WEST VIRGINIA
DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS
ENGINEERING DIVISION

CADD STANDARDS MANUAL

WVCADDStandard 1.0

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FILE NAMING CONVENTION

WVDOT has set up a file naming system. Each file is named based on their intended purpose. The naming system makes it easier to determine the purpose of each CADD file (i.e., Roadway Profile, Quantity Tables, Typical Section, etc.). The V8 version of microstation now allows for use of models. The use of models is discouraged but if used should likewise be named according to the convention shown below. Review Appendix I for allowable names and descriptions. Nested folders should be kept to a minimum.

SEED FILES (V8Seed2d.dgn and V8Seed3d.dgn)

Seed files have been provided to create new files using the correct naming convention. One 3D and one 2D seed file has been created. V8 has eliminated working units, so the seed file will define the Design Units, feet (`)and inches (“). Coordinate readout is set to master units and angular readout to bearings. Color table and the DESIGNLEVEL.dgnlib level library have been imported to the seed files. **Note: When using mapping or other survey from an unknown source, use the file as a seed file by copying and delete. This will assure that global settings are maintained

COLOR TABLE (2003.tbl)

The color table has been changed. Only three full rows and one partial row will be used. This has been done to minimize the amount of revision and editing, and ease editing for other applications. Each row will result in a decreasing shade when plotted. The first row will be dark, and will include design items and text. The second will include existing utilities. The third row will include other existing items. The fourth row will include gridlines and contour lines.
Note: When using Older files with the new CADD Standard Tools the toggle Workspace/Preferences/Reference/Remap Colors on Copy **must be turned off.**
If it is left on, Microstation will attempt to change the color number till it matches the visual color. This may cause plotting problems with pen tables that shade based on color numbers.

LEVEL SYMBOLOGY

The most significant change in CADD Standardization is the unlimited amount of levels and the bylevel controls available with V8. The unlimited amount of levels has made it practical to assign individual features of design on their own level. It is obvious that every item can not be given its own level. For those items that can not be readily categorized, it will be the drafter’s decision as to which level to place the feature, or create its own in level manger. Filters have been setup in order to simplify the breakdown of levels.

Level libraries can be attached or imported. This allows the draftsman the ability to detach the level library, leaving only the levels that have elements on them. If levels are attached their properties can not be edited, and retains the setup of the attached level library. If levels are imported, they become part of the file and must be physically deleted. However, level properties and attributes can be edited for individual files.

Additionally significant is the bylevel control. The CADD standardization process has identified many levels and assigned these levels their individual color, weight, style and custom scale. Setting the attribute to bylevel allows the drafter to choose the level they want to draw on, and have the attributes change automatically. This simplifies the work needed to adhere to the CADD standards. Another way to control symbology is to use the override capability of level symbology in view attributes. The overrides have been revised in V8 so each level can be controlled individually.

In the two level libraries that have been created, the bylevel scale is set to 20 for levels that have been assigned a custom linestyle. The override linestyle scale is set to Off. If a linestyle scale is needed for a different scale drawing, the level library can be exported and easily edited in Excel. Then import the file into a custom *.dgnlib and imported.

Linestyle scales can be adjusted for reference files. To do this, open level manager, locate the reference file, highlight the level, right click and hit properties, and adjust the scale. This will only change the scale for the referenced file, leaving the main file alone.

TEXT

The available amount of fonts will be decreased to four text fonts and one symbol font. The four fonts all look the same, differing only by the amount of room they take up or if they are straight or slanted. Reducing the amount of available fonts will establish a more unified look from one drafter to another. Squashed font will be used for design plans. Block font will be used for imported text from other applications. Straight font will be used for design text and slant font will be used for existing text on nongridline sheets. Slant font will be used on sheets with grids (cross section and profile sheets). Font 95 will still be used.

Font Matrix	**Squashed**	**Block**
Straight	Font 201	Font 202
Slant	Font 204	Font 203

TEXTSTYLES

The text attributes will now be controlled by textstyles. The textstyle library will be imported based upon the scale of the drawing, i.e. 20scaletext.dgnlib imported for a 20 scale plan sheet. The textstyle will control the text height, text width, line spacing and text font. If a different scale is necessary the classes in the text style library must be deleted before a new scale is imported.

Architectural text styles can be used with structural detail sheets. Using these text styles will maintain the same size text from one sheet to the next. The detail sheets

are drawn proportionally but not always to engineering scale. The normal workflow for dimensioning detail sheets is:

1) Draw and place details
2) Determine standard scale plan sheet to place around detail
   See Appendix III for Standard Architectural scales
3) Use the text attributes for that plan sheet scale

The textstyles and examples of where that type of style is to be used:

Design Class (Straight)	**Existing Class** (Slant)	**Plan Sheet Example**	**Cross Section Example**
Class I Design	Class I Existing	Project Title text(Beg, End Project, Beg R/W Project)	Stationing
Class II Design	Class II Existing	Stationing, Beg & End Work, Parcel & Tract	Side and Bottom Annotation
Class III Design	Class III Existing	PC, PT, Bearing, GR Drainage, E.O.P., Notes, ROW Label, Utilities	Proposed & Existing Elev.
Class IV Design	Class IV Existing	Misc. Notes, Deed Calls, Sta./Off.	Features, Slope, Notes

Alternate Method

Import the 1scaletext file. Now go to the model properties section and change the annotation scale to the appropriate scale. When placing text be sure that the annotation scale lock is on. The text height width and line spacing will be scaled by the annotation scale.

CELLS

Cells are now models inside of a single microstation file. Additional cells have been added to libraries in order to standardize CADD work. In order to comply with this standardization, cells should be placed as relative. This means they are placed on the active drawing level, not on the level that the cell was created on. If "place cell relative" is not in the main palette or cells subpalette, it will need to be added. Instructions to do this are the following:

1. Go to Workspace>Customize
2. Under the Toolboxes tab, on right under Edit Tool Box: pull down the list and choose Cells.
3. Under the Available Tools From: Microstation scroll down using the slider and choose Miscellaneous Tools at the very bottom and double click it to expand.
4. In this sub-list choose Place Active Cell Relative and hit the Copy button to copy it into your list on the right into the Cells Tool Box.
5. Hit the Save button and exit out of Workspace>Customize. Place Cell Relative should now appear in the Cells Tool Box.

V8 allows for all cells, with cell libraries in the configured pathname, to be shown at one time. The toggle, Display All Cells In Path, is located at the top of cell library dialog box.

The cell libraries are descriptively named in order to depict the included cell type, i.e. Quantity.cel or Border.cel. For drawings that are not to scale such as typical sections and quantity tables, the border cells should be placed at a scale of 20. In other words, 20 scale will be the default border placement for drawings with no specified scale. Libraries are also classified by placement scale. The library Feature Label.cel includes cells that represent the location of features in a cross section; therefore, their size should be relative to the border of the cross section. These typically look like a small tick with text and are used to denote existing edges of pavement, edge of water etc. The library Actual Feature.cel includes cells that are placed at actual scale or a scale of 1. For example, these cells include Type B and Type C inlets for placement on plan sheets. If these were to be scaled the dimensions of the inlets would be incorrect, therefore they are always placed at a scale of 1.

CELL LIBRARY	**SCALE TO USE WHEN PLACING**
Border.cel	Based on Sheet Scale
Quantity.cel	Based on Sheet Scale
Terminator Labels.cel	Based on Sheet Scale
Cross Section & Profile Labels.cel	Based on Sheet Scale
Actual Feature.cel	Based on Actual Scale, AS=1
Curb & Median Shapes.cel	Based on Actual Scale, AS=1
Drainage Items.cel	Based on Actual Scale, AS=1
GR End Treatments	Based on Actual Scale, AS=1

REFERENCE FILES

Reference files should be used to build all plan sheets.

Microstation V8 version has introduced a revised way to control symbologies. The bylevel symbology has already been described. The level symbology of a referenced file can be controlled independent from the main file (see Level Symbology).

Example: Property lines
Property lines are drawn for the 20-scale plan sheet using the bylevel symbology that uses custom linestyle scale of 20. When drafting the property map it is necessary to use a scale of 200 to include all properties. In the past the drafter would have to copy the properties into another file and modify the property lines to match the 200 scale and reference that file into the property map. The drafter would have to modify two files if there are changes. With the level manager in V8, the drafter can reference the 20-scale property lines file and modify the symbology. In level manager, expand the files, on left side, until the referenced file appears. Highlight the reference file, right click the property line level, and hit properties. In

the level properties/styles dialogue box change the bylevel custom linestyle scale to 200. This will change the linestyle scale in the property map but leave the .prp file at 20 scale. **Note** the lines will only change scale if the property line were originally drawn bylevel.

INTERFACE

With the proliferation of levels and cells with the V8 version of microstation, it was felt an easier way of manipulating CADD standards was needed. A custom menu bar has been added to ease the transition into CADD standardization. The custom menu bar has been added, but its use is not mandatory. The drafter can use the filter system or any other way they may want in order to maintain CADD standards. The custom menu bar can be accessed at the initial file open dialogue box. In the Workspace section, locate Interface pulldown. Change the Interface to "CADD Menu". This will open the file with the custom menu bar at the top.

Custom Menu Bar

To use the custom menu bar, the user needs to "setup" the file on the initial usage. The user needs to attach the Designlevels.dgnlib and a textstyle library (the correct text scale library for the drawing). **This is a mandatory step!** The custom menu bar has been set up to build on these two items. Additionally, several macros have written to be used to interface with the user. When these macros appear, follow the directions closely in order to get them to function correctly. The main function of the subpalettes and buttons is to change the active symbology to correspond to the level wanted. As a secondary function, the most probable action is activated when the button is hit.

> Example: To draw a 24" pipe the pulldown for Design Drainage is selected, the Pipes subpalette is chosen, locate the 24" pipe button. The main function of the button is to change the level to PIPE(24) and change the symbologies to "bylevel". The secondary action of place smartline function is activated and a line can be immediately drawn. As a text example, a label is needed, the corresponding button is hit, the level and symbology is changed. Secondarily, the correct textstyle for that label is activated, along with place text dialogue box. When a button is hit and the secondary function is not the one that is needed, simply go to the main palette, choose the correct one. The primary function will still activate the level and symbology and the drafter can draw still conforming to CADD standards.

File Setup (Additional instructions)

Before the file can be used, a setup procedure has to be performed.

1. The designer can either import or attach a level library depending on the type of file. The design level libraries should be imported. This allows the levels attributes to be controlled individually. Using the attach capability is acceptable. The drafter should note that if attach is used, attributes controlled by the level manager are not editable. The need to edit these attributes, particularly those with custom linestyles, will be discussed further in the reference section. The level libraries are set assuming a 20 scale drawing with the override set to Off. The base scale of 20 means custom linestyle scale is set to 20. All sheets that are normally drawn "not to scale" (typical section, general notes, estimate sheet, etc.) should be drawn using a 20 scale border.

2. Textstyle scale file has to be attached for the scale drawing. The designer will attach the textstyle library that corresponds to the scale of the sheet.

Appendix I
File Names and Description

Roadway

rdy_bas_filename.dgn = Base topo map generated through Survey Reduction

rdy_mbm_filename.dgn = Modified Base Map-Existing Topography

rdy_des_filename.dgn = Design Alignment & Design Features

rdy_sur_filename.dgn = Existing Surface Contours

rdy_txt_filename.dgn = Existing Text File

rdy_pro_filename.dgn = Profile

rdy_ttl_filename.dgn = Construction Title Sheet

rdy_geo_filename.dgn = Geometric Layout

rdy_ref_filename.dgn = Reference Points & Bench Marks

rdy_pav_filename.dgn = Pavement I/S Details

rdy_dtl_filename###.dgn = Special Details

rdy_gns_filename.dgn = General Note Sheet

rdy_typ_filename.dgn = Typical Section

rdy_qnt_filename.dgn = Quantity Tables

rdy_sup_filename.dgn = Superelevation Diagrams & Tables

rdy_xsc_filename.dgn = Cross Section

rdy_pln_filename###.dgn = Plan Sheet File

rdy_pro_filename###.dgn = Profile Sheets

rdy_xsc_filename###.dgn = Cross Section Sheets

Right of Way

row_prw_filename.dgn = Proposed Right-of-Way

row_cem_filename.dgn = Cemetery Reinternment

row_pln_filename###.dgn = Right-of-Way Plan Sheets

row_own_filename.dgn = Ownership Index and Property Map

row_prp_filename.dgn = Property lines and Existing Right-of-Way

row_ttl_filename.dgn = Right-of-Way Title Sheets

Acquisition Files

row_dpp_filename.dgn = Deed/Description Plats

row_pmp_filename.dgn = Property Management Plats

row_cdp_filename.dgn = Condemnation Plats

row_exf_filename.dgn = Court Exhibit Files

Soils and Testing

geo_des_filename.dgn = Design Alignment & Topo

geo_pro_filename.dgn = Roadway Profile

geo_ref_filename.dgn = Reference Points & Benchmarks

geo_spl_filename.dgn = Special Details

geo_xsc_filename.dgn = Cross Sections

Structures

str_lay_filename.dgn = Bridge Layout

str_naq_filename.dgn = Notes & Quantities

str_abt_filename.dgn = Abutments

str_pir_filename.dgn = Piers

str_frm_filename.dgn = Framing Plan

str_sup_filename.dgn = Superstructure Details

str_dae_filename.dgn = Deflection & Elevation Tables

str_slb_filename.dgn = Deck Slab

str_par_filename.dgn = Parapets & Guardrail

str_aps_filename.dgn = Approach Slab

str_bor_filename.dgn = Core Borings

str_bar_filename.dgn = Rebar Sheets

str_sit_filename.dgn = Layout File that is referenced by Roadway Design

Traffic

trf_ttl_filename.dgn = DT Title Sheet

trf_sgn_filename.dgn = All files associated with Signing; estimate, fabrication, etc.

trf_sgl_filename.dgn = All files associated with Signal; estimate, fabrication, etc.

trf_lit_filename.dgn = All files associated with Lighting estimate, fabrication, etc.

trf_mak_filename.dgn = All files associated with Markings estimate, layout, etc.

trf_tcp_filename.dgn = All files associated with Traffic Control Plans

Appendix II
Level Names and Attributes
DESIGNLEVEL.DGNLIB

Name	Number	Color	Style	Weight	Style Scale
EDGE OF PAVEMENT	200	1	0	4	
CENTERLINE	201	0	0	7	
SHOULDER	202	1	0	3	
PI SHOULDER	203	1	0	1	
GUARDRAIL	204	1	GRProp	4	20
CURBLINE	205	1	0	3	
CURB FEATURE	206	5	0	3	
SIDEWALK	207	1	0	3	
BENCH	208	7	0	2	
UNCONTROLLED	209	0	0	2	
TRANSVERSE	210	0	0	2	
DESIGN MAJOR CONTOURS	211	0	0	4	
DESIGN MINOR CONTOURS	212	0	0	2	
EXISTING MAJOR CONTOURS	213	50	0	2	
EXISTING MINOR CONTOURS	214	51	0	0	
CUT LIMITS	215	8	Cut	3	20
FILL LIMITS	216	12	Fill	3	20
EDGE OF PAVEMENT LABELS	220	0	0	4	
GUARDRAIL LABELS	221	0	0	4	
DRAINAGE LABELS	222	12	0	4	
STRUCTURE LABELS	223	8	0	2	
FUNDING SOURCE SIGN	224	7	0	3	
PROJECT LABELS	225	0	0	8	
CURVE LABELS	226	0	0	3	
MEDIAN-SIDEWALK-CURB LABELS	227	0	0	2	
MISC LABELS	228	0	0	3	
BORDER MATCHLINE	229	3	0	8	
BORDERS SHEET	230	12	0	15	
BORDERS TEXT	231	12	0	2	
PIPE(18)	236	13	Pipe	4	18
PIPE(24)	237	13	Pipe	4	24
PIPE(30)	238	13	Pipe	4	30
PIPE(36)	239	13	Pipe	4	36
PIPE(42)	240	13	Pipe	4	42
PIPE(48)	241	13	Pipe	4	48
PIPE(60)	242	13	Pipe	4	60
PIPE(72)	243	13	Pipe	4	72
PIPE(84)	244	13	Pipe	4	84
PIPE(96)	245	13	Pipe	4	96
OTHER PIPE	246	13	Pipe	4	
TYPE A	247	13	0	4	
TYPE B	248	13	0	4	
TYPE C	249	13	0	4	
TYPE D	250	13	0	4	
TYPE E	251	13	0	4	
TYPE F	252	13	0	4	

Name	Number	Color	Style	Weight	Style Scale
TYPE G	253	13	0	4	
TYPE H	254	13	0	4	
MISC INLET	255	13	0	4	
DITCH BOTTOM	256	2	flow	3	20
DITCH FORESLOPE	257	2	flow	3	
DITCH BACKSLOPE	258	2	flow	3	
TYPE A MATTING	259	14	mat	3	20
TYPE B MATTING	260	14	mat	3	20
TYPE A MANHOLE	261	14	0	4	
TYPE B MANHOLE	262	14	0	4	
ROCK GUTTER	263	5	0	3	
CONCRETE GUTTER	264	9	0	3	
SAFETY SLOPE END SECTION	265	12	0	3	
CULVERT WINGWALLS	266	12	0	3	
HEADWALLS	267	12	0	3	
DUMP ROCK GUTTER	268	5	0	3	
EDGE OF DESIGN CHANNEL	269	13	0	3	
FLOW DIRECTION	270	0	0	4	
STANDARD END SECTION	271	12	0	3	
OHW	272	0	OHW	3	20
BURIED ELECTRIC LINES	277	8	UE	4	20
ELECTRIC LINES	278	8	Elec	3	20
ELECTRIC TV LINES	279	8	ETV	3	20
ELECTRIC TEL LINES	280	8	ET	3	20
ELECTRIC TV TEL LINES	281	8	ETTV	3	20
ELECTRIC POLES	282	8	0	3	
ELECTRIC TEXT	283	8	0	3	
BURIED TELEPHONE LINES	284	4	UT	4	20
TELEPHONE LINES	285	6	Telephone	3	20
TELEPHONE POLES	286	6	0	3	
TELEPHONE TEXT	287	6	0	3	
WATER LINES	288	12	Water	4	20
WATER VALVES	289	12	0	4	
WATER METERS	290	12	0	4	
FIRE HYDRANTS	291	12	0	4	
WATERLINE TEXT	292	12	0	3	
SANITARY SEWER LINES	293	7	Sewer	4	20
SANITARY SEWER MANHOLES	294	7	0	4	
SANITARY TEXT	295	7	0	3	
GAS LINES	296	14	Gas	4	20
GAS VALVES	297	14	0	4	
GAS METERS	298	14	0	4	
GAS TEXT	299	14	0	3	
CABLE LINE	300	6	TV	4	20
FIBER OPTIC	301	0	FIBER	4	20
Default	1	0	0	0	
RIGHT OF WAY MARKERS	305	10	0	7	

