

Building Site Development
Dunn County, North Dakota

Soil properties influence the development of building sites, including the selection of the site, the design of the structure, construction, performance after construction, and maintenance. The following tables show the degree and kind of soil limitations that affect dwellings with and without basements, small commercial buildings, local roads and streets, shallow excavations, and lawns and landscaping.

Rating class terms indicate the extent to which the soils are limited by all of the soil features that affect building site development. Not limited indicates that the soil has features that are very favorable for the specified use. Good performance and very low maintenance can be expected. Slight indicates that the soil has features that are favorable for the specified use. The limitations are minor and can be easily overcome. Good performance and low maintenance can be expected. Moderate indicates that the soil has features that are moderately favorable for the specified use. The limitations can be overcome or minimized by special planning, design, or installation. Fair performance and moderate maintenance can be expected. Severe indicates that the soil has one or more features that are unfavorable for the specified use. The limitations generally cannot be overcome without major soil reclamation, special design, or expensive installation procedures. Poor performance and high maintenance can be expected.

Dwellings are single-family houses of three stories or less. For dwellings without basements, the foundation is assumed to consist of spread footings of reinforced concrete built on undisturbed soil at a depth of 2 feet or at the depth of maximum frost penetration, whichever is deeper. For dwellings with basements, the foundation is assumed to consist of spread footings of reinforced concrete built on undisturbed soil at a depth of about 7 feet. The ratings for dwellings are based on the soil properties that affect the capacity of the soil to support a load without movement and on the properties that affect excavation and construction costs. The properties that affect the load-supporting capacity include depth to a water table, ponding, flooding, subsidence, linear extensibility (shrink-swell potential), and compressibility. Compressibility is inferred from the Unified classification. The properties that affect the ease and amount of excavation include depth to a water table, ponding, flooding, slope, depth to bedrock or a cemented pan, hardness of bedrock or a cemented pan, and the amount and size of rock fragments.

Small commercial buildings are structures that are less than three stories high and do not have basements. The foundation is assumed to consist of spread footings of reinforced concrete built on undisturbed soil at a depth of 2 feet or at the depth of maximum frost penetration, whichever is deeper. The ratings are based on the soil properties that affect the capacity of the soil to support a load without movement and on the properties that affect excavation and construction costs. The properties that affect the load-supporting capacity include depth to a water table, ponding, flooding, subsidence, linear extensibility (shrink-swell potential), and compressibility (which is inferred from the Unified classification). The properties that affect the ease and amount of excavation include flooding, depth to a water table, ponding, slope, depth to bedrock or a cemented pan, hardness of bedrock or a cemented pan, and the amount and size of rock fragments.

Local roads and streets have an all-weather surface and carry automobile and light truck traffic all year. They have a subgrade of cut or fill soil material; a base of gravel, crushed rock, or soil material stabilized by lime or cement; and a surface of flexible material (asphalt), rigid material (concrete), or gravel with a binder. The ratings are based on the soil properties that affect the ease of excavation and grading and the traffic-supporting capacity. The properties that affect the ease of excavation and grading are depth to bedrock or a cemented pan, hardness of bedrock or a cemented pan, depth to a water table, ponding, flooding, the amount of large stones, and slope. The properties that affect the traffic-supporting capacity are soil strength (as inferred from the AASHTO group index number), subsidence, linear extensibility (shrink-swell potential), the potential for frost action, depth to a water table, and ponding.

Shallow excavations are trenches or holes dug to a maximum depth of 5 or 6 feet for graves, utility lines, open ditches, or other purposes. The ratings are based on the soil properties that influence the ease of digging and the resistance to sloughing. Depth to bedrock or a cemented pan, hardness of bedrock or a cemented pan, the amount of large stones, and dense layers influence the ease of digging, filling, and compacting. Depth to the seasonal high water table, flooding, and ponding may restrict the period when excavations can be made. Slope influences the ease of using machinery. Soil texture, depth to the water table, and linear extensibility (shrink-swell potential) influence the resistance to sloughing.

