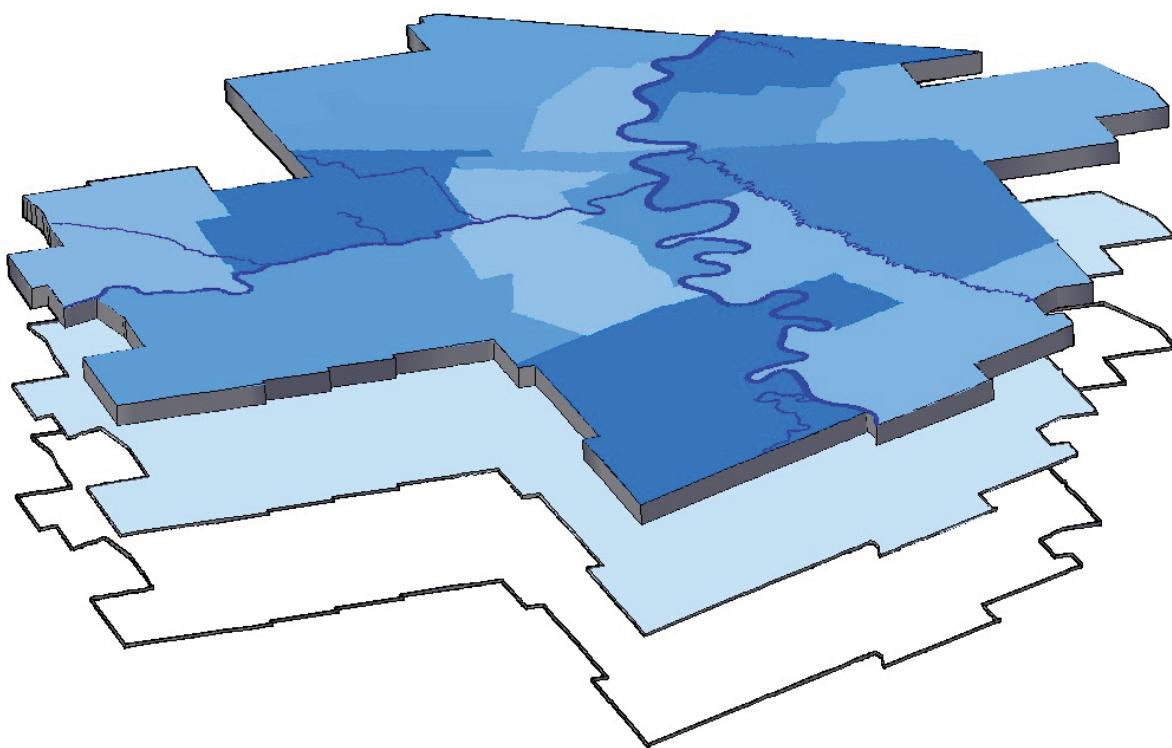


CITY OF WINNIPEG
Water and Waste Department



WWD CAD/GIS STANDARDS

Phase 1 - Capital Budget Renewals

Prepared by:
The Engineering Division
Water and Waste Department
City of Winnipeg

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1.0 GENERAL

1.1 INTRODUCTION

The Water and Waste Department (WWD) of the City of Winnipeg is developing these Standards in a phased approach. Phase 1 (this document) applies to Capital Budget renewal projects only, such as water main renewals. Upon implementation of Phase 1, Phase 2 will involve the addition of Standards for New Development Projects. Phase 3 of these Standards will involve the development of Standards for multi-discipline major Capital Projects such as plant expansions.

1.2 PURPOSE

The intent is to standardize the way electronic drawing files are produced and to make all drawing files, regardless of who produced them, similar in look and content. **This will reduce the challenges faced by the WWD in managing and manipulating disparate files and facilitate seamless integration with the Geographic Information System (GIS).**

Currently at the WWD, the disparity in the CAD files received precludes the use of automation for converting the information to GIS data. These Standards will facilitate a more seamless process.

These standards shall be used in all drawings that are produced using Computer Aided Drafting (CAD) for the WWD. Because of the rapidly changing technologies used in engineering design and drafting, this manual should be considered a "living" document, which will change as technologies change. These drawings will become permanent records of the distribution or collection system; therefore these standards must be adhered to.

It is acknowledged by the WWD that Consultants and Design firms have existing workflows and processes already in place to produce AutoCAD drawings for the WWD. **The Department hopes to disrupt these existing workflows as little as possible.**

1.3 SCOPE

This manual covers the basic preparation of project plans for the WWD using CAD as the method of plan preparation for both the design/construction and post construction phase of the project. The elements covered in this manual are the Department's CAD and GIS environments, general drafting conventions, the various prototype CAD drawings that should be used, the various types of projects this manual applies to, map projections, file naming, and the submission of record drawings.

1.4 TERMINOLOGY

Within this document:

- "**shall**" is used to express a requirement, i.e., a provision that the user is obliged to satisfy in order to comply with this specification;
- "**should**" is used to express a recommendation or that which is advised but not required; and
- "**may**" is used to express an option or that which is permissible within the limits of this specification.

1.5 TEXT STYLES USED IN THIS DOCUMENT

This document uses specific font text styles:

Normal text like this is used for all background and descriptive information.

Important notes for **quick reference** are inside a box like this

Quotes from other sources/documents are in italics and indented like this

References to other sections in this document are shown like this

2.0 WWD SOFTWARE ENVIRONMENT

2.1 AUTOCAD

2.1.1 Version

Drawing files provided to the Department in a digital format shall be produced in AutoCAD .DWG format and saved in the version presently being used by the Department. Final GIS drawing files submitted shall be 100% AutoCAD drawing format and 100% editable. Third party fonts, hatch patterns, custom line types or shapefiles, shall not be used in Final GIS CAD files submitted to the Department (See section 3.1.2 Final Record Drawings below) . Files can be submitted on either DVD or CD-ROM or via the Consultant's ftp.

The version of AutoCAD being used by the WWD at the time that these standards were established is AutoCAD 2012. These standards can only address those issues pertaining to this version of AutoCAD. Despite newer versions of AutoCAD now being available, projects shall be submitted in AutoCAD 2012.

Once the Department upgrades to a newer version of AutoCAD, that version shall be the official version and at that time the Department shall determine if submittals produced using earlier versions are acceptable.

2.1.2 Other Programs

There are many programs available that run as adjuncts to AutoCAD and can help prepare CAD projects more efficiently (i.e. Civil 3D, Map 3D, etc). These programs create new entity types, automate tasks, and can greatly aid in delivering a project in a timely manner. It is acknowledged that these programs are widely used throughout the industry and may be used for WWD projects.

However, the Department shall require that the final GIS Record Drawings submitted are viewable with "plain vanilla" AutoCAD (See Section 3.1 Basic Requirements - Construction and Final Record Drawings) .

2.2 GEOGRAPHIC INFORMATION SYSTEM (GIS)

2.2.1 GIS Environment

The WWD GIS environment currently consists of Intergraph's **GeoMedia Pro software with an Oracle 10g database**, and uses the following projection:

Universal Transverse Mercator (UTM), North American 1983 Datum (NAD 83) June 1990, Zone 14 North.

Implemented in 2002, the GIS has made digital data easily accessible; data is being employed by a large number of persons, not only in the WWD but in the City of Winnipeg at large, as well as outside agencies. The system is being used for analysis, planning, mapping, field location, and as an asset management/inventory tool. The data in the GIS is also being viewed enterprise wide via web application (iView). **For these reasons, the accuracy and completeness of the data is extremely important.**

These Standards will enable automation to be employed in converting the large number of CAD drawings received by the WWD into GIS data.

The information on record drawings received by the WWD ultimately becomes GIS data, and accounts for over 90% of the information currently being input. The importance of receiving CAD record drawings in a consistent format, that also accurately reflects the work that was done, cannot be overstated by the Department.

3.0 PREPARING AUTOCAD DRAWINGS FOR THE WATER AND WASTE DEPARTMENT

3.1 BASIC REQUIREMENTS – DESIGN/CONSTRUCTION AND FINAL RECORD DRAWINGS

The main difference of this CAD-GIS Standard, from any previous standard is the requirement for the submission of a second final record drawing—a Final GIS Drawing (See bullet 2 below in section 3.1.2 Final Record Drawings). The requirement for the Design/Construction drawing and Final Record Drawing have remained virtually the same. If the look of a typical drawing was acceptable before the implementation of these standards, chances are it will still be acceptable. Minor enhancements, such as Material list, shall be required.

It is acknowledged by the WWD that many Consultants and Design firms have existing workflows and processes already in place to produce AutoCAD drawings for the WWD. **The Department hopes to disrupt these existing workflows as little as possible.**

3.1.1 Design/Construction Drawing

The WWD will provide guidelines and a prototype drawing before the design/tendering phase of a project. It is important that the look of this drawing, when submitted and printed as a pdf, is identical to the WWD prototype. The layers, symbols, and colors in the WWD prototype drawing may be used by the Consultant/Design firm in the creation of their drawing, or, they may simply be used as a guideline.

The layers, colors, workflows, and adjunct software used to prepare the Construction/Design Drawings may be, if desired, entirely at the discretion of the individual Consultant/Design office.

3.1.2 Final Record Drawings

There are 2 AutoCAD drawings required as final records of projects completed for the Department.

The information contained in these drawings shall be oriented using the same datum as the WWD GIS: NAD 1983 1990.

1. Final Record Drawing -

This drawing will be used as the final legal record of the project. When submitted to the Department, this drawing shall be formatted in such a way so that the final 'Mylar' or pdf print of the AutoCAD drawing looks identical to the Department prototype drawing. The general look shall be followed. The line thicknesses, title blocks, fonts, etc. must be used. Layer names, colors, and symbols from the WWD Final Record Drawing prototype may be used in the completion of this drawing (See Section 3.4 Prototype Drawings).

The layers, colors, workflows, and adjunct software used to prepare the Final Record Drawings may be, if desired, entirely at the discretion of the individual Consultant/Design office.

2. Final GIS Drawing –

This is a stripped down representation of the work with minimal layers and detail, and will be used to enter the information into the GIS. When submitted to the Department, this drawing shall have a minimum of objects and layers and be formatted in a very specific way in terms of its layers and content. When project work involves several drawings, whether clustered together geographically or contiguous in model space, these drawings shall be submitted as a single drawing file when possible.

The entities contained within this drawing will ultimately become GIS objects/layers. The layers and symbols in this drawing shall not be edited and are to be used 'as is.'

3.1.3 Types of Projects

Some of the projects types typically prepared for the Department by consultants and covered by this document are:

- Combined Sewer Relief (SRS)
- External Point Repairs
- Feeder mains
- Full segment Sewer Renewals
- Force mains
- Gate chambers
- Interceptor Sewers
- Land Drainage Sewers
- Open Channel (Ditching)
- Outfall Repairs
- Pumping Stations
- Sewer Renewal by CIPP Lining/Augmented Lining
- Trenchless Point Repairs
- Valve Chambers
- Water Main Renewals

3.2 CADASTRAL BASE INFORMATION

Typically, the WWD shall provide the cadastral base information (positioned in the UTM projection noted in section 2.2.2) to initiate a project. This data shall include the pertinent cadastral, monument, and existing water and sewer data for the specific work. The data supplied is based on the best information available to date but **it is the responsibility of the designing agency to verify the information by surveying the site.**

When returned to the Department in the form of a record drawing:

- **Any and all data within shall be oriented in the NAD 83 1990 datum. Base data shall not be moved spatially, and shall be retained in model space in its original UTM view.** An exception to this would be an adjustment of the supplied water and sewer data to match surveyed results. Paper space and layout views shall be used to manipulate the data into a suitable drawing. These layouts shall follow the same standard naming convention provided by the WWD for the file names (**See section 3.2.19 File Names**).

- On large projects, where several drawings are needed to show continuous infrastructure, **the base entities and cadastral data shall be continuous in model space.** These entities shall not be “broken up,” rotated or edited in order to depict the specific sections of the project on individual drawings. Again, views, paper space and layouts shall be used to display the work.

3.3 PROTOTYPE DRAWINGS

The WWD will supply 3 digital prototype drawing sheets to consultants; they shall be used as a guide in the preparation of water or sewer projects for the Department. The drawing file format for the prototype drawings will be in the Department’s current version of AutoCAD. A symbol library will be included with the prototype drawings.

For Consultants/Design Firms who have established standards and workflows, some adjustment of existing processes shall be needed. For those without established workflows, it is strongly encouraged that their processes adopt the WWD prototype drawings, layers, and symbols.

The 3 prototype drawings are:

1. **Design/Construction** - Shall be used as an example of the look, when submitted and printed as a pdf, which is required for the creation of drawings for the Construction/Design phase of the project. Layering and symbology are only recommendations. (I.e.: If a design firm already has a symbol that is identical in look to the hydrant symbol provided by the WWD, that symbol may be used.)
2. **Final Record Drawing** - Shall be used as an example of the look, when printed-- that is required for the creation of Final Record Drawings. Layering and symbology are suggested only. I.e. if a design firm already has a symbol that is identical in look to the hydrant provided by WWD, that symbol may be used.

It is important to note that the layers, colors, workflows, and adjunct software used to prepare the Design/Construction Drawings and the Final Record Drawings may be, if desired, entirely at the discretion of the individual design office.

3. **Final GIS Drawing** - Shall contain the layering scheme and symbols to be used for the Final GIS Drawing. It shall be in model space only.

To facilitate seamless exchange with the Department’s GIS, the layers and symbols in this drawing shall not be edited and are to be used ‘as is.’ Also, the coordinate system shall be set to NAD 83 June 1990 Zone 14 North and the view to WORLD UCS

Design/Drawing packages shall be prepared using drawing sheets set up for one of two sizes, depending on the type of project. The Department shall supply full size, A1 (594 mm x 841 mm) prototype drawings for water projects or full segment sewer renewal projects; and 11” x 17” prototype drawings for sewer renewals by CIPP linings, external point repairs or trenchless point repairs (See examples below).

The order of drawings in a design/drafting package is as follows;

- Title/Cover Sheet
- Legend/Drawing index sheet
- Plan/Profile Sheet (for renewal packages) or Plan sheet for sewer repairs and CIPP

- Detail Sheet

3.3.1 Title/Cover Sheet

All projects prepared for the Department shall have a title sheet. The title sheet shall be the first drawing in the set and shall contain a City of Winnipeg logo, the name of the Department, the Division responsible for the project, the project title, the project bid opportunity number and a contract number, if applicable. The title sheet shall contain a Key Map (if applicable). The streets affected by the work shall be high-lighted in the Key Map. The scale of the Key Map will depend on the drawing size used for the project.

Oversize ISO A1 (594 mm x 841 mm) Landscape Title/Cover Sheet

Figure 1 below represents a typical A1 size title sheet. The coverage of the Key Map shall be sufficient to cover the project area, as well as give a general orientation of where the project area falls within the city while still insuring that street names are readable. The individual streets involved in the project should be high-lighted. If necessary, more than one key map can be used.

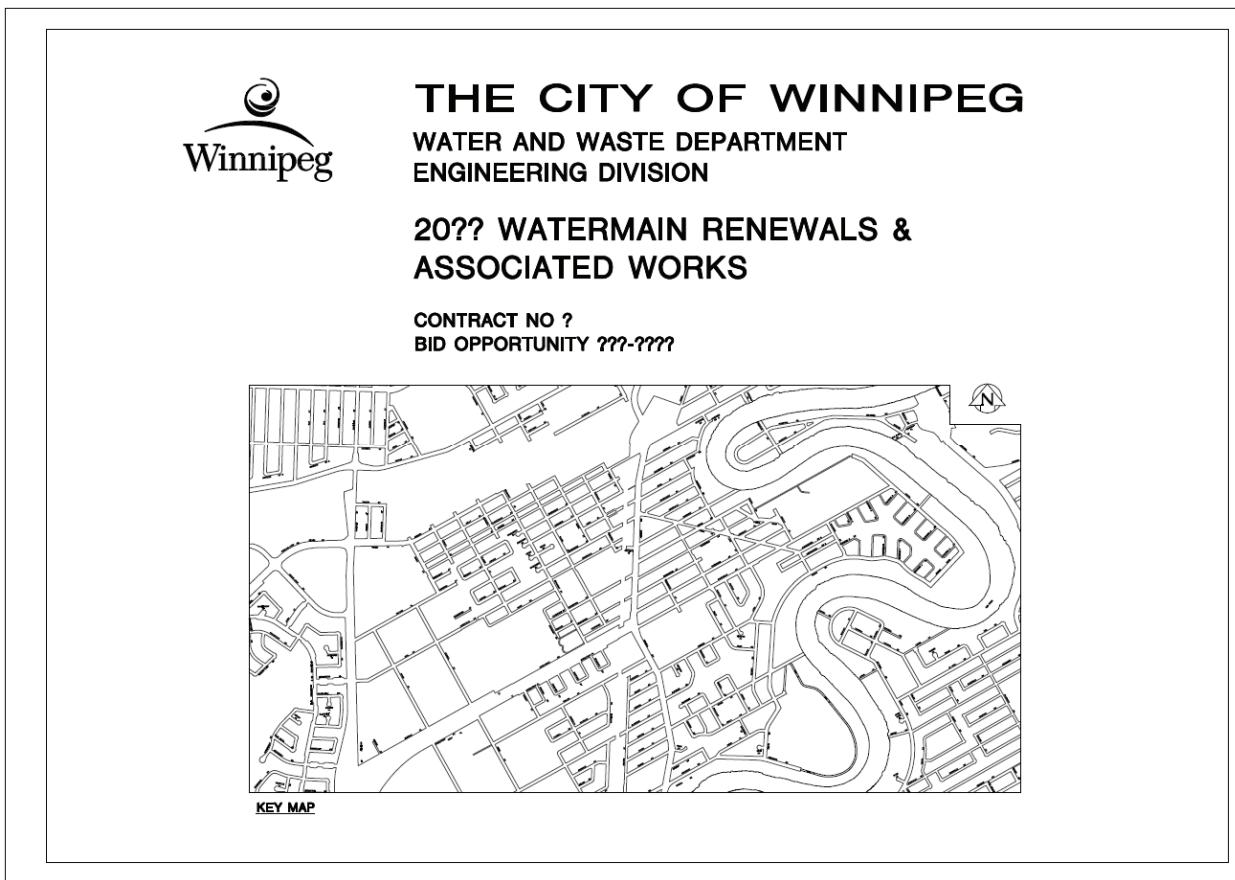


Figure 1
(For a larger view see Appendix A)

11"x 17" Title/Cover Sheet

Figure 2 below represents a typical A1 size title sheet. The coverage of the Key Map shall be sufficient to cover the project area, as well as to give a general orientation of where the project area falls within the city while still insuring that street names are readable. The individual streets involved in the project should be high-lighted. If necessary, more than one Key Map shall be used.

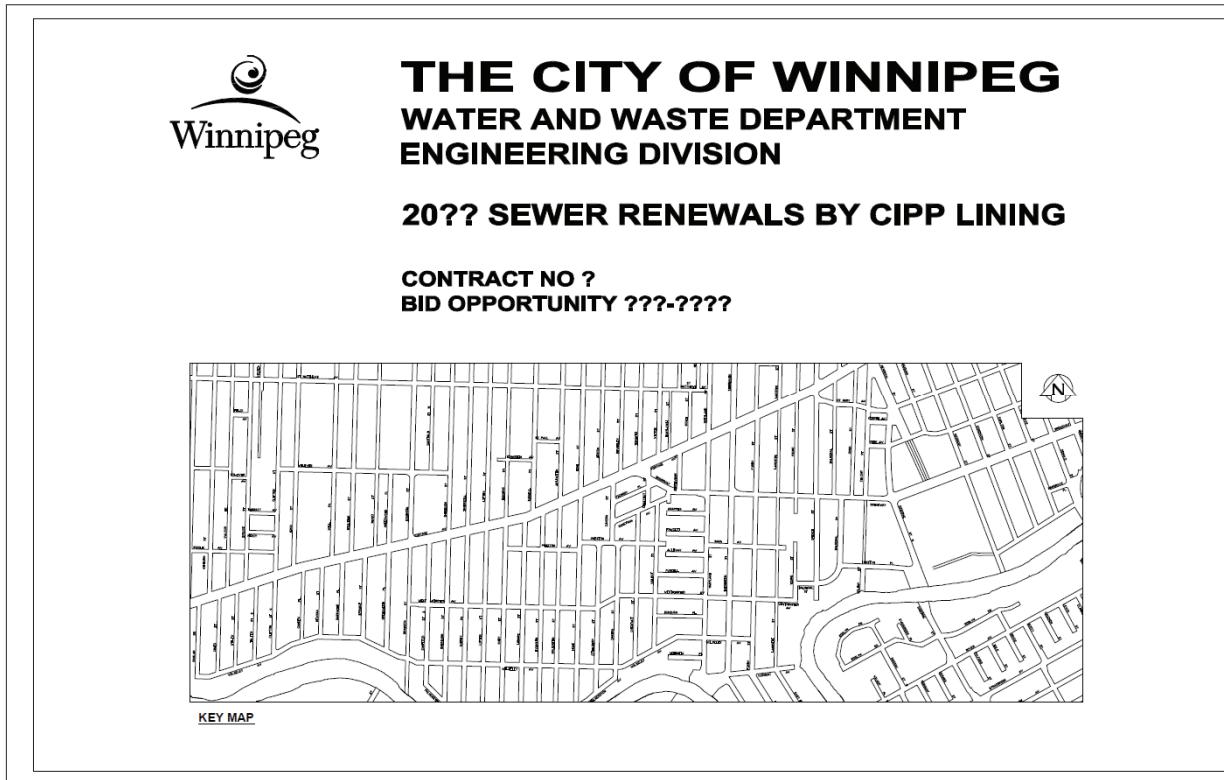


Figure 2
(For a larger view see Appendix B)

3.3.2 Legend/Drawing Index Sheets

All drawing packages prepared for the Department shall have a Legend/Drawing Index sheet. The Legend/Drawing Index sheet is the second drawing in the set and contains a list of all drawings, drawing title, drawing number and sheet numbers included. The Legend/Drawing Index also contains standard abbreviations, a legend of existing and proposed symbols and line types, and general construction notes.

Oversize ISO A1 (594 mm x 841 mm) Water Legend/Drawing Index Sheet

Figure 3a below represents a typical A1 Legend/Drawing Index sheet for water projects.

Figure 3a
(For a larger view see Appendix C)

Oversize ISO A1 (594 mm x 841 mm) Sewer Legend/Drawing Index Sheet

Figure 3b below represents a typical A1 Legend/Drawing Index sheet for sewer projects.

Figure 3b
(For a larger view see Appendix D)

11" x 17" Sewer Legend/Drawing Index Sheet

Figure 4 below represents a typical 11" x 17" Legend/Drawing Index sheet

Figure 4

3.3.3 Oversize ISO A1 (594 mm x 841 mm) Plan/Profile Sheet - Water

Figure 5 on the following page, is an example of a design drawing for a water main renewal using an A1 size plan/profile sheet. An example of an A1 size water main renewal drawing shall be included with these standards.

In general, the following information shall be shown in the plan portion of the drawing:

- All existing utilities and appurtenances (e.g. manholes, chambers, valves), including water and sewer mains that fall within the street right-of-way.
 - All existing water and sewer service connections; including shut-off valves (curb stops) and a water service table showing address, size, material and all location information for each service (**see section 3.3.10 Service Charts for an example**).
 - All property information such as property lines for the street right-of-ways, street names, lot lines, addresses (or lot, block and plan numbers) and survey monuments and bars.
 - All topographic information that falls within a street right-of-way, such as street curb, poles, trees and sidewalks.
 - Dimensions (off-set from property lines) for all existing utilities and street rights-of-way.

- All proposed design (in bold), including proposed appurtenances, off-set dimensions from property lines, a description of the pipe, and construction notes specific to the drawing. Note; general construction notes shall be shown on the Legend/Drawing Index sheet.
 - Blow-up details clarifying congested design such as a tie-in to an existing water main. Note: Details are primarily used for design that cannot be illustrated on the profile because it does not follow the horizontal design.
 - North arrow, scale bar, a note describing the chainage applicable to the drawing, metric note and suitable cautionary and warning notes shall be shown.
 - The drawing shall be stamped with the seal of a professional engineer. The seal shall be signed and dated.
 - Pipe ends are used when a dwg the existing infrastructure is beyond the limits, or when the proposed pipes continue on another dwg where the stationing does not

The following information shall be shown in the profile portion of the drawing:

- Identification of the geodetic datum
 - All existing water and sewer mains, including size and material.
 - Existing rim and invert elevations for existing sewer manholes.
 - Inverts for the existing water main, if known.
 - Chainage locations shall be noted for all existing water and sewer appurtenances, as well as for all proposed water appurtenances such as tees, valves and hydrant assemblies.
 - The proposed pipe design including, proposed size and material as well as proposed inverts.

The title block portion of the drawing shall be completed as shown in section 3.1.8.

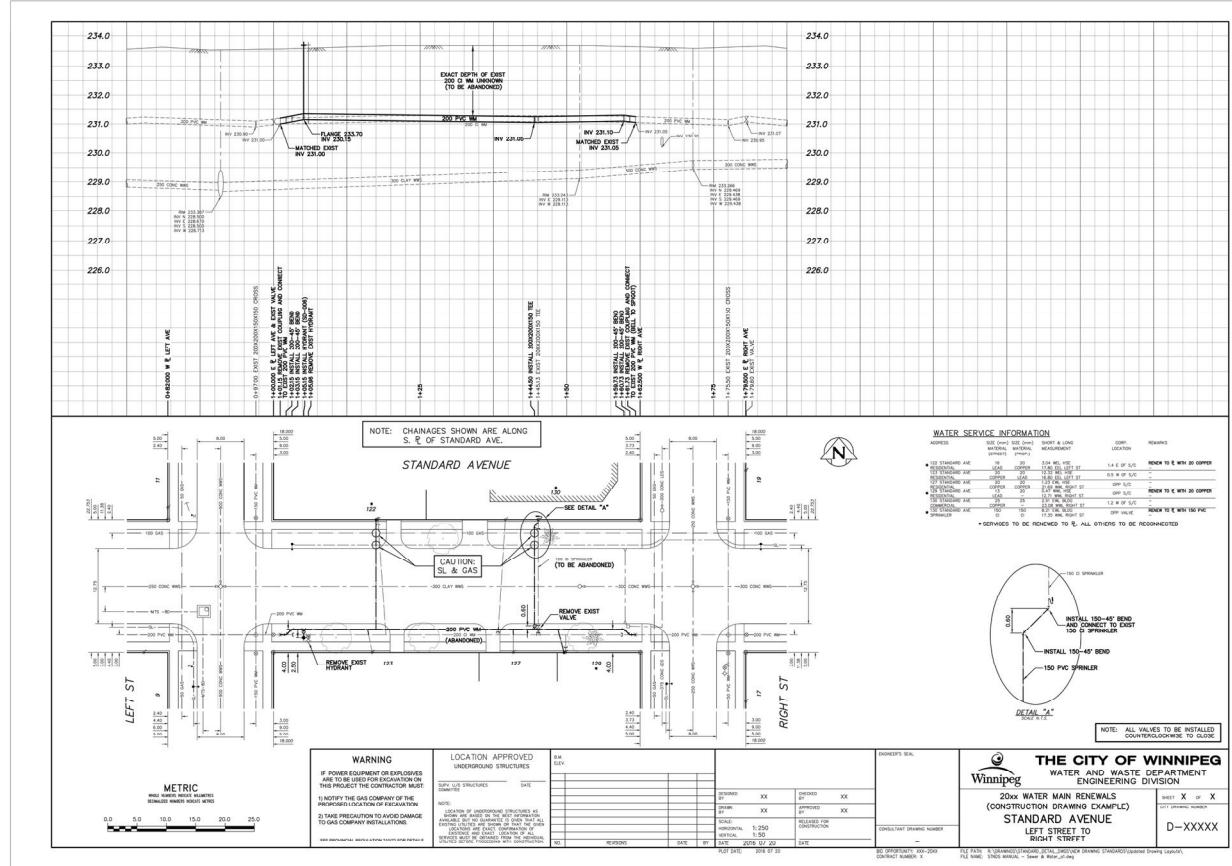


Figure 5
(For a larger view see Appendix F)

3.3.4 Oversize ISO A1 (594 mm x 841 mm) Plan/Profile Sheet - Sewer

Figure 6, on the following page, is an example of a design for a full segment sewer renewal drawn on an A1 size plan/profile sheet. An example of an A1 size water main renewal drawing shall be included with these standards. Similar to the water main renewal example above, the following information shall be shown in the plan portion of the drawing:

- All existing utilities and appurtenances (e.g. manholes, chambers, valves), including water and sewer that fall within the street right-of-way.
- All existing water and sewer service connections; including shut-off valves (curb stops) and a water service table and sewer service table showing address, size, material and all location information for each service (**See section 3.3.10 Service Charts for an example**).
- A sewer junction table, showing location information for each sewer junction shall also be shown.
- All property information such as property lines for the street right-of-ways, street names, lot lines, addresses (or lot, block and plan numbers) and survey monuments and bars.
- All topographic information that falls within a street right-of-way, such as street curb, poles, trees and sidewalks.
- Dimensions (off-set from property lines) for all existing utilities and street rights-of-way.
- All proposed design (in bold), including proposed appurtenances, off-set dimensions from property line, description of pipe, including the GIS sewer ID number and construction notes specific to the drawing.

Note: General construction notes shall be shown on the Legend/Drawing Index sheet.

- A north arrow, scale bar, a note describing the chainage applicable to the drawing, metric note and suitable cautionary and warning notes shall be shown.
- The drawing shall be stamped with the seal of a professional engineer. The seal shall be signed and dated.

The following information shall be shown in the profile portion of the drawing.

- Identification of the geodetic datum
- All existing water and sewer mains, including size and material.
- Existing rim and invert elevations for existing sewer manholes.
- Inverts for the existing water main, if known.
- Chainage locations shall be noted for all existing and proposed sewer manholes.
- Complete proposed pipe design including, proposed size and material as well as proposed inverts.

The title block portion of the drawing shall be completed as shown in section 3.1.8

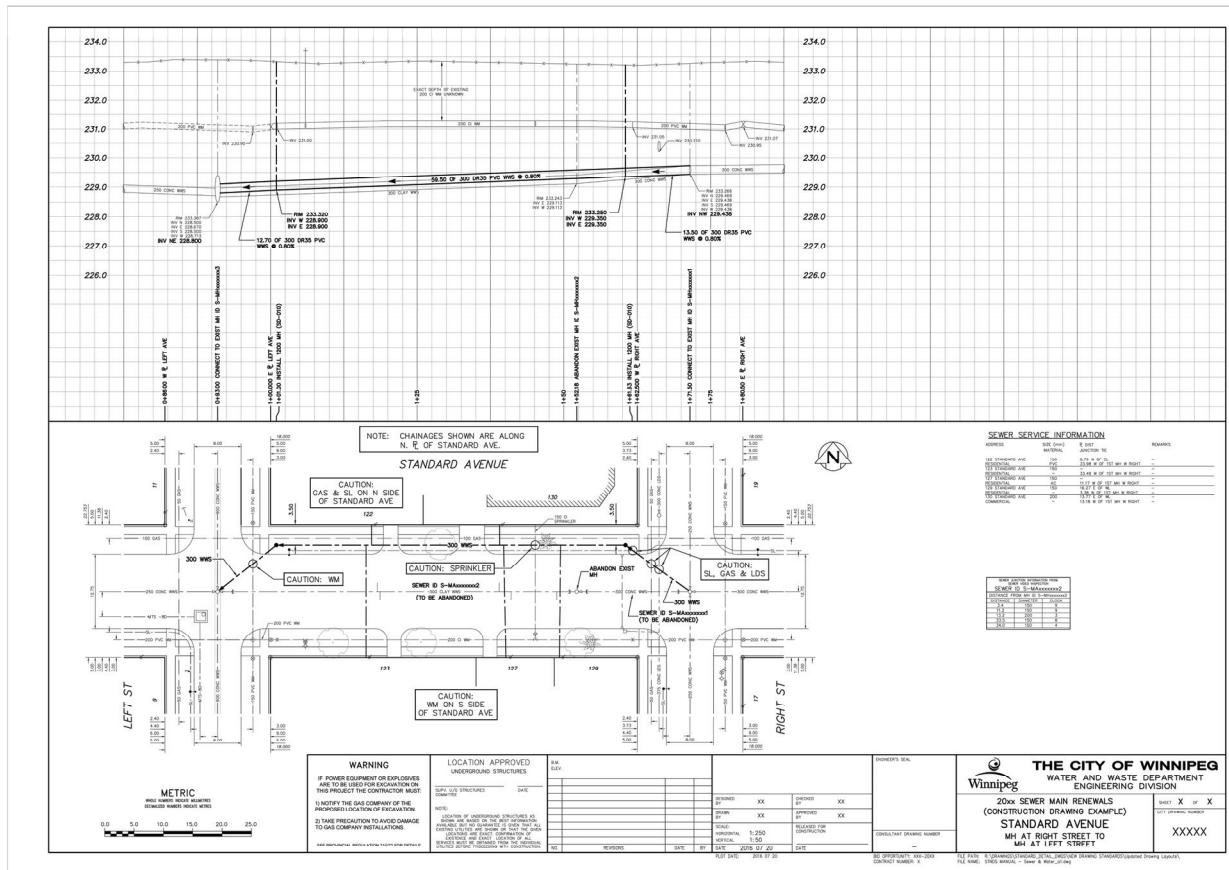


Figure 6
(For a larger view see Appendix G)

3.3.5 Oversize ISO A1 (594 mm x 841 mm) Plan/Profile Sheet – Open Channel (Ditching)

Figure 7 on the following page, is an example of a design for a ditch (Open Channel) re-grading drawn on an A1 size plan/profile sheet. An example of an A1 size Open Channel drawing shall be included with these standards. Similar to the sewer main renewal example above, the following information shall be shown in the plan portion of the drawing:

- Where applicable, all existing utilities and appurtenances (e.g. manholes, chambers, valves), including water and sewer that fall within the street right-of-way.
All property information such as property lines for the street right-of-ways, street names, lot lines, addresses (or lot, block and plan numbers) and survey monuments and bars.
- All topographic information that falls within a street right-of-way, such as street curb, poles, trees and sidewalks.
- Dimensions (off-set to property lines) for all existing utilities and street rights-of-way.
- All proposed design (in bold), including proposed appurtenances, direction of drainage, off-set dimensions to property line, and construction notes specific to the drawing.
Note: General construction notes shall be shown on the Legend/Drawing Index sheet.
- Separate cross section profile(s) wherever there is a change in the cross section (change in side slope or bottom width).
- A north arrow, scale bar, a note describing the chainage applicable to the drawing, metric note and suitable cautionary and warning notes shall be shown.
- The drawing shall be stamped with the seal of a professional engineer. The seal shall be signed and dated.

The following information shall be shown in the profile portion of the drawing.

- Identification of the geodetic datum
- All existing water and sewer mains, including size and material.
- Existing rim and invert elevations for existing sewer manholes.
- Chainage locations shall be noted for all existing and proposed sewer manholes.
- Complete proposed pipe design including, proposed size and material as well as proposed inverts.

