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Michael L. Montandon
Council Members
William E. Robinson
Stephanie S. Smith
Shari Buck
Robert L. Eliason



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Gregory E. Rose

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Utility Digital Plan Submittal Requirements

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Utilities Digital Plan Submittal Requirements

Introduction: Digital Data Submission Standards

The City of North Las Vegas has adopted geographical information system (GIS) technologies to store, manage, and maintain geographic / spatially-related data. Likewise, the majority of the civil engineering community has evolved to the point where the predominating design environment is computer-aided design and drafting (CAD). It is the goal of the City to use GIS and CAD technologies to expedite the design and review processes within the administration, by developing standards and procedures for integration of digital engineering CAD drawings into the GIS environment, maintaining the integrity and positional accuracy of the data.

Digital data submittals are required for both the approved engineering / improvement plans and Hydraulic Network Analyses. The CNLV Digital Submittal Standards are based on the American National Standards Institute (ANSI).

Digital Utility Plan Submittal Summary

Digital submittals shall conform to the following:

- 1) Include one comprehensive Utility plan in a *.dwg format in model space showing all proposed project utilities and all existing and proposed easements on one sheet including both on-sites and off-sites.
- 2) Ensure that the Utility Plan is inserted into the correct spatial location of the parcel data contained in Appendix Two (State Plane Projection).
 - A) The proposed comprehensive utility plan project needs to be moved and rotated to the street centerline or sectional corner coordinates that will generally geo-reference the consultant's work and keep all distances in ground values.
 - B) The City requires the POC of the proposed project to be based upon the City's current GIS data for existing water and sewer data. This data is not required to be included in the digital submittal. The point of commencement of the proposed project needs to be clearly indicated in the digital submittal by the labeling of "POC".
 - C) Note that no other plans or paper space sheets in the proposed project are required to be moved to the State Plane Projection other than the comprehensive utility plan.

- 3) Water, Sewer, and Storm Drain layers in the AutoCAD drawing shall be per ANSI standards as indicated in Appendix One. Each layer shall clearly indicate the pipe size and/or the type of appurtenance.
- 4) Include a plan set layout (Key Map Overlay) of all Utility sheets in the encompassing project per Appendix Two, Figure 3.
- 5) All proposed and existing easements and right-of-ways are to be included on their own individual AutoCAD layer. All documents and records of survey are required to be provided in a pdf format on the submittal CD.

Note: The main purpose of this digital submittal project is that the Industry draws a pipeline or appurtenance once in the lifecycle of the project. The City intends to map all off-site and on-site facilities. This data would then be available in a digital format to customers / clients, resulting in a more efficient and effective process / program for sharing digital data to the community.

Electronic Plan Requirements

Since March 1, 2005, the Utilities Department has required a Compact Disk containing electronic drawing files when submitting approved engineering / improvement plans on mylars. No Mylar Project will be approved without a correct digital submittal.

The “Approved Engineering / Improvement Plan” (Mylar) submittals shall include an electronic copy on Compact Disk (CD) or (DVD). This submittal shall include three parts:

- 1) A folder named “Improvement Plans” containing the approved engineering / improvement plan set. This may be submitted in bound XRef form (*.dwg, see file naming section below), *.pdf or *.dwf.
- 2) A folder named “Utility GIS Submittal” containing the overall comprehensive utility plan as laid out in these standards.
- 3) A folder named “Hydraulic Analysis” containing either the Hydraulic Analysis Files or the aforementioned “Hydraulic Analysis Not Required” text file.

Utility, Model Space Drawing

One encompassing Model Space Plan of the approved / improvement project shall be submitted in one encompassing model space drawing file. This file shall include all proposed off-site and on-site utilities. This file shall be spatially oriented within the downloadable parcel template available from the City’s website: <http://www.cityofnorthlasvegas.com/Departments/Utilities/UtilitiesEngineering.shtm>.

Key Map Overlay

A Model Space Key Map Overlay shall show the individual plan of each geo-referenced individual plan sheet extents. This overlay should correspond precisely with any matchline in your sheet set. See Figure 3 and Figure 4. The layers are provided in the CNLV Digital Submittal Template.

Project Setup

It is a requirement that the Utility Plan is inserted into the correct spatial location of the parcel data contained in Appendix Two (State Plane Projection).

- 1) The proposed comprehensive utility plan project needs to be moved and rotated to the street centerline or sectional corner coordinates that will generally geo-reference the consultant’s work and keep all distances in ground values.
- 2) The City requires the POC of the proposed project to be based upon the City’s current GIS data for existing water and sewer data. This data is not required to be included in the digital submittal. The point of commencement of the proposed project needs to be clearly indicated in the digital submittal by the labeling of “POC”.
- 3) Note that no other plans or paper space sheets in the proposed project are required to be moved to the State Plane Projection other than the comprehensive utility plan.

