



TECHNICAL BULLETIN

Ministry of Transportation

ENGINEERING BRANCH
TRAFFIC, ELECTRICAL, HWY SAFETY AND
GEOMETRIC STANDARDS. SECTION
BULLETIN NUMBER: **TE-2005-09**

Subject: Revisions to Electrical and Traffic Engineering Manual (December, 2003)	
Date: November 30, 2005	Author: Ross Casey
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Distribution	Standards Affected
All holders of the Electrical and Traffic Engineering Manual (December, 2003)	Electrical and Traffic Engineering Manual – Section 200, Appendix 200.

Background:

The Ministry has revised Section 200 and the related Appendices 200.2, .3, & .4 of the Electrical and Traffic Engineering Manual to ensure there are documented guidelines available to ensure a consistent approach in preparing and submitting designs and data

Policy:

The Ministry will only accept electrical designs which show conformance to the attached Design Process and Quality Management guidelines. All relevant documentation shall be read, understood, followed and where required, completed and submitted.

Procedure:

All holders of the Electrical and Traffic Engineering Manual shall replace the earlier version of Section 200 and the relevant part of Appendix 200 with the information attached to this technical bulletin.

All electrical, traffic and signing engineering assignments shall adhere to the requirements of Section 200 and Appendix. 200.

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Section 200
Design Process and Quality Management

Engineering Branch

August 2005

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201 INTRODUCTION TO DESIGN PROCESS

201.1 ABOUT SECTION 200

Section 200 provides guidelines for maintaining a consistent approach in preparing and submitting designs and data. All pre-requisite steps and procedures for Ministry Reviews and Acceptance are also described.

201.2 BEFORE YOU BEGIN

- .1 Designers shall be fully aware of the requirements of the *Ministry Electrical and Traffic Engineering Design Manual* as well as all associated *Technical Bulletins* and the *Ministry Standard Specifications for Highway Construction* prior to preparing a design.
- .2 A number of different fields of engineering are covered in this document (e.g., electrical, traffic, civil, structural, etc.). Agencies preparing designs must be competent in the fields of engineering required. Professional Engineers are required to sign and seal all drawings, specifications and reports submitted to the Ministry in accordance with the *Engineers and Geoscientists Act*.
- .3 All design submissions and revisions shall be in strict accordance with this section unless otherwise indicated by the Ministry Representative.
- .4 Design Agencies shall maintain and adhere to a documented Quality Management Program in place prior to preparing any designs or data. Failure to maintain an effective in-house Quality Management Plan shall result in poor performance ratings in the Consultant Performance Evaluation process and will affect future project work for the Engineering Consultant.

201.3 MINISTRY REFERENCE STAFF

- .1 Designers shall determine the following key Ministry project team members prior to proceeding with the design:
 - .1 Ministry Electrical Representative
 - .2 Regional Traffic Engineer
 - .3 Manager, Electrical Services
 - .4 Electrical Consultant Liaison Technician

201.4 TYPES OF PROJECTS

- .1 The intention of this manual is to document the design process required for all of the different types of projects. The types of projects and a brief description of each are as follows:
 - .1 Ministry Projects
 - .1 These are projects which are funded and managed the Ministry or a designated Engineering Consultant. These projects may be undertaken by the Electrical Maintenance Contractor, Ministry Electrical Forces or if tendered; via bid-build, design-build or design-build-finance-operate. The work may include geometric design, traffic engineering, electrical design, sign and pavement markings design, traffic signal design, lighting design, contract document preparation, construction engineering services and record drawings.
 - .2 Developer (non-Ministry) Funded projects
 - .1 These are projects which are funded by the Developer or other government agency. These projects may be undertaken via direct award by the developer or tender via bid-build, design-build or design-build-finance-operate. For these projects the Developer will typically identify the scope of the work with input from the Ministry or the designated Engineering Consultant. The Developer is typically responsible for all geometric design, traffic engineering, electrical design, sign and pavement markings design, traffic signal design, lighting design, contract document preparation, construction engineering services and record drawings.
 - .2 The Ministry will provide consultant performance reviews and acceptance at various stages as described later in this section.

201.5 GENERAL DESIGN PROCESS

- .1 Ministry Projects
 - .1 The Ministry will prepare a Terms of Reference (TOR) for the work and engage an Engineering Consultant to undertake the assignment. The TOR may include a scope of work for the assignment or the scope may be left up to those bidding or undertaking the assignment. The assignment shall generally be outcome based. The details of how to achieve the outcome are the responsibility of the Engineering Consultant subject to key review and acceptance check by the Ministry. The assignment may involve one or more of the following elements:

INTRODUCTION TO DESIGN PROCESS

- .1 Electrical
 - .2 Traffic engineering
 - .3 Signing and pavement markings. .
- .2 For electrical designs, the Engineering Consultant shall obtain a TE - Drawing Series number from the Electrical Consultant Liaison Technician.
 - .3 Where the assignment involves a traffic signal the Engineering Consultant shall prepare and submit a *Traffic Engineering Checksheet* and *Signal Timing Sheet (STS)* in accordance with *202.4 Traffic Engineering Checksheet Submittal*. The Electrical Engineering Consultant must not submit signal drawings until the *Traffic Engineering Checksheet* has been signed off by the Engineer of Record and the Regional Traffic Engineer.
 - .4 Upon Ministry acceptance and sign-off of the *Traffic Engineering Checksheet* the Electrical Engineering Consultant shall prepare the signal design based on the *Checksheet* and upon completion submit the electrical design and information as defined in *Section 202.5 Electrical Design Submittal*.
 - .5 The Electrical Engineering Consultant shall prepare a list of existing and proposed luminaries, lamp type and wattage, signal loads and all other electrical equipment connected to each service. All loads shall be calculated using the supplied Ministry power loading spreadsheet and shall be included with the Electrical Design Folder.
 - .6 Once comments are addressed the Ministry will sign off the drawings and the Electrical Consultant Liaison Technician will submit the following to:
 - .1 One full size set of prints, schedule of quantities, special provisions and materials list and electrical load spreadsheet to the Manager, Electrical Services;
 - .2 One full size set of prints, schedule of quantities and cost estimate, special provisions and materials list to the Ministry Project Manager;
 - .3 One full size set of prints to the Regional Traffic Engineer
 - .4 One full size set of prints (where signalized intersection) to the Electrical Engineering Centre Controller Technician;
 - .5 One half size set of print to the Engineering Consultant.
 - .7 Upon receipt of the signed-off electrical drawings the Engineering Consultant shall consult with the Manager, Electrical Services to define

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the method of contracting. The work may be undertaken by the Electrical Maintenance Contractor, Ministry Electrical Forces or where the project is part of road construction project, may be tendered with the road works contract.

- .8 Within 30 days of the completion of the project, the Engineering Consultant shall coordinate the collection data and submit completed signed and sealed record drawings for the project to the *Ministry Electrical Engineering Centre*.
- .9 Upon completion of the assignment the Ministry may undertake evaluation of the performance of the Engineering Consultant.
- .2 Municipal or Developer Funded Projects
 - .1 The entire process is defined for roadway lighting or traffic signal projects on the *Developer information Sheets* in the *Appendix 200.3 & .4*.

