APPENDIX B

Planimetric and Topographic Feature Depiction Specifications

This appendix contains guidance for depicting planimetric and topographic features based on the specified target scale. It is intended to consistently define the amount of feature density and detail required for a given scale, given the digitizing capabilities of a geospatial analyst operating at that scale. Unique project-specific features not normally or routinely encoded (usually due to the extra cost thereof) must be independently identified and scheduled in a contract as a "special mapping requirement." These specifications have been developed for the nominal target scales shown in each section. They may be approximately expanded to cover the scale ranges shown. Should variations exist between these specifications and EM 1110-1-1807, EM 1110-1-1807 will govern. (These specifications were developed by Atlantic Group, Huntsville, AL, a member of the Management Association for Private Photogrammetric Surveyors.)

Section I
Feature Depiction Specifications
Nominal Scale: 50 Feet per Inch
Target Scale Range: 20 to 60 Feet per Inch

B-1. Transportation

Paved Road - Polygon
Defined by edge of pavement, excluding paved shoulder or gutter.
**Topology: Paved road features cannot overlap other transportation features. Paved road features may overlap existing hydrographic features, and can be overlapped by bridges, overpasses and elevated walkways.*

Unpaved Road - Polygon
Dirt or gravel road maintained as a thoroughfare. Unpaved roads are frequently found in rural areas or in suburban areas. Unpaved alleys are depicted as unpaved roads. Define by edge of graded surface or edge of tire wear lines, whichever is appropriate. Also use unpaved road for unpaved runways.
**Topology: Paved road features cannot overlap other transportation features. Paved road features may overlap existing hydrographic features, and can be overlapped by bridges, overpasses and elevated walkways.*

Railroad - PolyLine
Digitize center line of all rails in use. Show all sidings and spurs (tracks for storage, etc.).
**Topology: Railroad lines should maintain connectivity through the length of the linear network. Railroad lines can overlap transportation features and can be overlapped by bridges, overpasses and elevated walkways. (In some cases these lines can be classified as Hidden Railroad.)*

Abandoned Railroad - PolyLine
Digitize center line of all abandoned railroads with tracks still intact and visible. Do not delineate old railroad grades with no tracks intact.
**Topology: Abandoned Railroad lines should maintain connectivity through the length of the linear network. Abandoned Railroad lines can overlap transportation features and can be overlapped by bridges, overpasses and elevated walkways. (In some cases these lines can be classified as Hidden Abandoned Railroad.)*

Bridge - Polygon
Structure erected over obstacle or depression. "Bridge" includes automotive bridges, railroad bridges, footbridges, and viaducts.
**Topology: Continue all depictions across bridge, including edge of paved road, railroad and guardrail, if the item continues on the bridge. Contours do not become generated over bridges as these are not bare earth features.*

Runway - Polygon
Airport pavement used for takeoff, landing, or taxiing of airplanes. "Runway" also includes helipads. Unpaved runways shall be shown with unpaved road features.
**Topology: Runway features cannot overlap other transportation features. Runway features may overlap existing hydrographic features, and can be overlapped by bridges, overpasses and elevated walkways.*

Retaining Wall - PolyLine
Fixed structure retaining earth located along thoroughfares. Digitize center line and for cartographic purposes, symbolize using tick patterns on high side of wall.
**Topology: Retaining Wall lines should maintain connectivity through the length of the linear network.*

Trail (Vehicular) - Polygon
Dirt passageway that is permanent in nature and wider than 6 ft. Trails are not maintained as well as dirt roads; field roads shall be shown with the collection of the edge the trail.
**Topology: Trails should not overlap and should snap to all transportation features, structures and slabs. Trail features can be overlapped by bridges, overpasses and elevated walkways.*

Curb - PolyLine
Raised edge defining edge of pavement, parking lot islands, etc.
**Topology: Curbs can overlap with other transportation features. Contours should run unbroken along curbs as these are not true bare earth features (do not snap to each side).*

Concrete Barrier - PolyLine
Short wall erected between traffic lanes. Digitize center line of barrier.
**Topology: Concrete Barrier lines should maintain connectivity through the length of the linear network.*

Paved Shoulder - Polygon
Pavement between edge of paved road and edge of total paved surface. Do not show unpaved shoulders.
**Topology: Curb and guardrail lines can overlap paved shoulder features. Paved shoulder should not overlap sidewalk or slab features, and should snap to paved drives and parking lots. Can be overlapped by bridges, overpasses and elevated walkways.*

Paved Drive - Polygon
Defined by the edge of pavement.
Topology: Paved drive features should not overlap other transportation features, sidewalks, structures, nor slabs. Retaining wall features can overlap paved drive. Can be overlapped by bridges, overpasses and elevated walkways.

Unpaved Drive - Polygon
Defined by the edge of gravel or dirt.
Topology: Unpaved drive features should not overlap other transportation features, sidewalks, structures, nor slabs. Retaining wall features can overlap unpaved drive. Can be overlapped by bridges, overpasses and elevated walkways.

Sidewalk - Polygon
Show edges of all sidewalks, public or private. Sidewalk should not continue across paved drives unless it does so visibly on photography. Show steps (if requested) as miscellaneous structures.
Topology: Unpaved drive features should not overlap other transportation features, structures, nor slabs. Retaining wall features can overlap sidewalks. Can be overlapped by bridges, overpasses and elevated walkways.

Path - PolyLine
Visible, permanent dirt trail less than 6 ft wide, used commonly for bikes or pedestrian traffic. Digitize center line of path.
**Topology: Path lines should snap to all transportation features that are polygonal in structure. Paths can be overlapped by bridges, overpasses and elevated walkways. (In some cases these lines can be classified as Hidden Path.) Paths should maintain connectivity through the length of the linear network.*

Guardrail - PolyLine
Single- or double-sided box beam, corrugated steel, wooden, or cable guide rail. Guardrails are usually located in medians of roads or along road edges near hazards. Digitize center line of rail.
**Topology: Guardrail lines should maintain connectivity through the length of the linear network.*

Paved Parking - Polygon
Digitize edge of pavement of parking lot and parking lot islands.
Topology: Paved parking features should not overlap other transportation features, sidewalks, structures, nor slabs. Retaining wall feature, curbs, and guardrails can overlap paved parking. Can be overlapped by bridges, overpasses and elevated walkways.

Unpaved Parking - Polygon
Digitize edge of gravel or dirt edge. Do not show islands in unpaved parking lots.
Topology: Unpaved parking features should not overlap other transportation features, sidewalks, structures, nor slabs. Retaining wall feature, curbs, and guardrails can overlap unpaved parking. Can be overlapped by bridges, overpasses and elevated walkways.

Parking Bumper (Special Request Only) - PolyLine
Temporary structure, usually concrete, used to delineate parking. Digitize edge of bumper.
**Topology: Can overlap any transportation feature.*

Paint Stripe (Special Request Only) - PolyLine
Digitize center line of stripes. Digitize outlines of very wide stripes and arrows, etc.
**Topology: Can overlap any transportation feature.*

B-2. Structures

Building - Polygon
"Building" includes residential or commercial trailers. Include covered porches, permanent overhangs, carport roofs, covered sidewalks, etc., as part of the building. Do not show common roof lines (e.g., between townhomes) or interior roof lines (e.g., dormers). Temporary structures are delineated as miscellaneous structures. Smokestacks are shown as buildings if freestanding.
**Topology: All features except for bridges, overpasses and elevated walkways should not overlap building features.*

Ruin or Under Construction Building - Polygon
Delineate all visible building outlines, including foundation slabs or basement remains. Ruins other than buildings should be outlined.
**Topology: All features except for bridges, overpasses and elevated walkways should not overlap ruins or under construction building features.*

Dam - Polygon
Barrier across river, creek, or swamp to regulate or obstruct water flow. Visible beaver dams large enough to affect water flow shall be outlined also.
**Topology: All features except for bridges, overpasses and elevated walkways should not overlap dam features.*

Cemetery - Polygon
Delineate cemetery boundary. Do not show headstones or sidewalks.
**Topology: Paved drives, unpaved drives, fences, and buildings can overlap cemetery features.*

Tank - Polygon
Outline public utility tanks and industrial storage tanks. Show small propane tanks only if used for a business.
**Topology: All features except for bridges, overpasses and elevated walkways should not overlap tank features.*

Silo - Polygon
Cylindrical receptacle for farm product storage.
**Topology: All features except for bridges, overpasses and elevated walkways should not overlap silo features.*

Fence - PolyLine
Digitize center lines of all visible fences. Do not differentiate between fence and gate. If gate closes across road, pull fence across road. Do not show individual fence posts.
**Topology: Fences should not overlap any structures. Fences can overlap all transportation features, cemeteries, bridges, and overpasses. Fence lines should maintain connectivity through the length of the linear network.*

Ornamental Wall - PolyLine
Fixed structure of concrete or brick not used for retention of earth (if constructed of wood, delineate as fence). Digitize center line of wall.
**Topology: Ornamental Wall lines should maintain connectivity through the length of the linear network. Ornamental walls should not overlap any structures.*

Slab - Polygon
Any miscellaneous concrete slab, such as a flagpole base or concrete around swimming pool. Also use slab for patio.
**Topology: Slab features should not overlap transportation features, sidewalks or structures. Bridges, overpasses and elevated walkways may overlap slabs.*

Pool – Polygon
Digitize interior edge of concrete around in ground pools, and center line of walls in above ground pools. Also collect aeration pools in industrial areas. Pool has precedence over slab and sidewalk symbology.
**Topology: All features except for bridges, overpasses and elevated walkways should not overlap pool features.*

Miscellaneous Post - Point
Pole greater than 6 ft in height, including basketball goals and unidentifiable poles. Digitize center of post.
**Topology: Miscellaneous Post features can overlap any transportation feature, sidewalk and slabs.*

Flagpole - Point
Digitize center of pole. Look for slab at base.
**Topology: Flagpole features can overlap any transportation feature, sidewalk and slabs.*

Mail Box - Point
Digitize center of mail box. Do not differentiate between collection boxes and delivery boxes.
**Topology: Mail Box features can overlap any transportation feature, sidewalk and slabs.*

