

Arapahoe County Water & Wastewater Authority
ENGINEERING DEPARTMENT

Vision to Reality - Quality Water, Wastewater, and Stormwater Systems

DESIGN REVIEW CHECKLIST – 1ST SUBMITTAL

All of the items below must be included in the submittal package to begin the review.

- _____ **Presubmittal Meeting** – Date completed _____

- _____ **Water and Sanitary Plans** – Must be signed and stamped by a Colorado registered Professional Engineer prior to final approval. The jurisdictional Fire Department must sign the plans and agree with the fire hydrant placements and fire flow before the second submittal. *(4 Sets)*

- _____ **Grading/Erosion Control Plan** *(1 Set)*

- _____ **Landscape Plan** – The size and location of all plantings in and within 10’ of the edge of any ACWWA easements and the irrigated area must be shown on the plan. *(1 Set)*

- _____ **Final Utility Report** - Water and sanitary sewer studies need to be performed per ACWWA requirements. *(2 Sets)*

- _____ **Fixture Unit Count** – completed following the AWWA M22 Manual. *(2 Sets)*

- _____ **Phase III Drainage Report** – if project site is located in the Lonetree Creek, Windmill Creek, or Dove Creek stormwater drainage basins. *(2 Sets)*

- _____ **Construction Plans for Regional Stormwater Facilities** – if applicable. *(1 Set)*

- _____ **Title Policy** – A title policy must be dated within 90 days. Must include title commitment and all exception documents. *(1 Set)*

- _____ **Final Plat** – A copy of the approved final plat for the property. *(1 Set)*

- _____ **Imprest Account** – The owner shall deposit \$7,000 into an imprest account to cover the cost of the design review.

- _____ **Section 11 Acknowledgment** – The owner must sign the last page of the Rules and Regulation Section 11 to acknowledge that he/she understands the design review and construction inspection procedures. *(1 Set)*

Section Eleven

11. DEVELOPMENT REVIEW AND INSPECTION PROCEDURES

This section provides information on the Authority's requirements and procedures for the development process.

Pre-Submittal Meeting

A pre-submittal meeting is required to discuss the development and exchange necessary information. ACWWA shall be provided with the following information no later than 5 business days before the meeting:

- Owner/Applicant name, address, and a contact name.
- Engineer's name, engineer's address, and an engineer contact name.
- A Plat (Preliminary or Final) of the development site.
- An estimated date that water/sanitary service is needed.

ACWWA will provide the design engineer the following items:

- General comments due to the nature or location of the development.
- Hydraulic Grade Line (HGL) on water tank for utility report.
- Web location to download ACWWA general notes required on the construction plans, easement form, and a design checklist and criteria for the utility study.
- As-Builts in the area (if applicable/available)

All correspondence relating to the project must show the plat name Filing/Block/Lot. For example, Dove Valley Business Park Filing 17 Block 1, Lot 2 would have a project reference number of "DVBP 17/1/2".

DESIGN REVIEW

The following items must be submitted to ACWWA for the review of construction drawings.

- **Water and Sanitary Plans (4 sets)** – The plans must include and overall utility plan showing the location of water, storm, and sanitary (dry utilities if possible). These must be signed and stamped by a Colorado registered Professional Engineer prior to final approval. The jurisdictional Fire Department must sign the plans and agree with the fire hydrant placements and fire flow before the second submittal.
- **Grading/Erosion Control Plan (1 set)**
- **Landscape Plan (1 set)** – The size and location of all plantings in and within 10' of the edge of any ACWWA easements and the irrigated area must be shown on the plan.
- **Final Utility Report (2 copies)** - Water and sanitary sewer studies need to be performed per ACWWA requirements. Sizing of lines,

both sewer and water, will be verified through these water and sewer studies. The fire flow approved by the Fire Department must be used in the study.

- **Fixture Unit Count (2 copies)** – The design engineer is required to provide a fixture unit count and meter sizing calculations (following the AWWA M22 Manual) for each building, and to call out the location and size of the meters on the construction plans. Each building shall be separately metered.
- **Phase III Drainage Report (2 copies)** – if project site is located in the Lonetree Creek, Windmill Creek, or Dove Creek stormwater drainage basins.
- **Construction Plans for Regional Stormwater Facilities (4 sets)** – if applicable.
- **Title Policy (1 copy)** – A title policy must be dated within 90 days of the first submittal of construction drawings to ACWWA.
- **Final Plat (1 copy)** – A copy of the signed and recorded Final Plat covering the development property.
- **Imprest Account** – The owner shall deposit \$7,000 into an imprest account to cover the cost of the design review. Any cost incurred by ACWWA above this amount will be charged to the owner at the time of tap application. Any balance remaining will be held in the imprest account for construction-related costs or returned to the owner upon receipt of written notice that construction will not proceed as previously planned.

The Authority must find all of the above items acceptable before the construction plans will be approved. Upon approval, ACWWA will require (2)-11 x 17 and (2)-24 x 36 bond sets and one digital copy of the approved final construction plans.

Tap Application/Permit

Once the construction plans are approved, the Authority will prepare a tap application, which will include fees for the following items (as applicable):

- Water/Irrigation/Sanitary Tap Fees & associated costs
- Stormwater System Development Fees – if applicable
- Surcharges for improvements benefiting the property that have been constructed by others.
- Design Review cost not covered by initial imprest deposit
- Legal

The owner must submit to ACWWA for review a cost estimate, based on awarded bid prices, of all facilities to be conveyed to ACWWA.

THESE FEES MUST BE PAID IN ORDER TO REQUEST A PRE-

CONSTRUCTION MEETING. CONSTRUCTION IS NOT PERMITTED UNTIL ALL FEES HAVE BEEN PAID TO THE AUTHORITY AND A PRE-CONSTRUCTION MEETING HAS BEEN HELD.

