

1 **Concrete Mix Design for Paving**

2 When combined aggregate concrete gradation is used, item 3 in Section 5-05.3(1) is
3 revised to read as follows:
4

5 (February 5, 2001)

- 6 3. Mix Design Modifications. The Contractor may initiate minor adjustments to
7 the approved mix proportions. The combined aggregate gradation may be
8 adjusted provided it remains within the specifications limits detailed above. The
9 mix design will not be required to be resubmitted as long as the water
10 cementitious ratio does not change.

11 Utilizing admixtures to accelerate the set or to increase the workability will be
12 permitted only when approved by the Engineer.

13 The Contractor shall notify the Engineer in writing of any proposed
14 modification. A new mix design will designate a new lot.

15 **Reinforced Concrete Bridge Approach Slabs**

16 Section 5-05.3(19) is supplemented with the following:
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18 (March 13, 1995)

19 The pavement end of the approach slab shall be constructed parallel to the
20 pavement seat.

21 (February 5, 2001)

22 The compression seal shall be D.S. Brown, CV-2502; Watson Bowman Acme, WA-
23 250; ESCO, X-2500; Structural Accessories Inc., SA-2500, or approved equal.
24

25 **Measurement**

26 Section 5-05.4 is supplemented with the following:
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28 (*****)

29 Grinding cement concrete pavement will be measured by the square meter.
30

31 **Payment**

32 Section 5-05.5 is supplemented with the following:
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34 (*****)

35 "Grinding Cement Conc. Pavement" per square meter.
36

37 **DIVISION 6**
38 **STRUCTURES**

39 **GENERAL REQUIREMENTS FOR STRUCTURES**

40 **Foundation Data**

41 Section 6-01.2 is supplemented with the following:
42

43 (June 26, 2000)

44 The attached log of test boring pages are reproductions of the original Log of Test
45 Boring for the test holes shown in the Plans.

46 The Contractor should review the geotechnical recommendations report prepared for
47 this project. Copies of the geotechnical recommendations report are available for
48 review by prospective bidders at the location specified in Section 1-02.4 as
49 supplemented in these Special Provisions.
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51 (August 6, 2001)

52 The Contractor should also review the Summary of Geotechnical Conditions in the
53 Appendix to the Special Provisions.
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1
2 **CONCRETE STRUCTURES**
3

4 **Materials**

5 Section 6-02.2 is supplemented with the following:
6

7 **(August 6, 2001)**
8 **Resin Bonded Anchors**

9 The resin bonded anchor system shall include the nut, washer, and threaded anchor rod
10 which is installed into hardened concrete with a resin bonding material. The resin
11 bonded anchor system shall be one of the systems specified in the current WSDOT
12 Qualified Products List or, if not specified in the current WSDOT QPL, shall meet the
13 following requirements:
14

15 1. Threaded Anchor Rod and Nuts

16 Threaded anchor rods shall conform to ASTM A 193M Grade B7M or ASTM A
17 449, except as otherwise noted, and be fully threaded. Threaded anchor rods
18 for stainless steel resin bonded anchor systems shall conform to ASTM F 593
19 and shall be Type 304 unless otherwise specified.
20

21 Nuts shall conform to AASHTO M 291M, Grade 10 F, except as otherwise
22 noted. Nuts for stainless steel resin bonded anchor systems shall conform to
23 ASTM F 594 and shall be Type 304 unless otherwise specified.
24

25 Washers shall conform to ASTM F 436M, except as otherwise noted.
26 Washers for stainless steel resin bonded anchor systems shall conform to AISI
27 B18.22.1 and shall be Type 304 Stainless Steel unless otherwise specified.
28

29 Nuts and threaded anchor rods, except those manufactured of stainless steel,
30 shall be galvanized in accordance with AASHTO M 232. Galvanized threaded
31 anchor rods shall be tested for embrittlement after galvanizing, in accordance
32 with Section 9-06.5(4).
33

34 Threaded anchor rods used with resin capsules shall have the tip of the rod
35 chiseled in accordance with the resin capsule manufacturer's
36 recommendations. Galvanized threaded rods shall have the tip chiseled prior
37 to galvanizing.
38

39 2. Resin Bonding Material

40 Resin bonding material shall be one of the following:
41

- 42 a. Vinylester resin.
43
44 b. Polyester resin.
45
46 c. Methacrylate resin.
47
48 d. A two component epoxy resin which meets the requirements of ASTM
49 C 881, Type IV. The grade and class of the epoxy resin shall be as
50 recommended by the epoxy resin manufacturer and as approved by
51 the Engineer.
52

53 3. Ultimate Anchor Tensile Capacity

54 Resin bonded anchors shall each have the following minimum ultimate tensile
55 load capacity when installed in concrete having a maximum compressive
56 strength of 28 megapascals at the embedment specified below:
57

Anchor Diameter (mm)	Tensile Capacity (kN)	Embedment (mm)
M10	40.5	90

1	M12	55.2	110
2	M16	84.5	145
3	M20	121	180
4	M22	142	200
5	M24	182	215
6	M32	400	290

7
8 **(June 26, 2000)**

9 **Epoxy Resin**

10 Epoxy resin shall be Type II, as specified in Section 9-26.1. The grade and class of
11 epoxy resin shall be as recommended by the resin manufacturer and approved by the
12 Engineer.

13
14 **(June 26, 2000)**

15 **Fractured Fin Finish**

16 The fractured fin effect shall be accomplished by the use of either an elastomeric form
17 liner or an ABS or plastic form liner.

18
19 Elastomeric form liners shall be selected from the approved products listed in the
20 WSDOT Qualified Products List, latest edition.

21
22 ABS or plastic form liners may be used to produce the required texture provided that the
23 fractured fin surface is equal to or less than the height of the full length form liner and
24 that the form liner is selected from the approved products listed in the WSDOT Qualified
25 Products List, latest edition.

26
27 **(June 26, 2000)**

28 **Pigmented Sealer**

29 The pigmented sealer shall be a semi-opaque colored toner containing only methyl
30 methacrylate-ethyl acrylate copolymer resins, toning pigments suspended in solution at
31 all times by a chemical suspension agent, and solvent. Toning pigments shall be
32 laminar silicates, titanium dioxide and inorganic oxides only. There shall be no settling
33 or color variation. Use of vegetable or marine oils, paraffin materials, stearates or
34 organic pigments in any part of coating formulation will not be permitted.

35
36 The color shall match the color chip Washington Gray (Revised) which is available at
37 the source specified in Section 9-08.4(7). A special color may be required to match
38 adjacent work, in which case the Contractor shall submit a color chip and a wet sample
39 to the Engineer for approval.

40
41 The pigmented sealer shall be selected from the approved products listed in the
42 WSDOT Qualified Products List, latest edition.

43
44 **(April 30, 2001)**

45 **Strip Seal Expansion Joint System**

46 The metal components shall conform to ASTM A 36M or ASTM A 588M, and shall be
47 protected against corrosion by one of the following methods:

- 48
- 49 1. Zinc metallized in accordance with the Special Provision **METALLIC**
50 **COATINGS**.
- 51
- 52 2. Hot-dip galvanized in accordance with AASHTO M 111.
- 53
- 54 3. Paint in accordance with Section 6-03.3(30) as supplemented in these Special
55 Provisions. The color of the final coat shall be Washington Gray (Revised).
56 The surfaces embedded in concrete shall be painted only with a shop coat of
57 inorganic zinc silicate paint.

58
59 The strip seal gland shall be continuous for the full length of the joint with no splices
60 permitted, unless otherwise shown in the Plans.

