VMC Submission Protocol Document

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Contents

1. Intent

The VMC digital 3D model is an integrated data rich model and communication tool with a high level of accuracy and detail. This comprehensive digital solution provides a collaboration platform for the City's internal departments and external agencies, and serves as an analytical tool to provide a more informed staff review of development applications in support of the Vaughan Official Plan and VMC Secondary Plan objectives. It has the power to engage stakeholders and the public in an effective and meaningful way by creating true visualizations of future development scenarios.

Note that this document and associated requirements will be reviewed and updated annually.

2. Scope and Responsibilities

As part of the complete submission, City of Vaughan requires all Applicants in the VMC, to submit a 3D digital model of their project as part of the development application and review process.

This document establishes a protocol for the submission of required digital data at both the Official Plan/Zoning and Site Plan stages for projects in the VMC.

To aid in the design review process City encourages Applicants to submit an earlier schematic/detailed model as part of each Design Review Panel (DRP) submission package in order to obtain a better understanding of the application by City staff and the DRP.

Compliance with the submission protocol procedure will ensure that digital data submitted to the City will be accurately incorporated into the overall VMC model, thereby increasing its efficiency and maintaining overall project continuity.

3. Accepted File Formats

The VMC 3D model accommodates the following file formats:

- **Revit - .RVT (Release 2016 or older)**
- **Industry Foundation Classes - .IFC**
- **3DsMax - .3DS**
- **Collada - .DAE**
- **Filmbox - .FBX (Release 2013 or older)**

These file formats can be exported using Autodesk software, such as REVIT, or a compatible software platform.

NOTE: Digital files must be submitted in **metric units** and georeferenced using the **NAD83, UTM zone 17N** coordinate system. The submitted files must include a project base point located within or in close proximity of the project.

A georeferenced AutoCAD base drawing may be obtained from the City by contacting the GIS section of the Development Planning Department.

4. Applicant Responsibility

The Applicant must ensure that their submission complies with the requirements set out in this protocol. While it is expected that following the requirements of this protocol will result in an acceptable model submission, it is the Applicant's responsibility to submit an accurate and complete model. While the City will provide assistance if a submission does not load accurately into the VMC model, the City is not responsible for resolving any problems related to the construction of the submitted model.

5. Procedures

Digital files are to be prepared in the Applicant's software of choice; however, consideration must be given to the ease of transfer to one of the acceptable file formats by the chosen design software.

5.1. Design Review Panel Schematic and Detail Design Stages (Encouraged)

The City encourages Applicants to submit their 3D model with the submission of the Design Review Panel (DRP) package at both the schematic design (first review) and detailed design (second review).

- Applicants may submit a CD as part of the DRP package that includes a georeferenced AutoCAD Site Plan file and 3D model.
- The City may include the proposed development in the staff presentation to DRP to provide a contextual overview.

Geometrical Level of Detail and Appearance Quality: Generalized geometry; the buildings are represented by a geometrically simplified outline contour with one percent (1%) geometrical deviation between the model and real world feature. On this level, only those objects whose shortest dimension is fifteen (15) centimetres or larger are included. Different finishing materials of the building are presented by the inclusion and material mapping of relevant textures and/or images on the model's surfaces.

5.2. Site Development Application Stage (Required)

Two submissions of the 3D model are required as part of the development application and review process. Stage 1) Official Plan and Zoning, Stage 2) Site Development Application:

1. **Official Plan and Zoning Stage**
   - Applicants are required to submit a CD/USB flash drive as part of the complete development application package to the Development Planning Department that includes the file document along with the ***Submission Information Form*** (Section 9) and all the required 2D and 3D files. Submitted information should follow the Document Review Checklist (see Section 8) so that the submitted information can be processed properly.
   - Upon successfully completing the file review, the City will notify the Applicant that the upload was successful.

The naming convention for the submitted Files is noted below:

OP.YY.AAA_PROJAC, Z.YY.AAA_PROJAC

- **OP/Z** represents Development Application
- **YY** represents the last two digits of the year
- **AAA** represents the Application Number
- **PROJAC** represents an acronym for the project kept to 6 characters

NOTE: *No use of 3rd party plug-ins is permitted. No use of copyrighted objects should be included.*

Geometrical Level of Detail and Appearance Quality: The level of detail and appearance quality requirement for this stage is the same as that for the DRP stage.

