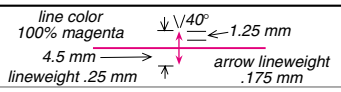
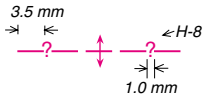
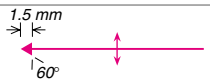
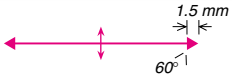
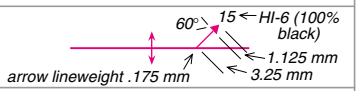
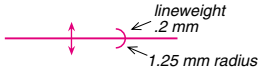
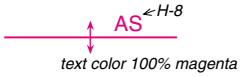
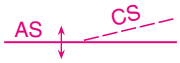
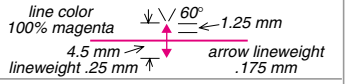
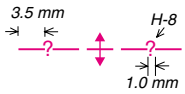
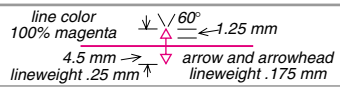
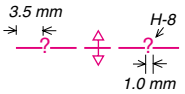
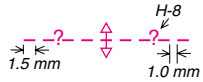
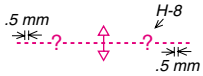
5—FOLDS

REF NO	DESCRIPTION	SYMBOL	CARTOGRAPHIC SPECIFICATIONS	NOTES ON USAGE
	5.1—Anticlines; antiforms			
5.1.1	Anticline—Certain			Place arrows perpendicular to fold trace to indicate general character of fold segment; do not place at specific locality where observation was made. Preferred usage is to show trace of axial surface of fold, not crest or trough; if the latter are shown instead, specify in symbol explanation. For folds that have near-vertical axial surfaces, trace of axial surface is independent of topography. May also be shown in black or other colors.
5.1.2	Anticline—Approximately located			
5.1.3	Anticline—Approximately located, queried			
5.1.4	Anticline—Inferred			
5.1.5	Anticline—Inferred, queried			
5.1.6	Anticline—Concealed			
5.1.7	Anticline—Concealed, queried			
5.1.8	Anticline—Showing name			Although only shown on anticlines, symbol ornamentation may be added to any type of fold trace. Plunge arrowheads indicate general direction of plunge only; do not add plunge angle. Plunge arrowheads may also be placed within fold trace. If trace of axial surface differs significantly from real plunge direction because of the topography and (or) character of fold, show direction and plunge as separate arrow placed along fold trace. Label both axial surface and crest and trough lines if both are shown on one map. May also be shown in black or other colors.
5.1.9	Plunging anticline—Showing direction of plunge			
5.1.10	Doubly plunging anticline			
5.1.11	Anticline—Showing direction and plunge of fold axis			
5.1.12	Anticline—Showing direction of closure of near-vertical fold limbs			
5.1.13	Anticline—Axial surface (AS) of fold			
5.1.14	Anticline—Showing crest line (CS) of fold where it diverges from axial surface			
5.1.15	Anticline—Showing trough line (TS) of fold where it diverges from axial surface			

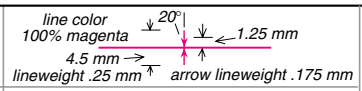
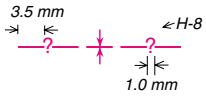
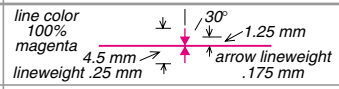
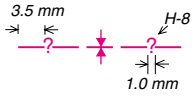
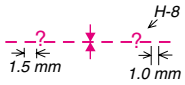
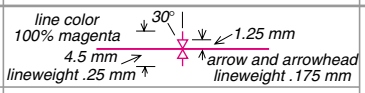
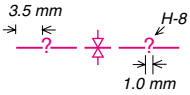
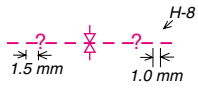
5—FOLDS (continued)

