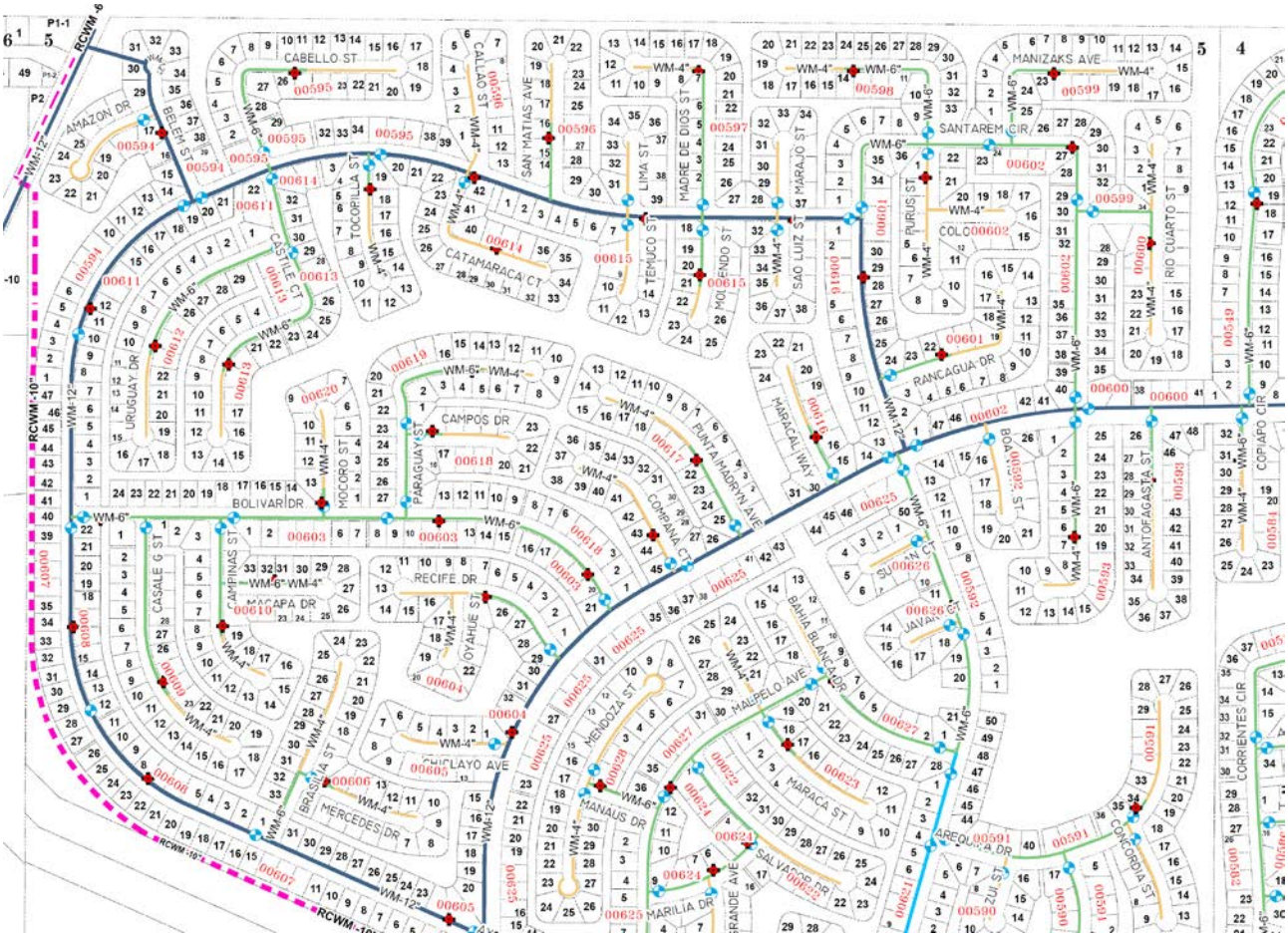
Charlotte County Utilities

CADD Standards

November 01, 2011



Charlotte County Utilities

25550 Harbor View Rd,

Port Charlotte FL 33980

(941) 764-4300

http://www.charlottecountyfl.com\ccu

CCU CADD STANDARDS FOR GIS

TABLE OF CONTENTS

1.0 INTRODUCTION

The Computer Aided Drafting and Design (CADD) Standards as outlined in this manual are intended to serve as a guideline for producing Plat Drawings and Record "As-Built" Utility Drawings created for Charlotte County. All Plat and Record "As-Built" utility CAD drawings created by or for Charlotte County are required to adhere to these standards. The Plat and Record Drawings electronically submitted to Charlotte County shall be identical to the submitted hardcopy set. These standards were created to help transfer data to an ArcGIS Geodatabase and therefore pertain only to that objective and do not address other standards the County may enforce concerning printing, layout, size, colors, and other formatting requirements. 'CADD standards' can be defined as the rules, guidelines, and standard operating procedures used in producing, maintaining. and sharing CAD data / drawings in the electronic environment. As stated previously, these standards pertain to formatting data that will be uploaded via a "Data loader" to an ArcGIS database. It is important that the data are created and formatted correctly in CAD so that a "clean" transfer of data is possible. Charlotte County will store all utility data in an ArcGIS Geodatabase. This database will allow the County to store, maintain, query, and analyze all utility data. A custom application (the CAD Data Loader) will be used to transfer all CAD to this format.

This manual was developed with trained CADD Technicians in mind and is neither a textbook nor a substitute for CADD knowledge, experience, or judgment. No attempt is made to explain or detail basic CADD techniques and/or commands.

1.1. SOFTWARE REQUIREMENTS AND FILE REQUIREMENTS

In order for CAD drawings to be transferred correctly to the ArcGIS Geodatabase, all CAD files must be received in the AutoCAD.dwg format (AutoCAD 2004 version). If Record "As-Built" Drawings have been prepared in a version of AutoCAD later than version 2004, the final Record "As-Built" Drawing file should be 'saved' in AutoCAD 2004 prior to submitting to CCU.

2.0 DRAWING SET-UP

The following standards relate to how the AutoCAD drawing will need to be set up.

