CHAPTER C

BRIDGES AND STRUCTURES

PERFORMANCE

A. Basic Function:
   1. Provide bridges and structures as required to fulfill needs described in the project program.
   2. The selected Design-Build shall conduct all work necessary to complete the project program. Elements of work shall include, but are not limited to, the following:
      a. Substructure: As defined in Chapter C1.
      b. Superstructure: As defined in Chapter C2.
      c. Bridge Services: As defined in Chapter C3.
   3. This design criteria defines the minimum technical, aesthetic, and engineering requirements for the design and construction of permanent structures under the design-build construction delivery method. The Design-Build is responsible for the safe design and construction in strict accordance of all applicable codes, laws, ordinances and construction standards.
   4. Where bridges and structures are integral with another element group, meet requirements of both element groups.
   5. In addition to the requirements of this chapter, comply with all applicable requirements of Chapter 111 - Improvement Performance.

B. Health and Safety:
   1. Fire Resistance: Design and select materials to provide fire resistance in accordance with Code.
      a. For all elements required to have a fire resistive rating and which are not made of materials and systems specified as acceptable by the Code, use proven-by-mock-up construction.
      b. For proven-by-mock-up construction, acceptable testing agencies are Underwriters Laboratories Inc.
      c. Minimum performance values for individual structural elements are also specified in other chapters.
      d. Substantiation:
         1) Proposal: Identification of major fire resistive materials and systems.
         2) Design Development: List of laboratory tested fire resistive assemblies to be used.
         3) Construction Documents: Identification of laboratory test numbers on the construction drawings for fire resistive assemblies to be used.
   2. Grounding: When grounding of electrical systems is accomplished using structural members, design to prevent shock to occupants.

C. Design Criteria:
   1. Triangle Garage Loads: Make all portions of the project comply with load requirements in the applicable codes, including, but not limited to, those listed below:
a. Plaza Level Dead Loads:
   1) Self weight of the structure.
   2) 10 psf allowance for items hung below the structure.
   3) 250 psf for future landscape, unless otherwise noted below.
      i. 600 psf for future landscape, West of Grid 5 and North of Grid E.
      ii. 600 psf for future landscape, East of Grid 12 and North of Grid C.
      iii. 600 psf for future landscape, East of Grid 15 and North of Grid D.
      iv. 180 psf for future landscape, South of Grid E.

b. Plaza Level Live Loads:
   1) 100 psf (not reducible), minimum at all areas.

c. Seismic Loads: Seismic evaluation and potential mitigation measures related to new grading of NE Pacific Pl are excluded from the project program and will be analyzed by the University.

2. Pedestrian Land Bridge Loads: Make all portions of the project comply with load requirements in the applicable codes, including, but not limited to, those listed below:
   a. Dead Loads:
      1) Self weight of the structure.
      2) 150 psf for future landscape.
      3) 10 psf allowance for items hung below the structure.
   b. Live Loads:
      1) H10 AASHTO truck loading.
      2) 100 psf (not reducible) pedestrian loading.
   c. Soil Loads:
      1) Lateral pressure of soil, including potential surcharges and hydrostatic pressures.
      2) Vertical pressure of soil, including hydrostatic pressures.
   e. Snow Loads
   f. Wind Loads

3. Pedestrian Land Bridge Performance: Make all portions of the project comply with performance requirements in the applicable codes, including, but not limited to, those listed below:
   a. Deflection: Meet all deflection criteria listed in the Guide Specifications for the Design of Pedestrian Bridges.
   c. Fracture Critical Restriction: Elements of the superstructure shall not be fracture critical. Any components that are fracture critical shall be clearly identified on the plans.
D. Personnel Requirements:
   1. The Design-Builders shall provide a Structural Engineer licensed under title 18 RCW, who shall be in responsible charge of all structural design elements of the project.

E. Special Precautions:
   1. Locate and protect all utilities at the project site, including, but not limited to, those listed below.
      a. Existing 7 foot by 10 foot utility tunnel that is located on the east side of the site, running from north to south.
      b. Existing 138 inch Metro sewer that is located near the center of the site, running from east to west.

