

**Computer Aided Design and Drafting (CADD)  
Standards Manual**



**MARCH 2017**

**THE ILLINOIS STATE TOLL HIGHWAY AUTHORITY**



The Computer Aided Design and Drafting (CADD) Standards Manual dated March 2017 replaces the previous version dated March 2016.

### **Major Highlight Revisions**

- Introduction: Revisions per Workspace and DRAFT IDOT CADD Manual updates
- Maintenance of Standards: Revisions per DRAFT IDOT CADD Manual updates
- Section G: Settings updates
- Section I Design and Survey Workspace - New
- Section J Superelevation – New
- Section K SUE/SUDA – New
- Section L Cross Sections – New
- Section M Revised naming convention per Workspace
- Section N Template Library - New
- Appendix D: Level Library - New

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## INTRODUCTION

This mission of the Illinois Tollway is to provide and promote a safe and efficient system of highways while ensuring the highest possible level of service to its customers. The successful project has efficient and fluid communication, and stays on budget and schedule. For this to occur, it is of the utmost important that plan sets developed by consultants are accurate, uniform, and easy to follow. For these reasons, it is essential that a common set of CADD standards are established and utilized.

The purpose of this manual is to provide general guidance for the preparation of Illinois Tollway drawings using MicroStation PowerGEOPAK V8i SELECTseries 4 . This manual assumes the CADD user is familiar with the software and makes no attempt to instruct the user on specific commands. It is intended to supplement other state and national drafting reference guides, and users should reference these sources for training or detailed instruction.

The Illinois Tollway's workspace should be referenced for roadway and bridge design. In cases where building designs include architectural, mechanical, and interior electrical design, the NCS CAD Standard may be followed for drafting. The Illinois Tollway workspace was designed as a guide for engineering consultants. The Illinois Tollway encourages ingenuity; therefore, if the designer believes [UK1]he/she has a more efficient way of completing the project, this should be discussed with the Illinois Tollway Project Manager before deviating from these standards. As of the publication date of this manual, all projects shall be required to comply with the standards and guidelines established herein.

The "CADD Standards Manual" is prepared and distributed by the Illinois Tollway. This manual is compliant with the Design Section Engineer's (DSE) Manual and Construction Manager (CM) Manual. This document supersedes the ICAPP manual. It is intended to be a new guideline and is not a revision to the discontinued ICAPP manual. With IDOT's recent release of the draft version of their new Computer Aided Design, Drafting, Modeling and Deliverables Manual, this CADD Standards Manual may be revised to reflect IDOT's final version.

## MAINTENANCE OF STANDARDS

The information and data described in the CADD Standards Manual is not intended to be a static document and is subject to change. Organizations exchanging Illinois Tollway data are responsible for ensuring that they are using the current version of these standards. This manual may be updated from time to time based on the following factors:

1. The Illinois Tollway deems it necessary to change or append their current standards.
2. The final version of IDOT's new Computer Aided Design, Drafting, Modeling and Deliverables Manual is released.
3. There are significant advances in technology or modifications to software that change the way drawings are produced.

Any questions or concerns regarding this manual should be directed to Tollway's Project Manager, who will forward the question/concern to the Illinois Tollway's CADD Manager.

More information may be found on the following web sites:

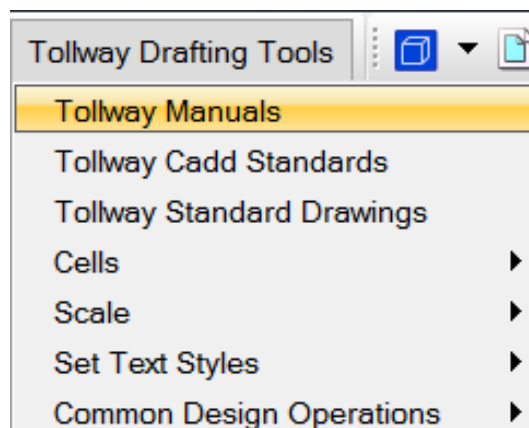
Illinois State Toll Highway Authority  
<http://www.illinoistollway.com>

Illinois Tollway CADD Standards  
<http://www.illinoistollway.com/doing-business/construction-engineering/manuals>

Illinois Department of Transportation  
<http://www.idot.illinois.gov/>

Bentley Systems, Inc.  
<http://www.bentley.com>

Illinois Tollway manuals, CADD standards, and standard drawings can also be accessed via the "Tollway Drafting Tools" dropdown menu within the workspace.





## Computer Aided Design and Drafting Standards

### A. General

The standards and guidelines detailed in this document are to be used on all CADD work produced for the Illinois Tollway. Each Design Section Engineer (DSE), Construction Manager (CM) and Permit Applicant shall be responsible for ensuring that the standards and guidelines are followed on their project. Existing CADD work obtained from other sources shall be converted to meet the guidelines established herein at no cost to the Illinois Tollway. Complete MicroStation and GEOPAK project files are required at the time of Final plan submittal.

### B. Program Software

The Illinois Tollway utilizes Bentley MicroStation PowerGEOPAK V8i SELECTseries 4 (08.11.09.878 or the most current version) as the CADD platform.

### C. Project Initiation

To begin an Illinois Tollway project the following steps should be taken:

1. Reference the latest version of the:
  - Illinois Tollway CADD Standards Manual.
  - IDOT CAD Manuals.
  - NCS CAD Standards Manual.
2. Collect any existing electronic files that may exist. The Illinois Tollway may have electronic files of the project area.
3. Download the latest version of the Illinois Tollway's workspace.
4. Use the appropriate Illinois Tollway seed file to create new design files as needed. The working units of these seed files are set to survey feet for the master units and survey inches for the sub-units.

### D. Resource Files

All resource files needed are included in the Illinois Tollway Workspace.

Illinois Tollway Workspace file location:

WBPM Folder: 0016 \ Documents \ Consultant Information \ CADD

or

<http://www.illinoistollway.com/doing-business/construction-engineering/manuals/>

## E. File Naming Convention

Naming conventions for electronic drawing files allow users to determine the contents of the file without actually displaying it. They also provide a convenient and clear structure for organizing drawing files within the project directory.

See Appendix A for File Naming Conventions.

## F. CAD File Concepts

There are two distinct types of MicroStation files, **Sheet** and **Design**.

1. **Sheet files** shall be used to assemble contract drawings. Each sheet file will produce one drawing for plotting and will contain references to the project border file and all necessary design files.
  - Sheet files may contain: design file references, north arrow, match lines, graphic scales, notes specific to the drawing, revision clouds, title block information and file name (locate in the lower left margin).
2. **Design files** are used for the design of project elements. These files will be created for plans, details, section and elevations. The elements in each design file shall be drawn true scale (1:1). Design files can contain multiple models, especially when using annotation scale and different scaled models are desired.
  - Design files can also be used as “container” or “model”. These files should not contain any elements. They group other design files together and create a nested reference scheme. The container/model can then be referenced into several different sheet files to produce the same look for each by controlling the level attributes in one place. A design team may choose to restrict the nesting depths of container files to affect sheet performance at their own discretion. Section 2-5 of the IDOT Computer Aided Design, Drafting, Modeling and Deliverables Manual offers additional guidance.

## G. Settings

Consider using the settings provided in the Illinois Tollway workspace. These settings include: but are not limited to: levels, features, text, dimensions, line styles, cell libraries, standard symbols, title blocks, borders, base sheets, and printing.

All text shall be vertical UPPERCASE lettering. Standard symbols such as section, detail and elevation callouts, and revision bubbles should be placed using the MicroStation “Detailing Symbols” menu.

**Note:** A new level naming convention has been implemented. See Appendix E for details.

## H. Submittal Requirements

See Illinois Tollway DSE Manual for submittal requirements.

## I. Design and Survey Workspace

There are two project settings within the workspace, and the workspace has been organized accordingly. The survey workspace is to be used for converting survey into visualized surface and existing conditions. The design workspace is to be used by designers and consultants for all proposed work. This allows for a distinct difference

between existing conditions and proposed design, and can be identified immediately through level names and cells.

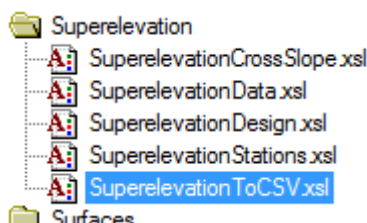
## J. Superelevation

Superelevation settings have been created to assist designers in developing superelevation along roadways, utilizing current Tollway and AASHTO standards. These settings shall be verified against the appropriate standards. The two superelevation settings files have been made for superelevation creation in SSR.

- 1) ILTOLLWAY-SUPERELEVATION-MAINLINE.sep  
To be used for mainline alignments using a design speed of 70 mph with an emax of 6%.
- 2) ILTOLLWAY-SUPERELEVATION-RAMP.sep  
To be used for all forms of ramps, including directional, for 6% and 8% emax for design speeds of 20, 25, 30, 35, 40, 45, and 50 mph.