Pre-Construction Meeting

After 1) construction plans are approved, and 2) all fees have been paid to ACWWA, the contractor may request a pre-construction meeting. The design engineer and utility contractor must attend the meeting.

The contractor is responsible for obtaining all applicable federal, state, and local permits including stormwater discharge permits.

At this meeting, the owner shall be required to raise the imprest account balance to 10% of the bid cost for facilities to be conveyed to ACWWA, or \$5,000, whichever is greater, for the first \$300,000 of that cost. For utility costs over \$300,000, 5% of the increment over \$300,000 must be added to the imprest balance. This imprest account will cover administration, construction inspection, and costs of items listed in Section 11.6 or 11.7 not completed within thirty days (30) after the punch list is issued. Any cost incurred by ACWWA over the balance of the imprest account will be charged to the owner.

Construction

To ensure a timely inspection, the contractor must call the Authority Inspector at least two (2) full business days prior to construction or any needed inspection. Utility installation cannot be backfilled until it has been inspected by the Authority Inspector or designated representative.

Powers and Authority of Inspectors: The Authority Manager, Inspector, or Representative bearing proper credentials and identification shall be permitted to enter all private properties within the Authority for the purpose of reading meters and testing related to discharge to the public system, inspection/observation, measurement, sampling, repair, maintenance of any portion of the water or sewer facilities lying within said properties, and related matters.

Construction Inspection: The Authority Manager, Inspector, or Representative shall have the right to inspect any and all work during construction to ensure installation in accordance with the Authority standards. After completion of construction of water or sewer lines, the Authority Inspector or Representative shall make a probationary inspection of construction as provided in Section 6.4 and 7.7.

Probationary Acceptance

Construction must be completed to a point that ACWWA can continuously use the line or facility for its intended use. The items listed below must also be completed prior to ACWWA issuing Probationary Acceptance. Water will be made available for testing purposes, but will be shut off and locked immediately after testing and will not be turned on until issuance of Probationary Acceptance.

If ACWWA finds that the lock is removed or damaged, a fee of \$1,000 will be charged to the owner. If the owner or owner's representative finds that a lock has been removed or damaged, the owner or representative MUST contact ACWWA immediately to avoid assessment of the lock fee.

- **Facilities tested** - All sanitary lines and manholes must be air-tested, mandrelled and videoed. All video must be submitted in either VHS or CD format to ACWWA to review and comment on accordingly. All water lines must pass a hydraulic flow pressure test, clear water test, and chlorine test.
- **Daily Reports** – ACWWA may require the Contractor to submit their daily progress report to the ACWWA Inspector each day. This report should include, but is not limited to: date, weather conditions, manpower, on-site equipment, equipment used, and work done for said reporting date. ACWWA inspector must receive and approve all daily reports for Probationary Acceptance.
- **Required Easements** – A legal description and sketch of all proposed ACWWA easements must be submitted for review at the completion of construction. ACWWA requires all water and sanitary lines to be in an easement dedicated to ACWWA by separate document. The easement legal descriptions and exhibits shall be in AutoCAD 14 (or higher) format as well as a hard copy on one or more 8 ½ x 11 sheets of paper. ACWWA requires that these legal descriptions and exhibits be tied to the Colorado State Plane, Central Zone (NAD 83) grid coordinates. Easement legal descriptions must be stamped and signed by a Colorado registered Professional Land Surveyor. The easement agreement forms may be picked up at the ACWWA office.
- **Service Line Location** – A drawing of the location of each service line (water, irrigation, and sewer) must be submitted for Probationary Acceptance. Each drawing must show alignment, depth to bury, size of service and any surface features associated with the service from the property line into the building. These drawings must also show address, date of inspection, inspector's name, name of company, and signature indicating services have been installed as shown on the drawing, in conformance to the current plumbing code, and per the approved construction plans.
- **Punch list** – Once pavement is installed, a walk-through will be conducted within 10 business days after the contractor's request. The

contractor has 30 days after the punch list is issued to complete the punch list items.

- **Record Drawings** - Record Drawings are to be submitted within 30 days after the punch list is issued. All manholes, valves, blow-offs and any other surface features shall be surveyed, and all coordinates for these items must be shown on the Record Drawings submitted to ACWWA prior to receiving project approval. The coordinates for these items must be tied into the Colorado State Plane, Central Zone (NAD 83) grid coordinates. The cover sheet of the Record Drawings must be a reproducible Mylar of the approved construction plan cover sheet with signatures of the appropriate agencies shown. All original design information must be shown on the Record Drawings and crossed out if inaccurate. A statement must be on the cover sheet of the Record Drawings attesting to who provided the as-constructed information and who prepared the Record Drawings, with a signature of the preparer and date. The contractor must submit to ACWWA a digital point file in AutoCAD Version 14 (or higher format) of all information shown on the Record Drawings and a digital copy of the Record Drawing plan set.
- **Test Results** - Compaction tests results, concrete tickets, and cut sheets must be submitted within 30 days after the punch list is issued.
- **Regional Stormwater Facilities** – The contractor is responsible for providing proof of maintenance eligibility by the Urban Drainage and Flood Control District for all regional stormwater facilities.
- **Site Restoration** – The contractor must complete the final site grading and install permanent erosion control measures.
- **Any outstanding items must be submitted.**
- **Prior to ACWWA issuing probationary acceptance, the owner shall be required to raise the imprest account balance to equal the account balance needed at the Pre-Construction meeting, as explained in Section 11.4. This imprest account will be used to cover any cost associated with the Warranty, as described in Section 11.7, not completed within thirty days (30) after the punch list is issued. Any cost incurred by ACWWA over the balance of the imprest account will be charged to the owner.**

Facilities are considered the property of ACWWA upon Probationary Acceptance.

