



# Engineering Design Criteria & Standard Drawings

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2020

## APPENDIX F – SCANNED RECORD INFORMATION, DATA SPECIFICATIONS FOR DIGITAL DRAWING SUBMISSIONS & AS- CONSTRUCTED DRAWING REQUIREMENTS



## F1 SCANNED RECORD INFORMATION

Record(s) are to be scanned into image type file(s) and information is to be populated into a reference database table supplied to the City of Vaughan.

### Scanning Specifications

- Records must be scanned into TIFF Group 4 Format (.tif).
- Images larger than 10 Megabytes in size must also be compressed into MRSID (.sid) format.
- Quality of scans must be such that all line types can be easily differentiated with a minimum scan resolution of 400 dots per inch (DPI).
- Image size must be at 1:1 scale with original record and printed items must maintain original drawing scale.
- Orientation of the Title Block and/or Descriptive Text must be horizontal.
- Drawing text of 5 point or higher must be legible and all characters easily differentiated on scanned image.
- Full size scanners must be used in processing scan.
- Microfilming will not be accepted.
- Scanners must contain adaptive area thresholding ability.
- Image must not be skewed where an acceptable skew is limited to ½ degree.
- Minimum of 25.4mm (1 inch) white space border provided around image, where image is defined as the area within the drawing neat-line.

### Reference Database Table

The reference database table shall be in DBF or Microsoft Access format. The table shall contain the following fields and specifications:

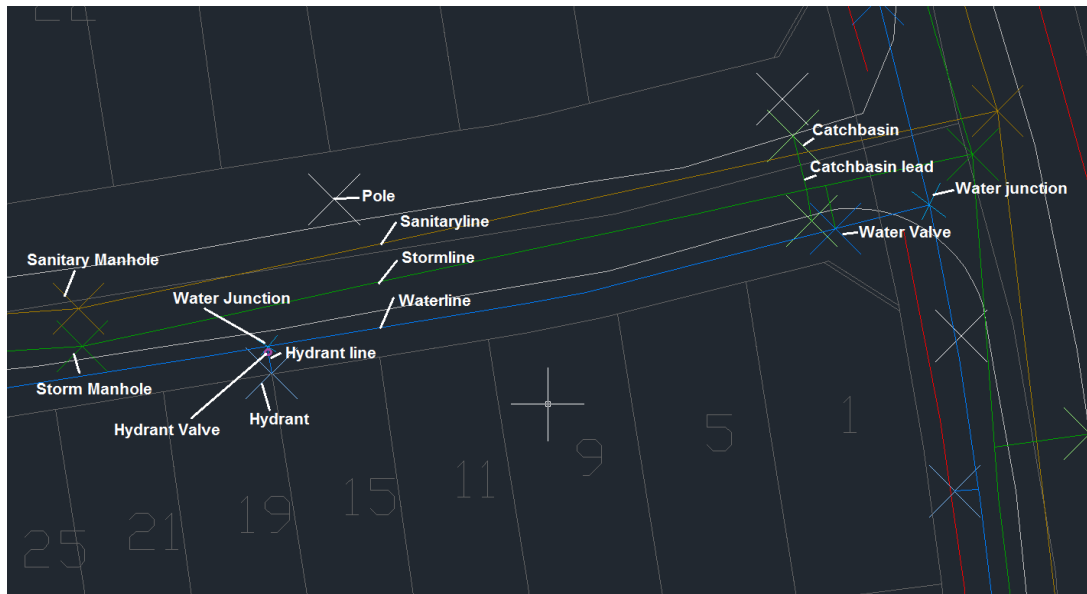
| Field Name | Field Type | Field Description   |
|------------|------------|---|
| FILEID     | Text       | Unique Identifying Attribute (no duplicates)  |
| FILENAME   | Text       | Name of Drawing such as the Street Name or Subdivision  |
| DWGNUMBER  | Text       | Designation or drawing number within the Title Block  |
| DWGTYPE1   | Text       | Type of Drawing such as a Plan and Profile, General Plan, Legal or Topographical Survey, Grading Plan, etc. |
| DWGTYPE2   | Text       | Whether drawing is "Approved for Construction", "As Built" / "As Constructed"                               |
| FROM       | Text       | From Street or Station, etc.  |
| TO         | Text       | To Street or Station, etc.  |
| LEGAL      | Text       | The Registered M or R Plan number that the area is related to.  |
| PROJECT    | Text       | The 19T number or Capital Works Number assigned to the project.   |
| GENERATOR  | Text       | Name of company responsible for creating the design and/or drawing.   |
| DATE       |            | Last date of issue or amendment recorded on the drawing.  |