1
2 **(BSP February 22, 2001)**

3 **High-Load Elastomeric Bearing Pad Assembly**

4 High-load elastomeric bearing pads shall meet all Level I and Level II acceptance
5 criteria as specified in AASHTO M 251.
6

7 The Contractor shall perform a Long Duration Compression Load test on high-load
8 elastomeric bearing pads randomly selected from each size and material batch of the
9 production bearings. The Contractor shall test one bearing per lot, minimum, where one
10 lot is defined as ten percent of the total number of production bearings in each size and
11 material batch. The Long Duration Compression Load test shall be as specified in
12 Sections 18.7.2.6 and 18.7.4.5.7, Division II Construction, of the AASHTO Standard
13 Specifications for Highway Bridges, Sixteenth Edition and latest interims. The
14 Contractor shall submit the test results to the Engineer for approval.
15

16 If one of the test bearings fails, all of the bearings of that lot shall be rejected, unless the
17 Contractor elects to test each bearing of the lot, at no additional expense to the
18 Contracting Agency. In lieu of this procedure, the Engineer may require the Contractor
19 to test all bearings of the lot.
20

21 Steel bars, plates, and shapes, shall conform to ASTM A 36M.
22

23 Silicon grease shall conform to Military Specification MIL-S-8660.
24

25 Epoxy gel shall conform to Section 9-26.1, Type I, Grade 3, Class A, B, or C.
26

27 Bolts shall conform to Section 9-06.5(3).
28

29 **Bridge Supported Utilities**

30
31 (June 26, 2000)

32 Inserts shall be of the type and model specified in the Plans. Inserts shall be galvanized
33 in accordance with AASHTO M 111.
34

35 (April 30, 2001)

36 Hanger rods, and associated nuts and washers, shall conform to Section 9-06.5(1), and
37 shall be galvanized in accordance with AASHTO M 232.
38

39 Steel bars and plates shall conform to ASTM A 36M and shall be galvanized in
40 accordance with AASHTO M 111.
41

42 (June 26, 2000)

43 Horizontal strut bolts, and associated nuts and washers, shall conform to Section 9-
44 06.5(3), and shall be galvanized in accordance with AASHTO M 232.
45

46 Pre-formed fabric pads shall be composed of multiple layers of duck, impregnated and
47 bound with high quality oil resistant synthetic rubber, compressed into resilient pads of
48 uniform thickness. The duck shall be of highest quality cotton or cotton-polyester 50-50
49 blend, and shall weigh a minimum of 272 grams per square meter. The cotton warp
50 and the filling yarn shall be 2-ply. The cotton-polyester warp and fill shall be single yarn,
51 with a minimum breaking strength by grab method of 1.03 megapascals warp, and 0.97
52 megapascals fill. The filling count of the duck shall be 40 ± 2 threads per 25.4
53 millimeters and the warp count shall be 50 ± 1 threads per 25.4 millimeters. The
54 number of piles shall be sufficient to produce the specified thickness, after compression
55 and vulcanizing.
56

57 The finished pads shall withstand compression loads perpendicular to the plane of the
58 laminations of not less than 68.95 megapascals without any sign of failure after the load
59 is removed. Failure is defined as any breakdown of the component materials or
60 laminations.

1
2 Pre-formed fabric pads shall have a shore A hardness of 90±5.
3

4 Pre-formed fabric pads for bridge utility supports will be accepted based on the
5 manufacturer's certificate of compliance that the material furnished conforms to these
6 specifications. The Contractor shall submit the manufacturer's certificate of compliance
7 to the Engineer in accordance with Section 1-06.3.
8

9 (June 26, 2000)

10 Pipe rolls or pipe saddles shall be of the type and model specified in the Plans.
11

12 **Construction Requirements**

13
14 Section 6-02.3 is supplemented with the following:
15

16 ***Bridge Supported Utilities***

17
18 (June 26, 2000)

19 The Contractor shall furnish and install inserts for the bridge utility supports as shown in
20 the Plans. The Contractor shall verify that the hanger rods freely hang plumb in their
21 inserts, and shall make adjustments to the inserts as necessary and as approved by the
22 Engineer prior to utility installation.
23

24 (*****)

25 The Contractor shall furnish and install the bridge utility supports, and the utility pipe or
26 conduit pipe, as shown in the Plans, with the following exceptions:
27

28 Qwest will furnish conduits for installation by the Contractor. These materials shall
29 include the following and all necessary fittings and couplings specified in the Plans:
30

31 PVC Conduit Schedule 80 – 100mm 1800m
32

33 Puget Sound Energy will furnish conduits for installation by the Contractor. These
34 materials shall include the following and all necessary fittings and couplings
35 specified in the Plans:
36

37 PVC Conduit Schedule 80 – 150mm 1600m
38

39 ***Proportioning Materials***

40 **Contractor Mix Design**

41 Section 6-02.3(2)A is supplemented with the following:
42

43 (April 30, 2001)

44 When combined aggregate gradation is used for structural concrete, the
45 Contractor's mix design shall include a plot of the combined gradation on the
46 0.45 power curve showing that the proposed gradation conforms to Section 9-
47 03.1(5). The requirement for the fine aggregate to conform to Section 9-
48 03.1(2) Class 1 or Class 2 gradation is eliminated when using a combined
49 gradation.
50

51 ***Acceptance of Concrete***

52 **Certification of Compliance**

53 Section 6-02.3(5)B is supplemented with the following:
54

55 (April 30, 2001)

56 When combined aggregate gradation is used for structural concrete, the
57 Certificate of Compliance shall include:
58
59
60

1 Manufacturer plant (batching facility)
2 Contracting Agency contract number
3 Date
4 Time batched
5 Truck No.
6 Initial revolution counter reading
7 Quantity (quantity batched this load)
8 Type of concrete by class and producer design mix number
9 Cement producer, type, and Mill Certification No. (The mill test number as
10 required by Section 9-01.3)
11 Fly ash (if used) brand and type
12 Mix design weight per cubic meter and actual batched weights for:
13 Cement
14 Fly ash (if used)
15 Aggregate components and moisture contents (each size)
16 Water (including free moisture in aggregates)
17 Admixtures brand and total quantity batched
18 Air-entraining admixture
19 Water reducing admixture
20 Other admixtures
21

22 **Conformance to Mix Design**

23 Section 6-02.3(5)C is supplemented with the following:

24
25 (April 30, 2001)

26 When combined aggregate gradation is used for structural concrete, the
27 specified aggregate weight tolerance shall be for the combined aggregate
28 instead of the coarse and fine aggregate components.
29

30 **Expansion Joints**

31 Section 6-02.3(13) is supplemented with the following:

32
33 **(*****)**

34 **Strip Seal Expansion Joint System**

35 The Contractor shall submit working drawings of the expansion joint system to the
36 Engineer for approval in accordance with Section 6-03.3(7). These plans shall
37 include but not be limited to the following:

- 38
39 1. Plan, elevation, and sections of the joint system and all components, with
40 dimensions and tolerances.
- 41
42 2. All material designations.
- 43
44 3. Manufacturer's written installation procedure.
- 45
46 4. Corrosion protection system used on the metal components.
- 47
48 5. Locations of welded shear studs, lifting mechanisms, temperature setting
49 devices, and construction adjustment devices.
- 50
51 6. Method of sealing the system to prevent leakage of water through the
52 joint.
53

54 The strip seal shall be removable and replaceable.

55
56 Other than items shown in the Plans, threaded studs used for construction
57 adjustments are the only items that may be welded to the steel shapes provided
58 they are removed by grinding after use, and the area repaired by application of an
59 approved corrosion protection system.
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The armored steel portion of the expansion joint at the abutment side of temporary Piers 1 and 3 and the corresponding gland shall not be reused in the permanent structure.

If the opening between the steel shapes is anticipated to be less than 38 millimeters at the time of seal installation, the seal may be installed prior to encasement of the steel shapes in concrete.

After the joint system is installed, the joint shall be flooded with water and inspected, from below the joint, for leakage. If leakage is observed, the joint system shall be repaired by the Contractor, as recommended by the manufacturer and approved by the Engineer, at no additional cost to the Contracting Agency.

Finishing Concrete Surfaces

Section 6-02.3(14) is supplemented with the following:

(June 26, 2000)

General Requirements for Concrete Surface Finishes Produced by Form Liners

Horizontal and vertical joints shall be spliced in accordance with the manufacturer's printed instructions. A copy of these printed instructions shall be submitted to the Engineer prior to placement of the form liners. The Contractor shall not place concrete against the form liners until receiving the Engineer's approval of the forms and splices.

Horizontal splicing of ABS and plastic form liners to achieve the required height is not permitted and there shall be no horizontal joints. The concrete formed with ABS and plastic form liners shall be given a light sandblast to remove the glossy finish.

Side forms, traffic barrier forms, and pedestrian barrier forms using these form liners may be removed after 24 hours provided a water reducing admixture approved by the Engineer is used in the concrete, and the concrete reaches 9.65 MPa minimum compressive strength before form removal. Concrete in load supporting forms utilizing these form liners shall be cured in accordance with Section 6-02.3(17)N. Once the forms are removed, the Contractor shall treat the joint areas by patching or light sandblasting as required by the Engineer to ensure that the joints are not visible.

Form liners shall be cleaned, reconditioned, and repaired before each use. Form liners with repairs, patches, or defects which, in the opinion of the Engineer, would result in adverse effects to the concrete finish shall not be used.

Care shall be taken to ensure uniformity of color throughout the textured surface. A change in form release agent will not be allowed.

All surfaces formed by the form liner shall also receive a Class 2 surface finish. Form ties shall be a type that leaves a clean hole when removed. All spalls and form tie holes shall be filled as specified for a Class 2 surface finish.

