

SECTION 1 - GENERAL REQUIREMENTS

1.1 GENERAL

- All plans must be provided to Alberta Transportation (AT) in hardcopy and digital formats.
- Beginning with the 2003 Highway and Bridge tender submissions, all electronic drawings submitted to AT must be in Microstation (dgn) format, compatible with the current AT version.
- CAD files shall be submitted in a “flat” format ie. with no external reference files. Any files used to create the drawing, including stamps and signatures, should be clipped and merged into the master drawing. The consultant shall submit one drawing per CAD file with the name of the file using the plan number for roadway plans (e.g. RD-10496-P.dgn), or using the file name convention for bridge plans provided by Alberta Transportation.
- AT staff and/or Consultants will be responsible for preparing all plans that are required for the phases of work they are engaged in for the Department. This may include, but is not limited to, plans for location studies, functional planning studies, location surveys, right-of-way acquisition, roadway design, utility coordination, railway board orders, preliminary bridge design drawing, bridge design, contract tendering and construction.
- Special details not covered by standard plans or specifications are to be shown on separate drawings. Examples of additional plans include but are not limited to: interchange, intersection treatment, drainage structures, railway crossings, utilities, mass haul diagram(s), typical cross-sections, pavement marking, signing, erosion control, standard and major bridge and culverts.
- Generally plans are prepared in three phases:
 - (1) Preliminary Plans
Horizontal alignment, ground lines, tentative design gradeline, soils logs, bridge preliminary design data drawings with laboratory results and any other basic information required for the purpose of holding "Design Review Meetings".
 - (2) Final Design Plans
Approved and signed, complete in all details and ready for tendering and construction.

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(3) As-Built Plans

Approved and signed, the final plans show the project as constructed in field.

- Department graphics libraries containing cells, symbols, standard drawings, etc, are available to persons/companies doing work for AT. Design Standards information can be accessed through the AT website at www.trans.gov.ab.ca
- Preliminary or intermediate plots of plans shall be done on a reproducible media (mylars preferred). Plans that are not signed and dated are considered "Preliminary". If prints of these plans are distributed, they should be stamped as "Preliminary" with a date of issue included.
- All "as-tendered" and "as-built" plans must be plotted on polyester film using a waterproof ink. This film must have a minimum thickness of 3 mil and a medium tooth matte finish on both sides. All plans are to be stamped and signed by the consultant.
- Titles shall be planned so that they appear centered in the title block.
- Dates shall be expressed numerically in order of year, month and day eg. 2002-07-18 (ISO Std. 8601).
- Drawings shall be planned from the upper left hand corner, leaving blank areas in the right and lower portions of the sheet.
- Place general notes on the right hand side of the drawing above the title block. Quantity estimate and/or index shall appear close to the title block. A 10 mm space shall generally be left directly above the title block and Index.
- Notes shall appear as close as practical to the referred figures. In no case shall lettering obscure any part of the drawing details.
- Conflict between letters and lines should be avoided i.e. lettering should not be placed over (on top of) details.
- Cross sections shall be shown looking in the direction of increasing chainage.
- North arrows shall follow department standards.
- No stick-on-decals, shading or letraset is allowed.
- Plans should generally be arranged so that North is orientated towards the top or the left side of the drawing. A North arrow must be included on all land-related plans or maps.
- Layout of items should be balanced and legible. References to other drawings or specifications must be clear and dominant.

- Unnecessary details should be eliminated and plans should be kept neat by using an enlargement or detail balloon for specific areas which would otherwise be crowded.
- All plans shall have the appropriate title block borders, trimming lines, punching areas, design and revision boxes, and signature blocks.
- Consultants are encouraged to contact Bridge Engineering Section and obtain sample set of drawings (if available) for a recently completed project similar to the one they are currently handling.

1.2 PLAN SUBMISSIONS

As Tendered Stage

The consultant shall provide Professional Services Section with:

- the signed and stamped full size As-Tendered mylars trimmed to standard sizes,
- a CD(one per project) containing the engineering drawings in Microstation format.

