Table of Contents

CHAPTER 19 - UTILITIES STANDARDS 19-1

19.1 INTRODUCTION OF UTILITY COORDINATION OF CADD FILES 19-1
19.2 UTILITY FILE COORDINATION OPTIONS 19-1
19.2.1 Sharing of Graphic Files 19-1
19.2.2 ASCII Input File 19-1
19.2.3 Geographic Information System (GIS) File 19-1
19.3 UTILITY COORDINATION WORKFLOW 19-2
19.3.1 Phase I Utility Coordination Workflow 19-2
19.3.2 Phase II Utility Coordination Workflow 19-2
19.3.3 Phase III Utility Coordination Workflow 19-3
19.3.4 Phase IV Utility Coordination Workflow 19-3
19.4 EXCHANGE OF GRAPHICS FILES 19-4
19.4.1 Standard File Names 19-4
19.5 UTILITY PLANS 19-5
19.6 ASCII FILE NAME CONVENTIONS 19-5
19.6.1 ASCII Header Convention 19-5
19.6.2 Format of Station and Offset ASCII File 19-6
19.6.3 Format of Northing and Easting ASCII File 19-7
19.6.4 ASCII Input File Examples 19-8
19.7 UTILITY SCANNED IMAGES 19-11

Chapter 19 - UTILITIES STANDARDS

CADD Production Criteria Handbook

19.1 INTRODUCTION OF UTILITY COORDINATION OF CADD FILES

The purpose of this chapter is to define guidelines for the sharing of data between the District Offices and the Utility Agency/Owner (UAO) and the final file format required for electronic submittals.

19.2 UTILITY FILE COORDINATION OPTIONS

There are three options available for the UAO to share files with FDOT:

- Exchange of graphic files (DGN or DWG) – the preferred option
- Creation of ASCII files
- Import of Geographic Information System (GIS) data

19.2.1 SHARING OF GRAPHIC FILES

Graphic design files are created to FDOT CADD Standards and returned to the District for review. The UAO will use these files as references to create the existing or proposed utility files. These files (existing or proposed) would also be submitted back to the District. It is the District's responsibility to coordinate with the UAO for delivery of graphic files or the second possible option - ASCII files.

19.2.2 ASCII INPUT FILE

The second option is the ASCII input file that can be created from existing or proposed utilities. The ASCII file format will be either in Station/Offset or in Northing/Easting (state plane coordinates). These files will contain information pertinent to the utility, as well as the type of utility and where it is located referenced to the (survey baseline) alignment or state plane coordinates.

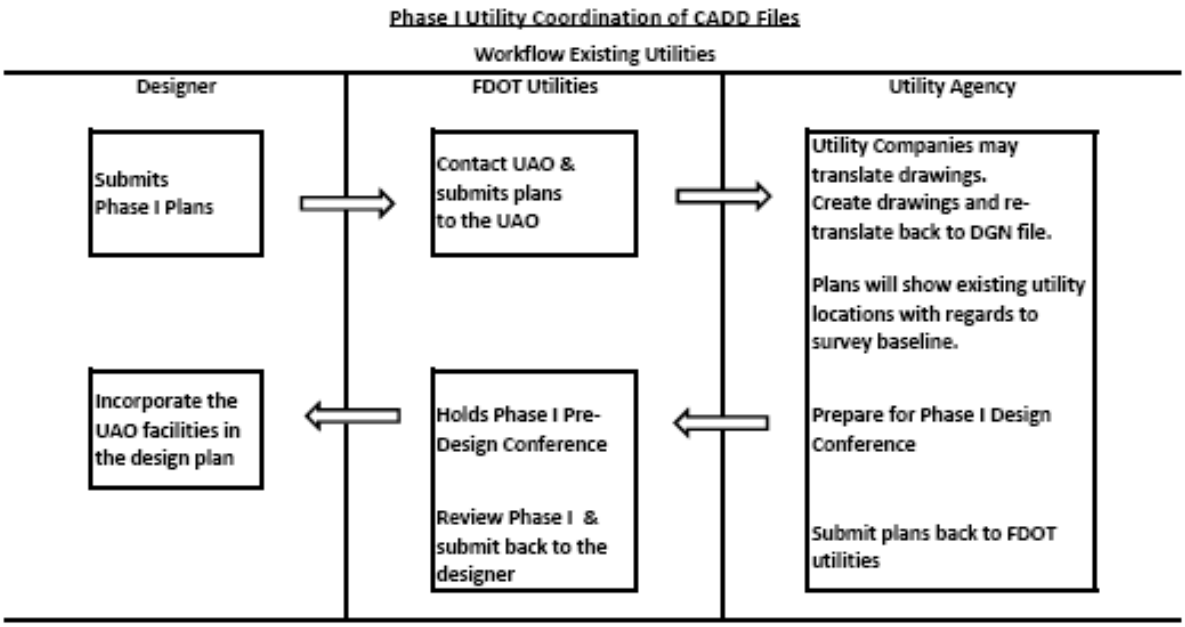
19.2.3 GEOGRAPHIC INFORMATION SYSTEM (GIS) FILE

In the event that a UAO maintains a GIS database of utility data, that data may be exchanged in GIS shape files.

