A2.7.3 Plan and Elevation

[Note: The following is only a guide for General Notes. Omit those sections, items and terms in parenthesis that are not applicable, except retain the parenthetical references to ASTM equivalents to AASHTO Specifications.]

General Notes:

Provide all materials and perform all work according to the Oregon Standard Specifications for Construction 2002.

Bridge(s) is(are) designed with an allowance of (25psf for present wearing surface) (and) (25psf, 50psf) for future wearing surface and all of the following Live Loads according to the (current) edition of the AASHTO LRFD Bridge Design Specifications (including 20XX thru 20XX interim revisions):

Service and Strength I Limit States:

- HL-93: Design truck (or trucks per LRFD 3.6.1.3) or the design tandems and the design lane load.

Strength II Limit State:

- ODOT Type STP-5BW Permit truck
- ODOT Type STP-4E Permit truck

[Select one of the following notes depending on the methodology used in the design of the bridge foundations]:

Bridge is designed in accordance with AASHTO LRFD Bridge Design Specifications.

[New Seismic Designs ----- Multi-Span Bridges]:
Seismic design is performed by the multi-mode (single-mode) analysis in accordance with the "AASHTO LRFD Bridge Design Specifications" ("AASHTO Guide Specifications for LRFD Seismic Bridge Design") as modified by the "ODOT Bridge Design & Drafting Manual". The 2002 USGS Seismic Hazard Maps have been used to collect the Seismic Hazard Values for the bridge site with Latitude and Longitude :

1000 Year Return Period ("No Collapse" criteria)

- Horizontal Peak Ground Acceleration Coefficient, PGA= g
- Horizontal Response Spectral Acceleration Coefficients: S_S= g, S_1= g

500 Year Return Period ("Serviceable" criteria)

- Horizontal Peak Ground Acceleration Coefficient, PGA= g
- Horizontal Response Spectral Acceleration Coefficients: S_S= g, S_1= g

The bridge site is defined as a Site Class with Site Factors of: F_{pga}= , F_a = , and F_v= .
The Response Modification factors used are: R= for column moments, R= 0.8 for abutment connections, and R= 1.0 for other components.

[New Seismic Designs -----Single-Span Bridges]:
Seismic design is performed in accordance with the "AASHTO LRFD Bridge Design Specifications" ("AASHTO Guide Specifications for LRFD Seismic Bridge Design") as modified by the "ODOT Bridge Design & Drafting Manual" for 500- and 1000-year criteria. The Horizontal Peak Ground Acceleration Coefficients (PGA) for the 500 year (Serviceable) and 1000 year (No Collapse) return periods are g and g respectively, based on 2002 USGS Seismic Hazard Maps.
The bridge site is defined as a Site Class with Site Factor (F_{pga}) of .

Deleted: (multi-mode)

Deleted: The site peak bedrock acceleration coefficients (A) for the 500 year (serviceable) and 1000 year (no collapse) return periods are g and g respectively and the assumed site coefficient (S) is .

Deleted: site peak bedrock acceleration coefficients

Deleted: serviceable

Deleted: no

Deleted: collapse

Deleted: and the assumed site coefficient (S) is .

General Notes - (continued)

[Widenings which do not carry the existing structure]:
Seismic design for widening is performed by the single-mode (multi-mode) analysis, with Response Modification Factors, in accordance with the "AASHTO LRFD Bridge Design Specifications" as modified by the "ODOT Bridge Design & Drafting Manual". Seismic design is based on __ ft of superstructure width and is not designed to carry the seismic load of the existing structure. The 2002 USGS Seismic Hazard Maps have been used to collect the Seismic Hazard Values for the bridge site with Latitude and Longitude :

1000 Year Return Period ("No Collapse" criteria)
- Horizontal Peak Ground Acceleration Coefficient, PGA= g
- Horizontal Response Spectral Acceleration Coefficients: S_S= g, S_1= g

500 Year Return Period ("Serviceable" criteria)
- Horizontal Peak Ground Acceleration Coefficient, PGA= g
- Horizontal Response Spectral Acceleration Coefficients: S_S= g, S_1= g

The bridge site is defined as a Site Class __ with Site Factors of: F_{pga}= , F_a = , and F_v= .

[Widenings which do carry the existing structure]:
Seismic design for widening is performed by the single-mode (multi-mode) analysis, with Response Modification Factors, in accordance with the "AASHTO LRFD Bridge Design Specifications" as modified by the "ODOT Bridge Design & Drafting Manual". The widened structure is designed to resist the full seismic load including the existing structure. The 2002 USGS Seismic Hazard Maps have been used to collect the Seismic Hazard Values for the bridge site with Latitude and Longitude :

1000 Year Return Period ("No Collapse" criteria)
- Horizontal Peak Ground Acceleration Coefficient, PGA= g
- Horizontal Response Spectral Acceleration Coefficients: S_S= g, S_1= g

500 Year Return Period ("Serviceable" criteria)
- Horizontal Peak Ground Acceleration Coefficient, PGA= g
- Horizontal Response Spectral Acceleration Coefficients: S_S= g, S_1= g

The bridge site is defined as a Site Class with Site Factors of: F_{pga}= , F_a = , and F_v= .

