Table K1.2A	Spec Section J10.10, J4.5, and Manual Eq. (9-30): T = B $c = t_p$ $a = b = (B-t_p) / 2$ $L = l_b$ Q_f per Spec Eq. (K2-3) with B/t < 30 per Manual page 9-15 R_n shall be doubled for 2 HSS sidewalls $\phi = 1.00$, $\Omega = 1.50$ Where connection is applied at a distance from the HSS member end less than as specified for Manual Eq. (9-30), R_n shall be reduced by 50%	–	–
	9	Shear Yielding (Punching) of the HSS Chord Connecting Face	Spec Eq. (K1-8) in Table K1.2 Subject to the limits in Table K1.2A	Spec Section J10.10 and Manual Eq. (9-29): $t_p = t_{des}$ (HSS) $F_y = F_y$ of HSS $c_{eff} = B_e$ Spec Eq. (K1-1) but deleting the $(F_y t/F_{yb} t_b)$ term (See Note 8) $L = t_p$ (plate) $\phi = 0.95$, $\Omega = 1.58$ Where connection is applied at a distance from the HSS member end less than [B*sqrt (1-β)], R_n shall be reduced by 50%. See Note 3	Spec Eq. (K1-8) in Table K1.2 Subject to the limits in Table K1.2A	Spec Section J10.10 and Manual Eq. (9-29): $t_p = t_{des}$ (HSS) $F_y = F_y$ of HSS $c_{eff} = B_e$ Spec Eq. (K1-1) but deleting the $(F_y t/F_{yb} t_b)$ term (See Note 8) $L = t_p$ (plate) $\phi = 0.95$, $\Omega = 1.58$ Where connection is applied at a distance from the HSS member end less than [B*sqrt (1-β)], R_n shall be reduced by 50%. See Note 3	–	–	–	–	–	–
HSS Column	10	Local Crippling/Buckling of HSS Sidewalls	Spec Eq. (K1-10) in Table K1.2 Subject to the limits in Table K1.2A	Spec Eq. (J10-4) $F_{yw} = F_y$ of HSS $t_w = t_f = t_{des}$ $d = H-3t_{des}$ $l_b = t_p$ R_n shall be doubled for 2 HSS sidewalls Tension: $Q_f = 1.0$ Compression: Q_f per Spec Eq (K3-14) Table K3.2 Where connection is applied at a distance from the HSS member end less than H/2, use Eqn (J10-5a)	Spec Eq. (K1-11) in Table K1.2 Subject to the limits in Table K1.2A	Spec Eq. (J10-8) $F_{yw} = F_y$ of HSS $t_w = t_{des}$ $h = H-3t_{des}$ R_n shall be doubled for 2 HSS sidewalls Tension: $Q_f = 1.0$ Compression: Q_f per Spec Eq (K3-14) Table K3.2 Where connection is applied at a distance from the HSS member end less than H/2, R_n shall be reduced by 50%	–	–	–	–	Spec Eq. (K1-15) in Table K1.2 Subject to the limits in Table K1.2A	Spec Eq. (J10-4) $F_{yw} = F_y$ of HSS $t_w = t_{des}$ (HSS wall thk) $t_f = t_p$ (cap plate thk) l_b = transverse plate thk d = B / 2 R_n shall be doubled for 2 HSS sidewalls Q_f is omitted If $(5t_p + b) > B$: Spec Eq. (J4-1): F_y and A_g of HSS See Note 6
	Additional Provisions		–	If the width of the transverse plate exceeds the width of the HSS member (not recommended), then the maximum plate width that can be used in calculations is $B_p = B$ and $\beta_{max} = 1.0$	–	If the width of the transverse plate exceeds the width of the HSS member (not recommended), then the maximum plate width that can be used in calculations is $B_p = B$ and $\beta_{max} = 1.0$	If a shear load is also applied parallel to the longitudinal axis of the HSS section, refer to the Shear Table Single Plate connection for corresponding limit states		–	–	–	–