(June 26, 2000)

Fractured Fin Finish

Form liners shall be placed with fins and joints normal to grade for barrier applications and vertical (or as shown in the Plans) for other applications. Horizontal joints in the elastomeric form liners are permitted on surfaces greater than 2.44 meters in height provided that the minimum form liner panel dimension is 2.44 meters.

1 (June 26, 2000)

2 **Pigmented Sealer**

3 All surfaces to be sealed shall receive a Class 2 finish and shall receive a light
4 brush sandblasting in order that complete neutralization of the surface and
5 subsequent penetration of the pigmented sealer is achieved. All curing agents and
6 form release agents shall be removed. The surface shall be dry, clean and
7 prepared in accordance with manufacturer's written instructions. The Contractor
8 shall submit four copies of the manufacturer's written instructions.
9

10 The pigmented sealer shall be spray applied in accordance with the manufacturer's
11 written instructions for application, qualification of applicator, rate of application,
12 and number of coats to apply. Sealer shall be applied only when the air
13 temperature is at or above 10C. It shall not be applied upon damp surfaces, nor
14 shall it be applied when the air is misty, or otherwise unsatisfactory for the work, in
15 the opinion of the manufacturer or the Engineer. The final appearance shall have
16 an even and uniform color acceptable to the Engineer.
17

18 For concrete surfaces such as columns, retaining walls and abutments, the
19 pigmented sealer shall extend to 300 millimeters below the finish ground line,
20 unless otherwise shown in the Plans.
21

22 (August 6, 2001)

23 **Placing Anchor Bolts**

24 Section 6-02.3(18) is supplemented with the following:
25

26 **Resin Bonded Anchors**

27 The Contractor shall submit item 1 and 2 to the Engineer for all resin bonded
28 anchor systems. If the resin bonded anchor system is not specified in the current
29 WSDOT Qualified Products List, the Contractor shall also submit item 3 to the
30 Engineer.
31

- 32 1. The resin manufacturer's written installation procedure for the anchors.
33 Resin bonding material used in overhead and horizontal application shall
34 be specifically recommended by the resin manufacturer for those
35 applications.
36
- 37 2. The manufacturer's certificate of compliance for the threaded anchor rod
38 certifying that the anchor rod meets the requirements of this Special
39 Provision.
40
- 41 3. Test results by an independent laboratory certifying that the threaded
42 anchor rod system meets the ultimate anchor tensile load capacity
43 specified in Section 6-02.2 as supplemented in these Special Provisions.
44 The tests shall be performed in accordance with ASTM E 488.
45

46 The embedment depth of the anchors shall be as specified in the Plans. If the
47 embedment depth of the anchor is not specified in the Plans then the embedment
48 depth shall be as specified in the table of minimum and maximum torque below.
49

50 The anchors shall be installed in accordance with the resin manufacturer's written
51 procedure.
52

53 Holes shall be drilled as specified in the Plans. Holes may be drilled with a rotary
54 hammer drill when core drilling is not specified in the Plans. If holes are core
55 drilled, the sides of the holes shall be roughened with a rotary hammer drill after
56 core drilling.
57

58 Holes shall be prepared in accordance with the resin manufacturer's
59 recommendations and shall meet the minimum requirements as specified herein.
60 Holes drilled into concrete shall be thoroughly cleaned of debris, dust, and laitance

1 prior to installing the threaded rod and resin bonding material. Holes shall not have
2 any standing liquid at the time of installation of the threaded anchor rod.
3

4 Threaded anchors shall not be installed in submerged liquid environments unless
5 specifically recommended by the resin manufacturer. The Contractor shall submit
6 tests performed by an independent laboratory which certifies that anchors installed
7 in a submerged environment meet the strength requirements specified in Section 6-
8 02.2 as supplemented in these Special Provisions.
9

10 The anchor nuts shall be tightened to the following torques when the embedment
11 equals or exceeds the minimum embedment specified.
12

13	Anchor	Minimum	Maximum	Minimum
14	Diameter (mm)	Torque (N.m)	Torque (N.m)	Embedment
15				(mm)
16				
17	M10	16.3	24.4	90
18	M12	29.8	47.5	110
19	M16	74.6	108	145
20	M20	144	190	180
21	M22	224	258	200
22	M24	264	305	215
23	M32	502	712	290
24				

25 When the anchor embedment depth is less than the minimum values specified, the
26 anchor nuts shall be tightened to the torque values specified in the Plans, or as
27 specified by the Engineer.
28

29 **Bridge Bearings**

30 **Elastomeric Bearing Pads**

31 Section 6-02.3(19)A is supplemented with the following:
32

33 (*****)
34

35 Bearing pads used to support the temporary structure shall be reused to
36 support the permanent structure. No rubber cement shall be used to bond the
37 lower contact surface of the elastomeric bearing pads to the temporary
38 structure.
39

40 **(BSP June 26, 2000)**

41 **High-Load Elastomeric Bearing Pad Assembly**

42 The Contractor shall install all bearings level, unless otherwise shown in the
43 Plans.
44

45 The Contractor shall measure the slope of the top surface of the bearing and
46 the contact surface of the bridge superstructure. If the difference in slope
47 between these surfaces exceeds 0.005 radians, the Contractor shall adjust the
48 surfaces to within this tolerance by shimming, grouting, or other method as
49 approved by the Engineer.
50

51 The Contractor shall set the sole plate with epoxy gel just before setting the
52 superstructure in place on the bearing. The Contractor shall spread a thin
53 uniform film of silicone grease on the top surface of the sole plate in contact
54 with the epoxy gel to prevent bonding of the sole plate to the epoxy gel. The
55 Contractor shall grease the bolts attaching the sole plate to the superstructure
56 to prevent bonding and allow for future removal. The Contractor shall apply
57 epoxy gel to the bottom surface of the superstructure and immediately bolt the
58 sole plate in place to obtain a level surface at the bottom of the sole plate. The
59 Contractor shall set the superstructure in place on the bearing before the
60 epoxy gel has cured, squeezing out excess epoxy gel. The Contractor shall

1 immediately remove all excess epoxy gel and grease. After the epoxy gel has
2 cured, the Contractor shall tighten the sole plate attachment bolts.
3

4 **Grout for Anchor Bolts and Bridge Bearings**

5 Section 6-02.3(20) is supplemented with the following:
6

7 (June 26, 2000)

8 Grout placed at the following locations shall conform to the requirements of this
9 section.

10
11 (*****)

12 Where called for in the Plans
13

14 **Reinforcement**

15 **Placing and Fastening**

16 Section 6-02.3(24)C is supplemented with the following:
17

18
19 (June 26, 2000)

20 **Drilling Holes for, and Setting, Steel Reinforcing Bar Dowels**

21 Where called for in the Plans, holes shall be drilled into existing concrete to the
22 size and dimension shown in the Plans. The Contractor may use any method
23 for drilling the holes provided the method selected does not damage the
24 concrete and the steel reinforcing bar that is to remain. Core drilling will be
25 required when specifically noted in the Plans.
26

27 The Contractor shall exercise care in locating and drilling the holes to avoid
28 damage to existing steel reinforcing bars and concrete. Location of the holes
29 may be shifted slightly with the approval of the Engineer in order to avoid
30 damaging the existing steel reinforcing bars. All damage caused by the
31 Contractor's operations shall be repaired by the Contractor at no cost to the
32 Contracting Agency and the repair shall be as approved by the Engineer.
33

34 Steel reinforcing bars shall be set into the holes noted in the Plans with epoxy
35 resin. The holes shall be blown clean with dry compressed air before placing
36 the resin.
37

38 The Contractor shall demonstrate, to the satisfaction of the Engineer, that the
39 method used for setting the steel reinforcing bars completely fills the void
40 between the steel reinforcing bar and the concrete with epoxy resin. Dams
41 shall be placed at the front of the holes to confine the epoxy and shall not be
42 removed until the epoxy has cured in the hole.
43

44 **Measurement**

45 Section 6-02.4 is supplemented with the following:
46

47 (June 26, 2000)

48 "Roadway Deck – Bridge No. 405/43" and "Roadway Deck – Temporary Bridge"
49 contains the following approximate quantities of materials and work:
50

51 Roadway Deck – Bridge No. 405/43

52	Epoxy-coated St. Reinf. Bar (includes sidewalk)	95,000 kg
53	St. Reinf. Bar	90,000 kg
54	Concrete Class 28D	935 m ³
55	Concrete Class 28 (includes sidewalk)	100m ³
56	Elastomeric Bearing Pad - Expansion Brgs.	22each
57	Elastomeric Bearing Pad - Girder Stops	40each
58	Expansion Joint System Strip Seal	76m
59	Pedestrian Barrier	200m
60		

1	Bridge Railing Type BP	200m
2	Luminaire Pole Anchorage	60 kg
3	Sign Bridge Anchorage	700 kg

4
5 Roadway Deck - Temporary Bridge

6		
7	Expansion Joint System Strip Seal Joint Armor	38m
8	Expansion Joint System Strip Seal Gland	70m

9
10 The quantities are listed only for the convenience of the Contractor in determining the
11 volume of work involved and are not guaranteed to be accurate. The prospective
12 bidders shall verify these quantities before submitting a bid. No adjustments other than
13 for approved changes will be made in the lump sum contract price for "Roadway Deck –
14 Bridge No. 405/43" and "Roadway Deck – Temporary Bridge" even though the actual
15 quantities required may deviate from those listed.