Warranty

Issuance of Probationary Acceptance by ACWWA begins the one-year warranty period. ACWWA will hold the remaining imprest account balance throughout the warranty period. The owner may substitute a certification of deposit or letter of credit for the imprest account balance.

Approximately 11 months following the date of Probationary Acceptance, a

walk-through will be conducted and a punch list submitted to the owner. Final completion of the punch list items must be corrected within 30 days. If not completed within 30 days, ACWWA has the right to contract the work and deduct that cost of work from the imprest account, letter of credit, or certificate of deposit. Any cost incurred by ACWWA over the balance of the account will be charged to the owner.

Once the items on the punch list and any outstanding items are complete, any remaining balance of the imprest account will be automatically returned to the owner by ACWWA. Money due must be paid to ACWWA. ACWWA will then issue FINAL ACCEPTANCE.

If ACWWA has incurred costs exceeding the imprest account balance, the additional cost must be paid to ACWWA within 30 days after invoicing. In addition to withholding FINAL ACCEPTANCE, ACWWA will shut off and lock out water service for late payment and will not turn water back on until payment is received. (See Article 11.6 for fees assessed for lock damage or removal.)

Indemnity

ACWWA's inspections, design reviews, permits, approvals and the like do not relieve the owner, developer, engineer or contractor ("Indemnifying Party") from any liability such party may have for construction of water and sewer lines, including the liability to conform to all federal, state and/or local laws and rules, design requirements and warranty obligations. Any inspections, design reviews, permits, approvals and the like that ACWWA may conduct are intended for internal purposes only. ACWWA disclaims any liability arising out of its inspections, design reviews, permits or approvals of construction of the water and sewer lines. The Indemnifying Party agrees to indemnify ACWWA with respect to any claims arising from its construction of the water and sewer lines, as well as ACWWA's inspections, design reviews, permits and approvals of such lines.

I acknowledge that I have read and understand the information outlined in Section 11 of ACWWA's Rules and Regulations and agree to abide by the policies and procedures.

Owner / Owner Representative

Date



WATER AND SANITARY SEWER CONSTRUCTION DRAWING REQUIREMENTS

Detailed construction drawings for system extensions shall be prepared for approval with a submittal to the Authority. All construction drawings submitted shall be in strict compliance with the ACWWA Engineering Standards and shall meet special conditions that may be reasonably required. The design and installation of all facilities shall insure development of an integrated system. No work shall commence on any facilities until the construction drawings are approved in writing by the Authority General Manager. Construction drawings are only valid for six (6) months from the approval date. All final plans shall contain, but are not limited to, the following information:

I. SHEETS

The following items are the minimum required for each sheet of the plan set:

- Size – All sheets shall be 24" x 36"
- Stamped Plans – All sheets shall be signed and stamped by the Design Engineer.
- Scale – No greater than 1"=100' on any sheet. Also, a bar scale shall be shown on each sheet.
- North Arrow – All design sheets shall have the north arrow oriented toward the top or right of the sheet.
- Legend of Symbols
- Key Map
- Benchmarks

A. Title Sheet shall contain:

1. Name of Project
2. Development Name and Filing Number
3. Sheet Index
4. Legend
5. Vicinity Map
6. Agency List
7. Name and Address of Developer or Owner
8. Name and Address of Engineer
9. Signature line for Development Project Manager
10. Professional Engineer's Seal and Signature
11. Signature line for Fire Marshall on all water main construction drawings showing required fire flow.
12. "ACWWA # " to be assigned by review engineer.

B. Notes Sheet shall contain:

1. General Construction notes
2. Water notes
3. Sewer notes
4. Typical street or easement section showing location of utilities
5. Quantities List – table of quantities for water and sewer pipes, valves, manholes, and all related appurtenances.

C. Overall Utility Plan shall contain:

1. Locations, horizontal alignment, and dimensions of dedicated streets, easements (including ownership and bk/pg or reception # information) and right-of-ways.
2. Street names, or letters if names have not been assigned.
3. Lots to be served.
4. All existing or proposed curb and gutter and pavement(hatched so it is distinguishable).
5. All existing or proposed utilities with correct sizes.

ACWWA – Construction Drawing Requirements

6. All existing or proposed obstructions such as vaults or manholes, catch basins, traffic islands, etc.
7. The proposed alignment of the water mains and sewer mains and the location of all existing and proposed facilities such as valves, fire hydrants, fittings, vaults and/or manholes, cleanouts, meter pits, water service lines, sewer service lines, and taps.
 - i. For water main or water service line construction, the overall must show any existing valve that can be used to isolate the proposed mains or service lines from the existing system during construction.
8. Any gas, electric, cable TV, and/or telephone lines that will be impacted by the proposed construction.
9. Existing and proposed contours (min. 2' contours)
10. Scale shall be no smaller that 1" = 100' (i.e. 1"=200' is not acceptable)

C. Water Plan (Potable and Nonpotable) shall contain:

In plan view:

1. Locations, dimensions, ownership, and recording information of existing dedicated streets, easements, and rights-of-way.
2. Location and dimensions of proposed easements.
3. Lot lines and lot labels.
4. Lots to be served.
5. Size and location (by station) of services.
6. All existing and proposed curb & gutter, pavement (hatched to be distinguished from unpaved areas), and sidewalks.
7. All existing utilities with correct sizes (shaded lightly and dashed).
8. Nearest upstream and downstream line valve.
9. Proposed alignment of the water main and the location of all proposed water facilities such as valves, fire hydrants, fittings, kickblocks, rodding, and etc.
10. Location and size of all meters for domestic and irrigation connections. If behind fences location of remote for easy reading.
11. Key Map
12. North arrow
13. Bar Scale
14. Pipe or street centerline stationing
15. Vertical information at utility crossings (smaller than 8")
16. A minimum scale of 1"=50'

In profile view (for 8" or larger)

1. Pipe or street centerline stationing.
2. Vertical alignment of waterline and all appurtenances.
3. All other existing and proposed utilities that cross the water line.
4. Top of pipe and bottom of pipe elevations at all utility crossings.
5. Pipe sizes, lengths, depths, slopes, elevations, and top of pipe elevations on all fittings.
6. Existing and proposed ground lines
7. A minimum scale of 1"=50' horizontal and 1"=5' vertical

E. Sanitary Sewer Plan shall contain:

SAME AS WATER PLAN EXCEPT **ALL SIZES** OF SEWER MUST BE PROFILED.