The title block portion of the drawing shall be completed as shown in section **3.1.8. Title Block**

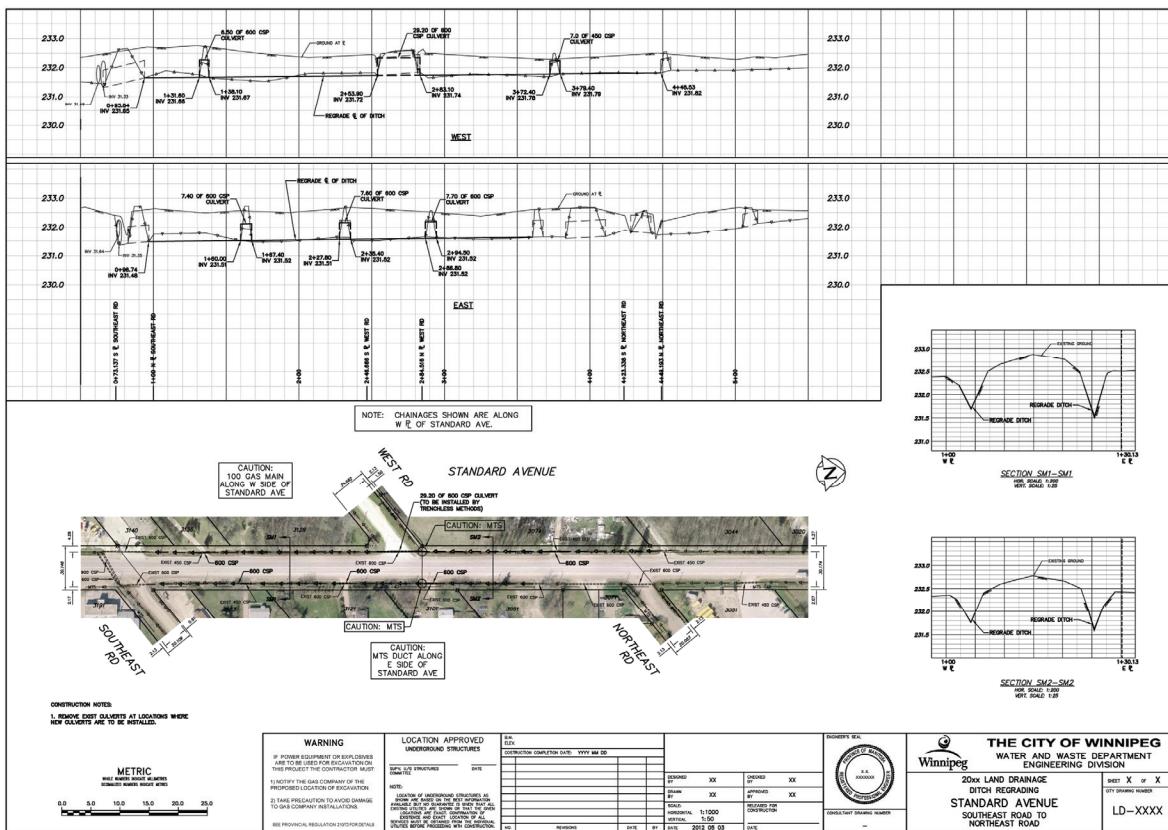


Figure 7
(For a larger view see Appendix H)

3.3.6 11" x 17" Sewer Sheet

As mentioned in section 3.3 The Prototype Drawing – the 11" x 17" plan drawing sheet shall be used for sewer renewals by CIPP linings, external sewer point repairs (EPR) and trenchless sewer point repairs (TPR).

11" x 17" Sewer Renewal by CIPP Lining

Figure 8 on the following page, is an example of a sewer renewal by CIPP lining utilizing an "11 x 17" drawing sheet. An example of an 11" x 17" size CIPP lining drawing shall be included with these standards. In general, the following information shall be shown on the drawing:

- Drawn at a 1:750 scale with the current City of Winnipeg air photo. Existing houses and buildings along street right-of-ways visible on air photo.
- All property information such as property lines for the street right-of-ways, street names, lot lines and addresses (or lot, block and plan numbers).
- All existing water and sewer pipes and appurtenances (e.g. manholes, chambers, valves) that fall within the street right-of-way. Existing Pipe labelled (size, material, and type).
- The portion of the existing main, thickened to show the extent of CIPP lining (*Polyline* with a *Global Width* of 0.4). Also labelled with its length, size, sewer ID, and deterioration.
- MH ID, rim and invert elevations for the manholes (up and down stream) on the sewer segments to be lined.
- A north arrow, scale bar, metric note and suitable cautionary and warning notes shall be shown.
- The drawing shall be stamped with the seal of a professional engineer. The seal shall be signed and dated.

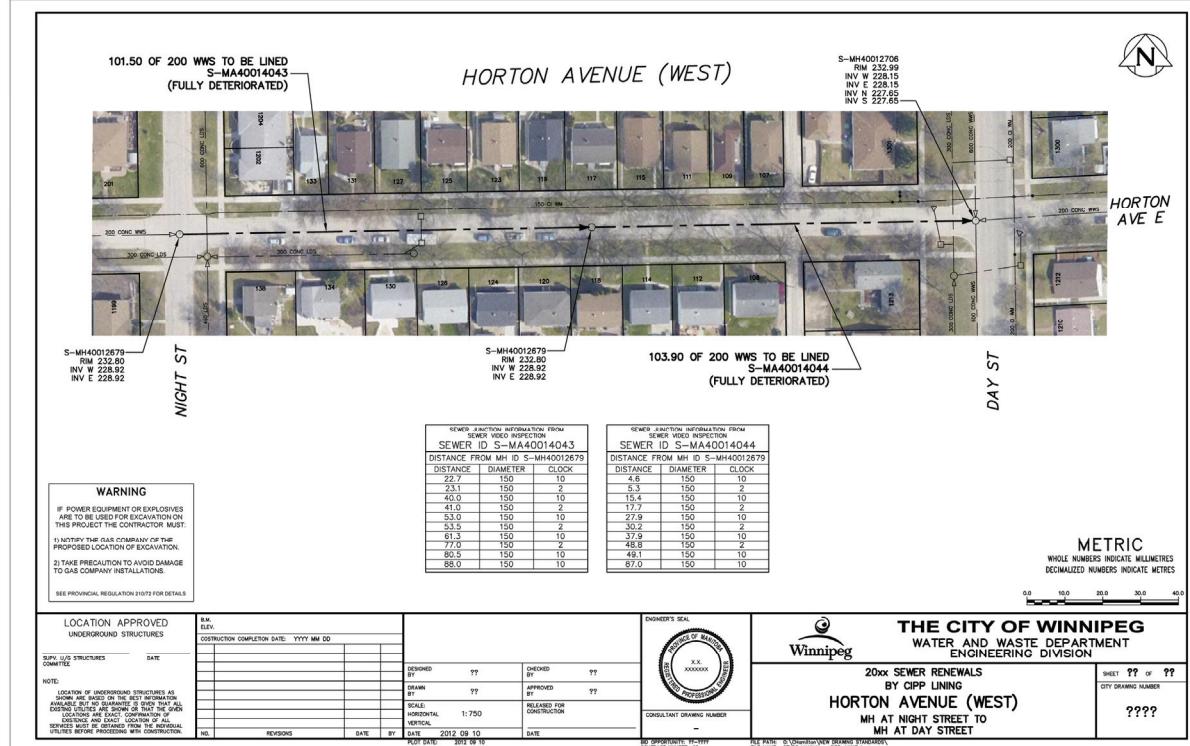


Figure 8

11" x 17" External Point Repair (EPR) and Trenchless Point Repair (TPR) Sheets

Figure 9 on the following page, is an example of a sewer renewal by EPR displayed on an "11 x 17" drawing sheet. An example of an 11" x 17" size EPR drawing shall be included with these standards. The same example is relevant for a trenchless point repair drawing. In general, the following information shall be shown on the drawing:

- All existing utilities and appurtenances (e.g. manholes, chambers, valves), including water and sewer that fall within the street right-of-way.
 - All existing sewer junctions (sewer service connections at the main) as well as a table showing all sewer junction information as identified by sewer video inspection records.
 - Dimensions (off-set from property lines) for all existing utilities and street rights-of-way.
 - The portion of the existing main, high-lighted to show the location of the repair. A description of the proposed repair should be indicated and pointed to the high-lighted area.
 - Notes at the upstream and downstream manholes indicating what manhole is at 0+00, and chainage to the beginning and end of the high-lighted location to represent the limits of the EPR.
 - Notes at both the upstream and downstream sewer manholes indicating the GIS ID number as well as the diameters for the manhole opening, riser and base.
 - Notes at both the upstream and downstream sewer manholes indicating rim and invert elevations.
 - GIS ID number indicated for the existing sewer with the repair.

- A north arrow, scale bar, metric note and suitable cautionary and warning notes shall be shown.
- The drawing shall be stamped with the seal of a professional engineer. The seal shall be signed and dated.

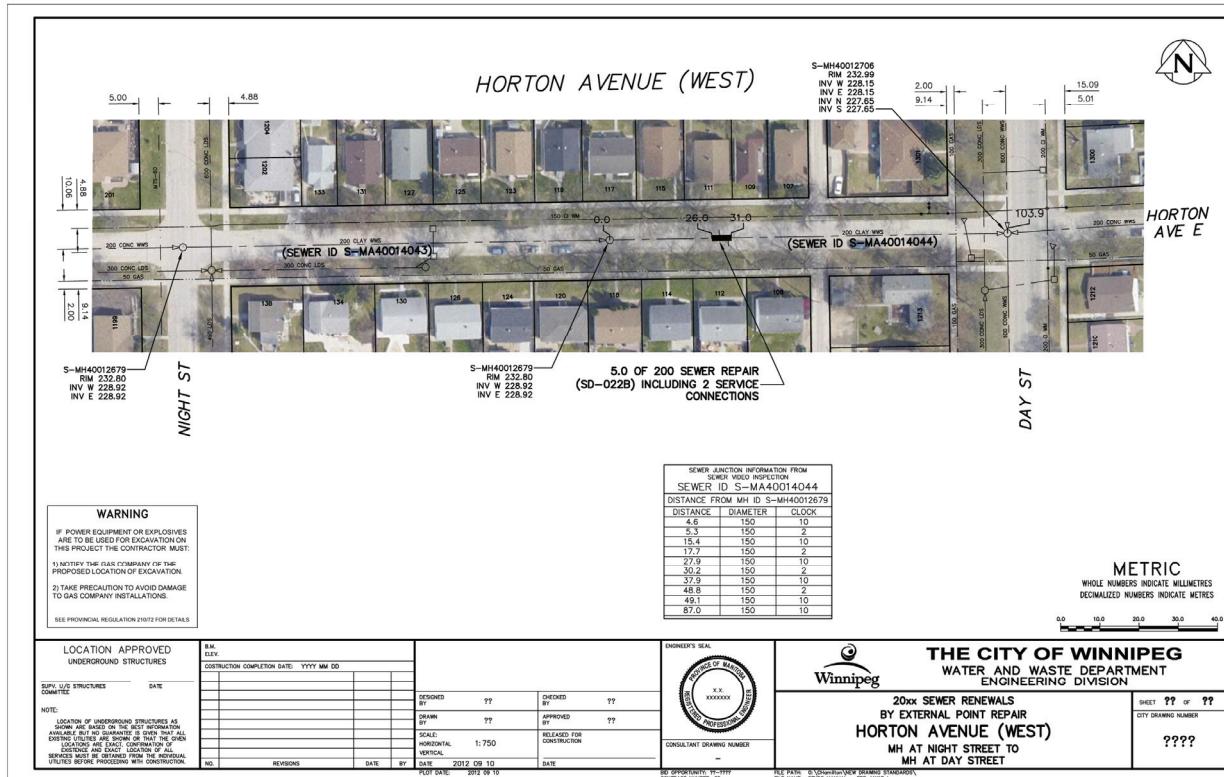


Figure 9
(For a larger view see Appendix I)

11" x 17" Augmented Lining Design Drawing

Figure 10 below is an example of a sewer renewal by Augmented Lining displayed on an "11 x 17" drawing sheet.

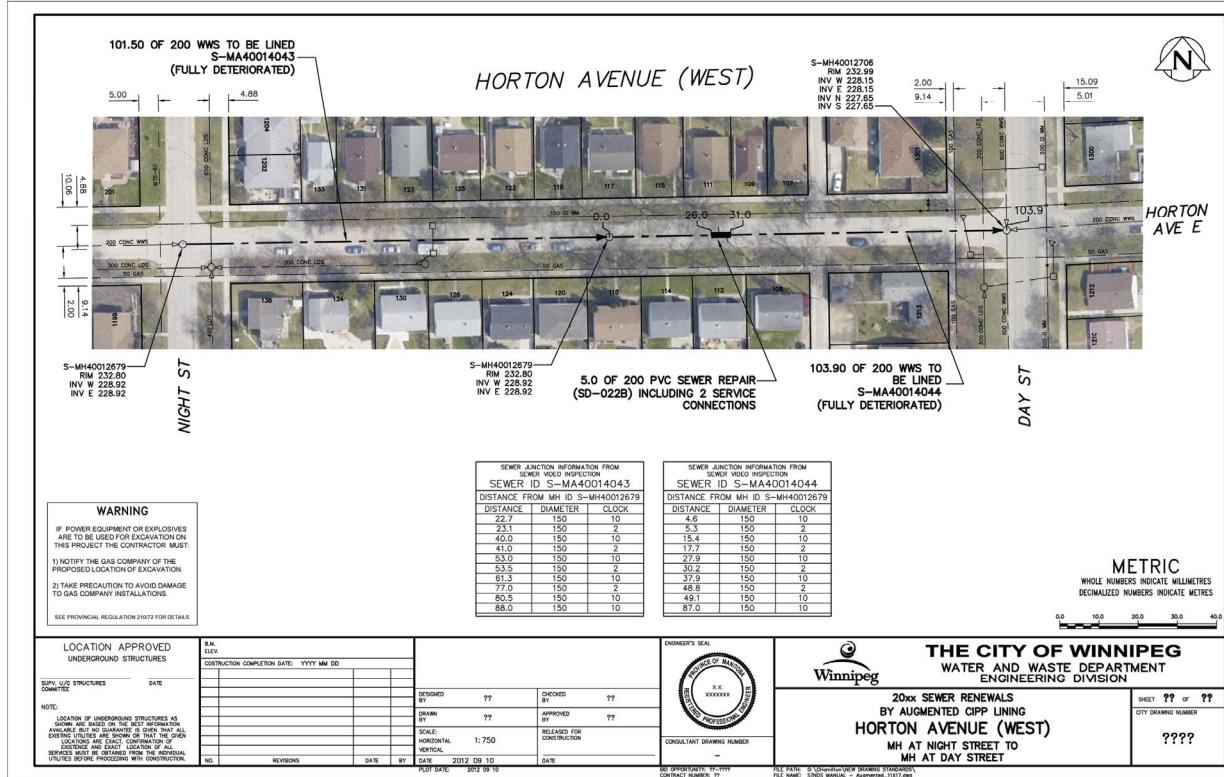


Figure 10
(For a larger view see Appendix I)

3.3.7 Detail Sheets

Detail plan sheets, both A1 and 11" x 17" sizes, shall be used for pumping station upgrade projects and control structure or gate chamber upgrades in order to display plan views, elevation views, complicated details and blow-ups, as well as modified standard drawings such as for manholes.

Oversize ISO A1 (594 mm x 841 mm) Detail Sheet

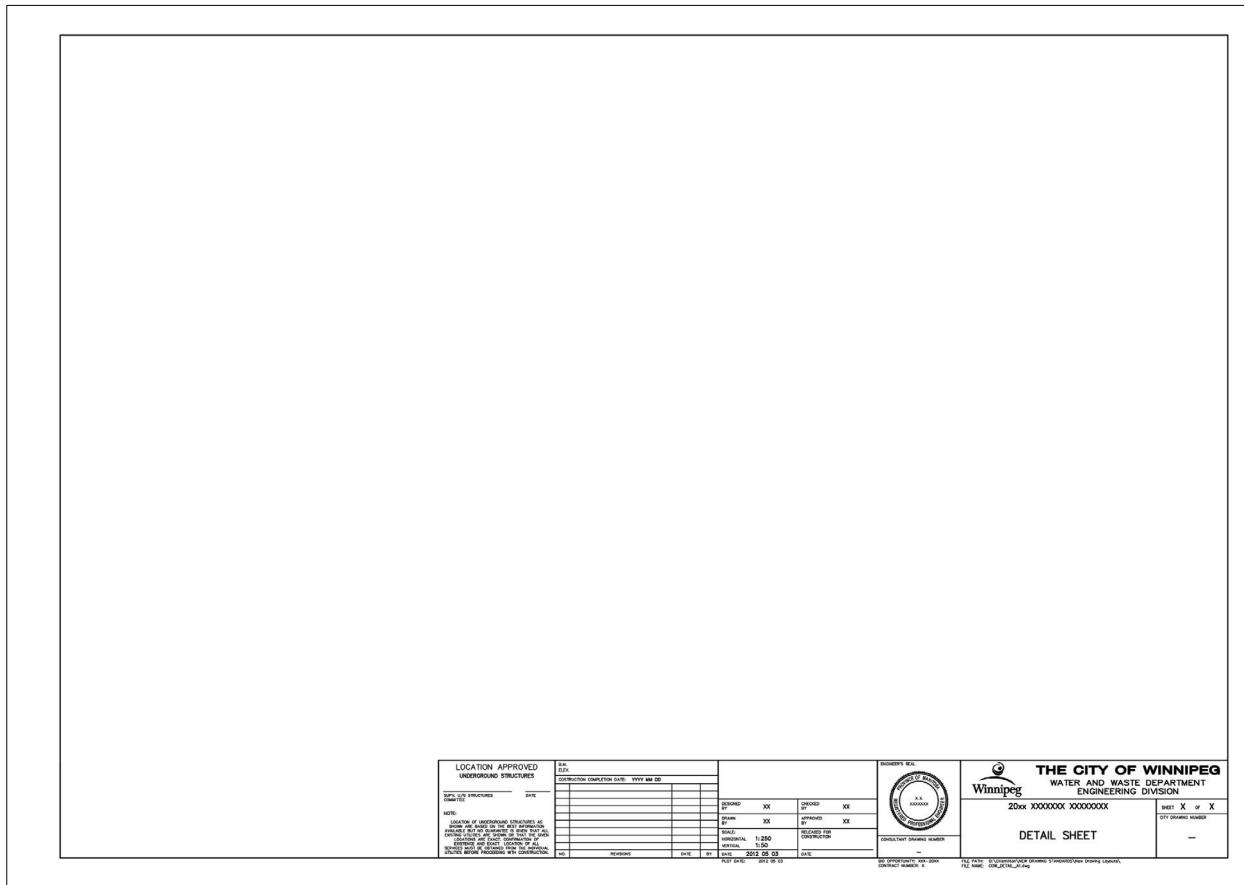


Figure 11
(For a larger view see Appendix J)

11"x 17" Detail Sheet

LOCATION APPROVED UNDERGROUND STRUCTURES		EM. ELN.				INNOVATION SUSTAINABILITY EXCELLENCE		THE CITY OF WINNIPEG WATER AND WASTE DEPARTMENT ENGINEERING DIVISION		Winnipeg	
SUPV./U/A STRUCTURES COMPLETED	DATE	DESIGNED BY	XX	CHECKED BY	XX	ORIGINAL SIGNATURE BY X.X. XXXXXXXX CITY OF WINNIPEG PROFESSIONAL ENGINEER	20xx XXXXXX XXXXXXXX	SHEET X OF X			
NOTE: <small>LOCATION OF UNDERGROUND STRUCTURES AS SHOWN ARE BASED ON THE BEST INFORMATION AVAILABLE AT THE TIME OF DRAWING. THE CITY OF WINNIPEG DOES NOT OWN OR MAINTAIN THESE UTILITIES. IT IS SOON AS THAT THE OWNER LOCATES THESE UTILITIES, THE CITY OF WINNIPEG WILL FURTHER APPROVE THE LOCATION OF THESE UTILITIES. THIS DRAWING IS FOR INFORMATION PURPOSES ONLY. IT IS THE RESPONSIBILITY OF THE DESIGNER TO VERIFY THE EXISTENCE AND EXACT LOCATION OF ALL UTILITIES BEFORE PROGRESSING WITH CONSTRUCTION.</small>		DRAWN BY	XX	APPROVED BY	XX	CONSULTANT DRAWING NUMBER —	FILE NAME: D:\Common\Winnipeg\Standard\DWG\Drawing\Copy\DWG\Drawings\100\	FILE NUMBER	—		
NO.		REVISIONS	DATE BY	DATE	HORIZONTAL VERTICAL	DATE	CONTRACT NUMBER X	CONTRACT NUMBER X	CONTRACT NUMBER X		
FILE PATH: D:\Common\Winnipeg\Standard\DWG\Drawing\Copy\DWG\Drawings\100\											

Figure 12
(For a larger view see Appendix K)

3.3.8 Title Block

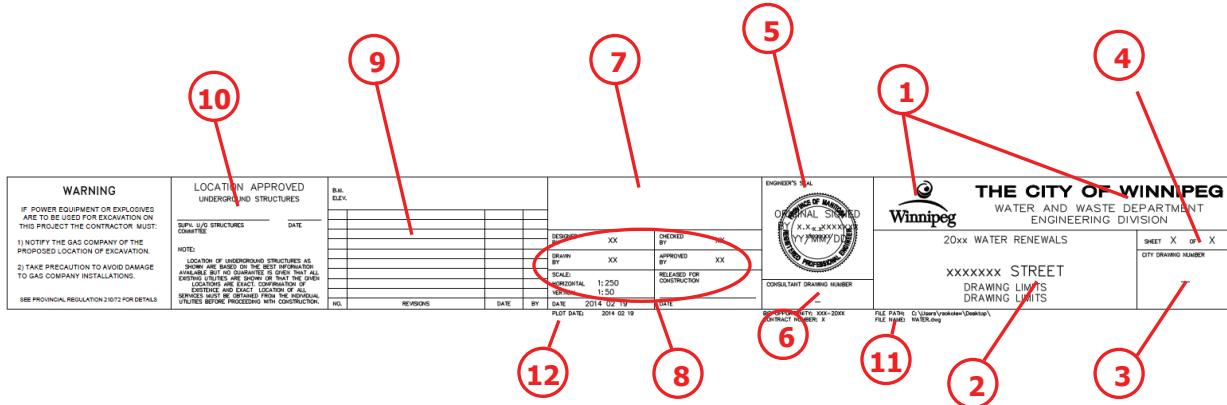


Figure 13
(For a larger view see Appendix L)

1. City of Winnipeg/Water and Waste Department identification – Space is provided for the City of Winnipeg and WWD logos which shall be provided in the prototype drawing.

2. Drawing Title Area – This space shall consist of three parts: Description of the municipal work being installed, the street, and the specific location on that street.

3. Water and Waste Drawing Number – shall be supplied prior to the construction and drawing submission upon request, by the Water and Waste Department.

4. Sheet Identification – Identifies the sheet number and the total number of sheets in the set, i.e. 3 of 12. The size of the numbers shall be

5. Engineer's Seal – Space is provided for the Seal of the Engineer who is responsible for the design. Additional seals shall be placed outside of the title block.

6. Consultant Drawing Number – Drawings originating from a consulting firm may have a drawing number from their own filing system.

7. Consultant's Identification – Space is provided for the consultant's name and logo. In the case of an "in-house" project, the Department, Division, Section, or Branch shall be identified in this space, i.e.;

**Public Works Department
Streets Engineering Division**

8. Drawing Details –

Designed By: Initials of designing engineer or technologist

Drawn By: Initials of drafting technician or technologist

Checked By: Understood to mean the drafting and design have been checked by the undersigned

Scale: Horizontal and vertical scale shall be noted here. Detail scale shall be noted on each detail as needed

Date: Date that the drawing was completed

Approved By: Understood to mean approval of the design by the engineer in charge of the project at the consulting firm or at the City of Winnipeg

Released For Construction: The date and signature of the appropriate City official from the initiating area

9. Revision Section – Revision block shall include the number of the revision, brief description of the revision, date revision was completed and the initials of the Engineer (or his designate) that originally approved the drawing.

10. Underground Structures – Approval and waiver shall be included in the Title Block of the plan-profile sheet as per the Underground Committee Agreement January 1, 1974. Note that:

Locations of underground structures as shown are based on the best information available, but no guarantee is given that all existing utilities are shown or that the given locations are exact. Confirmation of existence and exact location of all services must be obtained from the individual utilities before proceeding with construction.

11. File Path – Space is provided to indicate the location of the digital file of the drawing.

12. Plot Date – Space is provided to indicate the date the drawing was printed to hardcopy.

3.4 GENERAL DRAFTING REQUIREMENTS

All drawings shall be metric. Drawing scales, including bar scales and dimensions shall be shown on all drawings. It is not necessary to place the appropriate metric symbol (m or mm) after each dimension if the note, as shown in figure 14 below, is placed boldly on the drawing.



Figure 14

Drawings shall be neat and legible with adequate clearance margins between the drawing information and the title block border. Notes and text shall locate and describe the proposed work in sufficient detail to facilitate construction. Limits of construction and match lines shall be clearly marked on the drawing.

All elevations shown on drawings shall be metric geodetic datum. The source and location of the datum shall be clearly noted on each drawing (See Section 3.4.17 Survey).

The information contained in the drawings shall be oriented in the same datum as the GIS, NAD 1983 1990.

Standard details such as manholes, catch basins, hydrants, etc., that are shown and described in the City of Winnipeg Standard Construction Manual do not need not be shown in detail on the drawings. The standard detail drawing number shall be quoted on the plan for reference.

All drawings shall bear the dated stamp/seal and signature of the professional engineer responsible for the design.

Provision shall be made on all drawings for the insertion of the City of Winnipeg - Water & Waste Department drawing number in the space provided in the title block labelled "City Drawing Number". The WWD shall provide the drawing number. Consultant drawing numbers shall be placed in the space in the title block labelled for that purpose.

Numerical values shown on the Construction drawings shall be to two (2) decimal places unless accuracy warrants otherwise.

Survey monument/bar infrastructure must be shown in the plan portion on all drawings. This information can be acquired from the Planning Property and Development Department, Development and Inspections Division, Geomatics Branch.

Main line water valves installed in the City of Winnipeg turn either to the left, (counter-clockwise) or to the right (clockwise) to close, depending on the area they are being located in, as shown on SD-008 of the Standard Construction Manual (See Figure 15, on the following page).

Actual proposed works such as sewer mains, water mains, or valves in the plan portion of the drawing shall be created in the model space tab. Other components of the drawing submittal such as design notes, text, dimensions, etc. should be drawn in paper space.

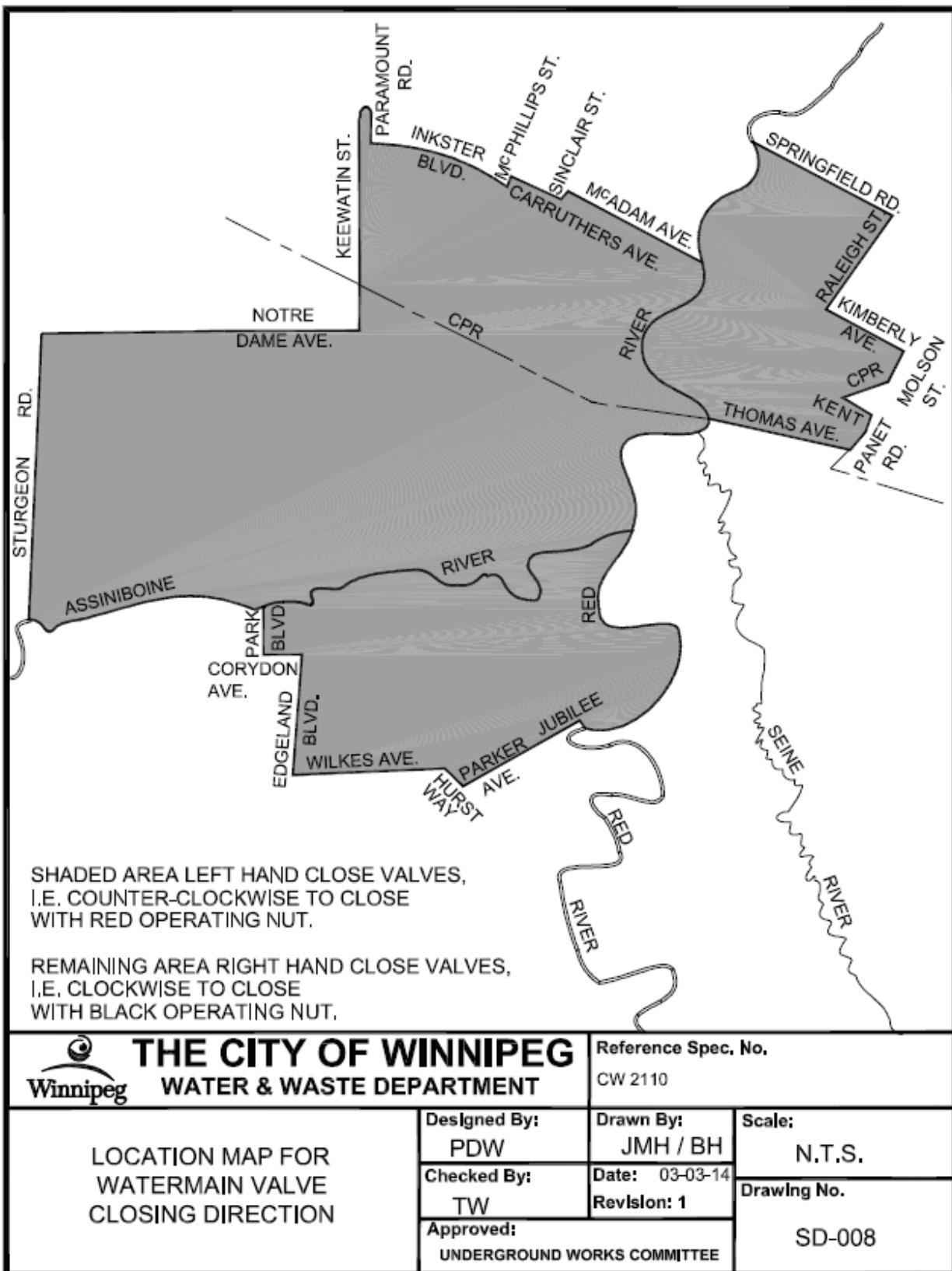


Figure 15

A note (whichever is applicable), similar to the example shown below in figure 16 shall be shown on all drawings.

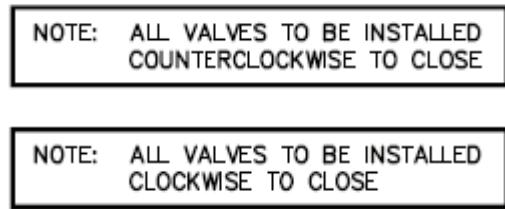


Figure 16

Whenever the proposed location for the new water or sewer infrastructure is in close proximity to a gas line a caution note shall be placed in the plan portion of the drawing as close to the potential conflict as possible. The cautionary note should look similar to Figure 17 below.

WARNING

IF POWER EQUIPMENT OR EXPLOSIVES
ARE TO BE USED FOR EXCAVATION ON
THIS PROJECT THE CONTRACTOR MUST:

- 1) NOTIFY THE GAS COMPANY OF THE PROPOSED LOCATION OF EXCAVATION.
- 2) TAKE PRECAUTION TO AVOID DAMAGE TO GAS COMPANY INSTALLATIONS.

SEE PROVINCIAL REGULATION 210/72 FOR DETAILS

Figure 17

3.4.1 Drawing Orientation

Plans shall be oriented to allow the pointing of the north arrow to the top or to the right of the sheet for the major portion of the alignment. Assuming the top of the sheet as due north, the range within which the north arrow may point is from 45° west of north to 135° east of north (see Figure 18 below).

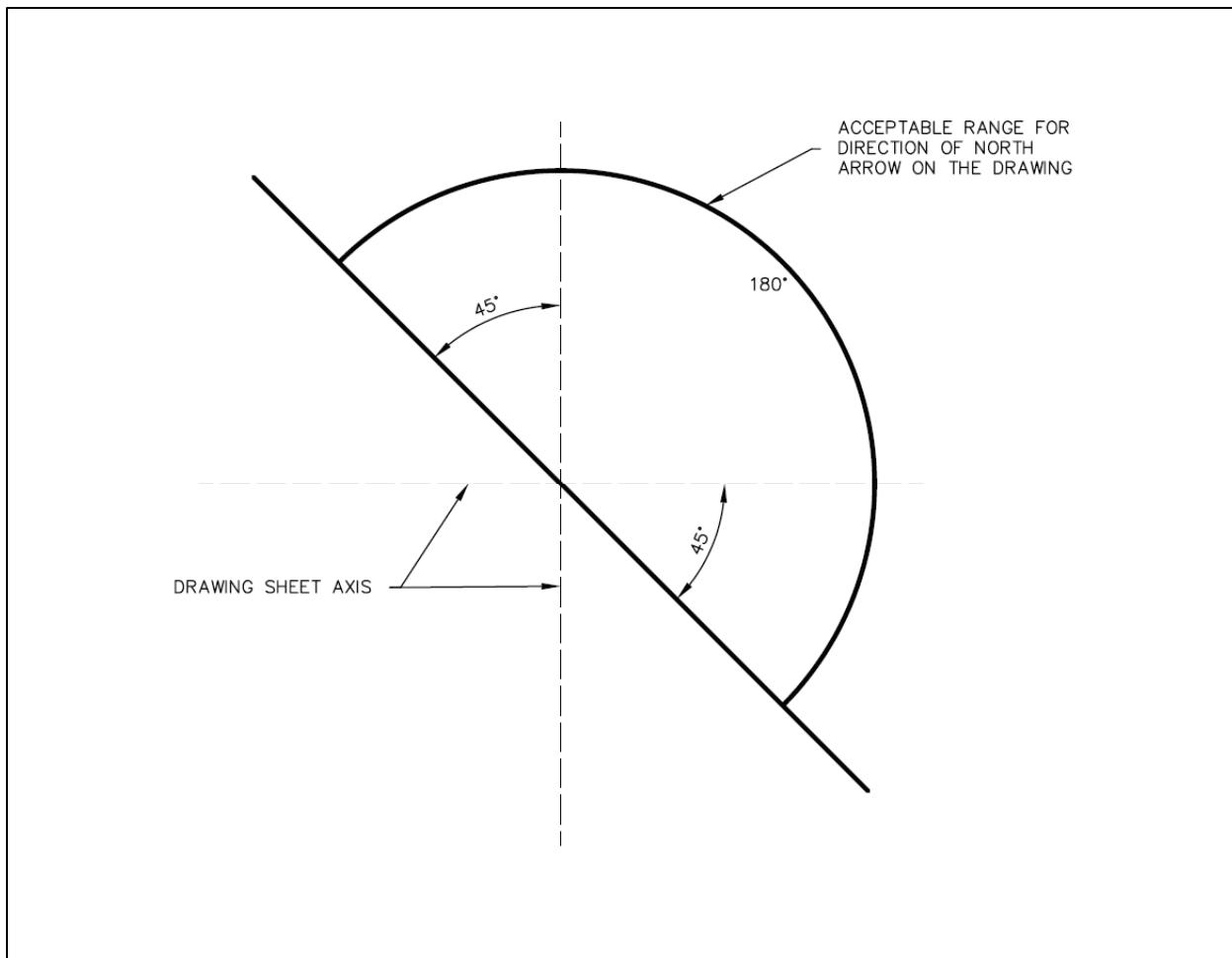


Figure 18

3.4.2 Text Orientation

The direction of lettering shall conform to the slope of the symbol or line. The correct placement is as shown in Figure 19 below. The space between line and lettering shall not be less than 1mm.

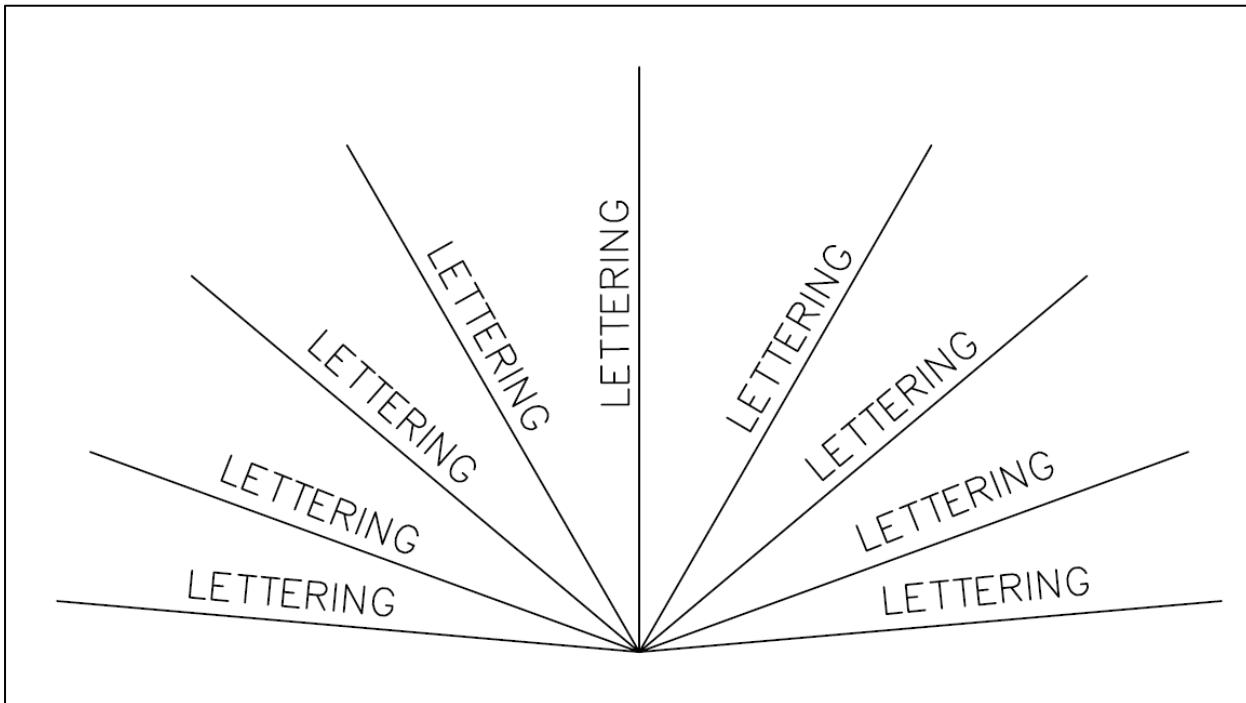


Figure 19

3.4.3 Caution Note for Other Utilities

A utility caution note, similar to the examples in figure 20 below, shall be placed in close proximity or connected with a leader line to the applicable area, on all drawings.