To assist the stringless paving technologies, it is recommended that parabolic transitions are adopted for superelevation, in accordance with the Roadway Design Criteria. The following workflow has been identified as a method for achieving this:

- 1) Follow the superelevation general workflow, as specified in SS4 Help
  - a. Make sure the appropriate .sep file is selected when creating this
- 2) Create superelevation report, as specified in SS4 Help
- 3) Select "SuperelevationToCSV.xml"



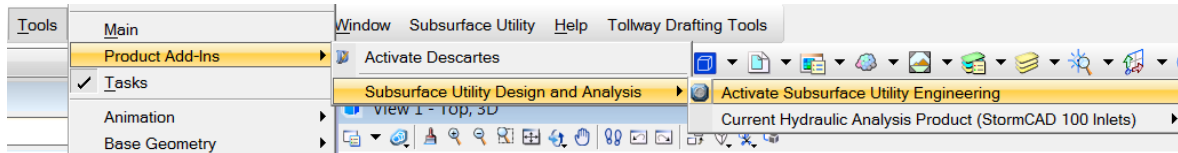
- 4) Copy contents of the report into a new .csv file
- 5) Change sixth column input in "Transition ID" from liner to parabolic
  - a. Enter PC for parabolic in place of L
- 6) Assign nonlinear curve length value to 70 for mainline or 50 for ramp in column 7
- 7) Re-import .csv via superelevation editor and verify changes have been made

Superelevation configuration settings have been set up for a design speed of 70 mph with 13 foot lanes. For assistance adjusting these settings, there are PDFs provided in the superelevation folder within the workspace. For assistance manipulating the .csv file, refer to IMPORT-SUPER-FORMAT.xlsx, located in Documents folder within the workspace.

## K. Subsurface Utility Engineering and Subsurface Utility Design and Analysis (SUE/SUDA)

SUDA is a new feature for modelling underground utilities. The Illinois Tollway has implemented several specific drainage items to utilize in the hydraulic modeling process. The workspace also features standard flex tables that can be utilized in projects to transfer data into plan sets. SUDA default settings can be modified in: ILTOLLWAY\SS4\DESIGN\ DGNLIB\ILTOLLWAY-LEVELS-HYDRAULIC SEED.dgnlib.

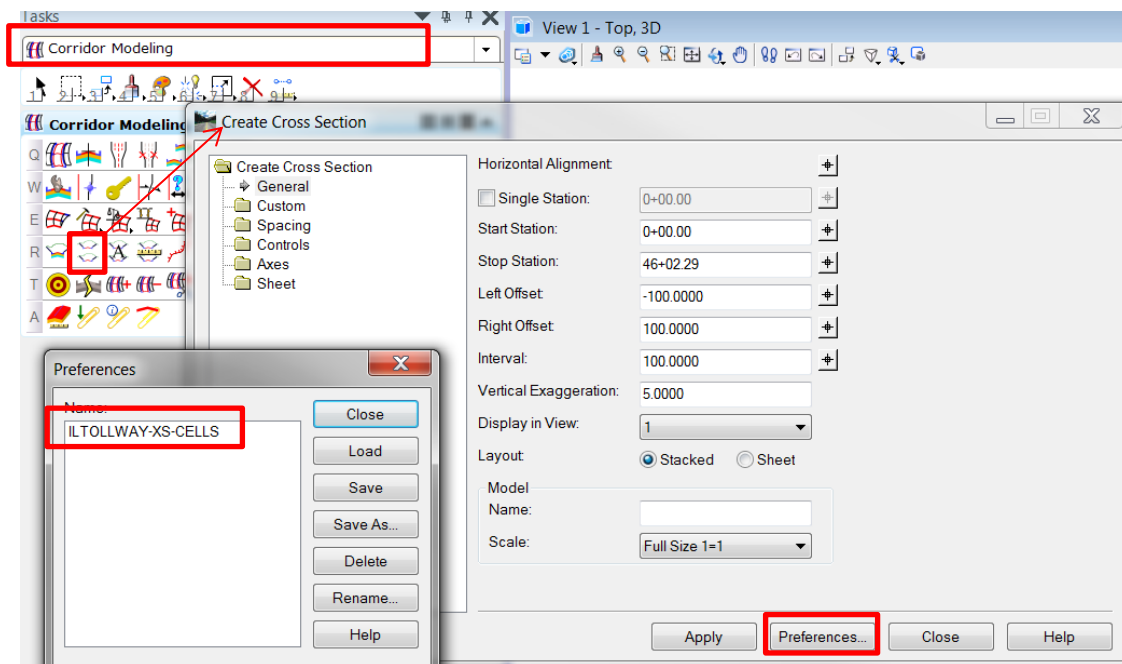
To launch the SUE/SUDA application, see the picture below. This menu bar also displays the current drainage software being used.



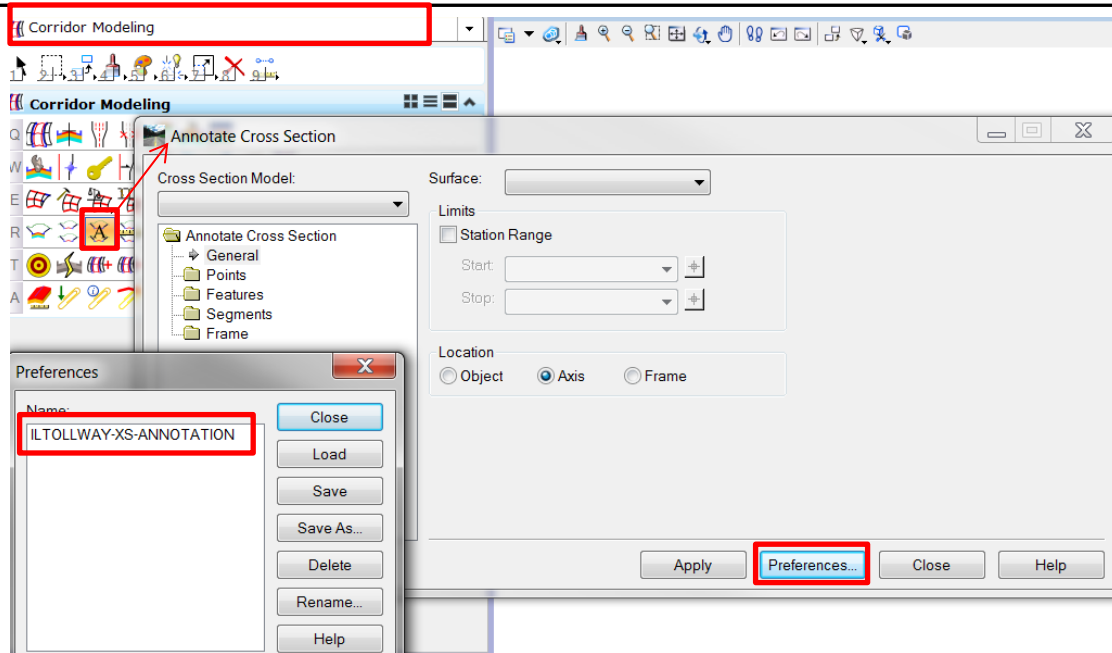
## L. Cross Sections

Cross section settings have been developed for Illinois Tollway's use within SS4. Instructions to load the settings are outlined below. It is recommended to use "stack layout" for cross sections to ensure the proper use of cross section sheeting set-up files and legacy labeling tools, including ancillary features.

To load cross section settings, select "Preferences" within the "Create Cross Section" command. Load the settings provided.

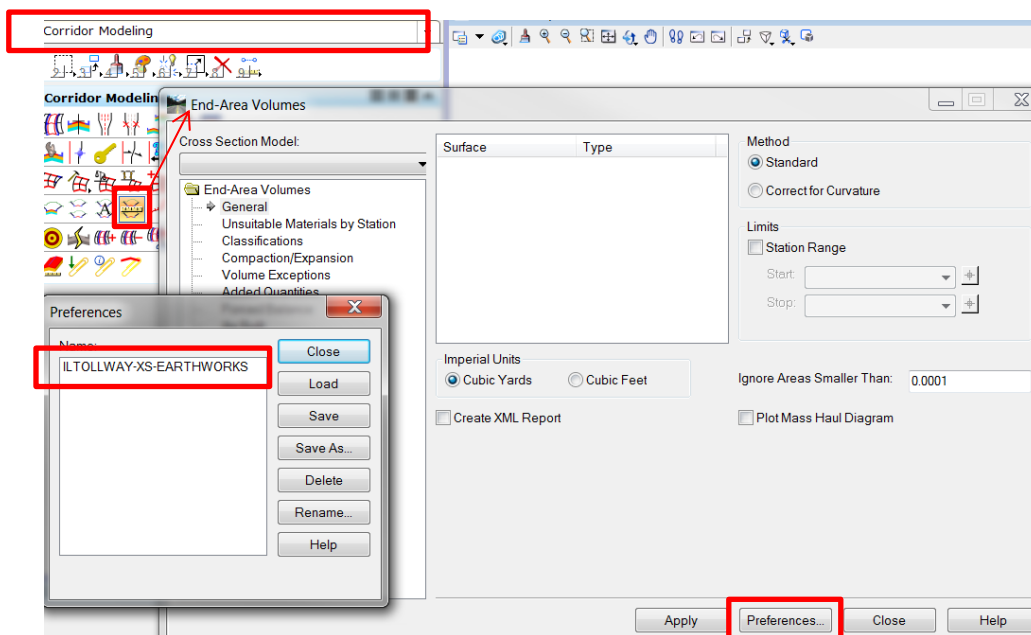


To load cross section annotation settings, select "Preferences" within the "Annotate Cross Section" command. Load the settings provided.



