



CAD STANDARDS MANUAL

JANUARY 2024



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1.0 PURPOSE OF THE MANUAL

The purpose of these standards is to promote uniformity of appearance, increase departmental efficiency, provide concepts for best practices, and provide a consensus standard to be used by City of Mesa Engineering Department staff and all outside consultants that engage in and prepare contract drawings and documents for the City of Mesa Engineering Department and for Capital Improvement Project work with the City of Mesa.

This document shall:

- Provide a ready reference to CAD staff, design team, and outside consultants.
- Reflect and promote established City of Mesa CAD standards on Capital Projects.
- Facilitate the production of uniform and accurate drawings.
- Introduce guidelines in the decisions of use of 3D or 2D software on projects.
- Assist in the preparation of drawing 3D and 2D applications.

It is the intent of the City of Mesa CAD Standards Committee to follow the current version of the US National CAD Standards where possible and abide by the approved CAD standards herein stated. Further, it is the intent to periodically update this manual and its supporting appendices. Requests for changes, additions, or modifications to this manual will be considered on an annual basis and upon review and approval of the City of Mesa CAD Standards Committee, for incorporation into the latest version of this manual.

2.0 PROJECT START-UP

2.1 Project Initiation and Communication

When a project is created or desired by a City department via a project information form request, it is required by the City of Mesa Engineering Department Project Manager to gather all the key personnel for successful completion of the project and hold a kick-off meeting. The intent of this kick-off meeting is to equip key personnel with information about expectations, schedules, deadlines, and budgets that will assist with providing a successful project delivery. In relation to the CAD manual, it

is anticipated that CAD staff be invited to that kick-off meeting for in-house design efforts and be engaged to inform those within this group of acceptable CAD standards that have been outlined.

Any project communications that are vital to the in-house design of the project should include CAD staff so they are familiar with the expectations and concerns that may arise throughout the design. Likewise, CAD staff is responsible to inform the project team of any anticipated delays in schedule, roadblocks with design that prohibit completion, regular project updates to the key project team members, and any communications that may need to be shared throughout the duration of the project.

2.2 Project Naming Convention

Each project is assigned a project number by the Budget Office or our Contracts group when a project is created. In general, the following format is used as a prefix for project naming convention:

CP or C – Capital Improvement Project – Projects funded through a public revenue or bond.

LF – Life Cycle Project – Projects funded as life cycle projects for various departments.

M – Miscellaneous Projects – Projects of a miscellaneous nature or coordination. Generally, lacks a direct funding source.

O – Operational Projects – Projects with a focus on operational needs for departments that are not created as an actual Capital Improvement Project but are funded through operational budgets of departments.

YY-XXX-XXX – Older projects (Prior to 2010) at the City of Mesa followed this naming convention starting with the year and an ascending order for projects as they were created. The City of Mesa no longer utilizes this naming convention for projects; however, this information is provided for reference only. This naming convention was abandoned at the end of 2011.

A project title always provides the project number followed by the title of the project.

2.3 Basis of Bearing

The City of Mesa maintains a Geographical Information Systems (GIS) (grid coordinate based) database and utilizes a GDAC Map (ground coordinates) for establishing base data used in plan

development. A grid of established City of Mesa survey benchmarks and supplemental survey are used in association with this base data.

2.4 CAD Directory Structure

All project directories and associated CAD files are located on a network drive designated “I:” or [\\isrc01\ESProject\](#) for the preparation and housing of all CAD related files for a project. Within the project CAD directory, sub-folders are created for files storage and use.

Name	Date modified	Type	Size
AERIALS	4/1/2019 2:37 PM	File folder	
BLOCKS	12/9/2019 4:21 PM	File folder	
CIVIL 3D DATA	4/16/2018 9:56 AM	File folder	
EXHIBITS	12/9/2019 4:21 PM	File folder	
GIS	8/11/2021 2:20 PM	File folder	
MISC	4/16/2018 9:56 AM	File folder	
PLANS	8/11/2021 2:21 PM	File folder	
TRANSER-IN	12/9/2019 4:21 PM	File folder	
TRANSFER-OUT	12/9/2019 4:21 PM	File folder	
XREFS	9/3/2020 3:45 PM	File folder	

Figure 2.3-1 – CAD Sub-Folder Structure

The following descriptions are offered for descriptions of each sub-folder and what they are intended to be used for:

- **ARCHIVE** – To be utilized for all CAD files that: a) may need to be retrieved later, b) shared with a consultant/other department or, c) for Final Approved Plans. A subdirectory with the current date and a description (e.g., 2017-##-##_Phase 1) should be created for these files. Use the AutoCAD eTransmit function to save each Plan or Exhibit Sheet as a compressed .zip file in the new directory. This will maintain each Sheet layout and x-reference base file saved in the condition they were in at the time of compression. When retrieved and extracted the relational condition of x-references to Sheets and layer settings will also be regenerated in their original state upon extraction.

Some additional rules to consider when archiving: 1) Do not change the file names or subdirectories of the drawings being archived. 2) Detach all x-referenced files that may exist in the base file. 3) Use the “PURGE” command and select the “All” option to clean the files and minimize complications for others that may occur upon restoration of files. 4) If the files to be archived are for sharing with a consultant or other department, verify the version of software that they use and, if an earlier version, use the “Save As” command to set each file to the earliest version necessary. 5) Other guidelines may need to be introduced on a project basis when using shared combinations 3D or 2D software.

- **EXHIBITS** – To be utilized for exhibits only that may not have a direct correlation with the construction plan set. Examples of files to be saved in this may include special exhibit generated for a public meeting, a council requested map, or TCE Exhibits.
- **PLANS** – To be utilized for storage of construction plan sheets for any given project.
- **TRANSFER-IN** – To be utilized for all files and relevant information received for preparation of a construction plan document. Examples of files to be saved in this may include external CAD drawings sent to the City of Mesa for plan preparation, Survey work, or GIS data utilized in preparation of the construction plan set. The files remain unedited here.
- **TRANSFER-OUT** – To be utilized for all files and relevant information sent to consultants, client departments, or a formal benchmark submittal on a project. The files remain unedited here.
- **XREFS** – To be utilized for base and reference files that are actively referenced to a plan sheet.

2.5 File Types

The City of Mesa file types are intended to facilitate the assembly of City of Mesa Engineering design plan sets by using the following file types when preparing plans:

- Sheet Files (refer to Chapter 1 of Engineering and Design Standards)
- Base files that become the scaled reference of what is shown on plan sheets

Each sheet shall include the project number as a prefix in the drawing name, as shown below in Figure 2.4-1. A City of Mesa AutoCAD template (Section 2.7) is available for setting up each sheet so that the

annotation, construction notes, note callouts, linetypes, layers, and applicable blocks are illustrated to the City of Mesa CAD standards and are readily available for implementation.

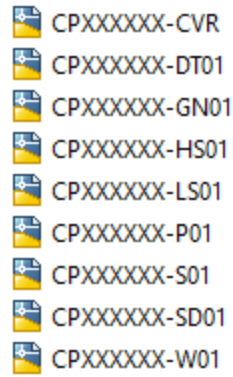


Figure 2.4-1 – Sheet Naming Convention Example

The x-referenced files serve as the core foundation for design. To simplify the production of construction plan documents and optimize computer usage, the following file x-referenced base file types are recommended in the production of construction plan sheets as reference drawing files:

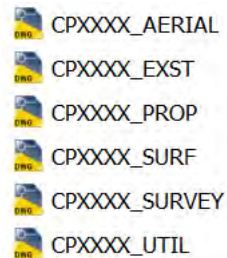


Figure 2.4-2 – CAD File Types

- **AERIAL** – This reference file contains an aerial image within a CAD base that is scaled and positioned to match a projects horizontal datum. A tutorial on how to extract aerials from GIS is included in Appendix M as a “how to” reference.
- **EXST** – To be utilized for all existing topographic elements. The information includes (and not limited to) various existing elements such as: building and roadway structures, roadway elements like curb and gutter, edge of pavement, dirt roads, walkways, driveways, property

lines and property data, right-of-way lines, easements, traffic control signals, pavement marking, roadway lighting, sign structures, vegetation, contours (copied from the SURF file), etc.

- **PROP** – Used to develop construction design data for a proposed project.
- **SURF** – This file includes all surfaces and surface data, contours, horizontal alignments, and vertical profiles generated from collected coded survey data.
- **SURV** – To be used for the importing, processing, and manipulation of survey data and points provided as survey for the project.
- **UTIL** – Serves as the base file for all existing and proposed utilities.

While these reference files serve as the core base data for most projects, it is understood that additional reference files may be needed and created on a case-by-case basis. Appendix G includes additional reference file types with descriptors, content, and template files to be used. Section 3.1 – Referencing Files should be referred to for the proper method for referencing files.

2.6 AutoCAD Map and AutoCAD Civil 3D Settings

To utilize the proper City of Mesa Pen Table (COM.ctb), plotters and templates, you will need to set the path in the AutoCAD “**OPTIONS**” dialogue box. This will allow you to path to the appropriate pathing to CAD templates and printer support file paths that are looked to when you print.

1. Open AutoCAD Map/Civil 3D
2. Enter the command “**options**” or “**op**” in the AutoCAD command dialogue box.
3. Select the “**Files**” tab, expand the “**Support File Search Path**” menu.
 - a. Select the “**Add...**” button and browse to the highlighted path directory seen in Figure 2.5-1A and Figure 2.5-1B.
4. Expand the “**Device Driver File Search Path**”
 - a. Select current path and browse to highlighted path directory seen in Figure 2.5-1A and Figure 2.5-1B.
5. Expand the “**Printer Configuration Search Path**”
 - a. Select current path and browse to highlighted path directory seen in Figure 2.5-1A and Figure 2.5-1B.

6. Expand the **“Printer Description File Search Path”**
 - a. Select current path and browse to highlighted path directory seen in Figure 2.5-1A and Figure 2.5-1B.
7. Expand the **“Plot Style Table Search Path”**
 - a. Select current path and browse to highlighted path directory seen in Figure 2.5-1A and Figure 2.5-1B.
8. Expand the **“Template Settings”**
 - a. Expand the **“Drawing Template File Location”**
 - b. Select current path and browse to highlighted path directory seen in Figure 2.5-1A and Figure 2.5-1B.
9. Select the **“Apply”** button to apply modifications.

Creating a profile will allow you to save these settings and export your profile to your computer. If these settings happen to not save and you lose all these settings, importing this profile will restore these settings. This can be done in the **OPTIONS** dialogue box.

10. Select the **“Profiles”** tab, select the **“Add to List...”** button, assign your profile name and create your profile. Select your profile and select Export button and export your profile to the location of your choice on your PC.
11. Select the **“Apply”** button to apply modifications and the **“OK”** button, close Options dialogue box.
12. Exit out of AutoCAD and then Reopen. Upon exiting AutoCAD, the program will assign the settings and set as default so every time AutoCAD is opened, these settings will be applied.

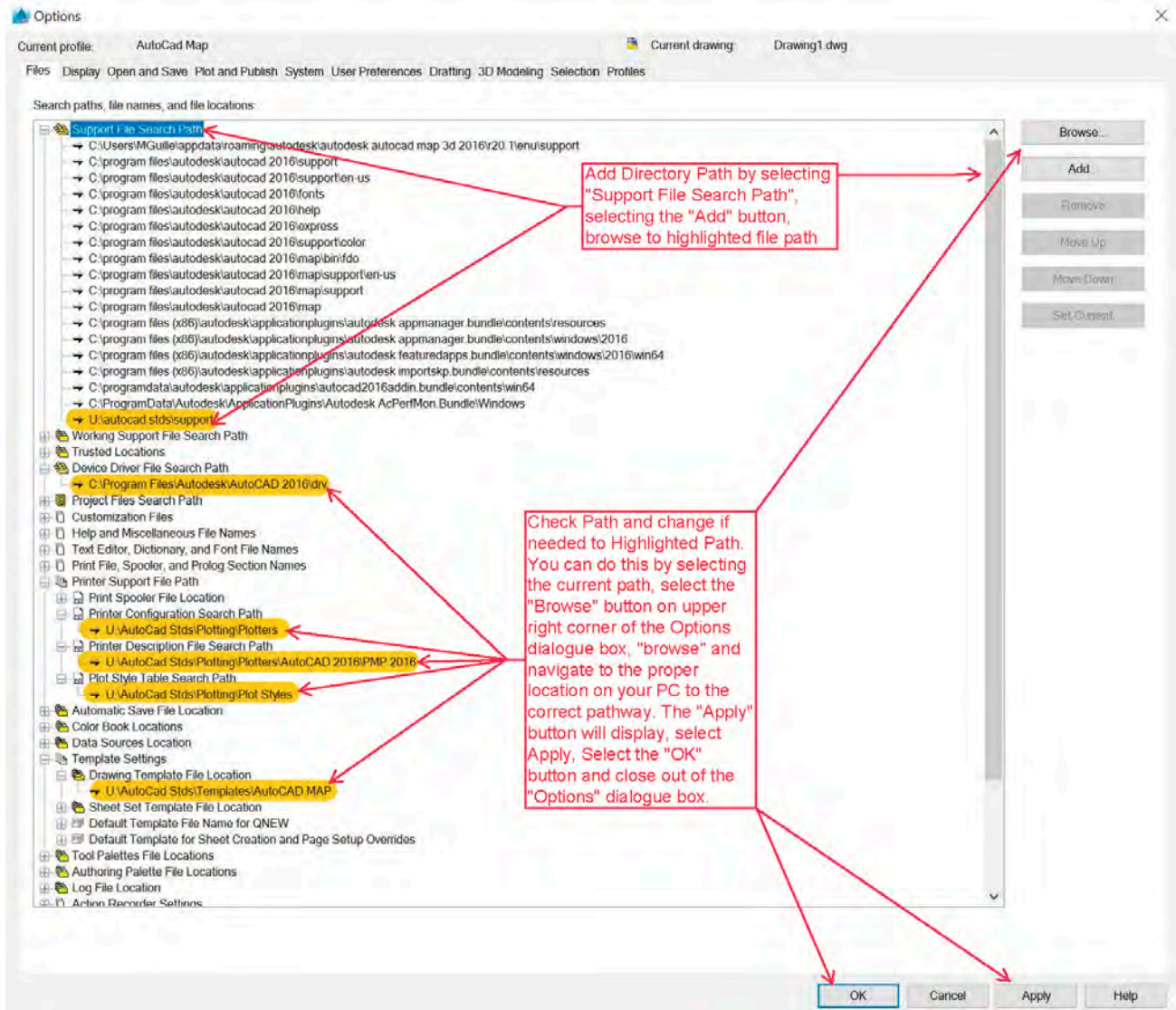


Figure 2.5-1A – Drawing Settings for AutoCAD Map 3D

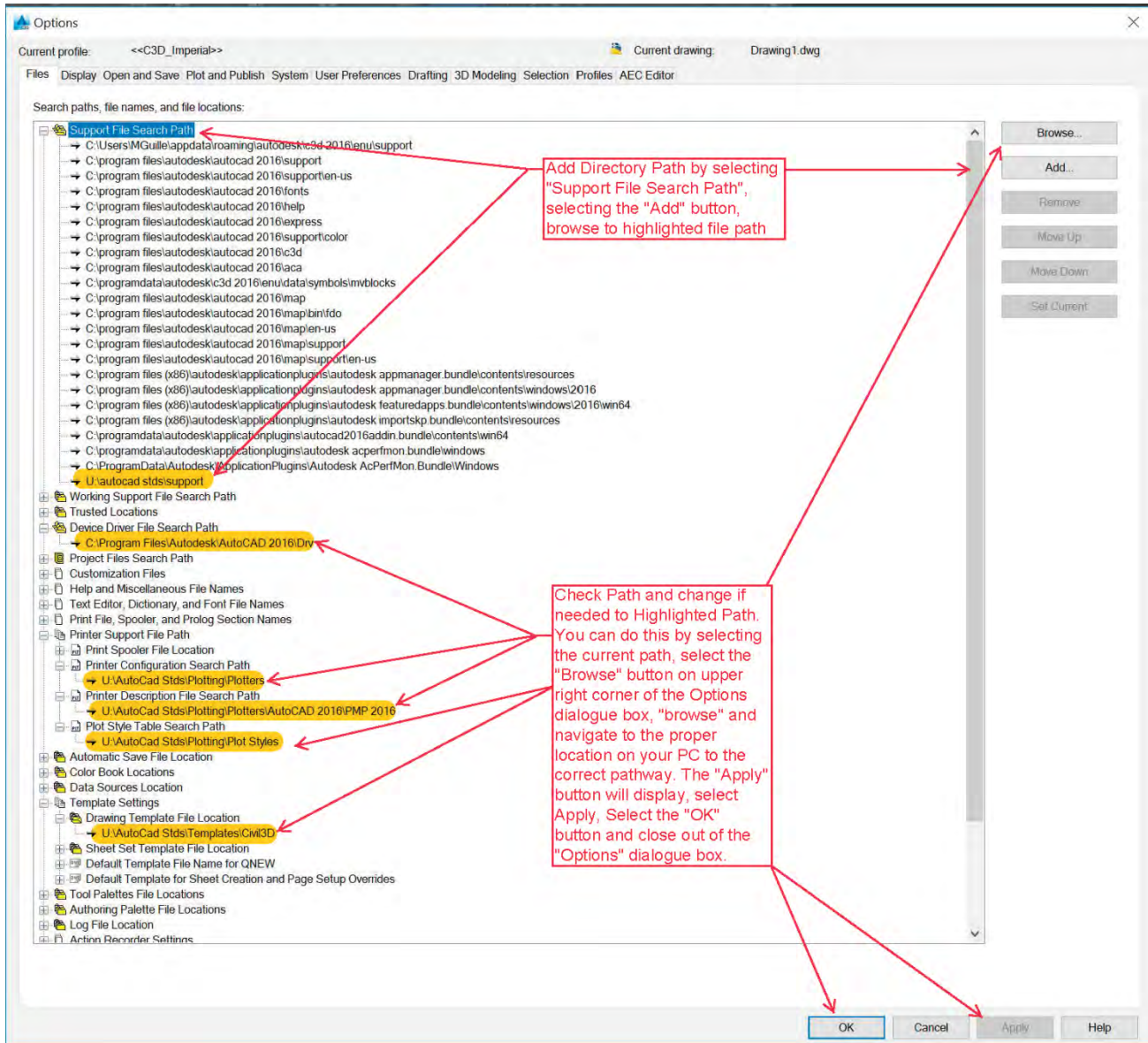


Figure 2.5-1B – Drawing Settings for AutoCAD Civil 3D

2.7 Templates

The City of Mesa CAD Standards Committee has created template drawings for use of all file creation for CAD drawings within the City of Mesa. The template drawings contain standard layer conventions with appropriate colors, line types, and line weights, dimension styles, multi-leader styles, text styles, etc.

To create a new file from the City of Mesa templates on the “U Drive”, select the **File** pulldown, and select New. This will direct you to your previously paths drawing settings (See Section 2.5 – Drawing Settings). Select the needed template from those available, and then select **Open**, as shown below.

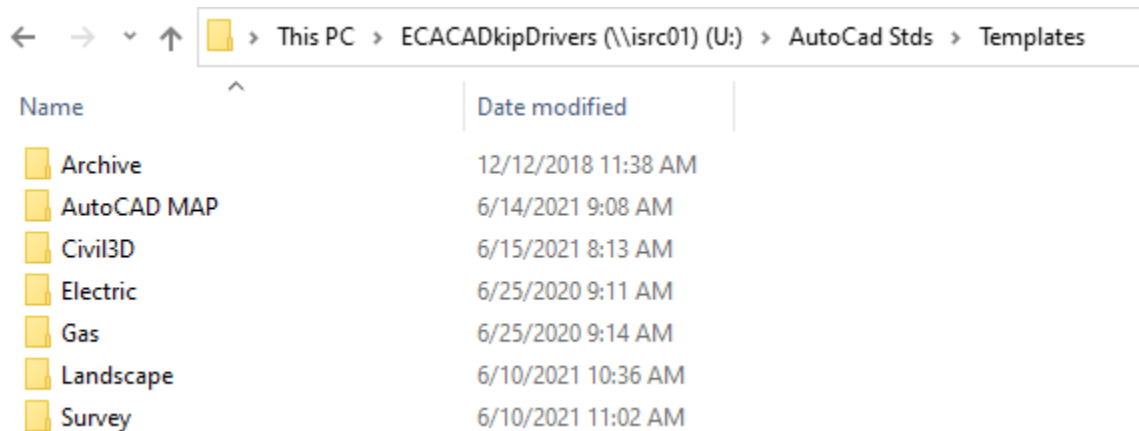


Figure 2.6-1 – Template Options Available

It is important to utilize the templates provided by the City of Mesa CAD Standards Committee. These templates include all the appropriate styles, layers and blocks utilized in preparation of construction plan set documents. If they are not utilized, it is anticipated that CAD files provided to the City of Mesa during final production will be rejected until otherwise brought into conformance.

Below, Figure 2.6-2 and Figure 2.6-3, summarize all available templates for the City of Mesa. These templates include:

- MAP COM Template.dwt

This template contains all City of Mesa layers, linetypes, text styles and information needed for all general projects and plans and does not include any Civil 3D styles and civil design standards.

- Aerial COM Template.dwt

This template contains the layers and information needed for aerial imagery. Importing aerials and the aerial data from GIS can be implemented by using the MAPIINSERT command. Once the aerial is imported correctly into the drawing, the grid-to-ground scale factor will need to be implemented using 0,0,0 as a reference point. Aerials brought in via GIS require a “Grid-to-Ground” conversion factor. The conversion scale factor for Grid-to-Ground is

1.000156168. Notes can be placed in this aerial cad file documenting with descriptions of what they are to be utilized for.

- C3D COM TEMPLATE.dwt

The Civil 3D template contains all layers and information needed for all design files and design. This file also contains Civil 3D styles that have been set to adhere to City of Mesa Standards while utilizing the Civil 3D functionality of the design program. These styles include alignments, surfaces, profiles, labeling, piping, grade and drainage, survey data, corridors, and cross sections.

- SURVEY COM TEMPLATE-2023.dwt

The survey template contains the line types, layers and information required for processing survey calculations and field data to prepare survey base files for topographic mapping, boundary maps, plats and exhibit drawings. The Survey Template utilizes the Survey Codes revised in 2022. Tabs have been added to the template to include title blocks for all typical sizes of exhibit or plan sheets, as well as a Meta Data statement for Survey Control, which can be edited from the standard, if required.

- UTILITY COM TEMPLATE.dwt

This utility template contains the linetypes and layers needed for placing existing utilities and proposed utilities into a base design file. Existing utilities are based off current and past as-built projects and City of Mesa GIS extracted data. If utilities are extracted from the COM GIS database and imported into a utility base file utilizing the Utility COM Template, the grid-to-ground scale factor will need to be implemented using 0,0,0 as a reference point. Utility Data in the form of shape files (.shp) brought in via GIS require a “Grid-to-Ground” conversion factor. The conversion scale factor for Grid-to-Ground is 1.000156168.

- COM_ELC_STD_TEMPLATE.dwt

This City of Mesa Electrical Engineering Group template contains information necessary to comply with the City’s design parameters regarding Electrical Utility design. This AutoCAD template includes information needed for all electric utility design. This file also contains standard electrical blocks, linetypes, layers, tool pallets, and electrical symbology that have been set to adhere to City of Mesa Standards.

- COM LANDSCAPE STD TEMPLATES

This City of Mesa Landscape Engineering Group templates include several templates that focus on Demolition, Hardscape, Landscape, Lighting, Irrigation, and Landscape topography. These templates will include, COM standard layers, linetypes, text styles, blocks, dwg settings in regard to Landscape design

Name	Date modified	Type	Size
Archive	9/21/2023 10:00 AM	File folder	
Aerial COM Template	9/21/2023 10:03 AM	AutoCAD Template	2,007 KB
MAP COM Template	9/21/2023 10:01 AM	AutoCAD Template	911 KB
UTILITY COM TEMPLATE	9/21/2023 10:05 AM	AutoCAD Template	3,439 KB

Table 2.6-1 – Template Files for AutoCAD Map

Name	Date modified	Type	Size
Aerial COM Template	1/28/2021 11:16 AM	AutoCAD Template	2,000 KB
C3D COM TEMPLATE	2/1/2021 4:50 PM	AutoCAD Template	2,066 KB
UTILITY COM TEMPLATE	6/8/2021 4:57 PM	AutoCAD Template	2,150 KB

Table 2.6-2 – Template Files for Civil 3D

3.0 DRAWING CREATION

3.1 Referencing Files

Referenced files are defined as all files attached to a construction plan set that contain all existing and proposed line work. A reference file may be overlaid to another reference file but ***in no case, should either be attached to each other.*** All projects should include topographic elements (EXST) and new proposed infrastructure (PROP).

The City of Mesa requires all X-Referenced files be inserted as “Overlay” and not as “Attachment”. All files should be X-Referenced with the base coordinates of 0, 0, 0. All the files should be attached with “Relative

Path” and not “Full Path”. Please note that until a file is saved from the template, “Relative Path” will not work as an option.

3.2 Layer Management

The City of Mesa approved layers and uses can be found in Appendix O. The City of Mesa layer naming convention follows the National CAD Standard’s format.

There are five (5) defined layer name data fields:

Discipline Designator – Major Group – Minor Group – Minor Group – Status

The Discipline Designator and Major Group fields are mandatory; the Minor Group and Status fields are optional. Each data field is separated from adjacent fields by a dash (“-”) for clarity.

The complete National CAD Standards layer name format is; the Discipline Designator, the Major Group, two Minor Groups, and the Status Field, as shown below:

C-ROAD-CURB-BACK-E

Discipline Designator

The Discipline Designator denotes the category of the subject matter contained on the specified layer.

DESIGNATOR	DISCIPLINE
A	Architectural
C	Civil
V	Survey

Major Group

The Major Group is a four (4) character field that identifies a major building system.

GROUP NAME	MAJOR GROUP
ANNO	Annotations (text)

BLDG	Building
BSTK	Bluestake
CATV	Cable Television
COMM	Communications
CTRL	Control Points
DETL	Details
ELEC	Electric
FOPT	Fiber Optic
IRRG	Irrigation
LEGL	Legal
MONU	Monument
NGAS	Natural Gas
NODE	Node (Survey)
PLNT	Plant
RAIL	Railroad
RCLM	Reclaimed Water
ROAD	Roadways
SITE	Site (Survey)
SSWR	Sewer
STRM	Storm Sewer
SURV	Survey
TELE	Telephone
TINN	Triangulated Irregular Network (DTM)
TOPO	Topographic Feature
WATR	Water

Minor Group

This is an optional, four (4) character field to further define the Major Groups. A second minor group

may be used for further delineation of the data contained on a layer.

A typical layer name showing the required data fields and one optional Minor Group field is listed below. The Minor Group field is highlighted:

C-ROAD-CURB

A typical layer name showing the required data fields and two optional Minor Group fields is listed below. The Minor Group fields are highlighted:

C-ROAD-CURB-FACE

EXAMPLES	
C-FIRE-HYD	Fire - Hydrant
C-ROAD-ASPH	Roadway - Asphalt
C-ROAD-CONC	Roadway - Concrete
C-ROAD-CURB-BACK	Roadway – Back of Curb
C-ROAD-CURB-FACE	Roadway – Face of Curb
C-SSWR-PIPE	Sanitary Sewer - Pipe
C-STRM-PIPE	Storm Sewer – Pipe
C-WATR-VALV	Water Valve

Status Field

The status field is an optional single character field that distinguishes the data contained on the layer according to the status of the work or the construction phase. Layer names without a status field code are assumed to be new work.

Status field codes commonly used are as follows:

CODE	STATUS INDICATED
E	Existing to Remain

A typical layer name showing all data fields with the Status field is highlighted:

C-ROAD-CURB-FACE-E

Color and Linetypes

Drawing entities assume Color and Linetype assigned to the layer that the entity resides on. Standard colors and linetypes are assigned to City of Mesa standard layers in the City of Mesa Template drawings. In general, existing items are usually depicted in lighter/thinner lines; new items are usually shown with bolder/thicker lines. A detailed explanation of color and associated pen thicknesses can be found in Appendix O.

3.3 Dimension Styles

Dimensions should be placed in Paper Space of the individual sheet files while utilizing the command “**DIMSCALE**” to control the size and true scale of object(s) dimensioned to match the viewport and its scale. There is no distinction between new and existing dimensions by line weight or style. All dimensions should be placed on the **C-ANNO-DIMS** layer (see Section 3.2 - Layer Management).

Additional information should be added to the Text Override line of the properties menu. The additional information should be preceded by the symbols <> so the actual distance is not effected when changed. To place the additional information on the next line, the following text should proceed the dimensions: <>/XROW. This will place the distance above the dimension line and the ROW text below. The City of Mesa provides the **COM-A** dimstyle to be used in our standard template.

Additional write ups on Dimstyles for A, D, and G and for additional detail needed on dimensions, refer to Appendix M for additional reference material.

3.4 Text

The following fonts are commonly used to prepare Engineering drawings for the City of Mesa:

1. RomanS.shx
2. Arial.ttf
3. Italic.shx
4. Technic Lite.ttf (**only to be used for Mesa Standard Details**)

The above mentioned fonts are standard software fonts, thus allowing any that open these files to open the drawing files without error or non-reference. Although expectations for color exhibits or special presentations may be made, only native AutoCAD fonts should be used.

Text that pertains to proposed design and construction notes should be placed in Paperspace. Text that applies to existing conditions can be placed in Modelspace. Text that applies to Reference files will be placed in Modelspace of the referenced files. Typically, a referenced file text placement is used for data that is generated from design software such as Civil3D. Examples of that text could be placed are as follows:

- Centerline Bearings
- Centerline Stationing
- Existing Feature Labels
- Grading Points
- Profile Annotation (Slopes, Gradebreaks)
- Utility Line Labels

When adding text to the drawing, it is important to select the appropriate text style. The standard text styles mentioned in this section are included in the City of Mesa standard template. Table 3.4-1 below depicts the proper text style, font, height, and use for all text.

City of Mesa Text Styles for 20 Scale Drawings			
CONDITION	STYLE	FONT	HEIGHT
Existing Utility Labels	Exist	RomanS.shx	0.10
Existing Grading Points, Centerline Bearings	Exist	RomanS.shx	0.10
Existing Notes, Existing Dimensions, Key Notes, Station and Elevation in Profile Grids, Profile Annotation	Exist	RomanS.shx	0.10
Primary Road Name, Primary Building Name	Legend	Arial.ttf	0.25
Match Line Text, Side Street Name, Construction Note Title, Detail Title Name	Title	Arial.ttf	0.10
Parcel Numbers, APN Numbers	Exist	Italic.shx	0.15
General Note Subtitles, Construction Notes Subtitles, Title Blocks	Subtitle	Arial.shx	0.18
City of Mesa Standard Details	Exist	TechnicLite.ttf	0.80
Proposed Infrastructure and General Notes	RomanS	RomanS.shx	0.10

Table 3.4-1 – City of Mesa Text Styles

For proper setting of the text within your drawing, set the properties table to the following settings:

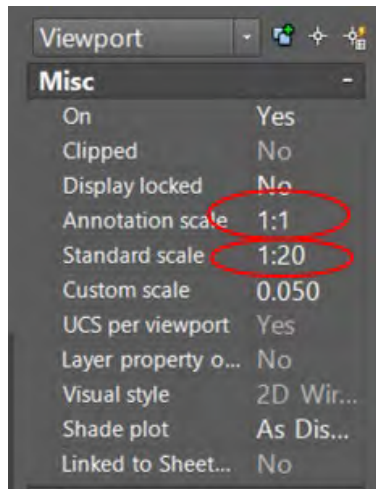


Figure 3.4-1 – Annotation Scale Settings

3.5 Blocks

Blocks are used to represent common features that are shown on construction plan sheets. A block is simply a collection of objects that has a name. Blocks have several advantages:

- A block uses less electronic space than individual objects, so your drawing file can remain smaller.
- By updating a block's definition, you can update all the blocks within a given drawing.

The City of Mesa has created a standard blocks sub-folder under the CAD standards folder. In the Blocks folder are subfolders of block groups divided as such:

Name	Date modified	Type	Size
.blocksMetadata	9/23/2021 2:40 PM	File folder	
APPROVED COM BLOCKS	7/25/2022 2:59 PM	File folder	
Base Vicinity Maps	9/6/2023 12:59 PM	File folder	
Civil	7/17/2023 2:31 PM	File folder	
Electric	7/18/2023 4:54 PM	File folder	
Energy	6/26/2018 10:32 AM	File folder	
Gas	7/24/2023 4:47 PM	File folder	
General	9/14/2023 2:11 PM	File folder	
Landscape	4/21/2022 1:26 PM	File folder	
MAG	1/24/2023 2:11 PM	File folder	
Misc	5/7/2018 2:46 PM	File folder	
RWCD	10/25/2016 8:04 AM	File folder	
Seals	9/14/2023 4:50 PM	File folder	
Site Wall Details	3/8/2022 9:00 AM	File folder	
Storm	9/18/2023 8:01 AM	File folder	
Survey	5/7/2018 2:46 PM	File folder	
Title Blocks	9/13/2023 12:51 PM	File folder	
Traffic	9/13/2023 1:09 PM	File folder	
Utilities	8/7/2018 7:11 AM	File folder	
Water	8/31/2023 4:58 PM	File folder	

Table 3.5-1 – City of Mesa Block Library File Structure

Standard blocks have been defined for 20 scale drawings and should be inserted as a scale of one (1). Blocks can be scaled up or down in size if they are inserted in a drawing outside of 20 scale.

Approved blocks that have been created by the City of Mesa CAD Committee were created on Layer 0 (Zero). Blocks created on Layer 0 (zero) will assume the properties of the current layer when they are inserted.

For a detailed description of the types of blocks that the City of Mesa uses and a matrix of how those blocks should be utilized, refer to Appendix N for additional reference.

3.6 Pen Assignments

The City of Mesa has developed a Pen table (refer to Figure 3.6.1 below) to be used with the standard City of Mesa civil layers. This pen table is primarily for black and white prints but has provided for color options should those be required. Colors ending in one (1) and five (5) will print in color when matched with the color CTB. Colors ending in seven (7) will print screened back as indicated below. All new utilities are on colors that end in zero (0) and therefore appear on a black background screen bolder than the existing utilities that are in a color that ends in four (4).