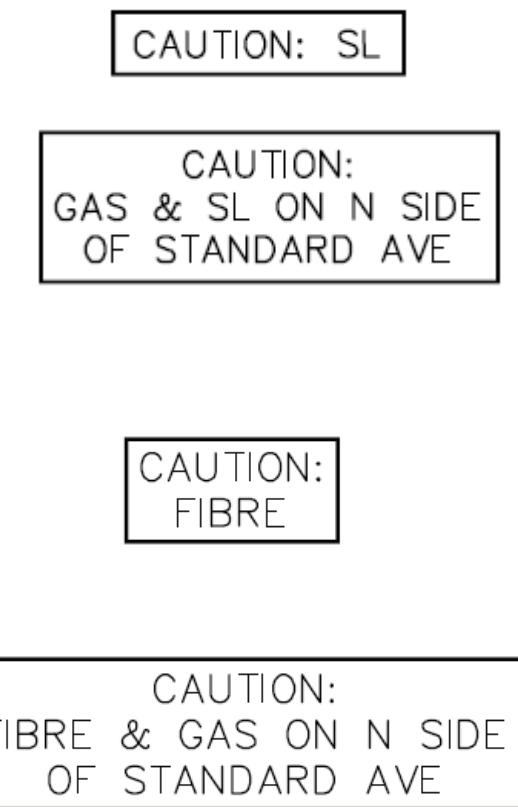


Figure 20

3.4.4 Legend

A Legend shall be included as part of the legend/drawing index sheet (see section 3.3.2. Legend/Drawing Index Sheets).

LEGEND

PLAN VIEW		
DESCRIPTION	EXISTING	PROPOSED
WATER PIPE	◇	◆
FIRE HYDRANT	◎	○
VALVE	○	●
CURB STOP	△	▲
REDUCER	△	▲
COUPLING OR SLIDDER	X	X
CROSS	⊕	⊕
BEND - 11.25°, 22.5°, 45°, 90°	Η Η Η Η	Η Η Η Η
TEE	△	△
VERTICAL BEND	H	H
ANODE	▽	▽
REPAIR MARKER	◊	◊
PLUG	J	J
SEWER PIPE	— — —	— — —
MANHOLE	○	●
CATCH BASIN	□	■
CURB INLET	▽	▽
JUNCTION	— — —	— — —
Q DITCH	→ → →	→ → →
CULVERT	— = = —	— = = —
SURVEY BAR	⊕	⊕
SURVEY MONUMENT	Ⓐ	Ⓐ
TREE - DECIDUOUS	⊙	
TREE - CONIFEROUS	★	
HYDRO		
HYDRO POLE	*H	
LAMP STANDARD	●●	
HYDRO POLE W/STREET LIGHTING	H●●	
POLE	*	
GUY ANCHOR	←	
M.T.S. POLE	*M	
PEDESTAL OR BOX	◻	
CABINET	☒	
M.T.S.	— · —	— · —
TRAFFIC SIGNALS	— — —	— — —
TRAFFIC LIGHT STANDARD	↔↔	
GAS	···	···
STEAM	····	····
FIBRE OPTIC	— — —	— — —
FENCE	X	X
EDGE OF PAVEMENT OR GUTTER	— — —	— — —
EDGE UNPAVED OR GRAVEL ROAD	— — — —	— — — —
R	— · —	— · —
PROJECTED R	··· ···	
LOT LINE	— — —	
SIDEWALK - PATHWAY	— — —	
EASEMENT	— — —	
EDGE OF BUILDING	▨	
MAILBOX	M	
TEST HOLE	◊	
TREE LINE OR BUSH	— — —	

Figure 21
(For a larger view see Appendix M)

3.4.5 Drawing Scales

All drafting shall be done at 1:1, in Decimal units, and in the AutoCAD model space environment. Plotting shall be done using the plot layout tools of AutoCAD's paper space environment. Drawing sheets shall be set up at a scale of 1:1 and views in the drawing shall be scaled using viewport scaling. In addition to the drawing border, other entities to be placed in paper space include general notes, north arrows and bar scale. All profiles are to be drawn in paper space.

The standard scale for a water main renewal project is 1:250 horizontal and 1:50 vertical.

The standard scale for a full segment sewer renewal project is 1:250 horizontal and 1:50 vertical.

The standard scale for large land drainage/ditch projects is 1:1000 horizontal and 1:50 vertical.

The standard scale for external point repairs, trenchless point repairs and sewer renewals by CIPP linings is 1:750 horizontal, and no profile is required.

The standard line type scale for all drawing lines is 1. Each drawing line type scale or 'ltscale' shall be set to 10 and Paper Space scale or 'psltscale' shall be set to 1.

3.4.6 Layers Required in the Final GIS Drawing

Layers, layer names, and layer properties are pre-set as part of the WWD supplied prototype drawings. AutoCAD to GIS or 'AG' block names shall be used for the proposed works.

If, when preparing the **Final GIS Drawing**, there is a project for which there are no layer names available, the consultant shall notify the Department and a layer name and specifics shall be provided. Once implemented by the Department, these layers shall become part of the prototype drawing.

To facilitate exchange with the Departments GIS, layers and symbols in the Final GIS Drawing shall not be edited and are used 'as is.' No layer names, other than those in the City's layer name list, shall be present in this drawing file. There are exceptions for those layer names automatically created by AutoCAD, (e.g., 0, DEFPOINTS, and ASHADE).

With the exception of survey point layers, layer names created by third party software or add-ons, including Autodesk add-ons shall not be accepted in the Final GIS Drawing.

(For a complete list of all the WWD layers see Appendix AA)

Sewer

Only these layers, whichever are applicable, shall be used in the Final GIS drawing for Sewer Renewals, Sewer Renewal by CIPP Lining/Augmented Lining, Combined Sewer Relief (SRS), Force mains, External Point Repairs, Trenchless Point Repairs, Gate Chambers, Interceptor Sewers, Land Drainage Sewers, Open Channel (Ditching), or Outfall Repairs.

WWD REQUIRED LAYERS - FINAL GIS DRAWING (SEWER)					
NAME	LINETYPE	FEATURE TYPE	PLOT STYLE	PLOTTABLE	DESCRIPTION
AG_BLOCK_ENTITIES	CONTINUOUS	LINEAR	COLOR_3 (GREEN)	YES	USED FOR ALL ENTITIES WITHIN A BLOCK REPRESENTING A PROPOSED OBJECT
AG_BLOCK_ENTITIES_E	CONTINUOUS	LINEAR	COLOR_1 (RED)	YES	USED FOR ALL ENTITIES WITHIN A BLOCK REPRESENTING AN EXISTING OBJECT
AG_OC_CHANNEL_JUNCTION	CONTINUOUS	POINT	COLOR_7 (WHITE)	YES	USED AT CHANGES OF PROPOSED DITCH GRADE AND/OR ALIGNMENT. ALSO AT BEGINNING & END OF A DITCH
AG_OC_CHANNEL_LINE	DITCHLINE	LINEAR	COLOR_7 (WHITE)	YES	USED AT THE CENTERLINE OF A PROPOSED DITCH OR CULVERT
AG_OC_INLET_OUTLET	CONTINUOUS	POINT	COLOR_7 (WHITE)	YES	USED AT THE TERMINATION OF CULVERT ENDS
AG_OC_INLET_OUTLET_CB	CONTINUOUS	BLOCK	COLOR_3 (GREEN)	YES	USED FOR PROPOSED CB'S WHICH DRAIN DITCHES INTO A CLOSED SYSTEM
AG_OC_INLET_OUTLET_E_CB	CONTINUOUS	BLOCK	COLOR_1 (RED)	YES	USED FOR EXISTING CB'S WHICH DRAIN A DITCH INTO A CLOSED SYSTEM
AG_OC_INLET_OUTLET_E_MH	CONTINUOUS	BLOCK	COLOR_1 (RED)	YES	USED FOR PROPOSED MH'S WHICH DRAIN DITCHES INTO A CLOSED SYSTEM
AG_OC_INLET_OUTLET_MH	CONTINUOUS	BLOCK	COLOR_3 (GREEN)	YES	USED FOR EXISTING MH'S WHICH DRAIN A DITCH INTO A CLOSED SYSTEM
AG_OC_XSECTION_POINT	CONTINUOUS	POINT	COLOR_7 (WHITE)	YES	USED FOR POINTS PROVIDING NORTHING, EASTING, AND ELEVATION ALONG A X-SECTION.
AG_SEWER_BEND	CONTINUOUS	BLOCK	COLOR_3 (GREEN)	YES	USED AT PROPOSED SEWER BENDS
AG_SEWER_CB	CONTINUOUS	BLOCK	COLOR_3 (GREEN)	YES	USED AT PROPOSED CB'S (NOT DRAINING DITCHES)
AG_SEWER_CB_LEAD	CENTER	LINEAR	COLOR_5 (BLUE)	YES	USED FOR CB LEADS (PIPE BETWEEN CB AND CONNECTION TO SEWER)
AG_SEWER_CB_TEE	CONTINUOUS	BLOCK	COLOR_3 (GREEN)	YES	USED FOR PROPOSED CB TEE'S (CONNECTION AT SEWER END OF CB LEAD)
AG_SEWER_CHAMBER	CONTINUOUS	LINEAR	COLOR_5 (BLUE)	YES	USED FOR SEWER CHAMBER OUTLINES
AG_SEWER_CI	CONTINUOUS	BLOCK	COLOR_3 (GREEN)	YES	USED FOR PROPOSED CURB INLETS (CI)
AG_SEWER_CONNECTION	CONTINUOUS	POINT	COLOR_7 (WHITE)	YES	USED WHERE A SEWER SERVICE CONNECTS WITH A SEWER
AG_SEWER_COUPLER	CONTINUOUS	BLOCK	COLOR_3 (GREEN)	YES	USED FOR SEWER COUPLINGS
AG_SEWER_END	CONTINUOUS	POINT	COLOR_7 (WHITE)	YES	USED AT THE END OF A SEWER PIPE (END OF OUTFALL PIPE, ETC.)
AG_SEWER_EXIST_CB	CONTINUOUS	BLOCK	COLOR_1 (RED)	YES	USED ON AN EXISTING CB WHICH A PROPOSED PIPE IS TO BE CONNECTED
AG_SEWER_EXIST_CI	CONTINUOUS	BLOCK	COLOR_1 (RED)	YES	USED ON AN EXISTING CI WHICH A PROPOSED PIPE IS TO BE CONNECTED
AG_SEWER_GATEVALVE	CONTINUOUS	BLOCK	COLOR_3 (GREEN)	YES	USED FOR PROPOSED GATE VALVES (SLUICE, GATES)
AG_SEWER_EXIST_MANHOLE	CONTINUOUS	BLOCK	COLOR_1 (RED)	YES	USED ON AN EXISTING MH WHICH A PROPOSED PIPE IS TO BE CONNECTED
AG_SEWER_MAIN	CENTER	LINEAR	COLOR_5 (BLUE)	YES	USED FOR PROPOSED SEWER MAINS

Figure 22

AG_SEWER_PLUG	CONTINUOUS	BLOCK	COLOR_3 (GREEN)	YES	USED FOR PROPOSED SEWER PLUGS
AG_SEWER_REDUCER	CONTINUOUS	BLOCK	COLOR_3 (GREEN)	YES	USED FOR PROPOSED SEWER REDUCERS
AG_SEWER_SERV_PL_CONNECTION	CONTINUOUS	POINT	COLOR_7 (WHITE)	YES	USED ON THE POINT WHERE A PROPOSED SEWER SERVICE CONNECTS TO THE EXISTING SEWER SERVICE AT THE PROPERTY LINE
AG_SEWER_SERVICE_PIPE	CENTER	LINEAR	COLOR_4 (CYAN)	YES	USED FOR PROPOSED SEWER SERVICES
AG_SEWER_TEE	CONTINUOUS	BLOCK	COLOR_3 (GREEN)	YES	USED FOR PROPOSED TEE'S ON SEWERS (NOT CB TEE'S)
AG_SEWER_THRUSTBLOCK	CENTER	BLOCK	COLOR_3 (GREEN)	YES	USED FOR PROPOSED SEWER THRUST BLOCKS
AG_SEWER_VALVE	CONTINUOUS	BLOCK	COLOR_3 (GREEN)	YES	USED FOR PROPOSED SEWER VALVES
AG_SEWER_Y	CONTINUOUS	BLOCK	COLOR_3 (GREEN)	YES	USED FOR PROPOSED SEWER Y'S
AG_SEWER_YARD_DRAIN_INLET	CONTINUOUS	BLOCK	COLOR_3 (GREEN)	YES	USED FOR PROPOSED YARD DRAIN INLETS
EASEMENTS	DASHED	GREEN	COLOR_3	YES	USED FOR INDICATING EASEMENTS
E_SEWER_ABAND_PLAN	CENTER	DARK GREY	COLOR_8	YES	USED FOR ALL ABANDONED SEWER PIPES & BLOCKS IN PLAN
E_SEWER_PLAN	CENTER	RED	COLOR_1	YES	USED FOR ALL EXISTING SEWER PIPES & BLOCKS IN PLAN
E_SEWER_SERVICES_PLAN	CENTER	RED	COLOR_1	YES	USED FOR EXISTING SEWER SERVICES IN PLAN
LEGAL	CONTINUOUS	CYAN	COLOR_4	YES	USED FOR ALL LEGAL LINES BESIDES LOTLINES
LOTLINES	CONTINUOUS	GREEN	COLOR_3	YES	USED FOR LOTLINES
TEXT_ADDRESS	CONTINUOUS	GREEN	COLOR_3	YES	USED FOR PROPERTY ADDRESS
ZPTMISC					FOR ANY ADDITIONAL TOPOGRAPHY/LEGAL/UTILITY/SURVEY
ZPTSEWER					FOR ALL SEWER RELATED SURVEY

Figure 22 (Continued)

Water

Only these layers, whichever are applicable, shall be used in the Final GIS drawing for water main renewals, Feeder mains, Aqueduct, and Valve Chambers:

WWD REQUIRED LAYERS - FINAL GIS DRAWING (WATER)

NAME	LINETYPE	FEATURE TYPE	PLOT STYLE	PLOTTABLE	DESCRIPTION
AG_AQ_JOINT_LOCATION	CONTINUOUS	POINT	COLOR_7 (WHITE)	YES	USED AT JOINT LOCATIONS ON AN AQUEDUCT
AG_AQ_PRESS_MANHOLE	CONTINUOUS	BLOCK	COLOR_7 (WHITE)	YES	USED AT PRESSURE MANHOLES ON AN AQUEDUCT
AG_AQ_UNDERDRAIN_PIPE	CONTINUOUS	LINEAR	COLOR_7 (WHITE)	YES	USED FOR UNDERDRAIN PIPE ALONG AN AQUEDUCT
AG_CATHODIC PROTECTION_MONITORING_SYSTEM	CONTINUOUS	BLOCK	COLOR_3 (GREEN)	YES	USED FOR LOCATIONS OF CATHODIC PROTECTION MONITORING SYSTEMS
AG_WATER_ANODE	CONTINUOUS	BLOCK	COLOR_3 (GREEN)	YES	USED FOR PROPOSED ANODES ON WATERMAINS
AG_WATER_BEND	CONTINUOUS	BLOCK	COLOR_3 (GREEN)	YES	USED FOR PROPOSED SEWER BENDS
AG_WATER_BLOW_OFF_VALVE	CONTINUOUS	BLOCK	COLOR_3 (GREEN)	YES	USED FOR PROPOSED BLOW OFF VALVES
AG_WATER_CASEMENT	CENTER	LINEAR	COLOR_4 (CYAN)	YES	USED FOR PROPOSED CASEMENT PIPE
AG_WATER_CATHODIC_PROTECTION	CONTINUOUS	LINEAR	COLOR_5 (BLUE)	YES	USED FOR A LENGTH OF EXISTING WATERMAIN WHICH IS TO BE CATHODICALLY PROTECTED
AG_WATER_CONNECT	CONTINUOUS	POINT	COLOR_7 (WHITE)	YES	USED AT PROPOSED CONNECTIONS TO EXISTING WATERMAINS WITHOUT COUPLING (BELL TO SPIGOT, ETC.)
AG_WATER_CONNECTION	CONTINUOUS	POINT	COLOR_7 (WHITE)	YES	USED AT PROPOSED WATER SERVICE CONNECTIONS AT A WATERMAIN (CORPORATION STOP)
AG_WATER_COUPLER	CONTINUOUS	BLOCK	COLOR_3 (GREEN)	YES	USED FOR PROPOSED COUPLINGS
AG_WATER_CROSS	CONTINUOUS	BLOCK	COLOR_3 (GREEN)	YES	USED FOR PROPOSED CROSSES
AG_WATER_CURB_STOP	CONTINUOUS	BLOCK	COLOR_3 (GREEN)	YES	USED FOR PROPOSED CURB STOPS
AG_WATER_DRAIN_VALVE	CONTINUOUS	BLOCK	COLOR_3 (GREEN)	YES	USED FOR DRAIN VALVES AT CHAMBERS (VALVE PITS, ETC.)
AG_WATER_EXIST_HYDRANT	CONTINUOUS	BLOCK	COLOR_1 (RED)	YES	USED FOR EXISTING HYDRANTS WHICH A PROPOSED PIPE IS TO BE CONNECTED
AG_WATER_EXIST_VALVE	CONTINUOUS	BLOCK	COLOR_1 (RED)	YES	USED FOR EXISTING VALVES WHICH A PROPOSED PIPE IS TO BE CONNECTED
AG_WATER_HYDRANT	CONTINUOS	BLOCK	COLOR_3 (GREEN)	YES	USED FOR PROPOSED HYDRANTS
AG_WATER_HYDRANT_BRANCH	WATER	LINEAR	COLOR_4 (CYAN)	YES	USED FOR ALL PIPE WITHIN A PROPOSED HYDRANT ASSEMBLY
AG_WATER_HYDRANT_TEE	CONTINUOUS	BLOCK	COLOR_3 (GREEN)	YES	USED FOR THE TEE OF A PROPOSED HYDRANT ASSEMBLY
AG_WATER_HYDRANT_VALVE	CONTINUOUS	BLOCK	COLOR_3 (GREEN)	YES	USED FOR THE VALVE ON A PROPOSED HYDRANT ASSEMBLY
AG_WATER_MAIN	WATER	LINEAR	COLOR_5 (BLUE)	YES	USED FOR PROPOSED WATERMAINS
AG_WATER_PLUG	CONTINUOUS	BLOCK	COLOR_3 (GREEN)	YES	USED FOR PROPOSED WATERMAIN PLUGS
AG_WATER_REDUCER	CONTINUOUS	BLOCK	COLOR_3 (GREEN)	YES	USED FOR PROPOSED WATERMAIN REDUCERS
AG_WATER_RELEASE_AIRVALVE	CENTER	BLOCK	COLOR_3 (GREEN)	YES	USED FOR PROPOSED AIR RELEASE VALVES
AG_WATER_SERVICE_CONNECTION	CONTINUOUS	POINT	COLOR_7 (WHITE)	YES	USED AT THE LOCATION WHERE A PROPOSED WATER SERVICE PIPE CONNECTS TO AN EXISTING SERVICE PIPE (RECONNECTION)
AG_WATER_SERVICE_PIPE	WATER	LINEAR	COLOR_4 (CYAN)	YES	USED FOR PROPOSED WATER SERVICE PIPES
AG_WATER_SERVICE_Y	CONTINUOUS	BLOCK	COLOR_3 (GREEN)	YES	USED FOR PROPOSED Y'S ON A PROPOSED WATER SERVICE
AG_WATER_TEE	CONTINUOUS	BLOCK	COLOR_3 (GREEN)	YES	USED FOR PROPOSED TEE'S (NOT HYDRANT TEE'S)
AG_WATER_THRUSTBLOCK	CONTINUOUS	BLOCK	COLOR_3 (GREEN)	YES	USED FOR PROPOSED WATERMAIN THRUSTBLOCKS

Figure 23

AG_WATER_VALVE	CONTINUOUS	BLOCK	COLOR_3 (GREEN)	YES	USED FOR PROPOSED WATERMAIN VALVES
AG_WATER_VALVE_PIT	CONTINUOUS	LINEAR	COLOR_3 (GREEN)	YES	USED FOR OUTLINE OF PROPOSED VALVE PITS
E_WATER_ABAND_PLAN	WATER	DARK GREY	COLOR_8	YES	USED FOR ALL ABANDONED WATER PIPES & BLOCKS IN PLAN
E_WATER_PLAN	WATER	RED	COLOR_1	YES	USED FOR ALL EXISTING WATER PIPES & BLOCKS IN PLAN
E_WATER_PROFILE	DASHED2	RED	COLOR_1	YES	USED FOR ALL EXISTING WATER PIPES & BLOCKS IN PROFILE
E_WATER_SERVICES_PLAN	WATER	RED	COLOR_1	YES	USED FOR EXISTING WATER SERVICES IN PLAN
EASEMENTS	DASHED	GREEN	COLOR_3	YES	USED FOR INDICATING EASEMENTS
LEGAL	CONTINUOUS	CYAN	COLOR_4	YES	USED FOR ALL LEGAL LINES BESIDES LOTLINES
LOTLINES	CONTINUOUS	GREEN	COLOR_3	YES	USED FOR LOTLINES
TEXT_ADDRESS		GREEN	COLOR_3	YES	USED FOR PROPERTY ADDRESSES
ZPTMISC					FOR ANY ADDITIONAL TOPOGRAPHY/LEGAL/UTILITY/SURVEY
ZPTWATER					FOR ALL WATER RELATED SURVEY

Figure 23 (Continued)

3.4.7 Blocks and Symbols – General Information

Each symbol used by the WWD for GIS input is a block. Symbols shall be issued for use in the Final GIS Drawing of projects for the WWD. Only these symbols shall be used in these drawings. A DVD or CD containing the Department's symbol file shall be provided along with the standard prototype drawings. These symbols shall be added to the Consultant's own symbol library.

Whenever possible, make use of WWD's supplied standard symbols. From time to time these symbols will be revised and/or new symbols will be added. If for any reason there is a need to create a new symbol either for local use or to keep for future projects, a request shall be made to the Department and a symbol shall be created. This symbol shall then become part of the WWD's standard symbol file.

To facilitate the data exchange with the Department's GIS, standard issue symbols for use in the Final GIS Drawing SHALL NOT be exploded, renamed or changed in any way.

Objects that are repeated throughout and/or are depicted in an exaggerated scale for clarity (fire hydrants, catch basins, water valves, etc) shall be represented by a symbol.

North arrows, graphical scales, logos, location maps and other similar symbols shall be inserted as blocks and left unexploded.

Consultants can insert a company logo or identification information in the form of an unexploded block. This block can be placed on all sheets, including the cover sheet, within the drawing area of each sheet.

3.4.8 AutoCAD to GIS Blocks or 'AG' Blocks

Block names beginning with 'AG' are to be used for proposed works in the Final GIS Drawing only. For existing items, the blocks indicated in **Figure 24 of the symbol list (Figure 24 in section 3.4.9. Symbol List)** shall be used.

Note that layer names do not begin with 'AG'. The only exception occurs when proposed works are going to be connected to an existing item (i.e. MH's, CB's, Hydrants, Valves, etc.), in which case the appropriate AG block as shown on Figure 25 and 26 shall to be used (e.g., S-E-CB, W-E-VALVE, etc.).

All AG blocks have a point constructed into the block which can be used as the snap point when being inserted. The point in each block has its own layer name which is integral to the AutoCAD to GIS conversion process.

AG blocks such as valves, manholes, catch basins, curb inlets, curb stops, hydrants, and flow direction arrows have wipeout masks built into them so the linear features they are attached to will not need to be trimmed. The following steps must be followed so drawings with these blocks look correct:

- The drawing units and insertion units should be set to 'unitless'.
- Insertion scale for A1 sized drawings should be 250 (x, y, and z scale factors)
- Insertion scale for 11x17 sized drawings should be 750 (x, y, and z scale factors)
- Wipeout frames should be set to 'off'.
- All lines passing through a block with wipeouts should be 'sent to back' in the display order - not trimmed.
- All block masking/wipeout layers (BLOCK WIPEOUT and BLOCK_MASKING) should be set as 'plot table'.

3.4.9 Symbol List

STANDARD BLOCKS			
BLOCK SYMBOL	BLOCK NAME (.dwg)	LAYER NAME	DESCRIPTION
/ \	E_11 Bend	E_WATER_PLAN or E_SEWER_PLAN	EXISTING 11.25° BENDS FOR SEWER OR WATER
/ \	E_22 Bend	E_WATER_PLAN or E_SEWER_PLAN	EXISTING 22.5° BENDS FOR SEWER OR WATER
/ \	E_45 Bend	E_WATER_PLAN or E_SEWER_PLAN	EXISTING 45° BENDS FOR SEWER OR WATER
⊸	E_90 Bend	E_WATER_PLAN or E_SEWER_PLAN	EXISTING 90° BENDS FOR SEWER OR WATER
⤠	E_Anode	E_WATER_PLAN	EXISTING ANODES
-	E_Catch Basin	E_SEWER_PLAN	EXISTING CATCH BASIN
X	E_Coupling	E_WATER_PLAN or E_SEWER_PLAN	EXISTING COUPLINGS FOR SEWER AND WATER
□	E_Cross	E_WATER_PLAN or E_SEWER_PLAN	EXISTING CROSS FOR SEWER AND WATER
V	E_Curb Inlet	E_SEWER_PLAN	EXISTING CURB INLET
◊	E_Curb Stop	E_WATER_PLAN	EXISTING CURB STOPS
⦿	E_Hydrant	E_WATER_PLAN	EXISTING FIRE HYDRANT
○	E_Manhole	E_SEWER_PLAN	EXISTING MANHOLES
⤠⤠	E_Plan_Flow_Arrow	E_SEWER_PLAN	EXISTING SEWER FLOW DIRECTION ARROW
] [E_Plug	E_WATER_PLAN or E_SEWER_PLAN	EXISTING PLUG ON SEWER OR WATER
()	E_Profile_Ellipse	E_WATER_PROFILE or E_SEWER_PROFILE	CROSSING SEWER OR WATER PIPE ON THE PROFILE
+	E_Profile_Hydrant_Top	E_WATER_PROFILE	SECTION OF HYDRANT ABOVE THE FLANGE ON THE PROFILE
⤠⤠	E_Profile_Pipe_End	E_WATER_PROFILE or E_SEWER_PROFILE	PIPE CONTINUATION AT LIMITS OF PROFILE
X	E_Profile_Valve	E_WATER_PROFILE or E_SEWER_PROFILE	EXISTING VALVES IN PROFILE
⤠⤠	E_Reducer	E_WATER_PLAN or E_SEWER_PLAN	EXISTING REDUCER FOR SEWER AND WATER
□	E_Tee	E_WATER_PLAN or E_SEWER_PLAN	EXISTING TEE FOR SEWER AND WATER
⤠⤠	E_Thrust_Block	E_WATER_PLAN or E_SEWER_PLAN	EXISTING THRUST BLOCK FOR SEWER AND WATER
⊗	E_Valve	E_WATER_PLAN or E_SEWER_PLAN	EXISTING VALVE FOR SEWER AND WATER
	E_Vertical_Bend	E_WATER_PLAN or E_SEWER_PLAN	EXISTING VERTICAL BEND FOR SEWER AND WATER
Ⓐ	Geodetic Bench Mark	LEGAL	GEODETIC BENCH MARK LOCATION
⤠⤠	Guy Anchor	E_HYDRO_PLAN	UTILITY POLE SUPPORT ANCHOR
⤠⤠H	Hydro Pole w_Street Light	E_HYDRO_PLAN	HYDRO POLE WITH STREET LIGHT ATTACHED
* H	Hydro Pole	E_HYDRO_PLAN	HYDRO POLE
#+#+	Iron Bar	LEGAL	PROPERTY BARS
M	Mail Box	O	MAIL BOX
* M	MTS Pole	E_MTS_PLAN	MTS POLE
()	P_Profile_Ellipse	P_WATER_PROFILE or P_SEWER_PROFILE	PROPOSED SEWER OR WATER CROSSING ON PROFILE
⤠⤠	P_Profile_Flow_Arrow	P_SEWER_PROFILE	PROPOSED SEWER FLOW DIRECTION
+	P_Profile_Hydrant_Top	P_WATER_PROFILE	SECTION OF HYDRANT ABOVE THE FLANGE ON THE PROFILE
⤠⤠	P_Profile_Pipe_End	P_WATER_PROFILE or P_SEWER_PROFILE	PIPE CONTINUATION AT LIMITS OF PROFILE
X	P_Profile_Valve	P_WATER_PROFILE or P_SEWER_PROFILE	PROPOSED VALVE IN PROFILE
*	Pole	O	UNKNOWN POLE
Ⓐ	Repair Marker	P_WATER_PLAN or P_SEWER_PLAN	REPAIR LOCATION MARKERS FOR SEWER OR WATER
⤠⤠	Street Light	E_HYDRO_PLAN	LAMP STANDARD (STREET LIGHT)
⤠⤠	Test Hole	TEST_HOLE	TEST HOLE LOCATIONS
⤠⤠	Traffic Signal	E_SIGNALS_PLAN	TRAFFIC SIGNALS
⤠⤠	Traffic Signals Box	E_SIGNALS_PLAN	TRAFFIC SIGNALS BOX
⤠⤠	TreeC	E_TREE_C	CONIFEROUS TREES
⤠⤠	TreeD	E_TREE_D	DECIDUOUS TREES

Figure 24
(For a larger view see Appendix N)

WATER BLOCKS			
BLOCK SYMBOL	BLOCK NAME (.dwg)	LAYER NAME	DESCRIPTION
—○—	W-ANODE	AG_WATER_ANODE	PROPOSED ANODE
●	W-AQ-MH	AG_AQ_PRESS_MANHOLE	PROPOSED AQUEDUCT PRESSURE MANHOLE
⊗	W-ARVALVE	AG_WATER_RELEASE_AIRVALVE	PROPOSED AIR RELEASE VALVE
/ \	W-BEND_11	AG_WATER_BEND	PROPOSED 11.25° WATER BEND
/ \	W-BEND_22	AG_WATER_BEND	PROPOSED 22.5° WATER BEND
/ \	W-BEND_45	AG_WATER_BEND	PROPOSED 45° WATER BEND
/ \	W-BEND_90	AG_WATER_BEND	PROPOSED 90° WATER BEND
II	W-V BEND	AG_WATER_BEND	PROPOSED VERTICAL WATER BEND
⊗	W-BOVALVE	AG_WATER_BLOW_OFF_VALVE	PROPOSED BLOW-OFF VALVE
—○—	W-CATHOD	AG_WATER_ANODE	PROPOSED ANODE INSTALLED AS CATHODIC PROTECTION
●	W-CATHOD-MON STATION	AG_CATHODIC PROTECTION MONITORING SYSTEM	PROPOSED CATHODIC PROTECTION MONITORING STATION
X	W-COUPLING	AG_WATER_COUPLER	PROPOSED WATER COUPLING
□	W-CROSS	AG_WATER_CROSS	PROPOSED WATER CROSS
•	W-CURBSTOP	AG_WATER_CURB_STOP	PROPOSED CURB STOP
⊗	W-DRVALVE	AG_WATER_DRAIN_VALVE	PROPOSED DRAIN VALVE
○—○	W-E-HYD	AG_WATER_EXIST_HYDRANT	EXISTING HYDRANT
⊗	W-E-VALVE	AG_WATER_EXIST_VALVE	EXISTING WATER VALVE
□	W-HYD TEE	AG_WATER_HYDRANT_TEE	PROPOSED HYDRANT TEE AT WATERMAIN
⊗	W-HYD VALVE	AG_WATER_HYDRANT_VALVE	PROPOSED HYDRANT VALVE
●—●	W-HYD	AG_WATER_HYDRANT	PROPOSED HYDRANT
□	W-PLUG	AG_WATER_PLUG	PROPOSED WATER PLUG
◀	W-REDUCER	AG_WATER_REDUCER	PROPOSED WATER REDUCER
■	W-TBLOCK	AG_WATER_THRUSTBLOCK	PROPOSED WATERMAIN THRUSTBLOCK
□	W-TEE	AG_WATER_TEE	PROPOSED WATER TEE
⊗	W-VALVE	AG_WATER_VALVE	PROPOSED WATER VALVE

Figure 25

SEWER BLOCKS			
BLOCK SYMBOL	BLOCK NAME (.dwg)	LAYER NAME	DESCRIPTION
/ \	S-BEND_11	AG_SEWER_BEND	PROPOSED 11.25° SEWER BEND
/ \	S-BEND_22	AG_SEWER_BEND	PROPOSED 22.5° SEWER BEND
/ \	S-BEND_45	AG_SEWER_BEND	PROPOSED 45° SEWER BEND
/ \	S-BEND_90	AG_SEWER_BEND	PROPOSED 90° SEWER BEND
	S-V BEND	AG_SEWER_BEND	PROPOSED VERTICAL SEWER BEND
□	S-CB TEE	AG_SEWER_CB_TEE	PROPOSED CATCHBASIN LEAD TEE AT SEWER MAIN
■	S-CB	AG_SEWER_CB	PROPOSED CATCHBASIN
▼	S-CI	AG_SEWER_CI	PROPOSED CURB INLET
X	S-COUPLING	AG_SEWER_COUPLER	PROPOSED SEWER COUPLING
□	S-E-CB	AG_SEWER_EXIST_CB	EXISTING CATCHBASIN
▽	S-E-CI	AG_SEWER_EXIST_CI	EXISTING CURB INLET
<--	S-E-FLOW	AG_SEWER_EXIST_MAIN_LINEDIR	FLOW DIRECTION ARROW ON AN EXISTING SEWERMAIN
○	S-E-MH	AG_SEWER_EXIST_MANHOLE	EXISTING MANHOLE
←	S-FLOW	AG_SEWER_MAIN_LINEDIR	FLOW DIRECTION ARROW ON A PROPOSED SEWERMAIN
●	S-MH	AG_SEWER_MANHOLE	PROPOSED MANHOLE
]	S-PLUG	AG_SEWER_PLUG	PROPOSED SEWER PLUG
◀	S-REDUCER	AG_SEWER_REDUCER	PROPOSED SEWER REDUCER
⌚	S-TBLOCK	AG_SEWER_THRUSTBLOCK	PROPOSED SEWERMAIN THRUST BLOCK
□	S-TEE	AG_SEWER_TEE	PROPOSED SEWER TEE
⊗	S-VALVE	AG_SEWER_VALVE	PROPOSED SEWER VALVE
⊗	S-GATE VALVE	AG_SEWER_GATE_VALVE	PROPOSED SEWER GATE VALVE
■	S-YARD DRAIN	AG_SEWER_YARD_DRAIN_INLET	PROPOSED YARD DRAIN

OPEN CHANNEL BLOCKS			
BLOCK SYMBOL	BLOCK NAME (.dwg)	LAYER NAME	DESCRIPTION
■	OC-CB	AG_OC_INLET_OUTLET_CB	PROPOSED OPEN CHANNEL CATCH BASIN
■	OC-E-CB	AG_OC_INLET_OUTLET_E_CB	EXISTING OPEN CHANNEL CATCH BASIN
●	OC-MH	AG_OC_INLET_OUTLET_MH	PROPOSED OPEN CHANNEL MANHOLE
●	OC-E-MH	AG_OC_INLET_OUTLET_E_MH	EXISTING OPEN CHANNEL MANHOLE

Figure 26

3.4.10 Service Charts

Water Service Chart

WATER SERVICE INFORMATION

ADDRESS	SIZE (mm) MATERIAL (STREET)	SIZE (mm) MATERIAL (PROP.)	SHORT & LONG MEASUREMENT	CORP. LOCATION	REMARKS
122 STANDARD AVE RESIDENTIAL	16 LEAD	20 COPPER	3.04 WEL HSE 17.80 EEL LEFT ST	1.4 E OF S/C	—
123 STANDARD AVE RESIDENTIAL	20 COPPER	20 LEAD	12.32 WEL HSE 16.80 EEL LEFT ST	0.5 W OF S/C	—
127 STANDARD AVE RESIDENTIAL	20 COPPER	20 COPPER	1.23 EWL HSE 21.69 WWL RIGHT ST	OPP S/C	—
129 STANDARD AVE RESIDENTIAL	13 LEAD	20 COPPER	0.47 WWL HSE 12.71 WWL RIGHT ST	OPP S/C	—
130 STANDARD AVE COMMERCIAL	25 COPPER	25 COPPER	2.51 EWL BLDG 23.08 WWL RIGHT ST	1.2 W OF S/C	—
130 STANDARD AVE SPRINKLER	150 CI	150 CI	8.21 EWL BLDG 17.35 WWL RIGHT ST	OPP VALVE	—

* SERVICES TO BE RENEWED TO P. ALL OTHERS TO BE RECONNECTED

Figure 27

Sewer Service Chart

SEWER SERVICE INFORMATION

ADDRESS	SIZE (mm) MATERIAL	P DIST JUNCTION TIE	REMARKS
122 STANDARD AVE RESIDENTIAL	150 PVC	8.79 W OF EL 33.98 W OF 1ST MH W RIGHT	—
123 STANDARD AVE RESIDENTIAL	150 CLAY	16.69 E OF WL 33.49 W OF 1ST MH W RIGHT	—
127 STANDARD AVE RESIDENTIAL	150 AC	5.38 E OF WL 11.17 W OF 1ST MH W RIGHT	—
129 STANDARD AVE RESIDENTIAL	150 CLAY	16.27 E OF WL 3.38 W OF 1ST MH W RIGHT	—
130 STANDARD AVE COMMERCIAL	200 CLAY	13.77 E OF WL 13.18 W OF 1ST MH W RIGHT	—

Figure 28

Sewer Televising Chart

SEWER JUNCTION INFORMATION FROM SEWER VIDEO INSPECTION		
SEWER ID S-MAxXXXXXX2		
DISTANCE FROM MH ID S-MHxxxxxx2		
DISTANCE	DIAMETER	CLOCK
3.4	150	9
11.2	150	9
13.2	200	3
33.5	150	8
34.0	150	4

Figure 29

3.4.11 Dimensioning

All drawings require existing utilities, legal limits, curbs and proposed works to be dimensioned in Paper Space. All dimensions shall have the correct Dim scale linear value based on the drawings scale. Drawings with a 1:250 scale will have a Dim scale value of -0.2500. Drawings with a 1:500 scale will have a Dim scale value of -0.500. Drawings with a 1:750 scale will have a Dim scale of -0.750.