- 4) Model Space – The drawing must be drawn in at full scale (1:1). Units are to be set to Decimal Feet at precision factor 0.00. Angle units are to be set to Decimal Degrees at precision factor 0.00. Insertion units for blocks and Xrefs are to be set to Feet.
- 5) Standard Sheet Sizes and Formats – All sheet sizes are to be ARCH D Plot – 24” x 36” (preferred format).
- 6) Standard Symbols / Blocks – Standard Symbols shall be used to reduce drafting time, increase legibility and conserve space. Symbols must be consistent throughout the plan set in accordance with City of North Las Vegas standards as outlined in the schedules. All blocks shown are standard AutoDesk type blocks (provided by the City of North Las Vegas Utilities Department). If a block is not present, then a renamed copy of a provided block is acceptable. All created blocks needs to have a 0.0 insertion point and created on layer 0.
- 7) Layering:
 - A) Layer names for required layers must appear exactly as in Appendix Table 1. The base layers are provided in the CNLV Standards File(s).
 - B) All required layers listed in the CAD layers must contain only the features that are described for that layer. For example, the B-BNDY-CNLV layer must only contain the boundary line and not such features as north arrows or parcels.
 - C) All required layers must be present in the drawing except for features that do not pertain to a particular project. For example, some commercial projects or apartment complexes may not contain sewer taps as part of the construction and should not be included in the drawing.
 - D) All layers must be clearly differentiated from each other.
 - i) Two layers having the names “C-WATR-PIPE-XXXX” and “C-WATR-PIPES-XXXX” should not exist in the same drawing.
 - ii) C-SEWR-PIPE-XXXX and SEWER-PIPE should not exist in the same drawing.
 - iii) C-SEWR-PIPE-0006 and C-SEWR-PIPE-0010 is preferred.
 - iv) All text must appear on separate layers from the layers they annotate. For example, text describing a sewer line must be on the C-SEWR-ANNO layer, not the C-SEWR-PIPE-XXXX layer, or any other layer in the drawing. Map annotation templates are acceptable.
 - v) Text leaders should be placed on the text layer, not the feature layer. For example, the leader for the diameter of a water pipe should be on the C-WATR-ANNO layer, not the C-WATR-PIPE-XXXX layer.
 - vi) Every individual feature class should be differentiated. Each pipe size should be differentiated and each appurtenance type should be differentiated [i.e. 6” Water Pipe is C-WATR-PIPE-0006 and 12” Water Pipe is C-WATR-PIPE-0012]. The XXXX is a user defined field and should be used to further define and differentiate items.

The City will provide to any Engineering consultant, upon a customer request (see form on website), a full digital file of all water and sewer data for the extents of that project. However, the City will not provide a drawing of the complete City network.

Drawing Principles

- 1) All layers must conform to the aforementioned layer standards.
- 2) All Polygon type features must be completely closed. Lines may need to be duplicated on more than one layer.
 - A) Subdivision / project parcels must be to closed figures on their layer (not closed with the subdivision / project boundary).
 - B) Road edge-of-pavement and road right-of-way must be drawn as closed polygons.
 - C) Where a polygon feature extends beyond the edge of the plan, the property boundary (repeated on the polygon feature's layer) will be used to close the polygon.
 - D) All edges on polygon features must be snapped together at the vertices. Gaps in polygon boundaries will not be accepted.
- 3) Sewer Features:
 - A) Sewer Lines and Sewer Taps need to be digitized with proper directionality: Lines must be drawn from the uphill node to the downhill node or flipped after the lines have been digitized.
 - B) All tangents between sewer manholes need to be drawn with a single polyline. Lines must not continue for more than one tangent.
 - C) All tangents must be snapped at endpoints intersecting at the exact center of the manhole. No gaps should exist between tangents.
 - D) Manholes need to be symbolized consistently with the provided block centered exactly on the tangent endpoints.
 - E) Sewer tap locations must be snapped to the sewer tangent and accurately placed. Placement should be based on direct survey of the tap where it connects to the sewer tangent, or based on the televising report. CCWA will verify tap placement against the televising report. Televising reports may be obtained from the CCWA inspector.
 - F) Sewer Manholes, Cleanouts, Appurtenances or any other item requiring elevations must be annotated on a separate annotation defined layer. The annotation should be comprehensive to each item.
- 4) Water Features:
 - A) Water lines must be digitized with all straight-line pipes consisting of only two end points. Straight-line pipes will begin and end at the following features (nodes): hydrants, valves, meters, pumps, tees, crosses, and valves. Polyline should be used wherever a water line contains elbows or bends (i.e., when the line does make a straight run from node to node).
 - B) Curves may be digitized with enough vertices to capture the curve geometry, but they must be single, continuous lines. Curves or arcs may also be used to designate curved pipe.

- C) Hydrants must be shown in their true, surveyed location, and must be connected to the water main via a valved fire hydrant line.
- D) All water lines must be continuous, with pipe endpoints snapped to each other at endpoints (nodes).
- E) End-of-line caps must be drawn to differentiate end-of-lines from lines that extend beyond the extent of the drawing. Caps should be drawn for lines that are to be permanently capped when the project is complete, not for lines that are temporarily capped pending inspection.

Symbolization

Symbols must be standardized according to examples provided in the City of North Las Vegas Standards file(s). All “point” features must be symbolized using standard City of North Las Vegas CAD symbols and drawn as inserts. An example of “point” objects is as follows:

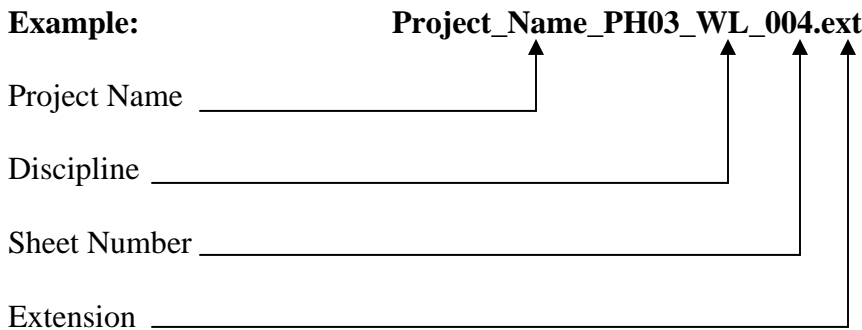
| | | |
|---------------|----------------|-------------------|
| Vault | Valve | Hydrant |
| Manhole | Meter | End of Line / Cap |
| Reducer | Drop Inlet | SD Manhole |
| Sewer Manhole | Direction Flow | Storm Manhole |
| Encasing | Well | Drain |
| Blowoff | Air Vac | Reservoir |

This list is not to be taken as all inclusive.

File Naming and Revisions

The AM/FM/GIS/Divisions have implemented the following standardized nomenclature for all record drawing files that are maintained by the Division. The new nomenclature is recognized by the City of North Las Vegas as the naming convention for all items relating to record drawings placed in Documentum and on the Repository.