## F2 DATA SPECIFICATIONS FOR DIGITAL DRAWING SUBMISSIONS

The City of Vaughan requires that data with respect to infrastructure reside as Object Data native to the AutoCAD MAP environment or a database table native to the ESRI GIS Shapefile format. All data records will be linked to the corresponding SPATIAL component. Drafting is to be neat and line/points to be on the correct drawing layer and connectivity maintained at the node, see example below. Piping line work will be drawn in accordance with the direction of flow within the pipe. AutoCAD drawing shall also be in the correct geospatial location i.e. Georeferenced.

The data (CADD/GIS) should be georeferenced/drawn in the correct spatial location. NAD83 UTM Zone 17N

An example of the AutoCAD layering:



## Sewer Pipe System Database Specification

All sewer and catchbasin lead pipe and open channel flow routes will contain the following data linked to the corresponding SPATIAL component:

| Field Name | Field Type   | Field Description   |
|------------|--------------|---|
| PIPEID     | Text         | Unique Pipe Identifier<br>ie. [Upstream Maintenance Hole or Headwall ID]_[Downstream Maintenance Hole or Headwall ID] |
| DIAMETER   | Text         | Pipe size (mm)  |
| HEIGHT     | Text         | Pipe size (mm)  |
| WIDTH      | Text         | Pipe size (mm)  |
| MATERIAL   | Text         | Pipe Material   |
| LENGTH     | Number 0.000 | Pipe length (m)   |
| SLOPE      | Number 0.000 | Pipe Slope (%)  |
| CAPACITY   | Number 0.000 | Theoretical Pipe Capacity (m <sup>3</sup> /s)   |
| VELOCITY   | Number 0.000 | Theoretical Pipe Velocity (m/s)   |
| TIME       | Number 0.000 | Time of Flow in Pipe (minutes)  |
| BEDDING    | Text         | Bedding Type  |
| RC         | Number 0.000 | Roughness Coefficient   |
| DEPTH      | Number 0.000 | Average Depth of Pipe (m)   |
| UP_MH_ID   | Text         | Upstream Manhole ID   |
| UP_INV_ELE | Number 0.000 | Upstream Invert Elevation (m)   |
| DN_MH_ID   | Text         | Downstream Manhole ID   |
| DN_INV_ELE | Number 0.000 | Downstream Invert Elevation (m)   |
| YEAR       | Number 0     | Year of Construction  |
| NOTES      | Text         | Notes and/or Observations   |

### Additional Fields For Storm Sewer Pipe

| Field Name | Field Type   | Field Description                            |
|------------|--------------|--|
| STM_AREA   | Number 0.000 | Tributary Area (ha)                          |
| RUN_COEF   | Number 0.000 | Runoff Coefficient                           |
| AREA_RC    | Number 0.000 | Section ARC [STM_AREA]*[RUN_COEF]            |
| ACC_AREA_C | Number 0.000 | Accumulative Area, Runoff Coefficient        |
| INTENSITY  | Number 0.000 | Rainfall Intensity (mm/hr)                   |
| ACC_TC     | Number 0.000 | Accumulative Time of Concentration (minutes) |
| STM_TOT_Q  | Number 0.000 | Total Flow Q (l/s)                           |

