PROVINCE OF BRITISH COLUMBIA

MINISTRY OF TRANSPORTATION AND HIGHWAYS

PAVEMENT DESIGN STANDARDS

(TECHNICAL CIRCULAR T - 9/95)

GEOTECHNICAL AND MATERIALS ENGINEERING BRANCH

JULY 10, 1995

Technical Circular T - 9/95
(July, 1995)

TO: REGIONAL MANAGERS, GEOTECHNICAL & MATERIALS ENG.
REGIONAL MANAGERS, OPERATIONS
REGIONAL MANAGERS, PROFESSIONAL SERVICES
REGIONAL MANAGERS, PAVING
REGIONAL ASPHALT LABORATORY SUPERVISORS

SUBJECT: PAVEMENT DESIGN STANDARDS

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PAVEMENT DESIGN STANDARDS

1.0 PURPOSE:

- The purpose of this technical circular is to define pavement design standards for new construction and reconstruction in the Province of British Columbia.

- The standards define the requirements for all pavement structures designed by British Columbia Ministry of Transportation and Highways personnel, private consultants and contractors. These standards have been developed in consultation with British Columbia Regional Pavement Designers.

- Four design standards, based on general roadway classification, are used to categorize British Columbia's provincial road network. Twenty (20) year design Equivalent Single Axle Loads (ESALs) are the primary criteria used for selection of the appropriate standard with additional subgrade material criteria applied to low volume roads and subdivision roads. These are summarized as follows:

STANDARD TYPE	ROADWAY DESIGNATION	20 YEAR DESIGN ESAL CRITERIA
TYPE "A"	HIGH VOLUME ROADS	> 1,000,000
TYPE "B"	MEDIUM VOLUME ROADS	100,000 to 1,000,000
TYPE "C"	LOW VOLUME ROADS	< 100,000
TYPE "D"	SUBDIVISION ROADS	< 100,000

1.0 PURPOSE (continued):

- The new standards specify the thicknesses of Asphalt Pavement (A.P.) and Crushed Base Course (C.B.C.). The structural requirements for Select Granular Sub-base (S.G.S.B.) thickness are to be determined by the pavement designer based on traffic loading, subgrade type and local environmental conditions (drainage conditions and frost penetration). In addition to structural requirements, minimum thicknesses of Select Granular Sub-base S.G.S.B. (Reference: Section 3.2) must be met.

- Where specific site conditions and economic benefits warrant departure from the pavement design standards specified herein, Crushed Granular Equivalency (C.G.E.) factors are provided **as a guide** for development of alternative pavement designs.

- It is the intent that the standards specified herein replace those currently specified in the Ministry of Transportation and Highways (M.O.T.H.) "Design Manual" (Reference: TAB 3/Part B - Cross Sections and Barrier Drawings for Low Volume Roads, Rural Local Undivided, Rural Collector and Arterial, RED and RFD).

2.0 BACKGROUND:

- Over the last decade, British Columbia pavement designs on primary highways have changed from relatively thin pavement layers consisting of 75 mm of dense graded Asphalt Pavement (A.P.) placed on Crushed Base Course (C.B.C.) and Select Granular Sub-base (S.G.S.B.) layers to current standards that designate 50 mm of dense graded Asphalt Pavement (A.P.) over 100 mm of Asphalt Base Course (A.B.C.) over Crushed Base Course (C.B.C.) and Select Granular Sub-base (S.G.S.B.) layers.

- Due to typically high asphalt cement contents (ranging from 4.0% to 5.0%) in the Asphalt Base Course (A.B.C.), the intended function of this layer to serve as a crack relief layer has been negated. The resultant 150 mm asphalt slab thickness has posed some problems during subsequent rehabilitation due to the difficulty of restoring pavements with cracks and other distress types that have propagated the full depth of the asphalt mat. In some cases, such as on the Coquihalla Highway, the use of Class "C" asphalts, the most temperature susceptible grade specified in the Canadian General Standards Board (C.G.S.B.) standards, have amplified the situation with a high frequency of transverse cracking that has occurred due to cold winter temperatures.

2.0 BACKGROUND (continued):

- Rehabilitation measures such as Hot In-Place (H.I.P.) recycling, which treat only the top 50 mm of the Asphalt Pavement (A.P.), are ineffective in preventing reflective cracking in thick asphalt slabs, since full depth cracks may be up to 150 mm in depth. Cold milling can retard the reflection of lower layer cracks in an asphalt pavement surface overlay; however, it necessitates the removal of most of the original asphalt pavement slab (i.e. up to 125 mm of a 150 mm thick pavement) at great expense.