202 TRAFFIC AND ELECTRICAL DESIGNS

202.1 GENERAL

- .1 This chapter covers the general guidelines for traffic and electrical designs.
- .2 The Ministry will not accept drawing/specifications submissions that do not meet the requirements listed in this section.
- .3 If the Engineering Consultant wishes to confirm scope of work issues or obtain Ministry feedback on particular design issues and policies, they shall arrange for a meeting with the Ministry. At this meeting, the Engineering Consultant shall present their issues and the Ministry shall provide verbal feedback. It is the responsibility of the Engineering Consultant to summarize and record any decisions made at this meeting and include this in the design folder for the project. ***The Ministry will not provide feedback for drawings that are not signed and sealed or are incomplete.***
- .4 The responsibility for undertaking the traffic and electrical design rests with the Engineering Consultant. The Ministry shall only perform the following functions:
 - .1 Reviewing and signing off of the *Traffic Engineering Checksheet* and *Signal Timing Sheets*.
 - .2 Review and sign-off drawings.
 - .3 Performing *Consultant Performance Evaluations* of the Engineering Consultant and performing quality audits on selected projects.
- .5 The Ministry will provide feedback on all submissions within two weeks provided all appropriate documentation is submitted as a complete package.
- .6 *Traffic Engineering Checksheets* which have *not* been signed by a Regional Traffic Engineer; and /or design drawings that have not been accepted and initialled by the Electrical Engineering Centre Representative will not be acceptable for construction.
- .7 The Ministry supplies traffic controllers or arranges to modify existing traffic controllers for all Ministry projects. The costs for this work and controller commissioning shall be paid by the project or Developer. Contact the Manager, Electrical Services to obtain costs for controller and electrical work defined under *Section 500 Signal Commissioning Guidelines of the Ministry of Transportation Traffic Controller Design Manual*.

TRAFFIC AND ELECTRICAL DESIGNS

- .8 In order to provide a new traffic controller or modify an existing traffic controller, the Ministry requires:
 - .1 Ministry signed off Traffic Engineering Checksheets,
 - .2 Ministry signed off electrical drawings,
 - .3 Ministry signed off Signal Timing Sheets,
 - .4 Funds to pay for the controller modifications and electrical work as defined by the Manager, Electrical Services.

- .9 All specific work to any existing energized electrical system must be undertaken by the Electrical Maintenance Contractor or Ministry Electrical Forces. The Engineering Consultant will need to coordinate the scope of what services are to be provided by the Electrical Maintenance Contractor or Ministry Electrical Forces prior to going to tender. To do this the Engineering Consultant must submit a copy of drawings to the Manager, Electrical Services and obtain information required. The Engineering Consultant must define work undertaken by the Electrical Maintenance Contractor or Ministry Electrical Forces in the contract special provisions and list costs for this work as part of the Engineering Consultant's cost estimate. Refer to 202.8 for further information.

202.2 DESIGNER QUALIFICATIONS

- .1 Electrical and traffic engineering designs must be prepared under the direction of a qualified professional engineer registered with the Association of Professional Engineers and Geoscientists of British Columbia (APEGBC). The engineer signing and sealing the drawings shall be known as the "Engineer of Record".
- .2 The Engineer of Record must be able to demonstrate a thorough understanding of Ministry standards and requirements.
- .3 The Ministry may request the Engineering Consultant provide documentation detailing their relevant experience in traffic, lighting, electrical and traffic signal design.

202.3 BEFORE PROCEEDING WITH DESIGN

- .1 Prior to starting a design it is recommended the Engineering Consultant contact the Ministry Electrical Representative to review the scope of work and design criteria. This is particularly important for Developer derived work

TRAFFIC AND ELECTRICAL DESIGNS

where the Ministry is not directly responsible for engaging the Engineering Consultant.

202.4 TRAFFIC ENGINEERING SUBMISSIONS

- .1 If a project involves either modifying an existing traffic signal or installing a new traffic signal, the designer shall complete and submit a *Traffic Engineering Checksheet and Signal Timing Sheet* for each signal. As the Ministry will be operating the traffic signal once the project is implemented, the Ministry uses the Checksheets to ensure that all factors associated with traffic signal designs (geometrics, signing, markings, and operations) are considered in the signal design.
- .2 The Engineering Consultant shall prepare and submit the Traffic Engineering Submission include all items listed in the *Traffic Design Folder* (refer to 202.6).
- .3 The *Traffic Design Folder* must be submitted to the Regional Traffic Engineer for sign-off of the *Traffic Engineering Checksheet*. Where deliverables are submitted as part of the Prime Consultant's package, additional copies shall be submitted directly to the Regional Traffic Engineer. If changes or clarifications are required, the Engineering Consultant may be required to revise and resubmit the *Traffic Design Folder*.
- .4 For further information on completing the *Traffic Engineering Checksheet* refer to the document *Traffic Engineering Checklist– How to Complete the Form or Signal Timing Sheets– How to Complete the Form* in Appendix 400 of this manual.

202.5 ELECTRICAL DESIGN SUBMISSIONS

- .1 Large projects may involve preliminary and functional designs which will typically be in narrative form. Preliminary and functional designs are typically in the form of a written report defining the scope of work, project design criteria, list of issues and concerns and a cost estimate. Typically, the preliminary or functional design report will be incorporated into the Prime Consultants report for all the project elements. Where such a report is produced it shall be submitted to the Ministry Electrical Representative and the Manager, Electrical Services for their information.

TRAFFIC AND ELECTRICAL DESIGNS

- .2 The electrical submission shall be forwarded to the Ministry Electrical Representative when complete. The Engineering Consultant is responsible for obtaining all comments. The submittal shall include the following:
 - .1 One full size and one half size hardcopy set of drawings signed by all designers and checkers and signed and sealed by the Engineer of Record.
 - .2 One hardcopy of the final design folder (refer to 202.7).
 - .3 One softcopy (ACAD digital files) of all electrical drawings via e-mail.
- .3 Where deliverables are submitted as part of the Prime Consultant's package, additional copies shall be submitted directly to the Ministry Electrical Representative.

202.6 TRAFFIC DESIGN FOLDERS

- .1 *Traffic Design Folders* provide relevant data and information to the Regional Traffic Engineer, aiding in any design review/compliance audit and sign off of the *Traffic Engineering Checklist*. The design folder is also used as supporting documentation in cases where legal action is brought against the Ministry/Engineering Consultant from motor vehicle accident claims. Traffic design folders are also useful when field changes are required during construction.
- .2 Traffic design folders shall:
 - .1 Be bound or fastened.
 - .2 Have a table of contents and title page.
 - .3 Follow the format of the attached sample in *Appendix 200 - Design Folder*
- .3 As a minimum, the traffic design folder shall contain the following:
 - .1 **Project Information** – Fill out *Project Information Template* in *Generic Design Folder* in *Appendix 200.1*.
 - .2 **Key Correspondence and Information** – This shall include records of e-mails, faxes and pertinent telephone conversations of key issues and discussions.
 - .3 **Relevant Calculations** – Copy of Synchro or Highway Capacity Software files in hardcopy and digital files.