Lawns and landscaping require soils on which turf and ornamental trees and shrubs can be established and maintained. Irrigation is not considered in the ratings. The ratings are based on the soil properties that affect plant growth and trafficability after vegetation is established. The properties that affect plant growth are reaction; depth to a water table; ponding; depth to bedrock or a cemented pan; the available water capacity in the upper 40 inches; the content of salts, sodium, or calcium carbonate; and sulfidic materials. The properties that affect trafficability are flooding, depth to a water table, ponding, slope, stoniness, and the amount of sand, clay, or organic matter in the surface layer.

Building Site Development--Continued
Dunn County, North Dakota

(The information in this table indicates the dominant soil condition but does not eliminate the need for onsite investigation. See text for definitions of terms used in this table. Absence of an entry indicates that no rating is applicable.)

| Map symbol and soil name | Shallow excavations | Dwellings without basements | Dwellings with basements | Small commercial buildings | Local roads and streets | Lawns and landscaping |
|--------------------------|-------------------------------------|---|-------------------------------------|---|---|--|
| 3: Channel----- | --- | --- | --- | --- | --- | --- |
| Straw----- | Severe: cutbanks cave | Severe: flooding | Severe: flooding | Severe: flooding | Severe: flooding | Severe: flooding |
| 4: Arnegard----- | Slight | Moderate: shrink-swell | Slight | Moderate: shrink-swell | Severe: low strength | Slight |
| 4B: Arnegard----- | Slight | Moderate: shrink-swell | Slight | Moderate: shrink-swell slope | Severe: low strength | Slight |
| 5: Tonka----- | Severe: ponding | Severe: shrink-swell ponding | Severe: shrink-swell ponding | Severe: shrink-swell ponding | Severe: low strength shrink-swell ponding | Severe: ponding |
| 7: Straw----- | Severe: cutbanks cave | Severe: flooding | Severe: flooding | Severe: flooding | Severe: flooding | Moderate: flooding |
| Rhoades----- | Moderate: flooding too clayey | Severe: flooding shrink-swell | Severe: flooding shrink-swell | Severe: flooding shrink-swell | Severe: flooding low strength shrink-swell | Severe: excess sodium |
| 8C: Cabba----- | Severe: depth to rock | Moderate: shrink-swell depth to rock | Severe: depth to rock | Moderate: shrink-swell slope depth to rock | Moderate: shrink-swell depth to rock | Severe: depth to rock |
| Chama----- | Slight | Moderate: shrink-swell | Moderate: shrink-swell | Moderate: shrink-swell slope | Severe: low strength | Moderate: area reclaim thin layer |
| 9D: Amor----- | Moderate: slope | Moderate: shrink-swell slope | Moderate: shrink-swell slope | Severe: slope | Severe: low strength | Moderate: area reclaim slope thin layer |
| Cabba----- | Severe: depth to rock | Moderate: shrink-swell slope depth to rock | Severe: depth to rock | Severe: slope | Moderate: shrink-swell slope depth to rock | Severe: depth to rock |
| 9E: Cabba----- | Severe: slope depth to rock | Severe: slope | Severe: slope depth to rock | Severe: slope | Severe: slope | Severe: slope depth to rock |
| 10D: Cabba----- | Moderate: slope | Moderate: shrink-swell slope | Moderate: slope | Severe: slope | Moderate: shrink-swell slope | Moderate: area reclaim slope thin layer |
| 11F: Cabba----- | Severe: slope depth to rock | Severe: slope | Severe: slope depth to rock | Severe: slope | Severe: slope | Severe: slope depth to rock |
| Badland----- | Severe: slope depth to rock | Severe: slope | Severe: slope depth to rock | Severe: slope | Severe: low strength slope | Severe: excess salt slope depth to rock |
| 12: Banks----- | Severe: cutbanks cave | Severe: flooding | Severe: flooding | Severe: flooding | Severe: flooding | Moderate: flooding droughty |

Building Site Development--Continued
Dunn County, North Dakota

(The information in this table indicates the dominant soil condition but does not eliminate the need for onsite investigation. See text for definitions of terms used in this table. Absence of an entry indicates that no rating is applicable.)