2.1. COORDINATE SYSTEM

Coordinate system will be as provided by the Surveyor as outlined in CCU Minimum Drawing and Submittal Requirements for Potable Water, Wastewater and Reclaimed Water Projects. The Scope of Work provided to the Surveyor should specify that survey data will be based on the coordinate system known as Florida State Plane West North American Datum (NAD) 1983 Zone Feet. Vertical elevations will be North American Vertical Datum (NAVD) 1988.

2.2. MODEL SPACE / PAPER SPACE

All entities are to be drawn in AutoCAD's model space. Paper space (layout view) shall be used for title blocks, north arrows, and other data not pertinent to the Geodatabase.

Rotation of the "model space" from the x, y, and z axis shall not be accepted. The axis shall be set to 0. Any rotation of the project view shall be done in the "layout view" or "paper space".

All plot configurations shall be set to Architectural D landscape page size.

2.3. DRAWING UNITS

Drawing units in AutoCAD should be set to decimal or engineering. Each drawing unit shall represent 1 foot. Architectural units will not be acceptable. Units for angles shall be set to decimal degrees for insertion. Scale units shall be set to unitless.

2.4. SNAPPING & CONNECTIVITY

All line work and objects will be created using standard AutoCAD "OSNAP" commands ensuring proper joining of the features. Objects inserted such as valves, meters, hydrants, etc., shall be snapped to the appropriate endpoint. Separate line segments shall be used to separate and identify varying pipe diameters and pipe materials, as well as distances between valves and fittings. Polygon easements will be represented in AutoCAD with lines, polylines, and arcs and all endpoints must be snapped ensuring that a closed polygon will be created in GIS. Additionally, the following shall apply:

- Each line will begin and end with a point entity
- Each line intersecting another line within the same layer shall be split
- A line being intersected by a line from an unrelated layer should not be split
- The appropriate point entity must be populated at intersections of all lines
    - e.g. 3 Pressurized Mains/Tee, or 4 Pressurized Mains/Cross
- If two distinctly different lines are connected, the appropriate point entity that describes the change must be used;
    - e.g. Reducer, Transition Gasket

2.5. AUTOCAD LINE OBJECTS

Only lines, polylines, and arcs are to be used. The use of Splines is not acceptable.

