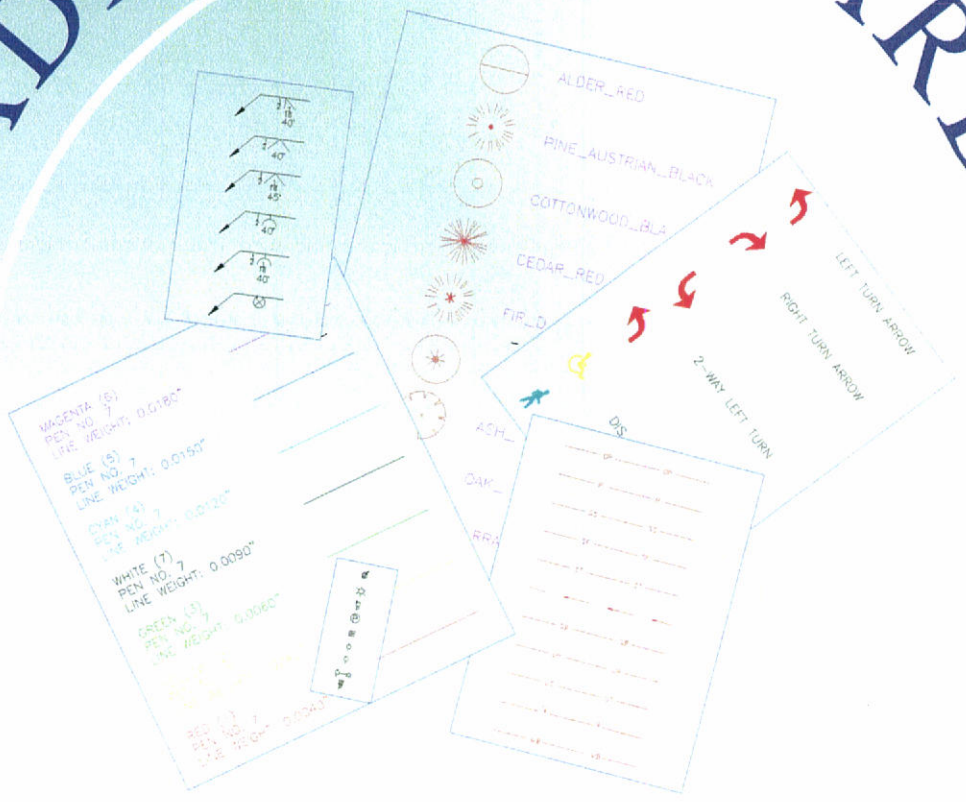
Department of Transportation
Road Services Division

May 2014

CADD STANDARDS MANUAL



King County

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CADD Standards Notice

Please note the print date of your hardcopy.

Users of the King County Department of Transportation Road Services Division CADD Standard hard copy should be aware that an electronic version exists in PDF form and as such supersedes all hardcopies.

Distributed King County DOT Road Services Division CADD Standards, Drawings, Parameters and Settings are to be used as a graphical "starting point" for which a contract drawing set shall be uniform and consistent. In no way shall an individual(s) or entity(ies) deem the Engineering value and aspects of such CADD drawings to be de facto, and that in all cases it is the responsibility of the user(s) of said CADD Standards and drawings containing engineered details and notes to verify their compliance with industry standards where applied.

The most current electronic King County DOT, Road Services Division CADD Standards may be found at \\DOT\Roads\ENProj\KingCountyCADStandards.

1.1 Detailing Practice

The objective of King County DOT, Road Services Division CADD (Computer Aided Drafting and Design) Standards is to provide uniformity of process and presentation. This objective is achieved through standards and guidelines for folder format, file naming, content and the process by which the data is created. Adherence to the organizations standards and procedures is essential to preserving a homogeneous character in drawings, increasing the efficiency of time and project management. Drawings produced by the guidance of these standards should demonstrate a professional and quality appearance. Technical competence and aesthetic judgment should be approximately demonstrated at every level.

Some of the immediate benefits of standardization are:

- Avoid confusion between workgroups
- Increase individual efficiency
- Reduce support calls
- Provide uniformity
- Ensure integrity
- Build clarity
- Simplify creation/modification
- Promote interchangeability
- Streamline workflow
- Improve communication
- Integrate new users more quickly
- Simplify procedures
- Save Money

1.2 Standard Office Practices

A. Practices and Procedures

The following will provide basic information on drafting and the fundamentals of Civil and Structural Standard drafting practices.

- Designers and Engineering Technicians are responsible for ensuring that these standards are implemented
- The Designer and the Civil and Structural Engineering Technicians together coordinate the scope of the detailing work involved in each project
- Time should be allotted for checking plans for accuracy and consistency with Department Practices and Procedures
- Similar Civil and Structural plans and details should be reviewed and kept as examples for maintaining consistent design and drafting practices. These examples should not be older than three years

B. Maintenance & Editing

Although the CADD Standards shall be used at all times, they are not intended to be static and will be enhanced and updated as appropriate. Suggestions for improvements are strongly encouraged so that subsequent CADD Standard Manuals will reflect both input and needs of the CADD user. Submit edit requests in the form of a memo to Michael Burk at Michael.burk@kingcounty.gov or by phone at 206-477-3587.

Edits should document the following:

- Why the current Standard or Procedure is inapplicable or effective.
- What the proposed edit should be
- How it would improve the CADD Standard or Procedures and the overall productivity.

C. Deviations from King County DOT CADD Standards

Prior written requests for deviations from the King County DOT CADD Standard may be requested by consultant for a particular project. Deviations must be clearly spelled out in a memo form and documented within the project folders for all personnel to follow.

Deviations should document the following:

- Why the current Standard or Procedure is inapplicable or effective.
- What the proposed modification/deviation should be
- How it would improve the CADD Standard or Procedures and the overall productivity

2.1 Project Files Template

The following is a project files template for Engineering Services Section. It is to be used solely for electronic and document control purposes. Each employee is responsible to ensure all files are stored in the proper locations under \\DOT\Roads\ENProj.

Main Project Files Location: \\DOT\Roads\ENProj.

CIP#, Name

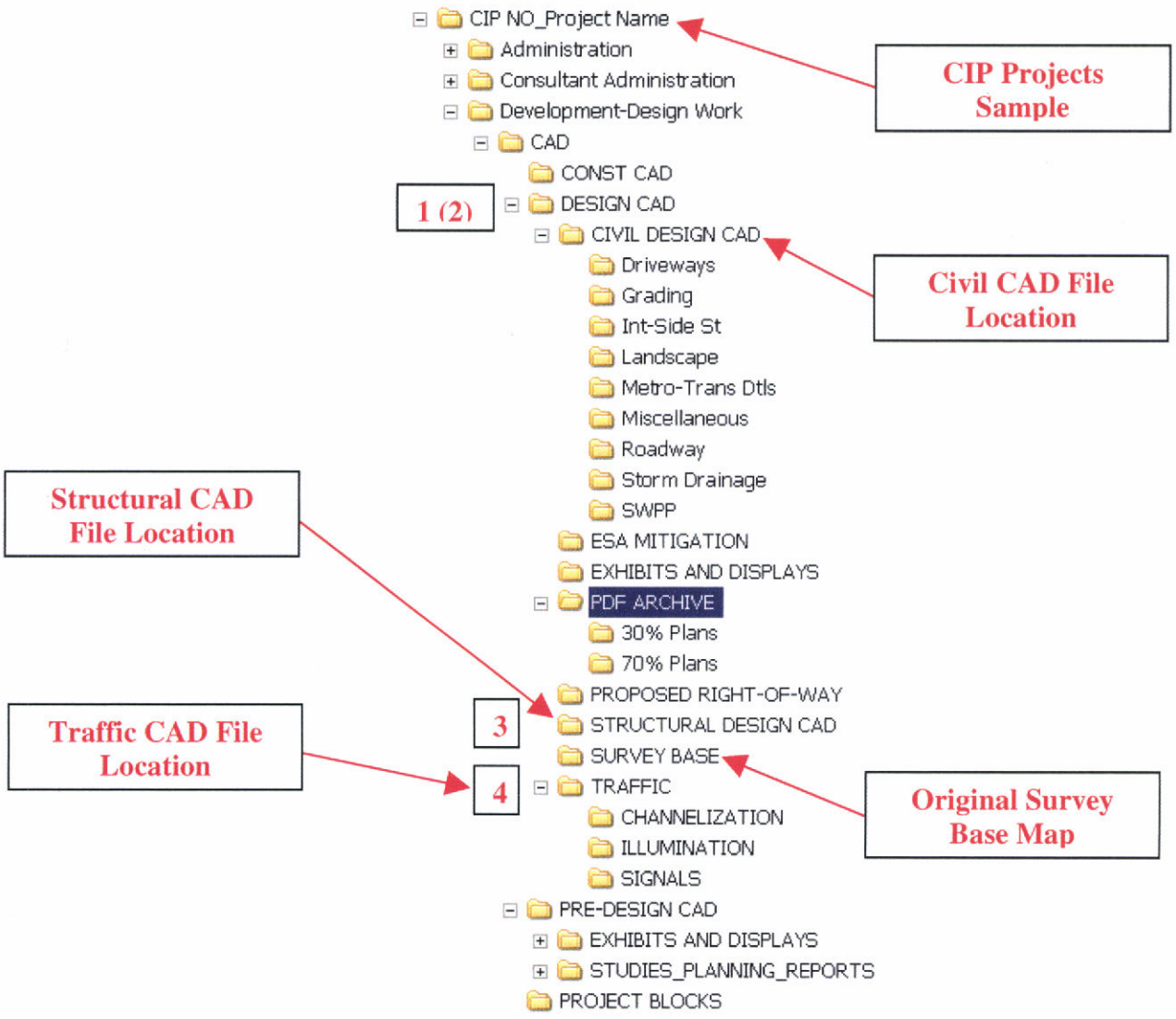
- **Administration Project**
  - Communication Logs
  - Correspondence (option *to centralize all correspondence here)*
  - Meeting agenda and minutes
  - Public Relations
  - Finance
    - Budget
    - Grants
  - Schedule

- **Consultant Administration**
  - Correspondence *(may be centralized in the above)*
  - Contracts
  - Cost Breakdowns
  - Selection
  - Invoices
  - Supplements

- **Development-Design Work** (*this area allows work groups to place working files and other data in a centralized area but allows a freedom of use and structure)*
  - CAD (**See CAD files structures on page 2-4***)*
  - Civil (**Civil Design Calculations File Location***)*
    - Design Calculations
  - Structural (**Structural Design Calculations File Location***)*
    - Design Calculations
  - Construction
  - Cost Estimate development
  - Consultant Work Products
  - Environmental
  - Geotechnical
  - Materials Lab
  - Specification
  - Right of Way
    - Legal Description
  - Storm water
  - Structural
  - Survey
  - Traffic
  - Utilities

- **Documents – Final and Reference**
  - Design Team Documents
  - Engineering Reports
  - Environmental Studies
  - Establishment Plans
  - Final Survey Base map
  - Final PS and E (*place in PDF or other view only format)*
  - Graphics
  - Permits and Approvals
  - Photos
  - Reference reports and studies
  - Right of Way

- **Project Construction**
  - Correspondence
  - Progress Payment
  - RFI & Responses
  - Submittals & Approvals
  - Change Orders
  - Closeout
  - Claims



(Sample CAD Files Structure for Civil and Structure)

Note: 1. Civil Design CAD files for main x-refs should be stored in the main **CIVIL DESIGN CAD Folder.** It should include the followings:

CIPNOxSV.dwg (Survey base map)
CIPNOxDS.dwg (Proposed Design)
CIPNOxTB.dwg (Civil title block)
CIPNOxPR.dwg (Main Profiles)
CIPNOxLANDS.dwg (Main Landscape)
CIPNOxSDPP.dwg (Main Erosion Control)
CIPNOxCH.dwg (Main Channelization)

2. See folder details for sheet placement on Section 2.2.

3. Structural Design CAD files for main x-refs should be stored in the main **CIVIL DESIGN CAD Folder.**

4. Traffic CAD files for main x-refs should be stored in the main **CIVIL DESIGN CAD Folder.**

2.2 Folder Details for Sheet Placement

The following is to provide details on CAD file structures (See previous sheet for illustrations):

A. CONST CAD:	Reference Chapter 4 Project Management Manual 2004
B. DESIGN CAD:	CAD Files Structure
C. CIVIL DESIGN CAD:	Civil CAD Files Location
DRIVEWAYS	Driveway Plan and Profiles
GRADING	Grading Plans and Details
INT-SIDE ST	Intersection Plans, Intersection Profiles and Details
LANDSCAPE	Landscape Notes, Legend, Plans and Details
METRO-TRANS DTLS	Metro Bus Plans
MISCELLANEOUS	Project Cover Sheet, Legend, Quantities Summary Sheet, Cross Section Details and Structure Notes.
ROADWAY	Roadway Plan and Profile and Sections
STORM DRAINAGE	Storm Drainage Plan and Profile, Storm Drainage Details and Sections
SWPP	Storm Water Pollution Prevention Plan Notes, Legend and Details
D. ESA MITIGATION:	Environmental Services/Mitigation Drawings
E. EXHIBITS AND DISPLAYS:	Design drawings for public meetings and in-house displays

F. PDF ARCHIVE:	Project archive location for CAD
30% Plans	Archive for 30% Plans
70% Plans	Archive for 70% Plans
G. PROPOSED RIGHT-OF-WAY:	Proposed Right-of-Way drawings
H. STRUCTURAL DESIGN CAD:	Structural CAD Files Location
I. SURVEY BASE:	Updated Survey Drawings
J. TRAFFIC:	Traffic Department CAD Drawings
CHANNELIZATION	Channelization Plans, Traffic Detour Plans and Channelization Details
ILLUMINATION	Street Lighting Plans and Details
SIGNALS	Signalization Plans and Details
K. PRE-DESIGN CAD:	Preliminary CAD drawings. Conceptual/Alternate horizontal & vertical alignments

3.1 Drawings Preparation Guide

A. Designer to place original survey base map to the Survey Base Folder (See Page 2-3)
B. Design Engineers to make copy of the survey base map to the Civil Design Calculations Folder (See Page 2-3)
C. Detailers will make copy of survey base files to the main x-refs folder under Design CAD Folder (See page 2-5)
D. Design Engineers to provide w-blocks for updated proposed features for detailers to put in the main base map.
E. Detailers to clean up general drawings to meet Engineering CAD Standards.
F. Reduce drawing file size by removing exploded blocks, unused layers and text styles.
G. Verify and reset LT Scale as necessary, it should match the drawings plotted scale.
H. Change the entity colors for use with plotters.
I. Change all existing text to style Romans and font Romans.

3.2 Drawing Clean Up

The following are useful steps a designer can take to improve a drawing's functionality. Many of these procedures require significant amounts of time but they can dramatically improve a drawings ease of use.

A. Change all entities in the drawing to color and line type BYLAYER.
B. Examine line types and text styles that loaded with drawing, change to Engineering Services Standards.
C. Purge non essential layers and other drawing elements.
D. Change all existing text to style Romans and font Romans.

3.3 Electronic Filing and Document Control

All project specific engineering documents that have been updated are to be stored in the main project locations. This is to ensure electronic drawing control, distribution of updated files, and backup of proper files.

(A general note of caution: Everyone who has used computers for any length of time can attest to using care when deleting or renaming files. If you don't know what it is and don't know what's in it, don't delete it. You might end up deleting or renaming some important Windows files and have a major system crash to contend with. The same goes for AutoCAD, DOS....)

3.4 File Name Conventions

File names for AutoCAD drawings and other engineering related documents will not exceed 20 characters. The name will be a combination of the project number, group designator and description per standards. See Section 3.5.

3.5 Engineering Drawing File Name Examples

CIPNO_COV.dwg General Arrangement Number 1 for project Number.
If the drawing consists of more than one sheet the drawing no. would be:
CIPNO_COV1.dwg
CIPNO_COV2.dwg

3.6 File Name Structures

The following outline is the suggested sequence to follow when assembling plans for a construction project. Plans sequence are referenced to WSDOT suggested sequence. For more detailed information regarding the content of individual plan sheets, please refer to the Plans Preparation Manual Section 460. Please note: sheets sequence and requirements varied from project to project depending on project scope. All file name conventions shall be in all caps.

460.01 General

CIPNO_COV.dwg	Cover Sheet
CIPNO_LEGAB.dwg	Legend and Abbreviations
CIPNO_SUM.dwg	Summary of Quantities
CIPNO_RECLM.dwg	Borrow, Pit, Quarry, Stockpile, Waste Sites, & Reclamation Plans
CIPNO_RDSEC.dwg	Roadway Sections
CIPNO_GRDSEC.dwg	Grading Sections (If Applicable)
CIPNO_CONSTPL.dwg	Stage Construction Plans (If Applicable)
CIPNO_ALGNRW.dwg	Alignment/Right of Way
CIPNO_QTYTAB.dwg	Quantity Tabulation Sheets (Q-Tabs). These sheets are to be placed immediately prior to the plans sheets showing the work being tabulated, such as site preparation items, Stormwater Pollution Prevention Plan (SWPPP) items, guardrail items, traffic items, etc.
CIPNO_INTDET.dwg	Intersection Details
CIPNO_OVPROJ.dwg	Overall Project Plan
CIPNO_SITEP.dwg	Site Preparation (existing topography, and removal and demolition work may be shown on alignment plans;

	however, if extension details are required, should be separate sheets).
CIPNO_EXUT.dwg	Existing Utilities (this is an extension of the site preparation plan and is only required if the existing utilities are so extensive that they can not be clearly shown on the site preparation plan).
CIPNO_SUPERE.dwg	Super Elevation
CIPNO_RDPP.dwg	Roadway Plan and Profile
CIPNO_DET.dwg	Details Sheet
CIPNO_GRAD.dwg	Grading Sheet
CIPNO_SWPPP.dwg	Stormwater Pollution Prevention Plan
CIPNO_STRUC.dwg	Structure Notes (will precede plan series showing drainage features).
CIPNO_SDPLN.dwg	Drainage plans (may not be required if work is minor and can be combined with another series of plans).
CIPNO_SDPROF.dwg	Drainage profiles (will follow plan series showing drainage features).
CIPNO_SDDET.dwg	Drainage details
CIPNO_UTSTRUC.dwg	Utility structure note sheets (only required if there is work to be done by the contractor on existing utilities).
CIPNO_UTPLN.dwg	Utility plans (only required if there is work to be done by the contractor on existing utilities).
CIPNO_UTDET.dwg	Utility details (only required if there is work to be done by the contractor on existing utilities).
CIPNO_MITG1.dwg	Mitigation Planting Plan (Irrigation structure note sheets)
CIPNO_MITG2.dwg	Mitigation Planting Plan (Irrigation plans)
CIPNO_MITG3.dwg	Mitigation Planting Details (Irrigation details)
CIPNO_LANDS.dwg	Landscape, wetland, rest areas, and viewpoints.
CIPNO_INTCHCONT.dwg	Interchange Contours
CIPNO_PAVPLN.dwg	Paving Plans are required for overlay projects when paving breaks, paving dimensions, intersection paving, taper lengths and dimensions of taper widths, etc. can't be shown adequately on the Roadway Sections. In this case, the Roadway Sections, Paving Plans and Paving Detail Sheets are to be prepared in conjunction with each other to show all the paving work.
CIPNO_PAVDET.dwg	Paving details
CIPNO_MINSTRUC.dwg	Minor structures (retaining walls, etc.)
CIPNO_CHAN.dwg	Channelization Plan
CIPNO_ILLUM.dwg	Illumination plans (may be shown on paving plans if illumination is minor and paving plan will not be too crowded).
CIPNO_ILLUMDET.dwg	Illumination details (will follow plan series showing illumination layout).
CIPNO_SIGPLN.dwg	Traffic Signal Plans

CIPNO_SIGDET.dwg	Traffic Signal details
CIPNO_ITSPLN.dwg	Intelligent Transportation System (ITS) plans
CIPNO_ITSDET.dwg	ITS details
CIPNO_SIGNSPC.dwg	Signing specification sheets (will precede the plan series showing the signing)
CIPNO_SIGNPLN.dwg	Signing plans (may be shown on paving plans if signing is minor and paving plans will not be too crowded)
CIPNO_SIGNDET.dwg	Signing details (will follow plan series showing signing)
CIPNO_BPLAN.dwg	Bridge Plan & Elevation
CIPNO_BSECT.dwg	Bridge Typical Sections
CIPNO_BQTY.dwg	General Notes and Quantities
CIPNO_BLOGS.dwg	Boring Logs
CIPNO_BDEMLT.dwg	Demolition
CIPNO_BCNSTSEQ.dwg	Construction Sequence
CIPNO_BCNSTACCSS.dwg	Construction Access / Staging
CIPNO_BFDNPLN.dwg	Foundation Plan
CIPNO_BFDNDET.dwg	Foundation Details
CIPNO_BPIER.dwg	Pier X
CIPNO_BPIERDET.dwg	Pier Details
CIPNO_BABUTMNT.dwg	Abutment Y
CIPNO_BABUTMNTDET.dwg	Abutment Details
CIPNO_BWINGW.dwg	Wing Walls Detail
CIPNO_BFRMPLN.dwg	Framing Plan
CIPNO_BGIRDDET.dwg	Girder Details
CIPNO_BDIAPHRAGM.dwg	Diaphragms
CIPNO_BSLABREINF.dwg	Slab Reinforcing Plan
CIPNO_BSLABXSECT.dwg	Slab Section
CIPNO_BDECK.dwg	Deck, Rail Post and Utilities Layout
CIPNO_BEXPBEAR.dwg	Expansion Bearings-Bridge rail plan and details
CIPNO_BFXBEAR.dwg	Fixed Bearings
CIPNO_BAPPRCHSLAB.dwg	Approach Slab
CIPNO_BREINFTBL.dwg	Reinforcement Table
CIPNO_TRFCONTRL.dwg	Traffic Control plans
CIPNO_DETOUR.dwg	Detour routes and detour signing (If the detour is simple and straight forward, this information could be shown on the vicinity map, providing the additional information does not detract from the vicinity map).
CIPNO_ROW.dwg	Right of Way Plans

3.7 AutoCAD Line Types

AutoCAD line types are to be generated based on standard layer names and line types. See Fig. 3-1 to 3-4 (Sheets 3-28 to 3-38).

3.8 Plotted Line Weights

AutoCAD manages line weight through the graphic use of colors. Entity colors are mapped to logical pens, and each pen has an assigned value for thickness and tone. The designer must be capable of visualizing a plotted drawing by looking at the screen.

Color conventions are as follows:

Red (1)
Yellow (2)
Green (3)
Cyan (4)
Blue (5)
Magenta (6)
White (7)
Gray (8)
Beige (21)
Brown (35)
Light Blue (153)
252
253
254

For half size prints (8 1/2x11, 8 1/2x14 and 11x17) the set-up is as follows:
(See Fig. 3-5 (Sheet 3-40) reference thickness)

Red(1)	Pen No. 7 Line weight: 0.0035"
Yellow(2)	Pen No. 7 Line weight: 0.0035"
Green(3)	Pen No. 7 Line weight: 0.0060"
Cyan(4)	Pen No. 7 Line weight: 0.0120"
Blue(5)	Pen No. 7 Line weight: 0.0150"
Magenta(6):	Pen No. 7 Line weight: 0.0180"

White(7)	Pen No. 7 Line weight: 0.0090"
Gray(8)	Pen No. 7 Line weight: 0.0035"
Beige(21)	Pen No. 21 Line weight: 0.0035"
Brown(35)	Pen No. 8 Line weight: 0.0030"
Light Blue(153)	Pen No. 7 Line weight: 0.0060"
Color 252,253,254	Pen No. 8 Line weight: 0.0035"

For full size plots (Over size ANSI D, ANSI D, etc.) the set-up is as follows:
(See Fig. 3-6 (Sheets 3-44) for reference thickness)

Red(1)	Pen No. 7 Line weight: 0.0100"
Yellow(2)	Pen No. 7 Line weight: 0.0120"
Green(3)	Pen No. 7 Line weight: 0.0160"
Cyan(4)	Pen No. 7 Line weight: 0.0230"
Blue(5)	Pen No. 7 Line weight: 0.0300"
Magenta(6)	Pen No. 7 Line weight: 0.0350"
White(7)	Pen No. 7 Line weight: 0.0180"
Gray(8)	Pen No. 7 Line weight: 0.0100"

Beige(21)	Pen No. 21 Line weight: 0.0100"
Brown(35)	Pen No. 8 Line weight: 0.0100"
Light Blue(153)	Pen No. 7 Line weight: 0.0100"
Color 252,253,254	Pen No. 8 Line weight: 0.0100" Line weight: 0.0050"

3.9 Revisions and Drawing Filing Procedures

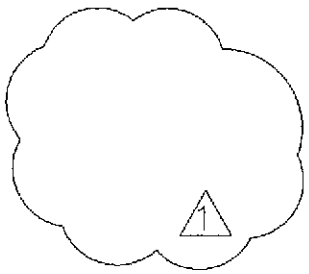
A. **Addenda** - Creating an Addendum Drawing

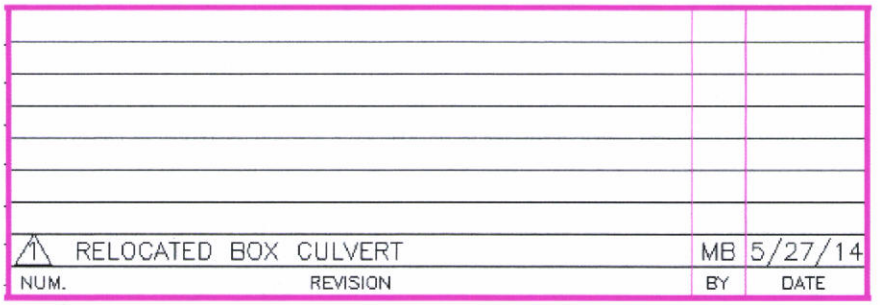
Addenda are made after general distributions and project ad but before the bid opening. See below for illustrations.