| Map symbol and soil name | Shallow excavations | Dwellings without basements | Dwellings with basements | Small commercial buildings | Local roads and streets | Lawns and landscaping |
|--------------------------|------------------------------------|------------------------------------|------------------------------------|------------------------------------|--|---|
| 13D: Wabek----- | Severe: cutbanks cave | Moderate: slope | Moderate: slope | Severe: slope | Moderate: slope | Severe |
| 15: Belfield----- | Moderate: too clayey wetness | Severe: shrink-swell | Severe: shrink-swell | Severe: shrink-swell | Severe: low strength shrink-swell | Severe: excess sodium |
| Farland----- | Severe: cutbanks cave | Moderate: shrink-swell | Moderate: shrink-swell | Moderate: shrink-swell | Severe: low strength | Slight |
| 16B: Belfield----- | Moderate: too clayey wetness | Severe: shrink-swell | Severe: shrink-swell | Severe: shrink-swell | Severe: low strength shrink-swell | Severe: excess sodium |
| Savage----- | Moderate: too clayey | Severe: shrink-swell | Severe: shrink-swell | Severe: shrink-swell | Severe: low strength shrink-swell | Slight |
| 18: Belfield----- | Moderate: too clayey wetness | Severe: shrink-swell | Severe: shrink-swell | Severe: shrink-swell | Severe: low strength shrink-swell | Severe: excess sodium |
| Grail----- | Moderate: too clayey | Moderate: shrink-swell | Moderate: shrink-swell | Moderate: shrink-swell | Severe: low strength | Slight |
| 19B: Belfield----- | Moderate: too clayey wetness | Severe: shrink-swell | Severe: shrink-swell | Severe: shrink-swell | Severe: low strength shrink-swell | Severe: excess sodium |
| Morton----- | Slight | Moderate: shrink-swell | Moderate: shrink-swell | Moderate: shrink-swell | Severe: low strength | Moderate: area reclaim thin layer |
| 21B: Cherry----- | Moderate: too clayey | Moderate: shrink-swell | Moderate: shrink-swell | Moderate: shrink-swell | Severe: low strength | Slight |
| 21C: Cherry----- | Moderate: too clayey | Moderate: shrink-swell | Moderate: shrink-swell | Moderate: shrink-swell slope | Severe: low strength | Slight |
| 22: Colvin----- | Severe: wetness | Severe: flooding wetness | Severe: flooding wetness | Severe: flooding wetness | Severe: flooding low strength wetness | Severe: excess salt flooding wetness |
| 24: Dimmick----- | Severe: ponding | Severe: shrink-swell ponding | Severe: shrink-swell ponding | Severe: shrink-swell ponding | Severe: low strength shrink-swell ponding | Severe: too clayey ponding |
| 25F: Baahish----- | Severe: slope | Severe: slope | Severe: slope | Severe: slope | Severe: slope | Severe: slope |
| Rock Outcrop----- | Severe: slope depth to rock | Severe: slope depth to rock droughty |
| 27: Farland----- | Severe: cutbanks cave | Moderate: shrink-swell | Moderate: shrink-swell | Moderate: shrink-swell | Severe: low strength | Slight |
| 27B: Farland----- | Severe: cutbanks cave | Moderate: shrink-swell | Moderate: shrink-swell | Moderate: shrink-swell slope | Severe: low strength | Slight |

Building Site Development--Continued
Dunn County, North Dakota

(The information in this table indicates the dominant soil condition but does not eliminate the need for onsite investigation. See text for definitions of terms used in this table. Absence of an entry indicates that no rating is applicable.)