2.6. LAYER FORMATTING

All objects shall be drawn or created on the appropriate layer. All properties (color, linetype) shall be set to "Bylayer". No entity shall have a separate color or linetype.

2.6.1. LAYER 0

Layer 0 - Color White, Continuous linetype. No entity or text should be drawn on Layer 0. Only blocks should be drawn on Layer 0 then inserted on the appropriate layer.

2.6.2. LAYER SEGREGATION

Components to be uploaded will be segregated in layers to include ***only*** the features for that component. Other line work and text not associated with that component but required for the production of the construction plans shall be housed on other layers. Not all layers will apply to all projects. Exact name matching is required for proper functionality. An AutoCAD template drawing containing these layers already set up is available from the County.

2.6.3. LAYER NAMES

Layer names have been preset by Charlotte County. Layer names are provided in the AutoCAD template provided by the County and listed in **Appendix 1**. It is essential that the correct entity is on the correct layer. **Do not alter any layer name; doing so will result in not capturing required data and failing QA.**

2.6.4. ADDITIONAL LAYERS

Record drawing data to be uploaded will include only new construction and care will be taken to exclude any “existing” facilities from this dataset so as to not duplicate information in the GIS system. Existing data can be included in the drawing but should reside on separate layers. It is recommended that the prefix “EX-“ be added to the layers of all existing data.

2.6.5. LAYER COLORS

Standardized colors for layers are not critical, however very light colors such as, but not limited to White, Yellow and Cyan shall not be used. They are too difficult to see on a computer screen or when plotted on white media.

2.6.6. DEFPOINTS LAYER

Do not alter, use or place objects in the Defpoints layer. AutoCAD automatically creates the Defpoints layer when dimensions are added to the drawing and its purpose is to contain the definition points at the end of the dimension lines. The Defpoints layer is designed not to plot and allows you to view and edit it's contents, however, do not alter the Defpoints layer. If you need to have objects on a viewable layer that won't plot, then you will need to create a specific layer for that purpose.

2.7. FONTS

Use standard AutoCAD fonts. Other fonts used, such as architectural fonts, must be approved by Charlotte County. Supply the electronic font file or shape file (.SHX) to the County if using a nonstandard AutoCAD font. SOFTDESK fonts are acceptable.

2.8. EXTERNAL REFERENCES

Drawings (Project_Name_Utilities_Only.DWG) submitted for the geodatabase shall not contain External References (xrefs). Before drawings are submitted to the County, all xrefs shall be bound to create a completely independent and standalone drawing.

2.9. TEMPLATES

Charlotte County will provide an AutoCAD template that will include all the standard layers listed in Appendix 1. This will be set to the appropriate drawing units. It is strongly recommended that all contractors use the provided template.

Example: The easiest way to utilize this template is to open it in AutoCAD and immediately SAVE AS: to whatever file name and location you were going to use for your drawing, so essentially you are using a copy of the template as a new drawing (.dwg) file. In this way, layer names will already be established for you and you can just pick which layers to utilize when drawing. Just remember not to overwrite the template itself.

APPENDIX 1

I. CCU CADD LAYER STANDARDS

1. The following table shows all CAD layers that shall be required for all CAD files submitted to CCU.

2. The template for the CAD layers and line types are available on the CCU web site in the Engineering Services area. At http://www.charlottecountyfl.com/ccu/Engineering .