1. **Revise Drawing**
   - Make revisions to drawing, and place a revision delta near each change.
   - Draw revision cloud around revise area, on separate "revision cloud" layer. Remove previous revision cloud.

2. **Update Revision Block**
   - Fill out revision block in ascending order.
   - Add revision delta to the revision block; describe revision, type initials for "approved by" and "date" (e.g. 4/2014).

3. **Issue Drawing**
   - Plot drawing.
   - See below for illustrations.





B. **Plans of Record** – Plans of record is the final update of the drawings, and reflect how the project was actually constructed.

3.10 Linetype Definitions:

Fundamental line works on our drawings consist of the following linetypes: **Continuous, Centerlines, Hidden lines, Dashed lines, Fence and Phantom lines.** In addition, please see Fig. 3-1 to 3-4 (Sheets 3-29 to 3-39) for standard linetypes.

LTSCALE is the AutoCAD line scale variable. In structural drawing, LTSCALE is a multiplier used to scale up line definitions to fit the drawings plotted scale. For example, during scale at 1/16"=1'-0" will have an LTSCALE of 192 in model space. The LTSCALE is then applied to the linetype definitions used on the drawing to provide proportional spacing for all linework. LTSCALE shall be set in model space. With the SETVAR PSLTSCALE set to "0". PSLTSCALE shall be set to "1" only on drawings with multiple view ports with multiple scales.

PSLTSCALE is an AutoCAD system variable with R12 and above. AutoCAD drawings that use single viewports should set this variable to 0. This will enable all linetypes to be plotted according to viewport scale factor (zoom XP).

3.11 AutoCAD Entity Color Table:

COLOR#	COLOR	GENERAL USE
1	Red	Hatching, Center Lines
2	Yellow	Drawing Text and Fine Line Work
3	Green	Drawing Medium Text and Fine Line Work
4	Cyan	Prop. Drainage or Secondary Lines
5	Blue	Ex. R/W or Prop. R/W
7	White	Medium line work such as edge of pavement
8	Gray	Ex. Line work
21	Beige	Ex. Major Contours
35	Brown	Ex. Minor Contours/Ex. Features
153	Light Blue	Profiles Grid

253	Half Tone Color
254	Half Tone Color/Solid Hatch

3.12 Lettering, Annotation, Text and Titles:

Consistent text on drawing construction is very important and directly impacts our quality as a county employee. The plotted size of lettering is significant as this will facilitate readability by clients, and field personnel, as well as microfilming and other photographic reducing processes.

Standard text height for design plan sets in Engineering Services Section is 0.125" or 1/8". Text height of .25" (2 times standard text height) is to be used for detail, section title and match line call out. See reference Fig. 3-17 (Sheets 3-55 & 3-57) for examples. Text height of 0.2500" (2 times standard text height) is to be used for primary street names. Secondary street names are to be 1 1/2 times (0.1875") standard text height.

ROAD SERVICES DIVISION STYLE SETTINGS:

Style name: ROMANS,	font name: ROMANS,	Style height=0
Width: 1.0,	oblique angle=0	backwards=N
Upside-down=N,	vertical=N	

USER NOTES:

Special characters: AutoCAD provides access to special text characters not available on standard keyboards through use of the %% mechanism. See below for tips on using short cut keys.

%%o	toggle overscore mode on/off	%%u	toggle underscore mode on/off
%%d	draw degrees symbol	%%p	draw plus/minus tolerance symbol
%%c	draw diameter symbol	%%%	force a single percent sign

CTRL + B TOGGLES SNAP MODE (F9)
CTRL + L TOGGLES ORTHO MODE (F8)
CTRL + G TOGGLES GRID ON AND OFF (F7)

3.13 Dimensioning:

- **Dimensioning** shall be placed on the drawing as required by discipline standards with a standard text height of 1/8" high. Text height varies depending on LTSCALE.
- **Dimensioning font** shall be set to Romans.
- **Text placement** shall be set to above for vertical and centered for horizontal.
- **Arrow heads** should be set to .18 and shall be set to "closed filled".
- **Scales for dimension features** should be in relation to scale factors used for each drawing set ups.

- All entities in relations to colors, line types, line weights shall be set to Bylayer.

3.14 Abbreviations and Acronyms:

General

- Abbreviations, as a rule, are to be avoided.
- Because different words sometimes have identical abbreviations or acronyms, the word should be spelled out where the meaning may be in doubt.
- Abbreviations and acronyms need to be spelled out on first reference
- A few standard signs are in common use in Civil, Bridge and Structures Office. These are listed with the abbreviations.
- A period should be placed after all abbreviations, except as listed below.
- Apostrophes are usually not used. Exceptions: pav't., req'd.
- Abbreviations for plurals are usually the same as the singular. Exceptions: figs., no., ctr., pp.
- No abbreviations in titles.

List of abbreviations commonly used on plan sheets:

A

Abutment	ABUT.
Adjust, Adjacent	ADJ.
Aggregate	AGG.
Alternate	ALT.
Ahead	AHD.
Aluminum	AL.
American Society for Testing and Materials	ASTM
American Association of State Highway and Transportation Officials	AASHTO
And	&

	Angle Point	A.P.
	Approved	APPRD.
	Approximate	APPROX.
	Area	A
	Asbestos Cement Pipe	ASB. CP
	Asphalt Concrete	AC
	Asphalt Treated Base	ATB
	At	@(used only to indicate spacing or pricing, otherwise spell it out)
	Avenue	AVE
	Average	AVG.
B		
	Back	BK.
	Back of Pavement Seat	B.P.S.
	Bearing	BRG.
	Begin Horizontal Curve (Point of Curvature)	P.C.
	Begin Vertical Curve	BVC (Vertical Curve)
	Bench Mark	BM
	Between	BTWN
	Bituminous Surface Treatment	BST
	Bottom	BOT.
	Boulevard	BLVD.
	Bridge	BR.
	Bridge Drain	BR. DR.
	Building	BLDG.
	Buried Cable	BC
C		
	Cast-In-Place	CIP
	Cast Iron Pipe	(C.I.P.)
	Center, Centers	CTR., CTRS.

Centerline	℄
Center of Gravity	CG
Center to Center	CTR. TO CTR., C/C
Celsius (formerly Centigrade)	C
Cement Treated Base	CTB
Centimeters	CM.
Circle	CIR
Class	CL
Clearance, Clear	CLR.
Compression, Compressive	COMP.
Column	COL.
Concrete	CONC.
Conduit	COND.
Concrete Pavement	PCCP
(Portland Cement Concrete Pavement)	
Construction	CONST. Or CONSTR.
Continuous	CONT. Or CONTIN.
Corrugated Metal	CM
Corrugated Steel Pipe	CSP
Countersink	CSK>
County	CO.
Creek	CR.
Cross Beam	X-BM.
Crossing	XING
Cross Section	X-SECT.
Cubic Feet	CF or CU. FT. or FT^3
Cubic Inch	CU. IN. or IN^3.
Cubic Yard	CY or CU. YD. OR YD^3.
Culvert	CULV.
D	
Degrees, Angular	° or DEG.

Degrees, Thermal	C or F
Diagonals(s)	DIAG.
Diameter	DIAM. OR ∅
Diaphragm	DIAPH.
Dimension	DIM.
Double	DBL.
Drive	DR.

E

Each	EA.
Each Face	E.F.
Easement	EASE., ESMT.
East	E
Edge of Pavement	EP
Edge of Shoulder	ES
Endwall	EW
Electric	ELECT
Elevation	EL.
Embankment	EMB.
End horizontal curve (Point of Tangency)	P.T.
End Vertical Curve	EVC (Vertical Curve)
Engineer	ENGR.
Equal(s)	EQ. (as in eq. spaces) or=(mathematical result)
Estimate(d)	EST.
Excavation	EXC.
Excluding	EXCL.
Expansion	EXP., EXPAN.
Existing	EXIST.
Exterior	EXT.

F		
	Fahrenheit	F
	Far Face	FF
	Far Side	FS
	Feet (foot)	FT. or '
	Feet per Foot	FT./FT. or '/' or '/FT.
	Field Splice	F.S.
	Figure, Figures	FIG., FIGS.
	Flat Head	F.H.
	Foot Kips	FT-KIPS
	Foot Pounds	FT-LB
	Footing	FTG.
	Forward	FWD.
	Freeway	FWY.
G		
	Gallon(s)	GAL.
	Galvanized	GALV.
	Galvanized Steel Pipe	GSP
	Gauge	GA.
	General Special Provisions	GSP
	Girder	GIR.
	Ground	GR.
	Guard Railing	GR
H		
	Hanger	HGR.
	Height	HT.
	Height (retaining wall)	H
	Hexagonal	HEX.
	High Strength	H.S.
	High Water	H.W.
	High Water Mark	H.W.M.

	Highway	HWY.
	Horizontal	HORIZ.
	Hot Mix Asphalt	HMA
	Hour(s)	HR.
	Hundred(s)	HUND.
I		
	Included, Including.	INCL.
	Inches(s)	IN. or ''
	Inside Diameter	I.D.
	Inside Face	I.F.
	Interior	INTR
	Intermediate	INTERM.
	Interstate	I
	Invert	INV
J		
	Joint	JT.
	Junction	JCT.
K		
	Kilometer(s)	KM.
	Kilopounds	KIPS, K.
L		
	Lane	LN
	Layout	LO
	Left	LT.
	Length of Curve	L.C.
	Linear Feet	L.F.
	Longitudinal	LONGIT.
	Lump Sum	L.S.
M		
	Maintenance	MAINT.
	Malleable	MALL.
	Manhole	MH

	Manufacturer	MFR.
	Maximum	MAX.
	Mean High Water	MHW
	Mean Higher High Water	MHHW
	Mean Low Water	MLW
	Mean Lower Low Water	MLLW
	Meters	M.
	Mile(s)	MI.
	Miles Per Hour	MPH
	Millimeters	MM.
	Minimum	MIN.
	Minute(s)	MIN. or '
	Miscellaneous	MISC.
	Modified	MOD.
	Monument	MON.
N		
	National Geodetic Vertical datum	N.G.V.D.
	Near Face	NF
	Near Side	NS
	North	N
	Northbound	NB
	Northwest/East	NW/NE
	Not To Scale	NTS
	Number; Numbers	#, NO., NOS.
O		
	Or	/
	Original Ground	O.G.
	Ounce(s)	OZ.
	Outside Diameter	O.D.
	Outside Face	O.F.
	Out to Out	O to O

	Overcrossing	O-XING
	Overhead	OH
P		
	Page; Pages	P.; PP.
	Pavement	PAV'T
	Pedestrian	PED.
	Percent	%
	Pivot Point	PP
	Plans, Specifications and Estimates	PS&E
	Place	PL
	Plate	PL or ℙ
	Point	PNT.
	Point of Compound Curve	PCC
	Point of Curvature	P.C. (Horizontal Curve)
	Point of Intersection	P.I. (Horizontal Curve)
	Point of Intersection Vertical Curve	P.V.I. (Vertical Curve)
	Point of Reverse Curve	PRC
	Point of Tangent	P.T. (Horizontal Curve)
	Polyvinyl Chloride	PVC
	Portland Cement Concrete	PCC
	Pound, Pounds	LB., LBS., #
	Pounds Per Square Foot	PSF, LBS./FT^2.
	Pounds Per Square Inch	PSI, LBS./IN^2
	Power Pole	PP
	Precast	PREC.
	Pressure	PRES.
	Prestressed	P.S.
	Prestressed Concrete Pipe	P.C.P.
Q		
	Quantity	QUANT.
	Quart	QT.

R		
	Radius	R.
	Railroad	RR
	Railway	RWY.
	Range	R.
	Regulator	REG.
	Reinforced, Reinforcing	REINF.
	Reinforced Concrete	RC
	Reinforced Concrete Box	RCB
	Reinforced Concrete Pipe	RCP
	Required	REQ'D
	Retaining Wall	RET. WALL
	Revised (date)	REV.
	Right	RT.
	Right of Way	R/W
	Road	RD
	Roadway	RDWY.
	Route	RTE.
S		
	Seconds	SEC. OR ''
	Section (map location)	SEC.
	Section (of drawing)	XSEC.
	Sheet	SHT.
	Shoulder	SHLD. Or SH.
	Sidewalk	SW. or SDWK
	South	S
	Southbound	SB
	Southwest/East	SW/SE
	Space(s)	SPA.
	Splice	SPL.
	Specification	SPEC.

	Square Foot (feet)	SQ. FT., FT^2 or SF
	Square Inch	SQ. IN. or IN^2.
	Square Yard	SY, SQ. YD. or YD^2.
	Station	STA.
	Standard	STD.
	State Route	SR
	Stiffener	STIFF.
	Stirrup	STIRR.
	Street	ST
	Structure, Structural	STR.
	Support	SUPP.
	Surface, Surfacing	SURF.
	Symmetrical	SYMM.
T		
	Tangent	TAN. or T.
	Telephone	TEL
	Temporary	TEMP.
	Test Hole	T.H.
	Thick(ness)	TH.
	Thousand	M
	Thousand (feet) Board Measure	MBM
	Ton(s)	T.
	Total	TOT.
	Township	T.
	Transition	TRANS.
	Transportation	TRANSP.
	Transverse	TRANSV.
	Treatment	TR.
	Typical	TYP.
U		
	Ultimate	Ult.

	Undercrossing	U-XING
V		
	Variable, Varies	VAR.
	Vertical	VERT.
	Vertical Curve	V.C.
	Vitrified Clay Pipe	VCP
	Volume	VOL. or V
W		
	Water Surface	W.S.
	Weight(s)	WT.
	Welded Steel Pipe	WSP
	Welded Wire Fabric	W.W.F.
	West	W.
	Willamette Meridian	W.M.
	Wingwall	WW
	With	W/
	Without	W/O
Y		
	Yard, Yards	YD., YDS.
	Year(s)	YR.

3.15 Standard Layer Names for Civil, Structural and Survey Units:

Standard layer names shall be used to maintain consistency from department to department. See Fig. 3-1 to 3-4 (Page 3-28 to 3-38) for reference.

CIVIL LAYER INFORMATION

Layer Name	Description	Color	Linetype
	TITLE BLOCK		
D-B-S	SURVEY TITLE BLOCK & BORDER	MAGENTA	CONTINUOUS
D-DAT-S	DATUM SYMBOL	GREEN	CONTINUOUS
D-GRD_EL-T	GRID ELEVATION TEXT	WHITE	CONTINOUS
D-GRD_FNE-L	FINE GRID LINE	153	FINE GRID
D-GRD_HVY-L	HEAVY GRID LINE	153	HEAVY GRID
D-ML-L	MATCHLINES	WHITE	CONTINUOUS
D-ML-T	MATCHLINE TEXT	WHITE	CONTINUOUS
D-NA_SC-S	NORTH ARROW, SCALE BAR	WHITE	CONTINUOUS
D-REV-L	REVISION CLOUD	CYAN	CONTINUOUS
D-SUMTB-L	SUMMARY TABLE LINE	WHITE	CONTINUOUS
D-S-T	STREET, WATERCOURSE NAMES	WHITE	CONTINUOUS
D-T-T	SECTION, TOWNSHIP, RANGE TEXT	CYAN	CONTINUOUS
	DESIGN ROW		
D-CL_BEAR-T	CONSTRUCTION CENTERLINE BEARING TEXT	WHITE	CONTINOUS
D-CL_CONST-L	CONSTRUCTION CENTERLINE	MAGENTA	CENTERLINE
D-CL_CONST-T	CONSTRUCTION CENTERLINE TEXT	CYAN	CONTINOUS
D-CL-L	DETAILED CENTERLINE	RED	CENTERLINE
D-CL_DWY-L	DRIVEWAY CONSTRUCTION CENTERLINE	MAGENTA	CENTERLINE
D-CL_STATIC-L	CONSTRUCTION CENTERLINE TICK SYMBOL	CYAN	CONTINOUS
D-CL_STA-T	CONSTRUCTION CENTERLINE STATION TEXT	CYAN	CONTINOUS
D-EA_AQUA-H	AQUATIC LANDS AGREEMENT HATCH	131	CONTINOUS
D-EA_ARD-D	A.R.D. DIMENSION	GREEN	CONTINOUS
D-EA_ARD-H	A.R.D. HATCH	10	CONTINOUS
D-EA_ARD-L	A.R.D. LINE	CYAN	CONTINOUS
D-EA_ARD-T	A.R.D. TEXT	GREEN	CONTINOUS
D-EA_CAD-T	ROW CADD NOTES	YELLOW	CONTINOUS
D-EA_CONSV-D	CONSERVATION EASEMENT DIMENSION	YELLOW	CONTINOUS
D-EA_CONSV-H	CONSERVATION EASEMENT HATCH	147	CONTINOUS
D-EA_CONSV-L	CONSERVATION EASEMENT LINE	CYAN	HIDDEN
D-EA_CONSV-T	CONSERVATION EASEMENT TEXT	YELLOW	CONTINOUS
D-EA_DRAIN-D	DRAINAGE EASEMENT DIMENSION	YELLOW	CONTINOUS
D-EA_DRAIN-H	DRAINAGE EASEMENT HATCH	221	CONTINOUS
D-EA_DRAIN-L	DRAINAGE EASEMENT LINE	CYAN	HIDDEN
D-EA_DRAIN-T	DRAINAGE EASEMENT TEXT	YELLOW	CONTINOUS
D-EA_GEN-D	GENERAL EASEMENT DIMENSION	YELLOW	CONTINOUS
D-EA_GEN-H	GENERAL EASEMENT HATCH	50	CONTINOUS
D-EA_GEN-L	GENERAL EASEMENT LINE	CYAN	HIDDEN
D-EA_GEN-T	GENERAL EASEMENT TEXT	YELLOW	CONTINOUS
D-EA_SLOPE-D	SLOPE EASEMENT DIMENSION	YELLOW	CONTINOUS
D-EA_SLOPE-H	SLOPE EASEMENT HATCH	80	CONTINOUS
D-EA_SLOPE-L	SLOPE EASEMENT LINE	GREEN	HIDDEN
D-EA_SLOPE-T	SLOPE EASEMENT TEXT	GREEN	CONTINOUS
D-EA_TCE-D	TEMPORARY CONST. EASEMENT DIMENSION	YELLOW	CONTINOUS
D-EA_TCE-H	TEMPORARY CONST. EASEMENT HATCH	244	CONTINOUS
D-EA_TCE-L	TEMPORARY CONST. EASEMENT LINE	CYAN	HIDDEN
D-EA_TCE-T	TEMPORARY CONST. EASEMENT TEXT	YELLOW	CONTINOUS
D-EA_UT_AERIAL-D	AERIAL EASEMENT DIMENSION	YELLOW	CONTINOUS
D-EA_UT_AERIAL-H	AERIAL EASEMENT HATCH	30	CONTINOUS
D-EA_UT_AERIAL-L	AERIAL EASEMENT LINE	WHITE	HIDDEN
D-EA_UT_AERIAL-T	AERIAL EASEMENT TEXT	YELLOW	CONTINOUS

FIG. 3-1
CIVIL LAYER INFORMATION

	DESIGN ROW (CONT)		
D-EA_UT_UG-D	UNDERGRND. UTILITY EASEMENT DIMENSION	YELLOW	CONTINOUS
D-EA_UT_UG-H	UNDERGRND. UTILITY EASEMENT HATCH	111	CONTINOUS
D-EA_UT_UG-L	UNDERGRND. UTILITY EASEMENT LINE	WHITE	HIDDEN
D-EA_UT_UG-T	UNDERGRND. UTILITY EASEMENT TEXT	YELLOW	CONTINOUS
D-EA_UT_WALL-D	WALL EASEMENT DIMENSION	YELLOW	CONTINOUS
D-EA_UT_WALL-H	WALL EASEMENT HATCH	43	CONTINOUS
D-EA_UT_WALL-L	WALL EASEMENT LINE	WHITE	HIDDEN
D-EA_UT_WALL-T	WALL EASEMENT TEXT	GREEN	CONTINUOUS
D-RW_DEED-D	ROW DEED TAKE DIMENSION	GREEN	CONTINUOUS
D-RW_DEED-H	ROW DEED TAKE HATCH	191	CONTINUOUS
D-RW_DEED-L	ROW DEED TAKE LINE	WHITE	CONTINUOUS
D-RW_DEED-T	ROW DEED TAKE TEXT	GREEN	CONTINUOUS
D-RW-D	NEW RIGHT OF WAY DIMENSION	GREEN	CONTINUOUS
D-RW-L	NEW RIGHT OF WAY LINES	BLUE	CONTINUOUS
D-RW-T	NEW RIGHT OF WAY TEXT	GREEN	CONTINUOUS
D-RW_NO-S	RIGHT-OF-WAY & PARCEL NUMBER SYMBOL	GREEN	CONTINUOUS
D-RW_NO-T	RIGHT-OF-WAY & PARCEL NUMBER TEXT	GREEN	CONTINUOUS
D-SC-S	DESIGN SURVEY CONTROL SYMBOLS	GREEN	CONTINUOUS
D-SC-T	DESIGN SURVEY CONTROL TEXT	GREEN	CONTINUOUS
D-ST-T	STREET NAMES	WHITE	CONTINUOUS
D-TAX-S	TAX LOT NUMBER SYMBOL	GREEN	CONTINUOUS
D-TAX-T	TAXT LOT NUMBER TEXT	GREEN	CONTINUOUS
	DESIGN FEATURES		
D-100YRFLD-L	100 YR FLOOD PLAIN LINES	CYAN	100_YEAR_FLOOD
D-CMJ-L	MAJOR (INDEX) DESIGN CONTOUR LINES	CYAN	CONTINUOUS
D-CMJ-T	DESIGN CONTOUR TEXT	WHITE	CONTINUOUS
D-CMN-L	MINOR DESIGN CONTOUR LINES	WHITE	CONTINUOUS
D-C&G-L	CLEARING AND GRADING LIMITS LINES	CYAN	CLEARING_GRADING
D-CRBB-L	DESIGN BACK OF CURB LINES	RED	CONTINUOUS
D-CRBF-L	DESIGN FACE OF CURB LINES	WHITE	CONTINUOUS
D-CATCH_CUT-L	DESIGN CUT CATCHLINES	YELLOW	CUT_LINE
D-CATCH_FILL-L	DESIGN FILL CATCHLINES	GREEN	FILL_LINE
D-DIT-L	DESIGN DITCH FLOWLINES	CYAN	DIVIDE2
D-DIT-S	DESIGN DITCH FLOWLINE SYMBOLS	CYAN	CONTINUOUS
D-DWY-L	DESIGN DRIVEWAY LINES	WHITE	CONTINUOUS
D-DWY_RMP-S	DESIGN DRIVEWAY RAMP SYMBOL	WHITE	CONTINUOUS
D-DWY-T	DESIGN DRIVEWAY TEXT	YELLOW	CONTINUOUS
D-EAC-L	DESIGN EDGE OF PAVEMENT LINES	WHITE	CONTINUOUS
D-EAC-T	DESIGN EDGE OF PAVEMENT TEXT	YELLOW	CONTINUOUS
D-EXC-L	DESIGN EXTRUDED CURB LINES	RED	CONTINUOUS
D-EXC-T	DESIGN EXTRUDED CURB TEXT	YELLOW	CONTINUOUS
D-FEN-L	DESIGN EXTRUDED FENCE LINES	GREEN	FENCE
D-FEN-S	DESIGN FENCE SYMBOLS	GREEN	CONTINUOUS
D-FEN-T	DESIGN FENCE TEXT	YELLOW	CONTINUOUS
D-FEN_HV-L	DESIGN HIGH VISIBILITY FENCE LINE	GREEN	HIGH VISIBILITY
D-FEN_HV-T	DESIGN HIGH VISIBILITY FENCE TEXT	YELLOW	CONTINUOUS
D-FLDWAY-L	DESIGN FLOOD WAY LINES	CYAN	FLOODWAY
D-FLDWAY-T	DESIGN FLOOD WAY TEXT	GREEN	CONTINUOUS
D-GRVL-L	DESIGN GRAVEL SHOULDER LINES	WHITE	CONTINUOUS
D-HNDRAIL-L	DESIGN HANDRAIL LINES	YELLOW	CONTINUOUS
D-HNDRAIL-T	DESIGN HANDRAIL TEXT	YELLOW	CONTINUOUS