TRAFFIC AND ELECTRICAL DESIGNS

- .4 **Traffic Engineering Checklists**– Checklists must be signed and sealed by the Engineer of Record and signed by the Regional Traffic Engineer.
- .5 **Signal Timing Sheets** – Sheets must be signed and sealed by Engineer of Record.
- .6 **Drawings** - One full size signed and sealed hardcopy of applicable geometric and signing and marking drawings.
- .7 **Pictures of the site** – Site pictures shall be labelled to identify location.
- .8 **Traffic Count Data** – In spreadsheet format defined in Appendix 400.

202.7 ELECTRICAL DESIGN FOLDERS

- .1 *The Electrical Design Folder* provides relevant data and information to the Ministry Electrical Representative, aiding in any design review/compliance audit of each project. The *Electrical Design Folder* may also be used as supporting documentation in cases where legal action is brought against the Ministry/Engineering Consultant from motor vehicle accident claims. *Electrical Design Folders* are also useful when field changes are required during construction and for revisions at a later date.
- .2 Electrical design folders shall:
 - .1 Be bound or fastened.
 - .2 Have a table of contents and cover page.
 - .3 Generally follow the format of the attached sample in *Appendix 200*.
- .3 As a minimum, the electrical design folder shall contain the following:
 - .1 **Project Information Sheet** – Copy of *Project Information Sheet* filled out with applicable information (refer to *Appendix 200.1* for template)
 - .2 **Key Correspondence and Information** – Copies of relevant e-mails, and faxes plus records of pertinent telephone conversations summarizing key issues and discussions.
 - .3 **Construction Cost Estimate and Materials List** – Copy of *Schedule of Quantities* form with the unit prices and total costs filled out. Cost estimates shall include all materials supplied by the Ministry as a separate line item.
 - .4 **Pictures of the site** – Copy of relevant pictures labelled to identify their location.

TRAFFIC AND ELECTRICAL DESIGNS

- .5 **Design Quality Review Checklist** – Copy of *Checklist* filled out and signed and sealed by the Engineer of Record (refer to *Appendix 200.2* for sheet).
- .6 **Calculations** – Copy of relevant calculations including volt drop, fault current, conduit fill, lighting, pole capacity, power loading spreadsheets. etc.
- .7 **Traffic Engineering Checklists and Signal Timing Sheets** – Copy of *Checklists* and *Sheets* signed and sealed by the Engineer of Record and the Ministry.
- .8 **Electrical Special Provisions** – Copy of electrical special provisions.

202.8 CONSTRUCTION

- .1 The Ministry has a contractual agreement with Electrical Maintenance Contractors for electrical construction and maintenance services in 3 of the Electrical Service Areas throughout the Province. Ministry electrical forces perform electrical maintenance services in the Southern Interior Region.
- .2 Regardless of who is funding the project only the Electrical Maintenance Contractor or Ministry Electrical Forces will be permitted to undertake work on existing energized electrical infrastructure as well as all traffic signal commissioning as identified in *Section 500 of the Traffic Controller Design Manual*.
- .3 For Developer projects, the Developer may tender or subcontract any new construction to his or her preferred Electrical Installation Contractor. However work on an energized system and commissioning of the traffic controller must be done by the Electrical Maintenance Contractor or Ministry Electrical Forces at the developer expense. As an example, if a development project involves the addition of an advance left turn arrow, the relocation of two traffic signal poles, installation of a new traffic island and curb, the addition of four new street lights; removal of 2 street lights; and the installation of 5 new traffic loops. The following would generally apply:
 - .1 The Electrical Installation Contractor would be responsible for:
 - .1 Installing two new bases only for the relocated traffic signal poles;
 - .2 Installing new bases and new street light poles and luminaires for the streetlights;

TRAFFIC AND ELECTRICAL DESIGNS

- .3 Installing new conduit and cabling between all the new bases and the nearest “energized junction box” (no connection to any energized wiring);
 - .4 Installing five new loops and coiling the loop lead-in’s at the nearest energized junction box; and
 - .5 All traffic management associated with their work.
- .2 The Electrical Maintenance Contractor or Ministry Electrical Forces would be responsible for:
- .1 Relocating the existing traffic signal poles to the new bases;
 - .2 Adding the advanced left turn arrow to the traffic signal poles;
 - .3 Adding any additional wiring in “energized conduit and equipment” and making final connections for the relocated traffic signal poles, new street lighting and new loops.
 - .4 Disconnecting redundant street lights and loops.
 - .5 Commissioning the traffic signal and traffic controller.
 - .6 All traffic management associated with their work.
- .3 On completion, the Electrical Installation Contractor is then responsible for:
- .1 Removal of old bases, conduit, and street lighting equipment.
 - .2 Removal of poles and delivery to designated yard.
 - .3 Installing the new traffic island and curbing.
 - .4 Completing all remaining civil construction work.
- .4 All Design Agencies undertaking work for Developers must clearly identify the work that will be done by the Electrical Installation Contractor and the Electrical Maintenance Contractor or Ministry Electrical Forces. The Manager, Electrical Services will provide a price to the Developer for the mandated Electrical Maintenance Contractor work. The Developer shall pay all costs incurred by the Ministry.
- .5 For Ministry funded projects the work will typically involve electrical with little or no road works upgrade or will be part of a road works upgrade project. As a rule of thumb, new electrical works constructed as part of road works projects will be tendered by the Ministry with the road works project. For these projects the Engineering Consultant is typically retained by the Prime Consultant and the electrical design is undertaken in concert with the road works. Projects where the Engineering Consultant undertaking the electrical design is the Prime Consultant and there is little or no road works

TRAFFIC AND ELECTRICAL DESIGNS

design the work will typically be undertaken by the Electrical Maintenance Contractor or Ministry Electrical Forces. Such projects could include a new signal or lighting installed on an existing roadway or may involve upgrades to an existing electrical system. Where modifications are being undertaken to existing electrical infrastructure and the majority of the work involves modifications to energized equipment and the total estimated electrical construction cost is less than \$50,000-(all Electrical Services areas except the South Coast Electrical Service Area where the total estimated electrical construction cost is less than \$10,000), the work may be performed by the Electrical Maintenance Contractor or Ministry Electrical Forces at the discretion of the Manager, Electrical Services. The \$50,000 and \$10,000 estimated construction costs do not include Ministry supplied materials.

- .6 All modifications to existing controllers; installation of new controllers commissioning of all traffic signals as per *Section 500 of the Traffic Controller Design Manual*; and work on existing energized electrical systems must be performed by the Electrical Maintenance Contractor or Ministry Electrical Forces. All costs shall be paid by the project or Developer, as applicable

203 SIGNING DESIGNS

203.1 GENERAL

- .1 Signing drawings will typically include all signs as required with the exception of temporary signs.