Telephone Booth - Point
Digitize center of booth or pedestal.
**Topology: Telephone Booth features can overlap any transportation feature, sidewalk and slabs.*

Broadcast Antenna - Point
Radio or television tower. Digitize center of tower.
**Topology: Broadcast Antenna features can overlap any transportation feature, sidewalk and slabs.*

Satellite Dish
Digitize center of commercial and private satellite dishes. Do not show satellite dishes on top of buildings.
**Topology: Satellite Dish features can overlap any transportation feature, sidewalk and slabs.*

Miscellaneous Structure - Polygon
Minor buildings (air conditioner, tool storage shed, loading dock, deck, structures within substations, etc.)
**Topology: All features except for bridges, overpasses and elevated walkways should not overlap miscellaneous structure features.*

Miscellaneous Feature - PolyLine
Items not classified as minor buildings, such as conveyors or crane tracks.
**Topology: All features except for bridges, overpasses and elevated walkways should not overlap miscellaneous features.*

Miscellaneous Circle - Point
Unidentifiable circular item, such as gas filler cap. Digitize center of item.
**Topology: Miscellaneous Circle features can overlap any transportation feature, sidewalk and slabs.*

Miscellaneous Square - Point
Unidentifiable square item, such as a corrugated metal valve cover. Digitize center of item.
**Topology: Miscellaneous Square features can overlap any transportation feature, sidewalk and slabs.*

Field Line (Special Request Only) - PolyLine
A change between plowed fields indicating a property line. Often apparent by a difference in crop or type of furrow. Digitize center line of rural field lines only.
**Topology: Field Line features should not overlap any structures. Field Lines should maintain connectivity through the length of the linear network.*

Golf Course - Polygon
Show outline of golf course. Do not digitize tees, greens, sand traps, or flags except upon special request. Show all paved and unpaved drives (cart paths) that are permanent in nature within the golf course. Show all hydrology and natural features within the golf course.
**Topology: Paved drives, unpaved drives, fences, and buildings can overlap golf course.*

Athletic Field - Polygon
Show the outline of the athletic field. Show permanent basketball goals, football goal posts, etc., as miscellaneous posts. Do not show tennis court nets or posts for tennis court nets.
Topology: Athletic Field features should not overlap other transportation features, sidewalks, structures, nor slabs. Show paved or unpaved tracks as paved or unpaved drives.

Debris - Polygon
Scattered and unsorted material covering ground. Digitize outline of area.
**Topology: All features except for bridges, overpasses and elevated walkways should not overlap debris features.*

Storage - Polygon
Stacked material or piles of dirt, sand, gravel, salt, etc. Digitize outline of area. Outline junkyards as storage.

**Topology: All features except for bridges, overpasses and elevated walkways should not overlap debris features.*

Quarry - Polygon
Mining area. No distinction is made between rock (consolidated) material mines and loose (unconsolidated) material mines. Show natural features present within quarry. Digitize quarry outline.
**Topology: Paved drives, unpaved drives, fences, buildings, and hydro features can overlap quarry area.*

Area Under Construction - Polygon
Digitize outline of entire area under construction. Show any roads under construction as unpaved roads. Digitize buildings under construction, and any feature that has been completed (e.g., curb or completed building). Do not show debris or storage within the area outline.
**Topology: Paved drives, unpaved drives, fences, buildings, and hydro features can overlap area under construction.*

Pipeline - PolyLine
Cross-country aboveground pipeline used for transportation of liquid, gas, or matter, usually found near industrial areas or public utilities plants. Digitize edge. Do not show supporting structures. Do not show pipes that do not touch the ground, such as between buildings.
**Topology: Pipelines should not overlap any structures. Pipelines can overlap all transportation features, cemeteries, bridges, and overpasses. Pipelines should maintain connectivity through the length of the linear network.*

Underground Pipeline (Special Request Only)
Digitize center line of apparent underground utility pipes.
**Topology: Underground Pipelines should maintain connectivity through the length of the linear network.*

Levee - Polygon
Earth wall for fluid retention, usually found along rivers or canals. Digitize outline of levee.
**Topology: Transportation features, fences and walls can overlap levees. Levees should not overlap structures.*

Pier - Polygon
Deck supported by posts extended over water. Digitize edge of pier.
**Topology: Pier features can overlap hydro features. Pier features should not overlap piers.*

Riprap - Polygon
Rocks placed along slopes to lessen erosion. Outline riprap area.

**Topology: Riprap should not overlap hydro features. Riprap may overlap culverts and ditches.*

Jetty - Polygon
Structure, usually earth or concrete, extended from shore to lessen erosion. Delineate any other features such as retaining walls or slabs.
**Topology: Jetty features should not overlap hydro features, nor structures.*

B-3. Natural Features

River - Polygon
Navigable stream. Digitize shorelines.
**Topology: Rivers should overlap piers and boat houses. Bridges, and overpasses may overlap River features. Other hydro features should not overlap River features.*

Lake - Polygon
A large inland body of water. Show man-made reservoirs as lakes. Digitize shoreline.
**Topology: Lakes should overlap piers and boat houses. Bridges, and overpasses may overlap Lake features. Other hydro features should not overlap Lake features.*

Pond - Polygon
A body of standing water much smaller than a lake, often man-made. Digitize shoreline.
**Topology: Ponds should overlap piers and boat houses. Bridges, and overpasses may overlap Pond features. Other hydro features should not overlap Pond features.*

Swamp - Polygon
Area of spongy, wet ground, usually harboring vegetation. Digitize any river, lake, pond, or creek outline within the swamp. Digitize outline of swamp. No distinction is made between a swamp, marsh, or inundated area.
**Topology: Swamps should overlap vegetation, piers and boat houses. Bridges, and overpasses may overlap Swamp features. Other hydro features that are polygonal should not overlap Swamp features. Linear hydro features should overlap Swamp features.*

Creek – Polygon/Polyline
Non-navigable stream. Digitize shorelines of streams wider than 5 ft, and digitize center lines of streams narrower than 5 ft.
**Topology: Creeks should overlap piers and boat houses. Bridges, and overpasses may overlap Creeks. Other hydro features and vegetation should not overlap Creeks. Creeks should maintain connectivity through the length of the network.*

Tree Mass - Polygon
Group of trees too close together to allow individual collection. Digitize edge of tree mass by following outline along the outer edge of the tree trunks.
**Topology: Tree mass should not overlap any "double-wide" linear feature (e.g., vehicular trail, creek over 5 ft wide) or any railroad line, regardless of canopy spread. Tree mass may overlap structures, single creeks, and fences.*

Tree - Point
Single tree over 8 ft tall (except upon special request). Digitize center of base of tree trunk. No distinction is made between deciduous and coniferous trees.
**Topology: Tree points should not overlap any features, but may be overlapped by bridges, overpasses and elevated walkways.*

Bush - PolyLine
Single bush less than 8 ft tall. Digitize center of bush. Do not show single bushes within a brush line. Do not show groups of flowers that may be interspersed with decorative bushes.
**Topology: Bush features should not overlap any features, but may be overlapped by bridges, overpasses and elevated walkways.*

Brush - Polygon
Trees under 8 ft tall, shrubs, and tall weeds thickly massed, usually found near forested areas, in unpopulated meadows or lots, or near rivers or creeks. Brush may also be used for bushes that are too densely grouped to digitize individually. Do not outline decorative bushes or bush rows with brush. Instead, use hedge row and collect lone bushes.
**Topology: Brush features should not overlap any features, but may be overlapped by bridges, overpasses and elevated walkways.*

B-4. Drainage Structures

Concrete Headwall - PolyLine
Concrete on the end of a transverse drain or pipe culvert. Digitize the center line of thin headwalls, such as those on ditches or under driveways. Digitize outer edge of thicker and larger headwalls.
**Topology: Concrete Headwall lines may overlap riprap features, but should snap to culvert lines.*

Culvert - PolyLine
Pipe drain, usually located under roads or driveways. Digitize length of pipe from center of each end. Do not show culverts if cement headwalls are present.
**Topology: Culvert lines may overlap riprap features, but snap to concrete headwall lines.*

Paved Ditch - Polygon
Digitize outer edge of paved ditch. Do not show water line inside ditch.

**Topology: Paved Ditch features should not overlap any features, however bridges, overpasses and elevated walkways may overlap Paved Ditches. Cap ends or join cleanly with headwalls.*

Unpaved Ditch - PolyLine
Man-made channel for drainage. Digitize the center line of all apparent ditches even if it contains water.
**Topology: Unpaved Ditch lines may overlap riprap features, but snap to concrete headwall lines, culverts and paved ditches. Unpaved Ditches should maintain connectivity through the length of the linear network.*

Circular Catch Basin - Point
Round drainage grating. Digitize center of catch basin.
**Topology: Circular Catch Basin features can overlap any transportation feature, sidewalk and slabs.*

Square Catch Basin - Point
Small rectangular or square drainage grate. Digitize center of catch basin.
**Topology: Square Catch Basin features can overlap any transportation feature, sidewalk and slabs.*

Curb Inlet - Point
Drainage opening beneath a curb and interrupting the gutter. Frequently curb inlets have a manhole directly above them. Digitize center of curb inlet.
**Topology: Curb Inlet features can overlap any transportation feature, sidewalk and slabs.*

B-5. Signs and Traffic Control

Single Leg Sign - Point
Digitize center of signpost.
**Topology: Single Leg Sign features can overlap any transportation feature, sidewalk and slabs.*

Double Leg Sign
Includes multileg signs and overhead signs. Digitize center of each leg. Cartographically label overhead signs "O/H."
**Topology: Double Leg Sign features can overlap any transportation feature, sidewalk and slabs.*

Traffic Signal Pole - Point
Digitize center of post. Do not show signals suspended over roads.
**Topology: Traffic Signal Pole features can overlap any transportation feature, sidewalk and slabs.*