| Map symbol and soil name | Shallow excavations | Dwellings without basements | Dwellings with basements | Small commercial buildings | Local roads and streets | Lawns and landscaping |
|------------------------------|-----------------------------------|-----------------------------------|-----------------------------------|------------------------------------|---|---|
| 29B: Farland----- | Severe: cutbanks cave | Moderate: shrink-swell | Moderate: shrink-swell | Moderate: shrink-swell | Severe: low strength | Slight |
| Rhoades----- | Moderate: too clayey | Severe: shrink-swell | Severe: shrink-swell | Severe: shrink-swell | Severe: low strength shrink-swell | Severe: excess sodium |
| 30E: Cohagen----- | Severe: slope depth to rock | Severe: slope | Severe: slope depth to rock | Severe: slope | Severe: slope | Severe: slope depth to rock |
| Vebar----- | Severe: slope cutbanks cave | Severe: slope | Severe: slope | Severe: slope | Severe: slope | Severe: slope |
| 31F: Cohagen----- | Severe: slope depth to rock | Severe: slope | Severe: slope depth to rock | Severe: slope | Severe: slope | Severe: slope depth to rock |
| Vebar----- | Severe: slope cutbanks cave | Severe: slope | Severe: slope | Severe: slope | Severe: slope | Severe: slope |
| Rock Outcrop----- | Severe: slope depth to rock | Severe: slope depth to rock | Severe: slope depth to rock | Severe: slope depth to rock | Severe: slope depth to rock | Severe: slope depth to rock droughty |
| 32B: Flaxton----- | Severe: cutbanks cave | Moderate: shrink-swell | Moderate: shrink-swell | Moderate: shrink-swell | Severe: low strength | Slight |
| Williams----- | Slight | Moderate: shrink-swell | Moderate: shrink-swell | Moderate: shrink-swell | Severe: low strength | Slight |
| 32C: Flaxton----- | Severe: cutbanks cave | Moderate: shrink-swell | Moderate: shrink-swell | Moderate: shrink-swell slope | Severe: low strength | Slight |
| Williams----- | Slight | Moderate: shrink-swell | Moderate: shrink-swell | Moderate: shrink-swell slope | Severe: low strength | Slight |
| 33: Grail----- | Moderate: too clayey | Moderate: shrink-swell | Moderate: shrink-swell | Moderate: shrink-swell | Severe: low strength | Slight |
| 33B: Grail----- | Moderate: too clayey | Moderate: shrink-swell | Moderate: shrink-swell | Moderate: shrink-swell slope | Severe: low strength | Slight |
| 35: Lawther----- | Severe: cutbanks cave | Severe: shrink-swell | Severe: shrink-swell | Severe: shrink-swell | Severe: low strength shrink-swell | Severe: too clayey |
| 35B: Lawther----- | Severe: cutbanks cave | Severe: shrink-swell | Severe: shrink-swell | Severe: shrink-swell | Severe: low strength shrink-swell | Severe: too clayey |
| 37: Trembles Variant----- | Severe: ponding | Severe: flooding ponding | Severe: flooding ponding | Severe: flooding ponding | Severe: flooding ponding | Severe: flooding ponding |
| 39: Havrelon----- | Moderate: flooding | Severe: flooding | Severe: flooding | Severe: flooding | Severe: flooding low strength | Moderate: flooding |

Building Site Development--Continued
Dunn County, North Dakota

(The information in this table indicates the dominant soil condition but does not eliminate the need for onsite investigation. See text for definitions of terms used in this table. Absence of an entry indicates that no rating is applicable.)

| Map symbol and soil name | Shallow excavations | Dwellings without basements | Dwellings with basements | Small commercial buildings | Local roads and streets | Lawns and landscaping |
|-----------------------------|-------------------------------------|------------------------------------|------------------------------------|------------------------------------|--|---|
| 40: Havrelon----- | Moderate: flooding | Severe: flooding | Severe: flooding | Severe: flooding | Severe: flooding low strength | Severe: flooding |
| Channel----- | --- | --- | --- | --- | --- | --- |
| 41: Heil----- | Severe: ponding cutbanks cave | Severe: shrink-swell ponding | Severe: shrink-swell ponding | Severe: shrink-swell ponding | Severe: low strength shrink-swell ponding | Severe: excess sodium ponding |
| 42B: Lefor----- | Slight | Moderate: shrink-swell | Moderate: shrink-swell | Moderate: shrink-swell | Moderate: frost action shrink-swell | Moderate: area reclaim thin layer |
| 42C: Lefor----- | Slight | Moderate: shrink-swell | Moderate: shrink-swell | Moderate: shrink-swell slope | Moderate: frost action shrink-swell | Moderate: area reclaim thin layer |
| 43B: Havrelon, 0.23----- | Moderate: flooding | Severe: flooding | Severe: flooding | Severe: flooding | Severe: flooding low strength | Moderate: flooding |
| 44B: Lihen----- | Severe: cutbanks cave | Slight | Slight | Slight | Slight | Moderate: droughty |
| 44D: Lihen----- | Severe: cutbanks cave | Moderate: slope | Moderate: slope | Severe: slope | Moderate: slope | Moderate: slope droughty |
| 45B: Ruso----- | Severe: cutbanks cave | Slight | Slight | Slight | Slight | Moderate: droughty |
| 45C: Ruso----- | Severe: cutbanks cave | Slight | Slight | Moderate: slope | Slight | Moderate: droughty |
| 46: Bowdle----- | Severe: cutbanks cave | Slight | Slight | Slight | Moderate: frost action | Slight |
| 46B: Bowdle----- | Severe: cutbanks cave | Slight | Slight | Moderate: slope | Moderate: frost action | Slight |
| 47: Moreau----- | Moderate: too clayey | Severe: shrink-swell | Severe: shrink-swell | Severe: shrink-swell | Severe: low strength shrink-swell | Severe: too clayey |
| 47B: Moreau----- | Moderate: too clayey | Severe: shrink-swell | Severe: shrink-swell | Severe: shrink-swell | Severe: low strength shrink-swell | Severe: too clayey |
| 47C: Moreau----- | Moderate: too clayey | Severe: shrink-swell | Severe: shrink-swell | Severe: shrink-swell | Severe: low strength shrink-swell | Severe: too clayey |
| 48B: Temvik----- | Slight | Moderate: shrink-swell | Moderate: shrink-swell | Moderate: shrink-swell slope | Moderate: low strength shrink-swell | Slight |
| 49: Morton----- | Slight | Moderate: shrink-swell | Moderate: shrink-swell | Moderate: shrink-swell | Severe: low strength | Moderate: area reclaim thin layer |