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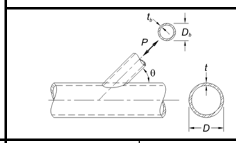
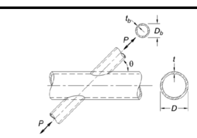
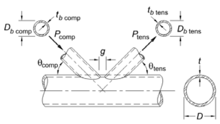
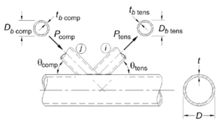
LIMIT STATE TABLE: CONNECTION AVAILABLE STRENGTH

TRUSS | Round HSS-to-HSS Truss Connections

LIMIT STATE TABLE: CONNECTION AVAILABLE STRENGTH									
		HSS-TO-HSS TRUSS CONNECTIONS							
Limit State		ROUND HSS-TO-HSS TRUSS CONNECTIONS							
		T- and Y-Connections		Cross-Connections		K-Connections with Gap		K-Connections with Overlap	
									
AISC Specification and Manual References		AISC 360-10 and 14th Ed. Manual	AISC 360-16 and 15th Ed. Manual	AISC 360-10 and 14th Ed. Manual	AISC 360-16 and 15th Ed. Manual	AISC 360-10 and 14th Ed. Manual	AISC 360-16 and 15th Ed. Manual	AISC 360-10 and 14th Ed. Manual	AISC 360-16 and 15th Ed. Manual
NO. ROW COL NO.		A	B	C	D	E	F	G	H
1	**Plastification of the HSS Chord Connecting Face**	Spec Eq. (K2-2) Table K2.1 Subject to limits in Table K2.1A	Spec Eq. (K3-2) Table K3.1 Subject to limits in Table K3.1A	Spec Eq. (K2-3) Table K2.1 Subject to limits in Table K2.1A	Spec Eq. (K3-3) Table K3.1 Subject to limits in Table K3.1A	Spec Eq. (K2-4) and (K2-5) Table K2.1 Subject to limits in Table K2.1A	Spec Eq. (K3-4) and (K3-5) Table K3.1 Subject to limits in Table K3.1A	Spec Eq. (K2-4) and (K2-5) Table K2.1 Subject to limits in Table K2.1A	Spec Eq. (K3-4) and (K3-5) Table K3.1 Subject to limits in Table K3.1A
2	**Shear Yielding (Punching) of the HSS Chord Connecting Face**	For $D_b < (D-2t)$: Spec Eq. (K2-1) Table K2.1 Subject to limits in Table K2.1A	For $D_b < (D-2t)$: Spec Eq. (K3-1) Table K3.1 Subject to limits in Table K3.1A	For $D_b < (D-2t)$: Spec Eq. (K2-1) Table K2.1 Subject to limits in Table K2.1A	For $D_b < (D-2t)$: Spec Eq. (K3-1) Table K3.1 Subject to limits in Table K3.1A	For $D_b < (D-2t)$: Spec Eq. (K2-1) Table K2.1 Subject to limits in Table K2.1A	For $D_b < (D-2t)$: Spec Eq. (K3-1) Table K3.1 Subject to limits in Table K3.1A	–	–
3	**Local Yielding of HSS Chord**	–	–	–	–	–	–	–	–
4	**Local Crippling of HSS Chord**	–	–	–	–	–	–	–	–
5	**Local Buckling of HSS Chord**	–	–	–	–	–	–	–	–
6	**Local Yielding of HSS Branch(es) Due to Uneven Load Distribution**	–	–	–	–	–	–	–	–
7	**Shear Yielding of HSS Chord**	–	–	–	See Note 7	–	See Note 7	–	–

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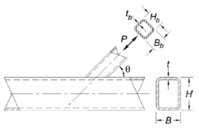
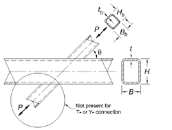
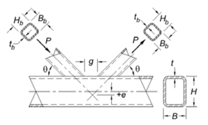
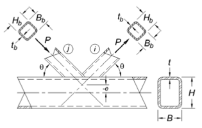
LIMIT STATE TABLE: CONNECTION AVAILABLE STRENGTH