2. **Site Development Application Stage**
   - The initial submission requirements for the Site Development Application are the same as the Official Plan and Zoning stage. At the end of the site plan process, the Applicant must submit the final 3D model based on the final drawings approved by the City.

Geometrical Level of Detail and Appearance Quality: The buildings are represented by a geometrically exact outer shell including all components of the real world feature. The deviation between the model and real world features is zero or negligible. This level of detail requires the highest possible resolution and includes objects whose shortest dimension is one (1) centimetre or longer.

The naming convention for the submitted Files at this stage is noted below:

DA.YY.AAA_PROJAC

- **DA** represents Development Application
- **YY** represents the last two digits of the year
- **AAA** represents the Application Number
- **PROJAC** represents an acronym for the project kept to 6 characters

Letter of Credit: The City will require a Letter of Credit in the amount of $12,000 to be posted at the Official Plan and Zoning Stage or as a condition of site plan approval. The Letter of Credit will be released upon the submission of the final 3D Model.

6. 3D Model Composition

The submitted file should cover the entire project area and should not contain any interior building elements (except floor slabs, interior structural columns and shear/loadbearing walls) or underground elements, with each building being represented by only one file. All model components should be separate objects and be assigned individual materials based on the real-life physical appearance of the components.

The 3D Model must be submitted in **metric units** and georeferenced using the coordinate system **NAD83 UTM zone 17N.**

6.1. Exterior Architectural Components

The model must contain all above ground building related exterior architectural features and other site-related features within the limit of construction boundary, including the features listed below:

- Exterior building envelope (including brick, pre-cast panels, stone, metal and canopies).
- Roofing system including sloping.
- Exterior equipment (including owner-provided equipment).
- Exterior doors (including frames).
- Exterior glazing (including frames, glazing, curtain wall mullions).
- Exterior wall signage.

6.2. Structural Components

The model must contain all above ground exterior structural features for the building including:

- Above ground foundations, footings, piers, walls (including areaways), and pits.
- Exterior framing.
- All exterior structural steel members in their true shape and size.
- Miscellaneous exterior structural components.

The model must contain above ground interior structural features for the building including:

- Interior floor slabs.
- Interior structural columns and shear/ loadbearing walls.

6.3. Site Components

The model must contain all hardscape and softscape components within the site. The site and landscape data can be provided in .RVT, .DAE or .FBX format as outlined in section 2. The hardscape 3D data should cover items such as:

Hardscape:

- Outdoor furniture, including benches, waste/recycle receptacles, bicycle rings, etc.
- Electrical fixtures, including street lights, bollard lights and pedestrian lighting.
- Auxiliary structures, such as utility boxes, fire hydrant, loading areas, etc.
- Landscape features, including fences, walls, trellises, decks, water features, etc.
- Right-of-way elements, including sidewalks, driveways, planters and parking islands.
- Grading elements, including steps, stairs, ramps, riprap, etc.
- Signage, including pylons and traffic signs.
- Public Art

Softscape:

- Shrubs, perennials and sodded areas can be shown by the use of material applied to surfaces.
- Paving, including sidewalks, driveways, parking pads and boulevard areas, can be shown by the use of material applied to surfaces.

In the submitted 3D model, all elements related to site including; steps, stairs, ramps, riprap, etc. should be modeled as a separate component from the buildings.

7. 2D Model Composition

The submitted CD/USB flash drive must contain the following georeferenced AutoCAD 2D files:

- Site Plan
- Grading Plan
- Landscape Plan

Site Plan must include the limit of construction boundary and all hardscape components within. The Site Plan should also include the location of all sanitary and storm water sewer manholes.

Grading Plan should include spot elevations, as well as the elevation of the building footprints.

Landscape Plan must include the limit of construction boundary and all hardscape and softscape components within.

- Landscape Plan should not contain any “Hatch Pattern”; please remove hatches from the plan do not explode hatch patterns.
- Please ensure all landscaped areas have closed polyline.
- Submit a separate table for the species and the mature height of the proposed trees.