Typical Dimensions-Existing Items shall be set as follows:

Layer=TEXT_RED
Font=simplex.shx (See Figure 31 in section 3.4.12. Fonts)
Text Height=1.8
Text Offset=0.3
Oblique Angle=0 (except for existing legal dimensions which shall have an Oblique Angle of 15.)
Text Placement=Centered (Both vertical and horizontal)
Arrows size=2.0 and Closed Filled
Ext line and Ext line offset=minimum 1.0 and maximum 2.0
Dim line forced set=Off
Dim line inside set=On
Precision=0.00 except legal dimensions which=0.000
(See Figure 30, next page)

Typical Dimensions-Proposed Items shall be set as follows:

Layer=TEXT_GREEN
Font=simplex.shx (See Figure 31 in section 3.4.12. Fonts)
Text Height=2.4
Text Offset=1.0
Oblique Angle=0
Text Placement=Centered (Both vertical and horizontal)
Arrows size=3.00 and Closed Filled
Ext line and Ext line offset=minimum 1.0 and maximum 2.0
Dim line forced set=Off
Dim line inside set=On
Precision=0.00 except legal dimensions which=0.000
(See Figure 30, next page)

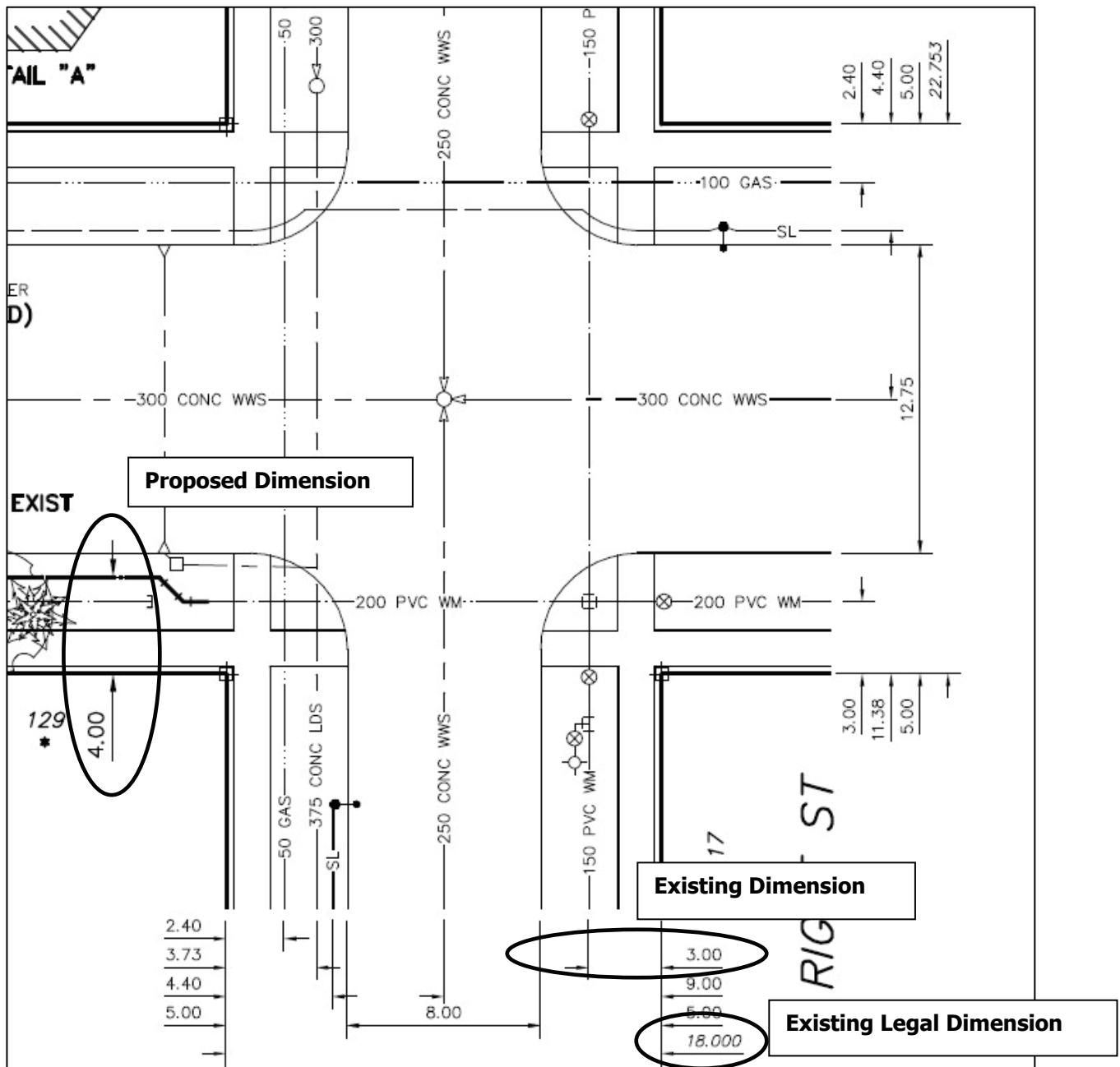


Figure 30

3.4.12 Fonts

TEXT IN PAPER SPACE (TITLE BLOCK)							
FONT USE	LAYER	COLOR	PLOT STYLE	SIZE	OBLIQUE ANGLE	WIDTH FACTOR	FONT FILE NAME
CITY OF WINNIPEG	DWG_TB_TEXT3	CYAN	COLOR_4	5.5	0.0000	1.3500	x-hlvm1d.shx
WATER AND WASTE DEPARTMENT	DWG_TB_TEXT3	CYAN	COLOR_4	3.5	0.0000	0.0000	simplex.shx
ENGINEERING DIVISION	DWG_TB_TEXT3	CYAN	COLOR_4	3.5	0.0000	0.0000	simplex.shx
YEAR AND WORK TYPE	DWG_TB_TEXT3	CYAN	COLOR_4	3.5	0.0000	0.0000	simplex.shx
STREET NAME	DWG_TB_TEXT3	BLUE	COLOR_5	5.0	0.0000	0.0000	simplex.shx
DRAWING LIMITS	DWG_TB_TEXT3	CYAN	COLOR_4	3.5	0.0000	0.0000	simplex.shx
SHEET NUMBER	DWG_TB_TEXT3	CYAN	COLOR_4	3.5	0.0000	0.0000	simplex.shx
CITY DRAWING NUMBER	DWG_TB_TEXT3	CYAN	COLOR_4	3.5	0.0000	0.0000	simplex.shx
DESIGNED BY INITIALS	DWG_TB_TEXT1	YELLOW	COLOR_2	2.5	0.0000	0.0000	simplex.shx
DRAWN BY INITIALS	DWG_TB_TEXT1	YELLOW	COLOR_2	2.5	0.0000	0.0000	simplex.shx
CHECKED BY INITIALS	DWG_TB_TEXT1	YELLOW	COLOR_2	2.5	0.0000	0.0000	simplex.shx
APPROVED BY INITIALS	DWG_TB_TEXT1	YELLOW	COLOR_2	2.5	0.0000	0.0000	simplex.shx
HORIZONTAL & VERTICAL DRAWING SCALE	DWG_TB_TEXT1	YELLOW	COLOR_2	2.5	0.0000	0.0000	simplex.shx
DRAWING DATE	DWG_TB_TEXT1	YELLOW	COLOR_2	2.4	0.0000	0.0000	simplex.shx
RELEASED FOR CONSTRUCTION DATE	DWG_TB_TEXT1	YELLOW	COLOR_2	2.5	0.0000	0.0000	simplex.shx
CONSULTANT DRAWING NUMBER	DWG_TB_TEXT3	GREEN	COLOR_3	2.5	0.0000	0.0000	simplex.shx
CONSTRUCTION COMPLETION DATE	DWG_TB_TEXT1	YELLOW	COLOR_2	2.0	0.0000	0.0000	simplex.shx
BOX DESCRIPTIONS	DWG_TB_TEXT2	RED	COLOR_1	1.8	0.0000	0.0000	simplex.shx
DRAWING METADATA	DWG_TB_TEXT2	RED	COLOR_1	1.8	0.0000	0.0000	simplex.shx

TEXT IN MODEL SPACE							
FONT USE	LAYER	COLOR	PLOT STYLE	SIZE	OBLIQUE ANGLE	WIDTH FACTOR	FONT FILE NAME
PROPERTY ADDRESSES	TEXT_ADDRESS	GREEN	COLOR_3	0.6	15.0000	0.0000	simplex.shx
ABANDONED SEWER DESCRIPTION	TEXT_SEWER	DARK GREY	COLOR_8	0.45	0.0000	0.0000	simplex.shx
ABANDONED WATER DESCRIPTION	TEXT_WATER	DARK GREY	COLOR_8	0.45	0.0000	0.0000	simplex.shx
EXISTING SEWER DESCRIPTION	TEXT_SEWER	RED	COLOR_1	0.45	0.0000	0.0000	simplex.shx
EXISTING WATER DESCRIPTION	TEXT_WATER	RED	COLOR_1	0.45	0.0000	0.0000	simplex.shx
PROPOSED SEWER DESCRIPTION	TEXT_SEWER	CYAN	COLOR_4	0.6	0.0000	0.0000	simplex.shx
PROPOSED WATER DESCRIPTION	TEXT_WATER	CYAN	COLOR_4	0.6	0.0000	0.0000	simplex.shx
EASEMENT NUMBER	TEXT_GREEN	GREEN	COLOR_3	0.45	0.0000	0.0000	simplex.shx
OTHER UTILITY DESCRIPTION	TEXT_RED	RED	COLOR_1	0.45	0.0000	0.0000	simplex.shx

Figure 31

TEXT IN PAPER SPACE (PLAN)							
FONT USE	LAYER	COLOR	PLOT STYLE	SIZE	OBLIQUING ANGLE	WIDTH FACTOR	FONT FILE NAME
PROPERTY ADDRESSES	TEXT_ADDRESS	GREEN	COLOR_3	2.4	15.0000	0.0000	simplex.shx *
ABANDONED SEWER DESCRIPTION	TEXT_SEWER	DARK GREY	COLOR_8	1.8	0.0000	0.0000	simplex.shx *
ABANDONED WATER DESCRIPTION	TEXT_WATER	DARK GREY	COLOR_8	1.8	0.0000	0.0000	simplex.shx *
EXISTING SEWER DESCRIPTION	TEXT_SEWER	RED	COLOR_1	2.4	0.0000	0.0000	simplex.shx *
EXISTING WATER DESCRIPTION	TEXT_WATER	RED	COLOR_1	1.8	0.0000	0.0000	simplex.shx *
PROPOSED SEWER DESCRIPTION	TEXT_SEWER	CYAN	COLOR_4	2.4	0.0000	0.0000	simplex.shx *
PROPOSED WATER DESCRIPTION	TEXT_WATER	CYAN	COLOR_4	2.4	0.0000	0.0000	simplex.shx *
EASEMENT NUMBER	TEXT_GREEN	GREEN	COLOR_3	1.8	0.0000	0.0000	simplex.shx *
OTHER UTILITY DESCRIPTION	TEXT_RED	RED	COLOR_1	1.8	0.0000	0.0000	simplex.shx *
NOTES FOR EXISTING	TEXT_RED	RED	COLOR_1	1.8	0.0000	0.0000	simplex.shx
NOTES FOR PROPOSED WORK	TEXT_SEWER	CYAN	COLOR_4	2.4	0.0000	0.0000	simplex.shx
CAUTION NOTE	TEXT_GREEN	GREEN	COLOR_3	3.5	0.0000	0.0000	simplex.shx
CHAINAGE NOTE	TEXT_GREEN	GREEN	COLOR_3	3.5	0.0000	0.0000	simplex.shx
EXISTING DIMENSIONS	TEXT_RED	RED	COLOR_1	1.8	0.0000	0.0000	simplex.shx
EXISTING DETAIL TEXT	TEXT_RED	RED	COLOR_1	1.8	0.0000	0.0000	simplex.shx
PROPOSED DETAIL TEXT	TEXT_CYAN	CYAN	COLOR_4	2.4	0.0000	0.0000	simplex.shx
PROPOSED DIMENSIONS	TEXT_ADDRESS	GREEN	COLOR_3	2.4	15.0000	0.0000	simplex.shx
STREET NAMES	TEXT_ADDRESS	CYAN	COLOR_4	5.0	15.0000	0.0000	simplex.shx
SERVICE TABLE TITLES	DWG_NOTES2	GREEN	COLOR_3	3.5	0.0000	0.0000	simplex.shx
SERVICE TABLE BODY (EXISTING)	DWG_NOTES1	RED	COLOR_1	1.8	0.0000	0.0000	simplex.shx
SERVICE TABLE BODY (RENEWED)	DWG_NOTES2	GREEN	COLOR_3	1.8	0.0000	0.0000	simplex.shx
SEWER TELEVISING TABLE TITLE	DWG_NOTES1	RED	COLOR_1	1.8	0.0000	0.0000	simplex.shx
SEWER TELEVISING TABLE SEWER ID NUMBER	DWG_NOTES1	YELLOW	COLOR_2	2.4	0.0000	0.0000	simplex.shx
SEWER TELEVISING TABLE BODY	DWG_NOTES1	RED	COLOR_1	1.8	0.0000	0.0000	simplex.shx
MATERIALS LIST TITLE & HEADINGS	DWG_NOTES2	GREEN	COLOR_3	1.8	0.0000	0.0000	simplex.shx
MATERIALS LIST BODY	DWG_NOTES1	YELLOW	COLOR_2	1.8	0.0000	0.0000	simplex.shx
MATERIALS LIST CONTRACTOR NAME	DWG_NOTES2	GREEN	COLOR_3	3.0	0.0000	0.0000	simplex.shx
DETAIL & SECTION NAME	DWG_NOTES2	GREEN	COLOR_3	3.0	15.0000	0.0000	simplex.shx
DETAIL & SECTION SCALE	DWG_NOTES1	YELLOW	COLOR_2	1.8	0.0000	0.0000	simplex.shx
MATCHLINE	DWG_NOTES2	CYAN	COLOR_4	3.0	0.0000	0.0000	simplex.shx

Figure 31 (Continued)

TEXT IN PAPER SPACE							
(PROFILE)							
FONT USE	LAYER	COLOR	PLOT STYLE	SIZE	OBLIQUING ANGLE	WIDTH FACTOR	FONT FILE NAME
EXISTING SEWER DESCRIPTION	TEXT_SEWER	YELLOW	COLOR_2	1.8	0.0000	0.0000	simplex.shx
EXISTING WATER DESCRIPTION	TEXT_WATER	YELLOW	COLOR_2	1.8	0.0000	0.0000	simplex.shx
PROPOSED SEWER DESCRIPTION	TEXT_SEWER	CYAN	COLOR_4	2.4	0.0000	0.0000	simplex.shx
PROPOSED WATER DESCRIPTION	TEXT_WATER	CYAN	COLOR_4	2.4	0.0000	0.0000	simplex.shx
NOTES FOR EXISTING	TEXT_RED	RED	COLOR_1	1.8	0.0000	0.0000	simplex.shx
NOTES FOR PROPOSED WORK	TEXT_CYAN	CYAN	COLOR_4	2.4	0.0000	0.0000	simplex.shx
EXISTING DIMENSIONS	TEXT_RED	RED	COLOR_1	1.8	0.0000	0.0000	simplex.shx
PROPOSED DIMENSIONS	TEXT_GREEN	GREEN	COLOR_3	2.4	0.0000	0.0000	simplex.shx
CHAINAGES	TEXT_CYAN	CYAN	COLOR_4	2.4	0.0000	0.0000	simplex.shx
ELEVATION DATUM	TEXT_CYAN	CYAN	COLOR_4	3.5	15.0000	0.0000	simplex.shx
EXISTING INVERTS & ELEVATIONS	TEXT_RED	RED	COLOR_1	1.8	0.0000	0.0000	simplex.shx
PROPOSED INVERTS & ELEVATIONS	TEXT_CYAN	CYAN	COLOR_4	2.4	0.0000	0.0000	simplex.shx

TEXT IN PAPER SPACE							
(TITLE PAGE - A1)							
FONT USE	LAYER	COLOR	PLOT STYLE	SIZE	OBLIQUING ANGLE	WIDTH FACTOR	FONT FILE NAME
CITY OF WINNIPEG	TEXT_CYAN	CYAN	COLOR_4	18.0	0.0000	1.3500	x-hlvm1d.shx
WATER AND WASTE DEPARTMENT	TEXT_BLUE	BLUE	COLOR_5	12.0	0.0000	0.0000	x-hlvm1d.shx
ENGINEERING DIVISION	TEXT_BLUE	BLUE	COLOR_5	15.0	0.0000	0.0000	x-hlvm1d.shx
CONTRACT AND BID OPPORTUNITY NUMBERS	TEXT_CYAN	CYAN	COLOR_4	9.0	0.0000	0.0000	x-hlvm1d.shx
KEY MAP	TEXT_CYAN	CYAN	COLOR_4	6.0	0.0000	0.0000	x-hlvm1d.shx

TEXT IN MODEL SPACE							
(TITLE PAGE - A1)							
FONT USE	LAYER	COLOR	PLOT STYLE	SIZE	OBLIQUING ANGLE	WIDTH FACTOR	FONT FILE NAME
STREET NAMES	TEXT_RED	RED	COLOR_1	8.0	0.0000	0.0000	simplex.shx

TEXT IN PAPER SPACE							
(TITLE PAGE - 11X17)							
FONT USE	LAYER	COLOR	PLOT STYLE	SIZE	OBLIQUING ANGLE	WIDTH FACTOR	FONT FILE NAME
CITY OF WINNIPEG	TEXT_CYAN	CYAN	COLOR_4	12.0	0.0000	1.3500	x-hlvm1d.shx
WATER AND WASTE DEPARTMENT	TEXT_BLUE	BLUE	COLOR_5	8.0	0.0000	0.0000	x-hlvm1d.shx
ENGINEERING DIVISION	TEXT_BLUE	BLUE	COLOR_5	8.0	0.0000	0.0000	x-hlvm1d.shx
CONTRACT AND BID OPPORTUNITY NUMBERS	TEXT_CYAN	CYAN	COLOR_4	6.0	0.0000	0.0000	x-hlvm1d.shx
KEY MAP	TEXT_CYAN	CYAN	COLOR_4	3.0	0.0000	0.0000	x-hlvm1d.shx

TEXT IN MODEL SPACE							
(TITLE PAGE - 11X17)							
FONT USE	LAYER	COLOR	PLOT STYLE	SIZE	OBLIQUING ANGLE	WIDTH FACTOR	FONT FILE NAME
STREET NAMES	TEXT_RED	RED	COLOR_1	8.0	0.0000	0.0000	simplex.shx

Figure 31 (Continued)

3.4.13 Linear Entities - Direction of Flow

All new/proposed features in a GIS Final Drawings will eventually become GIS objects; for this reason **linear features (or lines) that are drawn to depict sewer entities shall be drawn in the direction of flow of that entity, high elevation to low (upstream to downstream)**.

3.4.14 Plot Styles

Plot styles shall be supplied by the WWD and can be found inside the Plot Style folder on the provided cd (See Figure 32 below).

Note: If a Consultant/Design firm is using that firm's workflow and layers to produce a drawing, it is of course, not necessary to use this plot style.

These plot styles have been constructed in conjunction with the layering conventions present in the prototype drawings and the colors shall not be changed when giving the finished drawing back to the WWD.

The screenshot shows a Windows application window titled "Plot Style Table Editor - STANDARD_CAD.ctb". The window has a menu bar with "File", "Edit", "View", "Format", "Insert", "Table View", and "Form View". The "Table View" tab is selected. The main area is a grid table with 10 columns and approximately 20 rows of data. The columns are labeled: Name, Description, Color, Enable dithering, Convert to grayscale, Use assigned pen #, Virtual pen #, Screening, Linetype, Adaptive adjustment, Line weight, Line End Style, Line Join style, and Fill Style. The rows correspond to the nine colors: Color 1 (red), Color 2 (yellow), Color 3 (green), Color 4 (cyan), Color 5 (blue), Color 6 (magenta), Color 7 (black), Color 8 (dark gray), and Color 9 (light gray). The "Color" column shows "Black" for all colors except Color 1 which is red. The "Line weight" column shows various values like 0.1800 mm, 0.2500 mm, etc. The "Fill Style" column shows "Use object fill style" for all colors. At the bottom of the window are buttons for "Add Style", "Delete Style", "Edit Lineweights...", "Save As...", "Save & Close", "Cancel", and "Help".

Figure 32
(For a larger view see Appendix O)

3.4.15 X-refs, and Aerial Images

X-references and image attachments are not to be used in the production of GIS Final Drawings for the WWD.

3.4.16 Base Lines and Chainages

The base line shall be located along the nearest property line parallel to the proposed work. If possible 1+00.000 shall be located at the property line intersection closest to the start of the proposed work. The chainage is shown in the profile at 25 meter increments for the scale 1:250 and at 50 meter increments for 1:500. A note should be placed in the plan portion of the drawing indicating the location of the baseline (See Figure 33 below).

NOTE: CHAINAGES SHOWN ARE ALONG
N R OF STANDARD AVE.

Figure 33

3.4.17 Survey

The survey of the existing infrastructure that is performed as part of any construction project for the Department is important for confirming the location in the GIS. At the time the Final GIS drawing is integrated with the GIS, a discrepancy may exist between the existing configuration in GIS and the new works. The survey may be referenced as a means to help resolve this conflict. **For this reason, it is important for all of the survey information to remain as part of the Final GIS drawing.**

Three (3) layers are provided to be used for survey:

- ZPTWATER (For all water related survey)
- ZPTSEWER (For all sewer related survey)
- ZPTMISC (For any additional topography/legal/utility survey)

Please see section **3.4.6. Layering Conventions** for a complete list of Final GIS drawing layers.

3.4.18 File Names

When submitting AutoCAD drawing files the drawing file name should be the City of Winnipeg drawing number supplied by the Department.

e.g..

(Water) **D-XXXXXX.DWG**

(Sewer) **XXXXXX.DWG**

(Land Drainage) **LD-XXXXXX.DWG**

(GIS Final) **GIS-XXXX-2013_1 (based on tender number)**

3.4.19 Details

All congested design shall be clarified with a detail:

- Blocks shall be at 1/1000
- Line segments are to be drawn not to scale (NTS) (NOTE: make sure all lines are relative to each other regarding lengths)
- Proposed shall be on layer "AG_XXXX"
- Existing linetype shall be layer "E_XXXX_"

- Dimension style shall be PRO_DIM
- Notes for construction phase shall be in post tense, notes for record dwg shall be in past tense.

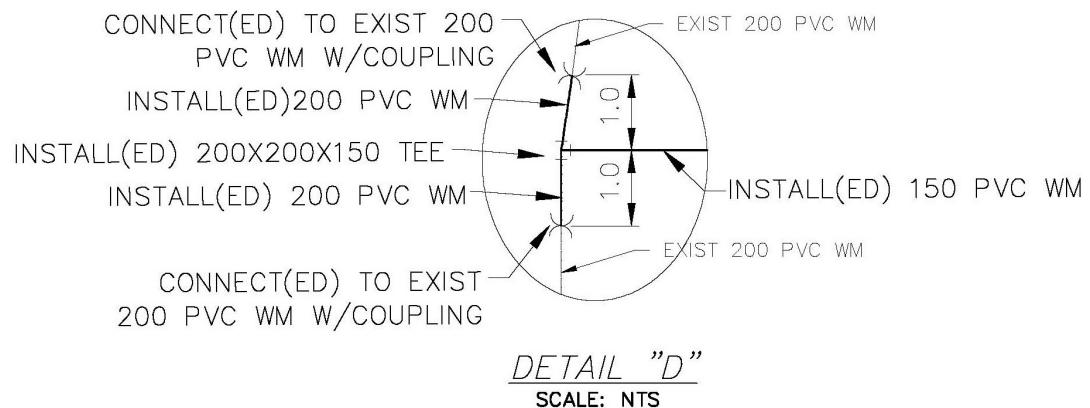


Figure 34

4.0 REVISING A CONSTRUCTION DRAWING TO A RECORD DRAWING

It must be kept in mind from the outset that the post construction drawing shall become a valuable permanent record. With the ability to integrate CAD drawings directly into the Department's GIS, the infrastructure shown in the GIS Record Drawing, as well as the Final Record Drawing, shall be accurately represented. This shall enhance the accuracy of the water and sewer infrastructure being displayed in the GIS. It is essential that the designing agency maintains an accurate record of any changes to the design occurring during construction, and that these changes are accurately and completely recorded on the post construction drawing.

The Association of Professional Engineers and Geoscientists of the Province of Manitoba (APEGM) define as-built drawings and record drawings as follows (taken from the document "Authentication of Professional Documents" dated September 16, 2010):

***As-built** drawings are prepared by a third party, or by the professional using information furnished by the contractor or other field staff. **Record drawings** are those prepared by the reviewing professional after verifying in detail the actual conditions of the completed project. For some projects, this verification may require frequent or continuous presence on site. The distinction between as-built and record drawings determines whether drawings representing the final state of the project should be authenticated.*

Because professionals are responsible for the content of drawings bearing their seals, as-built drawings should not be authenticated, since the engineer is not responsible for the contents of these documents.

Based on the above definitions, the expectation by the WWD is that record drawings are required for all water and sewer projects.

4.1 REQUIREMENTS FOR A WATER OR SEWER RECORD DRAWING

All dimensions shown shall reflect the "as constructed" conditions of the construction and all references to "proposed" or "new" shall be removed or worded in the past tense. Record drawings shall be drawn to scale in accordance with the "as-constructed" dimensions shown. The revision block shall be completed indicating the drawings have been revised to record drawings. All displays (viewports) of the drawing shall be locked.

Line work for all constructed works shown on the drawings shall retain the thicker line density (as for proposed works) for ease of determining the extent of works covered by the drawings. Proposed construction for future phases of the project shall not be shown on the record drawings.

The record drawing shall also include the location and elevation of all existing utilities and services encountered in the construction operation.

Construction Completion Date – approximate date the project was completed. The substantial completion date is an acceptable alternative. This shall be located in the lower right portion of the plan right above the title block.

4.1.1 Material Lists

The WWD GIS is currently being used to manage and inventory all of its underground assets. It is therefore extremely important that the materials and products used on projects be accurately listed and accounted for to facilitate entry into the GIS (see Figure 34 below).

MATERIALS LIST						
WATER						
ITEM	MANUFACTURER	MODEL	DIMENSION RATIO	PRESSURE CLASS	MATERIAL	TYPE
150 WM PIPE	IPEX	BLUE BRUTE	18	235	PVC	
150 FITTINGS	IPEX	BLUE BRUTE	18	235	PVC	INJECTION MOULDED
150 COUPLINGS	ROMAC INDUSTRIES	XR501			DUCTILE IRON	STRAIGHT
400 WM PIPE	ROYAL PIPE	ROYAL SEAL	18	235	PVC	
400 FITTINGS	SIGMA CORPORATION	TYTON JOINT		250	CAST IRON	
400 COUPLINGS	ROBAR INDUSTRIES	1507		200	DUCTILE IRON	STRAIGHT
19 SERVICE PIPE	WOLVERINE	TYPE K		K	COPPER	FLARED END
19 CURB STOPS	MUELLER CANADA	H-15154			BRASS	MINNEAPOLIS
19 CORPORATION STOPS	MUELLER CANADA	A-220			BRASS	
150 GATE VALVES	MUELLER CANADA	A-2360-40			CAST IRON	RESILIENT SEATED GATE
400 GATE VALVES	CLOW CANADA	F-6112			CAST IRON	RESILIENT SEATED GATE
150 HYDRANTS	MUELLER CANADA	CANADA VALVE-CENTURY			CAST IRON	
CONTRACTOR: JOE SMITH CONSTRUCTION						

MATERIALS LIST						
SEWER						
ITEM	MANUFACTURER	MODEL	DIMENSION RATIO	PRESSURE CLASS	MATERIAL	TYPE
LAND DRAINAGE						
250 LAND DRAINAGE PIPE	IPEX	RING-TITE	35	N/A	PVC	
250 LAND DRAINAGE FITTINGS	IPEX	RING-TITE	35	N/A	PVC	INJECTION MOULDED
LAND DRAINAGE MANHOLES	LAFARGE				PRECAST CONCRETE	
CATCH BASINS	INLAND PIPE				PRECAST CONCRETE	
CATCH BASIN FRAMES AND COVERS	TITAN FOUNDRY	TF-102				MOUNTABLE CURB AND GUTTER
MANHOLE FRAMES AND COVERS	TITAN FOUNDRY	TF-101-9			CAST IRON	SOLID COVER
600 CORRUGATED METAL PIPE (CMP)	ARMTEC	GAUGE 12			STEEL	GALVANIZED STEEL COATING
COMBINED SEWER						
750 COMBINED SEWER PIPE	LAFARGE	REINFORCED	N/A	CLASS IV	CONCRETE	PCCP (PRE-STRESSED CYLINDRICAL CONCRETE PIPE) -ASTM C76
750x750x200 SERVICE TEES	LAFARGE				CONCRETE	
300 COMBINED SEWER PIPE	ROYAL PIPE	ROYAL SEAL	35	N/A	PVC	N/A
300 COMBINED SEWER BENDS,PLUGS,REDUCERS	IPEX	RING-TITE			PVC	INJECTION MOULDED
300 SERVICE TEES	IPEX	RING-TITE	35	N/A	PVC	INJECTION MOULDED
200 SERVICE PIPE	REHAU INDUSTRIES	DURALOK	35	N/A	PVC	
SERVICE COUPLINGS	MISSION RUBBER	FLEX-SEAL			RUBBER	TRANSITION COUPLING
COMBINED SEWER MANHOLES	LAFARGE				PRECAST CONCRETE	
CONTRACTOR: JOE SMITH CONSTRUCTION						

MATERIALS LIST						
CIPP LINING						
ITEM	MANUFACTURER	MODEL	DIMENSION RATIO	PRESSURE CLASS	MATERIAL	TYPE
TUBE	APPLIED FELTS				POLYURETHANE COATED FELT	
RESIN	INTERPLASTIC CORPORATION	CORTZ-AT-470			POLYESTER	
CONTRACTOR: JOE SMITH CONSTRUCTION						

Figure 35

Products listed in the material list shall be described as completely as possible so as not to leave any ambiguity of what was used on the project. Only one type of material and manufacturer shall be shown on the list for any given item.

i.e.

150 PVC Water Main Pipe-Rehau/Ipex - **shall not be used.**

150 PVC Water Main Pipe-Rehau - **shall be used**

The specific instances of the other product(s) shall be noted on the plan portion of the drawing.

For a complete listing of up-to-date approved products for underground use in the City of Winnipeg please visit:
http://winnipeg.ca/finance/findata/matmgt/std_const_spec/current/Docs/Approved_Products_Underground_Works.pdf

4.1.2 Some Specific Requirements for Record Drawings

This section makes mention of some data that historically has not been provided on record drawings but is necessary to update the GIS.

AUGMENTED (Combination of Complete Relining with EPR)

- The location of all junctions that were reinstated.
- Invert elevations at the new pipe section ends.
- What connectors were used at the pipe connection ends, i.e. adapter or coupling
- Type of liner used and Manufacturer (**Please see figure 42 in section 4.2.4 11" x 17" Sewer Sheet Record Drawings**
 - i.e. Coated Felt Inversion Liner
Applied Felts
- Type of Resin used and the Manufacturer
 - i.e. Polyester
Alpha Owens Corning (AOC)
- Liner Thickness
 - i.e. 4.5 mm

CIPP Lining

For CIPP Lining projects the record drawings shall include:

- The location of all junctions that were reinstated.
- Type of liner used and Manufacturer (**Please see figure 40 in section 4.2.4 11" x 17" Sewer Sheet Record Drawings**
 - i.e. Coated Felt Inversion Liner
Applied Felts
- Type of Resin used and the Manufacturer
 - i.e. Polyester
Alpha Owens Corning (AOC)
- Liner Thickness
 - i.e. 4.5 mm

Ditch Work or 'Open Channel.'

For work that involves ditching, record drawings shall include:

- X-section(s) for the earth work wherever there is a change to the x-section. i.e. a change to the bottom width or side slope.
- Elevations of the ditch at the high and low points.
- Diameter and manufacturer of any corrugated metal piping (CMP).
- Type of grating (if applicable) and grate spacing.
- Identify rip-rap pads (if applicable).

External Point Repairs (SD-022A and SD-022B)

For External Point Repair projects the record drawings shall include:

- SD-022A is comprised of a length 2.9m or less, SD-022B is comprised of a length of 3.0m or greater
- All junction locations within the repaired pipe and if possible the street address of the affected services.
- Invert elevations at the new pipe section ends.
- What connectors were used at the pipe section ends, i.e. an adapter or coupling.