- The new pavement design standards incorporate the application of thinner asphalt pavements. Therefore, the pavement structure is generally cheaper to build, resulting in a more economical structure that can be rehabilitated effectively in the future at less cost.

3.0 PROCEDURE:

3.1 PAVEMENT DESIGN STANDARDS

- The new pavement design standards, replacing those currently specified in the Ministry of Transportation and Highways (M.O.T.H.) "Design Manual", are summarized in Tables 1 and 2 and illustrated with typical cross-sections in Figures 1, 2, 3 and 4.

3.2 MINIMUM SELECT GRANULAR SUB-BASE (S.G.S.B.) REQUIREMENTS

- The structural requirements for Select Granular Sub-base (S.G.S.B.) thickness are to be determined by the pavement designer based on traffic loading, subgrade type and local environmental conditions (drainage conditions and frost penetration). The minimum Select Granular Sub-base (S.G.S.B.) requirements specified herein shall apply.

3.2.1. ROCK SUBGRADES

- 150 mm minimum Select Granular Sub-base (S.G.S.B.) on Rock Subgrades.

- All levelling materials applied directly to blasted rock cuts shall be of Select Granular Sub-base (S.G.S.B.) quality.

TABLE - 1

PAVEMENT DESIGN STANDARDS

TYPE "A" (REFERENCE: FIGURE 1)
HIGH VOLUME ROADS: > 1,000,000 ESAL's

100 mm A.P.
150 mm C.B.C. (-25 mm)
150 mm C.B.C. (75 mm MAXIMUM Size)
S.G.S.B. (As required in Soil - * Minimum 300 mm Thickness)
S.G.S.B. (150 mm in Rock) **

TYPE "B" (REFERENCE: FIGURE 2)
MEDIUM VOLUME ROADS: 100,000 to 1,000,000 ESAL's

75 mm A.P. *
150 mm C.B.C. (-25 mm)
150 mm C.B.C. (75 mm MAXIMUM Size)
S.G.S.B. (As required in Soil - * Minimum 300 mm Thickness)
S.G.S.B. (150 mm in Rock) **

NOTES:

- **75 mm A.P. specified in Type "B" shall be constructed in 2 lifts for 19 mm MAXIMUM size aggregate and 1 lift for 25 mm MAXIMUM size aggregate (in accordance with the latest version of B.C. MOTH Standard Specifications for Highway Construction - Section 223, Subsection 223.23.06).**

- **No S.G.S.B. is required in exceptional circumstances where the following criteria have been met:**

  Structural Design Criteria is satisfied

  AND

  Subgrade material consists of clean granular deposits that satisfy S.G.S.B. gradation and construction criteria (i.e. rutting criteria) in accordance with the latest version of B.C. MOTH Standard Specifications for Highway Construction - Section 202 "GRANULAR SURFACING, BASE AND SUB-BASES", Subsection 202.06).

**** All levelling materials applied directly to blasted rock cuts shall be of S.G.S.B. quality.**

*** THE FINAL S.G.S.B. THICKNESS MUST BE APPROVED BY THE REGIONAL GEOTECHNICAL AND MATERIALS ENGINEER.**

TABLE - 2

PAVEMENT DESIGN STANDARDS

TYPE "C" (REFERENCE: FIGURE 3)
LOW VOLUME ROADS
< 100,000 ESAL's

50 mm A.P.
225 mm C.B.C. (-25 mm)
S.G.S.B. (As required in Soil - * Minimum Requirements Specified Below)
S.G.S.B. (150 mm in Rock) **

TYPE "D" (REFERENCE: FIGURE 4)
SUBDIVISION ROADS
< 100,000 ESAL's

50 mm A.P.
225 mm C.B.C. (-25 mm)
S.G.S.B. (As required in Soil - * Minimum Requirements Specified Below)
S.G.S.B. (150 mm in Rock) **

NOTES:

* Minimum 150 mm S.G.S.B. on Coarse Grained Subgrades (Unified Soils Classification System - GW/GP/GM/GC/SW/SP/SM/SC) where groundwater does not pose a drainage problem and frost penetration does not affect the structure.

- Minimum 300 mm S.G.S.B. on Fine Grained Subgrades (Unified Soils Classification System - ML/CL/OL//MH/CH/OH).