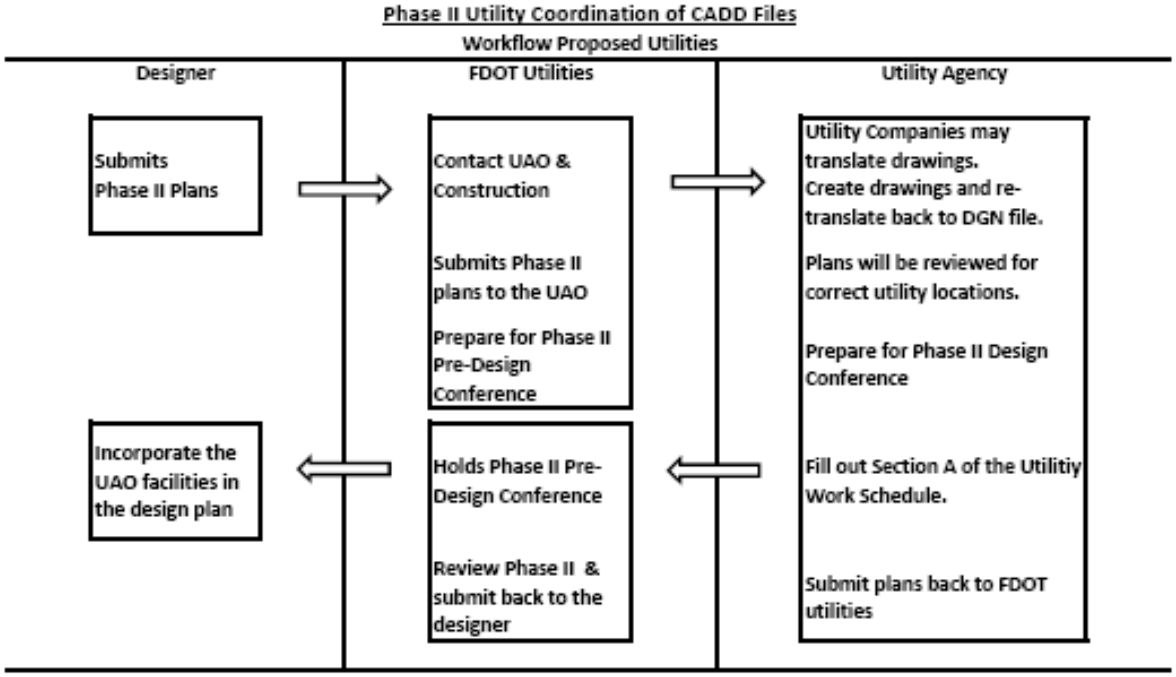
19.3 UTILITY COORDINATION WORKFLOW

Each workflow is shown as a flow chart from the Designer to the FDOT District Utilities Office, then to the Utility Agency and back to the FDOT District Utilities Office and finally to the Designer.