Internal Point Repairs (TPR's or Trenchless Point Repairs)

For this work the record drawings shall include:

- The location of the lining clearly defined.
- The location of all junctions that were reinstated and if possible the street address of the affected service.
- Type of liner used and Manufacturer (**Please see figure 41 in section 4.2.4 11" x 17" Sewer Sheet Record Drawings**)
 - i.e. Coated Felt Inversion Liner
Applied Felts
- Type of Resin used and the Manufacturer
 - i.e. Polyester
Alpha Owens Corning (AOC)
- Liner Thickness
 - i.e. 4.5 mm

Sewer Main Renewal

For Sewer Renewal projects the plan portion shall include:

- Property address of any sewer services that have been renewed.
- Property line measurement for any sewer services that have been renewed.
- Sewer televising table shall be removed from the final drawings

4.2 FINAL RECORD DRAWING EXAMPLES

4.2.1 Oversize ISO A1 (594 mm x 841 mm) Plan/Profile Record Drawing - Water

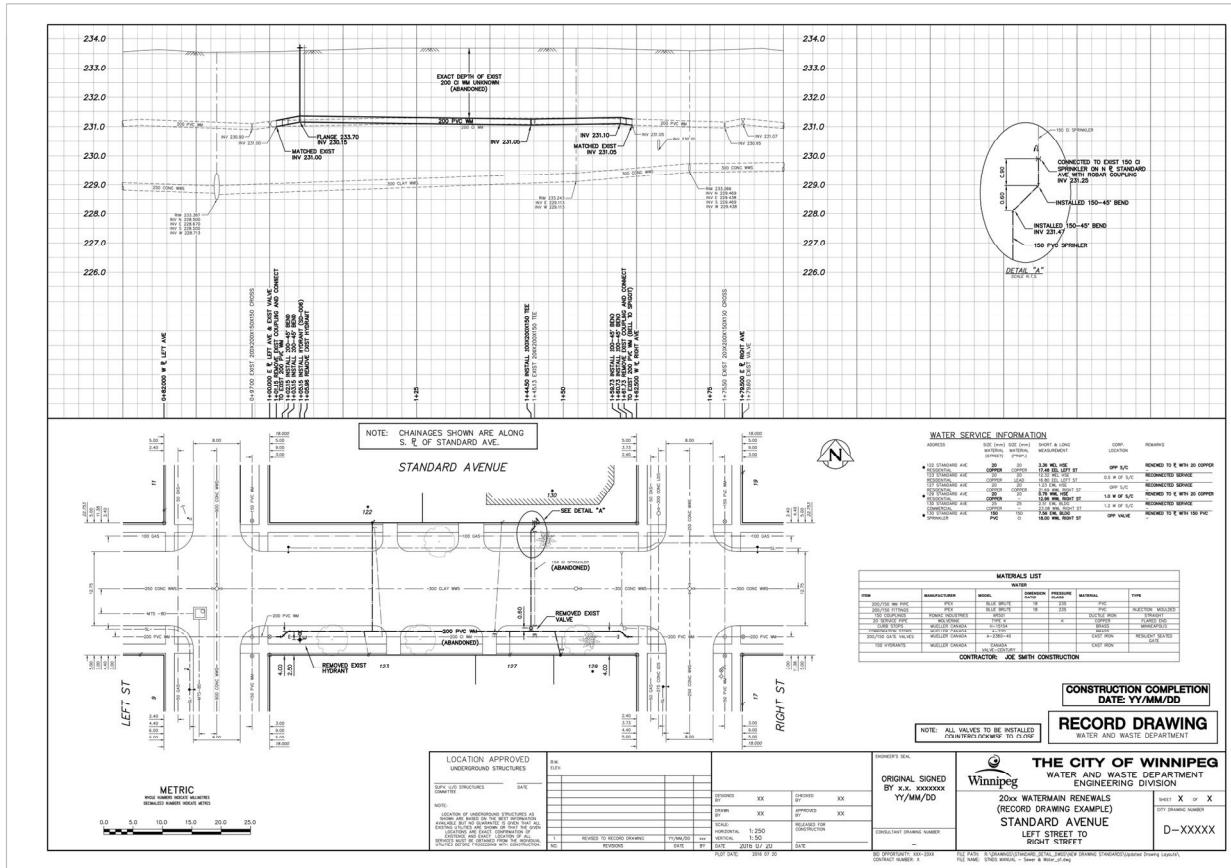


Figure 36
(For a larger view see Appendix P)

4.2.2 Oversize ISO A1 (594 mm x 841 mm) Plan/Profile Record Drawing - Sewer

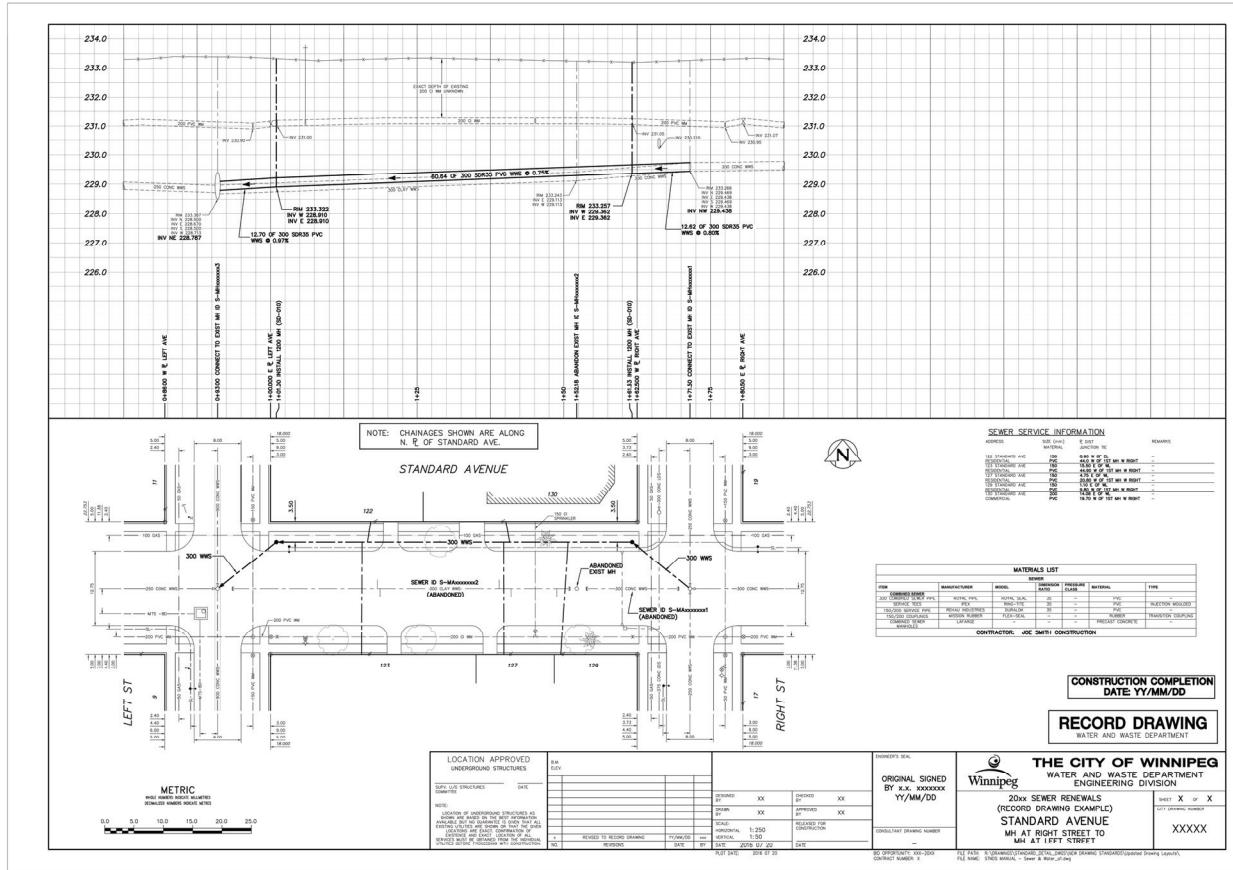


Figure 37
(For a larger view see Appendix Q)

4.2.3 Oversize ISO A1 (594 mm x 841 mm) Plan/Profile Record Drawing – Open Channel (Ditching)

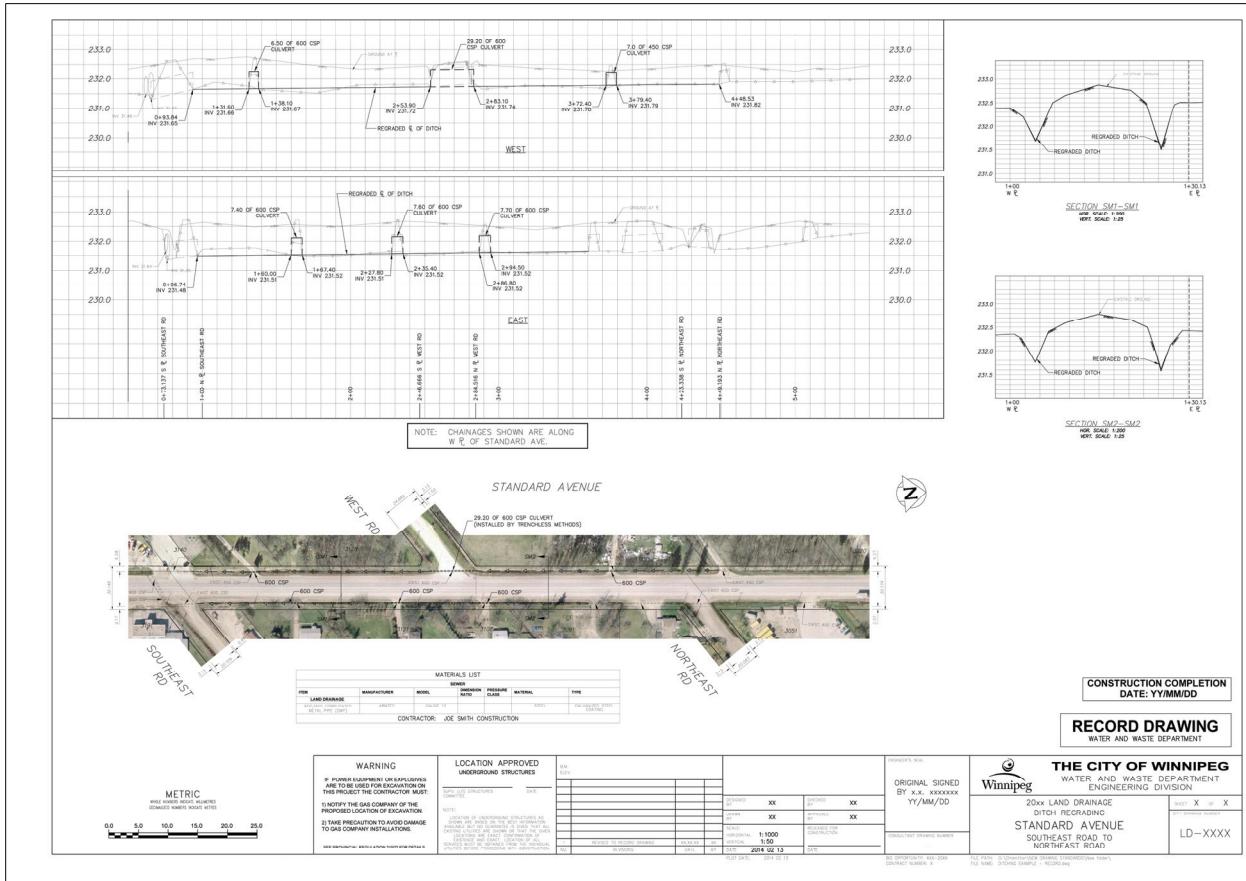


Figure 38
(For a larger view see Appendix R)

4.2.4 11" x 17" Sewer Sheet Record Drawings

11" x 17" Sewer Renewal by CIPP Lining Record Drawing

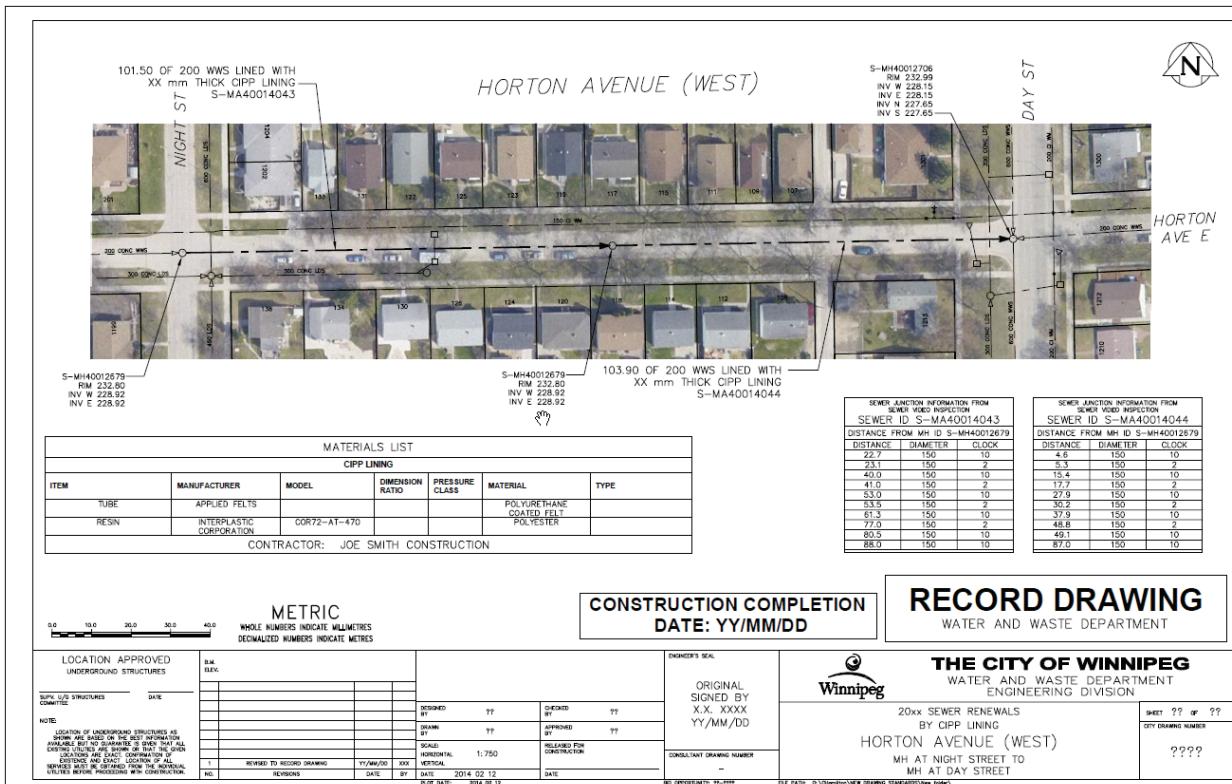
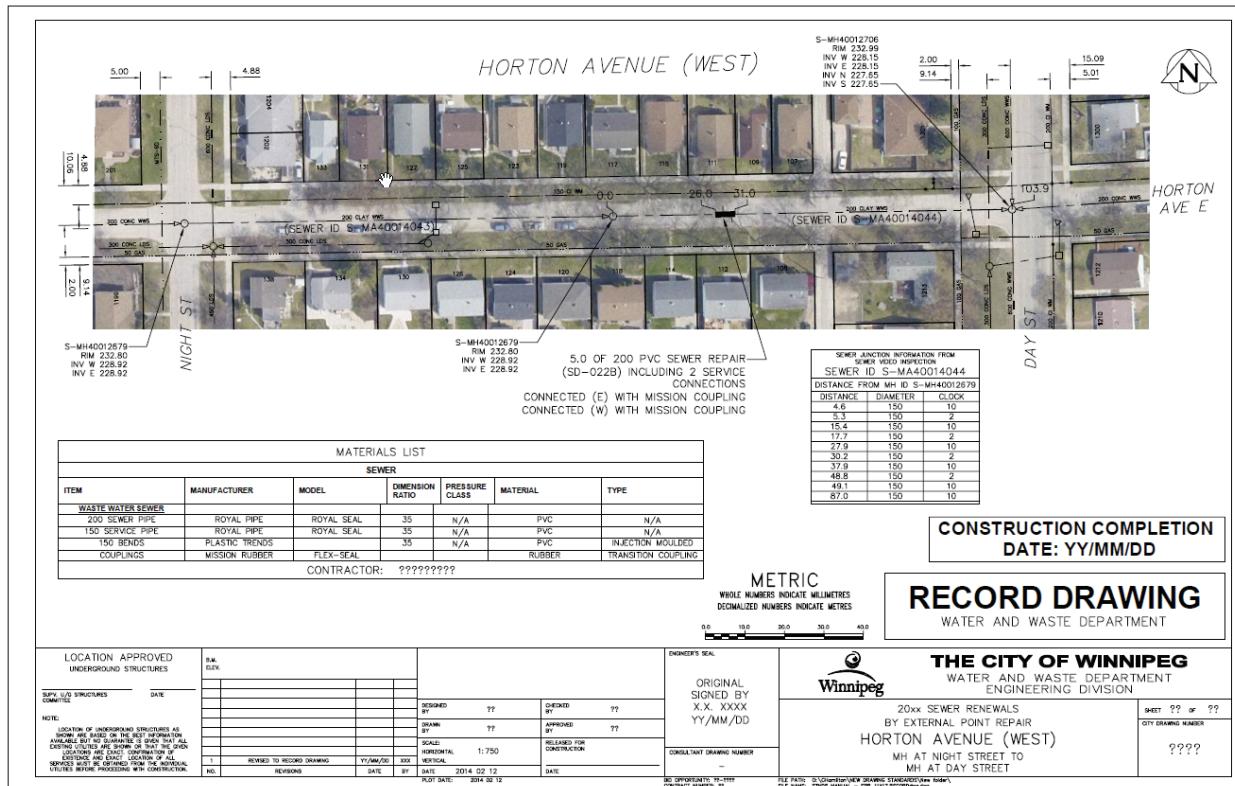


Figure 39
(For a larger view see Appendix S)

11" x 17" External Point Repair (EPR) and Trenchless Point Repair (TPR) Record Drawing**Figure 40**

(For a larger view see Appendix T)

11" x 17" Augmented Lining Record Drawing

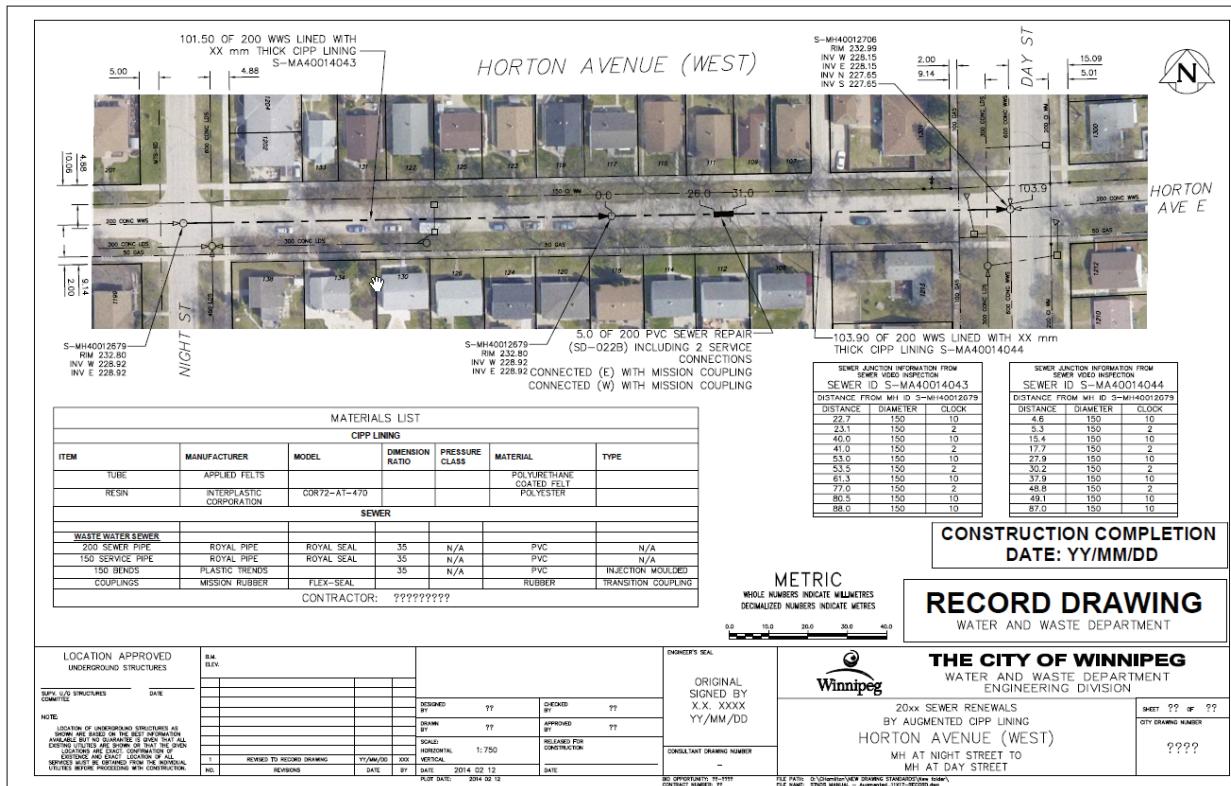


Figure 41

(For a larger view see Appendix U)

4.3 FINAL GIS DRAWING EXAMPLES

No layout is required for these drawings shown in model space view below. For the included layers
Please see section 3.4.6 Layers Required in The Final GIS Drawing

Where possible, one drawing file shall be submitted. This drawing file shall encompass the entire project in model space. See Figure 42 below



Figure 42

4.3.1 Oversize ISO A1 (594 mm x 841 mm) GIS Record Drawing – Water

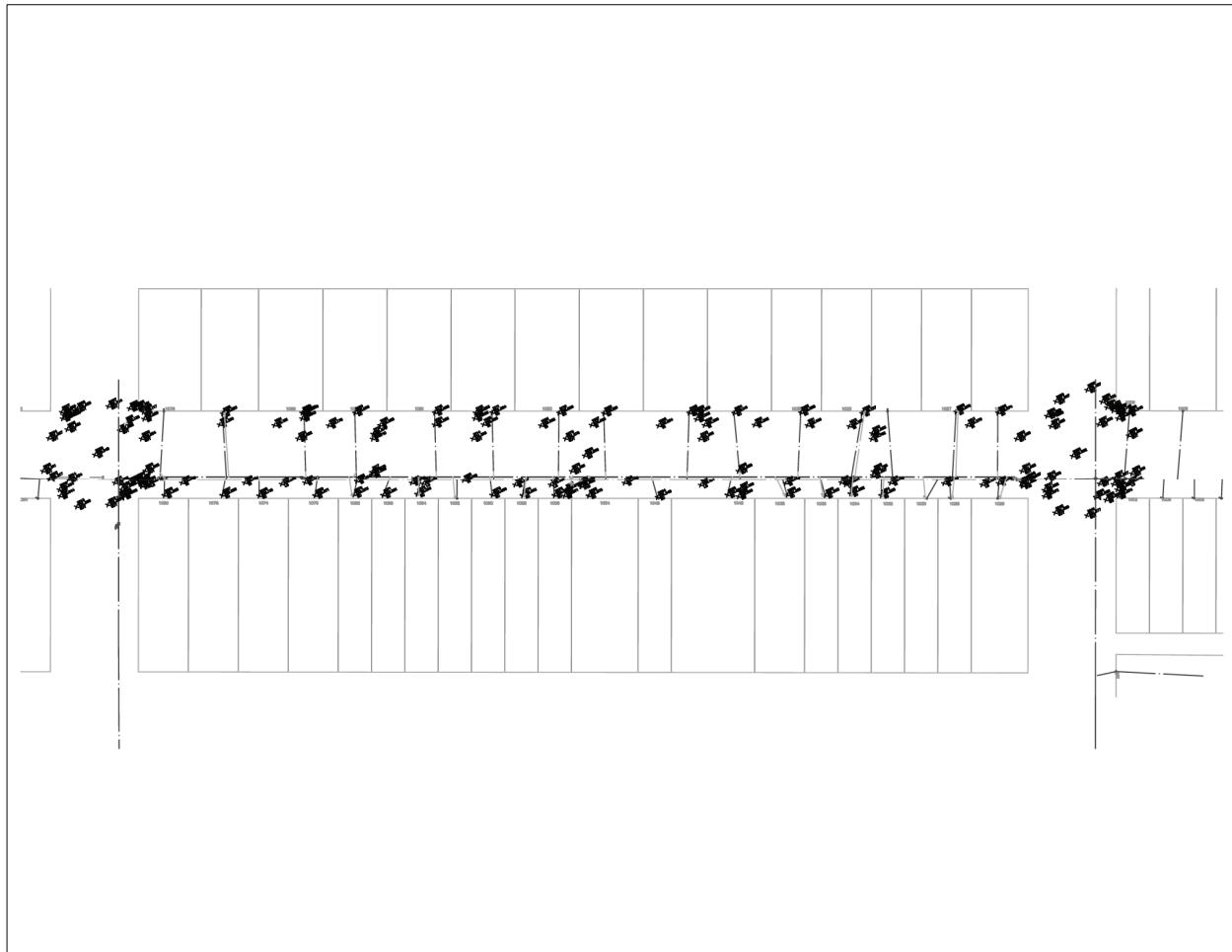


Figure 43
(For a larger view see Appendix V)

4.3.2 Oversize ISO A1 (594 mm x 841 mm) GIS Record Drawing - Sewer

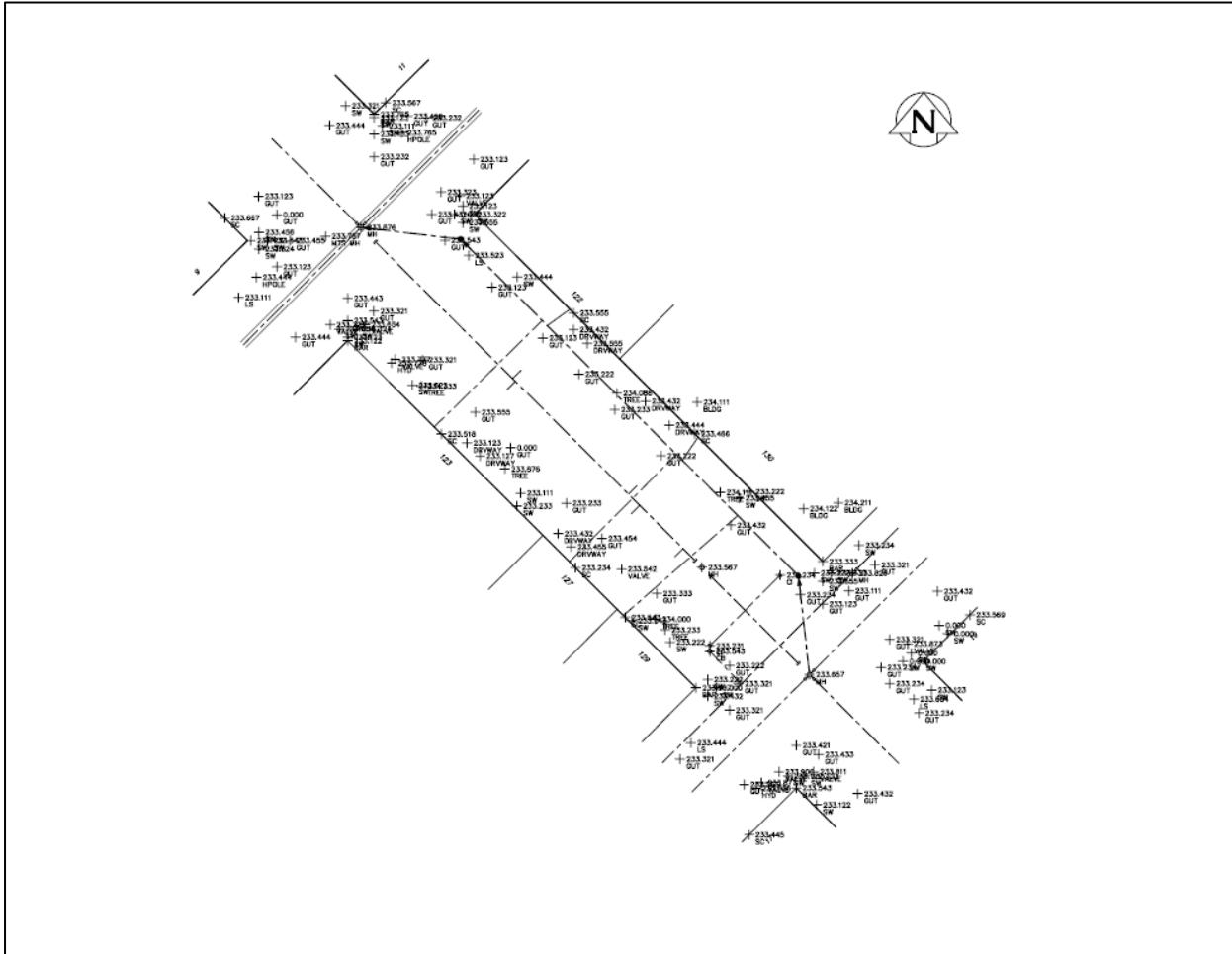


Figure 44
(For a larger view see Appendix W)

4.3.3 Oversize ISO A1 (594 mm x 841 mm) GIS Record Drawing – Open Channel (Ditching)

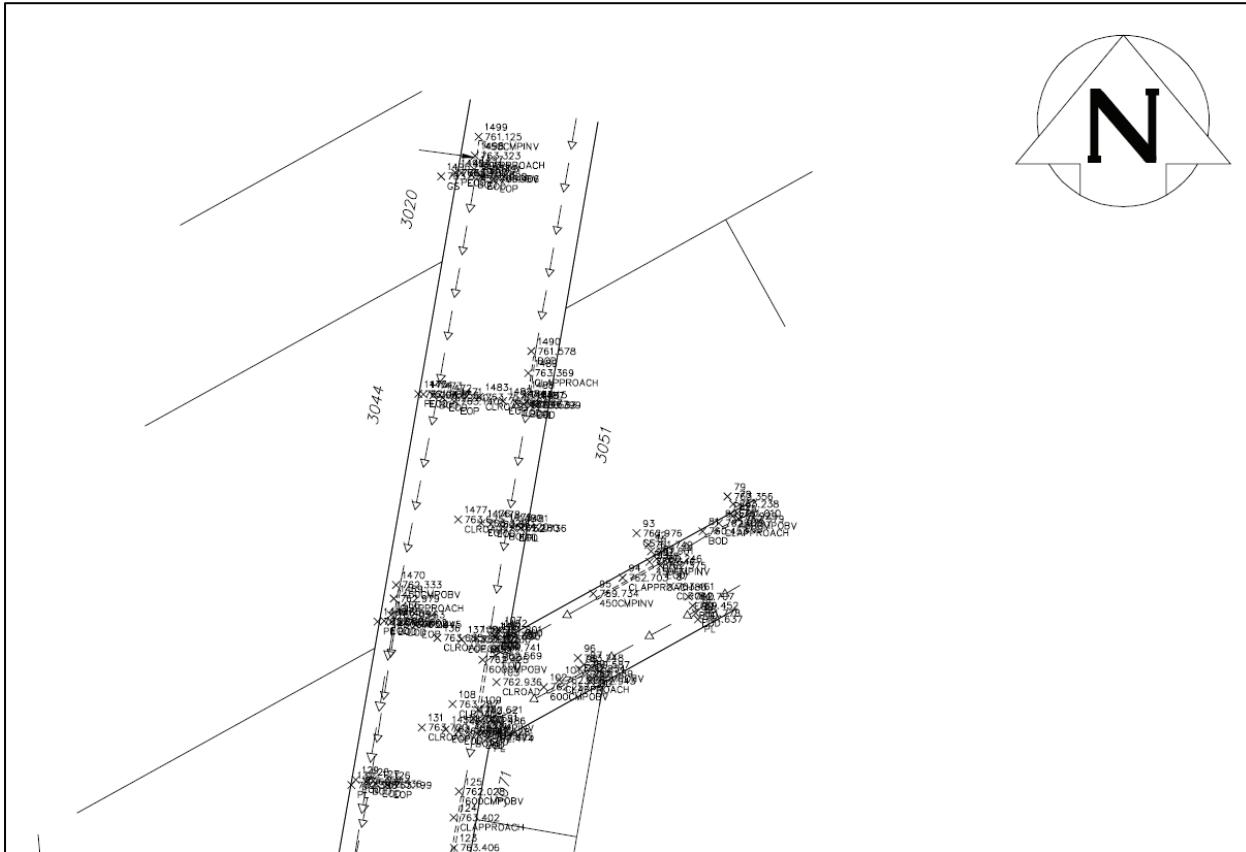


Figure 45
(For a larger view see Appendix X)

4.3.4 11" x 17" Sewer Sheet GIS Record Drawings

11" x 17" Sewer Renewal by CIPP Lining GIS Record Drawing

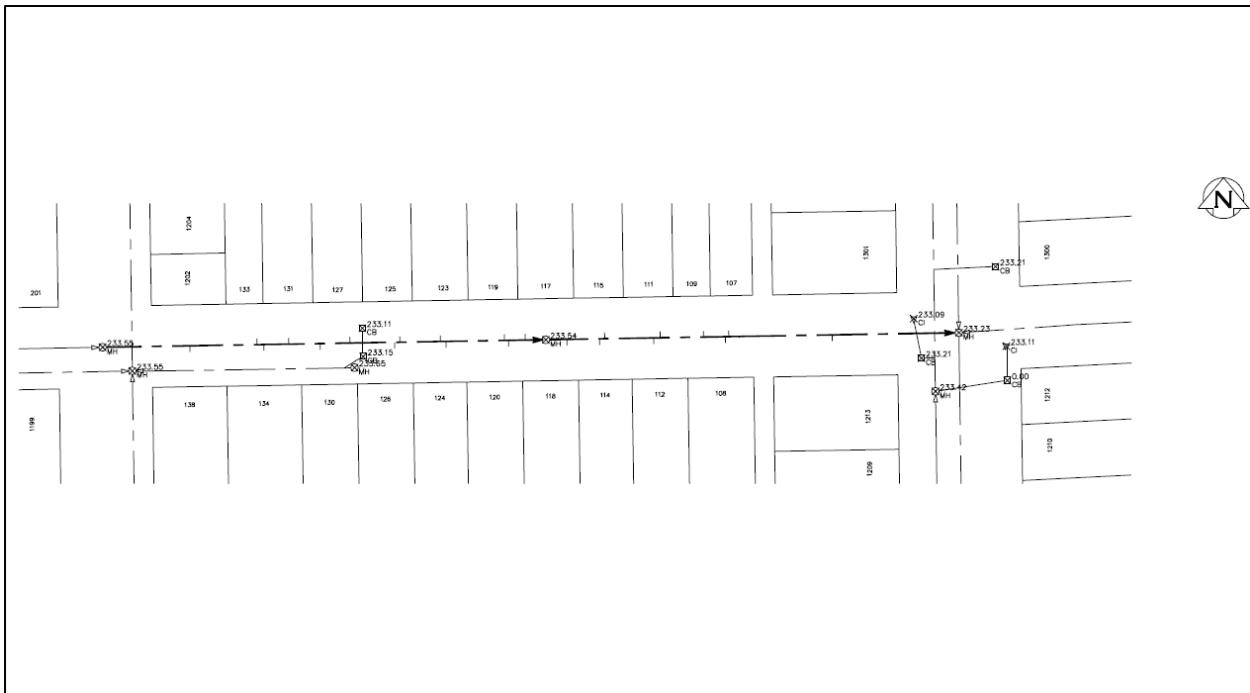


Figure 46
(For a larger view see Appendix Y)

11" x 17" External Point Repair (EPR) and Trenchless Point Repair (TPR) GIS Record Drawing

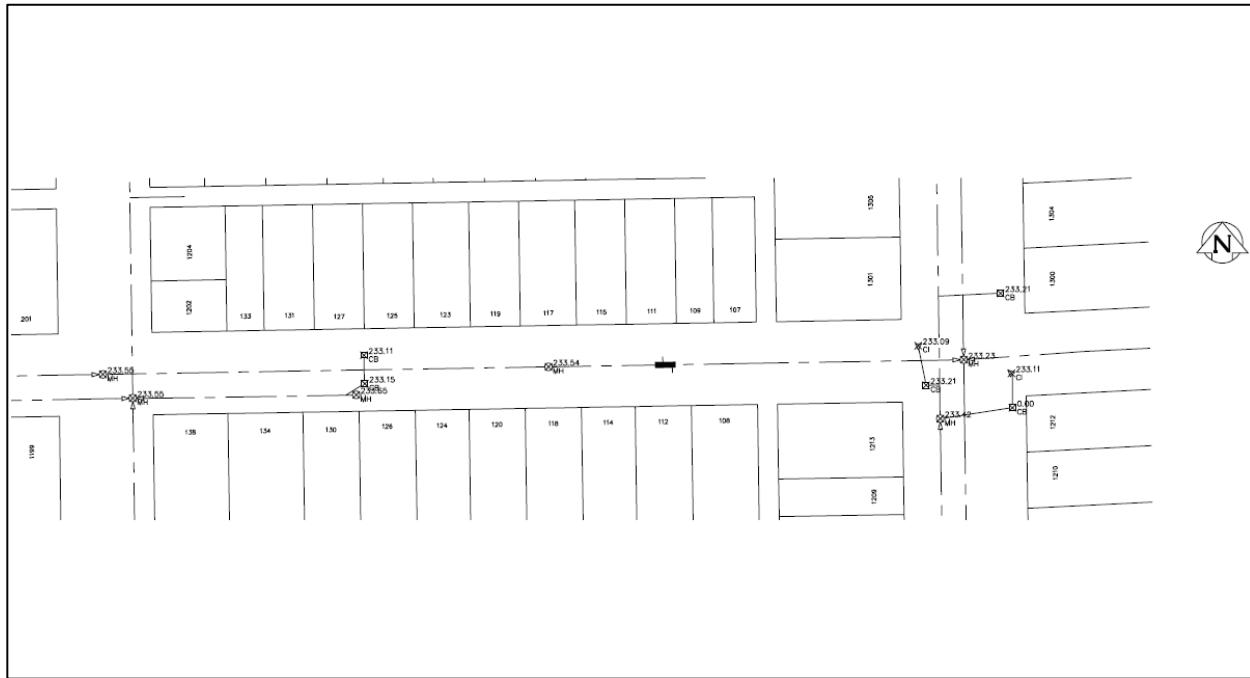


Figure 47
(For a larger view see Appendix Z)

5.0 SUBMITTING A RECORD DRAWING TO THE WWD

The procedure for submitting record drawings to the WWD is as follows:

5.1 PRELIMINARY REVIEW

Full size paper prints of the completed record drawings, plotted to scale, shall be submitted to the WWD for review prior to the submission of the Mylar record drawings.