- No S.G.S.B. is required in exceptional circumstances where the following criteria have been met:

  Structural Design Criteria is satisfied

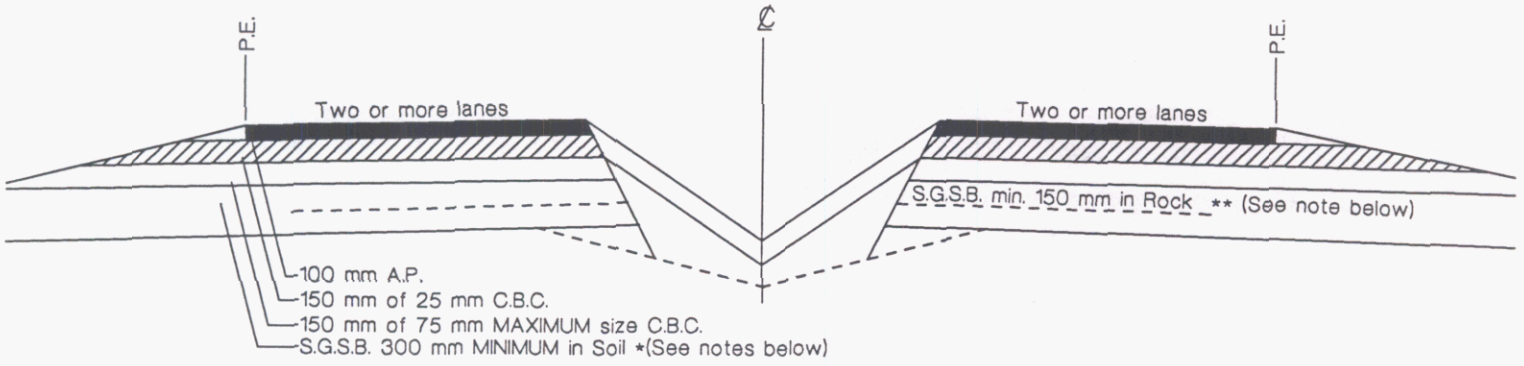
  AND

  Subgrade material consists of clean granular deposits that satisfy S.G.S.B. gradation and construction criteria (i.e. rutting criteria) in accordance with the latest version of B.C. MOTH Standard Specifications for Highway Construction - Section 202 "GRANULAR SURFACING, BASE AND SUB-BASES", Subsection 202.06).

** All levelling materials applied directly to blasted rock cuts shall be of S.G.S.B. quality.

- THE FINAL S.G.S.B. THICKNESS MUST BE APPROVED BY THE REGIONAL GEOTECHNICAL AND MATERIALS ENGINEER.

FIGURE - 1



TYPE "A"

HIGH VOLUME ROADS
>1,000,000 ESAL's

NOTES:

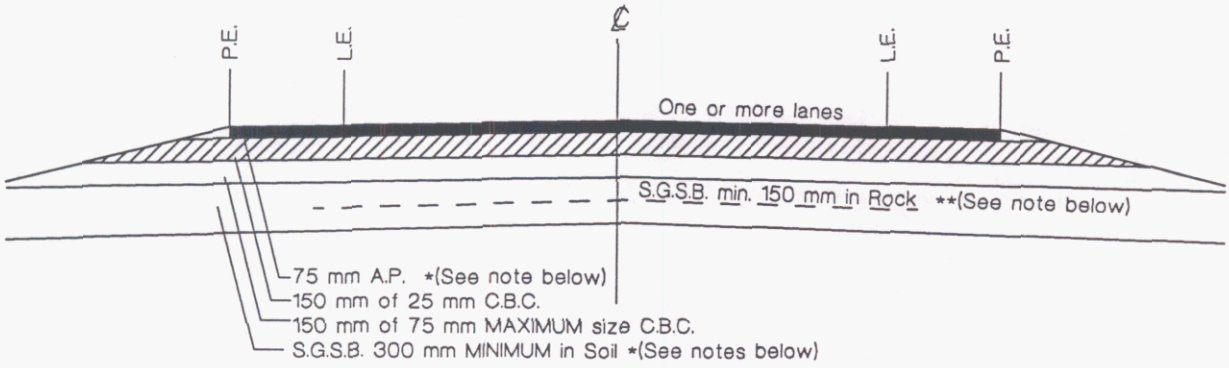
* No S.G.S.B. is required in exceptional circumstances where the following criteria have been met:

  Structural Design Criteria is satisfied
  and
  Subgrade material consists of clean granular deposits that satisfy S.G.S.B. gradation and construction criteria (i.e. rutting criteria) in accordance with the latest version of the B.C. MOTH Standard Specifications for Highway Construction - Section 202 "GRANULAR SURFACING, BASE AND SUB-BASES", (Subsection 202.06).