TRUSS | Rectangular HSS-to-HSS Truss Connections

		LIMIT STATE TABLE: CONNECTION AVAILABLE STRENGTH							
		HSS-TO-HSS TRUSS CONNECTIONS							
		RECTANGULAR HSS-TO-HSS TRUSS CONNECTIONS							
Limit State		T- and Y- Connections		Cross Connections		Gapped K-Connections		Overlapped K-Connections	
									
AISC Specification and Manual References		AISC 360-10 and 14th Ed. Manual	AISC 360-16 and 15th Ed. Manual	AISC 360-10 and 14th Ed. Manual	AISC 360-16 and 15th Ed. Manual	AISC 360-10 and 14th Ed. Manual	AISC 360-16 and 15th Ed. Manual	AISC 360-10 and 14th Ed. Manual	AISC 360-16 and 15th Ed. Manual
ROW NO. COL NO.		I	J	K	L	M	N	P	Q
1	**Plastification of the HSS Chord Connecting Face**	When $\beta \leq 0.85$: Spec Eq. (K2-7) Table K2.2 Subject to limits in Table K2.2A	Spec Section J10.10, J4.5, and Manual Eq. (9-30): $R_n = P_n \sin\theta$ $T = B$ $c = B_b$ $a = b = (B-B_b) / 2$ $L = l_b = H_b / \sin\theta$ Q_f per Spec Eq. (K2-3) with $B/t < 30$ per Manual page 9-15 Where connection is applied close to the HSS member end per Eq. (9-30), R_n shall be reduced by 50%	When $\beta \leq 0.85$: Spec Eq. (K2-7) Table K2.2 Subject to limits in Table K2.2A	Spec Section J10.10, J4.5, and Manual Eq. (9-30): $R_n = P_n \sin\theta$ $T = B$ $c = B_b$ $a = b = (B-B_b) / 2$ $L = l_b = H_b / \sin\theta$ Q_f per Spec Eq. (K2-3) with $B/t < 30$ per Manual page 9-15 Where connection is applied close to the HSS member end per Eq. (9-30), R_n shall be reduced by 50%	Spec. Eq. (K2-14) Table K2.2 Subject to limits in Table K2.2A	Spec. Eq. (K3-7) Table K3.2 Subject to limits in Table K3.2A	–	–
2	**Shear Yielding (Punching) of the HSS Chord Connecting Face**	For $0.85 < \beta \leq 1\text{-}1/\gamma$ or $B/t < 10$: Spec Eq. (K2-8) Table K2.2 Subject to limits in Table K2.2A	Spec Section J10.10 and Manual Eq. (9-29) $R_n = P_n \sin\theta$ $t_p = t_{des}$ of chord $F_y = F_y$ of chord $L = H_b / \sin\theta$ $c_{eff} = B_e$ Spec Eq. (K1-1) but deleting the $(F_y t/F_{yb} t_b)$ term (See Note 8) $\phi = 0.95$, $\Omega = 1.58$ Where connection is applied at a distance from the HSS member end less than [B*sqrt (1-β)], R_n shall be reduced by 50%. See Note 3	For $0.85 < \beta \leq 1\text{-}1/\gamma$ or $B/t < 10$: Spec Eq. (K2-8) Table K2.2 Subject to limits in Table K2.2A	Spec Section J10.10 and Manual Eq. (9-29) $R_n = P_n \sin\theta$ $t_p = t_{des}$ of chord $F_y = F_y$ of chord $L = H_b / \sin\theta$ $c_{eff} = B_e$ Spec Eq. (K1-1) but deleting the $(F_y t/F_{yb} t_b)$ term (See Note 8) $\phi = 0.95$, $\Omega = 1.58$ Where connection is applied at a distance from the HSS member end less than [B*sqrt (1-β)], R_n shall be reduced by 50% See Note 3	When $B_b < B\text{-}2t$: Spec. Eq. (K2-15) Table K2.2 Subject to limits in Table K2.2A No need to check for square branches	When $B_b < B\text{-}2t$: Spec. Eq. (K3-8) Table K3.2 Subject to limits in Table K3.2A No need to check for square branches	–	–
3	**Local Yielding of HSS Chord Sidewalls**	When $\beta = 1.0$: Spec Eq. (K2-9) Table K2.2 Subject to limits in Table K2.2A	For connections greater than d from HSS member end, Spec Eq. (J10-2): $R_n = P_n \sin\theta$ $t_w = 2 * t_{des}$ $l_b = H_b / \sin\theta$ k = corner radius ≥ $1.5 * t_{des}$ For connections less than d from HSS member end, use Spec Eq. (J10-3)	When $\beta = 1.0$: Spec Eq. (K2-9) Table K2.2 Subject to limits in Table K2.2A	For connections greater than d from HSS member end, Spec Eq. (J10-2): $R_n = P_n \sin\theta$ $t_w = 2 * t_{des}$ $l_b = H_b / \sin\theta$ k = corner radius ≥ $1.5 * t_{des}$ For connections less than d from HSS member end, use Spec Eq. (J10-3)	–	–	–	–