All AutoCAD Blocks “Insertion Base Point” should always be at the **centre of the geometry**.

All AutoCAD 2D plans should follow the **AIA CAD Layer Guidelines** and the required format detailed in Appendix A.

The 2D Models must be submitted in **metric units** and geo referenced using the **NAD83 UTM zone 17N** coordinate system.

8. Document Review Checklist

The Checklist below should be referenced by the Applicant to ensure that the file can be successfully imported into the VMC model. This Checklist itself does not need to be submitted, but should be followed in detail.

Has the correct file naming convention been used?	Yes No	If not, please ensure that all files have the correct name followed by the appropriate file extension.
Have you included a copy of the project submission in one of the acceptable formats?	Yes No	If not, please export an acceptable file from the design software used.
Does the file use metric units (meters)?	Yes No	If not, please convert units accordingly.
Is there a pivot point within the building footprint?	Yes No	If not, please create one.
Have you filled and signed the Submission Information Form?	Yes No	If not, please fill in the Submission Information Form and include a signed copy in the zip file for submission.
Have you included DWG files of the Site, Grading and Landscape plans?	Yes No	If not, please create the files and include it with the submission.
Did you purge extraneous data from the design software file?	Yes No	If not, please open the design software and purge the redundant data and recreate the file
Are the files geo referenced using NAD83 UTM zone 17N?	Yes No	If not, please geo reference the digital data using NAD83 UTM zone 17N.

9. Submission Information Form

PROJECT REFERENCE NUMBER	PROJECT NAME	PROJECT ADDRESS	COMPANY NAME, CONTACT NAME, EMAIL AND PHONE NUMBER

ORIGINAL DESIGN SOFTWARE	FILE SIZE
SUBMISSION DATE	SIGNATURE (to indicate compliance with submission procedures)

Appendix A:

CAD Layer Guidelines

Landscape Layers

Layers	Geometry	Description
FENCE		
L-FENC-IRON	Line/Polyline	Fences: wrought iron
L-FENC-LINK	Line/Polyline	Fences: chain link
L-FENC-LINK-1.2M	Line/Polyline	Fences: chain link:1.2 meter high
L-FENC-LINK-1.8M	Line/Polyline	Fences chain link: 1.8 meter high
L-FENC-PRVC	Line/Polyline	Fences: privacy
L-FENC-PRVC-ACST	Line/Polyline	Fences: acoustic privacy
L-FENC-WOOD	Line/Polyline	Fences: wood
PLANT MATERIAL		
L-PLNT-BEDS	Polygon/Closed Polyline	Plant and landscape material: perennial and annual beds
L-PLNT-BUSH	Block	Plant and landscape material: bushes and shrubs
L-PLNT-CTNR	Block	Plant and landscape material: container or planter
L-PLNT-GCVR	Polygon/Closed Polyline	Plant and landscape material: ground cover
L-PLNT-MLCH	Polygon/Closed Polyline	Plant and landscape material: mulches
L-PLNT-SEED	Polygon/Closed Polyline	Plant and landscape material: seeding areas
L-PLNT-TREE-DECI	Block	Plant and landscape material: Deciduous trees
L-PLNT-TREE-CONI	Block	Plant and landscape material: coniferous trees
L-PLNT-TURF	Polygon/Closed Polyline	Plant and landscape material: lawn areas
L-PLNT-VINE	Polygon/Closed Polyline	Plant and landscape material: vines
PAVEMENT		
L-PVMT-ASPH	Polygon/Closed Polyline	Pavement: asphalt
L-PVMT-BRCK	Polygon/Closed Polyline	Pavement: brick
L-PVMT-CONC	Polygon/Closed Polyline	Pavement: concrete
L-PVMT-CONC-AGGR	Polygon/Closed Polyline	Pavement: concrete: exposed aggregate
L-PVMT-GRVL	Polygon/Closed Polyline	Pavement: gravel
L-PVMT-PAVR	Polygon/Closed Polyline	Pavement: unit pavers
L-PVMT-RAMP	Polygon/Closed Polyline	Pavement: accessible ramp
L-PVMT-STRS	Polygon/Closed Polyline	Pavement: stair treads