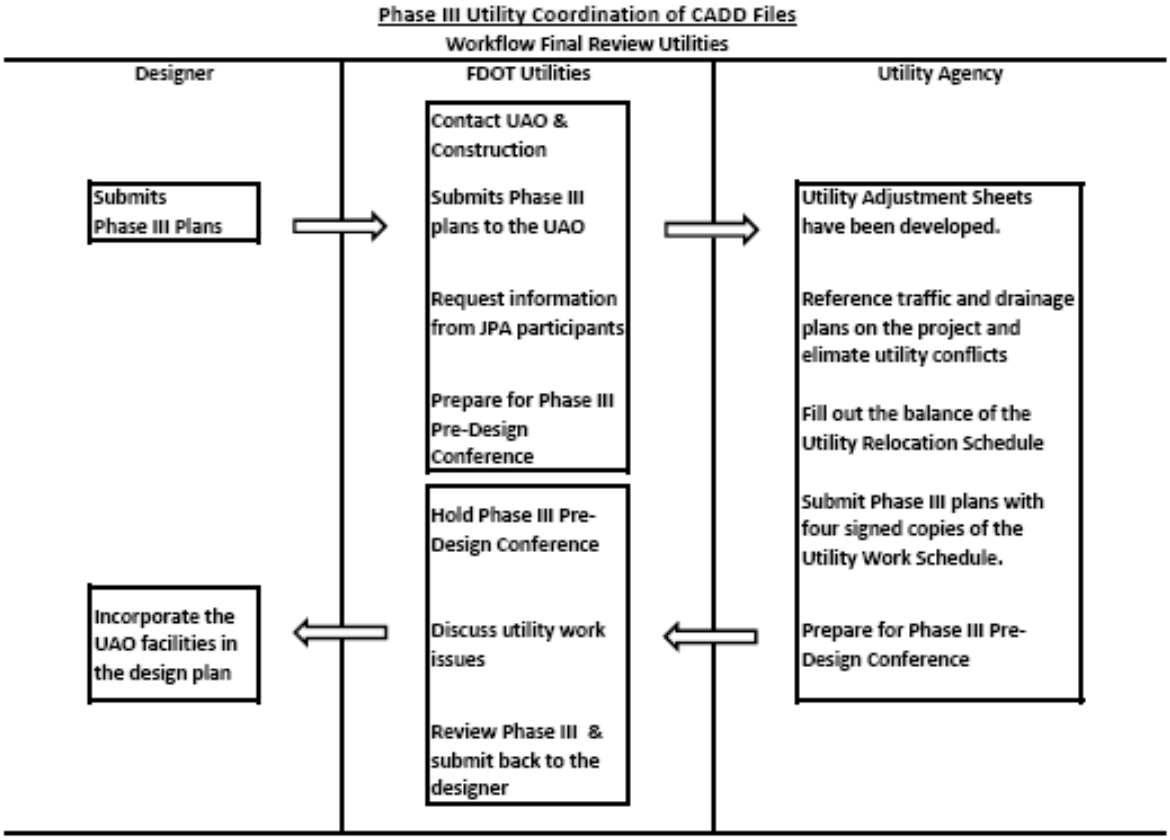
19.3.1 PHASE I UTILITY COORDINATION WORKFLOW



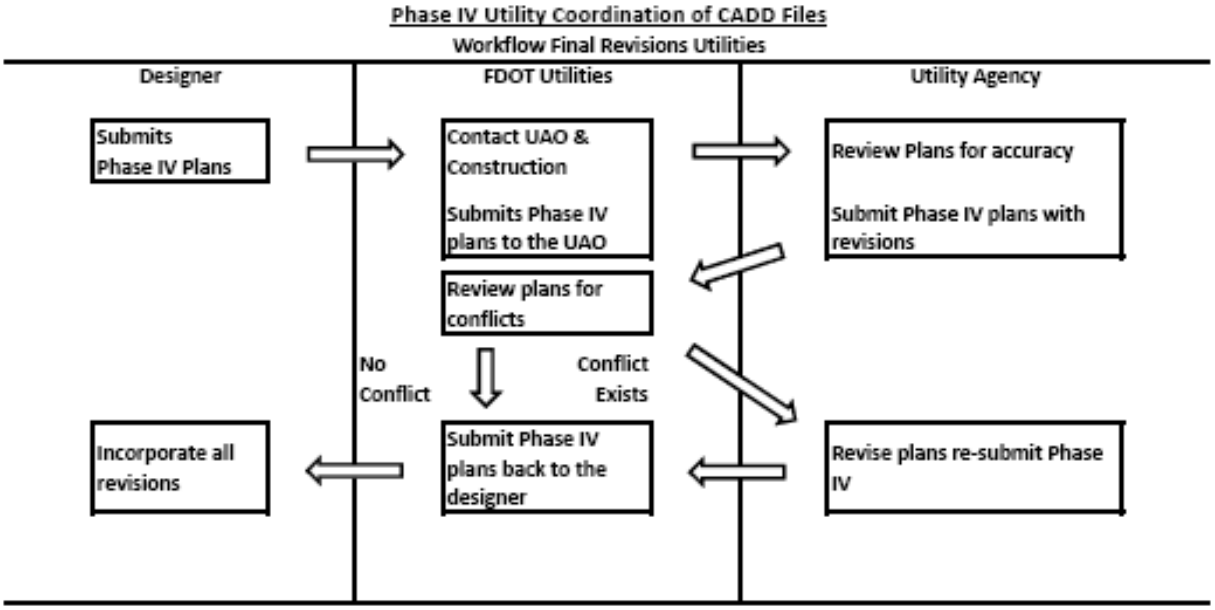
19.3.2 PHASE II UTILITY COORDINATION WORKFLOW



19.3.3 PHASE III UTILITY COORDINATION WORKFLOW



19.3.4 PHASE IV UTILITY COORDINATION WORKFLOW



19.4 EXCHANGE OF GRAPHICS FILES

After the FDOT District Utilities Office (via Utility Coordinator) has received the current phase submittal from the Roadway Designer, they will contact the involved utilities and notify them of the phase submittal. The UAO will then receive the phase documents from FDOT that will contain the Roadway Plans, the necessary CADD files and any Utility Relocation Agreements and Schedules. The required electronic files include the proposed roadway design; the existing topography, the existing and proposed ROW and the existing utilities gathered from the survey and previously supplied data.