Building Site Development--Continued
Dunn County, North Dakota

(The information in this table indicates the dominant soil condition but does not eliminate the need for onsite investigation. See text for definitions of terms used in this table. Absence of an entry indicates that no rating is applicable.)

| Map symbol and soil name | Shallow excavations | Dwellings without basements | Dwellings with basements | Small commercial buildings | Local roads and streets | Lawns and landscaping |
|--------------------------|-----------------------------------|--|---------------------------|--|---|--|
| 49B: Morton----- | Slight | Moderate: shrink-swell | Moderate: shrink-swell | Moderate: shrink-swell slope | Severe: low strength | Moderate: area reclaim thin layer |
| 49C: Morton----- | Slight | Moderate: shrink-swell | Moderate: shrink-swell | Moderate: shrink-swell slope | Severe: low strength | Moderate: area reclaim thin layer |
| 51C: Amor----- | Slight | Moderate: shrink-swell | Moderate: shrink-swell | Moderate: shrink-swell slope | Severe: low strength | Moderate: large stones thin layer |
| 52B: Morton----- | Slight | Moderate: shrink-swell | Moderate: shrink-swell | Moderate: shrink-swell | Severe: low strength | Moderate: area reclaim thin layer |
| Rhoades----- | Moderate: too clayey | Severe: shrink-swell | Severe: shrink-swell | Severe: shrink-swell | Severe: low strength shrink-swell | Severe: excess sodium |
| 52C: Morton----- | Slight | Moderate: shrink-swell | Moderate: shrink-swell | Moderate: shrink-swell slope | Severe: low strength | Moderate: area reclaim thin layer |
| Rhoades----- | Moderate: too clayey | Severe: shrink-swell | Severe: shrink-swell | Severe: shrink-swell | Severe: low strength shrink-swell | Severe: excess sodium |
| 53B: Watrous----- | Severe: depth to rock | Moderate: shrink-swell depth to rock | Severe: depth to rock | Moderate: shrink-swell depth to rock | Severe: low strength | Moderate: depth to rock |
| 54B: Parshall----- | Severe: cutbanks cave | Slight | Slight | Slight | Moderate: frost action | Slight |
| 55: Pits----- | Severe: slope cutbanks cave | Severe: slope | Severe: slope | Severe: slope | Severe: slope | Severe: slope small stones droughty |
| 58: Regent----- | Moderate: too clayey | Severe: shrink-swell | Severe: shrink-swell | Severe: shrink-swell | Severe: low strength shrink-swell | Moderate: thin layer |
| 58B: Regent----- | Moderate: too clayey | Severe: shrink-swell | Severe: shrink-swell | Severe: shrink-swell | Severe: low strength shrink-swell | Moderate: thin layer |
| 58C: Regent----- | Moderate: too clayey | Severe: shrink-swell | Severe: shrink-swell | Severe: shrink-swell | Severe: low strength shrink-swell | Moderate: thin layer |
| 61B: Regent----- | Moderate: too clayey | Severe: shrink-swell | Severe: shrink-swell | Severe: shrink-swell | Severe: low strength shrink-swell | Moderate: thin layer |
| Rhoades----- | Moderate: too clayey | Severe: shrink-swell | Severe: shrink-swell | Severe: shrink-swell | Severe: low strength shrink-swell | Severe: excess sodium |
| 61C: Regent----- | Moderate: too clayey | Severe: shrink-swell | Severe: shrink-swell | Severe: shrink-swell | Severe: low strength shrink-swell | Moderate: thin layer |