F. Durability:
   1. Corrosion Prevention: Provide supplementary protection for all metal elements, sufficient to prevent corrosion completely for the service life of the element without maintenance.

G. Operation and Maintenance:
   1. Provide structural elements that will endure for the lifetime of the project with no maintenance.
   2. The superstructure, joints, and bearings shall be accessible for inspection.

H. Aesthetics:
   1. Concrete walls of the Triangle Garage that are left permanently exposed due to excavation shall be covered with architectural panels.

I. Design Review:
   1. City of Seattle and University design review, as defined in the preceding chapter.

J. Substantiation:
   1. Proposal: Identify major structural materials and systems in a narrative format. Outline the sequence of Pedestrian Land Bridge construction and identify all layout areas. Indicate when minimum requirements are exceeded and describe the extent. Submit a written description of how existing utilities and structures will be protected from damage and isolated from new construction.
   2. Preliminary Design:
      b. A detailed listing of design criteria and preliminary analysis, prepared by a licensed structural engineer.
   3. Construction Documents: All Construction Documents shall bear the stamp and signature of a Structural Engineer, as required in Title 18 RCW.
      a. Drawings: The Design-Builders shall provide drawings in accordance with Chapter 111 - Improvement Performance.
      b. Calculations: The Design-Builders shall provide calculations to support all structural designs described in this Chapter. Calculations shall be in accordance with Chapter 111 - Improvement Performance.
   4. Shop Drawings:
      a. The Design-Builders shall submit the following shop drawings for review and comment by the University:
1) Steel elements.
2) Concrete elements.

b. As a minimum, the following information shall be included on shop drawings:
   1) Dimensions.
   2) Size of members and fasteners.
   3) Finishes.
   4) Weld sizes, types, procedures, and associated testing.
   5) Strand or rebar placement, jacking procedures, stress calculations, and elongations.
   6) Steel fabrication procedures.
   7) Beam and slab penetrations.
   8) Erection procedures.

5. Construction Engineering Submittals:
   a. The Design-Builder shall prepare plans and calculations for falsework, formwork, and temporary structures. The University will review the plans and calculations, and provide comments.
   b. The Design-Builder shall prepare plans and calculations for construction loads on existing structures. The University will review the plans and calculations, and provide comments.

6. Closeout Submittals:
   a. Record Documents: The Design-Builder shall prepare As-Built Construction Drawings when the project is complete, in accordance with Chapter 00830 - Design and Construction Procedures.
   b. Operation and Maintenance: The Design-Builder shall submit a report detailing the surface area of steel that will require painting as a part of future maintenance.

END OF CHAPTER C
CHAPTER C1

SUBSTRUCTURE

PERFORMANCE

A. Basic Function:
   1. Provide substructure as required to support the site improvements and superstructures safely and without uncontrolled settlement or other movement.
   2. The selected Design-Builder shall conduct all work necessary to complete substructures for the project program. Elements of substructure work shall include, but are not limited to, the following:
      b. Slabs on Grade: See Chapter C12.
      e. Lightweight Fill: See Chapter C15.
   3. Where substructures are integral with another element group, meet requirements of both element groups.
   4. In addition to the requirements of this chapter, comply with all applicable requirements of Chapter 111 - Improvement Performance and Chapter C - Bridges and Structures.

B. Geotechnical Investigation:
   1. A copy of the January 2010 Geotechnical Report is provided for information only. The Design-Builder is responsible for completing the geotechnical and soils investigations required to design and construct the substructures. A copy of all engineering documents shall be provided to the University.

C. Special Precautions:
   1. Substructure elements shall not impose loads or displacements on existing structures or utilities, which include, but are not limited to, the following:
      a. Existing 7 foot by 10 foot utility tunnel that is located on the east side of the site, running from north to south.
      b. Existing 138 inch Metro sewer that is located near the center of the site, running from east to west.
      c. Existing Triangle Garage that is located just south of the site, which includes basement walls, spread footings, and pile foundations.
   2. Substructure elements that are located in close proximity to existing structures or utilities shall be isolated from any movement.