No editing of any files provided by FDOT is permitted. The UAO will be placing data into newly created files at all times. File naming standards should be maintained at all times.

19.4.1 STANDARD FILE NAMES

FDOT utilizes standard naming conventions for all of its files. Some of the automation implemented in various tools provided by FDOT depends on naming conventions being met. More importantly, the naming convention confers information to the downstream customer of the data.
Standard file names should follow this format: AAAABB##.ex***t***

Where **AAAA** = *abbreviated file description*, **BB** = *Discipline Denotation*, ## =*Sequence number.*

Note Please see Chapter 5 of this document for more information.

If the Utility work is accomplished by a Highway Contractor as a separate contract (UWHC plans), the discipline designation for the file name is “UW”. For example a utility adjustment file name would be utaduw01.dgn. If the utility adjustments are included in the Roadway plan set the discipline designation for the file name is “RD”. For example a utility adjustment file name would be utadrd01.dgn. See Chapter 13 for the standard Utility file names defined for use by Roadway Design.

The following table defines the Utilities File Name Standards in regards to FDOT Projects with the understanding that each file name will include sequence numbering.

File Type	File Name	Model	File Description	Standard Rule	Seed File	Critical File
Borders & Sheets	BDPLUW.dgn	default	UWHC Border for Plan Sheets when sheet is referenced	planrd	$(MX_SEEDIR)fdotseed2d.dgn	
Borders & Sheets	GNNTUW.dgn	default	UWHC General Notes Sheet	planrd	$(MX_SEEDIR)fdotseed2d.dgn	
Borders & Sheets	PLANUW.dgn	default	UWHC Plan Sheet	planrd	$(MX_SEEDIR)fdotseed2d.dgn	
Borders & Sheets	PLPRUW.dgn (UTEXRD.dgn)	default	UWHC Plan & Profile Sheet	plprrd	$(MX_SEEDIR)fdotseed2d.dgn	
Borders & Sheets	PROFUW.dgn	default	UWHC Profile Sheet	plprrd	$(MX_SEEDIR)fdotseed2d.dgn	
Clipping	CLIPUW.dgn	default	UWHC Clip Borders	cliprd	$(MX_SEEDIR)fdotseed2d.dgn	
Clipping	MTPLUW.dgn	default	Motif files for plan sheets	planrd	$(MX_SEEDIR)fdotseed2d.dgn	
Clipping	MTPRUW.dgn	default	Motif files for profile sheets	plprrd	$(MX_SEEDIR)fdotseed2d.dgn	
Existing Topography	TOPOUW.dgn	default	UWHC Topography - Existing (Utilities or Drainage not included)	topord	$(MX_SEEDIR)fdotseed2d.dgn	
Key Sheet	KEYSUW.dgn	default	UWHC Key Sheet	keysht	$(MX_SEEDIR)fdotseedkeymap.dgn	

File Type	File Name	Model	File Description	Standard Rule	Seed File	Critical File
Proposed Design	TEXTUW.dgn	default	UWHC Text Labels and Miscellaneous Descriptions	planrd	$(MX_SEEDIR)fdotseed2d.dgn	
Utilities	UTADUW.dgn (UTADRD.dgn)	default	UWHC Utility Adjustment Sheet	utadrd	$(MX_SEEDIR)fdotseed2d.dgn	
Utilities	UTDTUW.dgn	default	UWHC Special Details	open	$(MX_SEEDIR)fdotseed2d.dgn	
Utilities	UTEXUW.dgn (UTEXRD.dgn)	default	UWHC Utilities - Existing	utexrd	$(MX_SEEDIR)fdotseed2d.dgn	X
Utilities	UTPRUW.dgn (UTPRRD.dgn)	default	UWHC Utilities - Proposed	utprrd	$(MX_SEEDIR)fdotseed2d.dgn	X
Verified Utilities	SBVHUW.dgn	default	UWHC Summary of Verified Utilities (2D)	planrd	$(MX_SEEDIR)fdotseed2d.dgn	
Verified Utilities	UTVHUW.dgn	default	UWHC Survey of Verified Utilities (3D version of UTEXRD.dgn)	utexrd	$(MX_SEEDIR)fdotseed3d.dgn	X

19.5 UTILITY PLANS

Major highway construction elements such as pavement areas, bridges, drainage structures, right of way, lane widths, control of access limits and highway-straight-line numbers should appear in the Utility plans.

The FDOT plans marked by the UAO shall use the following color code:

- ***Red:*** Existing utilities either (a) to be removed or relocated horizontally or (b) to be placed out-of-service (deactivated) but left in place.
- ***Green:*** Existing utilities to remain in place with no adjustment.
- ***Brown:*** Either (a) existing utilities to be adjusted vertically but to remain in the same horizontal alignment, or (b) completely new utilities to be installed.