203.2 SIGNING DRAWINGS AND SPECIFICATIONS

- .1 Signs shall be shown on drawings in accordance with Section 700. Existing and new signs shall be shown. Elevation drawings and foundation design drawings will be required for all signs on custom sign bridge or cantilever structures (refer to Section 500).
- .2 All signs shall be supplied and installed by the contractor unless otherwise noted.
- .3 All signs purchased for use on Ministry of Transportation right of way must comply with the following:
 - .1 The Manual of Standard Traffic Signs and Pavement Markings (http://www.th.gov.bc.ca/publications/eng_publications/electrical/MoST_PM.pdf)
 - .2 The Sign Pattern Manual (http://www.th.gov.bc.ca/publications/eng_publications/geomt/geomets_igns.htm)
 - .3 The Specification for Standard Highway Sign Materials, Fabrication and Supply (http://www.th.gov.bc.ca/publications/eng_publications/signs/Sign_Fabrication_Specs)
- .4 Special Provisions shall be prepared by the Engineering Consultant. Refer to Section 800 for Generic Special provisions which are to be modified to suit the specifics of the work.
- .5 Signing drawings shall be signed and sealed by a Professional Engineer registered with the APEGBC.

SIGNING DESIGNS

203.3 SERVICE AND ATTRACTION SIGNS

- .1 Refer to the Ministry *Service and Attraction Signing Manual* for information on Service and Attraction Signs.

203.4 GUIDE SIGNS

- .1 The Engineering Consultant shall prepare small scale concept drawing (1:2000 scale) showing guide sign locations, sizes and messages on the laning and geometrics drawings. This drawing shall be submitted to the Regional Traffic Engineer for review at the preliminary design stage. It is critical that the guide sign design be developed in concert with the road works design to allow drivers the required time to make the required movements.
- .2 Once the small scale sign concept drawings are accepted by the Regional Traffic Engineer, the concept drawing and the laning and geometric drawings shall be submitted to the Ministry Sign Design Group, who in turn will prepare the sign design sheets.
- .3 It is important to note this production may take 4 to 8 weeks depending on the size of the project and the complexity of the signing. As sign sizes will impact the support structure type and design it is critical sign sizes be verified early in the design process to avoid structure and foundation redesign due to changes in sign sizes.
- .4 Once sign design sheets are produced they shall be incorporated into the tender package as the bidders will need this information to accurately price the signs.

204 ENGINEERING WORK ACCEPTANCE

204.1 DEFINITION OF ACCEPTANCE

- .1 With respect to traffic and electrical engineering designs, the Engineering Consultant is responsible for the engineering content of the assignments. The Ministry will perform a cursory review and “accept” engineering products from the Engineering Consultant that comply with the “intent” of the original scope of work. This acceptance should in no way be interpreted as a quality assurance check on the engineering details of the assignment. Any errors or omissions of “accepted” drawings that result in additional costs to the Ministry may be charged back to the Engineering Consultant.

205 QUALITY MANAGEMENT

205.1 QUALITY MANAGEMENT

- .1 Design Agencies' shall maintain a Quality Management Plan. As a minimum this plan shall identify the various quality control and quality management tasks to be undertaken, and the staff that will be assigned to them. The quality management staff and their reporting relationships shall be shown in a project organization chart.
- .2 All work shall be carried out in accordance with the protocol described in the Quality Management Plan.
- .3 Upon request, the Engineering Consultant shall provide written documentation confirming their quality management program. The Ministry, at its discretion, may audit the Engineering Consultant's quality management program.
- .4 If the Engineering Consultant cannot demonstrate that they have and are implementing an appropriate quality management plan, the Ministry may choose to withhold any acceptance of engineering products until the Engineering Consultant can demonstrate that they have corrected the situation. Failure to employ an appropriate quality management plan will result in poor consultant performance evaluations which will negatively impact future consultant assignment selections.

Electrical Design Quality Review Checklist

DRAWINGS - GENERAL			
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<input type="checkbox"/>	Are Ministry drafting standards followed?	<input type="checkbox"/>	Is there a Key Plan/cover sheet? Is the Legend shown on sheet 1?
<input type="checkbox"/>	Is the print quality clear? Is unessential information lightly shaded in the background?	<input type="checkbox"/>	Are the Notes and Disclaimers ("DO NOT USE ...", "THIS DRAWING SUPERSEDES ...") shown?
<input type="checkbox"/>	Are Revision numbers and descriptions correct and consistent across all sheets?	<input type="checkbox"/>	Are correct Roadway names shown on site plans and elevations?
<input type="checkbox"/>	Are Elevations dimensioned and labeled correctly?	<input type="checkbox"/>	Are join lines matching and consistent, if applicable?
<input type="checkbox"/>	Are Schematics/Wiring Diagrams shown and labeled correctly?	<input type="checkbox"/>	Are station numbers shown and correct, if applicable?
<input type="checkbox"/>	Are Standard Specifications Supplementary Drawings (SP635) referenced?	<input type="checkbox"/>	Are the Laning and Geometrics consistent with the approved civil design?
<input type="checkbox"/>	Are Title block(s) correct and consistent across all sheets?	<input type="checkbox"/>	Are Pavement Markings generally consistent with the approved civil design?
<input type="checkbox"/>	Are Scales and North Arrows (True & Signal) shown on Site Plans and Elevations?	<input type="checkbox"/>	Is the posted speed for each roadway shown?

LIGHTING and UNDERGROUND			
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<input type="checkbox"/>	Is the existing equipment clearly identified?	<input type="checkbox"/>	Are photoelectric cells identified and labeled correctly on site plan, elevations and schematic?
<input type="checkbox"/>	Is the equipment to be removed clearly identified?	<input type="checkbox"/>	Are Service drops, Service panels and Disconnect panels identified?
<input type="checkbox"/>	Are existing and new conductors clearly identified?	<input type="checkbox"/>	Is J.B. type numbering per MoT standard (matches legend? Concrete.J.B. identified?)
<input type="checkbox"/>	Are existing and new conduits clearly identified?	<input type="checkbox"/>	Is there a Flasher control unit in the Wiring Schematic?
<input type="checkbox"/>	Is conduit sizing correct and are the necessary conduit fill calculations in the design folder?	<input type="checkbox"/>	Are there post mounted flashers as per Design Manual or as requested by RTE?
<input type="checkbox"/>	Are Conductor and Conduit sizes and symbols shown on schematic wiring diagrams?	<input type="checkbox"/>	Are pole bases correctly shown on elevations (height) and site plan (type, frangible, breakaway)?
<input type="checkbox"/>	Have questions re future requirements been addressed (pre-ducting, extra conductors, etc.)?	<input type="checkbox"/>	Are minimum backfill requirements around pole bases as per Standard Specifications?
<input type="checkbox"/>	Are existing utilities shown and all conflicts identified and noted in design folder?	<input type="checkbox"/>	Have pole placements been checked (1 m setback from curb; no conflicts with pedestrians, etc)?
<input type="checkbox"/>	Have clearances to overhead conflicts been verified in the field and with Hydro?	<input type="checkbox"/>	Are Clear Zone requirements met?
<input type="checkbox"/>	Are Service Panels numbered correctly?	<input type="checkbox"/>	Has a Pole loading review been done for all poles being modified? Placed in design folder?
<input type="checkbox"/>	Are Breaker Sizes correct?	<input type="checkbox"/>	Do lighting warrants conform to TAC <u>Illumination of Isolated Rural Intersections</u> and RTE requirements?
<input type="checkbox"/>	Is luminaire circuit numbering correct on Site Plan and Elevations?	<input type="checkbox"/>	Do lighting levels and uniformity ratios conform to MoT standards? Copies in Design Folder?
<input type="checkbox"/>	Are luminaire wattages (flat glass designation) correct?		