	Item	Layer	Color	Linetype	Lineweight [mm]
Water	abandoned water main	C-DOMWABM	white	ABANDONED_WATER_MAIN	0.35
	domestic existing water main	C-DOMWMAM-EX	blue	EXISTING_WATER_MAIN	0.25
	domestic existing water main text	C-DOMWMAMDIP-EX	blue	Continuous	0.13
	1" domestic water main	C-DOMWMAM-1	31	1IN_WATER_MAIN	0.25
	1" domestic water main text	C-DOMWMAMDIP-1	31	Continuous	0.13
	1.5" domestic water main	C-DOMWMAM-1.5	81	1.5IN_WATER_MAIN	0.25
	1.5" domestic water main text	C-DOMWMAMDIP-1.5	81	Continuous	0.13
	2" domestic water main	C-DOMWMAM-2	52	2IN_WATER_MAIN	0.25
	2" domestic water main text	C-DOMWMAMDIP-2	52	Continuous	0.13
	2.5" domestic water main	C-DOMWMAM-2.5	94	2.5IN_WATER_MAIN	0.25
	2.5" domestic water main text	C-DOMWMAMDIP-2.5	94	Continuous	0.13
	3" domestic water main	C-DOMWMAM-3	242	3IN_WATER_MAIN	0.25
	3" domestic water main text	C-DOMWMAMDIP-3	242	Continuous	0.13
	4" domestic water main	C-DOMWMAM-4	cyan	4IN_WATER_MAIN	0.25
	4" domestic water main text	C-DOMWMAMDIP-4	cyan	Continuous	0.13
	6" domestic water main	C-DOMWMAM-6	blue	6IN_WATER_MAIN	0.25
	6" domestic water main text	C-DOMWMAMDIP-6	blue	Continuous	0.13
	8" domestic water main	C-DOMWMAM-8	magenta	8IN_WATER_MAIN	0.25
	8" domestic water main text	C-DOMWMAMDIP-8	magenta	Continuous	0.13
	10" domestic water main	C-DOMWMAM-10	10	10IN_WATER_MAIN	0.25
	10" domestic water main text	C-DOMWMAMDIP-10	10	Continuous	0.13
	12" domestic water main	C-DOMWMAM-12	90	12IN_WATER_MAIN	0.25
	12" domestic water main text	C-DOMWMAMDIP-12	90	Continuous	0.13
	14" domestic water main	C-DOMWMAM-14	31	14IN_WATER_MAIN	0.25
	14" domestic water main text	C-DOMWMAMDIP-14	31	Continuous	0.13
	16" domestic water main	C-DOMWMAM-16	11	16IN_WATER_MAIN	0.25
	16" domestic water main text	C-DOMWMAMDIP-16	11	Continuous	0.13
	18" domestic water main	C-DOMWMAM-18	30	18IN_WATER_MAIN	0.25
	18" domestic water main text	C-DOMWMAMDIP-18	30	Continuous	0.13
	20" domestic water main	C-DOMWMAM-20	124	20IN_WATER_MAIN	0.25
	20" domestic water main text	C-DOMWMAMDIP-20	124	Continuous	0.13
	24" domestic water main	C-DOMWMAM-24	200	24IN_WATER_MAIN	0.25
	24" domestic water main text	C-DOMWMAMDIP-24	200	Continuous	0.13
	36" domestic water main	C-DOMWMAM-36	25	36IN_WATER_MAIN	0.25
	36" domestic water main text	C-DOMWMAMDIP-36	25	Continuous	0.13
	domestic fire main	C-DOMW-FIM	10	FIRE_LINE	0.25
	domestic fire main text	C-DOMWDIP-FIM	10	Continuous	0.13

