[Note: The following is only a guide for General Notes. Omit those sections, items and terms in parentheses that are not applicable, except retain the parenthetical references to ASTM equivalents to AASHTO Specifications.] [Revisions for April 2021 are marked in yellow highlight]

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

GENERAL NOTES:

Provide all materials and perform all work according to the "Oregon Standard Specifications for Construction 20XX".

Bridge(s) is(are) designed in accordance with the 20XX edition of the "AASHTO LRFD Bridge Design Specifications" (including 20XX thru 20XX interim revisions) and ____ edition of the "Oregon Bridge Design Manual" with an allowance of (____psf for present wearing surface) (and) (____psf) for future wearing surface and all of the following Live Loads :

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 seismic design of the bridge]:

[New Seismic Designs ----- Multi-Span Bridges]:
Seismic design is performed by the multi-mode (single-mode) analysis in accordance with the "AASHTO Guide Specifications for LRFD Seismic Bridge Design" ("AASHTO LRFD Bridge Design Specifications") as modified by the ____ edition "ODOT Bridge Design Manual". The 2014 USGS Seismic Hazard Maps have been used to collect the Seismic Hazard Values for the bridge site with Latitude 00.0000N and Longitude 000.0000W:

Seismic Performance Criteria	*Earthquake*	*Mapped Hazard Values*			*Site Class*	*Design Hazard Values*			*Seismic Design Category*
		PGA	*S_s*	*S_1*		*A_s*	*S_{DS}*	*S_{D1}*	
Life Safety	*1000-Year Return*	*0.000*	*0.000*	*0.000*	*X*	*0.000*	*0.000*	*0.000*	*X*
Operational	*Cascadia Subduction Zone*	*See the Design Response Spectrum plot below.*							

[Insert Design Response Spectrum plot here]

(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 Guide Specifications for LRFD Seismic Bridge Design" ("AASHTO LRFD Bridge Design Specifications") as modified by the ____ edition "ODOT Bridge Design Manual". The Horizontal Peak Ground Acceleration Coefficients (PGA) for 1000-year return (Life Safety) and Cascadia Subduction Zone Earthquake (Operational) are ___g and ___g respectively, based on 2014 USGS Seismic Hazard Maps. The bridge site is defined as a Site Class __ with Site Factor (F_{pga}) of ___.

[Widenings which do not carry the existing structure]:
Seismic design for widening is performed by the single-mode (multi-mode) analysis, in accordance with the "AASHTO Guide Specifications for LRFD Seismic Bridge Design" ("AASHTO LRFD Bridge Design Specifications") as modified by the ____ edition "ODOT Bridge Design Manual". Seismic design is based on __ feet of superstructure width and is not designed to carry the seismic load of the existing structure. The 2014 USGS Seismic Hazard Maps have been used to collect the Seismic Hazard Values for the bridge site with Latitude 00.0000N and Longitude 000.0000W:

[Insert the Seismic Data Table here]

[Widenings which do carry the existing structure]:
Seismic design for widening is performed by the single-mode (multi-mode) analysis, in accordance with the "AASHTO Guide Specifications for LRFD Seismic Bridge Design" ("AASHTO LRFD Bridge Design Specifications") as modified by the ____ edition "ODOT Bridge Design Manual". The widened structure is designed to resist the full seismic load including the existing structure. The 2014 USGS Seismic Hazard Maps have been used to collect the Seismic Hazard Values for the bridge site with Latitude 00.0000N and Longitude 000.0000W:

[Insert the Seismic Data Table here]

[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.

[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 crossbeam 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.

[Use the following notes for FRP strengthening project]

FRP Strengthening Notes:
Provide Fiber-Reinforced Polymer (FRP) products from the QPL, Section___.

