G1 INTRODUCTION

In order to ensure that conflicts are avoided among utilities, street trees, municipal services, and driveways, Consulting Engineer shall be responsible for preparing Composite Utility Plans (CUP). CUP shall indicate the location of all underground and aboveground services, utilities, regulatory signs and street trees. Consulting Engineer shall also be responsible for preparing Pavement Marking & Signage Plans (PMSP).

This section provides guidelines for the preparation of CUP and PMSP, as well as, submission and acceptance requirements.

G2 PREPARATION OF COMPOSITE UTILITY PLANS (CUP)

G2.1 Information to be Included on CUP

CUP shall be prepared at a scale of 1:500.

The following utilities, services and appurtenances shall be shown on CUP:

- Storm and sanitary sewers, catchbasins including RLCB, and manholes in the road ROW
- Watermains, watermain valves, valve chambers, hydrants, and water service curb stops
- Underground boulevard services, such as:
  - service connections
  - rear yard catchbasin leads
  - all utility route locations (Traffic Signal Cables, Powerstream, Telecom, Gas, Street Light Cable, Markham District Energy, Cable TV, and Grounding Rods)
- Aboveground services, structures, and utilities such as:
  - bridges, culverts, sewers, and outfalls
  - curb and gutter
  - trees
  - driveway locations
  - hydro poles and light standards (poles)
  - traffic signals
  - transformers
  - pedestals, junction boxes, major utility hubs/vaults, street light disconnection boxes, flush to grade handwells, and handholds
  - all easements with dimensions
  - walkways and sidewalks
  - all fences and retaining walls
  - Canada Post community mailboxes
  - pavement markings (only if there is no separate PMSP)
  - street name signs (as per PMSP)
  - regulatory signs (as per PMSP)

Other drawing requirements include:

- Typical street cross-sections including widths, depths and locations of offsets of utility/telecom trenches
- Utility structure details showing dimensions of underground and aboveground units (pedestals, flush to grade vaults and boxes, walk-in cabinets (WIC), outside plant interfaces (OPI) and maintenance holes)
- Clearly indicate the type of utility units and models
- CUP shall be reviewed/signed by all utilities as a part of acceptance process, before the City signs it
- Clearly indicate utility spacing
- Utility offsets to be included and clearly labelled
- Landscape drawings
- North arrow
- A key plan on each drawing at the top right-hand corner of the drawing illustrating the area covered by the specific drawings
- Lot and house numbers as soon as these are available
- Legend showing meaning of symbols
- Standard Notes (see Section G.2.2 below) pertaining to utility/street furniture layout
- City's standard title block and revision block, etc.
- Extended title block for approval by utilities (Powerstream, Telecom, Gas, Cable TV, Markham District Energy and Canada Post)

CUP shall be prepared in a digital format in accordance with the City's digital drawing requirements (see Section J - Drafting and Drawing Requirements).

G2.2 Standard Notes on CUP

The following Standard Notes shall be included in CUP drawings as a minimum. Additional notes, if required, shall also be included at the bottom of these notes:

1) UNDERGROUND HYDRO SHALL CLEAR MANHOLES, CATCHBASINS, VALVE CHAMBERS, AND HYDRANTS BY A MINIMUM OF 1.2 M, OTHERWISE, CONCRETE ENCASEMENT SHALL BE REQUIRED.
2) HYDRO LINES SHALL BE INSTALLED ON LOT SIDE OF HYDRANT WITH A MINIMUM OF 0.6 M CLEARANCE.
3) GAS MAINS SHALL CLEAR UNDERGROUND STRUCTURES BY MINIMUM 300 MM.
4) THE OFFICES OF POWERSTREAM, TELECOM, GAS, CABLE TV, MARKHAM DISTRICT ENERGY (IF APPLICABLE) AND WATERWORKS DEPARTMENT MUST BE CONTACTED FOR FIELD LOCATES BEFORE ANY DIGGING CAN COMMENCE IN BOULEVARD AREAS.
5) STREET FURNITURE SHALL BE LOCATED WITHIN 1.0 M OF THE PROJECTIONS OF SIDE LOT LINES UNLESS OTHERWISE ACCEPTED BY THE DIRECTOR OF ENGINEERING. FLANKAGE LOT UTILITY LOCATIONS SHALL GIVE REGARD TO THE PROPOSED HOUSE STYLES.

6) ALL DISTURBED AREAS MUST BE RESTORED TO ORIGINAL CONDITION OR BETTER TO THE SATISFACTION OF THE DIRECTOR OF ENGINEERING.

7) NOTICE OF CONSTRUCTION, ACCEPTED BY THE DIRECTOR OF ENGINEERING, SHALL BE DISTRIBUTED TO ALL ADJACENT DWELLINGS AND PARTIES INVOLVED, A MINIMUM OF 24 HOURS PRIOR TO CONSTRUCTION.

8) ALL CROSSINGS OF PAVED DRIVEWAYS, BUS STOPS, PAVED PARKING LOTS AND HEAVILY LANDSCAPED AREAS SHALL BE DIRECTIONALLY BORED WITH THE EXCEPTION OF ROAD CROSSINGS IN NEW SUBDIVISIONS WHICH MAY BE OPEN CUT WITH THE ACCEPTANCE OF THE DIRECTOR OF ENGINEERING.

9) A MINIMUM OF 1.2 M CLEARANCE SHALL BE MAINTAINED BETWEEN ALL STREET FURNITURE AND DRIVEWAYS AND HYDRANTS.