16
17 (BSP June 26, 2000)

18 High-load elastomeric bearing pads will be measured per each for each bearing pad
19 assembly furnished and installed in the bridge.

20
21 **Payment**

22
23 (June 26, 2000)

24 All costs in connection with producing fractured fin finish on concrete surfaces as
25 specified shall be included in the unit contract price per cubic meter for "Conc. Class
26 _____". If the concrete is to be paid for other than by class of concrete then the costs
27 shall be included in the applicable adjacent item of work.

28
29 The fifth and sixth bid items under Section 6-02.5 are supplemented with the following:

30
31 (June 26, 2000)

32 All costs in connection with drilling holes in concrete and setting steel reinforcing bar
33 dowels with epoxy resin as specified shall be included in the unit contract price per
34 kilogram for "St. Reinf. Bar _____" or "Epoxy-Coated St. Reinf. Bar _____" as
35 applicable. If the steel reinforcing bars are to be paid for other than by type of bar then
36 the costs shall be included in the applicable adjacent item of work.

37
38 Section 6-02.5 is supplemented with the following:

39
40 (*****)

41 "Roadway Deck - _____", lump sum.

42 The lump sum contract price for "Roadway Deck - _____" shall be full pay for
43 constructing the reinforced concrete portions of the steel bridge superstructure,
44 including epoxy-coated steel reinforcing bar, steel reinforcing bar, concrete class 28D,
45 concrete class 28 (sidewalk & misc), elastomeric bearing pad - expansion bearings,
46 elastomeric bearing pad - girder stops, expansion joint system strip seal, bridge railing
47 type bp, pedestrian barrier.

48
49 (BSP June 26, 2000)

50 "High-Load Elastomeric Bearing Pad - _____", per each.

51
52 The unit contract price per each for "High-Load Elastomeric Bearing Pad - _____" shall
53 be full pay for furnishing, testing, and installing the bearing assemblies as specified,
54 including all work required to adjust the bearing assemblies to their correct position
55 following installation.

56
57 (*****)

58 ***Bridge and Structures Minor Items***

59 For the purpose of payment, such bridge and structures items as premolded joint filler,
60 concrete inserts, lean concrete pad, weep holes, caulk, adhesive, sealant, etc., for

1 which there is no pay item included in the proposal, are considered as bridge and
2 structures minor items. All costs in connection with furnishing and installing these
3 bridge and structures minor items as shown and noted in the Plans and as outlined in
4 these specifications and in the Standard Specifications shall be included in the
5 applicable adjacent item at work.
6

7 **(June 26, 2000)**

8 **Bridge Supported Utilities**

9 All costs to place the conduit through the superstructure of NE 8th Bridge as shown in
10 the Plans, including grouting and installation of hangers shall be included in the unit
11 contract price per meter for "PVC Conduit – Sch. ____ Diam."
12

13 **(June 26, 2000)**

14 No additional compensation will be made by reason of any delay or other expense to
15 the Contractor caused by coordination with the utility company or by installing utility
16 company furnished items. However, any unavoidable delays to the Contractor caused
17 by coordination with the utility company or resulting from installing utility company
18 furnished items will be adjusted in accordance with Section 1-08.8.
19

20 **STEEL STRUCTURES**

21 **Materials**

22 Section 6-03.2 is supplemented with the following:
23

24 **(*****)**

25 **Temporary Supports at Existing Piers 2 thru 6**

26 Structural steel furnished by the Contractor shall conform to the requirements of ASTM
27 A 36M.
28

29 Steel reinforcing bars shall conform to Section 9-07.
30

31 Epoxy resin shall conform to Section 6-02.2 as supplemented in these Special
32 Provisions.
33

34 Cast-in-place concrete shall be Class 28 in accordance with Section 6-02.
35

36 Timber and lumber shall conform to Section 9-09.2, and shall be untreated.
37

38 Timber connection hardware shall conform to Section 9-06.22.
39

40 **(*****)**

41 **Temporary Pier 2**

42 Structural steel furnished by the Contractor shall be in accordance with AASHTO M
43 270M, Grade 345. Structural steel for the Contractor's provided design shall be in
44 accordance with AASHTO M 270M, Grade 345, unless otherwise approved by the
45 Engineer.
46

47 Steel reinforcing bars shall conform to Section 9-07.
48

49 Cast-in-place concrete shall be Class 28 in accordance with Section 6-02.
50

51 **(*****)**

52 **Relocating Superstructure**

53 The Structure lifting system components shall conform to the following requirements:
54

55 The jack shall be capable of sustaining the lifting load for long periods. The rated
56 capacity of the jack shall be clearly shown on the manufacturer's nameplate
57 attached to each jack. Each jack shall have a rated capacity of at least the capacity
58 shown in the Plans. The jacks shall be equipped with pressure gauges or other
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load measuring devices that enable the applied lifting forces to be monitored at all times.

The lifting system shall be capable of activating all the jacking cylinders simultaneously and shall be capable of providing adjustments so that the lift points will rise equally even though the loading on the individual jacking cylinders may differ.

All lifting equipment determined by the Engineer to be inadequate or faulty shall be removed from the project site and replaced by the Contractor at no additional cost to the Contracting Agency.

(*****)

Partial Removing and Modifying Temporary Piers 1 and 3

Steel reinforcing bars shall conform to Section 9-07.

Epoxy resin shall conform to Section 6-02.2 as supplemented in these Special Provisions.

Cast-in-place concrete shall be Class 28 in accordance with Section 6-02.

Construction Requirements

Section 6-03.3 is supplemented with the following:

(*****)

Temporary Supports at Existing Piers 2 thru 6

The Contractor shall design and detail the temporary supports at existing piers 2 thru 6, as specified in the Plans and this Special Provision, in accordance with Section 6-02.3(16) and Section 6-02.3(17) and in accordance with the following requirements:

The design loads shall consist of the sum of loads shown in the Plans and those specified in Section 6-02.3(17)A.

The Contractor shall construct and remove the temporary supports at existing piers 2 thru 6, as specified in the Plans and this Special Provision, in accordance with Section 6-02.3(16) and Section 6-02.3(17) and in accordance with the following requirements:

Temporary supports at existing piers 2 and 6 shall be placed on and anchored to temporary concrete footings. Temporary concrete footings shall conform to Section 6-02.3(17) D.

Temporary supports at existing piers 3 thru 5 shall be placed on and anchored to the existing concrete barriers.

The Contractor shall not drill anchors into the existing crossbeams and columns.

Removal of the temporary supports shall be in accordance with Section 2-02.3(2) as supplemented in these Special Provisions.

(*****)

Temporary Pier 2

The Contractor shall design and detail the temporary pier 2, including foundation, as specified in the Plans and this Special Provision, in accordance with the requirements of the AASHTO Standard Specifications for Highway Bridges Sixteenth Edition – 1996 and Interims through 2000. Seismic design of the temporary pier 2 shall be done using an acceleration coefficient of 0.15 and soil profile type II.

The Contractor shall construct and remove temporary Pier 2 as shown in the Plans and in accordance with Section 2-02.3(2) as supplemented in these Special Provisions.

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2 **(*****)**
3 **Relocating Superstructure**
4

5 **Submittals**

6 Superstructure Relocation shall be performed by a qualified Contractor or
7 Subcontractor. The Contractor or Subcontractor performing superstructure
8 relocation shall be prequalified in accordance with Section 1-02.1 and in
9 accordance with the following requirements:

10
11 The Contractor shall submit to the contracting Agency at least three examples of
12 previous projects where the Contractor or Subcontractor performed relocation of
13 bridges or other heavy construction.