D. Substantiation:
   1. Preliminary Design: Detail how existing utilities and structures will be protected from damage and isolated from new construction.
2. Construction Documents: If the existing Burke Gilman Trail Bridge is abandoned in place and is loaded by new substructures, submit calculations in accordance with Chapter C - Bridges and Structures, which show the Burke Gilman Trail Bridge is capable of supporting the new loads.

END OF CHAPTER C1
CHAPTER C11

FOUNDATIONS

PERFORMANCE

A. Basic Function:
   1. Provide foundations as required to support the superstructure safely and without uncontrolled settlement or other movement.
   2. The selected Design-Builder shall conduct all work necessary to complete foundations for the project program. Elements of foundation work shall include, but are not limited to, the following:
      a. Shallow Foundations: Spread footings and mat foundations.
      c. Foundation Systems: Permanent shoring and dewatering systems.
   3. Where foundations are integral with another element group, meet requirements of both element groups.
   4. In addition to the requirements of this chapter, comply with all applicable requirements of Chapter 111 - Improvement Performance, Chapter C - Bridges and Structures, and Chapter C1 - Substructure.

B. Water Protection:
   1. Drainage: Provide a method of collecting and draining water from below and around shallow foundations in accordance with City of Seattle Standard Plans and Specifications, City of Seattle Design Standards, including without limitation, Stormwater, Grading and Drainage Control Code (SMC 22.800 - 22.808) and its associated Director’s Rules. See Chapter G for additional stormwater requirements.
   2. Substantiation:
      a. Design Development: Subsurface investigation to identify location of water table and identification of areas requiring water protection systems.
      b. Construction Documents: Product data on specific water protection materials and systems; details of construction to achieve permanent water protection.

PRODUCTS

A. The following materials are available for construction of the foundations:
   1. ASTM A 709 structural steel, encased with concrete for corrosion resistance.
   2. Normal-weight concrete with reinforcing in accordance with ACI 318-08 Building Code Requirements for Structural Concrete.

B. Driven piles are prohibited.

END OF CHAPTER C11
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CHAPTER C12

SLABS ON GRADE

PERFORMANCE

A. Basic Function:
   1. Provide slabs on grade as required to support the site improvements without structural cracking, settlement, or other movement.
   2. The selected Design-Builder shall conduct all work necessary to complete slabs on grade for the project program.
   3. Where slabs on grade are integral with another element group, meet requirements of both element groups.
   4. In addition to the requirements of this chapter, comply with all applicable requirements of Chapter 111 - Improvement Performance, Chapter C - Bridges and Structures, and Chapter C1 - Substructure.

B. Durability:
   1. Floor Classifications: For concrete slabs on grade, comply with composition and finishing recommendations of ACI 302.1R-2004 for floor classifications based on type of anticipated traffic and intended use.
   2. Water-Cement Ratio: For concrete slabs on grade that are partly or completely exposed to freezing conditions, limit water-cementitious materials ratio as recommended by ACI 302.1R-2004.
   3. Air Content: For concrete slabs on grade that are partly or completely exposed to freezing conditions, provide air content in accordance with recommendations of ACI 201.2R-2008.

PRODUCTS

A. The following materials are available for construction of slabs on grade:
   1. Normal-weight concrete with reinforcing in accordance with ACI 318-08 Building Code Requirements for Structural Concrete.

END OF CHAPTER C12
Request for D-B Proposals
Rainier Vista Pedestrian Landbridge, Project No. 203207
Capital Projects Office, University of Washington

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CHAPTER C13

RETAINING WALLS

PERFORMANCE

A. Basic Function:

1. Provide retaining walls as required to support the site improvements without structural cracking, settlement, or other movement.

2. The selected Design-Builder shall conduct all work necessary to complete retaining walls for the project program.

3. Where retaining walls are integral with another element group, meet requirements of both element groups.

4. In addition to the requirements of this chapter, comply with all applicable requirements of Chapter 111 - Improvement Performance, Chapter C - Bridges and Structures, and Chapter C1 - Substructure.