Name	Number	Color	Style	Weight	Style Scale
MAJOR RIGHT OF WAY OFFSET	306	3	0	2	
MINOR RIGHT OF WAY OFFSET	307	3	0	2	
PROP EASEMENT LABEL	308	4	0	3	
PROP ROW LABEL	309	4	0	3	
EX ROW LABEL	310	6	0	3	
PARCEL TRACT NUMBER	311	5	0	9	
DEED CALLS	312	14	0	4	
BEG END RW PROJECT LABEL	313	0	0	9	
PROPOSED RIGHT OF WAY LINES	314	4	R/W	10	20
RIGHT OF WAY FENCE	315	9	Fence2	1	20
EXISTING RIGHT OF WAY LINE	316	6	R/W	4	20
PROPERTY LINE	317	14	Property	4	20
LOT LINE	318	14	Lot Line	4	20
LAND HOOK	319	14	0		
PROP EASEMENT LINES	320	3	R/W	10	20
AXIS	323	3	0	10	
AXIS ANNOTATION	324	2	0	6	
CROSS SECTION NOTES	325	0	0	6	
PROFILE NOTES	326	0	0	6	
MAJOR GRID LINES	327	44	0	2	
MINOR GRID LINES	328	51	0	2	
XSEC STATION	329	2	0	7	
PROPOSED ELEVATION	330	8	0	4	
EXISTING ELEVATION	331	1	0	4	
POINTS INFORMATION	332	0	0	4	
SLOPE INFORMATION	333	0	0	4	
FEATURES	334	16	0	4	
FEATURES ELEVATIONS	335	16	0	4	
FEATURES OFFSET	336	16	0	4	
FEATURES SLOPE	337	16	0	4	
DESIGN SURFACE	338	8	0	7	
EXISTING SURFACE	339	1	ustn3	7	20
EWT	340	3	0	2	
VOLUME SHAPES	341	1	0	4	
VOLUME ANNOTATIONS	342	16	0	6	
CORE BORING INFO	343	0	0	4	
CURVE DATA	348	0	0	4	
CENTERLINES 2D	349	0	0	7	
TICKS	350	3	0	4	
MAJOR STATIONS	351	3	0	5	
MINOR STATIONS	352	3	0	4	
CARDINAL POINTS	353	3	0	4	
BEARINGS	354	0	0	4	
SEDIMENT TRAPS	359	2	0	3	
SEDIMENT PONDS	360	2	0	3	
SEDIMENT DAMS	361	2	0	3	
SILT FENCE	362	2	0	3	

Name	Number	Color	Style	Weight	Style Scale
DITCH CHECKS	363	2	0	3	
TEMPORARY BERMS	364	2	0	3	
CONTOUR DITCHES	365	2	0	3	
CHECK DAMS	366	2	0	3	
SLOPE DRAINS	367	2	0	3	
ENV SENSITIVE AREA	368	8	0	3	
STATE LINE	373	0	State line	12	20
COUNTY LINE	374	0	County line	8	20
CORPORATION LINE	375	0	Corp line	8	20
OBJECT LINE	380	1	0	2	
CONSTRUCTION LINE	381	0	ustn6	3	20
HIDDEN LINE	382	4	ustn3	1	20
DIMENSION LINE	383	3	0	1	
STRUCTURAL STEEL	384	7	0	2	
PILES	385	7	0	3	
EXPANSION JOINT	386	12	0	1	
STRUCTURES TEXT	387	8	0	2	
STRUCTURES DESIGN CONTOUR	388	0	0	8	
REBAR	389	2	0	4	
STRUCTURES CENTERLINE	390	3	ustn4	1	20
SUBTITLE	391	12	0	8	
TITLE	392	12	0	10	
MOT SIGNS	500	6	0	2	
BARRICADES	501	6	0	2	
DRUMS	502	6	0	2	
CONES	503	6	0	2	
VERTICAL PANELS	504	6	0	2	
TEMPORARY GUARDRAIL	505	2	0	2	
TEMPORARY CONCRETE BARRIER	506	2	0	2	
TEMPORARY PAVEMENT MARKINGS	507	2	0	2	
TEMPORARY TRAFFIC SIGNALS	508	4	0	2	
WARNING LIGHTS	509	6	0	2	
TEMPORARY LIGHTING	510	4	0	2	
TEMPORARY RAISED PAVEMENT MARKERS	511	6	0	2	
FLAGGER	512	7	0	2	
TRAFFIC DIRECTOR	513	7	0	2	
SHADOW VEHICLE	514	7	0	2	
INTRUSION DETECTION ALARM	515	7	0	2	
ELECTRIC ARROW	516	7	0	2	
CHANGEABLE MESSAGE SIGN	517	7	0	2	
TEMPORARY PIPE FOR MAINTAINING TRAFFIC	518	0	0	2	
EDGE LINE	519	7	0	2	
LANE LINE	520	7	0	5	
BARRIER LINE	521	7	0	2	
STOP LINE	522	7	0	15	
CROSSWALK LINE	523	7	0	8	

Name	Number	Color	Style	Weight	Style Scale
STRIPE	524	7	0	4	
LANE ARROW	525	7	0	4	
LANE LETTER	526	7	0	10	
RAISED PAVEMENT MARKERS	527	7	0	4	
LIGHTING CONTROL STATION	528	12	0	3	
SIGNAL AND LIGHTING POLE	529	12	0	3	
SIGNAL HEADS	530	12	0	3	
SIGNAL POWER SERVICE	531	12	0	3	
SIGNAL CONTROLLERS	532	12	0	3	
JUNCTION BOX	533	12	0	3	
EXISTING CONDUIT	534	12	ustn4	3	
PROPOSED CONDUIT	535	12	ustn2	3	
VIDEO LOOP DETECTORS	536	12	ustn1	3	
IN PAVEMENT LOOP DETECTORS	537	12	0	3	
LUMINAIRES	538	12	0	3	
MESSENGER CABLE	539	12	0	5	
VIDEO CAMERAS	540	12	0	8	
PRIORITY CONTROL SYSTEM	541	12	0	3	
EXISTING SIGNS	542	2	0	2	
PROPOSED SIGNS	543	2	0	2	
OVERHEAD STRUCTURES	544	2	0	2	
SIGN POWER SERVICE	545	2	0	2	
SIGN SUPPORTS	546	2	0	2	
MISC TRAFFIC	547	4	0	3	

SURVEYLEVEL.DGNLIB

Name		Number	Color	Style	Weight	Style Scale
Default		0	32	0	2	
EXISTING MAJOR CONTOURS		213	50	0	2	
EXISTING MINOR CONTOURS		214	51	0	0	
TRVPT	Traverse point	999	23	0	2	
TP	Telephone pole	1000	20	0	3	
TL	Telephone line	1001	20	Telephone	3	20
UTL	Underground telephone line	1002	20	UT	3	20
TMH	Telephone manhole	1003	20	0	3	
PP	Power pole	1010	24	0	3	
PWL	Power line	1011	24	Elec	3	20
UEL	Underground power line	1012	24	UE	3	20
PMH	Power manhole	1013	24	0	3	
SGNLH	Signal light head	1015	26	0	3	
PTP	Power and telephone pole	1020	24	0	3	
PTVL	Power and TV line	1021	24	ETV	3	20
TVTL	TV and telephone line	1022	22	TTV	3	20
PTL	Power and telephone line	1023	24	ET	3	20
PTTVL	Power, telephone, and TV	1024	24	ETTV	3	20
GPOLE	Guy pole	1025	24	0	3	
TVP	TV pole	1026	22	0	3	
TVL	TV line	1027	22	TV	3	20
GWIRE	Guy wire	1028	24	0	3	
RRCP	Railroad communication pole	1029	36	0	2	
TGP	Telegraph pole	1030	20	0	2	
TGLN	Telegraph line	1031	20	0	2	
UTG	Underground telegraph	1032	20	0	2	
WL	Water line	1040	28	Water	3	20
WV	Water valve	1041	28	0	3	
WM	Water meter	1042	28	0	3	
FH	Fire hydrant	1043	29	0	3	
WMH	Water manhole	1044	28	0	3	
WWELL	Water well	1046	28	0	3	
VENT	Vent pipe	1047	41	0	2	
GM	Gas meter	1050	23	0	3	
GL	Gas line	1051	23	Gas	3	20
GV	Gas valve	1052	23	0	3	
GW	Gas well	1054	23	0	3	
OW	Oil well	1055	23	0	3	
MINE	Mine shaft	1056	41	0	2	
EW	Edge of water	1057	34	Stream	4	20
PL	Property line	1058	35	Property	3	20
OL	Oil line	1059	23	0	3	
PIN	Property pin or corner	1060	35	0	2	
ECHAN	Edge of channel	1061	34	0	4	
STATE	State line	1062	38	ustn6	8	20
GTFC	Gasoline tank filler cap	1063	37	0	2	

Name		Number	Color	Style	Weight	Style Scale
PTNK	Propane storage tank	1064	42	ustn3	2	20
SANL	Sanitary sewer line	1070	23	Sewer	3	20
SANMH	Sanitary sewer manhole	1071	23	ustn3	3	20
RRX	Railroad crossing	1079	36	0	2	
RR	Railroad tracks	1080	36	Railroad	6	20
RRSIG	Railroad signal	1081	36	0	2	
RRCB	Railroad control box	1082	36	0	2	
RRCL	Railroad communication line	1083	36	0	2	
TJB	Telephone junction box	1085	20	0	3	
TSTD	Telephone stand	1086	20	0	3	
TB	Telephone booth	1087	20	0	3	
TPED	Telephone pedestal	1088	20	0	3	
TREEL	Tree line	1090	47	Tree Line	4	20
HEDGE	Hedge or shrub line	1091	47	Hedges	4	20
TREED	Tree, deciduous	1092	47	0	6	
TREEC	Tree, coniferous	1094	47	0	6	
SHRUB	Shrub	1096	47	0	3	
TREEF	Tree, fruit	1098	47	0	4	
FENCE	Fence line	1100	37	Fence	2	20
RWFN	Right of way fence	1101	35	Fence2	2	20
GR	Guardrail	1102	37	GRExist	2	20
RWES	Right of way easement	1103	35	R/W	2	20
RW	Right of way	1104	35	R/W	4	20
CORP	Corporation line	1105	35	ustn6	8	20
CNTY	County line	1106	41	ustn7	8	20
SMK	Survey marker	1109	43	0	2	
IP	Iron pin	1110	37	0	2	
FCP	Full control point	1111	43	0	2	
HUB	Hub	1112	43	0	2	
BM	Bench mark	1113	27	0	2	
USGS	USGS marker	1114	27	0	2	
SPOT	Spot elevation	1115	33	0	2	
RWM	Right of way marker	1116	35	0	2	
ROCK	Rock outcrop	1117	42	ustn3	2	20
FP	Fixed point	1118	43	0	2	
COAL	Coal outcrop	1119	41	ustn3	2	20
EP	Edge of pavement	1120	37	ustn3	2	20
SW	Sidewalk	1121	37	ustn3	2	20
CURB	Curb line	1122	37	ustn3	2	20
CL	Centerline	1123	43	0	2	
STEPS	Steps	1124	37	0	2	
WALK	Walkway	1125	37	ustn3	2	20
WHGD	Wheel guard	1126	46	ustn3	2	20
CSLAB	Concrete slab	1127	41	ustn3	2	20
HWM	High water mark	1128	45	0	4	
FLOOR	Floor elevation	1129	37	0	2	

Name	Description	Number	Color	Style	Weight	Style Scale
BLDG	Building or shed	1130	37	0	4	
BLDR	Building ruins	1131	37	0	4	
SEPF	Septic field	1132	39	ustn5	2	20
BB	Billboard	1133	37	0	2	
SEPT	Septic tank	1134	39	0	2	
RSGN	Road sign	1135	37	0	2	
LPOLE	Light pole	1136	24	0	3	
SGNP	Signal pole	1137	26	0	3	
PJB	Power junction box	1138	24	0	3	
POST	Post	1139	37	0	4	
UST	Underground storage tank	1140	41	ustn5	2	20
AGST	Above ground storage tank	1141	37	0	2	
RETW	Retaining wall	1142	46	ustn3	2	20
GRDN	Garden	1143	47	ustn3	3	20
MBOX	Mailbox or paperbox	1144	37	0	2	
HMK	Historical marker	1145	37	0	2	
MP	Milepost	1146	37	0	2	
PMK	Project marker	1147	42	0	2	
SDSH	Satellite dish	1148	37	0	2	
LPOST	Light post	1149	24	0	3	
DI	Drop inlet	1150	45	0	2	
STOMH	Storm sewer manhole	1151	28	0	3	
DITCH	Drainage ditch	1152	34	Stream	2	20
STOL	Storm sewer line	1153	28	Sto	3	20
SIGN	Sign	1154	37	0	2	
CLP	Clothes line post	1155	37	0	4	
FNT	Fountain	1156	37	0	4	
CNPY	Canopy	1157	37	0	4	
BLDFN	Buildin foundation	1158	37	0	4	
CEM	Cemetery	1159	37	ustn3	2	20
RGUT	Rock gutter	1160	42	ustn3	2	20
PCULV	Pipe culvert	1161	45	ustn2	2	20
FL	Flow line	1162	45	0	2	
CGUT	Concrete gutter	1163	45	ustn3	2	20
CB	Catch basin	1164	45	ustn3	2	20
CIN	Curb inlet	1165	45	ustn2	2	20
GUT	Gutter	1166	45	0	2	
BRKLN	Crown of pavement	1167	32	ustn4	4	20
EUR	Edge of unimproved road	1170	37	ustn3	2	20
TRAIL	Trail	1171	37	ustn2	2	20
DW	Driveway	1172	37	ustn3	2	20
BRG	Bridge	1173	46	ustn3	2	20
PKLT	Parking lot	1174	37	ustn3	2	20
TUNL	Tunnel	1175	46	ustn3	2	20
CMED	Concrete median	1176	37	ustn3	2	20
SHLDR	Shoulder or berm	1177	37	ustn3	2	20

Name	Description	Number	Color	Style	Weight	Style Scale
ABUT	Abutment	1178	46	ustn3	2	20
ABBW	Abutment backwall	1179	46	ustn3	2	20
HORZ	Horizontal control point	1180	43	0	2	
VERT	Vertical control point	1181	43	0	2	
PIER	Pier	1182	46	ustn3	2	20
PWALL	Parapet wall	1183	37	ustn3	2	20
WW	Wing wall	1184	46	ustn3	2	20
HW	Headwall	1185	45	ustn2	2	20
BCULV	Box culvert	1186	46	ustn3	2	20
SLIDE	Slide perimeter	1187	42	ustn3	2	20
DCURB	Drop curb	1188	37	ustn3	2	20
GPI	Gasoline pump island	1189	37	ustn3	2	20
ISLND	Island	1190	37	ustn3	2	20
PLNTR	Planter or flower box	1191	37	0	2	
PKAR	Parking area	1192	37	ustn3	2	20
BRGDK	Bridge deck	1193	46	ustn3	2	20
MED	Median	1194	37	ustn3	2	20
ER	Edge of road	1195	37	ustn3	2	20
LWC	Low water crossing	1196	46	ustn2	2	20
DAM	Dam	1197	46	ustn2	2	20
SWAMP	Swamp	1198	33	0	2	
POND	Pond	1199	34	Stream	4	20
TOP	Top of slope	1200	33	ustn2	2	20
TOE	Toe of slope	1201	33	ustn2	2	20
JKYD	Junk yard	1202	37	ustn3	2	20
LMYD	Lumber yard	1203	37	ustn3	2	20
CW	Crosswalk	1204	37	0	4	
BRGAP	Bridge approach slab	1205	46	ustn2	2	20
BRGEJ	Bridge expansion joint	1206	46	ustn3	2	20
BRGST	Bridge seat	1207	46	ustn3	2	20
CBORE	Core boring	1210	46	0	2	
MK	Marker, generic	1211	27	0	2	
PED	Pedestal	1215	37	0	2	
PILL	Pillar	1216	37	0	2	
PORCH	Porch	1217	37	ustn3	2	20
WALL	Wall	1218	46	ustn3	2	20
GATE	Gate	1219	37	0	4	
HAND	Handrail	1220	37	0	2	
AC	Air conditioner	1221	37	0	2	
XSC	Cross section	1222	35	0	2	
OHW	Ordinary high water	1223	45	OHW	4	
FIB	Fiber optic line	1224	40	0	3	
EXISTING SURVEY LABELS		1300	32	0	3	
INTERMEDIATE CONTOURS		1301	50	0	2	
INDEX CONTOURS		1302	51	0	2	
OBSCURE INTERMEDIATE CONTOURS		1303	50	ustn1	2	20
OBSCURE INDEX CONTOURS		1304	51	ustn1	2	20

Appendix III
Textstyle files and Fonts

A. TEXTSTYLES

	CLASS I DESIGN		CLASS I EXISTING		CLASS II DESIGN		CLASS II EXISTING	
TEXTSTYLE FILE	Font	Text Size	Font	Text Size	Font	Text Size	Font	Text Size
in-ftscaletext.dgnlib	201	0.22	203	0.22	201	0.18	203	0.18
10scaletext.dgnlib	201	2.2	203	2.2	201	1.8	203	1.8
20scaletext.dgnlib	201	4.4	203	4.4	201	3.6	203	3.6
40scaletext.dgnlib	201	8.8	203	8.8	201	7.2	203	7.2
50scaletext.dgnlib	201	11	203	11	201	9.0	203	9.0
100scaletext.dgnlib	201	22	203	22	201	18	203	18
200scaletext.dgnlib	201	44	203	44	201	36	203	36
500scaletext.dgnlib	201	110	203	110	201	90	203	90
1000scaletext.dgnlib	201	220	203	220	201	180	203	180

	CLASS III DESIGN		CLASS III EXISTING		CLASS IV DESIGN		CLASS IV EXISTING	
TEXTSTYLE FILE	Font	Text Size	Font	Text Size	Font	Text Size	Font	Text Size
in-ftscaletext.dgnlib	201	0.14	203	0.14	201	0.10	203	0.10
10scaletext.dgnlib	201	1.4	203	1.4	201	1.0	203	1.0
20scaletext.dgnlib	201	2.8	203	2.8	201	2.0	203	2.0
40scaletext.dgnlib	201	5.6	203	5.6	201	4.0	203	4.0
50scaletext.dgnlib	201	7	203	7	201	5.0	203	5.0
100scaletext.dgnlib	201	14	203	14	201	10	203	10
200scaletext.dgnlib	201	28	203	28	201	20	203	20
500scaletext.dgnlib	201	70	203	70	201	40	203	40
1000scaletext.dgnlib	201	140	203	140	201	100	203	100

B. ARCHITECTURAL TEXTSTYLES

SCALE	Border Scale	Font	Dim Text Size	Subtitle Text Size	Title Text Size	Line Spacing
1/16"=1'-0"	16	201	2.341	3.512	4.682	1.171
1/8"=1'-0"	8	201	1.171	1.756	2.341	0.586
3/16"=1'-0"	5.333	201	0.878	1.317	1.756	0.439
1/4"=1'-0"	4	201	0.585	0.878	1.171	0.293
5/16"=1'-0"	3.2	201	0.512	0.768	1.024	0.256
3/8"=1'-0"	2.667	201	0.439	0.659	0.878	0.220
7/16"=1'-0"	2.286	201	0.366	0.549	0.732	0.183
1/2"=1'-0"	2	201	0.293	0.439	0.585	0.146
5/8"=1'-0"	1.6	201	0.256	0.384	0.512	0.128
3/4"=1'-0"	1.333	201	0.219	0.329	0.439	0.110
7/8"=1'-0"	1.143	201	0.183	0.274	0.366	0.091
1"=1'-0"	1	201	0.146	0.220	0.293	0.073
1 1/2"=1'-0"	0.667	201	0.110	0.165	0.219	0.055
2"=1'-0"	0.5	201	0.073	0.110	0.146	0.037
3"=1'-0"	0.333	201	0.048	0.072	0.097	0.024

AVAILABLE TEXT FONTS

FONT 201

ABCDEFGHIJKLMNOPQRSTUVWXYZ
abcdefghijklmnopqrstuvwxyz
0123456789:;<=>?@[\]_ ° ² ₵ ³ △ ∅
½ ¼ ¾ ⅛ ⅜ ⅝ ⅞ 1/16 3/16 5/16 7/16 9/16 11/16 13/16 15/16

FONT 202

ABCDEFGHIJKLMNOPQRSTUVWXYZ
abcdefghijklmnopqrstuvwxyz
0123456789:;<=>?@[\]_ ° ² ₵ ³ △ ∅
½ ¼ ¾ ⅛ ⅜ ⅝ ⅞ 1/16 3/16 5/16 7/16 9/16 11/16 13/16 15/16

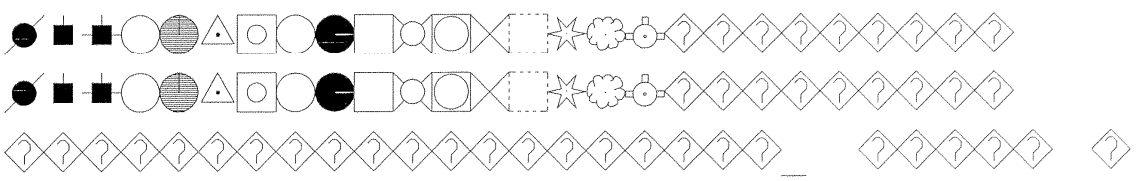
FONT 203

ABCDEFGHIJKLMNOPQRSTUVWXYZ
abcdefghijklmnopqrstuvwxyz
0123456789:;<=>?@[\]_ ° ² ₵ ³ △ ∅
½ ¼ ¾ ⅛ ⅜ ⅝ ⅞ 1/16 3/16 5/16 7/16 9/16 11/16 13/16 15/16

FONT 204

ABCDEFGHIJKLMNOPQRSTUVWXYZ
abcdefghijklmnopqrstuvwxyz
0123456789:;<=>?@[\]_ ° ² ₵ ³ △ ∅
½ ¼ ¾ ⅛ ⅜ ⅝ ⅞ 1/16 3/16 5/16 7/16 9/16 11/16 13/16 15/16

Font 95



Appendix IV

Plot Files

In order to standardize plots, pen tables for IPLOT and microstation PLOT have been created. The plot files for microstation PLOT are V8_micro_full.plt and V8_micro_half.plt. The pen tables for IPLOT are IPLOT_full.pen and IPLOT_half.pen.