### Additional Fields For Sanitary Sewer Pipe

| Field Name   | Field Type   | Field Description                    |
|--------------|--------------|--------------------------------------|
| SAN_AREA     | Number 0.000 | Tributary Area (ha)                  |
| PPHA         | Number 0.000 | Persons Per Hectare                  |
| POP          | Number 0.000 | Population                           |
| ACC_POP      | Number 0.000 | Accumulative Population              |
| HPF          | Number 0.000 | Harmon Peaking Factor                |
| SAN_PD_FLOW  | Number 0.000 | Peak Day Flow (l/s)                  |
| SAN_SEC_AREA | Number 0.000 | Section Area (ha)                    |
| SAN_ACC_AREA | Number 0.000 | Accumulative Area (ha)               |
| SAN_INF_FLOW | Number 0.000 | Infiltration (l/s)                   |
| SAN_TOT_Q    | Number 0.000 | Total Flow (l/s)                     |
| MIN_SLOPE    | Number 0.000 | Minimum slope for self cleansing (%) |

**Additional Fields For Foundation Drain Collector Sewer Pipe**

|              |              |                             |
|--------------|--------------|-----------------------------|
| NO_LOTS      | Number 0.000 | Section numbers of lots     |
| ACC_LOTS     | Number 0.000 | Accumulative number of lots |
| FDC_LOT_FLOW | Number 0.000 | Total Lot Flow (l/s)        |
| FDC_SEC_AREA | Number 0.000 | Section Area (ha)           |
| FDC_ACC_AREA | Number 0.000 | Accumulative Area (ha)      |
| FDC_INF_FLOW | Number 0.000 | Infiltration (l/s)          |
| FDC_TOT_Q    | Number 0.000 | Total Flow (l/s)            |

### Maintenance Hole, Headwall, Catchbasin Database Specification

All maintenance holes and headwalls will contain the following data linked to the corresponding SPATIAL component:

| Field Name | Field Type   | Field Description                                       |
|------------|--------------|---|
| ICID       | Text         | Unique Maintenance Hole Identifier                      |
| HWID       | Text         | Unique Headwall Identifier                              |
| CBID       | Text         | Unique Catchbasin Identifier                            |
| SYSTEM     | Text         | System Type (eg. Storm, Sanitary, F.D.C.)               |
| MATERIAL   | Text         | Type of Material (Concrete, CSP, etc.)                  |
| CONFIG     | Text         | Type of Structure (Pre-cast, Cast in Place, etc.)       |
| CONFIG2    | Text         | Type of Structure (Single or Double, Ditch Inlet, etc.) |
| STANDARD   | Text         | Applicable Standard(s)                                  |
| SIZE       | Text         | Size of structure (mm)                                  |
| TOP_ELEV   | Number 0.000 | Top elevation (m)                                       |
| COVER      | Text         | Type of Cover (Standard No.)                            |
| HEIGHT     | Number 0.000 | Height of Structure (m)                                 |
| GRATE      | Text         | Type of Grate (Standard No.)                            |
| PLATFORM   | Text         | Type of Safety Platform (Standard No.)                  |
| FR_TYPE    | Text         | Type of Flow Restriction (Orifice Plate)                |
| FR_SIZE    | Text         | Size of Flow Restriction on Device                      |
| FR_RATE    | Text         | Rate of Flow Restriction (l/s)                          |
| BENCHING   | Text         | Benching  |
| BEDDING    | Text         | Bedding Type  |
| N_PIPE_ID  | Text         | North Pipe ID   |
| N_INV_ELE  | Number 0.000 | North Invert Elevation (m)                              |