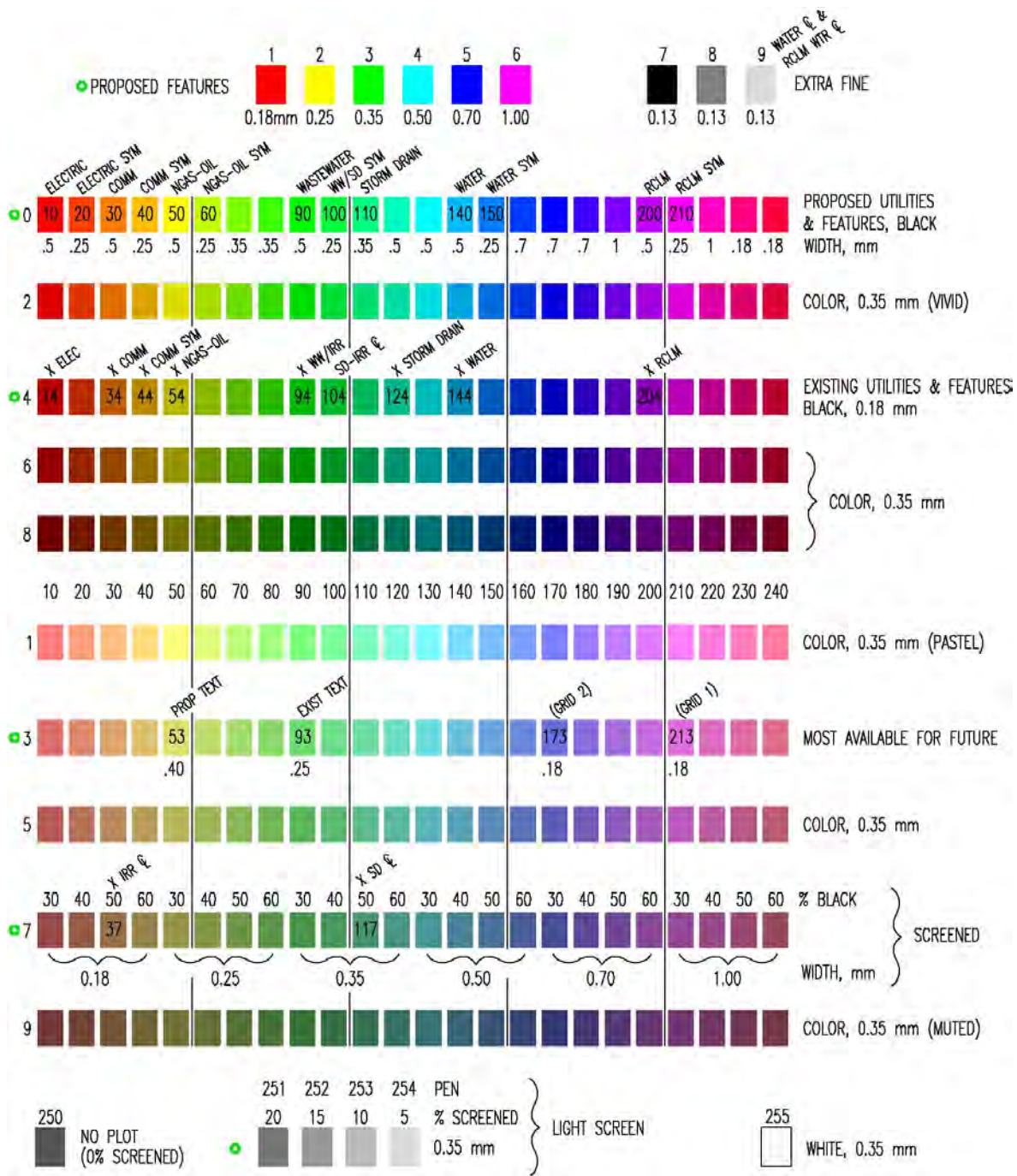


Figure 3.6.1 – Pen Table

3.7 Hatch Patterns

Hatch patterns are used to display the various types of materials. These materials involve patterns that visually display graphic representation in CAD. The various materials and patterns include earth,

pavement, concrete, gravel, sand, brick, solid shading, ANSI standard patterns, etc. Depending on the type of project and material involved, the same pattern can be used for various materials and modified to display differently. For example, concrete used for a Landscape Development plan might use various types of concrete. The characteristics of the concrete pattern can be changed by adjusting the scale, rotation and layer properties to differentiate between concrete materials. A list of graphical representations of each hatch patterns can be found in Appendix P.

3.8 Construction Notes and Callouts

A COM Construction Note is an AutoCAD Block with the following four elements:

- A **Callout Number** is a number shown within a geometric shape
- **Construction Note Text** applicable to the callout construction type and placed left justified and to the right of the Callout
- A **Quantity Number**, right justified
- A **Unit Abbreviation**, right justified

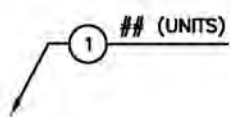
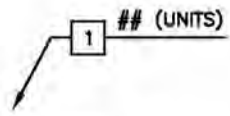
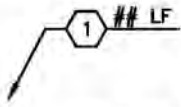
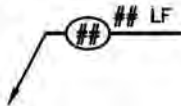
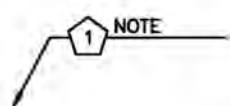
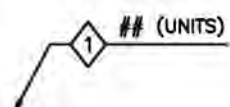
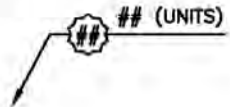
The number or text for each of the four elements is an attribute that can be updated upon clicking on the Construction Note block, then editing within the desired box.

These Construction Notes are placed in Paper Space, typically along the right side of a sheet border, and line up vertically with the callout number on the left and quantities and units right justified.

Construction Notes are grouped under an appropriate heading by construction, installation or revision type, as shown in Figure 3.8.1, below. The Construction Note group type determines the geometric shape applied to a Callout Number. Below is a listing of those note types:

- **Circle** General Use, the primary project element, or Waterline projects
- **Square** Removal and Replacement, Earthwork, Pavement, Surface Finishes
- **Hexagon** Sanitary Sewer
- **Ellipse** Storm and Drainage
- **Pentagon** Fiber Optics and Communications

- **Diamond** Natural Gas
- **Landscape** (Typically, per Table of Quantities associated with Landscape Legend)
- **Irrigation** (As shown below)
- **Pothole** (As shown below)
- **Electrical or M, P & E** Per COM Electrical Department or Consultant
- **Delta** (Triangle) Revisions
- **Octagon** Agency and Outside Utility References

	<p>GENERAL CONSTRUCTION NOTES</p> <p>① FURNISH AND INSTALL 12-INCH DIP WATER LINE PER MAG STD SPEC 750 WITH CATHODIC PROTECTION BONDS AT ALL JOINTS, PER DETAIL 2C ON DRAWING C9, AND POLYETHYLENE CORROSION PROTECTION PER MAG STD SPEC 610.5. PROVIDE JOINT RESTRAINTS PER MAG STD DTLS 303-1 & 303-2 AND AS NOTED IN PROFILE. ## LF</p>
	<p>REMOVAL & REPLACEMENT NOTES</p> <p>① SAWCUT, REMOVE, AND REPLACE EXISTING ASPHALT PAVEMENT PER COM STD DTLS M-19.04.1 AND M-19.04.2 TYPE A. ## SY</p>
	<p>SANITARY SEWER NOTES</p> <p>① FURNISH & INSTALL 15" PVC SDR-35 PVC SANITARY SEWER LINE. ## LF</p>
	<p>DRAINAGE NOTES</p> <p>① FURNISH & INSTALL 24" RGRCP, CLASS III STORM DRAIN. ## LF</p>
	<p>FIBER OPTICS / DATA NOTES</p> <p>① PROVIDE AND INSTALL 144 STRAND FIBER OPTIC CABLE AS PER COM ITD/ITS SPECIFICATIONS AND DETAIL "F1" ON DRAWING E9. ## LF</p>
	<p>NATURAL GAS NOTES</p> <p>① INSTALL 2" P.E. GAS PIPE PER TYPICAL GAS MAIN TRENCH DETAIL #, DRAWING C#. ## LF</p>
	<p>ELECTRICAL NOTES</p> <p>① ELECTRICAL NOTE QTY UNIT</p>

ANNOTATION

NOTE – ANNOTATION TEXT HEIGHT = 0.1, HAS BACKGROUND MASKING
CHOICE OF LEADERS OR NONE BY PROPERTIES AND ARROW TYPE BY PROPERTIES

PROPOSED ANNOTATION
(TEXT STYLE ROMANS)

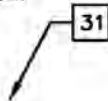
EXISTING ANNOTATION
(TEXT STYLE – EXISTING)

CONSTRUCTION JOINT
PER DETAIL D, DRAWING C5

EXISTING
GROUND

LANDSCAPE MATERIALS NOTES

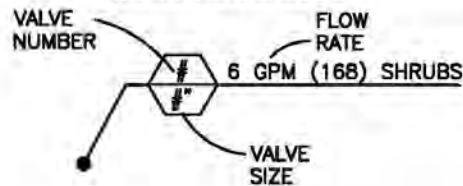
31 RIP-RAP, D50 MIN. MATCH NATIVE RIVER ROCK APPEARANCE. **##** SY



IRRIGATION NOTES

(TYPICALLY PER LANDSCAPE MATERIALS/PLANTING
LEGEND WITH CORRESPONDING QUANTITIES)

IRRIGATION CALLOUT:



REVISION NOTES

1	(DATE / TEXT)
----------	---------------

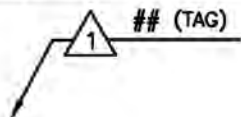


Figure 3.8.1 – Construction Note Callouts

3.9 Typical Sheet Layout Elements

Sheets shall be developed per City of Mesa Engineering and Design Standards, Chapter 1, and should include:

- Cover Sheet
- General Notes and Legend (line work and symbols)
- Control Sheet (If Applicable)
- Plan Sheets
- Plan and Profile Sheets (If Applicable)
- Detail Sheets (If Applicable)

3.9.1 Cover Sheet

A Cover Sheet should include the following elements as illustrated in Figure 3.9.1-1 below:

- Project title & address and project number
- Vicinity Map and Project Location Map (these utilize a GDAC based city map)
- Sheet Index
- Benchmark and Basis of Bearing (when applicable). Benchmark is displayed when project has been surveyed and benchmark has been located.
- “A” numbers should be obtained from Engineering Records Management prior to final design.
- Approvals for construction should be included on the Cover Sheet. These approvals include; stamps and signatures from Development Services for special inspections and RWCD (when applicable).
- Maricopa County approval block is displayed when project involves County water and sewer services.

- City of Mesa “Approved Copy” stamp, date, and signature for the plan set to be constructed.

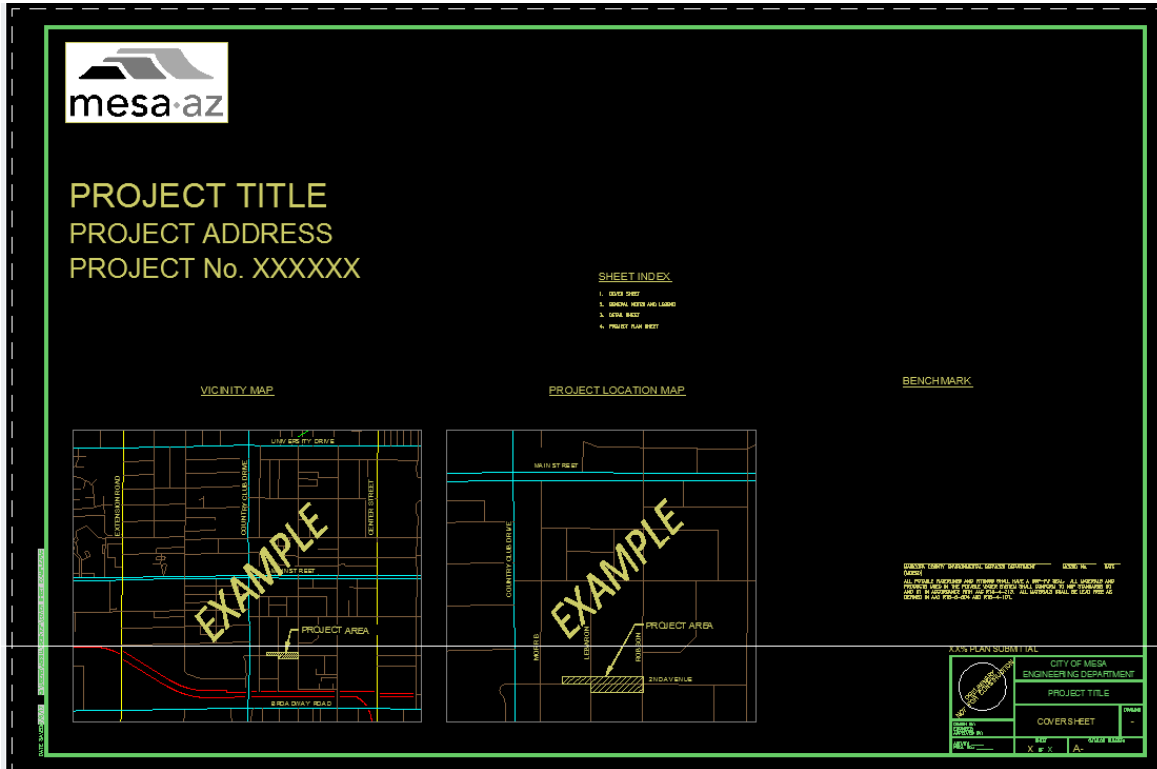


Figure 3.9.1-1 – Typical Example of a Cover Sheet

3.9.2 General Notes and Legend Sheet

A General Notes and Legend should include the following elements as illustrated in Figure 3.9.2-1 below:

- General Construction Notes. Occasionally, construction notes are updated. Confirm that construction notes are current. Current approved construction notes can be located at Appendix L.
- Legend. Only those elements that are applicable in the plan set should be shown. The legend should show items that are existing, to be removed and replaced, and proposed infrastructure applicable to the plan set. A method for automating the legend has been developed and is outlined in Appendix M.

- Abbreviations should capture all abbreviations stated within the plan set. The City of Mesa has prepared a comprehensive list of abbreviations that are typically found in City of Mesa construction plan sets. They are located in Appendix D. A method for autogenerating the abbreviations lists has been developed and is outlined in Appendix M.

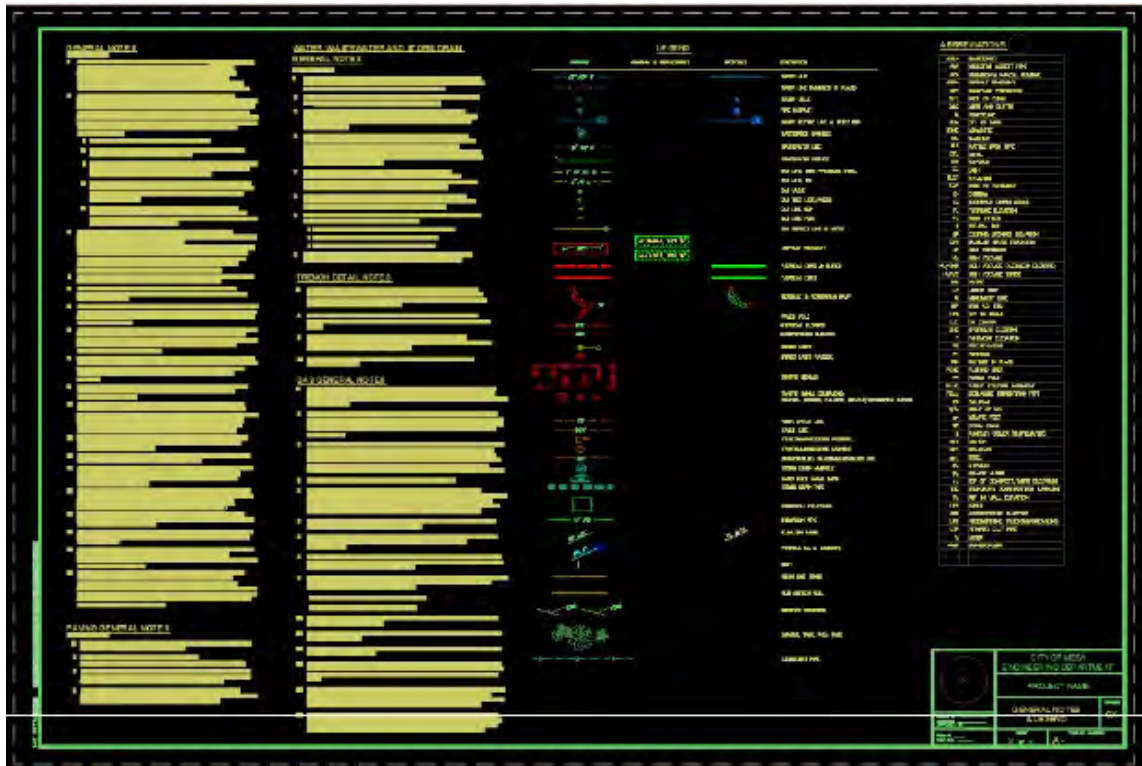


Figure 3.9.2-1 – Typical Example of General Notes and Legend Sheet

3.9.3 Survey Control Sheet

A Survey Control Sheet should include and capture the following elements:

- Section Lines
- Brass Caps
- Bearings and Distances between Section Corners
- Street Names
- Section Numbers

- Benchmarks (Project, Primary, and Secondary)
- Legend
- Data Tables Indicating Northings, Eastings, and Elevations of Surveyed Points
- Surveyor's Notes that include the combined scale factor for the project for conversion from grid to ground.
- Stamped by a Registered Licensed Surveyor

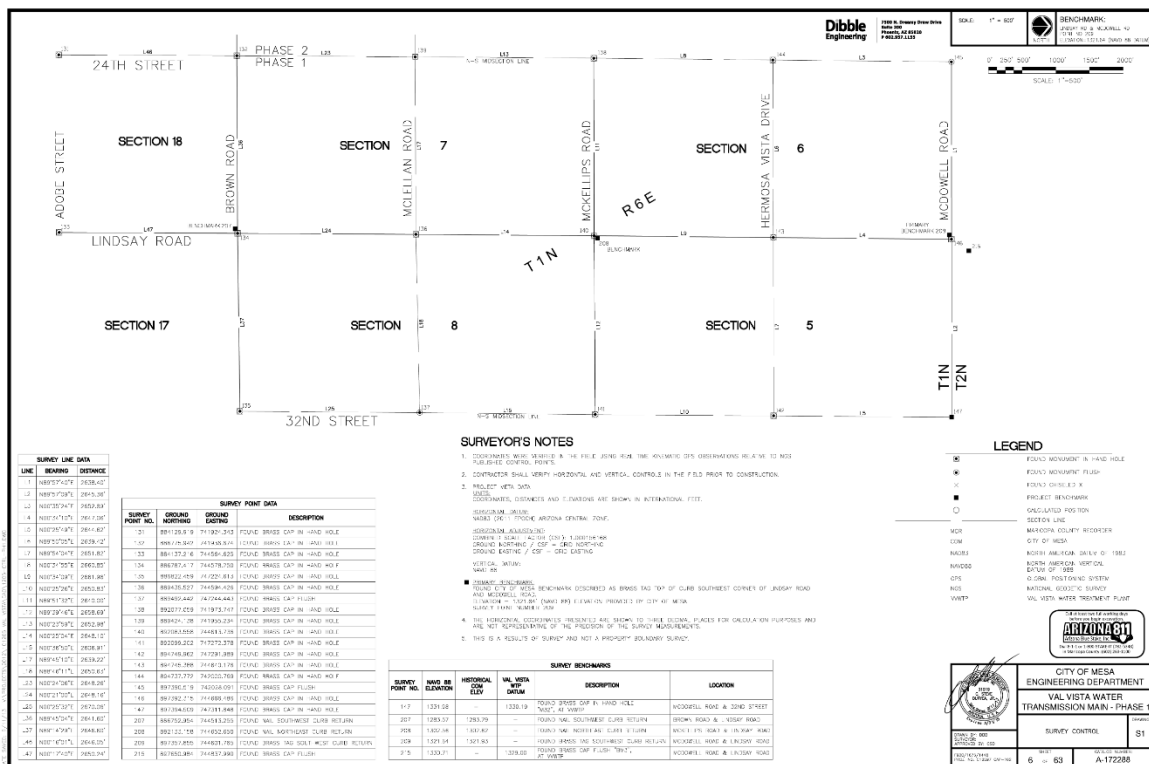


Figure 3.9.3-1 – Typical Example of a Survey Control Sheet

3.9.4 Plan and Profile Sheet

A typical Plan and Profile Sheet should include the following elements below and as shown in Figure 3.9.4-1 below:

- Alignment bearing and distance.
- Monuments (brass caps) should be called out.

- Construction notes should be readable and not overlap with other information on the sheet.
- North arrow and bar scale.
- Benchmark
- Proposed and existing utilities. Crossing utilities should be depicted in profile with clearances depicted.
- Size, material, and length of proposed utility pipes. Slope of pipe should also be shown.
- Angle points of proposed utilities should have stations and offsets shown.
- Trenching for proposed utilities should be depicted with a crosshatch pattern.
- Viewports of plan views should be created with at standard scale of 1" = 20'.

Title blocks and base sheets should be x-referenced into the working drawing. X-referenced files should be saved within the project folder under the **XREF** folder.

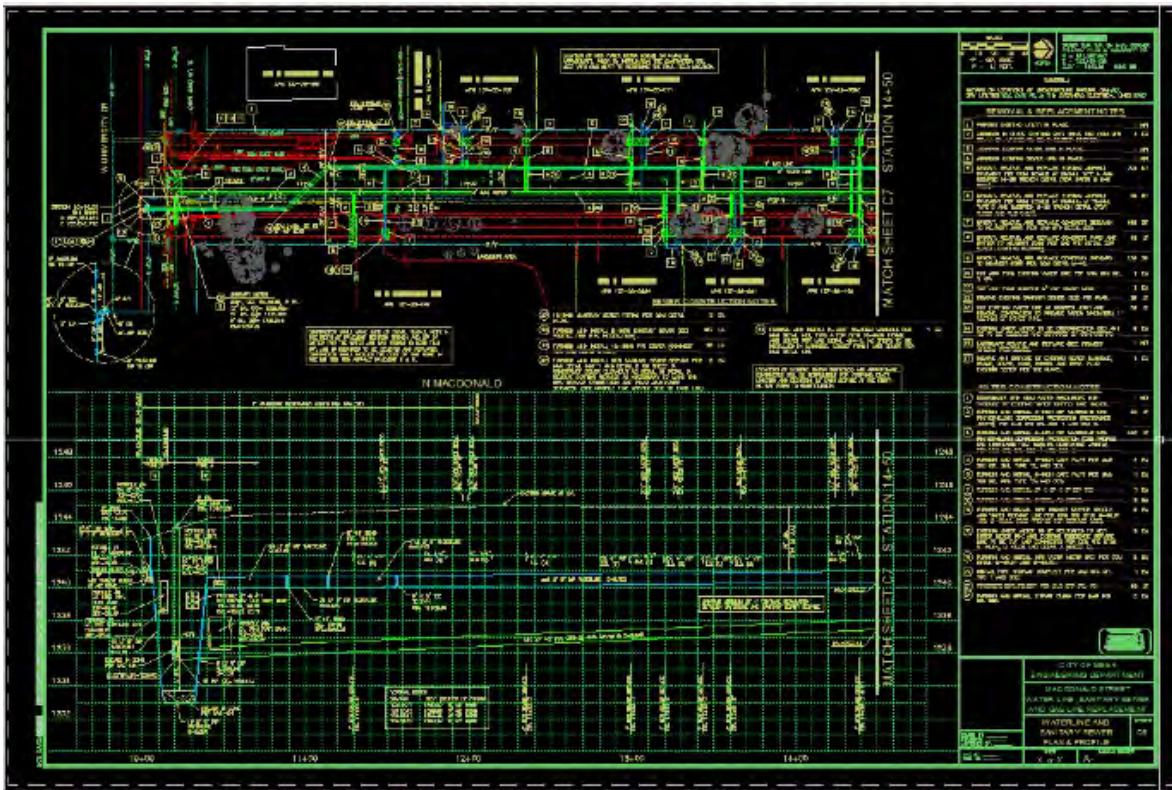


Figure 3.9.4-1 – Typical Example of a Plan and Profile Sheet

3.9.5 Detail Sheet

Details should be depicted true to proportion and to a scale whenever feasibly possible. In rare cases when this cannot be provided, a “NTS” for not to scale should be labeled for the detail.

Detail blocks are inserted at a scale that fits within the workable plan sheet and labeled with a text size of 0.1.

When Standard City of Mesa details are used and not modified, it is sufficient to just call out the detail in construction notes. The City of Mesa has also compiled a comprehensive library of non-standard details for use in preparation of plan sets. A list of those details is located in Appendix K.

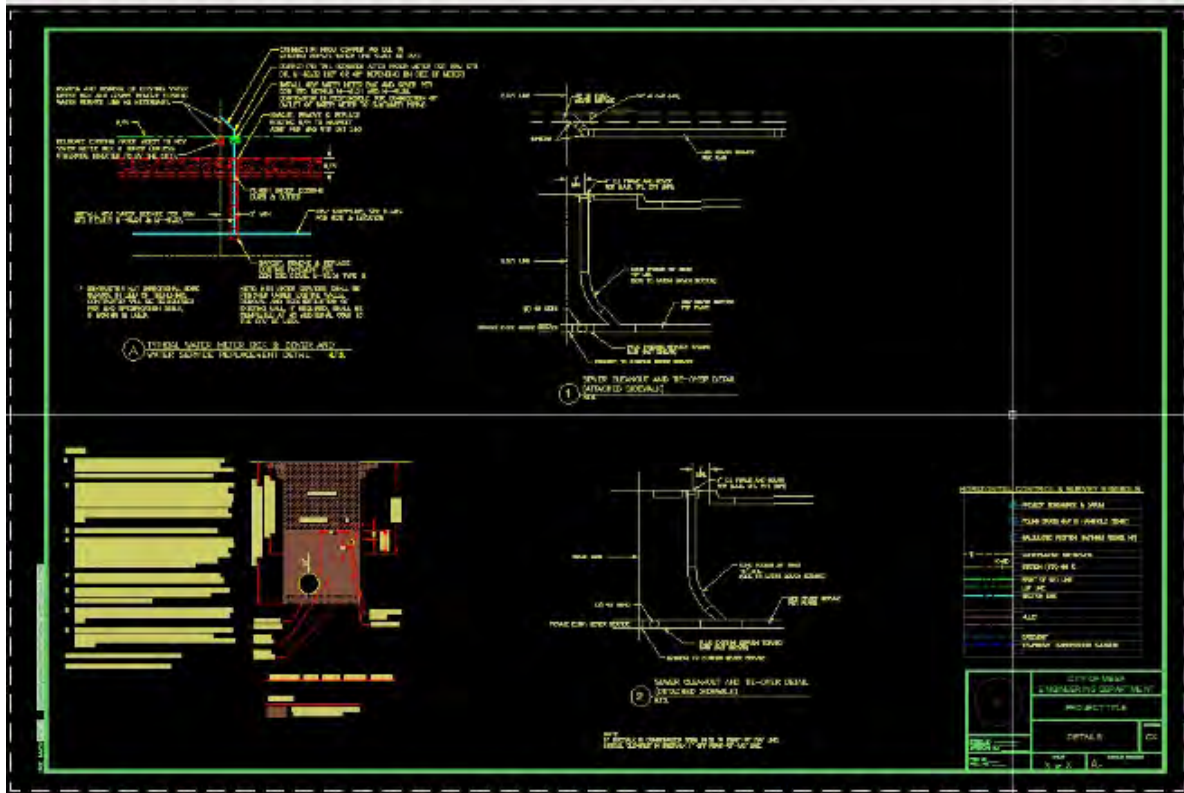


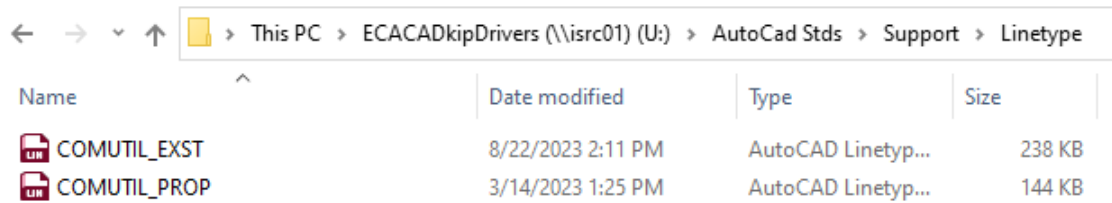
Figure 3.9.5-1 – Typical Example of a Detail Sheet

3.10 Design Submittal Guideline Conformance

In addition to typical sheets mentioned in this section of the manual, Submittal Guidelines have been prepared to aid staff with an understanding of the core elements that should exist at the various stages of a design as it progresses to a Final Design plan set. Depending on the type of design that is being prepared, these Design Submittal Guidelines should be utilized when applicable. These guidelines are located on the Engineering website at the following location: <http://www.mesaaz.gov/business/engineering/submittal-process-guidelines>

3.11 Linetypes

In addition to the standard default AutoCAD linetypes, the City of Mesa has created additional linetypes for use during project design. These linetype files can be found within the CAD standards folder displayed in Figure 3.11.1 below.



Name	Date modified	Type	Size
COMUTIL_EXST	8/22/2023 2:11 PM	AutoCAD Linetyp...	238 KB
COMUTIL_PROP	3/14/2023 1:25 PM	AutoCAD Linetyp...	144 KB

Figure 3.11.1 – COM Utility Linetype Files

A list of graphical representations of each linetype contained in these files above and their associated utility descriptions and use can be found in Appendix E.

Existing and proposed features within drawings often use the same linetype and rely on the boldness of the printed line to distinguish the difference between them. All entities should have an LTSCALE set to one (1) to properly display the lines in drawings. This should be the default setting. The exception to this rule is for linetypes that do not display properly at an LTSCALE of 1.

3.12 Existing Utility Pothole Callouts

Existing utilities should be clearly denoted in both plan view and profile view. The City of Mesa has a specific point type that they used for potholed locations in plan view as shown below:

Whenever utility information is collected for the plan set, it should denote or reflect applicable elevations, line sizes, line types and materials, whether the utility is encased and how deep. When construction plan sheets are prepared, profile elevations should be captured denoting the following level of accuracies in a profile elevations legend with the following nomenclature:

- **(U)** – Unknown. This should rarely, if never, be used. This denotes that all other feasible efforts have been made with the utility provider to identify the correct vertical information for the utility. These efforts should include surveying, potholing, and confirming a lack of information on any available record drawings.
- **(S)** – Field Measurement – Surveyed. Identifies that the utility has been located via a surveyor and has captured invert elevations, line sizes, material, and any other existing information that may be of value to reflect on a plan set. Generally, surveyed inverts are acceptable at

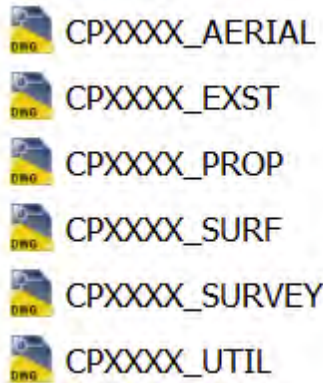
appurtenances such as irrigation standpipes, manholes (irrigation, drainage, sewer, fiber optic), cleanouts, and top of nut for water valves.

- **(PH)** – Field Measurement – Potholed. Identifies that the utility has been potholed which has captured the northing, easting, bottom elevation of utility, top elevation of utility, the size of the utility, if the utility is encased, the material of the utility, owner of the utility, and any other existing features associated with the utility that may be of value that would need to be reflected on the plan set to assist during construction.
- **(R)** – Record Drawing (Design/As-Built). In rare cases, this should be labeled as such when surveying and potholing did not locate this existing utility but has been reflected on a previous as-built plan set that is not abandoned. Elevations should be adjusted to the applicable vertical datum and where possible and projected or calculated from slopes and distances obtained from record drawings.