FRP material properties used for the design:
[Specify section properties]
Ultimate tensile strength = __ ksi
Tensile modulus of elasticity = __ ksi
Ultimate strain = __in./in.
Environmental reduction factor, C_E = __

Existing material properties of the strengthened elements used for the design:
Concrete, f'c = __ksi
Reinforcing steel, fy = __ksi

Design and construct FRP strengthening according to Special Provision Section ____.

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 ==> 12-3/4 x 0.375, ASTM A252 (Grade 2) or (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 Geotechnical 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.

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.

[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).
[Specify ASTM A706 reinforcement for vertical column bars when columns are supported on drilled shafts or when plastic hinging is anticipated in either the top or bottom of the column]

Provide reinforcing steel according to ASTM Specification A706 for the following bars:

- *Welded*
- *Column spirals and vertical reinforcement*

- *Drilled shaft spirals and vertical reinforcement*

Provide Type 2 mechanical splices for vertical reinforcement in column and drilled shaft as shown on the detail plans.

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):

[Use the following chart when the minimum concrete strength required is 3.3 ksi]
[Table not used for column and drilled shaft reinforcing splice length]

Reinforcing Splice Lengths (Class B) Grade 60 f'c = 3.3 ksi, λ_{rc} = 0.4, 2in min. concrete clear cover										
Bar Size	*#3*	*#4*	*#5*	*#6*	*#7*	*#8*	*#9*	*#10*	*#11*	*#14 & #18*
Uncoated	*1'-4"*	*1'-9"*	*2'-2"*	*2'-7"*	*3'-0"*	*3'-5"*	*3'-10"*	*4'-4"*	*4'-10"*	*Not permitted*
Coated (1)	*1'-7"*	*2'-1"*	*2'-7"*	*3'-2"*	*3'-8"*	*4'-2"*	*4'-8"*	*5'-3"*	*5'-10"*	*Not permitted*
Coated (2)	*2'-0"*	*2'-7"*	*3'-3"*	*3'-11"*	*4'-7"*	*5'-2"*	*5'-10"*	*6'-7"*	*7'-4"*	*Not permitted*

*Use Coated (1) for epoxy coated bars with cover at least 3*d_b and clear spacing between bars at least 6*d_b.*

*Use Coated (2) for epoxy coated bars with cover less than 3*d_b or clear spacing between bars less than 6*d_b.*

Increase all splice lengths 30% for horizontal or nearly horizontal bars so placed that more than 12" of fresh concrete is cast below the bar.

[Use the following chart when the minimum concrete strength required is 4.0 ksi]
[Table not used for column and drilled shaft reinforcing splice length]

Reinforcing Splice Lengths (Class B) Grade 60 f'c = 4.0 ksi, λ_{rc} = 0.4, 2in min. concrete clear cover										
Bar Size	*#3*	*#4*	*#5*	*#6*	*#7*	*#8*	*#9*	*#10*	*#11*	*#14 & #18*
Uncoated	*1'-4"*	*1'-7"*	*2'-0"*	*2'-5"*	*2'-9"*	*3'-2"*	*3'-7"*	*4'-0"*	*4'-5"*	*Not permitted*
Coated (1)	*1'-5"*	*1'-11"*	*2'-5"*	*2'-10"*	*3'-4"*	*3'-9"*	*4'-3"*	*4'-10"*	*5'-4"*	*Not permitted*
Coated (2)	*1'-10"*	*2'-5"*	*3'-0"*	*3'-7"*	*4'-2"*	*4'-9"*	*5'-4"*	*6'-0"*	*6'-8"*	*Not permitted*

*Use Coated (1) for epoxy coated bars with cover at least 3*d_b and clear spacing between bars at least 6*d_b.*

*Use Coated (2) for epoxy coated bars with cover less than 3*d_b or clear spacing between bars less*

*than 6*d_b.*

Increase all splice lengths 30% for horizontal or nearly horizontal bars so placed that more than 12" of fresh concrete is cast below the bar.