Billboard - PolyLine
Digitize across length of billboard at the base. Cartographically label "BB."
**Topology: Billboard features can overlap any transportation feature, sidewalk and slabs.*
Railroad Signal Pole - Point
Lights along rural tracks to guide trains or warning lights near track intersections with roads. Digitize center of post.
**Topology: Railroad Signal Pole features can overlap any transportation feature, sidewalk and slabs.*

B-6. Utilities

Power Pole - Point
Utility pole from which power, telephone, or cable television lines are suspended. Digitize center of pole. Power pole has precedence over light pole if the pole has a dual purpose. Traffic signal pole has precedence over power pole.
**Topology: Power Pole features can overlap any transportation feature, structure, hydro feature, sidewalk and slab.*

Light Pole - Point
Pole supporting a street light. If the pole has power lines also, digitize as a power pole. Digitize the center of the light pole. Do not differentiate between street lights and parking lot lights.
**Topology: Light Pole features can overlap any transportation feature, structure, sidewalk and slab.*

Yard Light - Point
Very short lights, usually located around sidewalks at businesses or residences. Digitize center of light.
**Topology: Yard Light features can overlap any transportation feature, sidewalk and slab.*

Transmission Tower - Polygon
Large structure for supporting power lines across long distances. Digitize base of tower.
**Topology: Transmission Tower features can overlap any transportation feature, structure, sidewalk and slab.*

Substation - Polygon
High-voltage units grouped together, usually within a fence. Digitize outline if not enclosed by fence. Show large structures within substations as miscellaneous structures.
**Topology: Substations may overlap slabs, unpaved drives, and trails. All other transportation features should not overlap Substation features. Do not show individual poles, pipes, or transformers within substation boundary.*

Runway Light - Point
Digitize center of visible runway and taxiway lights. Do not show reflectors.
**Topology: Runway Light features can overlap any transportation feature, airfield feature, sidewalk and slab.*

Electric Box - Point
Digitize center of structure.
**Topology: Electric Box features can overlap any transportation feature, airfield feature, sidewalk and slab.*

Fire Hydrant - Point
Digitize center of element.
**Topology: Fire Hydrant features can overlap any transportation feature, airfield feature, sidewalk and slab.*

Manhole - Point
A hole through which one can enter a sewer, conduit, etc. Digitize center of manhole.
**Topology: Manhole features can overlap any transportation feature, sidewalk and slab.*

B-7. Contours - PolyLine

a. Rules for contours (general).

(1) Man-made structures that do not conform to the ground (e.g., buildings, retaining walls, bridges, etc.), should not be used during contour generation. Contour lines should pull cleanly across areas where there are a lack of points due to the presence of these man-made features.

(2) Active quarries, areas under construction, debris piles, and storage piles, should be encompassed with an area feature to indicate an area of “low confidence”. These are areas of constant change and the depiction of the contours may not be accurate to meet the required accuracy specifications.

(3) Contours should turn back on single-line streams and should cross double-wide streams as a straight line from shore to shore.

b. Rules for depression contours. A depression is a contour that closes within the mapping limits such that the area enclosed by the contour is lower than the contour elevation. Depressions often occur around catch basins. If the contour turns back on a stream or ditch into a culvert or headwall, it is not a depression unless it closes on the other side of the culvert or headwall or under the road.

Index Contour
Every fifth contour shall be annotated and shall be clearly distinguished from intermediate contours. If the contours are absolutely too close to pull indexes through, such as on a cliff or in a quarry, every fifth index is to be pulled through and the others are to drop cleanly.

Hidden Index Contour (Special Request Only)
Indexes that are obstructed by dense vegetation shall be delineated as hidden index contours. The guidelines for index contours apply to hidden index contours also.

Depressed Index Contour (Special Request Only)
See C-7*b* above. Follow the same guidelines as for index contours.

Hidden Depressed Index Contour (Special Request Only)
Depression index obstructed by dense vegetation. Follow the same guidelines as for index contours.

Index Contour Label (Special Request Only) - Annotation
Label shall be placed on line of index contour in such a manner that the bottom of the number corresponds to the ground that is lower than the index elevation.

Intermediate Contour
Four intermediates exist between two index contours. Do not show any more or any less than four. Do not drop intermediate contours unless the indexes are less than 1/4 in. apart at map scale.

Hidden Intermediate Contour (Special Request Only)
Intermediate contour that is obstructed by dense vegetation, bridges, overpasses and elevated walkways. Follow the same guidelines as for intermediate contours.

Depressed Intermediate Contour (Special Request Only)
See C-7*b* above. Follow the same guidelines as for intermediate contours.

Hidden Depressed Intermediate Contour (Special Request Only)
Depressed intermediate contour obstructed by dense vegetation, bridges, overpasses and elevated walkways. Follow the same guidelines as for intermediate contours.

**Topology: Contours should not overlap each other and should not dangle unless on the end of the mapping area.*

Spot Elevation (Special Request Only) - Point
Supplemental elevation used in conjunction with contour information. Spot elevations should be placed at the following points:

(1) All road and/or railroad intersections.

(2) At each end of bridges on center line of road.

(3) At center line of roads above culverts.

(4) At the highest point of closed contour tops.

(5) At the lowest point of closed depressions, significant saddles, and quarries.

(6) At points visible through dense vegetation in obscured areas.

(7) Any necessary place such that in no place is there more than 2 in. (at map scale) between contours and/or spot elevations.

Water Elevation (Special Request Only) - Point
Elevation of surface of water. Place at or near the center of the water body itself or the water body shown on the model. Do not show water elevations on single-wide creeks or ditches.

B-8. Manuscript Data

Project Limit - Polygon
Show the extents of the mapping area. Planimetric features and contours should end exactly upon this extent.

Horizontal Control Point - Point
Place at coordinates and label if cartographically necessary. Show only if horizontal control is separate from vertical control.

Vertical Control Point - Point
Place at coordinates and label if cartographically necessary. Show only if horizontal control is separate from vertical control.

Control Point - Point
Point used for both horizontal and vertical control. Place at coordinates and label if cartographically necessary.

Control Point Annotation - Annotation
List point number. North and east coordinate values are to be shown on horizontal points; elevations are to be shown on vertical points. Use commas.

Grid Tick - Point
Place grid tick at grid line intersections (every 5 in. at map scale). Label outside of graphic detail such that each grid is labeled once.

Grid Lines (Special Request Only) - PolyLine
Place lines every 5 in. at map scale at even grid coordinates. End cleanly at match lines or neat lines.

Grid Annotation - Annotation
Place as appropriate. Use commas.

Standard Border – Polygon/PolyLine
Center border about graphic detail. Annotate if cartographically necessary the project, client name, scale, contour interval, map type, sheet number and index of all sheets, month of photography, and grid north.

Section II
Feature Depiction Specifications
Nominal Scale: 100 Feet per Inch
Target Scale Range: 80 to 160 Feet per Inch

B-9. Transportation

Paved Road - Polygon
Defined by edge of pavement, excluding paved shoulder or gutter.
**Topology: Paved road features cannot overlap other transportation features. Paved road features may overlap existing hydrographic features, and can be overlapped by bridges, overpasses and elevated walkways.*

Unpaved Road - Polygon
Dirt or gravel road maintained as a thoroughfare. Unpaved roads are frequently found in rural areas or in suburban areas. Unpaved alleys are depicted as unpaved roads. Define by edge of graded surface or edge of tire wear lines, whichever is appropriate. Also use unpaved road for unpaved runways.
**Topology: Paved road features cannot overlap other transportation features. Paved road features may overlap existing hydrographic features, and can be overlapped by bridges, overpasses and elevated walkways.*

Railroad - PolyLine
Digitize center line of all rails in use. Show all sidings and spurs (tracks for storage, etc.).
**Topology: Railroad lines should maintain connectivity through the length of the linear network.*

Railroad lines can overlap transportation features and can be overlapped by bridges, overpasses and elevated walkways. (In some cases these lines can be classified as Hidden Railroad.)

Abandoned Railroad - PolyLine
Digitize center line of all abandoned railroads with tracks still intact and visible. Do not delineate old railroad grades with no tracks intact.
**Topology: Abandoned Railroad lines should maintain connectivity through the length of the linear network. Abandoned Railroad lines can overlap transportation features and can be overlapped by bridges, overpasses and elevated walkways. (In some cases these lines can be classified as Hidden Abandoned Railroad.)*

Bridge - Polygon
Structure erected over obstacle or depression. "Bridge" includes automotive bridges, railroad bridges, footbridges, and viaducts.
**Topology: Continue all depictions across bridge, including edge of paved road, railroad and guardrail, if the item continues on the bridge. Contours do not become generated over bridges as these are not bare earth features.*

Runway - Polygon
Airport pavement used for takeoff, landing, or taxiing of airplanes. "Runway" also includes helipads. Unpaved runways shall be shown with unpaved road features.
**Topology: Runway features cannot overlap other transportation features. Runway features may overlap existing hydrographic features, and can be overlapped by bridges, overpasses and elevated walkways.*

Retaining Wall - PolyLine
Fixed structure retaining earth located along thoroughfares. Digitize center line and for cartographic purposes, symbolize using tick patterns on high side of wall.
**Topology: Retaining Wall lines should maintain connectivity through the length of the linear network.*

Trail (Vehicular) - Polygon
Dirt passageway that is permanent in nature and wider than 6 ft. Trails are not maintained as well as dirt roads; field roads shall be shown with the collection of the edge the trail.
**Topology: Trails should not overlap and should snap to all transportation features, structures and slabs. Trail features can be overlapped by bridges, overpasses and elevated walkways.*

Concrete Barrier - PolyLine
Short wall erected between traffic lanes. Digitize center line of barrier.
**Topology: Concrete Barrier lines should maintain connectivity through the length of the linear network.*

Paved Drive - Polygon
Defined by the edge of pavement.
Topology: paved drive features should not overlap other transportation features, sidewalks, structures, or slabs. Retaining wall features can overlap paved drive. Can be overlapped by bridges, overpasses and elevated walkways.

Unpaved Drive - Polygon
Defined by the edge of gravel or dirt.
Topology: Unpaved drive features should not overlap other transportation features, sidewalks, structures, or slabs. Retaining wall features can overlap unpaved drive. Can be overlapped by bridges, overpasses and elevated walkways.