As Built Stage

The consultant shall provide the Project Sponsor with:

- the signed and stamped full size As-Built mylars trimmed to standard sizes,
- a CD(one per project) containing the As-Built Microstation files.

See Engineering Consultant Guidelines for Highway and Bridge Projects (Volumes 1 and 2) for further information.

1.3 LETTERING AND SI UNITS

- All lettering is to be done in capitals except metric SI unit symbols which are to be done in lower case, (e.g., mm, m, km).
- The use of periods with abbreviations is not recommended.
- When possible, annotations will be in full and in a position that is readable from the bottom of the plan.
- River and stream names should follow the shape of the feature.

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- Condensed letters may be used where space considerations apply. Condensed, and normal types of lettering should never be intermixed in a word or a sentence.
- Attention may be brought to certain text by using boldface or lightface letters or by underlining.
- Unit symbols (m, kg, ... etc.) represent the unit. They are not abbreviations.
- Symbols do not change in plural.
- A space is used between numbers and units (i.e. 25 km, 100 mm).
- Symbols are written in lower case, always upright (i.e. kg, dm, ...etc.) except when unit is derived from proper name (i.e. N, W, ... etc.).
- Prefixes are directly attached to unit symbols at their front (i.e. km, cm, mm, ... etc.).
- When associated with a number, symbols (not name) shall always be used (i.e. 16 m, not 16 metre). In text, unit shall be spelled out in full.
- When a decimal fraction is used, a “0” shall always be placed before the decimal marker (i.e. 0.232 m).
- Use a period (dot) as a decimal marker.
- A space is optional for four digit numbers, (eg. 5634 or 5 634).

1.4 ABBREVIATIONS

- The general use of abbreviations is not encouraged.
- Abbreviations may be used where they save space and where the meaning is very clear. The end user of the information must always be taken into consideration.
- Standard abbreviations should be used.
- For a list of abbreviations and guidelines for correct use of abbreviations, refer to [Appendix 5.2](#) for Roadway Plan or [Section 2.1.18](#) for Bridge Plans.

1.5 LINEWORK

- To simplify the use of linework, AT utilizes, as much as possible, the line weights and styles (codes) as they appear in Microstation software.
- Unnecessary lines should be eliminated. Annotations should be placed as close as possible to relative items so that the use of arrows and leaders can be reduced or eliminated.

1.6 SYMBOLS

- Standard symbols as adopted by AT should be used. If a nonstandard symbol is required and used, it must be clearly noted and explained. If a legend is being used on the plan, all symbols should be shown.
- Department symbols have been created using Microstation software. Cell libraries containing some of these symbols are available. Objects which are drafted repeatedly should be symbolized.
- The adopted standard for working units in Microstation are as follows for
Cell Library files:
Master Units = mm (millimetres)
Sub-Units/Master Unit = 100
Positional Units/Sub-Unit = 1 or 1:100:1 millimetres
- Refer to [Section 2.1.16 and 2.1.17](#) or [Section 3.8](#) for List of Symbols

1.7 PLAN SHEET FORMAT

The Department uses of the following standard size sheets for engineering drawings.

SIZE	DIMENSIONS IN INCHES	TYPES OF DRAWINGS
A	8.5 x 11	Contract Maps, Standard Plans, Charts, Forms, Correspondence and Documents
B	11 x 17	Intersection, Signing, Painting and Standard Plans, Plans for Tender Documents
B x 2	11 x 34	Intersection, Signing, Painting and Lighting Plans
D	22 x 34	Plan-Profile sets including Title Sheets, Typical Cross-Section Sheet, Soils Log or Muskeg Probe Sheets, Mass Haul Diagram, Intersection and Interchange Drawings, Utility Plans, Railway Crossing Plans, Bridge Design Drawings and Bridge Preliminary Design Drawings, Standards and Navigable Waters and other Miscellaneous Details