Site Layers

SITE FEATURES		
L-SITE-BLDG	Polygon/Closed Polyline	Site features: Building footprints
L-SITE-BLRD	Block	Site features: bollards
L-SITE-BRDG	Polygon/Closed Polyline	Site features: bridge (pedestrian)
L-SITE-DECK	Polygon/Closed Polyline	Site features: deck (wood, typ.)
L-SITE-FURN	Block	Site features: furnishings
L-SITE-FIRE	Block	Site features: fire hydrant
L-SITE-LITE-BLRD	Block	Site features: Pedestrian Bollard Light
L-SITE-LITE-PEDS	Block	Site features: Pedestrian Street Light
L-SITE-LITE-POLE	Block	Site features: Street Light Pole
L-SITE-PLAY	Polygon/Closed Polyline	Site features: play structures area
L-SITE-PLAY-EQPM	Block	Site features: play structures: equipment
L-SITE-POOL	Polygon/Closed Polyline	Site features: pools and water features
L-SITE-PRKG	Polygon/Closed Polyline	Site features: parking area
L-SITE-PRKG-STRP	Polygon/Closed Polyline	Site features : parking: striping
L-SITE-ROAD	Polygon/Closed Polyline	Site features: edge of roadway line
L-SITE-ROAD-CNTR	Line/Polyline	Site features: roadway centre line
L-SITE-ROCK	Block	Site features: large rocks and rock outcroppings
L-SITE-RRAP	Polygon/Closed Polyline	Site features: riprap
L-SITE-RTWL	Polygon/Closed Polyline	Site features: retaining wall
L-SITE-SIGN	Block	Site features: pylon sign
L-SITE-SPRT	Polygon/Closed Polyline	Site features: sports fields
L-SITE-SPRT-EQPM	Block	Site features: sports fields: equipment
L-SITE-STEP	Polygon/Closed Polyline	Site features: steps
L-SITE-SWLK	Polygon/Closed Polyline	Site features: sidewalk from building to curb
L-SITE-TRAL-ASPH	Polygon/Closed Polyline	Site features: trail or path: asphalt
L-SITE-TRAL-CONC	Polygon/Closed Polyline	Site features: trail or path: concrete
L-SITE-TRAL-GRVL	Polygon/Closed Polyline	Site features: trail or path: gravel
L-SITE-WALL	Polygon/Closed Polyline	Site features: walls

Civil/Grading Layers

Layers	Geometry	Description
BOUNDARY		
C-LOCN	Polygon/Closed Polyline	Limits of construction
C-PROP-BNDR	Polygon/Closed Polyline	Property boundary
SANITARY AND STORM		
C-SSWR-MHOL	Block	Sanitary sewer: manhole
C-STRM-MHOL	Block	Storm sewer: manhole
TOPOGRAPHY		
C-TOPO-MAJR	Polyline	Topographic feature: major (contours)
C-TOPO-MINR	Polyline	Topographic feature: minor (contours)
C-TOPO-SPOT	Text/Point	Topographic feature: spot elevations

Additional Information

Additional information regarding software formats is available at the following webpages:

Revit (.RVT) - http://www.autodesk.com/products/revit-family/overview

Collada (.DAE) - http://en.wikipedia.org/wiki/COLLADA

Filmbox (.FBX) - http://www.autodesk.com/products/fbx/overview or http://en.wikipedia.org/wiki/FBX or http://knowledge.autodesk.com/support/revit-products/troubleshooting/caas/sfdcarticles/sfdcarticles/FBX-file-size-issues.html . A free desktop or mobile app for FBX review can be downloaded from http://www.autodesk.com/products/fbx/fbx-review.

Converting to Required File Formats

While many design packages have a built-in capability to export or convert to **.RVT**, **.DAE** and **.FBX**, some do not. Conversion software can be used in these situations to perform the file conversion. An example of software offering this conversion for an .FBX file is available at:

http://usa.autodesk.com/adsk/servlet/pc/item?siteID=123112&id=22694909