One set of the plans should be returned to the Department with each copy of the Utility Agreement.

19.6 ASCII File Name Conventions

The file naming convention for this input file will be utilex**.inp for existing utilities and utilpr**.inp for proposed utilities. The ** will be replaced by a sequencing number (01, 02, 03 etc.). Each electronic ASCII report file will be stored on media according to the FDOT CADD Deliverable Standards. This media will bear a label with the name of every input file, the utility owner's name, date, state project number and contact person's name and telephone number. When delivery is made, the ASCII report will be accompanied by a printed hardcopy. Provided are four examples of input files. Two examples are of Station/Offset and two are of Northing/Easting, each with and without explicit elevations or depth of cover.

19.6.1 ASCII HEADER CONVENTION

These files will follow a standard format and its header is described below:

1. "Name:" -- Utility owner's name.
2. "Date:" -- Month, Day, Year and optionally, the Time.
3. "Proj:" -- Project Financial Number
4. "Type:" -- Type of utility (Existing or proposed).
5. "File:" -- Filename
6. "Cont:" -- Utility owner's contact person responsible for creating the report.
7. "Note:" -- Any additional information that will describe the utility.

19.6.2 FORMAT OF STATION AND OFFSET ASCII FILE

The Station Offset Report method consists of generating a report, which will locate key utility points along a defined alignment. The report will store those points in the form of a utility chain.

Example of point location: LOC 10020 ON CHA blsr54 STA 18+89.760 OFF -8.534 $BT100

Format of the Command: LOCATE n ON CHAIN name STA station OFF offset $description

LOC	Initiates the locate command.
N	Determines the utility point number (begin with 10,000).
ON	Determines how to locate the utility point.
CHA	Initiates the read chain name command.
NAME	Describes the chain name, usually of the survey baseline, that is provided by FDOT.
STA	Initiates the find station command.
Station	Display's the utility point's station location.
OFF	Initiates the offset distance command.
Offset	The offset distance value, "+" for positive to the right and "-"for negative to the left, to the chain.
Description	The description has two options, the first showing the EL option with a defined elevation and the feature code. The second option shows the feature code and a defined depth of cover.

- **Example of Station Offset Option 1, Defined Elevation**

  LOC 10029 ON CHA blsr54 STA 19+79.818 OFF -8.530 $ EL 2.806000 BT100

The above statement locates point 10029 on chain blsr54 at station19+79.818 left 8.530 at elevation 2.80600 as a feature BT100 or Buried Telephone 100 pair.

- **Example of Station Offset Option 2, Fixed Depth of Cover**

  LOC 10020 ON CHA blsr54 STA 18+89.760 OFF -8.534 $ BT12

The above statement locates point 10020 on chain blsr54 at station 18+89.760 left 8.534 as a feature BT12 or Buried Telephone 12 pair. In the header of the file, there is a line that states the depth of cover. "All elevations assume a 0.750 meter depth of cover."

- **The Store Chain Command**

The store chain command will store a range of points as a utility chain. It provides the point range, the chain name and the feature that describe the utility chain. The format is shown below:

Command	STO CHA BT50A 10020 - 10023 $ BT50 list: BT1 - BT4
Format	STORE CHAIN name list $description
Store	Initiates the Store Chain Command.
Chain	Initiates the Read Chain Name Command.
Name	Names the Utility Chain (BT12 etc.).
Range	Defines a range of stores utility points.
$ Comment	Initiates a comment insertion.
Description	Describes the list of utility point numbers, which make the utility chain.

19.6.3 FORMAT OF NORTHING AND EASTING ASCII FILE

The Northing and Easting report method consists of generating a report which stores key utility points according to their relative State Plane Coordinates (X, Y, and Z) and stores this information in the form of a utility chain.

The store point command is shown below:

Command	S 10020 N 430059.370000 E 127421.085000 EL 2.513 $ BT100
Format	Store n N northing E easting EL elevation $description
S	Initiates the Store Point command.
n	Defines the utility point number (above 10,000).
N	Initiates the read Northing command.
Northing	Establishes the Y, horizontal coordinate.
E	Initializes the read Easting command.
Easting	Establishes the X, horizontal coordinate.
EL	Initiates either the read elevation command or uses a defined depth of cover.
Elevation	The Elevation argument has two options, the EL option with a defined read elevation. Second option is a defined depth of cover.
Description	This describes the utility feature code.

- **Example of Nothing Easting Option 1, Defined Elevation**

  S 10020 N 430059.370000 E 127421.085000 EL 2.513000 $ BT12

The above statement stores the point 10020 at 127421.085000/430059.370000 (X, Y) at elevation 2.513000 with a feature code of BT12 (Buried Telephone 12 pair).