APPENDIX A

Reference File Naming Convention

- COM Reference File Naming Convention will include the Project Number followed with an underscore and the Reference Type. (Example: CP1234_TOPO, CP5678_AERIAL, CP0987_SURVEY, etc)




APPENDIX B

Border Sheet Example

	BENCHMARK	
	LINE	SOURCE (C.S.A. ETC)
	CITY OF MESA ENGINEERING DEPARTMENT	
	PROJECT NAME	

APPENDIX C

Cover Sheet Example



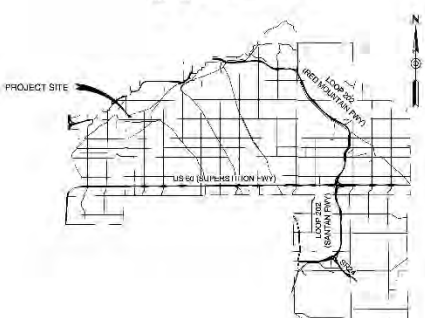
PROJECT NAME
PROJECT ADDRESS
PROJECT No.:XXXXXX

SHEET INDEX


SHEET	DESCRIPTION
1	COVER SHEET
2	GENERAL NOTES
3	GENERAL SITE PLAN

BENCHMARK
 (NAD 83 DATUM) (4.4)
 ELEVATION (109.318M)

CITY OF MESA VICINITY MAP
SCALE: 1" = 400'



PROJECT LOCATION MAP
SCALE: 1" = 327'



CITY OF MESA ENGINEERING DEPARTMENT	
(enter project name)	
COVER SHEET	C1
DATE: _____	DRAWN BY: _____
CHECKED BY: _____	SCALE: _____

APPENDIX D

Abbreviation and Legend Sheets

ABAN, ABND	ABANDONED
ACP	ASBESTOS CEMENT PIPE
APN	ASSESSOR'S PARCEL NUMBER
ASPH	ASPHALT PAVEMENT
BFP	BACKFLOW PREVENTER
BC, BOC, B/C	BACK OF CURB
BCHH	BRASS CAP IN HANDHOLE
BM	BENCHMARK
BNDY	BOUNDARY
(C), (CALC)	CALCULATED
C	CUT
C, COND	CONDUIT
C&G	CURB AND GUTTER
CAB	CABINET
CABL	CABLE
CATV	CABLE TELEVISION
CB	CATCH BASIN
CCP	CONCRETE CYLINDER PIPE
CIP	CAPITAL IMPROVEMENT PROJECT, CAST IRON PIPE, CAST-IN-PLACE
CIPP	CURED-IN-PLACE PIPE
CL	CENTERLINE
CMP	CORRUGATED METAL PIPE
CNTR	CENTER
CO	CLEAN-OUT
COM	CITY OF MESA
CONC	CONCRETE
CONT	CONTOUR
CTRL	CONTROL
DBNK	DUCTBANK
DIA	DIAMETER
DIP	DUCTILE IRON PIPE
DET, DTL	DETAIL
DW, D/W	DRIVEWAY
EA	EACH
EL, ELEV	ELEVATION
EPP	ELECTRIC POWER POLE
EP, EOP	EDGE OF PAVEMENT
E, EX, EXST, EXIST	EXISTING
F	FILL
FC	FACE OF CURB

FF	FINISHED FLOOR
FG	FINISHED GRADE
FH	FIRE HYDRANT
FL	FLOW LINE
FM	FORCE MAIN
FO	FIBER OPTICS
G	GAS
GM	GAS METER
GR	GRADE
GS	GAS SERVICE
GV	GAS VALVE
HP	HIGH PRESSURE
HV	HIGH VOLTAGE
HW	HIGH WATER, HEAD WALL
ICB	IRRIGATION CONTROL BOX
IE	INVERT ELEVATION
INV	INVERT
IRR	IRRIGATION
IV	IRRIGATION VALVE
LF	LINEAR FOOT
LP	LIGHT POLE
LPP	POWER POLE W/ STREET LIGHT
(M), (MEAS)	MEASURED
MAJR	MAJOR
MIN	MINIMUM
MINR	MINOR
ML	MONUMENT LINE
MON	MONUMENT
NPI	NON-PAY ITEM
NTS	NOT TO SCALE
OC	ON-CENTER
OHE, OVH	OVERHEAD ELECTRIC
P	PAVEMENT ELEVATION
PB	PULL BOX
PCCP	PRESTRESSED CONCRETE CYLINDER PIPE
PE	POLYETHYLENE
PED	PEDESTAL
PH	POTHOLE
PIP	PROTECT-IN-PLACE
PKNG	PARKING AREA

PP	POWER POLE
PROP	PROPOSED
PUE	PUBLIC UTILITY EASEMENT
PUFE	PUBLIC UTILITY FACILITY EASEMENT
PVC	POLYVINYL CHLORIDE
RCLM, RW	RECLAIMED PIPE (WATER, IRRIGATION, ETC)
RCP	REINFORCED CONCRETE PIPE
RET	RETENTION
RGRCP	RUBBER GASKETED REINFORCED CONCRETE PIPE
ROW, R/W	RIGHT-OF-WAY
SD	STORM DRAIN
SDMH	STORM DRAIN MANHOLE
SECT	SECTION
SF	SQUARE FOOT
SL	STREETLIGHT
SRP	SALT RIVER PROJECT
SS	SANITARY SEWER (WASTEWATER)
SMH	SEWER MANHOLE
SSMH	SANITARY SEWER MANHOLE
STA	STATION
STD	STANDARD
STL	STEEL
STRC	STRUCTURE
SW, SWK, S/W	SIDEWALK
S, SWR	SEWER
SY	SQUARE YARD
T, TEL, TELE	TELECOMMUNICATIONS
TBM	TEMPORARY BENCHMARK
TC	TOP OF CONCRETE, TOP OF CURB
TCE	TEMPORARY CONSTRUCTION EASEMENT
TOPO	TOPOGRAPHY, TOPOGRAPHIC
TS	TRAFFIC SIGNAL
TW	TOP OF WALL
TWR	TOWER
UG	UNDERGROUND GAS
UGE	UNDERGROUND ELECTRIC
UNDG	UNDERGROUND
UNKN	UNKNOWN
VCP	VITRIFIED CLAY PIPE
VLT	VAULT

APPENDIX E

Linetypes

---	---	---	CATV OVH	---	---	---	CATV OVH	---	---	Cable TV Overhead
---	---	---	CATV UNDG	---	---	---	CATV UNDG	---	---	Cable TV Underground
---	---	---	CATV	---	---	---	CATV	---	---	Cable TV
---	---	---	CENTLNK	---	---	---	CENTLNK	---	---	Cable TV CenturyLink
---	---	---	CENTLNK OVH	---	---	---	CENTLNK OVH	---	---	CenturyLink Overhead
---	---	---	CENTLNK UNDG	---	---	---	CENTLNK UNDG	---	---	CenturyLink Underground
---	---	---	COX	---	---	---	COX	---	---	Cable TV Cox
---	---	---	COX OVH	---	---	---	COX OVH	---	---	Cox Overhead
---	---	---	COX UNDG	---	---	---	COX UNDG	---	---	Cox Underground
---	---	---	DBNK	---	---	---	DBNK	---	---	Electric Cable Ductbank
---	---	---	OVH	---	---	---	OVH	---	---	Electric Cable Overhead
---	---	---	UNDG	---	---	---	UNDG	---	---	Electric Cable Underground
---	---	---	FO	---	---	---	FO	---	---	Fiber Optic Cable
---	---	---	DBNK	---	---	---	DBNK	---	---	Fiber Optic Cable Ductbank
---	---	---	12" IRR	---	---	---	12" IRR	---	---	Irrigation 12 IN
---	---	---	18" IRR	---	---	---	18" IRR	---	---	Irrigation 18 IN
---	---	---	24" IRR	---	---	---	24" IRR	---	---	Irrigation 24 IN
---	---	---	30" IRR	---	---	---	30" IRR	---	---	Irrigation 30 IN
---	---	---	36" IRR	---	---	---	36" IRR	---	---	Irrigation 36 IN
---	---	---	42" IRR	---	---	---	42" IRR	---	---	Irrigation 42 IN
---	---	---	48" IRR	---	---	---	48" IRR	---	---	Irrigation 48 IN
---	---	---	54" IRR	---	---	---	54" IRR	---	---	Irrigation 54 IN
---	---	---	IRR	---	---	---	IRR	---	---	Irrigation Existing
---	---	---	1" G	---	---	---	1" G	---	---	Natural Gas 1 IN
---	---	---	2" G	---	---	---	2" G	---	---	Natural Gas 2 IN
---	---	---	3" G	---	---	---	3" G	---	---	Natural Gas 3 IN
---	---	---	4" G	---	---	---	4" G	---	---	Natural Gas 4 IN
---	---	---	6" G	---	---	---	6" G	---	---	Natural Gas 6 IN
---	---	---	12" G	---	---	---	12" G	---	---	Natural Gas 12 IN
---	---	---	ABND G	---	---	---	ABND G	---	---	Natural Gas Abandoned
---	---	---	G	---	---	---	G	---	---	Natural Gas Existing
---	---	---	6" G FUEL	---	---	---	6" G FUEL	---	---	Natural Gas Fuel 6 IN
---	---	---	4" G HP	---	---	---	4" G HP	---	---	Natural Gas HP 4 IN
---	---	---	6" G HP	---	---	---	6" G HP	---	---	Natural Gas HP 6 IN
---	---	---	1" G PE	---	---	---	1" G PE	---	---	Natural Gas PE 1 IN
---	---	---	2" G PE	---	---	---	2" G PE	---	---	Natural Gas PE 2 IN
---	---	---	3" G PE	---	---	---	3" G PE	---	---	Natural Gas PE 3 IN
---	---	---	4" G PE	---	---	---	4" G PE	---	---	Natural Gas PE 4 IN
---	---	---	6" G PE	---	---	---	6" G PE	---	---	Natural Gas PE 6 IN
---	---	---	12" G PE	---	---	---	12" G PE	---	---	Natural Gas PE 12 IN
---	---	---	G SERV E	---	---	---	G SERV E	---	---	Natural Gas Service Existing
---	---	---	GS	---	---	---	GS	---	---	Natural Gas Service Existing
---	---	---	1" G STL	---	---	---	1" G STL	---	---	Natural Gas Steel 1 IN
---	---	---	2" G STL	---	---	---	2" G STL	---	---	Natural Gas Steel 2 IN
---	---	---	3" G STL	---	---	---	3" G STL	---	---	Natural Gas Steel 3 IN
---	---	---	4" G STL	---	---	---	4" G STL	---	---	Natural Gas Steel 4 IN
---	---	---	6" G STL	---	---	---	6" G STL	---	---	Natural Gas Steel 6 IN
---	---	---	12" G STL	---	---	---	12" G STL	---	---	Natural Gas Steel 12 IN
---	---	---	12" RW	---	---	---	12" RW	---	---	Reclaimed Water 12 IN
---	---	---	16" RW	---	---	---	16" RW	---	---	Reclaimed Water 16 IN
---	---	---	6" RW DIP	---	---	---	6" RW DIP	---	---	Reclaimed Water DIP 6 IN
---	---	---	8" RW DIP	---	---	---	8" RW DIP	---	---	Reclaimed Water DIP 8 IN

—	—	—	—	—	10" RW DIP	—	—	—	—	10" RW DIP	Reclaimed Water DIP 10 IN
—	—	—	—	—	18" RW DIP	—	—	—	—	18" RW DIP	Reclaimed Water DIP 18 IN
—	—	—	—	—	20" RW DIP	—	—	—	—	20" RW DIP	Reclaimed Water DIP 20 IN
—	—	—	—	—	24" RW DIP	—	—	—	—	24" RW DIP	Reclaimed Water DIP 24 IN
—	—	—	—	—	30" RW DIP	—	—	—	—	30" RW DIP	Reclaimed Water DIP 30 IN
—	—	—	—	—	36" RW DIP	—	—	—	—	36" RW DIP	Reclaimed Water DIP 36 IN
—	—	—	—	—	42" RW DIP	—	—	—	—	42" RW DIP	Reclaimed Water DIP 42 IN
—	—	—	—	—	— RW	—	—	—	—	— RW	Reclaimed Water Existing
—	—	—	—	—	1" SL C	—	—	—	—	1" SL C	Street Light Conduit 1 IN
—	—	—	—	—	1.5" SL C	—	—	—	—	1.5" SL C	Street Light Conduit 1.5 IN
—	—	—	—	—	2" SL C	—	—	—	—	2" SL C	Street Light Conduit 2 IN
—	—	—	—	—	— SL	—	—	—	—	— SL	Street Light Existing
—	—	—	—	—	— SL OVH	—	—	—	—	— SL OVH	Street Light Overhead
—	—	—	—	—	— SL UNDG	—	—	—	—	— SL UNDG	Street Light Underground
—	—	—	—	—	— ABND FM	—	—	—	—	— ABND FM	Force Main Abandoned
—	—	—	—	—	8" FM HDPE	—	—	—	—	8" FM HDPE	Force Main HDPE 8 IN
—	—	—	—	—	10" FM HDPE	—	—	—	—	10" FM HDPE	Force Main HDPE 10 IN
—	—	—	—	—	12" FM HDPE	—	—	—	—	12" FM HDPE	Force Main HDPE 12 IN
—	—	—	—	—	15" FM HDPE	—	—	—	—	15" FM HDPE	Force Main HDPE 15 IN
—	—	—	—	—	16" FM HDPE	—	—	—	—	16" FM HDPE	Force Main HDPE 16 IN
—	—	—	—	—	18" FM HDPE	—	—	—	—	18" FM HDPE	Force Main HDPE 18 IN
—	—	—	—	—	24" FM HDPE	—	—	—	—	24" FM HDPE	Force Main HDPE 24 IN
—	—	—	—	—	8" FM PE	—	—	—	—	8" FM PE	Force Main PE 8 IN
—	—	—	—	—	10" FM PE	—	—	—	—	10" FM PE	Force Main PE 10 IN
—	—	—	—	—	12" FM PE	—	—	—	—	12" FM PE	Force Main PE 12 IN
—	—	—	—	—	15" FM PE	—	—	—	—	15" FM PE	Force Main PE 15 IN
—	—	—	—	—	16" FM PE	—	—	—	—	16" FM PE	Force Main PE 16 IN
—	—	—	—	—	18" FM PE	—	—	—	—	18" FM PE	Force Main PE 18 IN
—	—	—	—	—	24" FM PE	—	—	—	—	24" FM PE	Force Main PE 24 IN
—	—	—	—	—	8" FM PVC	—	—	—	—	8" FM PVC	Force Main PVC 8 IN
—	—	—	—	—	10" FM PVC	—	—	—	—	10" FM PVC	Force Main PVC 10 IN
—	—	—	—	—	12" FM PVC	—	—	—	—	12" FM PVC	Force Main PVC 12 IN
—	—	—	—	—	15" FM PVC	—	—	—	—	15" FM PVC	Force Main PVC 15 IN
—	—	—	—	—	16" FM PVC	—	—	—	—	16" FM PVC	Force Main PVC 16 IN
—	—	—	—	—	18" FM PVC	—	—	—	—	18" FM PVC	Force Main PVC 18 IN
—	—	—	—	—	24" FM PVC	—	—	—	—	24" FM PVC	Force Main PVC 24 IN
—	—	—	—	—	4" S	—	—	—	—	4" S	Sewer 4 IN
—	—	—	—	—	6" S	—	—	—	—	6" S	Sewer 6 IN
—	—	—	—	—	8" S	—	—	—	—	8" S	Sewer 8 IN
—	—	—	—	—	10" S	—	—	—	—	10" S	Sewer 10 IN
—	—	—	—	—	15" S	—	—	—	—	15" S	Sewer 15 IN
—	—	—	—	—	18" S	—	—	—	—	18" S	Sewer 18 IN
—	—	—	—	—	24" S	—	—	—	—	24" S	Sewer 24 IN
—	—	—	—	—	30" S	—	—	—	—	30" S	Sewer 30 IN
—	—	—	—	—	— ABND S	—	—	—	—	— ABND S	Sewer Abandoned
—	—	—	—	—	8" S CIP	—	—	—	—	8" S CIP	Sewer CIP 8 IN
—	—	—	—	—	14" S CIP	—	—	—	—	14" S CIP	Sewer CIP 14 IN
—	—	—	—	—	4" S DIP	—	—	—	—	4" S DIP	Sewer DIP 4 IN
—	—	—	—	—	6" S DIP	—	—	—	—	6" S DIP	Sewer DIP 6 IN
—	—	—	—	—	8" S DIP	—	—	—	—	8" S DIP	Sewer DIP 8 IN
—	—	—	—	—	10" S DIP	—	—	—	—	10" S DIP	Sewer DIP 10 IN
—	—	—	—	—	12" S DIP	—	—	—	—	12" S DIP	Sewer DIP 12 IN

—	—	—	—	—	15"	S	DIP	—	—	—	—	—	15"	S	DIP	Sewer	DIP	15	IN
—	—	—	—	—	18"	S	DIP	—	—	—	—	—	18"	S	DIP	Sewer	DIP	18	IN
—	—	—	—	—	21"	S	DIP	—	—	—	—	—	21"	S	DIP	Sewer	DIP	21	IN
—	—	—	—	—	24"	S	DIP	—	—	—	—	—	24"	S	DIP	Sewer	DIP	24	IN
—	—	—	—	—	27"	S	DIP	—	—	—	—	—	27"	S	DIP	Sewer	DIP	27	IN
—	—	—	—	—	30"	S	DIP	—	—	—	—	—	30"	S	DIP	Sewer	DIP	30	IN
—	—	—	—	—	36"	S	DIP	—	—	—	—	—	36"	S	DIP	Sewer	DIP	36	IN
—	—	—	—	—	42"	S	DIP	—	—	—	—	—	42"	S	DIP	Sewer	DIP	42	IN
—	—	—	—	—	48"	S	DIP	—	—	—	—	—	48"	S	DIP	Sewer	DIP	48	IN
—	—	—	—	—	54"	S	DIP	—	—	—	—	—	54"	S	DIP	Sewer	DIP	54	IN
—	—	—	—	—	60"	S	DIP	—	—	—	—	—	60"	S	DIP	Sewer	DIP	60	IN
—	—	—	—	—	66"	S	DIP	—	—	—	—	—	66"	S	DIP	Sewer	DIP	66	IN
—	—	—	—	—	78"	S	DIP	—	—	—	—	—	78"	S	DIP	Sewer	DIP	78	IN
—	—	—	—	—	S			—	—	—	—	—	S			Sewer	Existing		
—	—	—	—	—	4"	S	PVC	—	—	—	—	—	4"	S	PVC	Sewer	PVC	4	IN
—	—	—	—	—	6"	S	PVC	—	—	—	—	—	6"	S	PVC	Sewer	PVC	6	IN
—	—	—	—	—	8"	S	PVC	—	—	—	—	—	8"	S	PVC	Sewer	PVC	8	IN
—	—	—	—	—	10"	S	PVC	—	—	—	—	—	10"	S	PVC	Sewer	PVC	10	IN
—	—	—	—	—	12"	S	PVC	—	—	—	—	—	12"	S	PVC	Sewer	PVC	12	IN
—	—	—	—	—	15"	S	PVC	—	—	—	—	—	15"	S	PVC	Sewer	PVC	15	IN
—	—	—	—	—	18"	S	PVC	—	—	—	—	—	18"	S	PVC	Sewer	PVC	18	IN
—	—	—	—	—	21"	S	PVC	—	—	—	—	—	21"	S	PVC	Sewer	PVC	21	IN
—	—	—	—	—	24"	S	PVC	—	—	—	—	—	24"	S	PVC	Sewer	PVC	24	IN
—	—	—	—	—	27"	S	PVC	—	—	—	—	—	27"	S	PVC	Sewer	PVC	27	IN
—	—	—	—	—	30"	S	PVC	—	—	—	—	—	30"	S	PVC	Sewer	PVC	30	IN
—	—	—	—	—	36"	S	PVC	—	—	—	—	—	36"	S	PVC	Sewer	PVC	36	IN
—	—	—	—	—	42"	S	PVC	—	—	—	—	—	42"	S	PVC	Sewer	PVC	42	IN
—	—	—	—	—	48"	S	PVC	—	—	—	—	—	48"	S	PVC	Sewer	PVC	48	IN
—	—	—	—	—	4"	S	RGRCP	—	—	—	—	—	4"	S	RGRCP	Sewer	RGRCP	4	IN
—	—	—	—	—	6"	S	RGRCP	—	—	—	—	—	6"	S	RGRCP	Sewer	RGRCP	6	IN
—	—	—	—	—	8"	S	RGRCP	—	—	—	—	—	8"	S	RGRCP	Sewer	RGRCP	8	IN
—	—	—	—	—	10"	S	RGRCP	—	—	—	—	—	10"	S	RGRCP	Sewer	RGRCP	10	IN
—	—	—	—	—	12"	S	RGRCP	—	—	—	—	—	12"	S	RGRCP	Sewer	RGRCP	12	IN
—	—	—	—	—	15"	S	RGRCP	—	—	—	—	—	15"	S	RGRCP	Sewer	RGRCP	15	IN
—	—	—	—	—	18"	S	RGRCP	—	—	—	—	—	18"	S	RGRCP	Sewer	RGRCP	18	IN
—	—	—	—	—	21"	S	RGRCP	—	—	—	—	—	21"	S	RGRCP	Sewer	RGRCP	21	IN
—	—	—	—	—	24"	S	RGRCP	—	—	—	—	—	24"	S	RGRCP	Sewer	RGRCP	24	IN
—	—	—	—	—	27"	S	RGRCP	—	—	—	—	—	27"	S	RGRCP	Sewer	RGRCP	27	IN
—	—	—	—	—	30"	S	RGRCP	—	—	—	—	—	30"	S	RGRCP	Sewer	RGRCP	30	IN
—	—	—	—	—	36"	S	RGRCP	—	—	—	—	—	36"	S	RGRCP	Sewer	RGRCP	36	IN
—	—	—	—	—	42"	S	RGRCP	—	—	—	—	—	42"	S	RGRCP	Sewer	RGRCP	42	IN
—	—	—	—	—	48"	S	RGRCP	—	—	—	—	—	48"	S	RGRCP	Sewer	RGRCP	48	IN
—	—	—	—	—	54"	S	RGRCP	—	—	—	—	—	54"	S	RGRCP	Sewer	RGRCP	54	IN
—	—	—	—	—	60"	S	RGRCP	—	—	—	—	—	60"	S	RGRCP	Sewer	RGRCP	60	IN
—	—	—	—	—	66"	S	RGRCP	—	—	—	—	—	66"	S	RGRCP	Sewer	RGRCP	66	IN
—	—	—	—	—	78"	S	RGRCP	—	—	—	—	—	78"	S	RGRCP	Sewer	RGRCP	78	IN
—	—	—	—	—	S	SERV	E	—	—	—	—	—	S	SERV	E	Sewer	Service	Line	Existing
—	—	—	—	—	SS			—	—	—	—	—	SS			Sewer	Service	Line	Existing
—	—	—	—	—	4"	S	VCP	—	—	—	—	—	4"	S	VCP	Sewer	VCP	4	IN
—	—	—	—	—	6"	S	VCP	—	—	—	—	—	6"	S	VCP	Sewer	VCP	6	IN
—	—	—	—	—	8"	S	VCP	—	—	—	—	—	8"	S	VCP	Sewer	VCP	8	IN
—	—	—	—	—	10"	S	VCP	—	—	—	—	—	10"	S	VCP	Sewer	VCP	10	IN
—	—	—	—	—	12"	S	VCP	—	—	—	—	—	12"	S	VCP	Sewer	VCP	12	IN

—	—	—	—	—	15" S VCP	—	—	—	—	15" S VCP	·	Sewer VCP 15 IN
—	—	—	—	—	18" S VCP	—	—	—	—	18" S VCP	·	Sewer VCP 18 IN
—	—	—	—	—	21" S VCP	—	—	—	—	21" S VCP	·	Sewer VCP 21 IN
—	—	—	—	—	24" S VCP	—	—	—	—	24" S VCP	·	Sewer VCP 24 IN
—	—	—	—	—	27" S VCP	—	—	—	—	27" S VCP	·	Sewer VCP 27 IN
—	—	—	—	—	30" S VCP	—	—	—	—	30" S VCP	·	Sewer VCP 30 IN
—	—	—	—	—	36" S VCP	—	—	—	—	36" S VCP	·	Sewer VCP 36 IN
—	—	—	—	—	42" S VCP	—	—	—	—	42" S VCP	·	Sewer VCP 42 IN
—	—	—	—	—	48" S VCP	—	—	—	—	48" S VCP	·	Sewer VCP 48 IN
—	—	—	—	—	54" S VCP	—	—	—	—	54" S VCP	·	Sewer VCP 54 IN
—	—	—	—	—	60" S VCP	—	—	—	—	60" S VCP	·	Sewer VCP 60 IN
—	—	—	—	—	66" S VCP	—	—	—	—	66" S VCP	·	Sewer VCP 66 IN
—	—	—	—	—	78" S VCP	—	—	—	—	78" S VCP	·	Sewer VCP 78 IN
—	—	—	—	—	15" SD	—	—	—	—	15" SD	·	Storm Drain 15 IN
—	—	—	—	—	18" SD	—	—	—	—	18" SD	·	Storm Drain 18 IN
—	—	—	—	—	24" SD	—	—	—	—	24" SD	·	Storm Drain 24 IN
—	—	—	—	—	36" SD	—	—	—	—	36" SD	·	Storm Drain 36 IN
—	—	—	—	—	48" SD	—	—	—	—	48" SD	·	Storm Drain 48 IN
—	—	—	—	—	60" SD	—	—	—	—	60" SD	·	Storm Drain 60 IN
—	—	—	—	—	ABND SD	—	—	—	—	ABND SD	·	Storm Drain Abandoned
—	—	—	—	—	24" SD CIPP	—	—	—	—	24" SD CIPP	·	Storm Drain CIPP 24 IN
—	—	—	—	—	30" SD CIPP	—	—	—	—	30" SD CIPP	·	Storm Drain CIPP 30 IN
—	—	—	—	—	36" SD CIPP	—	—	—	—	36" SD CIPP	·	Storm Drain CIPP 36 IN
—	—	—	—	—	40" SD CIPP	—	—	—	—	40" SD CIPP	·	Storm Drain CIPP 40 IN
—	—	—	—	—	42" SD CIPP	—	—	—	—	42" SD CIPP	·	Storm Drain CIPP 42 IN
—	—	—	—	—	48" SD CIPP	—	—	—	—	48" SD CIPP	·	Storm Drain CIPP 48 IN
—	—	—	—	—	54" SD CIPP	—	—	—	—	54" SD CIPP	·	Storm Drain CIPP 54 IN
—	—	—	—	—	60" SD CIPP	—	—	—	—	60" SD CIPP	·	Storm Drain CIPP 60 IN
—	—	—	—	—	66" SD CIPP	—	—	—	—	66" SD CIPP	·	Storm Drain CIPP 66 IN
—	—	—	—	—	72" SD CIPP	—	—	—	—	72" SD CIPP	·	Storm Drain CIPP 72 IN
—	—	—	—	—	78" SD CIPP	—	—	—	—	78" SD CIPP	·	Storm Drain CIPP 78 IN
—	—	—	—	—	84" SD CIPP	—	—	—	—	84" SD CIPP	·	Storm Drain CIPP 84 IN
—	—	—	—	—	SD	—	—	—	—	SD	·	Storm Drain Existing
—	—	—	—	—	6" SD HDPE	—	—	—	—	6" SD HDPE	·	Storm Drain HDPE 6 IN
—	—	—	—	—	8" SD HDPE	—	—	—	—	8" SD HDPE	·	Storm Drain HDPE 8 IN
—	—	—	—	—	10" SD HDPE	—	—	—	—	10" SD HDPE	·	Storm Drain HDPE 10 IN
—	—	—	—	—	12" SD HDPE	—	—	—	—	12" SD HDPE	·	Storm Drain HDPE 12 IN
—	—	—	—	—	15" SD HDPE	—	—	—	—	15" SD HDPE	·	Storm Drain HDPE 15 IN
—	—	—	—	—	18" SD HDPE	—	—	—	—	18" SD HDPE	·	Storm Drain HDPE 18 IN
—	—	—	—	—	6" SD PVC	—	—	—	—	6" SD PVC	·	Storm Drain PVC 6 IN
—	—	—	—	—	8" SD PVC	—	—	—	—	8" SD PVC	·	Storm Drain PVC 8 IN
—	—	—	—	—	10" SD PVC	—	—	—	—	10" SD PVC	·	Storm Drain PVC 10 IN
—	—	—	—	—	12" SD PVC	—	—	—	—	12" SD PVC	·	Storm Drain PVC 12 IN
—	—	—	—	—	15" SD PVC	—	—	—	—	15" SD PVC	·	Storm Drain PVC 15 IN
—	—	—	—	—	18" SD PVC	—	—	—	—	18" SD PVC	·	Storm Drain PVC 18 IN
—	—	—	—	—	15" SD RCP	—	—	—	—	15" SD RCP	·	Storm Drain RCP 15 IN
—	—	—	—	—	18" SD RCP	—	—	—	—	18" SD RCP	·	Storm Drain RCP 18 IN
—	—	—	—	—	24" SD RCP	—	—	—	—	24" SD RCP	·	Storm Drain RCP 24 IN
—	—	—	—	—	27" SD RCP	—	—	—	—	27" SD RCP	·	Storm Drain RCP 27 IN
—	—	—	—	—	30" SD RCP	—	—	—	—	30" SD RCP	·	Storm Drain RCP 30 IN
—	—	—	—	—	36" SD RCP	—	—	—	—	36" SD RCP	·	Storm Drain RCP 36 IN
—	—	—	—	—	40" SD RCP	—	—	—	—	40" SD RCP	·	Storm Drain RCP 40 IN

—	—	—	—	—	42" SD RCP	—	—	—	—	—	42" SD RCP	·	Storm Drain RCP 42 IN
—	—	—	—	—	48" SD RCP	—	—	—	—	—	48" SD RCP	·	Storm Drain RCP 48 IN
—	—	—	—	—	54" SD RCP	—	—	—	—	—	54" SD RCP	·	Storm Drain RCP 54 IN
—	—	—	—	—	60" SD RCP	—	—	—	—	—	60" SD RCP	·	Storm Drain RCP 60 IN
—	—	—	—	—	66" SD RCP	—	—	—	—	—	66" SD RCP	·	Storm Drain RCP 66 IN
—	—	—	—	—	72" SD RCP	—	—	—	—	—	72" SD RCP	·	Storm Drain RCP 72 IN
—	—	—	—	—	78" SD RCP	—	—	—	—	—	78" SD RCP	·	Storm Drain RCP 78 IN
—	—	—	—	—	84" SD RCP	—	—	—	—	—	84" SD RCP	·	Storm Drain RCP 84 IN
—	—	—	—	—	10" SD RGRCP	—	—	—	—	—	10" SD RGRCP	·	Storm Drain RGRCP 10 IN
—	—	—	—	—	12" SD RGRCP	—	—	—	—	—	12" SD RGRCP	·	Storm Drain RGRCP 12 IN
—	—	—	—	—	15" SD RGRCP	—	—	—	—	—	15" SD RGRCP	·	Storm Drain RGRCP 15 IN
—	—	—	—	—	18" SD RGRCP	—	—	—	—	—	18" SD RGRCP	·	Storm Drain RGRCP 18 IN
—	—	—	—	—	24" SD RGRCP	—	—	—	—	—	24" SD RGRCP	·	Storm Drain RGRCP 24 IN
—	—	—	—	—	27" SD RGRCP	—	—	—	—	—	27" SD RGRCP	·	Storm Drain RGRCP 27 IN
—	—	—	—	—	30" SD RGRCP	—	—	—	—	—	30" SD RGRCP	·	Storm Drain RGRCP 30 IN
—	—	—	—	—	36" SD RGRCP	—	—	—	—	—	36" SD RGRCP	·	Storm Drain RGRCP 36 IN
—	—	—	—	—	40" SD RGRCP	—	—	—	—	—	40" SD RGRCP	·	Storm Drain RGRCP 40 IN
—	—	—	—	—	42" SD RGRCP	—	—	—	—	—	42" SD RGRCP	·	Storm Drain RGRCP 42 IN
—	—	—	—	—	48" SD RGRCP	—	—	—	—	—	48" SD RGRCP	·	Storm Drain RGRCP 48 IN
—	—	—	—	—	54" SD RGRCP	—	—	—	—	—	54" SD RGRCP	·	Storm Drain RGRCP 54 IN
—	—	—	—	—	60" SD RGRCP	—	—	—	—	—	60" SD RGRCP	·	Storm Drain RGRCP 60 IN
—	—	—	—	—	66" SD RGRCP	—	—	—	—	—	66" SD RGRCP	·	Storm Drain RGRCP 66 IN
—	—	—	—	—	72" SD RGRCP	—	—	—	—	—	72" SD RGRCP	·	Storm Drain RGRCP 72 IN
—	—	—	—	—	78" SD RGRCP	—	—	—	—	—	78" SD RGRCP	·	Storm Drain RGRCP 78 IN
—	—	—	—	—	84" SD RGRCP	—	—	—	—	—	84" SD RGRCP	·	Storm Drain RGRCP 84 IN
—	—	—	—	—	1" TS C	—	—	—	—	—	1" TS C	·	Traffic Signal 1 IN
—	—	—	—	—	1.5" TS C	—	—	—	—	—	1.5" TS C	·	Traffic Signal 1.5 IN
—	—	—	—	—	2" TS C	—	—	—	—	—	2" TS C	·	Traffic Signal 2 IN
—	—	—	—	—	TS	—	—	—	—	—	TS	·	Traffic Signal
—	—	—	—	—	TS OVH	—	—	—	—	—	TS OVH	·	Traffic Signal Overhead
—	—	—	—	—	TS UNDG	—	—	—	—	—	TS UNDG	·	Traffic Signal Underground
—	—	—	—	—	2" W	—	—	—	—	—	2" W	·	Water 2 IN
—	—	—	—	—	3" W	—	—	—	—	—	3" W	·	Water 3 IN
—	—	—	—	—	4" W	—	—	—	—	—	4" W	·	Water 4 IN
—	—	—	—	—	6" W	—	—	—	—	—	6" W	·	Water 6 IN
—	—	—	—	—	8" W	—	—	—	—	—	8" W	·	Water 8 IN
—	—	—	—	—	12" W	—	—	—	—	—	12" W	·	Water 12 IN
—	—	—	—	—	16" W	—	—	—	—	—	16" W	·	Water 16 IN
—	—	—	—	—	ABND W	—	—	—	—	—	ABND W	·	Water Abandoned
—	—	—	—	—	4" W ACP	—	—	—	—	—	4" W ACP	·	Water ACP 4 IN
—	—	—	—	—	6" W ACP	—	—	—	—	—	6" W ACP	·	Water ACP 6 IN
—	—	—	—	—	8" W ACP	—	—	—	—	—	8" W ACP	·	Water ACP 8 IN
—	—	—	—	—	10" W ACP	—	—	—	—	—	10" W ACP	·	Water ACP 10 IN
—	—	—	—	—	12" W ACP	—	—	—	—	—	12" W ACP	·	Water ACP 12 IN
—	—	—	—	—	16" W ACP	—	—	—	—	—	16" W ACP	·	Water ACP 16 IN
—	—	—	—	—	18" W CCP	—	—	—	—	—	18" W CCP	·	Water CCP 18 IN
—	—	—	—	—	20" W CCP	—	—	—	—	—	20" W CCP	·	Water CCP 20 IN
—	—	—	—	—	24" W CCP	—	—	—	—	—	24" W CCP	·	Water CCP 24 IN
—	—	—	—	—	30" W CCP	—	—	—	—	—	30" W CCP	·	Water CCP 30 IN
—	—	—	—	—	36" W CCP	—	—	—	—	—	36" W CCP	·	Water CCP 36 IN
—	—	—	—	—	42" W CCP	—	—	—	—	—	42" W CCP	·	Water CCP 42 IN
—	—	—	—	—	6" W CIP	—	—	—	—	—	6" W CIP	·	Water CIP 6 IN

—	—	—	—	—	8" W CIP	—	—	—	—	8" W CIP	Water CIP 8 IN
—	—	—	—	—	10" W CIP	—	—	—	—	10" W CIP	Water CIP 10 IN
—	—	—	—	—	12" W CIP	—	—	—	—	12" W CIP	Water CIP 12 IN
—	—	—	—	—	16" W CIP	—	—	—	—	16" W CIP	Water CIP 16 IN
—	—	—	—	—	18" W CIP	—	—	—	—	18" W CIP	Water CIP 18 IN
—	—	—	—	—	6" W DIP	—	—	—	—	6" W DIP	Water DIP 6 IN
—	—	—	—	—	8" W DIP	—	—	—	—	8" W DIP	Water DIP 8 IN
—	—	—	—	—	10" W DIP	—	—	—	—	10" W DIP	Water DIP 10 IN
—	—	—	—	—	12" W DIP	—	—	—	—	12" W DIP	Water DIP 12 IN
—	—	—	—	—	16" W DIP	—	—	—	—	16" W DIP	Water DIP 16 IN
—	—	—	—	—	18" W DIP	—	—	—	—	18" W DIP	Water DIP 18 IN
—	—	—	—	—	20" W DIP	—	—	—	—	20" W DIP	Water DIP 20 IN
—	—	—	—	—	24" W DIP	—	—	—	—	24" W DIP	Water DIP 24 IN
—	—	—	—	—	30" W DIP	—	—	—	—	30" W DIP	Water DIP 30 IN
—	—	—	—	—	36" W DIP	—	—	—	—	36" W DIP	Water DIP 36 IN
—	—	—	—	—	42" W DIP	—	—	—	—	42" W DIP	Water DIP 42 IN
—	—	—	—	—	W	—	—	—	—	W	Water Existing
—	—	—	—	—	18" W PCCP	—	—	—	—	18" W PCCP	Water PCCP 18 IN
—	—	—	—	—	20" W PCCP	—	—	—	—	20" W PCCP	Water PCCP 20 IN
—	—	—	—	—	24" W PCCP	—	—	—	—	24" W PCCP	Water PCCP 24 IN
—	—	—	—	—	30" W PCCP	—	—	—	—	30" W PCCP	Water PCCP 30 IN
—	—	—	—	—	36" W PCCP	—	—	—	—	36" W PCCP	Water PCCP 36 IN
—	—	—	—	—	42" W PCCP	—	—	—	—	42" W PCCP	Water PCCP 42 IN
—	—	—	—	—	48" W PCCP	—	—	—	—	48" W PCCP	Water PCCP 48 IN
—	—	—	—	—	54" W PCCP	—	—	—	—	54" W PCCP	Water PCCP 54 IN
—	—	—	—	—	60" W PCCP	—	—	—	—	60" W PCCP	Water PCCP 60 IN
—	—	—	—	—	72" W PCCP	—	—	—	—	72" W PCCP	Water PCCP 72 IN
—	—	—	—	—	W SERV E	—	—	—	—	W SERV E	Water Service Line Existing
—	—	—	—	—	WS	—	—	—	—	WS	Water Service Line Existing

APPENDIX F

Plan Sheet Legend and Examples

APPENDIX G

CAD Template Details

- MAP COM Template.dwt
This template contains all City of Mesa layers, linetypes, text styles and information needed for all general projects and plans and does not include any Civil 3D styles and civil design standards.
- Aerial COM Template.dwt
This template contains the layers and information needed for aerial imagery. Importing aerials and the aerial data from GIS can be implemented by using the MAPIINSERT command. Once the aerial is imported correctly into the drawing, the grid-to-ground scale factor will need to be implemented using 0,0,0 as a reference point. Aerials brought in via GIS require a “Grid-to-Ground” conversion factor. The conversion scale factor for Grid-to-Ground is 1.000156168. Notes can be placed in this aerial cad file documenting with descriptions of what they are to be utilized for.
- C3D COM TEMPLATE.dwt
The Civil 3D template contains all layers and information needed for all design files and design. This file also contains Civil 3D styles that have been set to adhere to City of Mesa Standards while utilizing the Civil 3D functionality of the design program. These styles include alignments, surfaces, profiles, labeling, piping, grade and drainage, survey data, corridors, and cross sections.
- SURVEY COM TEMPLATE-2023
The survey template contains the line types, layers and information required for processing survey calculations and field data to prepare survey base files for topographic mapping, boundary maps, plats, and exhibit drawings. The Survey Template utilizes the Survey Codes revised in 2023. Tabs have been added to the template to include title blocks for all typical sizes of exhibit or plan sheets, as well as a Meta Data statement for Survey Control, which can be edited from the standard, if required.
- UTILITY COM TEMPLATE.dwt
This utility template contains the linetypes and layers needed for placing existing utilities and proposed utilities into a base design file. Existing utilities are based off current and past as-built projects and City of Mesa GIS extracted data. If utilities are extracted from the COM GIS database and imported into a utility base file utilizing the Utility COM Template, the grid-to-

ground scale factor will need to be implemented using 0,0,0 as a reference point. Utility Data in the form of shape files (.shp) brought in via GIS require a “Grid-to-Ground” conversion factor. The conversion scale factor for Grid-to-Ground is 1.000156168.