REF NO	DESCRIPTION	SYMBOL	CARTOGRAPHIC SPECIFICATIONS	NOTES ON USAGE
	5.1—Anticlines; antiforms (continued)			
5.1.16	Antiform, 1st type—Certain			Place arrows perpendicular to fold trace to indicate general character of fold segment; do not place at specific locality where observation was made. Preferred usage is to show trace of axial surface of fold, not crest or trough; if the latter are shown instead, specify in symbol explanation. For folds that have near-vertical axial surfaces, trace of axial surface is independent of topography. May also be shown in black or other colors.
5.1.17	Antiform, 1st type—Approximately located			
5.1.18	Antiform, 1st type—Approximately located, queried			
5.1.19	Antiform, 1st type—Inferred			
5.1.20	Antiform, 1st type—Inferred, queried			
5.1.21	Antiform, 1st type—Concealed			
5.1.22	Antiform, 1st type—Concealed, queried			
5.1.23	Antiform, 2nd type—Certain			Use to indicate another type or generation of antiform when more than one is shown on map. May also be shown in black or other colors.
5.1.24	Antiform, 2nd type—Approximately located			
5.1.25	Antiform, 2nd type—Approximately located, queried			
5.1.26	Antiform, 2nd type—Inferred			
5.1.27	Antiform, 2nd type—Inferred, queried			
5.1.28	Antiform, 2nd type—Concealed			
5.1.29	Antiform, 2nd type—Concealed, queried			

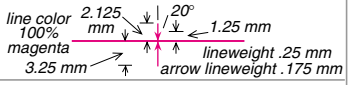
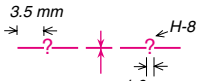
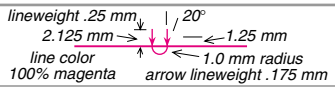
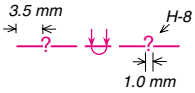
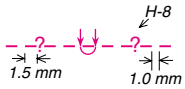
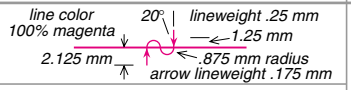
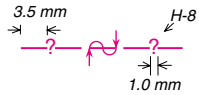
5—FOLDS (continued)

