UNIT	NAME	MATERIAL	THICKNESS m	TOPOGRAPHY	DRAINAGE PATTERN	GROUND ICE	COMMENTS
fO	Organic fenland	Peat, typically woody sedge peat	2-3	Flat to very gently sloping, in part with reticulate network of low ridges (50 cm high). Slope 0-2°	No integrated drainage system; water at surface throughout summer months	Commonly unfrozen to 2+m. Little data available on segregated ice content at greater depths	Poor drainage, plus high compressibility and low strength of the material makes it unsuitable for any type of construction
pO pO-k	Organic peatland	Peat, typically sedge and woody sedge overlain by sphagnum peat; commonly treeless or with scattered black spruce; lichens commonly constitute 50% or more of surface vegetation, resulting in high albedo	2-4	Flat to very gently sloping, typically with numerous shallow, steep-sided (2-3 m) depressions occupied by lakes, ponds, and bogs (pO-k)	Depressions interconnected by seepage channels; poorly drained	Commonly up to 20%, locally up to 60% segregated ice within peat; typically 30-100 cm, locally up to 3 m total thickness segregated ice in mineral soil immediately below peat. Peat in wet depressions commonly thawed to 1+ m	Subsidence of up to 1 m common and subsidence up to 3 m possible when vegetation is removed; alteration of permanently frozen peat plateaus and thawed depressions and water bodies presents serious problems in construction of roads, pipelines, etc.; material highly compressible when thawed
Ap	Alluvial plain	Medium to coarse sand or gavel of point bar deposits, overlain by silt and fine grained sand of overbank deposits	3-5	Floodplain and low bordering terraces, commonly with meander scars. Slope 0-3° Relief to 1 m	No integrated drainage system; impeded by meander scroll ridges where present. Poorly to moderately well drained	Permafrost lacking in unvegetated part of floodplain; elsewhere 10-25% segregated ice by volume as thin (1 mm-2 cm) seams. Cement ice only in coarse sand and gravel; ice wedges in polygonal pattern (diameter of polygons 6-25 m) common	Subject to periodic flooding; along rivers, such as Iroquois River and other secondary streams, silt and sand of overbank deposits may be underlain by gravel, but extraction of the gravel may produce serious deleterious changes in the stream course or downstream changes in stream regime
At	Alluvial terrace	Sand and silt; may be underlain by gravel	2-5	Flat to gently sloping, in part with meander scars and channels	No integrated drainage system. Poorly to moderately well drained	No data; ice content probably low to moderate	Occurs along Iroquois and Carwarth rivers as low terraces, intermediate in level between glaciofluvial terraces (Gt-c) and floodplains (Ap). Constitutes a potential source of aggregate, but areas of Gt-c are preferable sources
Af	Alluvial fans and fan aprons	Highly variable, mainly silt, sand, minor gravel; discontinuous layers of woody peat	30 +	Gently to moderately sloping fans and aprons. Slope 1-6°	One or more shifting streams usually present; downslope seepage in poorly define runnels	No data. Ice content probably medium to high	Fans subject to sudden and damaging shifts of streams; generally unsuitable for construction
Ax	Alluvial complex; includes Ap, Af	As for Ap and Af		As for Ap and Af	As for Ap and Af	As for Ap and Af	As for Ap and Af
Cb	Colluvial blanket	Rock detritus and surficial deposits transported by gravity	>3	Blanket conforms to bedrock topography; occurs mainly at the base of valley walls and scarps. Slope to 20°	Generally freely drained. No integrated drainage system; generally moderately well drained	No data, but because this unit generally overlies impermeable bedrock, high ice contents likely, particularly in foot slope positions	Active transportation of material by rock falls, creeping, and slumping; active layer detachment slides common, especially following forest fire
Cv	Colluvial veneer	Rock detritus and surficial deposits transported by gravity	0-2	Veneer conforms to bedrock topography; occurs mainly along valley walls and scarps. Slope up to 30°	Generally freely drained. No integrated drainage system; generally moderately well drained	No data, but because this unit generally overlies impermeable bedrock, high ice contents likely, particularly in foot slope positions	Active transportation of material by rock falls, creeping, and slumping; active layer detachment slides common, especially following forest fire