Standardized Document Naming (SDN):



| STANDARD DISCIPLINE SHEET REFERENCE | | | |
|-------------------------------------|-----------------------|----|----------------------------|
| C | CIVIL PLAN | R | DEMOLITION PLAN |
| D | DETAIL PLAN | RW | RIGHT OF WAY PLAN |
| DI | DROP INLET SECTIONS | S | STRIPE & SIGNAL PLAN |
| E | ELECTRICAL PLAN | SD | STORM DRAIN PLAN & PROFILE |
| EX | EXHIBIT | SL | STREET LIGHT PLAN |
| G | GENERAL NOTES, COVER, | SM | SIGNAL MODIFICATION PLAN |

| | | | |
|----|---------------------------|----|---------------------|
| | LEGEND, ABBREVIATIONS | | |
| HC | HORIZONTAL CONTROL | SS | SANITARY SEWER PLAN |
| IG | INTERSECTION GRADING PLAN | TS | TRAFFIC SIGNAL PLAN |
| LS | LANDSCAPE PLAN | TY | TYPICAL SECTIONS |
| M | MECHANICAL PLAN | U | UTILITY PLAN |
| PP | PLAN & PROFILE VIEW | WL | WATER LINE PLAN |

Easements and Right-of-Ways

All proposed and existing easements and right-of-ways in regard to any utility needs to be indicated on its own individual layer in a closed polyline format on the comprehensive utility plan. A copy of any documents and extracts with the record of survey is to be included on the CD in pdf format as accompanying documentation.

Deliverable Format

- 1) All files will be delivered on single disk media in AutoCAD (a release currently supported by Autodesk subscription plans) or DGN format (for projects created in Microstation). CD-ROM and DVD's are the only acceptable media. Files should not be spanned over more than one disk.
- 2) All deliverables will be labeled with the file name, company name, contact name, phone number, and the CNLV Hansen number. A transmission letter restating this information along with a statement requesting design review will also accompany the disk.

GIS, GPS, RDMS Digital Data or Hard Copy Plan Data provided to Consultants

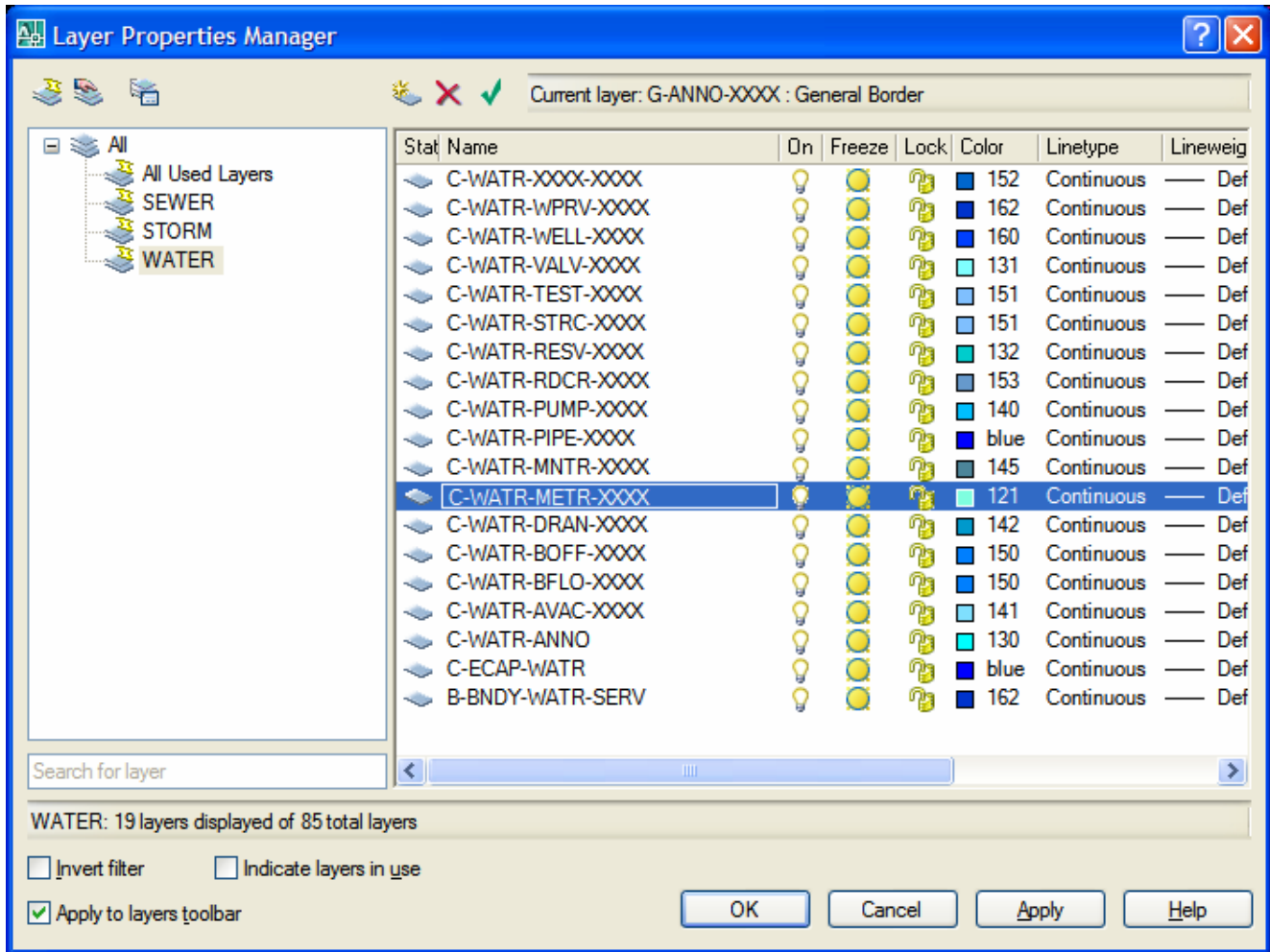
- 1) The City will provide Digital Data on existing or proposed water and Sewer facilities to Engineering companies saving these companies considerable time in redrawing and compiling existing or proposed CAD/GIS Data.
- 2) The City of North Las Vegas Utilities department will provide digital data, Hard copy plans on the Sewer or Water Networks to Engineering Consultants companies only on a project pacific basis on receipt of a electronic customer service request form - see Interactive Information Request Form <http://www.cityofnorthlasvegas.com/Departments/Utilities/UtilitiesEngineering.shtm>. The City will not provide any consultant company or organization the entire City network.
- 3) City of North Las Vegas Utility Department Disclaimer indicates a statement of understanding between the City of North Las Vegas Utility Department (City) and any and all subsequent users of Information obtained here from: The plan and supporting information is furnished by the City and is accepted / used by the recipient with the understanding that the City make no warranties, express or implied, concerning the accuracy. Completeness, reliability, or suitability of said plans or any supporting data, and further understands that all users are acting at their own risk. The city shall be under no liability whatsoever resulting form any use of this information. This information should not be relied upon as the sole basis for existing water and/or sewer locations. The engineer shall check and verify all dimensions and locations of existing utilities. The information delineated heron was compiled from available record data; no liability is assumed for accuracy. This includes all prints, emails and documents provided by the City of North Las Vegas.