Building Site Development--Continued
Dunn County, North Dakota

(The information in this table indicates the dominant soil condition but does not eliminate the need for onsite investigation. See text for definitions of terms used in this table. Absence of an entry indicates that no rating is applicable.)

| Map symbol and soil name | Shallow excavations | Dwellings without basements | Dwellings with basements | Small commercial buildings | Local roads and streets | Lawns and landscaping |
|--------------------------|-----------------------------------|---|--|------------------------------------|---|--|
| Rhoades----- | Moderate: too clayey | Severe: shrink-swell | Severe: shrink-swell | Severe: shrink-swell | Severe: low strength shrink-swell | Severe: excess sodium |
| 62B: Rhoades----- | Moderate: too clayey | Severe: shrink-swell | Severe: shrink-swell | Severe: shrink-swell | Severe: low strength shrink-swell | Severe: excess sodium |
| 62D: Rhoades----- | Moderate: slope too clayey | Severe: shrink-swell | Severe: shrink-swell | Severe: shrink-swell slope | Severe: low strength shrink-swell | Severe: excess sodium |
| Cabba----- | Severe: depth to rock | Moderate: shrink-swell slope depth to rock | Severe: depth to rock | Severe: slope | Moderate: shrink-swell slope depth to rock | Severe: depth to rock |
| 64: Badland----- | Severe: slope depth to rock | Severe: slope | Severe: slope depth to rock | Severe: slope | Severe: low strength slope | Severe: excess salt slope depth to rock |
| 67: Savage----- | Moderate: too clayey | Severe: shrink-swell | Severe: shrink-swell | Severe: shrink-swell | Severe: low strength shrink-swell | Slight |
| 67B: Savage----- | Moderate: too clayey | Severe: shrink-swell | Severe: shrink-swell | Severe: shrink-swell | Severe: low strength shrink-swell | Slight |
| 68: Vanda----- | Moderate: too clayey | Severe: shrink-swell | Severe: shrink-swell | Severe: shrink-swell | Severe: low strength shrink-swell | Severe: too clayey |
| 69B: Savage----- | Moderate: too clayey | Severe: shrink-swell | Severe: shrink-swell | Severe: shrink-swell | Severe: low strength shrink-swell | Slight |
| Rhoades----- | Moderate: too clayey | Severe: shrink-swell | Severe: shrink-swell | Severe: shrink-swell | Severe: low strength shrink-swell | Severe: excess sodium |
| 70C: Searing----- | Moderate: large stones | Moderate: large stones | Moderate: large stones | Moderate: large stones slope | Moderate: frost action large stones | Slight |
| 71B: Sen----- | Moderate: depth to rock | Moderate: shrink-swell | Moderate: shrink-swell depth to rock | Moderate: shrink-swell slope | Severe: low strength | Moderate: depth to rock |
| 71C: Sen----- | Moderate: depth to rock | Moderate: shrink-swell | Moderate: shrink-swell depth to rock | Moderate: shrink-swell slope | Severe: low strength | Moderate: depth to rock |
| 73C: Cherry----- | Moderate: too clayey | Moderate: shrink-swell | Moderate: shrink-swell | Moderate: shrink-swell slope | Severe: low strength | Slight |
| Vanda----- | Moderate: too clayey | Severe: shrink-swell | Severe: shrink-swell | Severe: shrink-swell | Severe: low strength shrink-swell | Severe: too clayey |
| 75: Straw----- | Severe: cutbanks cave | Severe: flooding | Severe: flooding | Severe: flooding | Severe: flooding | Moderate: flooding |

Building Site Development--Continued
Dunn County, North Dakota

(The information in this table indicates the dominant soil condition but does not eliminate the need for onsite investigation. See text for definitions of terms used in this table. Absence of an entry indicates that no rating is applicable.)