A test file has been provided to compare pen tables to a "key" print that is provided by engineering division. The key print can be picked up when the consultant is in Charleston for a progress meeting. The test print can be printed and then compared to the key print to see if changes need to be made based on the individual printers/plotters. The line weight widths should not be edited only compared to the key print. Since shading can vary from one printer to the next, the key print should be used to adjust the RGB numbers for each consultants printer. The RGB numbers provided are a merely a starting point.

The following RGB numbers and weight widths are those used in the *.pen and *.plt provided.

SHADING (For all pen tables Red, Green, Blue input)
Color 0-15 RGB (0,0,0)
Color 16-31 RGB (195,195,195)
Color 32-47 RGB (210,210,210)
Color 50-51 RGB (225,225,225)
All other Colors RGB (255,255,255)

WEIGHTS (Half Size)

Weights	Widths (in)	Width (mm)
0	0.002	0.05
1	0.004	0.10
2	0.006	0.15
3	0.008	0.20
4	0.010	0.25
5	0.012	0.30
6	0.014	0.35
7	0.016	0.40
8	0.018	0.45
9	0.020	0.50
10	0.022	0.55
11	0.024	0.60
12	0.026	0.65
13	0.028	0.70
14	0.030	0.75
15	0.032	0.80
16	0.034	0.85
17	0.036	0.90
18	0.038	0.95
19	0.040	1.00

WEIGHTS (Full Size)

Weights	Widths (in)	Width (mm)
0	0.004	0.10
1	0.008	0.20
2	0.012	0.30
3	0.016	0.40
4	0.020	0.50
5	0.024	0.60
6	0.028	0.70
7	0.032	0.80
8	0.036	0.90
9	0.040	1.00
10	0.044	1.10
11	0.048	1.20
12	0.052	1.30
13	0.056	1.40
14	0.060	1.50
15	0.064	1.60
16	0.068	1.70
17	0.072	1.80
18	0.076	1.90
19	0.080	2.00

Appendix V
CELLS

The following cells will be those provided and supported by the WVDOT. Cells are simplified drawings used to simplify many standard drawings and borders. The border cells should be used as shown and as delivered. Alteration to these cells should only be as directed. Others cells can be modified per specific project needs.

Border

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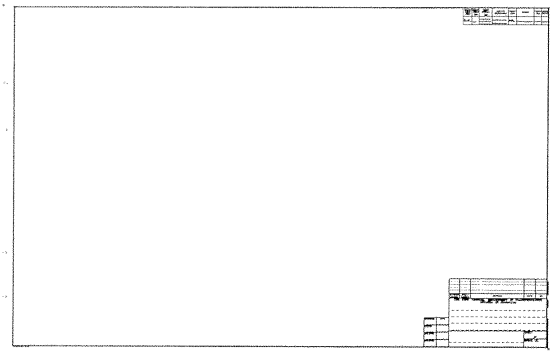
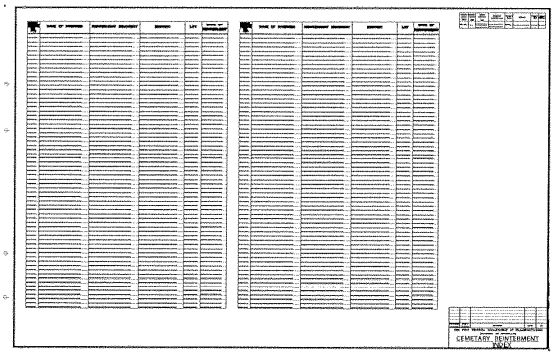
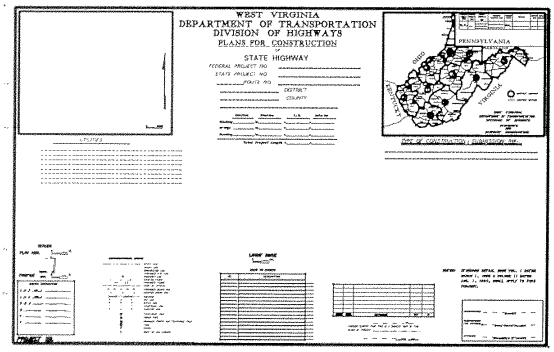


BRIDGE



CEMTRY



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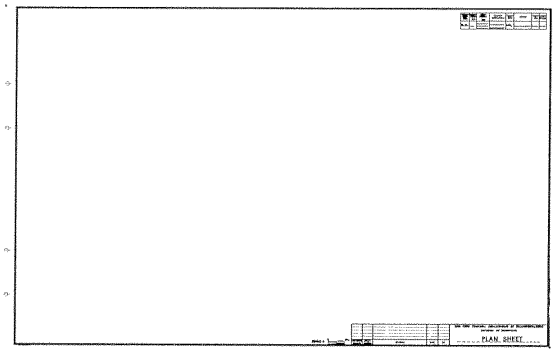
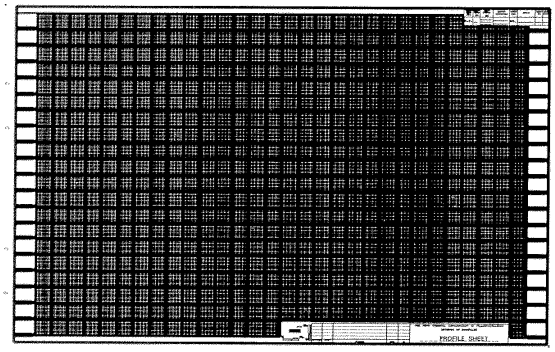
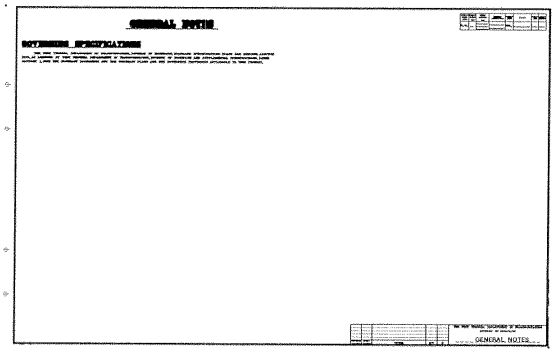


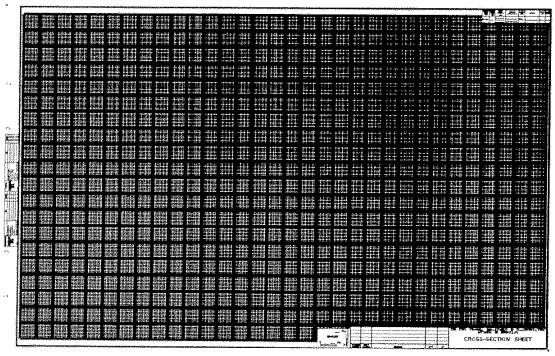
PLAN



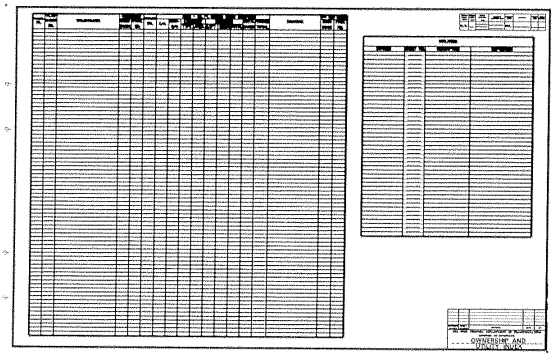
PROFILE



GENOTS



XSECT



OWNER

Border

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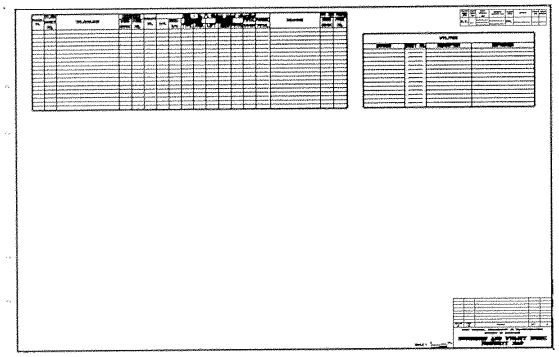
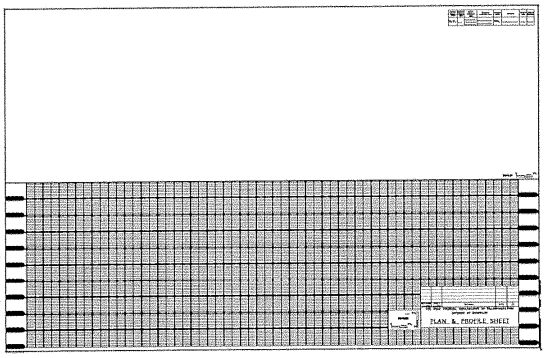
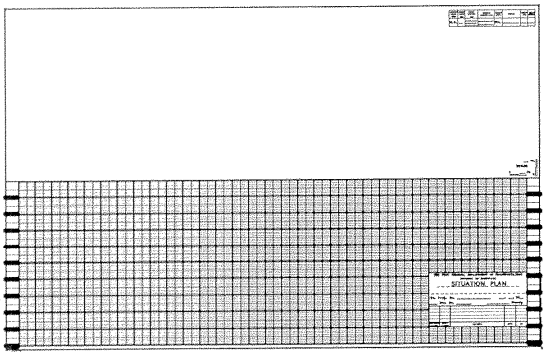


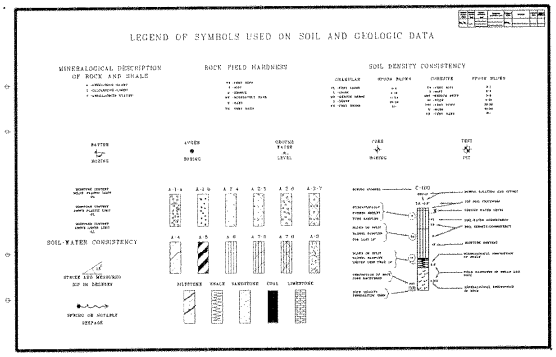
OWNUP



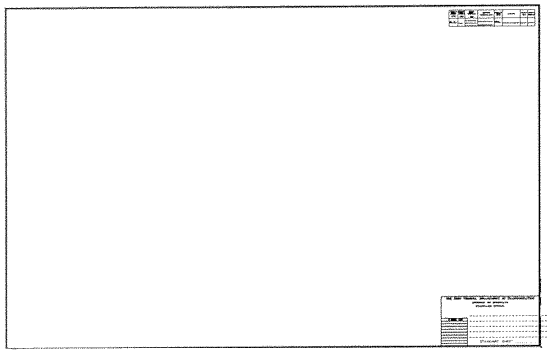
PLNPRO



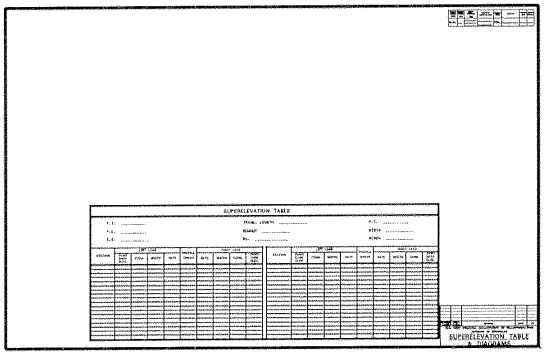
SIT



STITLE

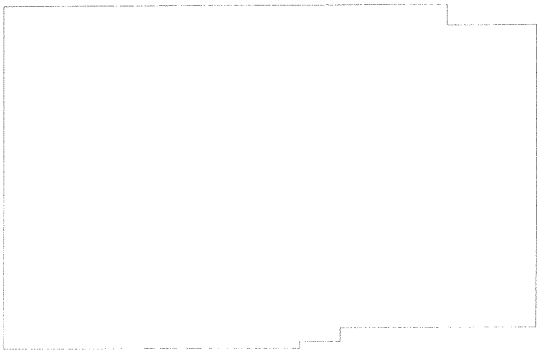


STDBOR



SUPER

CBLANK



EDGES1

Border

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STATE PROJECT NUMBER: _____ DATE: _____
FEDERAL PROJECT NUMBER: _____ SUFF. RATING: _____

DESCRIPTION: _____ INVENTORY NO.: _____
COUNTY: _____

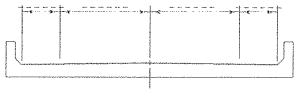
A.D.T. _____ DESIGN SPEED _____ TRUCKS _____

EXISTING ROADWAY: PAVEMENT: _____ SHOULDERS: _____
EXISTING BRIDGE: WIDTH: _____ LENGTH: _____

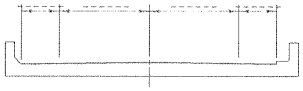
*PROPOSED ROADWAY: PAVEMENT WIDTH _____
SHOULDER WIDTH _____ USABLE

*PROPOSED BRIDGE CLEAR WIDTH _____ TO FACE OF GUARDRAIL

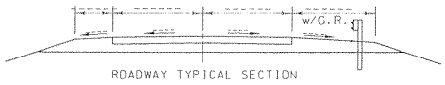
*Obtained From Table 7.6. and 9
of the Geometric Design Guide
for Local Roads and Streets



BRIDGE TYPICAL SECTION



BRIDGE TYPICAL SECTION WITH SIDEWALK



ROADWAY TYPICAL SECTION

RECOMMENDED TYPICAL SECTION: AS SHOWN ABOVE
HYDRAULIC DATA:

Drainage Area _____ sq mi
Q_{10} _____ cfs
Q_{25} _____ cfs
Q_{50} _____ cfs
Ave. High Water = _____ ft
Ext. High Water = _____ ft

cc: DD(MF)

DSSHT1

ABLANK

W. VA. DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS
RIGHT OF WAY DIVISION

PROJECT NO(S).	FEDERAL: / STATE:	PARCEL NO(S).	OWNER(S) NAME:
DISTRICT:	COUNTY:	SCALE: 1":	DATE:

ACQ11

W.V. DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS
PLAN OF PROPOSED IMPROVEMENTS OF STATE HIGHWAY

PROJECT NAME _____
STATE PROJECT NO. _____
FEDERAL PROJECT NO. _____
COUNTY _____
LENGTH _____ MILES _____ COORDINATES: X = DEG. MIN.
Y = DEG. MIN.
TERMINI BEGIN: _____
END: _____
TYPE OF IMPROVEMENT _____
EXISTING ADT _____

"TRAFFIC CONTROL FOR STREETS AND HIGHWAY CONSTRUCTION AND MAINTENANCE OPERATIONS" DATED FEBUARY 1996, AND STANDARD DETAILS BOOK, VOLUME I, DATED JANUARY 1, 2000 , AND VOLUME II, DATED JANUARY 1, 1994, SHALL APPLY TO THIS PROJECT.

RECOMMENDED
FOR APPROVAL _____
STATE HIGHWAY ENGINEER

APPROVED _____
COMMISSIONER OF HIGHWAYS

I HEREBY CERTIFY THAT THIS IS A CORRECT COPY OF THE PLANS OF PROJECT _____

EXECUTIVE SECRETARY
DAY OF ,20

TIT8.5

Border

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THE WEST VIRGINIA DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS
ENGINEERING DIVISION
IN-HOUSE SECTION

Subject: Project Name: of

Prepared By: Date: Project No: County:

STAND

BRIDGE REPLACEMENT STUDY

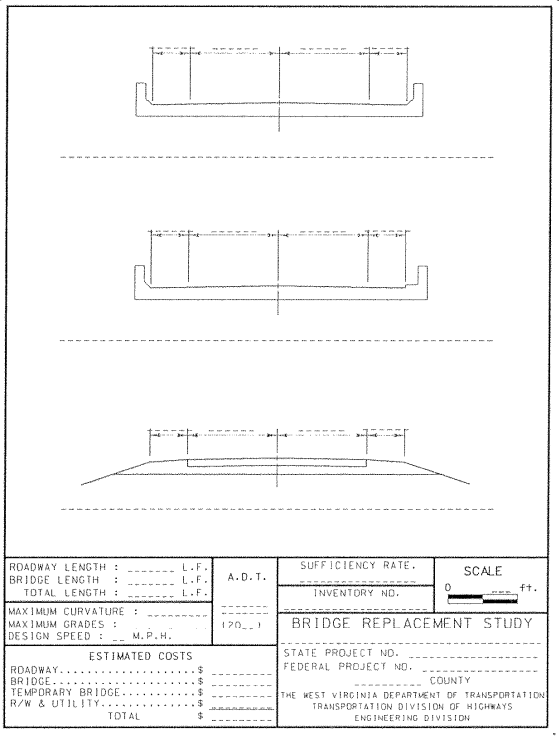
STATE PROJECT NO.

FEDERAL PROJECT NO.

COUNTY

WEST VIRGINIA DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS
ENGINEERING DIVISION

YR1



ROADWAY LENGTH : _____ L.F.
BRIDGE LENGTH : _____ L.F.
TOTAL LENGTH : _____ L.F.

A.D.T.

MAXIMUM CURVATURE :
MAXIMUM GRADES :
DESIGN SPEED : __ M.P.H.

(20__)

SUFFICIENCY RATE.

INVENTORY NO.

SCALE 0 ft.

BRIDGE REPLACEMENT STUDY

STATE PROJECT NO.

FEDERAL PROJECT NO.