These annotation settings will annotate all desired points with elevation and offset from the alignment, as well as slopes between these points.

To load the end-area calculation settings, select “Preferences” within the “End-Area Volumes” command. Load the settings provided.



All cross section sheeting, annotation, and end area method preferences are found within the XIN file, located at ILTOLLWAY\SS4\DESIGN\MODELING\XIN\ILTOLLWAY-XIN-DESIGN.XIN.

## M. Naming Convention

Naming conventions that are inconsistent in its use of characters lead to lack of organization and quality. Standardized wording and alphanumeric usage are used to be

more intuitive and less prone to user error, especially on large jobs with multiple designers. With a standard naming convention, plan production, verification and quality control, and eventual contractor work can understand what each element represents. The Tollway has provided a method for naming alignments, profiles, and corridors, which is explained in the Documents folder in the workspace.

Key identifiers like what contract the alignment belongs to, the type of alignment it is, where it is, what road it belongs to, etc. all need to be named in such a way that the name is unique but easily identifiable to the designer, reviewer, and those constructing the project. The number of characters is also essential as MicroStation has limits in its name. The larger the name, the harder it is for users to quickly identify what the element is.

## **N. Template Library**

The Illinois Tollway has developed a standard template library covering general roadway components for use by designers to develop a proposed model. The template library is located at `ILTOLLWAY\SS4\DESIGN\MODELING\TEMPLATES\ILTOLLWAY-TEMPLATES-DESIGN.itl`. Operational instructions of the templates may be found within the Document folder in the workspace. The file is titled “ILTOLLWAY-TEMPLATE-OPERATIONS.xlsm.” This library may be modified per project as needed.

It is recommended that all templates that are built contain a component using the feature “XS-ZTP” which represents the top surface of the design, and a component using “XS-ZBT” which represents the bottom subgrade surface of the design. Customized graphic filters used for developing terrain models utilize these features. Grading models and earthwork surfaces can be developed quickly and efficiently due to these components because you can use one graphic filter to pick up one level. *Instead of picking different levels to determine the top surface, you should pick the same level.*

## **O. 3-D Engineered Models**

All 3-D Engineered Models shall be delivered as CADD, Breakline and Surface files, in the following formats:

- All CADD Models shall be provided in their native CADD format as well as 3-D DGN files.
- Breakline files shall be provided as a LandXML file. The “Export to Native” command in OpenRoads General Geometry tab will allow the user to convert breaklines to a LandXML file.
- Surface files shall be provided as a LandXML file. The “Export to File” command in OpenRoads Terrain Model tab will allow the user to convert a surface (terrain model) to a LandXML file.

## **P. Sheet Revisions**

After contract plans have been posted for bidding, revisions or changes to the plan sheets may be required in the form of an "Addendum" or "Construction Revision".

In the event that a sheet is to be added to the contract plans, the entire sheet shall be "bubbled" and noted as such in the description. When a sheet is to be removed from the contract plans, the entire sheet shall be "bubbled" and labeled as intentionally left blank. All other revisions shall only "bubble" the change, as depicted in the example in Appendix B.

## **Appendix A - File Naming Convention**



## Appendix A – File Naming Convention

File naming will follow the convention described below. Recognizing that using this naming convention may not cover all circumstances, if additional or unique file names are required, the file naming may be modified to accommodate the circumstances. If a new file name is needed that is not listed, please follow the template to create it.

### **Sheet files:**

####-sht-Description-###.dgn

Contract # =	Illinois Tollway Contract Number (for Contract “I-14-8944” use 8944)
sht =	Designates that it is a sheet file
Description =	Brief word to describe the file
File # =	File Number

Example: **8944-sht-typical-001.dgn** (Typical Sheet Example for contract I-14-8944)

### **Design files:**

####-Description.dgn

Contract # =	Illinois Tollway Contract Number (for Contract “I-14-8944” use 8944)
Description =	Brief word to describe the file

Example: **8944-align.dgn** (Survey Alignment Design file for Contract I-14-8944)

### **Description Examples**

#### **General**

asphalt	Asphalt Selection Chart
border	Border Sheet
cover	Cover Sheet
dowel	Dowel Bar Layout Sheet
gennote	General Notes
index	Index of Sheets
lgnd	lgnd Symbol Legend & Abbreviations
key	Key Map
schprog	Suggested Progress Schedule
schew	Earthwork Schedule
schqty	Schedule of Quantities
seals	Professional Seals and Signatures
soq	Summary of Quantities
typical	Typical Sections

## **Surveying**

aerial	Aerial Survey and Mapping Plan
align	Alignment Data File
contour	Existing Contours Plan
gshot	XYZ ground shots file
lgndsur	Survey Legend
poh	Plat of Highways Plan
row	Land Acquisition work file
topo	Topography plan conditions of project area

## **MOT**

mot#	Maintenance of Traffic Plan - Stage #
mot#label	Maintenance of Traffic Label Plan - Stage #
motdetour	Maintenance of Traffic Detour Plan
motnote	Maintenance of Traffic General Notes & Sequence of Construction
motsign	Maintenance of Traffic Signing Details

## **Roadway**

3Dmodel	3D Model
lgndrdy	Roadway Legend
lgndrem	Removal Legend
rdy	Roadway Plan
rdydetail	Roadway Details
rdylabel	Roadway Labeling
rdynote	Roadway General Notes
rdyprf	Roadway Profile
rem	Existing Roadway & Removal Plan
remlabel	Removal Labeling

## **Pavement Jointing/Elevations & Grading**

3Dfg	3D Proposed Finish Grade
3Dsg	3D Proposed Sub-grade
goreelev	Gore Elevation Details
lgndpvtjoint	Pavement Jointing Legend
pvtlev	Pavement Elevation Plan
pvtjoint	Pavement Jointing Plan
grading	Grading Plan

## **Pavement Marking & Signing**

lgndpmk	Pavement Marking Legend
lgndsigns	Signing Legend
pmk	Pavement Marking Plan
pmklabel	Pavement Marking Labeling
pmknote	Pavement Marking Notes
signs	Roadway Signing
signslabel	Roadway Signing Labels
signsnote	Roadway Signing Notes

## **Cross Sections**

xsc	
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## Landscaping & Erosion Control

eros	Erosion and Sediment Control Plan
eros0	Initial Erosion Control Plan
eros0label	Initial Erosion Control Plan
eros#	Erosion Control Plan – Stage #
eros#label	Erosion Control Plan – Stage #
eroslabel	Erosion and Sediment Control Plan
erosnote	Erosion and Sediment Control Notes
erossch	Erosion Control Schedule of Quantities
lgnderos	Erosion and Sediment Control Legend
lgndlndscp	Landscaping Legend
lndscp	Landscaping Sheets
lndscpdetail	Landscaping Details
lndscplabel	Landscaping Labeling
lndscpnote	Landscaping Notes
lndscpsch	Landscaping Schedule of Quantities
wetland	WOUS & Wetland Delineation File

## Drainage

drain	Drainage Plan
drainbdyex	Existing Drainage Boundaries
drainbdypr	Proposed Drainage Boundaries
draindetail	Drainage Details
drainlabel	Drainage Labeling
drainnote	Drainage General Notes
drainprf	Drainage Profile
drainrem	Existing Drainage and Removals
drainremlabel	Drainage Removal Labeling
drainsch	Drainage Schedule
lgnddrain	Drainage Legend
lgnddrainrem	Drainage Removal Legend
lgndundrn	Pipe Underdrain Legend
undrn	Pipe Underdrain Plan
undrnlabel	Pipe Underdrain Labeling
undrnsch	Pipe Underdrain Schedule

## Utilities

lgndutil	Utility Legend
sue	Sub-surface Utility Engineering
util	Utility Plan (Water, Sanitary Sewer, Storm Sewer, Power, Fiber Optic, Telephone, Cable TV, Natural Gas, Communications, ITS & Toll Collection)
utildetail	Utility Details
utillabel	Utility Labeling
utilmatrix	Utility Matrix
utilnote	Utility General Notes
utilprf	Utility Profile
utilrem	Utility Removals

### **Intelligent Transportation System**

fo	Fiber Optic Plan
fodetail	Fiber Optic Details
folabel	Fiber Optic Labeling
its	Intelligent Transportation System
itsdetail	ITS Details
itslabel	ITS Labeling
itsnote	ITS General Notes
itssch	ITS Schedule of Quantities
lgndits	ITS Legend
lgndtoll	Toll Collection Legend
toll	Toll Collection Plaza Plans
tolldetail	Toll Collection Plaza Details
tollsch	Toll Collection Schedule of Quantities