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

[Use the following chart when the minimum concrete strength required is 4.5 ksi and reinforcing steel is Grade 60]
[Table not used for column and drilled shaft reinforcing splice length]

Reinforcing Splice Lengths (Class B) Grade 60 f'c = 4.5 ksi, λ_{rc} = 0.4, 2in min. concrete clear cover										
Bar Size	*#3*	*#4*	*#5*	*#6*	*#7*	*#8*	*#9*	*#10*	*#11*	*#14 & #18*
Uncoated	*1'-4"*	*1'-6"*	*1'-11"*	*2'-3"*	*2'-7"*	*3'-0"*	*3'-4"*	*3'-9"*	*4'-2"*	*Not permitted*
Coated (1)	*1'-4"*	*1'-10"*	*2'-3"*	*2'-8"*	*3'-2"*	*3'-7"*	*4'-0"*	*4'-6"*	*5'-0"*	*Not permitted*
Coated (2)	*1'-8"*	*2'-3"*	*2'-10"*	*3'-4"*	*3'-11"*	*4'-5"*	*5'-0"*	*5'-8"*	*6'-3"*	*Not permitted*

*Use Coated (1) for epoxy coated bars with cover at least 3*d_b and clear spacing between bars at least 6*d_b.*

*Use Coated (2) for epoxy coated bars with cover less than 3*d_b or clear spacing between bars less than 6*d_b.*

Increase all splice lengths 30% for horizontal or nearly horizontal bars so placed that more than 12" of fresh concrete is cast below the bar.

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

[Use the following chart when the minimum concrete strength required is 4.5 ksi and reinforcing steel is Grade 80]
[Table not used for column and drilled shaft reinforcing splice length]

Reinforcing Splice Lengths (Class B) Grade 80 f'c = 4.5 ksi, λ_{rc} = 0.4, 2in min. concrete clear cover										
Bar Size	*#3*	*#4*	*#5*	*#6*	*#7*	*#8*	*#9*	*#10*	*#11*	*#14 & #18*
Uncoated	*1'-6"*	*2'-0"*	*2'-6"*	*3'-0"*	*3'-6"*	*4'-0"*	*4'-6"*	*5'-0"*	*5'-7"*	*Not permitted*
Coated (1)	*1'-10"*	*2'-5"*	*3'-0"*	*3'-7"*	*4'-2"*	*4'-9"*	*5'-4"*	*6'-0"*	*6'-8"*	*Not permitted*
Coated (2)	*2'-3"*	*3'-0"*	*3'-9"*	*4'-5"*	*5'-2"*	*5'-11"*	*6'-8"*	*7'-6"*	*8'-4"*	*Not permitted*

*Use Coated (1) for epoxy coated bars with cover at least 3*d_b and clear spacing between bars at least 6*d_b.*

*Use Coated (2) for epoxy coated bars with cover less than 3*d_b or clear spacing between bars less than 6*d_b.*

Increase all splice lengths 30% for horizontal or nearly horizontal bars so placed that more than 12" of fresh concrete is cast below the bar.

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.

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

Provide epoxy coated reinforcing steel, except prestressing steel, in precast (slabs), (boxes). This includes bars extending from the precast (slab) (box) into the (bridge rail) (curb) (sidewalk) (deck).

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 (A706 only) (unless shown otherwise). The top bends of stirrups extending from prestressed precast units may be shop or field bent (A706 only) (unless shown otherwise).

Do not fabricate reinforcing steel for columns (and walls) until final substructure 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. ______.

Provide Class HPC4500 - 1 1/2 concrete in deck (except in prestressed or post-tensioned sections).

Provide Class ____ - 1 1/2, 1 or 3/4 concrete in (columns, footings, etc.).

Provide Class 3300 (Seal Concrete) - 1 1/2, 1 or 3/4 concrete in seals.

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

Provide Class HPC4500 – 1 1/2 concrete in reinforced concrete approach slabs.