Sidewalk - Polygon
Show edges of all sidewalks, public or private. Sidewalk should not continue across paved drives unless it does so visibly on photography. Show steps (if requested) as miscellaneous structures.
Topology: Unpaved drive features should not overlap other transportation features, structures, or slabs. Retaining wall features can overlap sidewalks. Can be overlapped by bridges, overpasses and elevated walkways.

Path - PolyLine
Visible, permanent dirt trail less than 6 ft wide, used commonly for bikes or pedestrian traffic. Digitize center line of path.
**Topology: Path lines should snap to all transportation features that are polygonal in structure. Paths can be overlapped by bridges, overpasses and elevated walkways. (In some cases these lines can be classified as Hidden Path.) Paths should maintain connectivity through the length of the linear network.*

Guardrail - PolyLine
Single- or double-sided box beam, corrugated steel, wooden, or cable guide rail. Guardrails are usually located in medians of roads or along road edges near hazards. Digitize center line of rail.
**Topology: Guardrail lines should maintain connectivity through the length of the linear network.*

Paved Parking - Polygon
Digitize edge of pavement of parking lot and parking lot islands.
Topology: Paved parking features should not overlap other transportation features, sidewalks, structures, or slabs. Retaining wall feature, curbs, and guardrails can overlap paved parking. Can be overlapped by bridges, overpasses and elevated walkways.

Unpaved Parking - Polygon
Digitize edge of gravel or dirt edge. Do not show islands in unpaved parking lots.
Topology: Unpaved parking features should not overlap other transportation features, sidewalks,

structures, or slabs. Retaining wall feature, curbs, and guardrails can overlap unpaved parking. Can be overlapped by bridges, overpasses and elevated walkways.

B-10. Structures

Building - Polygon
"Building" includes residential or commercial trailers. Include covered porches, permanent overhangs, carport roofs, covered sidewalks, etc., as part of the building. Do not show common roof lines (e.g., between townhomes) or interior roof lines (e.g., dormers). Temporary structures are delineated as miscellaneous structures. Smokestacks are shown as buildings if freestanding.
**Topology: All features except for bridges, overpasses and elevated walkways should not overlap building features.*

Ruin or Under Construction Building - Polygon
Delineate all visible building outlines, including foundation slabs or basement remains. Ruins other than buildings should be outlined.
**Topology: All features except for bridges, overpasses and elevated walkways should not overlap ruins or under construction building features.*

Dam - Polygon
Barrier across river, creek, or swamp to regulate or obstruct water flow. Visible beaver dams large enough to affect water flow shall be outlined also.
**Topology: All features except for bridges, overpasses and elevated walkways should not overlap dam features.*

Cemetery - Polygon
Delineate cemetery boundary. Do not show headstones or sidewalks.
**Topology: Paved drives, unpaved drives, fences, and buildings can overlap cemetery features.*

Tank - Polygon
Outline public utility tanks and industrial storage tanks. Show small propane tanks only if used for a business.
**Topology: All features except for bridges, overpasses and elevated walkways should not overlap tank features.*

Silo - Polygon
Cylindrical receptacle for farm product storage.
**Topology: All features except for bridges, overpasses and elevated walkways should not overlap silo features.*

Fence - PolyLine
Digitize center lines of all visible fences. Do not differentiate between fence and gate. If gate closes across road, pull fence across road. Do not show individual fence posts.
**Topology: Fences should not overlap any structures. Fences can overlap all transportation features, cemeteries, bridges, and overpasses. Fence lines should maintain connectivity through the length of the linear network.*

Ornamental Wall - PolyLine
Fixed structure of concrete or brick not used for retention of earth (if constructed of wood, delineate as fence). Digitize center line of wall.
**Topology: Ornamental Wall lines should maintain connectivity through the length of the linear network. Ornamental walls should not overlap any structures.*

Slab (Greater Than 8 ft × 8 ft) - Polygon
Any miscellaneous concrete slab, such as a flagpole base or concrete around swimming pool. Also use slab for patio.
**Topology: Slab features should not overlap transportation features, sidewalks or structures. Bridges, overpasses and elevated walkways may overlap slabs.*

Pool - Polygon
Digitize interior edge of concrete around in ground pools, and center line of walls in above ground pools. Also collect aeration pools in industrial areas. Pool has precedence over slab and sidewalk symbology.
**Topology: All features except for bridges, overpasses and elevated walkways should not overlap pool features.*

Flagpole - Point
Digitize center of pole. Look for slab at base.
**Topology: Flagpole features can overlap any transportation feature, sidewalk and slabs.*

Broadcast Antenna - Point
Radio or television tower. Digitize center of tower.
**Topology: Broadcast Antenna features can overlap any transportation feature, sidewalk and slabs.*

Commercial Satellite Dish - Point
Digitize center of commercial and private satellite dishes. Do not show satellite dishes on top of buildings.
**Topology: Satellite Dish features can overlap any transportation feature, sidewalk and slabs.*

Miscellaneous Structure - Polygon
Minor buildings (air conditioner, tool storage shed, loading dock, deck, structures within substations, etc.)
**Topology: All features except for bridges, overpasses and elevated walkways should not overlap miscellaneous structure features.*

Miscellaneous Feature - PolyLine
Items not classified as minor buildings, such as conveyors or crane tracks.
**Topology: All features except for bridges, overpasses and elevated walkways should not overlap miscellaneous features.*

Miscellaneous Circle - Point
Unidentifiable circular item, such as gas filler cap. Digitize center of item.
**Topology: Miscellaneous Circle features can overlap any transportation feature, sidewalk and slabs.*

Miscellaneous Square - Point
Unidentifiable square item, such as a corrugated metal valve cover. Digitize center of item.
**Topology: Miscellaneous Square features can overlap any transportation feature, sidewalk and slabs.*

Field Line (Special Request Only) - PolyLine
A change between plowed fields indicating a property line. Often apparent by a difference in crop or type of furrow. Digitize center line of rural field lines only.
**Topology: Field Line features should not overlap any structures. Field Lines should maintain connectivity through the length of the linear network.*

Golf Course - Polygon
Show outline of golf course. Do not digitize tees, greens, sand traps, or flags except upon special request. Show all paved and unpaved drives (cart paths) that are permanent in nature within the golf course. Show all hydrology and natural features within the golf course.
**Topology: Paved drives, unpaved drives, fences, and buildings can overlap golf course.*

Athletic Field - Polygon
Show the outline of the athletic field. Show permanent basketball goals, football goal posts, etc., as miscellaneous posts. Do not show tennis court nets or posts for tennis court nets.
Topology: Athletic Field features should not overlap other transportation features, sidewalks, structures, or slabs. Show paved or unpaved tracks as paved or unpaved drives.

Debris (Greater Than 10 ft × 10 ft) - Polygon
Scattered and unsorted material covering ground. Digitize outline of area.

**Topology: All features except for bridges, overpasses and elevated walkways should not overlap debris features.*

Storage (Greater Than 10 ft × 10 ft) - Polygon
Stacked material or piles of dirt, sand, gravel, salt, etc. Digitize outline of area. Outline junkyards as storage.
**Topology: All features except for bridges, overpasses and elevated walkways should not overlap debris features.*

Quarry - Polygon
Mining area. No distinction is made between rock (consolidated) material mines and loose (unconsolidated) material mines. Show natural features present within quarry. Digitize quarry outline.
**Topology: Paved drives, unpaved drives, fences, buildings, and hydro features can overlap quarry area.*

Area Under Construction - Polygon
Digitize outline of entire area under construction. Show any roads under construction as unpaved roads. Digitize buildings under construction, and any feature that has been completed (e.g., curb or completed building). Do not show debris or storage within the area outline.
**Topology: Paved drives, unpaved drives, fences, buildings, and hydro features can overlap area under construction.*

Pipeline - PolyLine
Cross-country aboveground pipeline used for transportation of liquid, gas, or matter, usually found near industrial areas or public utilities plants. Digitize edge. Do not show supporting structures. Do not show pipes that do not touch the ground, such as between buildings.
**Topology: Pipelines should not overlap any structures. Pipelines can overlap all transportation features, cemeteries, bridges, and overpasses. Pipelines should maintain connectivity through the length of the linear network.*

Underground Pipeline (Special Request Only)
Digitize center line of apparent underground utility pipes.
**Topology: Underground Pipelines should maintain connectivity through the length of the linear network.*

Levee - Polygon
Earth wall for fluid retention, usually found along rivers or canals. Digitize outline of levee.
**Topology: Transportation features, fences and walls can overlap levees. Levees should not overlap structures.*

Pier - Polygon
Deck supported by posts extended over water. Digitize edge of pier.
**Topology: Pier features can overlap hydro features. Pier features should not overlap piers.*

Riprap - Polygon
Rocks placed along slopes to lessen erosion. Outline riprap area.
**Topology: Riprap should not overlap hydro features. Riprap may overlap culverts and ditches.*

Jetty - Polygon
Structure, usually earth or concrete, extended from shore to lessen erosion. Delineate any other features such as retaining walls or slabs.
**Topology: Jetty features should not overlap hydro features, or structures.*

B-11. Natural Features

River - Polygon
Navigable stream. Digitize shorelines.
**Topology: Rivers should overlap piers and boat houses. Bridges and overpasses may overlap River features. Other hydro features should not overlap River features.*

Lake - Polygon
A large inland body of water. Show man-made reservoirs as lakes. Digitize shoreline.
**Topology: Lakes should overlap piers and boat houses. Bridges and overpasses may overlap Lake features. Other hydro features should not overlap Lake features.*

Pond - Polygon
A body of standing water much smaller than a lake, often man-made. Digitize shoreline.
**Topology: Ponds should overlap piers and boat houses. Bridges and overpasses may overlap Pond features. Other hydro features should not overlap Pond features.*

Swamp - Polygon
Area of spongy, wet ground, usually harboring vegetation. Digitize any river, lake, pond, or creek outline within the swamp. Digitize outline of swamp. No distinction is made between a swamp, marsh, or inundated area.
**Topology: Swamps should overlap vegetation, piers and boat houses. Bridges and overpasses may overlap Swamp features. Other hydro features that are polygonal should not overlap Swamp features. Linear hydro features should overlap Swamp features.*

Creek – Polygon/Polyline
Non-navigable stream. Digitize shorelines of streams wider than 5 ft, and digitize center lines of streams narrower than 5 ft.