TAC – Transportation Association of Canada
 MoT – Ministry of Transportation
 RTE –Regional Traffic Engineer

TEC – Traffic Engineering Checklist
 SS – Standard Specifications for Highway Construction

Electrical Design Quality Review Checklist

TRAFFIC SIGNALS			
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<input type="checkbox"/>	Is the Traffic Engineering Checklist signed-off by the RTE? Have the drawings and TEC been compared for conformity?	<input type="checkbox"/>	Does the Signal Sequence Display match the TEC? Are roadways named and north arrow shown? Is T-intersection / 4-way intersection shown?
<input type="checkbox"/>	Is pole numbering as per MoT standards and consistent on the site plan and elevations?	<input type="checkbox"/>	Is there a geometric conflict with opposing double left turns? Is this noted on the Signal Sequence Display?
<input type="checkbox"/>	Does the controller type match the TEC?	<input type="checkbox"/>	Is Bus priority shown in the Signal Sequence Display?
<input type="checkbox"/>	Has the cone of vision been checked for all approaches? Are signal heads aligned correctly?	<input type="checkbox"/>	Is Emergency vehicle pre-emption equipment correctly shown on the drawings? Is it correctly shown on the Signal Sequence Display per the TEC?
<input type="checkbox"/>	Signal heads visibility meets the requirements noted in "MUTCDC B3.2 - Visibility of Traffic Signal Heads"? Auxiliary heads required as per MUTCD B3.3.3 - Auxiliary Signal Head Locations"?	<input type="checkbox"/>	Does the Signal Display have Railway pre-emption clearance and pre-emption phasing per the TEC?
<input type="checkbox"/>	Has the number of conductors for signal heads incl. service pole been checked?	<input type="checkbox"/>	Are LED No Left Turn Signs required and shown?
<input type="checkbox"/>	Has phasing of signal heads on site plan and signal display been checked to comply with the TEC?	<input type="checkbox"/>	Has the Conductor Colour Coding been checked for correct wiring (controller, flashers, lighting, pre-emption)?
<input type="checkbox"/>	Has the Phasing Designation of heads on elevations been checked for conformity?	<input type="checkbox"/>	Are Street Name Signs correctly shown on elevations?
<input type="checkbox"/>	Are tunnels, arrows, etc. shown on elevations and site plan where required?	<input type="checkbox"/>	Are Lane Use Signs and correctly shown on the approaches per the TEC?
<input type="checkbox"/>	Are pedestrian pushbuttons within 3 m of crossings and conveniently located?	<input type="checkbox"/>	Are Turn Control Signs correctly shown on the drawings per the TEC?
<input type="checkbox"/>	Are pedestrian pushbutton signs appropriately located and designated (R vs. L)?	<input type="checkbox"/>	Has accommodation been made for cyclists (pushbuttons, loops, stencils) per the TEC and RTE requirements?
<input type="checkbox"/>	Have the position, phase designation, dimension and numbering of detector loops been checked to comply with MoT standards?	<input type="checkbox"/>	Have Advance Warning Flashers warrants been reviewed and signs installed as required? Are sign locations based on speed and grade and dimensions shown on drawings?
<input type="checkbox"/>	Has the detector loop table been verified to conform with the site plan and phasing?	<input type="checkbox"/>	Does the telephone / cellular / time clock synchronization requirements match the TEC?
<input type="checkbox"/>	Have all right turn lane loops been classified as counting unless directed otherwise by the RTE?	<input type="checkbox"/>	Do drawings conform with all other requirements in TEC?

DESIGN FOLDER	
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<input type="checkbox"/>	Is the Design Folder complete?
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I _____, P. Eng. (Professional Engineer) declare that the drawings being submitted have been thoroughly quality managed and that each of the items noted in this review checklist have been checked for compliance. I also understand that this review checklist is not complete and that it is my responsibility to ensure that I have a quality control and assurance plan in place and that ALL requirements and standards for the project are met. I understand that any errors or omissions of the design that impact the project and cause delays or additional costs to the project may be subject to claims under my Professional Errors and Omissions Insurance.

Professional Engineer Signature

Date

Electrical Design Quality Review Checklist

Poor consultant work performance will impact consultant selection and assignments on future projects.

Developer Information Sheet – Street Lighting Projects

(Projects which do not include traffic signals)

A: How does my development approval application get processed?

The primary contact for a Developer is the District Development Technician. The District Development Technician is responsible for ensuring that your application is processed and all appropriate reviews and approvals are obtained from the various business units in the Ministry of Transportation (Ministry). These business units consist of Traffic Engineering, Electrical Engineering, Electrical Maintenance, Highway Engineering, District Operations, Property Services and Pavement Markings.

B: What must I do to ensure my application is processed efficiently?

The sequence of events that must occur to successfully process your development approval application that may include new or modified street lighting or other minor electrical work is as follows (note that if the development will/may require signals, the *Developer Information Sheet – Traffic Signals* should be used):

1. The **Developer contacts** the local Ministry District Office with his development plans. The District office assigns a District Development Technician to “project manage” your application.
2. Based on the Developer application, the District Development Technician determines whether a Traffic Impact Study (TIS) needs to be done. The Terms of Reference for the TIS will be prepared by the District Development Technician, Traffic Engineering and Planning departments, and then provided to the Developer.
3. The **Developer arranges** to have the Traffic Impact Study completed by a qualified Transportation Engineer or Engineering firm and then returns it to the District Development Technician.
4. The District Development Technician arranges for the TIS to be reviewed by the Ministry Traffic Engineering and Planning groups. The District Development Technician grants approval in principle identifying the preliminary scope and extent of the works based on the TIS and Traffic Engineering input. The District Development Technician may request the Developer submit preliminary drawings at this stage depending on the size of the project.
5. The District Development Technician notifies all internal agencies and local governments that may potentially be impacted by the development or may be planning construction, rehabilitation or maintenance activities in the subject area that the development has been proposed and to determine jurisdictional boundaries.
6. Ministry internal departments that may be required to provide services to the development application provide their preliminary cost estimates to the District Development Technician.
7. The District Development Technician reviews comments from affected agencies as well as summarizes the estimated recoverable costs from internal departments and advises the Developer that these costs will be charged to the Developer.
8. The District Development Technician advises the Developer that they may proceed with the civil design stage of the project.
9. The **Developer**
 - **Arranges** to have their Engineering Consultant prepare a civil design for the project showing the existing and proposed geometric improvements; existing and proposed guide, regulatory, warning and guide signing; and existing and proposed pavement markings. The drawings shall be signed and sealed by a professional engineer.
 - **Arranges** to have their Traffic Engineering Consultant a) prepare a TAC Lighting warrant spreadsheet for each intersection/access, and b) identify the locations that will require island flashers based on the signed and sealed civil design drawings.
10. The District Development Technician forwards the civil design drawings to the Regional Traffic Engineer who will either a) accept and sign the final section of the Traffic Engineering Checklist or b) identify deficiencies that need correction and return the TEC to the District Development Technician.