14
15 Each previous project submitted shall include project name and location,
16 description of work performed, type of rollers and relocation equipment used,
17 distance the object was moved, period of time in which the relocation was
18 completed, name and address of the owner or contracting agency, and description
19 of all difficulties encountered and corrective measures taken during relocation
20 process.

21
22 At least one of the previous projects shall be a project involving relocation of a
23 highway bridge of similar steel girders/concrete deck composition and of similar or
24 larger overall weight.

25
26 At least one of the previous projects shall be a project involving relocation of a
27 bridge over a distance of at least 10 meters over an uphill grade of 2% or steeper.

28
29 At least one of the previous projects shall be a project involving relocation of a
30 highway bridge in the United States of America.

31
32 **Structure Lifting System Plan**

33 The Contractor shall design and detail the structure lifting system, as specified in
34 the Plans and this Special Provision. The design of the structure lifting system
35 shall be prepared by a professional engineer in accordance with Section 6-
36 02.3(16). The Contractor's professional engineer shall be available for consultation
37 in interpreting the design and details of the structure lifting system and in the
38 resolution of problems that may arise during performance of the work.

39
40 The Contractor shall submit working drawings and design calculations of the
41 structure lifting system to the Engineer for approval in accordance with Section 6-
42 02-3(16). The structure lifting system plan shall include, but not be limited to, the
43 following:

- 44
- 45 1. Lift point locations. A lift point is defined as the point where the lifting load
46 is applied, as shown in the Plans.
 - 47
 - 48 2. Blocking point locations. A blocking point is defined as a point other than
49 a lift point where the structure is temporarily supported while in the raised
50 position, as selected by the Contractor and approved by the Engineer.
 - 51
 - 52 3. Calculated lifting loads. A lifting load is defined as the load required to lift
53 the structure at the locations shown in the Plans based on structure dead
54 load only.
 - 55
 - 56 4. Calculated loads at blocking points. A blocking load is defined as the load
57 required to support the structure in the raised position at the location as
58 selected by the Contractor and approved by the Engineer, based on
59 structure dead load only.
 - 60

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5. Details for all lifting equipment, support systems, jacking frames, and blocking point assemblies.
6. Details and locations of all temporary stiffeners that may be required at selected blocking points. The details shall include the method and procedure for ensuring tight fit of the stiffener and for installing the stiffener.
7. Detailed procedure describing the lifting operation, including the set-up and testing of the system and individual components prior to beginning the operation at each pier, a written description of all steps in the jacking cycle including work crew instructions, the methods used to ensure no differential movement, the methods and forms (with attached sample form) used to monitor jack pressures, jack loads, and blocking point and bridge superstructure movement, the methods used to transfer the structure load to the blocking points are separate from lifting points, the methods used to secure the bridge structure while in the raised position, and the methods used to lower the structure.
8. Type and grade of all materials.
9. Distance that each lifting point shall be raised.
10. Schematic hydraulic layout to include pumps, hydraulic hoses, valves, and gauges.
11. All disconnections, reconnections, or adjustments that are necessary to properly complete the lifting operations. This includes but is not limited to railings and expansion joints.

The working drawings shall show the functions and capacities of the main components of the jacking system and shall include the sizes, the strokes, the capacities, and the rate of rise of the jacking cylinders. The method of adjusting flow into the individual cylinders to provide equal rise of the cylinders, and the method of checking the positions of the lift points during all stages of raising and lowering the structure shall be specified on the working drawings.

Jacking shall not commence until the working drawings for the structure lifting system have been approved in writing by the Engineer. Approval of the working drawings by the Engineer shall not relieve the Contractor of responsibility for the adequacy of the structure lifting system.

Superstructure Relocation Plan

The Contractor shall submit a superstructure relocation plan to the Engineer for approval, with supporting calculations and working drawings in accordance with Section 6-02.3(16). The superstructure relocation plan shall include, but not be limited to, the following:

1. A list of all equipment used, including descriptions of all jacks, winches or other pull/push mechanism, rollers and associated hardware, and breaking system.

The roller system shown in the Plans is only shown as an example. The Contractor shall select the type and number of rollers as appropriate for the Contractor's design.

2. A step-by-step narrative description of the relocation procedure. The narrative shall describe preparing the superstructure for jacking, raising the superstructure, preparing the superstructure for transfer from the temporary piers to the final alignment, the transfer process (including the method and

1 sequence of operating the tension lines with winches and the hold back lines
2 with brakes), and lowering the superstructure onto the new bridge piers.
3

- 4 3. Plans views, sections and details, showing the location of all equipment and
5 operations during each stage of the relocation procedure.
6
7 4. A description of the synchronizing equipment used and measures taken to
8 ensure equal travel at all piers (preventing twisting), and to ensure maintaining
9 tension and control in all cables (tension and hold back).
10

11 The Contractor shall not begin relocating the superstructure from temporary piers to the
12 final bridge alignment until receiving the Engineer's approval of the superstructure
13 relocation plan.
14

15 **Superstructure Relocation**

16 The Contractor shall perform lifting and lowering operations in accordance with the
17 structure lifting system plan as approved by the Engineer. The Contractor shall
18 move the superstructure from the temporary piers to the final alignment in
19 accordance with the relocation plan as approved by the Engineer. The Contractor
20 shall complete relocating the superstructure from the temporary piers to the final
21 alignment within six (6) hours.
22

23 The Contractor shall furnish and install all blocking point assemblies, temporary
24 stiffeners, and shims as required. All Contractor supplied blocking point
25 assemblies, temporary stiffeners, and shims shall remain the property of the
26 Contractor at the conclusion of the project. The Contractor shall raise (and lower)
27 the designated lifting points simultaneously, at each bridge pier, by applying the
28 necessary lifting load at each lift point. The Contractor shall not apply a lifting load
29 greater than 0.57 times the rated lifting capacity of the jack, as specified on the
30 manufacturer's nameplate attached to each jack.
31

32 The jacking cylinders shall be kept vertical during all phases of the lifting and
33 lowering operation.
34

35 The Contractor shall make frequent measurements at the pier while jacking is
36 progressing to ensure that the lift points are rising or falling equally. If unequal
37 rising or falling of the lift points is detected, the Contractor shall immediately stop
38 jacking and make necessary adjustments prior to resuming jacking.
39

40 During the lifting and lowering operation, the relative difference of vertical
41 displacements at adjacent lift points shall not exceed 5 millimeters. The Contractor
42 shall conduct the lifting and lowering operations in cycles of 5 millimeters.
43

44 The maximum vertical displacement of the portion of the bridge structure being
45 lifted shall be the minimum necessary to conduct the specified construction
46 operations and shall not exceed the dimension specified in the Plans.
47

48 The Contractor shall safely secure the bridge superstructure at the earliest possible
49 moment during and after the lift cycle and the lowering cycle by securing each jack
50 and shimming at blocking points. Sustained loads shall be supported by structural
51 and mechanical means only, and shall not be supported by hydraulic means.
52

53 The Contractor shall maintain at least one extra jack at each pier as backup should
54 a jack failure occur during lifting operations.
55

56 The Contractor shall maintain the jacking equipment in satisfactory working
57 condition at all times. The jacking equipment shall remain the property of the
58 Contractor at the conclusion of the contract.
59

1 There shall be no live load or construction load on the superstructure span being
2 raised while the lifting or lowering operation is in progress, while the superstructure
3 span is in the raised position, or while the superstructure is being moved.
4
5 There shall be no jacking or moving of the superstructure when the wind speed
6 (including gusts) at the site exceeds 16 kilometers per hour, or if the wind speed
7 (including gusts) specified by a National Weather Service weather forecast is
8 predicted to exceed 16 kilometers per hour on the day of the scheduled jacking or
9 relocation.
10
11 Lubrication of rollers, roller tracks and other moving parts shall be manufacturer's
12 recommendations.
13
14 The superstructure shall be moved from temporary piers to the final alignment at
15 very slow speed. The rolling speed shall be as dictated by the type of rollers/track
16 system used and by the type of winches or pull/push mechanism used, but in no
17 case shall exceed 1 meter per minute.
18
19 The Contractor shall make continuous measurements at each pier while rolling is
20 progressing to ensure that the superstructure is moving at equal speeds at each
21 pier. If unequal rolling speed is detected, the Contractor shall immediately stop
22 rolling and make necessary adjustments prior to resuming rolling.
23
24 The Contractor shall make continuous observation of rollers and tracks while rolling
25 is progressing. If binding of rollers is detected, the Contractor shall immediately
26 stop rolling and make necessary adjustments prior to resuming rolling.
27
28 The Contractor shall make continuous observation of supporting piers and all
29 superstructure elements while rolling is progressing to ensure that bridge elements
30 are not experiencing undue stress. If distress is detected, i.e. warping of plate
31 girder(s), failure of connection(s), cracking of concrete, etc., the Contractor shall
32 immediately stop rolling and notify the Engineer. Upon evaluation of distress
33 area(s), the Engineer shall determine whether rolling shall resume.
34
35 Tracks shall be constructed to tolerances shown on Plans.
36
37 The Contractor shall test breaking system after moving the superstructure at least
38 0.5 meters but no more than 1.0 meter.
39
40 The Contractor shall maintain the relocation equipment in satisfactory working
41 condition at all times. The relocation equipment shall remain the property of the
42 Contractor at the conclusion of the contract.
43
44 **(*****)**
45 ***Partial Removing and Modifying Temporary Piers 1 and 3***
46 After the superstructure has been relocated from the temporary piers to the final bridge
47 alignment, the Contractor shall partially remove upper portions of the temporary piers 1
48 and 3 and construct coping as specified in the Plans and this Special Provision.
49
50 Removal of the temporary supports shall be in accordance with Section 2-02.3(2) as
51 supplemented in these Special Provisions.
52
53 (BSP January 7, 2002)
54 Structural high strength steel shall conform to AASHTO M 270M, Grade HPS 485W,
55 with supplementary requirements S83 and S84 as applicable.
56
57 The Contractor is advised that quenched and tempered AASTO M 270M Grade HPS
58 485W steel plates are limited to a 15.24 meter maximum delivery length from the mill.
59