11x17 Drawings shall be accompanied by the AutoCAD drawing files.

The paper prints and AutoCAD drawing files (if applicable) shall be sent to the WWD attention,

**The Supervisor, Drafting and Graphic Services
Engineering Division
Water and Waste Department
110-1199 Pacific Avenue
Winnipeg MB, R3E 3S8**

The WWD will review the prints for errors and or omissions. The "marked up" prints, with comments shall be returned to the submitting organization under instructions to revise the record drawings according to the changes indicated on the prints.

The revised or 'final' drawings (please see below) will be proofed to ensure any requested changes have been completed to the satisfaction of the WWD. Drawings not completed to the satisfaction of the WWD shall be returned to the submitting organization for correction.

5.2 FINAL REVIEW

Once the record drawings have been revised, the Final Record drawings shall be prepared using 3 mil, matte, 2 sided Polyester film (often referred to as 'Mylar'). The final Polyester film drawings shall be stamped and signed by a professional engineer prior to submitting the drawings to the WWD. An AutoCAD file and a pdf file for each individual record drawing shall be submitted along with the record drawings.

5.3 DIGITAL FILES

1. Final GIS Drawing files provided to the Department shall be produced in AutoCAD or AutoCAD LT .dwg format and saved in the version presently being used by the WWD. Third party fonts, hatch patterns, custom line types or shapefiles, shall not be used in Final GIS Drawing files.
2. Drawing files shall be submitted on CD or DVD or made available on an ftp site.
3. Each individual Final Record drawing that is part of an overall project package must be submitted to the WWD as individual drawing files, using the Department assigned drawing number as the file name, e.g. D-xxxxxx.DWG. **In the case of the Final GIS Drawings, where at all possible, 1 drawing file shall be submitted. This 1 drawing file shall encompass the entire project in model space.**
4. On large projects, where several drawings are needed to show continuous infrastructure, the base entities and cadastral data shall be continuous in model space. These entities shall not be

"broken up," rotated or edited in order to depict the specific sections of the project on individual drawings. Only views, paper space and layouts shall be used to display the work.

5. All Final Record Drawing and Final GIS Drawing files shall have all tabs and model space zoomed to EXTENTS, prior to any submittal to the WWD, whether it is the final or a working submittal. This is to ensure that there are no extraneous entities in the drawing.
6. All Final Record Drawing files shall be saved with the first layout tab active.
7. ALL FINAL FILES (OF BOTH FINAL RECORD AND FINAL GIS DRAWINGS) SHALL BE FULLY PURGED PRIOR TO SUBMITTAL.

6.0 FAQ

Question: We have established workflows that adhere to the City 'Bluebook' manual and we have been using these for years to produce drawings for the WWD. Will we now have to completely re-engineer our process to produce a CAD drawing?

Answer: Hopefully this will not be the case. If the look of a typical drawing that was submitted was acceptable before implementation of these standards, chances are it will still be acceptable now. Minor enhancements such as Material list shall be required.

The significant difference that this manual contains is the requirement of a second final drawing to be submitted. The entities in this drawing will become GIS objects. This drawing has an absolute minimum of WWD designated layers and symbols and may be generated however the Consultant/Design Office wishes.

Having said that, the original City 'Bluebook' manual was written, and then subsequently updated, in eras that did not have capacity for computer assisted drafting. The basic principles within that document are still sound, however an update to the processes used to produce drawings was needed.

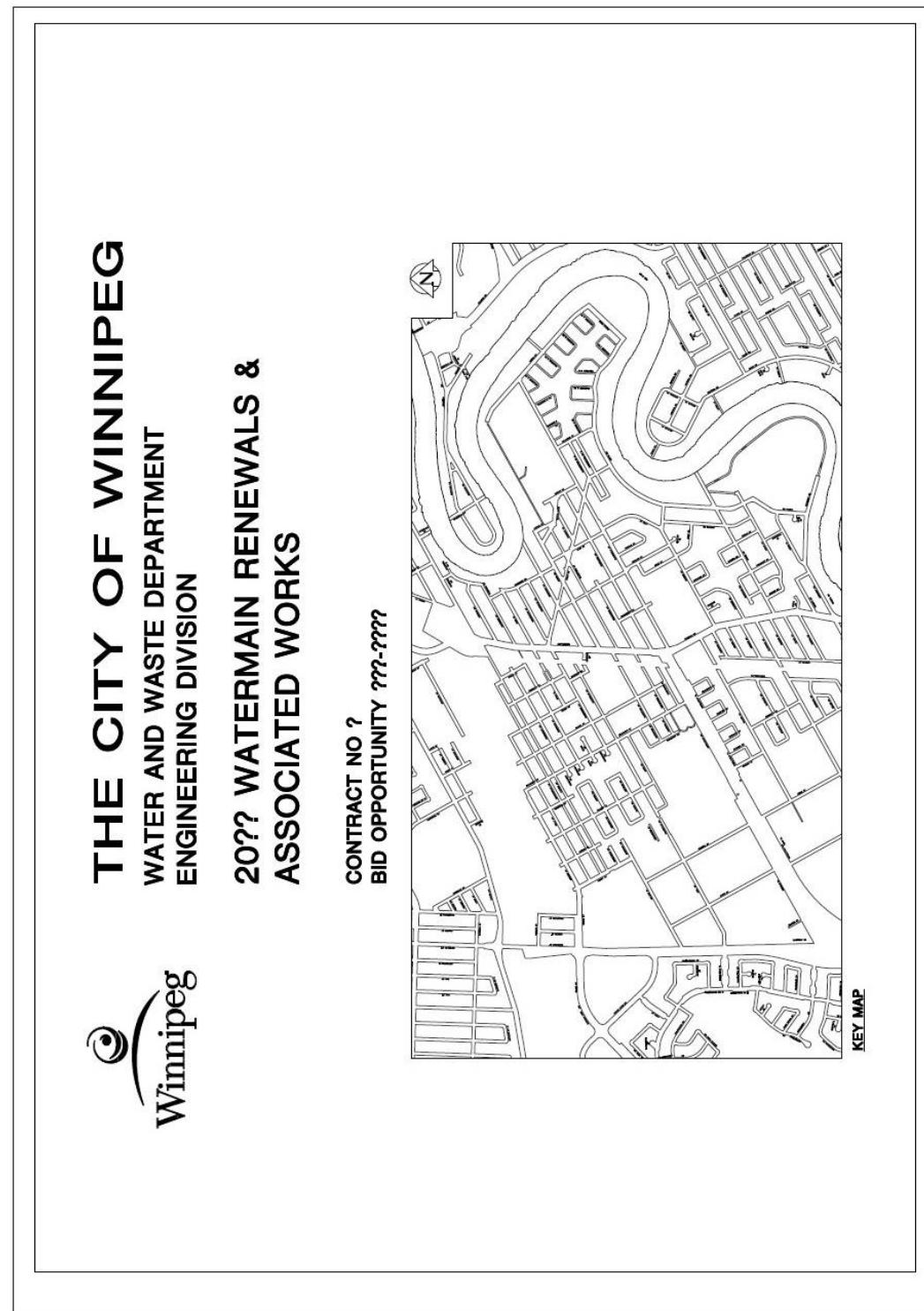
7.0 SUMMARY - CHECKLIST

1. All renewal projects for WWD shall be prepared using these standards and, where applicable, using the prototype drawing files, symbols, and layering conventions supplied by the Department.
2. The Final GIS drawings shall be prepared using AutoCAD or AutoCAD LT and saved in the file format for the version of AutoCAD currently used by the Department.
3. The Department shall supply cadastral and existing water/sewer network data, exported from the Department's GIS, to be used in the production of base information for a design project. Once incorporated into the drawing this data shall not be spatially moved.
4. Layers and symbols as described for the Final GIS Drawing shall not be edited and blocks must not be exploded.
5. The Final GIS drawings shall have the coordinate system set to NAD 83 June 1990 Zone 14 North and the view set to WORLD UCS
6. All linear features depicting sewer lines in CAD drawings shall be drawn in the direction of flow for that entity, high elevation to low.
7. All drawing sets must start with a Title/Cover drawing, followed by a Legend/Drawing Index drawing.
8. All design drawings submitted to the Department must be stamped with the signed and dated seal of a professional engineer, signed and dated.
9. With the exception of aerial photography, AutoCAD drawing files submitted to the Department must not contain x-references and image attachments.
10. Upon completion of construction, the design drawings shall be revised to reflect all changes that occurred during construction.
11. The CAD drawing files shall be purged prior to submission to the WWD.
12. Drawings revised to reflect construction conditions shall be referred to, and labeled as RECORD DRAWINGS.
13. Full size paper prints of the completed record drawings, plotted to scale shall be submitted to the Department for review prior to the submission of the final **Polyester film** (often referred to as 'Mylar'), record drawings. The paper prints shall be accompanied with the AutoCAD drawing files.
14. Upon completion of the review of the preliminary record drawings, the final record drawings shall be plotted on **3 mil, matte, 2 sided, Polyester film**, re-stamped and re-signed by a professional engineer. Each Polyester film drawing shall be accompanied with:
 1. A Final GIS Drawing CAD file
 2. A Final Record Drawing CAD file
 3. A pdf file of the Final Record Drawing.
15. Preliminary record drawings and final Polyester film drawings must be submitted to:

**The Supervisor, Drafting and Graphic Services
Engineering Division
Water and Waste Department
110-1199 Pacific Avenue
Winnipeg, Manitoba
R3E 3S8**
16. With the exception of GIS Record Drawings, the various drawings that comprise a set of drawings must be saved as individual digital drawing files. The City of Winnipeg WWD supplied drawing number shall be used as the file name for the digital drawing.

APPENDIX A

Oversize ISO A1 (594 mm x 841 mm) Landscape Title/Cover Sheet



APPENDIX B

11"x 17" Title/Cover Sheet

THE CITY OF WINNIPEG

WATER AND WASTE DEPARTMENT
ENGINEERING DIVISION

20?? SEWER RENEWALS BY CIPP LINING

CONTRACT NO ?
BID OPPORTUNITY ???-????



Winnipeg

APPENDIX C

Oversize ISO A1 (594 mm x 841 mm) Water Legend/Drawing Index Sheet

APPENDIX D

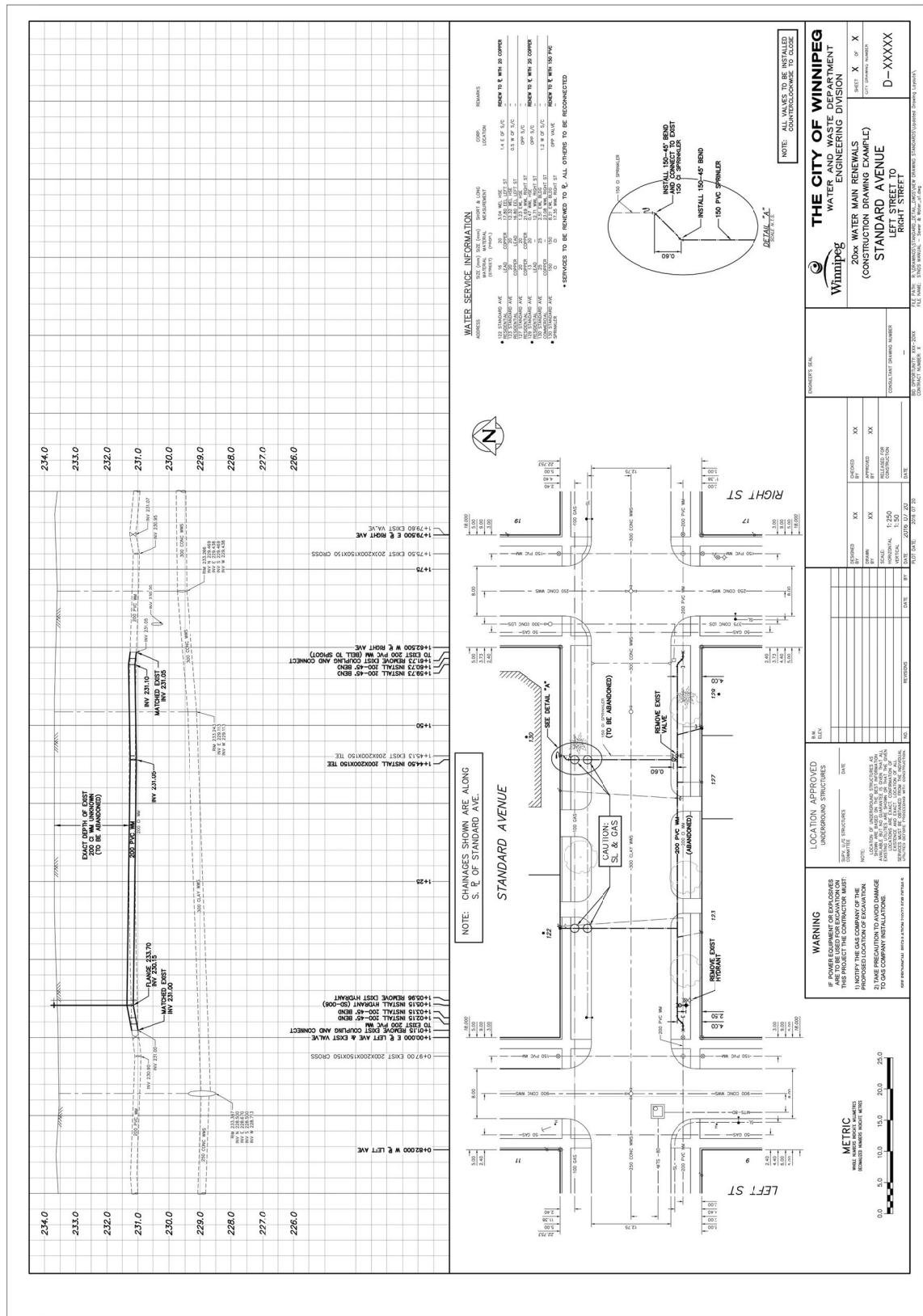
Oversize ISO A1 (594 mm x 841 mm) Sewer Legend/Drawing Index Sheet

APPENDIX E

11" x 17" Sewer Legend/Drawing Index Sheet

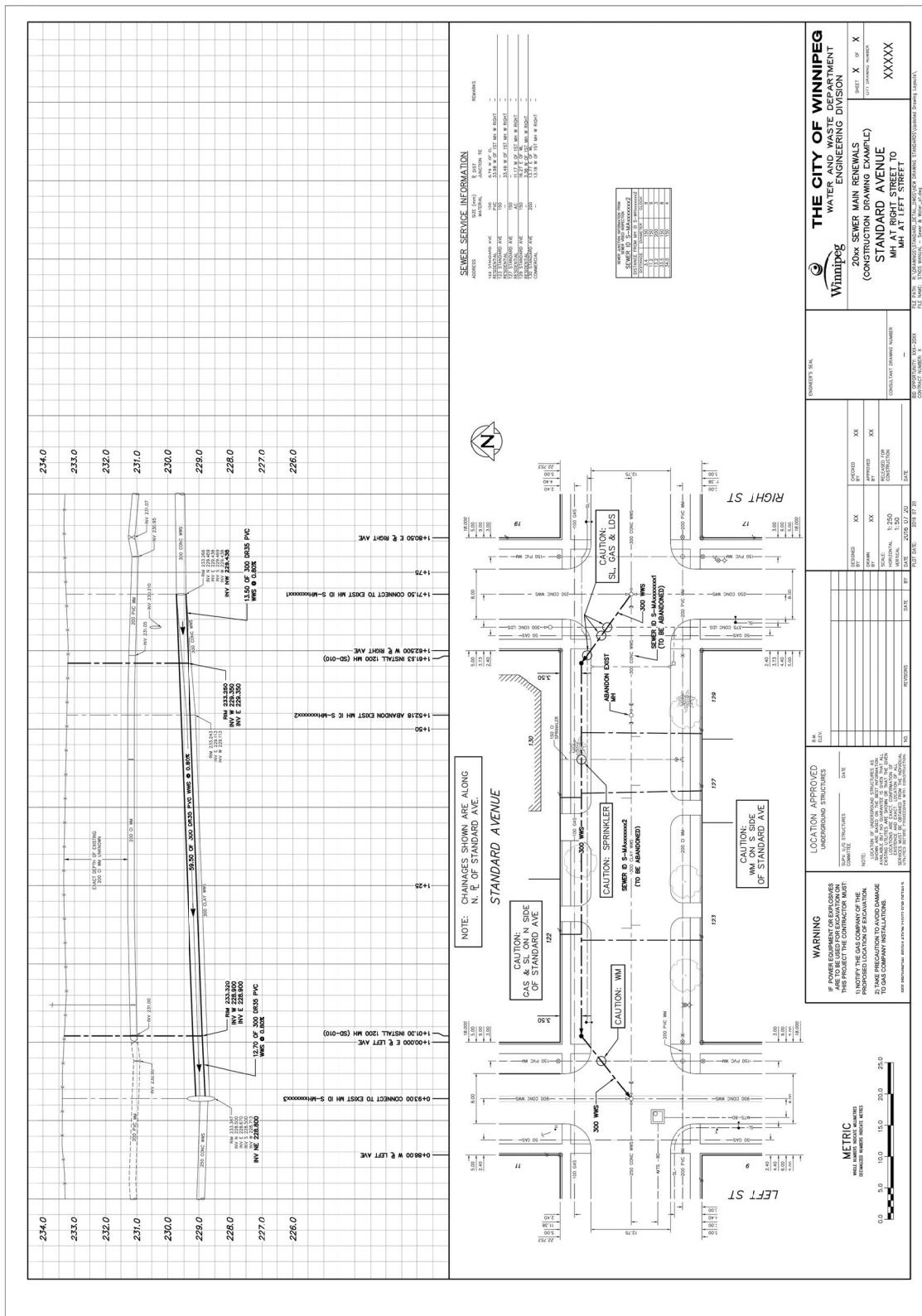
APPENDIX F

Oversize ISO A1 (594 mm x 841 mm) Plan/Profile Sheet – Water



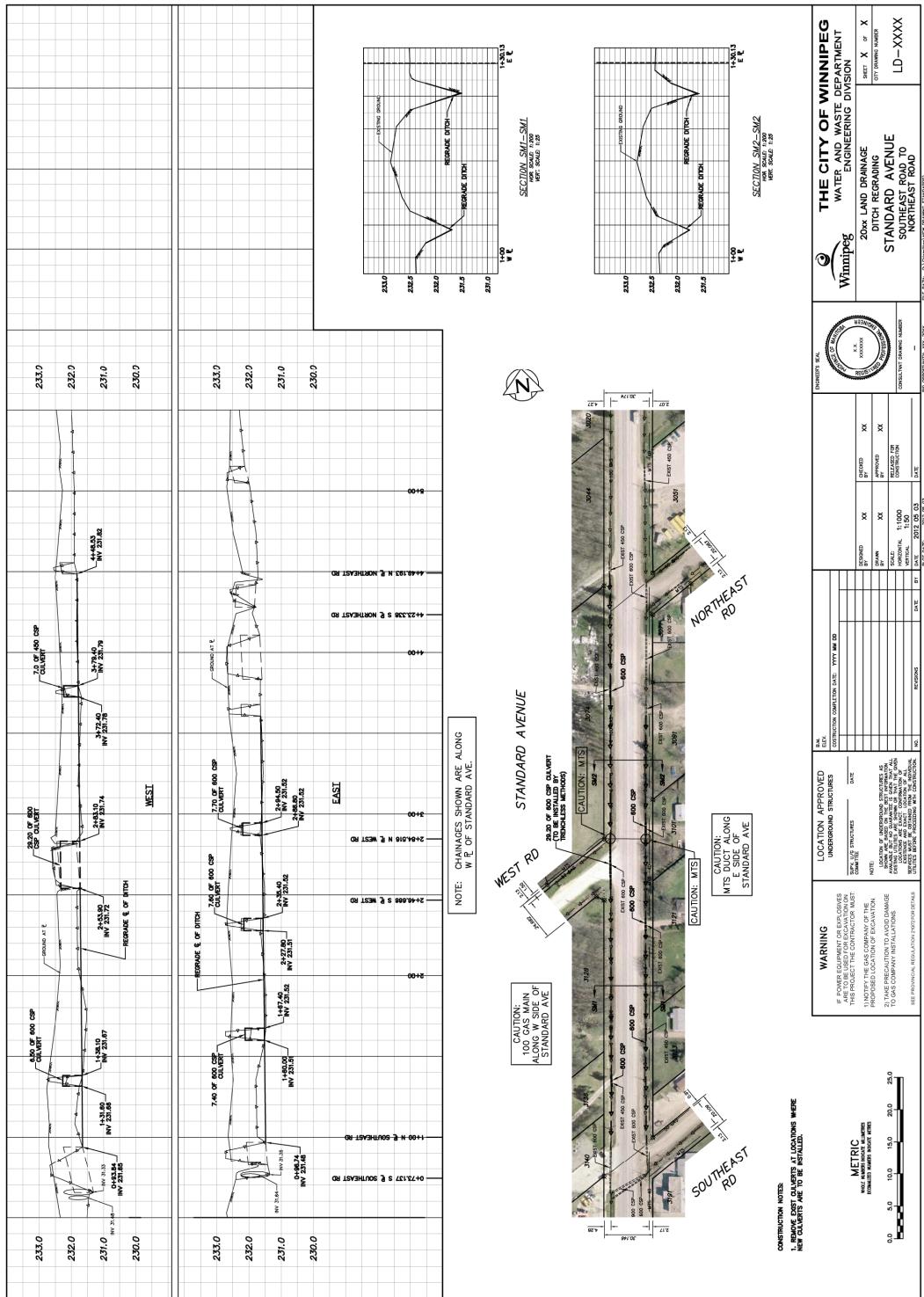
APPENDIX G

Oversize ISO A1 (594 mm x 841 mm) **Plan/Profile Sheet – Sewer**



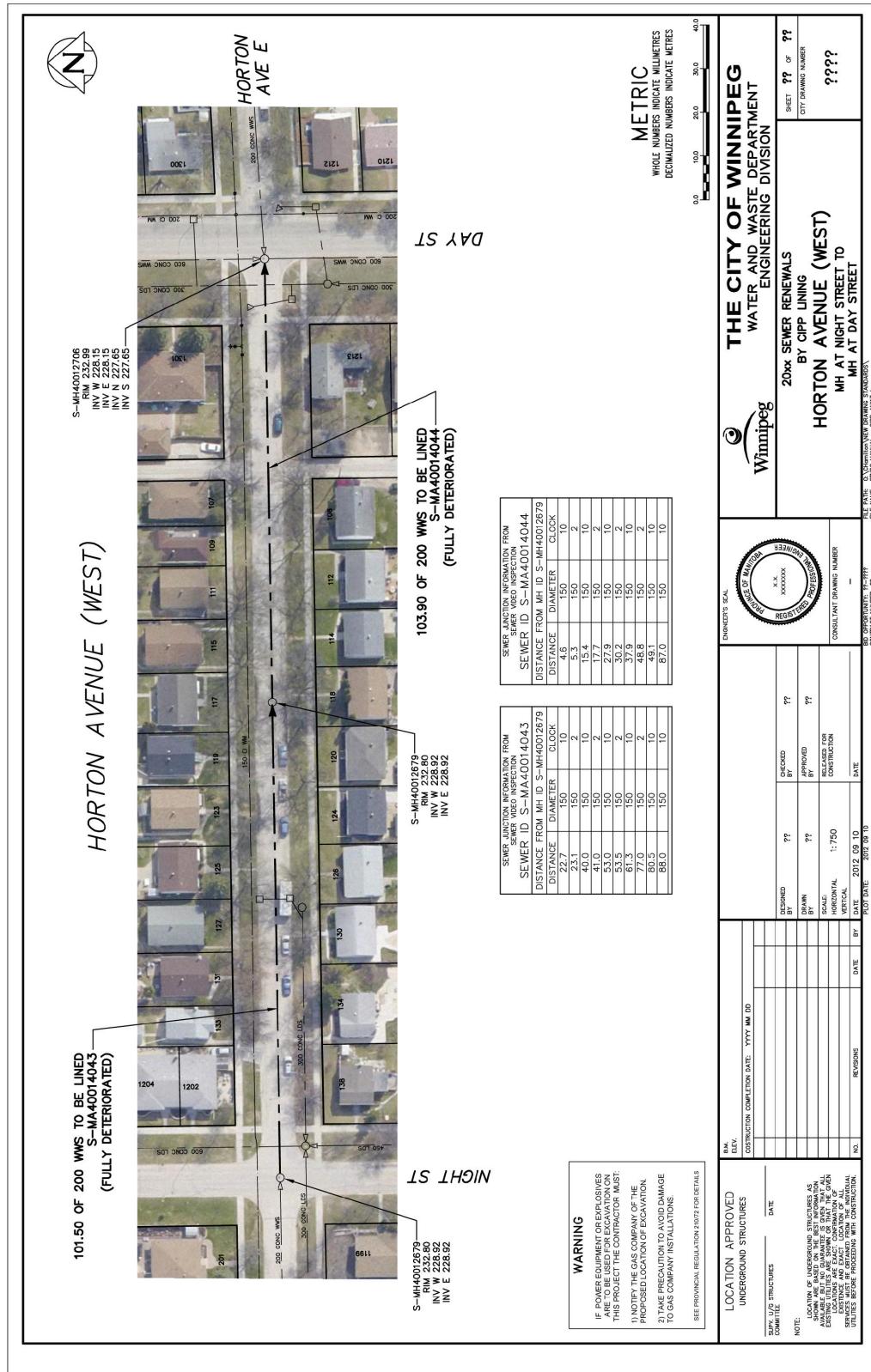
APPENDIX H

Oversize ISO A1 (594 mm x 841 mm) Plan/Profile Sheet – Open Channel (Ditching)



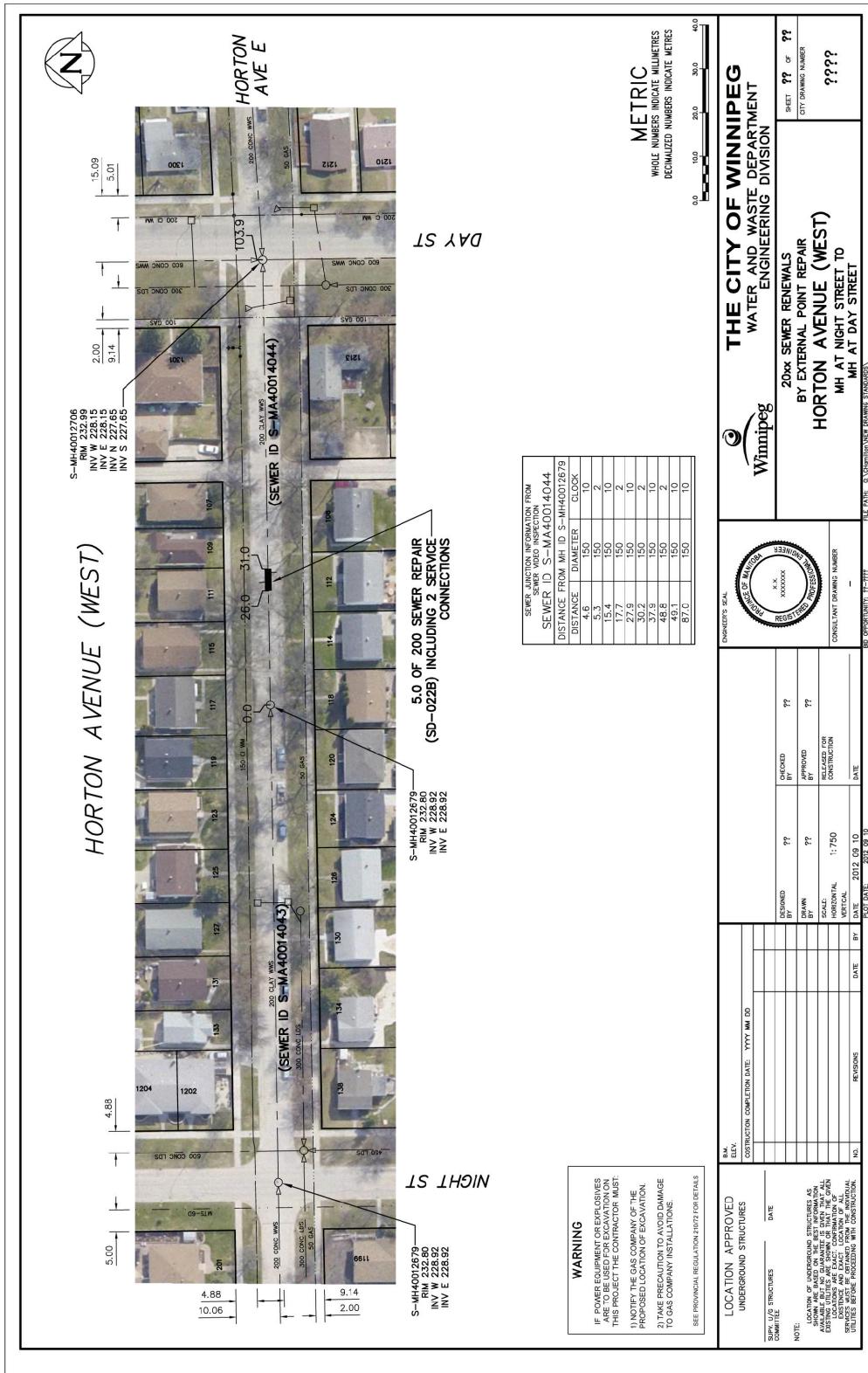
APPENDIX I

11" x 17" Sewer Renewal by CIPP Lining and Trenchless Point Repair Design Drawing



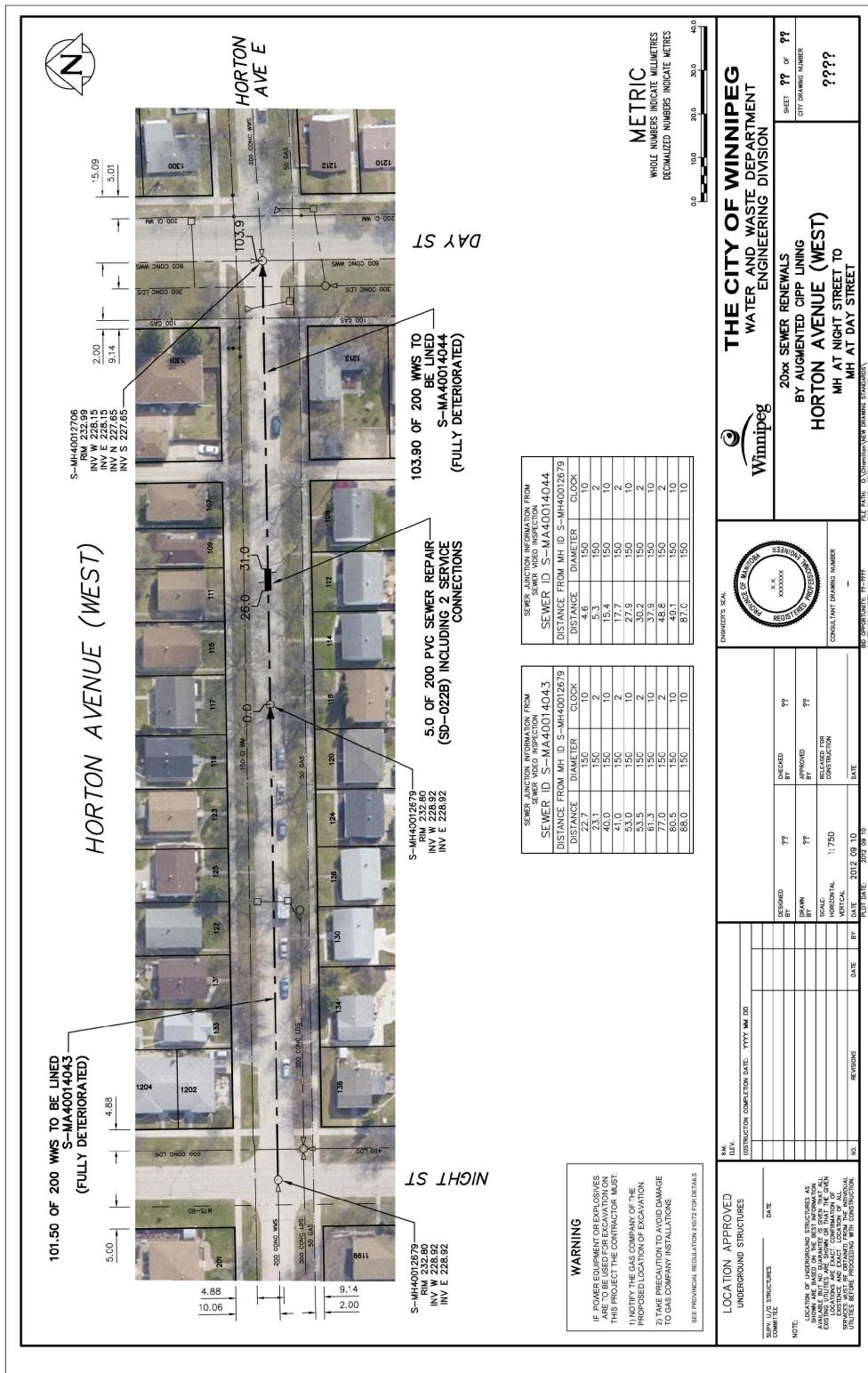
APPENDIX I (CON'T)

11" x 17" External Point Repair (EPR) and Trenchless Point Repair (TPR) Sheets



APPENDIX I (CON'T)

11" x 17" Augmented Lining Design Drawing



APPENDIX J

Oversize ISO A1 (594 mm x 841 mm) Detail Sheet

APPENDIX K**11"x 17" Detail Sheet**

LOCATION APPROVED UNDERGROUND STRUCTURES		B.M. E.E.		DRAFTER'S SIGN OR SEAL OF DRAWING NUMBER X.X.X.X.XXXXXXX		WATER AND WASTE DEPARTMENT DIVISION OF ENGINEERING Winnipeg		THE CITY OF WINNIPEG WATER AND WASTE DEPARTMENT DIVISION OF ENGINEERING Winnipeg		SHEET X OF X DRAWING NUMBER XXXXXXX XXXXXXXX	
STEP 1/2 STRUCTURES COMMITTEE	DATE	REMOVED BY	XX	CHECKED BY	XX	APPROVED BY	XX	APPROVED FOR CONSTRUCTION BY	XX	APPROVED FOR CONSTRUCTION BY	XX
		UPDOWN	XX	SCALE	XX						
		HORIZONTAL	XX	VERTICAL	XX						
		DATE	BY DATE	DATE	BY DATE						
		NO. 100-00000000	PLATE DATE: 2014-02-12	NO. 100-00000000	PLATE DATE: 2014-02-12						
NOTE: LOCATION OF UNDERGROUND STRUCTURES AS APPROVED BY THIS DRAWING IS SUBJECT TO THE DRAFTING STANDARDS AND PRACTICES OF THE CITY OF WINNIPEG. DRAFTER IS NOT RESPONSIBLE FOR CONSTRUCTION OF THESE STRUCTURES. STRUCTURES ARE TO BE LOCATED IN A SUFFICIENT DISTANCE FROM EXISTING STRUCTURES BEFORE PROCEEDING WITH CONSTRUCTION.											