FIG. 3-1
CIVIL LAYER INFORMATION

	DESIGN FEATURES (CONT)		
D-LANDS-S	DESIGN LANDSCAPING SYMBOLS	WHITE	CONTINUOUS
D-LANDS-T	DESIGN LANDSCAPING TEXT	GREEN	CONTINUOUS
D-MBX-L	DESIGN MAIL BOX LINE	WHITE	CONTINUOUS
D-MBX-S	DESIGN MAIL BOX SYMBOL	WHITE	CONTINUOUS
D-MBX-T	DESIGN MAIL BOX TEXT	YELLOW	CONTINUOUS
D-PLNG-H	DESIGN PLANING HATCH	RED	CONTINUOUS
D-PLNG-T	DESIGN PLANING TEXT	RED	CONTINUOUS
D-POND-L	DESIGN POND LINE	CYAN	CONTINUOUS
D-POND-H	DESIGN POND HATCH	GRAY	CONTINUOUS
D-SGN-S	SIGN SYMBOL	WHITE	CONTINUOUS
D-SGN-T	TEXT FOR SIGNS	WHITE	CONTINUOUS
D-SHL-L	DESIGN SHOULDER LINES	YELLOW	CONTINUOUS
D-SHL-T	DESIGN SHOULDER TEXT	YELLOW	CONTINUOUS
D-SIGHT-L	SIGHT DISTANCE LINE	WHITE	CONTINUOUS
D-SIGHT-T	SIGHT DISTANCE TEXT	YELLOW	CONTINUOUS
D-STM-L	DESIGN RELOCATED STREAMS AND WATERCOURSE LINES	WHITE	DIVIDE 2
D-STM-T	DESIGN RELOCATED STREAMS AND WATERCOURSE TEXT	YELLOW	CONTINUOUS
D-SWCT-L	DESIGN SAWCUT LINES	CYAN	CONTINUOUS
D-SWCT-T	DESIGN SAWCUT TEXT	YELLOW	CONTINUOUS
D-SWK-L	DESIGN SIDEWALK LINES	GREEN	CONTINUOUS
D-SWK-T	DESIGN SIDEWALK TEXT	YELLOW	CONTINUOUS
D-SWK_RMP-H	DESIGN SIDEWALK RAMP HATCH	GRAY	CONTINUOUS
D-SWK_RMP-S	DESIGN SIDEWALK RAMP SYMBOL	GREEN	CONTINUOUS
D-TRAIL_PED-L	PEDESTRIAN TRAIL	GREEN	CONTINUOUS
D-TRAIL_HORSE-L	HORSE TRAIL	RED	CONTINUOUS
D-VEG-L	DESIGN LANDSCAPING VEGETATION LINES	WHITE	VEGETATION
D-VEG-S	DESIGN LANDSCAPING VEGETATION SYMBO	WHITE	CONTINUOUS
D-VEG-T	DESIGN LANDSCAPING VEGETATION TEXT	GREEN	CONTINUOUS
D-WAL_CNBLK-L	DESIGN CONCRETE BLOCK WALL LINES	CYAN	BLOCKWALL
D-WAL_CNBLK-T	DESIGN CONCRETE BLOCK WALL TEXT	YELLOW	CONTINUOUS
D-WAL_GABION-H	DESIGN GABION WALL HATCH	RED	CONTINUOUS
D-WAL_GABION-L	DESIGN GABION WALL LINE	CYAN	GABION
D-WAL_GABION-T	DESIGN GABION WALL TEXT	YELLOW	CONTINUOUS
D-WAL_MDBLK-L	DESIGN MODULAR BLOCK WALL LINE	CYAN	MODULAR
D-WAL_MDBLK-T	DESIGN MODULAR BLOCK WALL TEXT	YELLOW	CONTINUOUS
D-WAL_MSE-H	DESIGN MECHANICALLY STABILIZED EARTHWALL HATCH	RED	CONTINUOUS
D-WAL_MSE-L	DESIGN MECHANICALLY STABILIZED EARTHWALL LINE	CYAN	MSE WALL
D-WAL_MSE-T	DESIGN MECHANICALLY STABILIZED EARTHWALL TEXT	YELLOW	CONTINUOUS
D-WAL_ROC-L	DESIGN ROCK FACING WALL LINES	CYAN	ROCK FACING
D-WAL_ROC-T	DESIGN ROCK FACING WALL TEXT	YELLOW	CONTINUOUS
D-WAL_SLDR-L	DESIGN SOLDIER PILE WALL LINES	CYAN	SOLDIER PILE
D-WAL_SLDR-T	DESIGN SOLDIER PILE WALL TEXT	YELLOW	CONTINUOUS
D-WETL-L	WETLAND LINES	GREEN	WETLAND
D-WETL_BUFF-L	WETLAND BUFFER LINES	GREEN	WETLAND_BUFFER
	DESIGN UTILITIES		
D-FIBER_OPTIC-L	FIBER OPTIC LINES	YELLOW	FIBER OPTIC
D-FM-L	FORCE MAIN LINES	CYAN	FORCEMAIN

FIG. 3-1
CIVIL LAYER INFORMATION

D-FU_GA-L	GAS LINES	GREEN	GAS_LINE
D-FU_GA_1IN-L	1 INCH GAS LINES	GREEN	GAS_LINE_1
D-FU_GA_2IN-L	2 INCH GAS LINES	GREEN	GAS_LINE_2
D-FU_GA_4IN-L	4 INCH GAS LINES	GREEN	GAS_LINE_4
D-FU_GA_8IN-L	8 INCH GAS LINES	GREEN	GAS_LINE_8
D-FU_GA_12IN-L	12 INCH GAS LINES	GREEN	GAS_LINE_12
D-FU_GA-S	GAS SYMBOLS	GREEN	CONTINUOUS
D-FU_GA-T	GAS TEXT	YELLOW	CONTINUOUS
D-FU_PO-L	OVERHEAD POWER LINES	GREEN	OVERHEAD_POWER
D-FU_PO-S	POWER SYMBOLS	GREEN	CONTINUOUS
D-FU_PO-T	POWER TEXT	YELLOW	CONTINUOUS
D-FU_PO_UG-L	UNDERGROUND POWER LINES	GREEN	UNDERGROUND_POWER
D-FU_TE-L	TELEPHONE LINES	GREEN	UNDERG_TELE
D-FU_TE-S	TELEPHONE SYMBOLS	GREEN	CONTINUOUS
D-FU_TE-T	TELEPHONE TEXT	YELLOW	CONTINUOUS
D-FU_TV-L	TELEVISION LINES	GREEN	UNDERG_TV
D-FU_TV-S	TELEVISION SYMBOLS	GREEN	CONTINUOUS
D-FU_TV-T	TELEVISION TEXT	YELLOW	CONTINUOUS
D-FU_WA-L	WATER LINES	GREEN	WATER_LINE
D-FU_WA_4IN-L	4 INCH WATER LINES	GREEN	WATER_LINE_4
D-FU_WA_6IN-L	6 INCH WATER LINES	GREEN	WATER_LINE_6
D-FU_WA_8IN-L	8 INCH WATER LINES	GREEN	WATER_LINE_8
D-FU_WA_12IN-L	12 INCH WATER LINES	GREEN	WATER_LINE_12
D-FU_WA_16IN-L	16 INCH WATER LINES	GREEN	WATER_LINE_16
D-FU_WA-S	WATER SYMBOLS	GREEN	CONTINUOUS
D-FU_WA-T	WATER TEXT	YELLOW	CONTINUOUS
D-IRG-L	IRRIGATION LINE	GREEN	IRRIGATION
D-IRG-T	IRRIGATION TEXT	YELLOW	CONTINUOUS
D-SD-L	STORM DRAIN PIPE LINES	CYAN	STORM_LINE
D-SD-S	STORM DRAIN STRUCTURE SYMBOLS	CYAN	CONTINUOUS
D-SD-T	STORM DRAIN PIPE AND STRUCTURE TEXT	YELLOW	CONTINUOUS
D-SS-L	SANITARY SEWER LINES	CYAN	SEWER_LINE
D-SS-S	SANITARY SEWER SYMBOLS	CYAN	CONTINUOUS
D-SS-T	SANITARY SEWER TEXT	YELLOW	CONTINUOUS
D-STRM-L	STREAM LINES	YELLOW	STREAM LINE
	GENERAL FEATURES		
D-HATCH	EXISTING HATCH	GRAY	CONTINUOUS
D-HATCH2	DESIGN HATCH	RED	CONTINUOUS
D-HATCH_SOLID	DESIGN SOLID HATCH	254	CONTINUOUS
D-TEXT	GENERAL TEXT	YELLOW	CONTINUOUS
D-TEXT2	GENERAL MEDIUM TEXT	GREEN	CONTINUOUS
D-VIEWPORT	VIEWPORT LINE	YELLOW	CONTINUOUS
	PROFILE FEATURES		
D-CURVE_DAT-T	CURVE DATA TEXT	YELLOW	CONTINUOUS
D-EX_GRND-L	PROFILE EXIST GROUND LINE	GRAY	DASHED
D-EX_GRND-T	PROFILE EXIST GROUND TEXT	GRAY	CONTINUOUS
D-PROF-L	PROFILE FINISHED GRADE LINE	MAGENTA	CONTINUOUS
D-PROF_EL-T	PROFILE ELEVATION TEXT	WHITE	CONTINUOUS
D-PROF_EX_EL-T	PROFILE EX. ELEVATION TEXT	RED	CONTINUOUS
D-PROF-T	PROFILE TEXT	YELLOW	CONTINUOUS
D-PROF_STA-T	PROFILE STATION TEXT	WHITE	CONTINUOUS

FIG. 3-1
CIVIL LAYER INFORMATION

STRUCTURAL LAYER INFORMATION

Layer Name	Description	Color	Linetype
B-BEAM-L	BEAM LINE	CYAN	CONTINUOUS
B-BOLT-L	BOLTS, NUTS, HEX...	CYAN	CONTINUOUS
B-BRDGE-L	BRIDGE OUTLINE	CYAN	CONTINUOUS
B-BT_CHRDS-L	BOTTOM CHORD MEMBERS	CYAN	CONTINUOUS
B-CL-L	GENERAL CENTERLINE LINE	RED	CENTERLINE
B-CL_CONST-L	CONSTRUCTION CENTERLINE	MAGENTA	CENTERLINE
B-DET_HVY-L	GENERAL DETAIL LINE	CYAN	CONTINUOUS
B-DET_MED-L	GENERAL DETAIL LINE	WHITE	CONTINUOUS
B-DET_LGHT-L	GENERAL DETAIL LINE	GREEN	CONTINUOUS
B-FDN-L	FOUNDATION OUTLINE	CYAN	CONTINUOUS
B-HATCH	EXISTING HATCH	GRAY	CONTINUOUS
B-HATCH2	DESIGN HATCH	RED	CONTINUOUS
B-HATCH_SOLID	DESIGN SOLID HATCH	254	CONTINUOUS
B-HIDDEN-L	GENERAL HIDDEN LINES	GREEN	HIDDEN
B-HNDHOLE-L	HANDHOLE DETAIL LINE	YELLOW	HIDDEN
B-HNDRAIL-L	DESIGN HANDRAIL LINE	YELLOW	CONTINUOUS
B-HNDRAIL-T	DESIGN HANDRAIL TEXT	YELLOW	CONTINUOUS
B-PIER-L	PIER LOCATION LINE	CYAN	CONTINUOUS
B-PILE-L	PILE LAYOUT LINE	WHITE	CONTINUOUS
B-PLATE-L	STEEL PLATE LINE	WHITE	CONTINUOUS
B-REBAR-L	REBAR LINE	WHITE	REBAR
B-REBAR-S	REBAR SYMBOL	MAGENTA	CONTINUOUS
B-STEEL-L	STEEL LINE	CYAN	CONTINUOUS
B-STEEL-H	STEEL HATCH	RED	CONTINUOUS
B-TEXT	GENERAL TEXT	YELLOW	CONTINUOUS
B-TEXT2	GENERAL MEDIUM TEXT	GREEN	CONTINUOUS
B-TEXT3	GENERAL BOLD TEXT	WHITE	CONTINUOUS
B-TP_CHRDS-L	TOP CHORD MEMBER LINES	CYAN	CONTINUOUS
B-TRUSS-L	TRUSS MEMBER LINES	CYAN	CONTINUOUS
B-WAL-H	DESIGN WALL HATCH	RED	CONTINUOUS
B-WAL-L	DESIGN WALL LINE	CYAN	WALL LINE
B-WAL-T	DESIGN WALL TEXT	YELLOW	CONTINUOUS
B-VIEWPORT	VIEWPORT OUTLINE	YELLOW	CONTINUOUS

FIG. 3-2
STRUCTURAL LAYER INFORMATION

TRAFFIC LAYER INFORMATION

Layer Name	Description	Color	Linetype
	CHANNELIZATION		
D-CH_CL_CONT-L	CHAN. CENTERLINE DOUBLE YELLOW LINE	YELLOW	CONTINUOUS
D-CH_CL_SKIP-L	CHAN. CENTERLINE SKIP LINE	YELLOW	DASHED 2
D-CH_EDGE-L	CHAN. EDGE LINE	WHITE	CONTINUOUS
D-CH_LANE-SKIP-L	4" SKIP LANE SEPARATION	WHITE	SKIP_LANE_20
D-CH_RPM-L	CHAN. RAISED PAVEMENT MARKERS	WHITE	CONTINUOUS
D-CH_RUMBLE-L	RAISED RUMBLE MARKERS	WHITE	CONTINUOUS
D-CH-S	CHAN. PAVEMENT MARKING SYMBOLS	WHITE	CONTINUOUS
D-CH_SKIP-L	CHAN. SKIP LINE	WHITE	SKIP_LANE_20
D-CH_STOP-L	CHAN. STOP LINE	WHITE	CONTINUOUS
D-CH_WIDE-L	CHAN. WIDE LINE	WHITE	CONTINUOUS
D-CH_XWLK-S	CHAN. CROSSWALK SYMBOL	WHITE	CONTINUOUS
D-CH-T	CHAN. TEXT	GREEN	CONTINUOUS
	ILLUMINATION		
D-IL-L	ILLUMINATION LINES	GREEN	CONTINUOUS
D-IL_NOTE-T	ILLUMINATION NOTES	YELLOW	CONTINUOUS
D-IL_SCHD-T	ILLUMINATION SCHEDULE TEXT	YELLOW	CONTINUOUS
D-IL-S	ILLUMINATION SYMBOL	GREEN	CONTINUOUS
D-IL-T	ILLUMINATION TEXT	YELLOW	CONTINUOUS
	SIGNALIZATION		
D-SI_AERIAL-L	SIGNAL AERIAL WIRE	GREEN	CENTER 2
D-SI_CABINET-S	SIGNAL CABINETS	GREEN	CONTINUOUS
D-SI_HEAD-S	SIGNAL HEAD SYMBOL	GREEN	CONTINUOUS
D-SI_HEAD-T	SIGNAL HEAD TEXT	GREEN	CONTINUOUS
D-SI_JB_AERIAL-S	SIGNAL AERIAL JUNCTION BOX	GREEN	CONTINUOUS
D-SI_JB_UG-S	SIGNAL UNDERGROUND JUNCTION BOX	GREEN	CONTINUOUS
D-SI-L	SIGNAL LINES	GREEN	CONTINUOUS
D-SI_LGND	SIGNAL LEGENDS	GREEN	CONTINUOUS
D-SI_LOOP-BK-L	SIGNAL BIKE LOOP	GREEN	CONTINUOUS
D-SI_LOOP-L	SIGNAL LOOP LINES	GREEN	CONTINUOUS
D-SI_LOOP-T	SIGNAL LOOP TEXT	GREEN	CONTINUOUS
D-SI_NOTE-T	SIGNAL NOTES	GREEN	CONTINUOUS
D-SI_POLE-L	SIGNAL POLES	GREEN	CONTINUOUS
D-SI_VIDEO-S	SIGNAL VIDEO DETECTION & SURVEILLANCE CAMERA	WHITE	CONTINUOUS
D-SI_WIRE-L	SIGNAL CONDUIT	GREEN	PHANTOM
D-SI_WIRING	SIGNAL WIRING DIAGRAM	GREEN	CONTINUOUS
D-SI_WIRE_NOTES	SIGNAL WIRE NOTES	GREEN	CONTINUOUS
D-SI_WIRE_NOTES-S	SIGNAL WIRING NOTES SYMBOL	GREEN	CONTINUOUS
D-SI_WIRE_SCHD-T	SIGNAL WIRE SCHEDULE TEXT	WHITE	CONTINUOUS

FIG. 3-3
TRAFFIC LAYER INFORMATION

SURVEY LAYER INFORMATION

Layer Name	Description	Color	Linetype
0		WHITE	CONTINUOUS
DCA_INFO		WHITE	CONTINUOUS
DESC	FIELD CODE OR DESCRIPTION	GREEN	CONTINUOUS
EB-B-S	SURVEY TITLE BLOCK & BORDER	WHITE	CONTINUOUS
EB-L-S	NORTH ARROW, SCALE BAR, LEGEND	WHITE	CONTINUOUS
EB-M-L	MATCHLINES	WHITE	CONTINUOUS
EB-M-T	MATCHLINE TEXT	WHITE	CONTINUOUS
EB-N-T	GENERAL NOTES	WHITE	CONTINUOUS
EB-S-T	STREET, WATERCOURSE NAMES	MAGENTA	CONTINUOUS
EB-T-T	SECTION, TOWNSHIP, RANGE TEXT	BLUE	CONTINUOUS
ELEV	POINT (NODE) ELEVATION	RED	CONTINUOUS
ERROR	UNKNOWN FIELD CODE	WHITE	CONTINUOUS
ES-BOB	BASIS OF BEARING LINES & TEXT	RED	CONTINUOUS
ES-CK-P	CHECK SHOT	WHITE	CONTINUOUS
ES-CP-P	CALCULATED LOCATION	RED	CONTINUOUS
ES-EA-L	EASEMENT LINES	WHITE	DASHEDX2
ES-EA-T	EASEMENT TEXT	WHITE	CONTINUOUS
ES-GL-L	SECTION LINES	GREEN	CONTINUOUS
ES-GL-S	GLO CORNER SYMBOLS	WHITE	CONTINUOUS
ES-GL-T	GLO TEXT	CYAN	CONTINUOUS
ES-GQ-L	QUARTER SECTION LINES	CYAN	DASHED
ES-GQ-T	QUARTER SECTION LINE TEXT	CYAN	CONTINUOUS
ES-GR-S	GRID TICS	YELLOW	CONTINUOUS
ES-GR-T	GRID TEXT	YELLOW	CONTINUOUS
ES-GS-L	ALIQUOT SECTION SUBDIVISION LINES	RED	DASHEDX2
ES-GS-T	ALIQUOT SECTION SUBDIVISION LINES TEXT	WHITE	CONTINUOUS
ES-PL-L	FOUND PROPERTY CORNERS	CYAN	PHANTOM
ES-PL-S	FOUND PROPERTY CORNER SYMBOLS	CYAN	CONTINUOUS
ES-PL-T	PROPERTY LINE TEXT	CYAN	CONTINUOUS
ES-RC-L	RIGHT OF WAY CENTER LINE	WHITE	CENTERX2
ES-RC-T	RIGHT OF WAY CENTER LINE TEXT	CYAN	CONTINUOUS
ES-RW-L	RIGHT OF WAY LINES	BLUE	CONTINUOUS
ES-RW-T	RIGHT OF WAY TEXT	WHITE	CONTINUOUS
ES-SC-D	SURVEY CONTROL DESCRIPTION	GREEN	CONTINUOUS
ES-SC-E	SURVEY CONTROL EASTING	GREEN	CONTINUOUS
ES-SC-EL	SURVEY CONTROL ELEVATION	GREEN	CONTINUOUS
ES-SC-L	SURVEY CONTROL LINES	RED	CONTINUOUS
ES-SC-N	SURVEY CONTROL NORTHING	GREEN	CONTINUOUS
ES-SC-P	SURVEY CONTROL POINTS	GREEN	CONTINUOUS
ES-SC-PN	SURVEY CONTROL POINT NUMBER	YELLOW	CONTINUOUS
ES-SC-S	SURVEY CONTROL SYMBOLS	YELLOW	CONTINUOUS
ES-SC-T	SURVEY CONTROL TEXT	RED	CONTINUOUS
ES-SL-L	SURVEY BASELINE	YELLOW	CONTINUOUS
ES-SL-T	SURVEY BASELINE TEXT	CYAN	CONTINUOUS
ES-TAXNO-S	TAX NUMBERS	CYAN	CONTINUOUS
ES-TWP-L	TOWNSHIP LINES	BLUE	CONTINUOUS
ES-TWP-T	TOWNSHIP TEXT	RED	CONTINUOUS
ET-BAR-L	BARRIER LINES	161	CONTINUOUS
ET-BAR-P	BARRIER POINTS	161	CONTINUOUS
ET-BAR-S	BARRIER SYMBOLS	161	CONTINUOUS

