

GIS Requirements

Wastewater Main Construction Projects

The requirements and deliverables identified below are those for wastewater main construction projects performed by Developers, Contractors, and Internal Illinois-American Water crews.

At a high level overview, the Resident Project Representative (RPR) is responsible for the following. These deliverables are to be submitted to the ILAWC Engineering Project Manager upon project completion or when the project is substantially complete.

1. Two copies of the final as-built plan set
 - One copy will be paper and the other copy will be electronic, in its native AutoCAD format (.dwg) or MicroStation (.dgn). The paper copy should include any mark-up captured during the final walk through. The paper copy can be scanned and provided as a PDF.
2. GPS data
 - Submitted in Shapefile format, along with the source/raw GPS data file (i.e., job or ssf file) and a horizontal accuracy report.
3. Equipment Data Spreadsheet

The above deliverables are to be provided as a zip file to your ILAWC Engineering Project Manager.

Each deliverable is explained in more detail below:

Final As-Built Plan Set

The RPR will submit two copies of the final as-built plan set. One copy will be paper and the other copy will be electronic, in its native AutoCAD format (.dwg). The paper copy should include any mark-up captured during the final walk through. The paper copy can be scanned and provided as a PDF.

1. The final as-built shall be the entire plan set in its native AutoCAD format (.dwg). It shall include, at a minimum, cover sheets, any notes or specification sheets, all detail pages, additional inclusions, and attribution as noted below:
 - Each new manhole, valve, fitting, lift station, and grease trap shall be annotated with the same temporary ID assigned to it for both the GPS point and the corresponding record within the Equipment Data Spreadsheet.
 - Wastewater mains shall include:
 - Type (i.e., Gravity or Force)
 - Flow Direction
 - Diameter
 - Material
 - Length between fitting(s), manhole(s), valve(s), material change(s), and any other notable feature(s).
 - Upstream flowline elevation
 - Downstream flowline elevation

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- Lined (Yes/No)
 - If yes, note the Lining Material and Lining Method used.
- Tracer Wire (Yes/No)
- If applicable, service lines shall include:
 - Diameter
 - Material
 - Lined (Yes/No)
 - If yes, note the Lining Material and Lining Method used.
- Notes/details depicting assets that are to be retired. Please include whether the assets were abandoned in place or removed from the ground.
- Easements acquired, along with all relevant sketches and legal descriptions.
- Any and all field sketches that show variances from the design plan set.
- Detailed sketches depicting intersections and tie-ins.

GPS Data & the Equipment Data Spreadsheet

The Resident Project Representative (RPR) is responsible for collecting all GPS points for features and locations outlined below:

- The center of each manhole, valve, fitting, cleanout, meters, lift station, and grease trap
- Wastewater mains at deflection points and every 100 ft. along straight runs
- The location of each connection to existing facilities
- The corners of all easements being granted to the company as part of the project
- For projects that include the installation of service lines, GPS points will be required at the tap location, at the cleanout, and at the point where the lateral intersects the right-of-way, as well as at any bends in-between.
- Other locations as designated by the company

This data shall be collected after the piping and appurtenances are installed, but before the trench is backfilled. If it is decided to not collect GPS data while the trench is open, vertical riser pipes must be installed at each buried feature (i.e., valves, fittings, deflection points, etc...) and at every 100 ft. along the water main to allow collection of the GPS point.

All new manholes, valves, fittings, cleanout, meters, lift stations, and grease traps shall have records created within the provided Illinois-American Water Equipment Data Spreadsheet. All fields are to be populated. It is within this spreadsheet that the descriptive detail of each asset is captured.

Each GPS point collected shall be assigned a **unique** temporary ID and that **same** temporary ID shall be used within the Equipment Data Spreadsheet to allow for the association of point to record.

Suggested temporary IDs are:

- Manholes: MH1, MH2, MH3, etc...

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- Valves: V1, V2, V3, etc...
- Fittings: F1, F2, F3, etc...
- Lift Stations: LS1, LS2, LS3, etc...
- Grease Traps: GT1, GT2, GT3, etc...
- Additional Data: AD1, AD2, AD3, etc...

General Collection Requirements are as follows:

1. At minimum, Sub-foot accuracy is required.
2. GPS point coordinates must be field collected. Point coordinates **CANNOT** be generated from AutoCAD or other similar application and converted to a Shapefile.
3. A benchmark GPS shot must be collected at the start of GPS data collection, as well as again at the end of GPS data collection.
 - If you **are not** using a real time processing solution and are post processing your data please collect a benchmark at the start of each week of collection.
 - **Benchmark requirements:**
 - Please use an NGS-listed benchmark. Nearby benchmarks can be located using the following web site: <http://www.ngs.noaa.gov/NGSDataExplorer/>
 - Vertical only benchmarks are not allowed.

Setup/Collection Requirements are as follows:

1. The coordinate system **MUST** be defined as below:
 - Geographic Coordinate System: GCS WGS 1984
 - Projection: Web Mercator Auxiliary Sphere
2. Please be mindful of the coordinate definitions when processing your data. Please do not ignore any warnings that the coordinate systems do not match.
 - For example, when bringing/opening job(s) in Trimble Business Center, be sure to define the coordinate system of your project to match the definition assigned to your job.