APPENDIX L

Title Block

WARNING IF POWER EQUIPMENT OR EXPLOSIVES ARE TO BE USED FOR EXCAVATION ON THE PROJECT THE CONTRACTOR MUST: 1) NOTIFY THE GAS COMPANY OF THE PROPOSED LOCATION OF EXCAVATION. 2) TAKE PRECAUTION TO AVOID DAMAGE TO SACS COMPANY INSTALLATIONS. <small>SEE PROVINCIAL REGULATION 210/72 FOR DETAILS</small>		LOCATION APPROVED <small>B.M. ELEV.</small> <small>UP TO STRUCTURES OR BELOW</small> <small>DATE</small>		<small>APPROVED BY</small> <small>XX</small> <small>APPROVED BY</small> <small>XX</small>		<small>ENCLOSED BY</small> <small>XX</small> <small>RELEASED FOR CONSTRUCTION</small> <small>HORIZONTAL, 1:250 VERTICAL, 1:50</small> <small>REVISIONS</small> <small>DATE</small> <small>XX</small> <small>DATE</small> <small>XX</small>		<small>COMBINATION DRAWING NUMBER</small> <small>—</small>		
<small>LOCATION OF UNDERGROUND STRUCTURES AS AVAILABLE IN NO GUARANTEED TO OVER 70% LOCATED IN THE SOIL, NOT EXACTLY LOCATED OR LOCATED IN THE ROCK. COORDINATES EXACTLY LOCATED AND EXACT LOCATION OF SERVICES LOCATED AND EXACT LOCATION OF UTILITIES BEFORE PROCEEDING WITH CONSTRUCTION.</small>										<small>NO.</small> <small>1</small>
<small>NOTE:</small> <small>FILE PATH: C:\Users\yannick\Downloads\</small> <small>FILE NAME: title.lay</small>										
<small>REVISIONS</small> <small>DATE</small> <small>XX</small> <small>DATE</small> <small>XX</small>										
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APPENDIX M**Legend Part 1****PLAN VIEW**

DESCRIPTION	EXISTING	PROPOSED
WATER PIPE	—	—
FIRE HYDRANT	◊	◆
VALVE	⊗	◎
CURB STOP	♂	●
REDUCER	△	◀
COUPLING OR SLIDDER	X	X
CROSS	⊕	⊖
BEND - 11.25°, 22.5°, 45°, 90°	H H H T	H H H T
TEE	H	H
VERTICAL BEND	H	H
ANODE	⤒	⤒
REPAIR MARKER	Ⓐ	—
PLUG	J	I
SEWER PIPE	— — —	— — —
MANHOLE	O	●
CATCH BASIN	□	■
CURB INLET	▽	▼
JUNCTION	— — —	— — —
Q DITCH	→ → → —	→ → → —
CULVERT	□ — □ — □ — □	□ — □ — □ — □
SURVEY BAR	‡	◆
SURVEY MONUMENT	▲	▲
TREE - DECIDUOUS	•	•

APPENDIX M (CON'T)**Legend Part 2**

TREE - CONIFEROUS		
HYDRO		-----
HYDRO POLE	*H	-----
LAMP STANDARD	••	
HYDRO POLE W/STREET LIGHTING	H••	
POLE	•	
GUY ANCHOR	←	
M.T.S. POLE	•M	
PEDESTAL OR BOX	☒	
CABINET		
M.T.S.	-----	-----
TRAFFIC SIGNALS	-----	-----
TRAFFIC LIGHT STANDARD	•⇒	
GAS	-----	-----
STEAM	-----	-----
FIBRE OPTIC	-----	-----
FENCE	----- X -----	----- X -----
EDGE OF PAVEMENT OR GUTTER	-----	-----
EDGE UNPAVED OR GRAVEL ROAD	-----	-----
R		
PROJECTED R	· · · · ·	
LOT LINE		
SIDEWALK - PATHWAY		
EASEMENT	-----	-----
EDGE OF BUILDING		
MAILBOX		
TEST HOLE	◆	
TREE LINE OR BUSH		

APPENDIX N**Symbol List Part 1**

STANDARD BLOCKS			
BLOCK SYMBOL	BLOCK NAME (.dwg)	LAYER NAME	DESCRIPTION
/ \	E_11 Bend	E_WATER_PLAN or E_SEWER_PLAN	EXISTING 11.25° BENDS FOR SEWER OR WATER
/ \	E_22 Bend	E_WATER_PLAN or E_SEWER_PLAN	EXISTING 22.5° BENDS FOR SEWER OR WATER
/ \	E_45 Bend	E_WATER_PLAN or E_SEWER_PLAN	EXISTING 45° BENDS FOR SEWER OR WATER
\ /	E_90 Bend	E_WATER_PLAN or E_SEWER_PLAN	EXISTING 90° BENDS FOR SEWER OR WATER
→	E_Anode	E_WATER_PLAN	EXISTING ANODES
	E_Catch Basin	E_SEWER_PLAN	EXISTING CATCH BASIN
X	E_Coupling	E_WATER_PLAN or E_SEWER_PLAN	EXISTING COUPLINGS FOR SEWER AND WATER
□	E_Cross	E_WATER_PLAN or E_SEWER_PLAN	EXISTING CROSS FOR SEWER AND WATER
▽	E_Curb Inlet	E_SEWER_PLAN	EXISTING CURB INLET
○	E_Curb Stop	E_WATER_PLAN	EXISTING CURB STOPS
◆	E_Hydrant	E_WATER_PLAN	EXISTING FIRE HYDRANT
○	E_Manhole	E_SEWER_PLAN	EXISTING MANHOLES
←	E_Plain_Flow_Arrow	E_SEWER_PLAN	EXISTING SEWER FLOW DIRECTION ARROW
J	E_Plug	E_WATER_PLAN or E_SEWER_PLAN	EXISTING PLUG ON SEWER OR WATER
○	E_Profile_Ellipse	E_WATER_PROFILE or E_SEWER_PROFILE	CROSSING SEWER OR WATER PIPE ON THE PROFILE
+	E_Profile_Hydrant Top	E_WATER_PROFILE	SECTION OF HYDRANT ABOVE THE FLANGE ON THE PROFILE
○	E_Profile_Pipe End	E_WATER_PROFILE or E_SEWER_PROFILE	PIPE CONTINUATION AT LIMITS OF PROFILE
X	E_Profile_Valve	E_WATER_PROFILE or E_SEWER_PROFILE	EXISTING VALVES IN PROFILE
△	E_Reducer	E_WATER_PLAN or E_SEWER_PLAN	EXISTING REDUCER FOR SEWER AND WATER
□	E_Tee	E_WATER_PLAN or E_SEWER_PLAN	EXISTING TEE FOR SEWER AND WATER
■	E_Thrust Block	E_WATER_PLAN or E_SEWER_PLAN	EXISTING THRUST BLOCK FOR SEWER AND WATER
⊗	E_Valve	E_WATER_PLAN or E_SEWER_PLAN	EXISTING VALVE FOR SEWER AND WATER

APPENDIX N (CON'T)

Symbol List Part 2

	E_Vertical Bend	E_WATER_PLAN or E_SEWER_PLAN	EXISTING VERTICAL BEND FOR SEWER AND WATER
	Geodetic Bench Mark	LEGAL	GEODETIC BENCH MARK LOCATION
	Guy Anchor	E_HYDRO_PLAN	UTILITY POLE SUPPORT ANCHOR
	Hydro Pole w_Street Light	E_HYDRO_PLAN	HYDRO POLE WITH STREET LIGHT ATTACHED
	Hydro Pole	E_HYDRO_PLAN	HYDRO POLE
	Iron Bar	LEGAL	PROPERTY BARS
	Mail Box	O	MAIL BOX
	MTS Pole	E_MTS_PLAN	MTS POLE
	P_Profile_Ellipse	P_WATER_PROFILE or P_SEWER_PROFILE	PROPOSED SEWER OR WATER CROSSING ON PROFILE
	P_Profile_Flow Arrow	P_SEWER_PROFILE	PROPOSED SEWER FLOW DIRECTION
	P_Profile_Hydrant Top	P_WATER_PROFILE	SECTION OF HYDRANT ABOVE THE FLANGE ON THE PROFILE
	P_Profile_Pipe End	P_WATER_PROFILE or P_SEWER_PROFILE	PIPE CONTINUATION AT LIMITS OF PROFILE
	P_Profile_Valve	P_WATER_PROFILE or P_SEWER_PROFILE	PROPOSED VALVE IN PROFILE
	Pole	O	UNKNOWN POLE
	Repair Marker	P_WATER_PLAN or P_SEWER_PLAN	REPAIR LOCATION MARKERS FOR SEWER OR WATER
	Street Light	E_HYDRO_PLAN	LAMP STANDARD (STREET LIGHT)
	Test Hole	TEST_HOLES	TEST HOLE LOCATIONS
	Traffic Signal	E_SIGNALS_PLAN	TRAFFIC SIGNALS
	Traffic Signals Box	E_SIGNALS_PLAN	TRAFFIC SIGNALS BOX
	TreeC	E_TREE_C	CONIFEROUS TREES
	TreeD	E_TREE_D	DECIDUOUS TREES

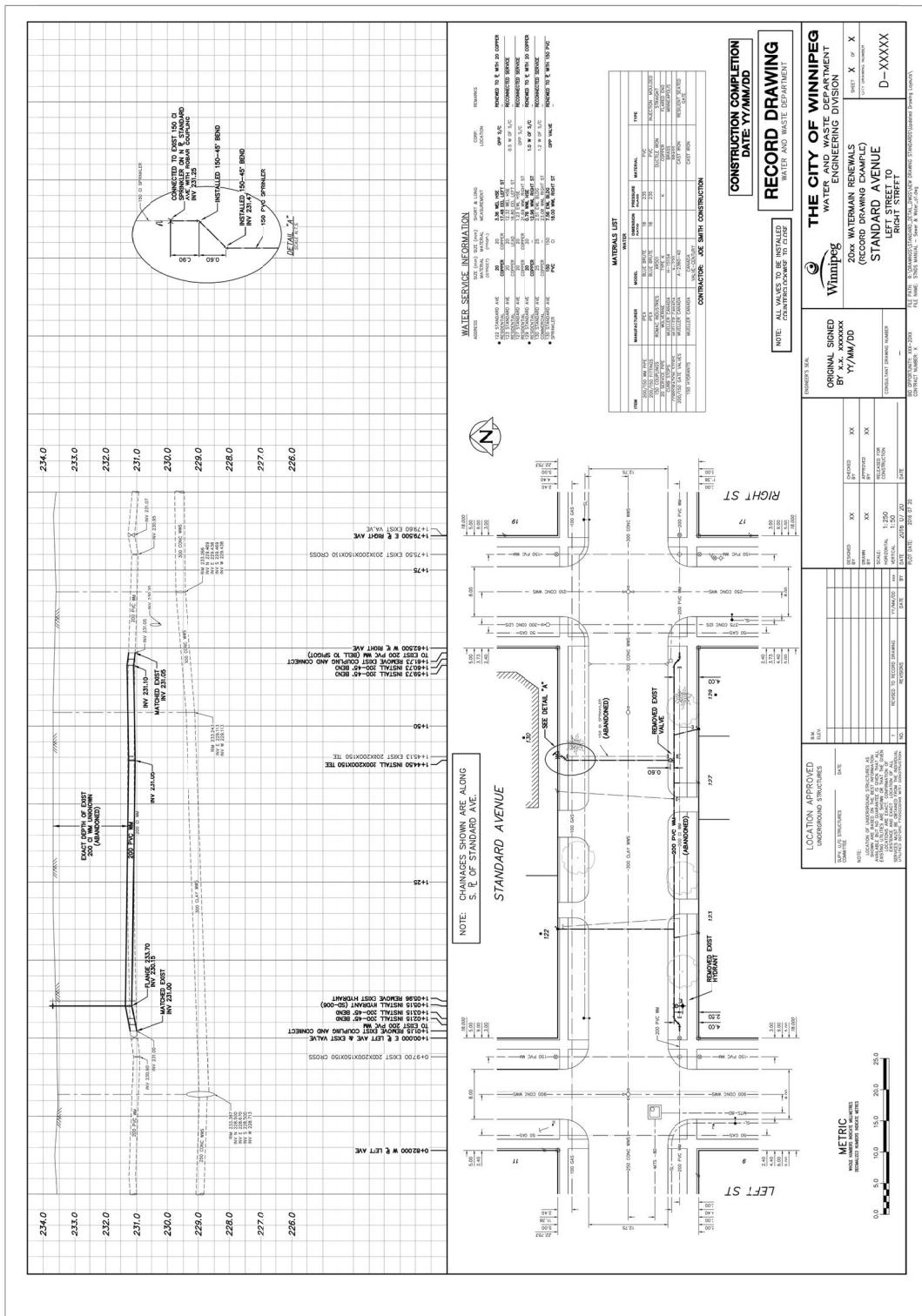
APPENDIX O

Plot Styles



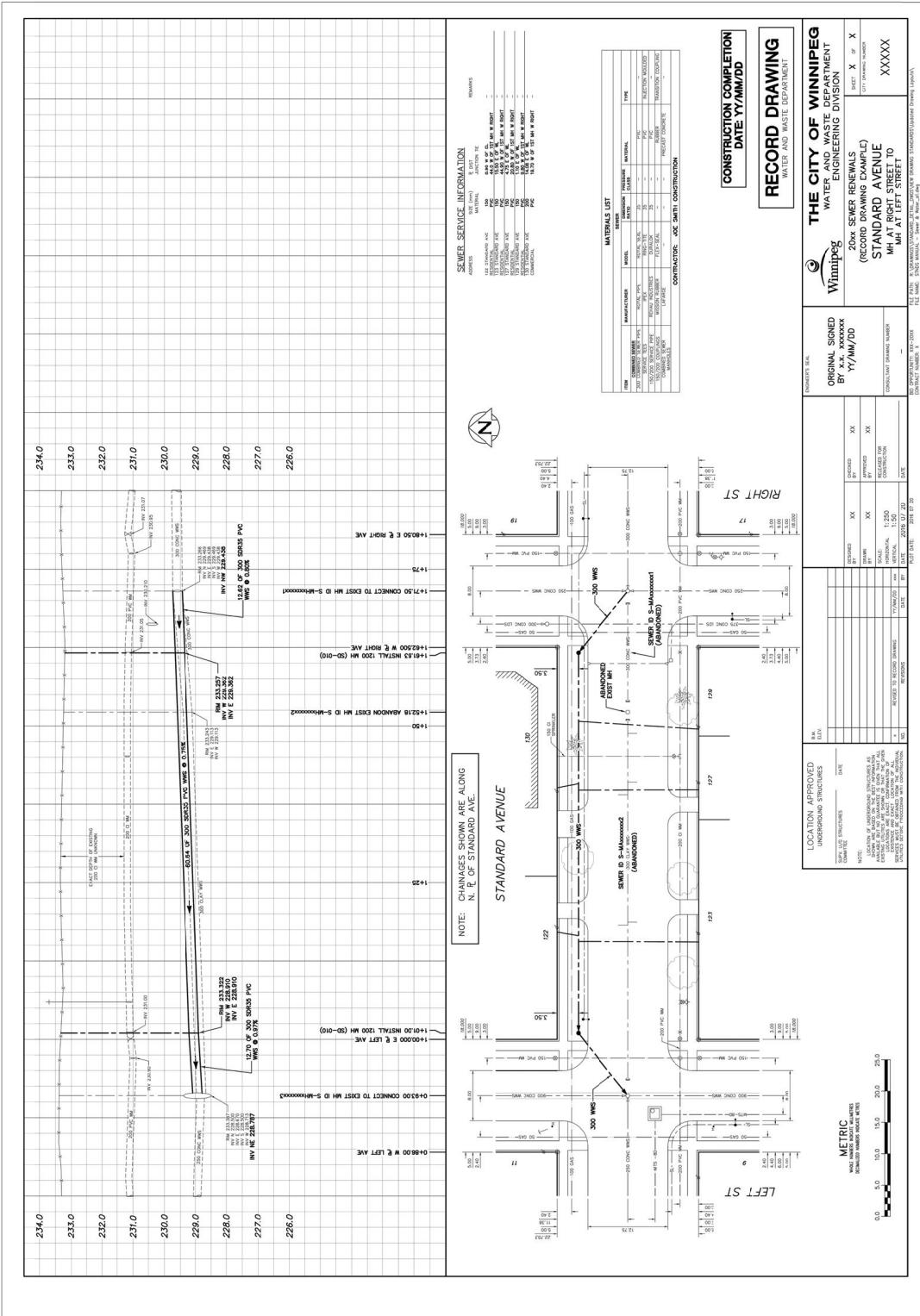
APPENDIX P

Oversize ISO A1 (594 mm x 841 mm) Plan/Profile Record Drawing - Water



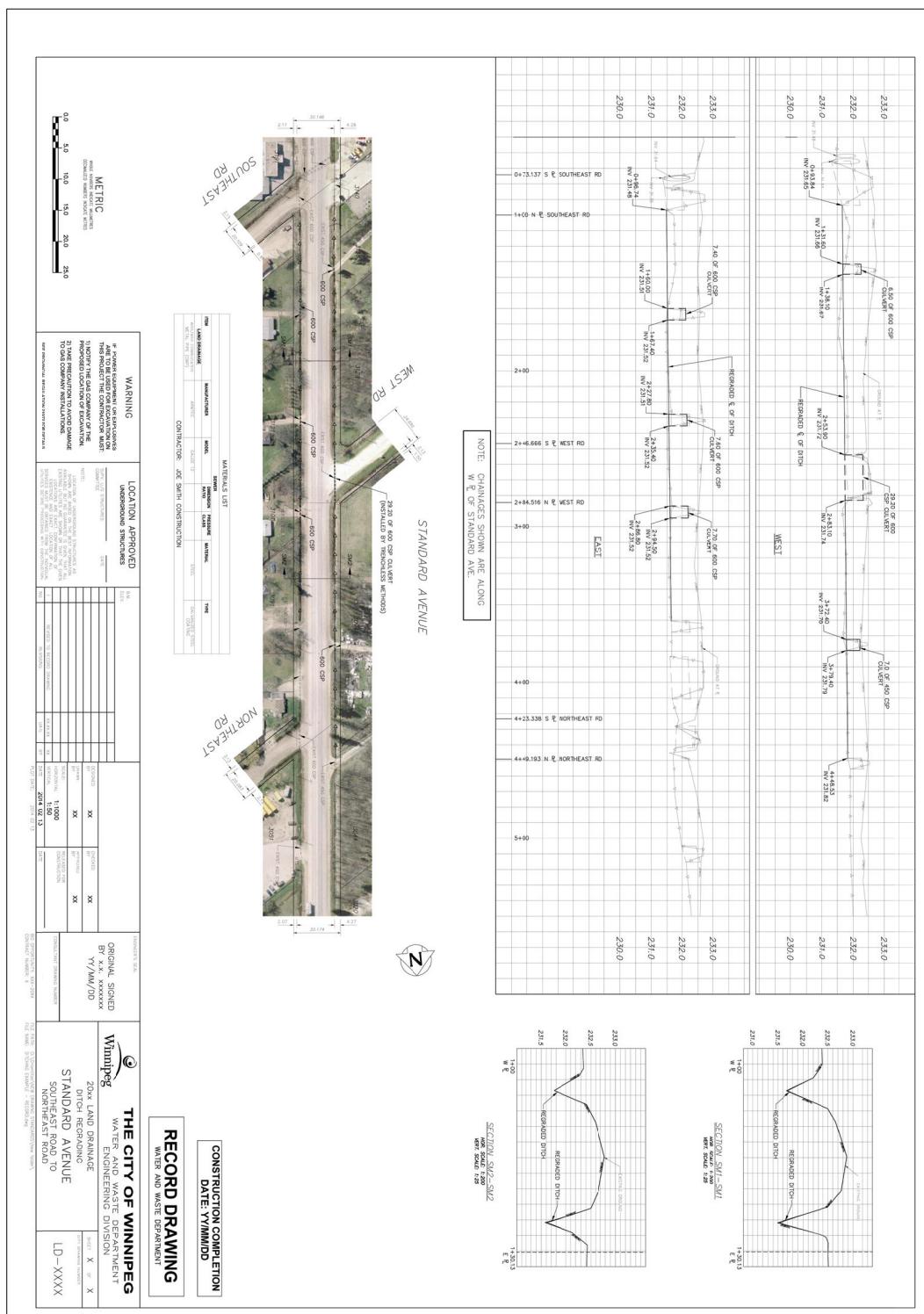
APPENDIX Q

Oversize ISO A1 (594 mm x 841 mm) Plan/Profile Record Drawing – Sewer



APPENDIX R

Oversize ISO A1 (594 mm x 841 mm) Plan/Profile Record Drawing – Open Channel (Ditching)

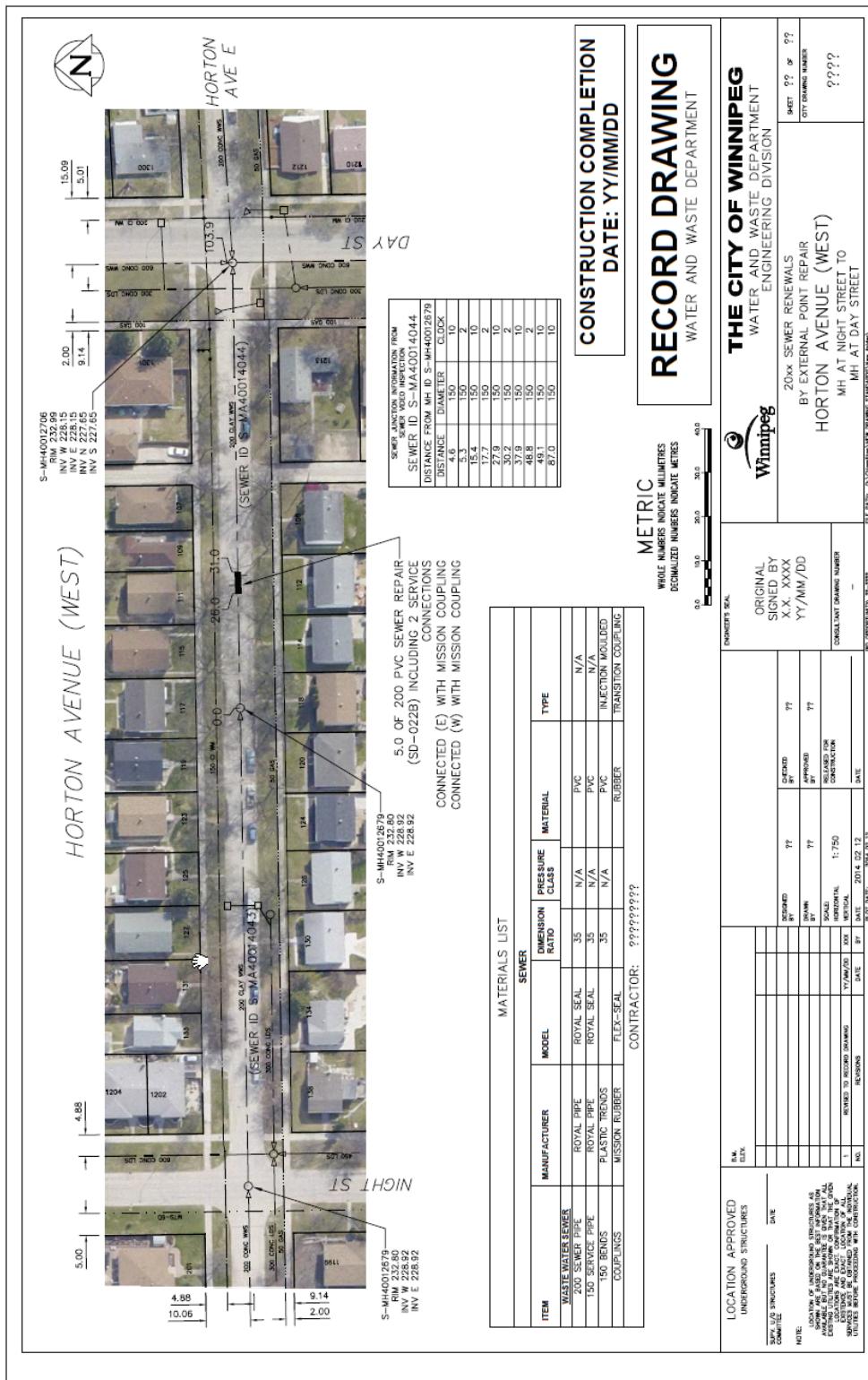


APPENDIX S

11" x 17" Sewer Renewal by CIPP Lining Record Drawing

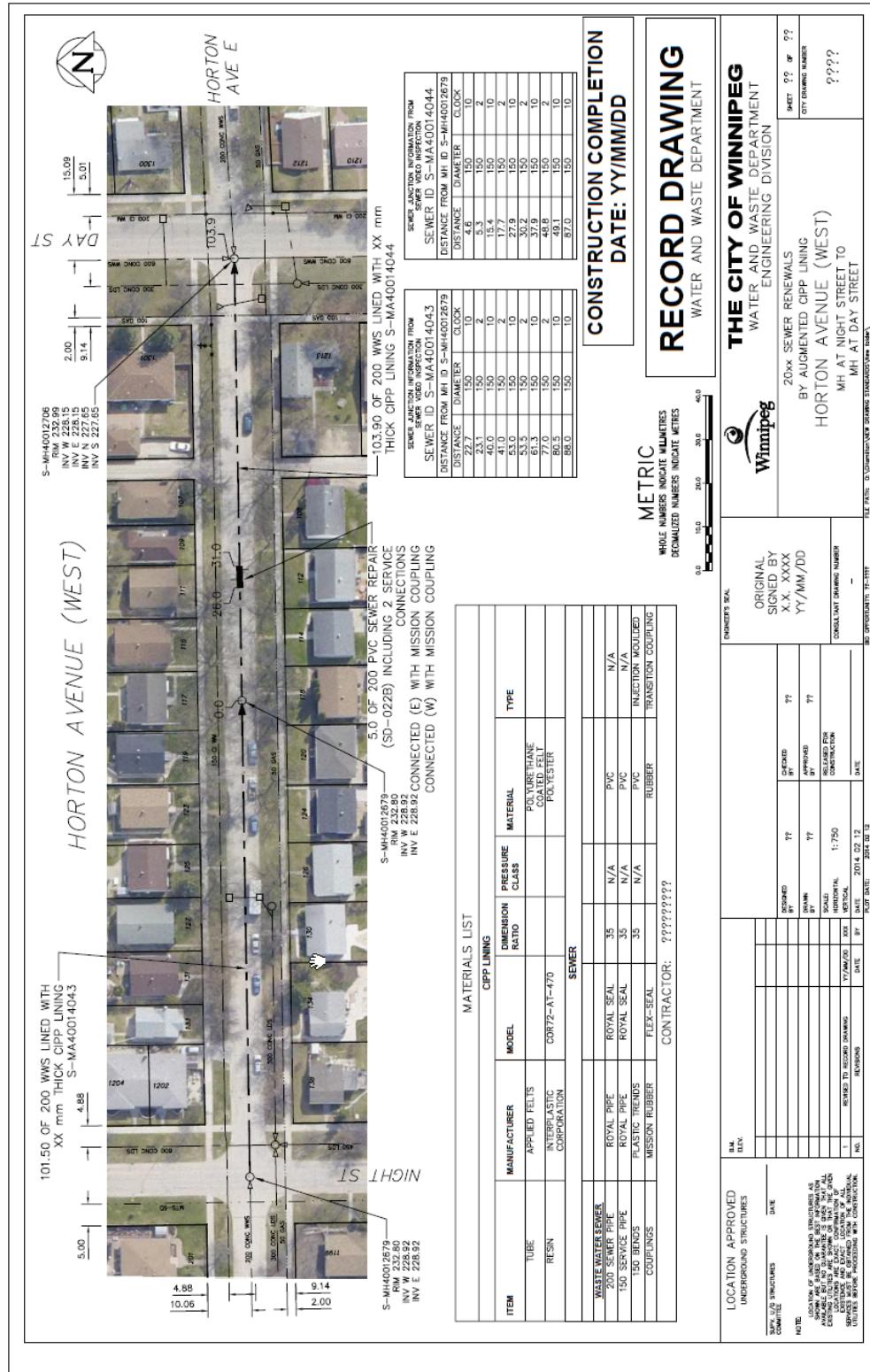
APPENDIX I

11" x 17" External Point Repair (EPR) and Trenchless Point Repair (TPR) Record Drawing