FIG. 3-4
SURVEY LAYER INFORMATION

ET-BAR-T	BARRIER TEXT	YELLOW	CONTINUOUS
ET-BRG-L	BRIDGE LINES	Varies	CONTINUOUS
ET-BRG-P	BRIDGE POINTS	WHITE	CONTINUOUS
ET-BRG-T	BRIDGE TEXT	WHITE	CONTINUOUS
ET-BRX-L	BRIDGE LINES NOT IN SURFACE MODEL	WHITE	CONTINUOUS
ET-BRX-P	BRIDGE POINTS NOT IN SURFACE MODEL	WHITE	CONTINUOUS
ET-CMJ-L	INDEX COUTOUR LINES	21	CONTINUOUS
ET-CMJ-T	CONTOUR LINE TEXT	21	CONTINUOUS
ET-CMN-L	INTERMEDIATE CONTOUR LINES	43	CONTINUOUS
ET-DIT-L	DITCH FLOWLINE LINES	CYAN	DIVIDE2
ET-DIT-P	DITCH FLOWLINE POINTS	CYAN	CONTINUOUS
ET-DIT-T	DITCH FLOWLINE TEXT	YELLOW	CONTINUOUS
ET-DWY-L	DRIVEWAY LINES	GREEN	DASHED2
ET-DWY-P	DRIVEWAY POINTS	GREEN	CONTINUOUS
ET-DWY-T	DRIVEWAY TEXT	YELLOW	CONTINUOUS
ET-EAC-L	EDGE OF ASPHALT LINES	RED	DASHED2
ET-EAC-P	ASPHALT POINTS	RED	CONTINUOUS
ET-EAC-T	ASPHALT TEXT	YELLOW	CONTINUOUS
ET-ECC-L	EDGE OF CONCRETE LINES	YELLOW	DASHED2
ET-ECC-P	CONCRETE POINTS	YELLOW	CONTINUOUS
ET-ECC-T	CONCRETE TEXT	YELLOW	CONTINUOUS
ET-EDW-L	EDGE OF WATER LINES	CYAN	DIVIDE2
ET-EDW-P	EDGE OF WATER POINTS	CYAN	CONTINUOUS
ET-EDW-S	EDGE OF WATER SYMBOLS	CYAN	CONTINUOUS
ET-EDW-T	EDGE OF WATER TEXT	YELLOW	CONTINUOUS
ET-EGR-L	EDGE OF GRAVEL LINES	RED	DASHED2
ET-EGR-P	GRAVEL POINTS	RED	CONTINUOUS
ET-EGR-T	GRAVEL TEXT	YELLOW	CONTINUOUS
ET-EXC-L	EXTRUDED CURB LINES	YELLOW	DASHED2
ET-EXC-P	EXTRUDED CURB POINTS	YELLOW	CONTINUOUS
ET-EXC-T	EXTRUDED CURB TEXT	YELLOW	CONTINUOUS
ET-FEN-L	FENCE LINES	161	FENCE_LINE2
ET-FEN-P	FENCE POINTS	161	CONTINUOUS
ET-FEN-S	FENCE SYMBOLS	161	CONTINUOUS
ET-FEN-T	FENCE TEXT	YELLOW	CONTINUOUS
ET-FLG-L	GUTTER FLOWLINE LINES	CYAN	DIVIDE2
ET-FLG-P	GUTTER FLOWLINE POINTS	CYAN	CONTINUOUS
ET-FLG-T	GUTTER FLOWLINE TEXT	YELLOW	CONTINUOUS
ET-GDB-L	TOE OF SLOPE LINES	170	DASHEDX2
ET-GDB-P	TOE OF SLOPE POINTS	170	CONTINUOUS
ET-GDK-L	GROUND BREAKLINE LINES	WHITE	DASHEDX2
ET-GDK-P	GROUND BREAKLINE POINTS	WHITE	CONTINUOUS
ET-GDK-T	GROUND BREAKLINE TEXT	YELLOW	CONTINUOUS
ET-GDS-P	GROUND SPOT ELEVATIONS	WHITE	CONTINUOUS
ET-GDT-L	TOP OF SLOPE LINES	GREEN	DASHEDX2
ET-GDT-P	TOP OF SLOPE POINTS	GREEN	CONTINUOUS
ET-OTH-D	CONSULTANT AND OTHERS WORK DETAILS	GREEN	CONTINUOUS
ET-OTH-L	CONSULTANT AND OTHERS WORK LINES	53	CONTINUOUS
ET-OTH-P	CONSULTANT AND OTHERS WORK POINTS	53	CONTINUOUS
ET-OTH-S	CONSULTANT AND OTHERS WORK LINES	53	CONTINUOUS
ET-OTH-T	CONSULTANT AND OTHERS WORK TEXT	YELLOW	CONTINUOUS
ET-PCL-L	PAINTED CENTERLINE	41	CENTERX2
ET-PED-L	PEDESTRIAN FEATURE LINES	YELLOW	DASHED2

FIG. 3-4
SURVEY LAYER INFORMATION

ET-PED-P	PEDESTRIAN FEATURE POINTS	YELLOW	CONTINUOUS
ET-PED-S	PEDESTRIAN FEATURE SYMBOLS	YELLOW	CONTINUOUS
ET-PED-T	PEDESTRIAN FEATURE TEXT	YELLOW	CONTINUOUS
ET-PLS-L	PAINTED STRIPING LINES	GREEN	DASHED
ET-PLS-P	PAINTED STRIPING POINTS	GREEN	CONTINUOUS
ET-PLS-S	PAINTED STRIPING SYMBOLS	WHITE	CONTINUOUS
ET-PLS-T	PAINTED STRIPING TEXT	YELLOW	CONTINUOUS
ET-ROC-L	ROCK AND RIPRAP LINES	WHITE	DASHED
ET-ROC-P	ROCK AND RIPRAP POINTS	WHITE	CONTINUOUS
ET-ROC-S	ROCK AND RIPRAP SYMBOLS	WHITE	CONTINUOUS
ET-ROC-T	ROCK AND RIPRAP TEXT	YELLOW	CONTINUOUS
ET-SGN-D	SIGN DESCRIPTION	GREEN	CONTINUOUS
ET-SGN-P	SIGN POINTS	161	CONTINUOUS
ET-SGN-S	SIGN SYMBOLS	161	CONTINUOUS
ET-SGN-T	SIGN TEXT	YELLOW	CONTINUOUS
ET-SHL-L	SHOULDER LINES	161	DASHED
ET-SHL-P	SHOULDER POINTS	161	CONTINUOUS
ET-SHL-T	SHOULDER TEXT	YELLOW	CONTINUOUS
ET-STD-H	STRUCTURE DETAIL HATCHING	9	CONTINUOUS
ET-STD-L	STRUCTURE DETAIL LINES	WHITE	CONTINUOUS
ET-STD-T	STRUCTURE DETAIL TEXT	YELLOW	CONTINUOUS
ET-STM-L	NATURAL STREAMS AND WATERCOURSE LINES	CYAN	DIVIDE2
ET-STM-P	STREAM AND WATERCOURSE POINTS	CYAN	CONTINUOUS
ET-STM-S	STREAM AND WATERCOURSE SYMBOLS	CYAN	CONTINUOUS
ET-STM-T	STREAM AND WATERCOURSE TEXT	YELLOW	CONTINUOUS
ET-STR-L	STRUCTURE LINES	MAGENTA	CONTINUOUS
ET-STR-P	STRUCTURE POINTS	MAGENTA	CONTINUOUS
ET-STR-T	STRUCTURE TEXT	YELLOW	CONTINUOUS
ET-STX-L	STRUCTURE LINES NOT IN SURFACE MODEL	WHITE	CONTINUOUS
ET-STX-P	STRUCTURE POINTS NOT IN SURFACE MODEL	WHITE	CONTINUOUS
ET-STX-S	STRUCTURE SYMBOLS	WHITE	CONTINUOUS
ET-TPC-L	TOP OF CURB LINES	GREEN	DASHED2
ET-TPC-P	TOP OF CURB POINTS	GREEN	CONTINUOUS
ET-TPC-T	TOP OF CURB TEXT	YELLOW	CONTINUOUS
ET-TPD-L	TOP OF DITCH LINES	GREEN	DASHED
ET-TPD-P	TOP OF DITCH POINTS	GREEN	CONTINUOUS
ET-TPD-T	TOP OF DITCH TEXT	YELLOW	CONTINUOUS
ET-VEG-D	VEGETATION & LANDSCAPING DESCRIPTIONS	GREEN	CONTINUOUS
ET-VEG-L	VEGETATION & LANDSCAPING LINES	GREEN	CONTINUOUS
ET-VEG-P	VEGETATION & LANDSCAPING POINTS	GREEN	CONTINUOUS
ET-VEG-S	VEGETATION & LANDSCAPING SYMBOLS	GREEN	CONTINUOUS
ET-VEG-T	VEGETATION & LANDSCAPING TEXT	YELLOW	CONTINUOUS
ET-WAL-L	RETAINING WALL LINES	WHITE	DASHED
ET-WAL-P	RETAINING WALL POINTS	WHITE	CONTINUOUS
ET-WAL-T	RETAINING WALL TEXT	YELLOW	CONTINUOUS
EU-GA-L	GAS LINES	42	DASHED2
EU-GA-P	GAS POINTS	42	CONTINUOUS
EU-GA-S	GAS SYMBOLS	42	CONTINUOUS
EU-GA-T	GAS TEXT	YELLOW	CONTINUOUS
EU-GP-L	PAINTED GAS LOCATION LINES	42	GASSY_LINE2
EU-GP-P	PAINTED GAS LOCATION POINTS	42	CONTINUOUS
EU-GP-T	PAINTED GAS LOCATION TEXT	YELLOW	CONTINUOUS
EU-MB-P	MAILBOX POINTS	WHITE	CONTINUOUS

FIG. 3-4
SURVEY LAYER INFORMATION

EU-MB-S	MAILBOX SYMBOLS	WHITE	CONTINUOUS
EU-MB-T	MAILBOX TEXT	YELLOW	CONTINUOUS
EU-MISC-L	MISC. OR UNDETERMINED TYPE UTILITY LINES	WHITE	CONTINUOUS
EU-MISC-P	MISC. OR UNDETERMINED TYPE UTILITY POINTS	WHITE	CONTINUOUS
EU-MISC-S	MISC. OR UNDETERMINED TYPE UTILITY SYMBOLS	WHITE	CONTINUOUS
EU-MISC-T	MISC. OR UNDETERMINED TYPE UTILITY TEXT	YELLOW	CONTINUOUS
EU-PO-L	POWER LINES	RED	DASHED
EU-PO-P	POWER POINTS	RED	CONTINUOUS
EU-PO-S	POWER SYMBOLS	RED	CONTINUOUS
EU-PO-T	POWER TEXT	YELLOW	CONTINUOUS
EU-PP-L	PAINTED POWER LOCATION LINES	230	POW_LINE2
EU-PP-P	PAINTED POWER LOCATION POINTS	230	CONTINUOUS
EU-PP-T	PAINTED POWER LOCATION TEXT	YELLOW	CONTINUOUS
EU-RR-L	RAILROAD LINES	WHITE	CONTINUOUS
EU-RR-P	RAILROAD POINTS	WHITE	CONTINUOUS
EU-RR-S	RAILROAD SYMBOLS	WHITE	CONTINUOUS
EU-RR-T	RAILROAD TEXT	YELLOW	CONTINUOUS
EU-SC-P	STORM DRAIN CULVERT POINTS	MAGENTA	CONTINUOUS
EU-SD-D	STORM DRAIN STRUCTURE DETAILS	GREEN	CONTINUOUS
EU-SD-L	STORM DRAIN PIPE LINES	MAGENTA	HIDDEN2
EU-SD-P	STORM DRAIN STRUCTURE POINTS	MAGENTA	CONTINUOUS
EU-SD-S	STORM DRAIN STRUCTURE SYMBOLS	WHITE	CONTINUOUS
EU-SD-T	STORM DRAIN PIPE AND STRUCTURE TEXT	GREEN	CONTINUOUS
EU-SP-L	PAINTED SANITARY SEWER LOCATION LINES	92	SAN_LINE2
EU-SP-P	PAINTED SANITARY SEWER LOCATION POINTS	92	CONTINUOUS
EU-SP-T	PAINTED SANITARY SEWER LOCATION TEXT	YELLOW	CONTINUOUS
EU-SS-L	SANITARY SEWER LINES	92	DASHED2
EU-SS-P	SANITARY SEWER POINTS	92	CONTINUOUS
EU-SS-S	SANITARY SEWER SYMBOLS	92	CONTINUOUS
EU-SS-T	SANITARY SEWER TEXT	YELLOW	CONTINUOUS
EU-SSX-P	SAN. SEWER INVERT POINTS NOT IN SURFACE MODEL	WHITE	CONTINUOUS
EU-SX-P	STORM PIPE IN STRUCTURE NOT IN SURFACE MODEL	WHITE	CONTINUOUS
EU-TE-L	TELEPHONE LINES	22	DIVIDE
EU-TE-P	TELEPHONE POINTS	22	CONTINUOUS
EU-TE-S	TELEPHONE SYMBOLS	22	CONTINUOUS
EU-TE-T	TELEPHONE TEXT	YELLOW	CONTINUOUS
EU-TP-L	PAINTED TELEPHONE LOCATION LINES	30	TEL_LINE2
EU-TP-P	PAINTED TELEPHONE LOCATION POINTS	30	CONTINUOUS
EU-TR-L	TRAFFIC LINES	191	CONTINUOUS
EU-TR-P	TRAFFIC POINTS	191	CONTINUOUS
EU-TR-S	TRAFFIC SYMBOLS	191	CONTINUOUS
EU-TR-T	TRAFFIC TEXT	YELLOW	CONTINUOUS
EU-TV-L	TELEVISION/CABLE LINES	30	CONTINUOUS
EU-TV-P	TELEVISION/CABLE POINTS	30	CONTINUOUS
EU-TVP-L	PAINTED TELEVISION/CABLE LOCATION LINES	30	TV_LINE2
EU-TVP-P	PAINTED TELEVISION/CABLE LOCATION POINTS	30	CONTINUOUS
EU-TVP-T	PAINTED TELEVISION/CABLE LOCATION TEXT	YELLOW	CONTINUOUS
EU-TV-S	TELEVISION/CABLE SYMBOLS	30	CONTINUOUS
EU-TV-T	TELEVISION/CABLE TEXT	YELLOW	CONTINUOUS
EU-WA-L	WATER LINES	170	CONTINUOUS
EU-WA-P	WATER POINTS	170	CONTINUOUS
EU-WA-S	WATER SYMBOLS	170	CONTINUOUS
EU-WA-T	WATER TEXT	YELLOW	CONTINUOUS

Fig. 3-4
SURVEY LAYER INFORMATION

EU-WP-L	PAINTED WATER LOCATION LINES	170	WAA_LINE2
EU-WP-P	PAINTED WATER LOCATION POINTS	170	CONTINUOUS
EU-WP-T	PAINTED WATER LOCATION TEXT	YELLOW	CONTINUOUS
PNT	POINT (NODE) NUMBERS	YELLOW	CONTINUOUS
TIN	TIN	WHITE	CONTINUOUS
TINLIMIT	TIN BOUNDRY	WHITE	CONTINUOUS

Fig. 3-4
SURVEY LAYER INFORMATION

RED (1)
PEN NO. 7
LINE WEIGHT: 0.0035"

YELLOW (2)
PEN NO. 7
LINE WEIGHT: 0.0045"

GREEN (3)
PEN NO. 7
LINE WEIGHT: 0.0060"

CYAN (4)
PEN NO. 7
LINE WEIGHT: 0.0120"

BLUE (5)
PEN NO. 7
LINE WEIGHT: 0.0150"

MAGENTA (6)
PEN NO. 7
LINE WEIGHT: 0.0180"

WHITE (7)
PEN NO. 7
LINE WEIGHT: 0.0090"

GRAY (8)
PEN NO. 7
LINE WEIGHT: 0.0040"

BEIGE (21)
PEN NO. 21
LINE WEIGHT: 0.0035"

BROWN (35)
PEN NO. 8
LINE WEIGHT: 0.0030"

LIGHT BLUE (153)
PEN NO. 7
LINE WEIGHT: 0.0060"

COLOR 252
PEN NO. 8
LINE WEIGHT: 0.0040"

COLOR 253
PEN NO. 8
LINE WEIGHT: 0.0040"

COLOR 254
PEN NO. 8
LINE WEIGHT: 0.0040"

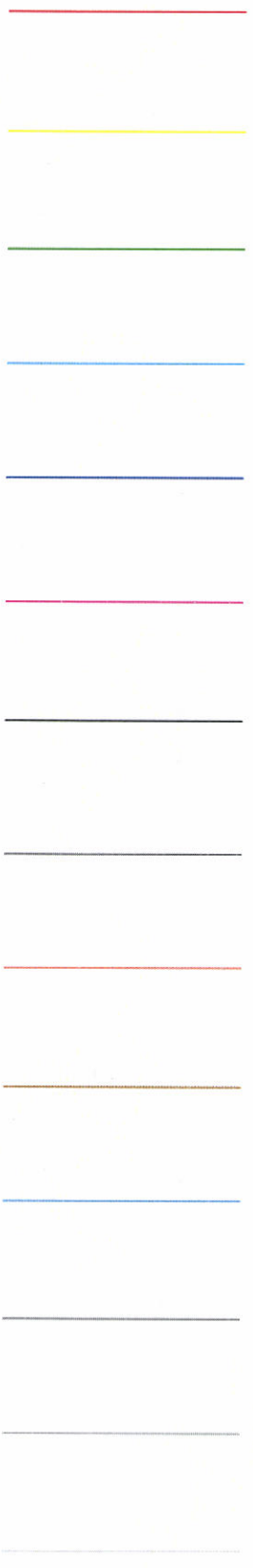


FIG. 3-5

HALF SIZE LINE WEIGHTS AND COLORS

RED (1)
PEN NO. 7
LINE WEIGHT: 0.0100"

YELLOW (2)
PEN NO. 7
LINE WEIGHT: 0.0120"

GREEN (3)
PEN NO. 7
LINE WEIGHT: 0.0160"

CYAN (4)
PEN NO. 7
LINE WEIGHT: 0.0230"

BLUE (5)
PEN NO. 7
LINE WEIGHT: 0.0300"

MAGENTA (6)
PEN NO. 7
LINE WEIGHT: 0.0350"

WHITE (7)
PEN NO. 7
LINE WEIGHT: 0.0180"

GRAY (8)
PEN NO. 7
LINE WEIGHT: 0.0100"

BEIGE (21)
PEN NO. 21
LINE WEIGHT: 0.0100"

BROWN (35)
PEN NO. 8
LINE WEIGHT: 0.0100"

LIGHT BLUE (153)
PEN NO. 7
LINE WEIGHT: 0.0100"

COLOR 252
PEN NO. 8
LINE WEIGHT: 0.0100"

COLOR 253
PEN NO. 8
LINE WEIGHT: 0.0100"

COLOR 254
PEN NO. 8
LINE WEIGHT: 0.0100"

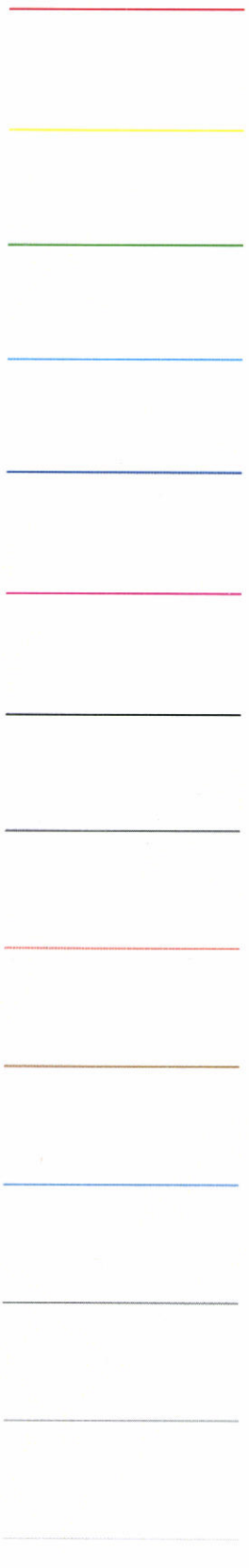


FIG. 3-6

FULL SIZE LINE WEIGHTS AND COLORS

DRAWING SCALE	SCALE FACTOR	PLOTTED TEXT HEIGHT IN INCHES			
		0.100" SMALL SZ.	0.125" STANDARD SZ.	0.1875" SECONDARY RD	0.250" TITLES/PRIMARY RD
		ARCHITECTURAL/STRUCTURAL SCALES			
1 1/2"	8	0.80	1.00	1.50	2.00
1"	12	1.20	1.50	2.25	3.00
3/4"	16	1.60	2.00	3.00	4.00
1/2"	24	2.40	3.00	4.50	6.00
3/8"	32	3.20	4.00	6.00	8.00
1/4"	48	4.80	6.00	9.00	12.00
3/16"	64	6.40	8.00	12.00	16.00
1/8"	96	9.60	12.00	18.00	24.00
3/32"	128	12.80	16.00	24.00	32.00
1/16"	192	19.20	24.00	36.00	48.00
ENGINEERING SCALES					
10'	10	1.00	1.25	1.875	2.50
20'	20	2.00	2.50	3.750	5.00
30'	30	3.00	3.75	5.625	7.50
40'	40	4.00	5.00	7.500	10.00
50'	50	5.00	6.25	9.375	12.50
100'	100	10.00	12.50	18.750	25.00
200'	200	20.00	25.00	37.500	50.00