Developer Information Sheet – Street Lighting Projects

(Projects which do not include traffic signals)

11. If the Regional Traffic Engineer rejects the civil design drawings, the District Development Technician advises the **Developer to arrange** for changes through their Engineering Consultant and resubmit to the District Development Technician for Ministry Traffic Engineering acceptance.
12. Once the civil drawings are accepted, the District Development Technician shall advise the Developer that they may proceed with the electrical design. **[Electrical designs proceeding beyond this point without Ministry accepted civil drawings may result in additional costs to the Developer due to potential changes required to the electrical design to ultimately meet Ministry requirements]**
13. The **Developer**
 - **Arranges** to have the electrical design completed by their Electrical Design Consultant based on the approved civil design drawings, TAC lighting warrants and island flasher warrants. The Electrical Design Consultant is responsible for providing a set of 90 % complete electrical drawings to the *Manager, Electrical Services* for comments / feedback prior to final submission to the District Development Technician.
 - **Submits** one half size and one full size set of signed and sealed electrical design drawings including ACAD digital copies of each drawing as well as an electrical design folder to the District Development Technician (Refer to Section 200, Electrical Design Submissions of the Ministry Electrical and Traffic Engineering Manual.)
 - Arranges for Security Bond in the Ministry's name.
14. The District Development Technician forwards the electrical design drawings, TAC Lighting warrants, digital files and design folder to the Ministry Electrical Engineering Centre (EEC) for review and acceptance.
15. If the drawings are not accepted, the Electrical Engineering Centre will advise the District Development Technician that the developer must resubmit. Once the drawings are accepted, the Electrical Engineering Centre sends the original signed and sealed drawings to the District Development Technician. The Electrical Engineering Centre also distributes copies of the drawings to the Manager, Electrical Services and the Regional Traffic Engineer.
16. Once the electrical drawings are accepted and the originals returned to the District Development Technician, the District Development Technician returns the drawing to the Developer.
17. The Manager, Electrical Services determines an estimate for the work to be undertaken by the Electrical Maintenance Contractor, based on the breakdown of work prepared by the Electrical Consultant. The Manager, Electrical Services forwards copies of the scope of work and costs to the District Development Technician. The District Development Technician will forward the costs and scope of work to the developer.
18. The District Development Technician arranges to delineate the jurisdictional boundaries with the municipality and receive a letter from the municipality agreeing to the boundaries.
19. The **Developer**
 - **Submits** to the District Development Technician a traffic management plan (including all utility relocation work necessary to complete the project), construction schedule and appropriate financial security for the complete project construction. The Ministry will recover costs from the Developer for all Ministry associated costs for the development (electrical maintenance inspections, paint marking, Ministry supplied materials, design review, etc.).
 - **Submits** to the District Development Technician a letter from the city council agreeing to cost sharing of the on going electrical power and maintenance costs incurred by the Ministry for additions to the electrical system.

Developer Information Sheet – Street Lighting Projects

(Projects which do not include traffic signals)

20. The District Development Technician issues the appropriate construction permits. The District Development Technician outlines to the Developer the electrical inspection fees, conditions of site acceptance and conditions of project closure. The permits issued are based on the current drawings and specifications submitted to the Ministry: changes to the design during construction due to unforeseen circumstances or Developer initiated changes must be resubmitted to the Ministry for approval and modification of the construction permit. Development work not conforming to these requirements may have a stop work order issued until they comply with these requirements.
21. The **Developer**
 - **Arranges** with the District Development Technician to initiate a pre-construction meeting for large projects with the Developer's Installation Contractor, the Electrical Maintenance Contractor, the Manager, Electrical Services and the Electrical Design Consultant. Key issues will include:
 - Schedule of Work
 - Lines of Communication
 - Traffic Control
 - List of materials and suppliers
 - **Proceeds** with the construction.
 - **Contacts** the District Development Technician to initiate Hydro billing with the utility and cost sharing arrangements with the municipality. The Developer will be required to coordinate service connections with BC Hydro (or alternate service provider) and coordinate all service applications through the Manager, Electrical Services. As the Ministry is the owner, the Manager, Electrical Services shall apply for the service based on information provided by the Developer. This work shall occur at the design stage to reduce delay.
 - **Advise**s the District Development Technician when work is complete.
22. The District Development Technician advises the District Operations, Electrical Engineering, Traffic Engineering and the Manager, Electrical Services that the site is ready for inspection.
23. The District Development Technician reviews input from the above and advises the Developer of any required changes.
24. Once all changes have been completed and inspected, the Developer submits signed and sealed civil and electrical record drawings as well as the associated digital files (in AutoCAD format) to the District Development Technician. The District Development Technician forwards these drawings to the District Operations (civil) and Electrical Engineering (electrical drawings) for acceptance. If drawings are not in compliance, the District Development Technician advises the Developer who arranges for any corrections and resubmits to the District Development Technician. Once the drawings are accepted, Electrical Engineering will forward drawings to the Manager, Electrical Services.
25. Once drawings are accepted by the Ministry, the District Development Technician charges back all cost recoverable charges from the Ministry to the Developer.
26. The District Development Technician releases the Developer's financial security for the completed project.