REF NO	DESCRIPTION	SYMBOL	CARTOGRAPHIC SPECIFICATIONS	NOTES ON USAGE
	5.2—Asymmetric, overturned, and inverted anticlines			
5.2.1	Asymmetric anticline—Certain		2.125 mm; 40°; lineweight .25 mm; 1.25 mm; 3.25 mm; arrow lineweight .175 mm; line color 100% magenta	Beds are upright; shorter arrow indicates steeper limb.
5.2.2	Asymmetric anticline—Approximately located		3.5 mm; H-8; 1.0 mm	Place arrows perpendicular to fold trace to indicate general character of fold segment; do not place at specific locality where observation was made.
5.2.3	Asymmetric anticline—Approximately located, queried			
5.2.4	Asymmetric anticline—Inferred		H-8; 1.5 mm; 1.0 mm	Preferred usage is to show trace of axial surface of fold, not crest or trough; if the latter are shown instead, specify in symbol explanation.
5.2.5	Asymmetric anticline—Inferred, queried			
5.2.6	Asymmetric anticline—Concealed		.5 mm; H-8; .5 mm	For folds having near-vertical axial surfaces, trace of axial surface is independent of topography.
5.2.7	Asymmetric anticline—Concealed, queried			May also be shown in black or other colors.
5.2.8	Overturned anticline—Certain		lineweight .25 mm; 40°; 2.125 mm; 1.25 mm; line color 100% magenta; 1.0 mm radius; arrow lineweight .175 mm	Beds on one limb are overturned; arrows show direction of dip of limbs.
5.2.9	Overturned anticline—Approximately located		3.5 mm; H-8; 1.0 mm	Place arrows perpendicular to fold trace to indicate general character of fold segment; do not place at specific locality where observation was made.
5.2.10	Overturned anticline—Approximately located, queried			
5.2.11	Overturned anticline—Inferred		H-8; 1.5 mm; 1.0 mm	Preferred usage is to show trace of axial surface of fold, not crest or trough; if the latter are shown instead, specify in symbol explanation.
5.2.12	Overturned anticline—Inferred, queried			
5.2.13	Overturned anticline—Concealed		.5 mm; H-8; .5 mm	For folds that have near-vertical axial surfaces, trace of axial surface is independent of topography.
5.2.14	Overturned anticline—Concealed, queried			May also be shown in black or other colors.
5.2.15	Inverted anticline—Certain		line color 100% magenta; 40°; 1.25 mm; 2.125 mm; .875 mm radius; lineweight .25 mm; arrow lineweight .175 mm	Beds on both limbs are overturned; arrows show direction of dip of limbs.
5.2.16	Inverted anticline—Approximately located		3.5 mm; H-8; 1.0 mm	Place arrows perpendicular to fold trace to indicate general character of fold segment; do not place at specific locality where observation was made.
5.2.17	Inverted anticline—Approximately located, queried			
5.2.18	Inverted anticline—Inferred		H-8; 1.5 mm; 1.0 mm	Preferred usage is to show trace of axial surface of fold, not crest or trough; if the latter are shown instead, specify in symbol explanation.
5.2.19	Inverted anticline—Inferred, queried			
5.2.20	Inverted anticline—Concealed		.5 mm; H-8; .5 mm	For folds that have near-vertical axial surfaces, trace of axial surface is independent of topography.
5.2.21	Inverted anticline—Concealed, queried			May also be shown in black or other colors.

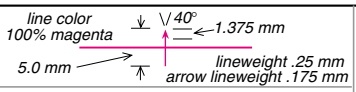
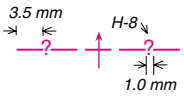
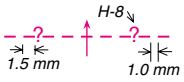
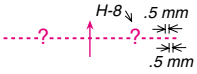
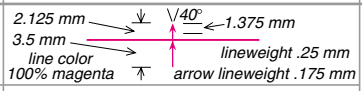
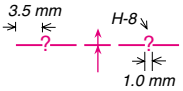
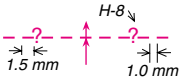
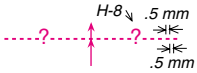
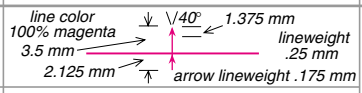
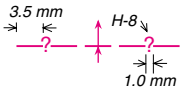
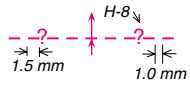
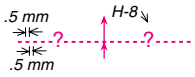
5—FOLDS (continued)

REF NO	DESCRIPTION	SYMBOL	CARTOGRAPHIC SPECIFICATIONS	NOTES ON USAGE
	5.3—Synclines; synforms			
5.3.1	Syncline—Certain			Place arrows perpendicular to fold trace to indicate general character of fold segment; do not place at specific locality where observation was made. Preferred usage is to show trace of axial surface of fold, not crest or trough; if the latter are shown instead, specify in symbol explanation. For folds that have near-vertical axial surfaces, trace of axial surface is independent of topography. May also be shown in black or other colors.
5.3.2	Syncline—Approximately located			
5.3.3	Syncline—Approximately located, queried			
5.3.4	Syncline—Inferred			
5.3.5	Syncline—Inferred, queried			
5.3.6	Syncline—Concealed			
5.3.7	Syncline—Concealed, queried			
5.3.8	Synform, 1st type—Certain			Place arrows perpendicular to fold trace to indicate general character of fold segment; do not place at specific locality where observation was made. Preferred usage is to show trace of axial surface of fold, not crest or trough; if the latter are shown instead, specify in symbol explanation. For folds that have near-vertical axial surfaces, trace of axial surface is independent of topography. May also be shown in black or other colors.
5.3.9	Synform, 1st type—Approximately located			
5.3.10	Synform, 1st type—Approximately located, queried			
5.3.11	Synform, 1st type—Inferred			
5.3.12	Synform, 1st type—Inferred, queried			
5.3.13	Synform, 1st type—Concealed			
5.3.14	Synform, 1st type—Concealed, queried			
5.3.15	Synform, 2nd type—Certain			Use to indicate another type or generation of synform when more than one is shown on map. May also be shown in black or other colors.
5.3.16	Synform, 2nd type—Approximately located			
5.3.17	Synform, 2nd type—Approximately located, queried			
5.3.18	Synform, 2nd type—Inferred			
5.3.19	Synform, 2nd type—Inferred, queried			
5.3.20	Synform, 2nd type—Concealed			
5.3.21	Synform, 2nd type—Concealed, queried			