- COM_ELC_STD_TEMPLATE.dwt

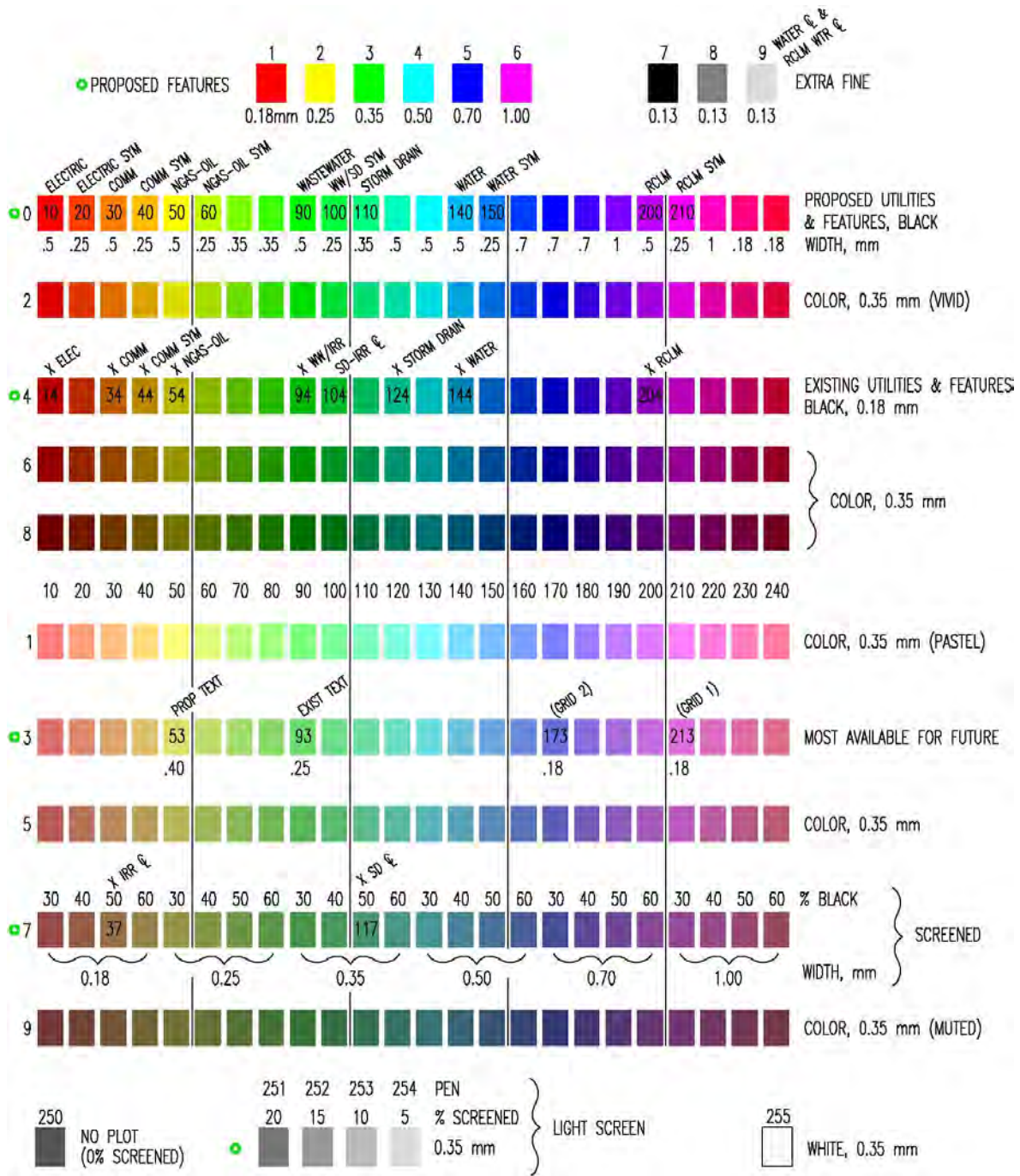
This City of Mesa Electrical Engineering Group template contains information necessary to comply with the City’s design parameters regarding Electrical Utility design. This AutoCAD template includes typical information needed for Mesa Power electric utility design. This file also contains COM Power electrical blocks, linetypes, layers, tool pallets, and electrical symbology that have been set to adhere to City of Mesa Standards.

- COM LANDSCAPE STD TEMPLATES

This City of Mesa Landscape Engineering Group templates include several templates that focus on Demolition, Hardscape, Landscape, Site Lighting, Irrigation, and Landscape topography. These templates include COM standard layers, linetypes, text styles, blocks, and dwg settings regarding Landscape, Hardscape, and Irrigation design.

APPENDIX H

Pen Tables



APPENDIX I

Lisp Routines and Descriptions

Routine	Description
ACRES	Calculates the acreage of a closed polyline and then places that number on the drawing at the location of your choice
ADDNUM	Adds specified amount to a number after prompted to enter the number of decimal places to add, and a constant number to add to the selected number in standard text format in AutoCAD (does not apply to mtext).
adp	Adds parenthesis around selected standard text in AutoCAD (does not apply to mtext).
AVTX	Adds vertex to a polyline without losing xdata
Bxx	Breaks line/polyline at specified location
Bylayer	Changes all AutoCAD entity properties that are not on ByLayer and places them on ByLayer
Dimline	Adds the length of line as text to a selected line
DVIEWTW	This lisp allows the user to select a line and utilize the DView "Twist" command to rotate the view relative to the line drawn.
FB	Fix Block: Puts all of a blocks sub-entities on layer 0 with color and linetype set to BYLAYER. The block, itself, will remain on its' original layer.
G2G	Grid2Ground: This routine scales the X & Y values of selected entities without effecting the Z. For conversions form grid to ground or vice versa.
INCNUM	increments a number by whatever increment is input. Text must be simple text or dtext (not mtext) in order to work
LAYCUR	Changes selected entities to the current layer
LSTacres	The purpose of this routine is to allow the user to pick a group of polylines/lwpolylines and have it list each one in (ACRES.)
LBLAREAS	The purpose of this routine is to allow the user to pick a group of polylines/lwpolylines and have it label each one in (SQ.FT.)
Ox	Offset an object from an xref
Pipe	This routine asks the user for a layer name. "SD" is the default. The user is asked to select a line or a polyline which is moved to the layer chosen by the user and changed to the pipe2 linetype. A copy is offset oneach side at the user defined size. The 2 new entities are moved to the chosen layer and their linetype are changed to continuous.
qs	Quick Save
rev	Used to reverse the direction in which Lines, Polylines and LWPolylines are drawn. Useful for correcting the "direction" of specialized complex linetypes.

SewerServ	(SVC): This routine inserts a 45-degree angle line between a sewer service line and a sewer main.
STRIM	This routine inserts a 45-degree angle line between a sewer service line and a sewer main.
swapline	Used to reverse the direction in which Lines, Polylines and LWPolylines are drawn
VP2MS	project a viewport into model space as a pline
Sel_by_OD__US	This allows the Cad user to select Cad elements with data linked to the cad element extracted from GIS Data Extract. You can sort the information linked to the cad object and it will select all that applies to your selection.
T1MJ	Text1MtextJust: T1MJ converts each selected Text entity separately to Mtext with same or equivalent justification as original Text, including vertical component but does not combine all mtext into one text string...keeps separately

APPENDIX J

CAD Detail Creation Process (Not Complete)

APPENDIX K

Mesa Non-Standard Details (Not Complete)

APPENDIX L

Construction Notes for Plan Sets

GENERAL NOTES

(REVISED 03-15-18) (2018 VERSION)

1. ALL WORK AND MATERIALS SHALL CONFORM TO CURRENT UNIFORM STANDARD SPECIFICATIONS AND DETAILS FOR PUBLIC WORKS CONSTRUCTION AS PUBLISHED BY THE MARICOPA ASSOCIATION OF GOVERNMENTS AND AS AMENDED BY THE CITY OF MESA. ALL WORK AND MATERIALS NOT IN CONFORMANCE WITH THESE AMENDED SPECIFICATIONS AND DETAILS ARE SUBJECT TO REMOVAL AND REPLACEMENT AT THE CONTRACTOR'S EXPENSE.
2. THE INFORMATION SHOWN ON DRAWINGS CONCERNING THE TYPE AND LOCATION OF EXISTING UNDERGROUND UTILITIES IS APPROXIMATE AND HAS NOT BEEN INDEPENDENTLY VERIFIED BY THE ENGINEER OR THE ENGINEER'S AGENT. THE CONTRACTOR SHALL DETERMINE THE EXACT LOCATION OF ALL EXISTING UTILITIES BEFORE COMMENCING WORK AND AGREES TO BE FULLY RESPONSIBLE FOR ANY AND ALL DAMAGES WHICH MAY OCCUR BY THE CONTRACTOR'S FAILURE TO EXACTLY LOCATE AND PRESERVE ANY AND ALL UNDERGROUND AND OVERHEAD UTILITIES.
 - A. CALL **602-263-1100** OR **811** FOR BLUE STAKE SERVICES.
 - B. CALL SALT RIVER POWER FOR POLE BRACING, ELECTRIC SERVICE OR CONSTRUCTION SCHEDULING AT **602-236-8888**.
 - C. CALL CITY OF MESA ELECTRICAL FOR POLE BRACING, ELECTRICAL SERVICE OR CONSTRUCTION SCHEDULING AT **480-644-2251** WITHIN CITY OF MESA ELECTRICAL SERVICE TERRITORY (DOWNTOWN MESA).
 - D. WHEN EXCAVATING IN OR ADJACENT TO A CITY PARK OR AQUATIC FACILITY THE CONTRACTOR SHALL CONTACT AQUATICS AND PARKS MAINTENANCE AT **480-644-3097** TO REQUEST ASSISTANCE IN LOCATING UNDERGROUND UTILITY FACILITIES.
 - E. WHEN EXCAVATING IN OR ADJACENT TO LANDSCAPING WITHIN THE RIGHT-OF-WAY, THE CONTRACTOR SHALL CONTACT TRANSPORTATION FIELD OPERATIONS AT **480-644-3380** TO REQUEST ASSISTANCE IN LOCATING UNDERGROUND IRRIGATION FACILITIES.
3. TRAFFIC CONTROL SHALL CONFORM TO THE CITY OF MESA TEMPORARY TRAFFIC CONTROL MANUAL. ELECTRONIC COPIES ARE AVAILABLE AT <http://www.mesaaz.gov/business/barricading-temporary-traffic-control-permits>. HARD COPIES CAN BE MADE AVAILABLE AT DEVELOPMENT SERVICES, 55 N. CENTER ST., MESA, ARIZONA
4. CONTRACTOR TO NOTIFY TRAFFIC OPERATIONS AT **480-644-3126** PRIOR TO SIGN REMOVAL AND WHEN READY TO PERMANENTLY RELOCATE SIGN.
5. CONTRACTOR TO OBTAIN ANY PERMITS REQUIRED UNLESS OTHERWISE INDICATED, AND COORDINATE ALL IRRIGATION DRY-UPS, RELOCATIONS, AND REMOVALS BY OTHERS.
6. CONTRACTOR SHALL POTHOLE EXISTING UTILITIES AHEAD OF CONSTRUCTION TO ALLOW FOR ANY NECESSARY ADJUSTMENTS IN GRADE LINE AND TO VERIFY PIPE MATERIALS FOR ORDERING THE APPROPRIATE TRANSITION AND TIE-IN FITTINGS THAT MAY BE REQUIRED.
7. THE CONTRACTOR IS RESPONSIBLE TO REMOVE ALL ABANDONED UTILITIES THAT INTERFERE WITH PROPOSED IMPROVEMENTS. THE CITY OF MESA UTILITIES DEPARTMENT LOCATING SECTION WILL ASSIST THE CONTRACTOR AS NEEDED, IN

DETERMINING IF THE UTILITY (GAS, WATER, AND WASTEWATER ONLY) IS ABANDONED BY CALLING **480-644-4500**.

8. PRIOR TO START OF CONSTRUCTION ON PRIVATE PROPERTY (EASEMENTS), THE CONTRACTOR SHALL GIVE THE OWNER SUFFICIENT TIME (MINIMUM 48 HOURS) TO REMOVE ANY ITEMS IN CONFLICT WITH CONSTRUCTION. THE CONTRACTOR SHALL ARRANGE TO REMOVE AND REPLACE ALL OTHER CONFLICTS AS REQUIRED.
9. THE CONTRACTOR SHALL COORDINATE WORK SCHEDULES TO PREVENT ANY CONFLICTING WORK CONDITIONS WITH THE CITY OF MESA UTILITY AND TRANSPORTATION CREWS.
10. THE CONTRACTOR IS ADVISED THAT A DUST CONTROL PERMIT AND A DUST CONTROL PLAN MAY BE REQUIRED BY THE MARICOPA COUNTY AIR QUALITY DEPARTMENT. IT SHALL BE THE CONTRACTOR'S RESPONSIBILITY TO OBTAIN THIS PERMIT, IF NECESSARY, AND COMPLY WITH ITS REQUIREMENTS. PRIOR TO CONSTRUCTION, THE CONTRACTOR SHALL PROVIDE A COPY OF THE DUST CONTROL PERMIT AND DUST CONTROL PLAN TO THE CITY FOR REVIEW.
11. INSPECTIONS SHALL BE PROVIDED BY THE CITY OF MESA. THE CONTRACTOR SHALL NOTIFY THE CITY INSPECTION DEPARTMENT AT LEAST 48 HOURS IN ADVANCE OF ANY CONSTRUCTION.
12. THE JOB SITE SHALL BE CLEANED OF ANY DEBRIS OR SPOIL RESULTING FROM THIS PROJECT AT THE COMPLETION OF CONSTRUCTION.
13. ALL EQUIPMENT AND MATERIALS NOT SHOWN OR SPECIFIED ON THE PLANS OR SPECIFICATIONS, BUT REQUIRED TO COMPLETE THIS PROJECT, SHALL BE SUPPLIED BY THE CONTRACTOR AS PART OF THIS CONTRACT WORK (NO ADDITIONAL COST TO THE CITY).
14. WHEREVER PAVEMENT REPLACEMENT PER MESA STD DETAIL M-19.04.1 OR MAG STD DETAIL 200 IS REFERRED TO WITHIN THESE PLANS, BACKFILLING SHALL BE PER THE CITY OF MESA STREET TRENCH BACKFILLING AND PAVEMENT REPLACEMENT POLICY STATEMENT, REVISED SEPTEMBER 29, 1999.
15. FOR PURPOSES OF PAVEMENT PER MAG STD DETAIL 200 OR MESA STD DETAIL M-19.04.1, INTERSECTIONS ARE DEFINED BY THE CURB RETURNS IN ALL DIRECTIONS.
16. ANY SURVEY MARKERS DISTURBED OR DAMAGED BY THE CONTRACTOR SHALL BE REPLACED IN KIND BY A REGISTERED LAND SURVEYOR AT NO ADDITIONAL COST TO THE CITY.
17. ALL EXISTING PAVEMENT MARKINGS, SIGNS, AND SIGNAL EQUIPMENT THAT ARE NOT PART OF THIS PROJECT BUT NEED TO BE REMOVED, REPLACED, RELOCATED, OR REPAIRED BECAUSE OF CONTRACTOR'S WORK WILL BE DONE AT THE CONTRACTOR'S EXPENSE.
18. THE CONTRACTOR IS ADVISED THAT DAMAGE TO ANY PUBLIC SERVICES OR SYSTEMS AS A RESULT OF THIS PROJECT SHALL BE REPAIRED BY THE CONTRACTOR AND INSPECTED BY THE CITY INSPECTOR. DEPENDING ON DAMAGES, ALL REPAIRS SHALL BE DONE WITHIN 24 HOURS. THE CONTRACTOR IS ADVISED THAT ANY COSTS RELATED TO REPAIR OR REPLACEMENT OF DAMAGED PUBLIC SERVICES OR SYSTEMS AS A RESULT OF CONTRACTOR'S NEGLIGENCE SHALL BE BORNE BY THE CONTRACTOR.

WATER, WASTEWATER AND STORM DRAIN GENERAL NOTES

(REVISED 04-15-21) (2021 VERSION)

1. MATERIALS AND INSTALLATION OF WATER AND SEWER MAINS, WATER METERS AND SERVICE LINE CONNECTIONS SHALL CONFORM TO CURRENT CITY DETAILS, MESA AMENDMENTS TO MAG SPECIFICATIONS, AND THE APPROVED PRODUCTS LIST. SEE BELOW FOR APPROVED PRODUCT LISTS FOR WATER AND WASTEWATER.

[CITY OF MESA APPROVED PRODUCTS LIST – WATER](#)

[CITY OF MESA APPROVED PRODUCTS LIST - WASTEWATER](#)

2. IN ACCORDANCE WITH ARIZONA ADMINISTRATIVE CODE (A.A.C). R18-4-213, ALL MATERIALS WHICH MAY COME INTO CONTACT WITH DRINKING WATER SHALL CONFORM TO NATIONAL SANITATION FOUNDATION (NSF) STANDARDS 60, 61, AND 372 AND SHALL BE LEAD-FREE AS DEFINED IN A.A.C. R18-5-504 AND R18-4-101.
3. THE CONTRACTOR IS RESPONSIBLE TO PROVIDE ALL NECESSARY FITTINGS AND ADAPTERS REQUIRED TO CONNECT DIFFERENT TYPES OF WATER MAIN MATERIALS.
4. PER MESA AMENDMENTS 610.4.2 ALL MINOR VERTICAL OR HORIZONTAL DEFLECTIONS SHALL BE BY PIPE JOINT DEFLECTION UNLESS OTHERWISE NOTED. PIPE JOINT DEFLECTION SHALL NOT EXCEED 3 DEGREES OR 2/3 OF PIPE MANUFACTURER'S RECOMMENDATIONS WHICHEVER IS LESS.
5. PER MAG AND MESA AMENDMENTS 610.11 ALL WATER LINE TESTS SHALL BE COMPLETED SO THAT NO EXISTING LINES, EXISTING VALVES, OR NEWLY INSTALLED VALVES WHICH ARE CONNECTED TO THE OPERATING WATER SYSTEM ARE INCLUDED IN THE TESTS. ALLOWABLE TIMEFRAMES SHOULD FOLLOW MESA AMENDMENTS TO MAG AND MUST BE COORDINATED WITH THE CITY INSPECTOR. FOR A DAYTIME TIE-IN, THE CONTRACTOR SHALL COMPLETE ALL WORK NECESSARY TO RESTORE UTILITY SERVICE AND FULLY OPEN THE TIE-IN AREA TO TRAFFIC WITHIN THE TIME ALLOWED.
6. WATER LINE FLUSHING, PRESSURE TESTING, AND DISINFECTION SHALL BE COMPLETED PER MAG SPECIFICATION SECTION 611, MESA AMENDMENTS TO MAG SPECIFICATION SECTION 611, AND AWWA C651 (CURRENT VERSION).
7. SOURCE WATER UTILIZED FOR FILLING, FLUSHING AND TESTING SHALL BE OBTAINED FROM A HYDRANT METER ORDERED THROUGH PERMIT SERVICES AND SET BY CITY OF MESA WATER RESOURCES STAFF. IT IS PROHIBITED TO OPEN A VALVE TO THE EXISTING WATER SYSTEM TO FILL A NEWLY CONSTRUCTED OR REPAIRED PIPELINE AS OUTLINED IN THE MESA AMENDMENTS TO MAG SECTION 610.11 AND 611.
8. WATER METERS, METER BOXES, LIDS, ETC. IN CONFLICT WITH NEW CONSTRUCTION SHALL BE RELOCATED PER CITY OF MESA STANDARD DETAIL M-49 BY THE CONTRACTOR. THE RELOCATION SHALL INCLUDE ALL MATERIALS NECESSARY TO RECONNECT THE METER TO THE CITY DISTRIBUTION SYSTEM. SERVICE LINE EXTENSIONS, IF APPROVED IN WRITING BY MESA WATER RESOURCES DEPARTMENT, SHALL CONFORM TO MESA STANDARD DETAIL M-49. WHEN SERVICE LINE EXTENSIONS ARE APPROVED PER MESA STANDARD DETAIL M-49, SERVICE LINE COUPLINGS SHALL NOT BE PLACED UNDER ROADWAY SURFACES, CONCRETE GUTTERS, CURB AND GUTTER, OR CONCRETE DRIVEWAYS.
9. VALVES SHALL BE INSTALLED WITH VALVE BOX AND COVER PER MAG STD DETAILS 391-1, TYPE C WITH A DEEP-SKIRTED LID (4-INCHES MINIMUM) AS NOTED IN THE APPROVED PRODUCTS LIST.
10. ALL WATER LINE ABANDONMENT CUT AND PLUGS FOR ACTIVE LINES SHALL CONFORM TO THE FOLLOWING:
 - A. 12" AND SMALLER DIAMETER PER MESA STANDARD DETAIL M-50.

- B. 16" DIAMETER PER M.A.G. STANDARD DETAIL 390, TYPE B.
 - C. GREATER THAN 16" DIAMETER, AS DESIGNED PER PLAN.
11. LIME-TREATED AGGREGATE BASE COURSE (ABC) MATERIAL, RECLAIMED CONCRETE MATERIAL (RCM), AND RECLAIMED ASPHALT PAVEMENT (RAP) MATERIALS ARE PROHIBITED FOR USE IN THE PIPE EMBEDMENT ZONE (BEDDING, HAUNCHING, INITIAL BACKFILL) FOR WATERLINE CONSTRUCTION PER MESA AMENDMENTS 601.4.2.
 12. PER MESA AMENDMENTS 610.11, APPLICATIONS TO THE CITY OF MESA ENGINEERING INSPECTOR AND REVIEWED AND APPROVED BY THE WATER RESOURCES DEPARTMENT FOR WATER SYSTEM SHUTDOWN FOR THE PURPOSES OF CONSTRUCTION-RELATED ACTIVITIES SHALL BE MADE A MINIMUM OF FIVE (5) BUSINESS DAYS PRIOR TO THE SCHEDULED SHUTDOWN DATE. THE REQUEST SHALL INCLUDE PRIMARY AND SECONDARY VALVE NUMBERS, WHETHER A TEST SHUTDOWN IS REQUESTED, AND THE DATE AND DURATION OF THE REQUESTED SHUTDOWN. PER MAG 610.11, THE CITY OF MESA DOES NOT GUARANTEE A COMPLETE SHUTDOWN.
 13. REQUIRED BACKFLOW PREVENTION ASSEMBLIES SHALL INCLUDE MANUFACTURERS AND MODELS DESIGNATED IN THE CURRENT "LIST OF APPROVED BACKFLOW PREVENTION ASSEMBLIES" AS PUBLISHED BY THE FOUNDATION FOR CROSS-CONNECTION CONTROL AND HYDRAULIC RESEARCH, UNIVERSITY OF SOUTHERN CALIFORNIA.
 14. BACKFLOW PREVENTION ASSEMBLIES SHALL BE TESTED AND APPROVED BY A CERTIFIED TECHNICIAN DESIGNATED IN THE CURRENT CITY OF MESA "LIST OF APPROVED INSPECTORS" PRIOR TO THE REQUEST FOR FINAL INSPECTION.
 15. ALL WATER METERS ARE TO BE SUPPLIED BY THE CITY OF MESA. CHARGES FOR INSTALLING NEW SERVICES AND METERS WILL BE IN ACCORDANCE WITH THE CURRENT UTILITY SERVICE FEE SCHEDULE. METERS TWO INCHES OR LESS WILL BE DELIVERED AND INSTALLED BY CITY FORCES. METERS LARGER THAN TWO INCHES WILL BE DELIVERED BY THE CITY AND INSTALLED BY THE CONTRACTOR AND REQUIRE SCHEDULING AND INSPECTIONS WITH CITY FORCES. CONTACT THE DEVELOPMENT SERVICES DEPARTMENT AT 480-644-4273 FOR THE SPECIFIC PROCEDURE. SEE M-27.01 FOR MORE INFORMATION.
 16. WHEN GROUTING OR CASTING CONCRETE AROUND PVC SEWER PIPE, SUCH AS AT MANHOLE OR VAULT PENETRATIONS, THE CONTRACTOR SHALL INSTALL WATER STOPS PER MESA AMENDMENTS TO MAG SPECIFICATION 625 AND MANUFACTURERS RECOMMENDATIONS.
 17. SEWER BUILDING CONNECTION LATERALS SHALL BE INSTALLED PER MAG STANDARD DETAIL 440. LATERAL WYES SHALL BE INSTALLED AT NO GREATER THAN A 45 DEGREE ANGLE FROM HORIZONTAL. SEWER LATERAL SLOPES SHALL BE AS INDICATED ON MAG STANDARD DETAIL 440 AND IN NO CIRCUMSTANCE SHALL SEWER LATERAL SLOPES EXCEED 7/8" PER FOOT FOR 6" LATERALS AND 1-1/2" PER FOOT FOR 4" LATERALS. FITTINGS SHALL BE INSTALLED WITH NO ANGULAR JOINT DEFLECTION AND ALL CONNECTIONS SHALL BE GASKETED OR SEALED PER MAG SPECIFICATIONS.
 18. SEWER MANHOLE BASES, BENCHES, SHELVES, AND CHANNELS SHALL BE CONSTRUCTED PER MAG STANDARD DETAIL 420. EACH INLET PIPE SHALL HAVE A DESIGNATED, FORMED CHANNEL AND BENCHING. THE DIMENSIONS OF CHANNELS, SHELF SLOPE, AND MINIMUM INLET PIPE ANGLES SHALL BE CONSTRUCTED PER MAG STANDARD DETAIL 420-3.
 19. PER MESA DESIGN STANDARDS, SEWER MANHOLES SHALL BE CONSTRUCTED PER MAG STANDARD DETAILS 420-1, TYPE 'A' TOP; AND 423-2 EXCEPT THAT:
 - A. MANHOLE SHAFT DIAMETERS SHALL BE 5 FEET.

- B. MANHOLE RINGS AND COVERS SHALL HAVE 30-INCH DIAMETERS.
- C. STEPS SHALL NOT BE INCLUDED.

PAVING GENERAL NOTES

(REVISED 02-07-18) (2018 VERSION)

1. CONTRACTOR SHALL COORDINATE ALL DRIVEWAY LOCATIONS WITH PRIVATE PROPERTY OWNERS AND THE CITY INSPECTOR.
2. FOR THE APPROVED LIST OF PAVING PRODUCTS SEE:
<http://www.mesaaz.gov/business/engineering/approve-products-equipment-natural-gas-line-contractors>.
3. ALL GUTTER GRADES LESS THAN 0.0020 FT/FT SHALL BE STAKED ALONG THE ACTUAL GUTTER ALIGNMENT (NOT OFFSET) AND CHECKED BY CITY OF MESA INSPECTOR IMMEDIATELY PRIOR TO PLACEMENT OF CONCRETE.
4. ALL FRAMES, COVERS, VALVE BOXES, ETC. SHALL BE ADJUSTED BY THE CONTRACTOR TO FINISHED GRADE AFTER PLACEMENT OF ASPHALT CONCRETE SURFACE COURSE PER MAG STD DETAILS 270, 422, OR 391-1-C.

GAS GENERAL NOTES

(REVISED 02-07-12)

1. ALL WORK AND MATERIALS SHALL CONFORM TO THE CURRENT CITY OF MESA GAS OPERATIONS, MAINTENANCE, EMERGENCY RESPONSE, AND CONSTRUCTION PRACTICE MANUAL.
2. WHEN GAS MAIN AND/OR SERVICES ARE EXPOSED, CONTACT THE CITY OF MESA AT **480-644-2261** FOR INSPECTION OF THE EXPOSED PIPE AND COATING PRIOR TO BACKFILLING THE TRENCH.
3. BEDDING OR SHADING MATERIAL ADJACENT TO THE CITY GAS PIPE SHALL BE SELECT SANDY TYPE SOIL FREE OF ROCK OR DEBRIS THAT WILL PASS THROUGH A 3/8 INCH "SCREEN" AS INSPECTED AND APPROVED BY THE CITY GAS INSPECTION PERSONNEL.
4. THE CONTRACTOR SHALL COMPLY WITH ALL REQUIREMENTS AS INDICATED ON MESA STD DETAIL M-58 WHEN TRENCHING FOR THE WATER LINE WHERE A GAS MAIN IS TO BE INSTALLED IN THE SAME TRENCH.
5. CONTACT THE GAS DIVISION AT **480-250-2982** FOR SCHEDULING AND COORDINATION OF THE INSTALLATION OF NATURAL GAS MAINS AND/OR SERVICES.
6. GAS LINE SHALL MAINTAIN A NOMINAL TWELVE (12) INCHES (MINIMUM OF EIGHT (8) INCHES) SEPARATION FROM EXISTING WATER, WASTEWATER, ELECTRICAL, CABLE TV, AND TELCO FACILITIES.

ITS/TRAFFIC SIGNAL GENERAL NOTES

(REVISED 06-26-18) (2018 VERSION)

1. THE CITY OF MESA REQUIRES AT LEAST TWO INTERNATIONAL MUNICIPAL SIGNAL ASSOCIATION (IMSA) CERTIFIED TRAFFIC SIGNAL TECHNICIANS ON SITE DURING ALL PHASES OF ANY TRAFFIC SIGNAL WORK. AT LEAST ONE TECHNICIAN MUST LEVEL II CERTIFICATION OR HIGHER. IT WILL BE THE RESPONSIBILITY OF THE CONTRACTOR TO PROVIDE VERIFICATION OF CERTIFICATION. IF A JOB SITE IS INSPECTED AND CERTIFIED TECHNICIAN IS NOT ON SITE, A STOP WORK ORDER WILL BE ISSUED. TEMPORARY AND CONTRACT EMPLOYEES DO NOT SATISFY THIS REQUIREMENT.
2. THE CONTRACTOR SHALL IMMEDIATELY REPORT ANY TRAFFIC SIGNAL DAMAGE TO THE ENGINEERING INSPECTOR OR ITS OPERATIONS SUPERVISOR AT **480-644-3129**. IT IS THE RESPONSIBILITY OF THE CONTRACTOR TO REPAIR DAMAGE TO ANY TRAFFIC SIGNAL EQUIPMENT SUCH AS CONTROLLER CABINET AND EQUIPMENT, DETECTOR LOOPS, PULL BOXES, CONDUIT, POLES, MAST ARMS, HEADS OR RELATED EQUIPMENT AS A RESULT OF THIS PROJECT. A CITY OF MESA TECHNICIAN SHALL INSPECT THESE REPAIRS.
 - A. A TRAFFIC SIGNAL CANNOT BE DARK OR IN FLASH FOR MORE THAN TWO HOURS.
 - B. A LOSS OF COMMUNICATION SHALL BE REPAIRED WITHIN 24 HOURS.
 - C. DETECTOR LOOPS SHALL BE REPLACED IN TWO WEEKS UNLESS THE TRAFFIC SIGNAL FOREMAN AGREES IN WRITING TO A DIFFERENT SCHEDULE.
3. IF THE CONTRACTOR CANNOT RESPOND OR MAKE THE REPAIRS WITHIN ABOVE NOTED TIME FRAMES, THE CITY TRAFFIC SIGNAL GROUP WILL MAKE THE NECESSARY REPAIRS AND CHARGE THE CONTRACTOR USING A "REPAIR ORDER FORM".
4. THE CONTRACTOR IS ADVISED THAT ANY COSTS RELATED TO REPAIR OR REPLACEMENT OF DAMAGED TRAFFIC SIGNAL EQUIPMENT AS A RESULT OF THE CONTRACTOR'S NEGLIGENCE SHALL BE BORNE BY THE CONTRACTOR.
5. IF THERE IS A TRAFFIC SIGNAL PROBLEM (INDICATION OUTAGES, KNOCKDOWNS, UTILITY POWER OUTAGES, ETC.) THAT IS NOT A DIRECT RESULT OF THE CONTRACTOR'S OR SUBCONTRACTOR'S WORK, AN ITS TECHNICIAN SHALL BE CALLED TO RESPOND. IF IT IS DETERMINED THE CONTRACTOR'S OR SUBCONTRACTOR'S WORK CAUSED THE TRAFFIC SIGNAL MALFUNCTION, THE CONTRACTOR THROUGH A "REPAIR ORDER FORM" SHALL PAY ALL COSTS OF REPAIRS.
6. TRAFFIC SIGNAL DETECTOR LOOPS SHALL BE INSTALLED IN ASPHALT CONCRETE PAVEMENT BEFORE THE FINAL LIFT. THE LOOP CONDUCTORS SHALL BE INSTALLED PER MESA STD DETAIL M-96.1.
7. THE CONTRACTOR IS ADVISED TO CONTACT THE CITY'S TRANSPORTATION MANAGEMENT CENTER AT **480-644-5888** AT LEAST 48 HOURS PRIOR TO ANY WORK WITHIN THE VICINITY OF OR THROUGH A SIGNALIZED INTERSECTION WHICH WILL CHANGE TRAFFIC LANE PATTERNS.