F. Detail sheet(s)

1. All details shall be ACWWA standard details and specifications given shall conform to the Authority Engineering Standards.

ACWWA – Construction Drawing Requirements

2. Detail sheets containing non-standard details shall be signed and stamped by a Colorado Professional Engineer.

II. PRECEDENCE OF CONSTRUCTION DOCUMENTS

- A. Addenda and modifications to the drawings and specifications take precedence over the original documents.
- B. Should there be a conflict within the specifications or on the drawings, the Authority Engineer or Manager shall decide which stipulation will provide the best installation and his decision shall be final.
- C. In the drawings calculated dimensions shall take precedence over scaled dimensions and noted material over graphic indication.

III. MISCELLANEOUS

- A. Dedicated streets, right-of-ways, easements and planned development complexes shall conform to the requirements of Arapahoe County Standards. A copy of the recorded subdivision plat, easements or right-of-ways shall be furnished to the Authority.
- B. Minimum easement width for one utility shall be 30 feet. Easement width for more than one utility shall be determined by ACWWA.

IV. VARIANCES

- A. Any request for a variance from the requirements of these Standard Specifications shall be submitted in writing to the Authority Manager. Each variance request shall include a detailed description of the proposed variance together with the Customer's Professional Engineer's analysis of the impact of the variance. Variances from the "Engineering Standards" or the "Rules and Regulations" must be approved by ACWWA's Board of Directors. The decision of the Authority Engineer to grant or deny any variance will be final.

For submittal procedures refer to Section 11 of ACWWA Rules and Regulations

ACWWA WATER STUDY REQUIREMENTS

1. Average Day Demand (No fire flow).
= 1/3 of adjusted-demand gpm from AWWA M22 Manual (fixture unit count and meter sizing manual).
Looking for - minimum pressure of 40 psi.
 - maximum pressure 110 psi.
 - maximum head loss of 2-foot/1,000 feet of pipe for 8-inch and 12-inch diameter pipe.
2. Maximum Day Demand (No fire flow).
= adjusted-demand Gpm from AWWA M22 Manual.
Looking for - same requirements as Avg. Day Demand.
3. Maximum Hour Demand or Peak Hour Demand (No fire flows).
= 2 X Maximum Day Demand.
Looking for - same requirements as Average Day Demand
 - maximum velocity of 6-feet/second.
4. Difference between Maximum Hour Demand and Average Day Demand.
Looking for - not greater than 30 psi change.
5. Maximum Day Demand and Fire Flows.
-obtain fire flow requirements from Fire Department.
-Maximum Day, see #2
Looking for - minimum pressure of 20 psi.
 - maximum velocity of 10-feet/second.

ACWWA SEWER STUDY REQUIREMENTS

Assumptions used to size pipe:

Non-Residential – approximately 80-gal /1000-ft² of building space.

Exceptions:

- Centennial Airport Area, non residential - 23-gal/1000 ft² of building, or approximately 6 gpcd at 1 person/250 ft² of building space.
- Lincoln Executive Center - -40-gal/1000 ft² of building, or approximately 10 gpcd at 1 person/250 ft² of building space.
- Others may apply
- ❖ Residential - 75 gal per capita per day X 2.9 people/single family house.
 - 75 gal per capita per day X 2.2 people/multi-family unit.
- ❖ Peak Factor = 3.5
- ❖ Infiltration = varies depending on soil type, etc.
(Usually is between 0 and 1000 gal/day/acre)

Looking For:

- ❖ Velocity minimum at Full-Flow = 2 ft/sec
- ❖ Velocity maximum at Full-Flow = 12 ft/sec
- ❖ Avg. Design Flow <0.1 cfs requires minimum of 0.6% slope for 8-inch diameter pipe.
- ❖ Avg. Design Flow >0.1 cfs requires minimum of 0.4% slope for 8-inch diameter pipe.
- ❖ Service 4-inch pipe requires minimum of 2% fall.
- ❖ Service 6-inch pipe requires minimum of 1% fall.

Other:

- ❖ MH 90° bends for Inv. IN and Inv. OUT require 0.3 feet of fall, or greater.
(Any drop greater than 18-inches inside a manhole requires a drop manhole).
- ❖ ACWWA requires inside-drop manholes.

Arapahoe County Water & Wastewater Authority
ENGINEERING DEPARTMENT

Vision to Reality - Quality Water, Wastewater, and Stormwater Systems

DESIGN REVIEW CHECKLIST – RESUBMITTAL

All of the items below must be included in the submittal package to begin the review.

_____ **Revised Water and Sanitary Plans** – All comments must be addressed before resubmittal. The cover sheet must be signed by the jurisdictional Fire Department with the required fire flow information.

_____ **Original Redlined Drawings**

_____ **Revised Landscape Plan** – The size and location of all plantings in and within 10’ of the edge of any ACWWA easements and the irrigated area must be shown on the plan.

_____ **Original Redlined Landscape Plan**

_____ **Revised Final Utility Report** - Water and sanitary sewer studies need to be performed per ACWWA requirements.

_____ **Original Redlined Utility Report**

_____ **Fixture Unit Count** – completed following the AWWA M22 Manual.

_____ **Revised Phase III Drainage Report** – if project site is located in the Lonetree Creek, Windmill Creek, or Dove Creek stormwater drainage basins.