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Appendix One CAD Layers

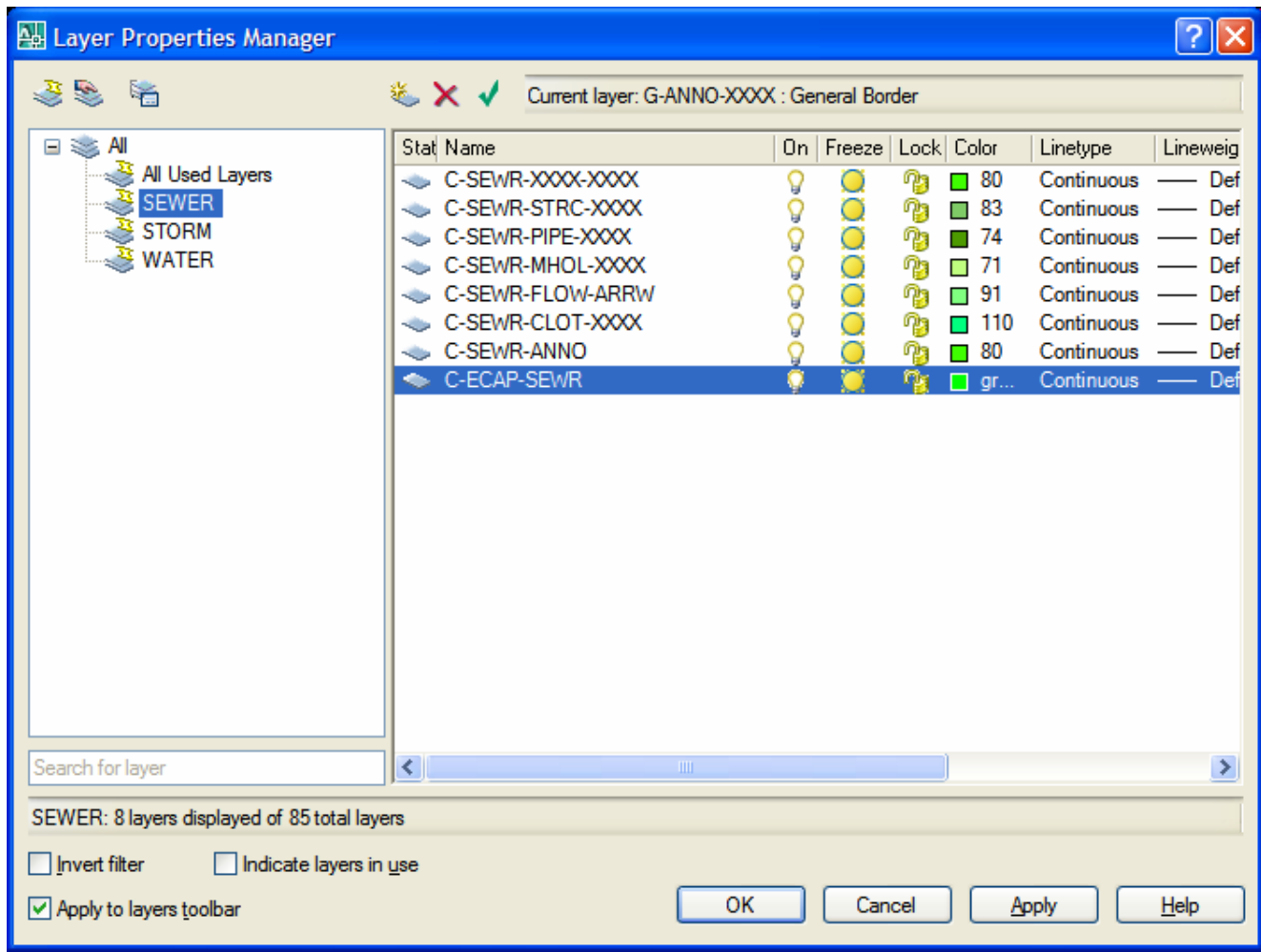
Water Map Layers (BLUE)

All Water layers are to be colored a shade of blue.