5—FOLDS (continued)

REF NO	DESCRIPTION	SYMBOL	CARTOGRAPHIC SPECIFICATIONS	NOTES ON USAGE
	5.4—Asymmetric, overturned, and inverted synclines			
5.4.1	Asymmetric syncline—Certain			Beds are upright; shorter arrow indicates steeper limb.
5.4.2	Asymmetric syncline—Approximately located			Place arrows perpendicular to fold trace to indicate general character of fold segment; do not place at specific locality where observation was made.
5.4.3	Asymmetric syncline—Approximately located, queried			
5.4.4	Asymmetric syncline—Inferred			Preferred usage is to show trace of axial surface of fold, not crest or trough; if the latter are shown instead, specify in symbol explanation.
5.4.5	Asymmetric syncline—Inferred, queried			
5.4.6	Asymmetric syncline—Concealed			For folds that have near-vertical axial surfaces, trace of axial surface is independent of topography.
5.4.7	Asymmetric syncline—Concealed, queried			May also be shown in black or other colors.
5.4.8	Overturned syncline—Certain			Beds on one limb are overturned; arrows show direction of dip of limbs.
5.4.9	Overturned syncline—Approximately located			Place arrows perpendicular to fold trace to indicate general character of fold segment; do not place at specific locality where observation was made.
5.4.10	Overturned syncline—Approximately located, queried			
5.4.11	Overturned syncline—Inferred			Preferred usage is to show trace of axial surface of fold, not crest or trough; if the latter are shown instead, specify in symbol explanation.
5.4.12	Overturned syncline—Inferred, queried			
5.4.13	Overturned syncline—Concealed			For folds that have near-vertical axial surfaces, trace of axial surface is independent of topography.
5.4.14	Overturned syncline—Concealed, queried			May also be shown in black or other colors.
5.4.15	Inverted syncline—Certain			Beds on both limbs are overturned; arrows show direction of dip of limbs.
5.4.16	Inverted syncline—Approximately located			Place arrows perpendicular to fold trace to indicate general character of fold segment; do not place at specific locality where observation was made.
5.4.17	Inverted syncline—Approximately located, queried			
5.4.18	Inverted syncline—Inferred			Preferred usage is to show trace of axial surface of fold, not crest or trough; if the latter are shown instead, specify in symbol explanation.
5.4.19	Inverted syncline—Inferred, queried			
5.4.20	Inverted syncline—Concealed			For folds that have near-vertical axial surfaces, trace of axial surface is independent of topography.
5.4.21	Inverted syncline—Concealed, queried			May also be shown in black or other colors.