### **Roadway Lighting**

light	Roadway Lighting Plan
lightdetail	Lighting Details
lightlabel	Lighting Labeling
lightnote	Lighting General Notes
lightsch	Lighting Schedule of Quantities
lgndlight	Lighting Legend
lgndtlight	Temporary Lighting Legend
tlight	Temporary Roadway Lighting Plan
tlightdetail	Temporary Lighting Details
tlightlabel	Temporary Lighting Labeling
tlightsch	Temporary Lighting Schedule of Quantities

### **Traffic Signals**

Intersec	Intersection Detail Sheets
ts	Traffic Signal Plans
tsdetails	Traffic Signal Details
tslabels	Traffic Signal Labels
tssch	Traffic Signal Schedule of Quantities
tts	Temporary Traffic Signal Plans
ttsdetails	Temporary Traffic Signal Details
tslabels	Temporary Traffic Signal Labels

## **Structural**

abut	Abutment (Plan, Elevation, Sections and Details)
anchbolt	Anchor Bolt Details
apprslab	Approach Slab Details
barrier	Barrier Details
barsplice	Bar Splicer Assembly
bcr	Bridge Condition Report
bearing	Expansion and Fixed Bearing Details
boring	Soil Boring Logs
cantilever	Cantilever Forming Brackets
deck	Deck (Plan, Sections and Details)
demo	Demolition
diaphragm	Diaphragm Details
expjoint	Expansion Joint Details
exstr	Existing Structures
fndtn	Foundation Plan Footing Layout
frame	Girder & Framing Plan
gpe	General Plan and Elevation
grdrelev	Girder Elevations (Camber Table, Moment Table)
nwall	Noise Abatement Wall
parapet	Parapet (Elevations and Details)
pier	Pier (Plan & Elevation and Details)
railing	Railing Details
rwall	Retaining Wall
staging	Construction Staging
stldtl	Steel Details
strucdrain	Drainage (System Details and Scupper Details)
strucnote	Structures Data (General Notes, Bill of Material, Index of Drawings)
strucrem	Existing Structural Removal
strucrpt	Structural Project Reports
strucsch	Structural Schedule
strucsec	Structural Section
topSlab	Top of Slab (Elevation Locations and Tables)
tsl	Type Size Location
xframe	Cross Frame Details

## **Soil Boring Logs**

blog	Boring Log Sheets
soil	Soil Report Plan Sheets

## **Buildings**

archdemo	Architectural Demolition
archdtl	Architectural Details
archelev	Architectural Elevation
archenlrg	Architectural Enlarged
archeqpt	Architectural Equipment
archex	Architectural Existing
archfloor	Architectural Floor Plan
archlgnd	Architectural Legend
archschedl	Architectural Schedule
archsctn	Architectural Sections
archroof	Architectural Roof Plan
elecauxlrypwr	Electrical Auxiliary Power
elecdemo	Electrical Demolition
elecldgrm	Electrical Diagram
elecddl	Electrical Detail
elecex	Electrical Existing
elecldghtng	Electrical Lighting
elecldgnd	Electrical Legend
elecschedl	Electrical Schedule
elecutltys	Electrical Utilities
elecpower	Electrical Power Plan
elecsplsystem	Special Systems Plan
mechhvac	Mechanical HVAC
mechdemo	Mechanical Demolition
mechldgrm	Mechanical Diagram
mechddl	Mechanical Detail
mechelev	Mechanical Elevation
mechenlrg	Mechanical Enlarged
mecheqpmnt	Mechanical Equipment
mechex	Mechanical Existing
mechldgnd	Mechanical Legend
mechschedl	Mechanical Schedule
mechsctn	Mechanical Section
plumdemo	Plumbing Demolition
plumldgrm	Plumbing Diagram
plumddl	Plumbing Detail
plumelev	Plumbing Elevation
plumenlrg	Plumbing Enlarged
plumeqpmnt	Plumbing Equipment
plumex	Plumbing Existing
plumlnd	Plumbing Legend
plumschedl	Plumbing Schedule
plumsctn	Plumbing Section
plumbing	Plumbing
piping	Special Piping

For Alternate designs, Staging, Structure numbers, Master Model files and Multiple discipline sheets, characters shall be added to the end of the file name as needed.

Examples:

Alternates for a design plan = "8944-plan-a.dgn" and "8944-plan-b.dgn"

Staging for Maintenance of Traffic

MOT Stage 1 = "8944-mot1.dgn"

MOT Stage 2 = "8944-mot2.dgn"

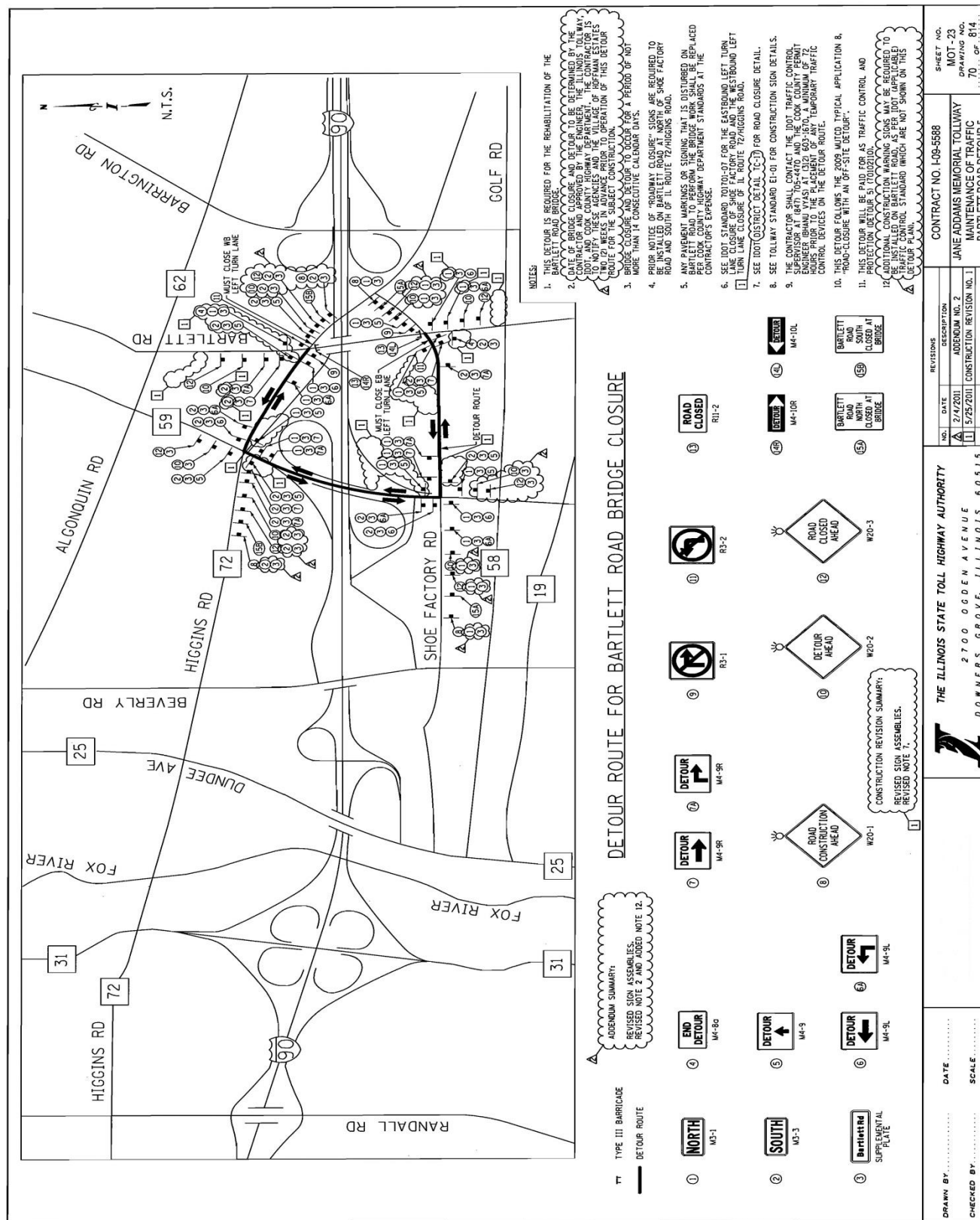
Master Model = "8944-mod-mot3.dgn" and "8944-mod-drain.dgn"

Multiple Structures = "8944-1968.dgn" and "8944-1971.dgn"  
"8944-sht-1968-001-gpe.dgn" and "8944-sht-1971-006- abut.dgn"

Multiple sheets = "8944-sht-drain-011.dgn" and "8944-sht-drain-012.dgn"  
"8944-sht-mot3-023.dgn" and "8944-sht-mot3-024.dgn"

## **Appendix B – Sheet Revisions Example**





## **Appendix C – Abbreviations**

## Appendix C – Abbreviations

ABV ABOVE  
A/C ACCESS CONTROL  
AC ACRE  
ADJ ADJUST  
AS AERIAL SURVEYS  
AGG AGGREGATE  
AH AHEAD  
APT APARTMENT  
ASPH ASPHALT  
AUX AUXILIARY  
AGS AUXILIARY GAS VALVE (SERVICE)  
AVE AVENUE  
AX AXIS OF ROTATION