FIG. 3-7

LETTERING SIZE AND SCALE CHART

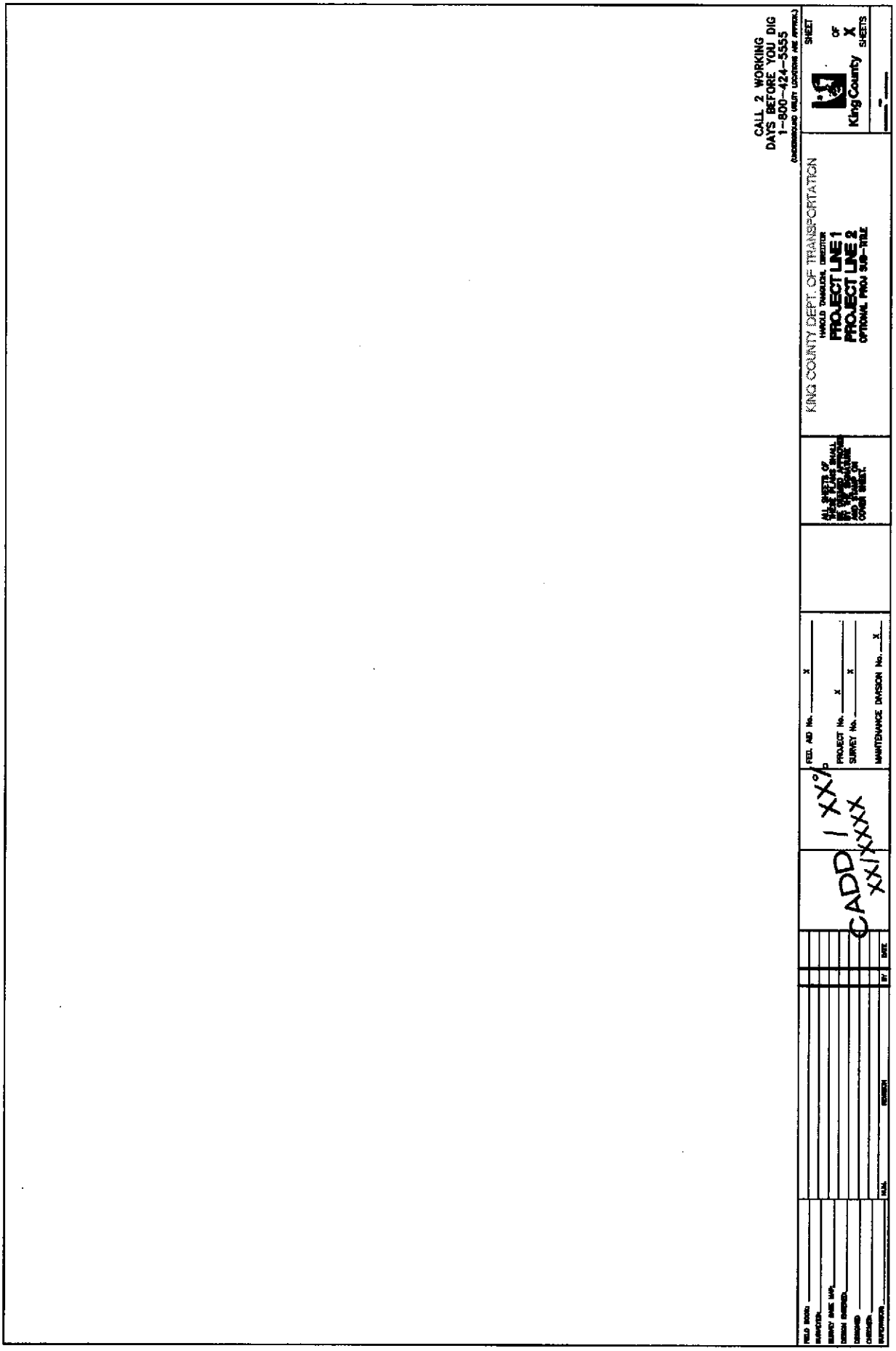


FIG. 3-8

TITLE BLOCK

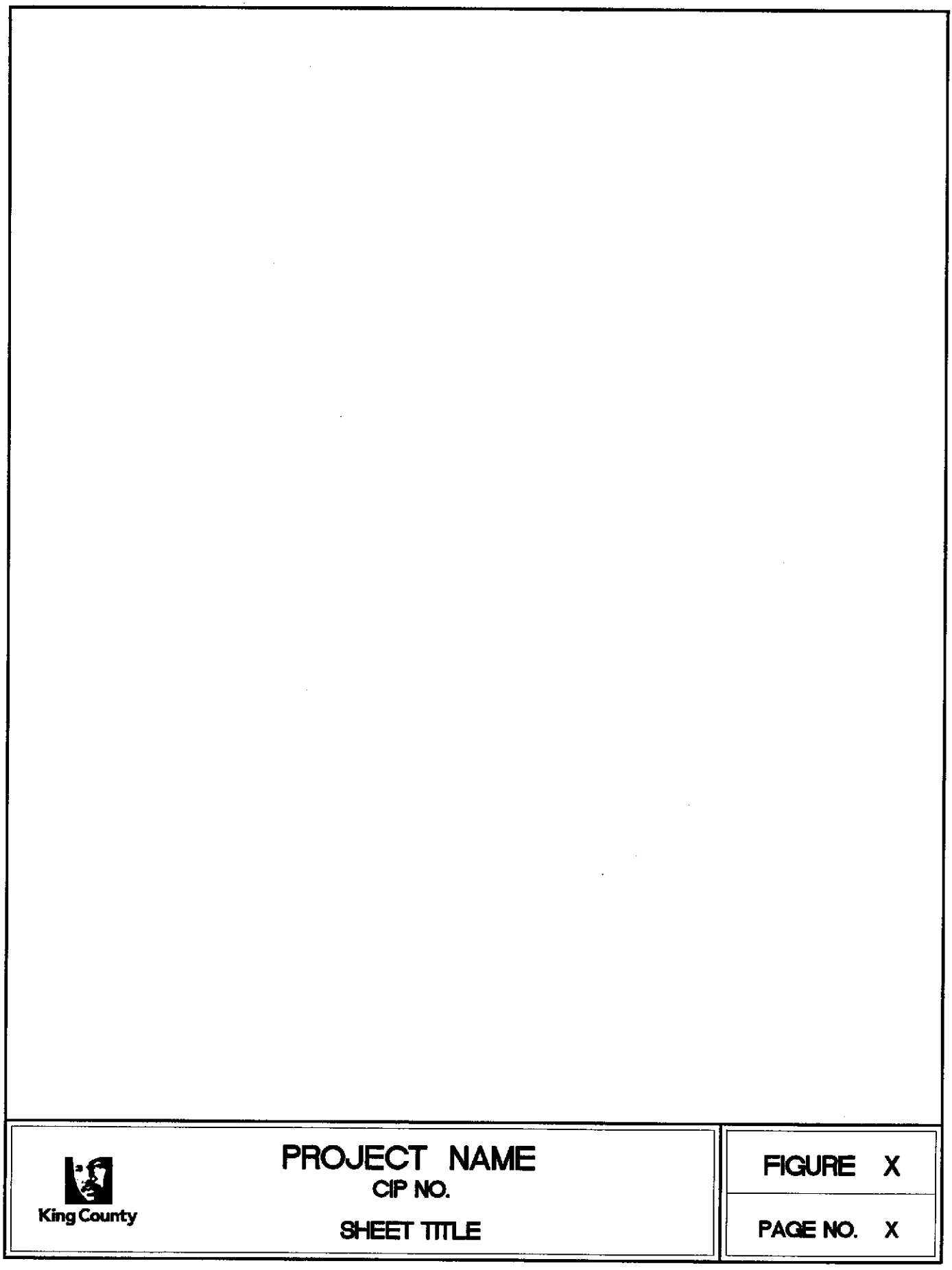


FIG. 3-9

REPORT TITLE BLOCK

COMMUNICATION/TEL./CABLE/FIBER OPTIC

LAYER	SYM	BLK	DESCRIPTION
EU-TE-S		TELR	TELEPHONE RISER
EU-TE-S		TV	TELEPHONE VAULT
EU-TE-S		MHT-E	TELEPHONE MANHOLE
EU-TE-S		UP-E	TELEPHONE POLE
EU-TE-S		TR-E	TELEPHONE RISER
EU-TE-S		UVT-E	UNDERGROUND TELEPHONE VAULT
EU-TE-S		TB-E	TELEPHONE BOX
EU-TV-S		MHTV-E	CABLE MANHOLE
EU-TV-S		TVB-E	TV BOX
EU-TV-S		TVR-E	TV RISER
EU-TV-S		UVTV-E	UNDERGROUND TV VAULT

GAS

LAYER	SYM	BLK	DESCRIPTION
EU-GA-S		GBO-E	GAS BLOW OFF
EU-GA-S		GM-E	GAS METER
EU-GA-S		GV-E	GAS VALVE
EU-GA-S		GVM-E	GAS VALVE MARKER
EU-GA-S		MHG-E	MANHOLE GRATE
EU-GA-S		UVG-E	UNDERGROUND GAS VAULT

POWER

LAYER	SYM	BLK	DESCRIPTION
EU-PO-S		PGC	ENCASED POWER GROUNDROD
EU-PO-S		LUM-E	LUMINAIRE
EU-PO-S		PB-E	POWER BOX
EU-PO-S		MHP-E	POWER MANHOLE
EU-PO-S		PM-E	POWER METER
EU-PO-S		UP-E	POWER & PHONE POLE
EU-PO-S		UP-E	POWER POLE
EU-PO-S		PLPL-E	POWER POLE W/LUMINAIRE HEAD
EU-PO-S		PR-E	POWER RISER
EU-PO-P		PTRAN	POWER TRANSFORMER
EU-PO-S		UVP-E	UNDERGROUND POWER VAULT
EU-PO-S		YL-E	YARD LIGHT
EU-PO-S		PTRAN	PAD MOUNTED TRANSFORMER
EU-PO-S		PV	POWER VAULT
EU-PO-S		PTWR	TRANSMISSION TOWER
EU-PO-S		UP	UTILITY POLE
EU-PO-S		UPA	UTILITY POLE ANCHOR
EU-PO-S		SFL	YARD LIGHT

SANITARY SEWER

LAYER	SYM	BLK	DESCRIPTION
EU-SS-S		SSCO	SAN. SEWER CLEAN OUT
EU-SS-S		SSMH	SAN. SEWER MANHOLE
EU-SS-S		SCO-E	SEWER CLEANOUT
EU-SS-S		MHSS-E	SEWER MANHOLE

STORM DRAINAGE

LAYER	SYM	BLK	DESCRIPTION
EU-SD-S		CBB-E	BRIDGE SCUPPER
EU-SD-S		CBG-E	CB GRATE
EU-SD-S		CB4-E	CURB INLET
EU-SD-S		DS-E	DOWNSPOUT
EU-SD-S		MHD-E	DRAIN MANHOLE
EU-SD-S		CB1-E	CB TYPE 1
EU-SD-S		CB236-E	CB TYPE 2 36" DIA.
EU-SD-S		CB248-E	CB TYPE 2 48" DIA.
EU-SD-S		CB254-E	CB TYPE 2 54" DIA.
EU-SD-S		CB260-E	CB TYPE 2 60" DIA.
EU-SD-S		CB272-E	CB TYPE 2 72" DIA.
EU-SD-S		CB284-E	CB TYPE 2 84" DIA.
EU-SD-S		CB296-E	CB TYPE 2 96" DIA.
EU-SD-S		CB2108-E	CB TYPE 2 108" DIA.
EU-SD-S		CB1NS-E	NON-STANDARD CB
EU-SD-S		SLID-E	SOLID CB LID
EU-SD-S		UVD-E	UNDERGROUND STORM DRAIN VAULT
EU-SD-S			UNDETERMINED OUTLET LOCATION
EU-SD-S		YD-E	YARD DRAIN
EU-SD-S		SDCB	STORM DRAIN CATCH BASIN
EU-SD-S		SDI	STORM DRAIN INLET (NO CATCH)

FIG. 3-10

EXISTING SURVEY BLOCKS

WATER

LAYER	SYM	BLK	DESCRIPTION
EU-WA-S		MW-E	MONITORING WELL
EU-WA-S		WSH-E	SPRINKLER HEAD
EU-WA-S		WSV-E	SPRINKLER CONTROL VALVE
EU-WA-S		UVW-E	UNDERGROUND WATER VAULT
EU-WA-S		WBO-E	WATER BLOW OFF
EU-WA-S		WDC-E	WATER DETECTOR CHECK VALVE
EU-WA-S		WM-E	WATER METER
EU-WA-S		WV-E	WATER VALVE
EU-WA-S		WVM-E	WATER VALVE MARKER
EU-WA-S		WEL-E	WELL
EU-WA-S		WCAP	CAP/PLUG
EU-WA-S		WCOUP	COUPLING
EU-WA-S		WGP	GUARD POST
EU-WA-S		WRED	REDUCER
EU-WA-S		WTB	THRUST BLOCK
FIRE HYDRANTS:			
EU-WA-S		FH-E	FIRE HYDRANT
EU-WA-S		WFH2	2-NOZZLE
EU-WA-S		WFH3	3-NOZZLE
JOINTS:			
EU-WA-S		WFL	FLANGE/BLIND FL
EU-WA-S		WMJ	MECHANICAL
EU-WA-S		WHUB	PUSH-ON/HUB
EU-WA-S		WTH	THREAD
VALVES:			
EU-WA-S		WARV	AIR RELIEF
EU-WA-S		WBOV	BLOW-OFF
EU-WA-S		WBFV	BUTTERFLY
EU-WA-S		WCKV	CHECK
EU-WA-S		WGV	GATE/GENERAL
EU-WA-S		WPV	PLUG VALVE
EU-WA-S		WMET	WATER METER

UTILITY LINES (LINETYPES)

LAYER	EX FEATURE	LTYPE	DESCRIPTION
EU-FO-L		FIBER_OPTIC	FIBER OPTIC LINE
EU-FO-L		FIBER_OPTIC	FIBER OPTIC LINE (PAINTED LOCATION)
EU-FM-L		FM_LINE	FORCE MAIN LINE
EU-GA-L		GAS_LINE	GAS LINE
EU-GA-L		GAS_LINE	GAS LINE (PAINTED LOCATION)
EU-OIL-L		OIL_LINE	OIL LINE
EU-PO-L		POW_ LINE	POWER LINE (UG)
EU-PO-L		ARIEL_POWER	POWER LINE (ARIEL)
EU-PP-L		POW_LINE	POWER LINE (PAINTED LOCATION)
EU-SD-L		STORM_LINE	STORM DRAIN LINE
EU-SS-L		SANSEWER_LINE	SANITARY SEWER LINE
EU-SS-L		SANSEWER_LINE	SANITARY SEWER LINE (PAINTED LOCATION)
EU-STM-L		STEAM_LINE	STEAM LINE
EU-TE-L		UGT_TELE	TELEPHONE LINE (UG)
EU-TE-L		ARIEL_TELE	TELPHONE LINE
EU-TE-L		UG_TV	TELEPHONE LINE (PAINTED LOCATION)
EU-TE-L		UG_TV	CABLE TELEVISION LINE (UG)
EU-TE-L		ARIEL_TV	CABLE TELEVISION LINE
EU-WA-L		CONTINUOUS	WATER LINE (SERVICE)
EU-WA-L		WATER_LINE	WATER LINE
EU-WA-L		WATER_LINE	WATER LINE (PAINTED LOCATION)

FIG. 3-10

EXISTING SURVEY BLOCKS

LINE TYPES

LAYER	LINE TYPES	DESCRIPTION
D-GA_1IN-L	1" G	1 INCH GAS LINE
D-GA_2IN-L	2" G	2 INCH GAS LINE
D-GA_4IN-L	4" G	4 INCH GAS LINE
D-GA_8IN-L	8" G	8 INCH GAS LINE
D-GA_12IN-L	12" G	12 INCH GAS LINE
D-GA-L	G	GAS LINE
D-IRG-L	IRG	IRRIGATION LINE
D-WA_4IN-L	4" W	4 INCH WATER LINE
D-WA_6IN-L	6" W	6 INCH WATER LINE
D-WA_8IN-L	8" W	8 INCH WATER LINE
D-WA_12IN-L	12" W	12 INCH WATER LINE
D-WA_16IN-L	16" W	16 INCH WATER LINE
D-WA-L	W	WATER LINE
D-CL-L	--	CENTER LINE
D-CL_CONST-L	--	**CENTER LINE (CONSTRUCTION)**
D-C&G-L	C&G	CLEARING AND GRADING
D-CUT_CATCH-L	C	CUT LINE
D-FIBER_OPTIC-L	FO	FIBER OPTIC
D-FEN-L	X	FENCE LINE
D-FILL_CATCH-L	F	FILL LINE
D-FLDWAY-L	FW	FLOOD WAY
D-FM-L	FM	FORCE MAIN
D-GRD_FNE-L	. . . . .	FINE GRID LINE
D-GRD_HVY-L	.....	HEAVY GRID LINE
D-FEN_HV-L	V	HIGH VISABILITY FENCE
D-100YRFLD-L	100Y	**100 YEAR FLOOD PLAIN**
D-PO-L	OP	OVER HEAD POWER
D-PO_UG-L	UP	UNDERGROUND POWER
D-SS-L	SS	SEWER LINE
D-FEN-L	SF	SILT FENCE
D-SD-L		STORM LINE
D-STRM-L		STREAM LINE
D-STRM_BUFF-L	SB	STREAM BUFFER
D-TE-L	OT	OVERHEAD TELEPHONE
D-TE_UG-L	OTV	UNDERGROUND TELEPHONE
D-TV-L	OT	OVERHEAD CABLE TELEVISION
D-TV_UG-L	UTV	UNDERGROUND CABLE TELEVISION
D-WETL-L		WETLAND
D-WETL_BUFF-L	WB	WETLAND BUFFER
D-WAL_CNBLK-L		BLOCK WALL
D-WAL_CANT-L		CANTILEVER WALL
D-WAL_GAB-L		GABION WALL
D-WAL_MSE-L		MSE WALL
D-WAL_ROC-L		ROCK FACING
D-WAL_SLDR-L		SOLDIER PILE WALL
D-VEG-L		VEGETATION LINE
B-REBAR-L		REBAR LINE

FIG. 3-11

LANDSCAPE FEATURES

SYMBOL	BLOCK	DESCRIPTION
	CEDAR_RED	RED CEDAR
	FIR_DOUGLAS	DOUGLAS FIR
	SPRUCE_SITKA	SITKA SPRUCE
	HEMLOCK_WESTERN	WESTERN HEMLOCK
	PINE_SHORE	SHORE PINE
	PINE_AUSTRIAN_BLACK	AUSTRIAN BLACK PINE
	ALDER_RED	RED ALDER
	COTTONWOOD_BLACK	BLACK COTTONWOOD
	MAPLE_BIG_LEAF	BIG LEAF MAPLE
	ASH_OREGON	OREGON ASH
	OAK_RED	RED OAK
	PEAR_MAPLE	ORNAMENTAL "STREET TREE"
	CRABAPPLE_WESTERN	WESTERN CRABAPPLE
	HAZELNUT_WESTERN	WESTERN HAZELNUT
	HAWTHORNE_BLACK	BLACK HAWTHORNE
	DOGWOOD_FLOWERING	FLOWERING DOGWOOD
	BITTER_CHERRY	BITTER CHERRY
	KATSURA_TREE	KATSURA TREE
	RHODEDENDRON_PACIFIC	PACIFIC RHODEDENDRON
	CASCARA	CASCARA
	MAPLE_VINE	VINE MAPLE

LANDSCAPE FEATURES

SYMBOL	BLOCK	DESCRIPTION
	WILLOW_PACIFIC	PACIFIC WILLOW
	WILLOW_SITKA	SITKA WILLOW
	WILLOW_SCOULER'S	SCOULER'S WILLOW
	DOGWOOD_RED_OZIER	RED OSIER DOGWOOD
	CURRANT_RED_FLOWER	RED FLOWERING CURRANT
	NINEBARK_PACIFIC	PACIFIC NINEBARK
	SALMONBERRY	SALMONBERRY
	THIMBLEBERRY	THIMBLEBERRY
	OCEANSPRAY	OCEANSPRAY
	PLUM_INDIAN	INDIAN PLUM
	BLACK_TWINBERRY	BLACK TWINBERRY
	MYRTLE_PACIFIC_WAX	PACIFIC WAX MYRTLE
	SNOWBERRY_COMMON	COMMON SNOWBERRY
	CORALBERRY	CORALBERRY
	HUCKLEBERRY_EVERGREEN	EVERGREEN HUCKLEBERRY
	ROSE_NOOTKA	NOOTKA ROSE
	RUGOSA ROSE	RUGOSA ROSE
	ROSE_CLUSTERED_WILD	CLUSTERED WILD ROSE
	GRAPE_OREGON	OREGON GRAPE
	FERN_SWORD	SWORD FERN
	SHRUBMASS (OR) GROUND COVER MASS	

LANDSCAPE FEATURES

	LARGE WOODY DEBRIS	LARGE WOODY DEBRIS
	STUMPS	STUMPS
	ROOTWAD	ROOTWAD

FIG. 3-12

LANDSCAPE FEATURES

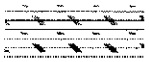
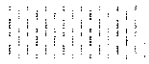
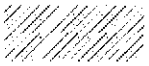
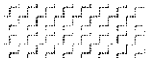
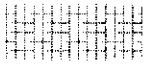
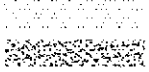
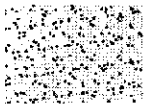
SYMBOL	BOTANICAL NAME	COMMON NAME	HATCH NAME
	CISTUS CORBARIENSIS	ROCKROSE	CORK
	GAULTHERIA SHALLON	SALAL	ANSI33
	MAHONIA AQUIFOLIUM 'COMPACTA'	COMPACT OREGON GRAPE	DASH
	SPECIFIED GROUND COVER	G.C.	SACNCR
	POLYSTICHUM MUNITUM	SWORD FERN	ZIGZAG
	ARCTOSTAPHYLOS UVA-URSI	KINNIKINNIK	TRIANG
	COTONEASTER DAMMERI	COTONEASTER	FLEX
	LONICERA JAPONICA 'HALLIANA'	HALL'S JAPANESE HONEYSUCKLE	ANSI38
	SEEDED EROSION CONTROL		DOTS-FINE HATCH
	SODDED LAWN		SAND
	ELYMUS GLAUCUS DESCHAMPSIA CESPITOSA	BLUE WILDRYE TUFTED HAIRGRASS	EARTH
	FESTUCA RUBRA HORDEUM BRACHYANTHERUM AGROSTIS ALBA LOLIUM PERENNIUM	CREEPING RED FESCUE MEADOW BARLEY REDTOP PERENNIAL RYE	AR-SAND (7) & SOLID (254)
	CAREX OBNUPTA ELOCHARIS PALUSTRIS JUNCUS BALTICUS SCIRPUS ACUTUS SPARGANIUM EMERSUM	SHOUGH SEDGE CREEPING RUSH BALTIC RUSH HARDSTEM BULRUSH SIMPLE-STEM BURREED	DOTS-MEDIUM HATCH

FIG. 3-13

DESIGN LANDSCAPE HATCHING

COMMUNICATION/TEL/CABLE/FIBER OPTIC

LAYER	SYM	BLK	DESCRIPTION
D-TE-S		TELR-D	TELEPHONE RISER
D-TE-S	T	TV-D	TELEPHONE VAULT
D-TE-S	T	MHT-D	TELEPHONE MANHOLE
D-TE-S		UP-D	TELEPHONE POLE
D-TE-S		TR-D	TELEPHONE RISER
D-TE-S	UVT	UVT-D	UNDERGROUND TELEPHONE VAULT
D-TE-S		TB-D	TELEPHONE BOX
D-TV-S	V	MHTV-D	CABLE MANHOLE
D-TV-S		TVB-D	TV BOX
D-TV-S		TVR-D	TV RISER
D-TV-S	UVT	UVTV-D	UNDERGROUND TV VAULT

GAS

LAYER	SYM	BLK	DESCRIPTION
D-GA-S		GBO-D	GAS BLOW OFF
D-GA-S	GM	GM-D	GAS METER
D-GA-S		GV-D	GAS VALVE
D-GA-S	GVM	GVM-D	GAS VALVE MARKER
D-GA-S	G	MHG-D	MANHOLE GRATE
D-GA-S	UVG	UVG-D	UNDERGROUND GAS VAULT

POWER

LAYER	SYM	BLK	DESCRIPTION
D-PO-S		PGC-D	ENCASED POWER GROUNDROD
D-PO-S		LUM-D	LUMINAIRE
D-PO-S		PB-D	POWER BOX
D-PO-S	P	MHP-D	POWER MANHOLE
D-PO-S	PM	PM-D	POWER METER
D-PO-S		UP-D	POWER & PHONE POLE
D-PO-S		UP-D	POWER POLE
D-PO-S		PLPL-D	POWER POLE W/LUMINAIRE HEAD
D-PO-S		PR-D	POWER RISER
D-PO-P		PTRAN-D	POWER TRANSFORMER
D-PO-S	UVP	UVP-D	UNDERGROUND POWER VAULT
D-PO-S		YL-D	YARD LIGHT
D-PO-S		PTRAN-D	PAD MOUNTED TRANSFORMER
D-PO-S	P	PV-D	POWER VAULT
D-PO-S		PTWR-D	TRANSMISSION TOWER
D-PO-S		UP-D	UTILITY POLE
D-PO-S		UPA-D	UTILITY POLE ANCHOR
D-PO-S		SFL-D	YARD LIGHT

SANITARY SEWER

LAYER	SYM	BLK	DESCRIPTION
D-SS-S	S	SSCO-D	SAN. SEWER CLEAN OUT
D-SS-S	S	SSMH-D	SAN. SEWER MANHOLE

STORM DRAINAGE

LAYER	SYM	BLK	DESCRIPTION
D-SD-S		CBB-D	BRIDGE SCUPPER
D-SD-S		CBG-D	CB GRATE
D-SD-S		CB4-D	CURB INLET
D-SD-S	DS	DS-D	DOWNSPOUT
D-SD-S		CB1-D	CB TYPE 1
D-SD-S		CB236-D	CB TYPE 2 36" DIA.
D-SD-S		CB248-D	CB TYPE 2 48" DIA.
D-SD-S		CB254-D	CB TYPE 2 54" DIA.
D-SD-S		CB260-D	CB TYPE 2 60" DIA.
D-SD-S		CB272-D	CB TYPE 2 72" DIA.
D-SD-S		CB284-D	CB TYPE 2 84" DIA.
D-SD-S		CB296-D	CB TYPE 2 96" DIA.
D-SD-S		CB2108-D	CB TYPE 2 108" DIA.
D-SD-S		CB1NS-D	NON-STANDARD CB
D-SD-S		SLID-D	SOLID CB LID
D-SD-S	UVD	UVD-D	UNDERGROUND STORM DRAIN VAULT
D-SD-S		YD-D	YARD DRAIN
D-SD-S		SDI-D	STORM DRAIN INLET (NO CATCH)
D-SD-S	25 L.F. 12" DIA.		STORM PIPE(PROPOSED) DOUBLE LINE TO SIZE OF PIPE DIAMETER
D-SD-S		MH248-D	48"ø MANHOLE (TYPE AND DIMENSION VARIES)

FIG. 3-14

DESIGN UTILITY BLOCKS

WATER

LAYER	SYM	BLK	DESCRIPTION
D-WA-S		MW-D	MONITORING WELL
D-WA-S		WSH-D	SPRINKLER HEAD
D-WA-S		WSV-D	SPRINKLER CONTROL VALVE
D-WA-S		UVW-D	UNDERGROUND WATER VAULT
D-WA-S		WBO-D	WATER BLOW OFF
D-WA-S		WDC-D	WATER DETECTOR CHECK VALVE
D-WA-S		WFPC-D	FIRE PUMP CONNECTION OR FDC RISER
D-WA-S		WM-D	WATER METER
D-WA-S		WV-D	WATER VALVE
D-WA-S		WVM-D	WATER VALVE MARKER
D-WA-S		WEL-D	WELL
D-WA-S		WCAP-D	CAP/PLUG
D-WA-S		WCOUP-D	COUPLING
D-WA-S		WGP-D	GUARD POST
D-WA-S		WRED-D	REDUCER
D-WA-S		WTB-D	THRUST BLOCK
FIRE HYDRANTS:			
D-WA-S		FH-D	FIRE HYDRANT
D-WA-S		WFH2-D	2-NOZZLE
D-WA-S		WFH3-D	3-NOZZLE
JOINTS:			
D-WA-S		WFL-D	FLANGE/BLIND FL
D-WA-S		WMJ-D	MECHANICAL
D-WA-S		WHUB-D	PUSH-ON/HUB
D-WA-S		WTH-D	THREAD
VALVES:			
D-WA-S		WARV-D	AIR RELIEF
D-WA-S		WBOV-D	BLOW-OFF
D-WA-S		WBFV-D	BUTTERFLY
D-WA-S		WCKV-D	CHECK
D-WA-S		WGV-D	GATE/GENERAL
D-WA-S		WPV-D	PLUG VALVE