ITD FIBER OPTIC GENERAL NOTES

(REVISED 02-15-12) (2018 VERSION)

1. FIBER OPTIC DUCT WORK MAY BE INSTALLED BY EITHER OPEN CUT OR GUIDED BORE UNLESS OTHERWISE NOTED. ANY SURFACE RESTORATION RELATED TO EITHER METHOD IS A NON-PAY ITEM AND SHALL BE INCIDENTAL TO THE CORRESPONDING BID ITEM FOR CONDUIT INSTALLATION UNLESS OTHERWISE NOTED. SURFACE RESTORATION SHALL BE COMPLETED IN ACCORDANCE WITH CITY OF MESA AND MAG STANDARD SPECIFICATIONS.

ASPHALT DRIVEWAY OR PARKING LOT RESTORATION SHALL COMPLY WITH MAG STD DETAIL 200, TYPE B; AND MAG SPECIFICATION SECTION 336 UNLESS OTHERWISE NOTED.

2. FOR NON-CAPITAL (PRIVATE) PROJECTS, NO COMPONENT OR PART OF THE CONDUIT FIBER SYSTEM SHALL BE INSTALLED, CONSTRUCTED, LOCATED ON, OR ATTACHED TO ANY PROPERTY WITHIN THE CITY'S PUBLIC RIGHT-OF-WAY UNTIL CONTRACTOR HAS APPLIED FOR AND RECEIVED APPROVAL FOR RIGHT-OF-WAY PERMITS AND/OR RIGHT-OF-WAY ENCROACHMENT PERMITS FOR SUCH WORK ON THE CONDUIT FIBER SYSTEM.
3. ALTHOUGH THE EXACT PLACEMENT AND LOCATIONS OF CONDUIT FIBER SYSTEM MAY BE REVISED DURING THE PERMIT PROCESS, IT IS THE CITY'S EXPRESSED DESIRE TO HAVE THE CONDUIT FIBER SYSTEM INSTALLED OUTSIDE PAVED AREAS WHENEVER FEASIBLE. FURTHERMORE, WHEN NECESSARY FOR THE CONDUIT FIBER SYSTEM TO CROSS UNDER CITY STREETS OR PAVED AREAS, THE CONTRACTOR SHALL USE DIRECTIONAL BORING PER MESA STD DETAILS M-18 AND M-18.1.
4. PULL BOXES AND VAULTS ARE SHOWN ACCORDING TO AVAILABLE DATA. FIELD ADJUSTMENTS MAY BE NECESSARY TO AVOID CONFLICTS AND INTERCEPT EXISTING CONDUIT. CONFIRM FINAL LOCATION OF ALL NEW PULL BOXES AND VAULTS WITH CITY OF MESA REPRESENTATIVE.
5. WIDTH OF PLAN SYMBOLS MAY BE GREATER THAN ACTUAL DISTURBED AREAS. ITEMS DEPICTED ON THE PLANS ARE TO BE INSTALLED WITHIN THE RIGHT-OF-WAY OR PERMANENT EASEMENT WHERE NOTED ON THE PLANS.
6. THE CITY REQUIRES AT LEAST ONE CERTIFIED TECHNICIAN ON SITE DURING ALL PHASES OF ANY TELECOMMUNICATIONS WORK. IT WILL BE THE RESPONSIBILITY OF THE CONTRACTOR TO PROVIDE VERIFICATION OF CERTIFICATION. IF A JOB SITE IS INSPECTED AND A CERTIFIED TECHNICIAN IS NOT ON SITE, THE JOB WILL BE SHUT DOWN.
7. THE CONTRACTOR IS ADVISED TO CONTACT THE CITY'S DOIT DEPARTMENT AT **480-644-3129**, 48 BUSINESS HOURS PRIOR TO ANY WORK WITHIN THE VICINITY OF OR THROUGH A SIGNALIZED INTERSECTION WHICH WILL CHANGE TRAFFIC LANE PATTERNS.
8. THE CONTRACTOR SHALL IMMEDIATELY REPORT ANY TRAFFIC SIGNAL DAMAGE TO THE ENGINEERING INSPECTOR. DAMAGE TO ANY TRAFFIC SIGNAL EQUIPMENT SUCH AS CONTROLLER CABINET AND EQUIPMENT, DETECTOR LOOPS, PULL BOXES, CONDUIT, POLES, MAST ARMS, HEADS OR RELATED EQUIPMENT AS A RESULT OF THIS PROJECT IS THE RESPONSIBILITY OF THE CONTRACTOR AND SHALL BE REPAIRED BY THE APPROPRIATE IMSA LEVEL CERTIFIED TRAFFIC SIGNAL TECHNICIAN ACCORDING TO CITY OF MESA TRAFFIC SIGNAL SPECIFICATION. A CITY OF MESA TRAFFIC SIGNAL TECHNICIAN SHALL INSPECT THESE REPAIRS.
 - A. A TRAFFIC SIGNAL CANNOT BE DARK OR IN FLASH FOR MORE THAN TWO HOURS.
 - B. A LOSS OF COMMUNICATION SHALL BE REPAIRED WITHIN 24 HOURS.
 - C. DETECTOR LOOPS SHALL BE REPLACED IN TWO WEEKS UNLESS THE ITS FOREMAN AGREES IN WRITING TO A DIFFERENT SCHEDULE.
 - D. IF THE CONTRACTOR CANNOT RESPOND OR MAKE THE REPAIRS WITHIN ABOVE NOTED TIME FRAMES, THE CITY OF MESA WILL MAKE THE NECESSARY REPAIRS AND CHARGE THE CONTRACTOR.
 - E. IF THERE IS AN OUTAGE(S) THAT IS NOT A DIRECT RESULT OF THE CONTRACTOR'S OR SUBCONTRACTOR'S WORK, CITY OF MESA SHALL BE CALLED TO RESPOND. IF IT IS DETERMINED THE CONTRACTOR'S OR SUBCONTRACTOR'S WORK CAUSED THE OUTAGE, THE CONTRACTOR SHALL PAY ALL COSTS OF REPAIRS.
9. ALL SIDEWALK REPLACEMENT SHALL BE PER MAG STD DETAIL 230.

10. THE CONTRACTOR SHALL VIDEOTAPE THE ENTIRE PROJECT AREA PRIOR TO START OF CONSTRUCTION. THE VIDEOTAPE SHALL INCLUDE THE ENTIRE PROJECT AREA WHERE THE CONTRACTOR WILL BE PERFORMING THE WORK AND SHALL BE SUBMITTED TO THE CITY FOR APPROVAL PRIOR TO STARTING WORK.
11. THE CONTRACTOR SHALL COORDINATE WITH THE CITY OF MESA TO ATTAIN ANY NECESSARY PERMITS FROM ADOT.
12. RIGHTS-OF-WAY FOR ALL WORK SPECIFIED IN THIS CONTRACT MAY NOT BE SHOWN ON THE PLANS, AND THE CONTRACTOR SHALL NOT ENTER OR OCCUPY WITH PERSONNEL, TOOLS, EQUIPMENT, OR MATERIALS ANY PRIVATE GROUND OUTSIDE THE RIGHT-OF-WAY WITHOUT THE CONSENT OF THE OWNER.
13. POTHOLING AND RELATED SURFACE RESTORATION SHALL BE COMPLETED IN ACCORDANCE WITH CITY OF MESA STD DETAILS M-18 THRU M-18.3, MAG STD DETAIL 212, AND SPECIFICATION SECTION 335. IN THE CASE OF A CONFLICT BETWEEN THE TWO SPECIFICATIONS THE CITY OF MESA'S REQUIREMENTS SHALL PREVAIL.

ITD FIBER SPLICING AND INSTALLATION NOTES

(REVISED 02-15-12) (2018 VERSION)

1. THE CONTRACTOR SHALL NOTIFY THE ITD REPRESENTATIVE 48 HOURS IN ADVANCE OF FIBER OPTIC CABLE INSTALLATION INTO ANY EXISTING OR NEW CONDUIT.
2. DISTANCES SHOWN ON THE PLANS ARE APPROXIMATE. CONTRACTOR SHALL CAREFULLY MEASURE DISTANCES AND MAKE ALLOWANCES FOR SLACK BEFORE ORDERING AND CUTTING CABLE.
3. FUSION SPLICES SHALL BE PERFORMED WITH EQUIPMENT HAVING THE FOLLOWING FEATURES: AUTOMATIC FIBER ALIGNMENT AND AUTOMATIC LIGHT INJECTION WITH DETECTION DEVICES OR PROFILE ALIGNMENT ALGORITHMS TO PROPERLY ALIGN THE FIBER CORES AND ESTIMATE SPLICE LOSSES. "V" GROOVE ALIGNMENT SHALL NOT BE PERMITTED.
4. ALL FIBER OPTIC WORK SHALL BE PERFORMED IN OFFICE TYPE ENVIRONMENTS IN BUILDINGS, SPLICE TRAILERS AND SPLICING TENTS WITH FLOORS.
5. AT THE TIME OF FIBER OPTIC CABLE INSTALLATION, LIVE 120/240 VAC AND/OR 280 VAC POWER CONDUCTORS SERVING TRAFFIC CONTROL EQUIPMENT AND LIGHTING MAY BE PRESENT IN JUNCTION BOXES, WHERE FIBER IS TO BE INSTALLED. THE CONTRACTOR SHALL TAKE ALL NECESSARY SAFETY PRECAUTIONS.
6. CABLE SHALL BE INSTALLED AS ONE CONTINUOUS PIECE WITH NO SPLICES, EXCEPT WHERE INDICATED ON PLANS.
7. ALL CONDUITS TO BE UTILIZED FOR THE FIBER SYSTEM SHALL BE BLOWN OUT WITH COMPRESSED AIR AND HAVE A METAL DISK MANDREL PULLED THROUGH. AN ITD REPRESENTATIVE SHALL BE ON SITE DURING MANDREL PROCEDURE.
8. INSTALL ONE (1) NO.12 XHHW COPPER STRANDED IN 1" PVC ABOVE FIBER CONDUIT.
9. THE CONTRACTOR SHALL USE LUBRICANT OF THE TYPE AND QUANTITY AS RECOMMENDED BY THE CABLE MANUFACTURER WHEN PULLING CABLE.

10. DURING PULLING, A FIBER OPTIC BREAK AWAY SWIVEL SHALL BE USED.
11. THE CONTRACTOR SHALL ENSURE THAT THE TENSILE LOAD ON THE CABLE DOES NOT EXCEED MANUFACTURER SPECIFICATIONS BY USING A SUITABLE RATED SHEAR PIN AND A SYSTEM WHICH INCLUDES A MEANS OF ALERTING THE INSTALLER WHEN PULLING TENSION APPROACHES THE LIMIT AND DISPLAYS THE ACTUAL TENSION ON THE CABLE.
12. DURING PULLING, THE CABLE SHALL BE CONTINUOUSLY LUBRICATED.
13. MANUFACTURER RECOMMENDED PULLING SPEEDS SHALL NOT BE EXCEEDED.
14. FIBER OPTIC SPLICING SHALL BE PERFORMED ONLY AT THE DESIGNATED LOCATIONS SHOWN ON THE PLANS.
15. THE CONTRACTOR SHALL CERTIFY THAT THE INSTALLATION OF THE COMMUNICATIONS CABLE SUB-SYSTEM IS IN ACCORDANCE WITH THE CABLE AND SPLICE MANUFACTURER'S RECOMMENDATIONS AND THE PROJECT SPECIFICATIONS.
16. THE CONTRACTOR SHALL NOT CAUSE THE CABLE TO VIOLATE THE MINIMUM BENDING RADIUS FOR WHICH THE CABLE WAS DESIGNED.
17. IF THE CABLE IS DAMAGED DURING INSTALLATION, THE ENTIRE LENGTH OF CABLE BETWEEN THE NEAREST SPLICE POINTS SHOWN ON THE PLANS SHALL BE REMOVED AND REPLACED AT THE CONTRACTOR'S EXPENSE.
18. ONE HUNDRED (100) FEET OF EACH CABLE SHALL BE LOOSELY LOOPED AND COILED IN EACH FIBER OPTIC 4' X 4' MANHOLE.
19. SIXTY (60) FEET OF EACH CABLE SHALL BE LOOSELY LOOPED AND COILED IN EACH FIBER OPTIC NO. 9 PULL BOX.
20. TWENTY-FIVE (25) FEET OF EACH CABLE SHALL BE LOOSELY LOOPED AND COILED IN EACH FIBER OPTIC NO. 7 PULL BOX.
21. TWENTY-FIVE (25) FEET OF EACH CABLE SHALL BE LOOSELY COILED AND RACKED INSIDE EQUIPMENT ROOMS.
22. THE SLACK LENGTH REQUIREMENTS ARE MINIMUMS. THE CONTRACTOR MAY PROVIDE EXTRA SLACK, NOT TO EXCEED THREE TIMES THE MINIMUM AMOUNT, FOR CONTRACTOR'S SPLICING CONVENIENCE, AT NO ADDITIONAL COST TO THE CITY.
23. THE CONTRACTOR SHALL REMOVE AND DISPOSE OF ALL EMPTY REELS AND RESIDUAL MATERIALS.
24. A PERMANENT HIGH-QUALITY LABEL IDENTIFYING EACH CABLE SHALL BE APPLIED TO THE CABLE WITHIN TWO (2) FEET OF THE SPLICE CLOSURE AND/OR PATCH PANEL.

ITD FIBER OPTIC TESTING NOTES

(REVISED 02-15-12) (2018 VERSION)

1. ALL FIBER OPTIC TESTING SHALL BE PERFORMED WITH AN OTDR CAPABLE OF PRODUCING PC COMPATIBLE OUTPUT FILES.
2. ELECTRONIC SUBMITTAL ON CD SHALL BE REQUIRED. TEST RESULTS SUPPLIED ELECTRONICALLY SHALL BE IN PDF FORMAT, OTDR NATIVE FORMAT, AND INCLUDE OTDR SOFTWARE FOR VIEWING.
3. FIBERS SHALL BE IDENTIFIED BY STRAND NUMBER.
4. EACH BINDER SHALL HAVE A COVER SHEET INDICATING WHICH CABLE(S) WERE TESTED, THE OTDR USER'S NAME, THE REVIEWER'S NAME, THE TYPE OF TEST PERFORMED, AND

THE DATE(S) OF THE TEST. FOR INTERMEDIATE RESULTS, AN INDEX OF SHEETS THAT CONTAIN ANY DISCREPANCIES WITH THE SPECIFICATIONS SHALL BE PROVIDED IMMEDIATELY FOLLOWING THE COVER SHEET.

5. COVER SHEETS FOR FINAL TEST RESULTS SHALL BEAR THE REVIEWER'S SIGNATURE, THE DATE, AND A STATEMENT INDICATING THAT THE INSTALLATION COMPLIES WITH THE REQUIREMENTS OF THE PROJECT SPECIFICATIONS.
6. ALL OTDR TRACES SHALL BEAR THE SIGNATURE OR INITIALS AND PRINTED NAME OF THE CONTRACTOR'S EMPLOYEE WHO HAS REVIEWED THE TRACES. THE CONTRACTOR SHALL PLACE A CHECK MARK ON ALL TRACES THAT SATISFY THE REQUIREMENTS IDENTIFIED HEREIN. FOR INTERMEDIATE TEST RESULTS, THE CONTRACTOR SHALL HIGH LIGHT ANY DISCREPANCIES WHICH MAY EXIST AND PLACE A POST-IT FLAG ON THE SUBJECT PAGE. THE PAGE SHALL BEAR A SHORT DESCRIPTION OF THE PROPOSED CORRECTIVE ACTION (E.G. RE-SPLICE).
7. SINGLE-MODE FIBER OPTIC CABLE SHALL BE TESTED IN ACCORDANCE WITH EIA-455-61 OR ANY SUBSEQUENT REVISIONS OR REPLACEMENTS. CABLE SEGMENTS HAVING ATTENUATION GREATER THAN 0.4 DB/KM AT 1310 NM AND 0.3 DB/KM AT 1550 NM SHALL BE REJECTED. CABLE SEGMENT LOSS EVENTS GREATER THAN 0.20 DB SHALL BE REJECTED.
8. MULTI-MODE FIBER OPTIC CABLE ATTENUATION SHALL BE LESS THAN OR EQUAL TO 0.35 DB PER KM AT 1310 NM AND 0.25 DB PER KM AT 1550 NM.
9. THE MAXIMUM INSERTION LOSS FOR CONNECTORS SHALL BE 0.50 DB. THE CONNECTORS SHALL BE POLISHED TO ENSURE THAT BACK REFLECTION DOES NOT EXCEED 30 DB.
10. POST INSTALLATION TESTING: THE FIBER OPTIC CABLE SHALL BE TESTED AFTER INSTALLATION TO VERIFY THE INTEGRITY OF THE FIBER OPTIC CABLE PLANT AND ITS PERFORMANCE. THE CONTRACTOR SHALL PERFORM AN INSERTION LOSS TEST ON EACH OUTSIDE PLANT CABLE USING THE ATTENUATION TEST SETS IN ACCORDANCE WITH EIA-455-171. OTDR TESTING IN ACCORDANCE WITH EIA-455-59 AND EIA-455-61 SHALL ALSO BE REQUIRED. SPLICES TESTING 0.1 DB OR GREATER SHALL BE RESPLICED BY CONTRACTOR AT NO ADDITIONAL COST TO THE CITY. CONNECTORS TEST GREATER THAN 0.5 DB SHALL BE REPLACED BY CONTRACTOR AT NO ADDITIONAL COST TO THE CITY.
11. THE CONTRACTOR SHALL PERFORM BIDIRECTIONAL OTDR TESTING ON ALL FIBERS. BARE FIBER ADAPTERS SHALL BE USED FOR OTDR TESTING. THE CONTRACTOR SHALL USE A POWER METER TO PERFORM ATTENUATION MEASUREMENTS.
12. THE CONTRACTOR SHALL PERFORM OTDR TESTING ON ALL FIBERS WITH THE ITD REPRESENTATIVE PRESENT BEFORE FINAL ACCEPTANCE. THE CONTRACTOR PROVIDED OPERATOR SHALL BE QUALIFIED TO PERFORM THE TEST. WRITTEN TEST RESULTS SHALL BE PROVIDED TO THE CITY OF MESA FIELD INSPECTOR FOR EACH FIBER TESTED. UNACCEPTABLE RESULTS SHALL REQUIRE THE CONTRACTOR TO REINSTALL NECESSARY SECTIONS OF CABLE, SPLICING ONLY AT POINTS INDICATED ON PLANS, AND AT THE CONTRACTOR'S EXPENSE.
13. THE CONTRACTOR SHALL COMPLETE A FIBER OPTIC CONTINUITY TEST WITH A MODULATED LIGHT SOURCE AND POWER METER TO VERIFY THAT SPLICES HAVE BEEN COMPLETED IN ACCORDANCE WITH THE PLANS.
14. RE-TESTING SHALL BE REQUIRED IF ANY SPLICE CLOSURE IS OPENED AFTER TESTING. AFTER COMPLETING THE REWORK, THE CONTRACTOR SHALL USE AN OTDR IN ACCORDANCE WITH EIA-455-59 AND EIA-455-61 TO TEST EACH AND EVERY FIBER STRAND PASSING THROUGH ANY SPLICE TRAY THAT WAS OPENED BY THE CONTRACTOR.

ITD FIBER OPTIC MATERIALS

(REVISED 11-23-11) (2018 VERSION)

1. REFERENCES TO A MANUFACTURER'S TRADE NAME OR CATALOG NUMBER ARE FOR THE PURPOSE OF IDENTIFICATION TO ESTABLISH A LEVEL OF QUALITY, AND THE CONTRACTOR WILL NOT BE PERMITTED TO FURNISH LIKE MATERIALS OF OTHER MANUFACTURERS, EXCEPT WHERE MANUFACTURER NAME IS NOT INDICATED, PROVIDED IF THEY ARE OF EQUAL QUALITY, COMPLETE WITH SPECIFICATIONS FOR THIS PROJECT, AND ARE APPROVED BY THE ENGINEER.
2. SEE TECHNICAL SPECIFICATIONS FOR FIBER OPTIC MATERIAL INFORMATION.
3. SEE TECHNICAL SPECIFICATIONS FOR PULL BOX MATERIALS INFORMATION. PULL BOX COVER LETTERING SHALL BE 1" LETTERS CAST IN STANDARD MARKINGS CITY OF MESA ITS FIBER OPTICS. PULL BOX COVER WILL BE SECURED WITH A 5-POINT SECURITY BOLT.
4. EACH FIBER SHALL BE DISTINGUISHABLE BY MEANS OF A COLOR CODE IN ACCORDANCE WITH TIA/EIA-598.
5. THE CABLE MANUFACTURER SHALL CERTIFY THAT THE CABLE IS IN CONFORMANCE WITH THE SPECIFICATIONS.
6. THE CONTRACTOR SHALL FURNISH AND INSTALL OUTDOOR RATED SPLICE CLOSURE IN MANHOLES AND SPLICE FIBER CABLE. THE CONTRACTOR SHALL FURNISH AND INSTALL FIBER PATCH PANEL IN CABINETS AND TERMINATE FIBER. THE CONTRACTOR SHALL FURNISH AND INSTALL ALL COUPLERS AND CONNECTORS.
7. ALL PATCH PANEL CONNECTORS SHALL BE LC TYPE CONNECTORS OR APPROVED EQUAL.

AIR PRODUCTS GENERAL NOTES

(REVISED 02-07-12) (2018 VERSION)

1. CONTRACTOR WILL REQUEST AND MAINTAIN A VALID ONE CALL NOTICE FOR THE DURATION OF THE EXCAVATION PERIOD. CONTRACTOR IS TO CONTACT AIR PRODUCTS 48 HOURS IN ADVANCE TO WORKING WITHIN TEN (10) FEET OF PIPELINE AT **480-225-1406**, **480-225-1889**, OR **480-899-1177**. CONTRACTOR SHALL USE SOFT DIG METHODS TO LOCATE AND IDENTIFY THE 6" NITROGEN PIPELINE WHEN THE WORK HAS BROUGHT THEM TO WITHIN FIVE (5) FEET OF THE 6" PIPELINE.
2. ANY CONTINUOUS EXPOSURE THAT UNDERMINES THE PIPELINE FOR FIFTEEN (15) FEET OR MORE SHALL BE SUPPORTED BY THE CONTRACTOR USING AN APPROVED METHOD AGREED UPON BY THE AIR PRODUCTS REPRESENTATIVE AND THE CONTRACTOR.
3. THE CONTRACTOR SHALL PROVIDE AND ALLOW SAFE JOB SITE ACCESS FOR THE AIR PRODUCTS REPRESENTATIVE TO THE NITROGEN PIPELINE FOR THE PURPOSE OF INSPECTIONS FOR PIPE AND OR COATING DAMAGE, OR REPAIR IF REQUIRED.
4. ANY NEW FACILITY BEING INSTALLED OR EXCAVATION DURING THIS PROJECT SHALL MAINTAIN A TWO (2) FOOT SEPARATION FROM THE NITROGEN PIPELINE IN ALL DIRECTIONS.
5. BACK FILL MATERIAL SHALL CONSIST OF CLEAN SAND FOR TWO FEET AROUND THE NITROGEN PIPELINE. SLURRY IS NOT TO BE PLACED ON OR WITHIN TWO (2) FOOT OF A NITROGEN PIPELINE.
6. IF DURING THE PROJECT THE CONTRACTOR ENCOUNTERS ANY AIR PRODUCTS TEST STATION(S) AND/OR VENT STATION(S) AND IT IS DETERMINED THAT A RELOCATION OF

THESE FACILITIES IS NECESSARY, THE CONTRACTOR SHALL PROVIDE TRENCHING AND BACKFILLING AS REQUIRED TO AN ADEQUATE DEPTH AND WIDTH FROM THE EXISTING TEST/VENT STATION(S) TO AN AREA AGREED UPON BY ALL PARTIES IN THE FIELD. OTHER THAN WELDING, AIR PRODUCTS WILL PROVIDE THE MATERIALS AND LABOR TO RELOCATE TEST/VENT STATION(S).

7. CONTRACTOR SHALL PROVIDE PROTECTION FOR ANY AND ALL AIR PRODUCTS FACILITIES ABOVE AND BELOW GROUND WITHIN THE SCOPE OF THIS PROJECT FOR THE DURATION OF THE PROJECT.

STREET LIGHTING GENERAL NOTES

(REVISED 05-17-12) (2018 VERSION)

1. ALL WORKMANSHIP, MATERIAL AND INSTALLATION SHALL COMPLY WITH THE CURRENT MAG UNIFORM STANDARD DETAILS AND SPECIFICATIONS AS AMENDED BY THE CITY OF MESA, THE CITY OF MESA ENGINEERING & DESIGN STANDARDS AND THE LATEST ADOPTED EDITION OF THE NATIONAL ELECTRIC CODE.
2. THE CITY OF MESA REQUIRES AT LEAST ONE IMSA CERTIFIED LEVEL I ROADWAY LIGHTING OR TRAFFIC SIGNAL TECHNICIAN ON SITE DURING ALL PHASES OF ANY STREET LIGHT WORK. IT WILL BE THE RESPONSIBILITY OF THE CONTRACTOR TO PROVIDE VERIFICATION OF CURRENT CERTIFICATION. IF A JOB SITE IS INSPECTED AND A CERTIFIED TECHNICIAN IS NOT ON SITE, THE JOB WILL BE SHUT DOWN.
3. CONTRACTOR SHALL SUBMIT A LIST CONTAINING NAMES AND QUALIFIED STATUS OF PERSONNEL THAT WILL BE ON THE IMMEDIATE JOB SITE TO THE INSPECTOR PRIOR TO STARTING ANY TYPE OF CONSTRUCTION. ANY CHANGE IN THIS LIST WILL REQUIRE IMMEDIATE NOTIFICATION TO THE INSPECTOR.
4. DURING THE CONSTRUCTION OR WARRANTY PERIOD, IF THE CONTRACTOR FAILS TO OR IS UNABLE TO COMPLY WITHIN TWO (2) WORKING DAYS OF A REQUEST OF THE INSPECTOR OR IF A STREET LIGHT OUTAGE MAKES IT NECESSARY FOR CITY FORCES TO DO WORK THAT IS NORMALLY THE CONTRACTOR'S RESPONSIBILITY, THE CITY WILL BE JUSTIFIED IN BILLING THE CONTRACTOR. A SEPARATE BILLING SHALL COVER EACH INCIDENT REQUIRING WORK BY CITY FORCES. THE AMOUNT OF EACH BILLING SHALL BE EITHER \$350.00 OR THE ACTUAL ACCUMULATED CHARGES FOR EMPLOYEES' TIME, MATERIALS, AND EQUIPMENT, WHICHEVER IS GREATER. EMPLOYEES' TIME WILL BE BILLED AT EACH INDIVIDUAL'S HOURLY RATE PLUS THE APPLICABLE CITY OVERHEAD RATE.
5. INSPECTIONS SHALL BE REQUESTED BY THE ELECTRICAL CONTRACTOR IN ACCORDANCE WITH THE FOLLOWING LIST:
 - A. BEFORE STARTING PROJECT (PRE-JOB INSPECTION).
 - B. BEFORE FILLING PULL BOX HOLES WITH AGGREGATE.
 - C. BEFORE BACKFILLING TRENCH AND COVERING CONDUIT.
 - D. WHEN THE POLE FOUNDATIONS ARE DUG, ANCHOR BOLTS, GROUND WIRE AND GROUND PLATE ARE READY AND IN PLACE, PRIOR TO POURING CONCRETE.
 - E. BEFORE PULLING WIRE.
 - F. BEFORE INSTALLATION OF FIXTURES AND PHOTOCCELL.
 - G. BEFORE MAKING SPLICES.

- H. WHEN PROJECT IS COMPLETED. IF NECESSARY, A LIST OF DISCREPANCIES WILL BE SUBMITTED TO THE CONTRACTOR FOR CORRECTIVE ACTION. FAILURE TO HAVE THESE ITEMS INSPECTED AND APPROVED BEFORE PROCEEDING WILL RESULT IN REJECTION OF THE WORK DONE, AND REMOVAL OF ALL SUCH WORK WILL BE REQUIRED.
6. ALL STREET LIGHTS SHALL BE CONNECTED TO THE PERMANENT POWER SUPPLY BY THE AGENCY SUPPLYING POWER. STREET LIGHT SYSTEMS WILL NOT BE ACCEPTED UNTIL THE SYSTEM HAS BEEN ENERGIZED AND FULLY OPERATIONAL FOR A MINIMUM ONE-HOUR TEST PERIOD AT RATED VOLTAGE.
 7. WHERE LIGHTING CONTROL CABINETS ARE UTILIZED, STREET LIGHT CIRCUITS SHALL BE 240 VOLT. WHERE CABINETS ARE NOT USED, STREET LIGHT CIRCUITS SHALL BE 120 VOLT. ALL SERVICES SHALL BE 120/240 VOLT. ALL CONTROL CIRCUITS SHALL BE 120 VOLT.
 8. BEFORE DISCONNECTING ANY EXISTING STREET LIGHTS, THE NEW LIGHT SYSTEM SHALL BE WORKING OR TEMPORARY LIGHTING INSTALLED. EXISTING STREET LIGHTS TO BE REMOVED AND NEW STREET LIGHTS SHALL NOT OPERATE AT THE SAME TIME.
 9. POLES HAVING MULTIPLE LUMINAIRES SHALL HAVE TWO (2) CONDUCTORS AND ONE (1) BOND WIRE PER LUMINAIRE. THE CONDUCTORS SHALL BE MARKED AS PAIRS AT THE HAND HOLE.
 10. ALL UNDERGROUND CIRCUIT CONDUCTORS SHALL BE BLACK, UNLESS OTHERWISE NOTED.
 11. WHERE STREET LIGHTS OR CIRCUITS ARE 120 VOLT, ONE CONDUCTOR SHALL BE UNFUSED AND BE EITHER WHITE OR MARKED WHITE, AS REQUIRED.
 12. ALL CIRCUIT CONDUCTORS IN CONDUIT SHALL BE XHHW/XHHW-2 INSULATION, EXCEPT PHOTOCELL CIRCUIT SHALL BE TRAY CABLE (SEE NOTE 13 THIS PAGE).
 13. THE TRAY CABLE SHALL BE [ROME FR-EPR XHHW-2 CONDUCTORS, CPE JACKET, 600VOLTS] FRPC 4/3 (COLORS: BLACK-RED-WHITE) OR EQUIVALENT. RUN UNDERGROUND FROM THE LIGHTING CONTROL CABINET TO THE HANDHOLE OF THE PHOTOCELL LIGHT POLE, WHICH SHALL BE CONTINUOUS & WITHOUT SPLICES. FROM THE HANDHOLE UP, THREE (3) CONDUCTORS OF NO. 14 AWG THHN OR EQUIVALENT WILL BE SPLICED WITH BUTT SPLICES (NO WIRE NUTS) TO THE TERMINAL BLOCK OF THE PHOTOCELL CONTROLLED LUMINAIRE. BUTT SPLICES SHALL BE INSULATED AND THE CRIMP TYPE.
 14. MINIMUM DEPTH FROM TOP OF CURB OR ROADWAY TO TOP OF CONDUIT SHALL BE TWENTY-FOUR (24) INCHES. MAXIMUM DEPTH SHALL BE FORTY-EIGHT (48) INCHES, UNLESS OTHERWISE APPROVED.
 15. UNDERGROUND WIRING SHALL BE INSTALLED IN SCHEDULE 40 RIGID PVC CONDUIT, UL APPROVED FOR ABOVE GROUND AND UNDERGROUND USE WITH 90 DEGREE C WIRE. WHERE TWENTY-FOUR (24) INCHES COVER IS NOT POSSIBLE, GALVANIZED RIGID STEEL CONDUIT (GRS) SHALL BE USED.
 16. GALVANIZED RIGID STEEL CONDUIT (GRS) SHALL BE DOUBLE WRAPPED WITH 20-MIL TAPE TO SIX (6) INCHES PAST THE THREADED METAL COUPLING. COMPRESSION COUPLINGS ARE NOT ALLOWED. PRIOR APPROVAL IS NEEDED FOR ANY DESIGN USING GRS CONDUIT. ALL CONDUITS SHALL BE BLOWN OUT USING 90-PSI AIR PRESSURE BEFORE PULLING WIRE.
 17. A TWO-PIECE EXPANSION JOINT COUPLING SHALL BE INSTALLED IN PVC CONDUIT RUNS AT INTERVALS NOT TO EXCEED ONE-HUNDRED (100) FEET.
 18. ALL FORTY-FIVE (45) AND NINETY (90) DEGREE BENDS OF CONDUIT SHALL HAVE A RADIUS OF NOT LESS THAN EIGHTEEN (18) INCHES. FACTORY BENDS ONLY SHALL BE USED.