- **Example of Northing Easting Option 2, Fixed Depth of Cover**

  S 10020 N 430059.370000 E 127421.085000 $ BT12

The above statement stores the point 10020 at 127421.085000/430059.370000 (X, Y) at a given depth of cover with a feature code of BT12 (Buried Telephone 12 pair).

- **The Store Chain Command**

The store chain command will store a range of points as a utility chain. It provides the point range, chain name and the feature that describes the utility chain. The format is shown below:

Command	STO CHA BT50A 10020 - 10023 $ BT50 list: BT1 - BT4
Format	STORE CHAIN name list $ description
Store	Initiates the Store Chain Command.
Chain	Initiates the Read Chain Name Command.
Name	Names the Utility Chain (BT12 etc.).
Range	Defines a range of stores utility points.
$ Comment	Initiates a comment insertion.
Description	Describes the list of utility point numbers, which make the utility chain.

19.6.4 ASCII INPUT FILE EXAMPLES

- **Northing Easting, no elevation**

```
$*********************************************************$
$************ Name: General Telephone Company *************$
$************ Date: Nov 5, 1999 08:00:00      *************$
$************ Proj: c:\proj\14570\1519        *************$
$************ Type: Existing Buried Telephone *************$
$************ File: utilex04.inp (Metric)     *************$
$************ Cont: Alex Bell (813) 975-6000  *************$
$ Note: All elevations assume a 0.750 meter depth of cover $
$*********************************************************$
S 10020 N 430059.370000  E 127421.085000  $ BT1
S 10021 N 430059.342000  E 127420.188000  $ BT2
S 10022 N 430058.733000  E 127420.235000  $ BT3
S 10023 N 430058.772000  E 127421.112000  $ BT4
S 10024 N 430025.015000  E 127425.677000  $ BT5
S 10025 N 430024.463000  E 127425.921000  $ BT6
S 10026 N 430024.120000  E 127425.150000  $ BT7
S 10027 N 430024.711000  E 127424.906000  $ BT8
S 10028 N 430010.203000  E 127442.371000  $ BT9
S 10029 N 430010.404000  E 127441.806000  $ BT10
S 10030 N 430009.593000  E 127441.488000  $ BT11
S 10031 N 430009.365000  E 127442.088000  $ BT12
S 10032 N 430011.003000  E 127472.172000  $ BT13
S 10033 N 430010.111000  E 127472.198000  $ BT14
S 10034 N 430010.091000  E 127471.575000  $ BT15
S 10035 N 430010.963000  E 127471.555000  $ BT16
S 10036 N 429939.130000  E 127431.218000  $ BT17
S 10037 N 429939.202000  E 127432.171000  $ BT18
S 10038 N 429940.582000  E 127432.122000  $ BT19
S 10039 N 429940.518000  E 127431.231000  $ BT20
S 10040 N 429974.677000  E 127481.061000  $ BT25
S 10041 N 429974.731000  E 127481.671000  $ BT26
S 10042 N 429973.882000  E 127481.730000  $ BT27
S 10043 N 429973.821000  E 127481.144000  $ BT28

$ BT50 list: BT1-BT4
STO CHA BT50A 10020-10023

$ BT75 list: BT17-BT20
STO CHA BT75A 10036-10039

$ BT100 list: BT5-BT8
STO CHA BT100A 10024-10027

$ BT200 list: BT9-BT12
STO CHA BT200A 10028-10031

$ BT300 list: BT13-BT16
STO CHA BT300A 10032-10035

$ BT400 list: BT25-BT28
STO CHA BT400A 10040-10043
```