B. Layout:

1. The retaining wall layout shall conform with the design intent shown in the 50% Schematic Design Documents, as referenced in Chapter 00300 – Information Available to Proposers.

2. Retaining walls shall be located on University property, clear of sidewalks, bicycle trails, and the existing Triangle Garage.

3. Reserved.

C. Aesthetics:

1. Material, finish, and other defined properties shall conform with the 50% Schematic Design documents, as referenced in Chapter 00300 – Information Available to Proposers.

PRODUCTS

A. Reserved.

END OF CHAPTER C13
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CHAPTER C14

EXCAVATION SHORING

PERFORMANCE

A. Basic Function:
   1. Provide temporary shoring as required to excavate the site improvements and substructure elements.
   2. The selected Design-Builder shall conduct all work necessary to complete temporary shoring for excavation required by the project program.
   3. In addition to the requirements of this chapter, comply with all applicable requirements of Chapter 111 - Improvement Performance, Chapter C - Bridges and Structures, and Chapter C1 - Substructure.

B. Design Criteria:
   1. Design temporary shoring walls to resist soil, water, and live load pressures.
      a. Design loads for the excavation shoring shall be established by a licensed geotechnical engineer experienced in shoring system design and construction.
      b. Design support members to resist the maximum loads expected to occur during the excavation, including interim construction stages.
      c. Obtain the necessary as-built utility depth and alignment data for all known and unknown utilities near the shoring walls so that the vertical and lateral support elements will maintain the required clearances in accordance with City of Seattle standards.

C. Water Protection:
   1. Dewatering: Prevent accumulation of water in excavation and subsequent deterioration of load bearing stratum. Install dewatering system as required for the proper performance of the excavation shoring system.

D. Abandoned Materials:
   1. Shoring materials shall not be left in-place or abandoned at the site.

E. Substantiation:
   1. Proposal: Submit a written description of the proposed excavation sequence and the proposed shoring systems.
   2. Design Development: Submit a written description of the proposed excavation support system including a description of the construction sequence, a description of structural components, and the methods proposed for installation.
   3. Construction Documents: Submit drawings and calculations in accordance with Chapter C - Bridges and Structures.
   4. Construction:
      a. At minimum, provide a weekly optical survey for shoring system components, which shall measure vertical and horizontal movement with accuracy of at least 0.01 feet.
b. Provide a contingency plan for mitigation measures to be implemented if lateral movement exceeds geotechnical recommendations, and keep on hand materials and equipment necessary to implement the contingency plan.

END OF CHAPTER C14
CHAPTER C15

LIGHTWEIGHT FILL

PERFORMANCE

A. Basic Function:
   1. Provide lightweight fill above the Triangle Garage as required to raise the finish elevation to the grade shown in the 50% Schematic Design Documents, which is referenced in Chapter 00300 – Information Available to Proposers.
   2. The selected Design-Builder shall conduct all work necessary to complete lightweight fill for the project program.
   3. In addition to the requirements of this chapter, comply with all applicable requirements of Chapter 111 - Improvement Performance, Chapter C - Bridges and Structures, and Chapter C1 - Substructure.

B. Design Criteria:
   1. Provide lightweight fill with adequate stiffness to prevent cracking of the following finishes:
      a. Concrete topping slab, 4 inches thick.
      b. Stone tile, 2 inches thick.
   2. Provide permanent restraints to prevent lateral movement of lightweight fill.
   3. Lightweight fill shall be resistant to deterioration from insects and weather.
   4. Voids larger than 1 cubic-foot are prohibited.
   5. Lightweight fill and the Triangle Garage structure shall be designed to allow future loading in accordance with Chapter C – Bridges and Structures.

C. Substantiation:
   1. Construction Documents: Submit calculations in accordance with Chapter C - Bridges and Structures, which show the weight of fill added above the Triangle Garage is within the capacity of the existing structure. Allowances for future loading shall be provided in accordance with Chapter C – Bridges and Structures.