19. ALL JOINTS BETWEEN PVC CONDUIT, COUPLINGS AND FITTINGS SHALL BE PREPARED WITH PURPLE PRIMER AND CEMENTED TOGETHER WITH GRAY PVC CEMENT.
20. THE CONDUIT LOCATIONS SHOWN ON PLANS ARE DIAGRAMMATIC REPRESENTATIONS ONLY. CONTRACTOR IS TO INSTALL CONDUIT TO AVOID CONFLICTS. THE CONTRACTOR MAY, AT HIS OPTION, BORE FOR THE PLACEMENT OF CONDUIT PER MESA STD DETAIL M-18. ALL CONDUITS SHALL BE PLACED WITHIN EXISTING RIGHT-OF-WAY UNLESS OTHERWISE APPROVED.
21. STREET LIGHT CONDUITS SHOULD BE INSTALLED PRIOR TO RESIDENTIAL DRIVEWAY INSTALLATIONS. IF STREET LIGHT CONDUIT IS INSTALLED AFTER RESIDENTIAL DRIVEWAY INSTALLATION, CONTRACTOR SHALL BORE CONDUIT UNDER DRIVEWAY. MEANDERING THE CONDUIT BEHIND THE ENTRANCE WILL NOT BE PERMITTED.
22. BACKFILL REQUIREMENTS FOR ALL TRENCHES SHALL CONFORM TO ARTICLE 300 OF THE NATIONAL ELECTRIC CODE, SECTION 601 OF THE UNIFORM STANDARD SPECIFICATIONS, AND MESA STD DETAIL M-19.4 FOR STREET TRENCH BACKFILL AND PAVEMENT REPLACEMENT.
23. WITH THE EXCEPTION OF DETACHED SIDEWALKS, PULL BOXES SHALL BE INSTALLED (SEE MESA STD DETAILS M-74.1 AND M-74.2) FIVE (5) FEET (CENTER TO CENTER) BETWEEN STREET LIGHT POLES AND PULL BOXES.
24. PHOTOCELL RECEPTACLE SHALL BE POSITIONED ON LUMINAIRE SO THAT WHEN INSTALLED, THE PHOTOCELL WILL FACE NORTH.
25. ALL SHORTING CAPS TO BE LOW PROFILE TYPE. NO HIGHER THAN 1-1/2" ABOVE SOCKET.
26. ALL PHOTOCELL CIRCUIT CONDUIT MUST BE 1-1/2" OR LARGER (TO INCLUDE CONDUIT STUBBING UP AT PHOTOCELL LIGHT POLE).
27. ALL FINISHED POLE FOUNDATIONS, SERVICE ENTRANCE SECTIONS, LIGHTING CONTROL CABINET PADS AND PULLBOXES SHALL BE AT SIDEWALK GRADE UNLESS OTHERWISE NOTED.
28. WHEN CONCRETE FOUNDATIONS ARE POURED, THEY SHALL BE VIBRATED WITH A MECHANICAL VIBRATOR.
29. POLE FOUNDATIONS SHALL CURE FOR 72 HOURS BEFORE INSTALLING LIGHT POLES OR REMOVING POLE BRACING.
30. ALL POLE FOUNDATIONS SHALL HAVE A COPPER GROUNDING PLATE PER MESA STD DETAIL M-73.6, G-101.
31. ALL STEEL POLES AND STEEL POLE PARTS SHALL BE HOT DIP GALVANIZED IN ACCORDANCE WITH MAG STANDARD SPECIFICATION 771.
32. ALL POLES SHALL BE WIRED USING TWO (2) NO. 12 BLACK THHN/THWN 90 DEGREE C STRANDED COPPER CONDUCTORS, 600 VOLT, NEC APPROVED AND ONE (1) NO.12 GREEN THHN/THWN STRANDED COPPER BOND WIRE GROUNDING THE LUMINAIRE. WIRES SHALL RUN FROM THE LUMINAIRE TO MINIMUM OF TWELVE (12) INCHES BELOW POLE HANDHOLE FOR TERMINATION. POLES HAVING MULTIPLE LUMINAIRES SHALL HAVE TWO (2) CONDUCTORS AND ONE (1) BOND WIRE PER LUMINAIRE, AND THE CONDUCTORS SHALL BE MARKED AS PAIRS AT THE HANDHOLE.
33. THREE WIRES SHALL BE RUN CONTINUOUSLY WITHOUT SPLICES FROM THE PHOTOCELL TO THE HAND HOLE COVER WHERE IT WILL BE BUTT SPLICED TO THE 14-4 TRAY (SEE NOTE 13 THIS PAGE). THEY SHALL BE NO. 12 THHN/THWN 90 DEGREE C STRANDED COPPER CONDUCTORS, 600 VOLT, NEC APPROVED. THE "POWER TO PHOTO" SHALL BE

IDENTIFIED BY BLACK INSULATION. THE "POWER FROM PHOTO" SHALL BE IDENTIFIED BY RED INSULATION. THE NEUTRAL SHALL BE IDENTIFIED BY WHITE INSULATION.

34. ALL LIGHTING CONDUCTORS AND BOND WIRES SHALL BE COPPER.
35. ALL PVC CONDUIT RUNS SHALL CONTAIN A MINIMUM NO. 8 GREEN XHHW INSULATED SEVEN (7) STRAND COPPER BOND WIRE.
36. ALL CONDUCTORS SHALL BE STRANDED.
37. THE NO. 8 STRANDED GROUNDING WIRE IN THE CONCRETE POLE FOUNDATION GOING TO THE GROUNDING PLATE SHALL BE INSULATED WITH XHHW INSULATION THROUGH THE CONCRETE FOUNDATION AND TWO (2) INCHES EACH SIDE OF THE CONCRETE FOUNDATION.
38. ALL LIGHTING CONTROL CABINETS SHALL BE INSTALLED WITHIN TWO (2) WEEKS OF BEGINNING THE STREET LIGHT IMPROVEMENTS.
39. EACH LUMINAIRE SHALL BE FUSED BEHIND THE POLE HANDHOLE COVER USING AN HEB TYPE FUSE HOLDER WITH INSULATING BOOTS AND A 5-AMP FNM FUSE OR APPROVED EQUAL.
40. ALL FINISHED STREET LIGHT POLE FOUNDATIONS AND CONTROLLER PAD SHALL BE AT SIDEWALK GRADE AND ADJACENT TO SIDEWALK UNLESS OTHERWISE NOTED. STREET LIGHT PULL BOXES SHALL BE AT SIDEWALK GRADE AND TWELVE (12) INCHES FROM SIDEWALK UNLESS OTHERWISE NOTED. (MESA STD DETAIL M-74.2, INSTALLATION NOTE 1).
41. PROJECT SHALL BE BLUE STAKED BEFORE ANY DIGGING IS STARTED BY CALLING **602-263-1100** OR **811**.
42. ALL HIGH-PRESSURE SODIUM LAMPS SHALL CONFORM TO THE APPROPRIATE LAMP SPECIFICATION FOR ITS PARTICULAR WATTAGE. SEE LAMP SPECIFICATION, MESA STD DETAIL M-71.
43. ALL SPLICES INCLUDING GROUNDS AND BONDS SHALL BE DONE WITH A GEL CAP STUB SPLICE KIT, GEL CAP #SL-2/0-3 HOLE, OTHER GEL CAP PRODUCTS OF APPROPRIATE SIZE OR APPROVED EQUAL. FOR APPROVED STREET LIGHT MATERIALS SEE: <http://www.mesaaz.gov/business/engineering/approve-products-equipment-natural-gas-line-contractors>.
44. STATION NUMBERS ARE APPROXIMATE. IN SUBDIVISIONS, LOCATE STREET LIGHT POLES AND LIGHTING CONTROL CABINETS ACCORDING TO LOT LINE MEASUREMENTS.
45. STREET PAVING PERMITTEE/CONTRACTOR IS HEREBY NOTIFIED THAT STREET PAVING WILL NOT BE ACCEPTED BY THE CITY OF MESA UNTIL ALL STREET LIGHTS, RETENTION BASINS AND LANDSCAPING IMPROVEMENTS ARE INSTALLED AND ACCEPTED.
46. IT SHALL BE THE CONTRACTOR'S RESPONSIBILITY TO ASSURE THAT ALL WORK ASSOCIATED WITH THE STREET LIGHTING SYSTEM IS INSPECTED AND APPROVED BY THE CITY PRIOR TO BACKFILLING TRENCHES OR COVERING ANY WORK. CONTACT THE CITY OF MESA ENGINEERING FIELD INSPECTOR TO ARRANGE FOR STREET LIGHT SYSTEM INSPECTION.
47. CONTRACTOR SHALL REMOVE AND DISPOSE OF ALL P-301 POLES WHERE IMPACTED BY PROJECT REQUIREMENTS. ALL OTHER LIGHTING EQUIPMENT SHALL BE RETURNED TO THE LIGHTING FOREMAN (**480-644-3178**) WITH 48 HOURS NOTICE.

LANDSCAPE GENERAL NOTES

(REVISED 02-15-18) (2018 VERSION)

1. LANDSCAPE CONTRACTOR SHALL CONFIRM LOCATION OF ALL UNDERGROUND UTILITIES PRIOR TO ANY EXCAVATION AND SHALL BE RESPONSIBLE FOR THE FOLLOWING:
 - A. DAMAGES TO SUCH UTILITIES CAUSED AS A RESULT OF THE CONTRACTOR'S ACTIVITIES.
 - B. DAMAGES TO EXISTING WALKS, WALLS, DRIVES, CURBS, ETC.
 - C. INSPECTING THE SITE IN ORDER TO BE FULLY AWARE OF EXISTING CONDITIONS PRIOR TO SUBMITTING A BID.
2. INSTALLATION OF ALL LANDSCAPE AND IRRIGATION MATERIALS SHALL COMPLY WITH SECTIONS 424, 425, 757, AND 795 OF THE MAG STANDARD SPECIFICATIONS.
3. CONTRACTOR SHALL REPAIR ANY DAMAGE MADE TO THE EXISTING SPRINKLER SYSTEM TO THE SATISFACTION OF THE CITY AT NO ADDITIONAL COST TO THE CITY.
4. LANDSCAPE REMOVAL IS A NON-PAY ITEM UNLESS OTHERWISE NOTED.
5. ALL EXISTING VEGETATION, WEEDS, DEBRIS, ETC. NOTED TO BE REMOVED ON THE PLANS AND SPECIFICATIONS SHALL BE REMOVED FROM PROJECT AREA AND DISPOSED OF PROPERLY OFF THE SITE AT THE CONTRACTOR'S EXPENSE (SCARIFY EXISTING SUBGRADE, MINIMUM SIX (6) INCHES DEPTH).
6. DAMAGE TO TURF SHALL BE REPAIRED BY CONTRACTOR, I.E., RUTS FILLED WITH CLEAN SOIL, COMPACTED TO MATCH SURROUNDING GRADES, EXCESS SOIL, ROCK, ETC. SHALL BE REMOVED TO LEAVE THE SITE CLEAN.
7. ALL PLANT MATERIAL, OTHER THAN TREES, SHALL CONFORM TO GRADING, TYPE, ETC. AS SET FORTH IN THE AMERICAN STANDARD FOR NURSERY STOCK BY THE AMERICAN ASSOCIATION OF NURSERYMEN. ALL TREES SHALL CONFORM TO THE CURRENT ARIZONA NURSERY ASSOCIATION TREE SPECIFICATIONS AND MAG SPEC 795.7. SHOULD ANY CONFLICTS IN THE SPECIFICATIONS OCCUR, THE ARIZONA NURSERY ASSOCIATION'S SPECIFICATIONS SHALL PREVAIL.
8. CITY RESERVES THE RIGHT TO INSPECT SHRUBS AND CONTAINERED TREES FOR CONDITION OF ROOT BALLS. FOR ANY SUCH INSPECTIONS WHICH MAY DESTROY ROOTBALL, CONTRACTOR SHALL SUPPLY ADDITIONAL PLANT AT NO COST TO CITY.
9. PLANT PITS SHALL BE INSPECTED BY CITY PRIOR TO PLANTING BY THE CONTRACTOR BY REQUESTING AN INSPECTION 48 HOURS IN ADVANCE.
10. ROUGH AND FINE GRADING TO ESTABLISH UNIFORM SMOOTH GRADE IS INCLUDED IN THIS PROJECT.
11. SOIL TEST FOR FERTILITY AND ADDITIVE RECOMMENDATIONS (FOR TURF AND ORNAMENTALS) SHALL BE COMPLETED BY CONTRACTOR TO DETERMINE IF ADDITIVES ARE REQUIRED. CONTRACTOR SHALL PROVIDE COPY OF SOIL TEST RESULTS FOR REVIEW AND APPROVAL TO ENGINEERING INSPECTOR AT LEAST SEVEN (7) DAYS PRIOR TO ANTICIPATED PLANTING. AFTER APPROVAL BY THE CITY, THE CONTRACTOR SHALL PROVIDE AND INCORPORATE ANY ADDITIVES REQUIRED PRIOR TO OR AT TIME OF PLANTING.
12. PLANT PIT SOIL MIXTURE SHALL CONSIST OF FOUR AND ONE-HALF PARTS NATURAL FERTILE, FRIABLE SOIL AND ONE PART HUMUS BY VOLUME, THOROUGHLY MIXED PRIOR TO BACKFILLING IN PITS. BACKFILLING SHALL BE IN 6" LIFTS WITH EACH LIFT WATER SETTLED WITHOUT PUDDLING.

13. CONTRACTOR SHALL STAKE TREE AND SHRUB LOCATIONS FOR 5-GALLON PLANTS AND LARGER. STAKES SHALL BE MARKED WITH PLANT NAME OR PLANT LEGEND ITEM NUMBER FROM PLANS.
14. ALL EXISTING (GAS, ELECTRIC, WATER, ETC.) COVERS AND BOXES SHALL REMAIN UNCOVERED. CONTRACTOR TO ADJUST TO FINAL GRADE AS NECESSARY. NON-PAY ITEM (NPI) UNLESS OTHERWISE NOTED.
15. THE CONTRACTOR SHALL BE RESPONSIBLE FOR LOCATING THE UNDERGROUND SPRINKLER SYSTEMS IN ADVANCE OF CONSTRUCTION. THE SPRINKLER SYSTEM LOCATIONS NOTED ON PLANS ARE FOR REFERENCE ONLY.
16. CONTRACTOR TO VERIFY DEPTH OF ALL INLET STRUCTURES AND SPRINKLER SYSTEMS PRIOR TO TRENCHING FOR LOW-FLOW CHANNEL.
17. CONTRACTOR TO PROVIDE PUMPING WITHIN FIVE (5) DAYS AFTER THE NOTICE TO PROCEED IS GIVEN AS REQUIRED TO DRY THE AREA SUFFICIENTLY TO BEGIN CONSTRUCTION.
18. CONTRACTOR SHALL ARRANGE FOR SPRINKLER SYSTEM SHUTDOWN DURING CONSTRUCTION BY CONTACTING THE ENGINEERING INSPECTOR.
19. NO ROCKS LARGER THAN 1" IN DIAMETER SHALL BE ALLOWED IN THE TOP SIX (6) INCHES OF TOPSOIL WHERE TURF ESTABLISHMENT IS SPECIFIED. ROCK REMOVAL AS NECESSARY IS A NON-PAY (NPI) ITEM UNLESS OTHERWISE NOTED.
20. WHERE CALICHE IS ENCOUNTERED IN PLANT PITS, DEPTH AND WIDTH OF PIT SHALL BE INCREASED BY ONE-THIRD (1/3) OVER SPECIFICATION, AND A LIQUID PENETRATOR, "ALKALICHE" OR EQUAL, SHALL BE INCORPORATED FOR EACH PIT PER MANUFACTURER'S RECOMMENDATIONS.
21. CONTRACTOR SHALL INSTALL DECOMPOSED GRANITE TO A ROLLED DEPTH PER THE APPROVED PLANS AND SPECIFICATIONS. DECOMPOSED GRANITE SHALL BE PER THE APPROVED PLANS AND SPECIFICATIONS WITH THE COLOR AS SPECIFIED ON THE PLANS. PRE-EMERGENT HERBICIDE SHALL BE APPLIED BEFORE AND AFTER PLACEMENT OF DECOMPOSED GRANITE PER THE MANUFACTURER'S RECOMMENDATIONS. PRE-EMERGENT HERBICIDE SHALL BE SURFLAN, DACTHAL, OR APPROVED EQUAL. SAMPLE TO BE PROVIDED FOR CITY REVIEW AND APPROVAL. CONTRACTOR SHALL WASH OFF ROCK MULCH ONCE FINAL PLACEMENT HAS OCCURRED.
22. RESTORE ALL EXISTING LANDSCAPE IRRIGATION SYSTEMS, COMPONENTS AND LANDSCAPE AREAS IMPACTED BY ANY WORK UNDER THIS CONTRACT. RESTORE ALL EXISTING IRRIGATION AND LANDSCAPE IN ACCORDANCE WITH THE LANDSCAPE RESTORATION NOTES INDICATED WITHIN THESE DOCUMENTS. AT A MINIMUM, ALL RESTORATION SHALL BE IN ACCORDANCE WITH M.A.G. SPECIFICATION 107.9 - PROTECTION AND RESTORATION OF PROPERTY AND LANDSCAPE. ALL RESTORATION WORK SHALL BE COMPLETED TO THE SATISFACTION OF THE CITY OF MESA ENGINEER.
23. ALL RESTORATION WORK SHALL BE COMPLETED IN ACCORDANCE WITH THE REFERENCED DETAILS AND ANY ADDITIONAL DETAILS PROVIDED.
24. REFER TO LANDSCAPE PLANTING SHEETS AND ENGINEERING DRAWINGS FOR ADDITIONAL RESTORATION NOTES AND REQUIRED COORDINATION.

LANDSCAPE IRRIGATION GENERAL NOTES

(REVISED 02-15-18) (2018 VERSION)

1. IRRIGATION DRAWINGS ARE DIAGRAMMATIC ONLY AND ARE INTENDED TO CONCEPTUALLY CONVEY FULL COVERAGE BY THE IRRIGATION SYSTEM. PRINTS SHALL NOT BE SCALED. IRRIGATION LINES SHALL BE PLACED IN PLANTERS AND TURF AREAS, RATHER THAN UNDER PAVEMENT, WHERE POSSIBLE. THE IRRIGATION CONTRACTOR SHALL BE RESPONSIBLE FOR THE INSTALLATION LAYOUT OF THE SYSTEM IN ACCORDANCE WITH THE DRAWINGS TO PROPORTIONALLY COVER THE GIVEN AREAS AS SHOWN. THE LAYOUT MAY BE MODIFIED IF NECESSARY TO OBTAIN FULL COVERAGE TO SUIT THE MANUFACTURER'S STANDARD SPECIFIED HEADS. MODIFICATIONS SHALL BE APPROVED BY THE LANDSCAPE ARCHITECT BEFORE ANY MODIFICATIONS ARE TO BE INSTALLED. DO NOT DECREASE THE NUMBER OF IRRIGATION HEADS OR EMITTERS INDICATED UNLESS THE LANDSCAPE ARCHITECT IS NOTIFIED IN WRITING AND HAS ACCEPTED. THE SYSTEM SHALL BE TESTED FOR COMPLETE COVERAGE AND ALL NECESSARY AND PROPER ADJUSTMENTS HAVE BEEN MADE TO GET FULL AND PROPER COVERAGE PRIOR TO ACCEPTANCE BY THE OWNER
2. PRIOR TO THE INSTALLATION OF ANY IRRIGATION SYSTEM COMPONENTS THE CONTRACTOR SHALL VERIFY THE STATIC PRESSURE OF THE AVAILABLE WATER POINT OF CONNECTION. IN THE EVENT THAT THE STATIC PRESSURE IS LESS THAN THE FIELD VERIFIED AMOUNT NOTED IN THE APPROVED PLANS AND SPECIFICATIONS THE CONTRACTOR SHALL NOTIFY THE LANDSCAPE ARCHITECT OF THE DISCREPANCY. THE LANDSCAPE ARCHITECT WILL ASSESS THE SITUATION AND ADJUST THE DESIGN IF NECESSARY. THE CONTRACTOR SHALL NOT CONTINUE IRRIGATION WORK UNTIL THE LANDSCAPE ARCHITECT HAS PROVIDED WRITTEN APPROVAL TO DO SO.
3. ALL IRRIGATION PIPE TYPE AND SIZE PER THE APPROVED PLANS AND SPECIFICATIONS. ALL MAINLINE PIPE SHALL BE NEW PVC PIPE. ALL MAINLINE FITTINGS SHALL BE ASTM 2466 OR ASTM 2464 FITTINGS. ALL LATERAL LINE PIPE SHALL BE NEW PVC PIPE. FITTINGS ON ALL PVC LATERAL LINES SHALL BE ASTM 2466 FITTINGS UNLESS OTHERWISE SHOWN ON THE PLANS AND DETAILS.
4. LIVE IRRIGATION MAINLINES SHALL BE INSTALLED A MINIMUM OF 24" BELOW FINISH GRADE. BACKFILL THE TRENCH AROUND LIVE SERVICE MAINLINES ACCORDING TO CITY OF MESA STANDARDS. LATERAL LINES SHALL BE PLACED A MINIMUM OF 18" BELOW FINISH GRADE.
5. WATER SERVICE LINE TO METER WILL BE PROVIDED BY GENERAL CONTRACTOR. WATER METER WILL BE INSTALLED BY THE CITY. INSTALL THE IRRIGATION MAINLINE TO THE BACKFLOW PREVENTION DEVICE AND WATER METER, CONNECTIONS AND BACKFLOW SHALL BE INSTALLED AS PER INDUSTRY AND CITY OF MESA STANDARDS.
6. ALL VALVES SHALL BE LOCATED IN GROUPS AS SHOWN ON DRAWINGS IN LANDSCAPE AREAS. VALVES SHALL BE LOCATED A MINIMUM OF 12" AWAY FROM ANY BUILDING, FENCE, MOWSTRIP, SIDEWALK OR CURB.
7. ALL VALVES ARE TO BE WIRED TO CONTROLLERS USING #14 AWG DIRECT BURY WIRE AND WATER-RESISTANT WIRE CONNECTORS. COMMON WIRE SHALL BE #12 AWG DIRECT BURIAL WIRE AND WATER-RESISTANT WIRE CONNECTORS. ALL VALVE WIRES UNDER PAVING SHALL BE INSTALLED IN SCHEDULE 40 PVC SLEEVES BURIED 24" DEEP. RUN ONE EXTRA WIRE FROM THE CONTROLLER TO EACH GROUP OF VALVES FOR FUTURE USE AND COIL A 48" LOOP OF WIRE IN A PULL BOX. MARK THE WIRE COIL WITH A CHRISTY TAG NOTING ITS CORRESPONDING STATION NUMBER.

8. THE CONTRACTOR SHALL PROVIDE AND INSTALL THE NEW IRRIGATION CONTROLLER IN THE LOCATION INDICATED ON THE PLANS. CONTRACTOR IS RESPONSIBLE FOR POWER CONNECTIONS FROM THE ELECTRICAL METER AND ALL SYSTEMS.
9. PROVIDE AND INSTALL ALL THE MANUFACTURER'S RECOMMENDED SURGE AND LIGHTNING PROTECTION EQUIPMENT ON ALL CONTROLLERS.
10. THE CONTRACTOR SHALL BE RESPONSIBLE FOR REPAIRING ANY SITE ITEMS DAMAGED DURING THE COURSE OF CONSTRUCTION WHERE CONSTRUCTION ACTIVITIES HAVE DISTURBED THE SITE INSIDE OR OUTSIDE OF THE CONTRACT LIMITS. ALL AREAS SHALL BE REPAIRED AND RESTORED TO ORIGINAL CONDITION. REPAIRED AREAS SHALL BE CONSTRUCTED TO PROVIDE A SMOOTH TRANSITION IN GRADING AND MATERIALS FROM EXISTING TO NEW CONSTRUCTION.
11. THE CONTRACTOR SHALL PROVIDE AS-BUILT DRAWINGS OF THE IRRIGATION SYSTEM SHOWING EXACT MEASURED AND DIMENSIONED LOCATIONS OF ALL VALVE BOXES, PULL BOXES, QUICK COUPLERS, METER MANIFOLD EQUIPMENT, CONTROLLERS, SLEEVES AND OTHER ITEMS. TIE DIMENSIONS TO PERMANENT FEATURES SUCH AS STRUCTURES.
12. IRRIGATION SLEEVES SHALL BE INSTALLED BENEATH ALL PAVEMENT, DRIVEWAYS AND DRAINAGE STRUCTURES THAT ARE CROSSED WITH IRRIGATION MAINLINE OR LATERAL PIPE OR CONTROLLER WIRE. ALL SLEEVES SHALL BE SCHEDULE 40 PIPE. SIZE SHALL BE 4" FOR ALL PIPING. SIZE SHALL BE 2" WHERE ONLY CONTROLLER WIRE IS PROVIDED. SLEEVES SHALL BE EXTENDED 6" INTO LANDSCAPE AREA.
13. ONLY ONE VALVE SHALL BE PROVIDED PER VALVE BOX. ALL HARDWARE SHALL BE STAINLESS STEEL. BOLTS SHALL HAVE WASHERS. EXPANSION COILS SHALL BE PROVIDED AT EACH WIRE CONNECTION IN VALVE BOX. WRAP WIRE AROUND 1/2" PVC PIPE 15 TIMES. COVER SHALL BE EMBOSSED WITH 1/2" LETTERS ON CONTROLLER AND ON VALVES WITH CORRESPONDING FIELD NUMBER.
14. ADEQUATE PRESSURE SHALL BE VERIFIED FOR ALL PIPE RUNS PRIOR TO COVERING PIPE IN TRENCHES. OWNER'S REPRESENTATIVE SHALL BE PRESENT FOR ALL IRRIGATION PRESSURE TESTING PRIOR TO COVERING TRENCHES.
15. ALL WORK AND MATERIALS MUST MEET CITY OF MESA STANDARDS.
16. THE CONTRACTOR SHALL PROVIDE ALL MATERIALS INCLUDING ALL APPURTENANCES AND LABOR NECESSARY TO INSTALL THE COMPLETE AUTOMATIC SPRINKLER SYSTEM FROM THE METER. WATER USAGE CHARGES SHALL BE PAID BY CONTRACTOR UNTIL PROJECT FINAL ACCEPTANCE BY CITY OF MESA.
17. PROJECT RECORD DRAWINGS FOR IRRIGATION SYSTEM:
 - A. MAINTAIN ON SITE AND SEPARATE FROM DOCUMENTS USED FOR CONSTRUCTION, ONE COMPLETE SET OF CONTRACT DOCUMENTS AS PROJECT RECORD DOCUMENTS. KEEP DOCUMENTS CURRENT. DO NOT PERMANENTLY COVER WORK UNTIL AS-BUILT INFORMATION IS RECORDED.
 - B. RECORD PIPE AND WIRING NETWORK ALTERATIONS. RECORD WORK WHICH IS INSTALLED DIFFERENTLY THAN SHOWN ON THE CONSTRUCTION DRAWINGS. RECORD ACCURATE REFERENCE DIMENSIONS, MEASURED FROM AT LEAST TWO PERMANENT REFERENCE POINTS, OF EACH IRRIGATION SYSTEM VALVE, EACH BACKFLOW PREVENTION DEVICE, EACH CONTROLLER OR CONTROLLER UNIT, EACH SLEEVE END, EACH STUB-OUT FOR FUTURE PIPE OR WIRING CONNECTIONS, AND OTHER IRRIGATION COMPONENTS ENCLOSED WITHIN A VALVE BOX.

PARK LIGHTING GENERAL NOTES

(REVISED 02-15-12) (2018 VERSION)

1. ALL WORKMANSHIP, MATERIAL AND INSTALLATION SHALL COMPLY WITH THE CURRENT M.A.G. UNIFORM STANDARD DETAILS AND SPECIFICATIONS AS AMENDED BY THE CITY OF MESA, THE CITY OF MESA ENGINEERING & DESIGN STANDARDS AND THE LATEST ADOPTED EDITION OF THE NATIONAL ELECTRIC CODE.
2. DURING THE CONSTRUCTION OR WARRANTY PERIOD, IF THE CONTRACTOR FAILS TO OR IS UNABLE TO COMPLY WITHIN TWO (2) WORKING DAYS OF A REQUEST OF THE INSPECTOR OR IF A PARK LIGHT OUTAGE MAKES IT NECESSARY FOR CITY FORCES TO DO WORK THAT IS NORMALLY THE CONTRACTOR'S RESPONSIBILITY, THE CITY WILL BE JUSTIFIED IN BILLING THE CONTRACTOR. A SEPARATE BILLING SHALL COVER EACH INCIDENT REQUIRING WORK BY CITY FORCES. THE AMOUNT OF EACH BILLING SHALL BE EITHER \$350.00 OR THE ACTUAL ACCUMULATED CHARGES FOR EMPLOYEES' TIME, MATERIALS, AND EQUIPMENT, WHICHEVER IS GREATER. EMPLOYEES' TIME WILL BE BILLED AT EACH INDIVIDUAL'S HOURLY RATE PLUS THE APPLICABLE CITY OVERHEAD RATE.
3. INSPECTIONS SHALL BE REQUESTED BY THE ELECTRICAL CONTRACTOR IN ACCORDANCE WITH THE FOLLOWING LIST:
 - A. BEFORE STARTING PROJECT (PRE-JOB INSPECTION).
 - B. BEFORE FILLING PULL BOX HOLES WITH AGGREGATE.
 - C. BEFORE BACKFILLING TRENCH AND COVERING CONDUIT.
 - D. WHEN THE POLE FOUNDATIONS ARE DUG, ANCHOR BOLTS, GROUND WIRE AND GROUND PLATE ARE READY AND IN PLACE, PRIOR TO POURING CONCRETE.
 - E. BEFORE PULLING WIRE.
 - F. BEFORE INSTALLATION OF FIXTURES AND PHOTOCCELL.
 - G. BEFORE MAKING SPLICES.
 - H. WHEN PROJECT IS COMPLETED.

IF NECESSARY, A LIST OF DISCREPANCIES WILL BE SUBMITTED TO THE CONTRACTOR FOR CORRECTIVE ACTION. FAILURE TO HAVE THESE ITEMS INSPECTED AND APPROVED BEFORE PROCEEDING WILL RESULT IN REJECTION OF THE WORK DONE, AND REMOVAL OF ALL SUCH WORK WILL BE REQUIRED.

4. ALL PARK LIGHTING SHALL BE CONNECTED TO THE PERMANENT POWER SUPPLY BY THE AGENCY SUPPLYING POWER. STREET LIGHT SYSTEMS WILL NOT BE ACCEPTED UNTIL THE SYSTEM HAS BEEN ENERGIZED AND FULLY OPERATIONAL FOR A MINIMUM ONE-HOUR TEST PERIOD AT RATED VOLTAGE.
5. BEFORE DISCONNECTING ANY EXISTING LIGHTS, THE NEW LIGHT SYSTEM SHALL BE WORKING OR TEMPORARY LIGHTING INSTALLED. EXISTING PARK LIGHTS TO BE REMOVED AND NEW PARK LIGHTS SHALL NOT OPERATE AT THE SAME TIME.
6. POLES HAVING MULTIPLE LUMINAIRES SHALL HAVE TWO (2) CONDUCTORS AND ONE (1) BOND WIRE PER LUMINAIRE. THE CONDUCTORS SHALL BE MARKED AS PAIRS AT THE HANDHOLE. ALL UNDERGROUND CIRCUIT CONDUCTORS SHALL BE BLACK, UNLESS OTHERWISE NOTED.

7. MINIMUM DEPTH FROM FINISHED GRADE TO TOP OF CONDUIT SHALL BE THIRTY-SIX (36) INCHES. MAXIMUM DEPTH SHALL BE FORTY-EIGHT (48) INCHES, UNLESS OTHERWISE APPROVED.
8. UNDERGROUND WIRING SHALL BE INSTALLED IN SCHEDULE 40 RIGID PVC CONDUIT, UL APPROVED FOR ABOVE GROUND AND UNDERGROUND USE WITH 90 DEGREE C WIRE. WHERE THIRTY-SIX (36) INCHES COVER IS NOT POSSIBLE, GALVANIZED RIGID STEEL CONDUIT (GRS), SHALL BE USED. GRS CONDUIT SHALL BE DOUBLE WRAPPED WITH 20-MIL TAPE TO SIX (6) INCHES PAST THE THREADED METAL COUPLING. COMPRESSION COUPLINGS ARE NOT ALLOWED. PRIOR APPROVAL IS NEEDED FOR ANY DESIGN USING GRS CONDUIT.
9. ALL CONDUITS SHALL BE BLOWN OUT USING 90-PSI AIR PRESSURE BEFORE PULLING WIRE.
10. A TWO-PIECE EXPANSION JOINT COUPLING SHALL BE INSTALLED IN PVC CONDUIT RUNS AT INTERVALS NOT TO EXCEED ONE-HUNDRED (100) FEET.
11. ALL FORTY-FIVE (45) AND NINETY (90) DEGREE BENDS OF CONDUIT SHALL HAVE A RADIUS OF NOT LESS THAN EIGHTEEN (18) INCHES. FACTORY BENDS ONLY SHALL BE USED.
12. ALL JOINTS BETWEEN PVC CONDUITS, COUPLINGS & FITTINGS SHALL BE PREPARED WITH PURPLE PRIMER AND CEMENTED TOGETHER WITH GRAY PVC CEMENT.
13. THE CONDUIT LOCATIONS SHOWN ON PLANS ARE DIAGRAMMATIC REPRESENTATIONS ONLY. CONTRACTOR IS TO INSTALL CONDUIT TO AVOID CONFLICTS. THE CONTRACTOR MAY AT HIS OPTION BORE FOR THE PLACEMENT OF CONDUIT PER MESA STD DETAIL M-18 AND M-18.1. ALL CONDUITS SHALL BE PLACED WITHIN EXISTING RIGHT-OF-WAY UNLESS OTHERWISE APPROVED.
14. LIGHTING CONDUITS SHOULD BE INSTALLED PRIOR TO DRIVEWAY, PARKING LOT, OR SIDEWALK INSTALLATIONS. IF LIGHTING CONDUIT IS INSTALLED AFTER DRIVEWAY, PARKING LOT, OR SIDEWALK INSTALLATIONS, CONTRACTOR SHALL BORE CONDUIT UNDER DRIVEWAY.
15. BACKFILL REQUIREMENTS FOR ALL TRENCHES SHALL CONFORM TO ARTICLE 300 OF THE N.E.C., SECTION 601 OF THE UNIFORM STANDARD SPECIFICATIONS, AND MESA STD DETAIL M-19.4 FOR STREET TRENCH BACKFILL AND PAVEMENT REPLACEMENT.
16. WITH THE EXCEPTION OF DETACHED SIDEWALKS, PULL BOXES SHALL BE INSTALLED (SEE MESA STD DETAILS M-74.1 AND M-74.2) FIVE (5) FEET (CENTER TO CENTER) BETWEEN STREET LIGHT POLES AND PULL BOXES.
17. PHOTOCELL RECEPTACLE SHALL BE POSITIONED ON LUMINAIRE SO THAT WHEN INSTALLED THE PHOTOCELL WILL FACE NORTH.
18. ALL SHORTING CAPS TO BE LOW PROFILE TYPE. NO HIGHER THAN 1-1/2" ABOVE SOCKET.
19. ALL PHOTOCELL CIRCUIT CONDUIT MUST BE 1-1/2" OR LARGER (TO INCLUDE CONDUIT STUBBING UP AT PHOTOCELL LIGHT POLE).
20. ALL FINISHED POLE FOUNDATIONS, SERVICE ENTRANCE SECTIONS, LIGHTING CONTROL CABINET PADS AND PULLBOXES SHALL BE AT SIDEWALK GRADE UNLESS OTHERWISE NOTED.
21. WHEN CONCRETE FOUNDATIONS ARE POURED, THEY SHALL BE VIBRATED WITH A MECHANICAL VIBRATOR.
22. POLE FOUNDATIONS SHALL CURE FOR 72 HOURS BEFORE INSTALLING LIGHT POLES OR REMOVING POLE BRACING.