10) ALL WATER SERVICE CONNECTIONS SHALL BE INSTALLED IN SUCH A WAY THAT THEY DO NOT CONFLICT WITH FUTURE DRIVEWAYS. IN CASE OF CONFLICT, BUILDER SHALL BE RESPONSIBLE FOR RELOCATING THE SERVICE CONNECTION OUT OF DRIVEWAY.

11) FOR DRIVEWAY WIDTH, REFER TO THE CITY'S BY-LAW 158-93 AND CITY STANDARDS.

12) WATERBOXES SHALL BE INSTALLED 0.1 M ON STREET SIDE OF THE STREET LINE. WATERBOXES SHALL NOT BE LOCATED IN SIDEWALK.

13) UTILITY ROAD CROSSING SHALL NOT OCCUR AT DRIVEWAYS.

14) UTILITY VAULTS THAT ARE LOCATED ANYWHERE IN A SIDEWALK WHERE VEHICULAR TRAFFIC IS LIMITED TO CLASS 7 VEHICLES (3,060 KG OR 2.5 TON TRUCK) REQUIRE A HEAVY DUTY COVER WITH AT LEAST A TIER 22 GRADE AND DESIGNED TO WITHSTAND A MAXIMUM APPLIED LOAD OF 9,979 KG OR 22,000 LBS.

G2.3 Minimum Clearances

A separation of 1.2 m between all street furniture and driveway edges shall be maintained.

Driveways shall be located to avoid catchbasins, where possible.

The following represents the minimum clear separation between public utilities and municipal sewer and water services:

	Minimum Clearance		
Condition	**For Gas line**	**For Powerstream, Telecom & Cable TV**	**Between Utilities, Sewers & Watermain**
Minimum vertical distance	0.3 m	0.6 m	1.75 m
Minimum horizontal distance	0.9 m	0.6 m	3.0 m
Minimum distance below ditch inverts	0.60 - 0.75 m	0.9 m	1.75 m
Minimum vertical distance from structures (hydrants, chambers etc.)	0.3 m	0.3 m	0.75 m

Note: Minimum vertical distance (bury) for all utilities to be 0.6 m (including ditch inverts).

Street trees shall be planted with the following minimum clearances:

- 1.0 m offset from overhead utilities
- 1.5 m offset from water hydrants
- 3.0 m offset from the opening side of hydro transformer; 1.5 m offset from the other side
- 5.0 m offset from streetlight (for large shade trees); 3.0 m offset from streetlight (for small ornamental flowering trees)
- 2.0 m offset for mailboxes
- 1.0 m offset for all other street furniture
- 1.5 metre offset from curbs
- 1.5 m offset from driveways (for large shade trees); 1.0 metre offset from driveways (for small ornamental flowering trees).
- Trees shall be placed minimum 15.0 m from a 'stop sign' at the intersection.

G3 PREPARATION OF PAVEMENT MARKING & SIGNAGE PLANS (PMSP)

A separate PMSP shall be required to show pavement markings and signages details and location, as necessary. The required information provided in PMSP shall be at a minimum include pavement marking, street tree locations, street name signs, and regulatory signs.

G4 SUBMISSION AND ACCEPTANCE

Initiation of CUP and PMSP preparation shall be as soon as in the detailed engineering design process.

A first submission of CUP and PMSP shall be made to the Director of Engineering with the second detailed engineering submission.

Completed CUP shall be signed by each Utility before submission to the Director of Engineering for signature.

Final submission CUP and PMSP shall be submitted for review by the Director of Engineering no later than the submission of detailed engineering drawings for final acceptance.

The Director of Engineering and City's Architect must be aware of all major utility hubs prior to acceptance of engineering drawings.

Owners and their Developers/Builders/Agents shall display copies of the accepted CUPs in their sales offices for viewing by potential homebuyers.

G5 SIGNATURE BLOCK FOR ALL UTILITIES

The City has various Third-Party Utilities / Services which own, maintain and operate their infrastructure and services in the City of Markham.companies:

Hydro
Alectra Utilities (PowerStream Inc.)

Gas
Enbridge Gas Distribution Inc.

Canada Post

Heating / Cooling System (include N/A in the column if there is no Heating / Cooling System)
Enwave Energy Corporation
Markham District Energy Inc.

Telecom
Acronym Solutions Inc.
Beanfield Technologies Inc
Bell Canada
CIK Telecom Inc.
Rogers Communications Inc.
Telus Communications Inc.
TelMAX Inc.
YTN Telecom Network Inc. (YorkNet)
Zayo Canada Inc.

Consulting Engineer shall ensure that all utility companies have been approached and obtain their sign off on the CUP, even if they are not participating at this time. The following information is required in the Signature Block:

Utility Companies	Approvals		Remarks Participating / Non-Participating
	Signature	Dated	
Telecom			
Acronym Solutions Inc.			
Beanfield Technologies Inc.			
Bell Canada			
CIK Telecom Inc.			
Rogers Communications Inc.			
Telus Communications Inc.			
TelMAX Inc.			
YTN Telecom Network Inc. (YorkNet)			
Zayo Canada Inc.			
Hydro			
Name of Streetlighting Consulting Engineer			
Alectra Utilities (PowerStream Inc.)			
Canada Post			
Gas			
Enbridge Gas Distribution Inc.			
Heating / Cooling System			
Enwave Energy Corporation			
Markham District Energy Inc.			