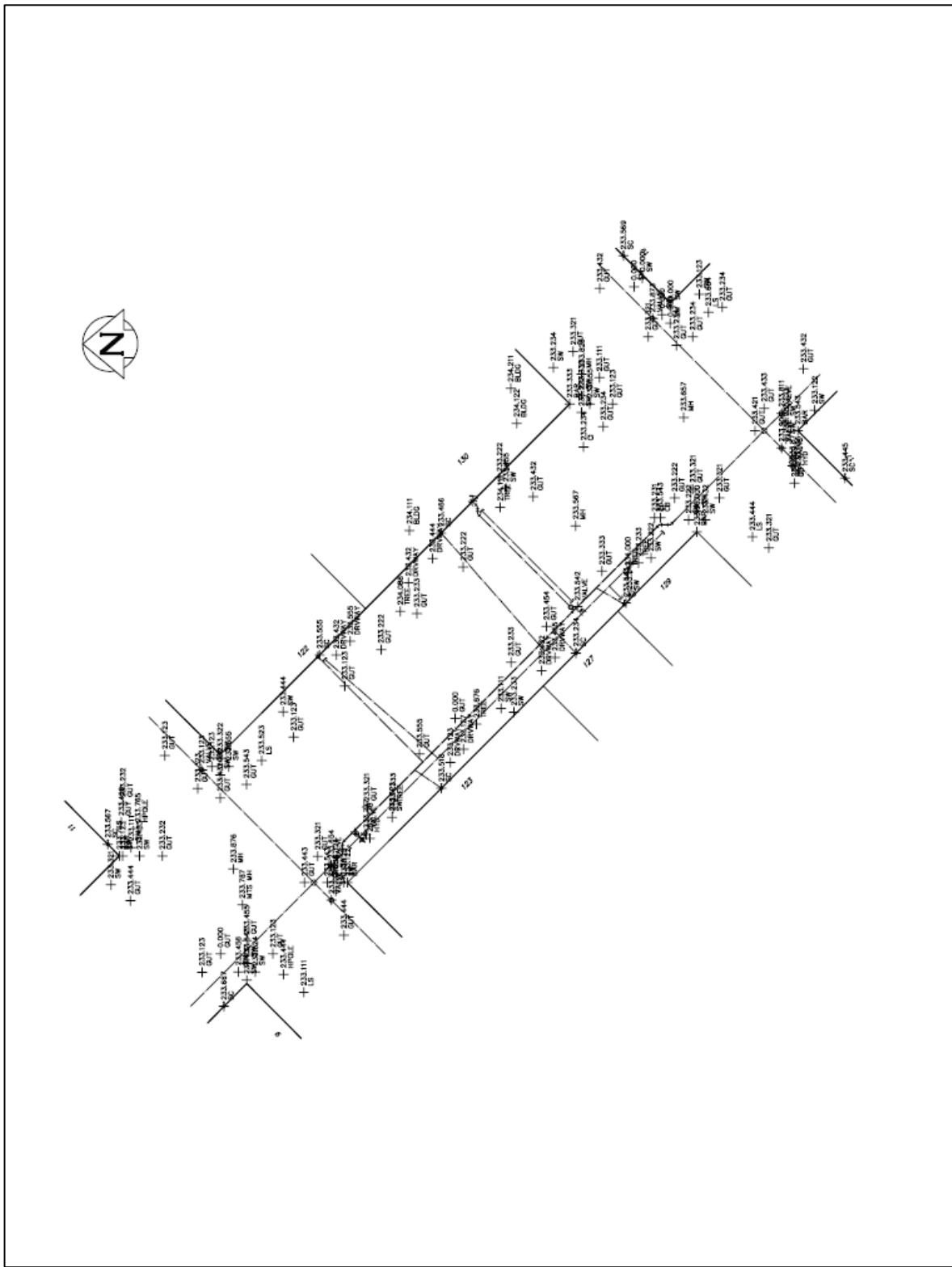
APPENDIX U

11" x 17" Augmented Lining Record Drawing



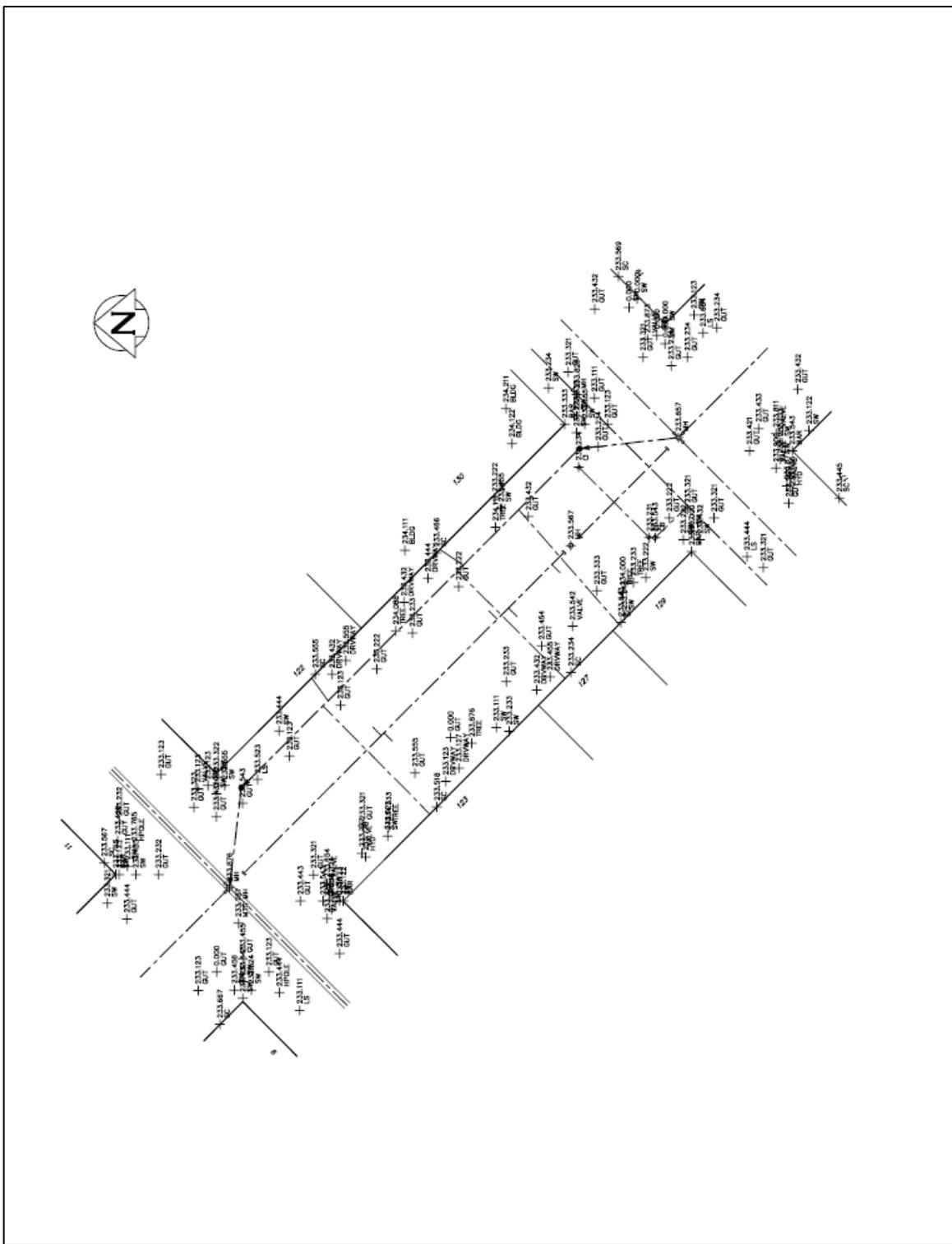
APPENDIX V

Oversize ISO A1 (594 mm x 841 mm) GIS Record Drawing – Water



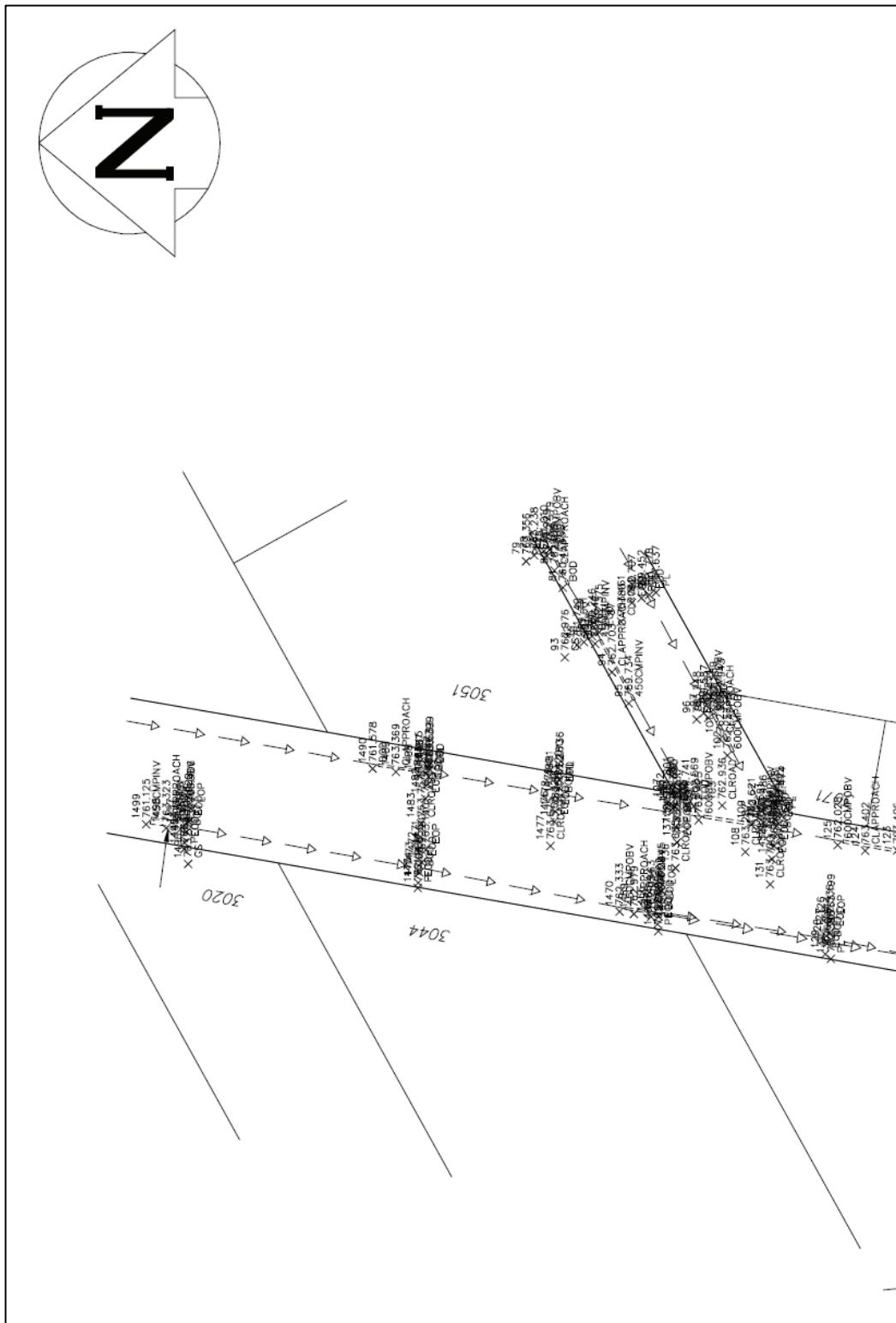
APPENDIX W

Oversize ISO A1 (594 mm x 841 mm) GIS Record Drawing - Sewer



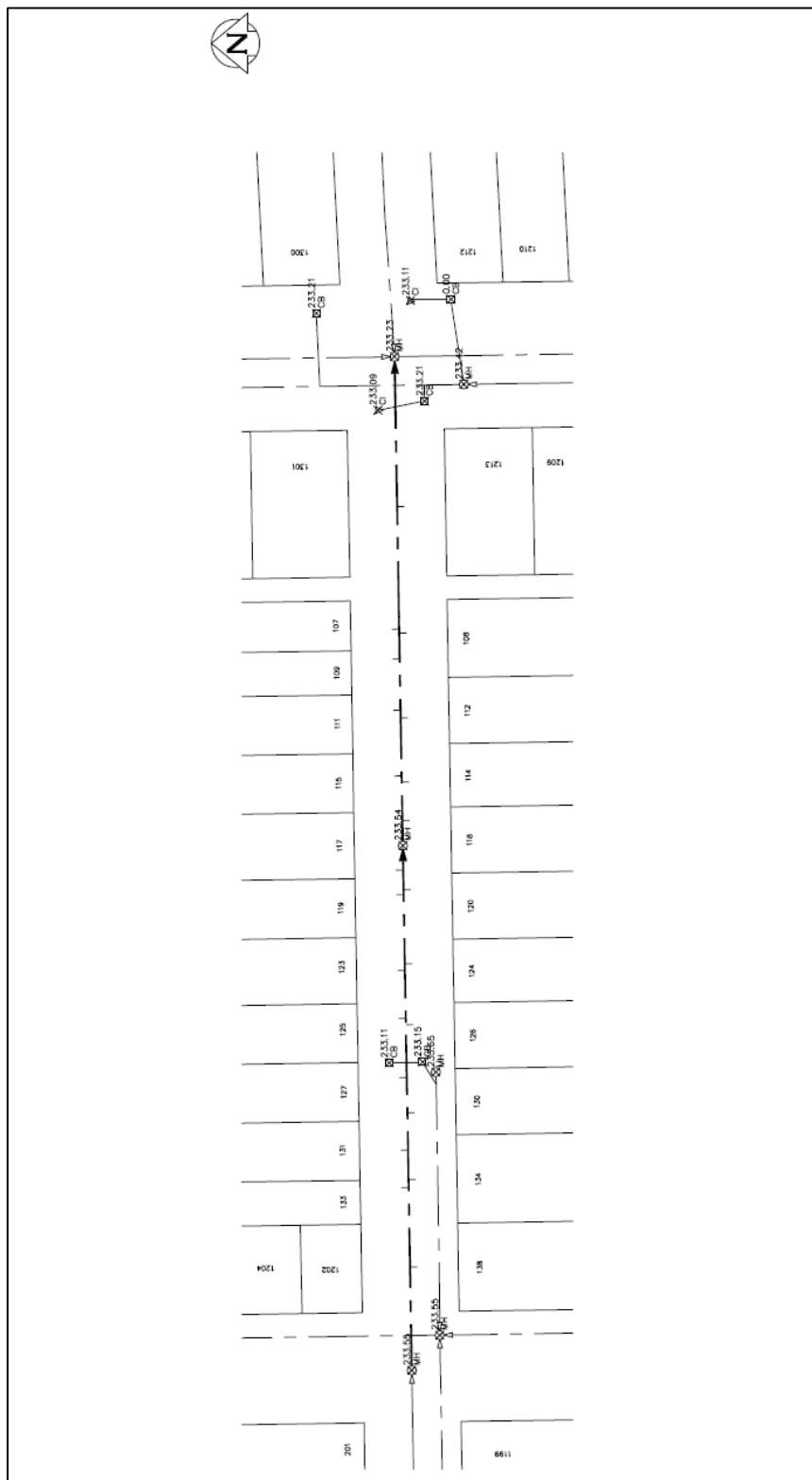
APPENDIX X

Oversize ISO A1 (594 mm x 841 mm) GIS Record Drawing – Open Channel (Ditching)



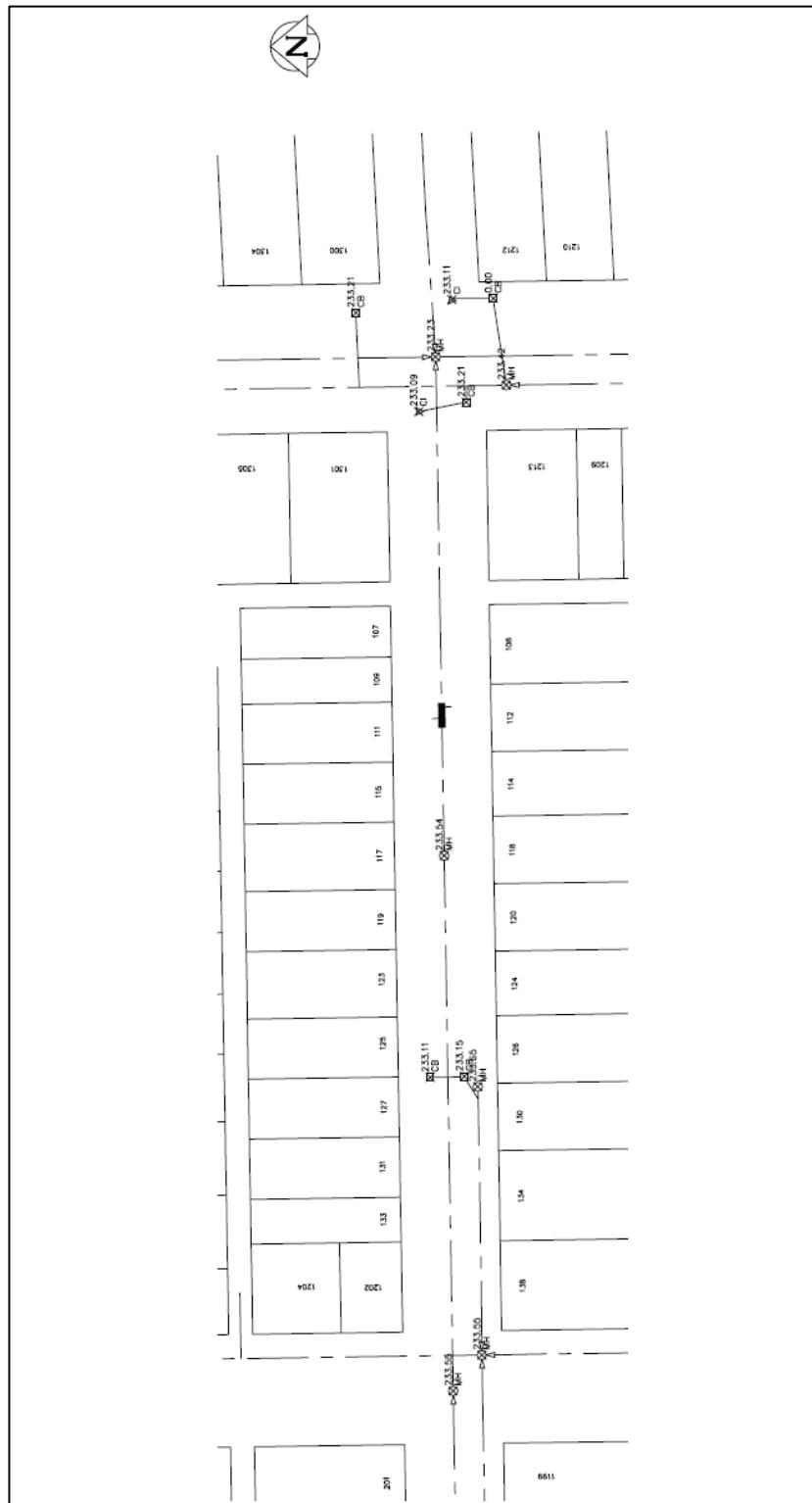
APPENDIX Y

11" x 17" Sewer Renewal by CIPP Lining GIS Record Drawing



APPENDIX Z

11" x 17" External Point Repair (EPR) and Trenchless Point Repair (TPR) GIS Record Drawing



APPENDIX AA

WWD STANDARD BASE DRAWING LAYERS

NAME	LINETYPE	COLOR	PLOT STYLE	PLOTTABLE	DESCRIPTION
0				YES	
DEFPOINTS				NO	USED FOR ENTITIES WHICH ARE NOT MEANT TO BE VISIBLE WHEN PLOTTED
DWG_BORDER	CONTINUOUS	BLUE	COLOR_5	YES	USED FOR THE DARK DRAWING BORDER (A1 & 11X17)
DWG_ENG_SEAL_SIGNED_BY	CONTINUOUS	CYAN	COLOR_4	YES	USED FOR "SIGNED BY" NOTE ON PDF'S
DWG_ENG_SEAL_STAMP	CONTINUOUS			YES	USED FOR ENGINEER SEAL (BLOCK)
DWG_GRID1	CONTINUOUS	DARK GREY	COLOR_8	YES	LIGHTER PROFILE LINES (A1)
DWG_GRID2	CONTINUOUS	RED	COLOR_1	YES	DARKER PROFILE LINES (A1)
DWG_NORTH_ARROW	CONTINUOUS	GREEN	COLOR_3	YES	USED FOR NORTH DIRECTIONAL ARROW
DWG_NOTES1	CONTINUOUS	RED	COLOR_1	YES	USED FOR TYPICAL DRAWING NOTES (TABLES, METRIC NOTE, CHAINAGE NOTE, ETC.)
DWG_NOTES2	CONTINUOUS	GREEN	COLOR_3	YES	USED FOR THICKER TYPICAL DRAWING NOTES (TITLES, BORDERS, ETC.)
DWG_PAPER	CONTINUOUS	RED	COLOR_1	YES	USED FOR OUTER LIGHTER COLOURED DRAWING BORDERS
DWG_PHOTO	CONTINUOUS	WHITE	COLOR_7	YES	USED FOR INSERTED IMAGE FRAMES
DWG_SCALEBAR	CONTINUOUS			YES	USED FOR DRAWING SCALEBAR (BLOCK)
DWG_TB_COW_LOGO	CONTINUOUS	RED	COLOR_1	YES	USED FOR THE CITY OF WINNIPEG LOGO
DWG_TB_LINES	CONTINUOUS	BLUE	COLOR_5	YES	USED FOR THICK TITLE BLOCK LINES
DWG_TB_LINES2	CONTINUOUS	YELLOW	COLOR_2	YES	USED FOR THIN TITLE BLOCK LINES
DWG_TB_TEXT1	CONTINUOUS	YELLOW	COLOR_2	YES	TITLE BLOCK TEXT WITH MEDIUM PEN WIEGHTS
DWG_TB_TEXT2	CONTINUOUS	RED	COLOR_1	YES	TITLE BLOCK TEXT WITH THIN PEN WIEGHTS
DWG_TB_TEXT3	CONTINUOUS	CYAN	COLOR_4	YES	TITLE BLOCK TEXT WITH THICK PEN WIEGHTS
E_BLDG_PLAN	CONTINUOUS	DARK GREY	COLOR_8	YES	USED FOR BUILDINGS OR HOUSES IN PLAN
E_BOLLARDS_PLAN	CONTINUOUS	RED	COLOR_1	YES	USED FOR EXISTING BOLLARDS IN PLAN
E_DITCHES_PLAN	DITCHLINE	RED	COLOR_1	YES	USED FOR ALL DITCHES IN PLAN
E_DYKE_PLAN	CONTINUOUS	RED	COLOR_1	YES	USED FOR DYKES & ABUTMENTS IN PLAN
E_FIBRE_OPTIC_PLAN	PHANTOM	RED	COLOR_1	YES	USE FOR ALL FIBRE OPTIC CABLE IN PLAN
E_GAS_ABAND_PLAN	GAS	DARK GREY	COLOR_8	YES	USED FOR ALL ABANDONED GAS IN PLAN
E_GAS_PLAN	GAS	RED	COLOR_1	YES	USED FOR ALL GAS IN PLAN (PIPE, VALVES, ETC.)
E_GRADE_DITCH_N_W_PROFILE	NDITCH	RED	COLOR_1	YES	USED TO SHOW NORTH OR WEST DITCHES IN PROFILE
E_GRADE_DITCH_S_E_PROFILE	SDITCH	RED	COLOR_1	YES	USED TO SHOW SOUTH OR EAST DITCHES IN PROFILE

WWD STANDARD BASE DRAWING LAYERS (CONTINUED)					
NAME	LINETYPE	COLOR	PLOT STYLE	PLOTTABLE	DESCRIPTION
E_GRADE_GROUND_PROFILE	GROUND	RED	COLOR_1	YES	USED TO SHOW EXISTING GROUND ABOVE PIPE IN PROFILE
E_GRADE_ROAD_PROFILE	CL	RED	COLOR_1	YES	USED TO SHOW EXISTING ROADS IN PROFILE
E_HATCH		DARK GREY	COLOR_8	YES	USED FOR ALL EXISTING HATCH PATTERNS
E_HYDRO_ABAND_PLAN	HYDRO1	DARK GREY	COLOR_8	YES	USED FOR ABANDONED HYDRO IN PLAN
E_HYDRO_PLAN	HYDRO1	RED	COLOR_1	YES	USED FOR HYDRO IN PLAN (CABLE, MH'S, CONDUITS, POLES, CABINETS, ETC.)
E_MTS_ABAND_PLAN	DIVIDE	DARK GREY	COLOR_8	YES	USED FOR ABANDONED MTS IN PLAN
E_MTS_PLAN	DIVIDE	RED	COLOR_1	YES	USED FOR MTS IN PLAN (CABLE, MH'S, CONDUITS, POLES, ETC.)
E_RD_CURB_PLAN	CONTINUOUS	RED	COLOR_1	YES	USED FOR PAVED ROADWAYS IN PLAN
E_RD_GRAVEL_PLAN	HIDDEN	RED	COLOR_1	YES	USED FOR GRAVEL ROADWAYS IN PLAN
E_RIVERLINE	CONTINUOUS	CYAN	COLOR_4	YES	USED FOR EXISTING EDGE OF RIVERS
E_SEWER_ABAND_PLAN	CENTER	DARK GREY	COLOR_8	YES	USED FOR ALL ABANDONED SEWER PIPES & BLOCKS IN PLAN
E_SEWER_PLAN	CENTER	RED	COLOR_1	YES	USED FOR ALL EXISTING SEWER PIPES & BLOCKS IN PLAN
E_SEWER_PROFILE	DASHED2	RED	COLOR_1	YES	USED FOR ALL EXISTING SEWER PIPES & BLOCKS IN PROFILE
E_SEWER_SERVICES_PLAN	CENTER	RED	COLOR_1	YES	USED FOR EXISTING SEWER SERVICES IN PLAN
E_SHOLDER_PLAN	CONTINUOUS	RED	COLOR_1	YES	USED FOR ROAD SHOULDERS IN PLAN
E_SIDEWALK_PLAN	CONTINUOUS	RED	COLOR_1	YES	USED FOR EXISTING SIDEWALKS, PATHS, OR OTHER WALKWAYS
E_SIGNALS_ABAND_PLAN	DASHDOT	DARK GREY	COLOR_8	YES	USED FOR ABANDONED TRAFFIC SIGNALS IN PLAN
E_SIGNALS_PLAN	DASHDOT	RED	COLOR_1	YES	USED FOR TRAFFIC SIGNALS IN PLAN (CABLE, TS STANDARDS, MH'S, ETC.)
E_STRUCTURE_PLAN	CONTINUOUS	RED	COLOR_1	YES	USED FOR EXISTING STRUCTURES (CHAMBERS, ETC.) IN PLAN
E_STRUCTURE_PROFILE	CONTINUOUS	RED	COLOR_1	YES	USED FOR EXISTING STRUCTURES (CHAMBERS, ETC.) IN PROFILE
E_TREE_C	CONTINUOUS	DARK GREY	COLOR_8	YES	USED FOR CONIFEROUS TREE BLOCKS
E_TREE_D	CONTINUOUS	DARK GREY	COLOR_8	YES	USED FOR DECIDUOUS TREE BLOCKS
E_WATER_ABAND_PLAN	WATER	DARK GREY	COLOR_8	YES	USED FOR ALL ABANDONED WATER PIPES & BLOCKS IN PLAN
E_WATER_PLAN	WATER	RED	COLOR_1	YES	USED FOR ALL EXISTING WATER PIPES & BLOCKS IN PLAN
E_WATER_PROFILE	DASHED2	RED	COLOR_1	YES	USED FOR ALL EXISTING WATER PIPES & BLOCKS IN PROFILE
E_WATER_SERVICES_PLAN	WATER	RED	COLOR_1	YES	USED FOR EXISTING WATER SERVICES IN PLAN
EASEMENTS	DASHED	GREEN	COLOR_3	YES	USED FOR INDICATING EASEMENTS
LEGAL	CONTINUOUS	CYAN	COLOR_4	YES	USED FOR ALL LEGAL LINES BESIDES LOTLINES

WWD STANDARD BASE DRAWING LAYERS (CONTINUED)					
NAME	LINETYPE	COLOR	PLOT STYLE	PLOTTABLE	DESCRIPTION
LOTLINES	CONTINUOUS	GREEN	COLOR_3	YES	USED FOR LOTLINES
P_HATCH		YELLOW	COLOR_2	YES	USED FOR ALL PROPOSED HATCH PATTERNS
P_SEWER_PROFILE	CONTINUOUS	BLUE	COLOR_5	YES	USED FOR ALL PROPOSED SEWER FEATURES IN PROFILE. MH'S IN PROFILE TO USE 'CENTER' LINETYPE
P_STRUCTURE_PROFILE	CONTINUOUS	CYAN	COLOR_4	YES	USED FOR ALL PROPOSED STRUCTURES IN PROFILE
P_WATER_PROFILE	CONTINUOUS	BLUE	COLOR_5	YES	USED FOR ALL PROPOSED WATER FEATURES IN PROFILE
TEST_HOLES	CONTINUOUS	YELLOW	COLOR_2	YES	USED FOR TEST HOLE LOCATIONS IN PLAN AND PROFILE
TEST_HOLES_HATCH	CONTINUOUS	LIGHT GREY	COLOR_9	YES	USED FOR TEST HOLE HATCHES IN PROFILE
TEXT_ADDRESS		GREEN	COLOR_3	YES	USED FOR PROPERTY ADDRESSES
TEXT_BLUE		BLUE	COLOR_5	YES	USED FOR TEXT REQUIRING THE THICKEST PEN WIEGHT
TEXT_CYAN		CYAN	COLOR_4	YES	USED FOR TEXT REQUIRING A THICK PEN WIEGHT. TYPICAL FOR PROPOSED NOTES IN PLAN & PROFILE
TEXT_GREEN		GREEN	COLOR_3	YES	USED FOR TEXT REQUIRING A MEDIUM PEN WIEGHT. TYPICAL FOR PROPOSED LEADERS & DIMENSIONS IN PLAN & PROFILE
TEXT_RED		RED	COLOR_1	YES	USED FOR TEXT WITH THIN PEN WIEGHTS. TYPICAL FOR EXISTING PIPE INFORMATION IN PLAN & PROFILE
TEXT_SEWER		WHITE	COLOR_7	YES	USED FOR TEXT RELATED TO SEWER INCLUDED IN GEOMEDIA EXPORT
TEXT_STREET NAMES		CYAN	COLOR_4	YES	USED FOR STREET NAMES IN PLAN
TEXT_WATER		WHITE	COLOR_7	YES	USED FOR TEXT RELATED TO WATER INCLUDED IN GEOMEDIA EXPORT
TEXT_YELLOW		YELLOW	COLOR_2	YES	USED FOR TEXT WITH THIN PEN WIEGHTS
VPORT	CONTINUOUS	MAGENTA	COLOR_6	NO	USED FOR ALL VIEWPORT WINDOWS
ZPTMISC	CONTINUOUS			YES	USED FOR ALL SURVEY POINTS OTHER THAN SEWER OR WATER
ZPTSEWER	CONTINUOUS			YES	USED FOR ALL SURVEY POINTS RELATED TO SEWER WORKS
ZPTWATER	CONTINUOUS			YES	USED FOR ALL SURVEY POINTS RELATED TO WATER WORKS

WWD PROPOSED DRAWING LAYERS (AG)

NAME	LINETYPE	FEATURE TYPE	PLOT STYLE	PLOTTABLE	DESCRIPTION
AG_AQ_JOINT_LOCATION	CONTINUOUS	POINT	COLOR_7 (WHITE)	YES	USED AT JOINT LOCATIONS ON AN AQUEDUCT
AG_AQ_PRESS_MANHOLE	CONTINUOUS	BLOCK	COLOR_7 (WHITE)	YES	USED AT PRESSURE MANHOLES ON AN AQUEDUCT
AG_AQ_UNDERDRAIN_PIPE	CONTINUOUS	LINEAR	COLOR_7 (WHITE)	YES	USED FOR UNDERDRAIN PIPE ALONG AN AQUEDUCT
AG_BLOCK_WIPEOUTS	CONTINUOUS	LINEAR	COLOR_6 (MAGENTA)	YES	USED IN BLOCKS FOR WIPEOUTS OR MASKS
AG_BLOCK_ENTITIES	CONTINUOUS	LINEAR	COLOR_3 (GREEN)	YES	USED FOR ALL ENTITIES WITHIN A BLOCK REPRESENTING A PROPOSED OBJECT
AG_BLOCK_ENTITIES_E	CONTINUOUS	LINEAR	COLOR_1 (RED)	YES	USED FOR ALL ENTITIES WITHIN A BLOCK REPRESENTING AN EXISTING OBJECT
AG_BLOCK_MASKING	CONTINUOUS	LINEAR	COLOR_6 (MAGENTA)	YES	USED IN BLOCKS FOR WIPEOUTS OR MASKS
AG_CATHODIC_PROTECTION_MONITORING_SYSTEM	CONTINUOUS	BLOCK	COLOR_3 (GREEN)	YES	USED FOR LOCATIONS OF CATHODIC PROTECTION MONITORING SYSTEM LOCATIONS
AG_OC_CHANNEL_JUNCTION	CONTINUOUS	POINT	COLOR_7 (WHITE)	YES	USED AT CHANGES OF PROPOSED DITCH GRADE AND/OR ALIGNMENT. ALSO AT BEGINNING & END OF A DITCH
AG_OC_CHANNEL_LINE	DITCHLINE	LINEAR	COLOR_7 (WHITE)	YES	USED AT THE CENTERLINE OF A PROPOSED DITCH OR CULVERT
AG_OC_INLET_OUTLET	CONTINUOUS	POINT	COLOR_7 (WHITE)	YES	USED AT THE TERMINATION OF CULVERT ENDS
AG_OC_INLET_OUTLET_CB	CONTINUOUS	BLOCK	COLOR_3 (GREEN)	YES	USED FOR PROPOSED CB'S WHICH DRAIN DITCHES INTO A CLOSED SYSTEM
AG_OC_INLET_OUTLET_E_CB	CONTINUOUS	BLOCK	COLOR_1 (RED)	YES	USED FOR EXISTING CB'S WHICH DRAIN A DITCH INTO A CLOSED SYSTEM
AG_OC_INLET_OUTLET_E_MH	CONTINUOUS	BLOCK	COLOR_1 (RED)	YES	USED FOR EXISTING MH'S WHICH DRAIN A DITCH INTO A CLOSED SYSTEM
AG_OC_INLET_OUTLET_MH	CONTINUOUS	BLOCK	COLOR_3 (GREEN)	YES	USED FOR PROPOSED MH'S WHICH DRAIN DITCHES INTO A CLOSED SYSTEM
AG_OC_XSECTION_POINT	CONTINUOUS	POINT	COLOR_7 (WHITE)	YES	USED FOR POINTS PROVIDING NORTHING, EASTING, AND ELEVATION ALONG A X-SECTION.
AG_SEWER_BEND	CONTINUOUS	BLOCK	COLOR_3 (GREEN)	YES	USED AT PROPOSED SEWER BENDS
AG_SEWER_CB	CONTINUOUS	BLOCK	COLOR_3 (GREEN)	YES	USED AT PROPOSED CB'S (NOT DRAINING DITCHES)
AG_SEWER_CB_LEAD	CENTER	LINEAR	COLOR_5 (BLUE)	YES	USED FOR CB LEADS (PIPE BETWEEN CB AND CONNECTION TO SEWER)
AG_SEWER_CB_TEE	CONTINUOUS	BLOCK	COLOR_3 (GREEN)	YES	USED FOR PROPOSED CB TEE'S (CONNECTION AT SEWER END OF CB LEAD)
AG_SEWER_CHAMBER	CONTINUOUS	LINEAR	COLOR_5 (BLUE)	YES	USED FOR SEWER CHAMBER OUTLINES
AG_SEWER_CI	CONTINUOUS	BLOCK	COLOR_3 (GREEN)	YES	USED FOR PROPOSED CURB INLETS (CI)
AG_SEWER_CIPP_LINER	CENTER	LINEAR	COLOR_5 (BLUE)	YES	USED FOR LENGTHS OF EXISTING SEWER WHICH ARE TO BE LINED
AG_SEWER_CONNECTION	CONTINUOUS	POINT	COLOR_7 (WHITE)	YES	USED WHERE A SEWER SERVICE CONNECTS WITH A SEWER
AG_SEWER_COUPLER	CONTINUOUS	BLOCK	COLOR_3 (GREEN)	YES	USED FOR SEWER COUPLINGS
AG_SEWER_END	CONTINUOUS	POINT	COLOR_7 (WHITE)	YES	USED AT THE END OF A SEWER PIPE (END OF OUTFALL PIPE, ETC.)
AG_SEWER_EXIST_CB	CONTINUOUS	BLOCK	COLOR_1 (RED)	YES	USED ON AN EXISTING CB WHICH A PROPOSED PIPE IS TO BE CONNECTED
AG_SEWER_EXIST_CI	CONTINUOUS	BLOCK	COLOR_1 (RED)	YES	USED ON AN EXISTING CI WHICH A PROPOSED PIPE IS TO BE CONNECTED

WWD PROPOSED DRAWING LAYERS (AG) - CONTINUED

NAME	LINETYPE	FEATURE TYPE	PLOT STYLE	PLOTTABLE	DESCRIPTION
AG_SEWER_EXIST_MANHOLE	CONTINUOUS	BLOCK	COLOR_1 (RED)	YES	USED ON AN EXISTING MH WHICH A PROPOSED PIPE IS TO BE CONNECTED
AG_SEWER_GATEVALVE	CONTINUOUS	BLOCK	COLOR_3 (GREEN)	YES	USED FOR PROPOSED GATE VALVES (SLUICE,GATE)
AG_SEWER_MAIN	CENTER	LINEAR	COLOR_5 (BLUE)	YES	USED FOR PROPOSED SEWER MAINS
AG_SEWER_MAIN_EXIST_LINEDIR	CONTINUOUS	BLOCK	COLOR_1 (RED)	YES	USED FOR FLOW DIRECTION OF EXISTING SEWERS
AG_SEWER_MAIN_LINEDIR	CONTINUOUS	BLOCK	COLOR_3 (GREEN)	YES	USED FOR FLOW DIRECTION OF PROPOSED SEWERS
AG_SEWER_MANHOLE	CONTINUOUS	BLOCK	COLOR_3 (GREEN)	YES	USED FOR PROPOSED MH'S
AG_SEWER_PLUG	CONTINUOUS	BLOCK	COLOR_3 (GREEN)	YES	USED FOR PROPOSED SEWER PLUGS
AG_SEWER_REDUCER	CONTINUOUS	BLOCK	COLOR_3 (GREEN)	YES	USED FOR PROPOSED SEWER REDUCERS
AG_SEWER_SERV_PL_CONNECTION	CONTINUOUS	POINT	COLOR_7 (WHITE)	YES	USED ON THE POINT WHERE A PROPOSED SEWER SERVICE CONNECTS TO THE EXISTING SEWER SERVICE AT THE PROPERTY LINE
AG_SEWER_SERVICE_PIPE	CENTER	LINEAR	COLOR_4 (CYAN)	YES	USED FOR PROPOSED SEWER SERVICES
AG_SEWER_SRB	CONTINUOUS	LINEAR	COLOR_3 (GREEN)	YES	USED FOR PROPOSED STORM RETENTION BASIN OUTLINES
AG_SEWER_TEE	CONTINUOUS	BLOCK	COLOR_3 (GREEN)	YES	USED FOR PROPOSED TEE'S ON SEWERS (NOT CB TEE'S)
AG_SEWER_THRUSTBLOCK	CENTER	BLOCK	COLOR_3 (GREEN)	YES	USED FOR PROPOSED SEWER THRUST BLOCKS
AG_SEWER_VALVE	CONTINUOUS	BLOCK	COLOR_3 (GREEN)	YES	USED FOR PROPOSED SEWER VALVES
AG_SEWER_Y	CONTINUOUS	BLOCK	COLOR_3 (GREEN)	YES	USED FOR PROPOSED SEWER Y'S
AG_SEWER_YARD_DRAIN_INLET	CONTINUOUS	BLOCK	COLOR_3 (GREEN)	YES	USED FOR PROPOSED YARD DRAIN INLETS
AG_WATER_ANODE	CONTINUOUS	BLOCK	COLOR_3 (GREEN)	YES	USED FOR PROPOSED ANODES ON WATERMAINS
AG_WATER_BEND	CONTINUOUS	BLOCK	COLOR_3 (GREEN)	YES	USED FOR PROPOSED SEWER BENDS
AG_WATER_BLOW_OFF_VALVE	CONTINUOUS	BLOCK	COLOR_3 (GREEN)	YES	USED FOR PROPOSED BLOW OFF VALVES
AG_WATER_CASEMENT	CONTINUOUS	LINEAR	COLOR_4 (CYAN)	YES	USED FOR PROPOSED CASEMENT PIPE
AG_WATER_CATHODIC PROTECTION	CONTINUOUS	LINEAR	COLOR_5 (BLUE)	YES	USED FOR A LENGTH OF EXISTING WATERMAIN WHICH IS TO BE CATHODICALLY PROTECTED
AG_WATER_CONNECT	CONTINUOUS	POINT	COLOR_7 (WHITE)	YES	USED AT PROPOSED CONNECTIONS TO EXISTING WATERMAINS WITHOUT COUPLING (BELL TO SPIGOT, ETC.)
AG_WATER_CONNECTION	CONTINUOUS	POINT	COLOR_7 (WHITE)	YES	USED AT PROPOSED WATER SERVICE CONNECTIONS AT A WATERMAIN (CORPORATION STOP)
AG_WATER_COUPLER	CONTINUOUS	BLOCK	COLOR_3 (GREEN)	YES	USED FOR PROPOSED COUPLINGS
AG_WATER_CROSS	CONTINUOUS	BLOCK	COLOR_3 (GREEN)	YES	USED FOR PROPOSED CROSSES
AG_WATER_CURB_STOP	CONTINUOUS	BLOCK	COLOR_3 (GREEN)	YES	USED FOR PROPOSED CURB STOPS
AG_WATER_DRAIN_VALVE	CONTINUOUS	BLOCK	COLOR_3 (GREEN)	YES	USED FOR DRAIN VALVES AT CHAMBERS (VALVE PITS, ETC.)
AG_WATER_EXIST_HYDRANT	CONTINUOUS	BLOCK	COLOR_1 (RED)	YES	USED FOR EXISTING HYDRANTS WHICH A PROPOSED PIPE IS TO BE CONNECTED

WWD PROPOSED DRAWING LAYERS (AG) - CONTINUED

NAME	LINETYPE	FEATURE TYPE	PLOT STYLE	PLOTTABLE	DESCRIPTION
AG_WATER_EXIST_VALVE	CONTINUOUS	BLOCK	COLOR_1 (RED)	YES	USED FOR EXISTING VALVES WHICH A PROPOSED PIPE IS TO BE CONNECTED
AG_WATER_HYDRANT	CONTINUOS	BLOCK	COLOR_3 (GREEN)	YES	USED FOR PROPOSED HYDRANTS
AG_WATER_HYDRANT_BRANCH	WATER	LINEAR	COLOR_4 (CYAN)	YES	USED FOR ALL PIPE WITHIN A PROPOSED HYDRANT ASSEMBLY
AG_WATER_HYDRANT_TEE	CONTINUOUS	BLOCK	COLOR_3 (GREEN)	YES	USED FOR THE TEE OF A PROPOSED HYDRANT ASSEMBLY
AG_WATER_HYDRANT_VALVE	CONTINUOUS	BLOCK	COLOR_3 (GREEN)	YES	USED FOR THE VALVE ON A PROPOSED HYDRANT ASSEMBLY
AG_WATER_MAIN	WATER	LINEAR	COLOR_5 (BLUE)	YES	USED FOR PROPOSED WATERMAINS
AG_WATER_PLUG	CONTINUOUS	BLOCK	COLOR_3 (GREEN)	YES	USED FOR PROPOSED WATERMAIN PLUGS
AG_WATER_REDUCER	CONTINUOUS	BLOCK	COLOR_3 (GREEN)	YES	USED FOR PROPOSED WATERMAIN REDUCERS
AG_WATER_RELEASE_AIRVALVE	CONTINUOUS	BLOCK	COLOR_3 (GREEN)	YES	USED FOR PROPOSED AIR RELEASE VALVES
AG_WATER_SERVICE_CONNECTION	CONTINUOUS	POINT	COLOR_7 (WHITE)	YES	USED AT THE LOCATION WHERE A PROPOSED WATER SERVICE PIPE CONNECTS TO AN EXISTING SERVICE PIPE (RECONNECTION)
AG_WATER_SERVICE_PIPE	WATER	LINEAR	COLOR_4 (CYAN)	YES	USED FOR PROPOSED WATER SERVICE PIPES
AG_WATER_SERVICE_Y	CONTINUOUS	BLOCK	COLOR_3 (GREEN)	YES	USED FOR PROPOSED Y'S ON A PROPOSED WATER SERVICE
AG_WATER_TEE	CONTINUOUS	BLOCK	COLOR_3 (GREEN)	YES	USED FOR PROPOSED TEE'S (NOT HYDRANT TEE'S)
AG_WATER_THRUSTBLOCK	CONTINUOUS	BLOCK	COLOR_3 (GREEN)	YES	USED FOR PROPOSED WATERMAIN THRUSTBLOCKS
AG_WATER_VALVE	CONTINUOUS	BLOCK	COLOR_3 (GREEN)	YES	USED FOR PROPOSED WATERMAIN VALVES
AG_WATER_VALVE_PIT	CONTINUOUS	LINEAR	COLOR_3 (GREEN)	YES	USED FOR OUTLINE OF PROPOSED VALVE PITS