	4" domestic fire main	C-DOMW-FIM-4	10	4IN_FIRE_LINE	0.25
	4" domestic fire main text	C-DOMWDIP-FIM 4	10	Continuous	0.13
	6" domestic fire main	C-DOMW-FIM-6	10	6IN_FIRE_LINE	0.25
	6" domestic fire main text	C-DOMWDIP-FIM 6	10	Continuous	0.13
	8" domestic fire main	C-DOMW-FIM-8	10	8IN_FIRE_LINE	0.25
	8" domestic fire main text	C-DOMWDIP-FIM 8	10	Continuous	0.13
	domestic water service	C-DOMWSEM	30	Continuous	0.25
	water valve	C-DOMWDEM	160	Continuous	0.25
	hydrant	C-DOMWHYM	red	Continuous	0.25
	water meter	C-DOMWMEM	160	Continuous	0.25
	fittings: blow off, cap, tee, cross, bend, reducer, plug	C-DOMWFTM	blue	Continuous	0.35
	water storage tank	C-DOMWTAM	76	Continuous	0.25
	general notes and general remarks	C-DOMWNOP	blue	Continuous	0.13
	domestic water main easement	C-DOMW-ESMT	153	Continuous	0.35
	domestic water main easement text	C-DOMWDIP-ESMT	153	Continuous	0.13
Sanitary sewer	existing gravity sewer	C-SSWRMAM-EX GS	90	EXISTING_GS	0.25
	existing gravity sewer text	C-SSWRMAMDIP-EX GS	90	Continuous	0.13
	gravity sewer	C-SSWRMAM-GS	90	GRAVITY_SEWER	0.25
	gravity sewer text	C-SSWRMAMDIP-GS	90	Continuous	0.13
	8" gravity sewer	C-SSWRMAM-GS 8	30	8IN_GRAVITY_SEWER	0.25
	8" gravity sewer text	C-SSWRMAMDIP-GS 8	30	Continuous	0.13
	10" gravity sewer	C-SSWRMAM-GS 10	80	10IN_GRAVITY_SEWER	0.25
	10" gravity sewer text	C-SSWRMAMDIP-GS 10	80	Continuous	0.13
	12" gravity sewer	C-SSWRMAM-GS 12	91	12IN_GRAVITY_SEWER	0.25
	12" gravity sewer text	C-SSWRMAMDIP-GS 12	91	Continuous	0.13
	15" gravity sewer	C-SSWRMAM-GS 15	70	15IN_GRAVITY_SEWER	0.25
	15" gravity sewer text	C-SSWRMAMDIP-GS 15	70	Continuous	0.13
	18" gravity sewer	C-SSWRMAM-GS 18	11	18IN_GRAVITY_SEWER	0.25
	18" gravity sewer text	C-SSWRMAMDIP-GS 18	11	Continuous	0.13
	21" gravity sewer	C-SSWRMAM-GS 21	14	21IN_GRAVITY_SEWER	0.25
	21" gravity sewer text	C-SSWRMAMDIP-GS 21	14	Continuous	0.13
	24" gravity sewer	C-SSWRMAM-GS 24	blue	24IN_GRAVITY_SEWER	0.25
	24" gravity sewer text	C-SSWRMAMDIP-GS 24	blue	Continuous	0.13
	36" gravity sewer	C-SSWRMAM-GS 36	120	36IN_GRAVITY_SEWER	0.25
	36" gravity sewer text	C-SSWRMAMDIP-GS 36	120	Continuous	0.13
	1.5" low pressure sewer	C-SSWRMAM-1.5	36	1.5IN_LOW_PRESSURE	0.25
	1.5" low pressure sewer text	C-SSWRMAMDIP-1.5	36	Continuous	0.13
	2" low pressure sewer	C-SSWRMAM-2	82	2IN_LOW_PRESSURE	0.25
	2" low pressure sewer text	C-SSWRMAMDIP-2	82	Continuous	0.13
	2.5" low pressure sewer	C-SSWRMAM-2.5	12	2.5IN_LOW_PRESSURE	0.25
	2.5" low pressure sewer text	C-SSWRMAMDIP-2.5	12	Continuous	0.13
	3" low pressure sewer	C-SSWRMAM-3	155	3IN_LOW_PRESSURE	0.25
	3" low pressure sewer text	C-SSWRMAMDIP-3	155	Continuous	0.13
	4" low pressure sewer	C-SSWRMAM-4	21	4IN_LOW_PRESSURE	0.25
	4" low pressure sewer text	C-SSWRMAMDIP-4	21	Continuous	0.13
	6" low pressure sewer	C-SSWRMAM-6	154	6IN_LOW_PRESSURE	0.25
	6" low pressure sewer text	C-SSWRMAMDIP-6	154	Continuous	0.13
	8" low pressure sewer	C-SSWRMAM-8	40	8IN_LOW_PRESSURE	0.25
	8" low pressure sewer text	C-SSWRMAMDIP-8	40	Continuous	0.13