_____ **Original Redlined Drainage Report**

_____ **Easement Legal Descriptions and Exhibits** – All facilities to be owned and maintained by ACWWA must be in an easement dedicated by separate document.

Legal Descriptions and Exhibits- Legal descriptions and the associated exhibits are required. ACWWA does not accept platted easements. All easements shall be granted by separate document and the easements shall be for the exclusive use of ACWWA's utilities. The minimum easement width for one utility shall be 30 feet. The minimum easement width for more than one utility shall be determined by ACWWA, but shall typically expand an additional 10 feet per utility. Fire hydrant easements shall be 15 feet wide if the fire hydrant lateral extends 15 feet or less beyond the water main easement. If the fire hydrant is located more than 15 feet from the edge of the water main easement, a 30 foot easement shall be required. In addition, the easement shall extend 5 feet beyond the hydrant.

All legal descriptions and exhibits shall conform to the following criteria:

1. Legal descriptions and exhibits must be submitted as an original document on letter size paper (8-1/2" x 11"). Descriptions may be computer generated or typewritten. Exhibits must be computer generated. Photocopies will not be accepted.
2. Each proposed easement requires a separate legal description and exhibit.
3. An introduction with the location of the property (Section, Township, Range, Principal Meridian, Municipality [if applicable], County and State), the subdivision name, filing, block, and lot (if applicable) and the intended use of the property being described, must be included.
4. Enough information must be given in the description body to avoid making assumptions or being ambiguous.
5. Legal descriptions shall be written in a metes and bounds format for the perimeter easement lines (centerline calls with a width either side will not be accepted).
6. The area shall be expressed in square feet (and acres to four (4) decimal places if over 1 acre) in the legal description.
7. The legal description shall contain a Basis Of Bearings statement that complies with Section 60.1 of "The Policies Of The State Board Of Registration for Professional Engineers and Professional Land Surveyors". The exhibit will also show the referenced Basis Of Bearings and be labeled as such.
8. Insert the following title on the top of the legal description (The exhibit letter and ACWWA number will be assigned after the first review):
"EXHIBIT _____"
"ACWWA NO. _____"
9. Each legal description shall be signed and sealed by a Professional Land Surveyor currently registered in the State Of Colorado.
10. Closure sheets must be submitted. Closure must be within 0.02 feet.
11. The exhibit must be tied to 2 Section Corners shown in the attached Arapahoe County Water and Wastewater Authority Control Diagram if the parcel is located within this area.
12. All existing easements are to be shown and labeled on the exhibit with the recording information.
13. The area shall be expressed in square feet (and acres to four (4) decimal places if over 1 acre) on the exhibit.
14. Minimum font size on the exhibit shall be 0.08 times the scale of the drawing (L80).
15. The exhibit shall show a north arrow and bar scale.
16. Insert the following title on the top of the exhibit drawing (The exhibit letter and ACWWA number will be assigned after the first review):
"Illustration for EXHIBIT _____"
"ACWWA NO. _____"
17. The following statement must appear on each exhibit: "This exhibit does not represent a monumented survey. It is intended only to depict the attached description".
18. The exhibit drawing shall not contain any screened linework or screened text.
19. An index number will be assigned to each legal description and exhibit once they have been submitted to the Authority for review.

Plat- Provide a recorded copy of the most recent final plat of development. If the plat was filed before 1975, then provide an ALTA/ACSM Land Title Survey that is no more than six months old.

Title Commitment- Provide a current copy of the title commitment and supply copies of all Schedule B Section 2 documents referenced in said title commitment.

Attachments:

- ACWWA 8.5 x 11 inch Legal Description format guide.
- ACWWA 8.5 x 11 inch Exhibit Example.
- ACWWA Control Diagram- reduced for 11x17 inch printing.

EXHIBIT __

ACWWA NO. _____

Sheet 1 of 2

[TYPE OF] EASEMENT

PREAMBLE:

BASIS OF BEARINGS:

BODY OF LEGAL DESCRIPTION:

CONTAINING XXX SQUARE FEET OR X.XXX AC..

[SURVEYORS NAME, PROFESSIONAL LAND SURVEYOR
COLORADO NO. XXXXX
FOR AND ON BEHALF OF [COMPANY NAME]
ADDRESS
CITY, STATE AND ZIP CODE