END OF CHAPTER C15
CHAPTER C16

UTILITY PROTECTION STRUCTURES

PERFORMANCE

A. Basic Function:
   1. Provide protection structures as required to prevent loading and movement of the existing utility tunnel that is located on the east side of the site, running from north to south.
   2. The selected Design-Builder shall conduct all work necessary to complete utility protection structures for the project program.
   3. In addition to the requirements of this chapter, comply with all applicable requirements of Chapter 111 - Improvement Performance, Chapter C - Bridges and Structures, and Chapter C1 - Substructure.

B. Design Criteria:
   1. The protection structure shall be capable of preventing loading and movement of the existing utility tunnel.
   2. Where the protection structure supports the sidewalk and roadway, design loads shall comply with the applicable codes, including, but not limited to, those listed below:
      a. Dead Loads:
         1) Self weight of the structure.
         2) All superimposed dead loads.
      b. Live Loads:
         1) HL93 AASHTO truck loading.
         2) Fire truck loading in accordance with City of Seattle standards.
         3) Bus loading in accordance with Chapter G21 - Roadway Improvements.

PRODUCTS

A. The following materials are available for construction of the utility protection structures:
   1. Normal-weight concrete with reinforcing in accordance with ACI 318-08 Building Code Requirements for Structural Concrete.

END OF CHAPTER C16
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CHAPTER C2

SUPERSTRUCTURE

PERFORMANCE

A. Basic Function:

1. Provide superstructure capable of supporting all anticipated loads without failure or damage.

2. The selected Design-Builder shall conduct all work necessary to complete superstructures for the project program. Elements of superstructure work shall include, but are not limited to, the following:
   
   
   b. Walls and Columns: See Chapter C22.
   
   c. Framing and Deck: See Chapter C23.
   
   d. Railings and Barriers: See Chapter C24.
   
   e. Anchors and Embeds: See Chapter C25.
   
   f. Stormwater vaults management and detention, as required to meet Code drainage requirements. See Chapter G32 – Storm Sewer.

3. Where superstructures are integral with another element group, meet requirements of both element groups.

4. In addition to the requirements of this chapter, comply with all applicable requirements of Chapter 111 - Improvement Performance, Chapter C - Bridges and Structures.

END OF CHAPTER C2
CHAPTER C21

INFILL WALLS

PERFORMANCE

A. Basic Function:
   1. Provide infill walls capable of supporting all anticipated loads without failure or damage.
   2. The selected Design-Builder shall conduct all work necessary to infill the opening in the north wall of the Triangle Garage, where the Rainier Vista Tunnel will be demolished.
   3. In addition to the requirements of this chapter, comply with all applicable requirements of Chapter 111 - Improvement Performance, Chapter C - Bridges and Structures, and Chapter C2 - Superstructure.

B. Water Protection:
   1. Wall joints shall be watertight.
   2. Infill walls shall be waterproof.

C. Durability:

D. Aesthetics:
   1. Material and finish of exposed, interior wall shall match adjacent walls in Triangle Garage.

PRODUCTS

A. The following materials are available for construction of the infill walls:
   1. Normal-weight concrete with reinforcing in accordance with ACI 318-08 Building Code Requirements for Structural Concrete.

END OF CHAPTER C21
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CHAPTER C22

WALLS AND COLUMNS

PERFORMANCE

A. Basic Function:
   1. Provide walls and columns capable of supporting all anticipated loads without failure or damage.
   2. The selected Design-Builder shall conduct all work necessary to complete walls and columns for the project program.
   3. Where walls and columns are integral with another element group, meet requirements of both element groups.
   4. In addition to the requirements of this chapter, comply with all applicable requirements of Chapter 111 - Improvement Performance, Chapter C - Bridges and Structures, and Chapter C2 - Superstructure.

B. Layout:
   1. Columns and walls shall be located on University property, clear of sidewalks, bicycle trails, and the existing Triangle Garage.

C. Durability:
   1. Traffic Protection: Columns exposed to traffic shall be encased with concrete to a minimum height of 42 inches and designed to resist vehicle impact.