** All levelling materials applied directly to blasted rock cuts shall be of S.G.S.B. quality.

* THE FINAL S.G.S.B. THICKNESS MUST BE APPROVED BY THE REGIONAL GEOTECHNICAL AND MATERIALS ENGINEER.

FIGURE - 2



TYPE "B"

MEDIUM VOLUME ROADS
100,000 to 1,000,000 ESAL´s

NOTES:

- 75 mm A.P. to be constructed in 2 lifts for 19 mm MAXIMUM size aggregate and 1 lift for 25 mm MAXIMUM size aggregate.
  (In accordance with the latest version of the B.C. MOTH Standard Specifications for Highway Construction - Section 223, Subsection 223.23.06)

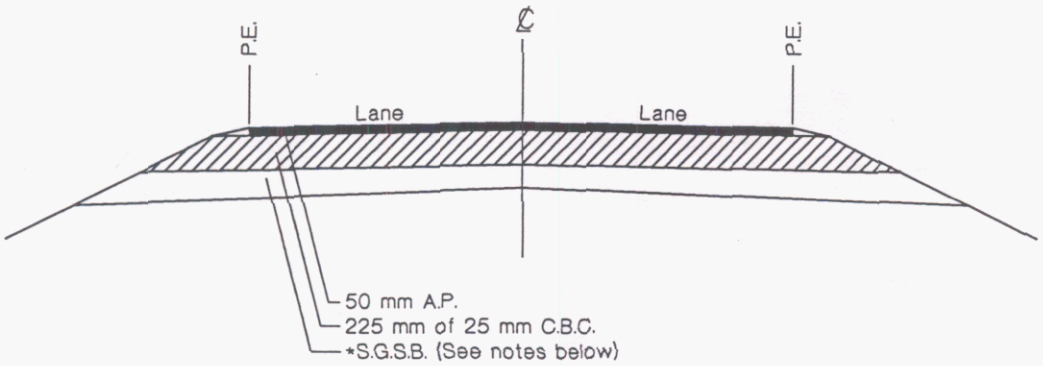
- No S.G.S.B. is required in exceptional circumstances where the following criteria have been met:

  Structural Design Criteria is satisfied
  and
  Subgrade material consists of clean granular deposits that satisfy S.G.S.B. gradation and construction criteria (i.e. rutting criteria) in accordance with the latest version of the B.C. MOTH Standard Specifications for Highway Construction - Section 202 "GRANULAR SURFACING, BASE AND SUB-BASES", (Subsection 202.06).

**All levelling materials applied directly to blasted rock cuts shall be of S.G.S.B. quality.

- THE FINAL S.G.S.B. THICKNESS MUST BE APPROVED BY THE REGIONAL GEOTECHNICAL AND MATERIALS ENGINEER.

FIGURE - 3



TYPE "C"

LOW VOLUME ROADS

<100,000 ESAL's

NOTES:

- Minimum 150 mm S.G.S.B. on Course Grained Subgrades (Unified Soils Classification System - GW/GP/GM/GC/SW/SP/SM/SC) where groundwater does not pose a drainage problem and frost penetration does not affect the structure.

- Minimum 300 mm S.G.S.B. on Fine Grained Subgrades (Unified Soils Classification System - ML/CL/OL/MH/CH/OH).

* No S.G.S.B. is required in exceptional circumstances where the following criteria have been met:

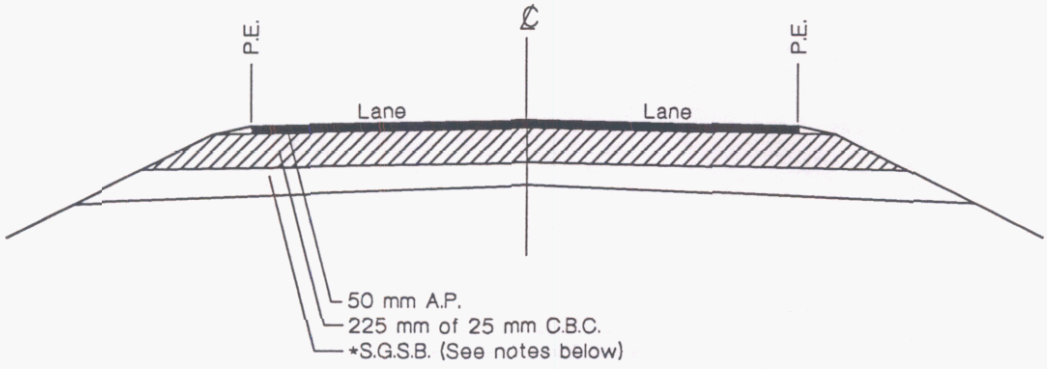
  Structural Design Criteria is satisfied
  and
  Subgrade material consists of clean granular deposits that satisfy S.G.S.B. gradation and construction criteria (i.e. rutting criteria) in accordance with the latest version of the B.C. MOTH Standard Specifications for Highway Construction - Section 202 "GRANULAR SURFACING, BASE AND SUB-BASES", (Subsection 202.06).