|             |              |                                     |
|-------------|--------------|-------------------------------------|
| N_INV_ELE2  | Number 0.000 | North Invert Drop Elevation (m)     |
| NE_PIPE_ID  | Text         | Northeast Pipe ID                   |
| NE_INV_ELE  | Number 0.000 | Northeast Invert Elevation (m)      |
| NE_INV_ELE2 | Number 0.000 | Northeast Invert Drop Elevation (m) |
| E_PIPE_ID   | Text         | East Pipe ID                        |
| E_INV_ELE   | Number 0.000 | East Invert Elevation (m)           |
| E_INV_ELE2  | Number 0.000 | East Invert Drop Elevation (m)      |
| SE_PIPE_ID  | Text         | Southeast Pipe ID                   |
| SE_INV_ELE  | Number 0.000 | Southeast Invert Elevation (m)      |
| SE_INV_ELE2 | Number 0.000 | Southeast Invert Drop Elevation (m) |
| S_PIPE_ID   | Text         | South Pipe ID                       |
| S_INV_ELE   | Number 0.000 | South Invert Elevation (m)          |
| S_INV_ELE2  | Number 0.000 | South Invert Drop Elevation (m)     |
| SW_PIPE_ID  | Text         | Southwest Pipe ID                   |
| SW_INV_ELE  | Number 0.000 | Southwest Invert Elevation (m)      |
| SW_INV_ELE2 | Number 0.000 | Southwest Invert Drop Elevation (m) |
| W_PIPE_ID   | Text         | West Pipe ID                        |
| W_INV_ELE   | Number 0.000 | West Invert Elevation (m)           |
| W_INV_ELE2  | Number 0.000 | West Invert Drop Elevation (m)      |
| NW_PIPE_ID  | Text         | Northwest Pipe ID                   |
| NW_INV_ELE  | Number 0.000 | Northwest Invert Elevation (m)      |
| NW_INV_ELE2 | Number 0.000 | Northwest Invert Drop Elevation (m) |
| YEAR        | Number 0     | Year of Construction                |
| NOTES       | Text         | Notes and/or Observations           |

## Stormwater Management Pond Database Specification

All Stormwater Management Pond will contain the following data linked to the corresponding SPATIAL component. Additional fields and/or alternate dataset(s) may be required given the nature of this infrastructure. Please consult with the City of Vaughan to determine our exact requirements prior to submittal:

| Field Name | Field Type   | Field Description                         |
|------------|--------------|---|
| PONDID     | Text         | Unique Pipe Identifier                    |
| NAME       | Text         | Pond name                                 |
| TYPE       | Text         | Pond Type                                 |
| CAPACITY   | Number 0.000 | Capacity (m <sup>3</sup> /s)              |
| LINING     | Number 0.000 | Lining material                           |
| BOTTOM     | Text         | Bottom treatment                          |
| MF_LEVEL   | Number 0.000 | Maximum flood level (m)                   |
| CON_AREA   | Number 0.000 | Contributing area (ha)                    |
| CNT_AREA   | Number 0.000 | Controlled area (ha)                      |
| RUN_COEF   | Number 0.000 | Runoff Coefficient                        |
| OPEN_PER   | Number 0.000 | Open space percentage (%)                 |
| SFRES_PER  | Number 0.000 | Residential percentage (%)                |
| IND_PER    | Number 0.000 | Industrial percentage (%)                 |
| COM_PER    | Number 0.000 | Commercial percentage (%)                 |
| ROAD_PER   | Number 0.000 | Roads percentage (%)                      |
| SED_BAY1   | Number 0.000 | Sediment forebay volume (m <sup>3</sup> ) |
| SED_BAY2   | Number 0.000 | Sediment forebay volume (m <sup>3</sup> ) |
| QUAL_RR    | Number 0.000 | Quality release rate (l/s)                |
| MOE_RR     | Number 0.000 | MOE quality release rate (l/s)            |
| Q_STOR     | Number 0.000 | Storage volume (m <sup>3</sup> /s)        |

|            |              |   |
|------------|--------------|---|
| Q_STOR_MAX | Number 0.000 | Maximum storage volume (m <sup>3</sup> /s)                |
| Q_PP       | Number 0.000 | Permanent pool storage volume (m <sup>3</sup> /s)         |
| Q_PP_MAX   | Number 0.000 | Maximum permanent pool storage volume (m <sup>3</sup> /s) |
| E_STOR_MAX | Number 0.000 | Maximum event storage volume (m <sup>3</sup> /s)          |
| E_ELV_MAX  | Number 0.000 | Maximum event level (m)                                   |
| STM_EVENT  | Text         | Storm Event   |
| DETENTION  | Number 0.000 | Detention time  |
| W_RATIO    | Text         | Water quality ratio                                       |
| F_CL       | Number 0.000 | Flood control level (m)                                   |
| F_STOR_MAX | Number 0.000 | Maximum flood storage volume (m <sup>3</sup> /s)          |
| F_RR_MAX   | Number 0.000 | Maximum flood release rate (l/s)                          |
| SPILLWAY   | Text         | Spillway  |
| MECH_CON   | Text         | Mechanical controls                                       |
| FENCE      | Text         | Fence type  |
| GATE       | Text         | Gate type   |
| SIGN       | Text         | Sign type   |
| ACCESS     | Text         | Access road type  |
| TURN       | Text         | Vehicle turn around type                                  |
| YEAR       | Number 0     | Year of Construction                                      |
| NOTES      | Text         | Notes and/or Observations                                 |