BK BACK  
B-B BACK TO BACK  
BKPL BACKPLATE  
B BARN  
BARR BARRICADE  
BGN BEGIN  
BM BENCHMARK  
BIND BINDER  
BIT BITUMINOUS  
BTM BOTTOM  
BLVD BOULEVARD  
BRK BRICK  
BBOX BUFFALO BOX  
BLDG BUILDING

CIP CAST IRON PIPE  
CB CATCH BASIN  
C-C CENTER TO CENTER  
CL CENTERLINE OR CLEARANCE  
CL-E CENTERLINE TO EDGE  
CL-F CENTERLINE TO FACE  
CTS CENTERS  
CERT CERTIFIED  
CHSLD CHISELED  
CS CITY STREET  
CP CLAY PIPE  
CLSD CLOSED  
CLID CLOSED LID  
CT COAT OR COURT  
COMB COMBINATION  
C COMMERCIAL BUILDING  
CE COMMERCIAL ENTRANCE  
CONC CONCRETE  
CONST CONSTRUCT  
CONTD CONTINUED  
CONT CONTINUOUS  
COR CORNER  
CORR CORRUGATED  
CMP CORRUGATED METAL PIPE  
CNTY COUNTY  
CH COUNTY HIGHWAY  
XSECT CROSS SECTION

CSE COURSE  
m3 CUBIC METER  
mm3 CUBIC MILLIMETER  
CU YD CUBIC YARD  
CULV CULVERT  
C&G CURB & GUTTER  
  
D DEGREE OF CURVE  
DC DEPRESSED CURVE  
DET DETECTOR  
DIA DIAMETER  
DIST DISTRICT  
DOM DOMESTIC  
DBL DOUBLE  
DSEL DOWNSTREAM ELEVATION  
DSFL DOWNSTREAM FLOWLINE  
DI DRAINAGE INLET/DROP INLET  
DR DRAINAGE OR DRIVE  
DRV DRIVEWAY  
DCT DUCT

EA EACH  
EB EASTBOUND  
EOP EDGE OF PAVEMENT  
E-CL EDGE TO CENTERLINE  
E-E EDGE TO EDGE  
EL ELEVATION  
ENTR ENTRANCE  
EXC EXCAVATION  
EX EXISTING  
EXPWAY EXPRESSWAY

F-F FACE TO FACE  
FA FEDERAL AID  
FP FENCE POST  
FE FIELD ENTRANCE  
FH FIRE HYDRANT  
FL FLOW LINE  
FB FOOT BRIDGE  
FDN FOUNDATION  
FR FRAME  
F&G FRAME & GRATE  
FRWAY FREEWAY

GAL GALLON  
GALV GALVANIZED  
G GARAGE  
GM GAS METER  
GV GAS VALVE  
GRAN GRANULAR  
GR GRATE  
GRVL GRAVEL  
GND GROUND  
GUT GUTTER  
GP GUY POLE  
GW GUY WIRE  
HH HANDHOLE  
HATCH HATCHING

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HD	HEAD	PVMT	PAVEMENT
HDW	HEADWALL	PM	PAVEMENT MARKING
HDUTY	HEAVY DUTY	PED	PEDESTAL
ha	HECTARE	PNT	POINT
HWY	HIGHWAY	PC	POINT OF CURVATURE
HORIZ	HORIZONTAL	PI	POINT OF INTERSECTION OF HORIZONTAL CURVE
HMA	HOT MIX ASPHALT	PRC	POINT OF REVERSE CURVE
HSE	HOUSE	PT	POINT OF TANGENCY
IL	ILLINOIS	POT	POINT ON TANGENT
IMP	IMPROVEMENT	POLYETH	POLYETHYLENE
IN DIA	INCH DIAMETER	PCC	PORTLAND CEMENT CONCRETE
INL	INLET	PP	POWER POLE OR PRINCIPAL POINT
INST	INSTALLATION	PRM	PRIME
IDS	INTERSECTION DESIGN STUDY	PE	PRIVATE ENTRANCE
INV	INVERT	PROF	PROFILE
IP	IRON PIPE	PGL	PROFILE GRADELINE
IR	IRON ROD	PROJ	PROJECT
JT	JOINT	P.C.	PROPERTY CORNER
kg	KILOGRAM	PL	PROPERTY LINE
km	KILOMETER	PR	PROPOSED
LS	LANDSCAPING	R	RADIUS
LN	LANE	RR	RAILROAD
LT	LEFT	RRS	RAILROAD SPIKE
LP	LIGHT POLE	RPS	REFERENCE POINT STAKE
LGT	LIGHTING	REF	REFLECTIVE
LF	LINEAL FEET OR LINEAR FEET	RCCP	REINFORCED CONCRETE CULVERT PIPE
L	LITER OR CURVE LENGTH	REINF	REINFORCEMENT
LC	LONG CHORD	REM	REMOVAL
LNG	LONGITUDINAL	RC	REMOVE CROWN
L SUM	LUMP SUM	REP	REPLACEMENT
MACH	MACHINE	REST	RESTAURANT
MB	MAIL BOX	RESURF	RESURFACING
MH	MANHOLE	RET	RETAINING
MATL	MATERIAL	RT	RIGHT
MED	MEDIAN	ROW	RIGHT-OF-WAY
m	METER	RD	ROAD
METH	METHOD	RDWY	ROADWAY
M	MID-ORDINATE	RTE	ROUTE
mm	MILLIMETER	SAN	SANITARY
mm DIA	MILLIMETER DIAMETER	SANS	SANITARY SEWER
MIX	MIXTURE	SEC	SECTION
MBH	MOBILE HOME	SEED	SEEDING
MOD	MODIFIED	SHAP	SHAPING
NC	NORMAL CROWN	S	SHED
NB	NORTHBOUND	SH	SHEET
NE	NORTHEAST	SHLD	SHOULDER
NW	NORTHWEST	SW	SIDEWALK OR SOUTHWEST
OLID	OPEN LID	SIG	SIGNAL
PAT	PATTERN	SOD	SODDING
PVD	PAVED	SM	SOLID MEDIAN
		SB	SOUTHBOUND
		SE	SOUTHEAST
		SPL	SPECIAL

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SD	SPECIAL DITCH	TSCB	TRAFFIC SIGNAL CONTROL BOX
SQ FT	SQUARE FEET	TRN	TURN
m2	SQUARE METER	TY	TYPE
mm2	SQUARE MILLIMETER	T-A	TYPE A
SQ YD	SQUARE YARD	TYP	TYPICAL
STB	STABILIZED		
STD	STANDARD	USGS	U.S. GEOLOGICAL SURVEY
SR	STATE ROUTE	UNDGND	UNDERGROUND
STA	STATION	USEL	UPSTREAM ELEVATION
SS	STORM SEWER	USFL	UPSTREAM FLOWLINE
STY	STORY	UTIL	UTILITY
ST	STREET		
STR	STRUCTURE	VBOX	VALVE BOX
SURF	SURFACE	VV	VALVE VAULT
SMK	SURVEY MARKER	VLT	VAULT
		VEH	VEHICLE
TEL	TELEPHONE	VP	VENT PIPE
TB	TELEPHONE BOX	VERT	VERTICAL
TP	TELEPHONE POLE	VC	VERTICAL CURVE
TEMP	TEMPORARY	VPC	VERTICAL POINT OF CURVATURE
TBM	TEMPORARY BENCH MARK	VPI	VERTICAL POINT OF INTERSECTION
TD	TILE DRAIN	VPT	VERTICAL POINT OF TANGENCY
TBE	TO BE EXTENDED		
TBR	TO BE REMOVED	WMAIN	WATER MAIN
TBS	TO BE SAVED	WM	WATER METER
TWP	TOWNSHIP	WV	WATER VALVE
TR	TOWNSHIP ROAD	WB	WESTBOUND
TRVL	TRAVEL	WILDFL	WILDFLOWERS
TRVS	TRANSVERSE	W	WITH
TS	TRAFFIC SIGNAL	WO	WITHOUT
TSC	TRAFFIC SYSTEMS CENTER		

## **Appendix D – Level Library**

**Level Library:** By having the name of the point used for the templates link with the level name linked with the element template used linked with a clean determination of quantities is essential for design efficiency and productivity.

Example:

The point named “BCB” represents a cable barrier, which is part of the template called “BCB.” Its feature (the item that is read by the template library) is called “3D-BCB”, which will create a level called “3D-BCB-Cable Barrier.” **With the common element of “BCB” in all the elements, one can determine how everything links with each other.**

There will be minor exceptions like gutter inverts, as per the following:

The template “B-6.06-L” creates a left positioned IDOT curb and gutter section B-6.06. Inside this template there is a point that represents the gutter invert, which is called “B606”. For this template it uses the feature “3D-B606” and produces a level called “3D-KGI-Gutter Invert-B606”

There is a common element of “B606” between point, template, level, and feature. This obvious link exponentially increases productivity as it is intuitive what belongs where just from the clear, consistent, and compact name of the element. Additionally this point when visualized into a level becomes simple to identify for quantity and plan production.

This may not follow the perfect pattern as for the cable barrier, but there are obvious links between the point, level, and feature. This obvious link exponentially increases productivity as it is intuitive what belongs where just from the clear, consistent, and compact name of the element. Additionally, this point, when visualized into a level, becomes simple to identify for quantity and plan production.