**Topology: Creeks should overlap piers and boat houses. Bridges and overpasses may overlap Creeks. Other hydro features and vegetation should not overlap Creeks. Creeks should maintain connectivity through the length of the network.*

Tree Mass - Polygon
Group of trees too close together to allow individual collection. Digitize edge of tree mass by following outline along the outer edge of the tree trunks.
**Topology: Tree mass should not overlap any "double-wide" linear feature (e.g., vehicular trail, creek over 10 ft wide) or any railroad line, regardless of canopy spread. Tree mass may overlap structures, single creeks, and fences.*

Tree – Point
Single tree over 10 ft tall. Digitize center of base of tree trunk. No distinction is made between deciduous and coniferous trees.
**Topology: Tree points should not overlap any features, but may be overlapped by bridges, overpasses and elevated walkways.*

Brush
Trees under 10 ft tall, tall weeds, or other vegetation usually found in unpopulated meadows, near forested areas, or near rivers or creeks. Outline brush only if it is dense enough to obscure ground.
**Topology: Brush features should not overlap any features, but may be overlapped by bridges, overpasses and elevated walkways.*

B-12. Drainage Structures

Culvert (Over 5 ft Wide) - PolyLine
Pipe drain, usually located under roads or driveways. Digitize length of pipe from center of each end. Do not show culverts if cement headwalls are present.
**Topology: Culvert lines may overlap riprap features, but snap to concrete headwall lines.*

Concrete Headwall - PolyLine
Concrete on the end of a transverse drain or pipe culvert. Digitize the center lines of headwalls less than 10 ft long. Digitize outer edge of thicker and larger headwalls.
**Topology: Concrete Headwall lines may overlap riprap features, but should snap to culvert lines.*

Paved Side Ditch - Polygon
Digitize outer edge of paved ditch. Do not show water line inside ditch.
**Topology: Paved Ditch features should not overlap any features, however bridges, overpasses and elevated walkways may overlap Paved Ditches. Cap ends or join cleanly with headwalls.*

Catch Basin - Point
Small rectangular or square drainage grate. Digitize center of catch basin.
**Topology: Square Catch Basin features can overlap any transportation feature, sidewalk and slabs.*

B-13. Signs and Traffic Control

Billboard - Point
Digitize the center of each post of billboard. Cartographically label "BB."
**Topology: Billboard features can overlap any transportation feature, sidewalk and slabs.*

B-14. Utilities

Power Pole - Point
Utility pole from which power, telephone, or cable television lines are suspended. Digitize center of pole. Power pole has precedence over light pole if the pole has a dual purpose. Traffic signal pole has precedence over power pole.
**Topology: Power Pole features can overlap any transportation feature, structure, hydro feature, sidewalk and slab.*

Transmission Tower - Polygon
Large structure for supporting power lines across long distances. Digitize base of tower.
**Topology: Transmission Tower features can overlap any transportation feature, structure, sidewalk and slab.*

Substation - Polygon
High-voltage units grouped together, usually within a fence. Digitize outline if not enclosed by fence. Show large structures within substations as miscellaneous structures.
**Topology: Substations may overlap slabs, unpaved drives, and trails. All other transportation features should not overlap Substation features. Do not show individual poles, pipes, or transformers within substation boundary.*

Light Pole - Point
Digitize center of street lights along roads. Do not show lights in parking lots or yard lights. Show lone, large light poles also (such as stadium lights or large lights at ballfields).
**Topology: Light Pole features can overlap any transportation feature, structure, sidewalk and slab.*

B-15. Contours - PolyLine

Index Contour
Every fifth contour shall be annotated and shall be clearly distinguished from intermediate contours. If the contours are absolutely too close to pull indexes through, such as on a cliff or in a quarry, every fifth index is to be pulled through and the others are to drop cleanly.

Hidden Index Contour (Special Request Only)
Indexes that are obstructed by dense vegetation shall be delineated as hidden index contours. The guidelines for index contours apply to hidden index contours also.

Depressed Index Contour (Special Request Only)
See C-7*b* above. Follow the same guidelines as for index contours.

Hidden Depressed Index Contour (Special Request Only)
Depression index obstructed by dense vegetation. Follow the same guidelines as for index contours.

Index Contour Label (Special Request Only) - Annotation
Label shall be placed on line of index contour in such a manner that the bottom of the number corresponds to the ground that is lower than the index elevation.

Intermediate Contour
Four intermediates exist between two index contours. Do not show any more or any less than four. Do not drop intermediate contours unless the indexes are less than 1/4 in. apart at map scale.

Hidden Intermediate Contour (Special Request Only)
Intermediate contour that is obstructed by dense vegetation, bridges, overpasses and elevated walkways. Follow the same guidelines as for intermediate contours.

Depressed Intermediate Contour (Special Request Only)
See C-7*b* above. Follow the same guidelines as for intermediate contours.

Hidden Depressed Intermediate Contour (Special Request Only)
Depressed intermediate contour obstructed by dense vegetation, bridges, overpasses and elevated walkways. Follow the same guidelines as for intermediate contours.
**Topology: Contours should not overlap each other and should not dangle unless on the end of the mapping area.*

Spot Elevation (Special Request Only) - Point
Supplemental elevation used in conjunction with contour information. Spot elevations should be placed at the following points:

(1) All road and/or railroad intersections.

(2) At each end of bridges on center line of road.

(3) At center line of roads above culverts.

(4) At the highest point of closed contour tops.

(5) At the lowest point of closed depressions, significant saddles, and quarries.

(6) At points visible through dense vegetation in obscured areas.

(7) Any necessary place such that in no place is there more than 2 in. (at map scale) between contours and/or spot elevations.

Water Elevation (Special Request Only) - Point
Elevation of surface of water. Place at or near the center of the water body itself or the water body shown on the model. Do not show water elevations on single-wide creeks or ditches.

B-16. Manuscript Data

Project Limit - Polygon
Show the extents of the mapping area. Planimetric features and contours should end exactly upon this extent.

Horizontal Control Point - Point
Place at coordinates and label if cartographically necessary. Show only if horizontal control is separate from vertical control.

Vertical Control Point - Point
Place at coordinates and label if cartographically necessary. Show only if horizontal control is separate from vertical control.

Control Point - Point
Point used for both horizontal and vertical control. Place at coordinates and label if cartographically necessary.

Control Point Annotation - Annotation
List point number. North and east coordinate values are to be shown on horizontal points; elevations are to be shown on vertical points. Use commas.

Grid Tick - Point
Place grid tick at grid line intersections (every 5 in. at map scale). Label outside of graphic detail such that each grid is labeled once.

Grid Lines (Special Request Only) - PolyLine
Place lines every 5 in. at map scale at even grid coordinates. End cleanly at match lines or neat lines.

Grid Annotation - Annotation
Place as appropriate. Use commas.

Standard Border – Polygon/PolyLine
Center border about graphic detail. Annotate if cartographically necessary the project, client name, scale, contour interval, map type, sheet number and index of all sheets, month of photography, and grid north.

Section III
Feature Depiction Specifications
Nominal Scale: 200 Feet per Inch
Target Scale Range: 180 to 320 Feet per Inch

B-17. TRANSPORTATION

Paved Road - Polygon
Defined by edge of pavement, excluding paved shoulder or gutter.
**Topology: Paved road features cannot overlap other transportation features. Paved road features may overlap existing hydrographic features, and can be overlapped by bridges, overpasses and elevated walkways.*

Unpaved Road - Polygon
Dirt or gravel road maintained as a thoroughfare. Unpaved roads are frequently found in rural areas or in suburban areas. Unpaved alleys are depicted as unpaved roads. Define by edge of graded surface or edge of tire wear lines, whichever is appropriate. Also use unpaved road for unpaved runways.
**Topology: Paved road features cannot overlap other transportation features. Paved road features may overlap existing hydrographic features, and can be overlapped by bridges, overpasses and elevated walkways.*

Railroad - PolyLine
Digitize center line of all rails in use. Show all sidings and spurs (tracks for storage, etc.).
**Topology: Railroad lines should maintain connectivity through the length of the linear network. Railroad lines can overlap transportation features and can be overlapped by bridges, overpasses and elevated walkways. (In some cases these lines can be classified as Hidden Railroad.)*

Abandoned Railroad – PolyLine
Digitize center line of all abandoned railroads with tracks still intact and visible. Do not delineate old railroad grades with no tracks intact.
**Topology: Abandoned Railroad lines should maintain connectivity through the length of the linear network. Abandoned Railroad lines can overlap transportation features and can be overlapped by bridges, overpasses and elevated walkways. (In some cases these lines can be classified as Hidden Abandoned Railroad.)*

Bridge - Polygon
Structure erected over obstacle or depression. "Bridge" includes automotive bridges, railroad bridges, footbridges, and viaducts.
**Topology: Continue all depictions across bridge, including edge of paved road, railroad and guardrail, if the item continues on the bridge. Contours do not become generated over bridges as these are not bare earth features.*

Runway - Polygon
Airport pavement used for takeoff, landing, or taxiing of airplanes. "Runway" also includes helipads. Unpaved runways shall be shown with unpaved road features.
**Topology: Runway features cannot overlap other transportation features. Runway features may overlap existing hydrographic features, and can be overlapped by bridges, overpasses and elevated walkways.*

Retaining Wall - PolyLine
Fixed structure retaining earth located along thoroughfares. Digitize center line and for cartographic purposes, symbolize using tick patterns on high side of wall.
**Topology: Retaining Wall lines should maintain connectivity through the length of the linear network.*

Trail - PolyLine
Visible, permanent dirt passageway greater than 200 ft long. Digitize center line of trail.
**Topology: Trails should not overlap and should snap to all transportation features, structures and slabs. Trail features can be overlapped by bridges, overpasses and elevated walkways.*

Paved Drive Over 200 ft Long - Polygon
Defined by the edge of pavement.