4	**Local Crippling of HSS Chord Sidewalls**	When $\beta = 1.0$: Spec Eq. (K2-10) Table K2.2 Subject to limits in Table K2.2A	Spec Eq. (J10-4): $R_n = P_n \sin\theta$ $t_w = t_f = t_{des}$ $l_b = H_b / \sin\theta$ $d = H - 3t_{des}$ R_n shall be doubled for 2 HSS sidewalls Tension: $Q_f = 1.0$ Compression: Q_f per Spec Eq (K3-14) Table K3.2 Where connection is applied at a distance from the HSS member end less than H/2, use Eqn (J10-5a)	When $\beta = 1.0$: Spec Eq. (K2-11) Table K2.2 Subject to limits in Table K2.2A	Spec Eq. (J10-4): $R_n = P_n \sin\theta$ $t_w = t_f = t_{des}$ $l_b = H_b / \sin\theta$ $d = H - 3t_{des}$ R_n shall be doubled for 2 HSS sidewalls Tension: $Q_f = 1.0$ Compression: Q_f per Spec Eq (K3-14) Table K3.2 Where connection is applied at a distance from the HSS member end less than H/2, use Eqn (J10-5a)	–	–	–	–
5	**Local Buckling of HSS Chord Sidewalls**	–	–	Not listed as it was perceived as non-governing	Spec Eq. (J10-8): $R_n = P_n \sin\theta$ $t_w = t_{des}$ $h = H - 3t_{des}$ R_n shall be doubled for 2 HSS sidewalls Where connection is applied at a distance from the HSS member end less than H/2, R_n shall be reduced by 50%	–	–	–	–
6	**Local Yielding of HSS Branch(es) Due to Uneven Load Distribution**	When $\beta > 0.85$: Spec Eq. (K2-12) Table K2.2 Subject to limits in Table K2.2A	Spec. Eq. J4-1 using B_e per Spec Eqn. (K1-1): $A_g = t_b(2H_b+2B_e - 4t_b)$	When $\beta > 0.85$: Spec Eq. (K2-12) Table K2.2 Subject to limits in Table K2.2A	Spec. Eq. (J4-1) using B_e per Spec Eqn. (K1-1): $A_g = t_b(2H_b+2B_e - 4t_b)$	Spec. Eq. (K2-16) Table K2.2 Subject to limits in Table K2.2A No need to check for square branches or if $B/t \geq 15$	Spec. Eq. (K3-9) Table K3.2 Subject to limits in Table K3.2A No need to check for square branches or if $B/t \geq 15$	Spec. Eq. (K2-17) to (K2-22) Table K2.2 Subject to limits in Table K2.2A	Spec. Eq. (K3-10) to (K3-13) Table K3.2 B_{ei} is the effective width of the overlapping branch '*i*' when the heel of the overlapping transverse branch wall lands on the surface of the chord. $B_{ei} = \frac{10}{B/t}\left(\frac{F_y t}{F_{ybi} t_{bi}}\right) B_{bi} \leq B_{bi}$ B_{ej} is the effective width of the overlapped branch '*j*' when the heel of the overlapping transverse branch wall lands on the surface of the overlapped branch. See B_{ej} equation below. $B_{ej} = \frac{10}{B_{bj}/t_{bj}}\left(\frac{F_{ybj} t_{bj}}{F_{ybi} t_{bi}}\right) B_{bi} \leq B_{bi}$ Subject to limits in Table K3.2A
7	**Shear Yielding of HSS Chord Sidewall**	–	–	For θ < 90 degrees and in Projected Gap Region: Spec Section G5 and Eq. (G2-1): $V_n = P_n \sin\theta$ $A_w = 2ht_{des}$ $h = H - 3t_{des}$ C_v per Sect G2.1.b with $k_v = 5$ Subject to limits in Table K2.2A	In Projected Gap Region Between Inclined Branches, where $\cos\theta > H_b/H$: Spec Eq. (G4-1): $V_n = P_n \sin\theta$ $A_w = 2ht_{des}$ $h = H - 3t_{des}$ C_{v2} per Sect G2.2 with $h/t_w = H/t_{des}$, $k_v = 5$ See Note 7	In the Gap Region: Spec Section G5 and Eq. (G2-1): $V_n = P_n \sin\theta$ $A_w = 2ht_{des}$ $h = H - 3t_{des}$ C_v per Sect G2.1.b with $k_v = 5$ Subject to limits in Table K2.2A Check not necessary for square chords	In the Gap Region: Spec Eq. (G4-1): $V_n = P_n \sin\theta$ $A_w = 2ht_{des}$ $h = H - 3t_{des}$ C_{v2} per Sect G2.2 with $h/t_w = H/t_{des}$, $k_v = 5$ Subject to limits in Table K3.2A Check not necessary for square chords. See Note 7	–	–

