

# Record Drawing Checklist

**ALL** of the following items must be submitted to begin the Record Drawing Review.

- ✓ Record Drawings
  - ✓ Completed Record Drawings Checklist
  - ✓ Form 2 – Developer’s Certification
  - ✓ Form 3 – Lien Waiver
  - ✓ Materials List (itemized & on Approved Contractor’s letterhead)
  - ✓ Property deed(s) - (Recorded)
  - ✓ Sewer Acceptance Letter (if sewer to be treated by non-City entity)
  - ✓ Mortgage(s) - (for subject properties of the developer that are being developed, mortgage must be recorded)
  - ✓ Off-site easement(s) (if applicable)
  - ✓ Encroachment permit(s) (if applicable)
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- All post construction submittals outside of City limits should be emailed to [Engprojects@columbiasc.gov](mailto:Engprojects@columbiasc.gov)
  - All post construction submittals inside City limits should be handled by contacting the Development Center at (803) 545-3420

# Record Drawing Checklist

Date	
Project Name	
Project Location	
City File Number	
Engineering Firm	
Engineer's Name	
Engineer's Phone #	
Engineer's Email	

- **Please make a selection for ALL items relevant to your project on this checklist. If any item requires additional notes/explanation, please provide the necessary information in "Notes" at the end of the section.**
- **Water and Sanitary Sewer submittals should be submitted separately with its own cover sheet.**
- **Use all certifications as it is written in its form in the checklist. Deviating from the city's written certifications could cause delays in the Record Drawing Review.**

**General/Format** – Verify or Indicate if the following are correct (see City's sample):

1.	<input type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> N/A	City's Record Drawing sample used
2.	<input type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> N/A	Does Record Drawing conform to approved Construction Plans and Approval Letter? <b>Note:</b> City does not determine meter size
3.	<input type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> N/A	Drawings should consist of a cover sheet, plan sheet(s) and profile sheet(s). <b>Notes:</b> 1. This item is N/A for water projects; 2. Showing both plan and profile view on one sheet only acceptable on small projects
4.	<input type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> N/A	All off-site easements obtained using City prepared documents and approved by the City's Real Estate Division
5.	<input type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> N/A	No easements for water, sewer, or storm drainage shown in dedicated (existing) public road right-of-way. <b>Note:</b> Does not apply to roadways not yet dedicated and/or privately owned roadways
6.	<input type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> N/A	Use standard symbols for appurtenances/fittings such as meter boxes, fire hydrants, valves, plugs, manholes, junction boxes, etc.
7.	<input type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> N/A	No copyright statements on record drawings or associated off-site easement exhibits
8.	<input type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> N/A	Is the project location within 5 miles of the nearest city boundary line?

# Record Drawing Checklist

9.	Notes	
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**Title Block** - Indicate if the following are included:

1.	<input type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> N/A	Title Block included on all Plan and Profile Sheets
2.	<input type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> N/A	“Project Name”; must identify subdivision or project name, phase number if applicable, City, County and State where project is located
3.	<input type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> N/A	“Prepared For”; must identify legal entity name, mailing address, and contact information for client including email if available
4.	<input type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> N/A	“Prepared By”; must identify engineering firm, engineer’s name, and P.E.’s license number responsible for drawing
5.	<input type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> N/A	“Last Revised”; must identify date of revisions and provide comments explaining items revised as of that date
6.	Notes			

**Cover Sheet** - Indicate if the following are included:

1.	<input type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> N/A	Name of the Subdivision or Project and City File number
2.	<input type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> N/A	State “Record Drawing Date _____, 20__”; <b>Notes:</b> 1. Do not use older label of “As-Built”; 2. Record Drawing date should not predate project approval letter date and should not be the same date as construction plan date
3.	<input type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> N/A	Show “General Notes” for project. See General Notes section of this checklist ( <b>cover sheet only</b> )
4.	<input type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> N/A	Name and address of the developer
5.	<input type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> N/A	Name, address, and email of the property owner
6.	<input type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> N/A	Name and address of the water provider
7.	<input type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> N/A	Name and address of the sanitary sewer provider
8.	<input type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> N/A	Name and address of the storm drainage provider
9.	<input type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> N/A	Vicinity map, with North arrow ( <b>cover sheet only</b> )
10.	Notes			