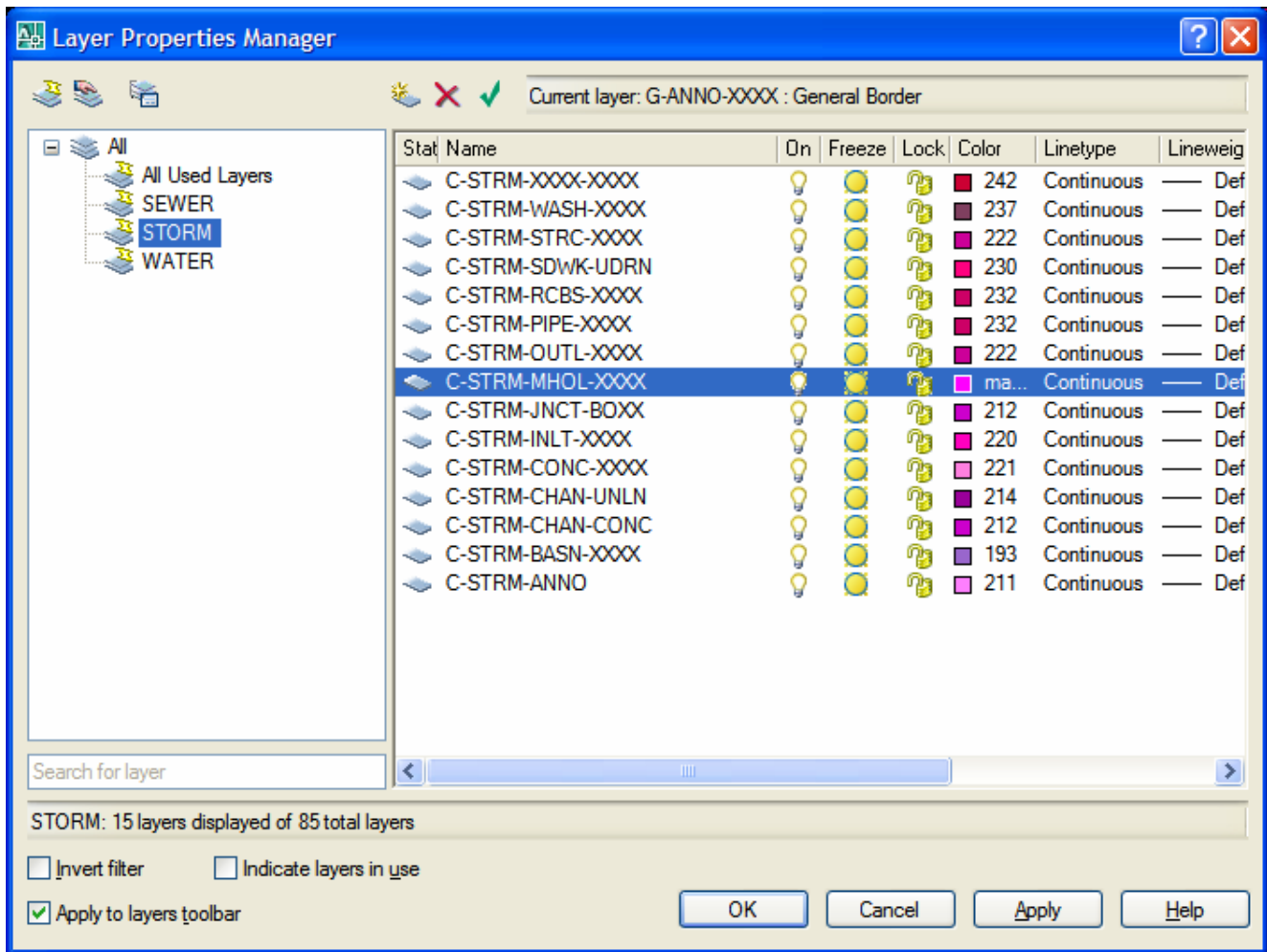
Sewer Map Layers (GREEN)

All Sewer layers are to be colored a shade of green.



Storm Drain Map Layers (MAGENTA)

All Storm Drain layers are to be colored a shade of magenta.



Other Layers

Remaining layers are variable in color with Fire Layers Red.