- Minimum 150 mm S.G.S.B. in Rock.

- All levelling materials applied directly to blasted rock cuts shall be of S.G.S.B. quality.

- THE FINAL S.G.S.B. THICKNESS MUST BE APPROVED BY THE REGIONAL GEOTECHNICAL AND MATERIALS ENGINEER.

FIGURE - 4



TYPE "D"

SUBDIVISION ROADS

<100,000 ESAL's

NOTES:

- Minimum 150 mm S.G.S.B. on Course Grained Subgrades (Unified Soils Classification System - GW/GP/GM/GC/SW/SP/SM/SC) where groundwater does not pose a drainage problem and frost penetration does not affect the structure.

- Minimum 300 mm S.G.S.B. on Fine Grained Subgrades (Unified Soils Classification System - ML/CL/OL/MH/CH/OH).

- No S.G.S.B. is required in exceptional circumstances where the following criteria have been met:

  Structural Design Criteria is satisfied
  and
  Subgrade material consists of clean granular deposits that satisfy S.G.S.B. gradation and construction criteria (i.e. rutting criteria) in accordance with the latest version of the B.C. MOTH Standard Specifications for Highway Construction - Section 202 "GRANULAR SURFACING, BASE AND SUB-BASES", (Subsection 202.06).

- Minimum 150 mm S.G.S.B. in Rock.

- All levelling materials applied directly to blasted rock cuts shall be of S.G.S.B. quality.

- THE FINAL S.G.S.B. THICKNESS MUST BE APPROVED BY THE REGIONAL GEOTECHNICAL AND MATERIALS ENGINEER.

3.2 MINIMUM SELECT GRANULAR SUB-BASE S.G.S.B. REQUIREMENTS (continued)

3.2.2 SOIL SUBGRADES

- **The following minimum Select Granular Sub-base (S.G.S.B.) thickness requirements on Soil Subgrades shall apply:**

PAVEMENT DESIGN STANDARDS - TYPES "A" & "B".

(1) Generally, a minimum thickness of 300 mm Select Granular Sub-base (S.G.S.B.) shall be applied over subgrade materials.

(2) No Select Granular Sub-base (S.G.S.B.) is required in exceptional circumstances where the following criteria have been met:

Structural Design Criteria is satisfied

AND

Subgrade material consists of clean granular deposits that satisfy Select Granular Sub-base (S.G.S.B.) gradation and construction criteria (i.e. rutting criteria) in accordance with the latest version of British Columbia Ministry of Transportation and Highways Standard Specifications for Highway Construction - Section 202 "GRANULAR SURFACING, BASE AND SUB-BASES", (Subsection 202.06).

(3) All final Select Granular Sub-base (S.G.S.B.) thicknesses must be approved by the Regional Geotechnical and Materials Engineer.

PAVEMENT DESIGN STANDARDS - TYPES "C" & "D"

(1) Generally, minimum thickness requirements for Select Granular Sub-base (S.G.S.B.) shall be based on subgrade material type as follows:

- Minimum 150 mm Select Granular Sub-base (S.G.S.B.) on Coarse Grained Subgrades (Unified Soils Classification System - GW/GP/GM/GC/SW/SP/SM/SC) where groundwater does not pose a drainage problem and frost penetration does not affect the structure.

3.2.2. SOIL SUBGRADES (continued)

PAVEMENT DESIGN STANDARDS - TYPES "C" & "D" (continued)

(1) (continued)

- Minimum 300 mm Select Granular Sub-base (S.G.S.B.) on Fine Grained Subgrades (Unified Soils Classification System - ML/CL/OL//MH/CH/OH).

(2) No Select Granular Sub-base (S.G.S.B.) is required in exceptional circumstances where the following criteria have been met:

Structural Design Criteria is satisfied

AND

Subgrade material consists of clean granular deposits that satisfy Select Granular Sub-base (S.G.S.B.) gradation and construction criteria (i.e. rutting criteria) in accordance with the latest version of British Columbia Ministry of Transportation and Highways Standard Specifications for Highway Construction 1995 -Section 202 "GRANULAR SURFACING, BASE AND SUB-BASES", (Subsection 202.06).