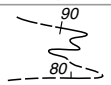
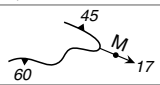
5—FOLDS (continued)

REF NO	DESCRIPTION	SYMBOL	CARTOGRAPHIC SPECIFICATIONS	NOTES ON USAGE
	5.5—Monoclines			
5.5.1	Monocline—Certain			Arrow points in direction of dip. Use to label trace of maximum dip of surface that connects anticlinal and synclinal bends too close together to show as separate traces. Place arrow perpendicular to fold trace to indicate general character of fold segment; do not place at specific locality where observation was made. May also be shown in black or other colors.
5.5.2	Monocline—Approximately located			
5.5.3	Monocline—Approximately located, queried			
5.5.4	Monocline—Inferred			
5.5.5	Monocline—Inferred, queried			
5.5.6	Monocline—Concealed			
5.5.7	Monocline—Concealed, queried			
5.5.8	Monocline, anticlinal bend—Certain			Shorter arrow on steeper beds. Use to label trace of anticlinal bend of monocline when both anticlinal and synclinal bends can be shown at map scale. Place arrows perpendicular to fold trace to indicate general character of fold segment; do not place at specific locality where observation was made. May also be shown in black or other colors.
5.5.9	Monocline, anticlinal bend—Approximately located			
5.5.10	Monocline, anticlinal bend—Approximately located, queried			
5.5.11	Monocline, anticlinal bend—Inferred			
5.5.12	Monocline, anticlinal bend—Inferred, queried			
5.5.13	Monocline, anticlinal bend—Concealed			
5.5.14	Monocline, anticlinal bend—Concealed, queried			
5.5.15	Monocline, synclinal bend—Certain			Shorter arrow on steeper beds. Use to label trace of synclinal bend of monocline when both anticlinal and synclinal bends can be shown at map scale. Place arrows perpendicular to fold trace to indicate general character of fold segment; do not place at specific locality where observation was made. May also be shown in black or other colors.
5.5.16	Monocline, synclinal bend—Approximately located			
5.5.17	Monocline, synclinal bend—Approximately located, queried			
5.5.18	Monocline, synclinal bend—Inferred			
5.5.19	Monocline, synclinal bend—Inferred, queried			
5.5.20	Monocline, synclinal bend—Concealed			
5.5.21	Monocline, synclinal bend—Concealed, queried			

5—FOLDS (continued)

