

## GIS Requirements

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### Water Main Construction Projects

The requirements and deliverables identified below are those for water 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 format (.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) or MicroStation format (.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.

1. The final as-built shall be the entire plan set in its native AutoCAD format (.dwg) or MicroStation format (.dgn). It shall include, at a minimum, cover sheet, construction notes, all detail pages, additional inclusions, and attribution as noted below:
  - Each new valve, hydrant, fitting, and, if applicable, corporation stop, meter pit, water main GPS point, service point, and casing point 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.
  - Water mains shall include:
    - Diameter
    - Material
    - Length between fitting(s), valve(s), start/end of encasement(s)/restraint(s), material change(s), and any other notable feature(s).

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- If applicable, service lines shall include:
  - Type: Domestic, Hydrant Lateral, Fire, Irrigation, or Combined
  - Diameter
  - Material
- 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 fitting, valve, and hydrant
- Water 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 for all service line related corporation stops, unions/couplings, reducers, valves (to include all curb stops), and/or meter pits, as well as any bends in between those features.
- 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 valves, hydrants, fittings, curb stops and, if applicable, corporation stops<sup>1</sup> and meter pits, shall have records created within the provided Illinois-American Water Equipment Data Spreadsheet. All fields shaded green in the provided spreadsheet are to be populated. It is within this spreadsheet that the descriptive detail of each asset is captured (i.e., valve size, hydrant type, etc...).

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<sup>1</sup> For corporation stops, complete a record within the Fittings tab of the Equipment Data Spreadsheet.

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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:

- Valves: V1, V2, V3, etc...
- Hydrants: H1, H2, H3, etc...
- Fittings: F1, F2, F3, etc...
- Meter Pits: MP1, MP2, MP3, 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/NGSDDataExplorer/>
    - 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.

### 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...)

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## 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 the minimum requested structure.

<b>GIS Deliverables Project Folder</b>	IL_Alton_Golf_As_Built
<b>Shapefile</b>	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>	
<b>Equipment Data Spreadsheet</b>	EquipmentData_Water_Golf_Alton_IL.xlsx
<b>As-Built in AutoCAD format</b>	IAWC (448385.0) WADLOW GOLF BASETOPO ASBUILT.dwg
<b>GPS Data Accuracy Report</b>	IAWC GOLF - QUALITY CONTROL REPORT.pdf
<b>As-Built in PDF format *</b>	IAWC GOLF IMPROVEMENTS (AS-BUILT) 2015-02-11.pdf
<b>GPS Data Source Data File **</b>	IAWC GOLF RD GIS.job

## Questions

Please e-mail any questions to Milan Cukvas, GIS Project Manager, at [Milan.Cukvas@amwater.com](mailto: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** Fittings?
- Did you collect shots on **all** Valves?
- Did you collect shots on **all** Hydrants?
- 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 (if applicable, list locations below)?
- Did you collect shots on **all** Service line features (if applicable) to include all corporation stops, valves/curb stops, meter pits, and any bends in between?

### Equipment Data Spreadsheet

- Do **all** fittings 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** hydrants have records created within the project's Equipment Data Spreadsheet? **Correct IDs?**
- Do **all** curb stops have records created within the project's Equipment Data Spreadsheet? **Correct IDs?**
- Do **all** meter pits 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?**
- Exterior Protection (Mains and Services - Yes/No); If "Yes", ensure the type of exterior protection is provided.
- Tracer Wire (Mains and Services - Yes/No)

### GIS Deliverables

- Do you have all required deliverables (i.e., Shapefile, source 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 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
- Joint Type
- Length between fitting(s), valve(s), start/end of encasement(s)/restraint(s), material change(s), and/or any other notable feature(s)

#### If application, are the following service line attributes present:

- Type: Domestic, Hydrant Lateral, Fire, Irrigation, or Combined
- Material and Diameter
- Joint Type

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

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