- **Northing and Easting Example with Elevation**

```
$*********************************************************$
$************ Name: General Telephone Company ************$
$************ Date: Nov 5, 1999 08:00:00      ************$
$************ Proj: c:\proj\14570\1519        ************$
$************ Type: Existing Buried Telephone ************$
$************ File: utilex03.inp (Metric)     ************$
$************ Cont: Alex Bell (813) 975-6000  ************$
$*********************************************************$
S 10020 N 430059.370000  E 127421.085000  EL 2.513000  $ BT1
S 10021 N 430059.342000  E 127420.188000  EL 2.532000  $ BT2
S 10022 N 430058.733000  E 127420.235000  EL 2.533000  $ BT3
S 10023 N 430058.772000  E 127421.112000  EL 2.502000  $ BT4
S 10024 N 430025.015000  E 127425.677000  EL 2.483000  $ BT5
S 10025 N 430024.463000  E 127425.921000  EL 2.470000  $ BT6
S 10026 N 430024.120000  E 127425.150000  EL 2.517000  $ BT7
S 10027 N 430024.711000  E 127424.906000  EL 2.530000  $ BT8
S 10028 N 430010.203000  E 127442.371000  EL 2.793000  $ BT9
S 10029 N 430010.404000  E 127441.806000  EL 2.806000  $ BT10
S 10030 N 430009.593000  E 127441.488000  EL 2.800000  $ BT11
S 10031 N 430009.365000  E 127442.088000  EL 2.788000  $ BT12
S 10032 N 430011.003000  E 127472.172000  EL 2.564000  $ BT13
S 10033 N 430010.111000  E 127472.198000  EL 2.576000  $ BT14
S 10034 N 430010.091000  E 127471.575000  EL 2.563000  $ BT15
S 10035 N 430010.963000  E 127471.555000  EL 2.551000  $ BT16
S 10036 N 429939.130000  E 127431.218000  EL 2.310000  $ BT17
S 10037 N 429939.202000  E 127432.171000  EL 2.250000  $ BT18
S 10038 N 429940.582000  E 127432.122000  EL 2.286000  $ BT19
S 10039 N 429940.518000  E 127431.231000  EL 2.266000  $ BT20
S 10040 N 429974.677000  E 127481.061000  EL 2.671000  $ BT25
S 10041 N 429974.731000  E 127481.671000  EL 2.639000  $ BT26
S 10042 N 429973.882000  E 127481.730000  EL 2.698000  $ BT27
S 10043 N 429973.821000  E 127481.144000  EL 2.679000  $ BT28

$ BT50 list: BT1-BT4
STO CHA BT50A 10020-10023

$ BT75 list: BT17-BT20
STO CHA BT75A 10036-10039

$ BT100 list: BT5-BT8
STO CHA BT100A 10024-10027

$ BT200 list: BT9-BT12
STO CHA BT200A 10028-10031

$ BT300 list: BT13-BT16
STO CHA BT300A 10032-10035

$ BT400 list: BT25-BT28
STO CHA BT400A 10040-10043
```

- **Station Offset Example with Assumed Depth of Cover**

```
$*************************************************************$
$************ Name: General Telephone Company  ************$
$************ Date: Nov 5, 1999 08:00:00       ************$
$************ Proj: c:\proj\14570\1519         ************$
$************ Type: Existing Buried Telephone  ************$
$************ File: utilex02.inp (Metric)      ************$
$************ Cont: Alex Bell (813) 975-6000   ************$
$ Note: All elevations assume a 0.750 meter depth of cover $
$*************************************************************$
LOC 10020 ON CHA blsr54 STA 18+89.760 OFF -8.534  $ BT1
LOC 10021 ON CHA blsr54 STA 18+99.818 OFF -8.530  $ BT2
LOC 10022 ON CHA blsr54 STA 19+09.018 OFF -8.524  $ BT3
LOC 10023 ON CHA blsr54 STA 19+19.018 OFF -8.540  $ BT4
LOC 10024 ON CHA blsr54 STA 19+29.760 OFF -8.534  $ BT5
LOC 10025 ON CHA blsr54 STA 19+39.818 OFF -8.530  $ BT6
LOC 10026 ON CHA blsr54 STA 19+49.018 OFF -8.524  $ BT7
LOC 10027 ON CHA blsr54 STA 19+59.018 OFF -8.540  $ BT8
LOC 10028 ON CHA blsr54 STA 19+69.760 OFF -8.534  $ BT9
LOC 10029 ON CHA blsr54 STA 19+79.818 OFF -8.530  $ BT10
LOC 10030 ON CHA blsr54 STA 19+89.018 OFF -8.524  $ BT11
LOC 10031 ON CHA blsr54 STA 19+99.018 OFF -8.540  $ BT12
LOC 10032 ON CHA blsr54 STA 20+09.760 OFF -8.534  $ BT13
LOC 10033 ON CHA blsr54 STA 20+19.818 OFF -8.530  $ BT14
LOC 10034 ON CHA blsr54 STA 20+29.018 OFF -8.524  $ BT15
LOC 10035 ON CHA blsr54 STA 20+39.018 OFF -8.540  $ BT16
LOC 10036 ON CHA blsr54 STA 19+49.760 OFF +8.534  $ BT17
LOC 10037 ON CHA blsr54 STA 19+59.818 OFF +8.530  $ BT18
LOC 10038 ON CHA blsr54 STA 19+69.018 OFF +8.524  $ BT19
LOC 10039 ON CHA blsr54 STA 19+79.018 OFF +8.540  $ BT20
LOC 10040 ON CHA blsr54 STA 19+89.760 OFF +8.534  $ BT25
LOC 10041 ON CHA blsr54 STA 19+99.818 OFF +8.530  $ BT26
LOC 10042 ON CHA blsr54 STA 20+09.018 OFF +8.524  $ BT27
LOC 10043 ON CHA blsr54 STA 20+19.018 OFF +8.540  $ BT28

$ BT50 list: BT1-BT4
STO CHA BT50A 10020-10023

$ BT75 list: BT17-BT20
STO CHA BT75A 10036-10039

$ BT100 list: BT5-BT8
STO CHA BT100A 10024-10027

$ BT200 list: BT9-BT12
STO CHA BT200A 10028-10031

$ BT300 list: BT13-BT16
STO CHA BT300A 10032-10035

$ BT400 list: BT25-BT28
STO CHA BT400A 10040-10043
```