# Record Drawing Checklist

## General Notes - Indicate if the following are included:

1.	<input type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> N/A	Tax map parcel numbers of subject site in General Notes section of Cover Sheet
2.	<input type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> N/A	Ten State Standards in General Notes section of Cover Sheet –“Ten State Standards maintained between water, sewer, and storm drainage”
3.	<input type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> N/A	Easement language regarding service lines, in General Notes section of Cover Sheet ( <i>see “Easement Language,” included in Appendix</i> )
4.	<input type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> N/A	If sewer provided through septic tank, state “DHEC Septic Tank Approval Letter dated _____, expires five (5) years from date of issue” in General Notes section
5.	<input type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> N/A	Provide mean sea level datum and state in statement form
6.	<input type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> N/A	Identify in statement form to who new roadways will be conveyed (SCDOT, City or County). Only use approved roadway names/do not change roadway names without approval
7.	<input type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> N/A	Other notes deemed appropriate and specific to the project
8.	<b>Notes</b>			

## Plan Sheet(s) - Indicate if the following are included:

1.	<input type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> N/A	Identify graphic scale (must use 10, 20, 30, 40, 50, or 60; 100 only if necessary)
2.	<input type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> N/A	Blow-ups/insets for all fire hydrants and/or hydrant valves and elsewhere as deemed appropriate; identify either graphic scale or dimensions
3.	<input type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> N/A	North Arrow; specify if North Arrow is true or grid
4.	<input type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> N/A	Show and label phase lines
5.	<input type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> N/A	Label tax map number and owner’s information for subject property and all adjacent properties. Verify current information at richlandonline.com and www.lex-co.com
6.	<input type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> N/A	Label City File number in lower right quadrant
7.	<input type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> N/A	Show bearings (degrees, minutes, and seconds) and distances for all sanitary sewer mains, storm drainage lines and street boundaries
8.	<input type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> N/A	Label distances for all water mains and service lines (call out). Call outs should indicate size of pipe, material of pipe, and distance of pipe from fitting to fitting. Distances must be provided to nearest one-tenth of a foot ( <b>see Appendix for call out example</b> )
9.	<input type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> N/A	Label distances for all sanitary sewer mains, service lines, and storm drainage lines. Stated distance should match distances shown on profile sheet ( <b>see Appendix for call out example</b> )

# Record Drawing Checklist

10.	<input type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> N/A	<p>Location data: <b>All appurtenances/fittings must be identified</b> and “tied to” (i.e. provide the distance to) a nearby stable physical feature such as a true property corner or building corner. Two (2) tie point references are required to be shown on the drawing for the connecting point(s) and ending point(s) of all new lines (both main and service lines). A state plane coordinate table can be used to locate all other appurtenances/fittings such as hydrants, bends, reducers, meter boxes, blow offs, cleanouts, manholes, catch basin, etc. However, this coordinate table must also include the tie point reference distance between said appurtenance/fitting and a stable physical feature.</p> <p><b>(i.e., connecting point(s) of line is specified as the ultimate beginning where the new main/service line connects to existing City line or ending point(s), the ultimate end where the new main stops at a plug, stub-out, etc. or a service/lead line stops at a meter and/or fire hydrant) – See Appendix for example of state plane coordinate table</b></p>
11.	<input type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> N/A	Label lot numbers, buildings and, existing/new public and/or private roadways and most current tax map number(s) with ownership
12.	<input type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> N/A	Bends on water drawings must be identified by size (degrees) and noted as vertical, if the bend is a vertical bend
13.	<input type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> N/A	Location of utility lines within easement relative to easement boundaries
14.	<input type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> N/A	Show and label easements for all utilities (power, gas, etc.) on subject properties
15.	<input type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> N/A	Label easements for City utilities as “___’ Exclusive City of Columbia Water, Sanitary Sewer, Storm Drainage Easement.” Note: See “Easement Language” information in Appendix
16.	<input type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> N/A	Contours (2’ or more accurate) must be labeled and show multiple locations for ease of following. Top nut of hydrant may be substituted for elevation purposes. <b><u>Final grades required only on all areas City of Columbia will be receiving easement(s)</u></b>
17.	<input type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> N/A	Provide location and description of monuments (benchmarks)
18.	<input type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> N/A	Label road names and identify ownership of roadway and width of road right-of-way
19.	<input type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> N/A	Water/sewer/storm drainage lines cannot arbitrarily end at phase lines; there must be proper termination of the line (plug, manhole, etc.) A utility line cannot end at a tee
20.	<input type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> N/A	Show sewer profiles including separations for all other utilities meeting Ten State Standards
21.	<input type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> N/A	Identify all rights-of-way, easements, and areas to be dedicated for public use shown along with the purpose of each stated, including but not limited to power line rights of way, gas line rights of way, water, sanitary sewer, and storm drainage easements, public roadways
22.	<input type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> N/A	Label City File Number(s) and project name for existing lines being tied to