| Map symbol and soil name | Shallow excavations | Dwellings without basements | Dwellings with basements | Small commercial buildings | Local roads and streets | Lawns and landscaping |
|--------------------------|-----------------------------------|----------------------------------|-----------------------------------|------------------------------------|----------------------------------|--|
| 79: Velva----- | Moderate: flooding | Severe: flooding | Severe: flooding | Severe: flooding | Severe: flooding | Moderate: flooding |
| 81B: Vebar----- | Severe: cutbanks cave | Slight | Slight | Slight | Slight | Moderate: area reclaim thin layer |
| Parshall----- | Severe: cutbanks cave | Slight | Slight | Slight | Moderate: frost action | Slight |
| 81C: Vebar----- | Severe: cutbanks cave | Slight | Slight | Moderate: slope | Slight | Moderate: area reclaim thin layer |
| Parshall----- | Severe: cutbanks cave | Slight | Slight | Moderate: slope | Moderate: frost action | Slight |
| 81D: Vebar----- | Severe: cutbanks cave | Moderate: slope | Moderate: slope | Severe: slope | Moderate: slope | Moderate: area reclaim slope thin layer |
| 82D: Vebar----- | Moderate: slope | Moderate: slope | Moderate: slope | Severe: slope | Moderate: slope | Severe: large stones |
| 83E: Baahish----- | Severe: slope | Severe: slope | Severe: slope | Severe: slope | Severe: slope | Severe: slope |
| 84: Hidatsa----- | Moderate: dense layer | Slight | Slight | Slight | Slight | Slight |
| 84B: Hidatsa----- | Moderate: dense layer | Slight | Slight | Moderate: slope | Slight | Slight |
| 86F: Brandenburg----- | Severe: large stones slope | Severe: large stones slope | Severe: large stones slope | Severe: large stones slope | Severe: large stones slope | Severe: slope droughty |
| Cabba----- | Severe: slope depth to rock | Severe: slope | Severe: slope depth to rock | Severe: slope | Severe: slope | Severe: slope depth to rock |
| 87F: Lakoa----- | Severe: slope | Severe: slope | Severe: slope | Severe: slope | Severe: low strength slope | Severe: slope |
| 88: Williams----- | Slight | Moderate: shrink-swell | Moderate: shrink-swell | Moderate: shrink-swell | Severe: low strength | Slight |
| 88B: Williams----- | Slight | Moderate: shrink-swell | Moderate: shrink-swell | Moderate: shrink-swell slope | Severe: low strength | Slight |
| 88C: Williams----- | Slight | Moderate: shrink-swell | Moderate: shrink-swell | Moderate: shrink-swell slope | Severe: low strength | Slight |
| 90C: Williams----- | Slight | Moderate: shrink-swell | Moderate: shrink-swell | Moderate: shrink-swell slope | Severe: low strength | Moderate: large stones |

Building Site Development--Continued
Dunn County, North Dakota

(The information in this table indicates the dominant soil condition but does not eliminate the need for onsite investigation. See text for definitions of terms used in this table. Absence of an entry indicates that no rating is applicable.)