1 As an alternative, Grade HPS 485W thermo-mechanical-controlled-processing (TMCP)
2 steel plates with a minimum specified yield point of 485 MPa are also available from the
3 manufacturer in limited thicknesses, and may be directly substituted for the quenched
4 and tempered product. The HPS 485W TMCP product is not currently included in
5 AASHTO M 270M specifications. However, except for the rolling and heat treating
6 processes, the manufacture, testing, delivery and requirements for mill inspection of
7 HPS 485W TMCP steel shall conform to AASHTO M 270M Grade HPS 485W.
8

9 **Construction Requirements**

10 Section 6-03.3 is supplemented with the following:

11 (BSP January 7, 2002)

12 Structural steel fabricators for Bridge No. 405/43 shall be certified under the AISC
13 Quality Certification Program, Major Steel Bridges Category, with endorsement F,
14 Fracture Critical. Prior to approval for fabrication, the results of the latest AISC
15 certification review shall be submitted to the Engineer.
16

17 **Workmanship and Finish**

18 Section 6-03.3(11) is supplemented with the following:

19 (BSP January 7, 2002)

20 All fabrication shall conform to the latest edition of the AASHTO Guide
21 Specifications for Highway Bridge Fabrication with HPS 70W Steel, except as
22 modified by these Special Provisions.
23

24 Short term application of heat for purposes of heat curving, heat straightening,
25 camber and sweep adjustment, or other reasons, shall conform to Sections 6-
26 03.3(10) and 6-03.3(18), and is limited to 590C maximum.
27

28 **Planing of Bearing Surfaces**

29 Section 6-03.3(15) is supplemented with the following:

30 (June 26, 2000)

31 Where mill to bear is specified in the Plans, the bearing end of the stiffener shall be
32 flush and square with the flange and shall have at least 75 percent of this area in
33 contact with the flange.
34

35 **Welding and Repair Welding**

36 Section 6-03.3(25) is supplemented with the following:

37 (BSP January 7, 2002)

38 **Welding Requirements for AASHTO M 270M Grade HPS 485W Steel**

39 All welding shall conform to the latest edition of the AASHTO Guide Specifications
40 for Highway Bridge Fabrication with HPS 70W Steel.
41

42 Use of the ESAB ENi4 electrode in combination with Lincoln Mil800H flux will not
43 be allowed.
44

45 Only submerged arc and shielded metal arc welding processes will be permitted.
46 Consumable handling requirements shall be in accordance with AWS D1.5,
47 Sections 12.6.5 and 12.6.6, except that SAW consumables shall meet the
48 hydrogen control level of H4 as discussed in AWS D1.5, Section 12, Article 12.6.2.
49 SMAW consumables shall meet either H4 or H8 except the higher preheat and
50 interpass temperatures as noted in Table 3 of the AASHTO Guide Specifications
51 for Highway Bridge Fabrication with HPS 70W Steel apply to H8 conditions.
52

53 Filler metals used to make single pass fillet welds for web to flange applications,
54 and for attaching stiffeners and connection plates to webs and flanges, shall
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conform to AWS D1.5, Table 4.1 for AASHTO M 270M Grade 345W base metal. Filler metals for single pass fillet welds need not meet the requirements for exposed bare applications.

Filler metals used for all complete penetration groove welds connecting Grade HPS 485W plate to AASHTO M 270M Grade 345W plate may conform to the requirements for welding Grade 345W base metal, or may conform to the requirements for welding Grade HPS 485W base metal as listed below.

Filler metals used for all complete penetration groove welds connecting Grade HPS 485W plates shall conform to the requirements for HPS 485W base metal as follows:

Submerged Arc Welding process:

- Wire LA85 by Lincoln Electric Company
- Flux MIL800HPNi by Lincoln Electric Company

Shielded Metal Arc Welding process:

- Matching E9018MR*
- Undermatching E7018MR*

* the designator MR, for moisture resistant coating, is required for all SMAW electrodes used for welding HPS 485W steels.

The Contractor may request approval of alternative consumables in lieu of the above filler metals for SAW. The request for approval shall include documentation of successful welding in accordance with the AWS D1.5 Bridge Welding Code, and include diffusible hydrogen tests as described in AWS D1.5, Article 12.6.2 indicating the deposited weld metal under proposed fabrication shop conditions has a diffusible hydrogen level equivalent to H4 or less.

If specified in the Plans, additional weld procedure qualification tests shall measure the Charpy V-notch toughness of the coarse grained area of the heat affected zone (HAZ). The notch in the specimens shall be carefully located in the coarse grained area of the HAZ, as determined by macroetching the specimens prior to machining and testing. The toughness requirement for the HAZ shall be the same as the weld metal.

All procedure qualification tests shall be ultrasonically tested in accordance with AWS D1.5-96, Section 6, Part C. Evaluation shall conform to AWS D1.5-96, Table 9.1, Ultrasonic Acceptance - Rejection Criteria - Tensile Stress. Indications found at the interface of the backing bar may be disregarded, regardless of the defect rating.

The Engineer shall be allowed to witness all welding procedure specification qualification tests.

In general, post weld heat treatment shall not be required. The use of such post weld heat treatment shall require additional qualification testing.

Whenever magnetic particle testing is done, only the yoke technique will be allowed, as described in Section 6.7.6.2 of the AASHTO/ AWS D1.5 Bridge Welding Code, modified to test using alternating current only. The prod technique will not be allowed.

1 **Shop Assembly**

2
3 **Method of Shop Assembly**

4 Section 6-03.3(28)A is supplemented with the following:

5
6 (June 26, 2000)

7 The girders shall also be shop assembled either completely or progressively in
8 the transverse direction. The transverse shop assembly shall consist of a
9 minimum of two adjacent girders, with pier diaphragms and temporary bracing
10 between girders at the end of the shop assembly (longitudinally). Staging of
11 the transverse shop assembly shall proceed along with the longitudinal shop
12 assembly. Each next stage of the transverse shop assembly shall be
13 assembled to one of the previous transverse shop assemblies, repositioned if
14 necessary, and pinned to ensure accurate alignment.

15
16 **Check of Shop Assembly**

17 Section 6-03.3(28)B is supplemented with the following:

18
19 (June 26, 2000)

20 If an assembly or stage of assembly is not approved by the Engineer,
21 deficiencies shall be corrected and the assembly or stage of assembly shall be
22 resubmitted to the Engineer for approval.

23
24 **Painting**

25 Section 6-03.3(30) is supplemented with the following:

26
27 (March 6, 2000)

28 Paint for the new steel shall be applied in accordance with Section 6-07.3(1). The
29 color of the third coat, when dry, shall match Washington Gray (Revised). Color
30 chips are available from the source specified in Section 9-08.4(7).