Developer Information Sheet – Street Lighting Projects

(Projects which do not include traffic signals)

The following provisions shall form part of the Development Approval Permit

- A. All electrical work shall conform to the current edition of the Canadian Electrical Code and the B. C. amendments.
- B. The Manager, Electrical Services shall coordinate all electrical inspections.
- C. All electrical fees and permits associated with the project are the responsibility of the electrical contractor.
- D. All electrical work shall conform to the current Ministry Standard Specifications for Highway Construction available through the Ministry, Management Services - <http://www.publications.gov.bc.ca/>
- E. All electrical designs shall conform to the latest version of the Ministry Electrical and Traffic Engineering Manual with associated Technical Bulletins, specifications and materials and be accepted and signed by the Ministry Electrical Engineering Representative.
http://www.th.gov.bc.ca/publications/eng_publications/electrical/electrical_and_traffic_eng/2004-Electrical_Signing_Design_Manual/tableofcontents.htm
http://www.th.gov.bc.ca/publications/eng_publications/TE_Bulletins/TE_bulletins.htm
- F. All geometric, paving marking and signing designs shall conform to the latest TAC Guidelines, B.C. Supplement to TAC Guidelines, Ministry Pedestrian Crossing Manual and Ministry Sign and Pavement Marking Standards Manual.
- G. All materials utilized in the construction of Ministry electrical installations shall be from *the Ministry Recognized Products Book*. http://www.th.gov.bc.ca/publications/eng_publications/geotech/rpb.htm
- H. Prior to commencement of any electrical construction, the electrical contractor shall contact the Manager, Electrical Services or his designate, in order to establish an inspection schedule, and to ensure that they are aware of construction standards, specifications and approved materials.
- I. The electrical contractor shall advise the Manager, Electrical Services of the intended start date a minimum of one week in advance.
- J. The electrical contractor shall **NOT** enter any Ministry electrical installation without prior approval of the Manager, Electrical Services.
- K. The project will not be considered complete until a final acceptance inspection is completed by the Manager, Electrical Services, or his designate.
- L. The project will not be considered complete until all electrical utilities have been properly connected.
- M. The project will not be considered complete until the Provincial Electrical Inspector completes a final inspection.
- N. The project will not be considered complete until the Developer's Electrical Design Consultant has submitted a final set of "Record" signed and sealed electrical drawings (including digital ACAD drawings) to the District Development Technician.
- O. The project will not be considered complete until the appropriate hydro and cost sharing agreement information has been submitted and signed.
- P. The electrical contractor will be notified in writing of any deficiencies within 14 days of the Manager, Electrical Services inspection.
- Q. The Developer's electrical contractor shall correct any deficiencies within 14 days of notification from the Manager, Electrical Services.
- R. After 14 days, the Manager, Electrical Services will arrange to have the deficiencies completed and charged back to the Developer.

Developer Information Sheet - Traffic Signal Projects

(Projects which include traffic signals)

A: How does my development approval application get processed?

The primary contact for a Developer is the District Development Technician. The District Development Technician is responsible for ensuring that your application is processed and all appropriate reviews and approvals are obtained from the various business units in the Ministry of Transportation (Ministry). These business units consist of Traffic Engineering, Electrical Engineering, Electrical Maintenance, Highway Engineering, District Operations, Property Services and Pavement Markings.

B: What must I do to ensure my application is processed in a timely manner?

The sequence of events that must occur to successfully process your development approval application that includes new or modified traffic signals is as follows:

1. The **Developer contacts** the local Ministry District Office with his development plans. The District office assigns a District Development Technician to “project manage” your application.
2. Based on the Developer application, the District Development Technician determines whether a Traffic Impact Study (TIS) needs to be done. The Terms of Reference for the TIS are prepared by the District Development Technician, Traffic Engineering and Planning departments, and then provided to the Developer.
3. The **Developer arranges** to have the Traffic Impact Study completed by a qualified Transportation Engineer or Engineering Firm and then returns it to the District Development Technician.
4. The District Development Technician arranges for the TIS to be reviewed by the Ministry Traffic Engineering and Planning groups. The District Development Technician grants approval in principle identifying the preliminary scope and extent of the works based on the TIS and Traffic Engineering input. The District Development Technician may request the Developer submit preliminary drawings at this stage depending on the size of the project.
5. The District Development Technician notifies all internal agencies and local governments that may potentially be impacted by the development or may be planning construction, rehabilitation or maintenance activities in the subject area that the development has been proposed and to determine jurisdictional boundaries.
6. Ministry internal departments that may be required to provide services to the development application provide their preliminary cost estimates to the District Development Technician. The District Development Technician reviews comments from affected agencies as well as summarizes the estimated recoverable costs from internal departments and advises the Developer that these costs will be charged to the Developer.
7. The District Development Technician advises the Developer that they may proceed with the civil design stage of the project.
8. The **Developer**
 - **Arranges** to have their Engineering Consultant prepare a civil design for the project showing the existing and proposed geometric improvements; existing and proposed guide, regulatory and warning signing; and existing and proposed pavement markings. The drawings shall be signed and sealed by a professional engineer.
 - **Arranges** to have their Traffic Consultant prepare a Traffic Engineering Checklist (TEC) and preliminary Traffic Signal Timing sheet based on the signed and sealed civil design drawings.
 - **Forwards** the civil design drawings, preliminary Traffic Signal Timing sheet and the Traffic Engineering Checklist to the District Development Technician.
 - Arranges for Security Bond in the Ministry’s name.

Developer Information Sheet - Traffic Signal Projects

(Projects which include traffic signals)

9. The District Development Technician forwards the TEC, preliminary Traffic Signal Timing Sheet and civil design drawings to the Regional Traffic Engineer who will either a) accept and sign the final section of the Traffic Engineering Checklist or b) identify deficiencies that need correction and return the TEC to the District Development Technician.
10. If the Regional Traffic Engineer rejects the TEC, the District Development Technician advises the **Developer to arrange** for changes through their Traffic Engineering Consultant and resubmit to the District Development Technician for Ministry Traffic Engineering acceptance.
11. Once the TEC is accepted, the District Development Technician shall advise the Developer that they may proceed with the electrical design for the traffic signal. **[Electrical designs proceeding beyond this point without a Ministry accepted TEC may result in additional costs to the Developer due to potential changes required to the electrical design to ultimately meet Ministry requirements]**
12. The **Developer**
 - **Arranges** to have the electrical design completed by their Electrical Design Consultant based on the approved civil design drawings, preliminary Traffic Signal Timing sheet and the accepted TEC. The Electrical Design Consultant is responsible for providing a set of 90% preliminary electrical drawings to the Manager, Electrical Services for comments / feedback prior to final submission to the District Development Technician.
 - **Submits** two half size and two full size copies of the signed and sealed electrical design drawings including ACAD digital copies of each drawing to the District Development Technician
13. The District Development Technician forwards the electrical design drawings and digital files along with the TEC and preliminary Signal Timing sheet to the Regional Traffic Engineer and Ministry Electrical Engineering Centre (EEC) for acceptance.
14. The EEC initials the electrical design drawings for acceptance and returns the originals to the District Development Technician. If the drawings are not accepted, the **Developer revises** the drawings and resubmits to the District Development Technician for acceptance. The EEC distributes accepted drawings to the Manager, Electrical Services, Traffic Engineering and Traffic Controller Design group as well as enters the digital drawings into the Ministry database. The EEC design group forwards a copy of the accepted TEC to the EEC Traffic Controller Group.
15. Once the electrical drawings are accepted and returned to the District Development Technician, the District Development Technician returns the drawings to the Developer and advises the Developer that they need to submit a final signed and sealed Traffic Signal Timing Sheet.
16. The **Developer**
 - **Arranges** to have a signed and sealed Traffic Signal Timing sheet prepared by their Traffic Engineering Consultant.
 - **Submits** the signed and sealed Traffic Signal Timing sheet along with all supporting documentation such as a site plan showing assumed measurements, Synchro files, digital copy of the timing sheet, digital file of the traffic volume count used in the analysis and any other assumptions used to prepare the timing sheet.
17. The District Development Technician forwards this information to the Regional Traffic Engineer for acceptance (initialing of the timing sheet). Any rejected timing plans are returned to the Developer for correction prior to proceeding to the next stage of the project.
18. The District Development Technician arranges to delineate the jurisdictional boundaries with the municipality and receive a letter from the municipality agreeing to the boundaries.