D. Aesthetics:
   1. Material, finish, and other defined properties shall conform with the 50% Schematic Design documents, as referenced in Chapter 00300 – Information Available to Proposers.
   2. The following requirements apply to walls columns located between the Burke-Gilman Trail and NE Pacific Place:
      a. No more than five columns may be located in this area.
      b. Column size should be minimized. Suggested column diameter is not more than 24 inches.
      c. Concrete columns shall be cylindrical.
      d. Walls are prohibited.

PRODUCTS

A. The following materials are available for construction of walls and columns:
   1. ASTM A 709 structural steel, painted or encased with concrete for corrosion resistance.
   2. Normal-weight concrete with reinforcing in accordance with ACI 318-08 Building Code Requirements for Structural Concrete.

END OF CHAPTER C22
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CHAPTER C23

FRAMING AND DECK

PERFORMANCE

A. Basic Function:
   1. Provide framing and deck capable of supporting all anticipated loads without failure or damage.
   2. The selected Design-Builder shall conduct all work necessary to complete framing and deck for the project program.
   3. Where framing and deck are integral with another element group, meet requirements of both element groups.
   4. Stormwater management and detention, as required to meet Code drainage requirements. See Chapter G32 – Storm Sewer.
   5. In addition to the requirements of this chapter, comply with all applicable requirements of Chapter 111 - Improvement Performance, Chapter C - Bridges and Structures, Chapter C2 - Superstructure, and Chapter G Site Work, and their subchapters.

B. Layout:
   1. The Pedestrian Landbridge geometry shall conform with the 50% Schematic Design Document, as referenced in Chapter 00300 – Information Available to Proposers.
   2. The maximum finish elevation of the Pedestrian Landbridge shall conform with the 50% Schematic Design Document, as referenced in Chapter 00300 – Information Available to Proposers, allowing for 12 inches of finish thickness above the structural deck.
   3. The Pedestrian Landbridge structure shall allow for Metro clearance on NE Pacific Pl in accordance with Chapter 111 – Improvement Performance.
   4. Framing Penetrations: Provide at least four sleeves spaced evenly through the side of each framing member. Minimum sleeve diameter shall be 8 inches. Sleeves shall be located at a constant elevation below the deck, within the upper half of the beam depth.
   5. Trolley Cable Anchorage: Provide freestanding pole supports for trolley cables in accordance with Metro standards. Trolley cables shall not be anchored to the Pedestrian Landbridge structure.
   6. Trolley Cable Insulation: Provide insulation between the Pedestrian Landbridge and the trolley cables in accordance with Metro standards and NESC requirements.
   7. Provide deterrents to discourage birds from nesting on ledges below the bridge deck.

C. Water Protection:
   1. Framing:
      a. Drip plates shall be provided on the bottom flanges of steel girders to keep water runoff from the bearings and bridge seats.
2. Deck:
   a. All deck joints shall be watertight and bicycle-safe.
   b. The deck shall be waterproof, free-draining, and not capable of storing water on the deck surface.

D. Aesthetics:
   1. The aesthetics of the Pedestrian Land Bridge shall conform with the 50% Schematic Design Document, as referenced in Chapter 00300 – Information Available to Proposers.
   2. Color of painted steel shall be submitted to the University for approval.
   3. Suspension structures are prohibited.

PRODUCTS
A. The following materials are available for construction of the framing:
   1. ASTM A 709 structural steel, painted for corrosion resistance.
   2. Normal-weight concrete with reinforcing in accordance with ACI 318-08 Building Code Requirements for Structural Concrete.

B. The deck shall be constructed with reinforced normal-weight concrete, cast-in-place. Stay-in-place forms are prohibited.

END OF CHAPTER C23
CHAPTER C24

RAILINGS AND BARRIERS

PERFORMANCE

A. Basic Function:

1. Provide railings capable of supporting all anticipated loads without failure or damage. Provide barriers capable of supporting all anticipated loads with failure.

2. The selected Design-Builder shall conduct all work necessary to complete railings and barriers for the project program. Elements of railing and barrier work shall include, but are not limited to, the following:
   a. Pedestrian Handrails and Guardrails.
   b. Bicycle Guardrails.
   c. Vehicle Barriers.