31
32 **Bolted Connections**

33 Section 6-03.3(33) is supplemented with the following:

34
35 (June 26, 2000)

36 All bolted connections for bridge structures shall use Type 3 bolts.

37
38 **Swinging the Span**

39 Section 6-03.3(39) is supplemented with the following:

40
41 (June 26, 2000)

42 The Contractor shall measure and submit to the Engineer camber values at the
43 points indicated in the Plans at each of the following times:

- 44
45 1. After the spans are swung.
46
47 2. After roadway slab placement.
48

49 **Measurement**

50 Section 6-03.4 is supplemented with the following:

51
52 (*****)

53 Structural low alloy steel contains the following approximate steel quantities:

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55

Bridge	Quantity
405/43 (Grade 345W)	130,000 kg
(Grade HPS 345W)	<u>210,000 kg</u>
Total	340,000 kg

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60 The estimated overall length of the safety cables is as follows:

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Bridge	Length
405/43	2,000 m

Structural high strength steel contains the following approximate steel quantities:

Bridge	Quantity
405/43	390,000 kg

Temporary Supports At Existing Piers 2 Thru 6 contains the following approximate quantities of materials and work:

Structural Low Allow Steel	22,500 kg
Concrete Class 28	5 m ³
Steel Reinforcing Bar	600 kg
Removing Temporary Supports	5 each

The quantities are listed only for the convenience of the Contractor in determining the volume of work involved and are not guaranteed to be accurate. The prospective bidders shall verify these quantities before submitting a bid. No adjustments other than for approved changes will be made in the lump sum contract price for Constructing and Removing Temporary Supports At Existing Piers 2 Thru 6 even though the actual quantities required may deviate from those listed.

Temporary Pier 2 contains the following approximate quantities of materials and work:

Structural Low Allow Steel	45,000 kg
Structural Excavation Class A Incl. Haul	315 m ³
Concrete Class 28	130 m ³
Steel Reinforcing Bar	13,000 kg
Removing Temporary Pier	1 each

The quantities are listed only for the convenience of the Contractor in determining the volume of work involved and are not guaranteed to be accurate. The prospective bidders shall verify these quantities before submitting a bid. No adjustments other than for approved changes will be made in the lump sum contract price for Temporary Pier 2 even though the actual quantities required may deviate from those listed.

Relocating Superstructure contains the following approximate quantities of materials and work:

Structural Low Allow Steel	3,000 kg
Rollers	24 each
Relocating superstructure	1 each

The quantities are listed only for the convenience of the Contractor in determining the volume of work involved and are not guaranteed to be accurate. The prospective bidders shall verify these quantities before submitting a bid. No adjustments other than for approved changes will be made in the lump sum contract price for Relocating Superstructure even though the actual quantities required may deviate from those listed.

Partial Removing And Modifying Temporary Piers 1 and 3 contains the following approximate quantities of materials and work:

Sawcutting	120 m
Removing Concrete	255 m ³
Concrete Class 28	18 m ³
Steel Reinforcing Bar	320 kg

1 The quantities are listed only for the convenience of the Contractor in determining the
2 volume of work involved and are not guaranteed to be accurate. The prospective
3 bidders shall verify these quantities before submitting a bid. No adjustments other than
4 for approved changes will be made in the lump sum contract price for Partial Removing
5 And Modifying Temporary Piers 1 and 3 even though the actual quantities required may
6 deviate from those listed.
7

8 **Payment**

9
10 The second bid item under Section 6-03.5 is supplemented with the following:

11
12 (June 26, 2000)

13 All costs in connection with furnishing and installing safety cables as shown in the Plans
14 shall be included in the lump sum contract price for "Structural Low Alloy Steel".
15

16 Section 6-03.5 is supplemented with the following:

17
18 (*****)

19 "Temporary Supports at Existing Piers 2 thru 6", lump sum.

20 The lump sum contract price for "Temporary Supports at Existing Piers 2 thru 6" shall be
21 full pay for designing, constructing and removing temporary supports at existing piers 2
22 thru 6 as specified in the Plans and in this Special Provisions.
23

24 (*****)

25 "Temporary Pier 2", lump sum.

26 The lump sum contract price for "Temporary Pier 2" shall be full pay for designing,
27 constructing and removing temporary pier 2 as specified in the Plans and in this Special
28 Provisions.
29

30 (*****)

31 "Relocating Superstructure", lump sum.

32 The lump sum contract price for "Relocating Superstructure" shall be full pay for
33 relocating superstructure from the temporary piers to the final alignment as specified in
34 the Plans and in this Special Provisions.
35

36 (*****)

37 "Partial Removing and Modifying Temporary Piers 1 and 3", lump sum.

38 The lump sum contract price for "Partial Removing and Modifying Temporary Piers 1
39 and 3" shall be full pay for partial removing and modifying temporary piers 1 and 3 as
40 specified in the Plans and in this Special Provisions.
41

42 **CONCRETE BARRIER**

43 **Construction Requirements**

44 ***Cast-In-Place Concrete Barrier***

45
46 Section 6-10.3(2) is supplemented with the following:

47
48 (March 6, 2000)

49 Pedestrian barrier and traffic barrier shall be constructed in accordance with the
50 requirements for cast-in-place concrete barrier, and shall be cured and finished in
51 accordance with Sections 6-02.3(11)A and 6-02.3(14) respectively.
52

53 ***Temporary Concrete Barrier***

54
55 Section 6-10.3(5) is supplemented with the following:

56
57 (March 13, 1995)

58 Delineators shall be placed on the traffic face of the barrier 150 millimeters from the
59 top and spaced a maximum of 12 meters on tangents and 6 meters through curves.
60

1 Reflector color shall be white on the right of traffic and yellow on the left of traffic.

2
3 The Contractor shall maintain, replace, and clean the delineators when ordered by
4 the Engineer.

5
6 (*****)

7 When anchoring of the barrier is required, it shall be anchored in accordance with
8 Standard Plan C-8e.

9
10 **Placing Concrete Barrier**

11 Section 6-10.3(6) is supplemented with the following:

12
13 (March 13, 1995)

14 Precast barrier intended for permanent placement may be used at temporary
15 locations and will be considered temporary barrier until installed at a permanent
16 location.

17
18 Barrier damaged while being used at a temporary location shall not be reused at a
19 permanent location even though it has been repaired, and when no longer required
20 at a temporary location, shall become the property of the Contractor and removed
21 from the project.

22
23 **Measurement**

24 Section 6-10.4 is supplemented with the following:

25
26 (August 6, 2001)

27 Pedestrian barrier and traffic barrier will be measured by the meter along the completed
28 line and slope.

29
30 **Payment**

31 Section 6-10.5 is supplemented with the following:

32
33 (April 28, 1997)

34 The following paragraph is added immediately following the bid item, "Temporary Conc.
35 Barrier".

36
37 The unit contract price per meter for "Temporary Conc. Barrier" shall include all
38 costs for furnishing, placing, maintaining, replacing, and cleaning barrier
39 delineation.

40
41 (*****)

42 The following paragraph is added immediately following the bid item, "Precast Conc.
43 Barrier Type ____":

44
45 The unit contract price per meter for "Precast Conc. Barrier Type ____" shall include
46 all costs associated with anchoring the barrier.

47
48 (March 6, 2000)

49 "Pedestrian Barrier", per meter.

50 "Traffic Barrier", per meter

51 The unit contract price per meter for "Pedestrian Barrier" and "Traffic Barrier" shall be
52 full pay for performing the work as specified, excluding the steel reinforcing bars that
53 extend from the roadway deck slab, wingwalls, and retaining walls.

54
55 **CONTRACTING AGENCY-FURNISHED QUICKCHANGE MOVABLE BARRIER**
56 **(QMB) AND TRANSFER/TRANSPORT VEHICLE MODEL 3 (TTV)**

57 **Description**

58 This work consists of transporting, installing, relocating, and maintaining 516 meters of
59 Contracting Agency-furnished Quickchange Movable Barrier (QMB) and transporting,

1 operating, and maintaining one Contracting Agency-Furnished Transfer/Transport Vehicle
2 Model 3 (TTV), as manufactured by Barrier Systems Incorporated.

3
4 The TTV is capable of shifting continuous lengths of QMB a minimum of 1.2 meters to a
5 maximum of 5.5 meters across the roadway in one pass at speeds of 3-5 mph. Further
6 information on the TTV and QMB can be obtained from:

7
8 **Barrier Systems, Inc.**
9 West Coast Operations
10 104 Flindell Way
11 Folsom, CA 95630
12 Attn: Mr. Bill Lake
13 Phone: 916-984-7473

Barrier Systems, Inc.
Main Office
1100 East William Street, Suite 206
Carson City, NV 89701-3104
Phone: 775-885-2500

14
15 The QMB and TTV will be available to the Contractor on June 4, 2002, and shall be returned
16 to the Contracting Agency by November 12, 2003.

17 18 **Construction Requirements**

19 ***Initial Delivery and Placement***

20 The Contractor shall transport the QMB, one TTV, and replacement parts to the job site
21 from Contracting Agency storage sites located within 10 miles of Seattle as listed below.