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Output Requirements are as follows:

The following lists the items to be submitted, as well as defines the required properties of those items as it pertains to the collected GPS points.

1. Please export the collected data as a Shapefile.
2. Please run a report that documents, at minimum, the horizontal accuracy of each point.
3. Along with the exported output, as well as an accuracy report, please also return any/all source collection files (i.e., ssf, job, etc...)

GIS Project Deliverables – Delivery Requirements

Please place all GIS Project Deliverables within a named project folder. Zip this folder up and provide to your ILAWC Engineering Project Manager. Please see graphic below for requested structure.

GIS Deliverables Project Folder	IL_Alton_Golf_As_Built
Shapefile	IAWC GOLF - GIS SHAPEFILE.shp
<i>Note: The shapefile is a GIS data format that is composed of (at minimum) 4 files that have the same name with the extensions: dbf, prj, shp, and shx.</i>	Points.dbf Points.prj Points.shp Points.shx
<i>Please place your shapefile in its own folder within the GIS Deliverables Project Folder.</i>	
Equipment Data Spreadsheet	EquipmentData_Water_Golf_Alton_IL.xlsx
As-Built in AutoCAD format	IAWC (448385.0) WADLOW GOLF BASETOPO ASBUILT.dwg
GPS Data Accuracy Report	IAWC GOLF - QUALITY CONTROL REPORT.pdf
As-Built in PDF format *	IAWC GOLF IMPROVEMENTS (AS-BUILT) 2015-02-11.pdf
GPS Data Source Data File **	IAWC GOLF RD GIS.job

Questions

Please e-mail any questions to Milan Cukvas, GIS Project Manager, at Milan.Cukvas@amwater.com. Be sure to CC your Illinois-American Water Engineering Project manager, as well.

For your convenience, a checklist is provided.

GIS Requirements | Checklist

Project Name: _____

District: _____

In-Service Date: _____

Please check all boxes below that have been completed and have all unchecked boxes corrected.

GPS Points

- Did you collect all required benchmark shots?
- Did you collect shots on **all** Manholes?
- Did you collect shots on **all** Valves?
- Did you collect shots on **all** Fittings?
- Did you collect shots on **all** Cleanouts?
- Did you collect shots on **all** meters?
- Did you collect shots on **all** Lift Stations?
- Did you collect shots on **all** Grease Traps?
- Did you collect shots every 100 feet along straight runs?
- Did you collect shots at **all** main deflection points (If applicable)
- Did you collect shots at **all** corners of all easements being granted to ILAW as part of the project (If applicable)
- Did you collect shots at **all** location(s) of each connection to existing facilities (if applicable)
- Did you collect shots at **all** other locations, as designated by the ILAWC Engineering Project Mgr.
- Did you collect shots on **all** Service line features (if applicable)? To include the tap location, clean out, intersection of lateral and right of way, as well as any bends in-between?

Equipment Data Spreadsheet

- Do **all** Manholes have records created within the project's Equipment Data Spreadsheet? **Correct IDs?**
- Do **all** Valves have records created within the project's Equipment Data Spreadsheet? **Correct IDs?**
- Do **all** Fittings have records created within the project's Equipment Data Spreadsheet? **Correct IDs?**
- Do **all** Cleanouts have records created within the project's Equipment Data Spreadsheet? **Correct IDs?**
- Do **all** meters have records created within the project's Equipment Data Spreadsheet? **Correct IDs?**
- Do **all** Lift Stations have records created within the project's Equipment Data Spreadsheet? **Correct IDs?**
- Do **all** Grease Traps have records created within the project's Equipment Data Spreadsheet? **Correct IDs?**
- Do **all** additional data shots have records created within the project's Equipment Data Spreadsheet? **Correct IDs?**

GIS Deliverables

- Do you have all required deliverables (i.e., Shapefile, source/raw GPS data file, accuracy report, equipment data spreadsheet, and two copies of the final as-built plan set zipped up in a GIS deliverable project folder)?

As-Built Plan Set

- Two copies ready to submit? One being the electronic AutoCAD or MicroStation version and the other being the paper/PDF copy?
- Does the paper/PDF copy include all mark-ups?
- Are all features attributed with their correct temporary ID (i.e., V1, H1, F1, MP1, AD1)?

Are the following main attributes present?

- Material and Diameter
- Type (i.e., Gravity or Force)
- Length between fitting(s), valve(s), manhole(s), material change(s), and/or any other notable feature(s)
- Flow Direction, Upstream Invert, and Downstream Invert Elevation
- Lined (Yes/No); If "Yes", ensure the lining material and lining method is provided.
- Line Locator (Tracer Wire) (Yes/No)

If application, are the following service line attributes present:

- Material and Diameter
- Lined (Yes/No); If "Yes", ensure the lining material and lining method is provided.

If application, are the attributes/notes/details below present:

- Notes/details depicting assets to be retired (if applicable)
- All relevant Easement documentation?