Layer Properties Manager

Current layer: 0 : General Border

| Stat | Name | On | Freeze | Lock | Color | Linetype | Lineweight |
|------|------------------|----|--------|------|--------|------------|------------|
| ✓ | 0 | ☑ | ☑ | 🔒 | wh... | Continuous | Def |
| | B-BNDY-CNLV | ☑ | ☑ | 🔒 | 12 | Continuous | Def |
| | B-BRDR-XXXX | ☑ | ☑ | 🔒 | 10 | Continuous | Def |
| | B-PROP-PRCL-XXXX | ☑ | ☑ | 🔒 | 147 | Continuous | Def |
| | B-SECT-IDEN | ☑ | ☑ | 🔒 | 51 | Continuous | Def |
| | B-SECT-XXXX | ☑ | ☑ | 🔒 | 32 | Continuous | Def |
| | B-TOPO-MAJR | ☑ | ☑ | 🔒 | 40 | Continuous | Def |
| | B-TOPO-MINR | ☑ | ☑ | 🔒 | 30 | Continuous | Def |
| | B-TOPO-UGPS-XXXX | ☑ | ☑ | 🔒 | 210 | Continuous | Def |
| | C-ANNO-XXXX | ☑ | ☑ | 🔒 | wh... | Continuous | Def |
| | C-BLDG-XXXX | ☑ | ☑ | 🔒 | 254 | Continuous | Def |
| | C-CONC-CASE-XXXX | ☑ | ☑ | 🔒 | 123 | Continuous | Def |
| | C-ECAP-XXXX | ☑ | ☑ | 🔒 | blue | Continuous | Def |
| | C-FIRE-HYDR-XXXX | ☑ | ☑ | 🔒 | red | Continuous | Def |
| | C-FIRE-STRC-XXXX | ☑ | ☑ | 🔒 | red | Continuous | Def |
| | C-IMAG | ☑ | ☑ | 🔒 | wh... | Continuous | Def |
| | C-LIFT-STAT-XXXX | ☑ | ☑ | 🔒 | 113 | Continuous | Def |
| | C-RAIL-XXXX | ☑ | ☑ | 🔒 | 253 | Continuous | Def |
| | C-RAMP-ACCS | ☑ | ☑ | 🔒 | 253 | Continuous | Def |
| | C-ROAD-ANNO | ☑ | ☑ | 🔒 | wh... | Continuous | Def |
| | C-ROAD-CLNE | ☑ | ☑ | 🔒 | 231 | CENTER | Def |
| | C-ROAD-HGWY-XXXX | ☑ | ☑ | 🔒 | 9 | Continuous | Def |
| | C-ROAD-MAJR-XXXX | ☑ | ☑ | 🔒 | 51 | Continuous | Def |
| | C-ROAD-MINR-XXXX | ☑ | ☑ | 🔒 | 254 | Continuous | Def |
| | C-SITE-AVIA | ☑ | ☑ | 🔒 | 254 | Continuous | Def |
| | C-SITE-XXXX | ☑ | ☑ | 🔒 | 43 | Continuous | Def |
| | C-UTIL-ANNO | ☑ | ☑ | 🔒 | wh... | Continuous | Def |
| | Defpoints | ☑ | ☑ | 🔒 | wh... | Continuous | Def |
| | G-ANNO-MISC | ☑ | ☑ | 🔒 | 41 | Continuous | Def |
| | G-ANNO-XXXX | ☑ | ☑ | 🔒 | 254 | Continuous | Def |
| | G-BLCK-XXXX | ☑ | ☑ | 🔒 | wh... | Continuous | Def |
| | G-BRDR-XXXX | ☑ | ☑ | 🔒 | red | Continuous | Def |
| | G-HTCH-XXXX | ☑ | ☑ | 🔒 | 61 | Continuous | Def |
| | G-MISC-XXXX | ☑ | ☑ | 🔒 | 253 | Continuous | Def |
| | G-SITE-KMAP-ANNO | ☑ | ☑ | 🔒 | 50 | Continuous | Def |
| | G-SITE-KMAP-XXXX | ☑ | ☑ | 🔒 | yel... | Continuous | Def |
| | G-TBLK-ANNO | ☑ | ☑ | 🔒 | wh... | Continuous | Def |
| | G-TBLK-BRDR | ☑ | ☑ | 🔒 | 254 | Continuous | Def |
| | G-TBLK-XXXX | ☑ | ☑ | 🔒 | wh... | Continuous | Def |
| | G-UTIL-WRNT-XXXX | ☑ | ☑ | 🔒 | 31 | Continuous | Def |
| | G-VIEW-XXXX | ☑ | ☑ | 🔒 | 254 | Continuous | Def |
| | G-XREF-XXXX | ☑ | ☑ | 🔒 | wh... | Continuous | Def |

Search for layer

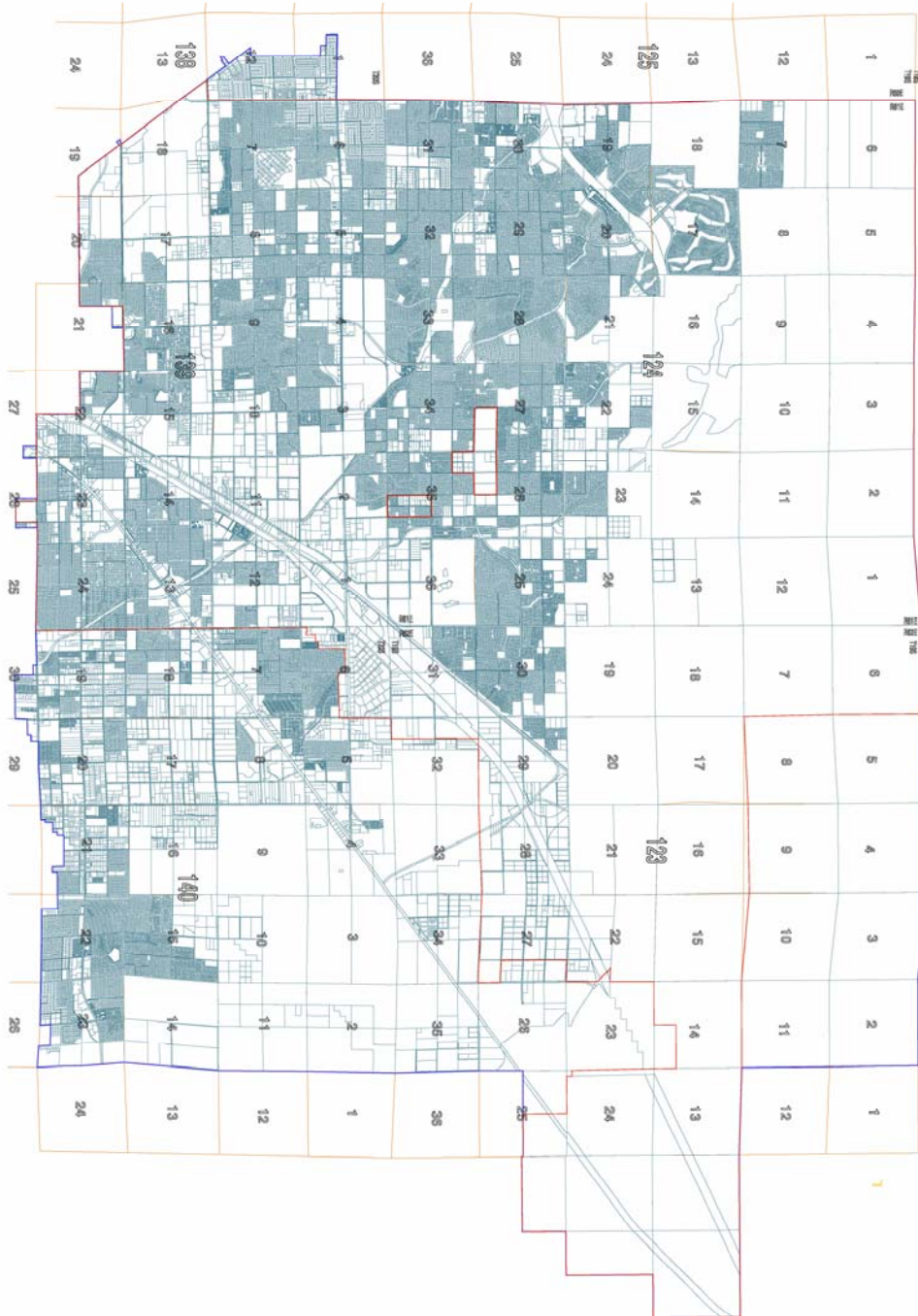
NON UTL: 42 layers displayed of 84 total layers