## Water Distribution Pipe Database Specification

All water distribution system pipe will contain the following data linked to the corresponding SPATIAL component:

| Field Name | Field Type   | Field Description         |
|------------|--------------|---------------------------|
| WPIPID     | Text         | Unique Pipe Identifier    |
| DIAMETER   | Text         | Pipe size (mm)            |
| MATERIAL   | Text         | Pipe Material             |
| LENGTH     | Number 0.000 | Pipe length (m)           |
| BEDDING    | Text         | Bedding Type              |
| DEPTH      | Number 0.000 | Average Depth of Pipe (m) |
| YEAR       | Number 0     | Year of Construction      |
| NOTES      | Text         | Notes and/or Observations |

## Water Distribution System Appurtenances Database Specification

All water distribution system appurtenances will contain the following data linked to the corresponding SPATIAL component:

| Field Name | Field Type   | Field Description                                   |
|------------|--------------|---|
| WAID       | Text         | Unique Maintenance Hole Identifier                  |
| TYPE       | Text         | Type (eg. Valve, Chamber, Hydrant, Tee, Bend, etc.) |
| MATERIAL   | Text         | Type of Material (Cast Iron, Steel, etc.)           |
| CONFIG     | Text         | Type of Structure (Pre-cast, Cast in Place, etc.)   |
| COLOUR     | Text         | Colour of Hydrant                                   |
| STANDARD   | Text         | Applicable Standard(s)                              |
| SIZE       | Text         | Size of structure (mm)                              |
| TOP_ELEV   | Number 0.000 | Top elevation (m)                                   |
| COVER      | Text         | Type of Cover (Standard No.)                        |
| HEIGHT     | Number 0.000 | Height of Structure (m)                             |
| BEDDING    | Text         | Bedding Type  |
| PRESSURE   | Text         | Pressure  |
| OPEN       | Text         | Direction to Open (Left or Right)                   |
| YEAR       | Number 0     | Year of Construction                                |
| NOTES      | Text         | Notes and/or Observations                           |

## Streetlight Database Specification

All streetlight poles and fixtures will contain the following data linked to the corresponding SPATIAL component:

| Field Name | Field Type   | Field Description                  |
|------------|--------------|------------------------------------|
| SLID       | Text         | Unique Streetlight Pole Identifier |
| POLE_NO    | Text         | Assigned Pole Number               |
| POLE_TYPE  | Text         | Pole Type                          |
| POLE_MAN   | Text         | Pole Manufacturer                  |
| ARM_TYPE   | Text         | Arm Style                          |
| ARM_MAN    | Text         | Arm Manufacturer                   |
| ARM_OR     | Number 0.000 | Arm Outreach                       |
| FIX_TYPE   | Text         | Fixture Style                      |
| FIX_MAN    | Text         | Fixture Manufacturer               |
| LUM_TYPE   | Text         | Luminaire Type                     |
| LUM_MAN    | Text         | Luminaire Manufacturer             |
| LUM_WAT    | Text         | Luminaire Wattage                  |
| YEAR       | Number 0     | Year of Construction               |
| NOTES      | Text         | Notes and/or Observations          |