23. ALL POLE FOUNDATIONS SHALL HAVE A COPPER GROUNDING PLATE PER MESA STD DETAIL M-73.6, G-101.
24. ALL STEEL POLES AND STEEL POLE PARTS SHALL BE HOT DIP GALVANIZED IN ACCORDANCE WITH MAG STANDARD SPECIFICATION 771.
25. ALL POLES SHALL BE WIRED USING TWO (2) NO. 12 BLACK THHN/THWN 90 DEGREE C STRANDED COPPER CONDUCTORS, 600 VOLT, NEC APPROVED AND ONE (1) NO. 12 GREEN THHN/THWN STRANDED COPPER BOND WIRE GROUNDING THE LUMINAIRE. WIRES SHALL RUN FROM THE LUMINAIRE TO MINIMUM OF TWELVE (12) INCHES BELOW POLE HANDHOLE FOR TERMINATION. POLES HAVING MULTIPLE LUMINAIRES SHALL HAVE TWO (2) CONDUCTORS AND ONE (1) BOND WIRE PER LUMINAIRE, AND THE CONDUCTORS SHALL BE MARKED AS PAIRS AT THE HANDHOLE.
26. THREE WIRES SHALL BE RUN CONTINUOUSLY WITHOUT SPLICES FROM THE PHOTOCELL LIGHTING CONTROL CABINET. THEY SHALL BE NO. 12 THHN/THWN 90 DEGREE C STRANDED COPPER CONDUCTORS, 600 VOLT, NEC APPROVED. THE "POWER TO PHOTO" SHALL BE IDENTIFIED BY BLACK INSULATION. THE "POWER FROM PHOTO" SHALL BE IDENTIFIED BY RED INSULATION. THE NEUTRAL SHALL BE IDENTIFIED BY WHITE INSULATION.
27. ALL LIGHTING CONDUCTORS AND BOND WIRES SHALL BE COPPER.
28. ALL PVC CONDUIT RUNS SHALL CONTAIN A MINIMUM NO. 8 GREEN XHHW INSULATED SEVEN (7) STRAND COPPER BOND WIRE.
29. ALL CONDUCTORS SHALL BE STRANDED.
30. THE NO. 8 STRANDED GROUNDING WIRE IN THE CONCRETE POLE FOUNDATION GOING TO THE GROUNDING PLATE SHALL BE INSULATED WITH XHHW INSULATION THROUGH THE CONCRETE FOUNDATION AND TWO (2) INCHES EACH SIDE OF THE CONCRETE FOUNDATION.
31. ALL LIGHTING CONTROL CABINETS SHALL BE INSTALLED WITHIN TWO (2) WEEKS OF BEGINNING THE STREET LIGHT IMPROVEMENTS.
32. EACH LUMINAIRE SHALL BE FUSED BEHIND THE POLE HANDHOLE COVER USING AN HEB TYPE FUSE HOLDER WITH INSULATING BOOTS AND A 5-AMP FNM FUSE OR APPROVED EQUAL.
33. ALL PULLBOXES AND LIGHTING CONTROL CABINET PADS SHALL BE ADJACENT TO SIDEWALK UNLESS OTHERWISE NOTED.
34. PROJECT SHALL BE BLUE STAKED BEFORE ANY DIGGING IS STARTED BY CALLING **602-263-1100** OR **811**.
35. ALL HIGH-PRESSURE SODIUM LAMPS SHALL CONFORM TO THE APPROPRIATE LAMP SPECIFICATION FOR ITS PARTICULAR WATTAGE. SEE LAMP SPECIFICATION, MESA STD DETAIL M-71.
36. ALL SPLICES INCLUDING GROUNDS AND BONDS SHALL BE DONE WITH A GEL CAP STUB SPLICE KIT, GEL CAP #SL-210-3 HOLE, OTHER GEL CAP PRODUCTS OF APPROPRIATE SIZE OR APPROVED EQUAL. FOR APPROVED STREET LIGHT MATERIALS SEE: <http://www.mesaaz.gov/business/engineering/approve-products-equipment-natural-gas-line-contractors>.
37. THE EXISTING LIGHT AND ELECTRICAL EQUIPMENT SHALL BE RETURNED TO THE CITY OF MESA STORAGE YARD AT 2430 NORTH CENTER STREET. CONTRACTOR SHALL CALL THE PARK MAINTENANCE FOREMAN, AT **480-644-3097**, 48 HOURS PRIOR TO DELIVERING THE

EQUIPMENT. CITY PARK PERSONNEL WILL OPEN THE YARD AND SUPERVISE THE LOADING, HAULING AND UNLOADING OF THIS EQUIPMENT.

ANNOTATION

NOTE - ANNOTATION TEXT HEIGHT = 0.1" HAS BACKGROUND MASKING
 CHOICE OF LEADERS OR LIGNE BY PROPERTIES AND ARROW TYPE BY PROPERTIES

PROPOSED ANNOTATION (TEXT STYLE ROMANS) EXISTING ANNOTATION (TEXT STYLE POSTING)

CONSTRUCTION JOINT PER DETAIL D, DRAWING 05 PASTING (SAND)

SCALE: 1" = 20' HORZ. 1" = 5' VERT.

MEASUREMENTS LEGEND

PH ## (UTL)
 ELEV
 DEPTH
 STA. OFF
 N #####
 E #####

NOT FIELD - FIELD MEASURED (F#)
 SURVEYED - FIELD MEASURED (S)
 RECORD DRAWING - AS DIMENSIONED (R)
 UNKNOWN - (U)
 CALCULATED - (C)

CAUTION!

BEWARE OF LOCATIONS OF UNDERGROUND NATURAL GAS (G), UTY UTILITIES (U), 24" & 36" OVERHEAD ELECTRICAL LINES (E).

GENERAL CONSTRUCTION NOTES

1 ## (UNITS) 1 FURNISH AND INSTALL 12-INCH D.P. WATER LINE PER MAG STD SPEC 750 WITH CATHODIC PROTECTION BONDS AT ALL JOINTS PER DETAIL 20 ON DRAWING 05 AND POLYETHYLENE CORROSION PROTECTION PER MAG STD SPEC 810.5. PROVIDE JOINT RESTRAINTS PER MAG STD DLS 303-1 & 303-2 AND AS NOTED IN PROFILE. ## LF

REMOVAL & REPLACEMENT NOTES

1 ## (UNITS) 1 SAWCUT, REMOVE, AND REPLACE EXISTING ASPHALT PAVEMENT PER COM STD DTL M-18.04. ## SY

SANITARY SEWER NOTES

1 ## (UNITS) 1 FURNISH & INSTALL 15" PVC SDR-35 PVC SANITARY SEWER LINE. ## LF

DRAINAGE NOTES

1 ## (UNITS) 1 FURNISH & INSTALL 24" RGRCP, CLASS II STORM DRAIN. ## LF

FIBER OPTICS / DATA NOTES

1 ## (UNITS) 1 PROVIDE AND INSTALL 144 STRAND FIBER OPTIC CABLE AS PER COM STD/S SPECIFICATIONS AND DETAIL 17 ON DRAWING 05. ## LF

NATURAL GAS NOTES

1 ## (UNITS) 1 INSTALL 2" P.F. GAS PIPE PER TYPICAL GAS MAIN TRENCH DETAIL #, DRAWING 05. ## LF

ELECTRICAL NOTES

1 ## (UNITS) 1 ELECTRICAL NO. E QTY/UNIT

REVISION NOTES

1 ## (UNITS) 1 (DATE) / (TEXT)

LANDSCAPE HARDSCAPE MATERIALS

31 RFP-RAP, 050 MIN. MATCH NATIVE RIVER ROCK 7# SY

LANDSCAPE PLANT MATERIALS

LEGEND	BOTANICAL NAME	SIZE	QTY
	PARQUISONIA FLORIDA BLUE PALM VERDE	24" BOX	4
	PARQUISONIA PARVOCOX SONORAN PALM VERDE	24" BOX	3
	PROSOPIA LYBROS 'PHOENIX' PHOENIX THORNLESS MESQUITE	24" BOX	4-36' (1) (1)
	ACACIA S. LINDLEYANA SHOESTRING ACACIA	24" BOX	1-36' (1) (1)
	CHILOPSIS LINEARIS 'ART'S SEEDLESS' SEEDLESS JESUIT WILLOW	24" BOX	1
SHRUBS & GROUND COVER			
	CARISSA M. LITTLE NATAL PLUM	1 GALLON	24
	HESPERALOE PARVIFLORA RED YUCCA	5 GALLON	12
	RUFIA PENINSULARIS ULSERI BUELLIA	5 GALLON	12
	MUEHLBERGIA CAPILLARIS REGAL MIST DEER GRASS	5 GALLON	26
	MUEHLBERGIA CAPILLARIS CHIHUAHUA RAIN SAGE	5 GALLON	18

IRRIGATION NOTES
(TYPICALLY PER LANDSCAPE MATERIALS/PLANTING LEGEND WITH CORRESPONDING QUANTITIES)

IRRIGATION CALLOUT:

(AS USED IN ANY PILING REPAIRS ON "THREE (3) S-WRP-DWRP/TORX MANS", COM PROJ # D1007740005, PARZANA SYSTEM)

AGENCY & UTILITY REFERENCE KEY

1	CITY OF MESA	COM
1A	COM - SOUTHFAST WATER RECLAMATION PLANT	SEWRP
1B	COM - GREENFIELD WATER RECLAMATION PLANT	GWRP
1C	NATURAL GAS - COM	COM-G
2	TOWN OF GILBERT	LOG
3	ROOSEVELT WATER CONSERVATION DISTRICT	RWCD
4	ARIZONA DEPARTMENT OF TRANSPORTATION	ADO
5A	UNION PACIFIC RAILROAD	UPRR
5B	LEVEL 3 COMMUNICATIONS, FIBER OPTICS-TYP	LV-3
6	MARICOPA COUNTY OF DEPARTMENT OF TRANSPORTATION	MCDOT
6A	MARICOPA COUNTY FLOOD CONTROL DISTRICT	MCFCD
6B	MARICOPA COUNTY ENVIRONMENTAL SERVICES DEPT	MCESD
6C	MARICOPA COUNTY ASSESSORS PARCEL NUMBER	APN
7A	ELECTRIC POWER - SALT RIVER PROJECT	SRP-ELEC
7B	IRRIGATION - SALT RIVER PROJECT	SRP-IRR
8	NATURAL GAS - COM	COM-G
9	NATURAL GAS, KINDER MORGAN (E. PASO GAS) KINDER MORGAN C.	SWG
9B	NATURAL GAS, SOUTHWEST GAS	SWG
9B	COMMUNICATIONS, LEVEL 3 (FIBER OPTIC-TYP)	LV-3
10	COMMUNICATIONS, QWEST	QWEST
11	COMMUNICATIONS, AT&T	AT&T
12	COMMUNICATIONS, COX CABLE	COX
13	COMMUNICATIONS, SPRINT	SPRINT
14	COMMUNICATIONS, CENTURY LINK	CLINK

(AS USED IN "SOSSAMAN STORM CHANNEL REPAIR" COM PROJ # 010790300, MELBODY ZIEBART)

AGENCY & UTILITY REFERENCE KEY

A	ELECTRIC POWER - SALT RIVER PROJECT	SRP
B	COM - SANITARY SEWER	COM-SS
C	NATURAL GAS - NATURAL GAS, SOUTHWEST GAS	SWG
D	COMMUNICATIONS, CENTURY LINK	CLINK

AGENCY & UTILITY COORDINATION

1	PROTECT EXISTING UTILITIES IN PLACE	4
2	CAUTION, OVERHEAD POWER LINES	3
3	CONTRACTOR TO PROVIDE BRACING AND GUY WIRE PROTECTION PLAN	2

1 1 HIGH VOLTAGE ELECTRIC POWER UNDERGROUND FIBER OPTIC & GUY WIRE

APPENDIX M

Tips and How To Write-Ups (Not Complete)

APPENDIX N

City of Mesa Approved Blocks and Uses

Name	Description
C-ACFL-ALUMINUM CAP FLUSH3	Control: Aluminum Cap Flush
C-ACHH-ALUMINUM CAP IN HANDHOLE3	Control: Aluminum Cap in Hand Hole
C-BCFL-BRASS CAP FLUSH3	Control: Brass Cap Flush
C-BCHH-BRASS CAP IN HANDHOLE3	Control: Brass Cap in Hand Hole
C-BM-BENCHMARK3	Control: Benchmark
C-CCP-CALCULATED CONTROL POINT3	Control: Calculated Control Point
C-CN-CONCRETE NAIL3	Control: Concrete Nail
C-CP-CONTROL POINT3	Control: Control Point
C-CPT-CALCULATED POSITION (NOTHING FOUND)3	Control: Calculated Position Nothing (Nothing Found)
C-IPF-IRON PIN FOUND3	Control: Iron Pin Found
C-SET-SRB-SET REBAR AND CAP3	Control: Set Rebar and Cap
CM-CBLMH-CABLE MANHOLE3	Communication: Cable Manhole
CM-CBLPED-CABLE PEDESTAL (RISER)3	Communication: Cable Pedestal (Riser)
CM-FOMH-FIBER OPTICS MANHOLE3	Communication: Fiber Optics Manhole
CM-FOMK-FIBER OPTICS MARKER3	Communication: Fiber Optics Marker
CM-FOPB-FIBER OPTICS PULL BOX3	Communication: Fiber Optics Pull Box
CM-FOPED-FIBER OPTICS PEDESTAL3	Communication: Fiber Optics Pedestal
CM-TCAB-TELEPHONE CABINET3	Communication: Telephone Cabinet
CM-TMH-TELEPHONE MANHOLE3	Communication: Telephone Manhole
CM-TPED-TELEPHONE PEDESTAL (RISER)3	Communication: Telephone Pedestal (Riser)
CM-TP-TELEPHONE POLE3	Communication: Telephone Pole
C-NGS-NATIONAL GEODETIC SURVEY3	Civil: National Geodetic Survey
C-PK-PK NAIL3	Civil: Pk Nail
C-RB-REBAR FOUND3	Civil: Rebar Found
C-ROWM-RIGHT OF WAY MARKER3	Civil: Right Of Way Marker
C-RRS-RAILROAD SPIKE3	Civil: Railroad Spike
C-SCTCOR-SECTION CORNER IN HANDHOLE3	Civil: Section Corner in Handhole
C-TBM-TEMPORARY BENCHMARK3	Civil: Temporary Benchmark
D-CO-STORM DRAIN CLEAN OUT3	Drainage: Storm Drain Clean Out
D-DWDC-DRYWELL DUAL CHAMBER3	Drainage: Drywell Dual Chamber
D-DW-DRYWELL3	Drainage: Drywell
D-MH-STORM DRAIN MANHOLE3	Drainage: Storm Drain Manhole
D-V-DRAINAGE VALVE3	Drainage: Drainage Valve
E-AP-GUY ANCHOR POLE3	Electric: Guy Anchor Pole
E-BOX-ELECTRICAL BOX3	Electric: Electrical Box
E-CAB-ELECTRICAL SES3	Electric: Electrical SES
E-GWA-GUY-WIRE ANCHOR POINT3	Electric: Guy Wire Anchor Point
E-LPD-STEETLIGHT DOUBLE3	Electric: Steetlight Double
E-LP-STREETLIGHT3	Electric: Streetlight

E-LTP-LIGHT POLE3	Electric: Light Pole
E-LTTX-TAXIWAY LIGHT3	Electric: Taxiway Light
E-LTYD-YARD LIGHT3	Electric: Yard Light
E-LUM-LUMINAIRE3	Electric: Luminaire
E-MH-ELECTRICAL MANHOLE3	Electric: Electrical Manhole
E-PB-ELECTRICAL PULL BOX3	Electric: Electrical Pull Box
E-PED-ELECTRICAL PEDESTAL (RISER)3	Electric: Electrical Pedestal (Riser)
E-PJU-JOINT USE POLE3	Electric: Joint Use Pole
E-PPLP-POWER POLE WITH STREETLIGHT3	Electric: Power Pole with Streetlight
E-PP-POWER POLE3	Electric: Power Pole
E-SLPB-STREETLIGHT PULL BOX3	Electric: Streetlight Pull Box
G-AN-GAS ANODE3	Gas: Gas Anode
G-M-GAS METER3	Gas: Gas Meter
G-MH-GAS MANHOLE3	Gas: Gas Manhole
G-V-GAS VALVE3	Gas: Gas Valve
I-AV-IRRIGATION ALFALFA VALVE3	Irrigation: Irrigation Alfalfa Valve
I-CV-IRRIGATION CONTROL VALVE3	Irrigation: Irrigation Control Valve
I-MH-IRRIGATION MANHOLE3	Irrigation: Irrigation Manhole
I-SP-IRRIGATION STANDPIP2E3	Irrigation: Irrigation Standpipe
RW-HYD-RECLAIMED WATER HYDRANT3	ReclaimWater: Reclaimed Water Hydrant
RW-MH - RECLAIMED WATER MANHOLE3	ReclaimWater: Reclaimed Water Manhole
RW-MTRB-RECLAIMED WATER METER BOX3	ReclaimWater: Reclaimed Water Meter Box
RW-V-RECLAIMED WATER VALVE3	ReclaimWater: Reclaimed Water Valve
S-CO-SEWER CLEAN OUT3	Sewer: Sewer Clean Out
S-MH-SEWER MANHOLE3	Sewer: Sewer Manhole
T-BLD-BOULDER3	Topo: Boulder
T-BOL-BOLLARD3	Topo: Bollard
T-FP-FLAG POLE3	Topo: Flag Pole
T-MB-MAILBOX3	Topo: Mailbox
T-MWELL-MONITORING WELL3	Topo: Monitoring Well
T-POST-POST3	Topo: Post
T-PTHL-POTHOLE3	Topo: Pothole
TR-ADAPS-ADA PARKING SPACE PAINT3	Transportation: ADA Parking Space Handicap Symbol
TR-ADASYN-ADA SYMBOL SIGN3	Transportation: ADA Symbol Sign
TR-CAB-TRAFFIC SIGNAL CONTROL CABINET3	Transportation: Traffic Signal Control Cabinet
TR-SNSN-STREET SIGN DOUBLE3	Transportation: Street Sign Double
TR-SN-STREET SIGN3	Transportation: Street Sign
TR-TSM-TRAFFIC SIGNAL ON MAST3	Transportation: Traffic Signal on Mast
TR-TSPB-TRAFFIC SIGNAL PULL BOX3	Transportation: Traffic Signal Pull Box
TR-TSP-TRAFFIC SIGNAL ON POLE3	Transportation: Traffic Signal on Pole

V-AGAVE-CACTUS AGAVE3	Survey: Cactus Agave
V-B-BUSH3	Survey: Bush
V-BRL-CACTUS BARREL3	Survey: Cactus Barrel
V-CHO-CACTUS CHOLLA3	Survey: Cactus Cholla
V-CITRUS-CITRUS TREE3	Survey: Citrus Tree
V-CONIF-CONIFEROUS TREE3	Survey: Coniferous Tree
V-DT-DECIDUOUS TREE3	Survey: Deciduous Tree
V-MESQ-MESQUITE3	Survey: Mesquite
V-PALM-PALM TREE3	Survey: Palm Tree
V-PALO-PALO VERDE3	Survey: Palo Verde
V-PEAR-CACTUS PRICKLY PEAR3	Survey: Cactus Prickly Pear
V-SAGUAR-SAGUARO3	Survey: Saguaro
V-SHRUB-SHRUB3	Survey: Shrub
V-TREE-TREE3	Survey: Tree
W-BFP-WATER BACKFLOW PREVENTER3	Water: Water Backflow Preventer
W-FH-FIRE HYDRANT3	Water: Fire Hydrant
W-M - WATER METER ASSEMBLY3	Water: Water Meter Assembly
W-MB-WATER METER3	Water: Water Meter
W-MH-WATER MANHOLE3	Water: Water Manhole
W-V-WATER VALVE3	Water: Water Valve

APPENDIX O

City of Mesa Approved Layers and Uses

Layer Name	Layer Description
0	0
A-BLDG-FPRT-E	Architectural: Existing building footprint
C-ALIN	C-ALIN
C-ALIN-BRNG	Alignments: Bearing and Distance Labels
C-ALIN-CNTR	Alignments: Centerline
C-ALIN-NPLT	Alignments: No Plot Layer
C-ALIN-TAGS	Alignments: Line, Curve and Spiral Tags
C-ANNO	Annotation:
C-ANNO-CNOT	Annotation: Construction notes
C-ANNO-DIMS	Annotation: Dimensions
C-ANNO-KEYN	Annotation: Keynotes and Symbols
C-ANNO-PTHL	Annotation: Pothole
C-ANNO-TABL-ANNO	Annotation: Table annotation
C-ANNO-TABL-BRDR	Annotation: Table Borders
C-ANNO-TABL-GRID	Annotation: Table line work
C-ANNO-TABL-PATT	Annotation: Table Hatch
C-ANNO-TABL-TITL	Annotation: Table title label
C-ANNO-VFRM	Annotation:
C-CATV-CABL-ANNO-E	Cable TV: Existing cable annotation
C-CATV-CABL-E	Cable TV: Existing cable/conduit
C-CATV-CABL-OVH-E	Existing: Cable TV Overhead Lines
C-CATV-CABL-STRC-E	Cable TV: Existing structure
C-CATV-CABL-UNDG-E	Existing: Cable TV Underground Lines
C-CATV-E	Existing: Cable TV Line
C-CATV-EQUP-E	Cable TV: Existing pedestal, cabinet, riser, etc
C-CENTLNK-E	Existing: Centurylink Cable TV Line
C-CENTLNK-OVH-E	Existing: Centurylink Cable TV Overhead Line
C-CENTLNK-UNDG-E	Existing: Centurylink Cable TV Underground Line
C-CORR	C-CORR
C-CORR-NODE	C-CORR-NODE
C-COX-E	Existing: Cox Cable TV Line
C-COX-OVH-E	Existing: Cox Cable TV Overhead Line
C-COX-UNDG-E	Existing: Cox Cable TV Underground Line
C-DETL-1~~~	Details: Very thin line weight
C-DETL-2~~~	Details: Thin line weight
C-DETL-3~~~	Details: Medium line weight
C-DETL-4~~~	Details: Med-thick line weight

C-DETL-5~~~	Details: Thick line weight
C-ELEC-ANNO	Electric: Annotation
C-ELEC-ANNO-E	Electric: Existing annotation
C-ELEC-CABL-DBNK-E	Existing: Duct bank
C-ELEC-CABL-E	Electric: Existing cable/wire
C-ELEC-CABL-OHED	Electric: Overhead cable/wire
C-ELEC-CABL-OHED-E	Electric: Existing overhead cable/wire
C-ELEC-CABL-UGND	Electric: Underground cable/wire
C-ELEC-CABL-UGND-E	Electric: Existing underground cable/wire/conduit
C-ELEC-COND	Electric: Conduit
C-ELEC-COND-E	Electric: Existing conduit
C-ELEC-EQUP	Electric: SES, Transformer, etc
C-ELEC-EQUP-E	Electric: Existing SES, Transformer, etc
C-ELEC-PBOX	Electric: Pull box
C-ELEC-PBOX-E	Electric: Existing pull box
C-ELEC-POLE	Electric: Power pole
C-ELEC-POLE-E	Electric: Existing power pole
C-ELEC-POLE-GUY	Electric: Power pole guy wire
C-ELEC-POLE-GUY~E	Electric: Existing power pole guy wire
C-ELEC-STRC	Electric: Structure
C-ELEC-STRC-E	Electric: Existing structure
C-FENC-BWIR-E	Fence: Existing barbed wire
C-FENC-CLNK-E	Fence: Existing chain-link
C-FENC-WALL-CMU~E	Fence: Existing CMU wall
C-FENC-WIRN-E	C-FENC-WIRN-E
C-FENC-WOOD-E	Fence: Existing wood
C-FENCE-WIRN-E	Fence: Existing wrought iron
C-FOPT-CABL	Fiber-Optic: Cable
C-FOPT-CABL-ANNO	Fiber-Optic: Cable annotation
C-FOPT-CABL-ANNO-E	Fiber-Optic: Existing cable annotation
C-FOPT-CABL-E	Fiber-Optic: Existing cable
C-FOPT-DBNK-E	Existing: Duct Bank
C-FOPT-EQUIP-E	Fiber-Optic: Existing pedestal, cabinet, riser, etc
C-FOPT-EQUP	Fiber-Optic: Pedestal, cabinet, riser, etc
C-FOPT-PBOX	Fiber-Optic: Pull box
C-FOPT-PBOX-E	Fiber-Optic: Existing pull box
C-FOPT-STRC	Fiber-Optic: Structure
C-FOPT-STRC-E	Fiber-Optic: Existing structure
C-IMAG	Images
C-IRR-12-E	Existing: 12" Irrigation

C-IRR-18-E	Existing: 18" Irrigation
C-IRR-24-E	Existing: 24" Irrigation
C-IRR-30-E	Existing: 30" Irrigation
C-IRR-36-E	Existing: 36" Irrigation
C-IRR-42-E	Existing: 42" Irrigation
C-IRR-48-E	Existing: 48" Irrigation
C-IRR-54-E	Existing: 54" Irrigation
C-IRR-E	Existing: Irrigation
C-IRR-LS-SHRUB	Existing: 12" Irrigation
C-IRR-LS-TREE	Existing: 12" Irrigation
C-IRRG-PIPE-ANNO-E	Irrigation: Existing pipe annotation
C-IRRG-PIPE-CNTR-E	Irrigation: Existing pipe existing (center)
C-IRRG-PIPE-E	Irrigation: Existing pipe(outside)
C-IRRG-STRC-E	Irrigation: Existing structure
C-IRRG-VALV-E	Irrigation: Existing valve
C-LEGL-ANNO	Legal: Annotation brg, dist, etc
C-LEGL-ANNO-E	Legal: Existing annotation Brg, dist, etc
C-LEGL-ESMT-ACCS	Legal: Easement Ingress-egress/access
C-LEGL-ESMT-PUE~	Legal: Easements PUE
C-LEGL-ESMT-PUE~-E	Legal: Existing Easements PUE
C-LEGL-ESMT-PUFE	Legal: Easements PUFE
C-LEGL-ESMT-PUFE-E	Legal: Existing Easements PUFE
C-LEGL-ESMT-TCE~	Legal: Easements TCE
C-LEGL-ESMT-TCE~-E	Legal: Existing Easement TCE
C-LEGL-PROP-ANNO	Legal: Property label - address & lot number
C-LEGL-PROP-BNDY	Legal: Property boundary
C-LEGL-PROP-BRNG	Legal: Property bearing
C-LEGL-PROP-LINE	Legal: Property lines
C-LEGL-PROP-LINE-E	Legal: Existing property lines
C-LEGL-PROP-LOTS	Legal: Property lots
C-LEGL-PROP-RSRV	Legal: Property reserved
C-LEGL-RWAY-LINE	Legal: Right-of-Way Line
C-LEGL-RWAY-LINE-E	Legal: Existing right-of-way line
C-NGAS-0.5-E	Existing: 1" Natural Gas
C-NGAS-1-E	Existing: 1" Natural Gas
C-NGAS-2-E	Existing: 2" Natural Gas
C-NGAS-3-E	Existing: 3" Natural Gas
C-NGAS-4-E	Existing: 4" Natural Gas
C-NGAS-6-E	Existing: 6" Natural Gas
C-NGAS-8-E	Existing: 6" Natural Gas

C-NGAS-12-E	Existing: 12" Natural Gas
C-NGAS-ABND-E	Existing: Abandoned Natural Gas
C-NGAS-E	Existing: Natural Gas
C-NGAS-FUEL-6-E	Existing: 6" Fuel Natural Gas
C-NGAS-HP-4-E	Existing: 4" HP Natural Gas
C-NGAS-HP-6-E	Existing: 6" HP Natural Gas
C-NGAS-METR	Natural gas: Meter
C-NGAS-METR-E	Natural gas: Existing meter
C-NGAS-PE-1-E	Existing: 1" PE Natural Gas
C-NGAS-PE-2-E	Existing: 2" PE Natural Gas
C-NGAS-PE-3-E	Existing: 3" PE Natural Gas
C-NGAS-PE-4-E	Existing: 4" PE Natural Gas
C-NGAS-PE-6-E	Existing: 6" PE Natural Gas
C-NGAS-PE-12-E	Existing: 12" PE Natural Gas
C-NGAS-PIPE	Natural gas: Proposed pipe
C-NGAS-PIPE-ANNO	Natural gas: Pipe annotation
C-NGAS-PIPE-ANNO-E	Natural gas: Existing pipe annotation
C-NGAS-PIPE-E	Natural gas: Existing pipe
C-NGAS-PIPE-FITT	Natural gas: Pipe fittings/symbols
C-NGAS-PIPE-FITT-E	Natural gas: Existing pipe fittings/symbols
C-NGAS-PROF	Natural gas: Profile pipe
C-NGAS-PROF-E	Natural gas: Existing profile pipe
C-NGAS-SERV	Natural gas: Service pipe
C-NGAS-SERV-E	Natural gas: Existing service pipe
C-NGAS-STL-1-E	Existing: 1" STL Natural Gas
C-NGAS-STL-2-E	Existing: 2" STL Natural Gas
C-NGAS-STL-3-E	Existing: 3" STL Natural Gas
C-NGAS-STL-4-E	Existing: 4" STL Natural Gas
C-NGAS-STL-6-E	Existing: 6" STL Natural Gas
C-NGAS-STL-12-E	Existing: 12" STL Natural Gas
C-NGAS-STRC	Natural gas: Structure underground
C-NGAS-STRC-E	Natural gas: Existing structure underground
C-NGAS-VALV	Natural gas: valve
C-NGAS-VALV-E	Natural gas: Existing valve
C-PIPE	C-PIPE
C-PLNT-BUSH	Plant: Bush
C-PLNT-BUSH-E	Plant: Existing bush
C-PLNT-CACT	Plant: Cactus
C-PLNT-CACT-E	Plant: Existing cactus
C-PLNT-PNTR-E	Plant: Existing planter

C-PLNT-TREE	Plant: Tree
C-PLNT-TREE-E	Plant: Existing tree
C-PROF-ANNO	Profiles: Labels
C-PROF-ANNO-E	C-PROF-ANNO-E
C-PROF-EXST	Profiles: Existing Ground
C-PROF-GRID	Profiles: Profile View Grid
C-PROF-NPLT	C-PROF-NPLT
C-PROF-PREF	Profiles: Superimposed Profiles
C-PROF-PROP	Profiles: Proposed Ground
C-PROF-STAN	Profiles: Profile View Stations and Elevations
C-PROP-TEXT	C-PROP-TEXT
C-RAIL-TRAK-E	Railroad Track: Existing
C-RCLM-12-E	Existing: 12" Reclaimed Water
C-RCLM-16-E	Existing: 16" Reclaimed Water
C-RCLM-ANNO	Reclaimed Water: Annotation
C-RCLM-ANNO-E	Reclaimed Water: Existing Annotation
C-RCLM-DIP-6-E	Existing: 6" DIP Reclaimed Water
C-RCLM-DIP-8-E	Existing: 8" DIP Reclaimed Water
C-RCLM-DIP-10-E	Existing: 10" DIP Reclaimed Water
C-RCLM-DIP-18-E	Existing: 18" DIP Reclaimed Water
C-RCLM-DIP-20-E	Existing: 20" DIP Reclaimed Water
C-RCLM-DIP-24-E	Existing: 24" DIP Reclaimed Water
C-RCLM-DIP-30-E	Existing: 30" DIP Reclaimed Water
C-RCLM-DIP-36-E	Existing: 36" DIP Reclaimed Water
C-RCLM-DIP-42-E	Existing: 42" DIP Reclaimed Water
C-RCLM-E	Existing: Reclaimed Water
C-RCLM-FITT	Reclaimed Water: Fittings
C-RCLM-FITT-E	Reclaimed Water: Existing fittings
C-RCLM-HYDT	Reclaimed Water: Hydrant
C-RCLM-HYDT-E	Reclaimed Water: Existing hydrant
C-RCLM-METR	Reclaimed Water: Meter box
C-RCLM-METR-E	Reclaimed Water: Existing meter box
C-RCLM-PIPE	Reclaimed Water: Pipe
C-RCLM-PIPE-E	Reclaimed Water: Existing pipe
C-RCLM-SERV	Reclaimed Water: Service pipe
C-RCLM-SERV-E	Reclaimed Water: Existing service pipe
C-RCLM-STRC	Reclaimed Water: Structure
C-RCLM-STRC-E	Reclaimed Water: Existing structure
C-RCLM-VALV	Reclaimed Water: Valve
C-RCLM-VALV-E	Reclaimed Water: Existing valve

C-ROAD	Roadways:
C-ROAD-ANNO	Roadways: Annotation
C-ROAD-ANNO-E	Roadways: Existing annotation
C-ROAD-ASPH-EOP~	Roadways: Asphalt Edge of Pavement
C-ROAD-ASPH-EOP~-E	Roadways: Existing Asphalt Edge of Pavement
C-ROAD-ASPH-PATT	Roadways: Asphalt hatching
C-ROAD-ASSM	Roadways: Assemblies and Subassemblies
C-ROAD-ASSM-BLIN	Roadways: Assembly baseline
C-ROAD-ASSM-OFFS	Roadways: Assembly offset
C-ROAD-BRNG	Roadways: Bearings
C-ROAD-CNTR	Roadways: Centerline
C-ROAD-CNTR-E	Roadways: Existing centerline
C-ROAD-CONC-BOC~	Roadways: Back of curb
C-ROAD-CONC-BOC~-E	Roadways: Existing back of curb
C-ROAD-CONC-DRWY	Roadways: Concrete driveway
C-ROAD-CONC-DRWY-E	Roadways: Existing concrete driveway
C-ROAD-CONC-EOP~	Roadways: Concrete Edge
C-ROAD-CONC-EOP~-E	Roadways: Existing Concrete Edge
C-ROAD-CONC-FLOW	Roadways: Flow line
C-ROAD-CONC-FLOW-E	Roadways: Existing Flow line
C-ROAD-CONC-FOC~	Roadways: Face of curb
C-ROAD-CONC-FOC~-E	Roadways: Existing face of curb
C-ROAD-CONC-GLIP	Roadways: Lip of gutter
C-ROAD-CONC-GLIP-E	Roadways: Existing Lip of gutter
C-ROAD-CONC-PATT	Roadways: Concrete hatching
C-ROAD-CONC-SRMP	Roadways: Concrete sidewalk ramp
C-ROAD-CONC-SRMP-E	Roadways: Existing concrete sidewalk ramp
C-ROAD-CONC-SWLK	Roadways: Concrete sidewalk
C-ROAD-CONC-SWLK-E	Roadways: Existing concrete sidewalk
C-ROAD-CORR	Roadways: corridor
C-ROAD-CORR-PATT	Roadways: corridor patterns
C-ROAD-CURV	Roadways: curves
C-ROAD-FEAT	Roadways: feature line
C-ROAD-INTS	C-ROAD-INTS
C-ROAD-INTS-ANNO	C-ROAD-INTS-ANNO
C-ROAD-LABL	Roadways: labels
C-ROAD-LINE	Roadways: tangent lines
C-ROAD-LINK	Roadways: corridor and section links
C-ROAD-MARK	Roadways: corridor and section marks
C-ROAD-MASS-LINE	C-ROAD-MASS-LINE