REF NO	DESCRIPTION	SYMBOL	CARTOGRAPHIC SPECIFICATIONS	NOTES ON USAGE
	5.6—Minor folds; boudinage			
5.6.1	Minor fold, horizontal axial surface		diameter 3.0 mm; lineweight .175 mm; lineweight .25 mm; color 100% magenta	Preferred usage is to show trace of axial surface; may be used separately or in combination with symbols for axes of minor folds. Use when beds are too tightly folded to show traces of individual folds completely or when folds are observed in outcrop but cannot be traced elsewhere. May also be shown in black or other colors.
5.6.2	Minor antiform, vertical or near-vertical axial surface—Showing strike		4.25 mm; 60°; 1.125 mm; color 100% magenta; 5.0 mm; lineweight .25 mm; arrow lineweight .175 mm	
5.6.3	Minor antiform, inclined axial surface—Showing strike and dip	65	tick lineweight .175 mm; HI-6 (100% black); 65; 1.5 mm	
5.6.4	Minor anticline, vertical or near-vertical axial surface—Showing strike		4.25 mm; 20°; 1.125 mm; color 100% magenta; 5.0 mm; lineweight .25 mm; arrow lineweight .175 mm	
5.6.5	Minor anticline, inclined axial surface—Showing strike and dip	55	tick lineweight .175 mm; HI-6 (100% black); 55; 1.5 mm	
5.6.6	Minor overturned anticline, inclined axial surface—Showing strike and dip	15	2.125 mm; 15; HI-6 (100% black); lineweight .25 mm; color 100% magenta; 20°; 1.0 mm radius; arrow lineweight .175 mm	
5.6.7	Minor synform, vertical or near-vertical axial surface—Showing strike		4.25 mm; 60°; 1.125 mm; color 100% magenta; 5.0 mm; lineweight .25 mm; arrow lineweight .175 mm	
5.6.8	Minor synform, inclined axial surface—Showing strike and dip	75	tick lineweight .175 mm; HI-6 (100% black); 75; 1.5 mm	
5.6.9	Minor syncline, vertical or near-vertical axial surface—Showing strike		4.25 mm; 20°; 1.125 mm; color 100% magenta; 5.0 mm; lineweight .25 mm; arrow lineweight .175 mm	
5.6.10	Minor syncline, inclined axial surface—Showing strike and dip	70	HI-6 (100% black); 70; 1.5 mm; tick lineweight .175 mm	
5.6.11	Minor overturned syncline, inclined axial surface—Showing strike and dip	25	arrow lineweight .175 mm; 20°; 1.0 mm radius; 2.125 mm; lineweight .25 mm; 25; HI-6 (100% black)	
5.6.12	Minor dome		5.0 mm; 1.375 mm; color 100% magenta; 20°; lineweight .175 mm	Use of minor dome and basin symbols is usually restricted to small-scale maps. May also be shown in black or other colors.
5.6.13	Minor basin		color 100% magenta; 5.0 mm; 1.375 mm; lineweight .175 mm; 20°; 2.125 mm	
5.6.14	Vertical minor fold axis		color 100% magenta; 2.5 mm; 60°	May be used separately or in combination with other symbols. For single, unidirectional arrow symbols, the point of observation may either be in the middle, at the tip, or at the tail end of the arrow; whichever is preferred, it is important to specify in the symbol explanation which method has been used. For combined symbols, the point of observation is at the tail end of the arrow, the junction point common to all symbols. Use when beds are too tightly folded to show traces of individual folds completely or when folds are observed in outcrop but cannot be traced elsewhere. May also be shown in black or other colors.
5.6.15	Horizontal minor fold axis—Showing bearing		color 100% magenta; 6.25 mm; arrow lineweight .175 mm; 20°; dot diameter .75 mm; 1.5 mm	
5.6.16	Inclined minor fold axis—Showing bearing and plunge	25	HI-6 (100% black); 25	
5.6.17	Minor anticline—Showing bearing and plunge	10	10; .825 mm radius; lineweight .175 mm	
5.6.18	Minor syncline—Showing bearing and plunge	18	18; .825 mm radius	
5.6.19	Minor fold, dextral rotation sense (Z–shaped asymmetry)—Showing bearing and plunge	23	.5 mm radius; 1.75 mm; 23; 2.5 mm	
5.6.20	Minor fold, sinistral rotation sense (S–shaped asymmetry)—Showing bearing and plunge	26	.5 mm radius; 1.75 mm; 26; 2.5 mm	
5.6.21	Minor folds—Showing bearing and plunge	17	22.5°; 17; 1.25 mm	
5.6.22	Boudinage—Showing bearing and plunge	30	.825 mm radius; 30; .875 mm	

5—FOLDS (continued)

REF NO	DESCRIPTION	SYMBOL	CARTOGRAPHIC SPECIFICATIONS	NOTES ON USAGE
	5.7—Free-form fold symbology			
5.7.1	Open anticlinal fold			Use to represent general character of structures in complexly deformed rocks or in terranes where outcrops are sparse. Symbols are diagrammatic: point of observation is not well-specified, and lines that represent fold limbs often extend over areas far from site of observation. May also be shown in black or other colors.
5.7.2	Tight anticlinal fold			
5.7.3	Open synclinal fold			
5.7.4	Tight synclinal fold			
5.7.5	Isoclinal fold			
5.7.6	Complex fold—Showing direction and plunge. Triangle indicates dip of foliation; tick indicates dip of beds			Examples of free-form fold symbology showing actual structures (located accurately and to scale). May be combined with other planar and linear features.
5.7.7	Trace of iron formation—Showing dip. Dashed where inferred			
5.7.8	Trace of gneiss—Showing dip of foliation and bearing and plunge of mineral lineation