## Survey Control Monument Specification

All Survey Control Monuments will contain the following data linked to the corresponding SPATIAL component:

| Field Name | Field Type   | Field Description  |
|------------|--------------|--|
| MONID      | Text         | Unique Monument Identifier   |
| YEAR       | Number 0     | Year of Construction   |
| PROJECT    | Text         | Project Constructed By   |
| TYPE       | Text         | Monument Type  |
| RELATE     | Text         | Relationship to Ground   |
| INV1       | Text         | Monument No. Inter-visible with  |
| INV2       | Text         | Monument No. Inter-visible with  |
| INV3       | Text         | Monument No. Inter-visible with  |
| INV4       | Text         | Monument No. Inter-visible with  |
| LAT        | Number 0.000 | Latitude   |
| LONG       | Number 0.000 | Longitude  |
| ELEV       | Number 0.000 | Elevation  |
| MTM_N      | Number 0.000 | Ministry of Natural Resources COSINE Northing                                |
| MTM_E      | Number 0.000 | Ministry of Natural Resources COSINE Easting                                 |
| MTM_ELEV   | Number 0.000 | Ministry of Natural Resources COSINE Elevation                               |
| UTM_N      | Number 0.000 | Universal Transverse Mercator Northing                                       |
| UTM_E      | Number 0.000 | Universal Transverse Mercator Easting  |
| UTM_ELEV   | Number 0.000 | Universal Transverse Mercator Elevation                                      |
| LOCATION   | Text         | Description of the monument physical location in the surrounding environment |

### Regulatory/Traffic Sign and Traffic Signal Database Specification

All regulatory/traffic sign and traffic signal will contain the following data linked to the corresponding SPATIAL component:

| Field Name | Field Type | Field Description   |
|------------|------------|---|
| POSTID     | Text       | Unique Maintenance Hole Identifier                            |
| TYPE       | Text       | Type (eg. Stop, No Parking, Pedestrian Crossing, Signal etc.) |
| TYPE2      | Text       | Electrical Signal (Yes or No)                                 |
| MATERIAL   | Text       | Type of Material (Wood, Concrete, Steel, etc.)                |
| STANDARD   | Text       | Applicable Standard(s)  |
| YEAR       | Number 0   | Year of Construction  |
| NOTES      | Text       | Notes and/or Observations                                     |



## F3 AS-CONSTRUCTED DRAWING REQUIREMENTS

### **Prior to the issuance of the Completion Approval Notice for the start of the guarantee maintenance period.**

One COMPLETE set of bound “As Built” civil engineering and electrical street lighting drawings, paper copy, including “As Built” design calculation sheets showing the as constructed works for our preliminary review. The Engineering Drawings to conform to City’s Design Standards, Specifications and Drawing Standards.

- Revise COVER PAGE and ALL DRAWINGS, the title block to include the Planning File Number, 19T-# and Registered/ Reference Plan Number(s), 65M-#/ 65R-#.
- **Identify Lot/ Block Numbers and Municipal House Numbers on ALL OF THE DRAWINGS.** Contact the City’s Planning Department for municipal addresses at 905 832-8565.
- Identify on the GENERAL PLAN(S) the local or established benchmark(s) and elevation(s) used to complete the drawings.
- Revise all drawings to state “**As Built**” along with the date. The term “**Record Drawing**” is not acceptable nor should any “©” copyright symbols appear on any of the drawings.
- Revise **Director’s signature block** to include their typed name and date of their original signature, if the drawings were not hand drawn.
- Revise all invert elevations, slopes, lengths and locations for the Storm Sewer, Foundation Drain Collector Sewer (if applicable), Sanitary Sewer, Rear Lot Catch Basins, House/ Commercial Connections, Watermain, Hydrants, Valve Chambers and any other revisions to reflect actual as built site conditions ON ALL OF THE DRAWINGS.
- Identify **Lateral Ties and Invert Elevations for SAN & STM/ FDC Connections** at property line from house corners or side yard lot lines on **all Plans & Profile Drawings**. A chart format is acceptable.
- Revise all **UTILITY COORDINATION DRAWINGS including electrical street lighting drawings** for all above ground utilities/ features/ driveways/ sidewalks/ mailboxes and for all underground services.
- Remove any notes stating “**to be removed**”, “**future**”, “**by others**”, “**proposed**”, etc. from **ALL OF THE DRAWINGS**. Obsolete Drawings and any phasing to be properly identified on the Cover Page of the project.
- Provide a set general plans (or registered plan) marked in red indicating all easements and their purpose within the plan of subdivision.
- All **plan views** to include the following:
  - a) All street names per registered plans.
  - b) Maintenance hole identifications.
  - c) Items to be revised if different than proposed include and not necessarily limited to:
    - i. Piped Infrastructure and Appurtenances locations
    - ii. Curb widths
    - iii. Sidewalk locations
    - iv. Curb radii