COUNTY

THE WEST VIRGINIA DEPARTMENT OF TRANSPORTATION
TRANSPORTATION DIVISION OF HIGHWAYS
ENGINEERING DIVISION

ESTIMATED COSTS

ROADWAY.....$
BRIDGE.....$
TEMPORARY BRIDGE.....$
R/W & UTILITY.....$
TOTAL $

YR2

SITE PLAN

CONTOUR INTERVAL FEET
NATIONAL GEODETIC VERTICAL DATUM OF 1929

ROAD CLASSIFICATION

Heavy-duty
Medium-duty
Light-duty
Unimproved dirt

Interstate Route
U.S. Route
State Route

QUADRANGLE LOCATION

YR2

Border

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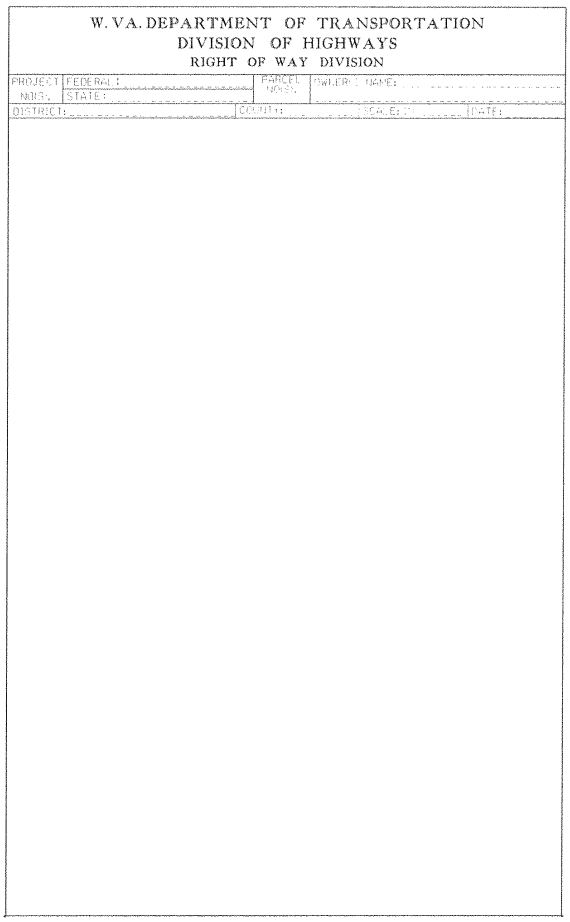

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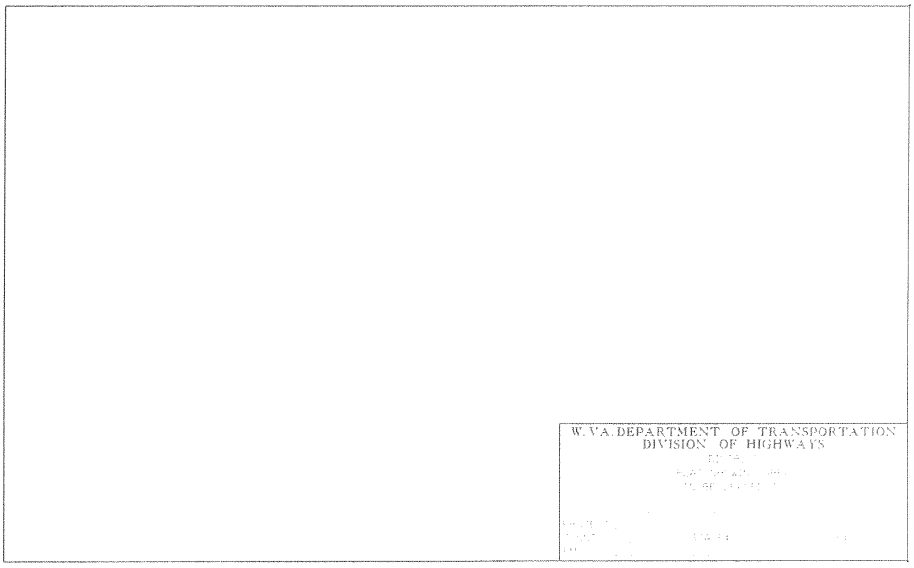

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YR4

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Border

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EDGES2

SUPERELEVATION TABLE

P.I. _____ TRANS. LENGTH _____ P.T. _____

P.C. _____ RUNOUT _____

S.E. _____ Dc. _____

STATION	LEFT LANE - SOUTHBOUND				PROFILE GRADE	RIGHT LANE - NORTHBOUND			
	PVMT. EDGE ELEV.	CORR.	WIDTH	RATE		RATE	WIDTH	CORR.	PVMT. EDGE ELEV.

STATION	LEFT LANE - SOUTHBOUND				PROFILE GRADE	RIGHT LANE - NORTHBOUND			
	PVMT. EDGE ELEV.	CORR.	WIDTH	RATE		RATE	WIDTH	CORR.	PVMT. EDGE ELEV.

SUPER2

THE WEST VIRGINIA DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS

SITUATION PLAN

St. Proj. No. _____ ___, __, 20__

____ Rte. No. _____ _____ County

REVISION NUMBER	SHEET NUMBER	REVISION	DATE	BY

SITBLK

CURVE #__

PI = _____

△ = _____

D = _____

R = _____

L = _____

T = _____

SE = _____

CRVDAT

REVISION NUMBER	SHEET NUMBER	REVISION	DATE	BY

THE WEST VIRGINIA DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS

BLOCK1

Border

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W.V. DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS
PLAN OF PROPOSED IMPROVEMENTS OF
STATE HIGHWAY

PROJECT NAME _____
STATE PROJECT NO. _____
FEDERAL PROJECT NO. _____
COUNTY _____
LENGTH _____ MILES

RIGHT OF WAY

TYPE OF IMPROVEMENT _____

RECOMMENDED
FOR APPROVAL _____
STATE HIGHWAY ENGINEER

APPROVED _____
COMMISSIONER OF HIGHWAYS

I HEREBY CERTIFY THAT THIS IS A CORRECT COPY OF THE
PLANS OF PROJECT _____

_____
EXECUTIVE SECRETARY
_____ DAY OF _____, 20__

RWTIT

REVISION NUMBER	SHEET NUMBER	REVISION	DATE	BY	THE WEST VIRGINIA DEPARTMENT OF TRANSPORTATION DIVISION OF HIGHWAYS

BLOCK2

STATION	LENGTH (FT)	SEEDING & MULCHING		CLEARING & GRUBBING		EXCAVATION						EMBANKMENT					
		WIDTH (FT)	AREA (SF)	WIDTH (FT)	AREA (SF)	UNCLASSIFIED (SF)	UNCLASSIFIED (CY)	UNSUITABLE (SF)	UNSUITABLE (CY)	_____ (SF)	_____ (CY)	UNCLASSIFIED (SF)	UNCLASSIFIED (CY)	SELECT (SF)	SELECT (CY)	_____ (SF)	_____ (CY)

EWT

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PTAG

SCALES
___ ft.
0 ___ ft. 0

HVSCAL

STANDARD DETAILS		
DWG. NO.	DESCRIPTION	DATE

STNDRD DTL

Public Roads Div.	State Dist. No.	State Project No.	Federal Project No.	Fiscal Year	County	Sheet No.	Total Sheets
W.V.	__	_____	_____	200_	_____	___	___

INFO

PROJECT SITE

SITE4

PROJECT SITE

SITE4

PROJECT SITE

SITE2

PROJECT SITE

SITE1

SCALE : ___ ft.
0

VSCALE

SCALE : 0 ___ ft.

HSCALE

Quant03

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BORROW COMPUTATIONS

SELECT EMBANKMENT REQUIRED (FROM TABLE "GRADING SUMMARY") = _____ C.Y.

SELECT EMBANKMENT AVAILABLE (FROM TABLE "PROBABLE SOURCE OF SELECT EMBANKMENT") = _____ C.Y.

= _____ C.Y.

ROCK BORROW EXCAVATION REQUIRED TO MEET SELECT EMBANKMENT REQUIREMENTS WITH _15% SWELL FACTOR :

ITEM 211002-000, ROCK BORROW EXCAVATION = (SELECT EMBANKMENT NEEDED) / 1.0,15 = _____ C.Y.

UNCLASSIFIED EMBANKMENT REQUIRED (FROM TABLE "GRADING SUMMARY") = _____ C.Y.

ADJUSTED EXCAVATION (FROM TABLE "GRADING SUMMARY") = _____ C.Y.

SELECT EMBANKMENT AVAILABLE (FROM TABLE "PROBABLE SOURCE OF SELECT EMBANKMENT") = _____ C.Y.

EMBANKMENT NEEDED = _____ C.Y.

EXCAVATION REQUIRED TO MEET EMBANKMENT REQUIREMENTS WITH _10% SHRINK FACTOR:

ITEM 211001-000, UNCLASSIFIED BORROW EXCAVATION = (EMBANKMENT NEEDED) / 1.0,10 = _____ C.Y.

BC

LOCATION STATION	LOCATION STATION	LENGTH LT	LENGTH RT	DEPTH	WIDTH	TYPE	ITEM	REMARKS
Total								

EC5

CLEARING & GRUBBING / SEEDING & MULCHING

LOCATION STATION	LOCATION STATION	ITEM 201001-000 CLEARING AND GRUBBING S.F.	ITEM 201001-000 CLEARING AND GRUBBING ACRES	ITEM 652001-000 SEEDING AND MULCHING S.F.	ITEM 652001-000 SEEDING AND MULCHING ACRES	ITEM 652001-001 AGRICULTURAL LIMESTONE TON	ITEM 652002-001 FERTILIZER 10-20-10 TON	ITEM 652002-002 UREA FORMALDEHYDE FERTILIZER TON	ITEM 652003-001 SEED MIXTURE A, C-1, OR C-2 LB.	ITEM 652003-002 SEED MIXTURE D LB.	ITEM 652004-001 STRAW OR HAY MULCH TON	ITEM 652004-002 WOOD CELLULOSE FIBER MULCH TON	ITEM ---- ---- ----	REMARKS
TOTAL														

CAGSAM

LOCATION STATION	LOCATION STATION	LENGTH LEFT	LENGTH RIGHT	----	ITEM ---- ---- ----	REMARKS
TOTAL						

EC1

WATERLINE RELOCATION QUANTITIES

LOCATION STATION	LOCATION STATION	ITEM STO__-__	ITEM STO__-__	ITEM STO__-__	ITEM STO__-__	ITEM STO__-__	ITEM STO__-__	ITEM STO__-__	ITEM STO__-__	REMARKS

WRQ

LOCATION STATION	LOCATION STATION	LENGTH LEFT	LENGTH RIGHT	----	REMARKS

EC2

STATION	OFFSET LEFT	OFFSET RIGHT	----	REMARKS

EC4

BUILDING DEMOLITION

BUILDING NO.	STATION	OFFSET LEFT	OFFSET RIGHT	REMARKS

BD

LOCATION STATION	LOCATION STATION	---- ----	---- ----	REMARKS

EC3

GRADING SUMMARY

LOCATION STATION	LOCATION STATION	TOTAL UNCLASS. EXCAV. ITEM 207001-001 C.Y.	UNSUIT. EXCAV. C.Y.	USABLE EXCAV. C.Y.	SHRINK OR SWELL C.Y.	ADJUST. EXCAV. C.Y.	UNCLASS. EMBANK. C.Y.	SELECT EMBANK. C.Y.	TOTAL EMBANK. C.Y.	EXCESS(+) OR BORROW(-) C.Y.	REMARKS

GS

SEEDING & MULCHING

LOCATION STATION	LOCATION STATION	ITEM 652001-001 AGRICULTURAL LIMESTONE TON	ITEM 652002-001 FERTILIZER 10-20-10 TON	ITEM 652002-002 UREA FORMALDEHYDE FERTILIZER TON	ITEM 652003-001 SEED MIXTURE A, C-1, OR C-2 LB.	ITEM 652003-002 SEED MIXTURE D LB.	ITEM 652004-001 STRAW OR HAY MULCH TON	ITEM 652004-002 WOOD CELLULOSE FIBER MULCH TON	REMARKS

SAM

Quant03

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GUARDRAIL

LOCATION		ITEM 607001-001				ITEM 607065 -00- F.E.T.	ITEM 607066 -001- T.E.T.	ITEM 607025-001 C.S.T.		ITEM 607006 -00- THRIE BEAM	ITEM 607037 -00- BUFFER END	REMARKS
		CLASS ___		CLASS ___								
STATION	STATION	LEFT	RIGHT	LEFT	RIGHT			A	B			

G

PAVING QUANTITIES

LOCATION		LENGTH	ITEM 401002 -00-	ITEM 401002 -00-	ITEM 401001 -007-	ITEM 401001 -002-	ITEM 302001 -000-	ITEM 308003 -000-	ITEM 201002 -000-	ITEM 201004 -000-	ITEM 317256 -001-				
STATION	STATION		TON	TON	TON	TON	C.Y.	C.Y.	C.Y.	S.Y.	C.Y.	___	___	___	___

PQ

PIPE CULVERTS

LOCATION		SKEW											
STATION	STATION	__°	__'	__°	____	__°	__'	__°	____	__°	__'	__°	____

PC

SEDIMENT BASIN SUMMARY

STATION	LT RT	BASIN NO.	BASIN TYPE	207001 UNC EXC	207034 FABRIC FOR SEPARATION	211001 UNC BORROW EXC (NOTE 1)	211006 ROCK BORROW EXC	211027 TEMPY. CONS	604001 OUTLET PIPE	642035 RISER	642036 SEDIMENT REMOVAL	(NOTE 2) CLEAR/ GRUBB	SEED MIX	MULCH	(NOTE 3) FERTILIZER	AGR. LIMESTONE	REMARKS
				CY	SY	CY	TN	SF	LF	EACH	CY	ACRE	LB	TON	TON	TON	

NOTE 1: UNCLASSIFIED BORROW EXCAVATION QUANTITY CALCULATED FOR EACH BASIN ON THE TOTAL REQUIRED EXCAVATION FOR EACH BASIN.
NOTE 2: COST AND QUANTITY INCLUDED IN THE UNIT PRICE BID FOR ITEM 201001, CLEARING AND GRUBBING. PER L.S. - QUANTITY FOR INFORMATION ONLY.
NOTE 3: COST TO BE INCLUDED IN THE UNIT BID PRICE FOR ITEM 207001, UNCLASSIFIED EXCAVATION. PER CY. MATERIAL CERTIFICATION REQUIREMENTS FOR THESE ITEMS SHALL BE WAIVED. QUANTITIES FOR INFORMATION ONLY.

SBS

PIPE CULVERT SUMMARY

LOCATION		SKEW	TYPE 60400 -0-	___	___	___	___	___	___	___	___	___	___ K ___	INLET				MANHOLE				WINGWALL		CLASS B CONC.	STANDARD END SECTION	SAFTY SLOPE END SECTION	REMARKS
														LEFT		RIGHT		LEFT		RIGHT		LEFT	RIGHT				
STATION	STATION			L.F.	L.F.	L.F.	L.F.	L.F.	L.F.	L.F.	L.F.	L.F.	L.F.	NUMBER	TYPE	NUMBER	TYPE	NUMBER	TYPE	NUMBER	TYPE	EACH	EACH	C.Y.	EACH	EACH	
Total																											

PCS

TEMPORARY POLLUTION CONTROL

LOCATION		ITEM 642001-00 TEMPORARY BERM	ITEM 642002-00 SLOPE DRAINS	ITEM 642031-00 DITCH CHECKS	ITEM 642032-00 CHECK DAMS	ITEM 642033-00 SED. TRAP OR SED. POND	ITEM 642034-00 SEDIMENT DAM	ITEM 642035-00 RISER	ITEM 642036-00 SEDIMENT REMOVAL	ITEM 642004-00 TEMPORARY SEED	ITEM 642004-00 SEED MIXTURE B	ITEM 642004-00 SEED MIXTURE D	ITEM 642005-00 STRAW OR HAY MULCH	ITEM 642005-00 WOOD CELL. FIBER MULCH	ITEM 642006-00 FERTILIZER	ITEM 642007-00 FIBER MATTING	ITEM 642008-00 TEMPORARY PIPE	ITEM 642009-00 CONTOUR DITCH	ITEM 642010-00 AGRICULT. LIME LIMESTONE	ITEM 642011-00 HAY OR STRAW BALES	ITEM 642012-00 SILT FENCE	REMARKS
STATION	STATION	L.F.	L.F.	EA.	EA.	C.Y.	C.Y.	EA.	C.Y.	LBS.	LBS.	LBS.	TON	TON	TON	S.Y.	L.F.	L.F.	TON	EA.	L.F.	
Total																						

TPC

MAINTENANCE OF TRAFFIC SUMMARY

ITEM NO.	DESCRIPTION	QUANTITY UNIT	TOTAL
636002-002	Aggregate for Maintaining Traffic- Slag	Ton	
636002-001	Aggregate for Maintaining Traffic- Stone or Gravel	Ton	
636003-001	Bituminous Material for Dust Palliative	Gal.	
636004-001	Calcium Chloride for Dust Palliative	Ton	
636005-001	Temporary Structure for Maintaining Traffic	L.S.	
636008-001	Pilot Truck and Driver	Day	
636007-001	Eradication of Pavement Markings	L.F.	
636008-001	Temporary Pavement Markings - Paint	L.F.	
636009-001	Temporary Pavement Markings - Tape Type ____	L.F.	
636010-001	Temporary Raised Pavement Markers - Type ____	Each	
638011-001	Traffic Control Devices	Unit	
638012-010	Cleaning or Proper Traffic Control Devices	Each	
638013-001	Cleaning or Individual Traffic Control Devices	Each	
636014-001	Flagger	Hr.	
636015-001	Temporary Guardrail Channelization Device	L.F.	
636016-001	Remove and Reset Temp. Guardrail Channelization Device	L.F.	
636017-001	Temporary Concrete Barrier	L.F.	
636017-002	DOH Furnished Temporary Concrete Barrier	L.F.	
636018-001	Remove and Reset Temporary Concrete Barrier	L.F.	
636018-002	Remove and Reset DOH Furnished Temp. Concrete Barrier	L.F.	
636019-001	Temporary Guardrail Barrier	L.F.	
636020-001	Remove and Reset Temporary Guardrail Barrier	L.F.	
638021-001	Electric Arrow	Day	
638022-001	Changeable Message Sign	Day	
636023-001	Temporary Traffic Signal	L.S.	
636024-001	Temporary Flow for Maintaining Traffic	L.F.	
636026-001	TA1 Warning Lights	Day	
636025-001	TB1 Warning Lights	Day	
636025-001	TC1 Warning Lights	Day	
636026-001	Temporary Lighting	L.S.	
636028-001	Shadow Vehicle	Day	

MOTS

TRAFFIC CONTROL DEVICE QUANTITIES

DEVICE	DESCRIPTION	VALUE IN UNITS	QUANTITY	TOTAL UNITS
*1	SIGNS ON PORTABLE MOUNTS AND BARRICADES. (Total Sign Area 16 S.F. or Greater.)	170		
*2	SIGNS ON PORTABLE MOUNTS AND BARRICADES. (Total Sign Area Less Than 16 S.F.)	80		
*3	SIGNS ON PERMANENT POSTS. (Total Sign Area 16 S.F. or Greater.)	180		
*4	SIGNS ON PERMANENT POSTS. (Total Sign Area Less Than 16 S.F.)	90		
**5	BARRICADES - Type I	35		
**6	BARRICADES - Type II	60		
**7	BARRICADES - Type III	90		
**8	DRUMS	60		
9	CONES	5		
10	VERTICAL PANELS OR GROUND MOUNTED DELINEATORS.	10		
11	BARRIERS OR GUARDRAIL MOUNTED DELINEATORS. (To be bid inadvertent to the cost of the barrier or guardrail.)	0		
12	TEMPORARY OVERLAYS AND TEMPORARY OVERSIZE SIGNS			
		SUBTOTAL		
* - ORANGE SIGN SHEETING TO BE REFLECTIVE FLOURESCENT ORANGE, TYPE V		15% OF SUBTOTAL ITO BE USED AT THE DIRECTION OF THE ENGINEER.)		
** - BARRICADES AND DRUM SHEETING TO BE 6" FLEXIBLE HIGH INTENSITY, TYPE IV		TOTAL		