Level Type	Description
3D	Civil 3D design levels
2D	Civil 2D design levels
AL	Chain Alignment Levels
AP	Profile Alignment Levels
CA	Cable Conduit Levels (utility)
EC	Erosion Control Levels
EL	Electric Conduit Levels (utility)
FO	Fiber Optic Conduit Levels (utility)
GA	Gas Conduit Levels (utility)
GE	General Drafting Levels
LS	Landscaping Items Levels
PM	Pavement Marking Levels
RE	Removal Levels
RW	Right-of-Way Levels
SA	Sanitary Sewer Levels (utility)
SS	Storm Sewer and Drainage Levels
ST	Structural Design Levels
TC	Traffic Control Levels
TM	Terrain Modeling Levels
TP	Telephone Conduit Levels (utility)

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WA	Watermain Levels
XS	Component Levels
ZZ	Setting levels

<b>Level Type</b>	<b>Level Name</b>
2D	2D-BCB-Cable Barrier
2D	2D-BFD-F-Type Double Barrier Wall
2D	2D-BFS-F-Type Single Barrier Wall
2D	2D-BL6-Guard Rail 6 Foot Posts Left Face
2D	2D-BL9-Guard Rail 9 Foot Posts Left Face
2D	2D-BR6-Guard Rail 6 Foot Posts Right Face
2D	2D-BR9-Guard Rail 9 Foot Posts Right Face
2D	2D-BSD-Single Slope Double Barrier Wall
2D	2D-BSS-Single Slope Single Barrier Wall
2D	2D-BWB-Barrier Wall Back
2D	2D-BWF-Barrier Wall Front
2D	2D-KBK-Back of Curb
2D	2D-KEP-Lip of Curb
2D	2D-KGI-Gutter Invert
2D	2D-KTK-Top of Curb
2D	2D-PAG-Aggregate Pavement
2D	2D-PAS-Asphalt Pavement
2D	2D-PCO-Concrete Pavement
2D	2D-SAW-Sawcut
2D	2D-VPA-Side Walk
2D	2D-WFB-Retaining Wall
<b>Level Type</b>	<b>Level Name</b>
3D	3D-BCB-Cable Barrier
3D	3D-BFD-F-Type Double Barrier Wall
3D	3D-BFS-F-Type Single Barrier Wall
3D	3D-BL6-Guard Rail 6 Foot Posts Left Face
3D	3D-BL9-Guard Rail 9 Foot Posts Left Face
3D	3D-BR6-Guard Rail 6 Foot Posts Right Face
3D	3D-BR9-Guard Rail 9 Foot Posts Right Face
3D	3D-BSD-Single Slope Double Barrier Wall
3D	3D-BSS-Single Slope Single Barrier Wall
3D	3D-BWB-Barrier Wall Back
3D	3D-BWF-Barrier Wall Front
3D	3D-DSD-Sub Drain
3D	3D-ECP-Cut
3D	3D-EDI-Drain
3D	3D-EFP-Fill
3D	3D-EHP-Hinge Point



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3D	3D-KBK-Back of Curb
3D	3D-KEP-Lip of Curb
3D	3D-KGI-Gutter Invert-B606
3D	3D-KGI-Gutter Invert-B612
3D	3D-KGI-Gutter Invert-B618
3D	3D-KGI-Gutter Invert-B624
3D	3D-KGI-Gutter Invert-B912
3D	3D-KGI-Gutter Invert-B918
3D	3D-KGI-Gutter Invert-B924
3D	3D-KGI-Gutter Invert-G2 Gutter
3D	3D-KGI-Gutter Invert-G2 Gutter Modified
3D	3D-KGI-Gutter Invert-G3 Gutter
3D	3D-KGI-Gutter Invert-G3 Gutter Modified
3D	3D-KGI-Gutter Invert-M206
3D	3D-KGI-Gutter Invert-M212
3D	3D-KGI-Gutter Invert-M406
3D	3D-KGI-Gutter Invert-M412
3D	3D-KGI-Gutter Invert-M418
3D	3D-KGI-Gutter Invert-M424
3D	3D-KGI-Gutter Invert-M606
3D	3D-KGI-Gutter Invert-M612
3D	3D-KGI-Gutter Invert-M618
3D	3D-KGI-Gutter Invert-M624
3D	3D-KGI-Gutter Invert-Type C
3D	3D-KTK-Top of Curb
3D	3D-PAG-Aggregate Pavement
3D	3D-PAS-Asphalt Pavement
3D	3D-PCO-Concrete Pavement
3D	3D-PHP-Pavement Hinge Point
3D	3D-SAW-Sawcut
3D	3D-SBR-Bridge
3D	3D-SCO-Concrete
3D	3D-VPA-Side Walk
3D	3D-WBK-Retaining Wall Back
3D	3D-WFB-Retaining Wall Bottom
3D	3D-WTW-Retaining Wall Top
3D	3D-ZZZ-Component Breaklines
<b>Level Type</b>	<b>Level Name</b>
AL	AL-B00-Bridge Alignment
AL	AL-BAN-Bridge Alignment Annotation
AL	AL-C00-Road Alignment
AL	AL-CAN-Road Alignment Annotation
AL	AL-D00-Stormwater Alignment
AL	AL-DAN-Stormwater Alignment Annotation

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AL	AL-E00-Other Alignment
AL	AL-EAN-Other Alignment Annotation
AL	AL-K00-Curb Alignment
AL	AL-KAN-Curb Alignment Annotation
AL	AL-U00-Utility Alignment
AL	AL-UAN-Utility Alignment Annotation
AL	AL-V00-Driveway Alignment
AL	AL-VAN-Driveway Alignment Annotation
AL	AL-W00-Wall Alignment
AL	AL-WAN-Wall Alignment Annotation
AL	AL-Z00-Existing Alignment
AL	AL-ZAN-Existing Alignment Annotation
<b>Level Type</b>	<b>Level Name</b>
AP	AP-B00-Bridge Alignment Profile
AP	AP-BAN-Bridge Alignment Profile Annotation
AP	AP-C00-Road Alignment Profile
AP	AP-CAN-Road Alignment Profile Annotation
AP	AP-D00-Stormwater Profile Alignment
AP	AP-DAN-Stormwater Alignment Profile Annotation
AP	AP-E00-Other Alignment Profile
AP	AP-EAN-Other Alignment Profile Annotation
AP	AP-K00-Curb Alignment Profile
AP	AP-KAN-Curb Alignment Profile Annotation
AP	AP-U00-Utility Alignment Profile
AP	AP-UAN-Utility Alignment Profile Annotation
AP	AP-V00-Driveway Alignment Profile
AP	AP-VAN-Driveway Alignment Profile Annotation
AP	AP-W00-Wall Alignment Profile
AP	AP-WAN-Wall Alignment Profile Annotation
AP	AP-Z00-Existing Alignment Profile
AP	AP-ZAN-Existing Alignment Profile Annotation
AP	AP-ZEL-Profile Elevation Text
AP	AP-ZST-Profile Station Text
AP	AP-ZXX-Proposed Surface
<b>Level Type</b>	<b>Level Name</b>
CA	CA-025-Cable 0-25in Conduit
CA	CA-050-Cable 0-50in Conduit
CA	CA-075-Cable 0-75in Conduit
CA	CA-0AE-Cable Aerial Line
CA	CA-100-Cable 1in Conduit
CA	CA-125-Cable 1-25in Conduit
CA	CA-150-Cable 1-50in Conduit
CA	CA-175-Cable 1-75in Conduit

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CA	CA-200-Cable 2in Conduit
CA	CA-225-Cable 2-25in Conduit
CA	CA-250-Cable 2-50in Conduit
CA	CA-275-Cable 2-75in Conduit
CA	CA-300-Cable 3in Conduit
CA	CA-350-Cable 3-50in Conduit
CA	CA-400-Cable 4in Conduit
<b>Level Type</b>	<b>Level Name</b>
EC	EC-BAR-Perimeter Barrier
EC	EC-FNC-Fence
EC	EC-PRM-Permanent Items
EC	EC-TMP-Temporary Items
<b>Level Type</b>	<b>Level Name</b>
EL	EL-025-Electric 0-25in Conduit
EL	EL-050-Electric 0-50in Conduit
EL	EL-075-Electric 0-75in Conduit
EL	EL-0AE-Electric Aerial Line
EL	EL-100-Electric 1in Conduit
EL	EL-125-Electric 1-25in Conduit
EL	EL-150-Electric 1-50in Conduit
EL	EL-175-Electric 1-75in Conduit
EL	EL-200-Electric 2in Conduit
EL	EL-225-Electric 2-25in Conduit
EL	EL-250-Electric 2-50in Conduit
EL	EL-275-Electric 2-75in Conduit
EL	EL-300-Electric 3in Conduit
EL	EL-350-Electric 3-50in Conduit
EL	EL-400-Electric 4in Conduit
EL	EL-DLT-Double Mast Arm Light
EL	EL-MAN-Electric Manhole
EL	EL-MSC-Miscellaneous
EL	EL-POL-Electric Pole
EL	EL-POL-Utility Pole
EL	EL-SLT-Single Mast Arm Light
<b>Level Type</b>	<b>Level Name</b>
FO	FO-0AE-Fiber Optic Aerial Line
FO	FO-100-Fiber Optic 1in Cable Conduit
FO	FO-100-Fiber Optic 1in Electric Conduit
FO	FO-100-Fiber Optic 1in Telephone Conduit
<b>Level Type</b>	<b>Level Name</b>
GA	GA-020-Gas 2in Conduit