(3) All final Select Granular Sub-base (S.G.S.B.) thicknesses must be approved by the Regional Geotechnical and Materials Engineer.

3.3 TRAFFIC ANALYSIS

The recommended method for determination of 20 year design Equivalent Single Axle Loads (ESALs) is the Modified Asphalt Institute Method specified in Table 3. Furthermore, it is recommended that in the application of this method, ESALs for various truck axle configurations are determined based on the Transportation Association of Canada (TAC) Vehicle Weights and Dimensions Study, illustrated in Figure 5 (ESALs vs Axle Group Load).

TABLE - 3

ESAL CALCULATIONS
MODIFIED ASPHALT INSTITUTE METHOD

ESAL = AADT * HVP * HVDF * NALV * TDY

where:

ESAL = EQUIVALENT SINGLE AXLE LOADS PER LANE PER YEAR (FOR THE BASE YEAR)

AADT = AVERAGE ANNUAL DAILY TRAFFIC (ALL LANES & BOTH DIRECTIONS)

HVP = HEAVY VEHICLE PERCENTAGE (DIVIDED BY 100)

HVDF = HEAVY VEHICLE DISTRIBUTION FACTOR (% OF HEAVY VEHICLES IN THE DESIGN LANE)

NALV = NUMBER OF EQUIVALENT AXLE LOADS PER VEHICLE (ESAL's PER VEHICLE)