12" low pressure sewer	C-SSWRMAM-12	magenta	12IN_LOW_PRESSURE	0.25
12" low pressure sewer text	C-SSWRMAMDIP-12	magenta	Continuous	0.13
existing force main	C-SSWRMAM-EX FM	30	EXISTING_FORCE_MAIN	0.25
existing force main text	C-SSWRMAMDIP-EX FM	30	Continuous	0.13
2" force main	C-SSWRMAM-FM 2	yellow	2IN_FORCE_MAIN	0.25
2" force main text	C-SSWRMAMDIP-FM 2	yellow	Continuous	0.13
3" force main	C-SSWRMAM-FM 3	133	3IN_FORCE_MAIN	0.25
3" force main text	C-SSWRMAMDIP-FM 3	133	Continuous	0.13
4" force main	C-SSWRMAM-FM 4	13	4IN_FORCE_MAIN	0.25
4" force main text	C-SSWRMAMDIP-FM 4	13	Continuous	0.13
6" force main	C-SSWRMAM-FM 6	blue	6IN_FORCE_MAIN	0.25
6" force main text	C-SSWRMAMDIP-FM 6	blue	Continuous	0.13
8" force main	C-SSWRMAM-FM 8	30	8IN_FORCE_MAIN	0.25
8" force main text	C-SSWRMAMDIP-FM 8	30	Continuous	0.13
10" force main	C-SSWRMAM-FM 10	cyan	10IN_FORCE_MAIN	0.25
10" force main text	C-SSWRMAMDIP-FM 10	cyan	Continuous	0.13
12" force main	C-SSWRMAM-FM 12	magenta	12IN_FORCE_MAIN	0.25
12" force main text	C-SSWRMAMDIP-FM 12	magenta	Continuous	0.13
14" force main	C-SSWRMAM-FM 14	200	14IN_FORCE_MAIN	0.25
14" force main text	C-SSWRMAMDIP-FM 14	200	Continuous	0.13
15" force main	C-SSWRMAM-FM 15	53	15IN_FORCE_MAIN	0.25
15" force main txt	C-SSWRMAMDIP-FM 15	53	Continuous	0.13
16" force main	C-SSWRMAM-FM 16	22	16IN_FORCE_MAIN	0.25
16" force main text	C-SSWRMAMDIP-FM 16	22	Continuous	0.13
18" force main	C-SSWRMAM-FM 18	13	18IN_FORCE_MAIN	0.25
18" force main txt	C-SSWRMAMDIP-FM 18	13	Continuous	0.13
20" force main	C-SSWRMAM-FM 20	34	20IN_FORCE_MAIN	0.25
20" force main text	C-SSWRMAMDIP-FM 20	34	Continuous	0.13
21" force main	C-SSWRMAM-FM 21	20	21IN_FORCE_MAIN	0.25
21" force main txt	C-SSWRMAMDIP-FM 21	20	Continuous	0.13
24" force main	C-SSWRMAM-FM 24	150	24IN_FORCE_MAIN	0.25
24" force main txt	C-SSWRMAMDIP-FM 24	150	Continuous	0.13
36" force main	C-SSWRMAM-FM 36	red	36IN_FORCE_MAIN	0.25
36" force main text	C-SSWRMAMDIP-FM 36	red	Continuous	0.13
treatment plant	C-SSWRPLM	blue	Continuous	0.25
treatment plant txt	C-SSWRPLMDIP	blue	Continuous	0.13
airline	C-SSWRMAM-AIRLINE	240	AIRLINE	0.25
airline txt	C-SSWRMAMDIP-AIRLINE	240	Continuous	0.13
drainage	C-SSWRMAM-DRAINAGE	blue	DRAINAGE	0.25
drainage txt	C-SSWRMAMDIP-DRAINAGE	blue	Continuous	0.13
sanitary sewer service	C-SSWRSEM	30	Continuous	0.25
general notes and general remarks	C-SSWRNOP	white	Continuous	0.13
lift station	C-SSWRLIM-LS	90	Continuous	0.25
lift station number	C-SSWRLIMDIP-LS NR	90	Continuous	0.13
manhole	C-SSWRJBM-MANHOLE	90	Continuous	0.25
manhole number	C-SSWRJBMDIP-MANHOLE NR	90	Continuous	0.13
sewer valve	C-SSWRDEM	green	Continuous	0.25
fittings: tee, cross, cap, reducer	C-SSWRFTM	green	Continuous	0.35
cleanout	C-SSWRFTM-CO	green	Continuous	0.35
flow direction arrow	C-SSWRFLM	magenta	Continuous	0.25
sanitary sewer easement	C-SSWR-ESMT	173	Continuous	0.25