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GA	GA-025-Gas 2-50in Conduit
GA	GA-030-Gas 3in Conduit
GA	GA-040-Gas 4in Conduit
GA	GA-050-Gas 5in Conduit
GA	GA-060-Gas 6in Conduit
GA	GA-080-Gas 8in Conduit
GA	GA-100-Gas 10in Conduit
GA	GA-120-Gas 12in Conduit
<b>Level Type</b>	<b>Level Name</b>
GE	GE-DIM-Dimensions
GE	GE-NOT-Notes
GE	GE-NOT-Titles
GE	GE-PRC-Profile Cell
GE	GE-SHT-Clip Border
GE	GE-SHT-General
GE	GE-SHT-Matchlines
GE	GE-SHT-Plot Border
GE	GE-XSA-Annotation
GE	GE-XSA-Cross Section Pattern Lines
GE	GE-XSA-Cross Section Stations
GE	GE-XSA-Features
GE	GE-XSC-Cross Section Cell
<b>Level Type</b>	<b>Level Name</b>
LS	LS-FEN-Fence
LS	LS-MSC-Landscaping Items
<b>Level Type</b>	<b>Level Name</b>
PM	PM-A4C-Asphalt 4in Yellow Solid Double Line RRPM
PM	PM-A4D-Asphalt 4in Yellow Solid Double Line
PM	PM-A4W-Asphalt 4in White Solid Line
PM	PM-A4Y-Asphalt 4in Yellow Solid Line
PM	PM-A5W-Asphalt 5in White Solid Line
PM	PM-A5Y-Asphalt 5in Yellow Solid Line
PM	PM-A64-Asphalt 6in White Skipped Dash 40 Marker RRPM
PM	PM-A68-Asphalt 6in White Skipped Dash 80 Marker RRPM
PM	PM-A6H-Asphalt 6in Yellow Skipped Dash 80 Marker RRPM
PM	PM-A6K-Asphalt 6in Yellow Skipped Dash
PM	PM-A6L-Asphalt 6in Yellow Skipped Dash 40 Marker RRPM
PM	PM-A6S-Asphalt 6in White Skipped Dash
PM	PM-A6T-Asphalt 6in White Dotted Line
PM	PM-A6W-Asphalt 6in White Solid Line
PM	PM-A6Y-Asphalt 6in Yellow Solid Line
PM	PM-A8W-Asphalt 8in White Solid Line

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PM	PM-A8Y-Asphalt 8in Yellow Solid Line
PM	PM-AAT-Asphalt 10in White Dotted Line
PM	PM-AAY-Asphalt 10in Yellow Solid Line
PM	PM-ACW-Asphalt 12in White Solid Line
PM	PM-ACY-Asphalt 12in Yellow Solid Line
PM	PM-ALE-Asphalt Yellow 2 Way Left Turn lane Left Face
PM	PM-ARE-Asphalt Yellow 2 Way Left Turn lane Right Face
PM	PM-ARM-Asphalt Reflective Markers
PM	PM-ASB-Asphalt 24in White Stop Bar
PM	PM-AYM-Asphalt Symbols and Letters
PM	PM-C4C-Concrete 4in Yellow Solid Double Line RRPM
PM	PM-C4D-Concrete 4in Yellow Solid Double Line
PM	PM-C4W-Concrete 4in White Solid Line
PM	PM-C4Y-Concrete 4in Yellow Solid Line
PM	PM-C5W-Concrete 5in White Solid Line
PM	PM-C5Y-Concrete 5in Yellow Solid Line
PM	PM-C64-Concrete 6in White Skipped Dash 40 Marker RRPM
PM	PM-C68-Concrete 6in White Skipped Dash 80 Marker RRPM
PM	PM-C6H-Concrete 6in Yellow Skipped Dash 80 Marker RRPM
PM	PM-C6K-Concrete 6in Yellow Skipped Dash
PM	PM-C6L-Concrete 6in Yellow Skipped Dash 40 Marker RRPM
PM	PM-C6S-Concrete 6in White Skipped Dash
PM	PM-C6T-Concrete 6in White Dotted Line
PM	PM-C6W-Concrete 6in White Solid Line
PM	PM-C6Y-Concrete 6in Yellow Solid Line
PM	PM-C8W-Concrete 8in White Solid Line
PM	PM-C8Y-Concrete 8in Yellow Solid Line
PM	PM-CAT-Concrete 10in White Dotted Line
PM	PM-CAY-Concrete 10in Yellow Solid Line
PM	PM-CCW-Concrete 12in White Solid Line
PM	PM-CCY-Concrete 12in Yellow Solid Line
PM	PM-CLE-Concrete Yellow 2 Way Left Turn lane Left Face
PM	PM-CRE-Concrete Yellow 2 Way Left Turn lane Right Face
PM	PM-CRM-Concrete Reflective Markers
PM	PM-CSB-Concrete 24in White Stop Bar
PM	PM-CYM-Concrete Symbols and letters
PM	PM-M4C-MOT 4in Yellow Solid Double Line RRPM
PM	PM-M4D-MOT 4in Yellow Solid Double Line
PM	PM-M4W-MOT 4in White Solid Line
PM	PM-M4Y-MOT 4in Yellow Solid Line
PM	PM-M5W-MOT 5in White Solid Line
PM	PM-M5Y-MOT 5in Yellow Solid Line
PM	PM-M64-MOT 6in White Skipped Dash 40 Marker RRPM
PM	PM-M68-MOT 6in White Skipped Dash 80 Marker RRPM

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PM	PM-M6H-MOT 6in Yellow Skipped Dash 80 Marker RRPM
PM	PM-M6K-MOT 6in Yellow Skipped Dash
PM	PM-M6L-MOT 6in Yellow Skipped Dash 40 Marker RRPM
PM	PM-M6S-MOT 6in White Skipped Dash
PM	PM-M6T-MOT 6in White Dotted Line
PM	PM-M6W-MOT 6in White Solid Line
PM	PM-M6Y-MOT 6in Yellow Solid Line
PM	PM-M8W-MOT 8in White Solid Line
PM	PM-M8Y-MOT 8in Yellow Solid Line
PM	PM-MAT-MOT 10in White Dotted Line
PM	PM-MAY-MOT 10in Yellow Solid Line
PM	PM-MCW-MOT 12in White Solid Line
PM	PM-MCY-MOT 12in Yellow Solid Line
PM	PM-MLE-MOT Yellow 2 Way Left Turn lane Left Face
PM	PM-MRE-MOT Yellow 2 Way Left Turn lane Right Face
PM	PM-MRM-MOT Reflective Markers
PM	PM-MSB-MOT 24in White Stop Bar
PM	PM-MYM-MOT Symbols and letters
<b>Level Type</b>	<b>Level Name</b>
RE	RE-ARE-Area Removal
RE	RE-EAC-Item Removal
RE	RE-LIN-Linear Item Removal
<b>Level Type</b>	<b>Level Name</b>
RW	RW-ACC-Access Control
RW	RW-EAS-Existing Easement
RW	RW-EAS-Permanent Easement
RW	RW-EAS-Temporary Easement
RW	RW-LOC-Limits of Construction
RW	RW-P-L-Property Lines
RW	RW-ROW-Existing ROW
RW	RW-ROW-Proposed ROW
RW	RW-ROW-ROW Markers
<b>Level Type</b>	<b>Level Name</b>
SA	SA-004-Sanitary 4in Pipe
SA	SA-006-Sanitary 6in Pipe
SA	SA-008-Sanitary 8in Pipe
SA	SA-010-Sanitary 10in Pipe
SA	SA-012-Sanitary 12in Pipe
SA	SA-015-Sanitary 15in Pipe
SA	SA-018-Sanitary 18in Pipe
SA	SA-021-Sanitary 21in Pipe
SA	SA-024-Sanitary 24in Pipe