[**Phase 1 Seismic Retrofit Designs - select appropriate sections**]:

Seismic retrofit design to prevent superstructure pull-off is based on a Horizontal Peak Ground Acceleration Coefficient (PGA) of g and a Site Factor (F_{pga}) of for the Site Class .

[Simple Span Support Connections:]
Longitudinal design forces:
Force to prevent pull-off by single-mode analysis, without substructure stiffness considered, with a maximum response not greater than 2.5 x PGA.

Transverse design forces:
Force equal to 2.5 x PGA x supported dead load.

Deleted: The site peak bedrock acceleration coefficients (A) for the 500 year (serviceable) and 1000 year (no collapse) return periods are ___g and ___g respectively and the assumed site coefficient (S) is __.

Deleted: The site bedrock acceleration coefficients (A) for the 500 year (serviceable) and 1000 year (no collapse) return periods are ___g and ___g respectively and the assumed site coefficient (S) is __.¶

Deleted: site bedrock acceleration coefficient

Deleted: an assumed site coefficient (S)

General Notes - (continued)

[Continuous Span Series Support Connections:]
Longitudinal design forces:
"Plastic hinging" of columns and forces to prevent pull-off by single-mode analysis, considering substructure stiffness with column capacity limitation (strength), maximum response not greater than 2.5 x PGA.

Transverse design forces:
"Plastic hinging" of column(s) (and x-beam frame).

[In-Span Hinges:]
Longitudinal design forces:
"Plastic hinging" of columns and forces to prevent pull-off by single-mode analysis, considering substructure stiffness with column capacity limitation (strength), maximum response not greater than 2.5 x PGA.

Transverse design forces:
Force equal to 2.5 x PGA x supported dead load.

Cable for seismic restraint devices will be furnished by the Department. See Section 00160.30 of the Special Provisions.

( ) indicates (Options), [ ] indicates [Instructions]

For pile foundations:

All Bent(s), Provide _____ [insert pile type & grade of steel*] piling (with reinforced tips) driven (open-ended or closed-ended) to a nominal resistance of _____ kips per pile.

* *example* ==> Pipe Pile ==> 12-¾ x 0.375, ASTM A252 (Grade 2)(Grade 3)

H-Pile ==> HP 10 x 42, ASTM A572, Grade 50

Pile tip elevation for minimum pile penetration at (All) Bent(s) (___) (is elevation _____ feet) (according to the Pile Penetration Table).

[Use one of the following as directed by the Foundation Designer]

Drive (Bent ___), (All) piling to the specified nominal resistance using driving criteria developed from a Wave Equation Analysis.

Drive (Bent ___), (All) piling to the specified nominal resistance using driving criteria developed from the FHWA Gates Equation.

Note: Currently (April, 2007) the use of the FHWA Gates Equation (LRFD) instead of the ODOT Gates Equation (ASD) has to be specified in the contract Special Provisions.

Determine pile resistances from the results of Capwap Analysis and/or Dynamic Pile Load Tests as specified in the Special Provisions.

(If applicable)

Support all falsework on driven piles.

General Notes - (continued)

NOTE: If project plans have a separate footing plan sheet, place all foundation design notes on the footing plan sheet and reference them in the "General Notes"; "See Footing Plan for foundation design notes."

Provide spiral column reinforcement according to ASTM Specification A706, AASHTO Specifications M31 (ASTM A615) Grade 60, AASHTO M225 (ASTM A496), or AASHTO M32 (ASTM A82).

Provide all (other) reinforcing steel according to ASTM Specification A706, or AASHTO M31 (ASTM A615) Grade 60. (Provide Field bent stirrups according to ASTM Specification A706.) Use the following splice lengths (unless shown otherwise):

Reinforcing Splice Lengths (Class B) Grade 60										
Bar Size	#3	#4	#5	#6	#7	#8	#9	#10	#11	#14 & #18
Uncoated	1'-0"	1'-4"	1'-8"	2'-0"	2'-8"	3'-6"	4'-4"	5'-7"	6'-9"	Not permitted
Coated	1'-5"	1'-10"	2'-4"	2'-10"	3'-9"	4'-11"	6'-1"	7'-10"	9'-6"	Not permitted

Splice reinforcing steel at alternate bars, staggered at least one splice length or as far as possible, unless shown otherwise.