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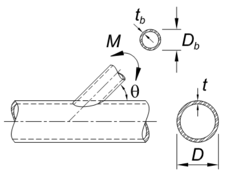
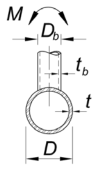
LIMIT STATE TABLE: CONNECTION AVAILABLE STRENGTH

MOMENT | Round HSS-to-HSS Moment Connections

LIMIT STATE TABLE: CONNECTION AVAILABLE STRENGTH

HSS-TO-HSS MOMENT CONNECTIONS

ROUND HSS-TO-HSS MOMENT CONNECTIONS

Limit State		Branch(es) Under In-Plane Bending T-, Y-, and Cross Connections		Branch(es) Under Out-of-Plane Bending T-, Y-, and Cross Connections	
					
AISC Specification and Manual References		AISC 360-10 and 14th Ed. Manual	AISC 360-16 and 15th Ed. Manual	AISC 360-10 and 14th Ed. Manual	AISC 360-16 and 15th Ed. Manual
ROW NO. / COL NO.		A	B	C	D
1	Plastification of the HSS Chord Connecting Face	Spec Eq. (K3-1) Table K3.1 Subject to limits in Table K3.1A	Spec Eq. (K4-1) Table K4.1 Subject to limits in Table K4.1A	Spec Eq. (K3-3) Table K3.1 Subject to limits in Table K3.1A	Spec Eq. (K4-3) Table K4.1 Subject to limits in Table K4.1A
2	Shear Yielding (Punching) of the HSS Chord Connecting Face	Spec Eq. (K3-2) when $D_b < (D-2t)$ Table K3.1 Subject to limits in Table K3.1A	Spec Eq. (K4-2) when $D_b < (D-2t)$ Table K4.1 Subject to limits in Table K4.1A	Spec Eq. (K3-4) when $D_b < (D-2t)$ Table K3.1 Subject to limits in Table K3.1A	Spec Eq. (K4-4) when $D_b < (D-2t)$ Table K4.1 Subject to limits in Table K4.1A
3	Local Yielding of HSS Chord	–	–	–	–
4	Local Crippling of HSS Chord	–	–	–	–
5	Local Buckling of HSS Chord	–	–	–	–
6	Local Yielding of Branch/Branches Due to Uneven Load Distribution	–	–	–	–
7	Chord Distortional Failure at T- and Unbalanced Cross-Connections	–	–	–	–