# Record Drawing Checklist

23.	<input type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> N/A	Identify meter box(es) and/or sewer clean out for each lot, with references (tie points)
24.	<b>Notes</b>			

**Profile Sheet(s)** – Indicate if the following are included:

1.	<input type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> N/A	Identify horizontal and graphic scales for each profile
2.	<input type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> N/A	Label station numbers on all manholes, junction boxes, catch basins, etc. Also, show distances of main lines along profile view. Distances and station numbers should correlate
3.	<input type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> N/A	Show size, material, and slope between manholes, and lengths of all sanitary sewer lines on plan view and profiles
4.	<input type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> N/A	Label City File number in lower right quadrant
5.	<b>Notes</b>			

**Attachments** - Indicate if the following are included:

1.	<input type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> N/A	Off-site easement documentation, if applicable
2.	<input type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> N/A	Must submit Sewer Acceptance Letter upon receipt (if sewer to be treated by non-City entity)
3.	<input type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> N/A	Form 2 – Developer’s Certification (not required for CIP); See City of Columbia Engineering Regulations section 6.5
4.	<input type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> N/A	Form 3 – Lien Waiver Form signed by Contractor (not required for CIP); See City of Columbia Engineering Regulations section 6.6
5.	<input type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> N/A	Itemized Materials List
6.	<input type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> N/A	Provide copy of recorded deed for subject properties of the developer/owner being developed as part of this project (not required on CIP unless pipe installed on City-owned property)
7.	<input type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> N/A	Provide copy of recorded mortgage on subject properties of the developer/owner being developed as part of this project (not required on CIP unless pipe installed on City-owned property)
8.	<input type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> N/A	Copy of encroachment permits for new water, sewer and/or storm drainage lines constructed within dedicated (existing) public roadways and/or rights-of-way. <b>Note: The City applies for encroachment permits upon receipt of encroachment applications.</b>

# Record Drawing Checklist

<b>9.</b>	<b>Notes</b>	
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**Certifications, Seals and Signatures** - Indicate if the following are included:

<b>1.</b>	<input type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> N/A	Infiltration certification on all sewer drawings: "I hereby certify that the infiltration/exfiltration does not exceed 200 gallons per-day per- inch of pipe diameter per-mile of sewer pipe including manholes for any section of the system."
<b>2.</b>	<input type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> N/A	Engineer's Certification Statement ( <b>cover sheet only</b> ) – See Appendix for the statement to include on the cover sheet
<b>3.</b>	<input type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> N/A	SC Professional Engineer Seal, Signature, and Date ( <b>on each sheet</b> )
<b>4.</b>	<input type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> N/A	Engineering Firm's Certificate of Authorization Seal ( <b>on each sheet</b> )
<b>5.</b>	<b>Notes</b>			



# Record Drawing Checklist

## RECORD DRAWING APPENDIX

### Engineer's Certification Statement

- The certification below should be used on the cover sheet on all projects. Use the certification as it is written below.

### ENGINEER'S CERTIFICATION

THESE RECORD DRAWINGS ARE A COMPILED REPRESENTATION OF THE CONSTRUCTED PROJECT. I HEREBY CERTIFY THAT TO THE BEST OF MY KNOWLEDGE AND BELIEF, BASED ON OBSERVATIONS DURING CONSTRUCTION, MY ASSESSEMENT OF THE COMPLETED WORK AND REVIEW OF THE "AS-BUILT" SURVEY, THE PROJECT INCLUDING...

- |                             |                                 |
|-----------------------------|---------------------------------|
| _____ Water Mains           | _____ Sewer Force Mains         |
| _____ Sanitary Sewer System | _____ Lift Station/Pump Station |
| _____ Storm Drainage System | _____ Reclaimed Water Mains     |
| _____ Streets               |                                 |

WAS COMPLETED BY THE CONTRACTOR IN ACCORDANCE WITH THE INTENT OF THE PERMITS, APPROVED PLANS, AND SPECIFICATIONS

ENGINEER'S SIGNATURE & DATE: \_\_\_\_\_ Date: \_\_\_\_\_  
 NAME: \_\_\_\_\_  
 SOUTH CAROLINA LICENSE NO: \_\_\_\_\_ (AFFIX SEAL HERE)

#### INFORMATION PROVIDED BY:

##### **GENERAL CONTRACTOR**

Name: \_\_\_\_\_  
 Address: \_\_\_\_\_  
 Phone #: \_\_\_\_\_  
 S.C. License Number: \_\_\_\_\_