DATE

ILLUSTRATION FOR EXHIBIT _____

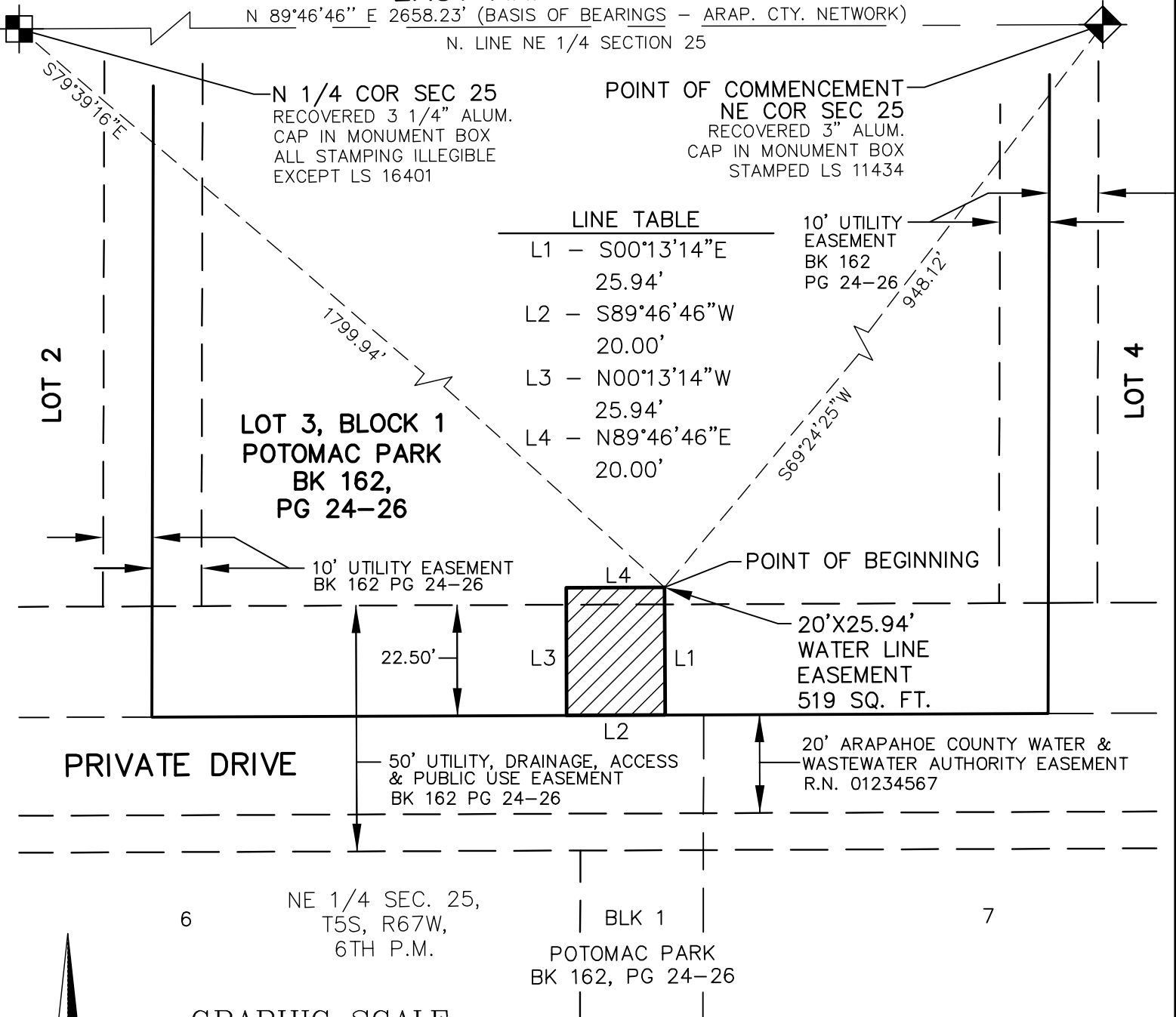
ACWWA NO. _____

SHEET 2 OF 2

EAST ARAPAHOE ROAD

N 89°46'46" E 2658.23' (BASIS OF BEARINGS - ARAP. CTY. NETWORK)

N. LINE NE 1/4 SECTION 25

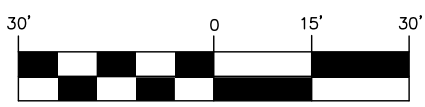


LINE TABLE	
L1	S00°13'14"E 25.94'
L2	S89°46'46"W 20.00'
L3	N00°13'14"W 25.94'
L4	N89°46'46"E 20.00'

6 NE 1/4 SEC. 25,
T5S, R67W,
6TH P.M. 7

BLK 1
POTOMAC PARK
BK 162, PG 24-26

GRAPHIC SCALE



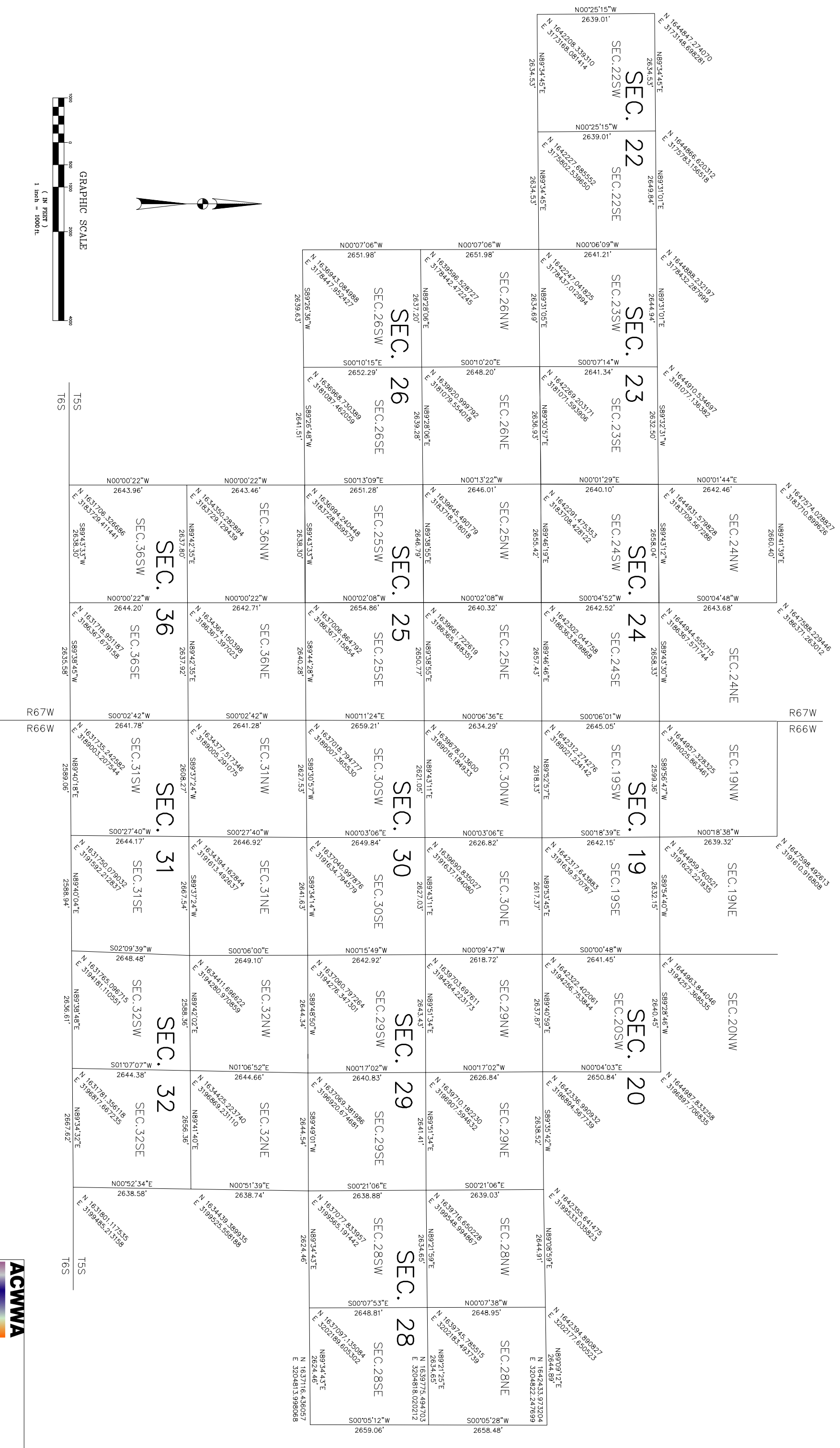
(IN FEET)
1 inch = 30 ft.