Ca	Sheetwash deposits	Mostly organic silt and sand	1-2	Occurs as veneer or blanket on gently sloping (5-10°) scarps and valley sides developed on glaciolacustrine sediments or soft bedrock	No integrated drainage system. Poorly to moderately well drained	No data; material suggests that moderate to high ice content likely	The probability of high ice content makes this unit a poor candidate for construction
Cx	Slope complex (Cv, Cb, Ca, Af, undivided)	Deposits derived from entire range of surficial material plus bedrock detritus transported by gravity, rainfall, and intermittent or permanent waters	0-5	Occurs as veneer or blanket on gently to steeply sloping scarps and valley sides. Slope 1-30° Relief to 90 m	No integrated drainage system. Poorly to moderately well drained	No data; ice content probably highly variable depending on texture and thickness of material forming the unit	Potential slope instability presents major problems for any kind of construction
Lp-k	Glaciolacustrine thermokarst plain	Gaciolacustrine silt and clay, minor sand; discontinuous organic cover	3-15 +	Flat to gently sloping, numerous thermokarst lakes and ponds. Slope 0-5° Relief to 6 m	Seepage centripetal to ponds and lakes, intermittent seepage along fen-filled depressions between ponds and lakes. Poorly drained	Commonly 10 to 25% segregated ice as thin (1 mm-2 cm) seams in upper 1-3 m; segregated ice as reticulate network to 50% by volume, or thick tabular bodies of nearly pure ice at greater depth	Thermokarst processes active around pond margin; active layer detachment slides, followed by development of retrogressive flow slides especially following fire or other disturbance of vegetation
Gp Gt Gf	Glaciofluvial plain Glaciofluvial terrace Glaciofluvial fan	Sand, gravel, locally with veneer of eolian silt or sand; silt and/or peat may occur as filling in channels	3-30	Flat to gently sloping; interrupted by shallow channels. Slope 0-2°	Drainage mainly subsurface, locally with seepage along channels. Well drained except for channels	Very low ice content, but when ice present consists of cement ice only	Offers good construction sites; major source of aggregate where the material is gravel rather than sand. Where the unit grades into glaciolacustrine deposits, the surface deposit is typically sand rather than gravel and may be underlain by ice-rich silt
Gh Gr	Hummocky, ridged glaciofluvial deposits (include esker complexes)	Gravel, sand	3-20	Hummocks and ridges. Slope 5-15° Relief to 25 m	Drainage mainly subsurface. Hummocks and ridges well drained; intervening depresssions may be poorly drained	Very low ice content, but when ice present consists of cement ice only	Major source of aggregate where the material is gravel rather than sand
Gx	Glaciofluvial complex (Gh, Gr, Gp, undivided)	Gravel, sand	2-20	Hummocky-kettled topography connected with short flat surfaces. Slope 0-15° Relief to 25 m	As for Gh, Gr, Gp	As for Gh, Gr, Gp	Major source of aggregate where the material is gravel rather than sand
Mp	Moraine plain	Glacial till, typically clay, silt, minor sand and gravel	3-20	Flat to gently sloping. Slope 0-5°	Downslope seepage in shallow subparallel runnels. Generally poorly to moderately well drained	Commonly 10-25% segregated ice as thin (1 mm-2 cm) irregular discontinuous seams in upper 2-3 m. Thicker (10 cm to 3 + m) ice lenses may occur at depth, but uncommon	Potential subsidence upon removal of vegetation typically less than 1 m; potential for creep of active layer. Because of drainage by numerous runnels, roads and berms normal to slope direction require numerous culverts to avoid impoundment of surface water
Mb	Moraine blanket	Glacial till, typically clay, silt, minor sand and gravel	3-6	Gentle to steeper slopes. Slope 5-15°	Downslope seepage in shallow subparallel runnels; moderately well to well drained	Low ice content in till; subjacent bedrock typically free of visible ice	Where slopes are gentle, the unit offers relatively good construction sites