3. Where railings and barriers are integral with another element group, meet requirements of both element groups.

4. In addition to the requirements of this chapter, comply with all applicable requirements of Chapter 111 - Improvement Performance, Chapter C - Bridges and Structures, and Chapter C2 - Superstructure.

B. Design Criteria:

1. Bicycle and Pedestrian Railings:
   a. Pedestrian Landbridge railings shall be continuous and provide a barrier that prevents the passage of a 4 inch diameter sphere from the finished grade to the top of handrail.
   b. Pedestrian Landbridge railings shall meet the height requirements for bicycles. The handrail shall not present a snagging hazard to traffic.
   c. See Chapter C31 – Bridge Lighting for Pedestrian Landbridge lighting scenarios at the upper deck surface.

2. Vehicle Barriers:
   a. Removable barriers installed to prevent unauthorized motor vehicle access, shall consist of removable bollards, with lock and key, approved by the University.

END OF CHAPTER C24
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CHAPTER C25

ANCHORS AND EMBEDS

PERFORMANCE

A. Basic Function:

1. Provide anchors and embeds capable of supporting all anticipated loads without failure or damage.

2. The selected Design-Builder shall conduct all work necessary to complete anchors and embeds for the project program. Elements of anchorage and embed work shall include, but are not limited to, the following:
   a. Cast-in-Place Anchors and Embeds.
   b. Post-Installed Anchors.

3. Where anchors and embeds are integral with another element group, meet requirements of both element groups.

4. In addition to the requirements of this chapter, comply with all applicable requirements of Chapter 111 - Improvement Performance, Chapter C - Bridges and Structures, and Chapter C2 - Superstructure.

B. Design Criteria:

1. Anchoring to Concrete: Design of concrete anchors shall meet requirements of ACI 318-08 Appendix D, as referenced in the 2009 Seattle Building Code.

2. Post-Installed Anchors: Design of post-installed anchors shall be in accordance with an ICC-ES report valid for the 2009 IBC.

C. Substantiation:

1. Construction Documents:
   a. Calculations:
      1) Anchoring to Concrete: Provide calculations for concrete anchors in accordance with ACI 318-08 Appendix D.
      2) Post-Installed Anchors: Calculations for post-installed anchors shall reference the ICC-ES report used for the design.

2. Construction Submittals:
   a. Post-Installed Anchors: Submit copies of ICC-ES reports for review and comment by the University.

END OF CHAPTER C25
CHAPTER C3

BRIDGE SERVICES

PERFORMANCE

A. Basic Function:

1. Provide bridge services as required to fulfill needs described in the project program.

2. The selected Design-Builder shall conduct all work necessary to complete bridge services for the project program. Elements of bridge service work shall include, but are not limited to, the following:

3. Where bridge services are integral with another element group, meet requirements of both element groups.

4. In addition to the requirements of this chapter, comply with all applicable requirements of Chapter 111 - Improvement Performance and Chapter C - Bridges and Structures.

END OF CHAPTER C3
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CHAPTER C31

BRIDGE LIGHTING

PERFORMANCE

A. Basic Function:

1. Provide bridge lighting as required to fulfill the needs described in this scope of work.

2. The selected Design-Builder shall conduct all work necessary to complete bridge lighting for this scope of work.

3. In addition to the requirements of this chapter, comply with all applicable requirements of Chapter 111 - Improvement Performance, Chapter C - Bridges and Structures, and Chapter C3 – Bridge Services.

B. Design Criteria:

1. Lighting below the Pedestrian Land Bridge shall comply with SDOT and Metro requirements. The Design-Builder shall consider solutions which best integrate lighting fixtures and effect into the architectural character of the bridge structure.

2. Lighting above the Pedestrian Land Bridge shall either be (a) integrated with the guardrail, providing at least 2 foot-candles along each path of travel or (b) provided within the Landscape Restoration Design scope of work. The Landscape Restoration Design team will be evaluating this during their Schematic Design development effort. For the purposes of this submittal, include pricing and a design solution to accommodate integrated lighting with the guardrail.

END OF CHAPTER C31
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