TCDQ

6" UNDERDRAIN OUTLET PIPE

STATION	LT. / RT.	LENGTH	45° BENDS	REMARKS

UOP

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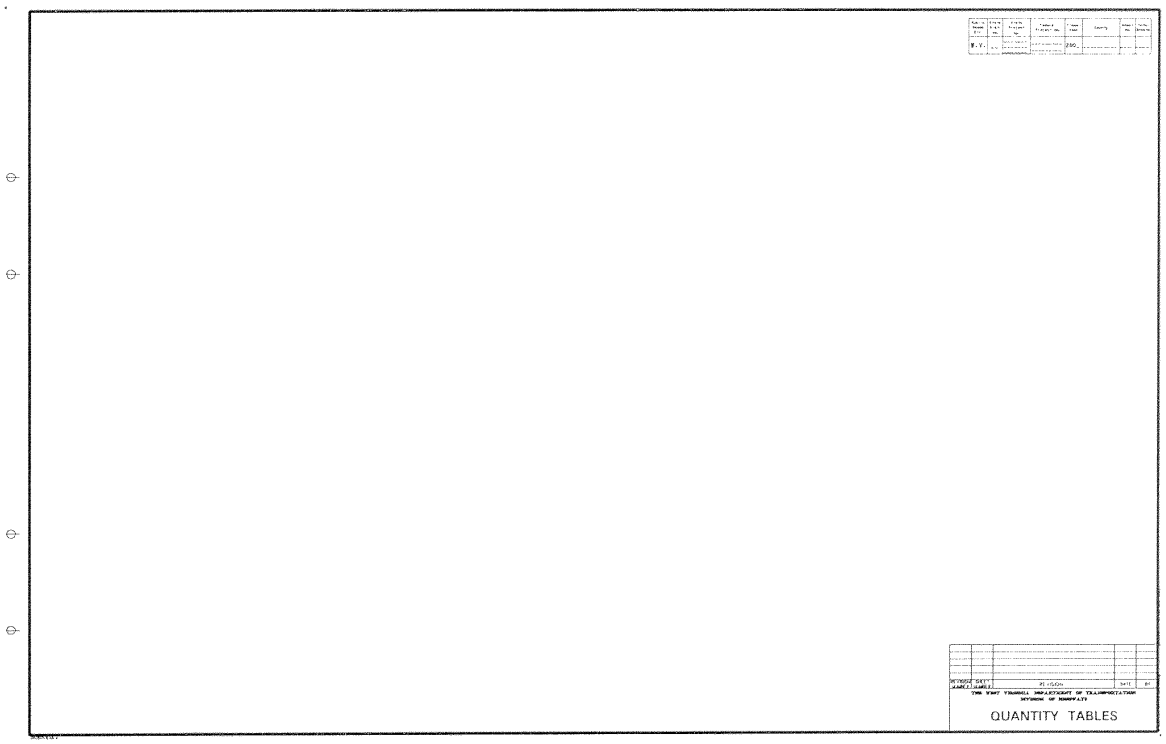

BORDER

Terminator Label

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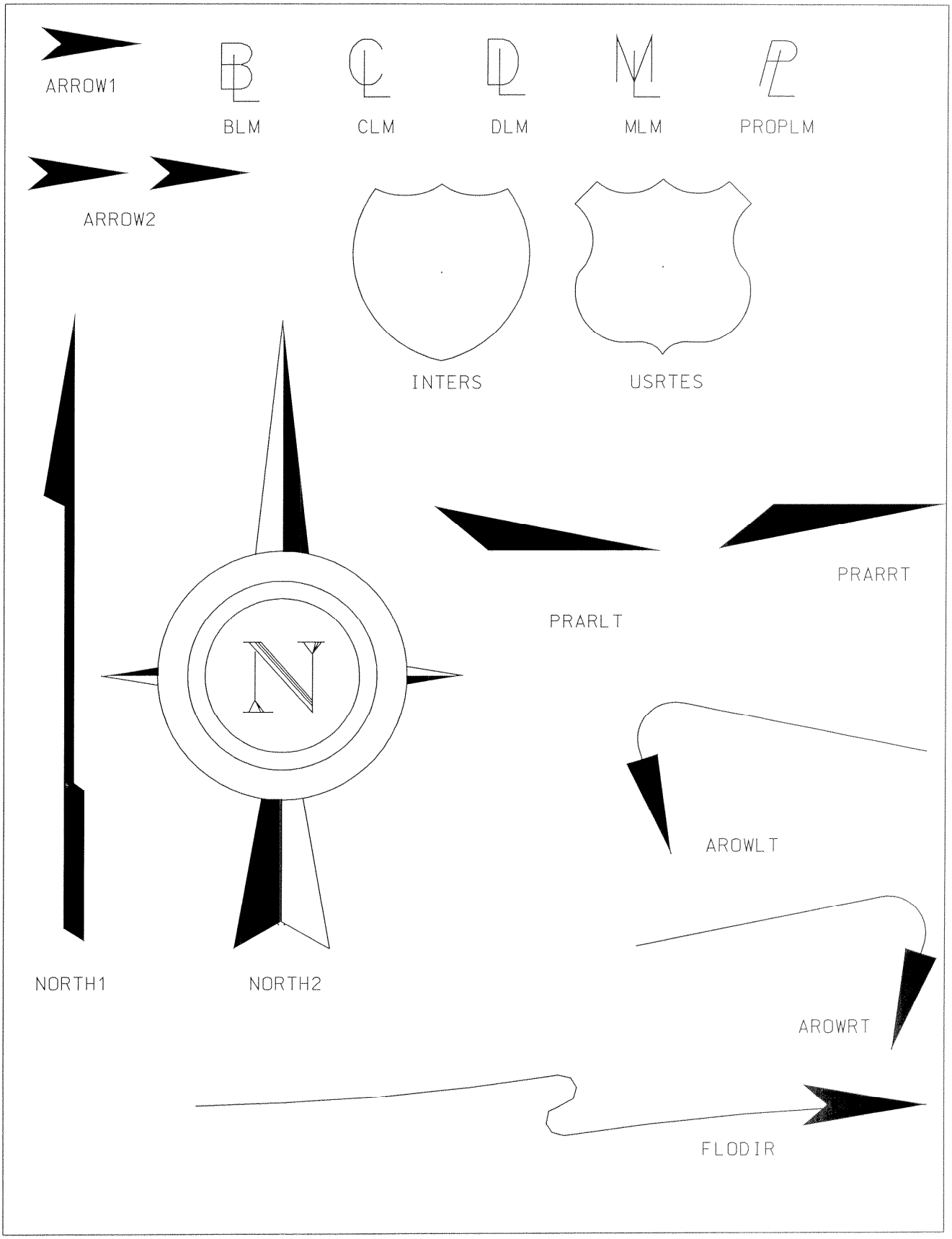

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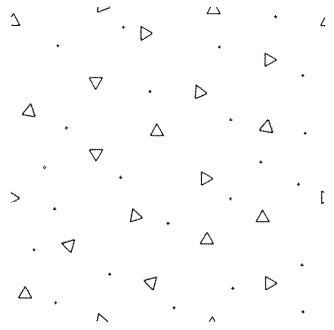

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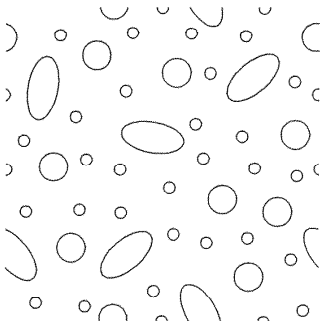
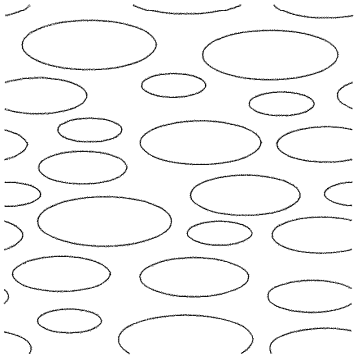


GRAVEL



RIPRAP

G.R. End Treatment

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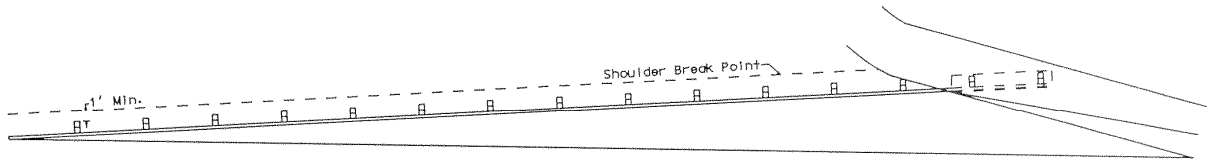

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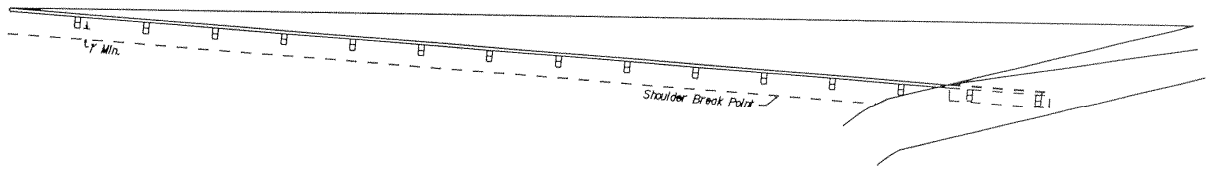

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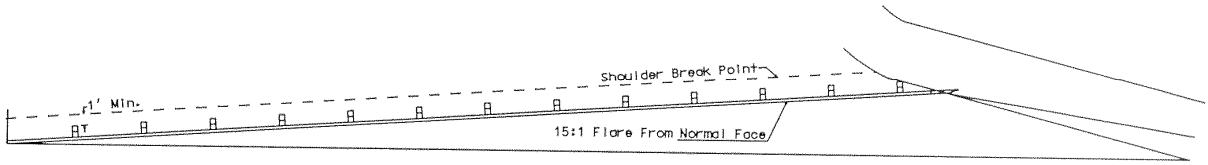

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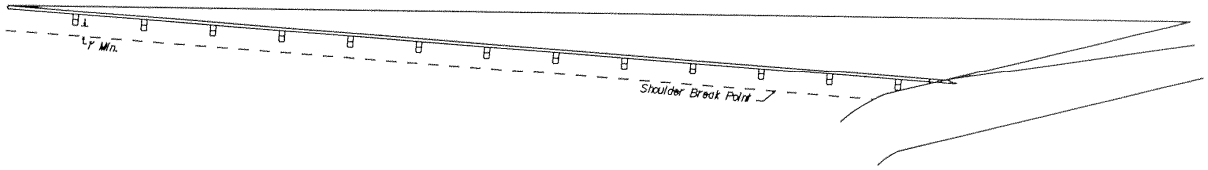
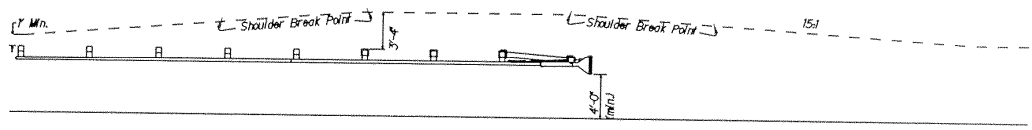
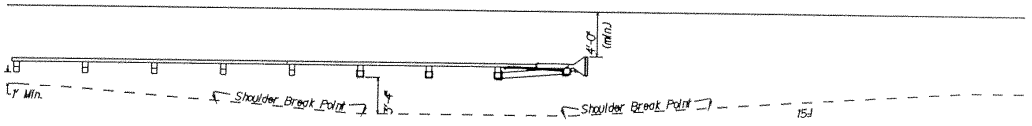


T CS B RT



T TE LT



T TE RT

G.R. End Treatment

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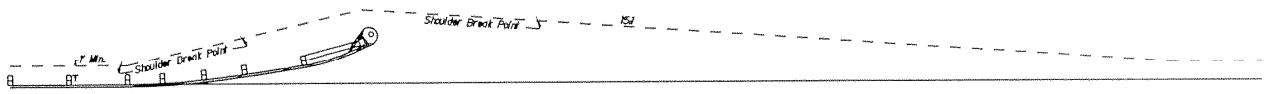
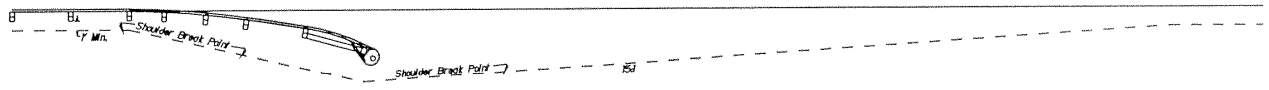
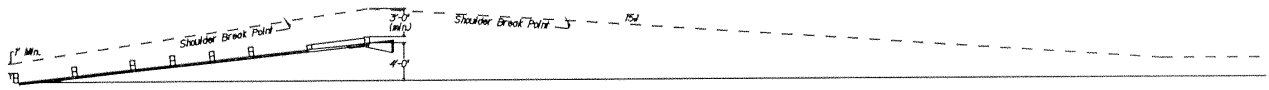


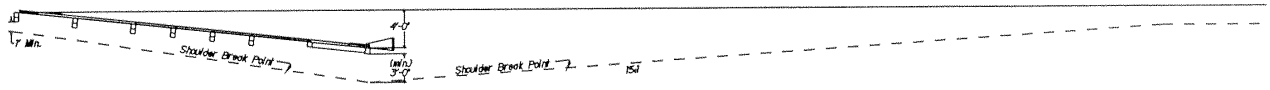
T FE PRABLIC LT



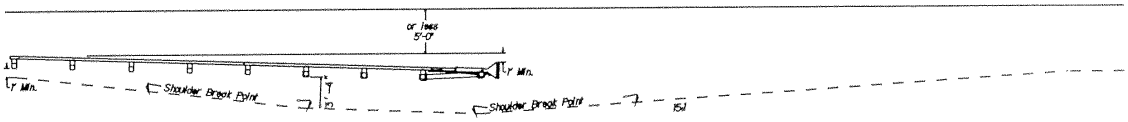
T FE PRABLIC RT



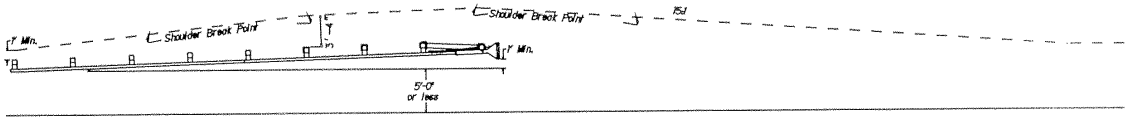
T FE STRAT LT



T FE STRAT RT



T TE FLARE RT



T TE FLARE LT

Drainage

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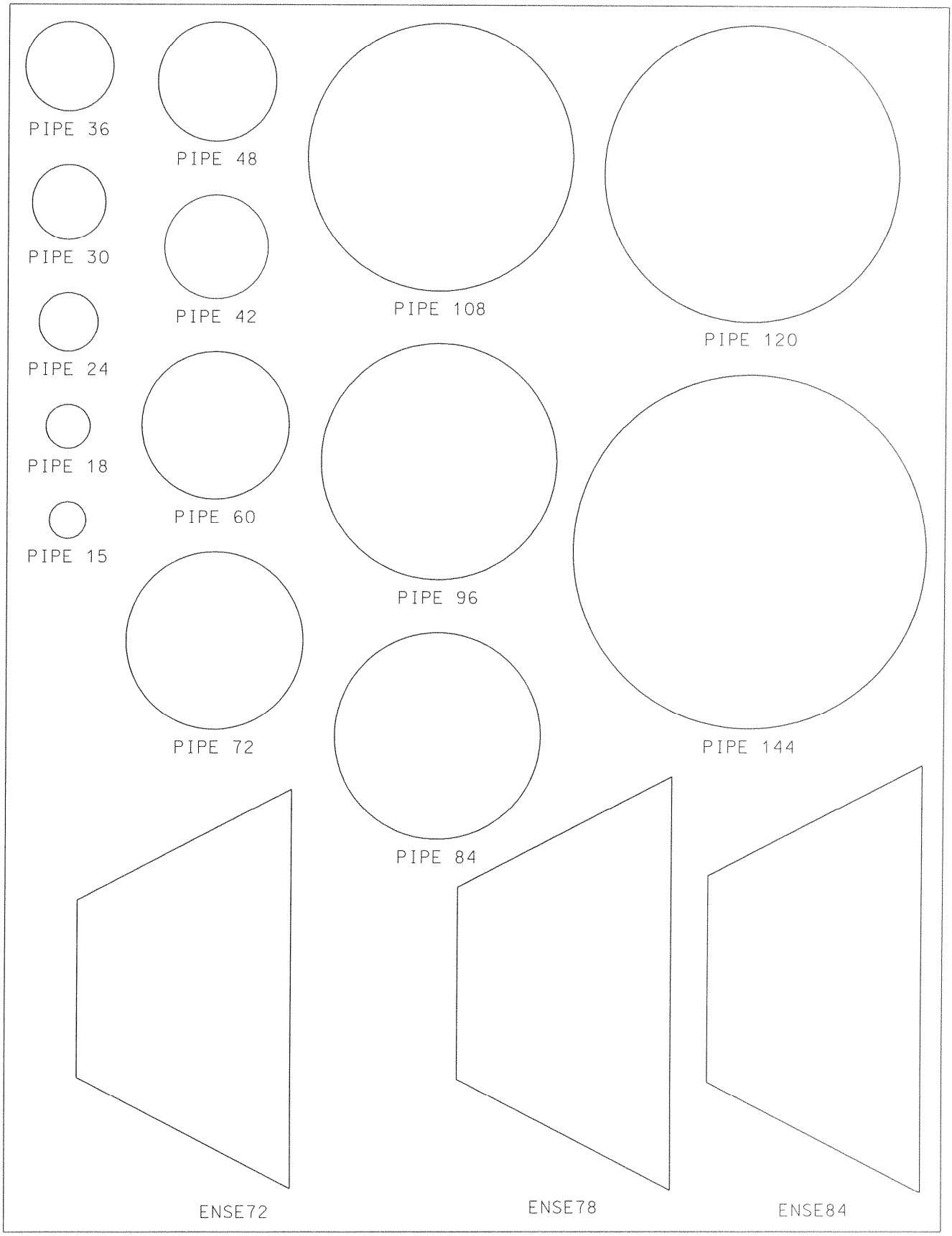

Drainage

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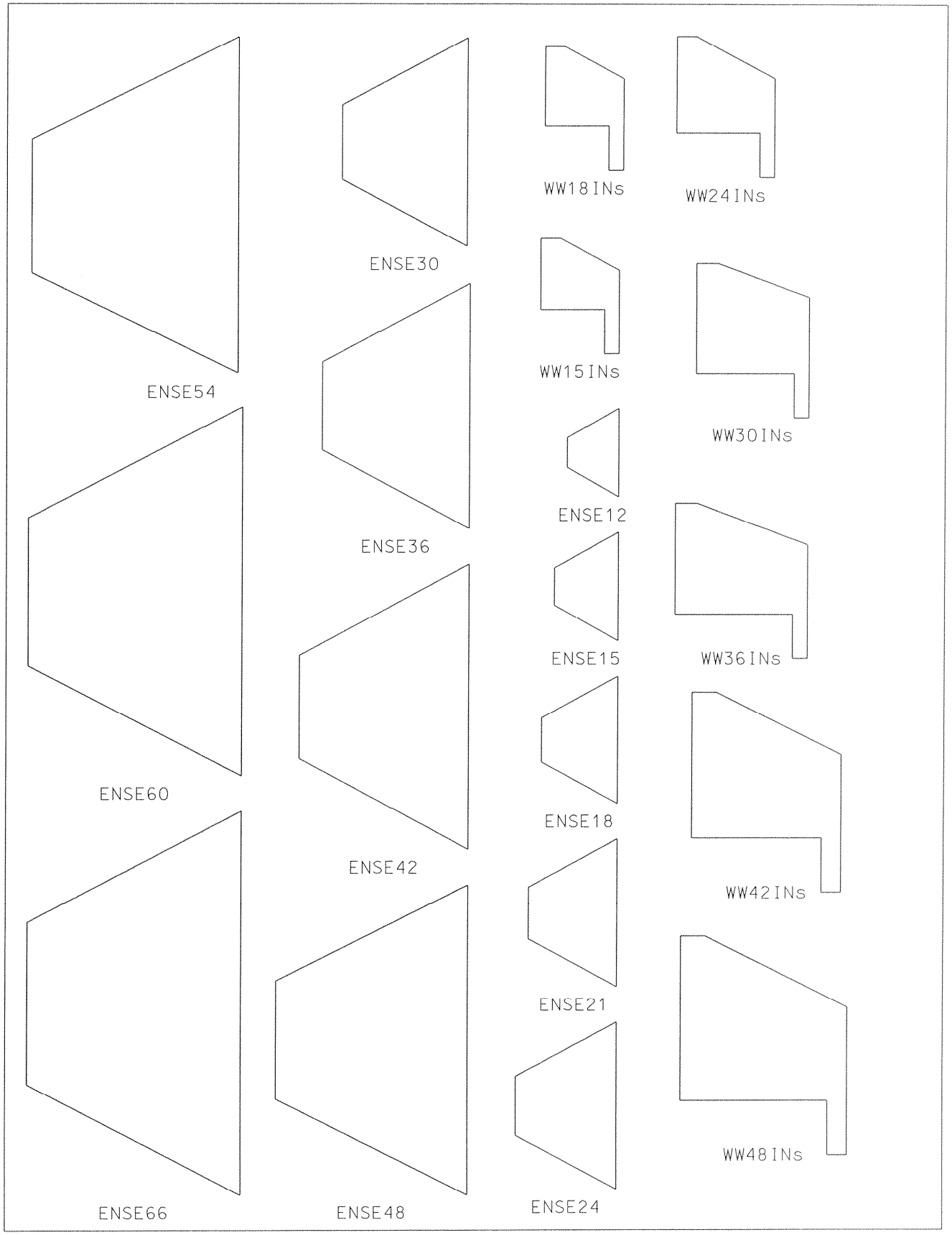