NOTE: THIS EXHIBIT DOES NOT REPRESENT A MONUMENTED SURVEY. IT IS INTENDED ONLY TO DEPICT THE ATTACHED DESCRIPTION.

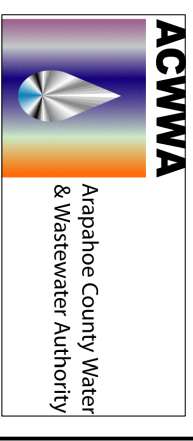


COMPANY NAME AND LOGO	
ADDRESS	
ADDRESS	
PHONE	
SCALE:	JOB NO.
DATE:	Drawing path
DRAWN BY:	SHEET: 2 OF 2

ARAPAHOE COUNTY WATER AND WASTEWATER AUTHORITY ARAPAHOE COUNTY SERVICE AREA CONTROL DIAGRAM



THE BEARING, DISTANCE AND COORDINATE VALUES SHOWN HEREON ARE PER THE ARAPAHOE COUNTY CONTROL NETWORK, PHASE 1 REVISION, AND ARE IN COLORADO STATE PLANE, COLORADO COORDINATE SYSTEM OF 1983-1992, CENTRAL ZONE. DATE OF DRAWING PREPARATION: AUGUST, 2005



Arapahoe County Water & Wastewater Authority

Engineering Department

Requirements on electronic as-builts:

An As-Built set is required for probationary acceptance. Use the following guidelines when preparing the plans.

1. **Original Design Plans-** The as-built plan set should be the original design plans with the design information crossed out. Add the as constructed information next to the crossed out design information.
2. **Preparer's Statement-** On the title sheet, include a statement of who provided the survey points, the contractor's redlines, and who prepared the As-Built plan set. The As-Built title sheet should be a copy of the title sheet from the original *approved* design plans with all approval signatures shown.
3. **Survey Points-** Insert points into As-Built production drawings. Every surface feature must have a survey point.
4. **NO XREFS-**None allowed
5. All As-Builts must be in AutoCAD or ESRI interchange file format.
6. **Submittal Package-** A complete As-Built plan set submittal must include 1 bond plan set with survey point file inserted, 1 digital copy of the As-Built plan set. Once the As-Builts are approved, a reproducible mylar plan set must be submitted.

General

All of these following features must be on their own layer.

Lots:

- _____ Outline
- _____ Lot number
- _____ Block number
- _____ Address

Streets:

- _____ Centerline
- _____ Full name
- _____ Right of way

Easements:

- _____ Outlines
- _____ Size (30', 50', etc.)
- _____ Type (utility, HOA, etc.)

Sections:

- _____ Corners
- _____ Lines

Water

_____ **(Y or N) Pressurized Mains:**

- _____ Pipe class (DR 14, DR 18, etc.)
- _____ Diameter
- _____ Depth
- _____ Pressure rating (150 psi, 250 psi, etc.)

_____ **(Y or N) System Valve:**

- _____ Type (butterfly, gate, plug, etc.)
- _____ Elevation
- _____ Manufacture
- _____ Diameter
- _____ Open left or right

_____ **(Y or N) Lateral Service Line:**

- _____ Type (commercial, domestic, fire, hydrant line, irrigation, multi-family, etc.)
- _____ Length
- _____ Material
- _____ Diameter

_____ **(Y or N) Underground Enclosure:**

- _____ Type (valve vault, vault, well valve, etc.)

_____ **(Y or N) Control Valve:**

- _____ Type (air release, PRV, Reduced Pressure Backflow, Vacuum, etc.)
- _____ Top of valve elevation
- _____ Manufacture
- _____ Diameter
- _____ Model
- _____ Pressure setting

_____ **(Y or N) Production Well:**

- _____ Name
- _____ Source (alluvial, groundwater, etc.)
- _____ Capacity
- _____ Elevation at ground

- _____ Depth maximum
- _____ Average flow
- _____ Peak flow
- _____ System (raw water, potable, JWPP, etc.)