C-ROAD-MASS-VIEW	C-ROAD-MASS-VIEW
C-ROAD-PROF	Roadways: profiles
C-ROAD-PROF-ANNO	Roadways: Profile text
C-ROAD-PROF-LTOF	Roadways: profile left offset sample lines
C-ROAD-PROF-PARB	Roadways: profile parabolic curves
C-ROAD-PROF-PNTS	Roadways: profile geometry points
C-ROAD-PROF-PROJ	C-ROAD-PROF-PROJ
C-ROAD-PROF-RTOF	Roadways: profile right offset sample lines
C-ROAD-SAMP	Roadways: sample lines
C-ROAD-SCTN	Roadways: grade in sections
C-ROAD-SCTN-ANNO	Roadways: section text
C-ROAD-SCTN-GRID	Roadways: section grid
C-ROAD-SCTN-PROJ	Roadways: section
C-ROAD-SCTN-TABL	Roadways: Section Table
C-ROAD-SCTN-TTLB	Roadways: Section table
C-ROAD-SGNL-ANNO	Roadways: Annotation
C-ROAD-SGNL-ANNO-E	Roadways: Existing annotation
C-ROAD-SGNL-CABL	Roadways: Signal cable/conduit
C-ROAD-SGNL-CABL-E	Roadways: Existing signal cable/conduit
C-ROAD-SGNL-CBNT	Roadways: Signal cabinet
C-ROAD-SGNL-CBNT-E	Roadways: Existing signal cabinet
C-ROAD-SGNL-LOOP	Roadways: Signal loop
C-ROAD-SGNL-LOOP-E	Roadways: Existing signal loop
C-ROAD-SGNL-PBOX	Roadways: Signal pull box
C-ROAD-SGNL-PBOX-E	Roadways: Existing signal pull box
C-ROAD-SGNL-POLE	Roadways: Signal pole
C-ROAD-SGNL-POLE-E	Roadways: Existing signal pole
C-ROAD-SHAP	Roadways: corridor and section shapes
C-ROAD-SHAP-PATT	Roadways: corridor and section shapes hatching
C-ROAD-SPIR	Roadways: spirals
C-ROAD-STAN	Roadways: stationing
C-ROAD-STAN-MAJR	Roadways: major stationing labels
C-ROAD-STAN-MINR	Roadways: minor stationing labels
C-ROAD-STLT-ANNO	Roadway Lighting: Annotation
C-ROAD-STLT-ANNO-E	Roadway Lighting: Existing annotation
C-ROAD-STLT-CABL	Roadway Lighting: Street light cable/conduit
C-ROAD-STLT-CABL-E	Roadway Lighting: Existing Street light cable/conduit
C-ROAD-STLT-GUY~	Roadway Lighting: Street light guy wire
C-ROAD-STLT-GUY~-E	Roadway Lighting: Existing street light guy wire
C-ROAD-STLT-LTPL	Roadway Lighting: Street light pole

C-ROAD-STLT-LTPL-E	Roadway Lighting: Existing street light pole
C-ROAD-STLT-PBOX	Roadway Lighting: Street light pull box
C-ROAD-STLT-PBOX-E	Roadway Lighting: Existing street light pull box
C-ROAD-STRC	Roadways: Structures
C-ROAD-STRC-E	Roadways: Existing structures
C-ROAD-SWCT	Roadways: Sawcut Line
C-ROAD-TABL	Roadways: Table
C-ROAD-TEXT	C-ROAD-TEXT
C-SECT-CNTR	Sections: Section Cut Lines and Line Labels
C-SECT-EXST	Sections: Existing Ground
C-SECT-GRID	Sections: Section View Grid
C-SECT-PROP	Sections: Proposed Ground
C-SECT-STAN	Sections: Section View Offsets and Elevations
C-SECT-TEXT	Sections: Labels
C-SL-CNDDT-1-E	Existing: 1" Street Light Conduit
C-SL-CNDDT-1.5-E	Existing: 1.5" Street Light Conduit
C-SL-CNDDT-2-E	Existing: 2" Street Light Conduit
C-SL-CNDDT-E	Existing: Street Light Conduit
C-SL-CNDDT-OVH-E	Existing: Overhead Street Light Conduit
C-SL-CNDDT-UNDG-E	Existing: Underground Street Light Conduit
C-SSFM-ABND-E	Existing: Abandoned Force Main
C-SSFM-HDPE-8-E	Existing: 8" HDPE Force Main
C-SSFM-HDPE-10-E	Existing: 10" HDPE Force Main
C-SSFM-HDPE-12-E	Existing: 12" HDPE Force Main
C-SSFM-HDPE-15-E	Existing: 15" HDPE Force Main
C-SSFM-HDPE-16-E	Existing: 16" HDPE Force Main
C-SSFM-HDPE-18-E	Existing: 18" HDPE Force Main
C-SSFM-HDPE-24-E	Existing: 24" HDPE Force Main
C-SSFM-PE-8-E	Existing: 8" PE Force Main
C-SSFM-PE-10-E	Existing: 10" PE Force Main
C-SSFM-PE-12-E	Existing: 12" PE Force Main
C-SSFM-PE-15-E	Existing: 15" PE Force Main
C-SSFM-PE-16-E	Existing: 16" PE Force Main
C-SSFM-PE-18-E	Existing: 18" PE Force Main
C-SSFM-PE-24-E	Existing: 24" PE Force Main
C-SSFM-PVC-8-E	Existing: 8" PVC Force Main
C-SSFM-PVC-10-E	Existing: 10" PVC Force Main
C-SSFM-PVC-12-E	Existing: 12" PVC Force Main
C-SSFM-PVC-15-E	Existing: 15" PVC Force Main
C-SSFM-PVC-16-E	Existing: 16" PVC Force Main

C-SSFM-PVC-18-E	Existing: 18" PVC Force Main
C-SSFM-PVC-24-E	Existing: 24" PVC Force Main
C-SSWR	Sanitary Sewer
C-SSWR-4-E	Existing: 4" Sewer
C-SSWR-6-E	Existing: 6" Sewer
C-SSWR-8-E	Existing: 8" Sewer
C-SSWR-10-E	Existing: 10" Sewer
C-SSWR-15-E	Existing: 15" Sewer
C-SSWR-18-E	Existing: 18" Sewer
C-SSWR-24-E	Existing: 24" Sewer
C-SSWR-30-E	Existing: 30" Sewer
C-SSWR-ABND-E	Existing: Abandoned Sewer Pipe
C-SSWR-ANNO	Sanitary Sewer: text
C-SSWR-ANNO-E	Sanitary Sewer: Existing text
C-SSWR-CIP-8-E	Existing: 8" CIP Sewer
C-SSWR-CIP-14-E	Existing: 14" CIP Sewer
C-SSWR-DIP-4-E	Existing: 4" DIP Sewer
C-SSWR-DIP-6-E	Existing: 6" DIP Sewer
C-SSWR-DIP-8-E	Existing: 8" DIP Sewer
C-SSWR-DIP-10-E	Existing: 10" DIP Sewer
C-SSWR-DIP-12-E	Existing: 12" DIP Sewer
C-SSWR-DIP-15-E	Existing: 15" DIP Sewer
C-SSWR-DIP-18-E	Existing: 18" DIP Sewer
C-SSWR-DIP-21-E	Existing: 21" DIP Sewer
C-SSWR-DIP-24-E	Existing: 24" DIP Sewer
C-SSWR-DIP-27-E	Existing: 27" DIP Sewer
C-SSWR-DIP-30-E	Existing: 30" DIP Sewer
C-SSWR-DIP-36-E	Existing: 36" DIP Sewer
C-SSWR-DIP-42-E	Existing: 42" DIP Sewer
C-SSWR-DIP-48-E	Existing: 48" DIP Sewer
C-SSWR-DIP-54-E	Existing: 54" DIP Sewer
C-SSWR-DIP-60-E	Existing: 60" DIP Sewer
C-SSWR-DIP-66-E	Existing: 66" DIP Sewer
C-SSWR-DIP-78-E	Existing: 78" DIP Sewer
C-SSWR-E	Existing: Sewer
C-SSWR-MHOL	C-SSWR-MHOL
C-SSWR-PIPE	Sanitary Sewer: Pipe
C-SSWR-PIPE-BLNK-E	Existing: Blank Sewer Pipe
C-SSWR-PIPE-CNTR	Sanitary Sewer: Pipe Centerline
C-SSWR-PIPE-E	Sanitary Sewer: Existing piping

C-SSWR-PIPE-PATT	Sanitary Sewer: Pipe Hatching
C-SSWR-PROF	Sanitary Sewer: Profile
C-SSWR-PROF-ANNO	Sanitary Sewer: Profile labels
C-SSWR-PROF-ANNO-E	Sanitary Sewer: Existing profile labels
C-SSWR-PROF-E	Sanitary Sewer: Existing profile
C-SSWR-PVC-4-E	Existing: 4" PVC Sewer
C-SSWR-PVC-6-E	Existing: 6" PVC Sewer
C-SSWR-PVC-8-E	Existing: 8" PVC Sewer
C-SSWR-PVC-10-E	Existing: 10" PVC Sewer
C-SSWR-PVC-12-E	Existing: 12" PVC Sewer
C-SSWR-PVC-15-E	Existing: 15" PVC Sewer
C-SSWR-PVC-18-E	Existing: 18" PVC Sewer
C-SSWR-PVC-21-E	Existing: 21" PVC Sewer
C-SSWR-PVC-24-E	Existing: 24" PVC Sewer
C-SSWR-PVC-27-E	Existing: 27" PVC Sewer
C-SSWR-PVC-30-E	Existing: 30" PVC Sewer
C-SSWR-PVC-36-E	Existing: 36" PVC Sewer
C-SSWR-PVC-42-E	Existing: 42" PVC Sewer
C-SSWR-PVC-48-E	Existing: 48" PVC Sewer
C-SSWR-RGRCP-4-E	Existing: 4" RGRCP Sewer
C-SSWR-RGRCP-6-E	Existing: 6" RGRCP Sewer
C-SSWR-RGRCP-8-E	Existing: 8" RGRCP Sewer
C-SSWR-RGRCP-10-E	Existing: 10" RGRCP Sewer
C-SSWR-RGRCP-12-E	Existing: 12" RGRCP Sewer
C-SSWR-RGRCP-15-E	Existing: 15" RGRCP Sewer
C-SSWR-RGRCP-18-E	Existing: 18" RGRCP Sewer
C-SSWR-RGRCP-21-E	Existing: 21" RGRCP Sewer
C-SSWR-RGRCP-24-E	Existing: 24" RGRCP Sewer
C-SSWR-RGRCP-27-E	Existing: 27" RGRCP Sewer
C-SSWR-RGRCP-30-E	Existing: 30" RGRCP Sewer
C-SSWR-RGRCP-36-E	Existing: 36" RGRCP Sewer
C-SSWR-RGRCP-42-E	Existing: 42" RGRCP Sewer
C-SSWR-RGRCP-48-E	Existing: 48" RGRCP Sewer
C-SSWR-RGRCP-54-E	Existing: 54" RGRCP Sewer
C-SSWR-RGRCP-60-E	Existing: 60" RGRCP Sewer
C-SSWR-RGRCP-66-E	Existing: 66" RGRCP Sewer
C-SSWR-RGRCP-78-E	Existing: 78" RGRCP Sewer
C-SSWR-SERV	Sanitary Sewer: Service
C-SSWR-SERV-E	Sanitary Sewer: Existing service
C-SSWR-STRC	Sanitary Sewer: Structures

C-SSWR-STRC-E	Sanitary Sewer: Existing structures
C-SSWR-STRC-PATT	Sanitary Sewer: Structure Hatching
C-SSWR-TEXT	C-SSWR-TEXT
C-SSWR-VCP-4-E	Existing: 4" VCP Sewer
C-SSWR-VCP-6-E	Existing: 6" VCP Sewer
C-SSWR-VCP-8-E	Existing: 8" VCP Sewer
C-SSWR-VCP-10-E	Existing: 10" VCP Sewer
C-SSWR-VCP-12-E	Existing: 12" VCP Sewer
C-SSWR-VCP-15-E	Existing: 15" VCP Sewer
C-SSWR-VCP-18-E	Existing: 18" VCP Sewer
C-SSWR-VCP-21-E	Existing: 21" VCP Sewer
C-SSWR-VCP-24-E	Existing: 24" VCP Sewer
C-SSWR-VCP-27-E	Existing: 27" VCP Sewer
C-SSWR-VCP-30-E	Existing: 30" VCP Sewer
C-SSWR-VCP-36-E	Existing: 36" VCP Sewer
C-SSWR-VCP-42-E	Existing: 42" VCP Sewer
C-SSWR-VCP-48-E	Existing: 48" VCP Sewer
C-SSWR-VCP-54-E	Existing: 54" VCP Sewer
C-SSWR-VCP-60-E	Existing: 60" VCP Sewer
C-SSWR-VCP-66-E	Existing: 66" VCP Sewer
C-SSWR-VCP-78-E	Existing: 78" VCP Sewer
C-STRM	Storm Drainage
C-STRM-15-E	Existing: 15" Storm Drain
C-STRM-18-E	Existing: 18" Storm Drain
C-STRM-24-E	Existing: 24" Storm Drain
C-STRM-36-E	Existing: 36" Storm Drain
C-STRM-48-E	Existing: 48" Storm Drain
C-STRM-60-E	Existing: 60" Storm Drain
C-STRM-ABND-E	Existing: Abandoned Storm Drain
C-STRM-ANNO	Storm Sewer: Annotation
C-STRM-BNDY	Storm Drainage: Watershed Boundary
C-STRM-BNDY-TEXT	Storm Drainage: Watershed Labels
C-STRM-CIPP-24-E	Existing: 24" CIPP Storm Drain
C-STRM-CIPP-30-E	Existing: 30" CIPP Storm Drain
C-STRM-CIPP-36-E	Existing: 36" CIPP Storm Drain
C-STRM-CIPP-40-E	Existing: 40" CIPP Storm Drain
C-STRM-CIPP-42-E	Existing: 42" CIPP Storm Drain
C-STRM-CIPP-48-E	Existing: 48" CIPP Storm Drain
C-STRM-CIPP-54-E	Existing: 54" CIPP Storm Drain
C-STRM-CIPP-60-E	Existing: 60" CIPP Storm Drain

C-STRM-CIPP-66-E	Existing: 66" CIPP Storm Drain
C-STRM-CIPP-72-E	Existing: 72" CIPP Storm Drain
C-STRM-CIPP-78-E	Existing: 78" CIPP Storm Drain
C-STRM-CIPP-84-E	Existing: 84" CIPP Storm Drain
C-STRM-E	Existing: Storm Drain
C-STRM-FLOW	C-STRM-FLOW
C-STRM-HDPE-6-E	Existing: 6" HDPE Storm Drain
C-STRM-HDPE-8-E	Existing: 8" HDPE Storm Drain
C-STRM-HDPE-10-E	Existing: 10" HDPE Storm Drain
C-STRM-HDPE-12-E	Existing: 12" HDPE Storm Drain
C-STRM-HDPE-15-E	Existing: 15" HDPE Storm Drain
C-STRM-HDPE-18-E	Existing: 18" HDPE Storm Drain
C-STRM-PIPE	Storm Sewer: Pipe
C-STRM-PIPE-ANNO	Storm Sewer: Pipe Annotation
C-STRM-PIPE-ANNO-E	Storm Sewer: Existing Pipe Annotation
C-STRM-PIPE-BLNK-E	Existing: Blank Storm Drain Pipe
C-STRM-PIPE-CNTR	Storm Sewer: Pipe Centerline
C-STRM-PIPE-CNTR-E	Storm Sewer: Existing Pipe Centerline
C-STRM-PIPE-E	Storm Sewer: Existing Pipe
C-STRM-PIPE-PATT	Storm Sewer: Pipe Hatching
C-STRM-PROF	Storm Sewer: Profile
C-STRM-PROF-ANNO	Storm Sewer: Profile Annotation
C-STRM-PROF-ANNO-E	Storm Sewer: Profile
C-STRM-PROF-E	Storm Sewer: Existing Profile
C-STRM-PVC-6-E	Existing: 6" PVC Storm Drain
C-STRM-PVC-8-E	Existing: 8" PVC Storm Drain
C-STRM-PVC-10-E	Existing: 10" PVC Storm Drain
C-STRM-PVC-12-E	Existing: 12" PVC Storm Drain
C-STRM-PVC-15-E	Existing: 15" PVC Storm Drain
C-STRM-PVC-18-E	Existing: 18" PVC Storm Drain
C-STRM-RCP-15-E	Existing: 15" RCP Storm Drain
C-STRM-RCP-18-E	Existing: 18" RCP Storm Drain
C-STRM-RCP-24-E	Existing: 24" RCP Storm Drain
C-STRM-RCP-27-E	Existing: 27" RCP Storm Drain
C-STRM-RCP-30-E	Existing: 30" RCP Storm Drain
C-STRM-RCP-36-E	Existing: 36" RCP Storm Drain
C-STRM-RCP-40-E	Existing: 40" RCP Storm Drain
C-STRM-RCP-42-E	Existing: 42" RCP Storm Drain
C-STRM-RCP-48-E	Existing: 48" RCP Storm Drain
C-STRM-RCP-54-E	Existing: 54" RCP Storm Drain

C-STRM-RCP-60-E	Existing: 60" RCP Storm Drain
C-STRM-RCP-66-E	Existing: 66" RCP Storm Drain
C-STRM-RCP-72-E	Existing: 72" RCP Storm Drain
C-STRM-RCP-78-E	Existing: 78" RCP Storm Drain
C-STRM-RCP-84-E	Existing: 84" RCP Storm Drain
C-STRM-RGRCP-10-E	Existing: 10" RGRCP Storm Drain
C-STRM-RGRCP-12-E	Existing: 12" RGRCP Storm Drain
C-STRM-RGRCP-15-E	Existing: 15" RGRCP Storm Drain
C-STRM-RGRCP-18-E	Existing: 18" RGRCP Storm Drain
C-STRM-RGRCP-24-E	Existing: 24" RGRCP Storm Drain
C-STRM-RGRCP-27-E	Existing: 27" RGRCP Storm Drain
C-STRM-RGRCP-30-E	Existing: 30" RGRCP Storm Drain
C-STRM-RGRCP-36-E	Existing: 36" RGRCP Storm Drain
C-STRM-RGRCP-40-E	Existing: 40" RGRCP Storm Drain
C-STRM-RGRCP-42-E	Existing: 42" RGRCP Storm Drain
C-STRM-RGRCP-48-E	Existing: 48" RGRCP Storm Drain
C-STRM-RGRCP-54-E	Existing: 54" RGRCP Storm Drain
C-STRM-RGRCP-60-E	Existing: 60" RGRCP Storm Drain
C-STRM-RGRCP-66-E	Existing: 66" RGRCP Storm Drain
C-STRM-RGRCP-72-E	Existing: 72" RGRCP Storm Drain
C-STRM-RGRCP-78-E	Existing: 78" RGRCP Storm Drain
C-STRM-RGRCP-84-E	Existing: 84" RGRCP Storm Drain
C-STRM-RRAP	Storm Sewer: Riprap
C-STRM-RRAP-E	Storm Sewer: Existing Riprap
C-STRM-STRC	Storm Sewer: Structures
C-STRM-STRC-E	Storm Sewer: Existing Structures
C-STRM-STRC-N	Storm Drainage: Structure
C-STRM-STRC-PATT	Storm Sewer: Structure Hatching
C-STRM-TABL	Storm Sewer: Table
C-STRM-TEXT	Storm Drainage: Labels
C-STRM-WSRF	Storm Drainage: Water Surface Contour
C-TELE-ANNO-E	Telephone: Existing Annotation
C-TELE-CABL-E	Telephone: Existing Cable
C-TELE-EQUP-E	Telephone: Existing pedestal, cabinet, riser, etc
C-TELE-STRC-E	Telephone: Existing Structure
C-TELE-TEXT	Existing: Communication Telephone
C-TINN	Triangulated irregular network
C-TINN-BNDY	Triangulated irregular network: boundary
C-TINN-BNDY-E	TIN: Existing Boundary
C-TINN-E	TIN: Existing

C-TINN-FALT	TIN: Breaklines
C-TOPO	Topography
C-TOPO-ANNO	Topography: Annotation
C-TOPO-CONT-ANNO	Topography: Contours Labels
C-TOPO-CONT-ANNO-E	Topography: Existing Contour Label
C-TOPO-CONT-MAJR	Topography: Contour Major
C-TOPO-CONT-MAJR-E	Topography: Existing Contour Major
C-TOPO-CONT-MINR	Topography: Contour Minor
C-TOPO-CONT-MINR-E	Topography: Existing Contour Minor
C-TOPO-CUT	C-TOPO-CUT
C-TOPO-FEAT	Topography: Feature Line (Breakline)
C-TOPO-FEAT-E	Topography: Existing Feature Line (Breakline)
C-TOPO-FILL	C-TOPO-FILL
C-TOPO-GRAD	Topography: Grading
C-TOPO-GRAD-ANNO	Topography: Grading Annotation
C-TOPO-GRAD-ANNO-E	Topography: Existing Grading Annotation
C-TOPO-GRAD-CUT~	Topography: Grading cut line
C-TOPO-GRAD-FILL	Topography: Grading fill line
C-TOPO-MISC	Topography: Miscellaneous item
C-TOPO-MISC-E	Topography: Existing miscellaneous item
C-TOPO-SPOT	Topography: Spot Elevations
C-TOPO-SPOT-NPLT	C-TOPO-SPOT-NPLT
C-TOPO-USER	Topography: user contours
C-TOPO-WDRP	Topography: Waterdrop
C-TOPO-WSHD	Topography: Watershed
C-TS-CNDT-1-E	Existing: 1" Traffic Signal Conduit
C-TS-CNDT-1.5-E	Existing: 1.5" Traffic Signal Conduit
C-TS-CNDT-2-E	Existing: 2" Traffic Signal Conduit
C-TS-CNDT-E	Existing: Traffic Signal Conduit
C-TS-CNDT-OVH-E	Existing: Overhead Traffic Signal Conduit
C-TS-CNDT-UNDG-E	Existing: Underground Traffic Signal Conduit
C-WATR	Water Supply
C-WATR-2-E	Existing: 6" Water
C-WATR-3-E	Existing: 6" Water
C-WATR-4-E	Existing: 6" Water
C-WATR-6-E	Existing: 6" Water
C-WATR-8-E	Existing: 8" Water
C-WATR-12-E	Existing: 12" Water
C-WATR-16-E	Existing: 16" Water
C-WATR-ABND-E	Existing: Abandoned Water Line

C-WATR-ACP-4-E	Existing: 4" ACP Water
C-WATR-ACP-6-E	Existing: 6" ACP Water
C-WATR-ACP-8-E	Existing: 8" ACP Water
C-WATR-ACP-10-E	Existing: 10" ACP Water
C-WATR-ACP-12-E	Existing: 12" ACP Water
C-WATR-ACP-16-E	Existing: 16" ACP Water
C-WATR-CCP-18-E	Existing: 18" ACP Water
C-WATR-CCP-20-E	Existing: 20" ACP Water
C-WATR-CCP-24-E	Existing: 24" ACP Water
C-WATR-CCP-30-E	Existing: 30" ACP Water
C-WATR-CCP-36-E	Existing: 36" ACP Water
C-WATR-CCP-42-E	Existing: 42" ACP Water
C-WATR-CIP-6-E	Existing: 6" CIP Water
C-WATR-CIP-8-E	Existing: 8" CIP Water
C-WATR-CIP-10-E	Existing: 10" CIP Water
C-WATR-CIP-12-E	Existing: 12" CIP Water
C-WATR-CIP-16-E	Existing: 16" CIP Water
C-WATR-CIP-18-E	Existing: 18" CIP Water
C-WATR-DIP-6-E	Existing: 6" DIP Water
C-WATR-DIP-8-E	Existing: 8" DIP Water
C-WATR-DIP-10-E	Existing: 10" DIP Water
C-WATR-DIP-12-E	Existing: 12" DIP Water
C-WATR-DIP-16-E	Existing: 16" DIP Water
C-WATR-DIP-18-E	Existing: 18" DIP Water
C-WATR-DIP-20-E	Existing: 20" DIP Water
C-WATR-DIP-24-E	Existing: 24" DIP Water
C-WATR-DIP-30-E	Existing: 30" DIP Water
C-WATR-DIP-36-E	Existing: 36" DIP Water
C-WATR-DIP-42-E	Existing: 42" DIP Water
C-WATR-E	Existing: Water
C-WATR-FHYD	Water: Fire Hydrant
C-WATR-FHYD-E	Water: Existing Fire Hydrant
C-WATR-FITT	Water: Fittings
C-WATR-FITT-E	Water: Existing Fittings
C-WATR-HBIB	Water: Hose Bib
C-WATR-HBIB-E	Water: Existing Hose Bib
C-WATR-HYDT	Water: Hydrant (Not Fire)
C-WATR-HYDT-E	Water: Existing Hydrant (Not Fire)
C-WATR-METR	Water: Meter box
C-WATR-METR-E	Water: Existing meter box

C-WATR-PCCP-18-E	Existing: 18" PCCP Water
C-WATR-PCCP-20-E	Existing: 20" PCCP Water
C-WATR-PCCP-24-E	Existing: 24" PCCP Water
C-WATR-PCCP-30-E	Existing: 30" PCCP Water
C-WATR-PCCP-36-E	Existing: 36" PCCP Water
C-WATR-PCCP-42-E	Existing: 42" PCCP Water
C-WATR-PCCP-48-E	Existing: 48" PCCP Water
C-WATR-PCCP-54-E	Existing: 54" PCCP Water
C-WATR-PCCP-60-E	Existing: 60" PCCP Water
C-WATR-PCCP-72-E	Existing: 72" PCCP Water
C-WATR-PIPE	Water: Pipe
C-WATR-PIPE-ANNO	Water: Pipe Annotation
C-WATR-PIPE-ANNO-E	Water: Existing Pipe Annotation
C-WATR-PIPE-CNTR	Water: Pipe Centerline
C-WATR-PIPE-E	Water: Existing Pipe
C-WATR-SERV	Water: Service pipe
C-WATR-SERV-E	Water: Existing service pipe
C-WATR-STRC	Water: Structure
C-WATR-STRC-E	Water: Existing Structure
C-WATR-TEXT	Existing: Water Text
C-WATR-VALV	Water: Valves
C-WATR-VALV-E	Water: Existing Valves
Defpoints	No Plot layer
L-BASE-BLDG	L-BASE-BLDG
L-BASE-DIMS	L-BASE-DIMS
L-BASE-HATCH	L-BASE-HATCH
L-BASE-LOC	L-BASE-LOC
L-BASE-TEXT	L-BASE-TEXT
L-DEMO	L-DEMO
L-DEMO SHRUB-E	L-DEMO SHRUB-E
L-DEMO-CONC-D	L-DEMO-CONC-D
L-DEMO-CONC-E	L-DEMO-CONC-E
L-DEMO-HATCH	L-DEMO-HATCH
L-DEMO-HATCH2	L-DEMO-HATCH2
L-DEMO-PALM-D	L-DEMO-PALM-D
L-DEMO-PALM-E	L-DEMO-PALM-E
L-DEMO-SHRUB-D	L-DEMO-SHRUB-D
L-DEMO-TEXT	L-DEMO-TEXT
L-DEMO-TREE-D	L-DEMO-TREE-D
L-DEMO-TREE-E	L-DEMO-TREE-E









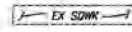
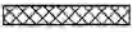



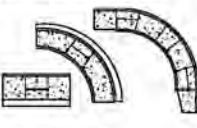

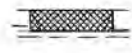




L-HD-COBBLE	L-HD-COBBLE
L-HD-CONC	L-HD-CONC
L-HD-CONC2	L-HD-CONC2
L-HD-CTRL JT	L-HD-CTRL JT
L-HD-DG	L-HD-DG
L-HD-EXP JT	L-HD-EXP JT
L-HD-FENCE	L-HD-FENCE
L-HD-FURN	L-HD-FURN
L-HD-HATCH	L-HD-HATCH
L-HD-HATCH2	L-HD-HATCH2
L-HD-HATCH3	L-HD-HATCH3
L-HD-PAVER	L-HD-PAVER
L-HD-PAVER2	L-HD-PAVER2
L-HD-PLANTER	L-HD-PLANTER
L-HD-SEATWALL	L-HD-SEATWALL
L-HD-SIGN	L-HD-SIGN
L-HD-STAB DG	L-HD-STAB DG
L-HD-STEEL	L-HD-STEEL
L-HD-TAKEOFF	L-HD-TAKEOFF
L-HD-WALL	L-HD-WALL
L-IRR-BFP	L-IRR-BFP
L-IRR-CONTRL	L-IRR-CONTRL
L-IRR-END CAP	L-IRR-END CAP
L-IRR-LAT-ACCT	L-IRR-LAT-ACCT
L-IRR-LAT-SHRUB	L-IRR-LAT-SHRUB
L-IRR-LAT-TREE	L-IRR-LAT-TREE
L-IRR-LAT-TURF	L-IRR-LAT-TURF
L-IRR-METER	L-IRR-METER
L-IRR-SLEEVE	L-IRR-SLEEVE
L-IRR-SPRAY	L-IRR-SPRAY
L-IRR-VALVE	L-IRR-VALVE
L-IRRI-MAINLINE	L-IRRI-MAINLINE
L-ACCENT	L-ACCENT
L-BOULDER	L-BOULDER
L-DG	L-DG
L-GC	L-GC
L-PALM	L-PALM
L-SHRUB	L-SHRUB
L-SHRUB-INT	L-SHRUB-INT
L-TREE	L-TREE












L-TREE-INT	L-TREE-INT
L-LT-CONTROL	L-LT-CONTROL
L-LT-DWN LT	L-LT-DWN LT
L-LT-POLE	L-LT-POLE
L-LT-TRNSFMR	L-LT-TRNSFMR
L-LT-UP LT	L-LT-UP LT
L-LT-WALL	L-LT-WALL
L-LT-WIRE	L-LT-WIRE
V-BLDG-OTLN	Survey Buildings: outline
V-BSTK-CATV-E	Bluestake: CATV
V-BSTK-ELEC-E	Bluestake: Electric
V-BSTK-FOPT-E	Bluestake: Fiber-Optic
V-BSTK-IRRG-E	Bluestake: Irrigation
V-BSTK-NGAS-E	Bluestake: Natural Gas
V-BSTK-RCLM-E	Bluestake: Reclaimed Water
V-BSTK-SSWR-E	Bluestake: Sanitary Sewer
V-BSTK-STRM-E	Bluestake: Storm Drain
V-BSTK-TELE-E	Bluestake: Telephone
V-BSTK-WATR-E	Bluestake: Water
V-CTRL-BMRK	Survey Control points: Benchmark.
V-CTRL-HCPT	Survey Control points: Horizontal.
V-CTRL-LINE-DIRC	Survey Control points: Traverse lines
V-CTRL-LINE-NETW	Survey Control points: Network
V-CTRL-LINE-SHOT	Survey Control points: Traverse sideshot
V-CTRL-MONU	Survey Control points: Monument found
V-CTRL-MONU-SET~	Survey Control points: Monument set
V-CTRL-NODE-KNOW	Survey Control points: Known points
V-CTRL-NODE-SHOT	Survey Control points: Sideshots
V-CTRL-NODE-UNKN	Survey Control points: Unknown points
V-CTRL-SECT-LINE	Survey Control points: Section lines
V-CTRL-TRAV	Survey Control points: Traverse
V-CTRL-TRAV-ERRO	Survey Control points: Traverse errors
V-CTRL-VCPT	Survey Control points: Vertical.
V-MONU	Survey: Monument found
V-MONU-SET~	Survey: Monument set
V-NODE	Survey Node:
V-NODE-ANNO	Survey Node: Annotation
V-NODE-BNDY	Survey Node: Boundary
V-NODE-BORE	Survey Node: Boring Location
V-NODE-NGAS	Survey Node: Gas line & appurtenances points.

V-NODE-POLE	Survey Node: Pole points (power, telephone, etc.).
V-NODE-SIGN	Survey Node: Sign
V-NODE-SSWR	Survey Node: Wastewater (SS) and appurtenances points.
V-NODE-STRM	Survey Node: Storm sewer and appurtenances points.
V-NODE-TREE	Survey Node: Tree points
V-NODE-WATR	Survey Node: Water line and appurtenances points.
V-ROAD-CNTR	Survey Road: Centerline
V-ROAD-CURB	Survey Road: Curbs
V-ROAD-UPVD	V-ROAD-UPVD
V-SITE-FNCE	Survey Site: Fences
V-SITE-VEGE	Survey Site: Vegetation, trees, shrubs
V-SURV-FIGR	Survey: Figure
V-SURV-LABL	Survey: Annotation
V-SURV-LINE	Survey: Lines
V-SURV-NTWK	Survey: Network
VPORT	Viewport
XREF	Drawings References (Overlay Method)

APPENDIX P

City of Mesa Approved Hatch Patterns and Uses

CIVIL HATCH PATTERNS			
LEGEND			
EXISTING	DEMOLITION & REMOVAL	PROPOSED & REPLACEMENT	DESCRIPTION
 	 		<p>ASPHALT PAVEMENT</p>
			<p>VERTICAL CURB & GUTTER OR VALLEY GUTTER</p>
			<p>CONCRETE SIDEWALK</p>
			<p>SIDEWALK PEDESTRIAN RAMP</p>
			<p>DRIVEWAY</p>
			<p>EMBANKMENT STABILIZATION, 2"-6" ANGULAR ROCK</p>
			<p>RIP-RAP</p>
			<p>COBBLE</p>

LANDSCAPE HATCH PATTERNS									
MATERIALS LEGEND									
SYMBOL	ITEM NAME / DESCRIPTION	SIZE	QTY	UNIT	SYMBOL	ITEM NAME / DESCRIPTION	SIZE	QTY	UNIT
	ROCK MULCH COLOR: EXPRESS BROWN OR APPROVED EQUAL	2 TO 6 INCH SCREENED 8" MIN. DEPTH	###	SF		CONCRETE PAVING COLOR: DARK GREY 8084 DAVIS COLORS OR APPROVED EQUAL. EXPOSED AGGREGATE FINISH	N/A	###	SF
	ROCK MULCH, DECOMPOSED GRANITE COLOR: SUNSET GOLD OR APPROVED EQUAL	1/2 INCH SCREENED 2" MIN. DEPTH	###	SF		CONCRETE PAVING COLOR: ADOBE 61078 DAVIS COLORS OR APPROVED EQUAL. MEDIUM SALT FINISH	N/A	###	SF
	GRASS MILLION BERMUOA 500		###	SF		SOFT SURFACE MATERIAL (EPDM) COLOR: BROWN OR APPROVED EQUAL. SMOOTH TROWEL FINISH	N/A	###	SF
	EMBANKMENT STABILIZATION 2"-6" ANGULAR ROCK		###	SY		CAST-IN-PLACE CONCRETE SEAT WALLS COLOR: DARK GREY 8084 DAVIS COLORS OR APPROVED EQUAL. SMOOTH TROWEL FINISH	N/A	###	CY
	RIP-RAP 18" DEPTH	D-50- 8" MIN	###	SY		VEHICLE RATED CONCRETE PAVING COLOR: NATURAL GRAY MEDIUM SALT FINISH PER DETAIL 5, SHEET L4			
	COBBLE ROUND, 6" DEPTH	2"-8" SCREENED 2" MIN. DEPTH	###	SY					