| Map symbol and soil name | Shallow excavations | Dwellings without basements | Dwellings with basements | Small commercial buildings | Local roads and streets | Lawns and landscaping |
|-----------------------------|--------------------------|------------------------------------|--|------------------------------------|--|--|
| 91B: Williams----- | Slight | Moderate: shrink-swell | Moderate: shrink-swell | Moderate: shrink-swell slope | Severe: low strength | Slight |
| Noonan----- | Moderate: wetness | Moderate: shrink-swell | Moderate: shrink-swell wetness | Moderate: shrink-swell slope | Severe: low strength | Severe: excess sodium |
| 91C: Williams----- | Slight | Moderate: shrink-swell | Moderate: shrink-swell | Moderate: shrink-swell slope | Severe: low strength | Slight |
| Noonan----- | Slight | Moderate: shrink-swell | Moderate: shrink-swell | Moderate: shrink-swell slope | Severe: low strength | Severe: excess sodium |
| 93C: Williams----- | Slight | Moderate: shrink-swell | Moderate: shrink-swell | Moderate: shrink-swell slope | Severe: low strength | Slight |
| Zahl----- | Slight | Moderate: shrink-swell | Moderate: shrink-swell | Moderate: shrink-swell slope | Severe: low strength | Slight |
| 93D: Williams----- | Moderate: slope | Moderate: shrink-swell slope | Moderate: shrink-swell slope | Severe: slope | Severe: low strength | Moderate: slope |
| Zahl----- | Moderate: slope | Moderate: shrink-swell slope | Moderate: shrink-swell slope | Severe: slope | Severe: low strength | Moderate: slope |
| 93E: Zahl----- | Severe: slope | Severe: slope | Severe: slope | Severe: slope | Severe: low strength slope | Severe: slope |
| Williams----- | Severe: slope | Severe: slope | Severe: slope | Severe: slope | Severe: low strength slope | Severe: slope |
| 94B: Moreau Variant----- | Severe: depth to rock | Severe: shrink-swell | Severe: shrink-swell depth to rock | Severe: shrink-swell | Severe: low strength shrink-swell | Severe: depth to rock |
| 94E: Wayden----- | Severe: slope | Severe: shrink-swell slope | Severe: shrink-swell slope | Severe: shrink-swell slope | Severe: low strength shrink-swell slope | Severe: area reclaim slope thin layer |
| 101B: Amor----- | Slight | Moderate: shrink-swell | Moderate: shrink-swell | Moderate: shrink-swell slope | Severe: low strength | Moderate: area reclaim thin layer |
| 101C: Amor----- | Slight | Moderate: shrink-swell | Moderate: shrink-swell | Moderate: shrink-swell slope | Severe: low strength | Moderate: area reclaim thin layer |
| 102: Shambo----- | Slight | Moderate: shrink-swell | Moderate: shrink-swell | Moderate: shrink-swell | Moderate: low strength shrink-swell | Slight |
| 102B: Shambo----- | Slight | Moderate: shrink-swell | Moderate: shrink-swell | Moderate: shrink-swell slope | Moderate: low strength shrink-swell | Slight |

Building Site Development--Continued
Dunn County, North Dakota

(The information in this table indicates the dominant soil condition but does not eliminate the need for onsite investigation. See text for definitions of terms used in this table. Absence of an entry indicates that no rating is applicable.)

| Map symbol and soil name | Shallow excavations | Dwellings without basements | Dwellings with basements | Small commercial buildings | Local roads and streets | Lawns and landscaping |
|--------------------------|-----------------------------------|------------------------------------|------------------------------------|------------------------------------|--|--|
| 105: Harriet----- | Severe: wetness | Severe: flooding wetness | Severe: flooding wetness | Severe: flooding wetness | Severe: flooding low strength wetness | Severe: excess sodium wetness |
| 106B: Daglun----- | Moderate: too clayey | Severe: shrink-swell | Severe: shrink-swell | Severe: shrink-swell | Severe: low strength shrink-swell | Severe: excess sodium |
| 107: Aquents----- | Severe: ponding | Severe: shrink-swell ponding | Severe: shrink-swell ponding | Severe: shrink-swell ponding | Severe: low strength shrink-swell ponding | Severe: too clayey ponding |
| 109B: Ekalaka----- | Severe: cutbanks cave | Slight | Slight | Slight | Moderate: frost action | Severe: excess sodium |
| 207F: Arikara----- | Severe: slope | Severe: slope | Severe: slope | Severe: slope | Severe: slope | Severe: slope |
| 209E: Cherry----- | Moderate: slope too clayey | Moderate: shrink-swell slope | Moderate: shrink-swell slope | Severe: slope | Severe: low strength | Moderate: slope |
| Cabba----- | Severe: slope depth to rock | Severe: slope | Severe: slope depth to rock | Severe: slope | Severe: slope | Severe: slope depth to rock |
| 211F: Badland----- | Severe: slope depth to rock | Severe: slope | Severe: slope depth to rock | Severe: slope | Severe: low strength slope | Severe: excess salt slope depth to rock |
| Cabba----- | Severe: slope depth to rock | Severe: slope | Severe: slope depth to rock | Severe: slope | Severe: slope | Severe: slope depth to rock |
| Arikara----- | Severe: slope | Severe: slope | Severe: slope | Severe: slope | Severe: slope | Severe: slope |
| W: Water----- | --- | --- | --- | --- | --- | --- |