Drainage

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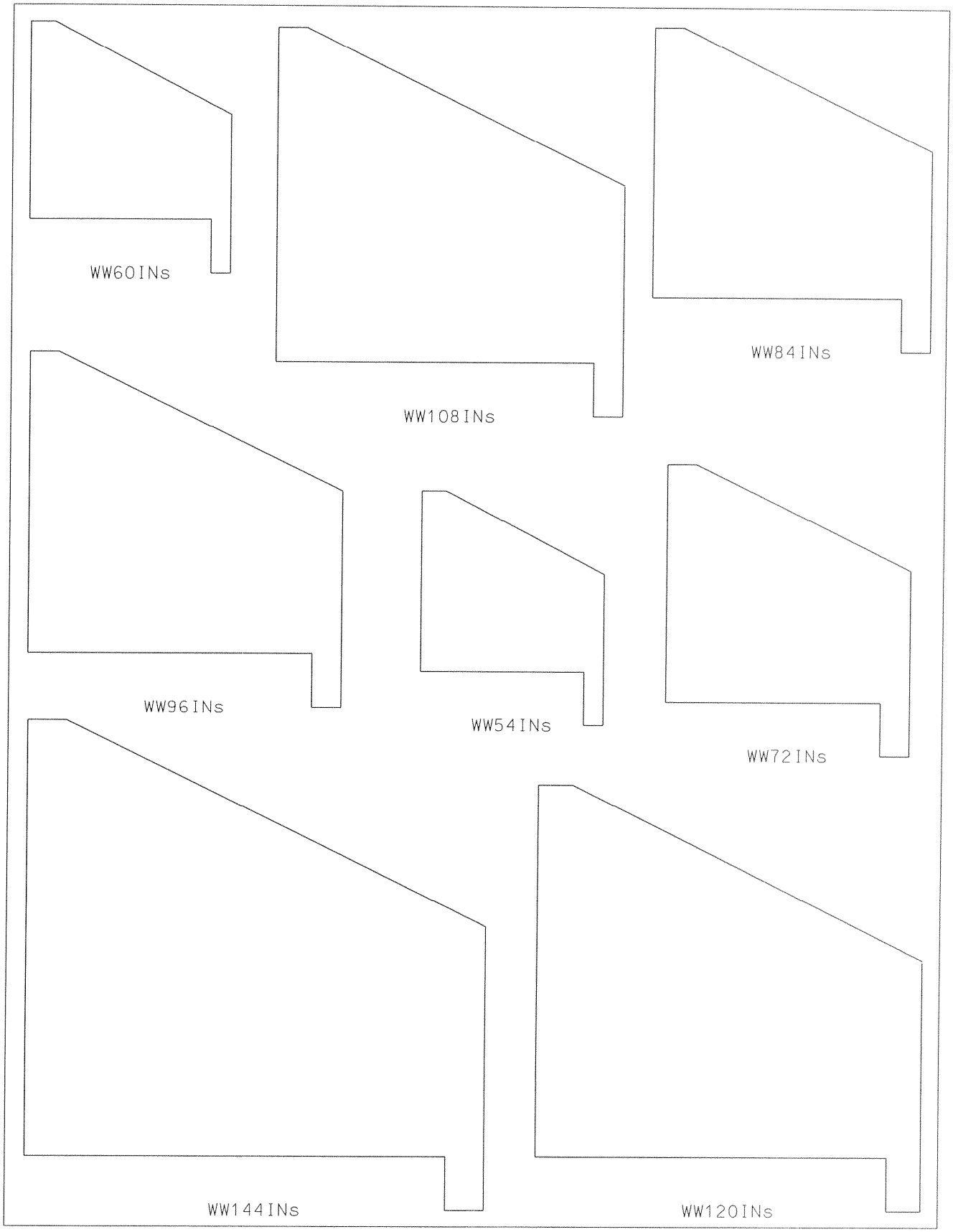

Drainage

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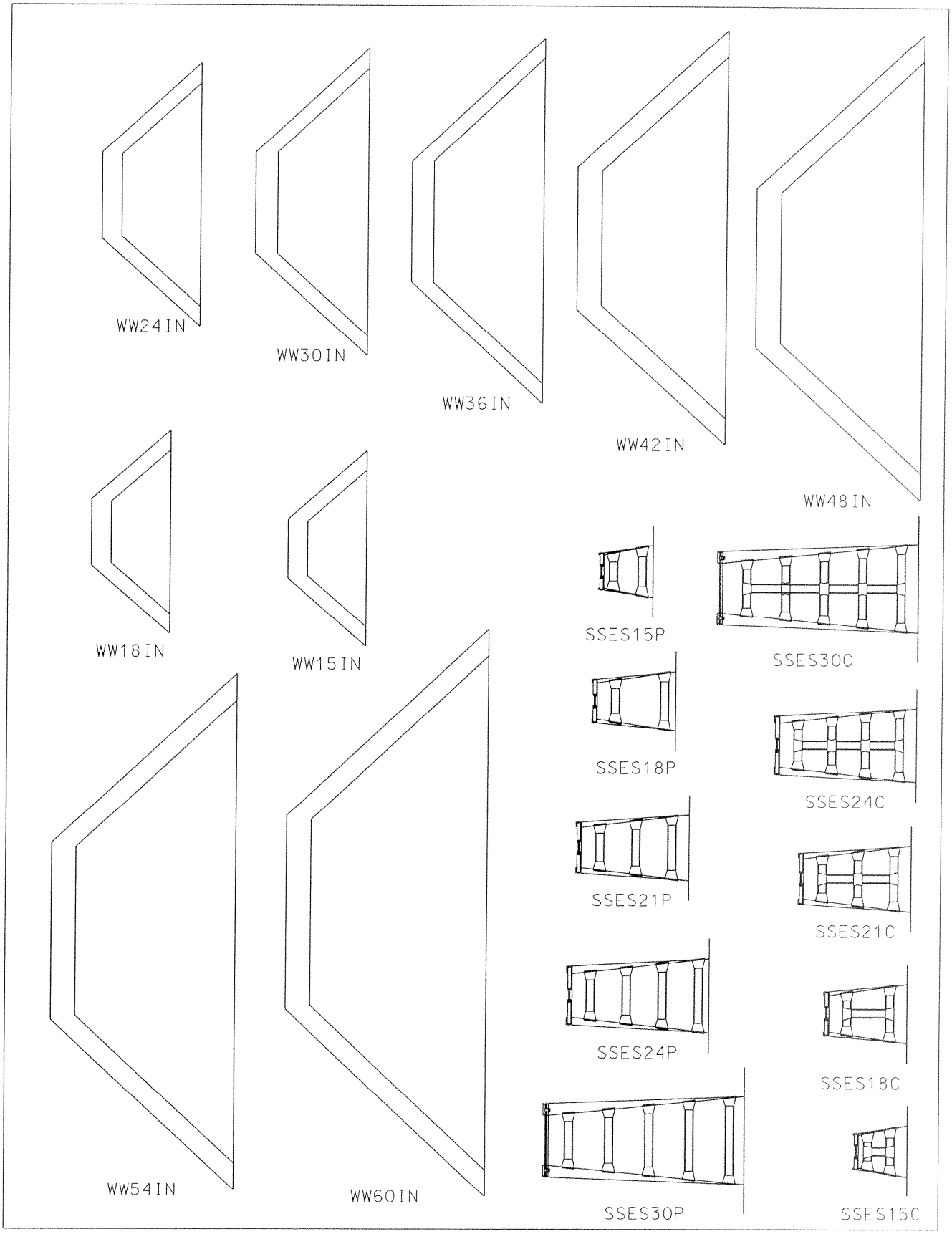
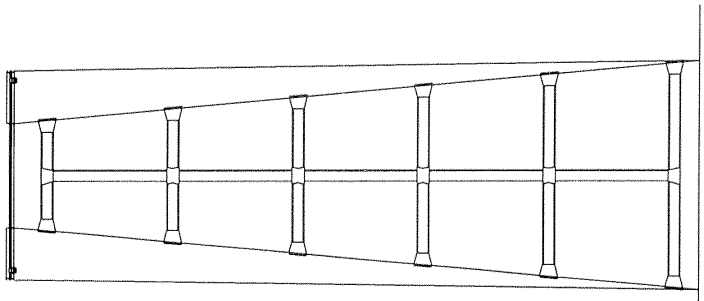
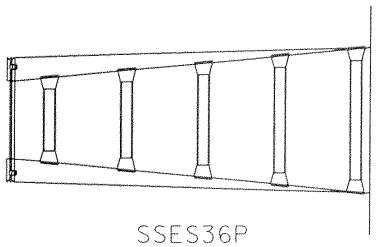


Drainage

z:\cells\Drainage.cel



SSES60C



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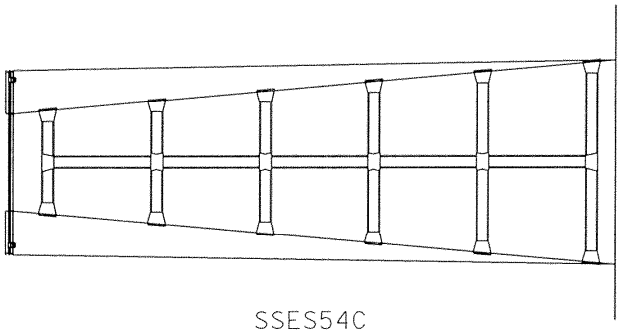
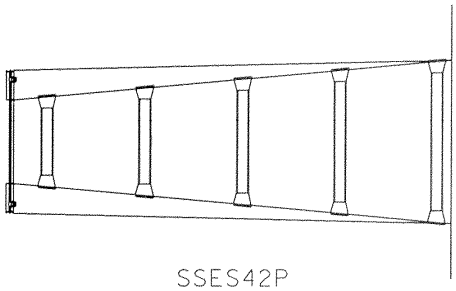
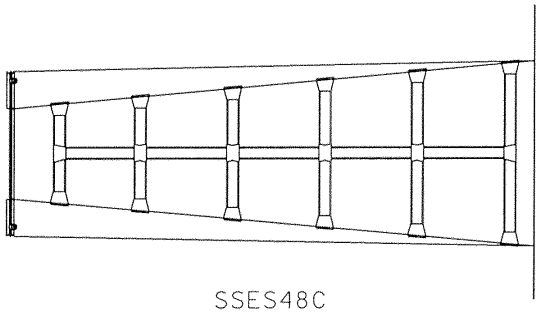


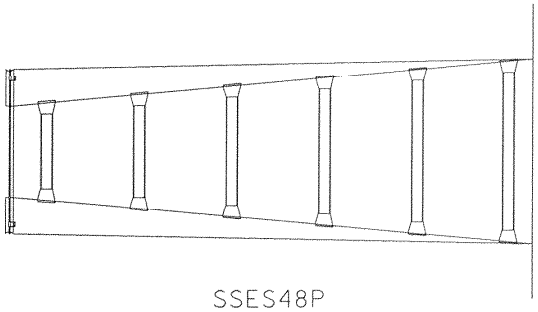
SSES54C



SSES42P



SSES48C



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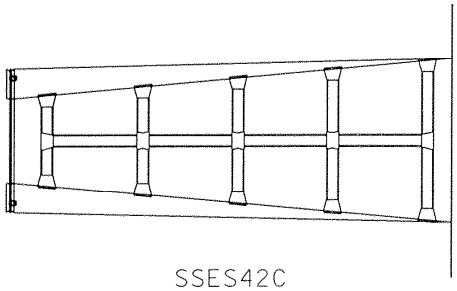

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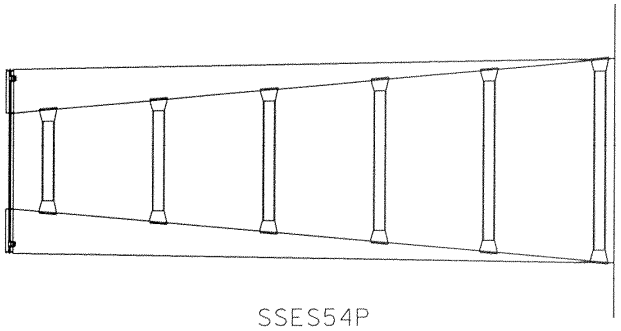

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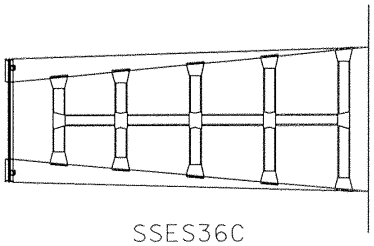
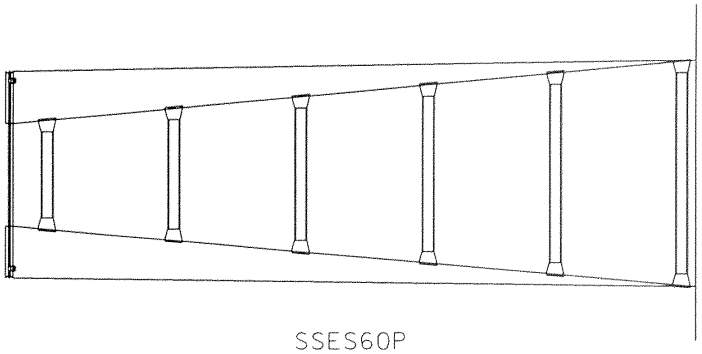


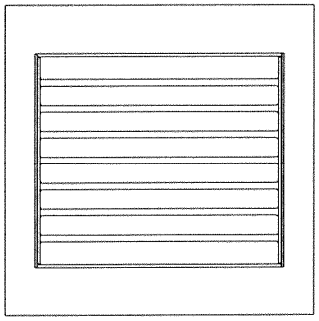
SSES36C



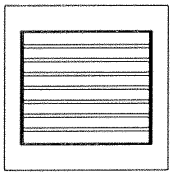
SSES60P

Drainage

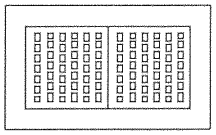
z:\cells\Drainage.cel



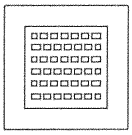
Inlet Type G 42



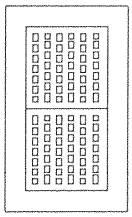
Inlet Type G 18



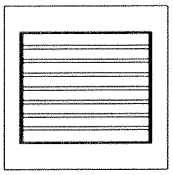
Inlet Type A



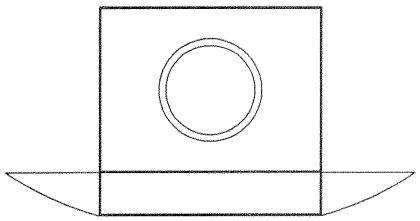
Inlet Type B



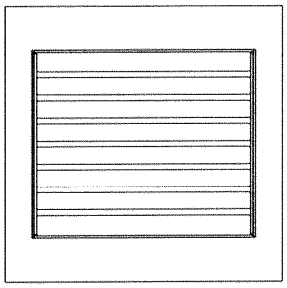
Inlet Type C



Inlet Type G 21



Inlet Type D



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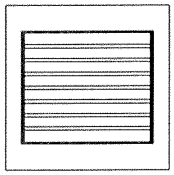

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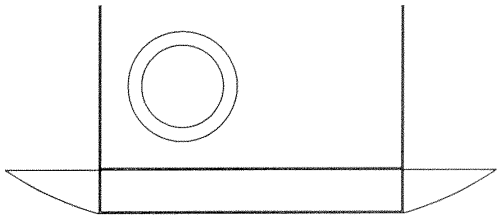
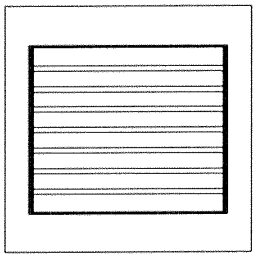
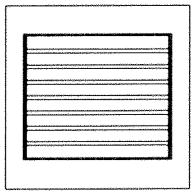