- **Station Offset Example with Elevation**

```
$*********************************************************$
$************ Name: General Telephone Company ************$
$************ Date: Nov 5, 1999 08:00:00      ************$
$************ Proj: c:\proj\14570\1519        ************$
$************ Type: Existing Buried Telephone ************$
$************ File: utilex01.inp (Metric)     ************$
$************ Cont: Alex Bell (813) 975-6000  ************$
$*********************************************************$
LOC 10020 ON CHA blsr54 STA 18+89.760 OFF -8.534    $ EL 2.513000  BT1
LOC 10021 ON CHA blsr54 STA 18+99.818 OFF -8.530    $ EL 2.532000  BT2
LOC 10022 ON CHA blsr54 STA 19+09.018 OFF -8.524    $ EL 2.533000  BT3
LOC 10023 ON CHA blsr54 STA 19+19.018 OFF -8.540    $ EL 2.502000  BT4
LOC 10024 ON CHA blsr54 STA 19+29.760 OFF -8.534    $ EL 2.483000  BT5
LOC 10025 ON CHA blsr54 STA 19+39.818 OFF -8.530    $ EL 2.470000  BT6
LOC 10026 ON CHA blsr54 STA 19+49.018 OFF -8.524    $ EL 2.517000  BT7
LOC 10027 ON CHA blsr54 STA 19+59.018 OFF -8.540    $ EL 2.530000  BT8
LOC 10028 ON CHA blsr54 STA 19+69.760 OFF -8.534    $ EL 2.793000  BT9
LOC 10029 ON CHA blsr54 STA 19+79.818 OFF -8.530    $ EL 2.806000  BT10
LOC 10030 ON CHA blsr54 STA 19+89.018 OFF -8.524    $ EL 2.800000  BT11
LOC 10031 ON CHA blsr54 STA 19+99.018 OFF -8.540    $ EL 2.788000  BT12
LOC 10032 ON CHA blsr54 STA 20+09.760 OFF -8.534    $ EL 2.564000  BT13
LOC 10033 ON CHA blsr54 STA 20+19.818 OFF -8.530    $ EL 2.576000  BT14
LOC 10034 ON CHA blsr54 STA 20+29.018 OFF -8.524    $ EL 2.563000  BT15
LOC 10035 ON CHA blsr54 STA 20+39.018 OFF -8.540    $ EL 2.551000  BT16
LOC 10036 ON CHA blsr54 STA 19+49.760 OFF +8.534    $ EL 2.310000  BT17
LOC 10037 ON CHA blsr54 STA 19+59.818 OFF +8.530    $ EL 2.250000  BT18
LOC 10038 ON CHA blsr54 STA 19+69.018 OFF +8.524    $ EL 2.286000  BT19
LOC 10039 ON CHA blsr54 STA 19+79.018 OFF +8.540    $ EL 2.266000  BT20
LOC 10040 ON CHA blsr54 STA 19+89.760 OFF +8.534    $ EL 2.671000  BT25
LOC 10041 ON CHA blsr54 STA 19+99.818 OFF +8.530    $ EL 2.639000  BT26
LOC 10042 ON CHA blsr54 STA 20+09.018 OFF +8.524    $ EL 2.698000  BT27
LOC 10043 ON CHA blsr54 STA 20+19.018 OFF +8.540    $ EL 2.679000  BT28

$ EL 2.000000 BT50 list: BT1-BT4
STO CHA BT50A 10020-10023

$ EL 2.000000 BT75 list: BT17-BT20
STO CHA BT75A 10036-10039

$ EL 2.000000 BT100 list: BT5-BT8
STO CHA BT100A 10024-10027

$ EL 2.000000 BT200 list: BT9-BT12
STO CHA BT200A 10028-10031

$ EL 2.000000 BT300 list: BT13-BT16
STO CHA BT300A 10032-10035

$ EL 2.000000 BT400 list: BT25-BT28

STO CHA BT400A 10040-10043
```

19.7 UTILITY SCANNED IMAGES

If the utilities are handled through a joint utility agreement and electronic files are not provided to the District for the Utility plans, the paper plans must be scanned. The format must be a published format with a minimum resolution of 300DPI. The preferred formats are Adobe PDF or Group 4 TIFFS.