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1.8 CONTROL SECTIONS

- Each highway in the province is divided into kilometre control section segments. For example the first control section on Highway 2, originates at the Montana/Alberta border, is 2:02 beginning at chainage 0 + 000.00 at a kilometre post value of 0.000 km. This first control section ends at km post 25.16 at the intersection of Primary Highway 5 just north of the border. The next Highway 2 control section 2:04, begins at the Highway 2 and 5 intersection, again with a kilometre post value of 0 + 000 km and ends 31.09 kilometres north at the Belly River bridge. Each consecutive control section number (segment) on Highway 2 is increased incrementally by a value of 2, i.e., 2:02, 2:04, 2:06, 2:08, 2:10, 2:12, etc., until the final control section 2:72 is reached at the intersection of Highway 2 and Highway 43 north of Grande Prairie.
- Alberta Transportation Highway Geomatics Section produces and annually updates the following control section maps:
 - Primary Highways 1-216 Progress Chart
 - Primary Highways 500-986 Progress Chart
- In addition to showing control sections, the maps also show surface types.
- The appropriate project/control section number shall be put on all plans. If chainage information is required the consultant can request this information from the CAD Support Technologist in Highway Geomatics.

1.9 DEPARTMENT PLAN NUMBERS

- Technical Standards Branch will provide numbers for all plans to ensure that the integrity of the Alberta Transportation databases is maintained.
- Plan numbers are to be obtained by the consultant prior to the project being tendered, when the total number of drawings to be included in the tender is known. The consultant shall contact the Bridge or Roadway Standards Technologist in Technical Standards to obtain the proper plan numbers. No incremental assignment of numbers is allowed by consultants.
- Technical Standards plans fall into five separate databases,
 - Plan-Profiles
 - Miscellaneous Plans (contract, utility, railway)
 - Intersection/Interchange
 - Bridge Plans (Construction, Shop Drawings)
 - Planning Drawings

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NOTE: Overhead sign structure plans are considered to be bridge plans and require Bridge drawing numbers, Bridge file number, Bridge steel A-ident numbers and use of Bridge Drafting Standards.

- Bridge plans are to contain one bridge file number only, if a particular drawing is used at more than one bridge site, additional drawing numbers are to be requested. This is required for future work at individual sites.

1.10 ALBERTA TRANSPORTATION STANDARD DRAWINGS

1.10.1 DRAWINGS AND DETAILS

- The drawings are produced by Alberta Transportation for interpretation and use by the Department. The information shown on the drawings may also be used by Consultants or by Contractors engaged by the Department to design or to construct a specific project, referred to as “Department Directed Projects”.
- The information and details shown on the drawings may not be used by a Consultant or by a Contractor on behalf of a third party (“Third Party Projects”) unless the Consultant or Contractor assumes full responsibility for all information and details shown on the drawings.
- PDF image files of standard drawings can be found on Department website at www.trans.gov.ab.ca. Revised drawings are posted to the website. No notification is sent out to Consultants or Contractors.

1.10.2 DEPARTMENT DIRECTED PROJECTS

- A “Department Directed Project” is defined as one that meets all of the following conditions:
 - It is situated along a highway or roadway that is currently open to the public, or will be open to the public in the future.
 - The design and construction is supervised by the Department or one of its assigns.
- When standard drawings or details are issued for Department Directed Projects, it is important that the recipient be aware of the conditions and limitations attached to their use. This is usually done by incorporating an exculpatory clause into the letter that accompanies the drawings at the time of issue. Typically this reads as follows:

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“Please note that the information and details on this standard drawing are intended for interpretation and use by Alberta Transportation. The Department disclaims responsibility for any other use made of this drawing by others. This drawing is valid at the time of issue and may be subject to change without notice. If this drawing is used subsequent to the date of issue, it is the responsibility of the user to ensure that this version of the drawing is still valid”.