##### **SURVEYOR**

Name: \_\_\_\_\_  
 Address: \_\_\_\_\_  
 Phone #: \_\_\_\_\_  
 S.C. License Number: \_\_\_\_\_



## Easement Language

Main lines and future extensions – ex: “15’ Exclusive City of Columbia Water Easement” Service Lines should be covered in a note: “There is a 10’ Exclusive City of Columbia water/sewer easement on all service lines from the main line to the meter/cleanout”

## Sanitary Sewer Language

This verbiage should be used on record drawings where the sanitary sewer service will be installed by the City of Columbia Forces – ex: “Future Sanitary Sewer Service line to be constructed by City of Columbia Forces”

## Storm Drain Certification Language

I hereby certify that the storm drainage system for \_\_\_\_\_ was installed in accordance with the City of Columbia approval letter dated \_\_\_\_\_, and meets storm drainage requirements and contained silt on the property concerned to the maximum extent feasible. Provisions for erosion and sediment control and storm drainage were met in accordance with the Columbia Sediment and Erosion Control and Storm Drainage Ordinance.

**Note:** If the City of Columbia will not be operating and maintaining the drainage system, the statement must be in letter format on the engineer’s letterhead. The statement must be signed and sealed by the Engineer of Record and must provide his P.E. Registration number (reference City Regulations Manual, page 14, items 3 & 4, under “Storm Sewer Design”).

## Final Submittal

- Record drawings are final (all requested revisions addressed, signed and sealed)
- All required documents for the project must be submitted on legal-size paper, including executed utility deeds, Declaration of Covenant, and Partial Mortgage Release (In instances where there is no mortgage on the property, the Owner must return form to the City identifying the project name and address with the notation, “There is no mortgage on this property.”)
- Final Record Drawing .PDF and .DWG must be submitted electronically through email. You will be notified if a CD ROM or DVD is required

## Submittal to DHEC

Final Package to DHEC must include:

1. **Engineer’s Certification Letter:** The Engineer must certify that the project has been built in accordance with the permitted plans and with good engineering practices. The certification is based upon periodic observation of the construction by the project engineer or a representative of his/her office. Infiltration Certification must also be included for all sewer projects.
2. **City’s Ownership, Operation & Maintenance Letter (O&M Letter):** This letter will be provided by the City of Columbia upon receipt of all required documents (deeds, covenants, etc.) approved pressure tests, bacteriological test, and final inspection by the City’s Utility Inspector.

3. **Pressure, Bacteriological and Fire Hydrant Flow Test Results:** Test results will be issued with the City's O&M Letter.
4. **Two (2) Sets of Record Drawings**

Complete package to be submitted by the Engineer to DHEC at:  
**Central Midlands District**  
**Environmental Quality Control**  
**P.O. Box 156**  
**State Park, South Carolina 29147**

**WATER CALL OUT VERBIAGE**

(distance of pipe) LF (size of pipe) (material of pipe) from (fitting) to (fitting)

**WATER CALL OUT EXAMPLE**

53.89 LF 6" DIP FROM 6" VALVE TO TEE

10.17 LF 6" DIP FROM 90° BEND TO 6" VALVE

5.80 LF 6" DIP FROM REDUCER TO 90° BEND

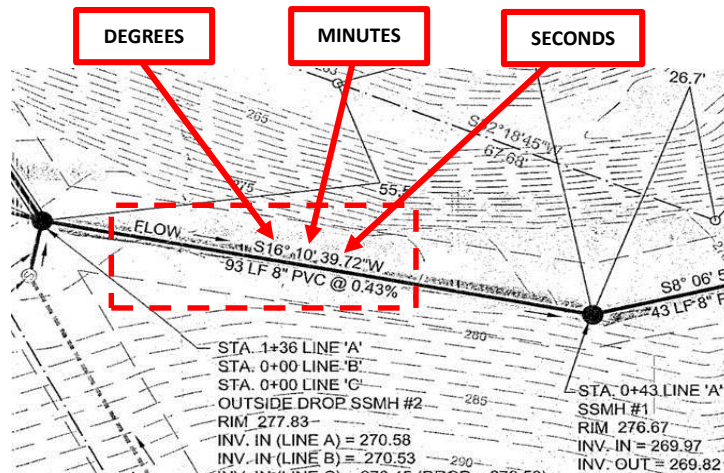
25.3 LF 6" DIP FROM BEND TO BEND

**SANITARY SEWER & STORM DRAINAGE CALL OUT**

Top portion is indicated by bearing (degrees, minutes, seconds) between station to station  
 Bottom portion is indicated by (distance of pipe) LF (size of pipe) (material of pipe)

Sewer Stations are always manholes or clean-outs  
 Storm Drainage Stations are junction boxes and catch basins

**SANITARY SEWER CALL OUT EXAMPLE**



**\*The same example can apply for storm drainage with the addition of junction boxes or catch basins\***

# Record Drawing Checklist

## COORDINATE TABLE

As stated on Page 5 of the Record Drawing Checklist, a coordinate table can be used to display all other appurtenances/fittings such as hydrants, bends, reducers, meter boxes, blow offs, cleanouts, manholes, catch basins, etc. to state plane coordinates. **Two (2) tie point references are required for each appurtenance/fitting on the coordinate table. The two tie points must be from said fitting to a stable physical feature such as true property corner or building corner.** Please see below for coordinate table example.