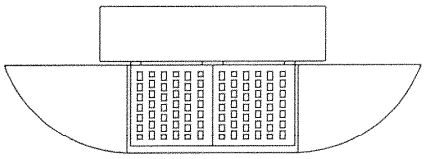
Inlet Type E



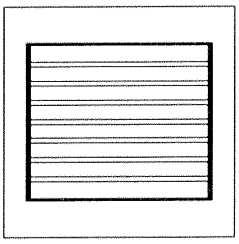
Inlet Type G 36



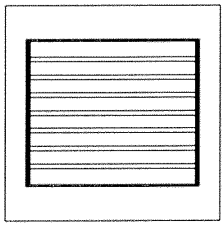
Inlet Type G 27



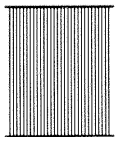
Inlet Type F



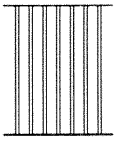
Inlet Type G 33



Inlet Type G 30



Grate Type 1



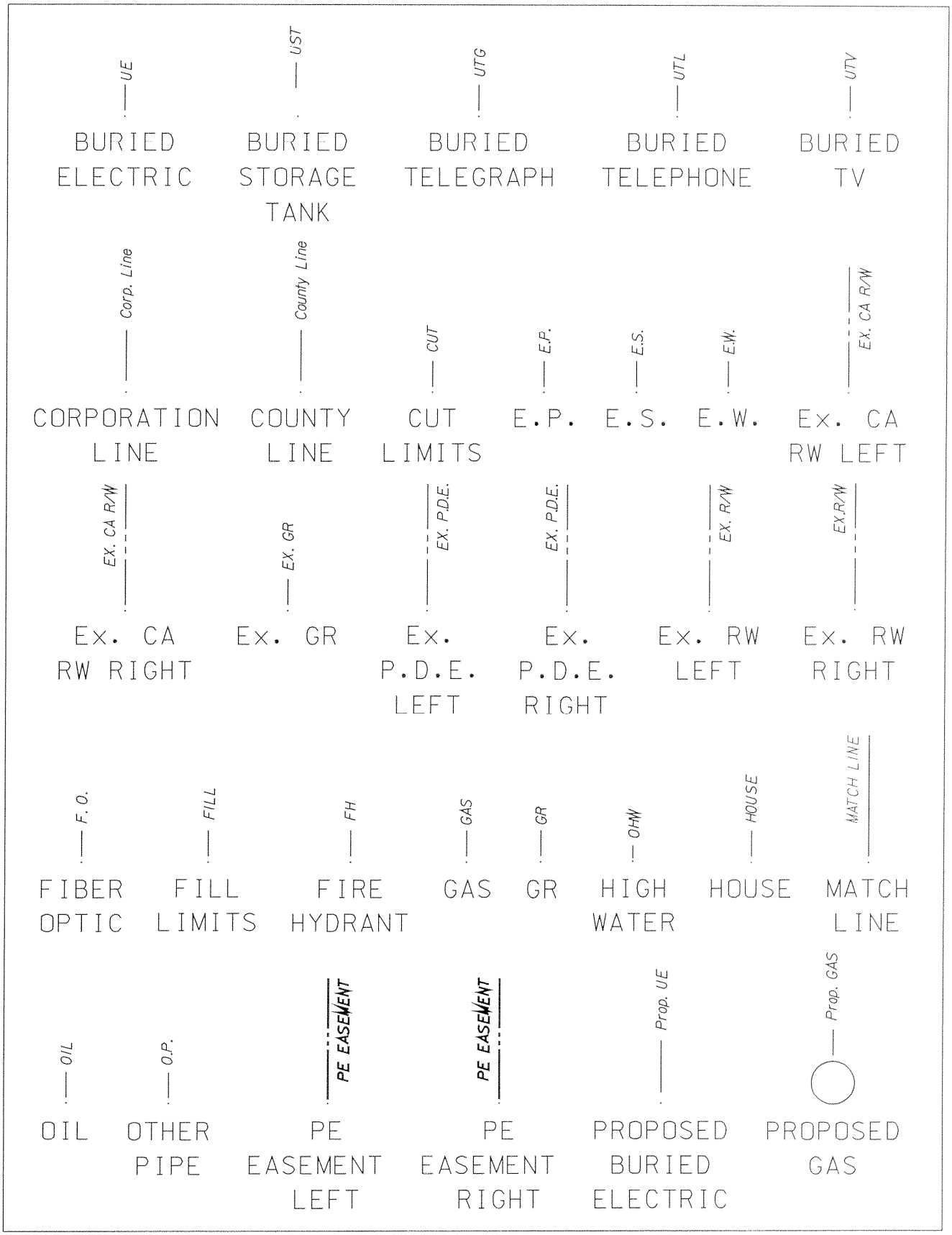
Grate Type 2

Curb & Median Shapes

z:\cells\Curb&Median Shapes.cel

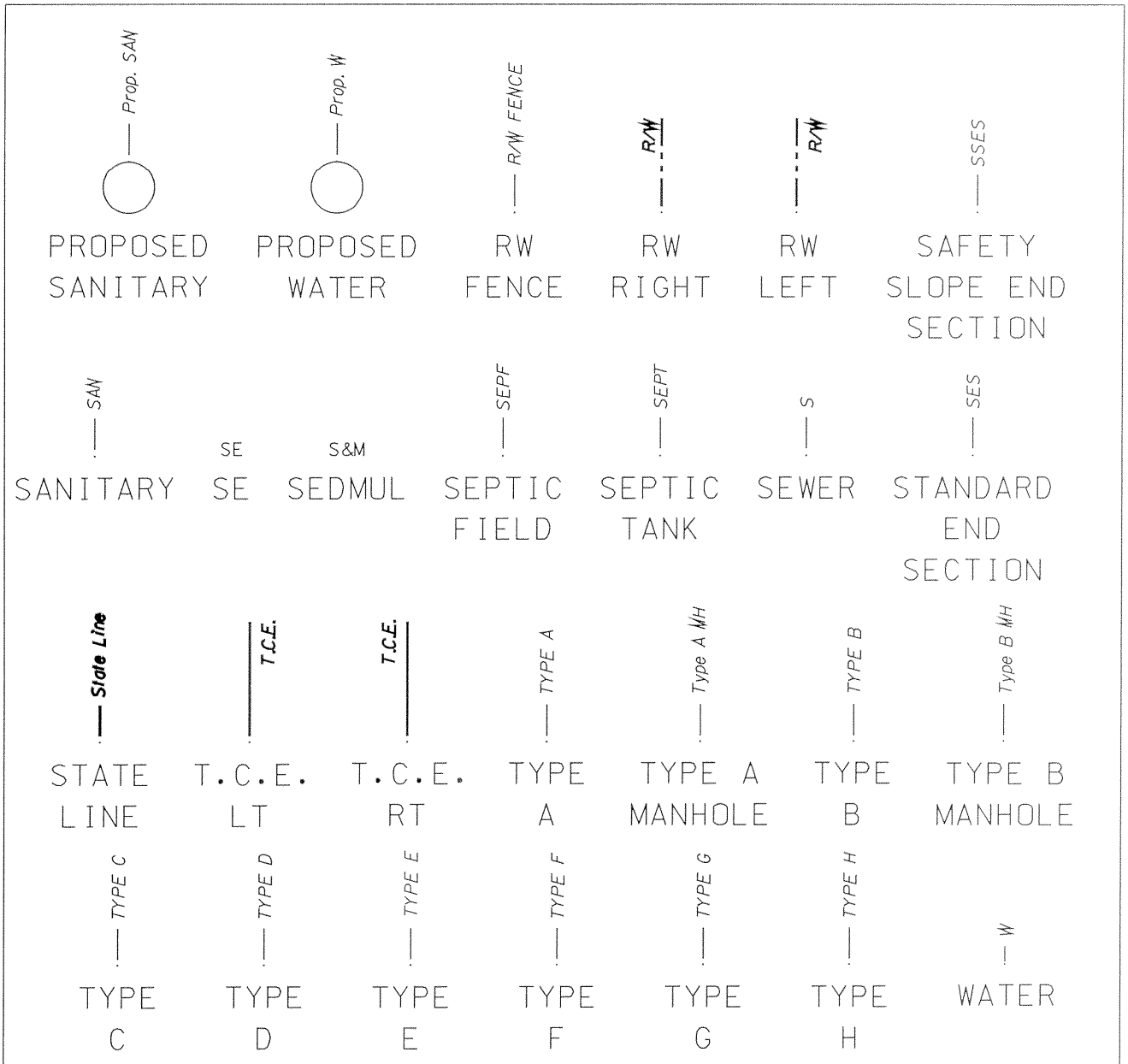
CrossSection&Profile

z:\cells\CrossSection&Profile.cel



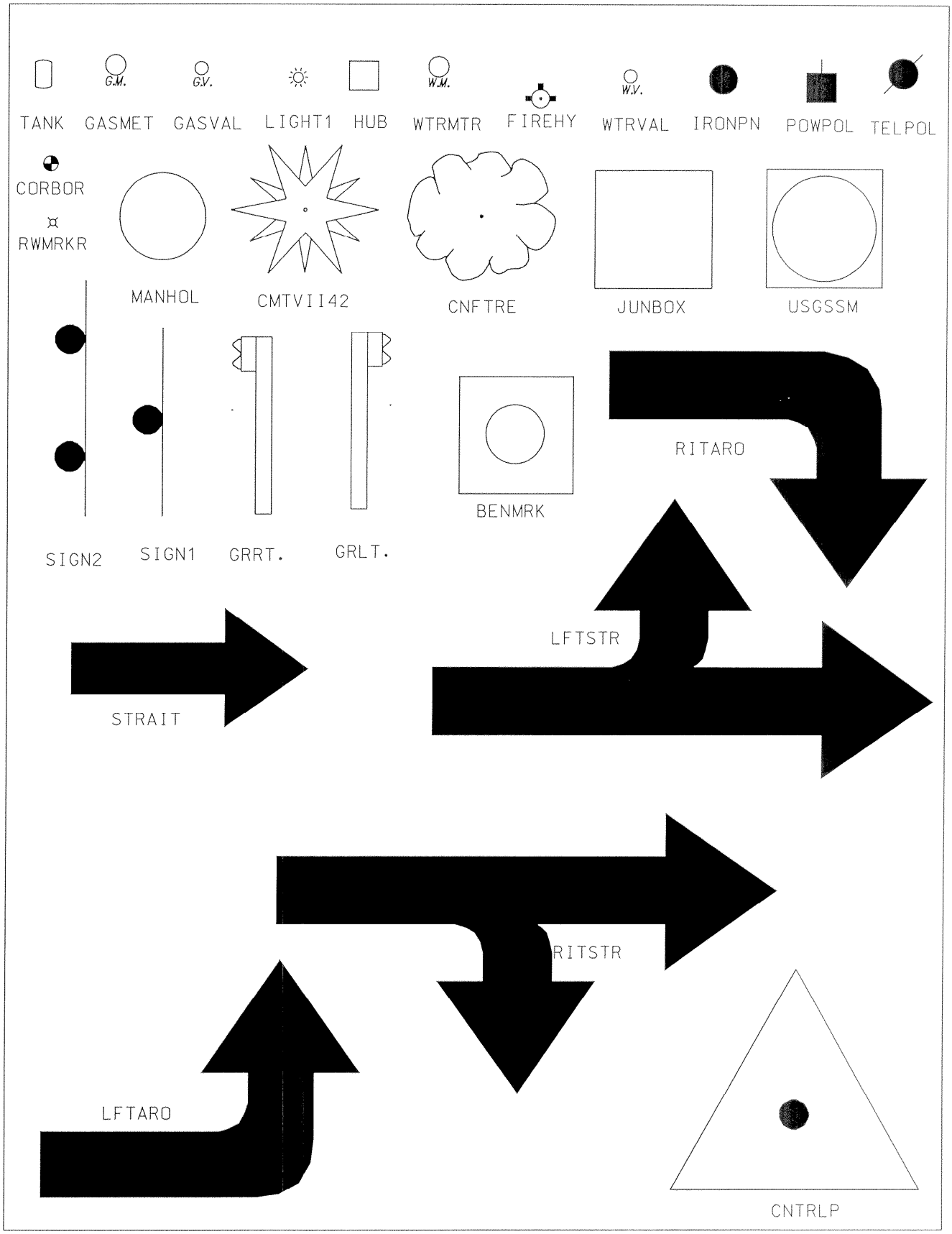
CrossSection&Profile

z:\cells\CrossSection&Profile.cel



Actual Features

z:\cells\Actual Feature.cel



Appendix VI

Microstation Configuration File and Barmenu Setup

1.Unzip WVCADDStandards file

Create folder *C:\CADDStandards*. Copy the folders from my \CADDStandards into your *C:\CADDStandards*. The configuration will look for applications in C: \CADDStandards drive.

2.MDL Applications

Copy the files (civtools.ma, msmtools.ma, setzv8.ma and synchbylevel.ma) from *C:\CADDStandards\MDL Applications* folder into the *C:\Program Files\Bentley\Program\Microstation\mdlapps*. There should be other *.ma applications located there.

3.User Workspace

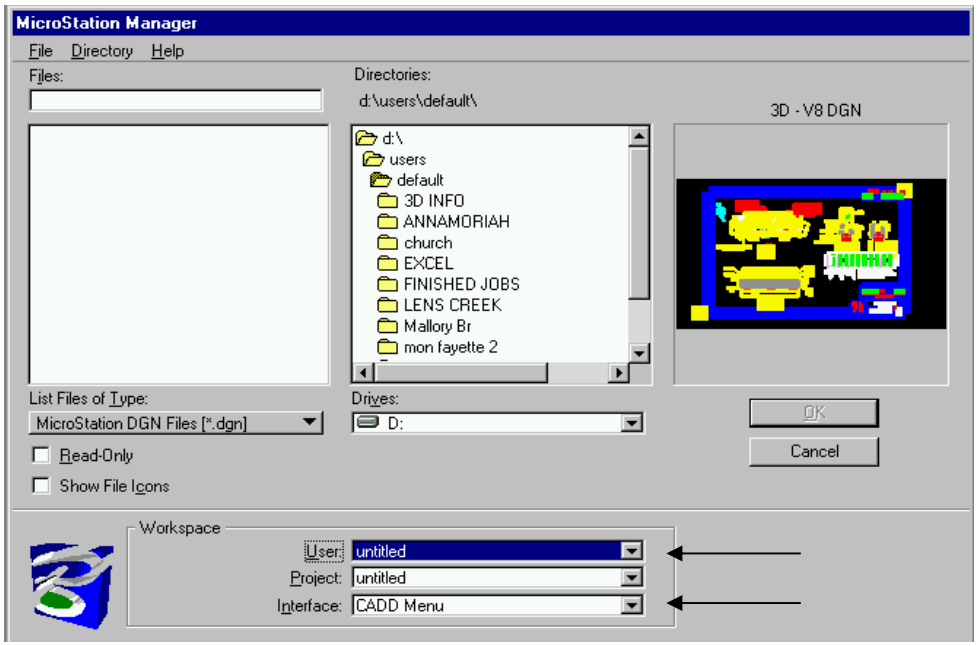
The user workspace sets the microstation configuration, where microstation looks for cells, macros, resource files, fonts, etc. Copy the file, *C:\CADDStandards\Configuration\CADDStandard.ucf*, from the folder to *C:\Program Files\Bentley\Workspace\Users*. There should be other *.ucf files located here.

4.To setup pulldown menus:

Copy the folder *C:\CADDStandards\Interface\CADD Menu*, folder included, into *C:\Program files\Bentley\Workspace\Interfaces\Microstation*. The pathname to the ustn.m01 file must read *c:\Program files\Bentley\Workspace \Interfaces\Microstation\CADD menu*\. When opening a microstation file the opening dialog will read the folder name as the interface.

5.Opening Microstation

The first time you open Microstation to access the Cadd Standards, change the workspace user from "untitled" to "CADDStandard". In order to access the pulldown menus, when entering microstation set the interface to CADD Menu. The additional pulldown should be available on the right side. See Picture



6.The CADD Menu

In order for the CADD Menu to work correctly there are 2 things that must be done:

1. Import the *C:/CADDStandards/Levels/Designlevel.dgnlib*, library into the Level Manager.

2. Import the correct Textstyle library, *C:/CADDStandards/Textstyles* for the scale drawing you are drafting with. These steps must be done for each new file. If these steps are not done then the buttons from the CADD Menu will not work correctly.

How the CADDStandard Configuration Modifies the configuration (For Information Only)

Cells

Cell Library Directories	c:\CADDStandards\cells
Cell Library List	c:\ CADDStandards\cells\actual features.cel
	c:\ CADDStandards\cells\feature label.cel
	c:\ CADDStandards\cells\pattern.cel
	c:\ CADDStandards\cells\terminator label.cel
Cell Selector Directory	c:\ CADDStandards\cells

Colors

Default Color Table	c:\ CADDStandards\color table\2003.tbl

Design Applications

Dump the 3 files (msmtools.ma, setzV8.ma and synchbylevel.ma) from \setup\mdlapps\ into c:\Program files\Bentley\Microstation\mdlapps\. In Design applications add the 3 applications.

Primary Search Paths

Macros	c:\ CADDStandards\macros\

Seed File

Default Design File Seed	C: \CADDStandards\SeedFile\V8seed3d.dgn\

Operation (Only when using a server machine)

Function Key Menu	C:\ProgramFiles\Bentley\Program\Microstation\funckey.mnu
File History	"1"

Symbology

Symbology Resources	c:\ CADDStandards\fonts\2003fonts.rsc
	C:\ CADDStandards\fonts\fonts.rsc
	'old fonts will be deleted in the future
	C: \CADDStandards\\symbology resource\roadway.rsc

Appendix VII
Consultant Minimum Requirements for CADD Standards

At a minimum the Consultant shall adhere to those portions of the CADD Standard outlined below. Flexibility in these listed areas will be limited and should be approached with the full knowledge that the consultant may be asked to change the plans if they are not strictly adhered to. When the consultant wishes to deviate from the standards it should be done in such a way that it conforms to the general theory of the Standards. Engineering and drafting judgment should be used when altering from the Standards. If in doubt about whether a change can be made please check with Steve Kimble of the Engineering Computer Services Division.

1. Filename conventions – Filenames have been set so that the exact information inside the file can be ascertained from the name. Example: The consultant wished to put all the pipes and drainage design features in a separate file. An acceptable change to the filename would be from rdy_filename_des.dgn to rdy_filename_des_pipes.dgn or rdy_filename_des_drainage design.dgn.

2. Level names – Level names have been developed. Many items have been addressed. It is encumbant on the consultant to review all the new levels and when drafting use the correct levels for the items to be drawn. Several tools have been developed to help the engineer/draftsman adhere to the CADD Standards. Level libraries have been established including assigned bylevel attributes. The consultant should review Bentley information on bylevel drafting. Filters have been setup in the seed files to breakdown the levels into more manageable numbers. Customized barmenus have been set up in order to maintain standards. Finally the level libraries have been broken down into csv files that can be downloaded and worked with in spreadsheets.
   It will be unacceptable to draft all elements on one level or use different names on final submission. Acceptable changes to the level names and attributes will be for those items that have not been addressed or that modify the original level name for clarity. Example: design trees have not been addressed, so if needed for a natural stream design, a level called design trees can be created or a modified G inlet is needed on a project, create the level name Modified G inlet and use the attributes from Type G Inlet.

3. Linestyle – Linestyles from the roadway.rsc file. Additionally the linestyle assigned to the level per the CADD Standards should be used. Scales should be changed based upon the scale drawing. Please refer to the bylevel scale properties for reference files.

4. Weight – The weights from the designlevel.csv and surveylevel.csv shall be used.

5. Color – The "color number theory" should be adhered to, meaning that only 4 lines of color should be used. This will be important for plotting using the correct shades. Please review the color shading scheme. The screen colors can be anything the consultant chooses.

6. Shading – A very important part of plan presentation consistency is shading. Information for shading and weight widths have been provided. Each printer does not print the same way and the WVDOH has attempted to develop a system whereby each consultant can plot relatively the same. Plot driver files for microstation Plot are also provided as a starting point for editing each consultants specific plotter. The WVDOH has set up 2 prints, Testplt.dgn available with a download and Keyplt available in the Conference rooms where monthly progress meetings are held. The Keyplt should be picked up during the monthly meeting. Once the testplt.dgn is downloaded and printed using the attached pen table it should be compared to the Keyplt. Adjustments to the shading should be made to RGB numbers in the pen table until it conforms to the Keyplt. The same changes should be made to the full size pen table. In general as a minimum standard the first line of colors (1-15) should be black, (16-31) should be slightly lighter, (32-47) should be lighter, and (50,51) should be shaded to the point that it is barely visible when reproduced.

7. Text Fonts – Only four alphanumeric fonts shall be used. The font numbers are 201-204. Straight font shall be used for design text and slant text shall be used for existing text.

8. Text Sizes - Only four text sizes per scale sheet shall be used. Please refer to the table showing Class I through Class IV text sizes for that scale sheet. At this time the consultant will use their judgement to determine what Class goes with what label.

9. The correct alpha codes, per Appendix IX, must be used for all surveys.

It should be noted that if deviations from the above minimum standards are necessary they should be addressed by Steve Kimble of the Engineering Computer Services Division. Adhering to 100% of any CADD Standard is nearly impossible and this is understood, however an obvious lack of adherence to the WVCADD Standards may result in the rejecting of final electronic submission.

Appendix VIII
SURVEY DOWNLOAD (Inroad SelectCADD Suvey)

2003 SURVEY REDUCTION PROCESS UTILIZING FEATURES

The goal of this class is to simplify and standardize plan development.