Topology: Paved drive features should not overlap other transportation features, sidewalks, structures, or slabs. Retaining wall features can overlap paved drive. Can be overlapped by bridges, overpasses and elevated walkways.

Unpaved Drive Over 200 ft Long - Polygon
Defined by the edge of gravel or dirt.
Topology: Unpaved drive features should not overlap other transportation features, sidewalks, structures, or slabs. Retaining wall features can overlap unpaved drive. Can be overlapped by bridges, overpasses and elevated walkways.

Commercial Paved Parking Over 200 ft Long - Polygon
Digitize edge of parking lot; do not show parking lot islands.
Topology: Commercial Paved parking features should not overlap other transportation features, sidewalks, structures, or slabs. Retaining wall feature, curbs, and guardrails can overlap commercial paved parking. Can be overlapped by bridges, overpasses and elevated walkways.

Commercial Unpaved Parking Over 200 ft Long - Polygon
Digitize edge of gravel or dirt edge. Do not show islands in unpaved parking lots.
Topology: Commercial unpaved parking features should not overlap other transportation features, sidewalks, structures, or slabs. Retaining wall feature, curbs, and guardrails can overlap commercial unpaved parking. Can be overlapped by bridges, overpasses and elevated walkways.

Guardrail Over 200 ft Long - PolyLine
Single- or double-sided box beam, corrugated steel, wooden, or cable guide rail. Guardrails are usually located in medians of roads or along road edges near hazards. Digitize center line of rail.
**Topology: Guardrail lines should maintain connectivity through the length of the linear network.*

B-18. Structures

Building - Polygon
"Building" includes residential or commercial trailers. Include covered porches, permanent overhangs, carport roofs, covered sidewalks, etc., as part of the building. Do not show common roof lines (e.g., between townhomes) or interior roof lines (e.g., dormers). Temporary structures are delineated as miscellaneous structures. Smokestacks are shown as buildings if freestanding.
**Topology: All features except for bridges, overpasses and elevated walkways should not overlap building features.*

Trailer Park - Polygon
Digitize edge of trailer park as apparent from lot location, property lines, and other clues. Show drives over 200 ft long.
**Topology: Trailer Parks may overlap slabs, unpaved drives, and trails. All other transportation*

features should not overlap Trailer Parks. Do not show trailers within trailer parks; do show buildings within parks if present.

Ruin or Under Construction Building - Polygon
Delineate all visible building outlines, including foundation slabs or basement remains. Ruins other than buildings should be outlined.
**Topology: All features except for bridges, overpasses and elevated walkways should not overlap ruins or under construction building features.*

Tank - Polygon
Public utility storage tank. Digitize edge of tank.
**Topology: All features except for bridges, overpasses and elevated walkways should not overlap tank features.*

Silo - Polygon
Cylindrical receptacle for farm product storage.
**Topology: All features except for bridges, overpasses and elevated walkways should not overlap silo features.*

Dam - Polygon
Barrier across river, creek, or swamp to regulate or obstruct water flow. Visible beaver dams large enough to affect water flow shall be outlined also.
**Topology: All features except for bridges, overpasses and elevated walkways should not overlap dam features.*

Cemetery - Polygon
Delineate cemetery boundary. Do not show headstones or sidewalks.
**Topology: Paved drives, unpaved drives, fences, and buildings can overlap cemetery features.*

Fence - PolyLine
Digitize center lines of visible back property line and cross-country fences.
**Topology: Fences should not overlap any structures. Fences can overlap all transportation features, cemeteries, bridges, and overpasses. Fence lines should maintain connectivity through the length of the linear network.*

Ornamental Wall - PolyLine
Fixed structure of concrete or brick not used for retention of earth. Digitize center line of walls over 20 ft long. Ornamental wall has precedence over fence or cemetery.
**Topology: Ornamental Wall lines should maintain connectivity through the length of the linear network. Ornamental walls should not overlap any structures.*

Public Pool - Polygon
Digitize interior edge of concrete around in-ground pools. Also use pool for aeration pools in industrial areas.
**Topology: All features except for bridges, overpasses and elevated walkways should not overlap pool features.*

Broadcast Antenna - Point
Radio or television tower. Digitize center of tower.
**Topology: Broadcast Antenna features can overlap any transportation feature, sidewalk and slabs.*

Miscellaneous Feature - PolyLine
Items not classified as minor buildings, such as conveyors or crane tracks.
**Topology: All features except for bridges, overpasses and elevated walkways should not overlap miscellaneous features.*

Field Line (Special Request Only) - PolyLine
A change between plowed fields indicating a property line. Often apparent by a difference in crop or type of furrow. Digitize center line of rural field lines only.
**Topology: Field Line features should not overlap any structures. Field Lines should maintain connectivity through the length of the linear network.*

Golf Course - Polygon
Show outline of golf course only if not bounded by a fence. Do not digitize tees, greens, or sand traps except upon special request. Show all paved drives (cart paths) that are permanent in nature. Show all hydrology and natural features.
**Topology: Paved drives, unpaved drives, fences, and buildings can overlap golf course.*

Athletic Field - Polygon
Outline field only if not depicted by fence.
Topology: Athletic Field features should not overlap other transportation features, sidewalks, structures, or slabs. Show paved or unpaved tracks as paved or unpaved drives.

Debris (Greater Than 20 ft × 20 ft) - Polygon
Scattered and unsorted material covering ground. Digitize outline of area.
**Topology: All features except for bridges, overpasses and elevated walkways should not overlap debris features.*

Storage - Polygon
Stacked material or piles of dirt, sand, gravel, salt, etc. Digitize outline of area. Outline junkyards as storage.

**Topology: All features except for bridges, overpasses and elevated walkways should not overlap debris features.*

Quarry - Polygon
Mining area. No distinction is made between rock (consolidated) material mines and loose (unconsolidated) material mines. Show natural features present within quarry. Digitize quarry outline.
**Topology: Paved drives, unpaved drives, fences, buildings, and hydro features can overlap quarry area.*

Area Under Construction - Polygon
Digitize outline of entire area under construction. Show any roads under construction as unpaved roads. Digitize buildings under construction, and any feature that has been completed (e.g., curb or completed building). Do not show debris or storage within the area outline.
**Topology: Paved drives, unpaved drives, fences, buildings, and hydro features can overlap area under construction.*

Pipeline - PolyLine
Cross-country aboveground pipeline used for transportation of liquid, gas, or matter, usually found near industrial areas or public utilities plants. Digitize center line and do not show supporting structures.
**Topology: Pipelines should not overlap any structures. Pipelines can overlap all transportation features, cemeteries, bridges, and overpasses. Pipelines should maintain connectivity through the length of the linear network.*

Underground Pipeline (Special Request Only) - Polyline
Digitize center line of apparent underground utility pipes.
**Topology: Underground Pipelines should maintain connectivity through the length of the linear network.*

Levee - Polygon
Earth wall for fluid retention, usually found along rivers or canals. Digitize outline of levee.
**Topology: Transportation features, fences and walls can overlap levees. Levees should not overlap structures.*

Commercial Pier - Polygon
Deck supported by posts extended over water. Digitize edge of pier. Do not show private piers.
**Topology: Pier features can overlap hydro features. Pier features should not overlap piers.*

Riprap (Over 20 ft x 20 ft) - Polygon
Rocks placed along slopes to lessen erosion. Outline riprap area.

**Topology: Riprap should not overlap hydro features. Riprap may overlap culverts and ditches.*

Jetty - Polygon
Structure, usually earth or concrete, extended from shore to lessen erosion. Delineate any other features such as retaining walls or slabs.
**Topology: Jetty features should not overlap hydro features, or structures.*
B-19. Natural Features

River - Polygon
Navigable stream. Digitize shorelines.
**Topology: Rivers should overlap piers and boat houses. Bridges and overpasses may overlap River features. Other hydro features should not overlap River features.*

Lake - Polygon
A large inland body of water. Show man-made reservoirs as lakes. Digitize shoreline.
**Topology: Lakes should overlap piers and boat houses. Bridges and overpasses may overlap Lake features. Other hydro features should not overlap Lake features.*

Pond - Polygon
A body of standing water much smaller than a lake, often man-made. Digitize shoreline.
**Topology: Ponds should overlap piers and boat houses. Bridges and overpasses may overlap Pond features. Other hydro features should not overlap Pond features.*

Swamp - Polygon
Area of spongy, wet ground, usually harboring vegetation. Digitize any river, lake, pond, or creek outline within the swamp. Digitize outline of swamp. No distinction is made between a swamp, marsh, or inundated area.
**Topology: Swamps should overlap vegetation, piers and boat houses. Bridges and overpasses may overlap Swamp features. Other hydro features that are polygonal should not overlap Swamp features. Linear hydro features should overlap Swamp features.*

Creek – Polygon/PolyLine
Non-navigable stream. Digitize shorelines of streams wider than 15 ft, and digitize center lines of streams narrower than 15 ft.
**Topology: Creeks should overlap piers and boat houses. Bridges, and overpasses may overlap Creeks. Other hydro features and vegetation should not overlap Creeks. Creeks should maintain connectivity through the length of the network.*

Tree Mass - Polygon
Group of trees too close together to allow individual collection. Digitize edge of tree mass by following outline along the outer edge of the tree trunks.

**Topology: Tree mass should not overlap any "double-wide" linear feature (e.g., vehicular trail, creek over 15 ft wide) or any railroad line, regardless of canopy spread. Tree mass may overlap structures, single creeks, and fences.*

B-20. Drainage Structures

Concrete Headwall - PolyLine

Concrete on the end of a transverse drain or pipe culvert. Digitize the center of headwalls less than 20 ft long. Digitize outer edge of thicker and larger headwalls.

**Topology: Concrete Headwall lines may overlap riprap features, but should snap to culvert lines.*

Paved Ditch - PolyLine

Digitize center line of paved ditch. Do not show water line inside ditch.