UTILITY LINES (LINETYPES)

LAYER	EX FEATURE	LTYPE	DESCRIPTION
D-FO-L	FO	FIBER_OPTIC	FIBER OPTIC LINE
D-FO-L	FO	FIBER_OPTIC	FIBER OPTIC LINE (PAINTED LOCATION)
D-FM-L	FM	FM_LINE	FORCE MAIN LINE
D-GA-L	G	GAS_LINE	GAS LINE
D-GA-L	G	GAS_LINE	GAS LINE (PAINTED LOCATION)
D-OIL-L	O	OIL_LINE	OIL LINE
D-PO_UG-L	UP	UNDERGROUND_POWER	POWER LINE (UG)
D-PO-L	P	OVERHEAD_POWER	POWER LINE (ARIEL)
D-SD-L	SD	STORM_LINE	STORM DRAIN LINE
D-SS-L	SS	SANSEWER_LINE	SANITARY SEWER LINE
D-SS-L	SS	SANSEWER_LINE	SANITARY SEWER LINE (PAINTED LOCATION)
D-STRM-L	STR	STREAM_LINE	STREAM LINE
D-TE-L	T	UGT_TELE	TELEPHONE LINE (UG)
D-TE-L	T	ARIEL_TELE	TELPHONE LINE
D-TE-L	T	UG_TV	TELEPHONE LINE (PAINTED LOCATION)
D-TE-L	T	UG_TV	CABLE TELEVISION LINE (UG)
D-TE-L	T	ARIEL_TV	CABLE TELEVISION LINE
D-WA-L	W	CONTINUOUS	WATER LINE (SERVICE)
D-WA-L	W	WATER_LINE	WATER LINE
D-WA-L	W	WATER_LINE	WATER LINE (PAINTED LOCATION)
D-IRG-L	IRG	IRRIGATION_LINE	IRRIGATION LINE

FIG. 3-14

DESIGN UTILITY BLOCKS

CHANNELIZATION

LAYER	SYMBOL	BLOCK	DESCRIPTION
D-PLS-S		ARROWS	STRAIGHT ARROW
D-PLS-S		ARROWLS	LEFT-STRAIGHT ARROW
D-PLS-S		ARROWRS	RIGHT-STRAIGHT ARROW
D-PLS-S		ARROWLR	LEFT-RIGHT ARROW
D-PLS-S		ARROWLRS	LT.RT.STR.ARROW
D-PLS-S		ARROWL	LEFT TURN ARROW
D-PLS-S		ARROWR	RIGHT TURN ARROW
D-PLS-S		ARROW2WAY	2-WAY LEFT TURN
D-PED-S		ADA	DISABILITY
D-PED-S		PEDPATH	PEDESTRIAN PATH
			
D-PED-S		BIPATH	BIKE PATH
D-PLSS-S		HOV	H.O.V. LANE SYMBOL
D-PLS-S		RR	RAILROAD CROSSING

CHANNELIZATION

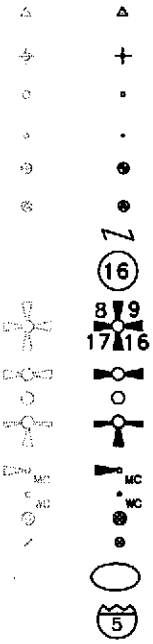
LAYER	SYMBOL	BLOCK	DESCRIPTION	
D-PLS-S		SCHOOL	SCHOOL	
D-PLS-S		STOP	STOP	
D-PLS-S		ONLY	ONLY	
D-TR-S		LINE1	LANE MARKERS TYPE I	
D-TR-S		LINE2	LANE MARKERS TYPE II	
D-TR-S		XWALK	CROSSWALK	8" LINE
D-TR-S			SOLID STRIPE	4" LINE
D-TR-S			SKIP STRIPE	4" LINE
D-TR-S			STOP BAR	4" LINE

SIGNALIZATION

LAYER	SYMBOL	BLOCK	DESCRIPTION
D-TR-S		CABC	CONTROLLER CABINET
D-TR-S		CABES	ELECTRICAL SERVICE CABINET
D-TR-S		POLESIGN	TRAFFIC SIGNAL POLE
D-TR-S		POLESIGNL	TRAFFIC SIGNAL POLE WITH LUMINAIRE
D-TR-S		POLEPED	PEDESTRIAN SIGNAL POLE
D-TR-S		POLESIGNPED	PEDESTRIAN PUSHBUTTON POLE
D-TR-S		POLELUM	LUMINAIRE POLE (TIMBER)
D-TR-S		JB1	JUNCTION BOX – TYPES 1
		JB2	JUNCTION BOX – TYPES 2
		JB3	JUNCTION BOX – TYPES 3
D-TR-S		SIGNV	VEHICLE SIGNAL HEAD
D-TR-S		SIGNP	PEDESTRIAN SIGNAL HEAD
D-TR-S		EVPE	EMERGENCY VEHICLE PRE-EMPTION DETECTOR
D-TR-S		LOOP	VEHICLE DETECTION LOOP
D-TR-S		COND	CONDUIT AND WIRING
D-TR-S		NOTEW	WIRE NOTE (SEE WIRING SCHEDULE)
D-TR-S		NOTEC	CONSTRUCTION NOTE
D-TR-S		NOTEP	POLE CONSTRUCTION NOTE
D-TR-S		CONDW	AERIAL CABLE
D-TR-S		VIDEODET	VIDEO DETECTION CAMERA (CAMV)
D-TR-S		VIDEOSURV	VIDEO SURVEILLANCE CAMERA (CAMS)

FIG. 3-15

SURVEY

SYMBOL	DESCRIPTION	(ABBR)
	ANGLE POINT	(AP)
	BENCH MARK	(BM)
	BLOCK CORNER	(BC)
	IRON PIPE	(IP)
	MONUMENT (IN CASE)	(MIC)
	MONUMENT (SURFACE)	(MON)
	OWNERSHIP TIE	(OT)
	SECTION CENTER	
	SECTION CORNER	
	QUARTER CORNER	
	SIXTEENTH CORNER	
	CLOSING CORNER	
	MEANDER CORNER	(MC)
	WITNESS CORNER	(WC)
	SOIL BORING	(SB)
	SPOT ELEVATION	(SE)
	TAX LOT / PARCEL NUMBER	
	INTERSTATE	

FEATURE LINETYPES	DESCRIPTION	LTYPE
SURVEY C/L	SURVEY CENTERLINE (TEXT SIZE .125) (WHEN CONGRUENT WITH R/W C/L)	CONTINUOUS
SURVEY C/L	SURVEY CENTERLINE (TEXT SIZE .125) (WHEN VARIES FROM R/W C/L)	CENTER
R/W C/L	RIGHT OF WAY C/L (TEXT SIZE .125)	CENTER
CONSTRUCTION C/L	CONSTRUCTION C/L (TEXT SIZE .125)	CENTER
DRAINAGE/UTILITY EASEMENT	EASEMENT (PERMANENT) (TEXT SIZE .125)	DASHED2
TEMPORARY CONST. EASEMENT	EASEMENT (TEMPORARY) (TEXT SIZE .125)	DASHED2
	PROPERTY LINE (EXISTING)	DASHED
	PROPERTY LINE (PROPOSED)	CONTINUOUS
	RESERVATION/PARK/FOREST (EX)	PARK
R/W	RIGHT-OF-WAY (EXISTING) (TEXT SIZE .125)	PHANTOM
PROPOSED R/W	RIGHT-OF-WAY (PROPOSED) (TEXT SIZE .125)	CONTINUOUS
	RIGHT-OF-WAY (LIMITED ACCESS) COINCIDENTAL (BLOCK EVERY 2')	CONTINUOUS
	CITY-LIMITS (BLOCK EVERY 5')	CONTINUOUS
T.26 N. T.25 N.	RANGE/TOWNSHIP LINE (TEXT SIZE 0.25)	CONTINUOUS
SECTION LINE N 88°57'32" E	SECTION LINE (TEXT SIZE .125)	CENTER
1/4 SECTION LINE S 89°06'58" W	QUARTER SECTION LINE (TEXT SIZE .125)	DASHED
1/16 SECTION LINE N 89°54'38" E	SIXTEENTH SECTION LINE (TEXT SIZE .125)	DASHED
	STATE/COUNTY/CORPORATE LIMIT (LINE WIDTH 1.1')	PHANTOM
	MEANDER LINE	CONTINUOUS
	BUILDING LINE (PROPOSED)	CONTINUOUS
	CREEK/DITCH CENTERLINE (PROP.)	DIVIDE 2
DRAW TO SCALE	GUARDRAIL (FOR DETAILS REFER TO WSDOT STANDARDS)	CONTINUOUS
	LAKE/POND	CONTINUOUS

FIG. 3-16

DESIGN SURVEY BLOCKS

PLAN/DETAIL VIEW:

TEXT	DESCRIPTION
BEGIN PROJECT **STA. XXX**	BEGINNING OF PROJECT BEGIN PROJECT: TEXT(STYLE BOLD)=2TIMES STANDARD TEXT HEIGHT STA TEXT: TEXT(STYLE BOLD)=1.5 TIMES STANDARD TEXT HEIGHT
END PROJECT **STA. XXX**	END OF PROJECT END PROJECT: TEXT(STYLE BOLD)=2TIMES STANDARD TEXT HEIGHT STA TEXT: TEXT(STYLE BOLD)=1.5 TIMES STANDARD TEXT HEIGHT
STA. XX+XX (ST NAME) **-STA. XXX (ST NAME)**	CALL OUT FOR INTERSECTION POINT TEXT(STYLE BOLD)=1.5 TIMES STANDARD TEXT HEIGHT
P.C. STA. 55+65.37(21'RT) BEGIN SIDEWALK STA. XX+XX.XX(XX'RT) RELOCATE POWER POLE (BY OTHERS)	PROPOSED PROJECT CALL OUTS TEXT SIZE = .125 TIMES SCALE FACTOR 1ST LINE IS DEFINED LOCATION (NOTE IF P.C., P.T., INT., ETC.)
50'	TYPICAL DIMENSION LINE W/ARROWS NOTE ARROW SIZE: 0.18" FOR 1:1 SCALE
NE 175 ST	ROAD-STREET NAMES IN BOLD (PRIMARY CONSTRUCTION ROAD) TEXT(STYLE BOLD)= 2 TIMES STANDARD TEXT HEIGHT
AVONDALE AVE N	SECONDARY ROADS ALONG PROJECT TEXT(BOLD)=1.5 TIMES STANDARD TEXT HEIGHT
CALL 2 WORKING DAYS BEFORE YOU DIG 1-800-424-5555 (UNDERGROUND UTILITY LOCATIONS ARE APPROX.)	GENERAL NOTE ON ALL SHEETS (N.T.S.)
9-1992-015-00	R/W AND PARCEL NUMBER SYMBOL
	TAX LOT NUMBER SYMBOL
N 87°13'44" E	BEARINGS PROPOSED TEXT SIZE = 1.25 TIMES STANDARD TEXT HEIGHT
HOUSING DIVISION/PLAT	TEXT(STYLE SHADOW)=1.75 TIMES STANDARD TEXT HEIGHT
SEC 25, T26 N, R5 E, WM	SECTION, TOWNSHIP, RANGE STYLE(BOLD) SIZE=2 TIMES STANDARD TEXT HEIGHT
SE $\frac{1}{4}$ NW $\frac{1}{4}$	QUARTER SECTION STYLE(ROMAND) ALPHAS SIZE: 1.2 TIMES STANDARD TEXT HEIGHT STYLE(ROMAND) NUMBERS SIZE: STANDARD TEXT HEIGHT

FIG. 3-17

PLAN/DETAIL VIEW(CONTINUED):

TEXT	DESCRIPTION
CITY OF PACIFIC	TEXT HEIGHT = 2.5 TIMES STANDARD TEXT HEIGHT FONTS = TECHNIC
DETAIL TITLE STA. XX+XX.XX TO STA. XX+XX.XX N.T.S.	TITLE(BOLD)=2 TIMES STANDARD TEXT HEIGHT TEXT= STA.00+00(ROMANS)=1.25 TIMES STANDARD TEXT HEIGHT
SURVEY C/L CURVE DATA Δ = 90°00'00" R = 55.00' T = 55' L = 86.39' PI = STA. XXX	CURVE DATA ALONG CENTERLINE CURVES. BORDER = CYAN(4) TEXT = GREEN (3) TEXT HEIGHT = STANDARD TEXT HEIGHT
P.T. CURB STA. 58+73.25(24'RT) BEGIN SIDEWALK FACE OF CURB = COLOR 7(WHITE) BACK OF CURB = COLOR 1(RED) R=55 CURB RETURN DATA Δ = 90°00'00" R = 55.00' T = 55' L = 86.39'	CURVE RETURN DATA BORDER: CYAN(4) TEXT: WHITE (7)
X / XX	SECTION CUT LINE TEXT(ROMANS): WHITE (7) LINE: CYAN (4)
SECTION A 15 DETAIL A 15	SECTION, VIEW AND DETAIL TITLE TEXT: WHITE (7) WITH HEIGHT OF 2 TIMES STANDARD TEXT HEIGHT

ROAD PLAN:

SYMBOL	DESCRIPTION	(ABBR)
	NORTH ARROW	
20 10 0 20 40 SCALE IN FEET	CIVIL SCALE BAR	
20 10 0 20 40 SCALE IN FEET	STRUCTURAL SCALE BAR	
	BREAKLINES FOR ROADS, PIPE, STC.	
(CHECK STNDS FOR DISTANCES) (WHEN USING THIS SYMBOL) 4' 5' 5'	CURB RAMP SYMBOL	
VARIES	DRIVEWAY CURB CUT SYMBOLS	
15 10	CUT SLOPE CATCH POINTS (OPTIONAL) (SCALEABLE) EMBANKMENT	
SHOULDER	FILL SLOPE CATCH POINTS (OPTIONAL) (SCALEABLE) EMBANKMENT	

FIG. 3-17

ROAD PROFILE:

SYMBOL	DESCRIPTION	(ABBR)
○	CIRCLE TO BE SHOWN AT GEOMETRICAL POSITIONS I.E. P.C.,P.T., INT. PVI,PI,BVC (BOTH IN PLAN AND PROFILE) 1" DIAM.	
△	POINT OF VERTICAL INTERSECTION	PVI
	DATUM (N.T.S.)	
	EQUATION FOR PROFILE CAN ALSO BE USED FOR BREAKING STEEP PROFILES TO FIT ON A PROFILE PAGE TEXT(ROMAND)=1.75 x STANDARD TEXT HEIGHT	
ARROWS:		
	PROFILE ARROWS ARROWS SIZE = .18 x SCALE FACTOR	
	ARROWS DEPICTING LEFT(UP) OR RIGHT(DOWN) USE HALF ARROW IF RT./LT. ITEM IS NOT LABELED. SIZE = 0.3 x 0.05 FOR 1:1 SCALE	
	FLOWLINE (EXIST) SIZE = 0.3 x 0.05 FOR 1:1 SCALE	
	FLOWLINE (PROP.) NO "+ OR – SIGN NEEDED SIZE = 0.3 x 0.05 FOR 1:1 SCALE	
	STORM DRAINAGE REFERENCE NOTE FOR STRUCTURE NOTE SHEET WITH TEXT ATTRIBUTES	

REFERENCE SYMBOL:

	CONSTRUCTION REFERENCE NOTE WITH TEXT ATTRIBUTES

REFERENCE SYMBOLS OR BULLETS CAN BE USED INSTEAD OF CALLING OUT STATIONS AND ITEMS

IF A REFERENCE SYMBOL IS USED THE ASSOCIATED DATA MUST BE WRITTEN SOMEWHERE WIHIN THE PLAN SET. THIS WILL BE ALL THE DESCRIPTIVE DATA AS WELL AS LOCATIONS USINT THE REFERENCE NUMBER AS A KEY.

PROFILE VIEW:

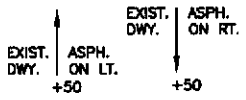
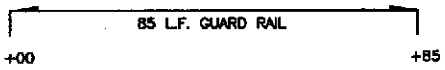
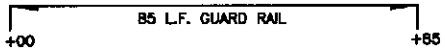
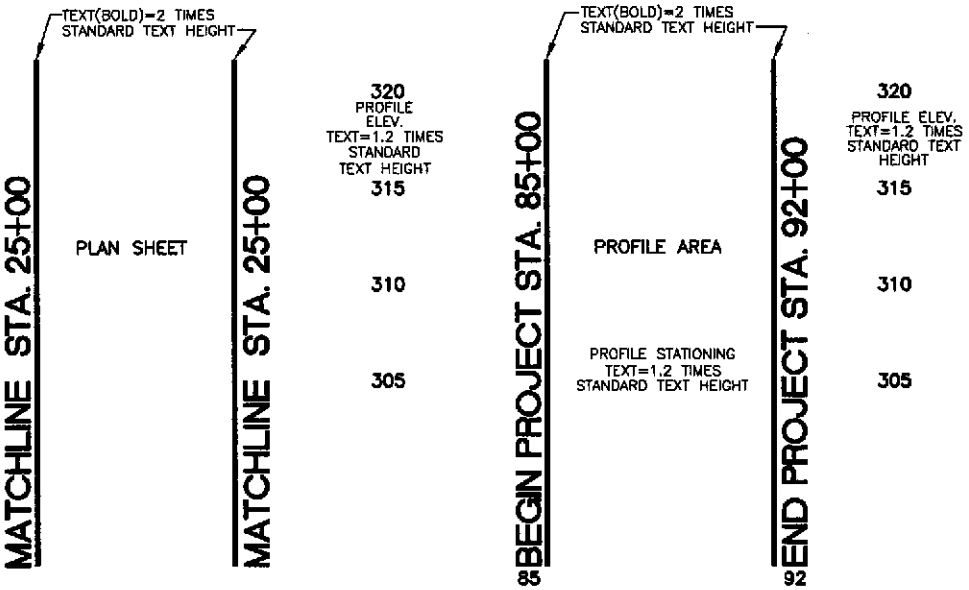
TEXT	DESCRIPTION
	DRIVEWAY CALL (PLUS SIGN ON STATION) TEXT HEIGHT = 1 x STANDARD TEXT HEIGHT
	STATION LOCATION
	GUARDRAIL ON LT
	GUARDRAIL ON RT

FIG. 3-17

PROFILE VIEW(CONTINUED):

TEXT DESCRIPTION



PROFILE EXAMPLES:

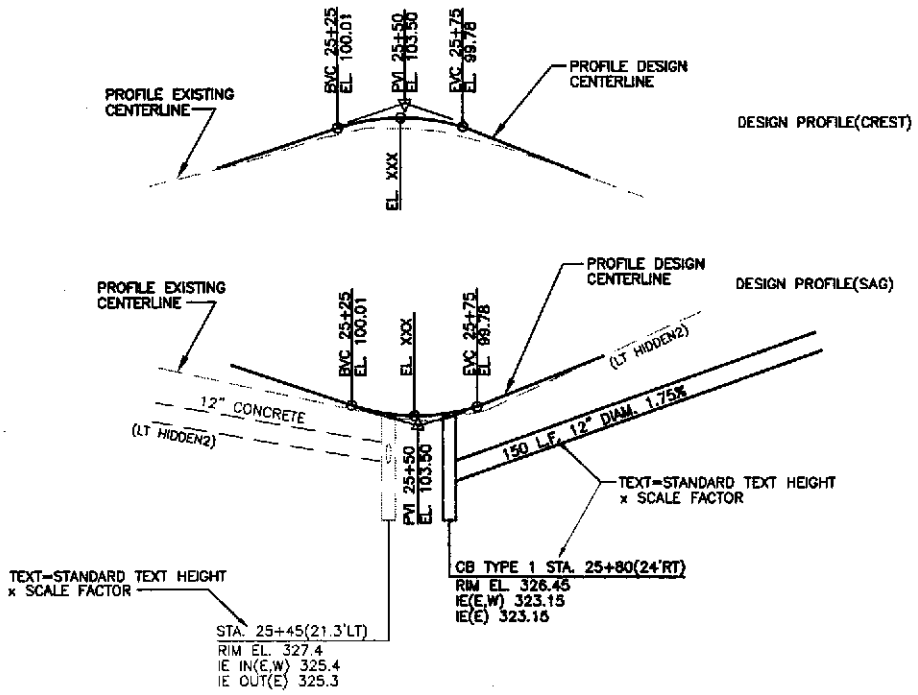


FIG. 3-17

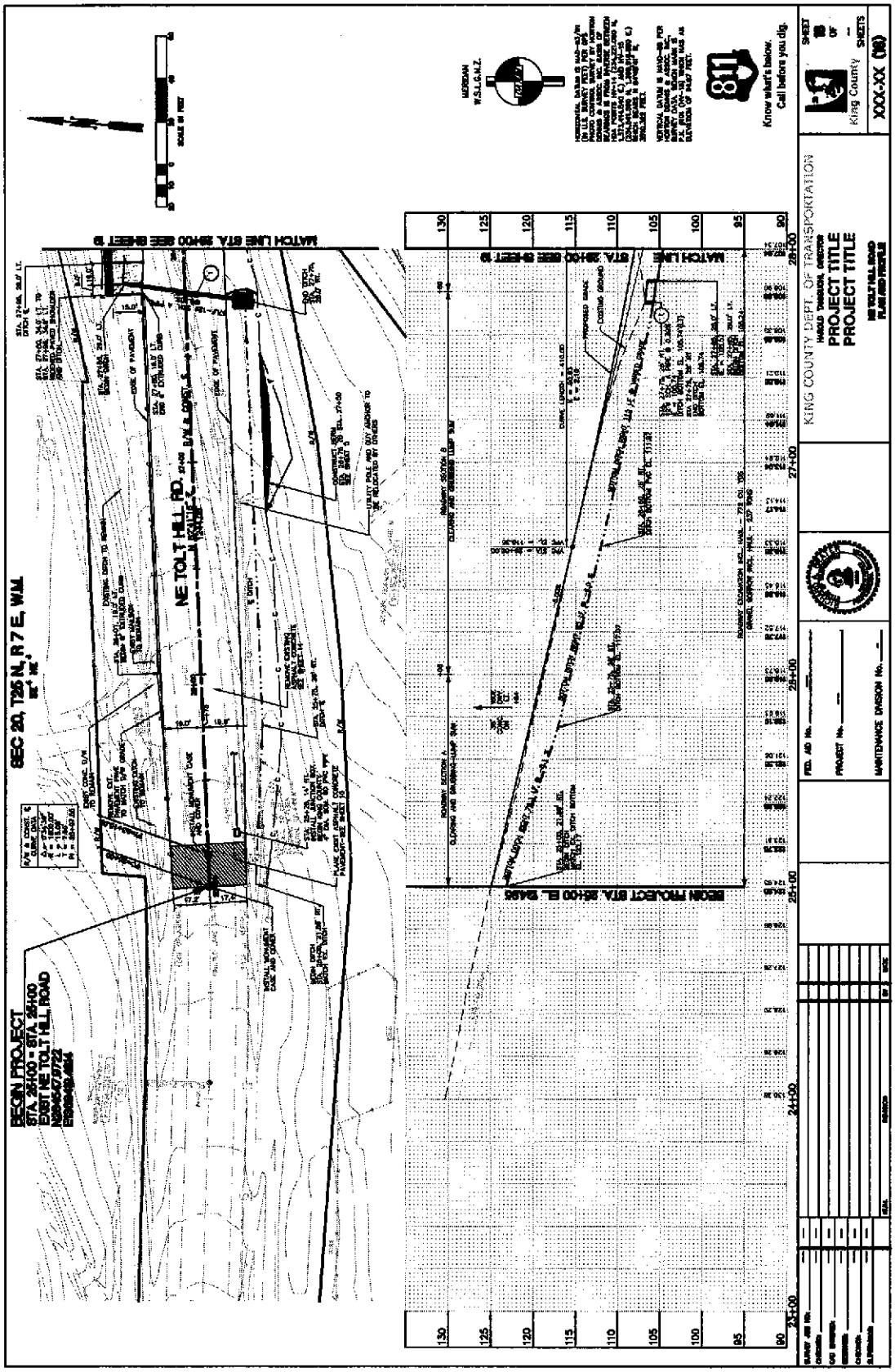


FIG. 3-18

SAMPLE PLAN AND PROFILE SHEET

4.1 Lettering:

A. General

- **Lettering** shall be upper case only, at approximately 90 degrees. General text is to be approximately 1/8" high.