22 23 **TTV and Replacement Parts Pick Up and Delivery Location**

24 WSDOT Shop/Equipment Maintenance Facility
25 6431 Corson Ave. S.
26 Seattle, WA 98108

27 28 **QMB Pick Up and Delivery Location**

29 WSDOT Yard
30 Northbound SR 5, MP 152 vicinity

31
32 The Contractor shall notify the Engineer, in writing, 15 working days in advance of the
33 pick up date.

34
35 The Contractor shall load the TTV on a trailer, lowboy, or similar conveyance and haul it
36 between the pick up location and the job site. The Contractor shall not attempt to
37 transport the TTV to the job site by driving it under its own power or by towing. The
38 Contractor shall be responsible for furnishing the approved personnel and equipment
39 necessary for loading and unloading the QMB and TTV at the pickup and delivery
40 locations.

41
42 The locations for initial placement of the QMB shall be approved by the Engineer.

43
44 When the Engineer determines that the QMB and TTV are no longer required, the
45 Contractor shall deliver the QMB and TTV to the locations listed above.

46
47 The Contractor will be relieved of responsibility for the TTV after the Engineer
48 determines that the TTV has been returned to the Contracting Agency in the same
49 condition as initially received by the Contractor. The Contractor shall return to the
50 Contracting Agency the same quantity of undamaged QMB as originally furnished.

51 52 **Contractor Submittals**

53 The Contractor shall submit a list of TTV/QMB operators and mechanics certified by
54 Barrier Systems Incorporated to the Engineer for approval. Certified operators and
55 mechanics shall have been trained in the manufacturer's recommended operations,
56 maintenance, and repair procedures for the TTV and QMB. Training shall be obtained
57 through Barrier Systems Incorporated and be completed prior to the initial pick up date.
58 Only approved personnel shall operate, maintain, or repair the TTV and the QMB.
59

1 **QMB and TTV Operation**

2 All proposed positions of the QMB shall be shown on the approved traffic control plan.
3 The TTV shall be used to move the QMB for access to the construction site only during
4 the lane closure hours specified in the subsection **Public Convenience And Safety** of
5 the Special Provision **LEGAL RELATIONS AND RESPONSIBILITIES TO THE**
6 **PUBLIC**. Traffic control devices shown in the approved traffic control plan shall be in
7 place prior to the QMB shift. The QMB shall be returned to its original position or
8 moved to another position called for by the approved traffic control by the end of the
9 lane closure period or as soon as there is no longer a need for the lane closure,
10 whichever occurs first. At no time shall the QMB be moved without the prior approval of
11 the Engineer.

12
13 QMB in use shall be inspected daily for cracks, chips, spalls, dirt, and traffic marks.
14 Damaged QMB sections shall be repaired or replaced according to the requirements of
15 the **Maintenance and Repair** subsection of this Special Provision.

16
17 No on-site storage for the TTV has been provided.

18
19 The TTV will not be available for use from July 21, 2002 through September 9, 2002.
20 The TTV will be removed and returned to the Contractor's storage site on the above
21 dates.

22
23 Closure restrictions identified in the Subsection **Public Convenience And Safety** of the
24 Special Provision **LEGAL RELATIONS AND RESPONSIBILITIES TO THE PUBLIC**
25 shall apply to the use of the QMB. Failure to open the roadway to travel by the time
26 limit specified will result in the assessment of damages as specified in the subsection
27 **Liquidated Damages** of the Special Provision **PROSECUTION AND PROGRESS**.

28
29 **Maintenance and Repair**

30 The Contractor shall be responsible for fueling, lubricating, and performing all routine
31 maintenance on the TTV recommended by the manufacturer to ensure that the TTV is
32 returned to the Contracting Agency in the same condition as initial delivery. The
33 Contractor shall provide the Engineer with complete monthly maintenance records. The
34 Contractor shall also be responsible for repairing the TTV if it is damaged while in the
35 Contractor's possession.

36
37 Maintenance shall be scheduled during periods when the TTV is not in use. A complete
38 set of replacement parts as listed below will be provided by the Contracting Agency at
39 the TTV pickup location. To minimize down time, the Contractor shall maintain in stock
40 the following quantities of these replacement parts which are noted by the manufacturer
41 to be typically required to maintain and repair the TTV:

42
43

30 each	Std. Conveyor Wheels, B900802
44 10 each	Spindle, Conveyor, S1350
45 5 each	Hub, Conveyor 1-100-03-01
46 6 each	Bearing, Conveyor Hub, L44649
47 5 each	Seal, Conveyor Hub, SL122-1
48 10 each	Dust Cap, Conveyor Hub, 1505
49 3 each	Engine Oil Filter, LF3349
50 2 each	Engine Fuel Filter, FF5052
51 1 each	Primary Air Filter, AF4668
52 1 each	Secondary Air Filter, AF 963
53 2 each	Water Fuel Separator, FF5079
54 2 sets	Engine Belts, 3911560
55 100 each	Conveyor Wheel Bolts (Lockwire), 1/2 x 2-1/4 Grd 5
56 10 each	5" OD Conveyor Wheel Washer, B880601 Rev A
57 30.5 m	12 Gauge Stainless Steel Ty-Wire
58 4 each	Electrical Contact Blocks, ZB2-BZ102 NC
59 1 each	Manual Control Valve Body, DGMFN-3-Y-A2W-B2W-21
60 1 each	Valve Bolt Kit, A920701

1	1 each	Filter, Ground Drive Suction, HC7500-SKS-8H
2	2 each	Filter, Auxiliary Return, HV7500-SKN-8H
3	1 each	Reservoir Breather, HC7500-SDP-4H
4	2 each	Seal Kit, Side Shaft Cylinder, KT25
5	2 each	Seal Kit, Steering Cylinder, KT35
6	2 each	Seal Kit, Leg Lift Cylinder, KT4
7	1 each	Idec Electrical Relay, RH2BUL-12VDC
8	1 each	P.Q. Controller, PQ 100-674
9	1 each	Backup Alarm 850
10	3 each	Fuses Buss 3 AGC
11	1 each	Tire and Wheel Assembly, C870715 rev 5
12		1400R20 Tire / 10-20 MD on 13-3/16 BC
13	2 each	Adjustable Carrier Wheel Assembly for Turn Section C880602 rev
14		1

16 The Engineer may, at any time, require the Contractor to purchase additional
17 replacement parts. When the TTV is no longer required for this project, new unused
18 excess replacement parts will be purchased from the Contractor by the Contracting
19 Agency if listed above or ordered by the Engineer. Replacement parts not listed above
20 nor ordered by the Engineer shall be considered ordered by the Contractor for his
21 convenience and will not be eligible for reimbursement.

23 The Contractor shall be responsible for the repair or replacement of the TTV and any
24 section of QMB damaged while in the Contractor's possession. The Contractor shall
25 notify the Engineer of the extent of the damage and give an estimate of the time it will
26 take to complete the repair.

28 If the Engineer agrees to the repair, the Contractor shall undertake repairs immediately.

30 QMB damaged beyond repair, as determined by the Engineer, shall be replaced with
31 undamaged sections. If the TTV is damaged beyond repair the Contractor shall notify
32 the Engineer immediately so that scheduling its use can be evaluated. Should a
33 replacement TTV be needed to complete the remaining work on the project the
34 Contractor, at the Contractor's expense, shall acquire a replacement or loaner TTV to
35 complete the unfinished work.

37 **Measurement**

38 Moving the QMB using the TTV will be measured by the meter along the QMB line and
39 slope. More than one pass to move the QMB from its current position to its new position per
40 the approved traffic control plan (ie a lateral shift greater than 5.5 meters) will be counted as
41 only one move. When moved twice in a single day, each move will be measured for
42 payment.

44 TTV mobilization will be measured per lump sum.

46 **Payment**

47 Payment shall be made in accordance with Section 1-04.1 for the following:

49 "Initial Delivery and Placement of QMB ", lump sum.

50 The lump sum contract price for "Initial Delivery and Placement of QMB " shall be full
51 pay for all costs associated with initially picking up the QMB, transporting it to the
52 jobsite, and placing the QMB in its initial position in accordance with the approved traffic
53 control plan, protecting the leading ends of QMB when placed in a storage location on
54 the roadway shoulder, return delivery of the QMB to the Contracting Agency storage
55 site upon completion of the project, and training Contractor personnel to operate and
56 maintain the TTV and QMB.

58 "Moving QMB with TTV", per meter.

59 The unit contract price per meter for "Moving QMB with TTV" shall be full pay for using
60 the TTV to move the QMB on the job site as specified, including providing trained