**Topology: Paved Ditch features should not overlap any features, however bridges, overpasses and elevated walkways may overlap Paved Ditches. Cap ends or join cleanly with headwalls.*

B-21. Utilities

Power Pole - Point

Utility pole from which power, telephone, or cable television lines are suspended. Digitize center of pole.

**Topology: Power Pole features can overlap any transportation feature, structure, hydro feature, sidewalk and slab.*

Transmission Tower - Polygon

Large structure for supporting power lines across long distances. Digitize base of tower.

**Topology: Transmission Tower features can overlap any transportation feature, structure, sidewalk and slab.*

Substation Greater Than 20 ft × 20 ft - Polygon

High-voltage units grouped together, usually within a fence. Digitize outline if not enclosed by fence. Show large structures within substations as miscellaneous structures.

**Topology: Substations may overlap slabs, unpaved drives, and trails. All other transportation features should not overlap Substation features. Do not show individual poles, pipes, or transformers within substation boundary.*

B-22. Contours

Index Contour

Every fifth contour shall be annotated and shall be clearly distinguished from intermediate contours. If the contours are absolutely too close to pull indexes through, such as on a cliff or in a quarry, every fifth index is to be pulled through and the others are to drop cleanly.

Hidden Index Contour (Special Request Only)
Indexes that are obstructed by dense vegetation shall be delineated as hidden index contours. The guidelines for index contours apply to hidden index contours also.

Depressed Index Contour (Special Request Only)
See C-7*b* above. Follow the same guidelines as for index contours.

Hidden Depressed Index Contour (Special Request Only)
Depression index obstructed by dense vegetation. Follow the same guidelines as for index contours.

Index Contour Label (Special Request Only) - Annotation
Label shall be placed on line of index contour in such a manner that the bottom of the number corresponds to the ground that is lower than the index elevation.

Intermediate Contour
Four intermediates exist between two index contours. Do not show any more or any less than four. Do not drop intermediate contours unless the indexes are less than 1/4 in. apart at map scale.

Hidden Intermediate Contour (Special Request Only)
Intermediate contour that is obstructed by dense vegetation, bridges, overpasses and elevated walkways. Follow the same guidelines as for intermediate contours.

Depressed Intermediate Contour (Special Request Only)
See C-7*b* above. Follow the same guidelines as for intermediate contours.

Hidden Depressed Intermediate Contour (Special Request Only)
Depressed intermediate contour obstructed by dense vegetation, bridges, overpasses and elevated walkways. Follow the same guidelines as for intermediate contours.
**Topology: Contours should not overlap each other and should not dangle unless on the end of the mapping area.*

Spot Elevation (Special Request Only) - Point
Supplemental elevation used in conjunction with contour information. Spot elevations should be placed at the following points:

(1) All road and/or railroad intersections.

(2) At each end of bridges on center line of road.

(3) At center line of roads above culverts.

(4) At the highest point of closed contour tops.

(5) At the lowest point of closed depressions, significant saddles, and quarries.

(6) At points visible through dense vegetation in obscured areas.

(7) Any necessary place such that in no place is there more than 2 in. (at map scale) between contours and/or spot elevations.

Water Elevation (Special Request Only) - Point
Elevation of surface of water. Place at or near the center of the water body itself or the water body shown on the model. Do not show water elevations on single-wide creeks or ditches.

B-23. Manuscript Data

Project Limit - Polygon
Show the extents of the mapping area. Planimetric features and contours should end exactly upon this extent.

Horizontal Control Point - Point
Place at coordinates and label if cartographically necessary. Show only if horizontal control is separate from vertical control.

Vertical Control Point - Point
Place at coordinates and label if cartographically necessary. Show only if horizontal control is separate from vertical control.

Control Point - Point
Point used for both horizontal and vertical control. Place at coordinates and label if cartographically necessary.

Control Point Annotation - Annotation
List point number. North and east coordinate values are to be shown on horizontal points; elevations are to be shown on vertical points. Use commas.

Grid Tick - Point
Place grid tick at grid line intersections (every 5 in. at map scale). Label outside of graphic detail such that each grid is labeled once.

Grid Lines (Special Request Only) - PolyLine
Place lines every 5 in. at map scale at even grid coordinates. End cleanly at match lines or neat lines.

Grid Annotation - Annotation
Place as appropriate. Use commas.

Standard Border – Polygon/PolyLine
Center border about graphic detail. Annotate if cartographically necessary the project, client name, scale, contour interval, map type, sheet number and index of all sheets, month of photography, and grid north.

Section IV
Feature Depiction Specifications
Nominal Scale: 400 Feet per Inch
Target Scale Range: 340 to 500 Feet per Inch

B-24. Transportation

Paved Road - Polygon
Defined by edge of pavement, excluding paved shoulder or gutter.
**Topology: Paved road features cannot overlap other transportation features. Paved road features may overlap existing hydrographic features, and can be overlapped by bridges, overpasses and elevated walkways.*

Unpaved Road - Polygon
Dirt or gravel road maintained as a thoroughfare. Unpaved roads are frequently found in rural areas or in suburban areas. Unpaved alleys are depicted as unpaved roads. Define by edge of graded surface or edge of tire wear lines, whichever is appropriate. Also use unpaved road for unpaved runways.
**Topology: Paved road features cannot overlap other transportation features. Paved road features may overlap existing hydrographic features, and can be overlapped by bridges, overpasses and elevated walkways.*

Railroad - PolyLine
Digitize center line of visible rails in use. Do not show sidings and spurs (tracks for storage, etc.).
**Topology: Railroad lines should maintain connectivity through the length of the linear network. Railroad lines can overlap transportation features and can be overlapped by bridges, overpasses and elevated walkways. (In some cases these lines can be classified as Hidden Railroad.)*

Abandoned Railroad - PolyLine
Digitize center line of all abandoned railroads with tracks still intact and visible. Do not delineate old railroad grades with no tracks intact.
**Topology: Abandoned Railroad lines should maintain connectivity through the length of the linear network. Abandoned Railroad lines can overlap transportation features and can be overlapped by bridges, overpasses and elevated walkways. (In some cases these lines can be classified as Hidden Abandoned Railroad.)*

Bridge - Polygon
Structure erected over obstacle or depression. Digitize general shape of bridge.
**Topology: Continue all depictions across bridge, including edge of paved road, railroad and guardrail, if the item continues on the bridge. Contours do not become generated over bridges as these are not bare earth features.*

Runway - Polygon
Airport pavement used for takeoff, landing, or taxiing of airplanes. "Runway" also includes helipads. Unpaved runways shall be shown with unpaved road features.
**Topology: Runway features cannot overlap other transportation features. Runway features may overlap existing hydrographic features, and can be overlapped by bridges, overpasses and elevated walkways.*

Retaining Wall - PolyLine
Fixed structure retaining earth located along thoroughfares. Digitize center line and for cartographic purposes, symbolize using tick patterns on high side of wall.
**Topology: Retaining Wall lines should maintain connectivity through the length of the linear network.*

Paved Drive Over 400 ft Long - Polygon
Defined by the edge of pavement.
Topology: Paved drive features should not overlap other transportation features, sidewalks, structures, or slabs. Retaining wall features can overlap paved drive. Can be overlapped by bridges, overpasses and elevated walkways.

Unpaved Drive Over 400 ft Long - Polygon
Edge of pavement of any kind has precedence over unpaved drive.
Topology: Unpaved drive features should not overlap other transportation features, sidewalks, structures, or slabs. Retaining wall features can overlap unpaved drive. Can be overlapped by bridges, overpasses and elevated walkways.

Commercial Paved Parking Over 400 ft Long - Polygon
Digitize edge of pavement of parking lot and parking lot islands.

Topology: Paved parking features should not overlap other transportation features, sidewalks, structures, or slabs. Retaining wall feature, curbs, and guardrails can overlap paved parking. Can be overlapped by bridges, overpasses and elevated walkways.

Commercial Unpaved Parking Over 400 ft Long - Polygon
Digitize edge of gravel or dirt edge. Do not show islands in unpaved parking lots.
Topology: Unpaved parking features should not overlap other transportation features, sidewalks, structures, or slabs. Retaining wall feature, curbs, and guardrails can overlap unpaved parking. Can be overlapped by bridges, overpasses and elevated walkways.

B-25. Structures

Building - Polygon
Digitize general shape of buildings over 40 ft x 40 ft. Do not show trailers at all. Visible smokestacks are shown as buildings if freestanding.
**Topology: All features except for bridges, overpasses and elevated walkways should not overlap building features.*

Ruin or Under Construction Building - Polygon
Delineate all visible building outlines, including foundation slabs or basement remains. Ruins other than buildings should be outlined.
**Topology: All features except for bridges, overpasses and elevated walkways should not overlap ruins or under construction building features.*

Trailer Park - Polygon
Digitize edge of trailer park as apparent from lot location, property lines, etc. Do not show trailers within trailer parks. Show drives over 400 ft long.
**Topology: Trailer Parks may overlap slabs, unpaved drives, and trails. All other transportation features should not overlap Trailer Parks. Do not show trailers within trailer parks; do show buildings within parks if present.*

Dam - Polygon
Barrier across river, creek, or swamp to regulate or obstruct water flow.
**Topology: All features except for bridges, overpasses and elevated walkways should not overlap dam features.*

Tank - Polygon
Public utility storage tank. Digitize edge of tank.
**Topology: All features except for bridges, overpasses and elevated walkways should not overlap tank features.*

Silo - Polygon
Large cylindrical receptacle for farm product storage.
**Topology: All features except for bridges, overpasses and elevated walkways should not overlap silo features.*

Cemetery - Polygon
Delineate cemetery boundary only if not bounded by a fence line. Show paved drives over 400 ft long.
**Topology: Paved drives, unpaved drives, fences, and buildings can overlap cemetery features.*

Fence - PolyLine
Digitize center lines of all visible cross-country fences.
**Topology: Fences should not overlap any structures. Fences can overlap all transportation features, cemeteries, bridges, and overpasses. Fence lines should maintain connectivity through the length of the linear network.*

Ornamental Wall - PolyLine
Fixed structure of concrete or brick not used for retention of earth. Digitize center line of walls over 40 ft long.
**Topology: Ornamental Wall lines should maintain connectivity through the length of the linear network. Ornamental walls should not overlap any structures.*

Broadcast Antenna - Point
Radio or television tower. Digitize center of tower.
**Topology: Broadcast Antenna features can overlap any transportation feature, sidewalk and slabs.*

Miscellaneous Feature - PolyLine
Items not classified as minor buildings, such as conveyors or crane tracks.
**Topology: All features except for bridges, overpasses and elevated walkways should not overlap miscellaneous features.*

Field Line (Special Request Only) - PolyLine
A change between plowed fields indicating a property line. Often apparent by a difference in crop or type of furrow. Digitize center line of rural field lines only.
**Topology: Field Line features should not overlap any structures. Field Lines should maintain connectivity through the length of the linear network.*

Golf Course - Polygon
Show outline of golf course only if not bounded by a fence. Do not digitize tees, greens, or sand traps except upon special request. Show all paved drives (cart paths) that are permanent in nature

and over 400 ft long. Show all hydrology and natural features.
**Topology: Paved drives, unpaved drives, fences, and buildings can overlap golf course.*

Athletic Field - Polygon
Outline field only if not depicted by fence. Show paved or unpaved tracks as paved or unpaved drives.
Topology: Athletic Field features should not overlap other transportation features, sidewalks, structures, or slabs. Show paved or unpaved tracks as paved or unpaved drives.