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SA	SA-027-Sanitary 27in Pipe
SA	SA-030-Sanitary 30in Pipe
SA	SA-033-Sanitary 33in Pipe
SA	SA-036-Sanitary 36in Pipe
SA	SA-042-Sanitary 42in Pipe
SA	SA-0FM-Sanitary Force Main
SA	SA-OSP-Sanitary Pipe Special
SA	SA-CON-Connection
SA	SA-FIT-Fitting
SA	SA-MAN-Manhole
SA	SA-PIP-Pipe
SA	SA-STA-Lift Station
SA	SA-TEE-Tee
SA	SA-VNV-Valve and Vault
<b>Level Type</b>	<b>Level Name</b>
SS	SS-010-Storm 10in Pipe
SS	SS-012-Storm 12in Pipe
SS	SS-014-Storm 14in Pipe
SS	SS-015-Storm 15in Pipe
SS	SS-016-Storm 16in Pipe
SS	SS-018-Storm 18in Pipe
SS	SS-020-Storm 20in Pipe
SS	SS-021-Storm 21in Pipe
SS	SS-024-Storm 24in Pipe
SS	SS-027-Storm 27in Pipe
SS	SS-030-Storm 30in Pipe
SS	SS-033-Storm 33in Pipe
SS	SS-036-Storm 36in Pipe
SS	SS-042-Storm 42in Pipe
SS	SS-048-Storm 48in Pipe
SS	SS-054-Storm 54in Pipe
SS	SS-060-Storm 60in Pipe
SS	SS-066-Storm 66in Pipe
SS	SS-072-Storm 72in Pipe
SS	SS-078-Storm 78in Pipe
SS	SS-084-Storm 84in Pipe
SS	SS-090-Storm 90in Pipe
SS	SS-096-Storm 96in Pipe
SS	SS-102-Storm 102in Pipe
SS	SS-108-Storm 108in Pipe
SS	SS-BAS-Catch Basin
SS	SS-BES-Box Culvert End Section
SS	SS-BOX-Box Culvert
SS	SS-CLR-Pipe Culvert

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SS	SS-ELB-Elbow
SS	SS-END-End Section
SS	SS-FNG-Frame and Grate
SS	SS-HDW-Headwall
SS	SS-INL-Inlet
SS	SS-MAN-Manhole
SS	SS-MSC-Miscellaneous
SS	SS-PIP-Pipe
SS	SS-TEE-Tee
SS	SS-TMP-Temporary Pipe
<b>Level Type</b>	<b>Level Name</b>
ST	ST-ABT-Abutment
ST	ST-BEM-Beam
ST	ST-BOX-Box Culvert
ST	ST-BRB-Bridge Bottom
ST	ST-BRG-Bearing
ST	ST-BRH-Bridge Reinforcement Hidden
ST	ST-BRI-Bridge
ST	ST-BRP-Bridge Pier
ST	ST-BRR-Bridge Reinforcement
ST	ST-CAP-Cap
ST	ST-CEL-Sign Cell
ST	ST-CEL-Structure Cell
ST	ST-CLM-Column
ST	ST-COH-Concrete Hidden
ST	ST-CON-Concrete
ST	ST-DEK-Deck
ST	ST-DPH-Diaphragm
ST	ST-FOT-Footing
ST	ST-MSC-Miscellaneous
ST	ST-PIL-Pile
ST	ST-PIR-Pier
ST	ST-RAL-Railing
ST	ST-REB-Rebar
ST	ST-RET-Retaining Wall
ST	ST-SGN-Sign
ST	ST-SHF-Drilled Shaft
ST	ST-SLP-Slope
ST	ST-SRT-Strut
ST	ST-STH-Steel Hidden
ST	ST-STL-Steel
ST	ST-TSL-TSandL
ST	ST-WAL-Wall
ST	ST-XFM-Cross Frame



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<b>Level Type</b>	<b>Level Name</b>
TC	TC-MOT-Barriers
TC	TC-MOT-Signs
TC	TC-SIG-Signals
TC	TC-SIG-Signs
<b>Level Type</b>	<b>Level Name</b>
TM	TM-EBB-Existing Subgrade Surface Boundary
TM	TM-EBP-Existing Subgrade Surface Primary Contour
TM	TM-EBS-Existing Subgrade Surface Secondary Contour
TM	TM-EBT-Existing Subgrade Surface Triangles
TM	TM-ETB-Existing Surface Boundary
TM	TM-ETP-Existing Surface Primary Contour
TM	TM-ETS-Existing Surface Secondary Contour
TM	TM-ETT-Existing Surface Triangles
TM	TM-PBB-Proposed Subgrade Surface Boundary
TM	TM-PBP-Proposed Subgrade Surface Primary Contour
TM	TM-PBS-Proposed Subgrade Surface Secondary Contour
TM	TM-PBT-Proposed Subgrade Surface Triangles
TM	TM-PTB-Proposed Surface Boundary
TM	TM-PTP-Proposed Surface Primary Contour
TM	TM-PTS-Proposed Surface Secondary Contour
TM	TM-PTT-Proposed Surface Triangles
TM	TM-QCU-Earthwork Cut
TM	TM-QFL-Earthwork Fill
<b>Level Type</b>	<b>Level Name</b>
TP	TP-025-Telephone 0-25in Conduit
TP	TP-050-Telephone 0-50in Conduit
TP	TP-075-Telephone 0-75in Conduit
TP	TP-0AE-Telephone Aerial Line
TP	TP-100-Telephone 1in Conduit
TP	TP-125-Telephone 1-25in Conduit
TP	TP-150-Telephone 1-50in Conduit
TP	TP-175-Telephone 1-75in Conduit
TP	TP-200-Telephone 2in Conduit
TP	TP-225-Telephone 2-25in Conduit
TP	TP-250-Telephone 2-50in Conduit
TP	TP-275-Telephone 2-75in Conduit
TP	TP-300-Telephone 3in Conduit
TP	TP-350-Telephone 3-50in Conduit
TP	TP-400-Telephone 4in Conduit
TP	TP-MAN-Telephone Manhole
<b>Level</b>	<b>Level Name</b>

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<b>Type</b>	
WA	WA-006-Watermain 6in Pipe
WA	WA-008-Watermain 8in Pipe
WA	WA-010-Watermain 10in Pipe
WA	WA-012-Watermain 12in Pipe
WA	WA-014-Watermain 14in Pipe
WA	WA-015-Watermain 15in Pipe
WA	WA-016-Watermain 16in Pipe
WA	WA-018-Watermain 18in Pipe
WA	WA-020-Watermain 20in Pipe
WA	WA-021-Watermain 21in Pipe
WA	WA-024-Watermain 24in Pipe
WA	WA-027-Watermain 27in Pipe
WA	WA-030-Watermain 30in Pipe
WA	WA-033-Watermain 33in Pipe
WA	WA-036-Watermain 36in Pipe
WA	WA-042-Watermain 42in Pipe
WA	WA-048-Watermain 48in Pipe
WA	WA-054-Watermain 54in Pipe
WA	WA-060-Watermain 60in Pipe
WA	WA-066-Watermain 66in Pipe
WA	WA-072-Watermain 72in Pipe
WA	WA-078-Watermain 78in Pipe
WA	WA-084-Watermain 84in Pipe
WA	WA-090-Watermain 90in Pipe
WA	WA-BTF-Butterfly Valve
WA	WA-CAP-Cap
WA	WA-CON-Connection
WA	WA-FIT-Fitting
WA	WA-HYD-Fire Hydrant
WA	WA-MAN-Manhole
WA	WA-MCH-Mechanical Joint
WA	WA-PIP-Pipe
WA	WA-PLG-Plug
WA	WA-RED-Reducer
WA	WA-TAP-Tap
WA	WA-TEE-Tee
WA	WA-VAL-Valve
WA	WA-VNV-Valve and Vault
<b>Level Type</b>	<b>Level Name</b>
XS	XS-BCB-Cable Barrier
XS	XS-BFD-F-Type Double Barrier Wall
XS	XS-BFS-F-Type Single Barrier Wall
XS	XS-BGF-Guard Rail Fence

## Computer Aided Design and Drafting (CADD) Standards Manual

XS	XS-BSD-Single Slope Double Barrier Wall
XS	XS-BSS-Single Slope Single Barrier Wall
XS	XS-DSD-Sub Drain
XS	XS-EAR-Earthworks
XS	XS-ETP-Topsoil
XS	XS-KER-Curbs
XS	XS-PBA-Base Course Asphalt
XS	XS-PBC-Base Course Concrete
XS	XS-PBE-Base Course PGE
XS	XS-PBG-Base Course Aggregate
XS	XS-PBH-Base Course Hot Mix Asphalt
XS	XS-PBP-Base Course PCCP
XS	XS-PBW-Base Course Warm Mix Asphalt
XS	XS-PPA-Pavement Asphalt
XS	XS-PPC-Pavement Concrete
XS	XS-PPE-Pavement PGE
XS	XS-PPG-Pavement Aggregate
XS	XS-PPH-Pavement Hot Mix Asphalt
XS	XS-PPP-Pavement PCCP
XS	XS-PPW-Pavement Warm Mix Asphalt
XS	XS-PSA-Sub Base Asphalt
XS	XS-PSC-Sub Base Concrete
XS	XS-PSE-Sub Base PGE
XS	XS-PSG-Sub Base Aggregate
XS	XS-PSH-Sub Base Hot Mix Asphalt
XS	XS-PSP-Sub Base PCCP
XS	XS-PSW-Subgrade Warm Mix Asphalt
XS	XS-SBR-Bridge
XS	XS-SCO-Concrete
XS	XS-VPA-Side Walk
XS	XS-WAL-Retaining Wall
XS	XS-ZBT-Bottom of Subgrade
XS	XS-ZTP-Top Surface
XS	XS-ZZZ-Construction
<b>Level Type</b>	<b>Level Name</b>
ZZ	ZZ-COR-Corridor
ZZ	ZZ-SUP-Superelevation