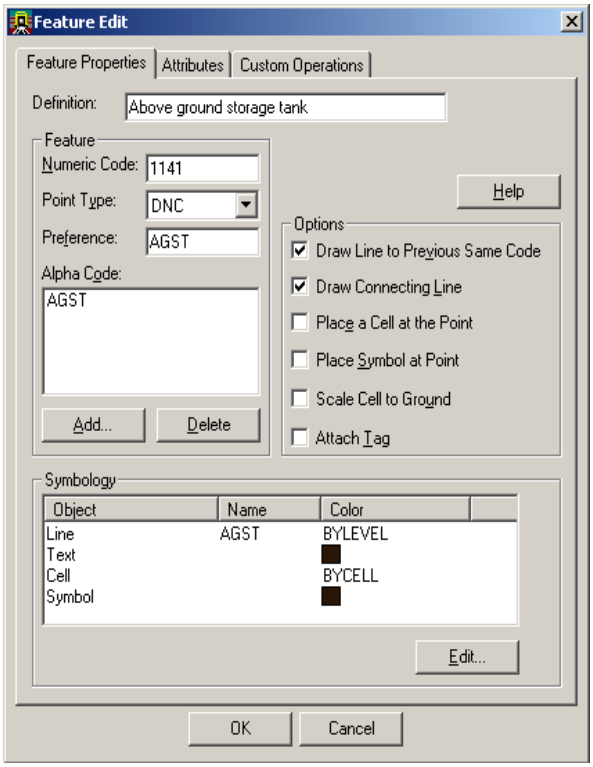
What Is a Feature?
A feature is a named set of points in a Digital Terrain Model (DTM). A feature can be one of five types, corresponding to the type of DTM points contained: random, breakline, exterior boundary, interior boundary, or contour. Features are essentially just groups of DTM points – each group is given a name and assigned a feature style (feature styles control everything about how features gets displayed). The ability to identify different features by name, to select and edit them using filters, and to independently control their display characteristics are benefits of organizing a DTM into features. In this class we are only concerned with the random points and the breakline features.

Key objects to remember…

The Inroads Survey Feature Table – This file is loaded under Survey>Feature Table>File>Open. It controls how a shot is read from the survey code or .RW5 file. It forms the fieldbook and tells the software how to display the information on the screen. This file also controls how a feature is named in a surface (we use the alpha code as the name for most features) and this name is called the Feature Style.

The Inroads Feature Style – This controls if a feature is to be displayed in plan view, x-section view and profile view. It also tells whether the feature is displayed as a point or a line in each view and assigns a symbology to the feature.

The Inroads Symbology – This controls how a feature, contour, axis, tick, station…etc looks in the plan, profile, x-section views or by default. This also controls the appearance of the item (weight, line style, color, level, text height, text width….etc.)

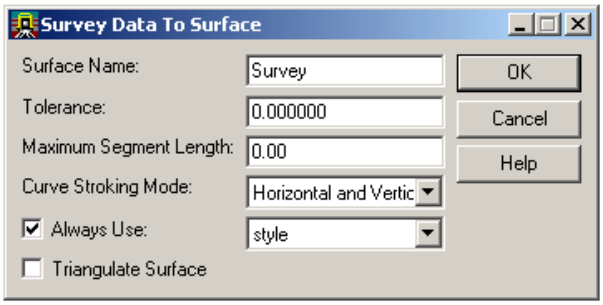


Process Description

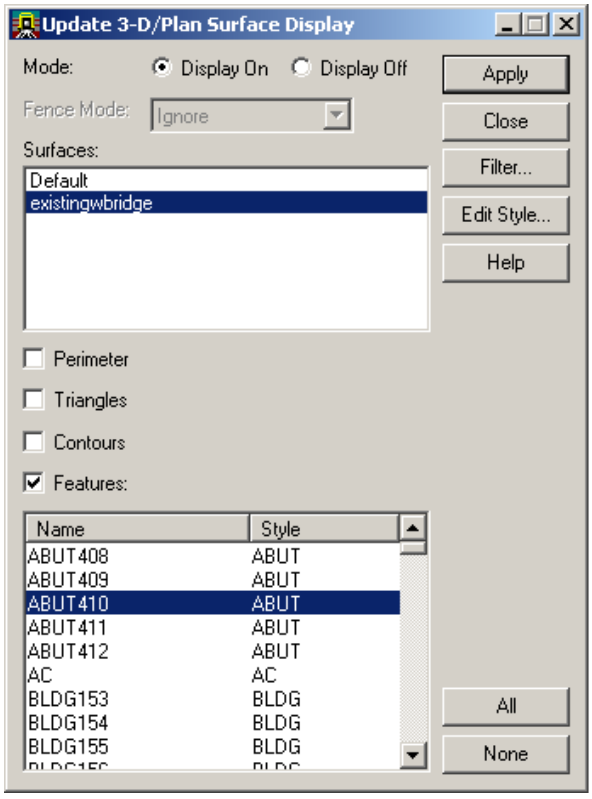
The Inroads Survey Feature Table reads the alpha code off of the .RW5 file and assigns a Feature Preference to it as it places the data into the fieldbook (survey data file .fwd when saved from Inroads Survey). This Preference name can be seen on the Feature Edit box out of the Inroads Survey Feature Table. It is the 4th white box down on the left side. This Preference name becomes the Inroads Feature Style name for that feature in the surface it belongs to. For most features in the table the Feature Preference is the same as the Alpha Code (5th box or region down on the left). The only Feature Preference names that differ from the Alpha Code are a few of those random or point features that have a text label associated with them, such as bench mark (BM) water meter (WM) and gas meter (GM). The purpose of this will be discussed later.

Once you have created the fieldbook from your .RW5 file and have viewed the planimetrics the data must

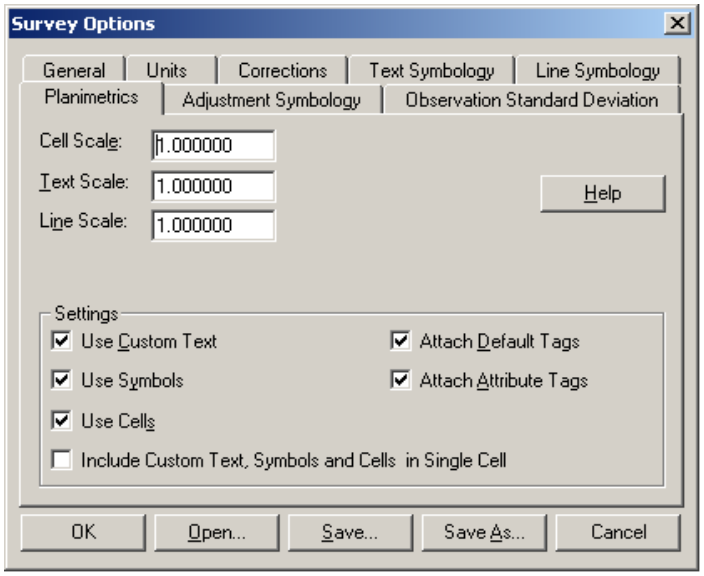
be corrected for errors. Once the data is correct, a surface will be created using the features (with their attached style name from the Preference). The difference between the old way of creating a surface and this new way is that now every line of the survey will be in the surface. Many parts of the survey will not be included in the triangulation, such as utility lines, trees, mailboxes etc. This control for do not triangulate or do not contour (DNC) is in the same Feature Table Edit box mentioned earlier. The third box down on the left toggles between those five types of DTM points (see what is a feature, 1st page). To create this surface you must use the Survey>Survey Data To Surface box and toggle on Always Use: style. Do not toggle on the Triangulate Surface box here; there is a bug in the software that causes problems if you triangulate the surface here. It is at this point where the Feature Table Preference turns into the Feature style name for each feature in your 3D surface.



You have the surface created so now we need to display the features of that surface in a plan view. This is done using the Surface>Update 3-D/Plan Surface Display box. Highlight the surface name and toggle on Features:. All the features will show up with their individual name on the left and their style name on the right. In order to see the features, you must turn the Display On, highlight them in the list and hit Apply. You can choose just one feature, a group of different features, features of the same style, etc. Hit the All button to highlight them and hit the Apply button to view them in your .mbm file. If you make a change to a feature, such as correcting an error you must re-display them in the .mbm file to see the correction. Keep the Display On toggled (there is no need to display off first then display on) highlight all of them and hit Apply. This type of control allows you to turn on and off certain features at will; obviously the problem is choosing each one you want out of the long list. Feature Filters are the solution to that problem.

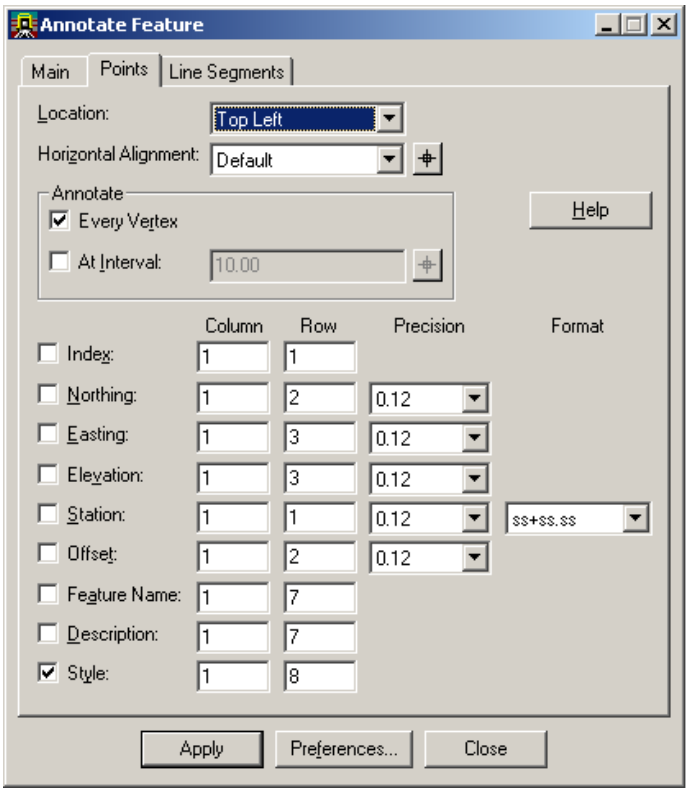


You may notice that the scales of the linestyle and point features are a bit small. This is because they are placed at a scale of one by default. You can now control the scale of the display under Tools>Survey Options in the Planimetrics tab. The point symbologies, like benchmark (BM), gas valve (GV), traverse point (TRVPT) etc. are now microstation cells so their size is controlled with the cell scale. The labels for the point features that have text associated with them, such as gas valve (GV), water valve (WV), water meter (WM) etc. are displaye-d separately but their size is controlled with the text scale. The line scale controls the appearance of the linestyle features. This type of control allows you to display all of your survey at 20, 50, 100 scale etc. whatever size you require. Note: if you decide you want to see the point numbers



remember your text scale is set higher than one after you display your survey, so those point numbers will show up very big. Simply change the text scale back down to one before you view the point numbers.

Now that you have the line and point features displayed at the chosen scale for your created surface the labels for those point features that have a text label associated with them need to be displayed. This is done under the Surface>View Surface>Annotate Feature box. On the main tab you want your created surface chosen at the top and Annotate Points toggled on and Line Segments toggled off at the bottom. On the Points tab you want Location: to be top left, Annotate Every Vertex toggled on (because the only vertex for point features is the middle of the cell) and at the bottom Style: toggled on. As stated earlier:



> The only Feature Preference names that differ from the Alpha Code are a few of those random or point features that have a text label associated with them, such as bench mark (BM) water meter (WM) and gas meter (GM).

When you display these Style labels you are actually displaying the Feature Preference names from the Inroads Survey Feature Table. This allows us to show a label different from the alpha code. For example the alpha code for property corner is PIN. If we did not use this Preference name we would see PIN as the label next to the cell for PIN in the .mbm file. Instead we will see property corner next to that cell. This Annotate Feature display works the same as the Update 3-D/Plan Surface Display. If you make a change you must re-display the annotation in order to see the change.

Step by Step

The new naming convention requires your .mbm files to be in this format: rdy_mbm_[project name].dgn There is no need for the .bas (basemap files) anymore so your survey reduction can be performed in the .mbm file.

The package:

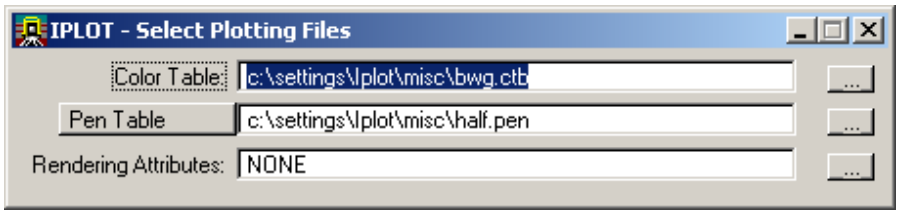
2003.tbl	This is the new color table.
2003surveylevels.dgnlib	This is the new survey level library.
2003surveysymbols.cel	This is the survey feature point cell library.
newcolorsurvey1.ini	This is the Inroads Survey Preference file (version 1).
2003tds.fwf	This is the Inroads Survey Feature Table.
2003.pen	This is a plotting pen table that utilizes the new color table.

1. Create your .mbm file as you open Inroads Survey
2. Attach the new color table 2003.tbl
3. Change your working units to Feet and Inches in your .mbm file Settings>Design File
4. Under the microstation level manager, attach the level library 2003surveylevels.dgnlib
5. Attach the cell library 2003surveysymbols.cel to your .mbm file
6. Save your settings under microstation, File>Save Settings or hold Ctrl+F after you click in the key in box.
7. In Inroads Survey open the preference file newcolorsurvey1.ini. It is important that you open this before the Inroads survey feature table file!

8. Open the Inroads Survey feature table file 2003tds.fwf under Survey>Feature Table> File>Open.
9. Make sure under Tools>Survey Options, Units tab that the Type: Angular, Units: DDD.MMSS is set properly.
10. Under File>Import>Survey Data, change Files of type: to TDS(*.rw5) and import your RW5 file. At this point you view your planimetrics and correct survey errors in the fieldbook file (.fwd).
11. Once your survey is corrected, create your surface using Survey>Survey Data to Surface using the style name. Do not triangulate the surface here.
12. Save your surface.
13. View your line and point features using Surface>Update 3-D/Plan Surface at the proper scale. At this point any errors in the features can be corrected here without going back to the fieldbook file.
14. Once the surface is corrected annotate the point features using Surface>View Surface>Annotate Feature.
15. Triangulate your surface and save it.
16. Detach the 2003survelevels level library under the microstation level manager

The two most difficult steps in this process is correcting the survey data (.fwd file) and correcting the surface by manipulating the features. Both of these will take much practice and assistance by those who have experience in troubleshooting; however, everyone can learn to perform these tasks. There will be a problem log that will be started after the training with statements about each problem encountered and what the solution was. This log will be kept in one place accessible to everyone through the network. When additional problems are encountered a new table of contents sheet will be created noting the addition with the same style as our DD's.

Now that your surface is final you need to place your contour lines in your .sur file using Inroads Survey and utilizing the Inroads survey preference file. The naming convention for this file will be rdy_sur_[project name].dgn. Under the Surface>View Contours box load the preference 2003surveycontourdisplay. Then under the Advanced tab you may need to change your Label Contours spacing. The scale should remain as 1 because the text size is controlled by the Inroads Survey preference file under the Tools>Survey Options in the Planimetrics tab. Any changes to major contour labels should be made there.



The new pen table (2003.pen) will need to be opened before plotting any file using the new color table (2003.tbl). In Iplot this is done under File>Select Plotting Files, chose the second button on the right labeled … to find the path of the 2003.pen file. This new pen table provides new shading techniques for the survey data in our hardcopies.

IX. SURVEY FEATURE TABLE

Alpha code	Description	Alpha code	Description	Alpha code	Description
AGST	Above ground storage tank	GWIRE	Guy wire	SDSH	Satellite dish
ABUT	Abutment	HAND	Handrail	SEPF	Septic field
ABBW	Abutment backwall	HW	Headwall	SEPT	Septic tank
AC	Air conditioner	HEDGE	Hedge or shrub line	SHLDR	Shoulder or berm
BM	Bench mark	HWM	High water mark	SHRUB	Shrub
BB	Billboard	HMK	Historical marker	SW	Sidewalk
BCULV	Box culvert	HORZ	Horizontal control point	SIGN	Sign
BRG	Bridge	HUB	Hub	SGNLH	Signal light head
BRGAP	Bridge approach slab	IP	Iron pin	SGNP	Signal pole
BRGDK	Bridge deck	ISLND	Island	SLIDE	Slide perimeter
BRGEJ	Bridge expansion joint	JKYD	Junk yard	SPOT	Spot elevation
BRGST	Bridge seat	LPOLE	Light pole	STATE	State line
BLDFN	Buildin foundation	LPOST	Light post	STEPS	Steps
BLDG	Building or shed	LWC	Low water crossing	STOL	Storm sewer line
BLDR	Building ruins	LMYD	Lumber yard	STOMH	Storm sewer manhole
CNPY	Canopy	MBOX	Mailbox or paperbox	SMK	Survey marker
CB	Catch basin	MK	Marker, generic	SWAMP	Swamp
CEM	Cemetery	MED	Median	TGLN	Telegraph line
CL	Centerline	MP	Milepost	TGP	Telegraph pole
CLP	Clothes line post	MINE	Mine shaft	TB	Telephone booth
COAL	Coal outcrop	OL	Oil line	TJB	Telephone junction box
CGUT	Concrete gutter	OW	Oil well	TL	Telephone line
CMED	Concrete median	OHW	Ordinary high water	TMH	Telephone manhole
CSLAB	Concrete slab	PWALL	Parapet wall	TPED	Telephone pedestal
CBORE	Core boring	PKAR	Parking area	TP	Telephone pole
CORP	Corporation line	PKLT	Parking lot	TSTD	Telephone stand
CNTY	County line	PED	Pedestal	TOE	Toe of slope
XSC	Cross section	PIER	Pier	TOP	Top of slope
CW	Crosswalk	PILL	Pillar	TRAIL	Trail
BRKLN	Crown of pavement	PCULV	Pipe culvert	TRVPT	Traverse point
CIN	Curb inlet	PLNTR	Planter or flower box	TREEL	Tree line
CURB	Curb line	POND	Pond	TREEC	Tree, coniferous
DAM	Dam	PORCH	Porch	TREED	Tree, deciduous
Default	Default	POST	Post	TREEF	Tree, fruit
DITCH	Drainage ditch	PTL	Power and telephone line	TUNL	Tunnel
DW	Driveway	PTP	Power and telephone pole	TVTL	TV and telephone line
DCURB	Drop curb	PTVL	Power and TV line	TVL	TV line
DI	Drop inlet	PJB	Power junction box	TVP	TV pole
ECHAN	Edge of channel	PWL	Power line	UEL	Underground power line
EP	Edge of pavement	PMH	Power manhole	UST	Underground storage tank
ER	Edge of road	PP	Power pole	UTG	Underground telegraph
EUR	Edge of unimproved road	PTTVL	Power, telephone, and TV	UTL	Underground telephone line
EW	Edge of water	PMK	Project marker	USGS	USGS marker
FENCE	Fence line	PTNK	Propane storage tank	VENT	Vent pipe
FIB	Fiber optic line	PL	Property line	VERT	Vertical control point
FH	Fire hydrant	PIN	Property pin or corner	WALK	Walkway
FP	Fixed point	RRCL	Railroad communication line	WALL	Wall
FLOOR	Floor elevation	RRCP	Railroad communication pole	WL	Water line
FL	Flow line	RRCB	Railroad control box	WMH	Water manhole
FNT	Fountain	RRX	Railroad crossing	WM	Water meter
FCP	Full control point	RRSIG	Railroad signal	WV	Water valve
GRDN	Garden	RR	Railroad tracks	WWELL	Water well
GL	Gas line	RETW	Retaining wall	WHGD	Wheel guard
GM	Gas meter	RW	Right of way	WW	Wing wall
GV	Gas valve	RWES	Right of way easement		
GW	Gas well	RWFN	Right of way fence		
GPI	Gasoline pump island	RWM	Right of way marker		
GTFC	Gasoline tank filler cap	RSGN	Road sign		
GATE	Gate	RGUT	Rock gutter		
GR	Guardrail	ROCK	Rock outcrop		
GUT	Gutter	SANL	Sanitary sewer line		
GPOLE	Guy pole	SANMH	Sanitary sewer manhole		