	sanitary sewer easement text	C-SSWRDIP-ESMT	173	Continuous	0.13
Reclaimed Water	existing reuse water	C-SSWRMAM-EX RECL	210	EXISTING_RECLAIMED_MAIN	0.25
	existing reuse water text	C-SSWRMAMDIP-EX RECL	210	Continuous	0.13
	3" reuse water	C-SSWRMAM-RECL 3	210	3IN_RECLAIMED_MAIN	0.25
	3" reuse water text	C-SSWRMAMDIP-RECL 3	210	Continuous	0.13
	6" reuse water	C-SSWRMAM-RECL 6	211	6IN_RECLAIMED_MAIN	0.25
	6" reuse water text	C-SSWRMAMDIP-RECL 6	211	Continuous	0.13
	8" reuse water	C-SSWRMAM-RECL 8	241	8IN_RECLAIMED_MAIN	0.25
	8" reuse water text	C-SSWRMAMDIP-RECL 8	241	Continuous	0.13
	10" reuse water	C-SSWRMAM-RECL 10	211	10IN_RECLAIMED_MAIN	0.25
	10" reuse water text	C-SSWRMAMDIP-RECL 10	211	Continuous	0.13
	12" reuse water	C-SSWRMAM-RECL 12	210	12IN_RECLAIMED_MAIN	0.25
	12" reuse water text	C-SSWRMAMDIP-RECL 12	210	Continuous	0.13
	14" reuse water	C-SSWRMAM-RECL 14	220	14IN_RECLAIMED_MAIN	0.25
	14" reuse water text	C-SSWRMAMDIP-RECL 14	220	Continuous	0.13
	16" reuse water	C-SSWRMAM-RECL 16	220	16IN_RECLAIMED_MAIN	0.25
	16" reuse water text	C-SSWRMAMDIP-RECL 16	220	Continuous	0.13
	18" reuse water	C-SSWRMAM-RECL 18	220	18IN_RECLAIMED_MAIN	0.25
	18" reuse water text	C-SSWRMAMDIP-RECL 18	220	Continuous	0.13
	reuse water service	C-SSWRMAMSEM-RECL	220	Continuous	0.25
	reuse water valve	C-SSWRMAMDEM-RECL	220	Continuous	0.25
	reuse water meter	C-SSWRMAMMEM-RECL	220	Continuous	0.25
	reuse fittings: blow off, cap, tee, cross, bend, reducer, plug, air release	C-SSWRMAMFTM-RECL	220	Continuous	0.35
	reuse general notes and general remarks	C-SSWRMAMNOP-RECL			
	reuse water easement	C- SSWRMAM-RECL-ESMT	143	Continuous	0.35
	reuse water easement text	C-SSWRMAMDIP-RECL-ESMT	143	Continuous	0.13