WATER MAIN LOCATION								
REF	REF PNT	NORTHING	EASTING	PNT	NORTHING	EASTING	DESC	DISTANCE
IPF	1	808769.95	1941841.49	2	808730.62	1941813.04	4" VALVE	48.55'
IPF	1	808769.95	1941841.49	3	808703.87	1941807.21	4" DIP WL	74.45'
IPF	1	808769.95	1941841.49	4	808657.41	1941801.54	4" DIP WL	119.43'
IPF	1	808769.95	1941841.49	5	808619.19	1941813.63	4" DIP WL	153.33'
IPF	1	808769.95	1941841.49	6	808580.79	1941805.92	METER	192.48'
IPF	1	808769.95	1941841.49	7	808577.26	1941794.31	4" DIP WL	198.38'
IPF	1	808769.95	1941841.49	8	808571.27	1941780.31	4" DIP WL	207.90'
IPF	1	808769.95	1941841.49	9	808570.33	1941780.31	11.25" BEND	211.11'
IPF	1	808769.95	1941841.49	10	808572.42	1941759.80	90° BEND	213.76'
IPF	1	808769.95	1941841.49	11	808569.21	1941759.04	90° BEND	217.02'
IPF	1	808769.95	1941841.49	12	808569.67	1941757.33	4" VALVE	217.25'
IPF	1	808769.95	1941841.49	13	808570.24	1941755.28	POST HYD	217.53'
IPF	1	808769.95	1941841.49	14	808572.73	1941746.33	METER	218.98'
IPF	1	808769.95	1941841.49	16	808648.01	1941800.89	45° BEND	128.52'
IPF	1	808769.95	1941841.49	17	808630.56	1941814.88	45° BEND	141.91'
IPF	1	808769.95	1941841.49	18	808588.13	1941810.20	45° BEND	184.50'
IPF	1	808769.95	1941841.49	19	808572.33	1941786.96	22.5" BEND	205.01'

Tie Point Reference #1

WATER MAIN LOCATION								
REF	REF PNT	NORTHING	EASTING	PNT	NORTHING	EASTING	DESC	DISTANCE
IPF	15	808568.97	1941748.54	2	808730.62	1941813.04	4" VALVE	172.42'
IPF	15	808568.97	1941748.54	3	808703.87	1941807.21	4" DIP WL	145.36'
IPF	15	808568.97	1941748.54	4	808657.41	1941801.54	4" DIP WL	100.87'
IPF	15	808568.97	1941748.54	5	808619.19	1941813.63	4" DIP WL	78.71'
IPF	15	808568.97	1941748.54	6	808580.79	1941805.92	METER	54.22'
IPF	15	808568.97	1941748.54	7	808577.26	1941794.31	4" DIP WL	42.13'
IPF	15	808568.97	1941748.54	8	808571.27	1941780.31	4" DIP WL	27.41'
IPF	15	808568.97	1941748.54	9	808570.33	1941780.31	11.25" BEND	19.87'
IPF	15	808568.97	1941748.54	10	808572.42	1941759.80	90° BEND	7.62'
IPF	15	808568.97	1941748.54	11	808569.21	1941759.04	90° BEND	6.04'
IPF	15	808568.97	1941748.54	12	808569.67	1941757.33	4" VALVE	4.38'
IPF	15	808568.97	1941748.54	13	808570.24	1941755.28	POST HYD	2.60'
IPF	15	808568.97	1941748.54	14	808572.73	1941746.33	METER	7.65'
IPF	15	808568.97	1941748.54	16	808648.01	1941800.89	45° BEND	92.40'
IPF	15	808568.97	1941748.54	17	808630.56	1941814.88	45° BEND	87.29'
IPF	15	808568.97	1941748.54	18	808588.13	1941810.20	45° BEND	60.32'
IPF	15	808568.97	1941748.54	19	808572.33	1941786.96	22.5" BEND	34.12'

Tie Point Reference #2