- All **profile views** to include the following:
  - a) All as built sewer invert elevations are to be shown. If difference is greater than 300mm between the as built and the proposed location, the sewer must be redrawn.
  - b) Any maintenance holes that differ by more than 3m from their proposed location must be redrawn.
  - c) As built items to be changed if different than proposed include and not necessarily limited to:
    - i. Types of maintenance holes
    - ii. Pipe sizes
    - iii. Pipe Fitting locations
    - iv. Road grades
    - v. Sewer grades
    - vi. Sewer material
    - vii. Class of pipe
    - viii. Bedding type
  - d) Remove all flags.
  - e) Maintenance hole identifications to be left on.
  - f) Existing road profile to be removed (if applicable).
  - g) Lot grading elevations are to be as built and all proposed elevations to be removed.
  - h) All stormwater management pond drawings and related details shall be revised to capture all key hydraulic data relating to inlet / outlet structures and storage characteristics of the stormwater management facility.
- An engineer's completion certificate for stormwater management facilities shall be provided.

## **UPON APPROVAL & REQUIRED PRIOR TO ASSUMPTION**

One **COMPLETE** set of **civil engineering & electrical street lighting "As Built" drawings including "As Built" Design Calculation Sheets** showing the as constructed works. "As Built" Design Calculation Sheets that were not incorporated as part of the original approved set must be included.

The **COMPLETE** set of **civil engineering & electrical street lighting "As Built" drawings including "As Built" Design Calculation Sheets** scanned into a Compressed Tiff Group 4, 400 DPI Image File as outlined in Appendix A. "As Built" Design Sheets that were not incorporated as part of the original approved set must be scanned as a Compressed Tiff Group 4, 400 dpi Image file and included in the submission.

One **COMPLETE** set of **"As Built" CADD/GIS files on CD Rom diskette(s)** formatted as outlined in Section F2.

## F4 INFRASTRUCTURE DELIVERY DEPARTMENT HANDOVER PACKAGE CONTENTS<sup>1</sup>:

### A. PERFECT SUBMISSION

1. Drawings
  - a) Hardcopy Prints of Drawings
  - b) Digital Set of Drawings (scan of each drawing in set)
  
2. Technical Reports
  - a) Technical Calculations<sup>2</sup>
  - b) Digital Report
    - i. Scan of report
    - ii. HIRMS Metadata entry

### B. APPROVED RECORDS (Issued for Construction)

1. Digital Set of Drawings
  - a) Scan of each drawing in set<sup>3</sup>
  - b) HIRMS Metadata entry
  - c) CADD file for each drawing in set
  
2. Technical Reports
  - a) Technical Calculations<sup>2</sup>
  - b) Digital Report
    - i. Scan of report
    - ii. HIRMS Metadata entry
  
3. Master Infrastructure File
  - a) Composite CADD or GIS file containing the entire scope of works<sup>4</sup>

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<sup>1</sup> Conforming to our Standards, 1.0 SUBMITTALS; The Consultant(s) shall complete the HIRMS Metadata Spreadsheet as part of submitting drawings and technical reports to the City.

<sup>2</sup> Calculation spreadsheet to be supplied. Any report undertaken in support of the project, preferably in PDF format.

<sup>3</sup> Scans preferably in TIFF format.

<sup>4</sup> CADD files must be georeferenced; conform to the Universal Transverse Mercator (UTM) coordinate system, North American Datum of 1983, Zone 17N referenced to legal property/parcel fabric.

### **C. AS BUILT RECORDS (As Constructed Records)**

1. Digital Set of Drawings
  - a) Scan of each drawing in set
  - b) HIRMS Metadata entry
  - c) CADD file for each drawing in set
  
2. Master Infrastructure File
  - a) Composite CADD or GIS file containing the entire scope of works<sup>4</sup>
  
3. Hardcopy Prints of As-Built Drawings<sup>5</sup>

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<sup>5</sup> Forward drawing set to Development Inspection Section.