Debris - Polygon
Scattered and unsorted material covering ground. Digitize outline of area.
**Topology: All features except for bridges, overpasses and elevated walkways should not overlap debris features.*

Storage - Polygon
Stacked material or piles of dirt, sand, gravel, salt, etc. Digitize outline of area. Outline junkyards as storage.
**Topology: All features except for bridges, overpasses and elevated walkways should not overlap debris features.*

Quarry - Polygon
Mining area. No distinction is made between rock (consolidated) material mines and loose (unconsolidated) material mines. Show natural features present within quarry. Digitize quarry outline.
**Topology: Paved drives, unpaved drives, fences, buildings, and hydro features can overlap quarry area.*

Area Under Construction - Polygon
Digitize outline of entire area under construction. Show any roads under construction as unpaved roads. Digitize buildings under construction, and any feature that has been completed (e.g., curb or completed building). Do not show debris or storage within the area outline.
**Topology: Paved drives, unpaved drives, fences, buildings, and hydro features can overlap area under construction.*

Pipeline - PolyLine
Cross-country aboveground pipeline used for transportation of liquid, gas, or matter, usually found near industrial areas or public utilities plants. Digitize center line and do not show supporting structures.
**Topology: Pipelines should not overlap any structures. Pipelines can overlap all transportation features, cemeteries, bridges, and overpasses. Pipelines should maintain connectivity through the length of the linear network.*

Underground Pipeline (Special Request Only) - PolyLine
Digitize center line of apparent underground utility pipes.
**Topology: Underground Pipelines should maintain connectivity through the length of the linear network.*

Levee - Polygon
Earth wall for fluid retention, usually found along rivers or canals. Digitize outline of levee.
**Topology: Transportation features, fences and walls can overlap levees. Levees should not overlap structures.*

Riprap (Over 40 ft x 40 ft) - Polygon
Rocks placed along slopes to lessen erosion. Outline riprap area.
**Topology: Riprap should not overlap hydro features. Riprap may overlap culverts and ditches.*

Commercial Pier - Polygon
Deck supported by posts extended over water. Digitize edge of pier. Do not show private piers.
**Topology: Pier features can overlap hydro features. Pier features should not overlap piers.*

Jetty - Polygon
Structure, usually earth or concrete, extended from shore to lessen erosion. Delineate any other features such as retaining walls or slabs.
**Topology: Jetty features should not overlap hydro features, or structures.*

B-26. Natural Features

River - Polygon
Navigable stream. Digitize shorelines.
**Topology: Rivers should overlap piers and boat houses. Bridges and overpasses may overlap River features. Other hydro features should not overlap River features.*

Lake - Polygon
A large inland body of water. Show man-made reservoirs as lakes. Digitize shoreline.
**Topology: Lakes should overlap piers and boat houses. Bridges and overpasses may overlap Lake features. Other hydro features should not overlap Lake features.*

Pond - Polygon
A body of standing water much smaller than a lake, often man-made. Digitize shoreline.
**Topology: Ponds should overlap piers and boat houses. Bridges and overpasses may overlap Pond features. Other hydro features should not overlap Pond features.*

Swamp - Polygon
Area of spongy, wet ground, usually harboring vegetation. Digitize any river, lake, pond, or creek outline within the swamp. Digitize outline of swamp. No distinction is made between a swamp, marsh, or inundated area.
**Topology: Swamps should overlap vegetation, piers and boat houses. Bridges and overpasses may overlap Swamp features. Other hydro features that are polygonal should not overlap Swamp features. Linear hydro features should overlap Swamp features.*

Creek - PolyLine
Non-navigable stream. Digitize center lines of streams.
**Topology: Creeks should overlap piers and boat houses. Bridges and overpasses may overlap Creeks. Other hydro features and vegetation should not overlap Creeks. Creeks should maintain connectivity through the length of the network.*

Tree Mass - Polygon
Group of trees. Digitize edge of tree mass by following outline along the outer edge of the tree trunks. Tree mass lines cannot cross over
**Topology: Tree Mass should not overlap any double-wide linear feature or any railroad line, regardless of canopy spread.*

B-27. Drainage Structures

Concrete Headwall - PolyLine
Concrete on the end of a transverse drain or pipe culvert. Digitize the center line of visible headwalls.
**Topology: Concrete Headwall lines may overlap riprap features, but should snap to culvert lines.*

Paved Ditch Over 40 ft Long - Polygon
Digitize outer edge of paved ditch. Do not show water line inside ditch.
**Topology: Paved Ditch features should not overlap any features; however bridges, overpasses and elevated walkways may overlap Paved Ditches. Cap ends or join cleanly with headwalls.*

B-28. Utilities

Transmission Tower - Polygon
Large structure for supporting power lines across long distances. Digitize base of tower.
**Topology: Transmission Tower features can overlap any transportation feature, structure, sidewalk and slab.*

Substation Greater Than 40 ft × 40 ft - Polygon
High-voltage units grouped together, usually within a fence. Digitize outline if not enclosed by fence. Show large structures within substations as miscellaneous structures.

**Topology: Substations may overlap slabs, unpaved drives, and trails. All other transportation features should not overlap Substation features. Do not show individual poles, pipes, or transformers within substation boundary.*

B-29. Contours

Index Contour
Every fifth contour shall be annotated and shall be clearly distinguished from intermediate contours. If the contours are absolutely too close to pull indexes through, such as on a cliff or in a quarry, every fifth index is to be pulled through and the others are to drop cleanly.

Hidden Index Contour (Special Request Only)
Indexes that are obstructed by dense vegetation shall be delineated as hidden index contours. The guidelines for index contours apply to hidden index contours also.

Depressed Index Contour (Special Request Only)
See C-7*b* above. Follow the same guidelines as for index contours.

Hidden Depressed Index Contour (Special Request Only)
Depression index obstructed by dense vegetation. Follow the same guidelines as for index contours.

Index Contour Label (Special Request Only) - Annotation
Label shall be placed on line of index contour in such a manner that the bottom of the number corresponds to the ground that is lower than the index elevation.

Intermediate Contour
Four intermediates exist between two index contours. Do not show any more or any less than four. Do not drop intermediate contours unless the indexes are less than 1/4 in. apart at map scale.

Hidden Intermediate Contour (Special Request Only)
Intermediate contour that is obstructed by dense vegetation, bridges, overpasses and elevated walkways. Follow the same guidelines as for intermediate contours.

Depressed Intermediate Contour (Special Request Only)
See C-7*b* above. Follow the same guidelines as for intermediate contours.

Hidden Depressed Intermediate Contour (Special Request Only)
Depressed intermediate contour obstructed by dense vegetation, bridges, overpasses and elevated walkways. Follow the same guidelines as for intermediate contours.

**Topology: Contours should not overlap each other and should not dangle unless on the end of the mapping area.*

Spot Elevation (Special Request Only) - Point
Supplemental elevation used in conjunction with contour information. Spot elevations should be placed at the following points:

(1) All road and/or railroad intersections.

(2) At each end of bridges on center line of road.

(3) At center line of roads above culverts.

(4) At the highest point of closed contour tops.

(5) At the lowest point of closed depressions, significant saddles, and quarries.

(6) At points visible through dense vegetation in obscured areas.

(7) Any necessary place such that in no place is there more than 2 in. (at map scale) between contours and/or spot elevations.

Water Elevation (Special Request Only) - Point
Elevation of surface of water. Place at or near the center of the water body itself or the water body shown on the model. Do not show water elevations on single-wide creeks or ditches.

B-30. Manuscript Data

Project Limit - Polygon
Show the extents of the mapping area. Planimetric features and contours should end exactly upon this extent.

Horizontal Control Point - Point
Place at coordinates and label if cartographically necessary. Show only if horizontal control is separate from vertical control.
Vertical Control Point - Point
Place at coordinates and label if cartographically necessary. Show only if horizontal control is separate from vertical control.

Control Point - Point
Point used for both horizontal and vertical control. Place at coordinates and label if cartographically necessary.

Control Point Annotation - Annotation
List point number. North and east coordinate values are to be shown on horizontal points; elevations are to be shown on vertical points. Use commas.

Grid Tick - Point
Place grid tick at grid line intersections (every 5 in. at map scale). Label outside of graphic detail such that each grid is labeled once.

Grid Lines (Special Request Only) - PolyLine
Place lines every 5 in. at map scale at even grid coordinates. End cleanly at match lines or neat lines.

Grid Annotation - Annotation
Place as appropriate. Use commas.

Standard Border – Polygon/PolyLine
Center border about graphic detail. Annotate if cartographically necessary the project, client name, scale, contour interval, map type, sheet number and index of all sheets, month of photography, and grid north.

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