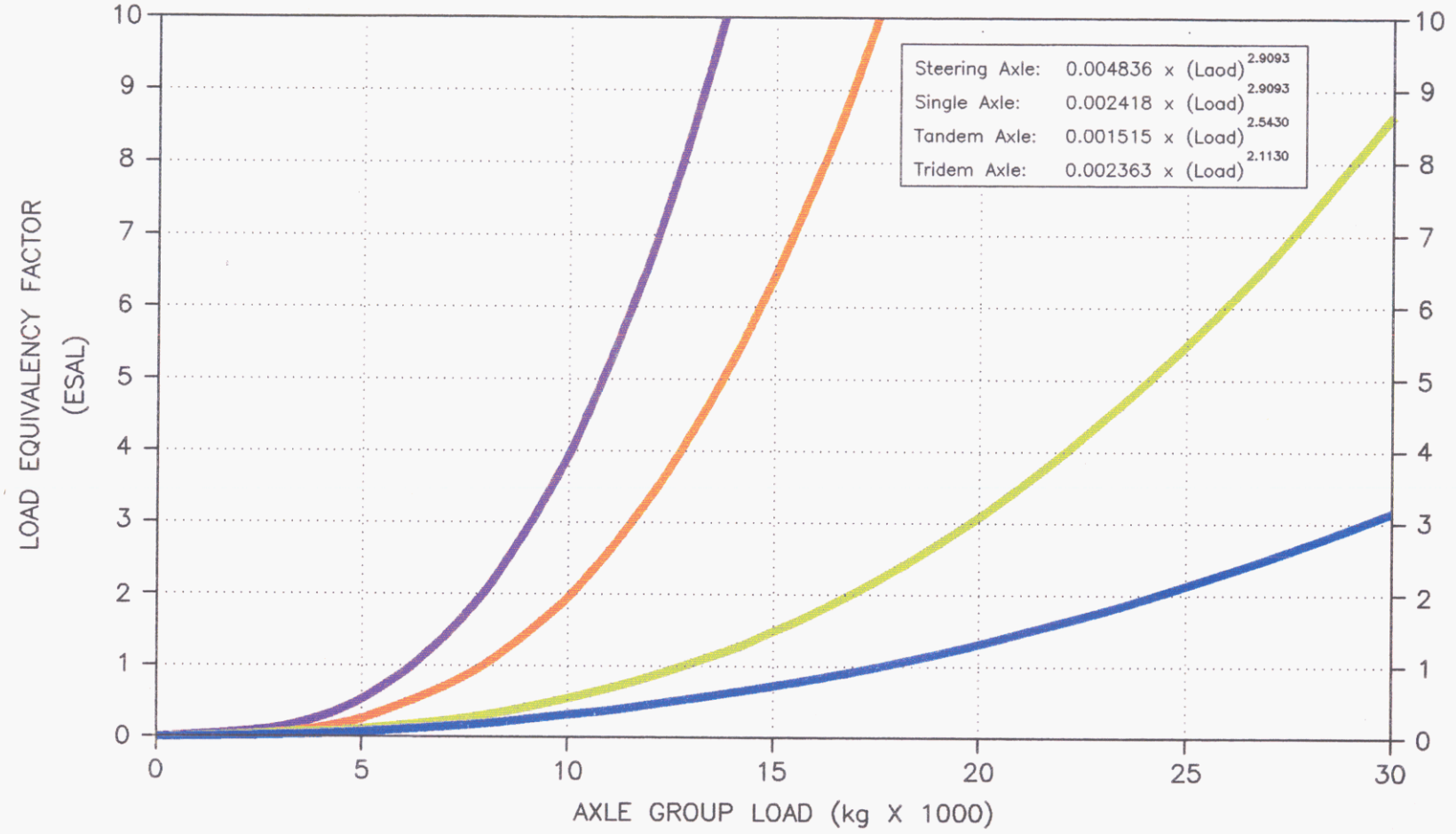
TDY = TRAFFIC DAYS PER YEAR

NOTE:

ESALs (BASE YEAR) X 20 YR. TRAFFIC GROWTH RATE FACTOR = 20 YEAR DESIGN ESALs

TAC

CANADIAN VEHICLE WEIGHTS AND DIMENSIONS STUDY



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Ministry of Transportation and Highways
GEOTECHNICAL and MATERIALS ENGINEERING

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DRAWN BY: RBW
DATE: 95-06-23

FIGURE 5

3.4 AMERICAN ASSOCIATION OF STATE HIGHWAY AND TRANSPORTATION OFFICIALS (AASHTO) PAVEMENT DESIGN CRITERIA

In order to ensure a consistent design approach using the American Association of State Highway and Transportation Officials (AASHTO) Pavement Design Method for new construction, the following criteria shall apply:

- **ANALYSIS PERIOD = 20 YEARS**
- **RELIABILITY (R):**

  HIGH VOLUME & MEDIUM VOLUME ROADS: R = 85%
  LOW VOLUME & SUBDIVISION ROADS: R = 75%

- **STANDARD DEVIATION (S_0): S_0 = 0.45**
- **PAVEMENT SERVICEABILITY INDEX (PSI):**

  INITIAL SERVICEABILITY INDEX: (p_i) = 4.2
  TERMINAL SERVICEABILITY INDEX: (p_t) = 2.5

- **MATERIALS CHARACTERIZATION:**

MATERIAL DESCRIPTION	RESILIENT MODULUS * (M_R) MPa (approx. psi)	STRUCTURAL LAYER COEFFICIENT (a_i)
ASPHALT PAVEMENT (A.P.)	2,750 (400,000)	0.40
CRUSHED BASE COURSE (C.B.C.) (25 mm, 50 mm & 75 mm)	200 (30,000)	0.14
SELECT GRANULAR SUB-BASE (S.G.S.B.)	100 (15,000)	0.10

* IF FIELD OR LABORATORY RESILIENT MODULUS VALUES (M_R) ARE AVAILABLE, THEY MAY BE USED. HOWEVER, THEY MUST BE APPROVED BY THE REGIONAL GEOTECHNICAL AND MATERIALS ENGINEER.

3.4 AMERICAN ASSOCIATION OF STATE HIGHWAY AND TRANSPORTATION OFFICIALS (AASHTO) PAVEMENT DESIGN CRITERIA (continued)

- **DRAINAGE COEFFICIENTS (m_i):**

  The following drainage coefficients (m_i) shall apply to untreated Crushed Base Course (C.B.C.) and Select Granular Sub-base (S.G.S.B.) materials:

m_i	CRUSHED BASE COURSE (C.B.C.)/SELECT GRANULAR SUB-BASE (S.G.S.B.) DESCRIPTION
1.15	*OPEN GRADED* CRUSHED BASE COURSE (C.B.C.) & SELECT GRANULAR SUB-BASE (S.G.S.B.)
0.95	*HIGH QUALITY* CRUSHED BASE COURSE (C.B.C.) & SELECT GRANULAR SUB-BASE (S.G.S.B.) (i.e. <5% FINES PASSING .075 mm SIEVE)
0.80	*POOR QUALITY* CRUSHED BASE COURSE (C.B.C.) & SELECT GRANULAR SUB-BASE (S.G.S.B.) (i.e. >5% FINES PASSING .075 mm SIEVE)

3.5 ALTERNATIVE PAVEMENT DESIGNS

- Where site specific conditions warrant (i.e. granular quality, granular availability, etc.) alternative pavement designs may be generated using the Crushed Granular Equivalency (C.G.E.) concept **as a guide**.