Mv	Moraine veneer	Glacial till, typically clay, silt, minor sand and gravel	0-2	Gently to steeply sloping veneer conforms to the underlying bedrock topography. Slope 8-15°	Downslope seepage in shallow subparallel runnels; moderately well to well drained	Low ice content in till; subjacent bedrock typically free of visible ice	Where slopes are gentle this unit offers relatively good construction sites
Md	Drumlinoid till plain	Glacial till, typically clay, silt, minor sand and gravel	3-30	Moraine plain with individual drumlins, to fluted moraine plain. Slope 2-15°	Parallel seepage or streams in fluted moraine, to trellis pattern or deranged drainage in moraine plain with drumlins	Commonly 10-25% segregated ice as thin (1 mm-2cm) irregular discontinuous seams in upper 2-3 m Thicker (10 cm to 3 + m) ice lenses may occur at depth. Subjacent bedrock typically free of visible ice	Crest of drumlins and drumlinoid ridges typically well drained, intervening depressions poorly drained; construction of roads easier parallel to rather than normal to orientation of drumlins
Mvd	Drumlinoid moraine veneer	Thin till over glacially eroded drumlinoid bedrock ridges	1-3	Moraine plain with individual drumlins, to fluted moraine plain. Slope 2-15°	Drumlinoid ridges well drained; intervening depressions commonly poorly drained	Low ice content in till on drumlinoid ridges; higher in till of intervening ridges; subjacent bedrock typically free of visible ice	Crest of drumlins and drumlinoid ridges typically well drained, intervening depressions poorly drained; construction of roads easier parallel to rather than normal to orientation of drumlins
Mm	Rolling moraine	Glacial till, typically with 5-20% pebble size and larger in a silty clay or clayey silt matrix; locally includes small areas of gravel	up to 20	Broad hummocks 10-20 m. Slope 0-10°	Drainage centripetal to local depressions. Elevated areas moderately well drained; intervening depressions generally poorly drained	Commonly 10-25% segregated ice as thin (1 mm-2 cm) irregular discontinuous seams in upper 2-3 m; irregularly shaped and irregularly distributed large masses of segregated ice common at greater depth	Summits of broad hummocks typically well drained; removal of vegetation may cause differential subsidence up to 3 m due to thawing of segregated ice masses
Mh	Hummocky moraine	Glacial till with 20-50% (locally 60%) pebble size in clayey silt to silty sand matrix; locally includes small areas of gravel (gMh)	up to 20	Individual or coalescent hummocks. Slope 0-20°, exceptionally 30° Relief 15-30 m	Hummocks well drained; intervening depressions may be poorly drained	Few data; ice content probably low	Crests of prominent hummocks are commonly well drained offering restricted good construction sites; ice content and potential for subsidence may be high in depressions
Mr	Ridged moraine	Glacial till with 20-50% (locally 60%) pebble size in clayey silt to silty sand matrix		Individual and compound straight to sinuous ridges 15 to 60 m high. Slope 0-20°, exceptionally 30° Relief to 60 m	Ridges well drained; intervening depressions may be poorly drained	Few data; ice content probably low	Crests of prominent ridges are commonly well drained and offer restricted good construction sites. Moraine ridges occur mainly along the outer (northern) margins of broad belts of Mhm, Mm, and Mh that occur in the southern part of the map area
R	Bedrock	Shale, sandstone, and limestone		Mainly prominent ridges, scarps, and hills developed on shale, sandstone, and limestone	Generally freely drained but with some poorly drained depression	No data	Bedrock within the map area comprises limestone and shale of Devonian Hume Formation; shale, siltstone, and minor limestone of Devonian Hare Indian Formation; limestone of Ramparts Formation; sandstone of Middle Devonian age; siliceous shale of Devonian Canol Formation; siltstone and sandstone of Devonian Imperial Formation; and sandstone and shale of Cretaceous age. Limestone of Ramparts Formation is suitable for rip-rap and along with limestone of Hume Formation can be crushed for use as road-metal. Shale of Canol Formatin can be crushed readily for use as road-metal, but has proven to be injurious to rubber tires. Other bedrock of the area is mostly too soft for use as road-metal, but low ground ice content makes it valuable for common fill