Invert filter Indicate layers in use

Apply to layers toolbar

OK Cancel Apply Help

Appendix Two Figures



**Figure 1
City Limits with Parcels**

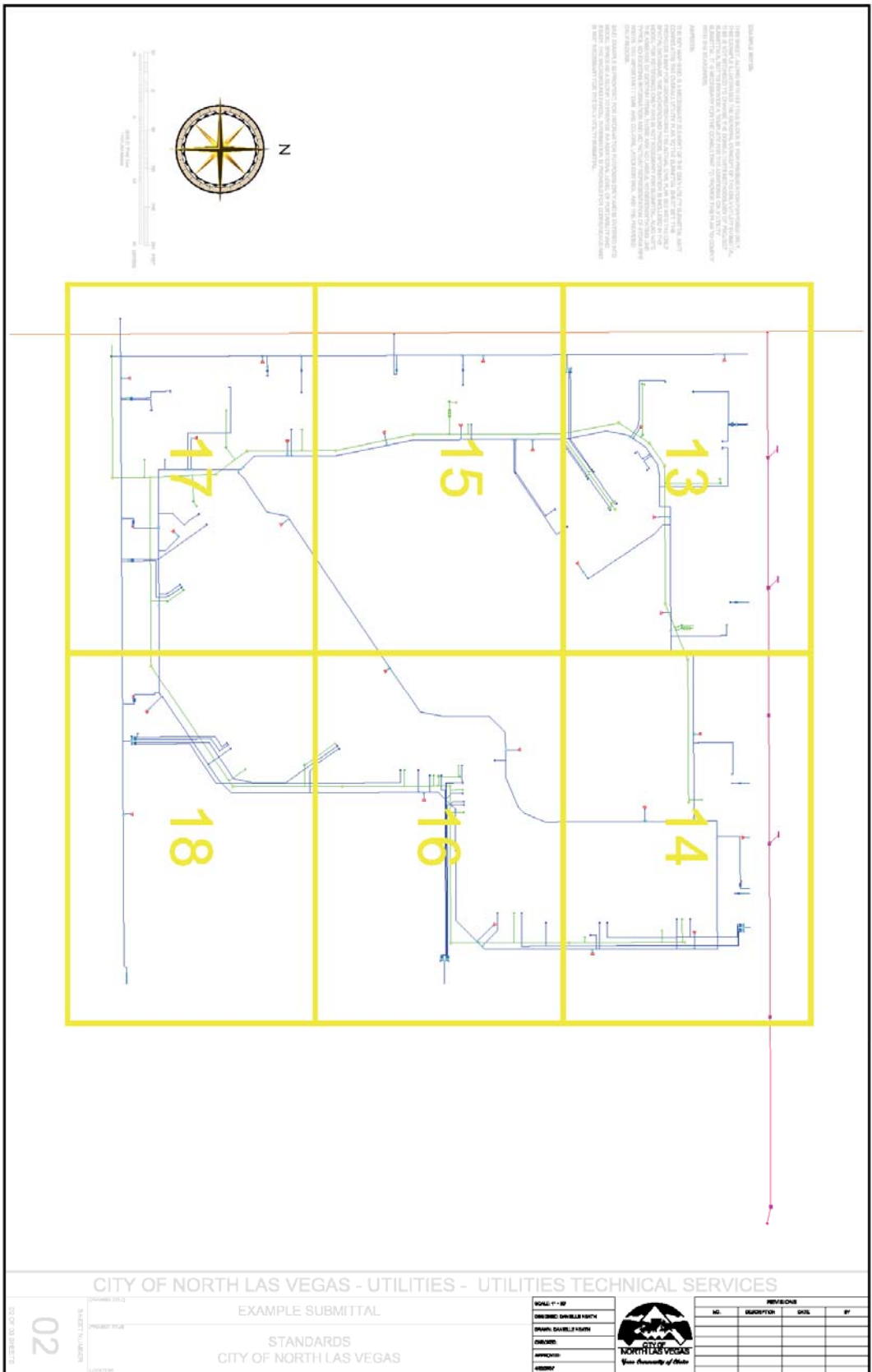


Figure 2