- The economic benefit of any alternative design (minimum practical thicknesses are to be maintained) is to be determined on a project specific basis.

- C.G.E. factors for New Construction and Pavement Rehabilitation are provided in Tables 4 and 5 respectively.

- Dynatest ELMOD software is acceptable for rehabilitation overlay design. However, ELMOD is not to be used for design of new construction.

TABLE - 4

CRUSHED GRANULAR EQUIVALENCY (C.G.E.) FACTORS NEW CONSTRUCTION

PAVEMENT MATERIAL	C.G.E. FACTOR
Bituminous Bound Layers	
Hot-Mix Asphalt Pavement (A.P.)	2.0
B.C. Stabilizer	1.5
Open Graded Granular Base (Bituminous Bound)	1.5**
Asphalt Base Course (A.B.C.)	1.7
Recycled Asphalt Pavement In Granular Base Course (Min. 50% Aggregate)	0.5*
Portland Cement Bound Layers	
Portland Cement Concrete	3.0
Roller Compacted Concrete	2.5
Cement Treated Base	1.8
Open Graded Granular Base (Cement Bound)	1.6
Unbound Crushed Base Course Layers(-25 mm, -50 mm & -75 mm)	
Well Graded Crushed Unbound Granular Base	1.0
Intermediate Graded Crushed Unbound Granular Base	1.1**
Open Graded Crushed Unbound Granular Base	1.2**
Unbound Granular Sub-base Layers	
Well Graded Crushed Unbound Granular Sub-base	1.0
Intermediate Graded Crushed Unbound Granular Sub-base	1.1**
Open Graded Crushed Unbound Granular Sub-base	1.2**
Pit Run Granular Sub-base	0.7
Screened Granular Sub-base	0.7

* Based on British Columbia Ministry of Transportation and Highways experience.

** Based on British Columbia Ministry of Transportation and Highways experience and must be confined with a minimum of 75 mm of dense graded Asphalt Pavement (A.P.).

NOTES:

(1) SURFACE TREATMENT:
For design, surface treatment is assumed to have no structural strength. Built-up layers of surface treatment (>75 mm thickness) could be assigned a C.G.E. of 1.5.

(2) GEOTEXTILES AND GEOGRIDS:
Geotextiles do not provide structural strength and are to be used only as separators. Geogrids can be used to provide structural equivalence if strain can be mobilized within the grid.

TABLE - 5

CRUSHED GRANULAR EQUIVALENCY (C.G.E.) FACTORS PAVEMENT REHABILITATION

PAVEMENT MATERIAL	C.G.E. FACTOR
Bituminous Bound Layers	
Hot-Mix Asphalt Pavement (uncracked)	2.0
Hot-Mix Asphalt Pavement (cracked)	1.5
Hot In-Place Recycled Asphalt Pavement	1.7*
Cold In-Place Recycled Asphalt Pavement	1.5
Recycled Asphalt Pavement In Granular Base Course (Min. 50% Aggregate)	0.5**
Portland Cement Bound Layers	
Portland Cement Concrete (good condition)	3.0
Portland Cement Concrete (fair condition)	2.5
Portland Cement Concrete (poor condition)	2.0
Cement Treated Base	1.5
Unbound Granular Base and Sub-base	
Old Granular Base	0.7
Old Granular Sub-base (Crushed)	0.7

* The C.G.E. for Hot In-Place (H.I.P.) Recycled Asphalt Pavement is lower than virgin material due to an expected reduced fatigue life.

** Based on British Columbia Ministry of Transportation and Highways experience.

NOTES:

(1) SURFACE TREATMENT:
For design, surface treatment is assumed to have no structural strength. Built-up layers of surface treatment (>75 mm thickness) could be assigned a C.G.E. of 1.5 (uncracked) and 1.1 (cracked).

(2) GEOTEXTILES AND GEOGRIDS:
Geotextiles do not provide structural strength and are to be used only as separators. Geogrids can be used to provide structural equivalence if strain can be mobilized within the grid.

3.6 RESPONSIBILITIES

- In accordance with Section 3.5, Alternative Pavement Designs are to be communicated to the Pavement Design Engineer, Geotechnical and Materials Engineering Branch in Victoria for review prior to tendering.

- Any future modifications to the PAVEMENT DESIGN STANDARDS specified herein shall be coordinated and issued by the Pavement Design Engineer, Geotechnical and Materials Engineering Branch in Victoria. Any future modifications will be developed in consultation with Regional Pavement Designers.

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