Support the bottom mat reinforcing steel from the forms with precast mortar blocks at 24" maximum centers each way. Support the top mat of reinforcing steel from the bottom mat of reinforcing steel with wire bar supports as shown in Chapter 3 of the CRSI Manual of Standard Practice (SBU, BBU, or CHCU). Place wire bar supports at 24" maximum centers.

Use (Stainless steel)(Epoxy coated)(uncoated) reinforcing steel in the deck (and bridge end panel). This includes top and bottom longitudinal bars, (and) top and bottom transverse bars, (and all bars extending into the (sidewalk)(curb)(parapet)).

Epoxy coat reinforcing steel, except prestressing steel, in precast beams (slabs, boxes).

Epoxy coat reinforcing steel in the upper portion of the prestressed (slab) [or] (box). This includes top longitudinal bars, top transverse stirrup ties and bars extending from the prestressed (slab) [or] (box) into the parapets or curbs.

General Notes - (continued)

Place bars 2" clear of the nearest face of concrete (unless shown otherwise). The top bends of stirrups extending from beam stems into the top slab may be shop or field bent (unless shown otherwise). The top bends of stirrups extending from prestressed precast units may be shop or field bent (unless shown otherwise).

Do not fabricate reinforcing steel for columns (and walls) until final footing elevations have been determined in the field.

Provide Class ____ - ___ concrete in post-tensioned box girder superstructure (prestressed-precast units) and as shown on detail plans. See dwg. _____.

General Notes - (continued)

Provide Class **HPC**4000 – 1 ½ , 1, or ¾ concrete in deck (except in prestressed or post-tensioned sections).

Provide Class ____ - 1 ½ , 1 or ¾ concrete in (columns, footings, etc.).

Provide Class 3600 (Seal Concrete) - 1 ½ , 1 or ¾ concrete in seals.

Provide Class 4000 – 3/8 concrete for all drilled shafts.

Provide Class HPC4000 – 1 ½ , 1, or ¾ concrete in reinforced concrete end panels.

Provide Class 3600 - 1 ½ , 1 or ¾ concrete for All (other) concrete.

Provide Class 3600 - 1 ½ , 1, ¾ or 3/8 concrete in walls with form liners.

Provide Class _____ - _____ concrete in precast prestressed (beams, boxes, slabs) according to detail plans. See dwg. _____. The minimum strength of concrete at transfer of prestress is ____ psi.

Provide prestressing steel according to detail plans.

Provide structural steel according to (AASHTO) [or] (ASTM) Specifications in accordance with detail plans.

("Galvanize-Control Silicon" – provided silicon content of the base metal in either of the ranges 0 to 0.04 percent, or 0.15 to 0.25 percent.)

Provide (7/8" diameter) (Type 3) high-strength fasteners at structural connections according to AASHTO Specification M164 (ASTM Specification A325) (unless shown otherwise).

Provide (lock-pin and collar) (black) (coated) (mechanically galvanized) (hot dip galvanized), high-strength fasteners (including washers).

Tighten high-strength fasteners using the (lock-pin and collar fastener tightening) (direct tension indicator tightening) (tension control fasteners tightening) (turn-of-nut tightening) method(s).

See the Special Provisions for detailed coating and tightening requirements.

Note: Consult with the Steel Design Standards and Practice Engineer to review structural steel and painting General Notes.

Provide Douglas Fir (non-laminated) timber conforming to _____ Grade [insert lumber grade] according to WCLIB rules.

Incise and treat sawn members with _____ [insert appropriate treatment from Section 02190] to a minimum retention level of _____ pcf [insert appropriate treatment level] in accordance with AWPA Specification C-2.

Provide all glued laminated timber members according to the requirements of the current American Institute of Timber Construction (AITC) Timber Construction Standards.

Allowable stresses in glued laminated members are per the latest version of AITC Specification 117.

General Notes - (continued)

Provide [insert wood species] glued laminated stringers according to combination symbol _____. [insert combination symbol]

Provide [insert wood species] glued laminated deck panels and rail posts according to combination symbol 2. [insert combination symbol]

Mark glued laminated stringers "Top" on the top at both ends.

Incise and treat glued laminated timber members with _____ [insert appropriate material from Section 02190] to a minimum retention level of _____ pcf. [insert appropriate level of retention] Treat laminated members after laminating in accordance with AWPA Specification C-28.

Perform cutting and drilling of timber members before preservative treatment. No field cutting of treated material will be permitted unless absolutely necessary. In the event of injury, drilling or cutting of treated material, field treat according to AWPA Specification M-4.

Provide structural steel, dowels (etc.) according to ASTM Specification _____. [insert Specification number] Provide all bolts, lag nuts and drift pins shall conform to AASHTO Specification M314, Grade 35 (ASTM A307) and/or AASHTO M314 Grade 105 (ASTM A449) as shown on the detail plans. Hot-dip galvanize structural steel, dowels, miscellaneous metal, bolts, lag bolts and drift pins after fabrication.