- **Detail titles** shall be a similar font as general text, about twice as high and of a heavier weight. Underline all titles with a single line having the same weight as the lettering.

B. Dimensioning

- A dimensioning shall be shown once on a drawing. Duplication and unnecessary dimensions should be avoided.

- All dimension figures shall be placed above the dimension line, so that they may be read from the bottom or the right edge of the sheet, as shown in the following detail:

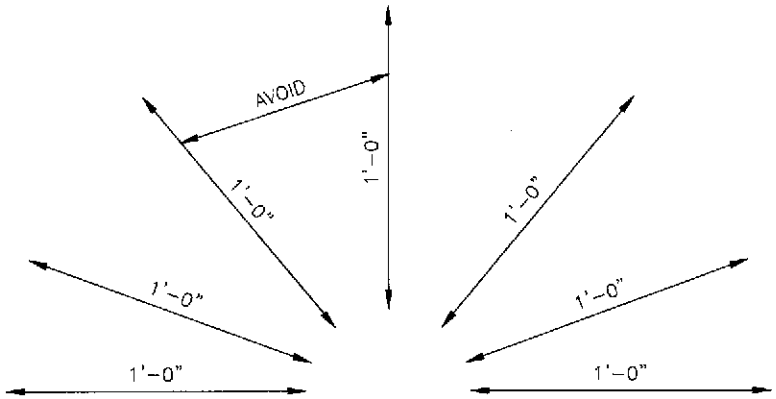


FIG. 4-1
SAMPLE DIMENSIONING

- Reinforcing bar clearance need not be specified on the plans unless different from the "General Notes".

- When details or structural elements are complex, utilize two drawings, one for dimensions and the other for reinforcing bar details.

- Dimensions 12 inches or more shall be given in feet and inches unless the item dimensioned is conventionally designated in inches (for example, 16" pipe).

- In dimensions that are less than one inch over an even foot, the fraction shall be preceded by zero (for example, 3'- 0 ¾").

- Place dimensions outside the view, preferably to the right or below. However, in the interest of clarity and simplicity it may be necessary to place them otherwise. Examples of dimensioning placement are shown on Fig. 4-7 (Sheet 4-78) for details.

C. Line Work

- All line work must be sufficient size, weight, and clarity so that it can be easily read from a print that has been reduced to 11"x17" or one-half the size of the original drawing.

- The line style used for a particular structural outline, centerline, etc., shall be kept consistent wherever that line is shown within a set of bridge plans.

- Line work shall have appropriate gradations of width to give line contrast as shown below. Care shall be taken that the thin lines are dense enough to show clearly when reproduced.

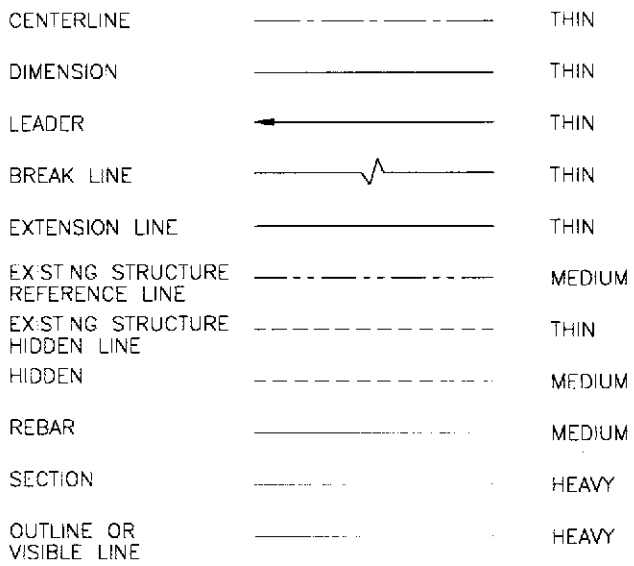
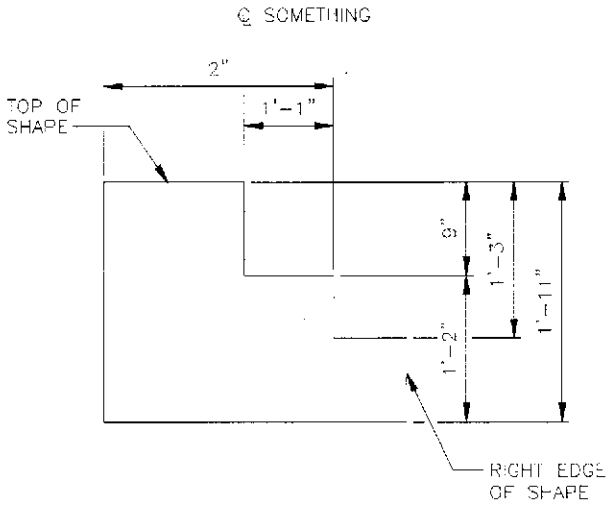


FIG. 4-2
STRUCTURAL LINE WORK

- When drawing structural sections showing reinforcing steel, the outline of the sections shall be a heavier line weight than the rebar.

- The order of line precedence (which of a pair of crossing lines is broken) is as follows.

    1. Dimension lines are never broken.
    2. Leader line from a callout.
    3. Extension line.



This Diagram demonstrates which line is to be broken when two lines cross.

FIG. 4-3
LINE PRECEDENCE DIAGRAM

D. Scale

- When selecting a scale, it should be kept in mind that the drawing will be reduced. Generally, the minimum scale for a section detail with rebars is 3/8"=1'. The minimum scale to be used on steel details will be 3/4"=1'.

- The contract plan sheets are not to be used to take measurements in the field. They will, however, be drawn using scales that can be found on any standard architectural or engineering scale.

- Care should be taken that all structural elements accurately drawn to scale.

- Sections and views may be enlarged to show more detail, but the number of different scales used should be kept to a minimum.

E. Graphic Symbols

1. Graphic symbols shall be in accordance with the following:

   a. Structural steel shapes. See also AISC Manual of Steel Construction.
   b. Welding symbols: See Lincoln Welding Chart or AWS Codes.

F. Structural Sections, Views and Details

- A section cuts through the structure, a view is from outside the structure, a detail shows a structural element in more detail, usually a larger scale.

- Whenever possible, sections and views shall be taken looking to the right, ahead on stationing, or down.

- Care shall be taken to ensure that the orientation of a detail drawing is identical to that of the plan, elevation, etc., from which it is taken. Where there is a skew in the bridge any sections should be taken from plan views.

- The default is to be looking ahead on stationing. The only mention of view orientation is if the view is looking back on stationing.

- On plan and elevation drawings where there is insufficient space to show cut sections and details, the section and detail drawing should be on the plan sheet immediately following the plan and elevation drawing unless there are a series of related plans. If it is impractical to show details on a section drawing, a detail sheet should immediately follow the section drawing. In other words, the order of plan sheets should be from general plan to more detail.

- Structural sections, view, and details shall be identified by a circle divided into upper and lower halves. Examples are shown in Fig. 4-8 (Sheet 4-79) for details.

- Breaks in lines are allowable provided that their intent is clear.

G. Miscellaneous

- Callout arrows are to come off either the beginning or end of the sentence. This means the top line of text for arrows coming off the left of the callout or the bottom line of text for arrows pointing right.

- Except for the Layout, wall elevations are to show the exposed face regardless of direction of stationing. The layout sheet stationing will read increasing left to right. The elevation sheets will represent the view in the field as the wall is being built.

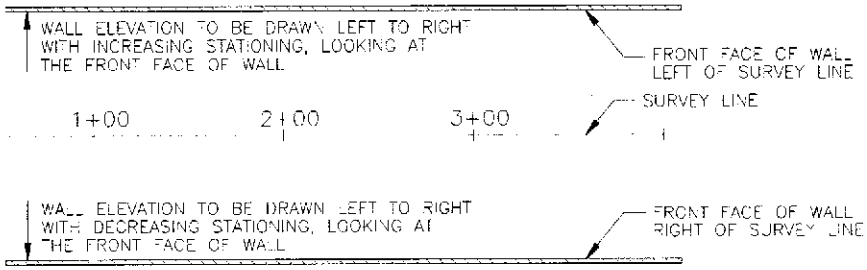


FIG. 4-4
MISCELLANEOUS STRUCTURAL CALL OUTS

- Do not detail a bridge element in more than one location. If the element is changed there is a danger that only one of the details is updated.

- Call out each rebar & spacing only once; the spacing for the bar is shown in one view and the bar is pointed to in a view taken from a different angle. The spacing for a bar must go on a dimension lines with extension lines, do not point to a single bar and call out the spacing.

- When calling out a rebar spacing always give a distance. If the distance needed is an odd member give a maximum spacing. Do not use "equal spaces" as in "23 equal spaces=18'-9", "the steel workers should not have to calculate the spacing. Also do not use the word "about" as in "23 spaces @ about 10"=18'-9" this is open to too much interpretation. Instead these should read "23 spaces @ 10" max.=18'-9".

H. Revisions

- See Chapter 3.10 (Page 3-15) for details.

4.2 Bridge Office Standard Drawings and Office Examples:

A. General

- The Bridge Office provides standard drawings and example sheets of various common bridge elements.

B. Use of Standards

- The Standard Drawings are to be considered as nothing more than examples of items like girders or traffic barriers which are often used and are very similar from job to job.

- They are to be copied to a structure project and modified to fit the particular aspects of the structure. They are not intended to be included in a contract plan set without close scrutiny for applicability to the job.

C. Changes to Standards

- New standard drawings and revisions to existing drawings shall be approved by the Bridge Engineer and shall be made according to the same office practices as contract plan sheets.

4.3 Plan Sheets:

Plan sheets should be assembled in reference to the Civil Design Sheets. See Chapter 3, Section 3.6 (Sheets 3-8 to 3-10) for more details. Structure sheets shall be assembled in the general order of listed below:

A. General Bridge Plan, Elevation, Section & Notes
B. Footing/Foundation Layout
C. Foundation Details (Spread Footing, Shaft, etc.)
D. Abutment
E. Pier/Bent
F. Super Structure (Girder, Truss, etc.)
G. Bridge Deck
H. Approach Slab
I. Bearing Details
J. Expansion Joints
K. Miscellaneous Structure Details
L. Traffic Barrier or Bridge Rails
M. Bar List

Bridge Engineer shall be consulted if additional details are refined and if different sequence is proposed.

A. General Plan, Section and Notes

- The sheets shall contain, but is not limited to:

  Plan view with ascending stations from left to right

  Elevation View shown as an outside view of the bridge and shall be visually aligned with the plan view.

- Typical Plan Section, General Notes and Structure Data

- The original preliminary plan will be copied to create the final layout. Views, data, and notes may be repositioned to improve the final product.

- Items on the preliminary plan, which should not appear on the final layout are as follows:
    - Typical roadway sections
    - Vertical curve, superelevation and curve data for other than the main line
    - Other information that was preliminary or that will be found elsewhere in the plans.
- Items not normally found on the preliminary plan, which should be added:
    - Test hole locations (designated by 3/16 inch circles, quartered) to plan view.
    - Elevation view of footings, seals, piles, etc. Show elevation at Bottom of footing and, if applicable, the type and size of piling.
    - General notes above legend on right hand side, usually in place of the typical section.
    - Title "LAYOUT" in the title block and sheet number in the space provided.
    - Other features, such as lighting, conduit, signs, excavation, riprap, etc. as determined by the designer.
    - The preliminary plan checklist in Appendix A, Chapter 2 can be used for reference.

B. Footing/Foundation Layout

- An abutment with a spread footing has a Footing Layout. An abutment with piles and pile cap has a Foundation Layout.
- The Footing Layout is a plan of the bridge whose details are limited to those needed to locate the footings. The intent of the footing layout is to minimize the possibility of error at this initial stage of construction.
- The Foundation Layout is a plan of the bridge whose details are limited to those needed to locate the shafts or piles. The intent of the Foundation layout is to minimize the possibility of error at this initial stage of construction.
- Other related information and/or details such as pedestal sizes, and column sizes are considered part of the pier drawing and should not included in the footing layout.

- The Footing Layout should be shown on the layout sheet if space allows. It need not be in the same scale. When the general notes and footing layout cannot be included on the first (layout) sheet, the footing layout should be included on the second sheet.

- Longitudinally, footings should be located using the survey line to reference such items as the footing, centerline pier, centerline column, centerline bridge/or centerline bearing, etc.

- When seals are required, their locations and sizes should be clearly indicated on the footing layout.

- The Wall Foundation Plan for retaining walls is similar to the Footing Plan for bridges except that it also shows dimensions to the front face of wall.

C. Foundation Details (Spread Footing, Shaft, etc.)

D. Abutment

- In general bridge elements which have not yet been built will not be shown. For example, the superstructure is not to be shown, dashed or not, on any substructure details.

- Elevation information for seals and piles or shafts may be shown on the abutment or pier sheets.

- Views are to be oriented so that they represent what the contractor or inspector would most likely see on the ground. Abutment 1 elevation is often shown looking back on stationing. A note should be added under the Elevation Abutment 1 title saying "Shown looking back on stationing".

E. Pier/Bent

- Each pier shall be detailed separately as a general rule. If the intermediate piers are identical except for height, then they can be shown together.

F. Super Structure (Girder, Truss, etc)

- Girder Lines must be identified in the plan view (Gir. A, Gir. B, etc.).

Typical Section

- Girder spacing, which is tied to the bridge construction baseline

- Roadway slab thickness, as well as web and bottom slab thicknesses for box girder.

- Limits of pigmented sealer
- Profile grade and pivot point and cross slopes
- Utility locations
- Curb to curb roadway width
- Soffit and drip groove geometry
- Prestressed girder sheets can be copied from the Bridge Office library but they must be modified to match the project requirements.

G. Bridge Deck.
Roadway Slab Reinforcement
Plan and transverse section views

H. Approach Slab

- Approach slab sheets can be copied from the Bridge Office library and modified as necessary for the project.

I. Bearing Details

J. Expansion Joints

K. Miscellaneous Structure Details

L. Traffic Barrier or Bridge Rail

- Traffic barrier or bridge rail details can be copied from the bridge office library but they must be modified to match the project requirements.

M. Barlist

- The barlist sheets are provided for contractor's convenience and reference only. It does not require stamping.

4.4 Structural Steel:

A. General

- Flat pieces of steel are termed plates, bars, sheets or strips, depending on the dimensions.

B. Bars

- Up to 6 inches wide, 0.203 in. (3/16 inch) and over the thickness, or 6 inches to 8 inches wide, 0.230 in. (7/32 inch) and over in thickness.

C. Plates

- Over 8 inches wide, 0.230 in. (7/32 inch) and over thickness, or over 48 inches wide, 0.180 in (11/64 inch) and over in thickness.

D. Strips

- Thinner pieces up to 12 inches wide are strips and over 12 inches are sheets. A complete table of classification may be found in the AISC Manual of Steel Construction, 8th Ed. See Fig. 4-5 (Sheet 4-73) for reference.

E. Labeling

- The following table shows the usual method of labeling some of the most frequently used structural steel shapes. Note that the inches symbol (") is omitted, but the foot symbol (*) is used for length including lengths less than a foot.

SECTION	DESIGNATION	SECTION	DESIGNATION
PLATES	PL 1/2 X 3/4 X 5'-6" (GROUP SYMBOL; THICKNESS IN INCHES; WIDTH IN INCHES; LENGTH IN FEET AND INCHES)	S-SHAPE	S 12 X 35 (GROUP SYMBOL; DEPTH IN INCHES; WEIGHT POUNDS PER FT.)
FLAT BARS	BAR 2 X 3/4 X 0'-6" (GROUP SYMBOL; THICKNESS IN INCHES; WIDTH IN INCHES; LENGTH IN FEET AND INCHES)	W-SHAPE	W 4 X 4.76 (GROUP SYMBOL; DEPTH IN INCHES; WEIGHT POUNDS PER FT.)
SQUARE BARS	BAR 2 □ X 3'-4" (GROUP SYMBOL; SIZE IN INCHES; CONVENTION FOR 'SQUARE'; LENGTH IN FEET AND INCHES)	MC-SHAPE	MC 18 X 58 (GROUP SYMBOL; DEPTH IN INCHES; WEIGHT POUNDS PER FT.)
RODS	ROD ø (GROUP SYMBOL; DIAM. IN INCHES)	WT-SHAPE	WT 15 X 74 (GROUP SYMBOL; DEPTH IN INCHES; WEIGHT POUNDS PER FT.)
ANGLES	L 6 X 5 X 2-1 X 2'-1" (GROUP SYMBOL; LONG LEG IN INCHES; SHORT LEG IN INCHES; THICKNESS IN INCHES; LENGTH IN FEET AND INCHES)	MT-SHAPE	MT 3 X 2.2 (GROUP SYMBOL; DEPTH IN INCHES; WEIGHT POUNDS PER FT.)
RECTANGULAR HSS	HSS 6 X 5 X 1/2 X 3'-2" (GROUP SYMBOL; WIDTH IN INCHES; WIDTH IN INCHES; WALL THICKNESS IN INCHES; LENGTH IN FEET AND INCHES)	ST-SHAPE	ST 4 X 11.5 (GROUP SYMBOL; DEPTH IN INCHES; WEIGHT POUNDS PER FT.)
ROUND HSS	HSS 3.000 X 0.250 X 2'-5" (GROUP SYMBOL; OUTSIDE DIAM. IN INCHES; WALL THICKNESS IN INCHES; LENGTH IN FEET AND INCHES)	HP-SHAPE	HP 14 X 89 (GROUP SYMBOL; DEPTH IN INCHES; WEIGHT POUNDS PER FT.)
M-SHAPE	M 4 X 6 (GROUP SYMBOL; DEPTH IN INCHES; WEIGHT POUNDS PER FT.)	STEEL PIPE	PIPE 3 X STRONG (GROUP SYMBOL; DEPTH IN INCHES; STRENGTH: XX STD)

FIG. 4-5
STEEL SECTION DESIGNATIONS

WELDING SYMBOLS

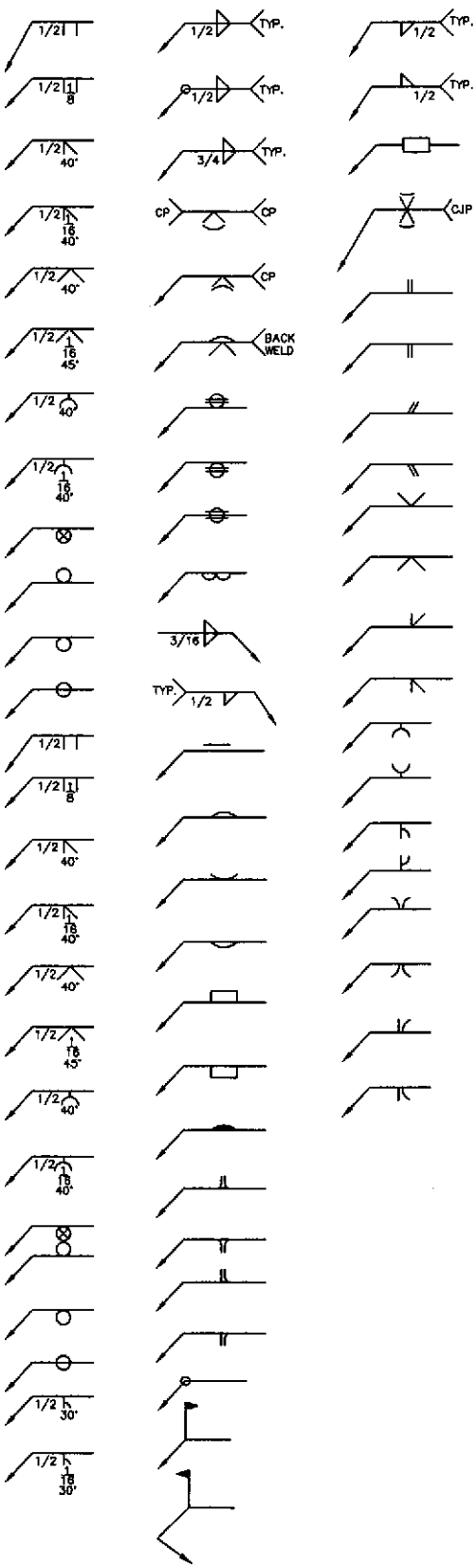
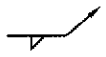
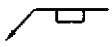
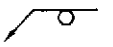
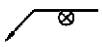
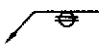
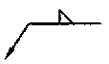
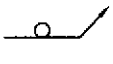
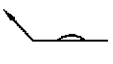
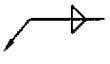
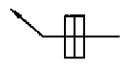
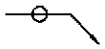
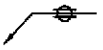
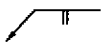
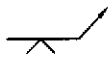
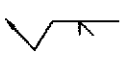
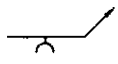
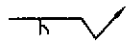
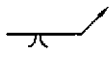
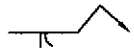
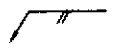
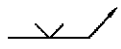
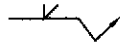
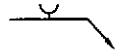
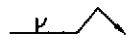
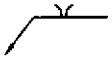
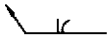
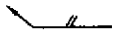
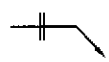
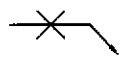
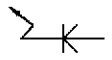
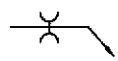
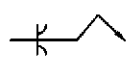
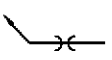
LAYER	SYM	DESCRIPTION
B-WELD-L (TYP.)		SEE AMERICAN WELDING CODES FOR REFERENCE

FIG. 4-6

BASIC WELDING SYMBOLS AND THEIR LOCATION SIGNIFICANCE

LOCATION SIGNIFICANCE	FILLET	PLUG OR SLOT	SPOT OR PROJECTION	STUD	SEAM	BACK OR BACKING	SURFACING	EDGE
ARROW SIDE								
OTHER SIDE				NOT USED			NOT USED	
BOTH SIDES		NOT USED	NOT USED	NOT USED	NOT USED	NOT USED	NOT USED	
NO ARROW SIDE OR OTHER SIDE SIGNIFICANCE	NOT USED	NOT USED		NOT USED		NOT USED	NOT USED	NOT USED

LOCATION SIGNIFICANCE	GROOVE							SCART FOR BRAZED JOINT
	SQUARE	V	BEVEL	U	J	FLARE–V	FLARE–BEVEL	
ARROW SIDE								
OTHER SIDE								
BOTH SIDES								
NO ARROW SIDE OR OTHER SIDE SIGNIFICANCE		NOT USED	NOT USED	NOT USED	NOT USED	NOT USED	NOT USED	NOT USED

SUPPLEMENTARY SYMBOLS

WELD–ALL–AROUND	FIELD WELD	MELT–THRU	CONSUMABLE INSERT
			(SQUARE)

BACKING/SPACER(RECTANGULAR)	CONTOUR		
	FLUSH OR FLAT	CONVEX	CONCAVE
BACKING SPACER			

BASIC JOINTS
IDENTIFICATION OF ARROW SIDE AND OTHER SIDE JOINT

BUTT JOINT

CORNER JOINT

T–JOINT

LAP JOINT

LOCATION OF ELEMENTS OF A WELDING SYMBOL

EDGE JOINT

LETTER DESIGNATIONS

WHER LETTER DESIGNATIONS ARE TO BE INCLUDED IN THE TALL OF THE WELDING SYMBOL, REFERENCE IS MADE TO TABLE 1, LETTER DESIGNATIONS OF WELDING AND ALTED PROCESSES AND THEIR VARIATIONS, OF AWS A2.4–98.