Developer Information Sheet - Traffic Signal Projects

(Projects which include traffic signals)

19. The **Developer**

- **Submits** to the District Development Technician a traffic management plan, construction schedule and appropriate financial security for the complete project construction. The Ministry will recover costs from the Developer for all Ministry associated costs for the development (controller, signal commissioning, paint marking, ministry supplied materials, design review, etc.).
- **Submits** to the District Development Technician a letter from the city council agreeing to cost sharing of the on going electrical power and maintenance costs incurred by Ministry for additions to the electrical system.

20. The District Development Technician issues the appropriate construction permits. The District Development Technician outlines to the Developer the controller delivery requirements, electrical inspection fees, conditions of site acceptance and conditions of project closure. The permits issued are based on the current drawings and specifications submitted to the Ministry: changes to the design during construction due to unforeseen circumstances or Developer initiated changes must be resubmitted to the Ministry for approval and modification of the construction permit. Development work not conforming to these requirements may have a stop work order issued until they comply with these requirements.

21. The **Developer**

- **Arranges** with the District Development Technician to initiate a pre-construction meeting with the Developer's Installation Contractor, the Electrical Maintenance Contractor, the Manager, Electrical Services and the Electrical Design Consultant. Key issues will include:
 - Schedule of Work
 - Lines of Communication
 - Traffic Control
 - List of materials and suppliers
- **Proceeds** with the construction.
- **Orders** a traffic controller from the Manager, Electrical Services by requesting a quote for a controller and providing a Purchase Order to the EEC.
- **Contacts** the District Development Technician who in turn contacts the Manager, Electrical Services to initiate BC Hydro (or other electrical service provider) billing with the utility and cost sharing arrangements with the municipality.

22. The Electrical Maintenance Contractor provides inspection; commissions the new/existing traffic controller and energizes the traffic signal. The signal may be made operational prior to all other Developer works being completed; the Manager, Electrical Services will determine whether the minimum requirements for activating a signal have been met.

23. The **Developer advises** the District Development Technician when all remaining electrical and construction work is complete.

24. The District Development Technician advises the District Operations and the Manager, Electrical Services, that the site is ready for their inspection.

25. The District Development Technician reviews input from the above and advises the Developer of any required changes.

26. Once all changes have been completed and inspected, the **Developer submits** signed and sealed civil and electrical Record drawings (in AutoCAD format) as well as the associated digital files to the District Development Technician. The District Development Technician forwards these drawings to the District Operations (civil) and Electrical Engineering (electrical drawings) for their acceptance. If drawings are not in compliance, the District Development Technician advises the **Developer who arranges** for any

Developer Information Sheet - Traffic Signal Projects

(Projects which include traffic signals)

corrections and resubmits to the District Development Technician. Once the drawings are accepted, Electrical Engineering will forward drawings to the Manager, Electrical Services.

27. Once drawings are accepted by the Ministry, the District Development Technician charges back all cost recoverable charges from the Ministry to the Developer.
28. The District Development Technician releases the Developer's financial security for the completed project.

Getting a traffic signal into operation to meet your development timetable!

Every traffic signal requires a controller to operate the signal. New signal controllers and modifications to existing for Ministry traffic signals are supplied exclusively by the Ministry, Electrical Engineering Centre (EEC), and Electrical Maintenance Contractor.

There may be up to a 12-week design, assembly, testing and delivery period for a new signal controller. This 12 week period does not commence until the EEC has received signed and sealed 1) **electrical design drawings**, 2) **traffic engineering check sheet**, 3) **Traffic Signal Timing Sheet**, and 4) **financial assurance**. The controller delivery period should be taken into account when determining the turn-on date for the new or modified signal.

The process outlined on this Information Sheet is designed to facilitate the supply of a new controller by ensuring the appropriate approvals and documents are provided at each stage of the project life cycle.

Developer Information Sheet - Traffic Signal Projects

(Projects which include traffic signals)

The following provisions shall form part of the Development Approval Permit

- A. All electrical work shall conform to the current edition of the Canadian Electrical Code and the B. C. amendments.
- B. The Manager, Electrical Services shall coordinate all Ministry electrical inspections.
- C. All electrical fees and permits associated with the project are the responsibility of the electrical contractor.
- D. All electrical work shall conform to the current Ministry Standard Specifications for Highway Construction available through the Ministry of Management Services - <http://www.publications.gov.bc.ca/>
- E. All electrical designs shall conform to Ministry Electrical and Traffic Engineering Manual with associated Technical Bulletins, specifications and materials and be accepted and signed by the Ministry Electrical Representative.
http://www.th.gov.bc.ca/publications/eng_publications/electrical/electrical_and_traffic_eng/2004-Electrical_Signing_Design_Manual/tableofcontents.htm
http://www.th.gov.bc.ca/publications/eng_publications/TE_Bulletins/TE_bulletins.htm
- F. All geometric, paving marking and signing designs shall conform to the latest TAC Guidelines, B.C. Supplement to TAC Guidelines, Ministry Pedestrian Crossing Manual and Ministry Sign and Pavement Marking Standards Manual.
- G. All materials utilized in the construction of Ministry electrical installations shall be from *the Ministry Recognized Products Book*, http://www.th.gov.bc.ca/publications/eng_publications/geotech/rpb.htm
- H. Prior to commencement of any electrical construction, the electrical contractor shall contact the Manager, Electrical Services or his designate, in order to establish an inspection schedule, and to ensure that they are aware of construction standards, specifications and approved materials.
- I. The electrical contractor shall advise the Manager, Electrical Services of the intended start date a minimum of one week in advance.
- J. The electrical contractor shall **NOT** enter any Ministry electrical installation without prior approval of the Manager, Electrical Services.
- K. The project will not be considered complete until a final acceptance inspection is completed by the Manager, Electrical Services or his designate.
- L. The project will not be considered complete until all electrical utilities have been properly connected.
- M. The project will not be considered complete until the Provincial Electrical Inspector completes a final inspection.
- N. The project will not be considered complete until the Developer's Electrical Design Consultant has submitted a final set of "Record" signed and sealed electrical drawings (including digital ACAD drawings) to the Ministry Electrical Representative.
- O. The project will not be considered complete until the appropriate hydro and cost sharing agreement information has been submitted and signed.
- P. The electrical contractor will be notified in writing of any deficiencies within 14 days of the inspection.
- Q. The Developer's electrical contractor shall correct any deficiencies within 14 days of notification from the Manager, Electrical Services..
- R. After 14 days, the Manager, Electrical Services will arrange to have the deficiencies completed and charged back to the Developer. .