1.10.3 THIRD PARTY PROJECTS

- A “Third Party Project” is defined as one that meets all of the following conditions”
 - The project is not in any way the responsibility of the Department.
 - The design and construction is not supervised by the Department or one of its assigns.
- When standard drawings are used in these applications, it is the responsibility of the Consultant or Contractor to remove the Alberta Transportation logo and all initials, signatures and dates from the Designed, Checked and Approved boxes in the Title Block.
- The Consultant must then stamp the drawing with his professional seal and signature and thereby assume full responsibility for all aspects of the design and drawing.

1.11 REVISIONS

- Plans are considered "Preliminary" until they are officially signed and dated. After the plan is approved, any changes that are made are considered to be revisions and must be noted as such. A small triangle with the revision number shall be placed by the item(s) that were revised, and the appropriate note and date shall be placed in the revision box.
- All revisions, even minor ones, must be made on the computer file and a new plot must be generated.
- It is understood that all revisions to be made to signed plans must be done with consent from the person(s) who originally approved and signed the plan. Minor revisions may be handled informally, however, if there are major revisions to be done on a project, it would be desirable to add an extra signature block titled "Revisions Approved". The revisions could then be checked, signed-off and dated.

1.12DRAWING UNITS

- The adopted standard for working units in Microstation are as follows:
 1. For Cell Library Files, Forms and Charts
 - Master Units = mm (millimetres)
 - Sub-Units/Master Unit = 100
 - Positional Units/Sub-Unit = 1
 2. For Civil Engineering Files
 - Master Units = m (metres)
 - Sub-Units/Master Unit = 100
 - Positional Units/Sub-Unit = 10
 3. For Structural Engineering Files
 - Master Units = mm (millimetres)
 - Sub-Units/Master Unit = 100
 - Positional Units/Sub-Unit = 1

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1.13 CAD LEVEL DEFINITION

Description	Level Number
Roadway Design Information	
Centerlines	1-3
- median centerlines	
- alignment centerlines	
- bridge symbols	
- chainages	
- curve data	
Profiles and Overhaul	1-3
- gradeline	3
- sodline	
- stationing	
- elevations	
- grades	
- chainage equations	
Cut and Fill	4
Proposed Right-of-Way	5
Surface Markings	6-8
- lanes	
- runways	
- shoulders	
- curb and gutter	
- edge of road	
- guardrail	
- sidewalk	
Soil Classification	9
- test holes	
- test piles	
Cross Sections	10
Railway Sight Lines	11
Drainage Information	12
- diversions	
- rip rap	
- sanitary sewers	
- catch basin	
- storm sewers	
- watermain	
- valve	
Landscape Information	13
- berms	
- trees	
- parking lot	
- fire pits	
- picnic tables	
Utilities Information	14-16
- gas/oil pipelines	
- telephone	
- fibre optic	
- hydro pole/tower	
- light standard	

Description	Level Number
Signing Symbols	17
Pavement Markings	18
Lighting	19
Planning Information	
Recommended Alternative, etc.	20-29
Bridge Information	
Bridge Fills, Berms, Rip-rap	30
Existing Bridge Components	31
Future Bridge Components	32
Open/Working	33
Open/Working	34
Object Lines	35
Hidden Lines	36
Patterns and Hatching	37
Reinforcing Steel	38
Dimensions, Text Notes, Section	
Symbols, Titles	39
Tables, General Notes, Index	40
Open/Working	41
Maps	42
Open	43
Open	44
Open	45
Survey and Base Information	
Monuments	50
Legal Land Lines, Boundaries	51
Existing Design Elements	52
Existing Utilities	53
Index Contours	54
Intermediate Contours	55
Map Grids	56
Hydrographics	57
- edge of bank, top	
- streambed	
Topographic Information	58
Land Titles	59
Standard Sheet Information	
Sheet Format and Text	60
Intermediate Vertical Profile Grid	62
Intermediate Horizontal Profile Grid	63