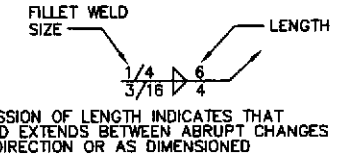
AMERICAN WELDING SOCIETY
550 N.W. LEJEUNE ROAD
MIAMI, FLORIDA 33126

FIG. 4-6

WELDING SYMBOLS

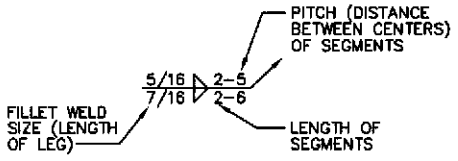
TYPICAL WELDING SYMBOLS

DOUBLE-FILLET WELDING SYMBOL

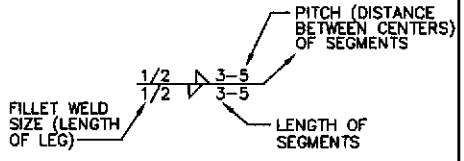


OMISSION OF LENGTH INDICATES THAT WELD EXTENDS BETWEEN ABRUPT CHANGES IN DIRECTION OR AS DIMENSIONED

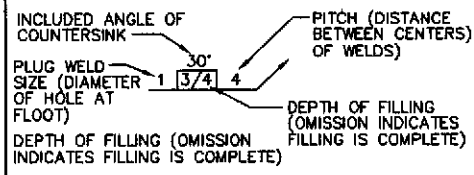
CHAIN INTERMITTENT FILLET WELDING SYMBOL



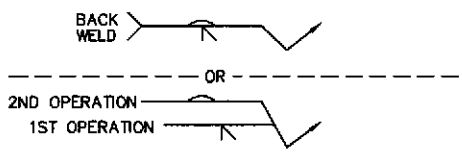
STAGGERED INTERMITTENT FILLET WELDING SYMBOL



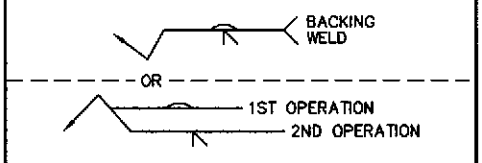
PLUG WELDING SYMBOL



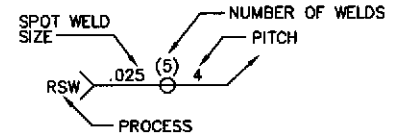
BACK WELDING SYMBOL



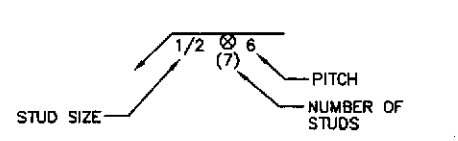
BACKING WELDING SYMBOL



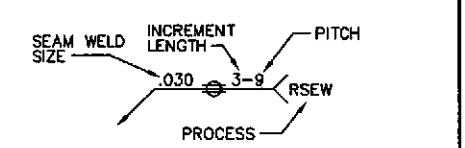
SPOT WELDING SYMBOL



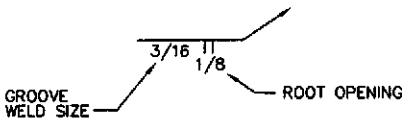
STUD WELDING SYMBOL



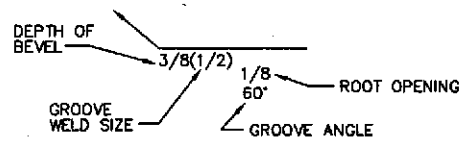
SEAM WELDING SYMBOL



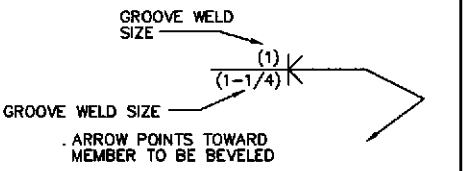
SQUARE-GROOVE WELDING SYMBOL



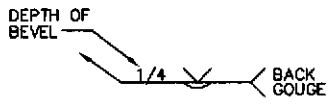
V-GROOVE WELDING SYMBOL



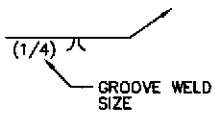
DOUBLE-BEVEL-GROOVE WELDING SYMBOL



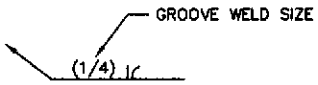
SYMBOL WITH BACKGOUGING



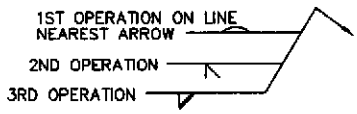
FLARE-V-GROOVE WELDING SYMBOL



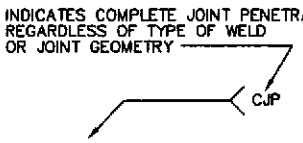
FLARE-BEVEL-GROOVE WELDING SYMBOL



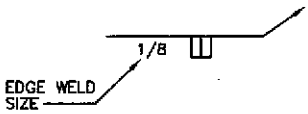
MULTIPLE REFERENCE LINES



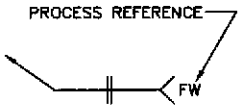
COMPLETE JOINT PENETRATION



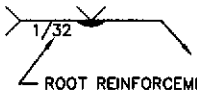
EDGE WELDING SYMBOL



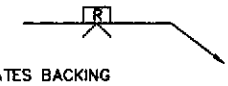
FLASH OR UPSET WELDING SYMBOL



MULTI-THRU SYMBOL



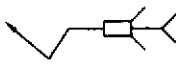
JOINT WITH BACKING



'R' INDICATES BACKING REMOVED AFTER WELDING

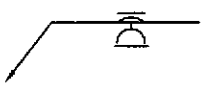
JOINT WITH SPACER

WITH MODIFIED GROOVE WELD SYMBOL

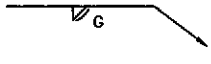


DOUBLE-BEVEL GROOVE

FLUSH CONTOUR SYMBOL



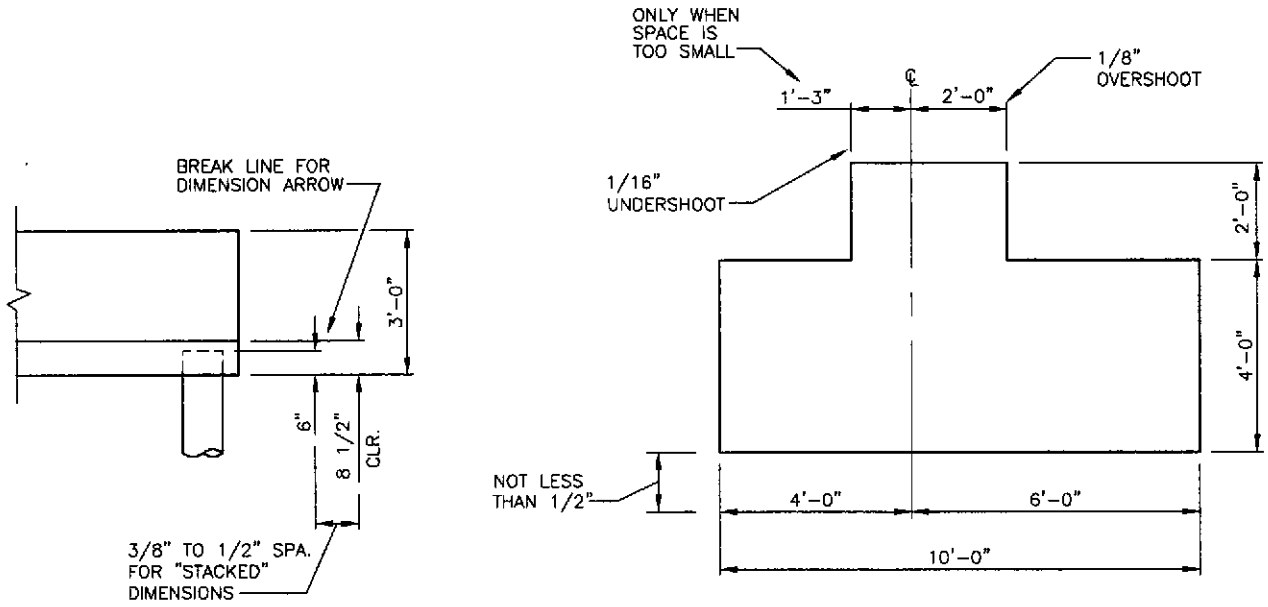
CONVEX CONTOUR SYMBOL

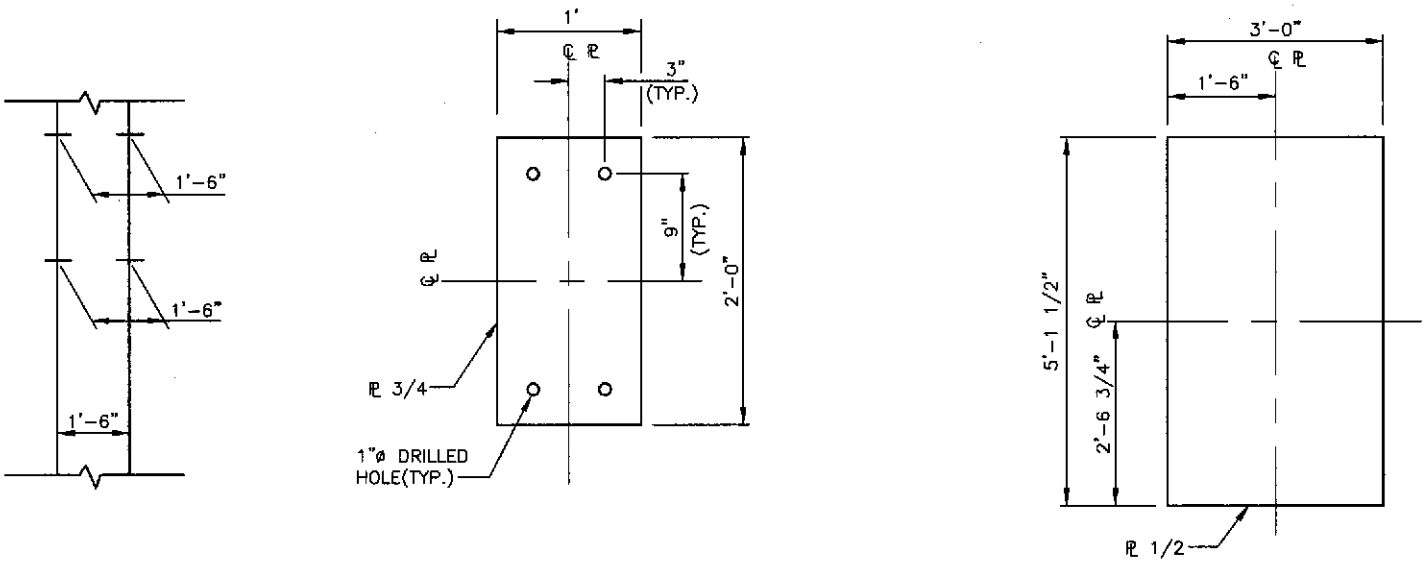


IT SHOULD BE UNDERSTOOD THAT THESE CHARTS ARE INTENDED ONLY AS SHOP AIDS. THE ONLY COMPLETE AND OFFICIAL PRESENTATION OF THE STANDARD WELDING SYMBOLS IS IN AWS A2.4-98, STANDARD SYMBOLS FOR WELDING, BRAZING, AND NONDESTRUCTIVE EXAMINATION.

FIG. 4-6

WELDING SYMBOLS





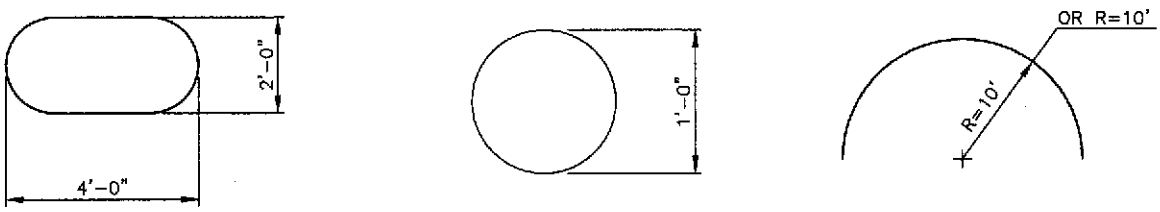
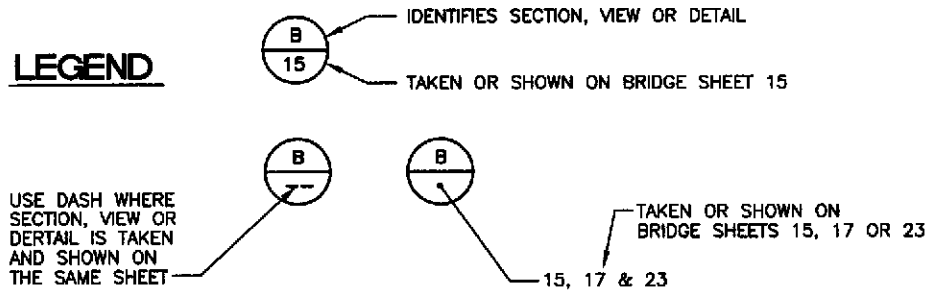
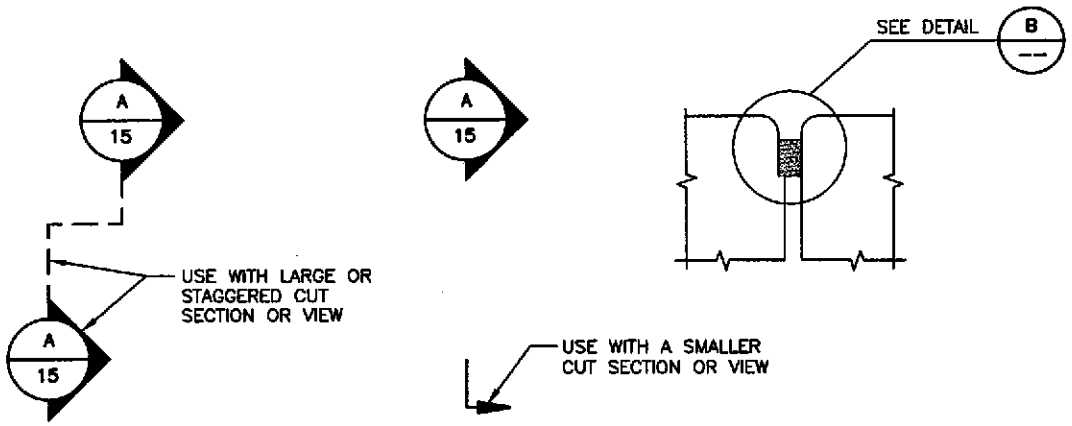


FIG. 4-7

STANDARD DIMENSION





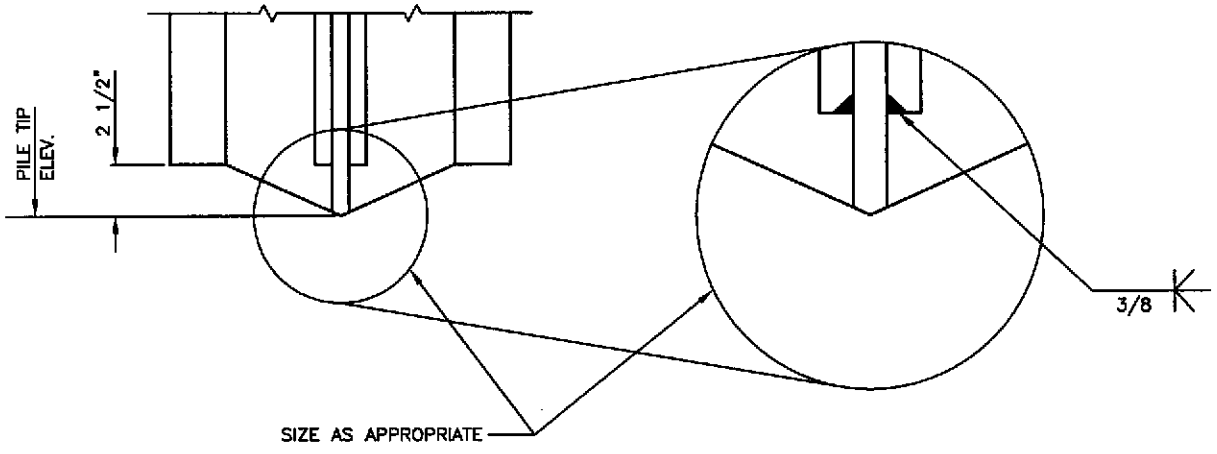
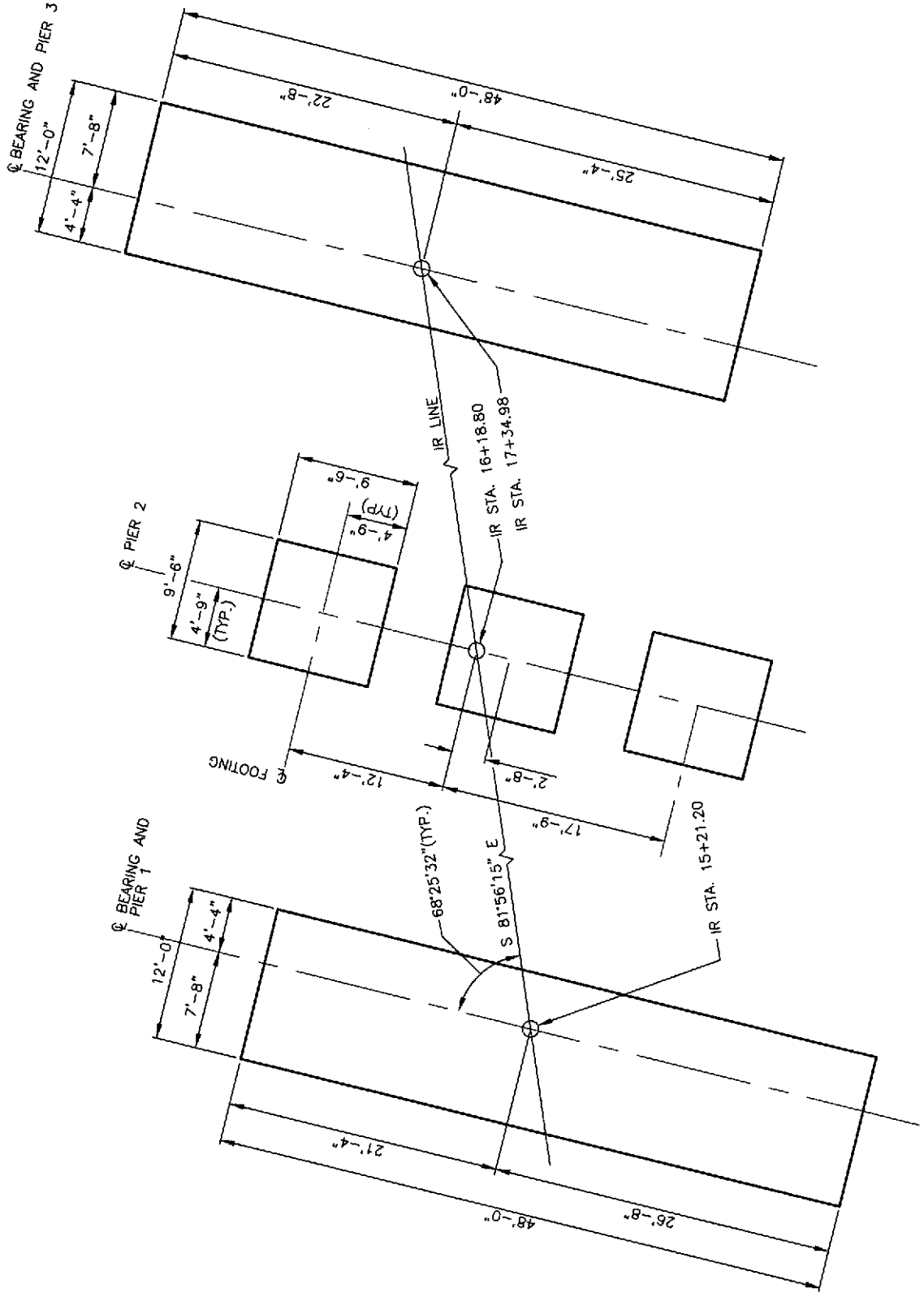


FIG. 4-8

STANDARD STRUCTURAL CALL OUTS



PLAN VIEW

FIG. 4-9

FOOTING LAYOUT

ASTM STANDARD REINFORCING BARS			
BAR SIZE DESIGNATION	NOMINAL AREA (SQ. IN.)	NOMINAL WEIGHT (LB PER FT)	NOMINAL DIAMETER (IN.)
#3	0.11	0.376	0.375
#4	0.20	0.668	0.500
#5	0.31	1.043	0.625
#6	0.44	1.502	0.750
#7	0.60	2.044	0.875
#8	0.79	2.670	1.000
#9	1.00	3.400	1.128
#10	1.27	4.303	1.270
#11	1.56	5.313	1.410
#14	2.25	7.65	1.693
#18	4.00	13.60	2.257

CURRENT ASTM SPECIFICATIONS COVER BAR SIZES #14 AND #18 IN A615 GRADES 60 AND 75 AND IN A706 GRADE 60 ONLY.

FIG. 4-10

HALF SIZE LINE WEIGHTS AND COLORS

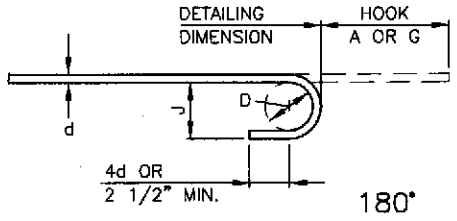
RECOMMENDED INDUSTRY PRACTICE FOR DETAILING REINFORCING MATERIALS

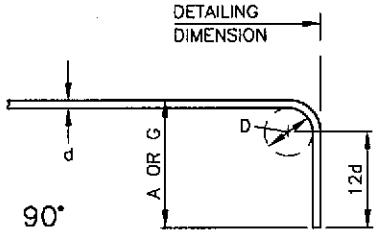
STANDARD HOOKS

ALL SPECIFIC SIZES RECOMMENDED BY CRSI BELOW MEET MINIMUM REQUIREMENTS OF ACI 318.

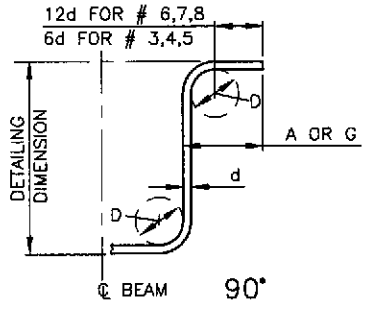
RECOMMENDED END HOOKS
ALL GRADES
D=FINISHED BEND DIAMETER

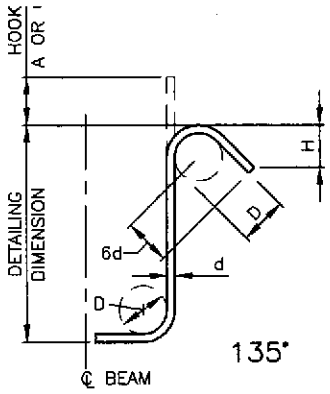
BAR SIZE	D	180° HOOKS		90° HOOKS
		A OR G	J	A OR G
#3	2 1/4	5	3	6
#4	3	6	4	8
#5	3 1/4	7	5	10
#6	4 1/2	8	6	1-0
#7	5 1/4	10	7	1-2
#8	6	11	8	1-4
#9	9 1/2	1-3	11 3/4	1-7
#10	10 3/4	1-5	1-1 1/4	1-10
#11	12	1-7	1-2 3/4	2-0
#14	18 1/4	2-3	1-9 3/4	2-7
#18	24	3-0	2-4 1/2	3-5



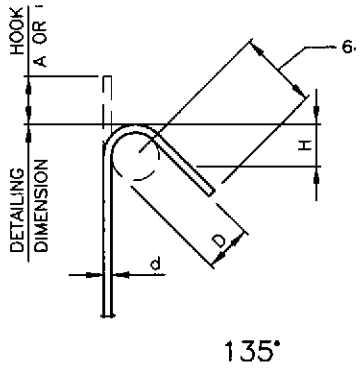


STIRRUP AND TIE HOOKS





135° SEISMIC STIRRUP/TILE HOOKS



STIRRUP
(TIES SIMILAR)
STIRRUP AND TIE HOOK DIMENSIONS
ALL GRADES

BAR SIZE	D (IN.)	90° HOOK	135° HOOK	
		HOOK A OR G	HOOK A OR G	H APPROX.
#3	1 1/2	4	4	2 1/2
#4	2	4 1/2	4 1/2	3
#5	2 1/2	6	5 1/2	3 3/4
#6	4 1/2	1-0	8	4 1/2
#7	5 1/4	1-2	9	5 1/2
#8	6	1-4	10 1/2	6

135° SEISMIC STIRRUP/TIE
HOOK DIMENSIONS
ALL GRADES

BAR SIZE	D (IN.)	135° HOOK	
		HOOK A OR G	HOOK APPROX.
#3	1 1/2	4 1/2	3
#4	2	4 1/2	3
#5	2 1/2	5 1/2	3 3/4
#6	4 1/2	8	4 1/2
#7	5 1/4	9	5 1/4
#8	6	10 1/2	6

FIG. 4-11