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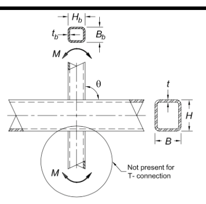
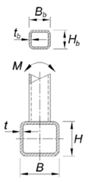
LIMIT STATE TABLE: CONNECTION AVAILABLE STRENGTH

MOMENT | Rectangular HSS-to-HSS Moment Connections

Limit State		LIMIT STATE TABLE: CONNECTION AVAILABLE STRENGTH			
		HSS-TO-HSS MOMENT CONNECTIONS			
		RECTANGULAR HSS-TO-HSS MOMENT CONNECTIONS			
		Branch(es) Under In-Plane Bending T- and Cross Connections		Branch(es) Under Out-of-Plane Bending T- and Cross Connections	
					
AISC Specification and Manual References		AISC 360-10 and 14th Ed. Manual	AISC 360-16 and 15th Ed. Manual	AISC 360-10 and 14th Ed. Manual	AISC 360-16 and 15th Ed. Manual
ROW NO. COL NO.		E	F	G	H
1	**Plastification of the HSS Chord Connecting Face**	Spec Eq. (K3-6) when $\beta < 0.85$ Table K̄3.2 Subject to limits in Table K3.2A	Spec Section J10.10, J4.5, and Manual Eq. (9-32): $t = t_{des}$ of HSS chord $T = B$ $L = H_b / \sin\theta$ $c = B_b$ $F_y = F_y$ of HSS chord Q_f per Spec Eq. (K2-3) with $B/t < 30$ per Manual page 9-15 $\phi = 1.00$ $\Omega = 1.50$ Where connection is applied at a distance from the HSS member end less than [B*sqrt (1-β)], M_n shall be reduced by 50% See Note 3 See Note 9 for STI Technical Paper No. 2, Equation (1) showing an alternate derivation based on virtual work and virtual rotation	Spec Eq. (K3-9) when $\beta < 0.85$ Table K̄3.2 Subject to limits in Table K3.2A	Spec Section J10.10, J4.5, Manual Eq. (9-34), and Manual Eq. (9-36): $t = t_{des}$ of HSS chord $T = B$ $L = H_b / \sin\theta$ $a = b = (B-B_b)/2$ $c = B_b$ Q_f per Spec Eq. (K2-3) with $B/t < 30$ per Manual page 9-15 $\phi = 1.00$ $\Omega = 1.50$ Where connection is applied at a distance from the HSS member end less than [B*sqrt (1-β)] , M_n shall be reduced by 50% See Note 3 See Note 9 for STI Technical Paper No. 2, Equation (6) showing an alternate derivation based on virtual work and virtual rotation
2	**Shear Yielding (Punching) of the HSS Chord Connecting Face**	–	$M_{n\text{-}ip} = \frac{0.6F_y tH_b}{\sin\theta}\left(\frac{H_b}{2\sin\theta} + B_{ep}\right)$ $B_{ep} = (10/(B/t))\,B_b < B_b$ $\phi = 0.95$, $\Omega = 1.58$ See Note 9 for STI Technical Paper No. 2, Equation (2)	–	$M_{n\text{-}op} = \frac{0.6F_y tH_b}{\sin\theta}\left(\frac{H_b}{2\sin\theta} + B_{ep}\right)$ $B_{ep} = (10/(B/t))\,B_b < B_b$ $\phi = 0.95$, $\Omega = 1.58$ See Note 9 for STI Technical Paper No. 2, Equation (7)