_____ **(Y or N) Enclosed Storage Facility:**

- _____ Type (tank, tower, etc.)
- _____ Capacity
- _____ Elevation at top
- _____ Elevation at bottom
- _____ Overflow elevation
- _____ Material
- _____ Level sensor type (air bubbler, electrode, float, micro processor, transducer, ultrasonic, etc.)
- _____ Elevation at ground

_____ **(Y or N) Fitting:**

- _____ Type (degree of bend, cap, cross, reducer, riser, saddle, sleeve, tap, tee, weld, wye, etc.),
- _____ Manufacture
- _____ Material (ductile iron, PVC, etc.)
- _____ Depth buried
- _____ If removed from design during construction, show extent of pipe deflection

_____ **(Y or N) Hydrant:**

- _____ Flange elevation
- _____ Manufacture
- _____ Seat diameter
- _____ Model
- _____ Serial number

_____ **(Y or N) Meter Pits:**

- _____ RIM elevation
- _____ Yoke model #

Pump Station:

_____ **(Y or N) Clear Well:**

- _____ Elevation
- _____ Manufacture
- _____ Capacity
- _____ Depth
- _____ Diameter
- _____ Operating maximum and minimum

_____ **(Y or N) Pump:**

- _____ Type (axial flow, centrifugal, jet, reciprocating, rotary, turbine)
- _____ Elevation at flanges
- _____ Manufacture
- _____ Inlet diameter
- _____ Discharge diameter
- _____ Rated flow
- _____ Rated pressure
- _____ Total dynamic head
- _____ Low set point
- _____ High set point
- _____ Model
- _____ Serial number

Sewer

_____ **(Y or N) Manhole:**

- _____ Type (drop, split, standard, summit, control, sampling, etc.),
- _____ Access diameter
- _____ Access type (door, grate, manhole cover, etc.)
- _____ RIM elevation
- _____ Barrel diameter
- _____ Invert elevations
- _____ Flume type

_____ **(Y or N) Lift Station:**

- _____ Name
- _____ Capacity
- _____ Elevation at bottom
- _____ Level sensor type (air bubbler, electrode, float, micro processor, transducer, ultrasonic, etc.)
- _____ Average flow
- _____ Peak flow
- _____ Wet well capacity
- _____ Wet well rim elevation
- _____ Wet well depth
- _____ Wet well access type
- _____ Wet well access diameter

_____ **(Y or N) Pump:**

- _____ Type (axial flow, centrifugal, jet, reciprocating, rotary, turbine)
- _____ Manufacture
- _____ Inlet diameter
- _____ Discharge diameter
- _____ Rated flow
- _____ Rated pressure

- _____ Total dynamic head
- _____ Low set point
- _____ High set point
- _____ Model
- _____ Serial number

_____ **(Y or N) Treatment Plant**

- _____ Name
- _____ Capacity
- _____ Average capacity
- _____ Maximum capacity
- _____ Minimum capacity
- _____ Elevation at headworks

_____ **(Y or N) Grease Separator**

- _____ Type (grease interceptor, grease trap, sand/oil, etc.)
- _____ Invert elevation
- _____ Manufacture
- _____ Model
- _____ Capacity
- _____ Depth buried
- _____ Maximum flow cap

_____ **(Y or N) Cleanout Structure**

- _____ RIM elevation
- _____ Diameter
- _____ Invert elevation

_____ **(Y or N) Pressurized Main**

- _____ Length
- _____ Material (PVC, etc.)
- _____ Exterior coating (tar, paint, zinc, aluminum, etc.)
- _____ Pipe class
- _____ Roughness
- _____ Diameter

_____ **(Y or N) Gravity Main**

- _____ Type (collector, interceptor, etc.)
- _____ Length
- _____ Material (PVC, etc.)
- _____ Exterior coating (tar, paint, zinc, aluminum, etc.)
- _____ Pipe class
- _____ Roughness
- _____ Diameter
- _____ Lining type (cement-motar, sliplining, etc.)

_____ **(Y or N) Lateral Line**

_____ Type (commercial, single family, industrial, multifamily, etc.)

_____ Length

_____ Material

_____ Diameter

Regional Stormwater:

_____ **(Y or N) Regional Stormwater**

_____ ACWWA's Regional Stormwater System

_____ Dove Creek

_____ Windmill Creek

_____ Lonetree Creek

_____ Pond/s

_____ Channel/s

_____ Pipe/s

_____ Manhole/s

_____ Outfall/s

_____ Inlet/s

_____ Capacities & Volumes

_____ Surface acres

_____ All Grade Elevations at tops and bottoms

_____ Elevations of Spillways and Overflows tops and bottoms

_____ Depths maximums minimums and averages

_____ Lengths and Widths / Cross sections of all ponds and channels

_____ Stormwater runoff drainage/s points

_____ Stormwater discharge/s points

_____ Types of materials used for construction

_____ **(Y or N) Stormwater Facilities / Structures / PBMPs**

_____ Facility / structures (circle as needed)

_____ Detention Pond

_____ Extended Detention Pond

_____ Constructed Wetland

_____ Pollution Removal Facility

_____ Phosphorus Removal Facility

_____ Sediment Removal Basin Structure

_____ Trash and Debris Removal Structure

_____ PBMP Permanent Best Management Practice

_____ Forebay/s

_____ Micro pool/s

_____ Stilling Basins

_____ Drop structures

_____ Trickle Channels

_____ **(Y or N) Stormwater Easements**

_____ ACWWA's easement

_____ Drainage easement

_____ Shared utility easement (Elec., Gas, Phone, Cable, access.) _____

_____ Other/s easements, list _____

_____ Floodplain delineation 100 year

_____ FEMA

_____ Other, list _____

Coordinate System:

All CAD and GIS files shall be registered to the North American Datum 83 (NAD 83) Colorado State Plane Central Zone coordinate system (Grid), units feet with ties to the monumented High Accuracy Reference Network System (HARN) points.

False Easting: 3,000,000.000000

False Northing: 1,000,000.000000

Central Meridian: -105.500000 (Decimal)

Standard Parallel 1: 38.450000 (Decimal)

Standard Parallel 2: 39.750000 (Decimal)

Latitude of origin: 37.833333 (Decimal)