Example Submittal Through Viewport

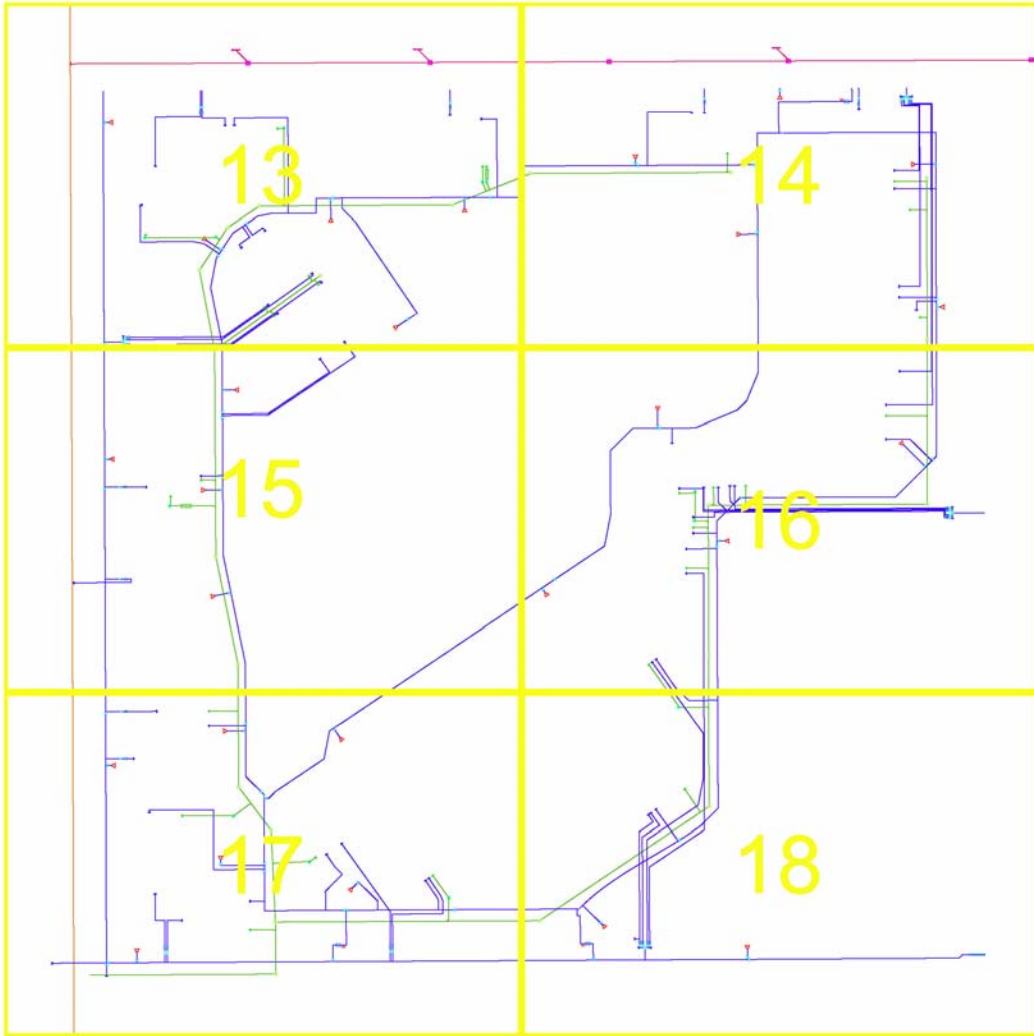


Figure 3
Key Map Overlay

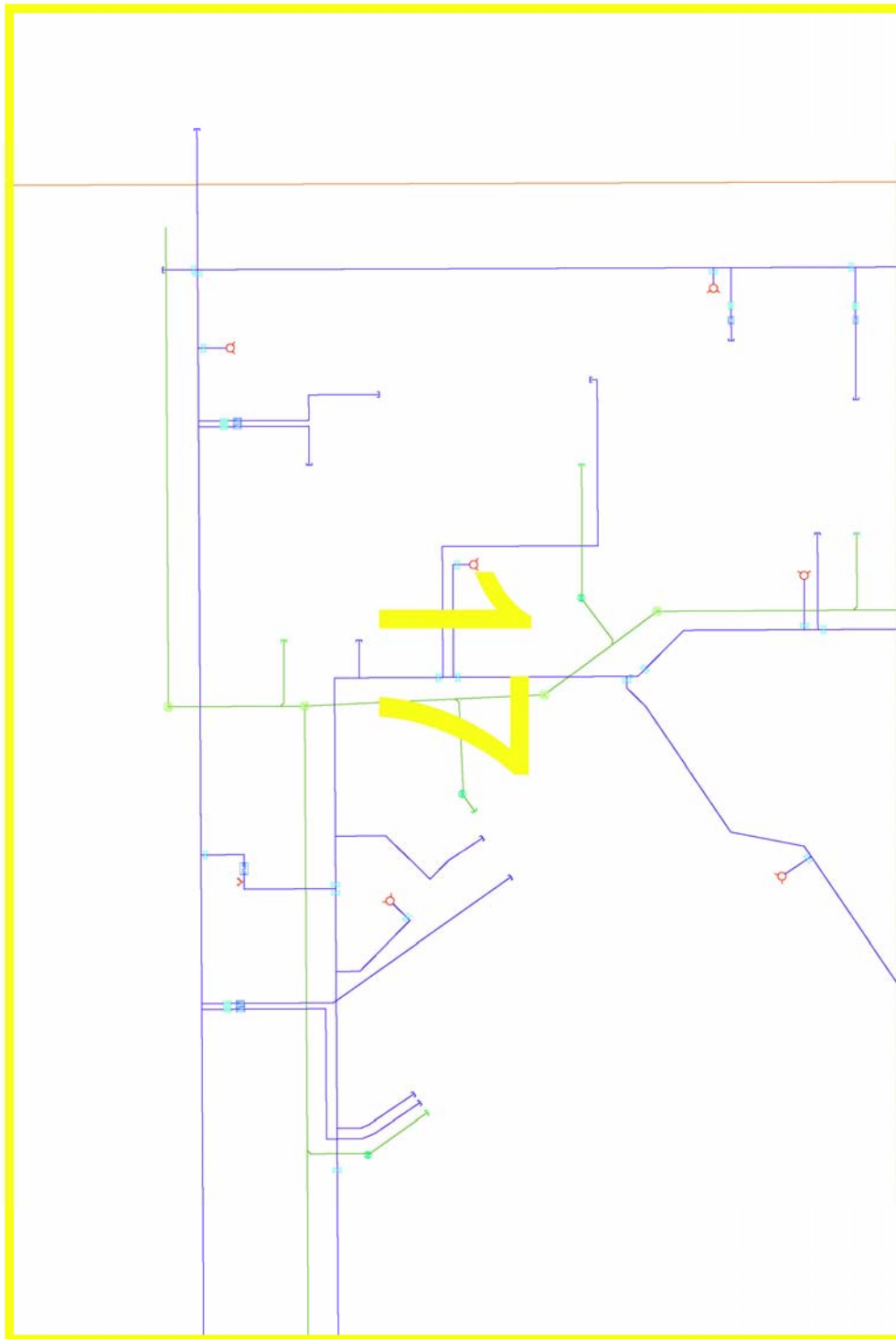


Figure 4
Sheet Detail Submittal

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