3	**Local Yielding of HSS Chord Sidewalls**	Spec Eq. (K3-7) when $\beta > 0.85$ Table K3.2 Subject to limits in Table K3.2A	Spec Section J10.2 Where $l_{end} > H$: Use Eq. (J10-2) Where $l_{end} < H$: Use Eq. (J10-3) To determine R_n: $t_w = t_{des}$ of HSS chord $k = t_{des}$ of HSS chord $l_b = H_b$ $F_y = F_y$ of HSS chord for T-Conns $F_y = 0.8F_y$ of HSS chord for Cross-Conns $R_n = F_y t[L_b + 5k]$ for $l_{end} > H$ $R_n = F_y t[L_b + 2.5k]$ for $l_{end} < H$ To determine M_n: Moment arm = $0.5(H_b + 5k)$ for $l_{end} > H$ Moment arm = $0.5(H_b + 2.5k)$ for $l_{end} < H$ $M_n = R_n$ *Moment arm $\phi = 1.00$ $\Omega = 1.50$ See Note 5	Spec Eq. (K3-10) when $\beta > 0.85$ Table K3.2 Subject to limits in Table K3.2A	Spec Section J10.2 Where $l_{end} > H$: Use Eq. (J10-2) Where $l_{end} < H$: Use Eq. (J10-3) To determine R_n: $t_w = t_{des}$ of HSS chord $k = t_{des}$ of HSS chord $l_b = H_b$ $F_y = F_y$ of HSS chord for T-Conns $F_y = 0.8F_y$ of HSS chord for Cross-Conns $R_n = F_y t[L_b + 5k]$ for $l_{end} > H$ $R_n = F_y t[L_b + 2.5k]$ for $l_{end} < H$ To determine M_n: Moment arm = $(B-t)$ $M_n = R_n$ *Moment arm $\phi = 1.00$ $\Omega = 1.50$ See Note 5
4	**Local Crippling of HSS Chord Sidewalls**	–	–	–	–
5	**Local Buckling of HSS Chord Sidewalls**	Not listed as it was perceived as non-governing	For Cross-Connections and Matched Width Ratios ($B = B_b$) Only Utilize Local Yielding of Sidewalls equation per Limit State Table Cell F3 $F_y^* = 0.8F_y$	Not listed as it was perceived as non-governing	For Cross-Connections and Matched Width Ratios ($B = B_b$) Only Utilize Local Yielding of Sidewalls equation per Limit State Table Cell H3 $F_y^* = 0.8F_y$
6	**Local Yielding of Branch/Branches Due to Uneven Load Distribution**	Spec Eq. (K3-8) when $\beta > 0.85$ Table K3.2 Subject to limits in Table K3.2A	Spec Eq. (F7-1) $F_y = F_{yb}$ $Z = Z_{net}$ based on the effective widths of the two transverse HSS branch walls per Eq (K1-1) $\phi = 0.95$, $\Omega =$ 1.58 See Note 5 See Note 9 for STI Technical Paper No. 2, Equation (5) showing an alternate derivation based on virtual work and virtual rotation	Spec Eq. (K3-11) when $\beta > 0.85$ Table K3.2 Subject to limits in Table K3.2A	Spec Eq. (F7-1) $F_y = F_{yb}$ $Z = Z_{net}$ based on the effective widths of the two transverse HSS branch walls per Eq (K1-1) $\phi = 0.95$, $\Omega = 1.58$ See Note 5 See Note 9 for STI Technical Paper No. 2, Equation (8) showing an alternate derivation based on virtual work and virtual rotation
7	**Chord Distortional Failure at T- and Unbalanced Cross-Connections**	–	–	Spec Eq. (K3-12) Table K3.2 Subject to limits in Table K3.2A	Spec Eq. (K4-7) Table K4.2 Subject to limits in Table K4.2A

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