Provide Class 3300 – 1 1/2, 1 or 3/4 concrete for All (other) concrete.

Provide Class 3300 – 1 1/2, 1, 3/4 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 0.06 percent, or 0.153 to 0.25 percent.)

Structural Steel Notes:

Provide all structural steel in girder webs, flanges, and cross frames, including splice plates, stiffeners, and all connection and gusset plate according to [Specify material type and grade] (weathering structural steel) conforming to (ASTM Specification A709, Grade 50W), except as noted. Provide all steel members subject to tensile stresses according to ASTM A709 Impact Testing Temperature Zone 2 requirements. This includes all girder flanges, webs and cross frame members designated with a ⊛. Paint structural steel portion as shown on Dwg. XXXXX [Insert dwg. number] and finish all exposed faces of weathering steel according to the Special Provisions. Provide steel erection plan for approval prior to construction.

[Specify primary members]
For the purpose of Charpy toughness testing and welding inspection/repair, etc., primary members are girders, all splice plates, bearing stiffeners, and cross frame members at bents.

Web thickness shown may be increased up to 1/16" at no cost to the Agency.

[Specify fit condition]
Detail girders and crossframes such that the girder webs are plumb at the Steel Dead Load Fit (SDLF) condition and prior to deck placement.

Do not punch or drill holes through girder webs for temporary work.

All bearing stiffeners and beam ends are to be vertical in final erected position under full dead load.

Provide shear connectors according to ASTM A108 headed concrete anchor studs.

[Specify minimum fillet weld size if not shown]
Use the following fillet weld sizes (unless otherwise shown):

Base Metal Thickness (T) of Thicker Part Joined	$T \leq 3/4"$	$3/4" < T$
Weld Size	$1/4"$	$5/16"$

Provide 7/8" diameter Type 3 weathering high-strength bolts at structural connections according to ASTM Specification F3125 GR A325 unless shown otherwise. All structural steel connections are slip critical connections with Class B faying surfaces unless shown otherwise. Exclude bolt threads from shear planes.

Framing Plan Notes:

All plan dimensions shown are measured horizontally or vertically unless otherwise noted and reflect the ultimate geometric shape and location of all elements at a temperature of 52°F. Adjust for superelevation and grade.

All crossframes and shear stud rows to be perpendicular to CL girder.

Web splices to be staggered a minimum of 6" from top or bottom flange splices and 6" minimum from intermediate stiffener or connection plate.

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

Coat all girders as shown, in accordance with the Specifications.
Produce the finish coat on all girders according to Federal Color Standards most closely matching steel rusted shade.
Submit rusted shade color to engineer for approval.

1. *All longitudinal dimensions are on a horizontal line – adjust for superelevation and grade.*
2. *All stiffeners and beam ends are to be vertical in final erected position unless noted otherwise.*
3. *Web thickness shown may be increased up to 1/16".*
4. *Additional compression flange weld splices will be permitted at locations approved by the Engineer.*
5. *Provide steel in top and bottom flanges according to ASTM A709, Grade 50W.*
6. *Provide steel in web according to ASTM A709, Grade XXXXX*

7. *Provide all other steel according to AASHTO M270, Grade XXXXX (ASTM A709, Grade XXXXX).*
8. *Indicates check sample required from flange plates so marked, see Special Provisions.*
9. *For the purpose of charpy toughness testing and welding inspection/repair, etc., main load carrying members are Girders and Stiffeners.*
10. *Assumed design temperature is XXX F.*

Timber 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.

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 according 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.

Resin Bonded Anchor Notes:

Provide and install (___" diameter (ASTM F1554) Grade (36) (55) (105)) (#__ AASHTO M 31, Grade 60 rebar) resin bonded anchors with high strength resin from the QPL. The minimum pullout strength is _____ lbs with a minimum embedment of ____in. Install anchors according to the manufacturer's recommendations and the Special Provisions.